PROPOSAL -
CONGRESS STREET BRIDGE LIGHTING PROJECT

December 1, 2016

Submitted To:

boston planning & development agency

Submitted By:

WSP | PARSONS BRINCKERHOFF

75 Arlington Street
9th Floor
Boston, MA 02116

Main: 617 426 7330
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December 1, 2016

Ms. Teresa Polhemus
Executive Director/Secretary
Boston Planning & Development Agency
One City Hall Square – Room 910
Boston, MA 02201-1007

Re: ***Congress Street Bridge Lighting Project***

Dear Ms Polhemus,

WSP | Parsons Brinckerhoff is pleased to present our technical and fee proposal (under separate cover) for lighting design of the Congress Street Bridge, an iconic structure connecting downtown Boston with an energetic Innovation District and artist community in the ever-changing Fort Point Channel/Boston waterfront area.

At WSP | Parsons Brinckerhoff, we bring experience working with public agencies to designing, engineering and administering aesthetic lighting projects in Boston and beyond. Under the leadership of our proposed Project Manager, Jeffrey T. Berg, AIA/LC, our designs for the Cathedral Church of Saint Paul, a National Historic Landmark on Tremont Street, and the AVA in Boston's Stuart Street Theater District, have won national awards this year from the Illuminating Engineering Society (IES). Our design and supervision of special-event lighting on the Zakim Bridge won an award at the international level from the IES. Services we have provided over several years to Light Boston, including reviewing and recommending maintenance procedures and upgrades to lighting of four historic churches on Tremont Street, won Light Boston's first Excellence in Lighting award. Finally, our lighting design for 131 Clarendon Street, the new headquarters of Brookline Bank, supported a restoration that garnered a Preservation Achievement Award from the Boston Preservation Alliance.

We are ever mindful of the need to preserve and enhance a historic setting with a lighting design that is not only constructible, efficient and cost effective, but also aesthetically appealing and respectful of the environment in which that design will live.

As a firm that has had a presence in Boston for over 50 years .we hope for an opportunity to enliven a Boston landmark. If you have any questions or require additional information, please call either Jeffrey Berg at 617 960 4846 (e-mail berg@pbworld.com) or me at 617 960 4919 (email obrien@pbworld.com) and we will respond promptly. I will serve as principal in charge for this project.

Thank you for the opportunity to demonstrate our experience, approach, and enthusiasm to be your consultant.

Sincerely,

PARSONS BRINCKERHOFF, INC.

Richard F. O'Brien, PE
Area Manager

(4) - Establishment (50+ employees)

SECTION B - COMPANY IDENTIFICATION

1. Parsons Brinckerhoff, Inc.
f/k/a PB Americas, Inc.
One Penn Plaza
New York
NY 10119 New York

2.a. Parsons Brinckerhoff, Inc.
f/k/a PB Americas, Inc.
75 ARLINGTON STREET 9TH FLR
BOSTON
MA 02116 Suffolk

SECTION C - TEST FOR FILING REQUIREMENT

1 - Y 2 - N 3 - N DUNS NO.: 00-000-0000

Y (WAS AN EEO-1 REPORT FILED FOR THIS ESTABLISHMENT LAST YEAR?)

SECTION D - EMPLOYMENT DATA

JOB CATEGORIES		MALE HISP (A)	FEMALE HISP (B)	MALE WHITE (C)	MALE BLACK (D)	MALE NHOPI (E)	MALE ASIAN (F)	MALE NAT AM (G)	MALE 2+RACE (H)	FEMALE WHITE (I)	FEMALE BLACK (J)	FEMALE NHOPI (K)	FEMALE ASIAN (L)	FEMALE NAT AM (M)	FEMALE 2+RACE (N)	TOTAL A - N (0)
EXEC / SENIOR MGRS	(1.1)	2	0	16	0	0	0	0	0	0	0	0	0	0	0	18
FIRST / MID-LEVEL MGRS	(1.2)	0	0	68	0	0	3	0	0	10	0	0	0	0	0	81
PROFESSIONALS	(2)	2	0	44	0	0	2	0	0	27	0	0	1	0	0	76
TECHNICIANS	(3)	0	1	16	2	0	3	0	2	6	1	0	0	0	0	31
SALES WORKERS	(4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADMIN SUPPORT	(5)	0	0	0	0	0	0	0	0	4	0	0	5	0	0	9
CRAFT WORKERS	(6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OPERATIVES	(7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LABORERS & HELPERS	(8)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SERVICE WORKERS	(9)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(10)	4	1	144	2	0	8	0	2	47	1	0	6	0	0	215
PREVIOUS YEAR TOTAL	(11)															

* OTHER QUESTIONS *

1 - 08/01/2013 THRU 08/15/2013 (DATE(S) OF PAYROLL PERIOD USED)

TABLE OF CONTENTS

THE PROJECT

Illuminating the Congress Street Bridge will make vibrant what is now a ghostly image at night. A new luminous presence will enhance its modern role as a connector of neighborhoods and a gateway to the Innovation District. The design team will consider the values of the diverse community and complementing the historic setting while also addressing feasibility and cost.

Task 1: Background Review

Members of the design team will return to the bridge and its environs to review existing infrastructure by day and lighting effects by night. They will pay particular attention to the impact of new development on the most recent conceptual lighting scheme. A thorough review of existing documentation will also be conducted.

Task 2: Conceptual Design

The design team will generate two or three alternative approaches to lighting the bridge. An overall architectural theme compatible with the surroundings will structure each option. The schemes will be presented in sketch form to the BPDA and other representatives within six weeks of the Notice to Proceed. The presentation will address the features of the bridge, including the historic lanterns, bridge piers, counterweight tower, bascule truss, steel channel and railing, other mechanisms of interest, and the Boston Tea Party Ships and Museum. Besides a plan or overall elevation the team will provide general details for luminaire types and bridge connections, and a rough estimate for the work of each option.

The schemes will reflect concern for recent advances in light source technology, especially color changing capability; lighting control technology and available software; use of existing electrical infrastructure; maintenance and operation; specification of marine grade materials wherever possible; and potential for utility rebate. The designs will include navigation lighting as required by the US Coast Guard and take care not to have features or programming that might confuse boaters.

Task 3: Preliminary Design

After discussion with the BPDA, the PWD and the community leading to approval of a Conceptual Design, the team will develop the preferred lighting option to become a Preliminary Design. It will comprise an electrical plan showing proposed luminaire locations and connections to the existing infrastructure, such as conduit, wiring and control cabinet; electrical details; a luminaire schedule; luminaire mounting details; and a preliminary statement of probable construction cost.

Task 4: Permitting & Public Comment Support

The designers will prepare for and attend meetings to present, explain and solicit comments regarding the preliminary and final designs. With the Public Works Department the team will meet to review preliminary and then final design, making revisions in response to comments after each. The consultants will prepare for and participate in a public hearing before the Boston Landmarks Commission, and revise the design in response to comments. To communicate with the Fort Point Channel community the designers will prepare for and attend one formal public meeting, and refine the design in response to comments. At the request of the BPDA the consultants will meet informally with small groups of community members, and take their comments into account when finalizing the design.

Task 5: Final Design

After review and comment the designers will prepare the final design. The construction contract documents will include an electrical plan showing proposed luminaire locations and connections to the existing infrastructure, such as conduit, wiring and control cabinet; electrical details; a luminaire schedule; luminaire mounting details; a one-line diagram; a panelboard schedule; specification of a digital color changing control system and other electrical elements; and a preliminary statement of probable construction cost. Documents showing the electrical design will be stamped and sealed by a licensed professional electrical engineer. Documents showing mounting

details will be stamped and sealed by a licensed professional structural engineer. Both engineers will be registered in Massachusetts.

Task 6: Construction Administration

The consultants will participate in a pre-bid conference; prepare addenda and clarifications; and review the contractor's submissions for general conformance with the construction contract documents. A consultant will run and document the project meeting and make one site visit each week. The consultants will respond to proposed changes in the work, review the contractor's periodic requests for payment, review final testing of systems and prepare a punch list of items to be completed for close-out. To keep the project on budget the consultants will track construction costs through each phase of the project. They will also facilitate coordination among the contractor, luminaire manufacturer, and lighting control supplier.

Task 7: Maintenance Plan

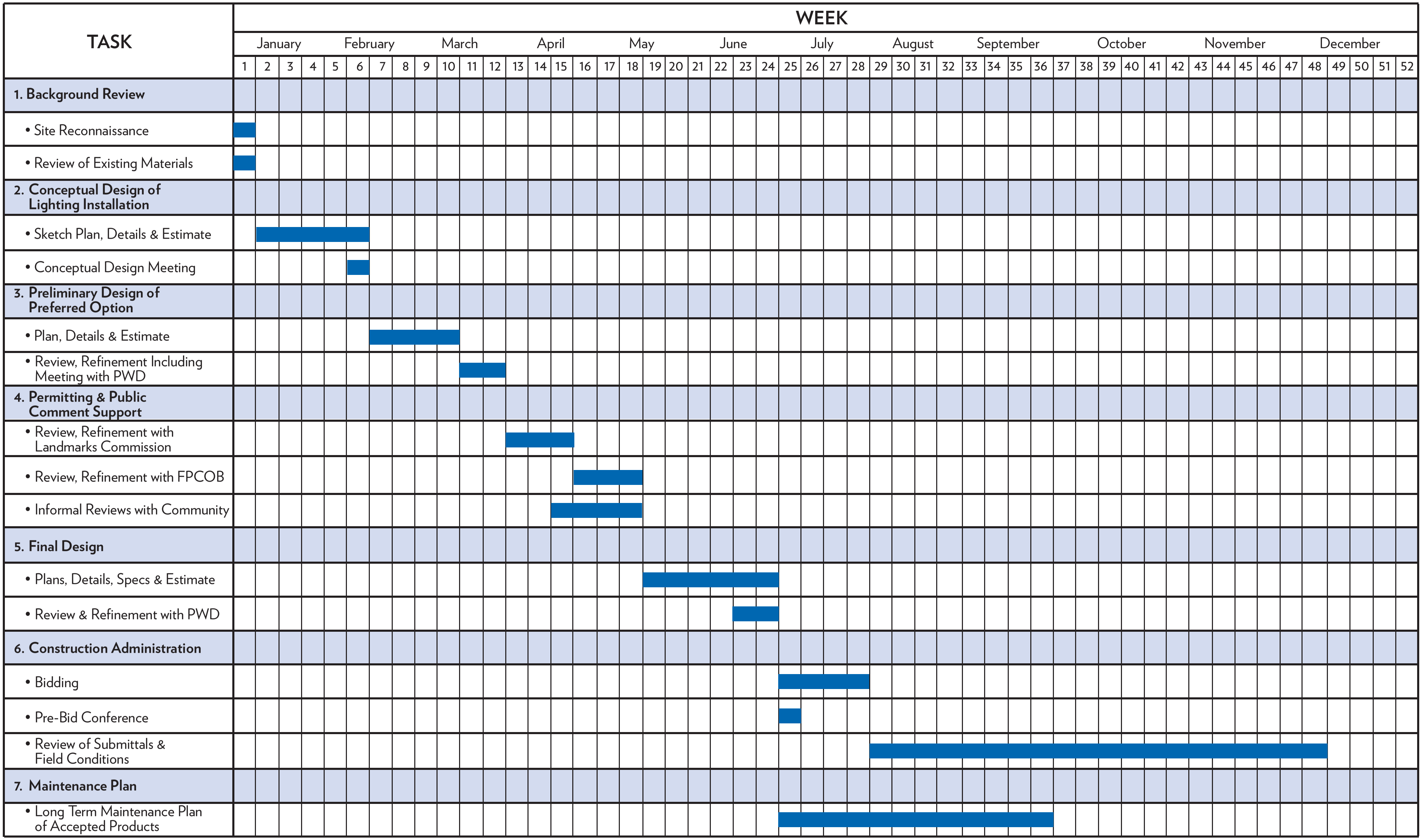
The consultants will develop a long term maintenance plan for the lighting installation, with a view to making the installation easily and efficiently maintained.

Project Schedule and Level of Effort

We envision the project developing according to the schedule and level of effort shown on the following pages.

Project Schedule

Congress Street Bridge Lighting Project



Level of Effort

Congress Street Bridge Lighting

Congress Street Bridge Lighting	Personnel>		Lutkevich	Berg	Sicard	Molloy	Weaver	CADD	Sharif	Moeller	Fisher	McMenimen	Walsh	Total
	%ByTaskV													
TASK 1: BACKGROUND REVIEW				1	1				1					3
TASK 2: CONCEPTUAL DESIGN				3	16		2							21
Tasks 1 & 2 Subtotal		8%	0	4	17	0	2	0	1	0	0	0	0	24
TASK 3: PRELIMINARY DESIGN	#sheets													
Preliminary Design Plans & Details														
Lighting model in AGi32 made from CADD or Revit				2	8									10
Lighting design refined in AGi32				2	12		1							15
Plan & elevation(+ details; & schedules later)	3							8	8	1				17
QA/QC														
Admin														
Task 3 Subtotal		14%	0	4	20	0	1	8	8	1	0	0	0	42
TASK 4: PERMITTING & PUBLIC COMMENT SUPPORT														
Meetings: Public Works Department (2)				6	6									12
Hearing: Boston Landmark Commission, incl. prep.				8	8									16
Formal community meeting in Fort Point				2	4									6
Informal community meetings in Fort Point				2	4									6
Drawing revisions				2	2			8	2					14
Task 4 Subtotal	3	18%	0	20	24	0	0	8	2	0	0	0	0	54
TASK 5: FINAL DESIGN														
Final Design														
Specifications				2					8	2				12
Luminaire schedule				4										4
Final plan & elevation; details; & schedules			1	8	8		4	48	8	4			1	82
Estimate											4			4
Structural details												4		4
QA/QC						1								1
Task 5 Subtotal		36%	1	14	8	1	4	48	16	6	4	4	1	107
TASK 6: CONSTRUCTION ADMINISTRATION														
Submittal Review														
Review of luminaires (4+2) & electrical equipment				6					4					10
Observation														
Site visits, incl. weekly project meeting				8						54				62
Task 6 Subtotal		24%	0	14	0	0	0	0	4	54	0	0	0	72
TASK 7: MAINTENANCE PLAN														
Contingency														
Task 7 Subtotal		0%	0	0	0	0	0	0	0	0	0	0	0	0
Number of Sheets	3													
Average Hours per sheet	18.0													
Total Hours		100%	1	56	69	1	7	64	31	61	4	4	1	299
			0%	19%	23%	0%	2%	21%	10%	20%	1%	1%	0%	100%

Assumptions:

1) Information on existing conditions will be provided.

2) Electrical design is included.

3) Hours are based on 1 design package.

4) Lighting calculations will be in accordance with IES recommendations.

5) Owner design criteria will be provided.

6) Emergency lighting is included.

7) Site visits are as listed.

8) Other areas of project are additional.

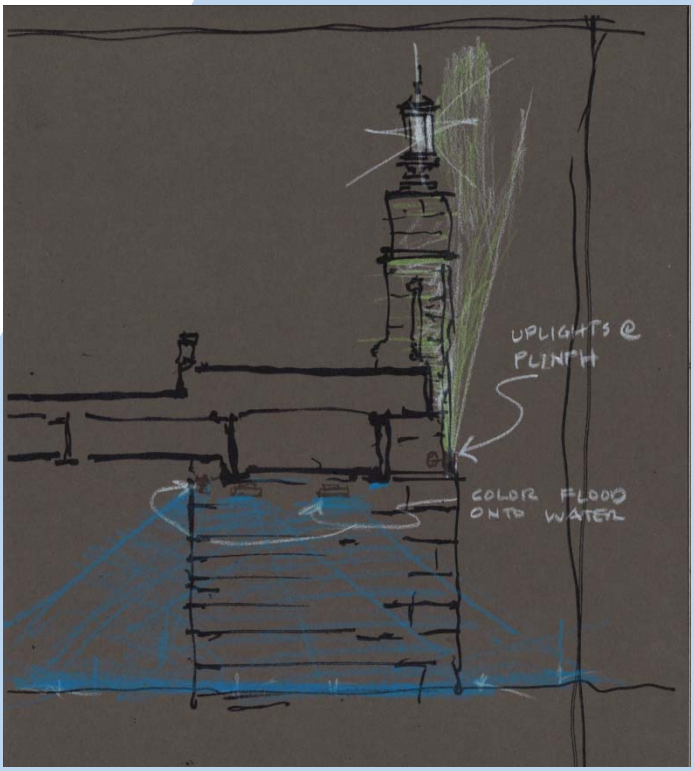
THE APPROACH

Illuminating the Congress Street Bridge will reinforce community pride, enhance orientation, supplement the visibility of the Boston Tea Party Ship and Museum, and encourage use of the Fort Point Channel neighborhoods at night.

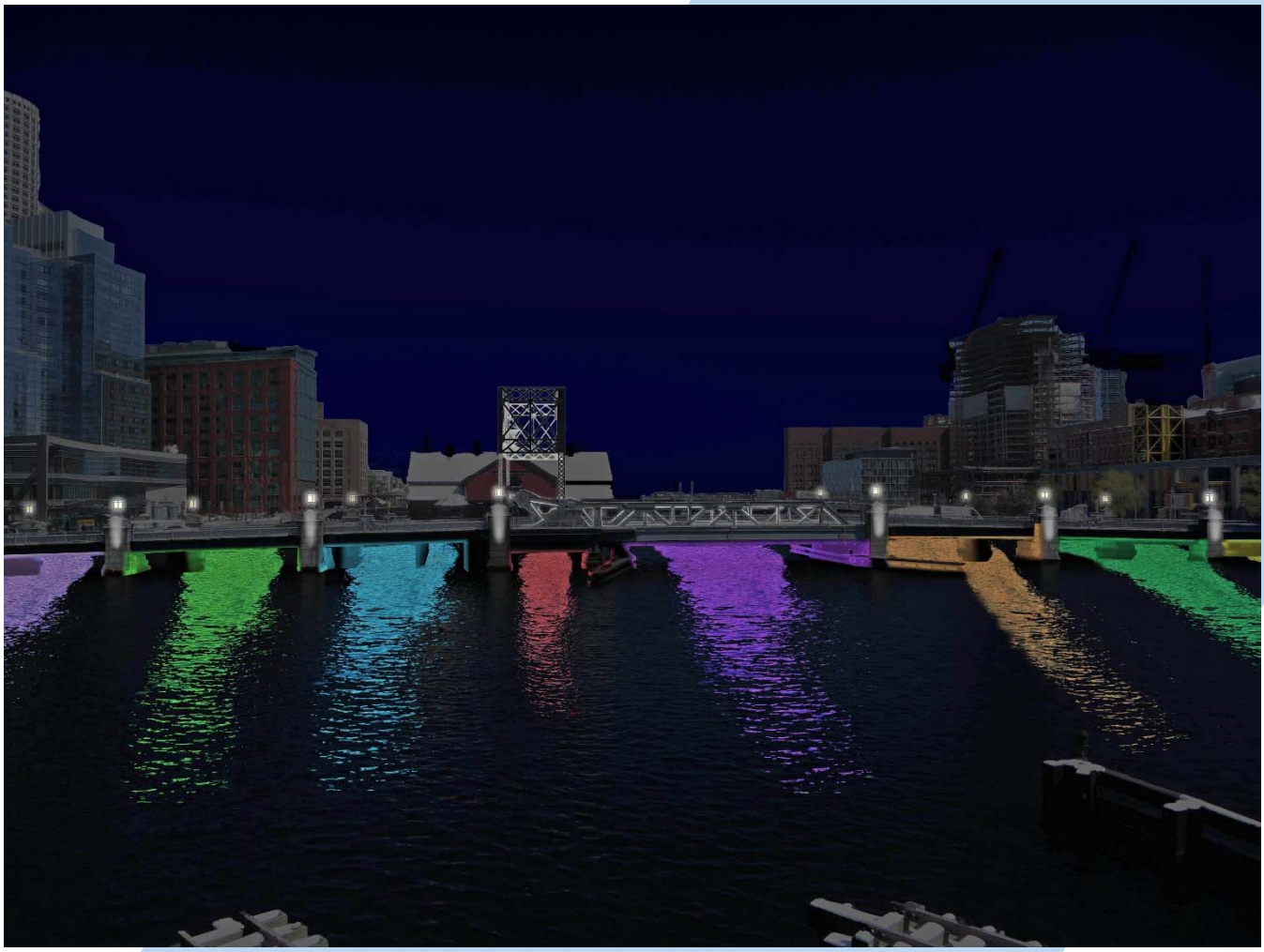
An inclusive design process will generate multiple options to explore and evaluate with regard to aesthetics, feasibility, sustainability, and cost. The WSP | Parsons Brinckerhoff designers suggest three options in this early conceptual stage, as follows.

"Rainbow"

Planning studies refer to the Fort Point Channel "water sheet". This scheme aims color changing floodlights at the water itself, creating ever-shifting evanescent patterns under and near the bridge. The piers are accented with uplights. The counterweight structure is washed with light so that it glows from within.



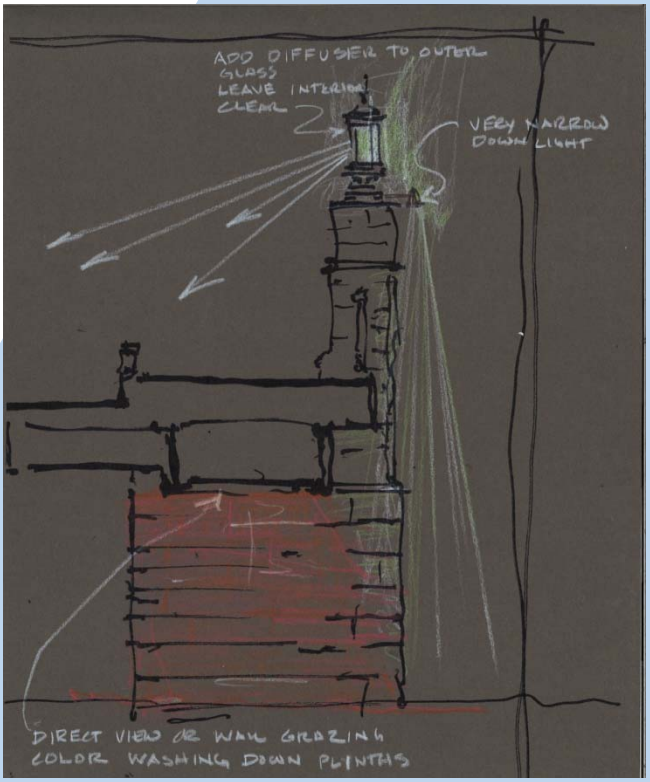
Concept sketches



Photoshop rendering

"Wash"

Grazing illumination is aimed down on the masonry of the piers and plinths. The lanterns are fitted with diffusing media on the water side to make them glow as decorative objects, but not to interfere with optics on the roadway side. Since most of the light is aimed down this scheme minimizes light pollution.

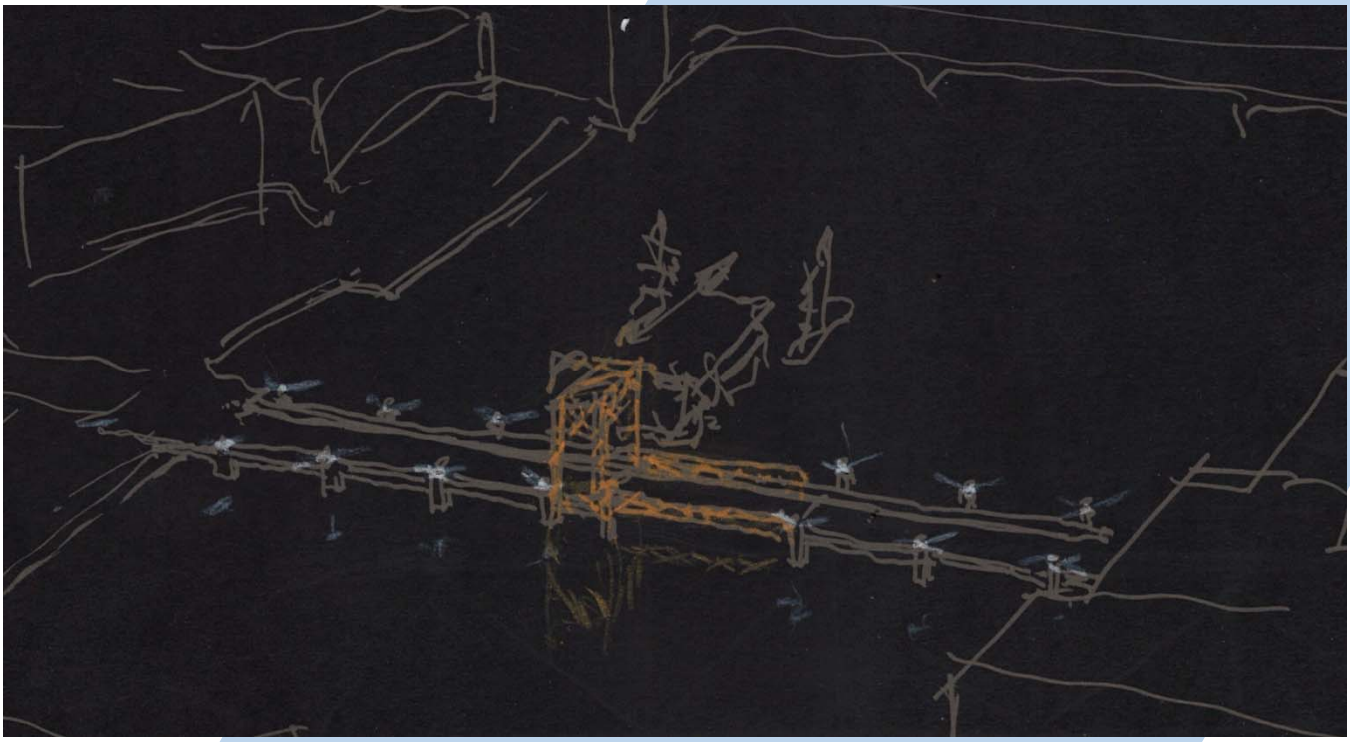


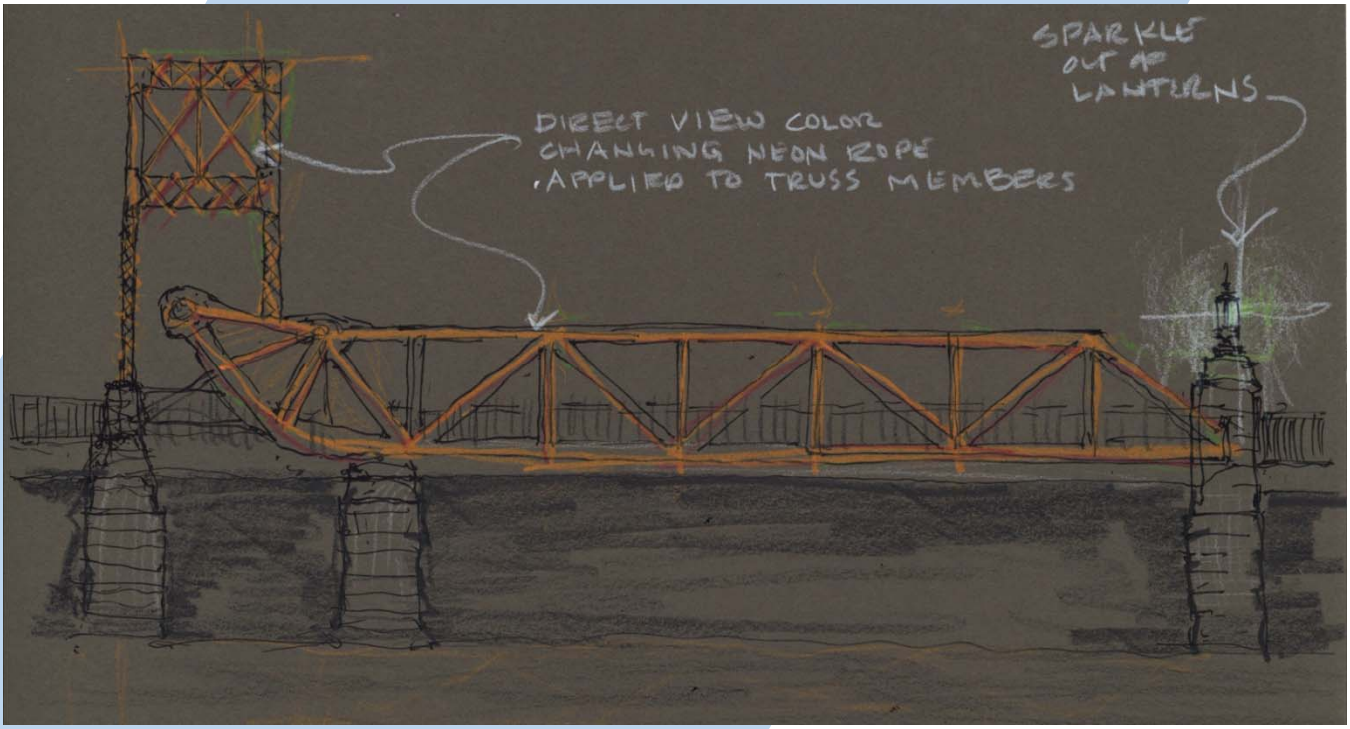
Concept sketches

Photoshop rendering

"Sparkle"

Direct view strips outline the truss and counterweight structure. The lanterns are fitted with diffusing media on the water side. This scheme is potentially the least difficult to construct, minimizing work over the water.





Concept sketches

Photoshop rendering

EXPERIENCE

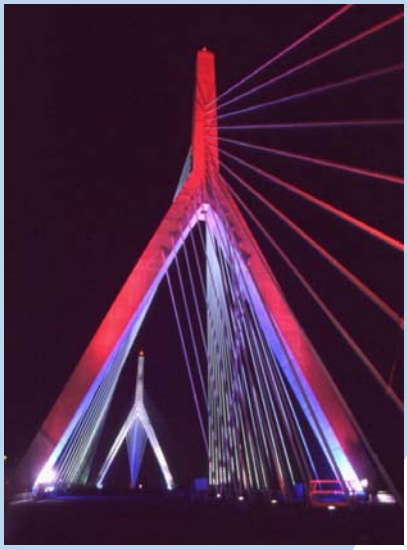
Leonard P. Zakim Bunker Hill Bridge Special Event Lighting, July 4, 2002

Prime consultant: Parsons Brinckerhoff

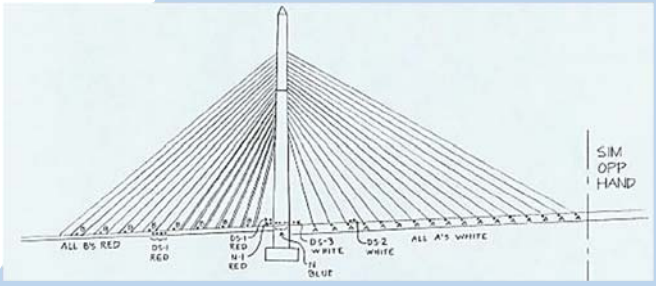
Lighting designer for special event: Berg/Howland Associates; Jeffrey T. Berg, principal

A special event called for special illumination of an iconic symbol of the new Boston. Temporary theatrical fixtures and accessories supplemented the permanent lighting installation to celebrate the opening of the bridge and to observe the first Independence Day after 9/11. This was design on a grand scale, combining elements of architecture, theater, and engineering.

The design was implemented for a single event, to make the bridge red, white and blue for the 4th of July 2002.



In the tower mockup, white spotlights lit the mainspan side of each tower and red spots lit the backspan side. This arrangement emphasized the three-part plan of the bridge and allowed all the colors to be seen together from the roadway. The fixture beam spreads were chosen to put most of the light on the towers and minimize spill to the sky.



Bridge officials asked for a special lighting design for holidays. The holiday scheme added metal halide spotlights to illuminate the faces of the towers and colored gels over existing fixtures to tint the light on the backspan cables.

The existing scheme for the bridge illuminates the cables with cool white spotlights and the undersides of the towers with blue filtered floodlights.

Tremont Street Churches, Boston

Lighting design: Berg/Howland Associates, Jeffrey T. Berg, principal
Review and upgrade recommendations: WSP | Parsons Brinckerhoff

Four churches on Tremont Street were illuminated and then upgraded under the auspices of Light Boston and the Edward Ingersoll Browne Trust Fund. The churches are King's Chapel, the Tremont Temple Baptist Church, Park Street Church, and the Cathedral Church of Saint Paul. WSP | Parsons Brinckerhoff reviewed the original installations to assess their condition and suggest improvements. Subsequently the firm facilitated upgrades to King's Chapel, Park Street Church and the Cathedral.

Lighting of the Park Street Church clocks passed review by the Beacon Hill Architectural Commission and was installed on street light poles by the Public Works Department.

King's Chapel

Park Street Church Clock Faces

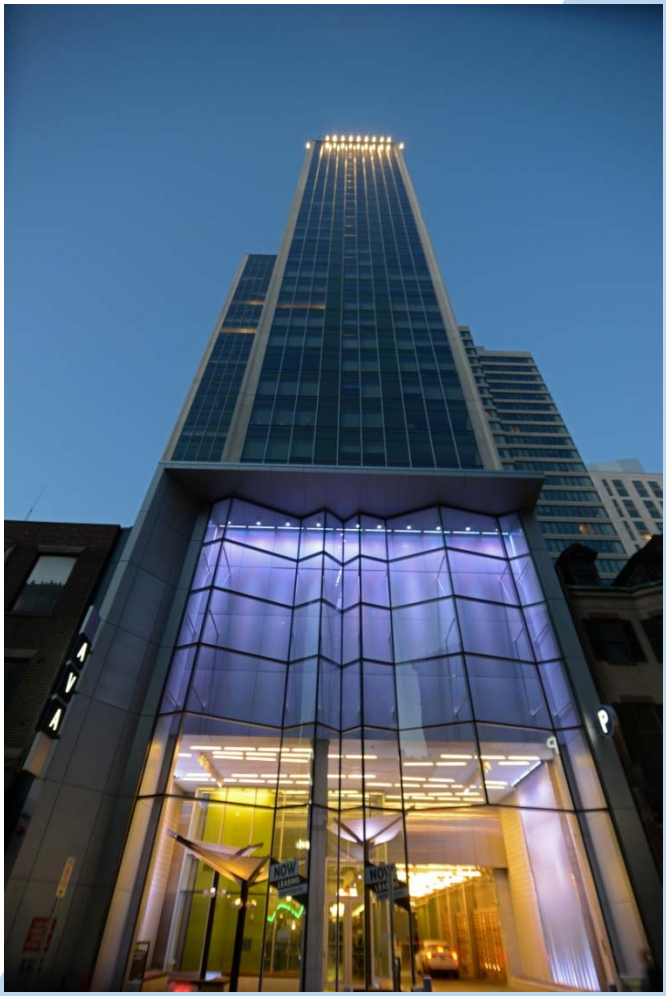
Tremont Temple Baptist Church

Cathedral Church of Saint Paul Portico

AVA Theater District, Boston

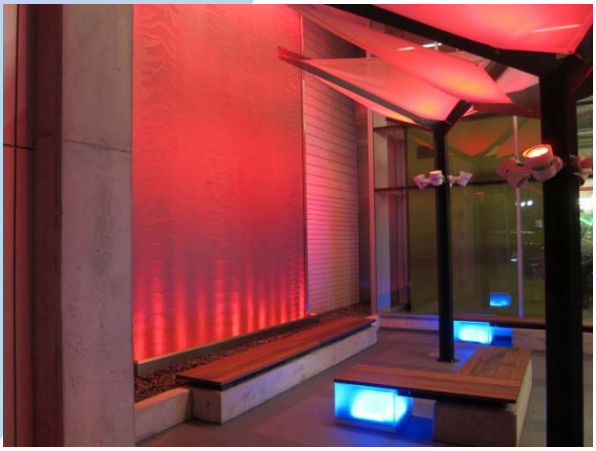
Architects: CBT/Childs Bertman Tseckares Inc.
Lighting designer: WSP | Parsons Brinckerhoff

The Boston Redevelopment Authority encouraged theatrical treatment of the façade and entry spaces of this residential tower on Stuart Street. At the high parapet white LED narrow spotlights, 3000°K, aimed down, graze concrete and metal panels while creating a “crown of jewels” effect.



Theater curtains inspired the main entry curtain wall. A row of color changing grazing luminaires supplemented by a row of narrow spotlights play moving color effects across the backdrop. All façade luminaires aim down, emit no light above the horizontal, and come under the energy allowance of the IECC-2012 by 16%.

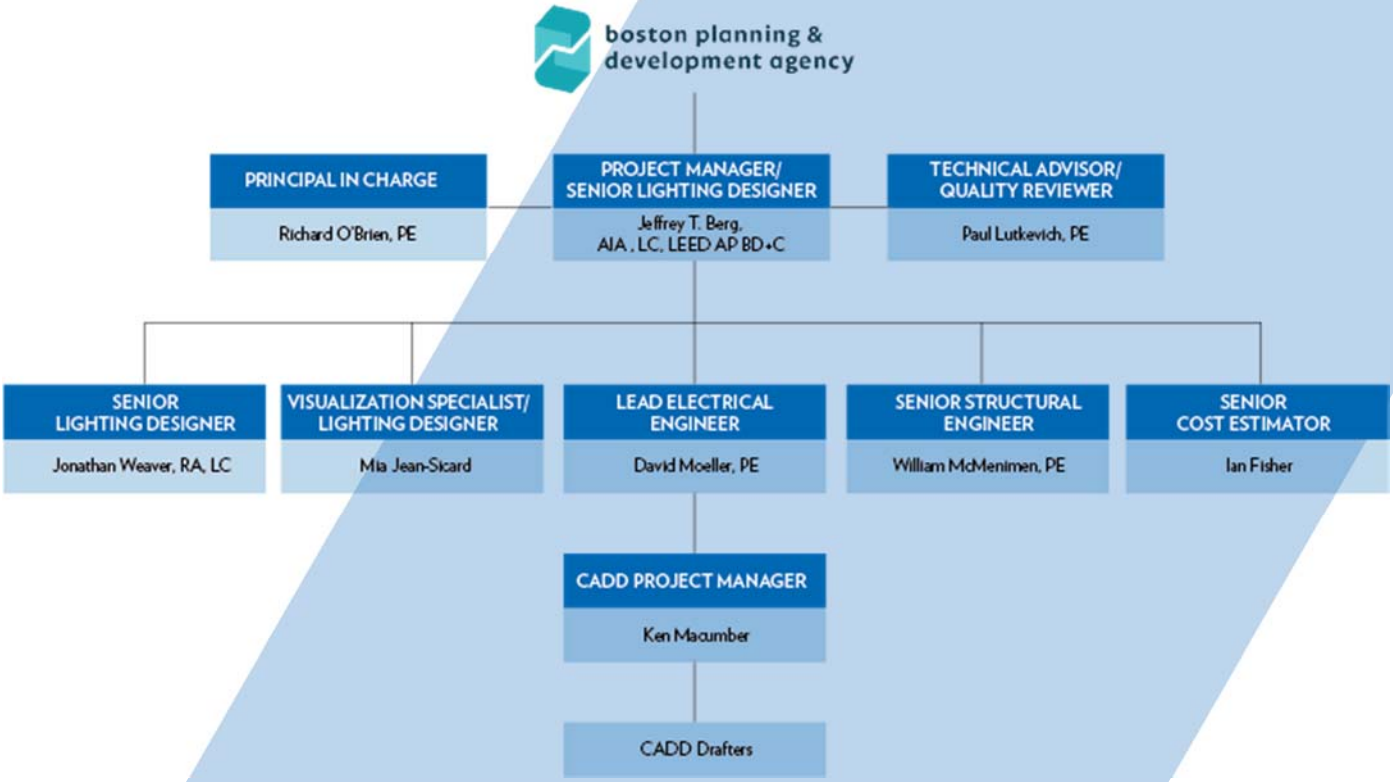
At the water walls water falling over a metal screen gives a metallic textured effect to the light. Grazing and spot fixtures above create a wash that blends with a candelabra effect from submersible spots below.



At right, canopies and wood benches create a conversational ambience. Decorative elements with frosted glass under the benches change color in response to motion.

PERSONNEL

All proposed staff are employees of WSP | Parsons Brinckerhoff's Transportation and Infrastructure group in Boston. The team has been organized to carry out the project as illustrated below.



Paul J. Lutkevich, PE

Lighting Specialty Group leader

Paul Lutkevich is a senior supervising engineer with WSP | Parsons Brinckerhoff experienced in the study, design, and construction inspection of lighting and electrical systems. He has served as an electrical engineer and lighting designer providing engineering and project management services for a wide range of projects such as urban roadways, bridges, tunnels, parks, buildings, and transit systems. He is also experienced in coordinating work with local, state and federal agencies.

Mr. Lutkevich is past chair of the Illuminating Engineering Society's (IES) Roadway Lighting Committee. Currently he is serving as a member of the IES Criteria Committee. He is a member of the Commission Internationale De L'Eclairage (International Commission on Illumination). He is actively involved in the development of national and international standards for outdoor lighting. He was also a member of the U.S. delegation in the Federal Highway Administration (FHWA)/American Association of State Highway and Transportation Officials (AASHTO) Bilateral Lighting Technology Exchange Program between outdoor lighting experts and international organizations in Europe. He has been involved in research with the FHWA investigating topics concerning lighting and safety, visualization techniques, and context sensitive solutions.

He has written and spoken extensively on the subjects of outdoor lighting including urban lighting, lighting for pedestrians, aesthetic considerations in outdoor lighting and lighting for safety. He is a co-author for the Transportation Association of Canada's outdoor lighting standards, which used the latest research from North American and international sources to compile a comprehensive design guide for the outdoor environment. He is co-author of the International Municipal Signal Association Lighting certification program. He is currently lead researcher for the revisions to the FHWA Roadway Lighting Handbook.

Jeffrey T. Berg, AIA, LC, LEED AP BD+C

Project Manager; Senior Lighting Designer

Jeffrey T. Berg is a registered architect and certified lighting designer who brings over 30 years of lighting design experience to complement landscapes, monuments and building facades in Boston, across the United States and abroad. Prior to joining the firm Mr. Berg consulted on illuminating the Leonard P. Zakim Bunker Hill Bridge, Boston for a special event, the facades of four churches on Tremont Street in Boston, an addition to the Rose Art Museum at Brandeis University, and the site and interior of the Carl B. Stokes US Courthouse in Cleveland and US embassies in Bangkok and Athens. He served on the Cambridge, Massachusetts City Manager's Street Lighting Advisory Committee and was active in the Cambridge Central Square neighborhood Crime Watches.

At WSP | Parsons Brinckerhoff he has continued consulting to Light Boston, Inc. on lighting the facades of four historic churches along Tremont Street near Boston Common, coordinating with representatives of each church, landmark district review boards, city agencies, and contractors. At the encouragement of the Boston Redevelopment Authority he designed theatrical lighting for the façade and entry court of the AVA Theater District residential tower. His lighting design work has received awards from the Illuminating Engineering Society (IES), the Designers' Lighting Forum, the International Association of Lighting Designers, and the US Department of Energy.

Mia Jean-Sicard

Visualization Specialist; Lighting Designer

Mia Jean-Sicard is a 3D visualization specialist and lighting designer with WSP l Parsons Brinckerhoff. She renders 3D lighting design models utilizing 3D Studio Max. She conducts lighting calculations for tunnels, roadways, and public garages with AGi32. She utilizes both programs for lighting analysis and design.

Ms. Jean-Sicard is a Boston resident.

Jonathan T. Weaver, RA, LC

Senior Lighting Designer

Jonathan Weaver is a senior lighting designer with Parsons Brinckerhoff (PB) experienced in the study, design, and construction inspection of lighting and associated control systems. He has provided lighting design and project management services for a wide range of projects such as urban roadways, tunnels, parks, schools, commercial and residential buildings, and has additional experience in architectural design and construction management. Jonathan's project management experience encompasses planning, coordinating, and directing project and construction scheduling; budgeting; consultant and contractor oversight; and subcontract preparation. He is also experienced in coordinating work with local, state, and federal agencies.

During his career, Mr. Weaver has led the lighting design effort for a wide variety of infrastructure improvement projects. These include most recently, the development of two new Light Rail stations for Sound Transit in Seattle, and a new Consolidated Rental Car center for San Diego's International Airport. In addition, he was involved in nearly $30 million of lighting systems work for the Massachusetts Highway Department on the Boston Central Artery/Tunnel Project.

David M. Moeller, PE
Lead Electrical Engineer

David Moeller is a lead electrical engineer at Parsons Brinckerhoff. He specializes in complete electrical systems specification and design for new and existing systems including future expansion; medium voltage and low voltage power distribution and back-up power generation; application of codes and industry standards and recommendations; and coordination between engineering disciplines, particularly with mechanical equipment. He provides full project lifecycle support including preliminary cost estimates and budgets, design, vendor selection, problem solving during construction, start-up procedures, and ensuring that the final product meets the project goals. His experience includes projects for the Massachusetts DOT and Massport.

Mr. Moeller is a Boston resident.

William R. McMenimen Jr., PE
Senior Structural Engineer

William McMenimen is a senior supervising structural engineer with WSP | Parsons Brinckerhoff. He has 34 years of engineering and management experience across a wide range of infrastructure projects, with particular expertise in the design of underground structures, bridges, foundations and buildings. He has been responsible for managing complex, multi-disciplinary projects throughout metropolitan Boston and is experienced in meeting the challenges commonly associated with projects in highly developed urban areas. He has served as project manager for the Massachusetts Highway Department project to rehabilitate the Avenue “A” Bridge over the Connecticut River in Western Massachusetts and the Massachusetts Bay Transportation Authority (MBTA) subway ventilation program for the Red, Blue and Green lines, an undertaking which involved extensive agency coordination and consideration of historical, archaeological, environmental, and hazardous waste issues.

Ian M. Fisher
Senior Capital Cost Estimator

Ian Fisher is a senior capital cost estimator with WSP | Parsons Brinckerhoff with more than 30 years of experience in engineering design and construction cost estimating. During this time, Ian has held positions of increasing responsibility such that his current position requires him to perform overall coordination and execution of complex building and facilities cost estimates plus provide technical supervision of more junior cost estimators on projects in the range of $260M. Mr. Fisher has gained extensive experience in the development of cost estimates during the conceptual/preliminary design phases of projects, through detail engineering and bid phase, and during construction. His local experience includes working as lead estimator for the Logan International Airport Consolidated Rental Car Facility, Terminal C-E Connector and Economy Parking Garage.

REFERENCES

Brett Donham, AIA
Donham & Sweeney - Architects
68 Harrison Avenue
Boston, MA 02111
(617) 423-1400
bdonham@donhamandsweeney.com

City of Cambridge, MA
Lisa C. Peterson
Deputy City Manager
Cambridge City Hall
795 Massachusetts Avenue
Cambridge, MA 02139
617-349-4000
lisap@cambridgema.gov

ADDITIONAL INFORMATION

WSP | PARSONS BRINCKERHOFF

JEFFREY T. BERG, AIA, LC, LEED AP BD+C

Senior Lighting Designer/Supervising Architect
Certified Project Manager

Years of Experience
37 (9 with Parsons Brinckerhoff; 28 with others)

Education
M. Architecture, Harvard University Graduate School of Design, 1978;
B.A., Architecture and Fine Arts, University of Pennsylvania, 1971

Professional Affiliations
American Institute of Architects; Illuminating Engineering Society of North America (IESNA): Light Boston, Board of Advisors

Professional Registrations
Registered Architect in the Commonwealth of Massachusetts (5174)
Lighting Certified by the National Council on Qualifications for the Lighting Professions
LEED Accredited Professional, Building Design + Construction (10218477)

Key Qualifications
Jeffrey T. Berg is a registered architect and certified lighting designer who brings over 30 years of lighting design experience to complement institutional, commercial and residential interiors as well as building facades and landscapes across the United States and abroad. Prior to joining PB Jeffrey consulted on illuminating the historic site and interiors of the Weeksville Heritage Center, New York City (a LEED project), the facades of four historic churches in the Freedom Trail in Boston, an addition to the Rose Art Museum at Brandeis University, an 18th Century imperial lodge in Beijing for the World Monuments Fund, the Carl B. Stokes US Courthouse in Cleveland, and US embassies in Tunis, Bangkok and Athens, among many other projects. His lighting design work has received awards from the Illuminating Engineering Society (IES), the Designers' Lighting Forum, the International Association of Lighting Designers, the US Department of Energy, and Light Boston.

Exterior Lighting
- AVA Theater District, Boston, Massachusetts: lighting designer and project manager producing color changing illumination for the façade and entry court of a residential tower in the reviving theater district. The redevelopment authority encouraged theatrical treatment of the façade and entry spaces. Short street frontage has to accommodate both pedestrian and vehicular entries to luxury residences, requiring coordination among luminaires and controls for driveway, adaptive and color changing lighting.
- Brookline Bancorp Headquarters Façade, Boston, Massachusetts: lighting designer and project manager for illuminating the façade of an early twentieth century Classical Revival industrial building. Given the historic nature of the project the LED luminaires were chosen and the wiring details were designed to minimize their daytime appearance. The project won a Preservation Achievement Award from the Boston Preservation Alliance.
- Cambridge Street Lighting Design, The City of Cambridge, Cambridge, Massachusetts: deputy project manager and lighting designer who participated in this study to improve the design and maintenance of the public lighting system in Cambridge. Primary objectives were to review existing public lighting; establish design guidelines for new construction; review and make recommendations on the lighting inventory; and research, evaluate and make recommendations on emerging light sources and fixtures. Worked with a Lighting Committee composed of staff from several City departments including the Electrical Department, Historical Commission, Department of Public Works, and Community Development Department to produce the report. This study built on the work of the City Manager's Street

Lighting Advisory Committee (ad hoc), in which Mr. Berg was a member. Parsons Brinckerhoff worked as a subconsultant to design light emitting diode (LED) lighting with wireless controls to replace all the roadway and decorative fixtures in the City.

- Tobin Memorial Bridge Aesthetic Lighting, Boston, Massachusetts: member of the aesthetic lighting evaluation and preliminary design team responsible for directing the visualization effort and assembling information for a cost estimate. The scope of services for the preliminary phase of design included assessing architectural ("aesthetic") lighting concepts from an earlier study for the main steel truss span and proposing enhancements and alternatives, in addition to evaluating roadway lighting and communications. The product of this phase was a report showing renderings of proposed lighting schemes, fixture descriptions and costs. A goal of the modernization effort is to improve functionality and illumination of the structure.

Previous Experience

- Berg Lighting Design, Cambridge, Massachusetts: principal of this firm who offered a full spectrum of lighting consulting services to enhance architecture, landscape and fine art. His most prestigious project was for the Qianlong Lodge of Retirement in Beijing, China, which he continued with PB. He consulted with architects from Tsinghua University and curators of the Palace Museum to light the retirement villa of Emperor Qianlong in the Forbidden City. A low voltage system illuminates historic murals covering the walls and ceiling of a two story space without disturbing the historic fabric, and also reveals living and working quarters throughout the building. This initial phase of a collaborative restoration project opened to the public for the first time during the 2008 Olympics.

- Berg/Howland Associates, Cambridge, Massachusetts: principal of this firm who directed daylighting analysis and design, including physical model testing, computer modeling, and LEED credit documentation; electric lighting design for institutional, commercial and residential interiors, including custom fixture design and documentation; landscape lighting, with LEED credit documentation; and illuminating of exhibits and public artwork. Relevant projects include:
  - Harvard School of Dental Medicine, Research & Education Building, Boston, Massachusetts For a new building on a tight urban site B/HA assisted the architects in illuminating teaching and working spaces that included laboratories, offices, conference rooms and a lecture hall. Special color effects enliven the main lobby. Interior perimeter lighting is used to determine the appearance of the building at night, eliminating facade lighting as such. The interior lighting won an award from the Illuminating Engineering Society. The project also included a light emitting diode (LED) installation in outdoor art.
  - Leonard P. Zakim Bunker Hill Bridge Holiday Lighting, Boston, Massachusetts: developed schemes for changing the decorative lighting of the bridge for special occasions. Schemes included a permanent installation as well as temporary lighting for a single event. The temporary approach was carried out to light the towers and cables of the bridge red, white and blue on the 4th of July 2002. This scheme won an award for outdoor lighting from the Illuminating Engineering Society at the international level and was published in *Lighting Design and Application*.
  - Tremont Street Corridor Landmark Churches Lighting, Boston, Massachusetts: B/HA worked with the non-profit group Light Boston, Boston Parks and Recreation, the Edward Ingersoll Browne Fund, the Boston Landmarks Commission, and church representatives to design lighting of facades of four landmark churches along Tremont Street: King's Chapel, Tremont Temple Baptist Church, the Cathedral Church of St. Paul, and Park Street Church. The firm produced bid documents for each of the four churches and provided construction administration services. Jeffrey subsequently received Light Boston's first annual Excellence in Lighting Award.
  - Bank of Boston (now Bank of America), Boston, Massachusetts: consulted on illuminating a major renovation of the headquarters lobby and plaza. Elements included plaza lanterns, facade lighting, canopy lighting, landscape lighting, custom exterior torchieres and custom lobby pendants. Provided contract documents for custom fixtures.

- Lindemann Hurley Center, Boston, Massachusetts: Existing exterior lighting, intended to illuminate the facade, a sculpture and the original terraces was supplemented and restored, in some cases with custom retrofits of original decorative housings.
- Commonwealth of Massachusetts Courthouses, Lawrence and Boston, Massachusetts: consulted on new lighting that included custom fixtures.
- Park Street Green Line Station, Massachusetts Bay Transportation Authority, Boston, MA: designed lighting for the oldest and central station in the regional mass transit system, including illuminating artwork, advertising and signage.
- Woburn Library, Woburn, Massachusetts: designed lighting to meet the modern needs, inside and out, of this National Historic Landmark. This project won an award from the IES.
- Design 2000, Marlborough, Massachusetts: B/HA provided technical assistance and design review in the custom measure utility incentive program, as well as expert witness services in the review of installations.

- Jeffrey T. Berg, Architect and Lighting Designer, Cambridge, Massachusetts: lighting designer/architect.
- William Lam Associates, Inc. Cambridge, Massachusetts: associate and lighting designer for this lighting consultant.

Teaching Experience

- Yale University School of Architecture, Critic in Lighting Design, 1987-1998.
- Rhode Island School of Design and Roger Williams College, Adjunct Instructor, 1982-1987.

Publications/Articles

- “Preserving the Night Sky as a Historic Landscape Resource”, poster presentation at the Alliance for Historic Landscape Preservation Annual Meeting 2010.
- “Top-Side Techniques” (on daylighting), Lighting Design and Application, July 2008.
- “Lighting for Videoconferencing and Multimedia”, with Nicholas Browse, The Construction Specifier, Feb.2005.
- Profile in “Non-traditional Careers”, GSD News (now Harvard Design Magazine), Fall 1994.
- ”Modern Approaches to Lighting Historic Interiors”, The Construction Specifier, July 1989.
- ”Lighting Historic Landscapes”, with John L. Powell, APT Bulletin, 1989.
- Various lighting design projects published in Architectural Lighting, Architectural Record, Design Times, and Lighting Design & Application.

Awards (with WSP | Parsons Brinckerhoff)

- Illuminating Engineering Society Illumination Award of Merit (national level), an Edwin F. Guth Memorial Award for Interior Lighting Design of the Cathedral Church of Saint Paul, Boston, 2016
- Illuminating Engineering Society Illumination Award of Merit (national level), an Aileen Page Cutler Memorial Award for Residential Lighting Design for the AVA Theater District Façade and Forecourt, Boston, 2016
- Illuminating Engineering Society Illumination Award of Excellence (international level), an Edwin F. Guth Memorial Award for Interior Lighting Design for the Mizu Salon, Boston, 2010
- Illuminating Engineering Society Illumination Award of Merit (regional level), an Edwin F. Guth Memorial Award for Interior Lighting Design of Phillips Academy, Andover Timken Room, 2009

PAUL J. LUTKEVICH, P.E.

Technical Director – Electrical
Principal Professional Associate – Lighting Design
Vice President

Years of Experience
30 (14 with WSP l Parsons Brinckerhoff; 16 with others)

Education
B.S., Electrical Engineering Technology, Southeastern Massachusetts University, 1981
Additional Training: Certificate of Technical Knowledge—Illuminating Engineering Society (IES)

Professional Affiliations
Illuminating Engineering Society (IES), Past Chair of Roadway Lighting Committee and Tunnel Lighting Subcommittee, Toll Plaza Lighting Committee, Work Zone Lighting Committee, Roundabout Lighting Committee; Past Member IES Technical Review Council; Member IESNA Criteria Committee; Commission Internationale De L'Eclairage (International Commission on Illumination) Division 4 Lighting for Signal and Transport, Tunnel and Underpass Committee, Tunnel Emergency Lighting Committee, Crime and Road Lighting Committee, Interference by Light with Astronomical Observations Committee; Designer's Lighting Forum

Professional Registrations
Professional Engineer: Massachusetts, 1994 (38509); Connecticut, 1996 (19600); Wisconsin, 1997 (32153)

Key Qualifications
Paul Lutkevich is a senior engineering manager with Parsons Brinckerhoff who is experienced in the study, design, and construction inspection of lighting and electrical systems. He has served as an electrical engineer and lighting designer providing engineering and project management services for a wide range of projects such as urban roadways, bridges, tunnels, parks, buildings, and transit systems. He is also experienced in coordinating work with local, state, and federal agencies.

Mr. Lutkevich is past chair of the Illuminating Engineering Society's Roadway Lighting Committee. Currently he is serving as a member of the IES Criteria Committee. He is a member of the *Commission Internationale De L'Eclairage* (International Commission on Illumination). He is actively involved in the development of national and international standards for outdoor lighting. Mr. Lutkevich was also a member of the US delegation in the FHWA/AASHTO Bilateral Lighting Technology Exchange Program between outdoor lighting experts and international organizations in Europe. He has been involved in research with the FHWA investigating topics concerning lighting and safety, visualization techniques, and context sensitive solutions.

He has written and spoken extensively on the subjects of outdoor lighting including urban lighting, lighting for pedestrians, aesthetic considerations in outdoor lighting, and lighting for safety. He is a co-author for the Transportation Association of Canada's outdoor lighting standards which used the latest research from North American and international sources to compile a comprehensive design guide for the outdoor environment. He is co-author of the International Municipal Signal Association Lighting certification program. He is the lead researcher for the revisions to the FHWA Roadway Lighting Handbook.

Transportation Facilities
- National Academy of Sciences, Transportation Research Board, Airport Cooperative Research Program, Washington, DC: researcher for the development of a guidebook for parking garage lighting including discussions of new and emerging lighting technologies including adaptive control technologies, and techniques for garage lighting as well as the development of a cost/benefit model and decision matrix to help owners select the best garage lighting solution for their facility.

- Roadway Lighting Design Award in recognition of outstanding roadway lighting design awarded by the IESNA Roadway Lighting Committee.

Publications/Presentations

- "Thought Leaders – Things that keep me up at night – emerging engineering trends", Consulting Specifying Engineer Magazine, December 2010
- Coauthor CIE 115:2010 Lighting of Roads for Motor and Pedestrian Traffic
- Coauthor CIE 193:2010 Emergency Lighting in Road Tunnels
- Coauthor CIE 88:2004 Guide for the Lighting of Road Tunnels and Underpasses
- Coauthor IES RP-22-11 American National Standard Practice for Tunnel Lighting
- Coauthor "Trees, Lighting, and Safety in Context Sensitive Solutions", Transportation Research Board, January 2009
- Coauthor IES ED-100 Exterior Lighting Educational Document, 2009
- Coauthor IES DG-19 Roundabout Design Guide
- Author American Public Transportation Association Security Lighting
- Coauthor "Roadway Lighting Level II Certification" International Municipal Signal Association, 2006
- Coauthor "3D Modeling for Lighting Visualization for Enhanced Safety" Transportation Research Board Visualization in Transportation 2006
- Coauthor, "Guide for the Design of Roadway Lighting", Transportation Association of Canada, 2006.
- "Lighting for Pedestrians," Maryland Office of Highway Safety – Pedestrian Safety Workshop, 2004.
- "Intersection Lighting," Mid Atlantic Intersection Safety Workshop and New Jersey Intersection Safety Workshop, 2003.
- "An Examination and Recommendations for Current Practices in Roundabout Lighting," Transportation Research Board, 2005.
- "Roundabout Lighting", *IMSA Journal*, September/October 2005.
- "An Eye Score," Bridge Lighting, *Roads and Bridges Magazine*, February 2004.
- Committee Member/Coauthor "CIE 88-2004 - Guide for the Lighting of Road Tunnels and Underpasses" International Commission on Illumination.
- "Lighting to Improve Safety at Pedestrian Crosswalks," 16th Biennial Symposium on Visibility and Simulation, Transportation Research Board, June 2002.
- "Roadway Lighting Revisited," *Public Roads Magazine*, May/June 2002.
- "It's Time to Look Beyond the Roadway: New Lighting Standards," *PB Network*, March 2001.
- "Lighting Visualization," *PB Network*, March 2001.
- Lighting workshops for various agencies, including Colorado DOT, New York DOT, and the Ministry of Transportation, BC, Canada.

JONATHAN WEAVER, R.A., LC

Senior Lighting Designer/ Lead Architect

Years of Experience
24 (9 with PB; 15 with others)

Education
B.S., Architectural Engineering, University of Kansas, 1987
Additional Training: Certificate of Technical Knowledge, Illuminating Engineering Society of North America (IESNA)

Professional Affiliations
Designer's Lighting Forum; Illuminating Engineering Society (IES), Roadway Lighting Committee, Tunnel Lighting Subcommittee, Short Tunnel Task Force (Chair)

Professional Registrations
Certified Lighting Consultant: LC
Registered Architect: Colorado, 1991 (304108)
Engineer-in-Training: Massachusetts, 1997

Key Qualifications
Jonathan Weaver is a senior lighting designer with Parsons Brinckerhoff (PB) experienced in the study, design, and construction inspection of lighting and associated control systems. He has provided lighting design and project management services for a wide range of projects such as urban roadways, tunnels, parks, schools, commercial and residential buildings, and has additional experience in architectural design and construction management. Jonathan's project management experience encompasses planning, coordinating, and directing project and construction scheduling; budgeting; consultant and contractor oversight; and subcontract preparation. He is also experienced in coordinating work with local, state, and federal agencies.

During his career, Jonathan has led the lighting design effort for a wide variety of infrastructure improvement projects. These include most recently, The development of two new Light Rail stations for Sound Transit in Seattle, and a new Consolidated Rental Car center for San Diego's International Airport. In addition, he was involved in nearly $30 million of lighting systems work for the Massachusetts Highway Department (MHD) on the Boston Central Artery/Tunnel Project, one of the largest U.S. public works programs ever undertaken. The project scope includes depressing the city's existing I-93 double-deck viaduct, creating a 35-acre (14-hectare) urban park and boulevard, and designing public and recreational open spaces within Boston and surrounding communities.

Relevant Experience
- East link Rail Light Rail Extension, Seattle Area, Sound Transit Authority: Supervising Lighting engineer for two new stations for the increasingly utilized Sound Transit system. Project entails inserting a station within the I-90 right of way on Mercer Island, and Judkins Park. Utilizing Sound Transit standard fixtures, creative energy efficient designs are being developed to compliment the modern architecture of the stations. Project includes extensive 3-D design development, Lighting modeling and investigations into the impact of the station lighting on the interstate highway. Project is at near final design, with construction not yet scheduled
- Rental Car Consolidation Facility, San Diego International Airport, San Diego Airport Authority, California: Supervising lighting designer for a new two million square foot four-level parking facility for use as a consolidated rental car facility. In addition to parking facilities, a "retail" level environment was provided for the rental car carriers to insert their concepts into. LED technology was implemented with day-lighting and maintenance controls. Project featured art installations as well as an illuminated landmark exterior façade along the Pacific Coast

Highway. The work involved assessment of required lighting systems, comparison of light source efficacy, life-cycle costing of designs, and construction phase services.

- Sumner Tunnel Rehabilitation, Boston, MassDOT: Lead for lighting design of the 20 year old lighting system first designed by PB as a portion of the overall renovation of the 80 year old structure. A complete rehabilitation of the structural lining, replacement of the roadbed and overhaul of all tunnel systems, including ventilation, ITS, Electrical, fire suppression, drainage and finishes. This project involves utilization of solid state (LED) lighting systems and controls. Project is currently in design.
- Copley Expansion and Prudential Tunnel Lighting Enhancements, Boston, Massachusetts: Lighting designer for this tunnel enabling project for a new tower to be built over the existing tunnel. In the tunnel, existing conditions inspection, design, construction phasing, to maintain traffic and improve tunnel lighting during the construction process This project also included a complete analysis and design concepts to serve as a Global Lighting Enhancement for MassDOT tunnel rehabilitation projects.
- Thomas Circle Tunnel, Massachusetts Avenue, Washington, DC: Provided tunnel lighting design expertise and project development as a sub-consultant to a MBE firm working within the nation's capital. The goal of the Project was to prepare prototypical design for tunnels in the DC area, using LED technology and integrated, adaptable digital controls. As project designer project, Jonathan was responsible for designing new tunnel lighting and control systems.
- Terminal C Connectors, Logan International Airport, Massachusetts Port Authority, Boston: Supervising lighting designer for a renovation of an existing terminal to accommodate a single carrier, while increasing the secure side interconnectivity to adjacent terminals. The work involved multiple project packages, to maintain operations while the work progresses. New emergency stairs, egress routes, and permanent relocation of restrooms as well as a complete concourse redesign. Project is in final design of the concourse with several early release packages currently under construction. (
- SH119 Tunnel, near Boulder, Colorado: Project Designer for LED conversion of rural tunnel on transportation link into the mountain communities from the Rocky Mountain front-range. Tunnel was intended as a prototype for other rural bi-directional tunnels in the area. Project was designed to allow for keeping one lane open at all times during maintenance operations. During construction, system required the complete closure for 3 nights. Project included initial analysis, review of technologies and future-proofing the concept for ease of maintenance going forward.
- Amtrak Interlocking Improvements, Amtrak, Northeast Corridor High Speed Rail Improvements, Trenton, NJ: Lead lighting engineer for the development of a prototype High-mast lighting system for the illumination for multiple track interlocking. This renovation of 3 existing interlocking to prepare for high speed rail improvements made use of high mast lighting to reduce the interference with high voltage catenary traction power lines. The work involved 3-D modeling of system and an illumination study for light trespass, as the location is near residential properties. Project has been designed and is progressing as part of the track improvement construction sequence and is not yet scheduled for construction.
- Baltimore/Washington International Airport, Maryland Department of Transportation, Maryland: lighting designer for a new nine-level parking facility outside of the nation's capital. The work involved assessment of required lighting systems, comparison of light source efficacy, life-cycle costing of architectural façade illumination designs, and design review.
- Blackhawk Tunnel, Blackhawk, Colorado: as part of an integrated tunnel systems team, Jonathan was responsible for developing life-cycle costs, operating and maintenance budget forecasts for this 3,900-foot-long (1,190-meter-long) twin bore tunnel. The Blackhawk

Improvement District, in cooperation with the Colorado Department of Transportation, privately funded this infrastructure project.

- Eisenhower-Johnson Memorial Tunnels, Dillon, Colorado: lead lighting designer for modernization of a 1.4-mile-long (2.3-kilometer-long) pair of tunnels in the heart of Colorado's ski country for the Colorado Department of Transportation. Project included reviewing and assessing existing lighting and power distribution, developing design alternatives, and construction phasing so that traffic operations would not be adversely affected. Visibility using stray light equivalent modeling was assessed in the various solutions developed for this project's unique requirements. Priority was given to selection of relatively maintenance-free equipment due to the site's harsh year-round environmental conditions.

Previous Experience

Prior to joining PB, Jonathan was a founding partner in Zelloe & Weaver Architects, Beverly MA and also led the lighting design section of another firm. His project experience ranges from lighting/architectural design to construction services, and includes:

- Logan International Airport Central Parking Garage, East Boston, Massachusetts: responsible for the design of the replacement lighting system for an entire 5,100-space garage using a white light source (metal halide). Work included the complete redesign of stairwell lighting to increase personal security. Lighting installations were phased to follow structural repairs and other modifications.
- Central Artery/Tunnel Project—East Boston Airport/Route 1A Interchange, Massachusetts: lead lighting designer for this system of roadways connecting I-90, the airport roadway system, Route 1A, Airport Station, and local streets—a final link among numerous elements of the massive Central Artery Project. Lighting designs were developed for multilevel curved viaducts, embankments, underpasses, boat sections, retaining structures, and recreational park facilities. The project required working with community leaders through public involvement hearings and traffic management during construction.
- Route I-495/Marston Street Interchange Improvement, Lawrence, Massachusetts: lead highway lighting designer for project involving extension of an I-495 northbound ramp to allow traffic to access the mill area and the addition of a southbound off ramp. This project also included two new bridges, two widened bridges, intersection improvements with new signalization, acceleration/deceleration lane modifications, shoulder widening, pavement markings, signing, and permits.
- Sumner and Callahan Tunnels, Boston, Massachusetts: lighting designer responsible for the preliminary design and prototype testing of a new light guide system in the Callahan Tunnel that consists of metal halide luminaires (spaced at 34 feet (10.4 meters)) attached to two 16-foot (4.9-meter) acrylic pipes lined with an optical lighting film. This lighting system, the first of its kind, is the world's largest light guide installation.
- Prudential Tunnel Lighting and Repair, Boston, Massachusetts: lead designer for this $11 million contract that included inspection, design, construction phase services, relighting, concrete repair, and painting tasks. This project also included a visibility analysis of existing tunnel portals and interiors to determine necessary lighting levels as well as development of mock-ups for all proposed systems.
- Logan International Airport Terminal E Renovation, Boston, Massachusetts: prepared the lighting design for this terminal, and carried it through from the conceptual stage through construction. Primary role during construction was to coordinate architectural, electrical, and mechanical details. (
- Central Artery/Tunnel Project I-93 Mechanical/Electrical Contract, Boston, Massachusetts: lighting design manager responsible for electrical/lighting engineering services during this

$155 million contract in 1993. Jonathan was also responsible for final design and contract drawing preparation and coordination of mechanical and electrical systems.

- Central Artery/Tunnel Project I-90 Mechanical/Electrical Contract, Boston, Massachusetts: lighting designer responsible for lighting design and construction contracts in 1989-1990. This $43 million project provided final mechanical/electrical design, construction phase services, O&M preparation, and system start-up.
- Ted Williams Tunnel, Boston, Massachusetts: provided final lighting design for a $227 million, four-lane immersed tube tunnel that is part of the Central Artery/Tunnel Project.
- 1997 Roadway Lighting Design Award in recognition of outstanding roadway lighting design awarded by the IESNA Roadway Lighting Committee for the lighting modernization of Boston's Callahan Tunnel.
- 1995 International Illuminating Design Award (IIDA) for Outstanding Achievement in Lighting Design awarded by the IES for the lighting modernization of Boston's Callahan Tunnel.
- 1993 IIDA, Sam Goody Records, Peabody, Massachusetts.

Teaching Experience

- Adjunct Professor for Interior Lighting Systems in the Interior Design Department of Wentworth Institute of Technology, teaching senior level studio classes applied lighting design for the past 5 years.

Publications/Presentations

- "National Roadway Lighting Recommended Practice," IES Roadway Lighting Committee, developing new revised standard practices, ANSI/IES RP-8.
- "National Tunnel Roadway Lighting Recommended Practice," IES Tunnel Lighting Subcommittee, which developed revised ANSI/IES RP-22, *Standard Practices for Tunnel Lighting*.
- "Airport Parking Garage Lighting Solutions", Airport Cooperative Research Program, Transportation Research Board and the Federal Aviation Administration
- Developed and taught 2015 Roadway Lighting Design Workshop, Vermont Department of Transportation, to introduce new Roadway Design manual
- Presentation on Fiber Optic and Light Guide Design to the IES in Boston.
- Presentation covering light guides as well as recent award winning installations throughout the U.S at the Roadway Lighting Committee Meeting.

MIA JEAN-SICARD

Lighting Designer

Years of Experience

3 (3 with WSP l Parsons Brinckerhoff; 0 with others)

Education

M.D.S., Sustainable Design, Boston Architectural College, 2016

Professional Affiliations

Illuminating Engineering Society (IES); International Association of Lighting Designers (IALD); Designer's Lighting Forum-New England (DLF-NE)

Key Qualifications

Mia Jean-Sicard is a 3D visualization specialist and lighting designer with WSP l Parsons Brinckerhoff. She renders 3D lighting design models utilizing 3D Studio Max. She conducts lighting calculations for tunnels, roadways, and public garages with AGi32. She utilizes both programs for lighting analysis and design.

Relevant Experience

- Boston Logan International Airport Terminal C Connector for Massachusetts Port Authority (Massport), Boston, Massachusetts: responsible for importing the structural model from Revit into 3D Studio Max, categorizing structural parts and minimizing geometry. Applied color coding and enhanced the structural model through realistic augmentation with layer and clipping plane demonstrations. For the Terminal B Connector on Level 2, used 3D Studio Max to create interior walkway renderings. Recreated architect's design for suspended perforated ceiling and terrazzo flooring. Aimed lighting for final renderings.
- North Link Project for Seattle Sound Transit, Seattle, Washington: provided AGI lighting calculations and renderings of the subway station.
- Boston Logan International Airport – Parking Garage Lighting Study for Virginia Polytechnic Institute, Boston, Massachusetts: field measured luminance/illuminance values in the parking garage.
- San Diego Airport Rental Car Center for San Diego County Regional Airport Authority (SDCRAA), San Diego, California: used 3D Studio Max to create façade and exterior lighting renderings. Incorporated Revit design model, placed, spaced, and aimed exterior lighting including façade, ramps, roof, and street. Native trees enhanced the final renderings. Also used AGI to calculate lighting for back of house and stairways. Used Photoshop to edit multiple renderings to express dusk and evening scenes in preparation for lighting design.
- Sakonnet River Bridge, Portsmouth – Tiverton, Rhode Island: used Photoshop to edit rendered images to express holiday lighting options for client review.
- Maurice J. Tobin Memorial Bridge, Boston – Chelsea, Massachusetts: responsible for reducing the geometry in a 3D Studio Max model. Removed texture to reveal categorized object colors, allowing the model to be enhanced through augmented reality. Created renderings with texture, sky and fixture lighting, and water.
- Madison Crosswalk, Madison, Wisconsin: prepared a 3D Studio Max lighting project for realistic augmentation. This involved reducing geometry, calibrating lighting, and baking textures.
- Cree LEDway Type II, Boston, Massachusetts: modeled Cree LEDway Type II fixtures in 3D Studio Max for presentation of interior parts through augmented reality overlay of the physical fixture sample.

- Evans Place Bridge Staircase, Amesbury, Massachusetts: used 3D Studio Max to render potential lighting options for staircase handrail and surrounding area.
- Denmark Sunscreen Tunnel, Copenhagen, Denmark: used 3D Studio Max to model sunscreen tunnel. Conducted daylighting analysis to review the practice of daylighting tunnels.
- IES Recommended Practice 22: used 3D Studio Max to model tunnels and surroundings scenes to replicated RP-22 driving scenarios. Created animations that demonstrate driver visibility of small targets in roadways.
- Webutuck Schools, Amenia, New York: used 3D Studio Max to conduct daylighting studies for optimal building orientation.
- I-70 Ramp for Ohio Department of Transportation, Montgomery County, Ohio: extracted AutoCAD plans into a scaled 3D Studio Max model, inserted photometric lights, and prepared camera views.
- Crosswalk Bollard Lighting, Minneapolis, Minnesota: utilizing 3D Studio Max, modeled bollards with photometric lighting to enhance crosswalk lighting. Prepared movies from camera views that were compiled in Media Encoder.
- Valmont Poles, Boston, Massachusetts: used 3D Studio Max to model Valmont scaled poles, bases, and transformer base covers for inventory of 3D modeled lighting objects.
- Freeway Lighting Project for Michigan Department of Transportation, Detroit, Michigan: reviewed drawings and streamlined conflicting tabulation of lighting inventories for bid. Utilized Google Earth to format scaled calculations of roadway, underpass, and interchange lighting locations. Provided lighting schedule, updated inventory, and AGI lighting calculations to the client.
- Fort McHenry Tunnel, First Bore for MDTA, Maryland: arranged and compared tunnel luminaire calculations according to tunnel lighting standards for optimal design. Used MicroStation to place lighting fixtures in drawings.
- I-91 Viaduct Garage for MassDOT, Springfield, Massachusetts: responsible for using AGI to calculate lighting levels for optimal garage lighting levels according to standards.
- I-4 Underpasses for Florida Department of Transportation, Orlando, Florida: prepared a set of AGI calculations for multiple roadway underpasses and a pedestrian underpass affected by reconstruction and rehabilitation of the I-4 highway.
- T.F. Green Airport Rental Car Garage Lighting Study for Virginia Polytechnic Institute, Warwick, Rhode Island: field measured luminance/illuminance values in the rental car garage.
- Scudder Falls Bridge, Bucks County, Pennsylvania – Mercer County, New Jersey: responsible for using Photoshop to edit view from pedestrian bridge to relay color change reed-like lighting on bridge piers.
- Fort McHenry Tunnel, Baltimore, Maryland: responsible for using Photoshop to edit Google Earth images to express a dusk scene with entrance threshold decorative lighting for client review.

Research

- Masters Thesis: “Calibrate for Climate Change: how climate change may be undermining standard daylighting metrics,” which explored the effects of sporadic weather pattern on daylighting standards of calculation and practice.
- Conducted comparative research of the lighting rendering accuracy of Maxwell Renderer against that of established 3D Studio Max Mental Ray Renderer and documented the findings.

Augmented Reality: continual research on wearable and applied technology advancements.

- LED Streetlighting Replacement, City of Cambridge, Massachusetts: lead lighting and electrical designer for the citywide replacement of the city's streetlighting system with LED streetlights and an adaptive control system for monitoring and dimming the streetlights during low pedestrian periods. The conversion cut the city's power costs and maintenance to more than half.
- Lighting Master Plan and Streetlighting Manual, City of Cambridge, Massachusetts: lead lighting and electrical designer for the development of a lighting master plan and streetlighting manual for the City of Cambridge. The plan included the development of typical street layouts and pedestrian safety measures and mitigation. Test streets include LED streetlighting with adaptive controls.
- FHWA Lighting Handbook: lead researcher and co-author of the revised FHWA lighting handbook providing guidance to lighting designers and State, city, and town officials concerning the design and application of roadway lighting.
- Maurice J. Tobin Memorial Bridge Lighting and Communications, Massachusetts Port Authority, Boston – Chelsea, Massachusetts: project manager for the relighting of the Tobin Bridge in Boston, including roadway and aesthetic lighting, as well as new communication links for cameras and control along the bridge. The design also included the provisions for 100% renewable power for the bridge lighting using photovoltaic panels in options of both stored power and direct utility grid connection.
- Logan International Airport Central Parking Garage, Massachusetts Port Authority, Boston, Massachusetts: provided lighting design for two additional parking levels and the rehabilitation of the remainder of this 5-story, above-grade parking structure. Also provided services during construction.
- Arlington Station Improvements, Massachusetts Bay Transportation Authority (MBTA), Boston, Massachusetts: project manager for mechanical and electrical system designs that improved accessibility within this light rail station.
- Bus Garage Conversion, MBTA, Boston, Massachusetts: supervised the lighting designs for modification and/or construction of new bus garages and maintenance areas to accommodate compressed natural gas (CNG) vehicles.
- Central Artery/Tunnel Project—Value Engineering (VE) Lighting Study and Design, Massachusetts Turnpike Authority (MTA), Massachusetts: performed a VE study and final lighting design to compare high mast lighting to alternative systems. Due to nearby residential and commercial concerns, the study included full 3D modeling and photorealistic renderings of both day and night scenes.

Awards

- Lifetime Achievement Award for Outstanding Research and Technical Contributions to the Lighting Field, IES Roadway Lighting Committee, 2013.
- IES Presidential Award for significant contributions of technical data and application criteria, 2009
- Institute of Transportation Engineers 2010 Traffic Engineering Council Best Paper Award for "Trees. Lighting, and Safety in Context Sensitive Solutions"
- FHWA Excellence In Highway Design, 2004 – Judge
- Executive Director's Award, International Darksky Association
- International Illuminating Design Award (IIDA) for Outstanding Achievement in Lighting Design awarded by the IESNA

DAVID MOELLER, P.E.

Lead Electrical Engineer

Years of Experience
8 (2 with Parsons Brinckerhoff; 6 with others)

Education
B.S., Electrical Engineering, University of Florida, 2007

Professional Affiliations
Institute of Electrical & Electronic Engineers (IEEE), Member

Professional Registrations
Professional Engineer: Florida, 2013 (#76121); Massachusetts, 2014 (#51259)

Key Qualifications
David Moeller is a lead electrical engineer at Parsons Brinckerhoff. He specializes in complete electrical systems specification and design for new and existing systems including future expansion; medium voltage and low voltage power distribution and back-up power generation; application of codes and industry standards and recommendations; coordination between engineering disciplines, particularly with mechanical equipment; and full project lifecycle support including preliminary cost estimates and budgets, design, vendor selection, problem solving during construction, start-up procedures, and ensuring that the final product meets the project goals.

Relevant Experience

- Terminal C Connectors – Logan International Airport, Boston, Massachusetts: electrical engineer responsible for designing the power distribution and fire alarming system for the renovation project to connect Terminals C and E post security including relocating a passenger boarding gate and associated jet bridge, tenant relocations, Transportation Security Administration (TSA) exit relocation, and vertical circulation renovations. Explored multiple designs for the relocation of a 15kV switching station to accommodate the connecting passage way with consideration of airfield operations disruptions, cost, constructability, schedule and aesthetics.
- Eisenhower Johnson Memorial Tunnel , Colorado Department of Transportation (CDOT), Dillon, Colorado: electrical engineer responsible for completing designs for 24.9kV and 2.4kV switchgear replacement projects including construction services, construction phasing, and integration of new gear into existing system (controls, interlocks, etc.) Also responsible for designing the relocation of the attendant stations at the east and west portals including the electrical power distribution, lighting, and provisions for IT equipment.
- Port Newark Container Terminal (PNCT), Port Authority of New York and New Jersey (PANYNJ), Newark, New Jersey: electrical engineer responsible for designing the power distribution system, fire alarming system, lightning protection system including the modification of the existing 13.8kV distribution loop at the terminal and provision of the refrigerated container electrical power distribution substation/system.
- Port of Charleston North Container Terminal G Yard Row E, South Carolina Ports Authority (SCPA), Charleston, South Carolina: electrical engineer responsible for designing the power distribution system including the modification of the existing 13.8kV distribution loop at the terminal and provision of the refrigerated container electrical power distribution substation/system.
- Eisenhower Lock Tunnel – St. Lawrence Seaway, Massena, New York: electrical engineer responsible for designing the replacement power distribution system for the tunnel electrical

rehabilitation including motor control centers (MCCs), ventilation fan controls, and required phasing plans.

- Charlesview Site Development – Harvard University, Boston, Massachusetts: electrical engineer for the design of electrical demolition plans and required phasing for the demolition of eight buildings.
- Permanent Taxi Pool and Bus/Limousine Pool – Logan International Airport, Boston, Massachusetts: electrical engineer responsible for performing engineering services during construction of the taxi and bus/limousine pools including reviewing/responding to Requests for Information (RFIs) and shop drawings as well as issuing addendums and bulletins for contract document revisions (drawings and specifications).
- Route I-91 Over City Streets & Garage Bridge Rehabilitation, Massachusetts Department of Transportation, Massachusetts: electrical engineer who oversaw the design of the viaduct rehabilitation including roadway lighting, load centers, as well as rehabilitation phasing.

Previous Experience

Prior to joining Parsons Brinckerhoff, David worked as an electrical engineer for a number of other engineering firms. His project experience includes:

- Efficiency Study – Hurlburt Field Air Force Base, Okaloosa County, Florida: observed and modeled interior lighting in over 60 buildings on Hurlburt Air Force Base and made recommendations for lighting upgrades for improved power consumption efficiency and compliancy with the current revision of the Department of Defense Unified Facilities Criteria. Observed all exterior lighting on Hurlburt Air Force Base and made recommendations for lighting upgrades for improved power consumption efficiency, improved safety and security on the base, and compliancy with the current revision of the Department of Defense Unified Facilities Criteria.
- Community Maritime Park, City of Pensacola, Florida: participated in design of entire site lighting, special event power distribution, and cathodic protection to fit within a stringent budget while maintaining compliancy with national codes, industry standards and recommendations, as well as public safety.
- Electrical Power Distribution Equipment Replacement – Destin Water Users, Destin, Florida: participated in replacement, simplification, and improved organization of existing power distribution equipment (paralleling gear, MCCs, back-up generators, etc.). Replacement design included coordination of plant downtimes, equipment replacement phasing, and working within existing physical space constraints.
- Unmanned Aerial Vehicles (UAV) Test Cell, DRS Technologies, Fort Walton Beach, Florida: participated in lighting and power distribution design for testing room for testing UAVs; design to comply with national codes, particularly with regards to aircraft hangars.
- Wastewater Treatment Plant Design, City of Deltona, Florida: participated in providing complete plant electrical design including power distribution, back-up power generation, Supervisory Control and Data Acquisition (SCADA)/network design, industrial controls and instrumentation, and lighting with plans for future expansion/build-out. Design also included various buildings (industrial and office spaces).
- Advanced Wastewater Treatment Plant Expansion Design, Panama City Beach, Florida: participated in complete plant rehabilitation and expansion including design of power distribution, back-up power generation, SCADA/network design and integration with existing SCADA/network, industrial controls and instrumentation, and lighting.
- Septage Receiving Station Design, Emerald Coast Utilities Authority, Pensacola, Florida: participated in design of new septage receiving station including power distribution, lighting,

controls and instrumentation, integration with existing plant fiber optic network, and integration with existing plant truck scale and entry/exit gates.

- Lift Station Rehabilitation, City of Dade City, Florida: participated in rehabilitation of six sanitary lift stations including design of power distribution, back-up power generation, and SCADA/network design and integration with existing SCADA/network via radio communication.
- Aircraft Mapping System Motherboard Replacement, Avalex Technologies, Pensacola, Florida: integrated a new motherboard to replace the obsolescent motherboard that was in use. Required complete redesign of all wiring harnesses, other circuit board modifications, updated other components, and all new installation of operating system and mapping software. Wrote all new work instructions for assembly, software and database loading, and testing/troubleshooting for all model number variations of the new generation of mapping system.

WILLIAM R. MCMENIMEN, JR. P.E.

Senior Project Manager/Professional Associate
Senior Supervising Structural Engineer

Years of Experience
34 (26 with PB, 8 with others)

Education
M.S., Civil Engineering, University of Lowell, 1991; B.S., Civil Engineering, University of Lowell, 1976; J.D., New England School of Law, 2000

Professional Affiliations
American Society of Civil Engineers; Boston Society of Civil Engineers

Professional Registrations
Massachusetts, 1981 (30630); Maine, 1982 (4497); New Hampshire, 1983 (05619); Rhode Island, 2004 (8107); Georgia, 2005 (030636)

Key Qualifications
William (Bill) McMenimen is a senior supervising structural engineer with Parsons Brinckerhoff (PB). He has 34 years of engineering and management experience across a wide range of infrastructure projects, with particular expertise in the design of underground structures, bridges, foundations and buildings. He has been responsible for managing complex, multi-disciplinary projects throughout metropolitan Boston and is experienced in meeting the challenges commonly associated with projects in highly developed urban areas. He is currently serving as lead structural engineer on the design of the station caverns for the New York Metropolitan Transportation Authority (MTA) East Side Access project that will extend the Long Island Rail Road (LIRR) to Grand Central Terminal on the east side of Manhattan. He also has served as project manager for the Massachusetts Highway Department (MHD) project to rehabilitate the Avenue "A" Bridge over the Connecticut River in Western Massachusetts and the Massachusetts Bay Transportation Authority (MBTA) subway ventilation program for the Red, Blue and Green lines, an undertaking which involved extensive agency coordination and consideration of historical, archaeological, environmental, and hazardous waste issues.

Bridges
- World Trade Center Viaduct Modifications, Boston, Massachusetts: supervised the inspection and rating of the structural thru-girder bridge spanning over Northern Avenue in South Boston. The structure is a three span continuous bridge connecting the Seaport hotel with the upper level of the World Trade Center. The inspection report summarizes findings and provided recommendations on the repair of the structure with specific attention to the condition of water leakage through the deck, corrosion of the structure, load carrying capacity of the bridge and seismic code compliance. Field inspection included petrographic analysis for alkali silica reaction and chloride content, as well as lead paint levels.
- Avenue "A" Bridge over Connecticut River, Massachusetts Highway Department, Gill-Montague, Massachusetts: project manager for the rehabilitation of the 1,700-foot long Avenue A bridge over the Connecticut River in western Massachusetts. The main river structure is a 3-span continuous truss of 1,250 feet (381 meters), with flanking 200-feet (61-meter) and 150-feet (46-meter) truss span. The project included the full replacement of the deck, seismic upgrade, gusset plate analysis and repairs to the major truss members.
- Railroad Bridge Inspection and Load Rating, Vermont Agency of Transportation (VTrans), Bennington to Burlington, Vermont: Supervised a team of engineers responsible for the in-depth inspections and load rating of 26 railroad bridges along the Vermont Railway. Services included field inspections, inspection/load rating reports and determining the required type and quantities of repairs of the following railroad bridge structure types: Riveted Deck Plate Girders,

Riveted Thru Plate Girders, Timber Stringer, Steel Stringer, Warren Truss and Stone Arch Culverts.

- Bridge Management Program, Boston, Massachusetts: project manager for the Redfield Bridge replacement and Shawmut Junction concrete repairs. He supervised the design of precast concrete box beams to replace an existing 2-span through-girder vehicular bridge over the Red Line subway and the commuter rail. The bridge is one of only two access roads into the Norfolk area of Dorchester. Key issues included constructability restrictions over the commuter rail and Red Line tracks, and community concerns regarding the length of time the bridge would be closed, impact on emergency response, and night-time work. Also included were concrete repairs to the tunnel structure beneath the Ashmont branch of the Red Line subway; the tunnel is currently used as part of a bike and pedestrian path for the Massachusetts Department of Conservation and Recreation.
- Railroad Bridge Inspections, Boston, Massachusetts: inspection of MBTA bridges along the Ipswich/Rockport Commuter Rail Line as part of the Beverly Salem Bridge Replacement Project.
- Avenue "A" Bridge over Connecticut River, Gill-Montague, Massachusetts: led a team in the inspection of the main truss members for this 5-span, steel truss bridge.
- Jamestown Bridge Inspection, Newport, Rhode Island: led a team in the inspection of the upper deck surface, sidewalk and railings. The bridge is a 23-span, precast concrete box girder bridge over Narragansett Bay.
- Central Artery Project, Temporary Ramp M, Boston, Massachusetts: assisted in the design of connections and foundations for Temporary Ramp M (TRM) during this multibillion-dollar project to replace a congested six-lane viaduct with an enlarged eight- to ten-lane underground expressway through the heart of Boston. One of the largest U.S. public works projects ever undertaken, the joint venture program includes managing the design and construction of a new four-lane immersed tube tunnel under Boston Harbor and a 3.9-mile (6.25-kilometer) extension of the Massachusetts Turnpike (I-90) through South Boston to Logan Airport. The temporary ramp was designed to replace the existing Northern Avenue Ramp, scheduled for demolition in the early phases of construction. The ramp consisted of nine spans with steel girders supported on drilled concrete pile foundations. Two spans framed into the existing elevated Artery Structure. The design of the connections and foundations these two sections considered the interaction of the existing structure and the new ramp and the transfer of loads between the two structures. Due to utilities and other physical restraints, available space was limited and innovative designs were developed to transfer the large forces developed from the interaction of the structures.
- World Trade Center Viaduct Modifications, Boston, Massachusetts: supervised the design of modifications to the existing World Trade Center Viaduct for the construction of the New Seaport Hotel. Supervision included the inspection, repairs and modifications of the existing viaduct; and design of a new span connecting to the hotel. The design included adding two new girders at an existing expansion joint in the viaduct and sliding bearings at the new hotel.

Transit

- MTA Project East Side Access, New York City: lead structural engineer for the design of the station caverns as part of the project to extend the Long Island Rail Road to New York's Grand Central Terminal on the east side of Manhattan. He is responsible for assisting in the design of major components of the project including a smoke exhaust plenum hung from the ceiling of the cavern, major precast elements including beams and deck panels supporting the upper level station tracks, precast wall panels and platforms, and elevator enclosures. He is also performing quality control review of contract drawing production and review of structural specifications. In addition, he has assisted in the development of construction staging and

sequencing operations. The cavern design is part of the overall $7.2 billion program to connect the Long Island Rail Road to Grand Central Terminal.

- North Station Green Line Relocation System-wide Elements, Boston, Massachusetts: project manager for the design of the system-wide elements for the relocation of the Green Line Subway from Haymarket to Science Park Station. He was responsible for coordinating the design of the system-wide elements including track, traction power, signals and communication, tunnel lighting, fire protection and tunnel ventilation. The system-wide elements contract was an element of the MBTA's plan to relocate the existing Green Line underground from 100-year-old elevated tracks, construct a major transit station serving the North Station area with connections to the Green and Orange Lines and Commuter Rail, and upgrade the signal systems from Haymarket to Lechmere Stations.
- MBTA Subway Ventilation Improvements Program, Boston, Massachusetts: project manager for this program to retrofit the existing tunnels with a mechanical ventilation system to control the flow of smoke and fumes caused by a fire or other emergency to allow for tunnel evacuation. His responsibilities include coordination of related disciplines at the conceptual, preliminary and final design stages; preparation of final contract drawings, cost estimates and specifications; and liaison and coordination with public and private agencies, community groups and utility companies. In addition, he has been actively involved in providing construction-phase services to the MBTA. Ventilation shafts designed under this program include:
  - Blue Line Vent Shaft B8: responsible for coordination of related disciplines. This project is located on the MBTA's Blue Line between Aquarium and State Street Stations in the vicinity of Boston's historical Custom House. Design of this project was completed in 1997. Construction completed in 2005.
  - Blue Line Vent Shafts B1, B2, B3 and B4: Located in the vicinity of Maverick Square, East Boston, the project consisted of the design of a new ventilation shaft within an abandoned tunnel loop located at the east end of Maverick Station and the renovation of an existing electrical unit substation to provide redundant power source to an existing ventilation shaft. Final design has been completed.
  - Green Line Vent Shafts G1 through G21: as deputy project manager, He was responsible for coordination with several public agencies including City of Boston Parks Department, the Public Facilities Department, the Transportation Department and the Back Bay Architectural Commission. Coordination with utility companies included Boston Edison, Boston Gas, New England Telephone, Boston Water and Sewer Commission and Boston Thermal. Additional issues encountered included historical, archaeological, environmental and hazardous waste. Project construction is completed.
  - Red Line Vent Shafts R13, R14 and R15: deputy project manager for subway ventilation improvements project along the MBTA's Red Line, located in South Boston between Broadway Station and the portal south of Andrew Station. He was actively involved in the coordination with South Boston community groups as well as city agencies and utility companies. Construction was completed in 1994.
  - Red Line Vent Shaft R10: project manager for this underground structure adjacent to Boston's Dewey Square Tunnel and designed to ventilate the MBTA's Red Line tunnel. The structure houses three, 175,000-cubic-foot (4,955-cubic-meter) per minute fans and associated electrical equipment. Due to its proximity with the Central Artery project the design of the shaft was closely coordinated with the project and construction included in the C17A6 Contract. Design was completed in 2001. Construction completed in 2007.
  - Red Line Vent Shafts R8 and R9: project manager responsible for coordination of related disciplines at the conceptual, preliminary and final design stages; preparation of final contract drawings, cost estimates and specifications; and liaison and coordination with public and private agencies, community groups and utility companies. These vent shafts are located in the prestigious Back Bay area and downtown Boston.

- MBTA South Station Piers Transitway, Boston, Massachusetts: investigated options for underpinning Boylston Station and other existing structures as part of the conceptual design of the South Boston Piers Transitway Project.
- MBTA Silver Line Maintenance Facility, South Boston, Massachusetts. Lead project engineer for the design of a two story Transportation Building, part of the maintenance facility for CNG buses to be used on the MBTA's new Silver Line. The structure is a braced steel frame connected to a precast concrete parking garage. The Transportation Building included office space on the second floor and an electrical substation on the ground floor. The structure also included walkways, stairs and an elevator for access to the parking garage. Eighty percent of the ground floor was open for access to the bus garage and other buildings within the facility. The project also included foundation design for the Transportation Building and Garage.
- North-South Rail Link Report, Boston, Massachusetts: assisted in a study of the feasibility of constructing a commuter rail tunnel linking the existing North Station and South Station facilities.
- Central Artery/Tunnel Project, Boston, Massachusetts: structural engineering and peer review, including:
  - Assisted in the Peer Review for the $420 million C17A6 Construction Contract.
  - Structural Engineer of Record Services for Vent Building No. 8 and East Boston Pump Station. Performed quality assurance reviews to substantiate that construction was progressing per the Massachusetts Building Code.
  - Structural Peer Review of a number of construction contracts including the I-90 Logan Interchange and Ventilation Building No. 3.
  - Lead structural engineer for the repairs to voids and defects in the slurry wall panels.
- U.S. Department of Transportation, Orlando, Florida: Design services to relocate and modify an existing radar tower for installation and test operation of a multipurpose airport radar system. Services included inspection of the existing tower as well as site investigations of the proposed test site. Design required analysis and modifications to the existing tower to accept the new radar unit, repairs to the existing foundation at the proposed test site, utility services and site improvements.

Structures

- General Engineering Consultant, Massachusetts Turnpike Authority. Air Rights Study, Boston, Massachusetts: analysis of the premium cost for constructing a high rise development over the Turnpike's parcels 16, 17 and 18. The development concept called for above ground parking with commercial space to be constructed on property owned by the MTA located above and adjacent to the turnpike. The analysis consisted of evaluating the foundation and deck costs as well as tunnel services for the proposed development.
- New England Patriots Stadium, Foxboro, Massachusetts: lead engineer for PB's role as representative of the Town of Foxboro, responsible for review and inspection of the structural components for the new stadium.

Insurance

We are in the process of obtaining new "of record" insurance forms from our providers. The attached forms represent the coverage that we are able to provide. New forms will be available prior to contract award, should be be selected for this project.

PARSBRI-01 HEVANS

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/5/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: JLT Service Team	
JLT Specialty Insurance Services Inc. 5847 San Felipe St. Suite 2800 Houston, TX 77057	PHONE (A/C, No, Ext): (713) 325-7615	FAX (A/C, No): (713) 789-0415
	E-MAIL ADDRESS: wsppbcertrequest@jltus.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich American Insurance Company	16535
INSURER B : Liberty Insurance Corporation	42404
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Parsons Brinckerhoff, Inc.
4139 Oregon Pike
Ephrata, PA 17522

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY			GLO9835819-02	04/01/2015	04/01/2016	EACH OCCURRENCE	$ 2,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 300,000
	X Contractual Liab						MED EXP (Any one person)	$ 5,000
							PERSONAL & ADV INJURY	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 5,000,000
	POLICY X PRO-JECT X LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
B	AUTOMOBILE LIABILITY			AS7-621-094060-035	10/01/2015	11/01/2016	COMBINED SINGLE LIMIT (Ea accident)	$ 2,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$
	DED RETENTION $							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N	N / A		WA7-62D-094060-15	10/01/2015	11/01/2016	X PER STATUTE OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?						E.L. EACH ACCIDENT	$ 2,000,000
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 2,000,000
							E.L. DISEASE - POLICY LIMIT	$ 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

THIRTY (30) DAYS NOTICE CANCELLATION

CERTIFICATE HOLDER

AS A MATTER OF RECORD

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

PARSBRI-01 HEVANS

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/29/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: JLT Service Team
JLT Specialty Insurance Services Inc. 5847 San Felipe St. Suite 2800 Houston, TX 77057	PHONE (A/C, No, Ext): (713) 325-7615 FAX (A/C, No): (713) 789-0415 E-MAIL ADDRESS: wsppbcertrequest@jltus.com
	INSURER(S) AFFORDING COVERAGE — NAIC #
	INSURER A : QBE Insurance Corporation — 39217
INSURED Parsons Brinckerhoff, Inc. 4139 Oregon Pike Ephrata, PA 17522	INSURER B : INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	☐ EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						PER STATUTE ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ N / A (Mandatory in NH)						E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
A	Professional Liab.			QPL0022630	11/01/2015	11/01/2016	Per Claim/Aggregate	1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

THIRTY (30) DAYS NOTICE OF CANCELLATION

CERTIFICATE HOLDER

AS A MATTER OF RECORD

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

CERTIFICATE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY): 3/31/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

If this certificate is being prepared for a party who has an insurable interest in the property, do not use this form. Use ACORD 27 or ACORD 28.

PRODUCER

JLT Specialty Insurance Services Inc.
5847 San Felipe Street, Suite 2750
Houston, TX 77057

CONTACT NAME: Jennifer Sprinkle
PHONE (A/C, No, Ext): 713-325-7593 FAX (A/C, No):
E-MAIL ADDRESS: wsppbcertrequest@jltus.com
PRODUCER CUSTOMER ID:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich Amreican Insurance Company	16535
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Parsons Brinckerhoff, Inc.
4139 Oregon Pike
Ephrata, PA 17522

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

LOCATION OF PREMISES / DESCRIPTION OF PROPERTY (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	COVERED PROPERTY	LIMITS
A	X **PROPERTY** — CAUSES OF LOSS — DEDUCTIBLES	MCP 4819384-02	4/1/2015	4/1/2016	BUILDING	$
	BASIC — BUILDING				PERSONAL PROPERTY	$
	BROAD — CONTENTS				BUSINESS INCOME	$
	X SPECIAL				EXTRA EXPENSE	$
	EARTHQUAKE				RENTAL VALUE	$
	WIND				BLANKET BUILDING	$
	FLOOD				BLANKET PERS PROP	$
					X BLANKET BLDG & PP	$ 1,000,000
	X Valuable Papers				X Valuable Papers	$ 1,000,000
						$
	INLAND MARINE — CAUSES OF LOSS	TYPE OF POLICY				$
	NAMED PERILS	POLICY NUMBER				$
						$
	CRIME — TYPE OF POLICY					$
						$
	BOILER & MACHINERY / EQUIPMENT BREAKDOWN					$
						$

SPECIAL CONDITIONS / OTHER COVERAGES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER

As a Matter of Record

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

PARSONS BRINCKERHOFF

75 Arlington Street
Boston, MA 02116
Tel: 617.426.7330

www.wsp-pb.com