Tighe&Bond

January 18, 2024
Tobey Reynolds, PE, Assistant Director of Project Development,
Chairperson, Consultant Selection
John O. Morton Building
7 Hazen Drive, PO Box 483
Concord, NH 03302-0483

Re: **NHDOT – Statewide On-Call Preliminary Engineering Prequalified List of Consultants for Locally Administered Local Public Agency (LPA) Qualifications-Based Selection Contracts**

Dear Mr. Reynolds:

Tighe & Bond is excited to submit this letter of interest and our firm's qualifications for the above referenced prequalification list. Tighe & Bond has been assisting our public and private clients with engineering solutions since 1911 and is now a full-service engineering and environmental consulting firm with 16 offices throughout New England and more than 550 employees. Our Portsmouth Office, with more than 35 employees representing the multi-disciplinary expertise and experience of our company has been providing services to municipalities for over 35 years. With our deep bench of transportation engineers/planners, bridge/structural engineers, site/civil engineers, environmental scientists, and other engineering and permitting support services, we have the in-house multi-disciplinary services detailed in the Project Understanding and Approach necessary to deliver highway and bridge design projects to New Hampshire municipalities and NH DOT.

Our Highway Design expertise includes roadway rehabilitation and realignments, intersection improvements, drainage systems, signalization, park and ride lots, pedestrian/bike facilities, safety enhancements and complete streets, as well as peer review of site access issues, traffic impact and planning-level corridor studies. We have extensive experience executing public engagement programs, facilitating regulatory approvals, utilizing alternative procurement methods, construction administration services, and coordination with the Department.

Our Bridge Design expertise includes bridge assessments/inspections and designing maintenance/preservation, rehabilitation, replacement of various bridge types, and retaining walls. Our staff prepare load ratings including gusset plates, bridge ratings, existing structures evaluations. We have in-house scour analysis and design countermeasures and substructure protection through our geotechnical engineering capabilities.

Our Environmental Engineers and scientists provide the necessary environmental documentation, including natural and cultural resource investigations to meet permitting requirements and we are currently one of the NHDOT On-Call Coastal Wetlands and Environmental consultants.

Tighe & Bond currently provides these services to municipalities across New England as a major component of our business, including more than 600 municipal clients with more than 50 in New Hampshire. For many of our clients, we have had long-standing relationships and are their consultant of choice, for example, for Portsmouth NH for more than 35 years; Rochester for more than 15 years, and Holyoke, MA for more than 113 years. We have built their trust, understand their needs, and successfully delivered projects in a timely, cost-effective, and quality manner.

I will serve as Project Manager, with more than 30 years of experience working with Massachusetts and New Hampshire municipalities. My team consists of Daniel Murphy, Highway Design Project Lead, and Eric Ohanian, Bridge Design Project Lead. Both are registered PEs with LPA Certifications in NH. We propose to use Doucet Survey for surveying/ROW plans and are committed to meeting any DBE/SBE requirements. Tighe & Bond has a robust internal QA/QC program with a multi-step review process that is applied to every deliverable that is produced by our Team.

We trust that this information gives you a brief introduction to our firm's ability to provide quality professional services to New Hampshire municipal clients that may procure our services under this assignment. Subsequent sections present our project understanding and approach, project team and organizational chart, staff resumes, project experience, and three references that can attest to the quality and timeliness of our services, and we encourage you to contact them. If you need any additional information, please do not hesitate to contact me at (978) 496-0208 or BMertz@tighebond.com.

Very truly yours,
TIGHE & BOND, INC.

William Mertz, PE Vice President

Richard Benevento, Senior Vice President

Project Understanding and Approach

HIGHWAY DESIGN, TRAFFIC ENGINEERING, AND TRANSPORTATION PLANNING

Tighe & Bond offers comprehensive transportation engineering services providing clients "one-stop shopping". We deliver innovative, context-sensitive, and cost-effective solutions that meet the multi-modal needs of diverse stakeholders. Based on the community's goals and objectives, we take a measured approach to the design solution, based on available funding, schedule and the desired improvement. We have a record of accomplishment identifying progressive and sustainable solutions to the most challenging issues and carry our designs through approvals and construction. We are recognized as progressive transportation engineering leaders and provide a broad spectrum of related services. Our experience includes pavement rehabilitation, capacity and safety improvements, intersections improvements, sidewalk mobility enhancements, streetscape and landscape design, and traffic operations and signal improvements. Recently, Tighe & Bond has been at the forefront of developing roundabout projects for both municipal and private clients.

Our staff is well-versed in the design of drainage facilities. We are adept at numerous hydrologic and hydraulic modeling environments and applications, including HEC-HMS, USGS Stream Stats, HEC-RAS, HY-8, HydroCAD, Autodesk Storm and Sanitary, and SewerGEMS. Our experienced staff of roadway designers understand the critical importance of stormwater collection relative to roadway geometrics and safety.

Tighe & Bond's staff includes Professional Traffic Operations Engineers (PTOEs) and Registered Safety Professionals (RSPs) with broad experience providing traffic safety analysis and design. Our traffic engineers have dual responsibilities to both understand the art of traffic engineering along with the physical design that accompanies traffic operation solutions. We study the need for additional traffic controls including stop signs, roundabouts, and signals through preparation of warrant analyses under the Manual of Uniform Traffic Control Devices (MUTCD). Recent projects include isolated and coordinated traffic control signals and traffic signal systems that incorporate the latest technologies. We have in-house capacity to analyze complex intersections using Synchro, SimTraffic and VISSIM software, as needed.

Our engineers and planners bring an extensive resume of relevant transportation planning experience. We provide a unique mix of experience developing transportation solutions that are guided by principles founded on traffic engineering and operational analysis, transportation system modeling, safety assessments, and roadway geometric design. These complementary capabilities are guided by our proven process of community engagement to help guide each planning process and provides the catalyst for the development of feasible and implementable multi-modal transportation solutions that fit each community's future vision. We are experienced in both planning and designing transportation facilities that accommodate all users as well as designing dedicated bicycle and pedestrian facilities. We have provided a variety of services related to multimodal mobility and safety on projects that include on-road bicycle networks in both urban and rural settings, greenways and river walks, and rails-to-trails. Our expertise in urban streetscape design allows us to utilize strategies and tactics that best suit the unique character and neighborhood desires for each streetscape project we undertake. Our vision for complete and livable streets provides consistency and clarity for multi-modal use and enhances aesthetics and safety.

Most of our projects involve federal, state, or local permitting. Our staff provide wetlands and ecological consulting services, and we take pride in offering these capabilities in addition to our renowned civil and environmental engineering capabilities. We have strong relationships with permitting agencies and local commissions that help facilitate negotiations to obtain required project permits.

BRIDGE DESIGN AND STRUCTURES

Tighe & Bond has a strong bridge group with sixteen structural engineers whose assignments include bridge analysis, design, rehabilitation, construction oversight, load ratings, and assessment. Our growth and success are attributed to key hires that bring experience ranging from small local bridge replacement to high-profile bridge projects across New England, offering diverse capabilities for projects in New Hampshire. As a New England based firm and not a large conglomerate, we take pride in our involvement in local communities. Our expertise is not just in designing new and rehabilitated bridges, but in our understanding of the needs of local municipalities for which we serve.

Our firm has worked on more than fifty bridge projects in the last five years. Additionally, our team has worked on an ABC bridge design with prestressed concrete NEXT beams on pile foundations, three modular truss replacements on existing foundations (to help open deteriorated bridges that have been closed to service) with spans from 50 – 140', rehabilitation design of three steel stringer bridges with concrete decks, design of new timber pedestrian bridges,

Project Understanding and Approach

evaluation of a long-span coastal structure integral with a causeway, design of several new utility corridors on existing bridges, and over a dozen short-span precast frame type structures.

At the beginning of every project, we hold a kickoff meeting with the client to ensure a clear understanding of project expectations. We then hold an internal team meeting to outline critical success factors, schedule, and ensure appropriate staffing for design and quality control & assurance reviews. Our team will carefully review existing information such as drawings, inspection reports, and load ratings and our engineers review site conditions in the field. Field data is collected to supplement available documentation including ground and boundary surveys, geotechnical explorations (such as borings, probes, soil sampling, and testing), streambed sampling for scour analysis, and environmental wetland resource delineation. Studies for endangered species or archaeological impacts may also be performed if the sites are within a sensitive area. Hydrologic & Hydraulic analysis is performed along with a scour analysis. All these conditions drive our design approach for each individual bridge project and are considered early in the Alternatives Analysis stage alongside cost estimating, constructability, land requirements, and community acceptance.

Based on our engineering study, we will collaborate with the client to determine the preferred solution and advance the project into preliminary design and final design. Final bid documents are prepared including drawings and specifications alongside a cost estimate for the client's use. We work with municipalities to inform the public and stakeholders often in the form of public meetings, as well as coordinating with the Department of Transportation. We provide bidding phase services to review technical questions, review bids, and assist in the selection of the contractor. We often provide construction administration and observation services such as shop drawing reviews, pay applications, and change orders after performing an independent estimate. Since our team has construction experience, we understand common issues that can arise in construction and address them in the design phase. To further assist our bridge clients, we can provide in-house drone assessment, underwater assessment via our inspection submarine, and 3D visualization and construction animation.

GEOTECHNICAL ENGINEERING

It is critically important to evaluate and understand geotechnical conditions for each project to develop viable cost-effective, constructible, and biddable solutions. Our team's strong geotechnical expertise and design experience provides our projects with the knowledge to develop cost-effective, practical, and long-term solutions. Our subsurface exploration programs will explore the nature of backfill, depth to groundwater and bedrock, cross-sectional geometry, and other essential subsurface factors to fully understand the geotechnical issues. Data collection and evaluation is critical to understanding each project. Test borings, test pits and vertical probes and cores are typically anticipated to establish parameters for analysis of the existing conditions and to support the development of design solutions. Historical research of projects, non-destructive geophysical methods may also be considered to supplement the field explorations.

Combinations of these options may be appropriate to provide cost effective, long-term solutions to any project in addition to recognizing the potential historical value of existing structures. The execution of a comprehensive subsurface investigation program, assessing the condition of the existing conditions, and identifying viable alternatives will be our primary geotechnical objective.

PUBLIC ENGAGEMENT

Tighe & Bond has considerable experience facilitating public engagement programs in support of our transportation, infrastructure, and other community projects. Our outreach techniques are intended to bring citizen groups, stakeholders, policy steering committees, and governing bodies to the table to help gather ideas and information that guide the project development process. This engagement with each community ensures that through a comprehensive outreach program, our projects obtain broad support which is the key to ultimate project success.

PROJECT FUNDING

Tighe & Bond is well versed in managing projects that are funded by State and Federal program, including but not limited to, Federal Transportation Alternatives Program (TAP), Federal Congestion Mitigation Air Quality Program (CMAQ), Federal Municipal Off System Bridge Program (MOBRR) and other Federal Aid funds for local and state highways and the State Bridge Aid Program (SBA), American Rescue Plan Act (ARPA) and Infrastructure Investment Jobs Act (IIJA). We have successfully secured 100s of millions of dollars for clients across New England.

NEW HAMPSHIRE DOT

STATEWIDE ON-CALL PRELIMINARY ENGINEERING PREQUALIFICATION LIST FOR HIGHWAY AND BRIDGE DESIGN ENGINEERING SERVICES IN SUPPORT OF LPA PROJECTS

Tighe&Bond

PROJECT MANAGER

WILLIAM MERTZ, PE

PROJECT DIRECTORS

RICHARD BENEVENTO
ROBERT JURASIN, PE

HIGHWAY DESIGN

DANIEL MURPHY, PE, LPA
Project Lead

PATRICK CRIMMINS, PE
Roadway/Intersection Design/ Drainage/MP&T

GREG LUCAS, PE, PTOE, RSP1
Traffic Signal Design/Traffic Analysis/Public Outreach

NATHANIEL COLP, PE, LPA
Roadway/Intersections/Pavement/ Drainage

JOSEPH PERSECHINO, PE
Utilities and Lighting

KRISTOPHER SURETTE, PE
Roadway Designers

ERIC DOREMUS, PE
Park & Ride Lots/Coastal Resiliency/Permitting

NEIL HANSEN, PE
Highway/Stormwater/ Permitting/Soil Erosion

RODNEY EMERY, PE, PTOE, FITE
Planning Level Corridor Studies/ Permitting/Public Outreach/QAQC

CRAIG YANNES, PE
Roundabouts Design

DANIEL MURPHY, PE, LPA
Tech Writing/Reports/Procedures

ROBERT JURASIN
Corridors Studies

BRIDGE/STRUCTURES DESIGN

ERIC OHANIAN, PE, LPA
Project Lead

JONATHAN IVES, PE
New/Rehab Bridge Design/ Load Ratings/QC

ANDREA LACASSE, PE
Maintenance and Preservation/ Substructures

JOSEPH CANAS, PE, CFM, LEED AP
Scour Analysis/Hydraulics and Hydrology

CHRISTOPHER HAKER, PE
Geotechnical Evaluations and Analysis

KAMILA O'NEILL, PE
Substructure Design

DAVID SULLIVAN, PE
Existing Structures Evaluation/ Retaining Wall Design

CRAIG FRENCH, PE
Retaining Wall Design/ Construction Support

DYLAN FELTY
Bridge Engineer

MATTHEW COUGHLIN, PE
Inspection/Load Ratings

DAN CIARAMICOLI
Coastal Engineering

ERIC OHANIAN, PE, LPA
Tech Writing/Reports/Procedures

ENVIRONMENTAL

DAN RUKAKOSKI, CWS, PWS, PSS
Project Lead

SUZANNE COURTEMANCHE, LSP, CHMM
Hazardous Materials Compliance

BRYAN GAMMONS
Groundwater, Limited Reuse Soils, PFAS

RICK CANAVAN, PHD, PWS, PSS
Water Quality/NEPA

TIMOTHY KUCAB, CHMM
Noise and Air Quality

SHARON ROONEY, AICP, RLA
Social and Economic Resources/Cultural

STEFANIE TETREAULT, CWS
Wetlands/Permitting

KRISTOPHER HOULE, PE
Fluvial Geomorphology, Bioengineering

KATIE SNYDER
Hazardous Building Materials

JEREMY DEGLER, PWS, CWS
Wetlands/Permitting

TRACY ADAMSKI, AICP
Planning and Permitting/ Public Outreach

SCOTT WOZNIAKOWSKI, PG
Due Diligence/Soil and Groundwater Management

DAN RUKAKOSKI, CWS, PWS, PSS
Tech Writing/Reports/Procedures

ADDITIONAL WORK ASSIGNMENTS

KRISTOPHER SURETTE, PE
Project Lead

DENNIS MORAN, PE
Traffic Control

JOSEPH CANAS, PE, CFM, LEED AP
Hydraulic & Hydrology

DAVID SULLIVAN, PE
Overhead Structures

CHRISTOPHER HAKER, PE
Geotechnical Evaluation/ Analysis and Design

ROBERT UHLIG, FASLA, LEED AP BD+C
Landscape Architecture

WILLIAM DOUCET, PS, DOUCET SURVEY
TopographicSurvey/ROW

KRISTOPHER SURETTE, PE
Tech Writing/Reports/Procedures

PROJECT TEAM

Tighe & Bond has six Core Values that drive our corporate culture and employee engagement: *Respect*, *Commitment, Integrity, Reliability, Excellence, and Safety*. Our project teams work in harmony with each of these values to improve the quality of life that surrounds us. Our teams are assembled to work seamlessly with our clients, understanding their needs, goals, and objectives. As shown in the matrix below, we have identified a typical project team with key members that deliver many aspects and services that can be involved in a multi-disciplinary municipal transportation project. Following the matrix, we explain how our teams works seamlessly with our clients to manage and deliver their projects. As an example of our dedication and client commitment, our original client in 1911 was the City of Holyoke, MA, and they remain a loyal client today, 113 years later.

Typical Team Matrix

HIGHWAY AND BRIDGE DESIGN ENGINEERING SERVICES IN SUPPORT OF LPA PROJECTS **Key Staff**		**Years of Experience**	**Years with Tighe & Bond**	**Project Management**	**Highway Design**	**Bridge Design (New/Rehab)**	**Bridge Load Rating**	**Bridge Inspections**	**Structural Engineering**	**Hydraulics/Hydrology & Drainage**	**Alternative Procurement Methods**	**Public Involvement**	**Corridor Study Planning**	**Traffic Analysis**	**Geotechnical Engineering**	**Environmental**	**Funding Programs**
William Mertz, PE	Project Manager	30	1	X	X					X	X	X	X				X
Richard Benevento	Project Director	45	1	X	X							X	X	X			X
Robert Jurasin PE	Project Director	44	9		X						X	X	X	X			X
Daniel Murphy PE	Project Lead, Highway Design	31	3	X	X					X	X	X	X	X			X
Eric Ohanian, PE, LPA	Project Lead, Bridge Design	12	7	X		X	X		X			X					X
Daniel Rukakoski PWS, CWS, PSS	Project Lead, Environmental	29	17	X								X				X	
Patrick Crimmins, PE	Roadway/ Intersection Design	23	13	X	X					X	X	X					
Greg Lucas PE, PTOE, RSP1	Traffic Signals/Analysis	27	2	X	X							X	X	X			X
Nathaniel Colp, PE, LPA	Roadway/Drainage	9	9		X					X							
Joseph Persechino, PE	Utilities and Lighting	22	13	X	X					X	X	X					
Kristopher Surette, PE	Roadway Design Lead	13	1	X	X							X					
Neil Hansen, PE	Stormwater/ Soil Erosion	12	8	X						X							
Rodney Emery, PE, PTOE, FITE	Planning /Public Outreach	53	1	X	X					X	X	X	X	X			
Craig Yannes, PE	Roundabouts Design	14	10	X	X					X		X	X	X			X
Jonathan Ives, PE	Bridge Design/ Load Ratings/QC	24	2	X	X	X	X	X	X		X	X					
Andrea Lacasse, PE	Maint and Pres/ Substructures	19	11			X	X	X	X			X					X
Joseph Canas, PE, LEED AP, CFM	Scour Analysis/ H&H	30	23							X		X				X	
Christopher Haker, PE	Geotech Evalua-tions & Analysis	29	16	X							X	X			X		
David Sullivan, PE	Structures Eval and Design	21	18			X	X	X	X						X		
Rick Canavan, PhD, PWS, PSS	Water Quality/ NEPA	27	7	X							X	X	X			X	
Sharon Rooney, AICP, RLA	Social & Economic Resources/ Cultural	32	4	X								X	X				X
Stefanie Tetreault, CWS	Wetlands/ Permitting	14	<1									X	X			X	
Jeremy Degler PWS, CWS	Wetlands/ Permitting	15	3									X				X	

PROJECT TEAM

The team will be led by our Project Manager, **William P. Mertz, PE**, a 30-year veteran providing municipal engineering services. Bill will lead his team of professionals and commit the necessary resources to ensure on-time project delivery, project quality and conformance with project budgets. His Project Leads, Daniel Murphy, PE, LPA for Highway Design, and Eric Ohanian, PE, LPA for Bridge Design will work with Bill to fully understand the client's project needs, goals, objectives, and desired outcome. Both Dan and Eric have the requisite experience to lead their capable staff of professional engineers, planners, and scientists to become an extension of the client's staff. One of their goals is to be considered an employee of the client, a trusted advisor, one that can be called upon at any hour, of any day of the week, and be responsive.

Dan and Eric are experienced in working together across in-house disciplines to identify and coordinate the needs of their projects including structural, roadway, civil (roadway, right-of-way, utilities, ADA compliance, and traffic), geotechnical, environmental, and hydraulic components. They frequently work with Greg Lucas, Andrea Lacasse, Chris Haker, David Sullivan, Robert Jurasin, Joseph Canas, Dan Rukakoski, and Jeremy Degler to deliver the desired outcome of a project. Tighe & Bond recently acquired World Tech Engineering in Woburn, MA which bring a wealth of additional traffic and transportation engineering and funding programs experience to the team including Rich Benevento, Rodney Emery, Kristopher Surette, and Bill Mertz with more than 100 years of combined experience between them.

Daniel Murphy, PE, LPA is a Senior Project Manager with more than 30 years of experience. He joined Tighe & Bond in 2020 and quickly got involved in some of our more challenging roadway and bridge projects. These projects have involved active collaboration between our roadway, bridge, geotechnical, hydraulics Engineers, and our Environmental Scientists and permitting specialists. He has been working with local conservation commissions and public agencies such as Massachusetts Department of Environmental Protection, Army Corps of Engineers, Coastal Zone Management toward the permitting of these projects. He has also worked with our clients and internal teams to secure construction funding from MEMA/FEMA, NOAA, CZM, and others. In addition to managing several multi-disciplinary highway design projects, Dan serves as Project Director on a number of highway and bridge projects and as Program Manager for our MassDOT Small Bridge Design Contract.

Eric Ohanian joined Tighe & Bond in 2017 with extensive experience from his previous work in New Hampshire. He served as the LPA Resident Project Representative for a unique bridge rehabilitation in Laconia, which he received a recommendation from NHDOT for his careful adherence to the LPA requirements. He accepted the 2016 ACEC-NH overall engineering excellence award on behalf of the project team and presented the project at the 2017 International Bridge Conference. Eric was also the lead project engineer for the NHDOT replacement of the Route 113 Bridge over the Bearcamp River in Tamworth, NH, which involved ABC replacement design with prestressed box beams on precast abutments. Eric has also worked on numerous bridge replacements from the Municipal Bridge Program. Eric's favorite project was serving as the lead project engineer for the relocation of the Village Covered Bridge from Bedford to Wentworth with abutment modification design for NHDOT. The project won a 2018 ACEC-NH engineering excellence award and the 2018 SENH award for excellence in structural engineering.

Patrick Crimmins is a Senior Project Manager who has been with firm since 2001 when he began as an intern while attending the University of New Hampshire. Patrick specializes in transportation/roadway and site/civil engineering projects, and is involved in the planning, design, construction and permitting of projects both for municipalities and the private sector in New Hampshire. Patrick has broad experience guiding projects through design, regulatory approvals, and construction. Patrick is a NHDOT registered LPA, and he is currently responsible for managing the design and permitting of the Longmeadow Road Expansion project in Portsmouth which is LPA funded. This 1,500-foot roadway extension connects Longmeadow Road to Lang Road to mitigate a longstanding safety concern of taking an unsignalized left turn off Lang Road onto US Route 1.

More information on additional staff capabilities and experience can be found in Appendix A – Resumes.

Tighe & Bond has teamed with Doucet Survey, LLC and has a long history of working with Bill Doucet, PS, President on all types of municipal projects. Doucet Survey, LLC has provided survey services to NHDOT and NH municipal on projects since their establishment.

Tighe & Bond References

Reference	Contact Information	Tighe & Bond Staff	Description
Portsmouth, NH **Dave Desfosses** **Project Manager** **Longmeadow Road Extension**	680 Peverly Hill Road Portsmouth, NH 03801 (603) 427-1530 djdesfosses@cityofportsmouth.com	Patrick Crimmins, Senior Project Manager Neil Hansen, Project Engineer Rick Canavan, Environmental Scientist	Roadway Design Hydraulic Calculations Topographic Survey ROW Layout NHDOT LPA coordination Traffic Analysis Geotechnical Analysis Environmental Permitting Public Involvement
Massachusetts Department of Transportation **John Bechard** **Deputy Chief Engineer of Project Development** **MassDOT Statewide Contracts** **- State-wide On-Call Contract** **- Small Bridge Contract** **- Safe Routes to School Contract** **- State-wide Bottleneck Contract**	MassDOT 10 Park Plaza, Suite 3800 Boston, MA 02116 (857) 368-9325 john.bechard@dot.state.ma.us	William Mertz, Project Manager Richard Benevento, Project Director Daniel Murphy Eric Ohanian	Roadway & Bridge Design Traffic Studies & Traffic Control Traffic Signal Design Stormwater Design Environmental Permitting Landscape Architecture Public Involvement Funding Programs
Town of Sudbury, MA **Daniel Nason, Director of Public Works** **Dutton Road Bridge Replacement**	Dan Nason, Director Sudbury Public Works Department 275 Old Lancaster Road Sudbury, MA 01776 t: 978.440.5490 f: 978.440.5404 e: nasond@sudbury.ma.us	Eric Ohanian, Senior Project Manager Chris Haker Dylan Felty Craig French Rick Canavan Daniel Murphy	Bridge Design Roadway design Traffic Control Hydraulic Calculations Topographical Survey Geotechnical Analysis Environmental Permitting Wetlands & Stream Crossings Retaining Walls Funding

Appendix A - Resumes

WILLIAM P. MERTZ, PE– PROJECT MANAGER, Bill Mertz is a Civil Engineer with over 30 years of design experience ranging from conceptual to final design and construction. He has participated in the design of various projects ranging from local roadway and highway design to a variety of utility projects. His responsibilities have included geometric roadway design, grading, drainage and sanitary sewer design, maintenance of traffic, and preparation of contract documents, including plans, profiles, sections, specifications, and construction cost estimates.

MASSDOT (609254)—LYNN: BROADWAY INTERSECTION IMPROVEMENTS AT 2 LOCATIONS
Project Manager responsible for the overall management of the preparation of contract documents for the reconstruction of Broadway from Bacheller Street to Euclid Avenue in Lynn, MA. The project is intended to provide safety and operational improvements at two high-crash locations clusters, at the intersections Broadway with Euclid Avenue and with Jenness Street. The Euclid Avenue intersection is among the top 200 high crash locations in Massachusetts with 55 crashes (13 with injuries) between 2013 and 2015. The project included safety improvements including replacement of outdated and non-compliant traffic signal equipment reconstruction of sidewalks, crosswalks and wheelchair ramps; addition of bicycle facilities; improvements to transit stops; and roadway resurfacing.

MASSDOT CONTRACT # 110656 STATEWIDE SERVICES—SAFE ROUTES TO SCHOOL
Project Director responsible for oversight and management of five safe Routes to School projects under a Statewide Services Contract. These projects were aimed at increasing safety for biking and walking for elementary and middle school students. These projects have included closing gaps is the pedestrian network by the construction of new ADA compliant sidewalks and ramps, multi-use paths, and new street crossings included raised crosswalks and the addition of Rectangular Rapid Flashing Beacons. Bicycle accommodations were designed to allow for safe transportation of students in and around the immediate school area. Traffic calming techniques were also implemented including raised crosswalks and raised intersections, as well as enhancements to the streetscape through the planting of new street trees. Our team is working alongside our partners at MassDOT to maintain strict compliance with Complete Streets guidelines. The projects included the following:

(610672) Elm Street Resurfacing and Sidewalk Improvements, Gardner, MA.

(610652) Robinson Park Elementary School Improvements, Agawam, MA.

(609510) Improvements at George Englesby Elementary School, Dracut, MA.

(612100) Beachmont Veterans Elementary School, Revere, MA.

(612816) William H. Lincoln School, Brookline, MA.

REHABILITATION OF MOUNT AUBURN STREET—WATERTOWN, MA - Project Manager responsible for oversight and management of the $30M rehabilitation of Mount Auburn Street. The project included the reconstruction of Mount Auburn Street from east of Summer Street and extending easterly through Coolidge Square and ending at the Cambridge city line, a distance of approximately 9,300 LF (1.76 miles) and along Arlington Street from Mount Auburn Street through the Grove Street intersection. The project includes incorporating a road diet, improvements to geometry, safety improvements, multi-modal accommodations (including pedestrians, bicyclists, and transit), roadway rehabilitation, ADA compliant sidewalks and wheelchair ramps, drainage improvements, improvements to traffic operations.

DANIEL L MURPHY, PE, LPA – TRANSPORTATION DESIGN/TRAFFIC CONTROL, Dan Murphy has 30 years' experience in a wide variety of transportation planning and engineering projects, bringing a deep level of expertise to public and private clients. His experience spans a wide array of highway engineering work such as large highway projects, tolling conversions, temporary traffic control including detours and temporary roadways, the study and design of roadway, pedestrian and bicycle facilities, utility coordination, traffic studies, public presentations, as well as multi-disciplinary and interagency coordination. Dan is a registered PE in New Hampshire, and has a current New Hampshire LPA Certification. He is currently Vice Chair of ASCE Transportation & Development Institute's Active Transportation Committee and is a member of the Street and Highway Operations Committee where he has had the opportunity to review and comment on amendments to the Manual on Uniform Traffic Control Devices (MUTCD) proposed by the National Committee on Uniform Traffic Control Devices (NCUTCD).

CENTRAL STREET BRIDGE REPLACEMENT—MANCHESTER-BY-THE-SEA, MA - Project manager and roadway technical lead responsible for multi-disciplinary and interagency coordination, alternatives analysis and design of curb extensions, crosswalk modifications, barrier selection, and roadway striping in conjunction with replacement of a 16 ft span stone arch bridge and integral seawall with a 20 ft span precast concrete arch

structure. Project involves tidal impacts, high ledge conditions, downtown village traffic management, historic abutting properties, and complex vehicular access at a nearby intersection. Dan is also heavily involved in the significant permitting effort required for this project.

CENTRAL STREET (RTE. 202) IMPROVEMENTS–WINCHENDON, MA - MassDOT project to reconstruct the main road through downtown Winchendon. Improvements included new pavement, curbing, sidewalks, and ornamental lighting in addition to water, sewer, and storm drain utilities. The project improved bicycle and pedestrian accommodation in compliance with ADA requirements. This project involved development of preliminary and final design documents, presented at town meeting and a design public hearing.

BASS RIVER CULVERT REPLACEMENTS—YARMOUTH, MA - Project manager and roadway technical lead on this exciting project to identify alternatives for replacement of two undersized culverts along Bass River in Yarmouth. Culverts are located on North Dennis Road and Wier Road in Yarmouth, MA. Project goals include improving water quality and ecological habitat along the river, and is being coordinated with adjacent water quality and wetland restoration programs. Services include hydrologic and hydraulic analysis, geotechnical analysis, and alternatives analysis.

ERIC OHANIAN, PE, LPA – BRIDGE DESIGN PROJECT MANAGER, Eric Ohanian with over 10 years' experience is a project manager focusing on bridge design, rehabilitations, analysis, assessments, estimating, specifications, and construction administration. Eric has presented at the International Bridge Conference, is published for complex bridges, and has expertise with short span structures. Eric's achievements include receipt of award for 2020 Young Professional of the Year by ACEC-MA and he has been recognized for his work on award-winning projects by ACEC-NH and SENH. Eric is a registered PE in New Hampshire and has a current New Hampshire LPA Certification.

MAIN STREET BRIDGE REHABILITATION—LACONIA, NH Engineer and full-time LPA resident project representative for $3.4M bridge rehabilitation project. Project involved phased construction, maintaining downtown traffic with a three-way intersection located over the bridge, and unique splayed variable span geometry with one abutment being 400 ft long and the other 120 ft long. Project won 2016 ACEC-NH engineering excellence award.

ROUTE 113 BRIDGE REPLACEMENT—TAMWORTH, NH Project engineer responsible for design, plan development, specifications, estimate, and schedule for an Accelerated Bridge Construction (ABC) replacement project for the NHDOT. The new structure consisted of a 133 ft span pre-stressed concrete box-beam bridge on cantilever abutments.

VILLAGE COVERED BRIDGE ADAPTIVE REUSE—WENTWORTH, NH Project engineer responsible for inspection, condition assessment, structural analysis, repair design, and NHDOT abutment modification design for a covered bridge relocated 80-miles from Bedford to Wentworth, NH. Project won 2018 awards for engineering excellence by ACEC-NH and SENH.

PATRICK CRIMMINS, PE, LPA – PROJECT MANAGER HIGHWAY DESIGN, Patrick Crimmins with 20 years of experience specializes in transportation/roadway and site/civil engineering projects, and is Project Manager in the planning, design, construction and permitting of projects both for municipalities and the private sector in New Hampshire. Patrick has broad experience guiding projects through design, regulatory approvals, and construction. Pat is a registered PE in New Hampshire and has a current New Hampshire LPA Certification.

LONGMEADOW ROAD EXTENSION – PORTSMOUTH, NH Managed the planning and design of the extension of Longmeadow Road for the City of Portsmouth. The 1,500-foot roadway extension connects Longmeadow Road to Lang Road to mitigate a longstanding safety concern of taking an unsignalized left turn off Lang Road onto US Route 1. The road includes LID stormwater management measures and new utilities. The project is a Local Public Agency (LPA) funded project. Responsible for obtaining necessary NHDOT LPA approvals, local subdivision approval and NHDES Alteration of Terrain approval.

ATLANTIC HEIGHTS EMERGENCY ACCESS STUDY – PORTSMOUTH, NH Managed and prepared an emergency access study for the City of Portsmouth for the Atlantic Heights neighborhood. Prepared multiple conceptual roadway layouts and determined associated costs and permitting for each alternative. Attended meetings including public outreach with the Atlantic Heights neighborhood and City Council to present the study's recommendations.

LOCKE ROAD – HAMPTON, NH Managed roadway design services for the reconstruction of Locke Road from Winnacunnet Road to High Street for the Town of Hampton. The roadway reconstruction design included the replacement of the existing sewer main and the water main from High Street to Winnacunnet Road. Design

included stormwater management improvements to provide drainage relief for the neighborhood. Patrick worked with the Town of Hampton to develop bid plans and specifications.

NATHANIEL COLP, PE, LPA - PROJECT ENGINEER, Nathaniel Colp is a Project Engineer who has over 7 years of experience working on site/civil and environmental engineering projects. His experience includes site, roadway and natural stream design, green infrastructure and low impact development, stormwater management and permitting for numerous projects throughout New England. Nathaniel is a registered PE in New Hampshire, and has a current New Hampshire LPA Certification.

TUSCAN VILLAGE ROADWAY—SALEM, NH Permitted and designed approximately 5,000 feet of new roadway for the proposed "Tuscan Village" development located at the old Rockingham Park Horse Track in Salem, NH. Work included the construction of associated site, drainage, and utility improvements such as a 10-foot-wide multi-use path, sidewalks, three double-lane and one single lane roundabouts, site lighting, retaining walls, fencing and the design of "Tuscan Lake" which is a 2.5-acre pond with site appurtenances such as a boardwalk, retaining wall with arches and a beach.

MERRYMOUNT PARKWAY RESONSTRUCTION (PHASES 1&2)-Quincy, MA Designed approximately 3,200 feet of roadway for the proposed "Merrymount Parkway Reconstruction" project. Work included the design of the roadway corridor which included on-street bicycle lanes, sidewalks and on-street parking, site lighting design, intersection design, stormwater design and permitting, extensive utility coordination with various utility companies and coordination with the replacement of the bridge over Blacks Creek which will utilize Accelerated Bridge Construction (ABC).

ALEXANDER SELLAR, PE, LPA - PROJECT ENGINEER , Alex Sellar is a project engineer supporting project teams with a variety of tasks, including construction management, stormwater design, civil/site design, and highway design. Alex has five years of civil construction experience and five years of civil design experience working on projects throughout New Hampshire, Maine, Vermont, and Massachusetts. Alex is a registered PE in New Hampshire, and has a current New Hampshire LPA Certification.

TUSCAN SOUTH AND CENTRAL VILLAGE—SALEM, NH Assisted in the design permitting of a 52-acre mixed-use development in Salem, NH. Work consisted of design of roadway, parking lot, stormwater, and associated utility infrastructure to meet local and state permitting requirements. Managed construction administration duties from communicating with construction management and contractors to assist in meeting a demanding construction schedule.

NH ROUTE 101 PAVEMENT AND BRIDGE REHAB – CANDIA, NH Assisted in the design and construction of median lane diversions which consisted of full roadway construction in the medians of NH Route 101. This project included FHWA sponsored study to assess lower impulse load levels on reinforced asphalt pavement using a fiberglass grid system along with additional bridge and pavement rehabilitation totaling almost $13.5 million.

RODNEY EMERY, PE, PTOE, FITE – TRAFFIC ENGINEERING, TRANSPORTATION PLANNING, TRAFFIC OPERATIONS DESIGN, Rodney Emery has over 50 years of diversified experience in traffic engineering and transportation planning. His extensive knowledge and experience in the New England Region has earned him a reputation for successfully completing complex, and fast-track projects. He advocates balanced transportation systems that encourage the recognition of non-auto usage in transportation solutions. He has expertise in performing analysis, planning and design in an open, participatory framework and facilitated discussion and mediated decision making among competing interests. He is a registered PE in New Hampshire.

REHABILITATION OF CENTRAL STREET, PEABODY, MA - Served as lead traffic engineer on design of traffic operations improvements at four locations along Central Street between Peabody Center and Wilson Square. The project included operational and safety improvements along a critical corridor in Downtown Peabody. The project includes multi-modal accommodations (including pedestrians, bicyclists, and transit), roadway and sidewalk rehabilitation/reconstruction with ADA conforming wheelchair ramps, drainage improvements, improvements to traffic operations, new signs and pavement markings, and pedestrian and streetscape enhancements.

RECONSTRUCTION OF BRIDGE STREET, BEVERLY, MA - Assisted with the design and performed QA/QC for traffic engineering elements of the project. The project entails the rehabilitation of pavement and sidewalk, including full depth reclamation, along Bridge Street from the Danvers town line to River Street, excluding the Hall Whitaker drawbridge. The cross-section was improved to include a bicycle lane in each

direction throughout the project, and an on-street parking lane on the south side, east of Western Avenue to Kernwood Avenue.

HARVARD UNIVERSITY, ALLSTON CAMPUS STREETSCAPE AND TRANSPORTATION INFRASTRUCTURE, ALLSTON, MA - Project Manager for a multi-disciplinary team of consultants tasked with the challenge of creating a world-class transportation system to serve Harvard's 50-year expansion into Allston. At the core of this project was system of world-class streets that will require careful planning and execution to meet Harvard's aggressive timetables. The team evaluated several design agendas including a balanced transportation system serving pedestrians, bicycles and automobiles, with equal emphasis on functionality and safety.

DANIEL RUKAKOSKI, PWS, CWS, PSS – ENVIRONMENTAL LEAD, Daniel Rukakoski is a Vice President with considerable experience in environmental consulting. He has more than 27 years of experience in wetland delineation, sediment evaluations, environmental and energy permitting, regulatory negotiations, site assessment and environmental construction observation. He regularly leads the environmental permitting efforts for municipal, commercial and public utility projects throughout the Northeast, and is also the Leader of the Environmental Business Line at Tighe & Bond.

TOWN OF JAFFREY, NEW HAMPSHIRE - Completed annual wetland monitoring to comply with a NHDES Large Groundwater Withdrawal Permit. Completed monthly water level monitoring within a piezometer/staff gage network to monitor the effects of long-term pumping on wetland and surface water hydrology. Completed routine site visits throughout the growing season to monitor changes in wetland species prevalence and vernal pool activity. Submitted annual reports to NHDES. Completed on-call wetland delineation and permitting for a culvert repair/slip lining project, emergency projects, and water main replacements.

EVERSOURCE ENERGY – NEW HAMPSHIRE, MASSACHUSETTS, CONNECTICUT - Completed wetland delineations, rare species surveys, environmental permitting and construction monitoring for Eversource Energy in New Hampshire, Massachusetts and Connecticut. Permitted the complete reconstruction of three separate transmission lines and two distribution lines totaling over 75 miles and a new electrical substation in New Hampshire. Completed GPS and rare plant surveys of transmission line corridors. Coordinated individual projects with municipal, state, and federal agencies, including the New Hampshire Department of Environmental Services, New Hampshire Fish and Game, New Hampshire Division of Historical Resources, New Hampshire Natural Heritage Bureau, U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service, and Federal Aviation Administration. Developed Best Management Practices manuals for utility companies.

GREG LUCAS, PE, PTOE, RSP1 TRAFFIC SIGNALS DESIGN, ROAD SAFETY AUDITS, COMPLETE STREETS, TRAFFIC STUDIES, Greg Lucas is a Senior Project Manager with over 25 years' experience utilizing his depth and breadth of experience to develop safety-focused solutions considering all modes of transportation and benefitting all users. His extensive experience in design of traffic signal systems, including application of advanced technologies such as adaptive signal control, traffic responsive timing plans, and peer-to-peer communication, has made him a go-to for both muncipal and agency clients in New England. He is proficient in leading, overseeing and performing Complete Streets design, temporary traffic control, traffic impact studies, capacity analysis, roundabout design and analysis, signage and pavement marking design, parking studies, and peer reviews. Greg is a registered PE in New Hampshire.

TRAFFIC SIGNAL SYSTEM IMPROVEMENTS—MERRIMACK, NH Lead traffic signal designer for improvements to four signalized locations along Amherst Road, Continental Boulevard and Greeley Street, including intersections with F.E. Everett Turnpike and Daniel Webster Highway (US 3). Improvements included a coordinated traffic signal system and a peer-to-peer traffic responsive system, the first of its kind in New Hampshire.

TRAFFIC SIGNAL IMPROVEMENTS—LACONIA, NH Lead traffic signal designer for improvements to Lakeport Square and to four additional isolated locations within Laconia. Improvements were designed in conjunction with sidewalk and ramp improvements to update ADA compliance, including Accessible Pedestrian Signal (APS) pushbuttons and countdown pedestrian signal heads.

NH ROUTE 125—EPPING, NH Led traffic evaluation and preliminary design along a 2.8-mile segment of NH Route 125. Project objective was to develop an alternative that will improve safety and mobility using Complete Streets principles. Alternatives evaluations included addition of lanes, development of consistent cross sections, intersection reconfigurations and access management. Roundabouts were being considered at both signalized and unsignalized locations.

Appendix A - Resumes

KRISTOPHER SURETTE, PE – PLANNING, DESIGN, CONSTRUCTION, Mr. Surette is a Civil Designer with over 12 years of experience in the planning, design, and construction of state and local roads. He has participated in the design of various projects requiring extensive coordination with state and local agencies. His responsibilities included geometric roadway design, drainage design, grading, and preparation of contract documents/plans with profiles, cross sections, specifications, and construction cost estimates. Mr. Surette has worked on key projects for state agencies and municipalities throughout New England, including: Londonderry, NH, Salem, NH, Londonderry, NH School District; and the NH DOT.

CLUFF CROSSING ROAD AND SOUTH POLICY STREET, SALEM, NH - Project Engineer responsible for the production of final design plans, and construction cost estimate of a $3.0M project, located in Salem, New Hampshire. Project entailed full depth roadway reclamation, installation of new drainage system, signal modifications, installation of sidewalks, and coordination with abutters. Tasks included the development of construction contract documents/construction plans, profiles, cross sections, curb tie plans, construction cost estimate, and quantity calculation book.

SOUTH ROAD CULVERT REPLACEMENT, LONDONDERRY, NH - Project Engineer responsible for the technical design and production of final plans. Project included the replacement of an existing 36" CMP culvert with a 8'x5-1/2' reinforced concrete box culvert and full depth road reconstruction of the roadway segment above the culvert. Tasks included the development of construction contract documents including; construction plans, pavement marking plans, roadway profiles, roadway cross sections, box culvert details, and a water diversion plan. Additional responsibilities included the creation of a construction estimate, and quantity calculation book.

JEREMY DEGLER, PWS, CWS – WETLAND DELINEATIONS, ASSESSMENTS & RESTORATION, ENVIRONMENTAL & NATURAL RESOURCE PERMITTING, VERNAL POOL SURVEYS, Jeremy Degler has 12 years of environmental science experience across the United States, seven of which have been spent in the environmental consulting field serving a wide variety of clients in the energy, transportation, and development sectors. His primary focus is wetland/stream delineations and assessments, mitigation and restoration, vernal pool surveys, environmental permitting, endangered species surveys, and construction regulatory compliance monitoring. Jeremy is a New Hampshire certified wetland scientist, (CWS).

GRANITE BRIDGE PIPELINE—MANCHESTER TO EXETER, NH - Conducted all wetland delineation and assessment work, vernal pool surveys, as well as rare, threatened, & endangered species surveys along Liberty Utility's proposed $414 million Granite Bridge pipeline project, a 27-mile long 16-inch pipeline along the Route 101 energy infrastructure corridor from Manchester to Exeter.

FIDELITY INVESTMENT SOLAR FARM—MERRIMACK, NH - Provided daily rare, threatened, and endangered species surveys and contractor trainings throughout the construction of New Hampshire's largest solar facility, located within the campus of Fidelity Investment in Merrimack, New Hampshire. This project also included the delineation and assessment of several ponds and wetlands located within the property and vernal pool surveys during the spring months.

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION—VARIOUS LOCATIONS IN NH -Has provided wetland delineations, vernal pool surveys, and permitting services for several transportation projects within the State of New Hampshire, including Interstate 93 from Salem to Hooksett, the Everett Turnpike in Nashua, NH Route 4 in Danbury, and NH Route 11 in Andover.

CHRISTOPER HAKER, PE - GEOTECHNICAL ENGINEERING/RETAINING WALL DESIGN, Chris Haker's 27-year background in dam engineering, foundation and earth retaining structure design and analysis, and soils engineering equips him to serve as technical lead on geotechnical projects. He has served as project manager, performed engineering analysis and design, and prepared contract drawings and specifications for rehabilitation of concrete and stone masonry structures and earth embankments, blasting, earthwork, temporary earth support, and permanent retaining wall structures. He has conducted analysis, design, and forensic investigations of earth retaining walls. Chris is a registered PE in New Hampshire and has a BS and MS in Civil Engineering with Geotechnical Specialization.

MASSDOT BIKEPATH—WORCESTER, MA Worked as the project manager and geotechnical lead for new bike path, which included a two tier, 8000- foot long, 30- foot high earth retaining walls to support a slope and residential structures above the wall.

COLLYER STREET RETAINING WALL—PROVIDENCE, RI Served as geotechnical lead for review failing pre-cast concrete bin wall and developing alternative for replacement options.

Appendix B – Applicable Work Experience

HIGHWAY DESIGN PROJECTS

NHDOT ROUTE 111 WINDHAM & ROUTE 12 CHARLESTOWN

Tighe & Bond recently initiated work on the NHDOT Route 111 Windham project as a subconsultant in which we are responsible for performing preliminary highway engineering at intersections, including traffic and safety studies and corridor- wide environmental impact assessments in developing mitigation measures; and on the NHDOT Route 12 Charlestown project as a subconsultant in which we are responsible for quality review and input of alternative analysis of transportation improvement layouts and design, traffic safety & operations, and corridor-wide environmental impact assessments in developing mitigation measures. We also have the current Statewide Coastal Wetlands & Environmental Services On-Call and were recently selected for the Water Quality & Wetlands On-Call.

LONGMEADOW ROAD EXTENSION – PORTSMOUTH, NH

Tighe & Bond performed planning and design services for the extension of Longmeadow Road for the City of Portsmouth. The 1,500-foot roadway extension connects Longmeadow Road to Lang Road to mitigate a longstanding safety concern of taking an unsignalized left turn off Lang Road onto US Route 1. The new roadway will divert traffic destined for southbound US Route 1 from Lang Road to the signalized intersection of US Route 1 at Longmeadow Road and Ocean Road to improve safety.
The road includes LID stormwater management measures and new utilities. The project is a Local Public Agency (LPA) funded project. Responsible for obtaining necessary NHDOT LPA approvals, local subdivision approval and NHDES Alteration of Terrain approval. Services included roadway design, wetland delineation, transportation engineering, signal design and geotechnical evaluation.

ATLANTIC HEIGHTS EMERGENCY ACCESS STUDY – PORTSMOUTH, NH

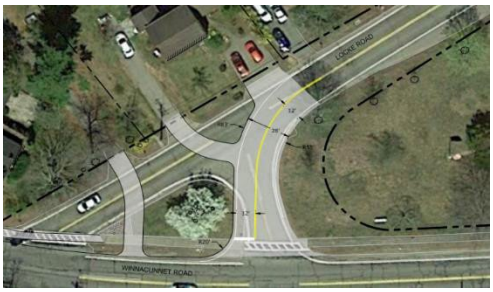
Tighe & Bond prepared an emergency access study for the City of Portsmouth for the Atlantic Heights neighborhood. Tighe & Bond was responsible for preparing multiple conceptual roadway layouts and determined associated costs and permitting for each alternative. Tighe & Bond performed various public presentations including public outreach meetings with the Atlantic Heights neighborhood and presentations to the City Council regarding the study's alternatives and the recommendations.

COMMERCE WAY – PORTSMOUTH, NH

Tighe & Bond performed roadway design services for the reconstruction of Commerce Way, a 2,500 linear foot road servicing an office park of 12 buildings, to City of Portsmouth standards. The roadway was a privately owned by The Kane Company and the City of Portsmouth reached an agreement with owner convert the roadway into a public right of way if reconstructed to city standards. Tighe & Bond completed the planning, design, permitting and construction documents for the reconstruction of this roadway. Improvements include a new pavement cross section and improved drainage, as well as improvements for pedestrians. This
includes new sidewalks, new lighting, installation of some existing overhead utilities underground, and enhanced landscaping including raised landscaped median islands. Tighe & Bond also completed a design analysis of the roadway to include modifications in the road layout to meet current safety standards. New public transportation stops were planned into the design.

Appendix B – Applicable Work Experience

LOCKE ROAD – HAMPTON, NH



Tighe & Bond performed roadway design services for the reconstruction of Locke Road for the town of Hampton. Locke Road is an existing street that extends from Winnacunnet Road to High Street. The roadway reconstruction design included the replacement of the existing sewer main and the water main from High Street to Winnacunnet Road. In addition, the design included stormwater management improvements to provide drainage relief for the neighborhood. Tighe and worked with the Town of Hampton to develop bid plans and specifications. Once bids were received from local contractors, we assisted the town in evaluating the bids and issuing a notice of award to the successful bidder.

PARK AVE – HAMPTON, NH

Tighe & Bond performed culvert design services for Town of Hampton for Park Avenue. The project included two phases of design and construction. The first phase included the replacement of an existing 24-inch culvert under Park Avenue that was undersized and resulted in flooding of north of Park Avenue during heavy rainfall events. Challenges to the culvert redesign included restrictions on the location and elevation due the location of existing sewer and water mains. Tighe & Bond evaluated and designed a solution to provide additional stormwater capacity within the stormwater management system. The discharge for the new culvert required a new headwall design and stream dredging to allow for unimpeded stormwater flow to the south. The second phase included stormwater improvements between Eaton Park and the south side of Park Avenue. Tighe Bond prepared a culvert design to replace the existing 48-inch culvert under Eaton Park and Park Ave. Tighe & Bond was responsible for obtaining NHDES Wetland Permits for the culvert replacements.

ROUTE 11 & MARKETPLACE BOULEVARD – ROCHESTER, NH

Tighe & Bond provided design for NHDOT permitting, construction documents, bidding, construction administration services and construction oversight for the Route 11 and Loop/Frontage Road improvements. These improvements included road widening, turn lanes and adding a 4th leg to the existing 3-way signalized intersection. The improvements are required to facilitate a new 2-phase multi-use development project on a 40-acre site. Our work included preparation of plans and specifications for 1,000 feet of improvements at NH Route 11. All work was performed in conformance with the standards, policies and procedures of the New Hampshire Department of Transportation (NHDOT) and Federal Highway Administration (FHWA) design guidelines and benchmark submittals. This project also involved close coordination with the City of Rochester. Construction is ongoing and we are providing full time observation services.

CHESLEY HILL – ROCHESTER, NH

Tighe & Bond performed roadway design services for the City of Rochester for Chesley Hill Road, an east-west connector between Routes 125 and Route 202. The proposed design and reconstruction of a Chesley Hill Road (+/-3,500 lf) included pavement reclamation and infrastructure improvements. The existing +/-1,600 lf of 6" clay sewer line was replaced with 8" PVC to provide longevity for the new system and provided capacity for potential expansion in the area. Water line improvements included connecting the water system on the adjacent roadway network into the existing 24" system within Chesley Hill Road. As part of the project, the existing drainage system, which currently

Appendix B – Applicable Work Experience

consists of roadside swales and aged culverts, was improved by replacing the roadside swales with swales with consistent cross section and a closed drainage system. The new drainage improvements erosion control enhancements for the steep roadway profile. During the design phase, Tighe & Bond identified additional drainage concerns on the adjacent roadway network which tied into Chesley Hill's drainage system. Tighe & Bond prepared an alternative drainage solution that was bid with the project to replace an undersized culvert, alleviate flooding concerns and replace dilapidated structures.

WAKEFIELD STREET – ROCHESTER, NH

Tighe & Bond performed roadway designs services for the City of Rochester for Wakefield Street, an existing 4,000 lf of roadway in downtown Rochester. The project included replacement of sidewalk along each side of Wakefeld Street, new striped parking, pedestrian crossings, new signal equipment and the addition of new downtown lighting, benches and street trees. Plans for drainage improvements included water quality throughout the Wakefeld Street corridor with the addition of new catch basins and green landscaped islands. The project also includes water and sewer improvements in the area. Integral to the completion of this project, Tighe & Bond created phasing plans so that the City could understand the impact to traffic patterns during construction.

RICHARDSON DRIVE – DOVER, NH

Tighe & Bond performed roadway design services for the City of Dover for Richardson Drive. Built in the mid twentieth century, the neighborhood around Richardson Drive and Old Stage Road was long overdue for infrastructure improvements. The neighborhood needed stormwater management upgrades as well as an extension to the municipal sewer service. These upgrades were critical because the neighborhood is located within the wellhead protection area of two wells that are integral to the municipal potable water supply, The roadway reconstruction project includes the permanent removal of nearly 30,000 square feet of impervious area; construction of new curbing; 2,900 feet of new sewer main; domestic water services; fire hydrants; and over 1,750 feet of drainage infrastructure. Tighe & Bond is providing civil/site engineering, stormwater management design, permitting, and required State Revolving Fund construction oversight services. In addition, Tighe & Bond has been active in the presentations to the public including providing design options to gain acceptance for the redevelopment.

TUSCAN VILLAGE MIXED-USE DEVELOPMENT- SALEM, NH

Tuscan Village, a mixed-use development on the Rockingham Park racetrack site in Salem, includes 120 acres of retail, offices, and residences in a contemporary urban style design. Tighe & Bond is providing site planning and design, permitting, environmental consulting, site/civil and transportation engineering, utility coordination, and construction-phase services for the project. Site work includes the design of approximately 9,700 linear feet of gravity sewer, stream restoration and re-routing, wildlife coordination with the New Hampshire Department of Fish & Game, wetland enhancement areas, and open and closed bottom culverts. As part of the project, the existing culverted stream, Policy Brook, was daylighted and restored to a natural stream channel. This created over 3,000 LF of natural stream and adjacent floodplain to support the development. In addition to the stream restoration, Tighe & Bond's site work included wetland enhancement areas, a pond, and design of open and closed bottom culverts. Osprey nests were relocated under the direction of the New Hampshire Fish & Game Department. Tighe & Bond is also providing services to reconfigure an existing 2.5 acre irrigation pond into the project's focal point, Tuscan Lake. The design meets or exceeds the Town of Salem and NHDES Alteration of Terrain requirements with use of conventional and Low Impact Development (LID) Best Management Practices (BMPs).

Appendix B – Applicable Work Experience

BRIDGE DESIGN PROJECTS

DUTTON ROAD BRIDGE REPLACEMENT – SUDBURY, MA

Tighe & Bond identified the Dutton Road Bridge as a top priority structure in the Town of Sudbury following a Town-wide culvert asset management inventory and assessment. Tighe & Bond was responsible for designing a 24-LF precast arch bridge to replace the deteriorating twin corrugated steel culverts. Tighe & Bond identified the existing bridge as an eligible candidate for state funding through the MassDOT Small Bridge Program and assisted the Town with receiving a $500,000 grant for construction funding through the program. Tighe & Bond's design included geotechnical evaluations, hydrologic and hydraulic analysis, environmental permitting, utility coordination, site roadway and drainage design, drawings and specifications, and obtaining Chapter 85 Approval through MassDOT. Technical assistance continued through the bidding and construction phase, with full-time construction observation on site. The new structure provides a durable and reliable structure for the Town and its residents and comes at a lower cost due to a strategic grant funding opportunity. Construction was completed in 2021.

JOHN PARKER ROAD BRIDGE REPLACEMENT – FALMOUTH, MA

As part of the Coonamessett River Restoration Project, Tighe & Bond designed a new 24-foot bridge to replace a series of three 24- inch diameter CMP culverts that prevented fish passage. The new bridge compliments the recent dam removal downstream and conversion of cranberry bogs to a restored river. The new hydraulic system brought back an ecosystem that has been missing for approximately 300 years. Tighe & Bond's design included geotechnical evaluations, an alternatives analysis to evaluate various structure types, design drawings and specifications, and MassDOT coordination. Technical assistance was provided during the bid phase and construction administration services. The new bridge consists of a precast concrete frame on pedestal spread footings. The design involved a roadway closure, stream bypassing, significant dewatering and accommodated tidal salt-water impacts.

DIVISION STREET BRIDGE REPLACEMENT & EMERGENCY REPAIR DESIGN– GREAT BARRINGTON, MA

Tighe & Bond was responsible for structural evaluations and performing an engineering study for replacement of a 140' span truss bridge. The engineering study involved extensive geotechnical evaluations, abutment re-use investigation, environmental habitat considerations, and structural alternatives analysis. The bridge was recently closed within the past year by MassDOT due to structural deficiencies which resulted in various members having zero capacity, While the bridge is in queue for future replacement with MassDOT, Tighe & Bond is currently designing emergency repairs for the Town to reopen this bridge which is depended upon for significant local, truck, and agricultural traffic. The emergency repair design involves a full truss analysis, local member analysis, and gusset plate analysis to restore the bridge's capacity to its original H15 design load.

Appendix B – Applicable Work Experience

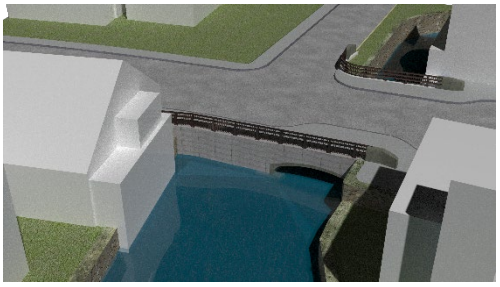
BRIDGE OF FLOWERS EVALUATION – SHELBURNE FALLS, MA

The Bridge of Flowers is an internationally known landmark and attraction in western Massachusetts and was converted from a railway bridge in 1929. The bridge is one of the premier tourist attractions in Massachusetts and centerpiece of the Village of Shelburne Falls. The bridge is a five-span, cast-in-place concrete spandrel arch. Concrete spandrel walls support fill topped by loam for plantings. Tighe & Bond performed a structural assessment in September 2019. The assessment was performed on deck, in the Deerfeld River, and via Tighe & Bond's drones. Pier footings were evaluated for overall stability and signs of scour. Tighe & Bond assessed exposed concrete surfaces on the bridge for signs of deterioration including cracks, spalls, efflorescence, abrasion, breakdown of cementitious material, and rust staining. The work also included the assessment of a test pit to expose reinforcement, development of conceptual design costs for rehabilitation, and assistance to the Fire District to determine and evaluate potential sources of funding to support upcoming rehabilitation work. T&B Staff recently worked (pro bono) with the town to relocate plantings from the bridge to a nearby farm so that repairs can be made.

SAMPSON'S MILL ROAD CULVERT REPLACEMENT– MASHPEE & BARNSTABLE, MA

Tighe & Bond designed a new 14-foot bridge to replace a deteriorated cast iron pipe and stone box culvert that prevented fish passage. The road width at the stream crossing was widened from a single lane to two lanes, significantly improving traffic safety. Roadway drainage was also improved to mitigate suspended solids and nutrients from stormwater runoff. Multiple stakeholders were involved with the planning process including the Mashpee Wapanoag Tribe, abutters to the site, and funding agencies that included the Division of Ecological Restoration and the US Department of Agriculture Natural Resource Conservation Services. Tighe & Bond's design included a hydraulic and scour analysis, geotechnical evaluations, and alternatives analysis to evaluate various structure types, design drawings and specifications. The project was also located on the border of two adjacent towns and coordination was needed between the two owners. The structure provides a long-term durable bridge in compliance with MassDOT Ch. 85 requirements, stream crossing standards, and greatly improved fish passage.

CENTRAL STREET BRIDGE AND SAWMILL BROOK RESTORATION – MANCHESTER-BY-THE-SEA, MA



Tighe & Bond designed and permitted a replacement bridge for Central Street where Sawmill Brook drains to Manchester Harbor. The design includes removing a tide gate under the bridge and restoring the marsh area upstream of the bridge. The site is in the middle of the Manchester-by-the-Sea historic district, with adjacent historic buildings integral with bridge and retaining wall structures. The narrow span of the existing bridge and the tide gate impede drainage to the Harbor resulting in localized flooding during severe storms, especially when combined with coastal surges or extreme high tides. The project design includes widening the bridge for top-side transportation improvements and increasing the span below in conjunction with removal of the existing tide gate to increase hydraulic capacity and promote fish passage of endangered rainbow smelt, American eel, and sea run brook trout. The bridge design includes replacement of the existing vintage stone and arch structure with a historically compatible design. Tighe & Bond worked closely with the Town, abutters, the Manchester Historic Commission, funding partners, and permitting agencies to develop the staging approaches, traffic maintenance, and structure design, while accommodating the complex utilities embedded in the current structure and reducing periods of road closure for this critical transportation corridor.