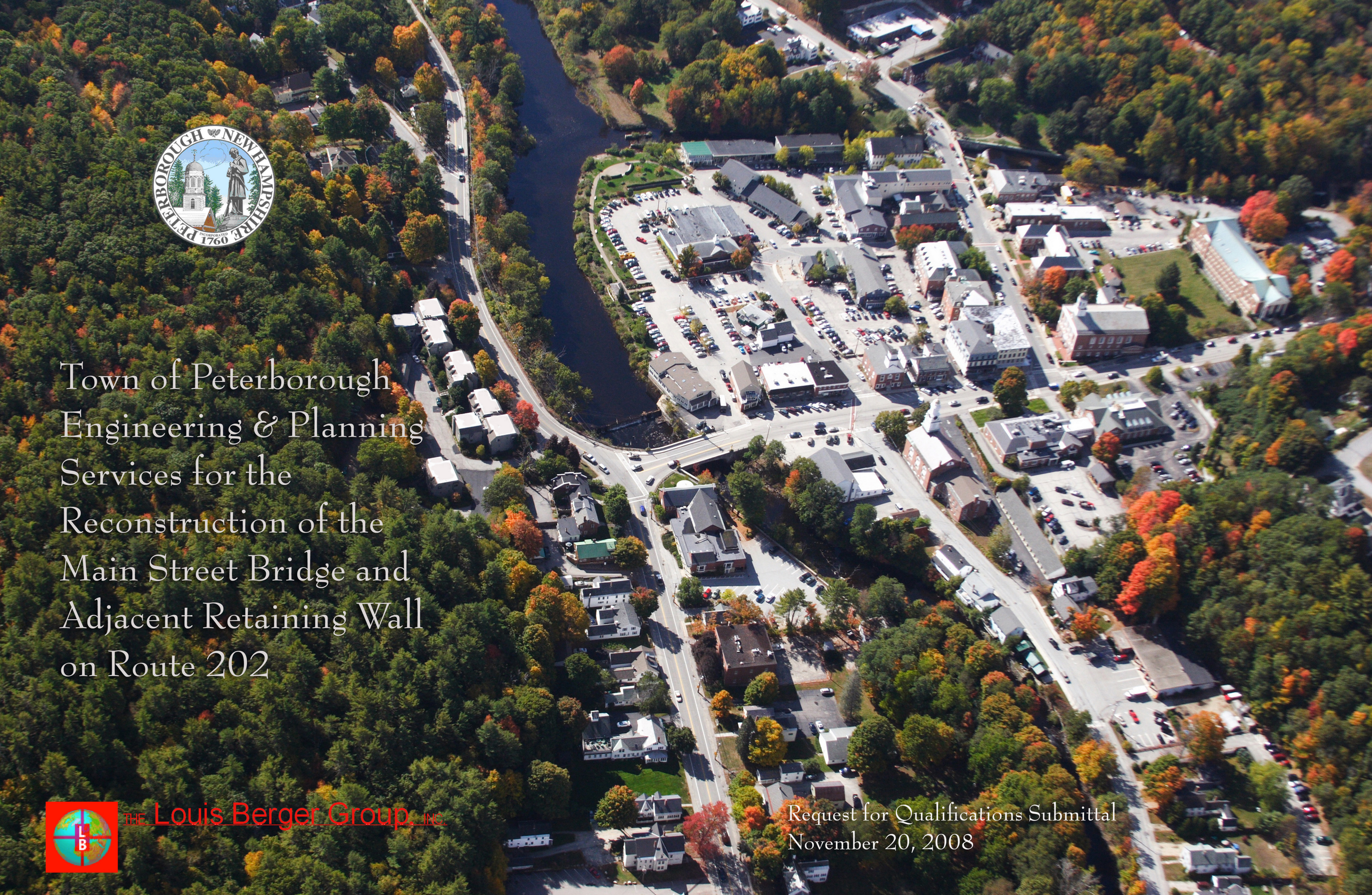


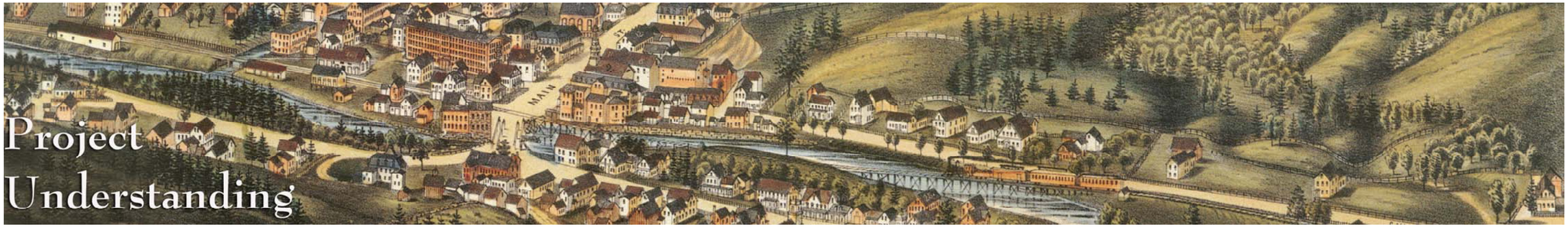
Town of Peterborough Engineering & Planning Services for the Reconstruction of the Main Street Bridge and Adjacent Retaining Wall on Route 202

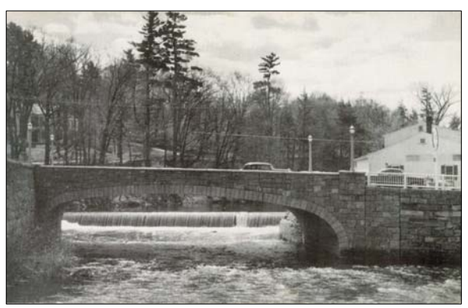
THE Louis Berger Group, INC.

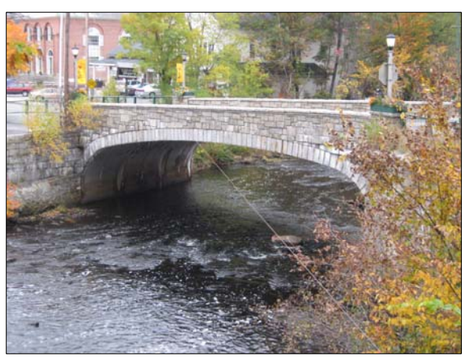
Request for Qualifications Submittal
November 20, 2008

TABLE OF CONTENTS

1.0 Project Understanding 2
1.1 Background 2
1.2 Key Issues 4
1.3 Essential Project Components 4
1.3.1 Context Sensitive Solutions 4
1.3.2 Traffic Management Plan 7
1.3.3 Historically Sensitive Design 7
1.3.4 Environmental Considerations 8
1.3.5 Geotechnical Considerations 8
2.0 Work Plan 10
3.0 Project Team 22
3.1 Firm Profiles 24
3.1.1 Louis Berger Group 24
3.1.2 IronWood Design Group 25
3.1.3 Paul J. McGinley 25
3.1.4 Ward Geotechnical Consulting 25
4.0 Team Experience 50







1. Project Understanding

1.1 Background

As with all of Peterborough and those who call "Our Town" their home, there is more to the Main Street Bridge than meets the eye. While reviewing pictures and reading stories about the Downtown, at the Peterborough Historical Society, we were struck by the fact that one of the earlier bridges at this location was known not as the Main Street Bridge but rather as the "Great Bridge." Such a noble name is deserving of a bridge with an equal amount of historic character. Perhaps one of the results from this project will be the restoration of Great Bridge as a local landmark.

The Main Street Bridge has deterioration of a type common with bridges built in the 1930's and 1940's. The current bridge was designed by the State Highway Department and was constructed in 1940 at a time when the role that air entrainment plays in enhancing the strength and durability of concrete was just beginning to be understood. We know from the testing of recent core samples taken from the bridge that the concrete was not air entrained and that half of the samples tested contained chloride levels sufficient to initiate corrosion of the embedded reinforcement steel. This corrosion results in the expansion of the steel and induces cracking along the direction of the reinforcement. This cracking allows the introduction of moisture into the concrete which leads to the more serious problem of extensive cracking due to alkali-silica reactivity (ASR). ASR is the process in which aggregate particles containing minerals such as silica, in the presence of moisture, are broken down by the alkaline environment of the concrete. Eventually, an alkali-calcium silica gel is formed which occupies more space than the original silica, creating tensile forces in the concrete which build to the point where cracking occurs. The cracking allows more water to penetrate the concrete and this moisture is absorbed by the gel, resulting in expansion of the gel and more extensive cracking. The ultimate end condition potentially includes failure or disintegration of the concrete.

Beginning at the upstream side of the Main Street Bridge an existing retaining wall extends approximately 1,000 feet southerly along the west side of NH Route 202 also known locally as Granite Street. A relatively narrow strip of wooded land, approximately 20 to 70 feet wide, is located between the face of the wall and the east bank of the Contoocook River. This land consists of a steeply sloping wooded embankment with large trees and underbrush that drops off from the base of the wall to the river's edge. Many of the large trees have been used as guy wire anchors for the utility poles located along Granite Street. The trees have started to grow around the wires and as a result some of them are dying. The vertical height of the wall varies between 3 and 17 feet along the length of the wall with about 17 feet at its highest near the bridge abutment.

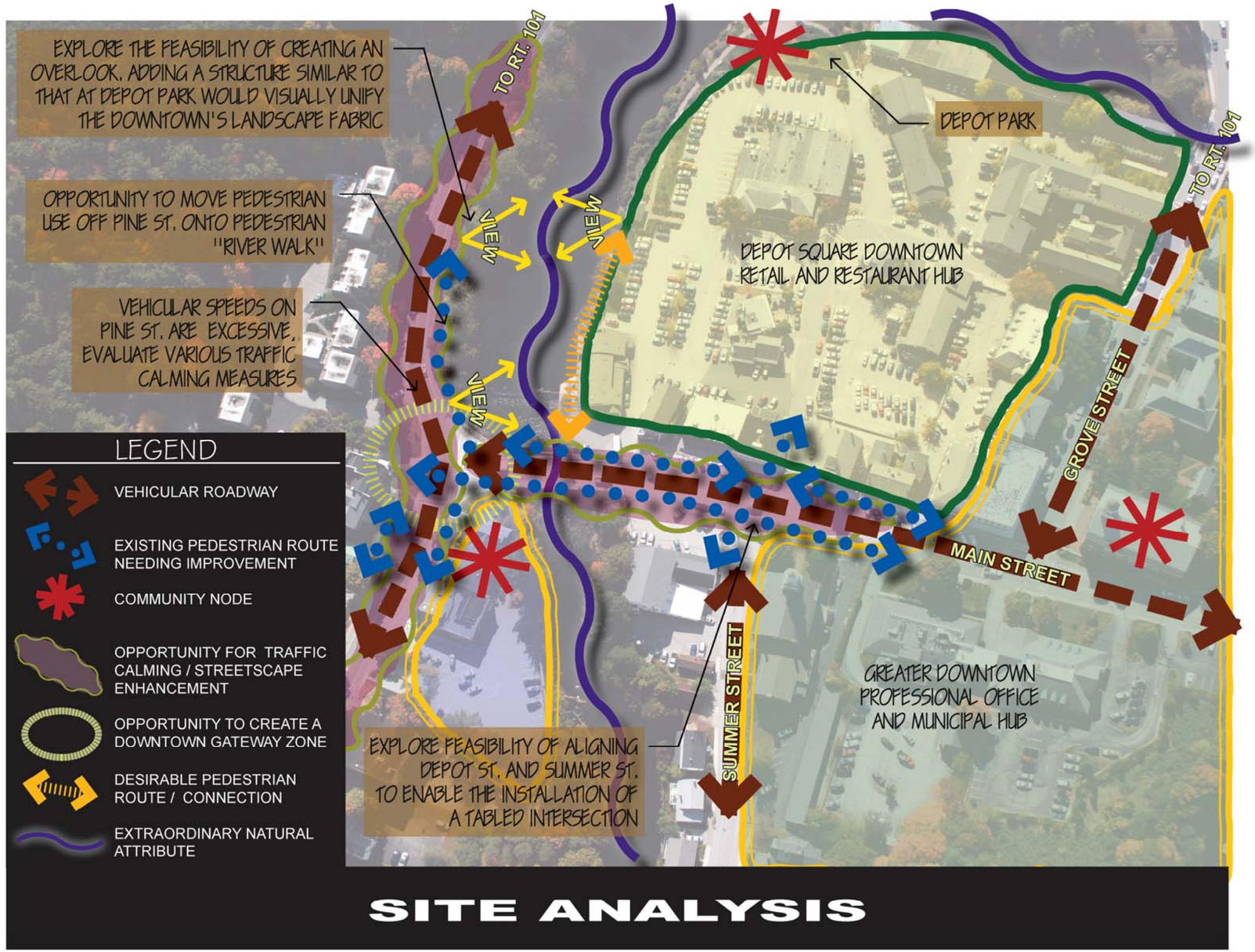
The northern half of the wall adjacent to the bridge is comprised of mortared dressed stone work constructed in 1940 as part of the wing wall for the Main Street Bridge and dry rubble masonry probably dating from the 1890's when the previous Great Bridge was constructed. The southern half of the wall is constructed of cast-in-place concrete, built sometime between the construction of the previous Great Bridge and the current Main Street Bridge. The foundation support systems for these wall segments are unknown at this time. Existing underground and overhead utilities are located in or adjacent to Route 202 and the retaining wall. These include water, sanitary sewer, storm drainage, electric, telephone and cable. The storm drainage is collected in catch basins located along the eastern side of Route 202, and discharges at several locations through pipes which protrude through the wall face and spill onto either concrete aprons or directly on the embankment. This discharge is causing erosion to the steep embankment areas. It has been reported that at least one of the storm drainage structures under Granite Street may have failed, which has caused pumping and migration of silts with subsequent settlement in the vicinity of the culverts.

The fence and sidewalk that are located along the westerly edge of Granite Street at the top of the wall are in poor condition and do not serve as crash-worthy vehicle barriers from the Contoocook River below. Several sections of sidewalk along the wall have experienced abrupt settlement of up to 6 inches, posing structural, safety and accessibility concerns. Southbound traffic on Granite Street has to negotiate a sharply curving roadway just past the intersection with Main Street with very little or no protection should a vehicle go off the road. Today's larger and longer trucks have difficulty navigating the tight reverse curves between the bridge and Pine Street, so they

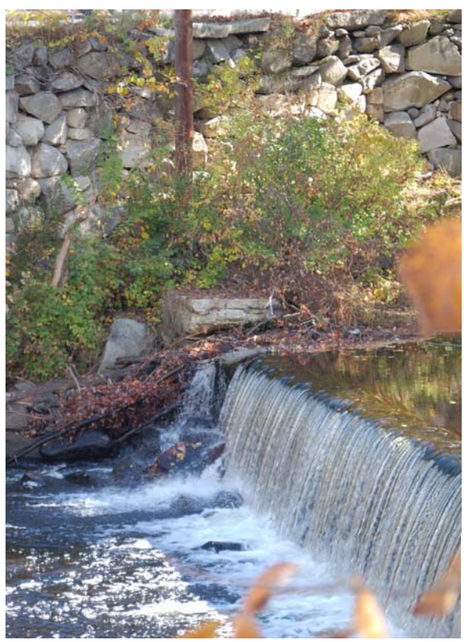
often end up traveling on top of the narrow sidewalk. For this reconstruction project, the sidewalks have been subject to quite a bit of discussion, alternatives could include placement on a separate pedestrian bridge, cantilevered to the outside, or provided on one side only. Ultimately the preferred alternative will depend on what the technical solutions are and what is feasible technically and economically. The sidewalks along Main and Granite Street will be re-constructed with the goal of keeping trucks off the sidewalks while they turn or continue along Route 202.

Lateral movements, tilting, and bulging of the rubble stone wall continues to be observed along the wall and the conditions may be worsening with time as the wall appears to be slowly failing and sliding towards the river. Soil erosion and sinkholes at several locations behind the wall have required regular repair. The Town is rightfully concerned that ultimately there may be a collapse if the underlying problems are not addressed. A partial or catastrophic failure of this wall would disrupt traffic on this section of Route 202 for a significant period of time and would result in detours that would have unacceptable impacts to the downtown commercial district, the local economy and quality of life in many quiet neighborhoods. In recognition that it will be easier and more cost effective to make planned repairs to the bridge and retaining wall than to have to undertake emergency repairs or replacement, the Town has spent considerable effort over the past several years to advance the importance of this project on the State's 10 year plan and obtain state funding.

The Main Street Bridge is on the NHDOT "Red List." Red List status doe not imply that there is an imminent threat to public safety or structural failure, but that one or more components of the structure have deteriorated to an unsatisfactory level and that inaction will eventually lead to restricting loads on the structure and possible bridge closure. The goal is to address issues



This Site Analysis has been created to depict the various features, viewsheds and opportunities that exist in the Main Street Bridge project area that can be used as a tool in the Public Informational process and may be useful in developing alternative design solutions.



reconstruction are maintaining a safe level of traffic during construction while also providing fire and emergency access. There will be a big demand for downtown merchant access during construction.

Although potential detour routes do exist, the Town does not have a specific detour plan at this time. Visitors would be expected to still head into town via Main Street during construction but locals would likely find their way around construction. One of these anticipated detours that locals may use includes Old Street and Summer/Hunt Street to Route 202. It is not known yet if the bridge will be left partially open or closed during construction; however, it is highly unlikely that the bridge will be closed for the duration of construction. It is more likely for it to be closed for a few hours or days at a time depending on what the technical solutions are and which construction approaches are feasible. It may also be beneficial to consider a temporary pedestrian bridge to increase available width during construction so that access can be maintained. The details of the re-built bridge, such as the width are not known but we do know the reconstructed bridge will resemble the old bridge.

Another key element nearby is the Transcript Dam, which is located upstream from the Main Street Bridge and is owned by the Town. The dam was rebuilt from an older dam associated with a grist mill in 1925 by the Transcript Printing Company and was operated as a hydroelectric facility until the early 1940's. It is a granite masonry dam with a vertical face and sloped crest that is capped with concrete. Previous assessments of the dam, including a 2001 study commissioned by the Town and an earlier assessment completed in 1987 by the NH Department of Environmental Services (NHDES), concluded that the dam is in a state of disrepair requiring extensive repair work. It has been reported that:

- The dam has numerous areas of leakage and many stones have been dislodged from the face of the dam which appears to have the potential for soil piping beneath the dam.
- The concrete portions of the abutments, intake structure and training walls are in very poor condition with erosion, exposed rebar and large areas of voids or cavities, the intake structure is inoperable and is in a state of disrepair.
- Although the west concrete retaining wall appears to be stable it has some section loss due to erosion. Continued erosion of the mortar and concrete facing may cause further loss of stones and weaken the wall. Collapse of the header stones on the outlet cavities could result in an abrupt failure of this westerly wall and pose a risk to the public.

Although the dam is classified as a type that would not be expected to result in loss of life or downstream damage in the event of failure, the potential impact to the Main Street Bridge in terms of scour of the sand and gravel bearing materials is considerable and suggests that a thorough re-evaluation of the dam should be an important component of this project.

1.2 Key Issues

With many projects the issues to be solved are complex and mostly technical in nature. Then there are projects, like the Main Street Bridge, where the issues are equally complex but mostly process oriented. The engineering challenges with the Main Street Bridge are ones that most firms can address. It is the process related issues associated with historic preservation and Context Sensitive Solutions (CSS) that are nuanced and require perhaps the most sensitivity as well as creativity, traits that many engineers find lacking. Traffic control during construction is perhaps the central and most important issue with downtown businesses, but in similar fashion as with the structural issues, the best solution will be founded on practicality and common sense.

We feel that the key for this project is how the selected team will appropriately address the three key issues of:

- Historic preservation of the bridge, Transcript Dam, and retaining wall as they have been central and important parts of the downtown viewshed for more than 100 years;
- Conducting the design in a Context Sensitive manner that is respective of the businesses and community as a whole. Standard application of the NHDOT CSS process will not work in this case as there are very specific and special needs of the downtown and Depot Square that need to be addressed;
- Taking this route out of commission will have a significant impact on the vitality of Peterborough because the Main Street Bridge is vital for commerce, downtown traffic, and emergency access.

1.3 Essential Project Components

In the previous section we highlighted what we felt were the three key issues to the project, we would like to expand upon that here to introduce how we will address those key issues and also introduce two additional areas of potential risk that we think should be acknowledged by the design team.

1.3.1 Context Sensitive Solutions

As we mentioned under key issues we feel that the CSS process needs to be tailored to the Main Street Bridge project. We have thought about some of these adjustments and thought that it would be helpful to understanding those adjustments by reviewing recent projects in Peterborough.

Feedback from Recent Projects in Peterborough

Successful projects don't happen by accident, there are lessons incorporated out of necessity and then specific problems and needs that inspire solutions and when all are in balance, there is the potential for success.

What follows is a breakdown of feedback from two recent projects in Peterborough that may help develop a project approach to accomplish the Town's goals for the Main Street Bridge:

West Peterborough TIF District

For those involved with the CSS process used on the West Peterborough TIF District (WPTIF) project, there are a few well understood experiences and lessons that should influence and improve the application of CSS on future projects in Peterborough. Although the overall application of the CSS process on the WPTIF project is an overwhelming success, the process has been evolutionary. Due to newness of the process the beginning was relatively slow and confusing for the public. This resulted in the need for adjustments throughout the project to improve and refine the process. In the end, the process presented at the June 26th Town Staff Retreat was overwhelmingly endorsed as a key component of future infrastructure projects in Peterborough. This endorsement was a reflection of the extraordinary effort put into the success of the process by the Directors of Public Works and Community Development.

Feedback on the WPTIF CSS process:

- The Project for Public Spaces (PPS) Place Audit was generally adapted for the Context Sensitive Solutions for West Peterborough, but the revisions to the audit survey were not extensive enough to fully reflect the uniqueness of West Peterborough.
- The kick-off meeting for the WPTIF project did not devote enough time to fully describe the CSS process and define what was expected of participants.
- It took the first few meetings in West Peterborough to settle on the appropriate forum and timing for the CSS meetings. In West Peterborough it was found that Saturday mornings were the best time to get the most productive input and eventually the meetings ended up being held at the Masons Lodge with breakfast being provided.

Downtown Low Impact Development Project

The Low Impact Development (LID) Demonstration Project, also known as the Contoocook River Urban Stormwater Improvements project, was completed this past summer through a NHDES Watershed Assistance grant. This project has improved stormwater drainage in the downtown area and included rain gardens at the Town House and Depot Park, infiltration basins on School and Depot Streets and a porous filtration strip in the municipal parking lot behind the movie theater on Depot Street.

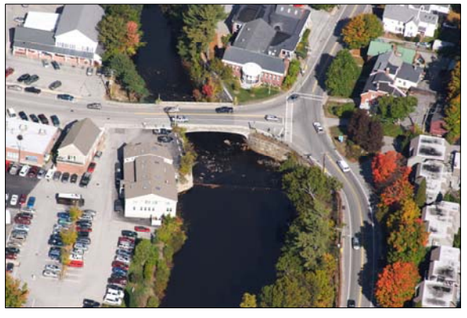
Feedback from the LID project:

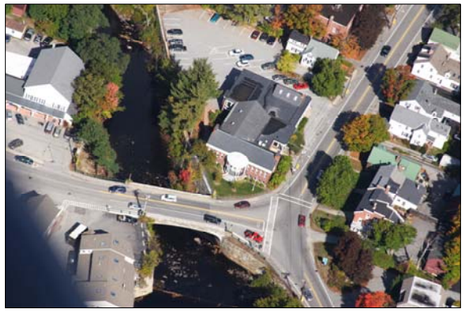
- Several business owners felt that not enough information was distributed about the project in advance of the informational meeting. This was important to those who had difficulty fitting the meeting into their schedule. This comment is similar to an issue with the WPTIF project regarding the level of information provided during the initial stages of the project.
- Business owners indicated that July is a big month for shops and restaurants in Peterborough. Projects that reduce parking are going to have a negative impact on businesses. The off-season months after the annual Peak into Peterborough and May are the best time to schedule meetings because businesses have more flexibility.
- Many who do business in the Downtown had a positive reaction to the availability of Town staff to meet with them and discuss the project and the schedule for construction. They were left with the feeling that the Town was really working with them.

Changes We Would Make to the CSS Process for the Main Street Bridge

After reviewing the feedback on the West Peterborough TIF District and Downtown LID projects we have developed the following changes we think would enhance the CSS process for the Main Street Bridge project:

- The Place Audit survey form needs to be revised for each project to address the characteristics of the project surroundings. We have developed a draft Audit Survey Form for the Main Street Bridge Project and included it in section 2.1.1
- The initial meeting(s) for projects using CSS need to clearly identify the process describing each of the steps and how they fit into the overall project schedule. We have developed a process specific to the Main Street Bridge along with a preliminary schedule as described in section 2.1.1.
- Projects within the Downtown should have meetings scheduled for weekday mornings prior to the opening of businesses. This will be the best time to meet with business owners who have a hard time breaking away once their shops or restaurants are open.
- Meetings need to recognize that the summer months are the peak season for businesses in Peterborough. Meetings should be scheduled for the period between the annual Peak into Peterborough and the end of May. The forum should move from business to business within the Greater Downtown to promote participation by the broadest cross section of businesses potentially impacted by construction.





Context Sensitive Solutions Process – Main Street Bridge

1 Problem Identification	2 Problem Solution	3 Solution Implementation	4 Operation-Evaluation
TIMELINE:			
January to May 2009	**May to December 2009**	**January to September 2010 Final Design** **2011 – 2012 Construction**	**2012**
· Identify problem or need · Identify stakeholders · Establish outreach process · Partnership building	· Conduct Place Audit · Develop consensus on Problem Statement · Develop consensus on a Vision Statement · Agree on project limits · Develop range of alternatives · Evaluate alternatives · Secure consensus on best alternative · Create conceptual design · Preliminary engineering of selected alternative	· Final design of selected solution · Prepare bid package · Advertise and bid project · Award contract · Construction	· Make any necessary adjustments · Monitor maintenance agreements · Evaluate the project · Capture lessons learned · Provide feedback · Provide input to new problems & needs identification
PRODUCTS: · Stakeholder list · Preliminary identification of issues	**PRODUCTS:** · Problem Statement · Vision Statement · Conceptual Design · Preliminary design	**PRODUCTS:** · Final Design · Bid Package · Completed project that meets purpose	**PRODUCTS:** · Adjusted facility · Captured lessons

1.3.2 Traffic Management Plan

Mission of the TMP

The project has the potential to significantly impact vehicular and bicycle-pedestrian traffic in Peterborough. On the typical busy weekday or weekend, the intersection of Main Street with Granite/Concord Streets experiences rush hour traffic backups to the extent that during a recent traffic study it was recommended that a traffic signal be installed. Without a TMP during the bridge reconstruction/replacement, businesses within the Downtown and Depot Square could be impacted and emergency access to the east side of the Contoocook River compromised. An impact of this magnitude may cause potential visitor trips to be canceled and local trips to be diverted to other routes that may not be suitable to increases in traffic.

An important component of the project will require the design team to work collaboratively with local officials and stakeholders on developing a TMP to lessen the traffic impacts on the Downtown, Depot Square, emergency access and bicycle-pedestrian traffic. We envision the following goals for this effort:

- Maintain visitor and local traffic mobility in and through the Downtown and Depot Square, and manage detour routes that may be used by locals or that may be necessary for temporary (hours or days only) closures.
- Minimizes disruption of parking within the Downtown and Depot Square by providing staging areas and construction worker parking outside the merchant areas and municipal parking areas. Potential sites include off Summer Street or on the back side of the Free Library.
- Maintain effective communication with the public, local government, adjacent neighborhoods, businesses, other stakeholders and emergency services providers during construction to insure proper coordination of efforts.
- Institute a workable TMP that maintains project construction cost-effectiveness and schedules, while addressing local access, minimizing impact to the local economy and maintaining emergency access.

TMP Strategies

The TMP should be comprehensive and responsive. It takes advantage of a range of alternative transport modes from bikes to buses to achieve a targeted 26% reduction in vehicular trips. The Plan identifies strategic traffic control measures to keep traffic moving. Key to the Plan is the public communications component.

Bridge Lane Treatment

At least one lane will be kept open on the bridge at all times through the use on temporary traffic signals. During the preliminary design phase, every attempt will be made to determine if it is technically and economically feasible to maintain two-way traffic during construction. To provide for traffic and safe work zones it may require the removal of both sidewalks during construction with accommodation on a temporary single-span pedestrian bridge.

Incident Response

Emergency services are located on Summer Street just north of Main Street. Although it is possible to access Route 202 by traveling northerly along Summer Street, response time would be adversely impacted. It will be important to make every effort possible to preserve public safety during construction by providing access for emergency services. Roadway incidents adjacent to construction zones will need to be promptly addressed and removed to facilitate the continuous flow of traffic.

Public Outreach Program

The success of the TMP and any alternatives will rest on the level of public participation. An aggressive, multi-leveled public outreach program will be initiated to increase public participation. It is important to begin the public participation process during the design process and continue through the construction phase.

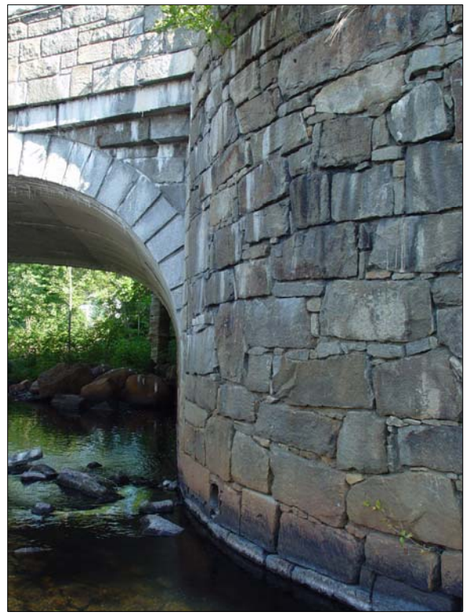
TMP Public Participation

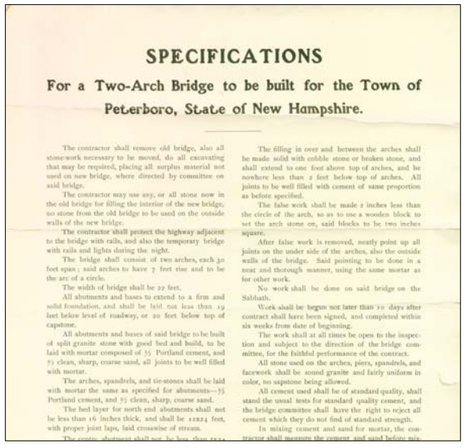
It may be possible to use the GDTIF Advisory Board to serve as a "Focus Group" to provide feedback on the TMP and communicating the TMP and any alternatives to the public.

1.3.3 Historically Sensitive Design

This project will create an enhanced gateway into the Peterborough downtown that reflects the history of the area as an early river crossing at the historic mill site by interpreting the industrial history of harnessing the river's waterpower and revealing the natural resources of the river. The historically sensitive renovation or replacement of the Main Street Bridge to meet modern transportation standards will also provide improved pedestrian sidewalks and trails that maximize views and enjoyment of the riverfront and the waterfall at the Transcript Dam.

Possibly locating the sidewalk along Granite Street at a lower level than the roadway at the reconstructed retaining wall may reduce reconstruction costs of the retaining wall and the required fill costs of a widened street and sidewalk while also providing pedestrians with a safer sidewalk and enhancing their visual enjoyment along the historic riverfront and waterfall of Transcript Dam. This new lower sidewalk would have a more user-friendly grade for pedestrians and would be connected by a sidewalk over the refurbished Main Street Bridge (or by a sensitive attached or an entirely separate new sidewalk that would enable





SPECIFICATIONS

For a Two-Arch Bridge to be built for the Town of Peterboro, State of New Hampshire.

The contractor shall remove old bridge, also all stone-work necessary to be moved, do all excavating that may be required, placing all surplus material not used on new bridge, where directed by committee on said bridge.

The contractor may use any, or all stone now in the old bridge for filling the interior of the new bridge, no stone from the old bridge to be used on the outside walls of the new bridge.

The contractor shall protect the highway adjacent to the bridge with rails, and also the temporary bridge with rails and lights during the night.

The bridge shall consist of two arches, each 30 feet span; said arches to have 7 feet rise and to be the arc of a circle.

The width of bridge shall be 22 feet.

All abutments and bases to extend to a firm and solid foundation, and shall be laid not less than 19 feet below level of roadway, or 20 feet below top of capstone.

All abutments and bases of said bridge to be built of split granite stone with good bed and build, to be laid with mortar composed of 1) Portland cement, and 3) clean, sharp, coarse sand, all joints to be well filled with mortar.

The arches, spandrels, and tie-stones shall be laid with mortar the same as specified for abutments—1) Portland cement, and 3) clean, sharp, coarse sand.

The bed layer for north end abutments shall not be less than 16 inches thick, and shall be 12x24 feet, with proper joint laps, laid crosswise of stream.

The filling in over and between the arches shall be made solid with cobble stone or broken stone, and shall extend to one foot above top of arches, and be nowhere less than 2 feet below top of arches. All joints to be well filled with cement of same proportion as before specified.

The false work shall be made 2 inches less than the circle of the arch, so as to use a wooden block to set the arch stone on, said blocks to be two inches square.

After false work is removed, neatly point up all joints on the under side of the arches, also the outside walls of the bridge. Said pointing to be done in a neat and thorough manner, using the same mortar as for other work.

No work shall be done on said bridge on the Sabbath.

Work shall be begun not later than 10 days after contract shall have been signed, and completed within six weeks from date of beginning.

The work shall at all times be open to the inspection and subject to the direction of the bridge committee, for the faithful performance of the contract.

All stone used on the arches, piers, spandrels, and facework shall be sound granite and fairly uniform in color, no sapstone being allowed.

All cement used shall be of standard quality, shall stand the usual tests for standard quality cement, and the bridge committee shall have the right to reject all cement which they do not find of standard strength.

In mixing cement and sand for mortar, the contractor shall measure the cement and sand before mix-

pedestrians to enjoy the arched granite façade of the refurbished new bridge).

The awkward and unattractive small parking area and inconsistent pavement widths at the southwest end of the bridge and Main Street could be transformed into a small landscaped park to provide an attractive streetscape and entrance into the downtown business area. The new bridge sidewalk would pass through and be connected to an enhanced downtown sidewalk network with attractive street furniture, period street lighting and traffic calming crosswalks.

The combined Main Street Bridge Reconstruction and Intersection Improvement Project provides many creative opportunities to efficiently and sensitively enhance the gateway and overall historic environment of downtown Peterborough while substantially improving the area's transportation network.

As an integral component of an intimate understanding of the combined bridge reconstruction and intersection improvement project, Paul McGinley, AICP - Preservation Planner and Historic Bridge Consultant, will undertake a comprehensive historical survey and inventory of the bridge and buildings within the project area and immediate adjacent areas to ascertain the historical context within which the project activities will be undertaken. Initial contact has already been made with the Peterborough Historical Society to review existing surveys and background data on the history of the bridge site and surrounding area including Transcript Dam, the former mill site, head and tail races, retaining walls and adjacent buildings of the downtown area.

The historical survey and inventory will determine all of the historical parameters and character-defining elements that must be considered and respected in the development of a historically sensitive design for the combined bridge/intersection improvement/ retaining wall project. It will also determine properties that are listed or are eligible for listing in the National Register of Historic Places and including preparation of a DHR Project Area Form. This will provide a sound basis for historical reviews of project proposals with the Peterborough Heritage Commission, NHDHR and NHDOT as required under Section 106. Data and results of the historical survey and inventory will be illustrated on project base maps and site plans.

1.3.4 Environmental Considerations

The Main Street Bridge will be funded under the NHDOT Bridge Aid Program and a portion of the match will come from federal highway funds. Generally, projects using federal funds are considered federal action projects which means they are subject to review under the National Environmental Policy Act (NEPA). For projects like the Main Street Bridge the important issue is whether there are impacts below the ordinary high water line and of what magnitude these impacts are since these can be the trigger for a Section 404 Army Corps of Engineers (ACOE) permit and also determines in part the extent of any environmental documentation that will be needed. Typically for a bridge replacement, the impacts to sensitive resources are low enough that the project can be classified as a Categorical Exclusion (CE) which lessens the level of environmental documentation needed. We have evaluated the range of permits and documentation that may be necessary and have identified the ones listed below. This list would be subject to a more thorough evaluation as the project gets underway and more details of the selected alternative become known:

- NEPA Categorical Exclusion;
- ACOE Section 10 and Section 403;
- ACOE Section 404;
- NHDES Alteration of Terrain Permit;
- NHDES Alteration of Terrain Permit;
- NHDES Comprehensive Shoreland Protection Act (CSPA); and
- Section 106 of the National Historic Preservation Act.

There may also be other permits that will be triggered depending upon impacts to the floodplain, the Transcript Dam, fishery resources (Salmon) or endangered species. The National Historic Preservation Act is certainly a critical element of the environmental documentation as the bridge was evaluated in a statewide bridge survey as eligible for listing on the registry. The bridge accorded "state level" significance which will require that a specific process be followed for the reconstruction or replacement of the bridge and portions of the retaining wall. The requirements of the CSPA can be very restrictive in terms of limitations on the cutting of trees within a protected area. A determination will be required as to whether the land adjacent to the Contoocook River can be classified as "special localized urbanized conditions" which would carry an exemption from the CSPA. This would require the Select board to make a formal request of the NHDES Commissioner to classify this area as exempt. One final environmental consideration is the status of the groundwater contaminant plume that is currently under study by the NHDES with monitoring wells installed in Depot Square. Of critical importance would be how this plume would interact with any dewatering that may be required during the bridge reconstruction/ replacement.

1.3.5 Geotechnical Considerations

As discussed in other sections, the project involves the rehabilitation or replacement of the Main Street Bridge over the Contoocook River and the adjacent retaining walls along the west side of Granite Street from Main Street to Pine Street.

The existing bridge is a concrete arch structure with stone masonry facing and stone masonry wing walls. The existing bridge was constructed in the early 1940's to replace a bridge that was damaged during flooding. Options to be considered for the bridge include rehabilitation of the superstructure, widening, and complete replacement. If the structure is to be widened or

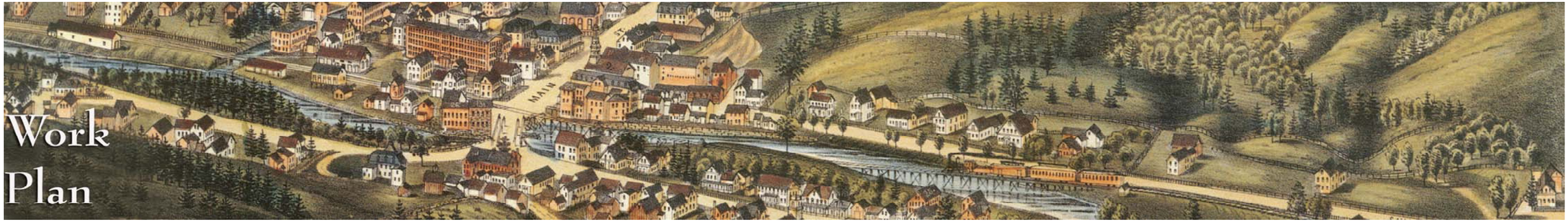
replaced, it is likely that the stone masonry facing will be retained to maintain the current appearance of the structure.

The stone masonry wing walls immediately adjacent to the existing bridge appear to be in good condition. These walls were constructed using cut and dressed masonry blocks. However, the wing wall at the southwest quadrant of the bridge was constructed on top of a concrete structure containing penstocks for the Transcript Dam, which is located immediately upstream of the bridge. The concrete is in very poor condition, showing signs of spalling and erosion. The wing wall at the northwest quadrant contains an outlet for a covered canal.

The cut stone masonry wing wall at the southeast quadrant transitions to a rubble stone masonry wall, and then to a concrete retaining wall, which support Granite Street between Main Street and Pine Street. Both the rubble stone wall, which forms the right (east) abutment of Transcript Dam, and the concrete wall are in very poor condition and are expected to be replaced as part of the project. Several options could be explored for replacement of these walls, including a conventional cast-in-place concrete cantilever or gravity wall, a segmental retaining wall, or a permanent tied-back soldier pile and lagging wall with concrete and stone facing. The evaluation of the various options must consider cost, construction access, the extent of disturbance to sensitive areas between the wall and river, traffic routing during construction, and the need for (and location of) a sidewalk along the west side of the road. The evaluation must also consider subsurface conditions (soil bearing conditions and depth to bedrock) and slope stability.

The Transcript Dam is located immediately upstream of the Main Street Bridge. The dam is a “run-of-the-river” structure constructed of timber cribbing with boulder infill. Craig Ward of WGC conducted a preliminary geotechnical evaluation of the dam while with his previous employer and is familiar with the condition of the dam. The timber cribbing is in poor condition and the sand with gravel foundation soils have been scoured in several locations along the toe of the dam. There is excessive seepage at the right abutment of the dam, which is the rubble stone retaining wall that supports Granite Street. At the time of the preliminary evaluation of the dam, the Town was considering several options for addressing the dam, including removal, rehabilitation, and replacement. Selection of the most appropriate option will depend on several factors including the frequency and severity of flooding in the business district, costs, and aesthetics. Also, the dam currently provides some protection to the bridge by breaking up ice flows.

The fate of the Transcript Dam will significantly impact the evaluation of bridge and retaining wall options, and the dam should be included in the study. As previously indicated, the rubble stone retaining wall supporting Granite Street forms the right abutment of the dam. The left abutment and associated penstocks support the cut stone retaining walls between the dam and the southwest quadrant of the bridge. Also, any changes to the height of the dam could alter flow and ice conditions at the bridge.



2.0 Work Plan

The following work plan outlines the approach we would take to the planning, design and permitting for the Main Street bridge project.

Context Sensitive Solutions

The Context Sensitive Solutions (CSS) process to be used on the Main Street Bridge and Retaining Wall project will be adjusted from the process used by NHDOT and the one that was used successfully on the West Peterborough TIF District project. These adjustments are a necessary recognition that there are differences in the Downtown area with regards to appropriate days and times to schedule meetings and that there are improvements to the process that can be made to maximize the productivity of the initial meetings held on the project and make the place audit tools more site specific.

The primary components of the CSS process will apply to all aspects of the project and represent a philosophical approach to the development of the project. At the outset Public Involvement will be the forum for soliciting input from stakeholders and concerned citizens on the problems and needs as well as the vision for the near and long term future of the bridge and adjacent areas. The process will be open and transparent and will be used to focus this input into a Problem Statement and then a Vision Statement that lay out the groundwork and goals to be addressed in the conceptual engineering. In a collaborative manner it will only be after reaching consensus at each step that we will move forward so that by the time we have committed efforts to developing a conceptual plan there is broad support and consensus for what is being done and how it will be accomplished. The tools we will use from an engineering perspective will not be the traditional design standards and criteria instead we will bring flexibility to the old standards that will allow us to better accommodate the work while preserving the look and feel of the bridge and it's view from the Downtown and the riverside park. We will bring traffic calming techniques and streetscape components that reflect treatments being used in other parts of Town to help preserve the fabric of Peterborough.

Public Involvement and Outreach

It is known that merchants in the Downtown and Depot Square experience their peak volume of business during the period from late May through the annual "Peak into Peterborough" held in mid-October. The quiet months before and after that period are good times to focus on public outreach. We anticipate the months of January through May to be spent on the ground meeting with merchants, stakeholders and concerned citizens as often as every 3 to 4 weeks. These meetings would rotate around the Downtown and Depot Square including the upstairs function room at Intermezzo, the Twelve Pine Marketplace, the Toadstool Bookshop, Townhouse and other venues as available. We anticipate that the Greater Downtown TIF Advisory Board would provide the forum for these meetings but would not have formal oversight on the project. We would expect to have several introductory meetings on the project prior to conducting the Place Audit in the late spring and development of the problem and Vision Statements shortly there after. Conceptual Engineering would not be undertaken until late in 2009 to allow the process to develop the consensus needed on the proposed plan and the important considerations such as Historic preservation and Traffic Management during Construction.

Strategies to be used for the Public Involvement and Outreach during design through construction phase will include:

- Conduct the Project Kick-Off meeting in an informative manner that fully describes the process to be used on the project, the schedule, how the meetings will be conducted, the expectations for the meetings, and what the attendees can expect along each step of the project.
- Bring the information on the project to the places where the merchants, stakeholders and concerned citizens are. Make the time and location convenient to the most people to maximize the potential turnout.
- Make the greatest use of the Town website, newsletters, mailing lists, bulletin boards, the Chamber of Commerce web site as well as those of other businesses if possible to get

the word out about past and upcoming meetings.

- Be available to meet with merchants, stakeholders and concerned citizens outside the forum of official meetings to work closely with them to understand their concerns and needs and minimize economic impacts.
- Develop a Main Street Bridge and Adjacent Retaining Wall specific Place Audit form to be used in the late spring for the Place Audit. The intent will be to have questions that are appropriate to that area and that can help focus the input and discussions.
- Develop a business survey that can be used to assist in developing an amenable construction sequencing scenario.
- Prepare a weekly electronic construction update/progress report and send it to property owners, tenants, Chamber of Commerce, etc.
- Initiate a bi-weekly a.m. coffee meeting with City staff, contractors, engineer, property owners, and tenants.
- Develop flyers for merchants to display – "Pardon our Dust"
- Facilitate a temporary public art exhibit during construction as a way of counteracting the negative impacts of construction; an example might be a storefront art campaign.

Landscape-Streetscape design

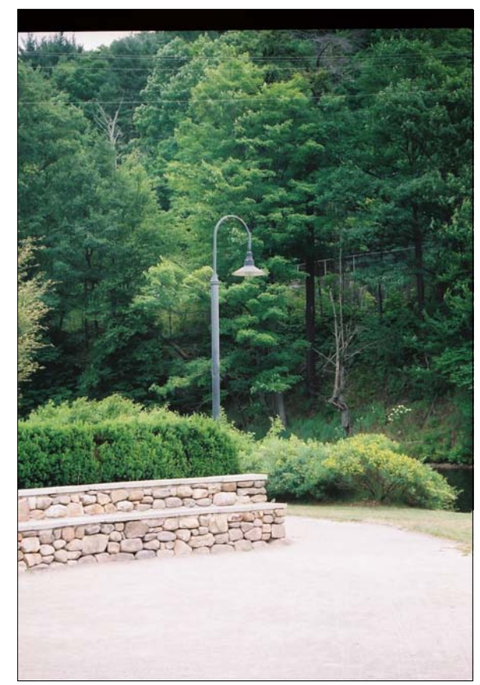
The center of Peterborough has long been established as the confluence of the Contoocook and Nubanusit Rivers. In order to preserve the connectivity of downtown with its outlying neighborhoods, the integrity of the bridges spanning these rivers must be maintained. It is this connectivity, and the perceived and actual walkability of Peterborough that are of the greatest importance to reconstruction success of the Main Street Bridge and its adjacent retaining wall. The concepts of an integrated landscape, streetscape and traffic calming design style that we use for CSS requires that we work collaboratively with Town leaders and staff, Town committees, stakeholders and community members. Some of the goals for landscape-streetscape design include:

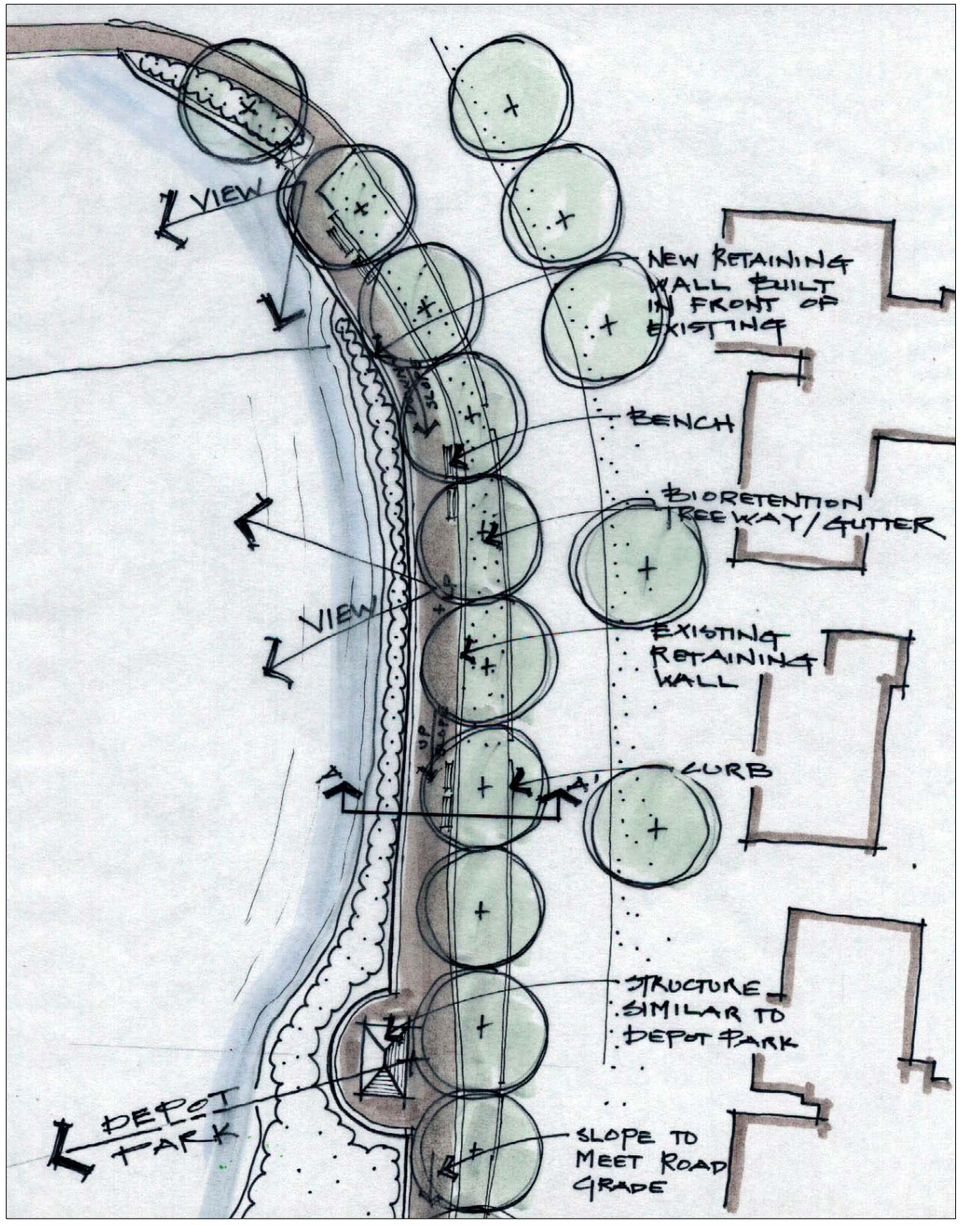
- Recognize the importance of the current bridge design and historical preservation components that will need to be reflected in the streetscape design such as the stone parapet walls, railings and street light fixtures.
- Approach Peterborough's historical and cultural nodes and architecture with sensitivity; balance the needs of today with the requirements of preservation to unify the streetscape
- Improve streetscape aesthetics. Utilize design elements such as accent paving, site furnishings, and landscaping to create a sense of place.
- Utilize alternative stormwater management techniques; such as rain gardens, bio-retention cells, and pervious pavements whenever possible to minimize pollutant charged stormwater from flowing unimpeded into water bodies, consistent with the Low Impact Development demonstration project recently completed in the Depot Square area.
- Incorporate sustainable design into all aspects of the project and evaluate "green" options in collaboration with Town staff.
- Develop a design and associated construction details that ensure maximum longevity of constructed elements. High quality materials and construction yields sustainability.
- Consider the source of specified materials and when feasible utilize regionally manufactured products and/or those products that embrace sustainability.
- Reuse salvaged materials and recycled base materials where available and appropriate.
- Develop a design that encourages alternative modes of transportation such as bicycles.
- Incorporate signage into the project that provides an opportunity for the new Welcome to Our Town signs as well as interpretive opportunities for historical features, landscapes and components of the area including the Transcript Dam, previous bridges at this location and historical buildings.

Pedestrian Access - Walkability

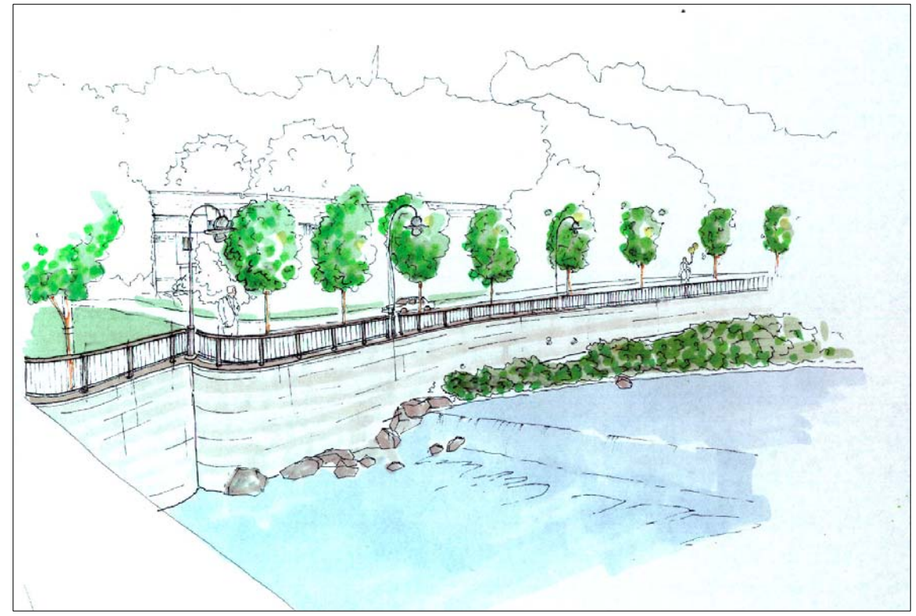
As a part this effort we need to determine the best means for pedestrian crossing on the Main Street Bridge: on a separate bridge cantilevered to the outside of the vehicular bridge or as a side walk on the vehicular bridge perhaps with overlooks to allow an appreciation of the viewshed upstream from the bridge. We also would propose to explore the feasibility of developing a pedestrian walkway or river walk along Pine Street. This concept of a riverwalk partway up a two tiered retaining wall is worthy of evaluation for several reasons:

- By leaving the existing retaining wall intact and constructing a new wall to the west opportunities are created to

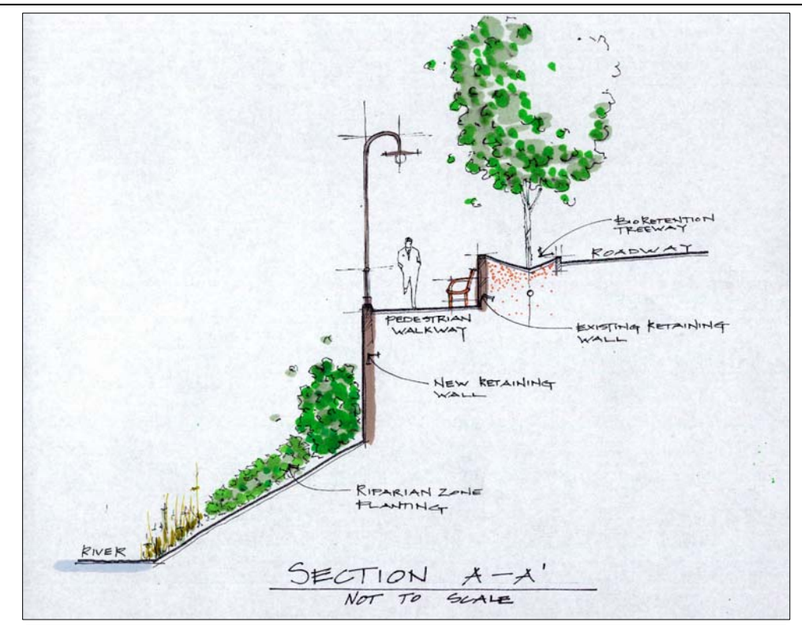




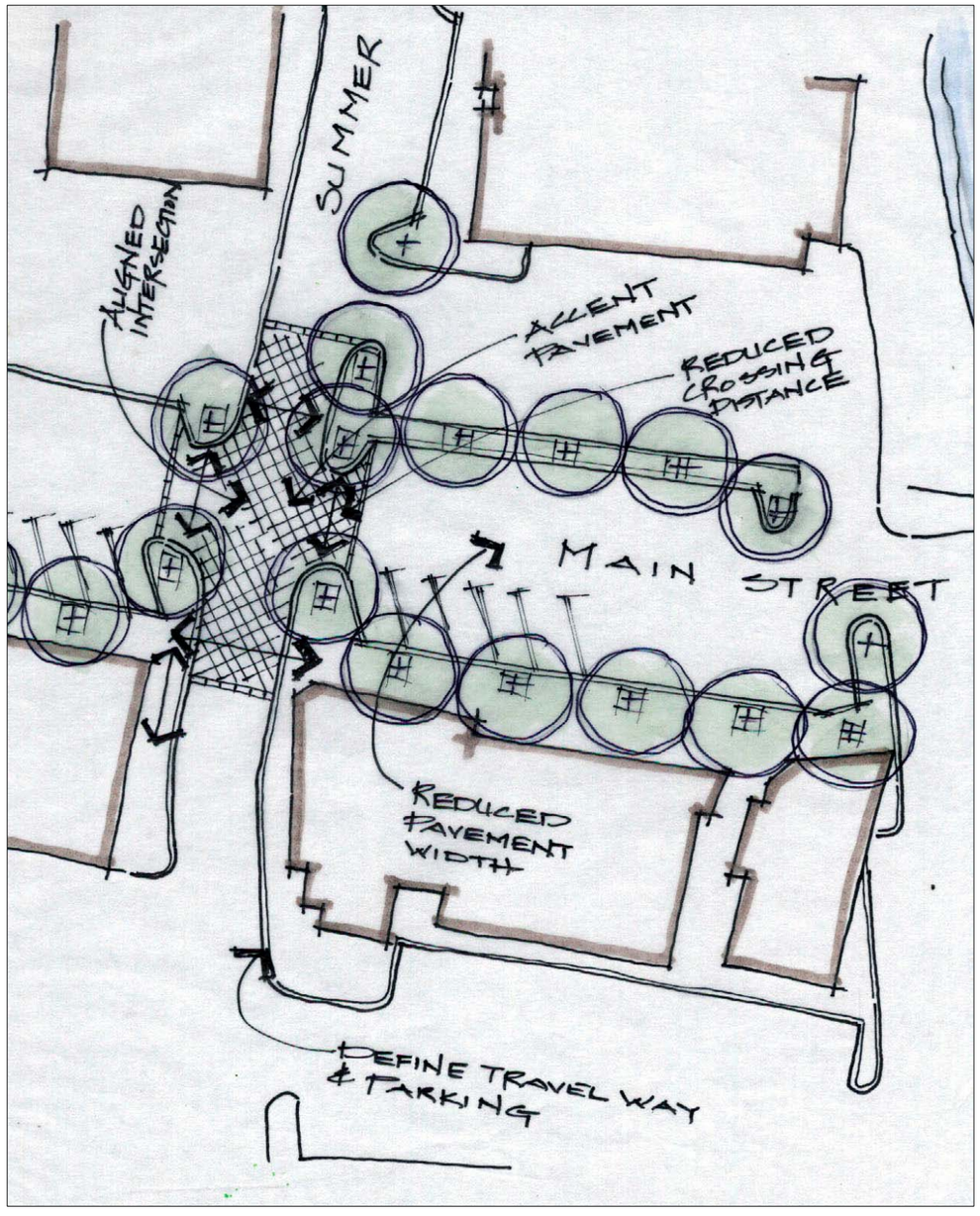
Conceptual Plan View of Riverwalk Alternative for Sidewalk Along Granite Street



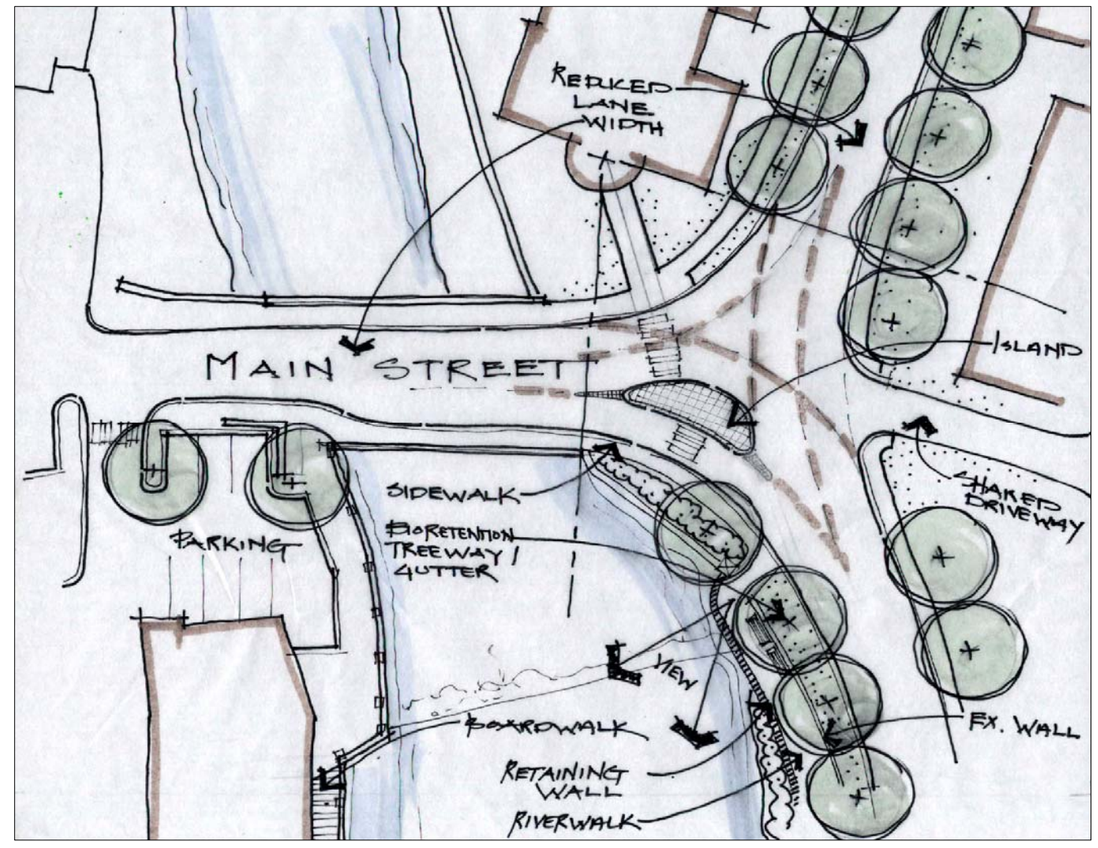
Perspective View of Retaining Wall With Riverwalk Looking From Main Street Bridge



Section Through Riverwalk Looking Northerly



Conceptual Plan Traffic Calming at Summer Street and Depot Street



Conceptual Plan of Pedestrian Access Improvements at Main Street Bridge and Contoocook River

explore pedestrian access along the water.

- A pedestrian sidewalk along the river would offer unprecedented views of picturesque depot square.
- Developing a pedestrian river walk would further unify the downtown by extending public access and open space along more water frontage. This is shown conceptually on the previous page.
- Inter-weaving park space between varying land use zones (commercial, residential, etc.) opens up greater opportunities for public enjoyment, tourism, and exercise.
- Leaving the existing wall in place may reduce the need for a road closure.

Traffic Calming Components

We will explore and evaluate traffic calming options consistent with those in use or to be constructed in other parts of town and identify conflict points between vehicles, pedestrians, and bicyclists. There are several considerations within the approaches to the bridge where improvements could be made. On the westerly approach the angle parking could be better defined through the use of bump outs. The poorly defined pedestrian corridor through here could also be better identified through the use of a raised crosswalk or through the use of a maintenance free imprinted resin inlay crosswalk such as the IMPRINT pavement texturing system. This would serve to better identify that you are entering the downtown and serve to slow traffic. We have shown some conceptual improvements in plan view on the preceeding page.

Maintenance of Traffic

The Main Street Bridge over the Contoocook River is an important connection between the Peterborough business district and Route 202, the primary north-south route in the region. According to traffic count conducted by NHDOT in August of 2007, the bridge carried approximately 16,000 vehicles per day, with over 1300 vehicles in the afternoon peak hour. In addition to these vehicles, consideration must be given for maintaining safe passage of pedestrians between the downtown area on the west side of the bridge and residential areas and the library on the east side of the structure.

The preferred traffic management plan (TMP) will need to balance the desire to minimize disruptions to the traffic flow in the area and the need to provide a cost-effective construction project. A range of traffic management alternatives will be prepared, evaluated, and discussed with the stakeholders. The selected plan must consider the impacts to traffic flow and construction limitations. Some of the alternatives for the TMP may include:

- Complete closure of the bridge to all traffic;
- Construction of a temporary bridge;
- Maintain traffic flow in one direction at all times;
- Install a temporary traffic signal to provide one-way alternating flow; and
- Allow two-way flow with multiple construction staging.

The complete closure of the bridge to all traffic would provide the quickest, safest, and most cost efficient construction operation, but would severely disrupt traffic flow in the area, and could adversely affect the businesses in the downtown. All traffic would have to be detoured to the south to use Route 101, creating longer travel paths and adversely affecting the capacity and operations at the intersection of Route 101/Granite Street and at the intersection of Route 101/Grove Street/Jaffrey Street.

Based on the limited right-of-way, the presence of existing buildings near the bridge, the short distance available to transition the alignment, and the cost associated with a temporary structure, the construction of a temporary bridge does not be a practical solution for this project.

Another alternative would be maintaining traffic flow in one direction at all times, but detouring traffic in the other direction. Maintaining the current westbound traffic appears to be preferable, since it would allow traffic on Route 202 to enter the business district as they currently do. Business traffic leaving the district would be signed to travel on alternative routes and would encounter the longer travel paths and the potential delays at the Route 101 intersections. It is probably easier to sign and less disruptive to the businesses to establish the westbound flow rather than the eastbound direction.

Installation of a temporary traffic signal at the intersection of Main Street and Route 202 would allow alternating one-way traffic across the bridge. The stop line for eastbound traffic would be placed to the west of the bridge, resulting in long clearance times and potentially lengthy delays for all vehicles.

Allowing two-way traffic with staged reconstruction of the bridge would provide the least disruption to traffic operations, but would result in longer and more costly construction. Due to the need to excavate to the full depth of the existing structure, very small work areas will be available at any given time, resulting in extensive sheeting, and multiple staging and shifting of traffic flows. The size of the work area and the number of phases will depend on whether the

bridge cross section will be maintained or expanded. If the bridge is widened (as described in the Typical Cross Section), the stage construction alternative may be more practical. Maintaining pedestrian traffic would be extremely difficult, and may require a temporary river crossing to provide a safe route for pedestrians.

Although all of the alternatives listed above (and any others presented by the stakeholders) above will be considered during the evaluation process, it appears that alternatives 3 and 4 provide the most reasonable compromise between the business and construction needs. If the bridge is to be widened, then alternative 5 may also be viable. Traffic counts should be conducted at the intersections of Main Street/Route 202, Routes 101/202 and at Route 101 and Grove Street. Capacity analysis would be conducted to determine the changes and Level of Service and delays at all intersections for each of the alternatives. A determination would be made on whether adjustments to signal timings or temporary police control of any intersection would provide acceptable traffic operations during the construction period.

Roadway Design

The reconstruction of the Main Street Bridge and the retaining wall on Route 202 should include consideration of improvements at the intersection of Main Street and Route 202. This intersection has been identified as a problem location in a number of previous studies. The U.S. 202 Corridor Study, completed in 2002, recommended that consideration be given to the placement of a traffic signal at the intersection. The 2006 Master Plan Update identified this intersection as one of four intersections in the Town with significant capacity and/or safety deficiencies and recommended that "signalization or other appropriate measures" be implemented.

As part of the engineering for the Main St. Bridge and the retaining wall on Route 202, updated traffic counts should be taken to provide current information. A Traffic Signal Warrant Analysis should be completed to determine if signals are justified, and capacity analysis should be conducted to verify that the proposed design will adequately handle to traffic. If signals are installed, emergency vehicle pre-emption equipment should be included to expedite access for fire department vehicle onto Route 202.

Consideration could also be given as to whether a roundabout is a viable option for the intersection design at this location. Assuming that a single lane roundabout is adequate, a roundabout design could reduce the desired width of the Main Street Bridge. However, a roundabout may be difficult to construct at this location due to the limited space available at the intersection and the need to accommodate large truck units on Route 202.

TYPICAL ROADWAY SECTION

The preferred typical roadway cross section for the reconstructed bridge should be established early in the design process.

The existing bridge width of 40 feet consists of 30 feet of pavement from curb to curb, with 5 foot sidewalks on each side. The paved surface is divided with pavement markings into three 10-foot wide lanes, with one lane for westbound traffic, and two lanes for eastbound traffic to allow for separate left and right turn storage lanes at the intersection of Main Street and Route 202. The curb-to-curb width does not allow any shoulders for offsets to the curb, drainage or bicycle usage. The usable sidewalk width is reduced by approximately 6 inches on each side due to the stone parapet cap detail.

While the replication of the existing roadway and sidewalk cross section is one alternative section to consider in the design process, the major reconstruction of this structure provides an opportunity to consider whether this is the desired cross section for the future. By reconstructing the stone facing wall on one side, widening of the bridge could be incorporated into this reconstruction project. The travel lanes could be widened, shoulders added and additional pedestrian clear width could be considered. The trade-off between the added safety and free movements to be provided with the widening should be evaluated with the Context Sensitive Solutions guidelines to be considered in this historic setting. If widening is desired, the total bridge widening could be between 10 and 20 feet.

Bridge Width Options

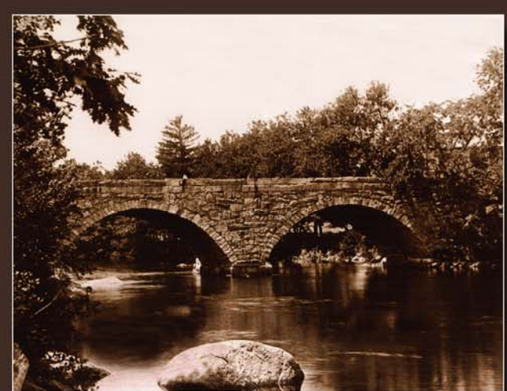
	Existing	Min. Widening	Max. Widening
Travel lanes	3 @ 10'=30'	3@ 11'=33'	3 @ 12'=36'
Shoulders	0	2 @ 2'=4'	2 @ 4' =8'
Sidewalks	2@ 4'6"=9'	2 @ 6'=12'	2 @ 8'=16'
Total Clear Width	39'	49'	60'

The potential widening should be done on one side to minimize construction costs. The widening would have to be coordinated with the roadway alignment due to the proximity of buildings and driveways on either side of the bridge.

The amount of widening could influence the preferred maintenance of traffic alternative during the construction period. The widening would be done in the first phase of construction, providing additional width for construction staging as described in the Maintenance of Traffic section.

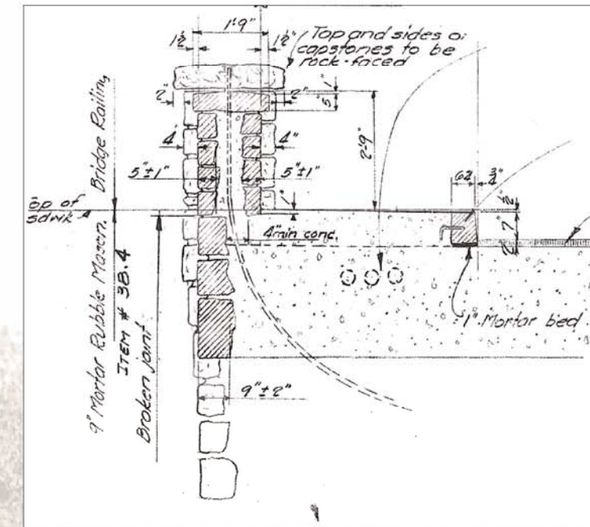
Restoration of Historic Bridges on the Contoocook River

The winter of 1935-36 was a hard and icy one for southern New Hampshire. In the spring of 1936 melting ice and snowfall combined with two extraordinarily heavy rainstorms brought extensive flooding to the Contoocook River and many of the historic bridges along the river were damaged. Then in September of 1938 Peterborough and Henniker, along with much of New England, was hit with the Great New England Hurricane. Even though most of New Hampshire was less damaged than other states, Peterborough and Henniker were particularly hard hit by four days of rain and flooding that resulted in the Great Bridge in Peterborough being overtopped and the Edna Dean Procter Bridge in Henniker collapsing. Both bridges were replaced in 1939-40 while preserving as much of the original stone as possible. The Edna Dean Proctor bridge was widened and reconstructed in the late 1990's and there are several commonalities between that reconstruction project and the Main Street bridge that are the focus of this case study.



PRESERVATION OF STONE FACADE

The reconstruction of the Edna Dean Proctor bridge in 1939 preserved much of the original stonework while the reconstruction 60 years later widened the bridge and used the original stone fascia to preserve the look of the original bridge. This was accomplished by mapping the stonework on the original fascia prior to dismantling and then cataloging and marking each stone after removal and storing securely off-site until needed. Critical elements to maintaining the original look are the replication of the original pattern(s), stone color where new material must be worked in, the grout coloring and joint appearance. A similar process will be used to maintain the original look of the Main Street Bridge.



BRIDGE RAIL / PARAPETS

Although aesthetically pleasing in its current configuration, the substandard height of the existing bridge parapet does not meet current safety standards for pedestrians and bicyclists. In addition to updating the geometry of the existing parapets, the reconstruction will be designed to meet 21st century vehicle crash worthiness requirements.

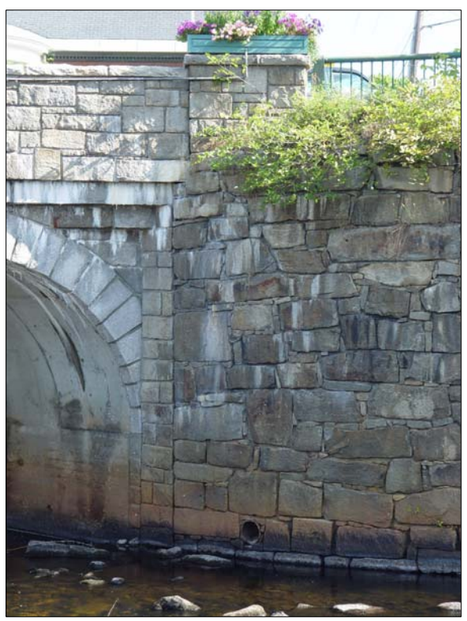
To solve a similar problem on the historic Edna Dean Proctor Bridge, Berger developed a unique method for upgrading the existing stone parapets on each side of the bridge to meet current safety requirements for crash-worthiness, again without compromising the aesthetic and historic nature of the railing. This was accomplished by constructing a new reinforced concrete core and applying the existing stone as a veneer to the outside face, and providing a new stone veneer and coping to the inside face and top of the railing to cover the remainder of the concrete core.

WIDENING AND TRAFFIC MANAGEMENT

The Edna Dean Proctor Bridge required not only structural updating but widening to safely accommodate vehicle and pedestrian traffic as well. At the time of reconstruction the bridge served almost 7,000 vehicles a day and provided the only cross-river pedestrian access to the Henniker town center for New England College students and others who lived or worked on the south side of the river. Conditions at the Main Street Bridge are very similar with traffic volumes around 9000 vehicles a day and concerns about maintaining the only cross-river pedestrian and vehicle access for this part of Downtown Peterborough and the Free Library on the east side of the river. Traffic Management Planning was a critical component to the Edna Dean Proctor Bridge and will be as well for the Main Street Bridge. These photographs show the relationship between construction zones and traffic flows during the reconstruction of the Edna Dean Proctor Bridge.

RETAIN THE VILLAGE ATMOSPHERE

As evidenced from this photograph taken right after completion of the project, the reconstruction of the Edna Dean Proctor Bridge paid meticulous attention to historical detail from the outset of engineering work throughout construction. The end result is an aesthetically pleasing and historically preserved bridge that was rebuilt to service modern day traffic demands. The Berger team understands how important the Main Street Bridge is to the economy and vitality of Peterborough and how it is equally important to the atmosphere of the Downtown area. Berger will bring the same meticulous concern for historical preservation to the project as we did on the reconstruction of the Edna Dean Proctor Bridge.



Historic Preservation Considerations

Throughout the development of Context Sensitive Solutions (CSS), Paul McGinley will work closely with all members of the Berger team to ensure that design alternatives and treatments are sensitive to historic preservation considerations. This will also ensure that the alternatives that are presented to local downtown businesses and community interests as well as state reviews by NHDHR and NHDOT are in compliance under Section 106 and NEPA requirements.

Paul McGinley, AICP, the team's preservation planning and historic bridge consultant, has a distinguished career of working with engineers on the sensitive and cost effective development of rehabilitation and replacements of bridges, sidewalks and historic downtown areas that readily adhere to CSS and Section 106 considerations. This includes historical appropriateness of salvaging and reusing existing granite and the design of compatible traffic barriers and pedestrian railings, and other materials that are significant to the integrity and context of the site. The use of cost-effective principles of installation and maintenance for long-term durability and creative design proposals that may relate to the location and placement of sidewalks and trails along both sides of the river with sensitive treatments of retaining walls, lighting, street furniture and materials will be consistent with CSS principles.

Mr. McGinley will assist engineers of the Berger team with the development of appropriate design details of alternative proposals that relate to the historical considerations of the project so that each alternative can be clearly evaluated by town decision-makers. He will also participate in public presentations and discussions that relate to historic preservation considerations of the project and assist with presentations to the Peterborough Heritage Commission, NHDHR and NHDOT under Section 106 reviews.

Although Peterborough, New Hampshire, has not been professionally surveyed for cultural resources, two properties near the proposed project have been listed in the National Register of Historic Places (the Unitarian Church and the Post Office), and the New Hampshire Division for Historical Resources (NH DHR) has determined Bridge 092/089 and a number of other resources (Public Library, Historical Building, American Guernsey Cattle Club, former Baptist Church, and Town Hall) eligible for listing in both the New Hampshire and National Registers. In addition, in its evaluation of the Peterborough Historical Building, NH DHR suggested that a National Register-eligible historic district may exist in downtown Peterborough. Given these circumstances, Berger expects that cultural resource issues will have a prominent place in the project's planning and permitting processes as they are carried out under the New Hampshire Department of Transportation's (NHDOT's) *Process for Municipally Managed Surface Transportation Program Projects*.

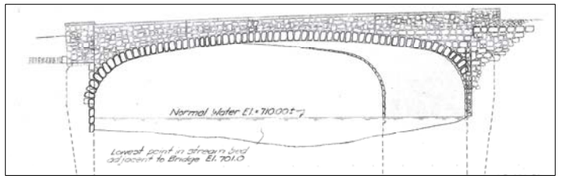
- Berger Team cultural resource personnel will accompany an engineer in a presentation at one of the regularly scheduled NHDOT/NH DHR project review meetings. The purpose of this meeting is to discuss the general outlines of the proposed project, determine the Area of Potential Effect (APE), and determine the need for studies to identify other cultural resources in the APE that could be affected by the project. Berger expects that meeting participants would also discuss rehabilitation versus replacement of the historic bridge, and what NH DHR expects to be considered in developing the alternatives.
- For purposes of this proposal, Berger assumes that NH DHR will require preparation of a *Project Area Form*. This document would provide an overview of the history and land use in the APE, summarize information about known and potential architectural resources, and evaluate the potential of the APE to contain intact prehistoric and/or historic period archaeological resources. This information would serve as the basis for NH DHR's recommendations regarding the need for more intensive archaeological and/or architectural survey to identify all National Register-eligible resources that could be affected by the project.
- Following submittal of the *Project Area Form*, Berger anticipates that a second DHR/DOT project review meeting is likely to be necessary to discuss the information presented on the form and the nature and extent of any further cultural resource investigations.
- Subsequent work elements will depend upon the results of preceding stages. Additional Project Review meetings may be required to review results of various cultural resource investigations, project design plans, and how any adverse effects of the project on National Register-listed or eligible resources would be resolved.

Geotechnical Investigation

During the design phase the Berger Team will evaluate the subsurface conditions within the project limits and provide design and construction recommendations for the geotechnical aspects of the project. Based on our understanding of the project and site

conditions, we have identified the following objectives for the geotechnical investigation:

- If the existing bridge will be widened or replaced, subsurface conditions will need to be evaluated for design of foundations and selection of appropriate cofferdam types. We expect that this task will be straightforward since borings drilled for the design of the existing bridge (circa 1940) and for the preliminary evaluation of Transcript Dam indicate the presence of competent granular alluvial soils. A boring program will be developed after the bridge option has been selected. The program will be designed to supplement the existing boring information. Foundation design and construction recommendations will be developed.
- Subsurface conditions will need to be evaluated for the retaining walls along Granite Street during the preliminary stages of the project. Soil and groundwater conditions, the depths to bedrock, and slope stability will impact the feasibility and selection of the replacement wall type. We expect that exploration program will include borings drilled at average spacings of about 100 feet along the wall alignment. The borings will be drilled in the southbound lane of Granite Street. This information will be used during the preliminary study stage to assist with wall type selection and during design to develop foundation design parameters. Slope stability will be assessed and design bearing pressures and lateral earth pressures will be determined.
- If Transcript Dam will be included in the project, we expect that the existing subsurface information will be sufficient for the preliminary stages of the project. However, for design of rehabilitation measures, additional surface information will be needed to supplement the information obtained from the preliminary evaluation of the dam. The extent of the boring program and geotechnical analyses will depend on the rehabilitation measures that are selected.



Structural Design

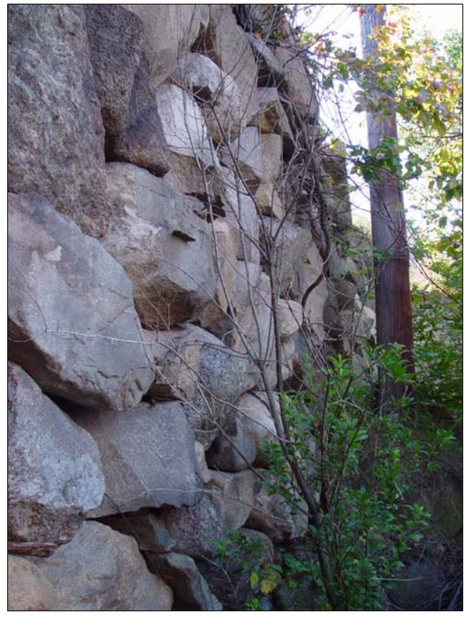
Bridge

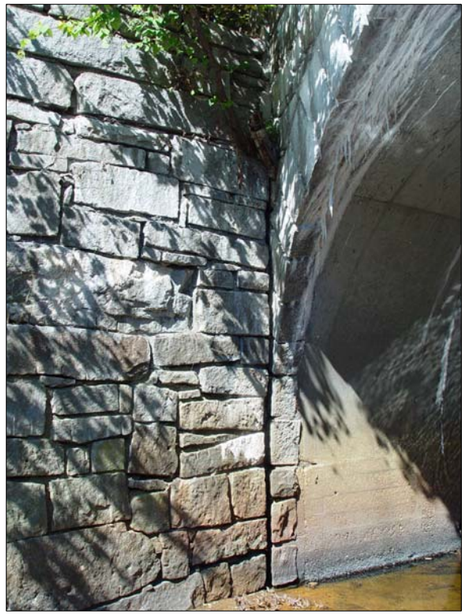
The physical constraints posed by the proximity of the Peterborough Library and other historic buildings located immediately adjacent to the bridge, and Transcript Dam located just up stream of the existing bridge will play an integral role in establishing the reconstruction techniques, construction phasing, and contractor work areas for the proposed project. It is understood that the intent of this project is to reconstruct the existing bridge, while maintaining the historic context, with a possible widening on the order of ten to twenty feet to better accommodate vehicular and pedestrian traffic. Consequently, the bridge form and clear span of the completed reconstruction project will match the existing conditions. Conventional steel or concrete beam and deck bridges are not anticipated to be considered as part of the engineering study process. The ultimate selection for bridge reconstruction will require careful consideration by the Town through the CSS process, and will likely be based on a number of issues including:

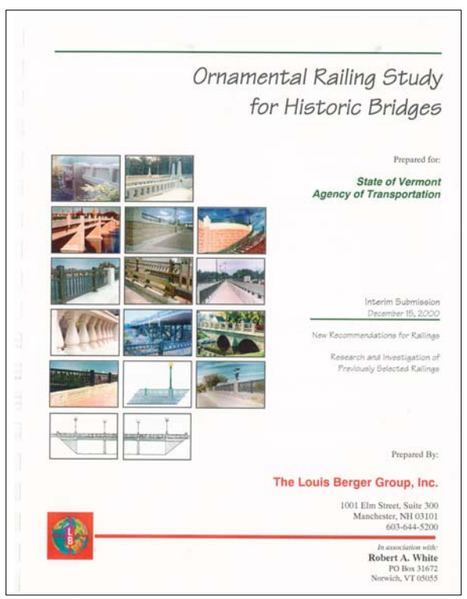
- Bridge function including configuration of traffic lanes and sidewalks on the rehabilitated bridge, incorporation of amenities such as overlooks, and provisions for carrying sewer, water and electrical utilities across the bridge.
- The economics of the reconstruction project will be evaluated to ensure that cost-effective construction solutions are provided with minimal long-term maintenance.
- Bridge aesthetics and amenities will be evaluated for incorporation based on the context of the structure and the downtown setting.
- traffic management, as discussed above, will play an integral role in development of the approach to the reconstruction project.
- The issues above will be evaluated separately and in whole to vet the resultant project approach for constructability and an acceptable construction schedule.

Retaining Wall

The stone masonry wingwalls immediately adjacent to the existing bridge appear to be in good condition. These walls were constructed using cut and dressed masonry blocks. However, the wingwall at the southwest quadrant of the bridge was constructed on top of a concrete structure containing penstocks for the Transcript Dam. The concrete is observed to be in very poor condition, showing signs of spalling and erosion. The wingwall at the northwest quadrant contains an outlet for a covered canal.







The cut stone masonry wingwall at the southeast quadrant transitions from cut stone masonry to a rubble stone masonry wall, and then to a concrete retaining wall, which support Granite Street between Main Street and Pine Street. Both the rubble stone wall, which forms the right (east) abutment of Transcript Dam, and the concrete wall are observed to be in very poor condition and are expected to be replaced as part of the project. Several options could be explored for replacement of these walls, including a conventional cast-in-place concrete cantilever or gravity wall, a segmental retaining wall, or a permanent tied-back soldier pile and lagging wall with concrete and stone facing.

A tied-back wall with concrete and stone facing is a primary alternative to consider. For this alternative, the structural components of the new wall will be behind the existing granite block and rubble wall. This alternative would maintain the historic appearance of the walls by re-utilizing the existing granite block for facing while providing a stable foundation and support. This approach was successfully used for the Henniker bridge project included in the Project References Section and is planned for the Washington Street Bridge project in Dover.

Similar to the Bridge, the evaluation of the various options for the Retaining Wall structure must consider economics, aesthetics, construction access, the extent of disturbance to sensitive areas between the wall and river, traffic maintenance during construction, and the need for (and location of) a sidewalk along the west side of Route 202.

Typical NHDOT Bridge Scope

The following section highlights the typical scope of services provided on NHDOT bridge aid projects. The tasks outlined below are based upon the Request for Qualifications, The NHDOT Process for Municipally Managed Projects, and recent similar experience with bridge/roadway projects.

Phase I – Engineering Study

The initial phase of the project will lay the groundwork for the successful completion of the design process. A complete and thorough understanding of the project area and issues are imperative. The engineering study will be developed from the following components:

Existing Conditions

Field surveys will be necessary to identify existing features and develop a comprehensive base plan of the entire project area. Berger will review existing ground information currently available from the Town and the project surveyor will perform additional survey as necessary to supplement this existing data. The survey will include location of topographical features (roadways, buildings, the existing bridge, etc.), establishment of right-of-way, and mapping of utilities. The Town's current GIS Data will also be utilized in preparation of the base plan. Berger will consider existing utilities during the design development, such as water and sewer. The project base plan will be sent to each utility company for verification of existing underground utilities. Coordination with the utility companies early in Phase I will help to identify any potential unknown conflicts between the proposed work and the existing utilities.

Design Criteria

The new bridge will be designed for HS-25 vehicular live load and an 85 psf pedestrian live load as applicable. The design criteria used to develop the bridge and roadway design will include current editions of NHDOT Bridge and Highway Design Manuals, Specifications and Standard Plans as well as a number of current AASHTO standards for LRFD Design, Bridge Welding, Condition Evaluations, :Pedestrian Bridge Design, and Highway Standards.

Bridge Type Studies and Recommendations

The Type Study will evaluate and make recommendations as to the most appropriate horizontal and vertical alignment, bridge structure type, amenity options, and bridge entry/gateway options. Results of the Study will be incorporated into a written report and the recommended alternative will be depicted in plan, elevation and section. Costs of comparative structure options will be provided with reasoning for the recommended alternative. Options discussed in the Project Understanding Section, and others as appropriate will be evaluated during the bridge type studies.

In addition to performing a study of options for the proposed Main Street Bridge, Berger will examine incorporation scenarios for a temporary bridge to carry pedestrians and or vehicular traffic during anticipated phased reconstruction.

Boring Layout and Logs

A subsurface investigation program will be performed by Berger Team member Ward Geotechnical Consultants. The subsurface investigation program will include reconnaissance, test borings, field observation, and geophysical testing of the existing masonry walls. One boring is anticipated at each abutment location to determine a reasonably accurate picture of the subsurface conditions. Data obtained through subsurface investigation and testing will be used to create a report of geotechnical recommendations for bridge foundation types, allowable soil pressures, and stability of the existing walls.

Cost Estimate

Berger will develop an itemized summary of quantities and cost estimate for the

recommended roadway and bridge alternate. Pay items and unit prices included in the estimate will be in consistent with the NHDOT Item Description Master File and up-to-date unit prices.

Environmental Considerations and Permitting

Berger team members in conjunction with our historic preservation partner Paul McGinley will conduct historical research, archaeological site file review, and a field reconnaissance in order to identify natural, cultural, social, and economic resources that may be affected by the recommended alternative. A New Hampshire Division of Historical Resources (NHDHR) Project Area Form will be completed for the project following an initial project meeting with NHDHR. The review to be conducted will provide sufficient information for NHDHR to reach a determination concerning the effects of the project on any National Register-eligible or listed resources. The archaeological site file review will provide information concerning the potential sensitivity of the project area to contain significant archaeological resources as discussed within the Project Understanding section.

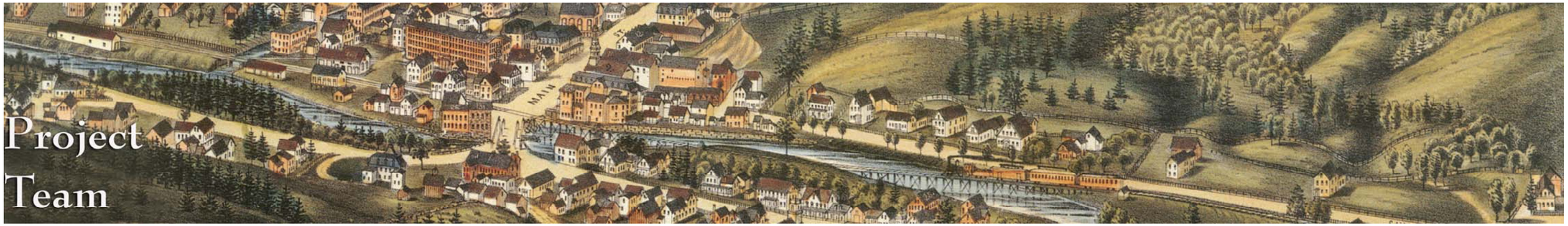
All necessary permitting and environmental review will be identified in the Engineering Study and then completed in the Preliminary Design Phase, a preliminary assessment of the likely permits needs was presented in Section 1.

Right-of-way Process

The proposed project will likely impact parcels, at least temporarily, on the banks of the Contoocook River. The process by which the rights are obtained for the required acquisitions follows and is intended to fulfill the requirements of the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. The Berger team will perform the services listed below under the right-of-way process.

- Property Abstracting
- Public Hearing
- Acquisition Plans & Documents
- Appraisals
- Negotiations

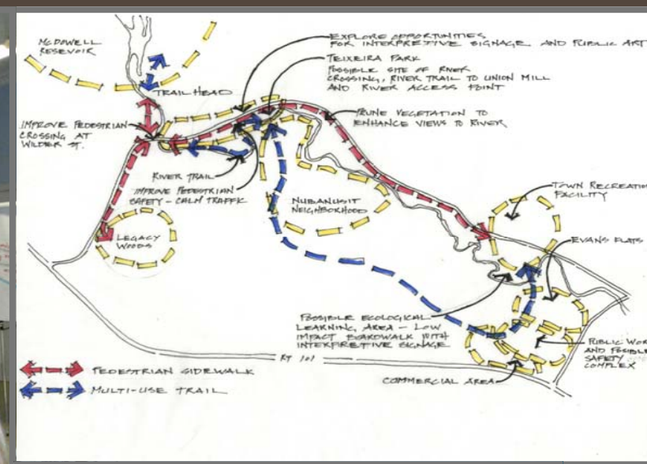
The Berger Team has been very successful negotiating acquisitions on prior projects on behalf of our clients. Berger's Right-of-Way Agent, Richard Flynn, has worked in excess of 30 years in acquiring right-of-way while with the NHDOT as a Relocation Advisor, Chief Relocation Advisor, Right-of-Way Agent, and later as their Chief Right-of-Way Agent.



Project Team

THE LOUIS BERGER GROUP, INC. (Berger), a nationally recognized consulting firm with more than 4,500 employees and 25 offices nationwide, is pleased to offer the Town of Peterborough our extensive experience in Context Sensitive Solutions, Historical Preservation Planning, Traffic Management and engineering design. The Berger Team has completed many projects encompassing transportation planning, urban design proposals, and visioning and streetscape projects.

We appreciate the opportunity to provide you information regarding the project team and the technical approach we would propose to use for for the Main Street Bridge and Adjacent Retaining Wall on Route 202.. The Berger Team has specialists in CSS, Historic Preservation, traffic and transportation, road and structural engineering, urban and sustainable design, and pulbic outreach who have worked in a collaborative manner on similar projects.



3.1 Firm Profiles

Berger has assembled a Project Team of knowledgeable in-house staff along with several specialized sub-consultants who will provide the Town of Peterborough with the people skills to lead the Context Sensitive Solutions (CSS) process along with the right balance of historic preservation, downtown planning and design expertise to successfully integrate the varied components and intricacies of balancing the reconstruction issues with stakeholder needs. The introduction to the Federal Highway Administration's Flexibility in Highway Design begins by saying "An important concept in highway design is that every project is unique." The Berger Team recognizes this concept and tries to bring to every project an understanding of the character and values of the community and with that perspective we have trained our transportation staff through Partnership for Public Spaces Context Sensitive Solutions training and at this time we have four staff members who have successfully completed the training program. The Berger Team will be led by the key staff members identified in this section and in the accompanying organizational chart.

Members of The Berger Team and their responsibilities are as identified below:

3.1.1 Louis Berger Group

The Louis Berger Group, Inc. (Berger) is a recognized worldwide leader in the consulting field. By drawing upon the imagination, experience, intelligence and versatility of its staff of over 5,000 employees Berger has earned a reputation for delivering outstanding quality coupled with on-time and on-budget performance. Berger is active throughout the United States and 80 countries throughout the world and has made its Northern New England home in Manchester, New Hampshire for more than a decade.

Peterborough Experience

Berger has a proven record of performance throughout New England including the Town of Peterborough. The firm has provided services in New England since 1962, with the aforementioned office in Manchester as well as Needham, Massachusetts, Portland, Maine and Providence, Rhode Island. Current staff in Manchester includes over 40 planners, engineers and support specialists. The Berger reputation has been built on its proven record of local responsiveness to clients' needs and concerns, adherence to tight schedules and successful integration of divergent concerns of stakeholders throughout the public participation process.

Berger has past and ongoing experience with design, planning and other projects in Peterborough including the phase 1 ESA of the Armory and Evans Flat DPW facility, the renovation of the Peterborough Free Library, Fire Department Structural evaluation, and the West Peterborough TIF (WPTIF) District Infrastructure Improvements project. As a result of our experience in using Context Sensitive Solutions (CSS) on the WPTIF District Project, Berger understands the challenges, intricacies and opportunities of working within the CSS framework in Peterborough. We understand the need to adjust the CSS process to suit the unique needs of individual projects within different parts of Peterborough.

Berger will be responsible for the following:

- Overall Project Management;
- Coordination with Town staff;
- Leading the CSS Public Informational Process;
- Maintenance of traffic during construction;
- Traffic analysis and traffic signal design;
- Preliminary and final design of roadway, sidewalk, parking, traffic calming, and other aesthetic improvements within the defined limits along Main Street and Route 202;
- Structural design for bridge and adjacent retaining wall;
- Environmental permitting;
- Utility coordination, identification of overhead utilities potentially impacted by reconstruction;
- Stormwater management planning and design;
- Traffic signage design;
- Preparation of contract plans, bid documents and specifications;
- Preparation of opinions of likely construction costs; and
- Quality Assurance/Quality Control

3.1.2 IronWood Design Group

Ironwood design group is a dynamic, forward-thinking, three person landscape architectural practice devoted to excellence in the planning and design of exterior environments to foster human interaction, comfort and vitality. We approach each project with dedication to a fresh design philosophy and a mandate of innovative design theory rooted in cultural understanding, environmental responsibility, and integrity. We view master planning, landscape architectural design and implementation as a continuum: developing solutions that integrate form, function, and economics.

Ironwood is committed to delivering professional, high value, design services and expertise. We thrive on collaboration, communication and creative challenge and engage our clients, stakeholders, and other professionals as partners. Together, we understand and embrace opportunities and constraints to arrive at solutions that exceed objectives.

Our Core Values can be boiled down to three simple elements: our clients, our people, and our work. Our success can be attributed to these fundamentals, and our devotion to them has attracted both great clients and great people. Woven through these values is our passion for sustainability, which at Ironwood is not a buzzword but a professional choice, a commitment to responsible development, and a way of life. These values have earned the trust of private and public partners who want to make a difference. With them, we strive to create great places that many generations will enjoy.

We are committed to building strong and longlasting relationships based on trust, honesty and integrity - we listen and respond to the needs of our Clients, who are our partners. We are committed to helping our Clients see and understand their project from different perspectives to reveal superior design options and memorable places.

We maintain a culture of high standards and care deeply about our work. We are committed to generating excitement about each and every project and let this passion guide us through the design process. We extract meaning in our projects and encourage contributions from all.

We see research, reconnaissance and analysis as the foundation of every project. Attention to detail is paramount to a strong design effort, and affords us the opportunity to effectively develop and evaluate design options that look beyond constraints to focus on solutions.

Berger teams with IronWood because of their values and the creativity they bring to a project. They intuitively find the balance between the project's needs and how it will fit into its neighborhood and environment with a sense of human scale. All of which are very real goals and ideals for the main Street bridge project. The Town is familiar with IronWood through their work on the West Peterborough TIF District project and understands the superlative planning and thought provoking solutions referred to in their company biography.

Project Experience:

- West Peterborough TIF District, Peterborough, NH
- Lower Court Street Reconstruction, Portsmouth, NH
- Washington Street Bridge, Dover, NH
- Main Street Historic District master Plan, Tilton, NH
- High-Hanover Streetscape Improvements, Portsmouth, NH
- Vaughan Mall Improvements, Portsmouth, NH
- Lowell Riverwalk, Lowell, MA
- Westfield Great River Bridge, Westfield, MA

IRONWOOD will bring their landscape and streetscape expertise to the project and will be responsible for:

- Project Master Planning;
- Assisting with the CSS Public Informational Process;
- Informational signage design;
- Pathway, walkway, bikeway planning and design;
- Land/Streetscape design

3.1.3 Paul J. McGinley

PAUL J. MCGINLEY, AICP

Mr. McGinley is a nationally recognized preservation planner who for more than four decades has been involved with complex projects involving planning and design of environmentally sensitive areas including historic structures and bridges.

Will be responsible for:

- Historic preservation planning;
- Historical documentation; and
- Assisting with historic bridge design parameters

3.1.4 Ward Geotechnical Consulting

Ward Geotechnical Consulting, PLLC (WGC) was founded in September of 2005 by Craig Ward, P.E. Prior to founding the Ward Geotechnical Consulting, Mr. Ward had worked for a nationally recognized geotechnical and environmental consulting and design engineering firm since

1985. Mr. Ward's extensive experience in geotechnical engineering includes building and bridge foundation design studies, evaluation and reconstruction of existing dams, design of subsurface drainage systems, investigations for sewer and storm drainage systems, slope stability evaluations and design of stabilization measures, and geotechnical design investigations for roadways, landfills, retaining walls, earth support, and dewatering systems. Mr. Ward has also conducted subsurface and hydrogeologic investigations for sites with groundwater contamination issues, and worked with the New Hampshire Department of Environmental Services to establish and maintain groundwater discharge and management permits.

Since its founding, WGC has been engaged to provide geotechnical engineering services for several transportation, dam, and building foundation projects. Descriptions of some representative projects are provided in Section 4.0 of this document.

30+ YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering

New England College

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

Design Build Institute of America
– Member Transportation Committee

American Road & Builders Association
– Member Public/Private Ventures Division

Mr. McKeever is a Vice President at The Louis Berger Group, Inc. He contributes with more than thirty years of broad based experience in business management, project development and construction of major infrastructure projects including risk management and use of alternative delivery methods. Joe has many years of experience in public and client relations and interfacing between professional service organizations and local, state and federal government units. His engineering background, complemented with his management style and public relations skills, are invaluable in assisting our clients to develop objectives, priorities and implement strategies which satisfy project requirements.

Joseph E. McKeever, Vice President
Vice President

Augusta Memorial Bridge Environmental Assessment, Managing Principal

The project included the preliminary engineering and environmental documentation for the replacement of the Augusta Memorial Bridge. The Maine Department of Transportation (MDOT) secured the services of Berger to update the 1997 STPA analysis and prepare Preliminary Engineering and an Environmental Assessment (EA) to provide a broad base qualification of impacts and analysis of potential alternatives. Each alternative was evaluated for primary and secondary social, economic and environmental impacts. The study area included Memorial Bridge, Memorial Circle, Cony Circle, Stone Street and Eastern Avenue.

I-295 Design Build, Portland, ME., Managing Principal

Responsible for the final engineering recommendations, subconsultant coordination, schedule and budget management, and coordination with Cianbro Corporation. This $18M project includes the design and construction of 1.8 miles of new and reconstructed roadways, three traffic signals, a multi-use trail traversing the project and three new bridges over the existing railroads. The project begins at the I-295 Congress Street Interchange, parallels the waterfront, and includes the reconstruction of Veteran's Circle. Berger is also assisting the Design / Build Team during its extensive public participation / partnering sessions. Berger is also working closely with Cianbro Corporation to provide Quality Assurance Management of the project design and construction. Critical issues affecting the construction and design schedules include utility relocations, coordination with the railroad, maintenance of traffic at Veteran's Circle and construction staging of embankments for consolidation of marine clays.

Edna Dean Proctor Bridge - Route 114 over Contoocook River, NHDOT, Henniker, NH

Principal in Charge for the final design and rehabilitation of this historic bridge. The old bridge was a stone faced, two span concrete arch bridge which had been adopted as the town symbol. The rehabilitation consisted of travel lane and sidewalk width improvements over the bridge. The existing stone fascia was removed and replaced in its existing configuration onto the widened bridge structure. The stone parapets were also upgraded for crash protection, while maintaining their historic character and aesthetic relationship to the bridge. Limited construction access and concerns related to widening the existing abutments and piers which are founded on "earth and logs" and original bridge foundations dating back to the 1800's, led to the use of drilled concrete shafts for the new foundation support system. New retaining walls with stone fascia and parapet detailed to match the appearance of the existing bridge were also required at the bridge approaches. Due to restrictions in right-of-way and temporary traffic control, as well as geotechnical issues related to soils ranging from unsuitable existing fill material to rock ledge, a one of a kind retaining wall system utilizing drilled soldier piles, tie-back anchors and a cast-in-place concrete backing wall integral with a stone masonry fascia was developed. The bridge project received a national ACEC Recognition Award.

Alternative Studies to Replace NH Route 119 Bridges over the Connecticut River, NHDOT, Hinsdale, NH - Brattleboro, VT

Managing Principal responsible for the overall management of the in-house and sub-consultant design teams, schedule and budget management, and coordination with the NHDOT, VTrans, and affiliated local groups for the type, span and location studies of this 1,800' signature crossing of the Connecticut River. The first phase of this project will evaluate a range of structure alternatives including; conventional steel and concrete girders, steel box girders, segmental concrete girders, steel truss, steel and concrete arches, and cable-stay alternatives. Important aspects of the study include satisfying historic requirements, incorporating aesthetics into the bridge design, and providing a visual tie to the existing truss bridges, which are to remain in place for pedestrian/bicyclist use. The ultimate goal of the study is to provide recommendations to the NHDOT for presentation at a design Public Hearing and then proceed into preliminary and final design.

24 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering

University of New Hampshire, 1980

REGISTRATIONS

Professional Engineer in NH, ME and MA

Mr. Clogston has over 25 years experience in the fields of transportation and civil/ site engineering with emphasis on heavy civil, highway and transportation engineering. Projects have included both design-build and traditional design-bid-build methods of delivery.

Brian W. Clogston, PE
Director, Transportation Engineering

West Peterborough Village Enhancement Project, Peterborough, New Hampshire

Project manager overseeing village planning, landscape architecture and engineering services for the West Peterborough Tax Increment Finance District in Peterborough, NH. Berger is working with the Town of Peterborough on one of the first Context Sensitive Solutions based engineering services projects in New Hampshire and the first that is using Tax Incremental Financing to fund the improvements. Major project components include traffic calming measures, sidewalk and roadway rehabilitation, utility improvements, lighting, parkland improvements, trail connections with adjacent developments, a historical interpretive walking tour, water quality improvements, and incorporating recycled materials and energy conservation into all aspects of the project.

I-93 Salem-Manchester Final Design

Project Manager for final design of Southern segment of the $300 million reconstruction and widening of Interstate I-93 for approximately eight miles, from the Massachusetts border northerly through the towns of Salem and Windham. The design consists of expanding I-93 from its existing two-lane facility to four-lanes and upgrade of interchanges at Exits 1, 2 and 3. The project is being bid in twelve separate construction contracts with the design addressing the required traffic and construction sequencing. The expansion also accounts for a future light rail line. Water quality is a particular element of concern relative to minimizing adverse run-off effects to public surface water supplies.

Trunk Highway 52 Design/Build Project, Rochester, Minnesota

Highway Design Lead in responsible charge of design for the reconstruction and widening of an Urban Freeway for the joint venture of Fluor Daniel and Ames Construction. This $232 million project involved widening 11-miles of urban freeway from 4 to 6-lanes; reconstruction and improvement of a parallel collector distributor road system; the reconstruction of 6 interchanges; and the construction of a new single point urban interchange. I was in charge of a 20-person design staff and I oversaw the preparation of preliminary design for the entire project and Final Design and Construction Plans for the 2003 Construction season. I also chaired weekly Work Management Team meetings, focused on issues resolution and comprised of local, state, and federal agency stakeholders along with members of all associated design disciplines. The final design effort included 6-miles of mainline, 4-miles of C/D roads, and staged construction elements for 4-interchanges. All designs were completed using MicroStation with GeoPak.

I-95 Widening Project, Maine Turnpike Authority

Senior Project Engineer for the widening of a 1.5-mile segment of I-95 from 2 to 3 lanes in each direction. My responsibilities focused upon development of cross sections and the design of a box culvert rehabilitation using a slip-lining with annular space grouting. All designs were completed using AutoCAD with Land Development Desktop.

US70 Hondo Valley Design/Build Project, Ruidoso Downs to Riverside, New Mexico

Senior Project Engineer and Assistant Design Lead for storm drainage design on this $180 million rural highway reconstruction and widening project. This two-lane rural highway was widened to four-lanes along a 38-mile segment of US 70 between Ruidoso and Riverside, NM. My responsibilities included hydrologic/hydraulic analysis, design of mainline cross culverts and assisting the Drainage Lead with technical oversight of a staff of 10 engineers.

Route 3A Improvements, Bristol, NH

Project Manager for a Statewide Highway agreement with the NHDOT to provide PS & E documents for improvements to Route 3A. The major design issue for this project was the stabilization of soils on a steep riverside embankment that threatened the integrity of the roadway. Design solutions used a deep under drain system and construction of a closed drainage system discharging to a stabilized outlet.

17 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering
University of New Hampshire, 1991

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Member

REGISTRATIONS

Professional Engineer in NH, ME, FL, VT, CT

National Highway Institute Certification
- Urban Drainage Design

New Hampshire Department of Transportation Certification
- Water Quality

Mr. Kendall has over seventeen years experience in transportation planning and highway design working in both the public and private sector. His experience in preliminary and final highway design, drainage and utility design, construction phasing and the public participation process provides a foundation for the design and review of multiple transportation and civil projects. His experience includes preliminary and final vertical and horizontal alignment layout, preliminary and final drainage layout and analysis, construction supervision and inspection, and wetland permitting.

Phillip E. Kendall, PE
Assistant Director, Transportation Engineering

West Street, Keene, NH - Box Widening/Sidewalk Replacement, Keene, NH

Project Manager for the final design of the upgrade to this a major connector of downtown Keene and Rte. 9. West Street experiences heavy vehicular and pedestrian traffic. The improvements along the West Street corridor included roadway/box widening and the replacement of the existing sidewalk. The widening was designed to incorporate an additional turn lane along the tight corridor. The project also included the coordination and signal timing adjustments of the three existing signals. In addition to the sidewalk replacement, the existing sidewalk ramps were redesigned to confirm to current ADA standards.

Downtown Revitalization Phase II, Stark Street, Manchester, NH

The City of Manchester implemented a Master Plan goal of linking the historic Millyard area near the Merrimack River with the Downtown. The Downtown improvements have created a pedestrian friendly atmosphere through traffic calming methods, streetscaping, lighting, and sidewalk improvements to encourage pedestrian travel between the two commercially developed areas. Project Engineer responsibilities included coordination with City officials and utility companies, design of curbing layout, drainage, preparation of contract plans, specifications and estimate, construction inspections.

I-93 Salem-Manchester Final Design

Highway Task Manager for final design of Southern segment of the reconstruction and widening of Interstate I-93 for approximately eight miles, from the Massachusetts border northerly through the towns of Salem and Windham. The design consists of expanding I-93 from its existing two-lane facility to four-lanes and upgrade of interchanges at Exits 1, 2 and 3. The project is being bid in twelve separate construction contracts with the design addressing the required traffic and construction sequencing. Phil is also the technical lead responsible for a 2-mile section of the project in the Exit 3 which is being bid in 5 of the 12 construction contracts each requiring design and development of contract plans and bid documents. Water quality is a particular element of concern relative to minimizing adverse run-off effects to public surface water supplies.

Edna Dean Proctor Bridge - N.H. Route 114, Henniker, NH, Final Highway Design

Roadway project engineer responsible for establishing the recommended alignments, drainage and pavement layout for the proposed configuration, and coordination with the NHDOT. The project involved the preparation of final design plans for the widening and realignment of the roadway approaches to the local historic stone arch bridge. The project involved other issues such as the addition of a second sidewalk over the bridge as well as minimizing impacts to the surrounding historic properties.

Augusta Memorial Bridge, Augusta, ME

Principal engineer for the preliminary engineering and environmental assessment to study alternatives for this 50 year old structure which provides the main connection between the easterly and westerly portions of Augusta, including two groups of state offices. Alternatives evaluated included the No-Build, an upgrade alternative and several new alignments. Each alternative was evaluated for primary and secondary social, economic and environmental impacts. The study area included Memorial Bridge, Memorial Circle, Cony Circle, Stone Street and Eastern Avenue.

30+ YEARS EXPERIENCE

EDUCATION

Certificate for Preparation of Agreement Documents under Section 106
University of Nevada, Reno,1991

Graduate studies in American architecture and history,
University of Iowa, Iowa City, 1976-1982

M.A. American History
University of Iowa, 1975

Graduate studies in linguistics
University of Massachusetts, Amherst 1971-1973

B.A. History
University of Massachusetts 1970

Macalester College, St. Paul MN, 1966-1968

PROFESSIONAL AFFILIATIONS

Vernacular Architecture Forum
Society for Industrial Archaeology
Southern New England Chapter, SIA
National Trust for Historic Preservation
Center for Research on Vermont

Responsible for the design, coordination, preparation and implementation of cultural resource services requiring architectural investigations, surveys and documentation for historic buildings and structures, cultural resource impact assessments and cultural resource management studies. These services are explicitly designed to help public agencies and private sector concerns meet state, federal and local requirements for identification and protection of archaeological resources and the historic built environment.

Martha H. Bowers
Principal Architectural Historian

HISTORIC BUILDING AND STRUCTURE ASSESSMENTS

- Historical/Architectural Resources Survey and Evaluation, Naval Shipyard, Portsmouth, New Hampshire; Naval Weapons Station Earle, New Jersey; Naval Air Station Willow Grove, Pennsylvania; Aviation Supply Office Philadelphia, Pennsylvania; Naval Security Group Activity Winter Harbor, Maine. Designed, supervised, and participated in preparation of historic contexts and National Register evaluation of World War II and Cold War-era resources. For the Northern Division, Naval Facilities Engineering Command.
- General Services Contract for Architectural Resource Investigations, Statewide, New Hampshire. Conducted architectural assessments in support of transportation improvement projects undertaken by the New Hampshire Department of Transportation.

HISTORIC AMERICAN ENGINEERING RECORD DOCUMENTATION (HAER)

- Chest Creek Bridge and Hogback Bridge, Clearfield County, Pennsylvania, and Ontelaunee Creek Bridge, Lehigh County, Pennsylvania. For the Pennsylvania Department of Transportation.
- Torpedo Firing Pier, Naval Undersea Warfare Center, Newport, Rhode Island. For the Northern Division, Naval Facilities Engineering Command.
- George P. Coleman Memorial Bridge, York and Gloucester Counties, Virginia. For the Virginia Department of Transportation.
- Landing Bridge over Raritan River, New Brunswick, New Jersey. For Buchart-Horn, Inc.

CONTRACT MANAGEMENT

General Services Contract for Architectural Resource Studies. With the New Hampshire Department of Transportation.

SPECIAL STUDIES

Prioritizing Treatment of Historic Dams in Vermont. Prepared first-stage planning document in a project to identify historic dams at risk of removal and establish priorities for preservation. Prepared in association with Vermont Division for Historic Preservation and Vermont Agency of Natural Resources, with assistance from USDA Forest Service.

Self-Guided Tour of Points of Interest at Marine Corps Base, Camp Lejeune, North Carolina. Selected 25 points of interest, including historic buildings, natural resources, and military equipment displays, prepared text and images for illustrated booklet, in association with MCB Camp Lejeune and Onslow County (NC) Tourism Board

6 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering
University of New Hampshire, 2002

PROFESSIONAL AFFILIATIONS

Structural Engineers of New Hampshire, Member
American Society of Civil Engineers, NH Section Treasurer (2006-2008)

REGISTRATIONS

Licensed Professional Engineer in NH & MA

As a Structural Engineer, Mr. Daigle has over 6 years of experience in design, construction and rehabilitation of highway and railroad bridge structures. His experience includes two years with a NH based bridge and marine contractor on assignments including structural design of falsework, shoring, sheeting, formwork, cost and quantity estimation, and negotiation of change orders. He has also served as a plan administrator for concrete bridge deck placements, part of the NHDOT QC/QA program. Chris has over four years of design experience ranging from bridge type studies to final design, analysis and rating of steel plate and concrete girder superstructures, reinforced concrete substructures, retaining walls, seawalls and buried structures. He also provides inspection oversight services on our various bridge projects in construction.

Christopher R. M. Daigle, PE
Senior Structural Engineer

Center Hill Road over Blakes Brook Bridge Replacement, Town of Epsom, NH

Senior Structural Engineer responsible for type-study and final design of a 22-foot span steel beam superstructure on cantilever abutments, which was damaged by flooding in April 2007. The proposed structure will be a 34-foot span precast concrete rigid frame on a 40 degree skew. Construction plans and specifications were prepared in a fast-track Part A / Part B format to allow fabrication of the bridge prior to the full construction contract, reducing the overall project schedule.

Washington Street over Cocheco River Bridge Replacement, Cit of Dover, NH

Project Engineer responsible for the design and community coordination efforts for the re-establishment of Washington Street over the Cocheco River via a new vehicular bridge to facilitate the proposed redevelopment of waterfront property in downtown Dover. The proposed structure will span 160 feet with steel plate girders and a reinforced concrete deck on spread footings. The work includes reconfiguration of the bridge approaches, relocation of three major utilities and the removal of an existing timber pedestrian bridge in a historic, urban setting. The bridge will feature a number of architectural amenities including ornamental railings, period lighting, stone veneers and landscaping treatments. The project is federally funded under the NHDOT Municipally Managed Project Program.

US Route 4 over the NHRR and Mascoma River Bridge Rehabilitation, City of Lebanon, NH

Senior Structural Engineer responsible for preliminary, final design and construction administration for this City owned structure federally funded under the NHDOT Municipally Project Program. The project involves historic rehabilitation of the superstructure for the existing bridge over the NH Railroad and the Mascoma River. The existing bridge, known as the Nu Bridge, was constructed in 1945 and was rehabilitated in 1968 and 1984. The bridge is a 3-span 284 foot long steel “deck” plate-girder structure with a maximum span of 150 feet and an overall width of 36 feet. Maintenance of traffic issues required development of a temporary detour using a temporary bridge and roadway.

City Wide Bridge Repair Program, City of Dover, NH:

Structural Engineer responsible for the development of a two-phase maintenance and repair program for their 12 City-maintained bridges. The first phase primarily addressed upgrades to bridge pavements, and required issuing a complete construction bid package for two bridges within 45 calendar days of the Notice to Proceed. One structure, however, was found to have severely deteriorated areas of the concrete bridge deck that affected the allowable posted weight. An expedited emergency repair was designed and implemented to restore full capacity of the bridge. The second phase of the repair program addressed the long term needs of the bridges with the goal of developing an annual budget and repair program that the City can utilize to appropriate construction funding and extend their life-span.

Rehabilitation and Widening of the Packers Falls Bridge, Durham, NH:

Project Engineer responsible for construction engineering and administration of this 42-foot single span cast-in-place concrete arch. Rehabilitation tasks include removal and reconstruction of the upstream fascia walls repair of existing arch and reconstruction of the arch intrados with a downstream widening approximately 9 feet to provide two 12-foot travel lanes. Pedestrian access was provided via a separate 70-foot span precast butted box beam structure on mortar rubble masonry retaining walls immediately adjacent to the widened arch. Decorative concrete rails were provided to replicate those of originally on structure. Roadway and bridge construction was accomplished in one season using both alternating one-way traffic and complete closures within a specified time.

12 YEARS EXPERIENCE

EDUCATION

MDOT Locally Administered Projects Certification Program, May 2008

Master of Science, Structural Engineering
Northeastern University, 2000

B.S., Civil Engineering
University of New Hampshire, 1996

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Member

NH ASCE President 2005 – 2006

REGISTRATIONS

Registered Professional Engineer: CT, MA, ME, NH, RI, VT

Mr. Gallant is responsible for managing operations and business development for Berger's Portland, Maine office. Jason has regional responsibilities within the CM Division for management, engineering support and QA/QC of projects for Berger's New England clients. He is a structural engineer and project manager with over twelve years of progressive experience in design, construction, rehabilitation and demolition of highway, railroad and building structures, with supplementary experience in environmental permitting, and site design. He has developed a strong knowledge of bridge design standards throughout the northeast US and has successfully managed and contributed to the design of many bridge and vertical structures using reinforced concrete, prestressed concrete, structural steel, and timber.

Jason L. Gallant, PE
Director of Engineering / Structural Engineer

Town of Loudon, NH – Emergency Bridge Replacement Program

Project Manager for the Town of Loudon under the NHDOT Municipally Managed Project Program. The project involved fast track design and construction of two bridge structures carrying local roads over Bee Hole Brook. Bridge design and bid phase services were advanced simultaneously over a six week time frame after the devastating May 2006 floods. Both structures were completely replaced under Berger supervision over a three month period during the fall of 2006.

City of Lebanon, NH – Rehabilitation of US Route 4 over the BMRR and Mascoma River

Project Manager for the design phase for the City of Lebanon under the NHDOT Municipally Managed Project Program. The $4.7 million project involves historic rehabilitation and partial superstructure replacement for the existing US 4 Bridge over the B&M Railroad (BMRR) and the Mascoma River, known as the Nu Bridge. The existing bridge was constructed in 1945 and was rehabilitated in 1968 and 1984. The bridge is a 3-span 384 foot long steel "deck" plate-girder structure with a maximum span of 150 feet and an overall deck width of 36 feet. Under the current project, the deck and supporting floor beams are being replaced to widen the deck to accommodate pedestrians. Other upgrades to the structure include partial substructure replacement and installation of new bearings to isolate the existing piers from seismic loads. Through the public hearing process, the community voiced a desire to minimize disruption to the approximately 10,000 vehicles per day and businesses on the Route 4 corridor adjacent to the site. To accommodate the community, Berger performed layout and environmental permitting for a 400-foot long three-span temporary bridge to avoid a two mile detour around the project site.

Town of Salem, NH – Bridge Repair and Bridge Replacement Program

Project Manager for the Town of Salem under the NHDOT Municipally Managed Project Program. The project involves design and construction of multiple interconnected culvert structures within the environmentally challenging Spicket River watershed. The phased contract includes interim repairs at three structures and the full replacement of six structures over a five-year period.

City of Dover, NH – Washington Street Bridge Replacement

Senior Structural Engineer for the design of the re-establishment of Washington Street over the Cocheco River via a new vehicular bridge to facilitate the proposed redevelopment of waterfront property in downtown Dover. The proposed structure will span 165 feet with steel plate girders and a reinforced concrete deck on spread footings. The work includes reconfiguration of the bridge approaches, relocation of three major utilities and the removal of an existing timber pedestrian bridge in an historic, urban setting.

Building Evaluation and Due Diligence, Peterborough, NH

Served as Project Manager for the evaluation of a 47-acre parcel including the 135,000 SF former NEBS industrial building for re-use as a municipal facility for the Town of Peterborough. Uses under consideration included Police, EMS, Public Works, Recreation, Vocational School Classrooms, and Town Administration. In addition to building evaluation the surrounding site is being conceptually evaluated for active and passive recreation opportunities along the Contoocook River in accordance with the Town Master Plan.

NHDOT - Conway Bypass Phase 4A, Conway, New Hampshire

Structural Engineer for the design of three highway structures and two railroad overpass structures at the intersection of Artist Falls Road and the new North-South Road in Phase 4A of the Conway Bypass Project. The North-South Road serves as an eastern bypass to the busy downtown section of NH Route 16 in Conway. The State of NH Railroad runs parallel to the roadway alignment within the project area. To facilitate the grade separation, 175 meters (575 feet) of MSE retaining wall structures were constructed at the approaches to two new warren deck truss bridges over Artist Falls Road and Artist Brook. The walls and bridge abutments were faced with granite to match the pink granite native to the Redstone area of Conway. The project included the rehabilitation of a late 19th century 25-foot diameter stone arch. Rehabilitation of the arch included re-pointing of the structure with low pressure grout and installation of a concrete load distribution slab over the arch.

20+ YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering

Michigan Technological University, 1986

REGISTRATIONS

Professional Engineer in NH, ME, VT and MI

Mr. Geiger has over 20 years experience in the fields of highway design, municipal infrastructure improvements and site development projects servicing the public and private sectors. Municipal engineering and site development experience has included the design, constructions administration, and inspection of water and sewer projects, site grading, drainage, and subdivision layout. Highway experience has included horizontal and vertical layout, drainage, and construction administration and inspection.

Bradley J. Geiger, PE
Project Engineer

I-93 Salem-Manchester NHDOT, Lead Highway Engineer

The project includes the design and development of contract plans and bid documents for the widening and reconstruction of a 9-mile segment of Interstate highway. Brad is currently leading the design squad responsible for a 2-mile section of the project in the Exit 3 area which is on new alignment and requires the complete redesign of a diamond interchange.

Trunk Highway 52, Rochester, MN, Project Engineer

The project consisted of providing final design and construction plan services for this 8.8 mile design/build reconstruction project. Improvements included reconstructing an existing 4-lane freeway and widening it to 6-lanes for the Minnesota DOT. 21 bridge structures were replaced or rehabilitated and 10 interchanges were reconstructed or constructed. Responsibilities included the final design and construction plans of the 75th Street Interchange, 1.5 miles of rural freeway, and frontage /local roads.

Route 3 North, Burlington, MA to Nashua, NH

This project consisted of providing final design and construction plan services for this design/build/operate and maintain project. The improvements included a 21-mile section of Route 3 between I-95 (Route 128) and the New Hampshire border. The project involved adding one lane in each direction and a full shoulder adjacent to the high-speed lanes. The designs were completed with the anticipation of a future fourth lane. In all, 49 bridge structures were replaced and nearly 150 lane miles of highway and ramps were built or rehabilitated. Responsibilities included the final design of the Route 62 Interchange, environmental compliance and interim drainage as well as assisting the contractor with various field design changes.

Maine Turnpike Widening - Mile 37 to 40

Project Highway Engineer for this Maine Turnpike Modernization Project. Services included the final design and construction support services for a 3-mile portion of the Maine Turnpike. The basic design features included the addition of one travel lane in each direction, drainage, signing, guardrail and other safety improvements. Three 8' x 8' box culverts and five pipe culverts for major stream crossings were extended as part of the project. For the Stuart Brook section of the highway, the profile was raised ten feet to bring the sag vertical curve up to AASHTO standards to improve sight distance. Since the existing 8' x 8' box culvert could not hold the additional load several alternatives were explored including strengthening the existing culvert to the use of lightweight fill. Hydraulic investigations concluded that there was excess capacity in the existing culvert allowing the use of an 84" pipe to slip line the existing culvert. Poor subsurface conditions also added special details to compensate for anticipated settlement.

Washington Street Reconstruction, Boston, Massachusetts

Project Engineer for this MBTA Project consisting of the first of two phases and included the final design for the reconstruction of approximately 2.1 miles of Washington Street. Included with the full depth reconstruction was the addition of a reserved lane and six new transit stations for the 60-foot, low emissions, articulated buses that are used on the Silver Line. In addition to full depth reconstruction of the roadway, other components of this first phase were utility reconstruction/relocation; urban design/streetscape features; traffic calming; improved landscaping treatments; areaway reconstruction; and sidewalk reconstruction and widening.

6 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering
University of New Hampshire, 2001

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)

REGISTRATIONS

Professional Engineer – New Hampshire, Vermont

Mr. Higginson has a variety of engineering experience and knowledge gained in his three years of experience with a New Hampshire based Civil Engineering firm prior to joining The Louis Berger Group in 2005. He has a diverse background in survey, site design, permitting, drafting, construction, inspection, project coordination, client contact, cost estimates, scheduling, planning and permitting and has been involved in presentations for a variety of design projects.

Timothy C. Higginson, PE
Senior Transportation Engineer

West Peterborough TIF District Improvements, Peterborough, NH

Served as staff/project engineer for the redevelopment/revitalization of the West Peterborough district including the reconstruction of Union Street. The project followed the Context Sensitive Solutions (CSS) design process to engage stakeholders to identify and develop solutions to pedestrian and driver safety in the context of the scenic, historic West Peterborough Tax Increment Finance District. The $2.5 million construction project includes the reconstruction of 1.2 miles of Union Street with new sidewalks, upgraded utilities, drainage improvements, traffic calming measures, on street parking and streetscape improvements. Effective coordination with Town Officials, stakeholders and the design team was critical to developing, permitting and producing bid documents for the district revitalization project.

Essex-Williston EIS, VTrans, Chittenden County, Vermont, Transportation Engineer

Transportation Engineer to evaluate alternatives and impacts for a portion of a circumferential highway around Burlington, Vermont. From a long list of alternatives, preliminary design was prepared for eight short-listed alternatives. Alternatives included upgrades to existing roadways and the construction of a new limited access highway or a boulevard. The upgrade alternatives considered improvements to existing signal systems as well as replacement of the signals with roundabouts. Extensive pedestrian and bicycle facilities were included with all alternatives. Evaluations and preliminary design was prepared for stormwater management systems and utility systems.

Keene/Swanzey Bypass, NH Route 9/10/12/101, NHDOT, Keene/Swanzey, NH

Transportation Engineer responsible for various aspects of the interim final design. This project involves the reconstruction and reconfiguration of sections of NH Routes 9, 10, 12 and 101, including a two lane roundabout and several signalized intersections. Designed/reviewed roadway elements and stormwater drainage facilities, prepared grading plans and quantity estimates.

Interstate 93, Salem-Manchester, NHDOT, NH: Transportation Engineer

The project includes the design and development of contract plans and bid documents for the widening and reconstruction of a 9-mile segment of the Interstate Highway. Tim has been involved in the 2-mile section of the project in the Exit 3 area which is on new alignment and requires the complete redesign of a diamond interchange. Work assignments include drainage layout and design, roadway design, quantity and estimate takeoffs and field investigations.

Campus Development and Planning, Colby-Sawyer College, New London, NH

Served as staff/project engineer for the continued planning and development of a growing Colby-Sawyer College campus. Met with client and design build team, coordinated and delegated many projects within the campus. Appeared at planning board meetings, met town officials for project approval on; field event areas for shot put and discus, improvements on drainage and irrigation on baseball field, walkway and park construction, utility and lighting improvements, maintenance site improvements, parking expansions, building design planning for construction and permitting. Aided in updates to master utilities infrastructure and facilities plans for the campus.

Lamb Road, City of Nashua, Nashua, NH

Staff Engineer for the realignment of 0.75 miles of Lamb Road, a two lane arterial collector road with an ADT of 10,000 vehicles per day. Responsibilities included municipal planning, design, review of horizontal and vertical alignment alteration, slope grading and relocations for plan preparation for construction.

16 YEARS EXPERIENCE

EDUCATION

Bachelors degree in Landscape Architecture and Fine Arts
University of Rhode Island
Rhode Island School of Design
American College of London

PROFESSIONAL AFFILIATIONS

Planning Board Executive Member, Stratham, NH
American Planning Association
Granite State Landscape Architects
Exeter Chamber of Commerce
American Society of Landscape Architects
US Green Building Council
Boston Society of Landscape Architects
Gateway Business District Master Plan Committee, Stratham, NH

REGISTRATIONS

State of New Hampshire #026
State of Rhode Island #402
CLARB #4544

Jeffrey is a principal of Ironwood design group and a registered landscape architect. He has close to 16 years of experience in the profession, and has contributed to the success of many award winning projects throughout New England. Prior to establishing Ironwood design group he was a landscape architect with firms in both Rhode Island and Massachusetts. Educated at the University of Rhode Island, Rhode Island School of Design, and the American College of London, Jeffrey has earned Bachelor degrees in Landscape Architecture and Fine Arts.

Jeffrey R. Hyland, RLA, ASLA, CLARB
Landscape Architect, Urban Designer, Site Planner

University of Massachusetts Lowell

Master planning, landscape and urban design services, construction phase services for the Bourgeois, Leitch and Donahue Quadrangle Improvements, Costello Gym Entrance and Walkway Improvements, Lowell Riverwalk, and the Boot Mill Courtyard.

City of Portsmouth

Master planning, landscape and urban design services Vaughan Mall Improvements.

Tilton Main Street Program

Master plan “visioning” design services for improvements to Tilton’s historic commercial business district including Historic Downtown and River Walk Master Plan.

City of Portsmouth

Master plan “visioning” design services for improvements to Tilton’s historic commercial business district including Lower Court Street Improvements, and State Street Reconstruction.

20 YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering, 1989

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)

REGISTRATIONS

Professional Engineer

Ms. Lane has 20 years of experience in transportation project development including substantial training experience in applying Context-Sensitive Solutions (CSS) to infrastructure projects. Ms. Lane's in-depth knowledge of CSS comes from a 15 year career with the North Carolina Department of Transportation (NCDOT). While at NCDOT she managed the NEPA process for numerous transportation projects and for these projects she developed and managed the stakeholder involvement process for federal, state, and local government agencies including elected officials, special interest groups, and the general public. She also encouraged flexibility in design to develop cost effective solutions that also minimized environmental and community impacts. Over the last five years, she has used her wealth of knowledge in the development and delivery of transportation projects to develop and provide instruction in both CSS and Community Impact Assessment as well as conduct research in these areas to advance the state of the practice in applying CSS to the transportation decision-making process. Her expertise has been recognized nationally by appointments to the Transportation Research Board's Committees on CSS, Environmental Justice and Social and Economic Factors of Transportation. She is frequently asked to present at national conferences on the above topics with particular focus on CSS design solutions that meet both engineering and community needs.

Leigh Blackmon Lane
Subject Mater Expert

US 321 Project, Blowing Rock, NC.

Project manager for the US 321 project involved the study of several bypass alternatives through pristine mountainous terrain of western NC. In addition, one of the alternatives proposed to widen existing US 321 in Blowing Rock through a Historic District as well as potentially impacted scenic views of the Blue Ridge Parkway. This project was extremely controversial with interest from citizens all over the country. The Blowing Rock area is a resort area for affluent retirees. North Carolina DOT used a Citizens Advisory Committee (one of only two CAC ever used by NCDOT for highway projects) to help identify issues and guide the project study team during preparation of the DEIS. This project not only involved Section 106(h) impacts but includes a Draft 4-f Statement addressing not only the Historic District but also visual impacts to the Blue Ridge Parkway. Because of the tremendous concern expressed by the residents of Blowing Rock, NCDOT created a video detailing the project alternatives. This video represented a new public involvement technique for NCDOT used to help citizens understand the impacts of the project alternatives. 4-D computer imaging was used to show what the alternatives looked like before and after construction. Impressive mitigation/enhancement measures were included in the design to preserve the historic integrity and small town charm of the community. These measures included decorative lighting, sidewalks, underground utilities, landscaping along the roadside in the median and at intersections, and replacement of rock walls. Computer simulation was used to visualize these measures and included as part of the video which was widely disseminated to people all over the country.

West Peterborough TIF District Engineering Services, Peterborough, NH

CSS Consultant working with the Project Team on one of the first Context Sensitive Solutions based engineering services projects in NH. A major component will be an extensive Public Involvement Program. Engineering components include design of traffic calming measures, roadway design for 1 mile of urban arterial, sidewalks, utility improvements, parkland improvements, pedestrian-bicycle trails, a historical interpretive walking tour and streetscape improvements.

Co Principal Investigator for NCHRP 8-68, Citizen's and Discipline Guide to Context Sensitive Solutions in Transportation

The objective of this research is to develop two CSS guides, one for citizens and one for discipline-specific professionals (i.e. practitioner). The guide will explain roles, responsibilities and opportunities throughout all phases of transportation decision-making from long-range planning through operations and maintenance. This work involves assisting with oversight of the development of both Guides and identification of gaps in knowledge from an extensive literature review of case studies as well as facilitating input from an Advisory Team of practitioners and citizen advocacy groups.

Task Order Leader for Federal Highway Administration's CSS Implementation Technical Assistance Program.

This work effort includes providing specialized technical assistance to 15 state DOTs requiring expertise in urban / rural design (design flexibility), transportation and land use planning including multi-modal planning and design, public involvement, consensus building techniques, tort liability, performance measures and organizational effectiveness.

Principal Investigator for NCHRP 20-5 (37-01) Synthesis Project entitled CSS and Multi-Disciplinary Teams.

This project synthesized current and emerging successful practices, case studies and guidance to further enable appropriate, cost-effective, and successful integration of multi-disciplinary teams into the project development process to inform and influence context sensitive design/solutions in a more widespread and consistent manner. A review of the relevant literature in the field was combined with survey results in order to report on the current state of the practice. Based on survey results, case studies and or profiles of successful practice were included to describe innovations in the field, lessons learned and gaps in information

20+ YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering,
University of Rhode Island, 1986

Real Estate Market Analysis,
Boston University, 1996

Fundamentals of Real Estate Development,
MIT/CRE, 1998

REGISTRATIONS

Professional Engineer, CT

Ms. Lepore is a Director of Engineering within Berger's New England Transportation Group. Responsible for project management and business development in the Needham MA office. She has over 20 years of experience in the field of urban design planning, civil engineering and land development servicing both public and private sector clients. She has a diverse background with facilitating public participation programs, including written and oral presentations regulatory and environmental permitting, strategic planning, and policy development. In all these sectors she has extensive technical experience preparing transportation studies, environmental impact reports, assessments, evaluations, site feasibility studies, planning and corridor studies.

Lisa E. Lepore, P.E.
Director of Engineering

South Coast Rail Federal Environmental Review Services, MA, Executive Office of Transportation/U.S. Army Corps of Engineers

Transportation Task Manager providing Federal Environmental Review Services to the Executive Office of Transportation, and for the U.S. Army Corps of Engineers, on the South Coast Rail project. This NEPA/MEPA study is underway to restore passenger rail between the cities of Fall River and New Bedford and downtown Boston. Responsibilities include the review of transportation alternatives and their related impacts to vehicular, pedestrian, and transit modes.

Boston Central Artery Surface Transportation Plan, Deputy Director

Supervised the public process with engineering consultants, community stakeholders and the MTA developing the new city roadway network. This surface artery connected on and off-ramps for final design of the surface street system build over the CA/T. The design became the Rose Kennedy Greenway.

Assembly Square Transit Oriented Development, Somerville, MA, Project Manager

Managed interdepartmental staff and consultants to effectively work with the developer to approve the transit oriented development at Assembly Square. Permitted the master plan to advance the development of this Smart Growth District. Approved the site and transportation elements for an IKEA site in this District. Coordinated the City master plan and special site plan review of the 66 acre site comprised of: 9+M s.f. of mix-use, 2100 residential units, and a new $50M transit station with open space valued over $2B over the next two decades. Secured federal and state funding to study and design I-93 Interchange and Multi-Modal Access Improvements in the District totaling $5.5M.

Green Line Extension EIR/EA, City Liaison to EOTPW

Provide program management for MBTA Green Line Extension proposed through the City of Somerville. Presented the work plan illustrating the alignment and station locations with site developments to the Office of Commonwealth Development. This plan enabled the City to have a stake and ensure its policies where included in the Light Rail's extension. Responsible for analyzing a framework for land use permitting, zoning, corridor assessment and real estate market analyses for new neighborhood stations, developing the design principles to guide the analysis.

Somerville Avenue Reconstruction

Project Manager reviewing the 75% design documents for this $23M roadway reconstruction project. Over a mile in length the project included separation of CSO, full depth reconstruction, streetscape design elements and interconnected traffic signal controls. Responsible for review of the final engineering 100% PS&E, schedule and budget productions, bid documents and contractor selection in coordination with MassHighway. Additionally, updated and maintained the project status in the TIP for construction funding.

Metropolitan Planning Organization, City of Somerville Representative

Responsible for procuring funding and issuing RFP's and contracts to proceed with study, design plans, specifications and estimates for construction of local roads, community paths, major arterials, interchanges, transit stations and corridor project. Developed the Scope of Work for a $1M federal earmark to evaluate the real estate development/market feasibility, deconstructing McGrath Highway (Route 28). Develop a plan to access and design infrastructure improvements to unlock the Inner Belt/Brick Bottom area constrained by surrounding highways and rail lines. Responsible for annual funding applications in the state Transportation Implementation Plan (TIP) and the Federal required Regional Transportation Plan (RTP). Coordinated with staff in the Executive Office Transportation public works (EOTPW) and the MassHighway Department preparing work plans and drafting scopes of work, request for proposals for the $60M of secured funding for Somerville's infrastructure.

30+ YEARS EXPERIENCE

EDUCATION

B.S., Engineering
Thayer School of Engineering

B.A. Engineering Science
Dartmouth College

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)

REGISTRATIONS

Professional Engineer

Mr. Lowry is a registered professional engineer with over 30 years of experience in civil engineering projects, with emphasis on site development projects, transportation engineering, and highway design. Site engineering has included the planning, design and construction administration for the site development of municipal projects, regional shopping malls, and industrial facilities. Responsibilities have included site planning and layout, grading, drainage and utility design. These projects have required coordination with building design, offsite roadway improvements and utility services and the preparation of Environmental Impact Reports and Assessments and environmental permitting. Traffic engineering experience has included the preparation of traffic impact analyses, traffic signal system design including several closed loop systems and development of traffic management plans. Projects have ranged from isolated intersection design to major Interstate projects. He has been involved in all stages of project development from initial conception, preparation of environmental assessments, design, environmental documentation and permitting and construction administration.

Joseph P. Lowry, PE
Senior Project Manager

I-295 Connector Design/Build, Portland, ME, Traffic Task Manager and Quality Control Review

Responsible for all traffic engineering design and also responsible for Quality Control Review of the roadway, drainage, utilities and landscaping design. This $18M project included the design and construction of 1.8 miles of new and reconstructed roadways, a multi-use trail traversing the project, three bridges over the railroad tracks, three traffic signals and two crossings for the multi-use trail. Critical issues affecting the construction and design schedules include utility relocations, coordination with the railroad, maintenance of traffic at Veteran's Circle and construction staging of embankments for consolidation of marine clays.

Road and Drainage Design, Moultonborough, NH, Project Manager

Project Manager for several road and drainage designs for the Town of Moultonborough, NH. Mr. Lowry has overseen the design, permitting, and construction administration and inspection of the Town's road improvement and reconstruction projects for the past four construction seasons. This role has included providing guidance toward roadway alignment and drainage design, as well as public relations and the acquisition of easements.

US Route 3/Daniel Webster Highway, Merrimack, NH

Project Manager for a corridor study along a 3.5 mile segment of this arterial roadway, which included seven major intersections. Study included accident analysis, collection of traffic volume data, capacity analysis, and coordination analysis. Recommendations, cost estimates, and priorities were included. Project is now proceeding to the design stage.

Military Road/Missouri Avenue Transportation Study, Washington, DC, Transportation Engineer

Participated on study team to investigate traffic management improvements along the Military Road and Missouri Avenue Corridor in Washington, DC. The study evaluated perceived speeding problems, traffic congestion, and pedestrian and vehicular safety problems. Recommendations included improvements to changes to lane utilization, signal timings and phasings, signs and pavement markings, improvements to wheelchair ramps, isolated parking restrictions and turn prohibitions, and enhanced enforcement of existing regulatory restrictions. Study included extensive community participation process to assist in the identification of the issues and to determine the local acceptability of the recommendations.

Road and Drainage Design, Moultonborough, NH

Project Manager for several road and drainage designs for the Town of Moultonborough, NH. Mr. Lowry has overseen the design, permitting, and construction administration and inspection of the Town's road improvement and reconstruction projects for the past four construction seasons. This role has included providing guidance toward roadway alignment and drainage design, as well as public relations and the acquisition of several necessary easements. Mr. Lowry has also served as the Project Manager through the construction administration phases of the projects, tracking budgets and project status

Friendship Heights Transportation Study, Washington, DC

Participated on study team to investigate traffic management improvements in the Friendship Heights area of Washington, DC. The study evaluated traffic congestion, pedestrian safety, truck operations, parking supply and demand, and neighborhood cut-through traffic problems. Recommendations included improvements to signal timings and phasings, signs and pavement markings, isolated parking restrictions and turn prohibitions, and enhanced enforcement of existing regulatory restrictions. Study included extensive community participation process to assist in the identification of the issues and to determine the local acceptability of the recommendations.

12+ YEARS EXPERIENCE

EDUCATION

MBA
Southern New Hampshire University, 2002

B.S., Civil Engineering
University of New Hampshire, 1995

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers – Associate Member
Boston Society of Civil Engineers
American Public Works Association

REGISTRATIONS

Professional Engineer in MA, NH, RI, CT
Safety Training (OSHA 10hrs, OSHA 40rs, Amtrack)
MA Certified Soil Evaluator

Mr. Marsette is an engineer within Berger's New England Transportation Group and is based out of our Needham Office. He has over twelve years of experience in the design and construction phases on a variety of civil engineering projects. He has designed all civil aspects of highway interchanges, signalized intersection improvements, roadway grade separations, roadway reconstruction projects, railroad grade crossing improvements, site development projects, and wetland restoration projects. He has designed highway geometrics, site improvements, utility upgrades, and stormwater drainage improvements.

Jeremy T. Marsette, PE
Assistant Director, Civil Engineering

Historic Paving Program, City of Newport, RI

As Project Manager, Mr. Marsette is responsible for the final design of the Washington Square and Lower Thames Street projects. These project sections are in Newport's historic waterfront area. Tasks include roadway realignment/design, design of bluestone sidewalks and crosswalks, wheelchair ramp design, drainage improvements, quantity/cost estimates, plan/specification preparation, construction phase services, and working closely with the City and Citizens Groups to create consensus and develop a project fitting with the historic setting of the area.

Manchester Street Corridor Improvements Project, Concord NH

Project Engineer for the preparation of design plans and specifications by consultant engineers for the construction of improvements to a 1-mile section of Manchester Street located between Rt. 106 and Loudon Road in Concord. Project included a new signalized intersection with Airport Road and Integra Drive, major utility relocations and roadway widening to provide for two through lanes and a center turning lane. The project improved traffic flow, reduce delays and provide for safer access to and from Manchester Street.

Commercial Street Corridor Improvements Project, Concord NH

Project Engineer for the preparation of design plans and specifications by consultant engineers for the construction of improvements to a ½ mile section of Commercial Street located between I-393 and Fan Road in Concord. Project included a new unsignalized intersection, utility relocation, mechanically stabilized earth retaining wall construction, new closed drainage system and roadway reconstruction. Represented the City of Concord in scope of service, design review and utility coordination meetings. Performed contract administration including recommendation of payments and negotiating contract change orders.

Parkway Design Project, Clinton and Pleasant Streets, Concord NH

Project Engineer for the preparation of design plans and specifications by consultant engineers for the construction of improvements to a new city street connecting Pleasant and Clinton Streets. This ¾ mile roadway traverses historic properties, wetlands and State agricultural land. The project included the design of the first inter-city parkway in New Hampshire, consisting of extensive earth retaining structures, bike and pedestrian paths, a wildlife and cross country ski trail bridge structure, wetland mitigation to satisfy the Army Corps of Engineers and State of New Hampshire Site Specific requirements and extensive landscaping required by State Historic Preservation Office. The project alleviated traffic congestion in downtown areas by diverting trips that originate and arrive at destinations outside the City proper. Represented the City of Concord in scope of service, design review and utility coordination meetings.

Garvins Falls Road Stormwater Drainage Reconstruction, Concord NH

Project Engineer and Project Manager for the preparation of design plans and specifications for the reconstruction of storm water drainage outfall to the Merrimack River. Prepared design plans, bid specifications, prepared NHDES permit documents, coordinated acquisition of easements, coordinated public information process, oversaw bidding and contractor selection process, and conduct field inspections for this $150,000 reconstruction project. The project involved the reconstruction of an eroded bluff and a deteriorated storm drainage outfall in an environmentally sensitive area

12+ YEARS EXPERIENCE

EDUCATION

B.S., Civil Engineering
University of New Hampshire, 1996

REGISTRATIONS

Professional Engineer in NH

Mr. Marshall has over twelve years of experience in bridge design. He has widespread experience with municipal bridge projects including over **fifty** within the New Hampshire Department of Transportation's Municipally Managed Bridge Program. His assignments have included work for the Connecticut Department of Transportation, the Maine Department of Transportation, the New Hampshire Department of Transportation, the New York State Department of Transportation and the Vermont Agency of Transportation on short; medium; and long; simple and multi-span bridge rehabilitation and replacement projects. Marshall has successfully managed and led the design of multiple bridge projects through all facets of the design process including the development and assembly of conceptual studies, preliminary plans, final design plans, specifications, contract documents, permitting applications and right of way documentation. He has also completed numerous bridge inspection and evaluation projects and overseen a variety of large and small bridge construction projects.

Thomas Marshall, PE
Project Manager/Assistant Director of Structural Engineering

Court Street (NH 12A) Bridge over the Ashuelot River; Keene, NH

Mr. Marshall served the City of Keene as Project Manager and Senior Bridge Engineer for the design of a new one hundred twenty-two foot, single span, three-lane bridge to replace the Court Street (NH Route 12A) Bridge over the Ashuelot River. The structure incorporated the use of weathering steel girders on pile supported integral abutments in order to minimize construction and long term maintenance costs. Mr. Marshall worked with the NHDOT to obtain approval of the City's preferred bridge and roadway alternate for funding under the Municipal Bridge Aid Program.

Great Bridge over the Exeter River; Exeter, NH

As Senior Bridge Engineer, Mr. Marshall served the Town of Exeter during design and construction phase for this challenging superstructure replacement project. The work was performed by stage construction (maintaining one lane of traffic on the bridge), through heavy downtown traffic, in a single construction season, and involved the relocation and support of multiple utility lines. In order to complete the project in one season the bridge was designed entirely of precast members. The exterior girders, ornamental railings, and lampposts were designed and detailed to match the appearance of the original arched structure that was constructed in the 1930's.

Island Street Bridge over the Ashuelot River; Keene, NH

This project required replacement of the bridge deck on the existing "Acrow" steel truss bridge with a custom designed precast deck slab system. As Senior Bridge Engineer and Technical Advisor, Mr. Marshall assisted in developing alternates for replacing the bridge deck which improved the roadway profile by eliminating the sag on the deck. His role also involved performing the final quality assurance review of the report, final design, and construction documents. It was a fast-track project due to the severity of the bridge's structural condition and the large volumes of traffic that use the bridge. The precast panel system allowed for quick installation and minimized the shutdown of the road.

Patterson Hill Road Bridge over the Contoocook River; Henniker, NH –

Mr. Marshall served as the Senior Bridge Engineer for the structural design, final plan preparation, and construction observation on the Patterson Hill Road Bridge under the NHDOT Municipally Managed Bridge program. The 1915 John Storrs, one hundred fifteen foot, single span, one lane, historic, high Pratt, steel truss bridge was rehabilitated to handle AASHTO H-20 loading. Mr. Marshall's responsibilities included generation of computer models for structural analysis of the truss and design and detailing of the components necessary to retrofit the existing truss system.

Spring Road Bridge over Nubanusit Brook; Peterborough, NH

Mr. Marshall served as Bridge Engineer for the design and construction observation phases for the replacement of the Spring Road Bridge under the NHDOT Municipally Managed Bridge program. The project consisted of replacing the existing two span bridge with a new, sixty-two foot, two span, continuous plate girder structure on rehabilitated abutments and a rehabilitated pier.

Main Street Bridge over the Piscataquog River; Goffstown, NH

Mr. Marshall served as Bridge Engineer on this unique project. The original 1928 Main Street Bridge was considered New Hampshire's fifth most historic concrete arch bridge. Rehabilitation consisted of the removal and reconstruction of structural sidewalk and bridge rail. Located in the center of town, the bridge carries approximately 15,000 vehicles per day. Two traffic lanes and uninterrupted access for the local merchants was maintained at all times. Mr. Marshall also performed load rating calculations on the existing arch as part of the project.

30+ YEARS EXPERIENCE

EDUCATION

B.S. Civil Engineering
Merrimack College, 1961

Public Administration,
Northeastern Graduate School

Former Adjunct Professor,
Boston University Historic Preservation Program

PROFESSIONAL AFFILIATIONS

American Institute of Certified Planners

American Planning Association

Member and Past Director, Historic Massachusetts

Member and Past Director, Society for Industrial Archaeology

National Trust for Historic Preservation

Trustee and Commissioner, Essex National Heritage Commission

Advisor, Trustees of Reservations – Castle Hill Reservation

Boston Preservation Alliance

Historic New England

Mr. McGinley is a nationally recognized preservation planner who has administered and coordinated all types of complex projects involving the planning and design of environmentally sensitive areas including historic structures and bridges. He has assisted public agencies and engineering in conducting area-wide historical surveys, environmental assessments and historical reviews under Sections 106 and 4(f) and the development of appropriate mitigation measures. He has extensive knowledge about all state and federal historic preservation regulations including the National Register, Historic American Engineering Record (HAER), the National Transportation Act, and the procedures of the Advisory Council on Historic Preservation.

Paul J. McGinley, AICP
Preservation Planner and Historic Bridge Consultant

Newburyport's Historic Market Square/Waterfront Redevelopment Project

Mr. McGinley became the Director of the Newburyport Redevelopment project to preserve the 22-acre, early nineteenth century seaport. In an area previously scheduled for demolition, the redesign emphasized preservation of all historic buildings, a comprehensive traffic and parking plan, and compatible new development and preservation techniques to enhance and protect the integrity of this historic town center. The project was implemented through imaginative uses of FHWA programs and urban renewal; it has been cited for the high degree of cooperation between city, state, MHD, FHWA, and HUD. *1975 AIA Honor Design Award, New England Regional Council; 1975 Henry David Thoreau Honor Award for Landscape Design; 1976 DOT Federal Highway Award for Extended Use; 1976 HUD National Honor Award for Design Excellence;1984 Urban Design Citation, Boston Society of Architects.*

Central Artery/Tunnel Project

Mr. McGinley was Project Manager of his firm's role as Project Conservator of historic resources for this massive and nationally acclaimed project. A preservation plan was developed to mitigate the adverse impacts to historic structures. *1990 Outstanding Project Award, American Planning Association.*

Statewide Consultant for Highways and Bridges

The MHD selected Mr. McGinley's firm to serve as their historic preservation consultant for proposed highway and bridge projects. Mr. McGinley was Project Manager of this contract to assist the Cultural Resource Division of the Department.

Canton Viaduct, Northeast Corridor Improvement Project

Project Director to MBTA and Amtrak for the design of new deck on top of this 1835 historic granite viaduct for high speed rail clearances. Full environmental approval was attained at the preliminary design stage.

Alaska Railroad Historic Bridge Consultant.

Mr. McGinley serves as a historical advisor and consultant to the Alaska Railroad for an overall historic survey of 152 bridges along the rail line, for historic documentation of individual bridges and for consultation on cultural resource issues.

Shore (Belt) Parkway, Brooklyn, New York

Mr. McGinley was part of a multi-disciplined team chosen by New York City DOT to develop a History Inventory and Master Design Plan for the Robert Moses 1939 Parkway along the shoreline of Brooklyn that was a foremost transportation/parkway of the Art Deco Style. He conducted a historic inventory of 13 bridges and the last remaining gasoline station along the parkway and development design recommendations to preserve the integrity of the overall parkway. Specific plans and details were developed for seven bridges that are to be replaced with new structures. *2006 New York City Art Commission Award for Excellence in Design.*

Carriage Road Bridge Resotration Plan, Acadia National Park

Mr. McGinley was Project Manager of this planning effort to restore the 29 historic stone arch concrete bridges on the 50-mile renowned carriage road system built by John D. Rockefeller, Jr. at Acadia National Park on Mt. Desert Island in Maine.

4+ YEARS EXPERIENCE

EDUCATION

M.S., Civil Engineering
University of Maine, 2006

B.S., Civil Engineering
University of Maine, 2004

AFFILIATIONS

American Society of Civil Engineers (ASCE)

Ms. Reuning has gained engineering experience in the fields of structural and transportation engineering during her master's thesis research with the United States Army Corps of Engineers beginning in 2004 as well as with The Louis Berger Group beginning in 2006. During her tenure at the Louis Berger Group she has gained a working knowledge of civil engineering working with both bridge and highway design groups. She has completed the NHDOT sponsored Context Sensitive Solutions training conducted by the Partnership for Public Spaces.

Ariel S. Reuning, EIT
Transportation Engineer

Interstate 93, Salem-Manchester, NHDOT, NH:

Transportation Engineer working on the widening of Interstate 93, from the border to 9 miles north of Massachusetts, focusing primarily on the preparation of final design plans in the area surrounding Exit 3. Ariel has been involved in the design efforts to relocate and widen NH Route 111, the NB and SB Barrels, as well as Interstate Ramps. Ariel also has been the Engineer in charge of estimating for the project involved with preparing estimates for construction contracts and also maintaining the Quarterly Cost Estimate Update for the entire 9-mile southern segment of the project.

Interstate 93, Salem-Manchester, NHDOT, NH:

Structural Engineer working on preparation of final bridge design plans for the roads relocated during the Interstate 93 widening. Ariel has been involved with bridge design for these new roadways located at Exit 1, Brookdale Road, and NH Route 111.

Keene/Swanzey Bypass, NH Route 9/10/12/101, NHDOT, Keene/Swanzey, NH:

Staff Engineer assisting the Project Team with various aspects of the interim final design. This project involves the reconstruction and reconfiguration of sections of NH Routes 9, 10, 12 and 101, including a two lane roundabout and several signalized intersections. Assisted with the final design of roadway elements.

West Peterborough TIF District Engineering Services, Peterborough, NH:

Staff Engineer working with the Town on one of the first Context Sensitive Solutions based engineering services projects in NH. A major component will be an extensive Public Involvement Program. Engineering components include design of traffic calming measures, roadway design for 1 mile of urban arterial, sidewalks, utility improvements, parkland improvements, pedestrian-bicycle trails, a historical interpretive walking tour and streetscape improvements. The project is currently entering the Contract Plan preparation stage.

12+ YEARS EXPERIENCE

EDUCATION

Stream Stability and Scour at Highway Bridges Seminar, October 2004, 1.8 ceu's

40-Hour OSHA HAZWOPER Training, June 1998

B.S. Civil Engineering, Columbia University School of Engineering and Applied Science, 1995

PROFESSIONAL AFFILIATIONS

Member - American Society of Civil Engineers (ASCE), 1993-2000

REGISTRATIONS

Professional Engineer – New Hampshire

Mr. Robinson is a professional engineer with over 12 years of experience in civil engineering on transportation, environmental and site development projects. He has managed projects from the planning stage through the preparation of construction drawings and bidding documents. His duties include supervision of technical personnel, public participation and presentations, and client liaison.

James M. Robinson, PE
Senior Civil Engineer

I-93 Salem-Manchester Final Design

Stormwater Management Engineer for the hydraulic/hydrological modeling and detention pond design for reconstruction and widening for eight miles of Interstate I-93 including exits 1 and 3. Permitting conditions as part of Section 401 of the Water Quality Act require no net increase of specific pollutants as a result of the project. The analysis requires the evaluation of pre and post pollutant discharge calculations and alternative evaluations of various BMPs to achieve the required pollutant uptake. Currently over 30 BMP's including wet and dry extended detention basins, gravel wetlands, infiltration basins and treatment swales are being used. The project is utilizing state of the art technology and design techniques for stormwater treatment.

Eastman Hill Road, Lebanon, NH

Project Engineer for design and reconstruction of 8,000 feet of Eastman Hill Road. The existing roadway was deteriorated with severe grades and limited storm water drainage along the roadway contributing to the continued deterioration of the roadway. Evaluated rehabilitation alternatives and geotextile reinforcement options. Prepared preliminary and final design of the in-situ reclamation alternative, developed construction plans, bid documents, and cost estimates. Conducted construction inspections, and alternative material evaluations.

South Manchester Rail Trail, City of Manchester, NH:

Sr Civil Engineer for a mixed use pedestrian path along 7,200 feet of the abandoned Manchester & Lawrence Branch railroad ROW with one at grade street intersection, and 9 connector trails. Coordinated with landscape architect, utility companies, stakeholders, and city officials to ensure the design met their needs and concerns. Designed erosion control measures, ditch line restoration, closed drainage system modifications, infiltration trench, and decorative trail lighting system. Prepared detailed plans for bidding. Prepared and oversaw implementation of measures to address removal, where necessary, of arsenic and poly-aromatic hydrocarbon contaminated soils and railroad ties. Prepared NH DES Site Specific, Dredge and Fill permit submissions and U.S. Army Corps of Engineers General Programmatic Review documents. Provided on-call construction inspection services.

Elm Street Reconstruction, City of Manchester, NH,

Jr. Project Engineer for the reconstruction of 3300 feet of Elm Street an urbanized main street. The project included traffic calming and streetscape components requiring coordination with area merchants to determine access, parking, and loading needs to help guide the design of angle parking, sidewalk bump-outs, pedestrian circulation, and vehicular turning lanes. Extensive multi-faceted coordination efforts with the project team and stakeholders were required for utilities, street trees, street lighting types and locations, parking meter types and locations, streetscape furnishings, sidewalk, crosswalk and handicap ramp treatments, and bus stop locations. Prepared contract plans, bid documents and engineer's estimate.

South Broadway (NH Route 28) Reconstruction, Salem, NH

Project Engineer for the off-site improvements associated with a retail development. Designed widening of 3,600 feet of urban arterial highway and improvements including median island relocation, and turning lanes to accommodate additional traffic volumes. Redesign of five signalized intersections three of which involved at-grade rail crossings and associated track relocation work. Prepared roadway geometry, signage, grading plans and 50' cross-sections. Detailed various roadway, landscaping, and drainage elements. Prepared existing and proposed catchment area analysis. Designed vertical layout of 36" stormwater conveyance and storage pipes to maintain constant hydraulic grade on extremely flat site. Checked extensive pre versus post development drainage evaluation for the flood sensitive area. The project involved an extensive coordination effort for a multidiscipline project.

17+ YEARS EXPERIENCE

EDUCATION

Urban Drainage Design,
National Highway Institute Certification - 2002

AASHTO Roadside Design,
National Highway Institute Certification – 2004

Safety and Operational Effects of Geometric Design Features,
National Highway Institute Certification – 2004

B.S. Civil Engineering Technology,
Wentworth Institute of Technology, 1991

REGISTRATIONS

Professional Engineer – New Hampshire

Mr. Snow has over seventeen years of experience in transportation engineering and highway design working in both the public and private sector. His extensive experience in preliminary and final design of large highway projects provides a major base for the design of any size transportation or civil project. The large majority of his experience is in highway design with specialization in drainage design. He has provided significant transportation engineering services to state agencies in the development of complex drainage analyses and highway design.

Keith A. Snow, PE
Senior Transportation Engineer

Keene-Swanzey Final Highway Design, Keene, NH

Senior Transportation Engineer for the final design of NH Routes 9, 10, 12, and 101 intersection in the City of Keene. This project reconfigured the major signalized intersection that was consistently failing to the first two-lane roundabout in New Hampshire. The Project involved closed system drainage design close to floodways with utility conflict issues to resolve, and a complex interim signalized traffic control layout during construction. The project required extensive coordination with the NHDOT and roundabout consultants.

Interstate 93, Exit 3 Final Highway Design, Windham, NH

Senior Transportation Engineer for ongoing final design efforts related to Interstate 93, Exit 3 interchange to provide safety and capacity improvements throughout the corridor. The project involves the preparation of final design plans, for the NHDOT, for the reconstruction of the I-93 Exit 3, which includes the relocation of the I-93 NB and SB barrels, NH Routes 111 and the realignment of all ramps. Lead drainage engineer responsible for coordinating and designing culverts, closed system drainage, detention basins, BMP's and other treatment facilities throughout the corridor.

NH Routes 11/103, Claremont-Newport, NH

Project Engineer for final design efforts related to the reconstruction of 4.0 miles of NH Routes 11/103 to provide safety and capacity improvements. This project includes expansion of existing truck climbing lanes; improvements to side road intersections; shoulder widening; and significant drainage improvements throughout the corridor.

NH Route 26 Over the Androscoggin River, Errol, NH

Engineer for the final design of the approach work for the replacement of a functionally obsolete bridge in Errol. Project included roadway widening, drainage upgrade, traffic control plans and estimate.

NH Route 33 Over I-95 NB and SB, Portsmouth, NH

Engineer for Traffic Control Plan design for the rehabilitation of a 280-foot-long, two-span, four-lane structure. Three-phase traffic control plans were designed to ensure minimal traffic interruption during construction.

Candia Road, Manchester, NH

Project Engineer for ongoing final design services for the reconstruction of a 1.8-mile section of Candia Road beginning at the I-93, Exit 6 eastern ramp and running easterly to the Massabesic Traffic Circle. Project includes reconstructing road to a two-lane urban section with shoulders for bicycles, analyzing signalized intersections, then designing signal improvements and additional lanes as required, installing curbing for full length of project, constructing sidewalks on both sides of roadway, removing existing concrete roadway slab, constructing closed drainage for entire length, designing sedimentation swales at outfalls, and improvements to Hanover and Bridge Street intersections.

30 YEARS EXPERIENCE

EDUCATION

M.S. Civil Engineering,
Northeastern University,1986

B.S. Civil Engineering,
Northeastern University, 1977

M.B.A.,
University of New Hampshire, 2006

PROFESSIONAL AFFILIATIONS

Member - American Society of Civil Engineers (ASCE)

Member - New Hampshire Section, ASCE,
Past President 2001-2002

REGISTRATIONS

Professional Engineer NH, ME, VT, MA, MD and DC

Mr. Stewart is a professional engineer with 30 years of experience in water resources, stormwater management, transportation, civil engineering and site development projects. He has managed projects from the planning stage through the preparation of construction drawings and bidding documents. His duties include supervision of technical personnel, budget control, public participation and presentations, and client liaison.

Richard L. Stewart, PE
Senior Project Manager

Winnipesaukee River Trail Phase II, Northfield-Tilton, NH

Project Manager for the final design of a 2 mile trail that runs in an abandoned railroad corridor along the Winnipesaukee River. The services include final design, permitting, historic resource evaluation, bidding assistance and construction services. This project is funded under the NH Department of Transportation's Transportation Enhancement (TE) Program.

Route 121 Sidewalk, Village of North Westminster, VT

Project Manager for a conceptual alignment analysis for a 0.6 mile sidewalk to provide a connection between residential areas, the Village Town Center building, and to a sidewalk that connects to downtown. The study investigates alternative alignments, and identifies right-of-way, utility, natural and cultural resources constraints. Several public meetings were held to gage support and define the project. Cost estimates were prepared and the feasibility of the project presented.

NH National Guard Training Center Combat Trail, Strafford, NH

Project Manager for a 12-ft wide 4000 ft long combat training trail conceptual alignment study. The trail will constructed through the heavily wooded site but will designed to avoid wetlands and minimize disturbance to vegetation and stream crossings. The trail will be designed for Humvees and other small trucks.

I-95 Taylor River Bridge and Dam, Hampton, NH

Deputy Project Manager for a dam removal/replacement feasibility study and preliminary design plans for replacement of I-95 Bridge over the Taylor River. The study includes Hydrocadd hydrologic, HEC-RAS hydraulic and sediment analyses, aquatic/fish passage assessment, and environmental studies.

Maple Street Sidewalk, Hartford, VT

Project Manager for a conceptual alignment analysis for a one-half mile sidewalk to provide a connection between Hartford Village and downtown White River Junction to serve residential areas, schools and businesses. The study investigates alternative alignments, and identifies right-of-way, utility, natural and cultural resources constraints. Several public meetings were held to gage support and define the project. Cost estimates were prepared and the feasibility of the project presented.

South Manchester Rail Trail, Manchester, NH

Project Manager for the final design of a 1.5 mile trail that runs in an abandoned railroad corridor from South Beech Street past Nutts Pond to Goffs Falls Road. Services include final design, permitting, historic resource evaluation, bidding assistance and construction services. This project is funded under the NH Department of Transportation's Congestion Mitigation and Air Quality (CMAQ) Program.

Precourt Park Trail and Bridge, Manchester, NH

Project Manager for the final design of an 1100 foot 8-foot wide paved multi-use trail and a 50-foot bridge that will connect to the South Manchester Rail Trail. Services include final design, permitting, bidding assistance and construction services.

17 YEARS EXPERIENCE

EDUCATION

B.S. Civil Engineering, California Polytechnic State University, 1991

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Member

Structural Engineers of New Hampshire, Member

REGISTRATIONS

Professional Engineer- CA, NH, MA, ME, VT, and CT

Mr. Stockton is a Principal Structural Engineer with over 17 years of experience in all aspects of bridge design and construction and serves as the senior technical bridge engineer for Berger's Manchester Structures Group. He has design, analysis and rating experience for new and existing bridges, as well as an extensive background in bridge construction for projects throughout New England and California. His experience includes structural steel, timber, cast-in-place and prestressed concrete bridge types for public sector clients such as NHDOT, MassHighway, Maine DOT, and Caltrans. He has a thorough knowledge of AASHTO guidelines, as well as NHDOT, MassHighway and Maine DOT Bridge Design Standards.

John G. Stockton, PE
Principal Structural Engineer

I-93 Salem-Manchester Final Design, Salem & Windham, NH:

Lead Structural Engineer for Type, Span & Location studies through Final Design of bridge structures in the Southern segment of the $185 million reconstruction and widening of Interstate 93 for the New Hampshire Department of Transportation. The design consists of expanding I-93 from the existing two-lane facility to four-lanes, upgrading the interchanges at Exits 1, 2 and 3, and replacing or rehabilitating 19 bridge structures from the Massachusetts border northerly through the towns of Salem and Windham, NH. The design will consist of expanding I-93 from existing two-lane facility to four-lanes and upgrade of interchanges at Exits 1, 2 and 3. Four bridge designs have been completed to date, with three of the bridges currently in construction. The Exit 1 ramp bridges in Salem, NH consist of two single-span curved steel plate girder structures over I-93. They have a centerline radius of 1550 feet on a crest vertical curve and span 144 and 165 feet with 29 and 34 degree skews, respectively. Construction began on these bridges in the fall of 2007. The Brookdale Road bridge over I-93 NB & SB, also in Salem, is a two-span tangent steel plate girder structure with equal 155 ft spans on a 9 degree skew. The bridge at Exit 3 in Windham, NH carries the I-93 NB lanes over NH Route 111 and has a centerline radius of 2771 feet with a sag vertical curve to tangent transition. The structure has an asymmetrical 150-230 foot span arrangement and 43.5 degree skew. Construction began on this bridge in summer 2008, and a twin structure for the southbound lanes is currently in design. All of these structures are supported by MSE-wrapped, pile-supported stub abutments, and the curved bridges were designed in accordance with the AASHTO LRFD Bridge Design Specifications.

Pedestrian/Bicycle Bridge over the Sandy River, Farmington, ME:

Lead Structural Engineer for the Preliminary Design Report for the construction of a two-span, 330-foot multi-use trail bridge. The bridge will utilize a prefabricated truss superstructure supported on reinforced concrete abutments and a river pier. The proposed project extends the existing Jay-Farmington Rail Trail across the Sandy River in Farmington. The project alignment will stay within the old railroad ROW resulting in the bridge being at a 45 degree skew to the river. The use of two simple spans will allow access to pedestrian overlooks that are desired at the river pier.

Washington St Bridge Replacement, Dover, NH:

Principal Structural Engineer for the preliminary design review of the re-establishment of Washington Street over the Cocheco River via a new vehicular bridge to facilitate the proposed redevelopment of waterfront property in downtown Dover. The proposed structure will span 160 feet with steel plate girders and a reinforced concrete deck on spread footings. The work includes reconfiguration of the bridge approaches, relocation of three major utilities and the removal of an existing timber pedestrian bridge in an historic, urban setting.

Bridge Repair and Bridge Replacement Program, Town of Salem, NH:

Senior Structural Engineer for the initial site reconnaissance and Quality Control review of the design and plan preparation. Under the NHDOT Municipally Managed Project Program, this project involves design and construction of multiple interconnected culvert structures within the environmentally challenging Spicket River watershed. The phased contract includes interim repairs at three structures and the full replacement of six structures over a five year period.

Manchester Rail Trail Precourt Park Pedestrian Bridge, Manchester, NH:

Senior Project Engineer responsible as the structural technical lead for initial bridge layout studies. This project includes the construction of a 45-foot single-span bridge as part of an improved trail network. Duties include preliminary bridge layout to meet proposed trail alignment and minimize environmental impacts to surrounding area, including several mature trees. The bridge employs a prefabricated timber truss superstructure supported on reinforced concrete abutments to maintain a 8-foot trail width over Baker Brook.

5 YEARS EXPERIENCE

EDUCATION

M.S. in Civil Engineering: University of Louisiana, Lafayette.

B.S. in Civil Engineering: Kakatiya University, Warangal, India

REGISTRATIONS

Professional Engineer- New Hampshire

Mr. Vyakaranam is a Professional Engineer with over 5 years experience in transportation planning and highway design working in both the public and private sector. His experience includes preparation of construction level design documents, preliminary/final drainage layout and analysis, design and development of wetland impact and right-of-way plans, sight line and turning movement studies and traffic impact analysis.

Vijay Vyakaranam, PE
Transportation Engineer

Salem-Manchester I-93 widening – Exit 3 Area

Analyzed the traffic data near the intersection of NH 111 and NH 111A to determine the effect on the intersection LOS with an additional driveway on the north side and made recommendations. Designed horizontal and vertical alignments for SB and NB on/off ramps to/from I-93. Currently assisting in the drainage design for the project.

Salem-Manchester I-93 widening- Brookdale Road Contract

Assisted in the development of Right-Of-Way plans in compliance with NHDOT standards. Computed various construction materials quantities.

Keene-Swanzey – West Street

Analyzed the traffic data for Level of Service (LOS) along West Street near the intersections with Southbound (SB) and Northbound (NB) on/off ramps to/from NH 101. Assisted in the development of the signal coordination plans ensuring compliance with New Hampshire Department of Transportation (NHDOT) standards..

Keene-Swanzey – Winchester Street

Analyzed the traffic data for LOS for a proposed roundabout at the intersection of NH 101 and Winchester Street. Designed the traffic sign layout for the roundabout and adjacent roadways within the project limits in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Assisted in the development of pavement marking & signing plans and computed various construction materials quantities in compliance with NHDOT standards.

Chittenden County Circumferential Highway (CIRC, I-289)

Developed horizontal and vertical alignments for I-289, US-2 and adjacent roadways for partial cloverleaf, full cloverleaf, directional, and diamond interchange configurations within the project limits, adhering to AASHTO Green Book and Vermont Agency of Transportation (VTrans) standards.

Traffic Impact Study

Reviewed and analyzed a traffic impact study for a potential shopping center in Manchester, NH. This analysis includes the comparison of LOS for existing conditions and proposed conditions. I have made recommendations to include a left

Ward Geotechnical Consulting, PLLC

21+ YEARS EXPERIENCE

EDUCATION

B.S. Civil Engineering,
University of New Hampshire, 1980.

Completed coursework for M.S. in Civil Engineering,
University of New Hampshire, 1985

REGISTRATIONS

Professional Engineer- NH, ME, NY, VT, and MA

Mr. Ward established Ward Geotechnical Consulting, PLLC (WGC) in September 2005. With more than 21 years as a practicing geotechnical engineer, he has performed and supervised subsurface investigations, laboratory soil testing, analyses, and design for various geotechnical and geoenvironmental engineering projects. Mr. Ward's geotechnical experience includes highway, bridge, sewer, retaining wall, and building foundation design studies, evaluation and remedial design of dams, design of earth support, traffic decking, underpinning, and dewatering systems, and development of erosion control measures. Geoenvironmental experience included pre-design studies and remedial design, construction management, and quality assurance for superfund sites and landfills.

Craig Ward, PE
Principal

NHDOT Salt Sheds, Various Sites, New Hampshire

Conducted foundation investigations for the design of new salt sheds for NHDOT patrol sheds located in Franconia, Franklin, Cornish, and Belmont. Subsurface explorations at each site include three to four borings. Foundation design and construction recommendations included footing design bearing pressures, removal of unsuitable soils, foundation drainage requirements, seismic design parameters per the International Building Code, backfill and compaction requirements, and dewatering requirements.

Hospital Connector Road, Peterborough, New Hampshire

This new road will be constructed to connect Route 202 and Old Street Road and improve access to the Monadnock Regional Hospital. The 2,000-foot-long road will cross wooded uplands and wetlands south of the hospital. A subsurface exploration program was conducted and recommendations were developed for geotechnical aspects of the design and construction of the road. Special embankment design and construction recommendations were provided for areas underlain by peat and organic soils and areas along the base of a very steep fill slope that supports a hospital parking lot.

Haverhill Road Bridge, Salem, New Hampshire

Conducted a foundation investigation for the replacement of the Haverhill Road Bridge over the Spicket River. The old bridge was a concrete arch structure supported on stone masonry abutments. The new bridge is a precast concrete arch or frame structure with a span of about 16 feet and cast-in-place concrete abutments. The subsurface exploration program consisted of borings drilled behind each abutment. Recommendations for foundation design and construction were provided.

Washington Street Bridge, Dover, New Hampshire

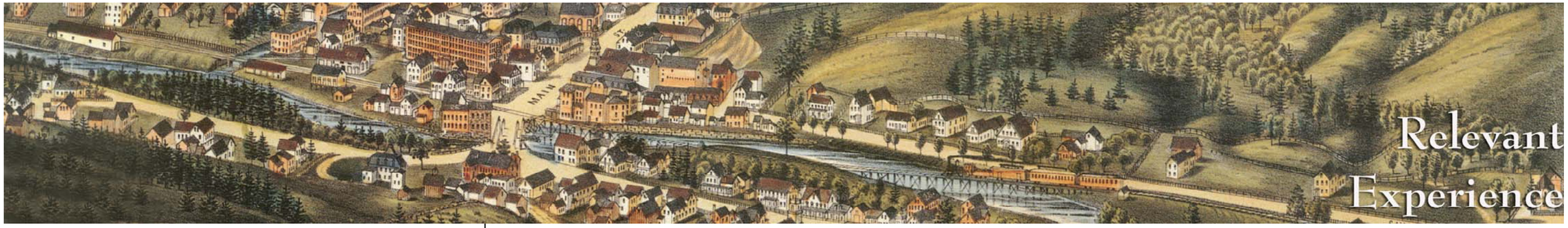
Provided geotechnical services for the design of this 190-foot-long steel girder bridge over the Cochecho River. A vehicular bridge previously at this location was demolished several years ago and a wooden covered pedestrian bridge was erected in its place. Current plans are to relocate the covered pedestrian bridge and construct a new vehicular bridge to improve access between the downtown area west of the river and commercial development planned for the east side of the river. WGC planned and conducted a test boring program to explore subsurface conditions in the area of the proposed bridge abutments and approach roadway improvements. Recommendations were provided for the geotechnical aspects of foundation design and construction.

Chichester Road Bridge, Loudon, New Hampshire

Conducted a foundation investigation for a new bridge to span Bee Hole Brook. The old bridge was washed out during major flooding in the spring of 2006. This project required fast-tracking due to concerns regarding access for emergency vehicles to a large part of the town. The new bridge will be a pre-cast concrete rigid frame structure with a span length of about 20 feet. Borings were drilled to evaluate subsurface conditions and recommendations for design and construction of foundations and abutment walls were developed.

Center Hill Road Bridge, Epsom, New Hampshire

Conducted a foundation investigation for the design of a new bridge over Blake Brook. The old bridge, which has a span of about 20 feet, was heavily damaged by flooding in the spring of 2007. The flooding undermined the old concrete abutments causing them to shift and settle. The new bridge will be a precast concrete structure supported on cast-in-place concrete abutments. The new bridge will have a longer span and be realigned to improve flow conditions.



4.0 Team Experience

On the following pages the Berger Team has included a series of representative projects for the Town's consideration. These projects include:

Louis Berger Group

- Stark Street Reconstruction – Manchester, NH
- Tenney bridge Replacement – Saxton's River, VT
- Washington Street Bridge – Dover, NH
- General Services City of Lebanon, NH

IRONWOOD Design Group

- Lower Court Street Reconstruction – Portsmouth, NH
- Washington Street Bridge – Dover, NH
- Main Street Historic District Plan – Tilton, NH
- High-Hanover Street Improvements – Portsmouth, NH
- Vaughan Mall Improvements – Portsmouth, NH
- Huntington Avenue Reconstruction – Boston, MA
- Westfield Great River Bridge – Westfield, MA
- Lowell Riverwalk – Lowell, MA

Ward Geotechnical Consulting

- Washington Street Bridge – Dover, NH
- Hospital Connector Road – Peterborough, NH
- Swift River Restoration Project – Conway, NH
- Center Hill Road bridge – Epsom, NH
- NHDOT Salt Sheds – Various, NH
- Nottingham Lake Dam – Nottingham, NH
- Oak Hill Road bridge – Northfield, NH
- Highland Lake Dam – Andover, NH
- Willow Pond Dam – Croydon, NH
- Langley parkway – Concord, NH

Lower Court Street Reconstruction
Portsmouth, NH

- *Scope:* acting as a sub-consultant we supplied landscape and urban design services for the reconstruction of a roadway through the City's historic Strawberry Banke neighborhood. We prepared a master plan that incorporated context sensitive solutions followed by construction drawings, and written specifications. During construction we supplied as needed construction phase services.
- *Design elements:* traffic calming measures, new brick and granite paving, reuse of salvaged historic paving materials, lighting, and planting.
- *Collaboration*: interests of the City, abutters and stakeholders were identified and evaluated in the design process.

Washington Street Bridge
Dover, NH

- *Scope:* acting as a sub-consultant we supplied landscape and urban design services for enhancement to the City's riverfront and Downtown. Design efforts were focused to support and enhance the development of a new bridge to connect the northern (downtown side) and the southern (future mixed use redevelopment side) of the Cochecho River.
- *Design elements:* traffic calming measures, decorative paving, seating, sidewalks, accessible river walk and boat dock, scenic overlooks, lighting, and planting.
- *Collaboration*: interests of City Departments, and Committees were identified and evaluated in the design process.

Main St Historic District Master Plan
Tilton, NH

- *Scope:* acting as the prime consultant we supplied master planning, landscape and urban design "visioning" for the revitalization of the Town's historic central business district. We prepared a master plan and presentation graphics, a grant application for transportation enhancement funding and participated in multiple public participation initiatives.
- *Design elements:* traffic calming measures, decorative paving, seating, sidewalks, boardwalk with scenic overlooks, lighting, grading, surface drainage and planting.
- *Collaboration*: interests of the State, Town and businesses were identified and evaluated in the design process.

High-Hanover Streetscape Improvements
Portsmouth, NH

- *Scope:* acting as the prime consultant we supplied master planning, landscape and urban design services for the revitalization of several streets and alley in the center of the City. The project's aim was to enhance pedestrian connections within the City's urban fabric by improving a core area. We prepared a master plan with phasing options, presentation graphics, construction documents for Phases I and II, written specifications, a grant application for transportation enhancement funding and participated in multiple public participation initiatives.
- *Design elements:* design of intermodal transportation hub, series of traffic calming measures, decorative paving, seating walls, sidewalks, lighting, grading, drainage and planting.
- *Collaboration*: interests of the City and abutting businesses were coordinated with established transportation providers

Vaughan Mall Improvements
Portsmouth, NH

- *Scope:* acting as the prime consultant we supplied landscape and urban design services for the revitalization of an existing commercial pedestrian mall. Originally designed in the 1970's, Vaughan Mall was in need of repairs and updating; site improvements were added to make it more attractive to pedestrians and shoppers.
- *Design elements:* an exterior performance space, revolving sculpture display, accent paving, colorful banners, informational kiosks, new lights, benches, trash receptacles and plantings.
- *Collaboration*: the project required the coordination of interests between the City's Community Development Department, Economic Development Committee and more than ten abutting businesses.

Huntington Avenue Reconstruction
Boston, MA

- *Scope:* landscape and urban design services for the reconstruction of a one mile stretch of Boston's Huntington Avenue cultural district.
- *Design elements*: pedestrian circulation and vehicular traffic improvements, streetscape amenities, lighting and signage.

Westfield Great River Bridge
Westfield, MA

- *Scope:* landscape and urban design of an historic downtown streetscape through the addition of the Great River Bridge.

Presentation graphics, construction documents, and written specifications were prepared. The project's goal was to improve traffic conditions and create new open spaces to serve as pedestrian links to the riverfront.

- *Design elements*: two riverfront parks having both passive and active recreation components, existing streetscape was enhanced with additional on-site amenities (benches, trash receptacles, bike racks), brick paving, and street tree planting.

Lowell Riverwalk
Lowell, MA

- Scope: landscape and urban design for the development of a one-mile walkway along the Merrimack River. We prepared presentation graphics, construction documents, written specifications, and oversaw project implementation and closeout. The Riverwalk connects many of Lowell's cultural and historic amenities and linked pedestrian paths along the canals of the City.
- *Design elements*: included in the design were several public art components: a table was designed that resembles an impeller, historically used to power Lowell's mills. Bronze plaques to document periods in Lowell history were designed for incorporation into pavement along the Riverwalk and create an interactive timeline (plaques not installed awaiting funding). Other improvements included cantilevered overlooks and rest areas, hardscape and accent paving, a pedestrian bridge, lighting, and site amenities riparian zone stabilization and enhancement and landscaping.
- *Collaboration:* City Officials, representatives of the National Parks Service, property owners and contractors on a weekly basis.

Washington Street Bridge
Dover, New Hampshire

WGC provided geotechnical engineering services for a new bridge over the Cochecho River. A vehicular bridge previously at this location was demolished several years ago and a wooden covered pedestrian bridge was erected in its place. Current plans are to relocate the covered pedestrian bridge and construct a new vehicular bridge to improve access between the downtown area west of the river and commercial development planned for the east side of the river. The new structure will be a steel girder bridge with a span of about 190 feet. WGC planned and conducted a test boring program to explore subsurface conditions in the area of the proposed bridge abutments and approach roadway improvements. Recommendations were provided for the geotechnical aspects of foundation design and construction.

Hospital Connector Road
Peterborough, New Hampshire

WGC provided geotechnical design and construction recommendations for the design of this new road that will connect Route 202 and Old Street Road and improve access to the Monadnock Regional Hospital. The 2,000-foot-long road will cross wooded uplands and wetlands south of the hospital. A subsurface exploration program was conducted and recommendations were developed for geotechnical aspects of the design and construction of the road. Special embankment design and construction recommendations were provided for areas underlain by peat and organic soils and areas along the base of a very steep fill slope that supports a hospital parking lot.

Swift River Restoration Project
Conway, New Hampshire

WGC conducted a foundation investigation for modifications to an existing railroad bridge embankment to improve hydraulic conditions, reduce sediment deposition upstream of the bridge, and reduce scour of the bridge abutments. The hydraulic opening for the 140-foot-long bridge constricts flow, causing sediment deposition upstream of the bridge and scour of the abutments. Current plans are to install a 66-foot-long arch bridge in one of the 20-foot-high approach embankments and twin 20-foot-long box culverts in the other approach embankment to improve flow conditions. The foundation investigation has included four borings through the embankments to assess foundation conditions for the new structures. Recommendations for the design and construction of the foundations for the new structures are being developed.

Center Hill Road Bridge
Epsom, New Hampshire

WGC conducted a foundation investigation for the design of a new bridge over Blake Brook. The old bridge, which has a span of about 20 feet, was heavily damaged by flooding in the spring of 2007. The flooding undermined the old concrete abutments causing them to shift and settle. About 200 feet of the road, which runs along the bank of the brook downstream of the bridge, was also damaged by the flooding. The new bridge will be a precast concrete structure supported on cast-in-place concrete abutments. The new bridge will have a longer span and be realigned to improve flow conditions. The road downstream of the bridge will be reconstructed and the adjacent bank of the brook will be protected with riprap.

NHDOT Salt Sheds
Various Sites, New Hampshire

WGC conducted foundation investigations for four new salt sheds to be constructed at NHDOT patrol stations in Cornish, Franklin, Franconia, and Franklin, New Hampshire. Subsurface investigation programs at each

site consisted of three to four borings to characterize subsurface conditions. Foundation design and construction recommendations provided for each site included design bearing pressures for footing design, evaluation of seismic design parameters per the International Building Code, foundation drainage parameters, backfill and compaction requirements, and excavation and dewatering requirements.

Nottingham Lake Dam
Nottingham, New Hampshire

WGC provided geotechnical design and construction recommendations for reconstruction of this dam, which was breached by overtopping during the spring flooding in 2007. The flooding also caused a bridge immediately downstream of the dam to be washed out. The embankment is about 130 feet long with a maximum height of about 14 feet. The dam has a concrete spillway and a turbine, which were not damaged by the flooding. WGC conducted subsurface explorations and provided recommendations for reconstruction of the embankment with filtered toe drains and construction of a new auxiliary spillway with a low level outlet.

Oak Hill Road Bridge
Northfield, New Hampshire

WGC conducted a foundation investigation for a new precast concrete arch bridge over Cross Brook. The existing corrugated metal elliptical pipe (CMP) culvert at this location was damaged and deformed during the extreme rainfall events that occurred in October 2005. Embankment soil was eroded from around the culvert, causing the formation of sinkholes and a depression in the pavement along the alignment of the culvert. Also, the granite block headwalls had shifted, causing the walls to bulge and lean in some areas. The proposed concrete arch bridge will have a single span of about 20 feet and cast-in-place concrete abutments. Borings were drilled to evaluate foundation conditions and recommendations for foundation design and construction were provided. WGC also conducted stability analyses for the abutments and wing walls.

Highland Lake Dam
Andover, New Hampshire

WGC provided geotechnical design and construction recommendations for the reconstruction of this embankment dam. The dam is approximately 9.2 feet high with an approximately 180-foot-long embankment that supports town road. The concrete stop log spillway discharged to a CMP culvert that passes beneath the road. During spring flooding in 2006 and 2007, whirlpools were observed in the lake upstream of the dam and several sinkholes developed in the embankment, indicating that internal erosion of the embankment was occurring. Field explorations revealed that the embankment was in very condition, containing many boulders, wood, and other organic materials. WGC provided recommendations for the reconstruction of the dam, which included replacement of the corroded CMP culvert with a larger precast culvert, installation of a cast-in-place concrete seepage cutoff wall, and construction of cast-in-place concrete retaining walls with filtered drains at the downstream face of the embankment.

Willow Pond Dam
Croydon, New Hampshire

WGC provided geotechnical services for the reconstruction of this 150-foot-long earthen embankment dam. Approximately 40 feet of the left end of the embankment has been breached, probably due to overtopping caused by blockage of the drop inlet pipe, which comprises the primary spillway. Depressions on the downstream slope of the embankment, especially along the alignment of the drop inlet pipe, appear to have been formed by internal erosion of the embankment soils. Reconstruction of the dam will include repair of the breach and the construction of filtered drains along the toe of the embankment to control seepage. The drop inlet pipe will be removed from the embankment, and a new cast-in-place concrete primary spillway will be constructed at the right abutment.

Langley Parkway
Concord, New Hampshire

While with his former employer, Mr. Ward conducted a geotechnical investigation for the construction of a new 4300-foot-long parkway and the reconstruction if an approximately 2400-foot-long portion of an existing road. Most of the two roadways are underlain by a thick glacial lake deposit of weak and compressible silty clay. Recommendations were provided for design of underdrains, large culvert foundations, a reinforced soil slope, mechanically stabilized earth retaining walls, staged embankment construction, and a settlement monitoring program. WGC was engaged by the project design engineer to provide consulting and field observation services during construction. These services include evaluation of the settlement monitoring data, observation of subgrades for foundations, and observation of wall and reinforced slope construction.