



Boston University Goldman School of Dental Medicine Boston, Massachusetts

Expanded Project Notification Form

May 15, 2017

submitted to the **Boston Planning and Development Agency**
submitted by **Trustees of Boston University**

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Chapter 1

PROJECT SUMMARY

CHAPTER 1: PROJECT SUMMARY

1.1 PROJECT IDENTIFICATION

Project Name: Renovation and Expansion to the Henry M. Goldman School of Dental Medicine

Project Proponent: Trustees of Boston University

Address/Location: 100 East Newton Street, Boston Massachusetts 02118

Assessor's Parcels: 0801297000, 0801296000, and 0801295000

1.2 INTRODUCTION

The Boston University Henry M. Goldman School of Dental Medicine ("GSDM") is a premier academic dental institution promoting excellence in dental education, research, oral health care, and community service to improve the overall health of the global population. The mission of the GSDM is to:

- Provide outstanding service to a diverse group of students, patients, faculty, staff, alumni, and healthcare professionals within its facilities, the community, and the world;
- Shape the future of the profession through scholarship, creating and disseminating new knowledge, developing and using innovative technologies and educational methodologies, and by promoting critical thinking and lifelong learning; and to
- Support this mission using responsible financial policies and philanthropy.

The GSDM will do so in an ethical, supportive environment, consistent with its core values of respect, truth, responsibility, fairness, and compassion; and its operational values of excellence, service, and effective communication in synergy with the strategic plan of Boston University.

In 2009, the School developed a strategic plan that outlined a vision to make the GSDM the premier institution promoting excellence in dental education, research, oral health care, and community service to improve the overall health of the global population. The plan identified a dramatically improved facility as a critical driver of success. School and University leaders have spent the ensuing seven years engaging in thoughtful planning and dialogue with alumni, faculty, and University administrators. After careful exploration of numerous possibilities, an expansion of the School's current building emerged as the best opportunity to pursue this vision.

GSDM maximizes the resources of its current building, which is home to more than 800 students and 400 faculty and staff, in addition to volunteers. Some 33,000 patients receive care on-site every year through 147,000 patient visits. By almost every measure, the current facility imposes constraints on the GSDM educational programs and clinical actions. The proposed expansion and renovations will provide better quality spaces for the School's educational and clinical needs. All members of the GSDM community will benefit from the new facility. For students, a better space will improve the learning experience by providing innovative collaboration spaces to prepare them for their careers. For patients, the new space will bolster the School's efforts to offer care and an experience on par with the best dental practices. For an institution that prides itself on patient-oriented care, this is a critically important outcome. Finally, faculty and staff will benefit from improved spaces for teaching and administrative support, along with a layout designed to make interactions with students and patients both easier and more frequent.

The Project provides flexible, contemporary dental treatment rooms (operatories) for patient care and clinical training. Sized at between 100 and 120 square feet (an increase from 80 square feet in the existing operatories), the new operatories can accommodate a broad range of procedures and as many as three learners with an instructor. Clinical support is located in the existing facility, adjacent to expanded building support that includes restrooms and distribution for power and data. The Pre-Doctoral Patient Treatment Center is organized into ten group practices of ten chairs, each under the supervision of a director and supervising faculty. The ideal configuration of the Pre-Doctoral Patient Treatment Center is this relationship of "fivepack" groups of ten that are distributed between the addition and the existing building on Floors 4, 5, and 6. The majority of the Post-Doctoral Patient Treatment Centers remain as is, with minor renovations to connect to the addition on Floors 2, 3, and 4. The 3rd Floor addition creates a new Simulation Learning Center ("SLC") adjacent to the existing classrooms, resulting in an integrated learning environment. The SLC will be relocated from its present location in a nearby building to effectuate this objective.

This Expanded Project Notification Form ("PNF") is being submitted by the Proponent in accordance with Article 80B of the Boston Zoning Code. The Project is located in the Boston University Medical Center ("BUMC"), which is comprised of Boston Medical Center Corporation ("BMC") and Boston University Medical Campus ("BU Medical Campus"), and lies within the boundaries of the Boston University Medical Center 2010 Institutional Master Plan ("IMP"). BUMC includes three of the Proponent's health science schools – the School of Medicine, the GSDM, and the School of Public Health. The expansion and renovation components of the Project will require an amendment to the IMP. The second amendment to the IMP ("IMP Amendment") has been initiated with the submittal by the Proponent of an Institutional Master Plan Notification Form ("IMP NPF") to the Boston Planning and Development Agency ("BPDA") concurrent with this PNF under the provisions of Article 80D of the Boston Zoning Code.

1.3 PROJECT SITE

The Project is located at 100 East Newton Street at the intersection of Newton and Albany Streets. The Project Site is surrounded by BMC's Newton Pavilion property. The 100 East Newton property boundaries to the northeast and northwest are roughly 36 feet from the existing building. The Project Site is approximately 0.58 acres.

See Figure 1-1, Locus Plan; Figure 1-2, Existing Conditions Survey; Figure 1-3, Aerial View and Existing Conditions Photographs Key Plan; and Figures 1-4 and 1-5, Existing Conditions Photographs.

1.4 PROJECT SUMMARY

The renovation and expansion plan for the GSDM provides for a total of approximately 126,100 square feet of Gross Floor Area¹ ("GFA") at the Project Site. The Project includes a new addition of approximately 41,900 GFA to the existing 84,200 GFA facility, and the renovation of approximately 53,100 GFA of the existing facility, with 31,100 GFA of existing space to remain.

The existing building footprint is approximately 13,000 Square Feet ("SF"). The existing building consists of a cafeteria, which is one level above grade, and the academic/clinical building, which is seven levels above grade, in addition to a rooftop penthouse. A full basement contains mechanical/electrical and support spaces. Level 1, the entry level, is 48" above grade. Floor to floor heights are 12'-0", which result in a roof elevation at approximately 104'-0" above grade. The building also includes a concrete panel wall which continues to become a 7' high parapet. The roof penthouse contains air handling equipment and machine rooms within a corrugated metal panel shell, to 121'-0" above grade.

The proposed building addition, which requires the removal of the existing one-story cafeteria, extends seven levels along the northwest edge of the existing building and one level along the northeast edge. The one level portion will have a basement addition. An electrical room and rooftop screen will obscure rooftop mounted mechanical equipment on the roof of the seven level addition. Following the completion of the proposed addition, the building footprint area will be approximately 18,000 SF.

The renovated and expanded building will be classified as a high-rise building. The program includes office, instructional, clinical, and student collaborative spaces on seven existing levels. The Project will also include support spaces, including mechanical, electrical, telecomm, and storage areas. The building systems associated with clinical function will be

¹ GFA is defined in Section 2A of the Boston Zoning Code.

scheduled for 8 a.m. – 6 p.m. occupancy. Offices, classrooms, and student spaces will be available 24 hours per day, 7 days per week.

The interior renovation of the existing structure will reconfigure the layout of the patient and student/faculty entry, the clinical space, and also classroom and student spaces. The existing style of the interior will be upgraded to reflect Boston University’s modern vision as well as provide upgrades to the building’s accessibility. The exterior will also receive a full modernization. The existing building will receive a cladding of terracotta to cover the exterior concrete face, with a large expanse of glass added at the entry level. The addition will tie seamlessly to the existing structure with similar color tone brick and a glass curtain wall. See Table 1-1 for a summary of the Project Program.

Table 1-1: Project Program Summary

Project Component	Existing Condition	Proposed Program
Total Project Site	25,490 SF (~0.58 acres)	25,490 SF (~0.58 acres)
Gross Floor Area (per zoning)	84,200	126,100
Floor Area Ratio (per zoning)	3.3	5.0
Stories (height)	7 (~103')	7 (~104')

Construction of the Project will be conducted in three phases over the course of 39 months. The phasing of the Project will be planned to optimize use of the building as classroom and patient treatment space during the course of construction. For this reason, the Project will be constructed in three phases, commencing on or about January 1, 2018.

Phase 1: Beginning with site setup and demolition, Phase 1 will include utility relocation, exterior wall removal, excavation and foundation construction as well as most of the new construction. Phase 1 is expected to be completed in March 2020.

Phase 2: This phase will overlap with and commence approximately three months prior to the completion of Phase 1, beginning in January 2020 and ending in August 2020. Phase 2 will consist of cladding the exterior of the existing building as well as replacement of the existing roof.

Phase 3: This phase will commence at the completion of Phase 1 and will overlap with Phase 2. Phase 3 will include interior fit out of levels 5 and 6 and core renovations of all levels (Basement through level 7).

1.5 PUBLIC REALM IMPROVEMENTS

1.5.1 CAMPUS DEVELOPMENT PAST AND PRESENT

As clinical care trends have evolved over the years, so have the physical parameters necessary to support them. Buildings with larger footprints and uninterrupted floor plates are often required. These large-scale designs sometimes result in unfortunate impacts on the urban fabric, such as the elimination of roadways and open spaces. While addressing the ever-changing aspects of clinical care, the BUMC Campus utilizes a balanced master planning approach with minimal collateral loss to existing infrastructure through its commitment to historical precedents and open space strategies. Recent planning initiatives sensitively maintain the integrity of the urban fabric and the surrounding neighborhoods while continuing to define a sense of campus and meet the institution's primary mission of education and medical research. As a result, many of the original streets of the historic urban fabric have been retained and enhanced to better integrate the campus with the neighborhood.

1.5.2 CAMPUS ACCESS AND CONNECTIVITY

The BUMC Campus is well connected to regional and district roadways, and several MBTA bus and rapid transit routes service the area. The intersections of Massachusetts and Harrison Avenues and Massachusetts Avenue and Albany Street form key entry points to BUMC.

Massachusetts Avenue, East Concord Street, East Newton Street, and East Brookline Street are the major north/south vehicular and pedestrian throughways that connect the campus to the neighborhood. East Concord Street is the most important north/south pedestrian connection due to its axial relationship with the public parking garage at 710 Albany Street and its central location to the east and west medical campuses and the medical school. Harrison Avenue and Albany Street are the major east/west vehicular and pedestrian throughways that connect the campus to Massachusetts Avenue (and Interstate Route I-93) and the neighborhood.

1.6 PUBLIC REVIEW PROCESS

Concurrent with the submission of this PNF to BPDA, the Proponent will meet with BPDA staff to present the Project to the BUMC Task Force (the "Task Force"). The Proponent looks forward to working with the BPDA, the community, and the City of Boston (the "City") on this Project.

1.6.1 ARTICLE 80 REVIEW PROCESS

As described in Section 1.2, this document is submitted to the BPDA pursuant to Article 80B, Large Project Review, of the Boston Zoning Code. A scoping session and a community meeting are expected to occur during the public comment period and prior to the issuance of a Scoping Determination.

Following submission of this PNF to the BPDA, the Proponent will meet with City agencies and present the Project at a combined community and Task Force meeting. The Proponent respectfully requests that the BPDA issue a Scoping Determination following the conclusion of the public comment period waiving further review for the Project.

1.6.2 BOSTON CIVIC DESIGN COMMISSION

As required by Article 28 of the Boston Zoning Code, the Proponent and the Project Team will meet with the Boston Civic Design Commission (“BCDC”) to review and discuss the design of the Project. The Proponent will seek a recommendation from the BCDC in advance of BPDA Board approval.

1.6.3 SOUTH END LANDMARK DISTRICT REVIEW

The Project Site is located within the South End Protection Area, which is adjacent to the South End Landmark District. The Project is subject to the review and approval by the South End Landmark District Commission (SELDC). The Proponent will consult with the SELDC, and following the submittal of a Design Approval Application, if required, will file a request for a Certificate of Appropriateness for SELDC review and approval at a public meeting.

1.6.4 BOSTON PUBLIC IMPROVEMENT COMMISSION

Although not anticipated at this time, the Project may require the review and approval of the Boston Public Improvement Commission (“PIC”) for proposed public realm improvements. At the appropriate time in the design process, if required, the Proponent will submit plans to the PIC to receive approval through a public hearing process for off-site improvements that the Proponent may propose within the public right-of-way.

1.6.5 BOSTON UNIVERSITY MEDICAL CENTER TASK FORCE

The Task Force is comprised of six representatives from areas surrounding the Boston University Medical Center Campus and one Boston University student body representative. Members of the Task Force include the following seven individuals:

- Evan Butland
- Michael Crowley
- Toni Corthall
- Caroline Foscatto
- Jeffrey Gates
- George Stergios
- David Stone

The Proponent will schedule Task Force meetings during the course of the Article 80B and Article 80D review process. All meetings of the Task Force will be open to the public.

1.7 PUBLIC AND COMMUNITY BENEFITS

The Project will provide a range of public and community benefits that extend to the BUMC neighborhood, and is committed to providing continued improvements to the area. Direct and indirect public and community benefits of the Project include the following:

- At the Patient Treatment Center, dental students and supervising faculty provide affordable, high-quality dental treatment to local residents.
- Through Smart Smiles, GSDM provides dental health education and important oral screenings for thousands of Boston public elementary students. During the 2015-16 school year, BU provided oral health education for 3,726 children; dental screenings, fluoride application and dental cleanings for 1,282 children; and 1,131 sealants for 372 children in 31 Boston Public Schools.
- GSDM's community outreach programs provide screenings and/or oral health education to over 2000 children in Boston area preschools, day care centers, Early Head Start, and Head Start programs as well as oral health education to preschool administrators, staff, teachers, and parents.
- The BU Fitness & Wellness Center at Boston Centers for Youth and Families (BCYF) Blackstone increases access to free and low-cost physical activities and healthy living resources in Boston's South End.
- With the Boston Health Care for the Homeless Program, the Proponent is helping develop strategic planning for funding for medical care for Boston's homeless population.

- The University provides oral health screenings and referrals for children enrolled in ABCD Early Head Start Centers throughout Boston neighborhoods.
- Through the Ryan White CARE Act, BU's dental school gives treatment and other services to patients with HIV and AIDS.
- Commitment to higher education in local neighborhoods through the Menino Scholars Program and the Community Service Awards has given over \$186 million in scholarships to promising Boston high school graduates since 1973.
- Through Boston University Geriatric Services, physicians and medical students provide an array of health services for Boston's elderly, including in-home care, making over 5,000 home visits to 800 elders each year.
- In the Horizons for Homeless Children program, volunteers from BU's School of Dental Medicine provide oral health education and treatment to homeless children in Boston who are under the age of six.
- BU's Community Service Center has a volunteer base of over 4,500 people who contribute an estimated 130,000 hours of service annually, largely to the greater Boston area.
- One of the longest running programs, Afterschool, offers tutoring, one-on-one homework assistance, and creative activities to students in grades pre-K–12.
- Branch Out improves Boston's public spaces with projects like beach cleanups, tree planting, invasive species removal, and more.
- Landscape and site improvements such as enhanced lighting and increased security will provide a safe and secure experience in and around the Project Site.
- The development of energy-efficient and environmentally friendly buildings that will be LEED certifiable support the City's goals for a sustainable future.
- The Project will create approximately 233 construction-related jobs (construction jobs and indirect and induced jobs)² and 6 direct or permanent jobs³, and will stimulate the local and regional economies. The Proponent will adhere to all standards set forth by the City's Residents Job Policy.

² Job figures are based on BPDA REMI model.

³ Job figures are based on Boston University projections.

1.8 SUMMARY OF REQUIRED PERMITS AND APPROVALS

Table 1-2 provides a list of approvals that may be required for the Project.

Table 1-2: Anticipated Project Approvals

Agency	Approval
Local	
Boston Planning and Development Agency (BPDA)	<ul style="list-style-type: none"> • Article 80B Large Project Review • Cooperation Agreement • Schematic Design Approval • Design Development Approval • Construction Document Approval • Boston Residents Construction Employment Plan • Certification of Compliance with Article 80B • Certification of Consistency with Article 80D • Development Impact Project Agreement
Boston Civic Design Commission	<ul style="list-style-type: none"> • Recommendation to the BPDA Board
Boston Zoning Commission	<ul style="list-style-type: none"> • Institutional Master Plan Amendment
Boston Landmarks Commission- Article 85	<ul style="list-style-type: none"> • Determination of No Significance
Boston Transportation Department	<ul style="list-style-type: none"> • Transportation Access Plan Agreement • Construction Management Plan
Boston Water and Sewer Commission	<ul style="list-style-type: none"> • Site Plan Approval
Public Improvement Commission	<ul style="list-style-type: none"> • Specific Repair Plan Approval
Inspectional Services Department	<ul style="list-style-type: none"> • Building Permit • Certificate of Occupancy • Flammable Storage and Garage Permit
Boston Zoning Board of Appeals	<ul style="list-style-type: none"> • Building Code Variances (if needed)
State	
Massachusetts Department of Public Health	<ul style="list-style-type: none"> • Determination of Need • Plan Review
Department of Environmental Protection	<ul style="list-style-type: none"> • Notification Prior to Construction or Demolition • Source Registration for Emergency Generator • Elevator Permit
Federal	
Environmental Protection Agency	<ul style="list-style-type: none"> • NPDES Construction/Stormwater General Permit

1.9 PROJECT TEAM

Proponent	Trustees of Boston University One Silber Way Boston, MA 02215 Contacts: Gary W. Nicksa, Senior Vice President for Operations nicksa@bu.edu Phone: 617-353-6500 Michael Donovan, Vice President for Real Estate and Facility Services donovnm@bu.edu Phone: 617-353-4468
Planning and Permitting	Fort Point Associates, Inc. 31 State Street, 3rd Floor Boston, MA 02109 Contact: Judith T. Kohn, RLA, Vice President jkohn@fpa-inc.com Phone: 617-357-7044 x211
Architect Landscape Architect MEP Sustainability/LEED	SmithGroupJJR 500 Griswold Street, Suite 1700 Detroit, MI 48226 Contact: Mark Potter, Principal mark.potter@smithgroupjjr.com Phone: 313-983-3600
Architect/Public Health Design Consultant	TRO Design 100 High Street, Suite 1800 Boston, MA 02110 Contact: Stacey Yeragotelis, LEED AP, Associate Principal syeragotelis@tro-design.com Phone: 617-502-3567

<p>Legal</p>	<p>Rubin and Rudman, LLP 50 Rowes Wharf Boston, MA 02110</p> <p>Contact: James H. Greene, Partner jgreene@RubinRudman.com Phone: 617-330-7000</p> <p>Verrill Dana, LLP One Boston Place, Suite 1600 Boston, MA 02108</p> <p>Contact: Andrew P. Rusczek, Partner arusczek@verrilldana.com Phone: 617-274-2856</p>
<p>Transportation</p>	<p>Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108</p> <p>Contact: Brian, J. Beisel, PTP, Associate bbeisel@hshassoc.com Phone: 617-348-3357</p>
<p>Civil Engineering</p>	<p>Nitsch Engineering, Inc. 2 Center Plaza #430 Boston, MA 02108</p> <p>Contact: Deb Danik, Project Manager ddanik@nitscheng.com Phone: 617-206-8737</p>
<p>Geotechnical</p>	<p>Haley and Aldrich 70 Blanchard Road Suite 204 Burlington, MA 01803</p> <p>Contact: Bryan Sweeney, Senior Vice President bsweeney@haleyaldrich.com Phone: 617-908-2715</p>

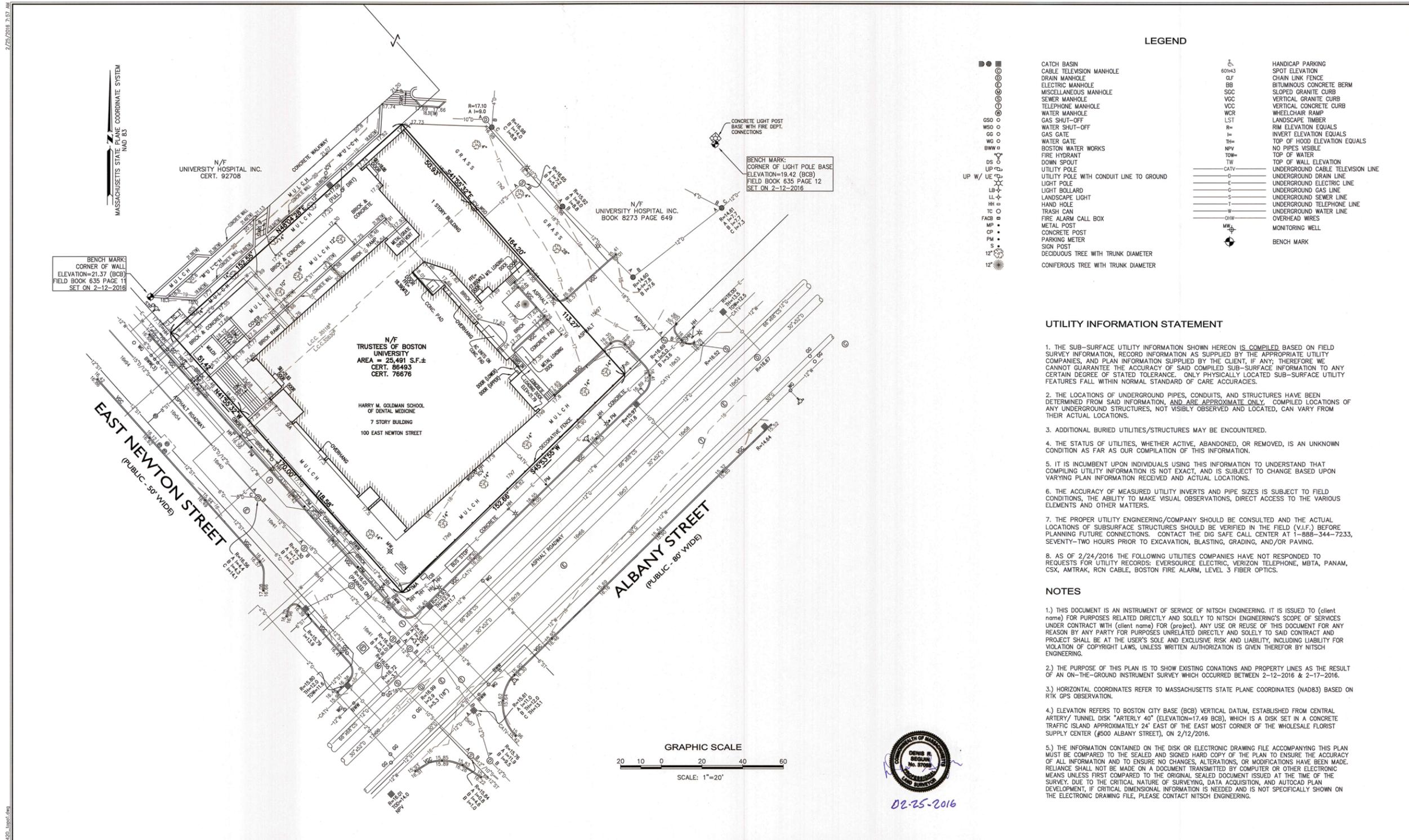
Pre-Construction Services	Turner Construction Company 2 Seaport Lane 2 nd Floor Boston, MA 02210 Contact: Matthew McCullough, Project Executive mmccullough@tcco.com Phone: 617-247-5544
----------------------------------	--



Boston, Massachusetts

Figure 1-1
Locus Plan

Source: USGS, Fort Point Associates, Inc., 2017



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- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

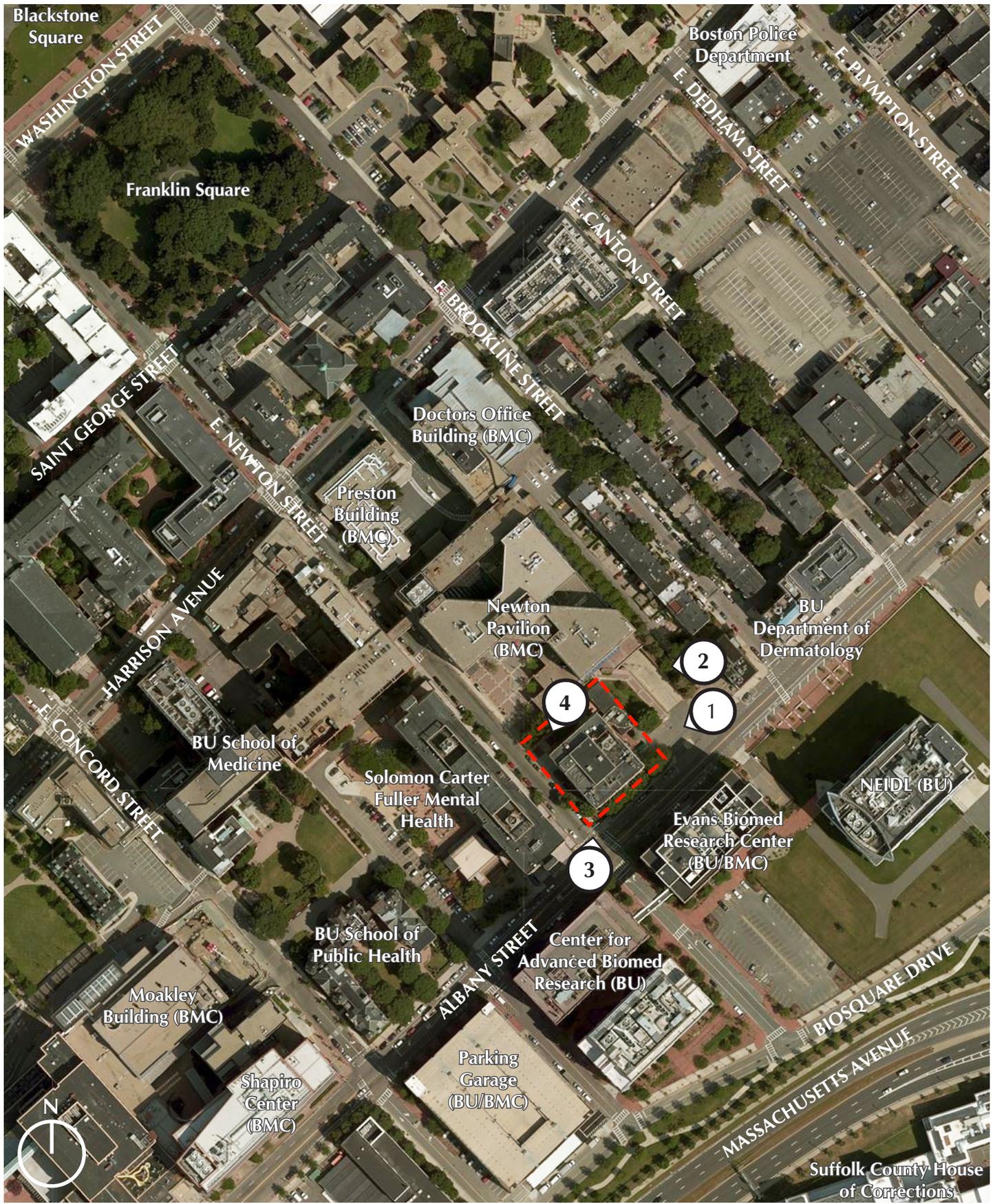
PROJECT # 11420
 FILE: 11420_TOP01.dwg
 SCALE: 1"=20'
 DATE: 2/25/2016
 PROJECT MANAGER: DRS
 FIELD BOOK: 635
 DRAFTED BY: JCC
 CHECKED BY:

REV.	COMMENTS	DATE

EXISTING CONDITIONS SURVEY
 GOLDMAN SCHOOL OF DENTAL MEDICINE
 100 E. NEWTON ST., BOSTON, MA 02118

PREPARED FOR:
BOSTON UNIVERSITY
 120 ASHFORD STREET, BOSTON, MA 02215

SHEET:
EX-1
 OF 1 REV.





Photograph 1: View of the Site looking southwest from adjacent BMC loading/ambulance access on Albany Street



Photograph 2: View of the Site looking southwest at single story cafeteria



Photograph 3: View looking north at the corner of Albany and E. Newton



Photograph 4: View of seating area looking southeast

Boston, Massachusetts

Figure 1-5

Existing Conditions Photographs

Source: The Architectural Team, Google Street View, 2017

Chapter 2

PROJECT DESCRIPTION

CHAPTER 2: PROJECT DESCRIPTION

2.1 PROJECT SITE AND SURROUNDINGS

The Project is located at 100 East Newton Street within the BUMC at the intersection of East Newton and Albany Streets. The property is surrounded by the Newton Pavilion property, which is owned by BMC. The Project Site is approximately 0.58-acres, with a building setback of approximately 19'-2" from the property line along Albany Street and a varying setback of approximately 15' to 30' along East Newton Street. Albany Street consists of two-way traffic with striped bicycle lanes and parallel parking in each direction. East Newton Street contains one-way traffic traveling to the northwest. Both streets have active Massachusetts Bay Transportation Authority (MBTA) bus routes and metered on-street parking spaces. There is an existing bus shelter and a traffic signal pole and control box in the Albany Street right-of-way ("ROW") that will be relocated as part of the project. A number of additional above and below ground utilities located within the ROW will be maintained. An existing BU Medical Center wayfinding sign resides on the GSDM property at the corner of Albany Street and East Newton Street.

The existing building's main entrance is on the southwest side along East Newton Street. A concrete staircase and ramp provide access to the elevated first floor. The concrete stairs and an associated ramp along the northwest façade connect to East Newton Street and the adjacent landscaped courtyard area, and fronts on East Newton Street, while the ramp is accessed from the north end of the courtyard near the entrance to the cafeteria.

The building is surrounded by mulched landscape beds and turf grass with several mature trees also located around the perimeter of the building.

Uses within the vicinity of the Project Site include medical services, clinical, institutional, research, BUMC support, and administration services.

2.1.1 EXISTING CAMPUS AND FACILITIES

BUMC is located in Boston's historic South End, and includes 33 Boston University Medical Center owned or controlled buildings, a helipad and development parcels that are individually-owned or controlled, as well as shared facilities associated with each or both of the institutions. In addition to the property owned or controlled by the Proponent, each institution also leases office, instructional, and/or clinical space in 8 buildings located on and/or proximate to the campus. Buildings range from 2 to 14 stories in height above ground. The buildings were built between 1864 (BCD/FGH), 2011 (Carl J. and Ruth Shapiro Ambulatory Care Center), and 2012 (Albany Fellows Phase 1 BU Medical Campus Graduate Student Housing). The Dr.

Solomon Carter Fuller Mental Health Center, a state mental health facility, is also located on the BUMC Campus.

BUMC is currently served by approximately 3,420 parking spaces. Of these spaces, approximately 2,665 are located in on-site garages, with the remaining spaces located at surface lots and off-site garages.

There are several public transportation services offered through the Medical Campus, including MBTA bus service, Silver Line, and Commuter Rail Service, as well as TransComm Shuttle Services. The existing public transportation is not expected to be impacted by the proposed Project.

The Project Site is also serviced by the University's free shuttle, known as the Boston University Shuttle (the "BUS"), which provides transportation to both the Charles River and Medical campuses.

See Figure 2-1, Project Site Plan, and Chapter 5: Transportation.

2.2 PROPOSED PROJECT

2.2.1 PROGRAM DESIGN GOALS

Critical program design goals for the Project have been identified as:

- Improve clinical space for patient care retention and experience.
- Enhance instructional space by creating multi-functional spaces that provide opportunities for new pedagogies and technologies.
- Relocate the Simulation Learning Center (SLC) to be contiguous with instructional space at the Project.
- Create student collaboration and gathering space that demonstrate the importance of informal and peer to peer learning.
- Transform the building exterior with a new façade while also creating dedicated patient and student entrances.

2.2.2 PROJECT PROGRAM

The addition to the existing building will be dedicated to clinical use, while the existing building will be repurposed in selected areas with a mix of patient waiting, office, and instructional space. The proposed addition is approximately 41,900 GFA, including the basement.

The reworked site circulation includes a dedicated patient entrance facing Albany Street, while the existing entrance will be converted to the student/faculty/staff entrance. This separation will reduce congestion, improve patient wayfinding, and relocate the front-door and visual identity of the GSDM to Albany Street in accordance with the Albany Corridor Plan. This new face along Albany Street will help to activate the corner of East Newton and Albany Streets, and will make the Project Site more harmonious with the existing urban fabric.

The existing basement will be enlarged to provide space for new mechanical equipment to handle the demands of the renovated building as well as the addition. Its primary use of building storage and housing mechanical equipment will not change.

The ground floor will be reworked to provide a spacious patient waiting area, a student lounge, collaboration space, and a large format classroom.

The additional floors will contain a mix of faculty and student laboratories, exam and clinic facilities, and a simulation learning center as well as support facilities in order to provide contemporary dental care for patients and clinical training for students/residents.

Clinical support is located in the existing facility adjacent to the expanded building, including restrooms and distribution for power and data.

The majority of the Post-Doctoral Patient Treatment Centers will remain as they are currently, with only minor renovations to connect the addition on floors 2, 4 and 7.

The 3rd floor provides space for a new Simulation Learning Center adjacent to the existing classrooms, resulting in an integrated learning environment.

The Pre-Doctoral Patient Treatment Center will be distributed between the addition and the existing building space on floors 4, 5 and 6.

See Figure 2-1, Project Site Plan, and Figures 2-2 through 2-9, Floor Plans.

A detailed summary of the program for the GSDM is included in Table 2-1.

Table 2-1: Anticipated Project Program

Space Type	Existing Total	Design Development			
	Total	New	Renovated	Exist to Remain	Total
Classroom	4,643	2,560	-	3,430	5,990
Laboratories	3,479	3,820	505	800	5,420
Office	19,344	5,080	3,690	5,853	14,633
Office (Shelled)	-	5,200	-	-	5,200
Study/Interaction Facilities	347	3,020	-	87	3,107
Collaboration	2,058	750	-	335	1,085
Support Facilities	1,845	-	1,700	-	1,700
Clinic Facilities	21,472	11,301	12,900	7,680	31,881
Waiting	1,592	1,115	5,400	716	7,231
Lobby/ Prefunction	890	1,440	1,900	-	3,340
Other non-occupied space	28,530	7,614	26,700	12,199	46,513
TOTAL (GFA)¹	84,200	41,900	53,100	31,100	126,100

2.2.3 BASEMENT USES

The expanded basement area will include space for mechanical equipment, clinical support, electrical equipment, the water service room, and the fire pump room.

2.2.4 GROUND FLOOR USES

The patient experience and the clinical design and planning begins immediately with the building entry and the registration/check-in desk. New (first time) patients are registered at the reception area on the first floor. Comfortable, ample seating adjacent to registration provides patient companions a relaxing waiting area with connections to the outside. Following registration and in subsequent visits, the patients will be encouraged to go directly to the floor where they will receive treatment.

2.2.5 CLINICAL FLOORS

On the clinical floors, the planning of clinical space allows for the easy transition of patients to the operatories. They are greeted at check-in desks and provided comfortable waiting areas before they are escorted to the treatment rooms by students.

¹ GFA totals are consistent with Article 2A of the Boston Zoning Code. Total areas have been rounded up to accommodate slight modifications as the building design progresses.

The focus is on providing a caring and supportive clinical environment that is open and well-lit, but does not allow for views into more private or functional areas.

Likewise, the student and faculty experience is carefully designed to allow for private work and functional spaces. A separate entrance for students/faculty/staff creates a sense of personal space for them, with a student lounge and private areas for gathering, socialization, and collaboration. The student study and collaboration areas are designed to increase the interaction between students and provide engaging space for a variety of study and collaboration modalities.

2.2.6 CLASSROOM/LEARNING ENVIRONMENT

The GSDM is committed to a robust and innovative learning environment that provides spaces, technologies, and opportunities for all students to maximize their academic potential. In alignment with this commitment, the school is on the forefront of digital imaging and design (CAD/CAM). Currently, images can be captured on mobile Sirona CEREC units and further manipulated by students and faculty in preparation for digital milling. Through this Project, the goal will be to provide image capture at the dental chair within the treatment room, removing the need for the mobile units (which will continue to be required at the existing operatories). The digital design laboratory will provide a space for students and faculty to manipulate and finalize images, then electronically transfer them to the digital milling laboratory where a restoration or appliance will be fabricated, with only final touches required to finalize either.

2.2.7 NEW OPERATORIES

New operatories will be increased in size over those currently existing in the facility. These new, expanded, 10' X 12' treatment areas provide for a more updated learning environment and patient centered care. The lowered walls in the majority of the treatment rooms offer faculty clear, unobstructed views of the learning environment (students treating their respective patients), allowing them to more rapidly respond to the needs of the students. The design and arrangement also increases daylight to the clinical space, improving both the patient and clinician experience. Upon completion of the Project, the building will support 175 treatment rooms.

2.3 SITE REQUIREMENTS

The Project Site boundaries to the northeast and northwest are roughly 36 feet from the existing building. This narrow, residual "L" shaped area is the available footprint for the building expansion. The potential building expansion footprint is approximately 8,000 SF.

The small available site area places some constraints on the design concept. The International Building Code restricts the percentage of open wall area (windows and other openings) as a

function of distance from the property line. The exterior wall of the proposed addition extends to the property line on Albany Street. Construction close to property lines places specific constraints on building elevations.

2.4 SITE CIRCULATION

Circulation around the Project Site and the Project will remain consistent with existing conditions.

2.4.1 VEHICULAR

BUMC is located in the South End neighborhood of Boston. Regional vehicular access to the Project Site via the north and south is provided directly via the Massachusetts Avenue Connector. At Massachusetts Avenue, the Connector joins Melnea Cass Boulevard, which provides a direct connection to the Longwood Medical and Academic Area. Local vehicular access is primarily from Harrison Avenue, Massachusetts Avenue, and Albany Street. East Concord Street and East Newton Street provide connections from the primary campus parking facilities (the 710 Albany Street and 610 Albany Street garages) to other facilities within the BUMC campus.

2.4.2 LOADING AND SERVICE

The GSDM utilizes an existing loading dock located on Albany Street between East Newton and East Brookline Streets (the “loading dock area”). This loading dock operates from 7:00 a.m. to 5:00 p.m. Monday through Friday. The Project will continue to utilize this loading dock area and maintain current hours of use.

2.4.3 PEDESTRIAN/BICYCLE CIRCULATION

The existing pathways along Melnea Cass Boulevard and the Southwest Corridor Park, in addition to improved sidewalks and pathways through the campus, serve transit, cyclist, and pedestrian trips generated by this Project.

The City of Boston has created marked bike lanes and marked shared-travel bike lanes (where space does not allow an exclusive bike lane) between parked cars and the outside travel lanes on Massachusetts Avenue between Albany Street and St. Botolph Street as part of a major improvement project. In addition, Albany Street, Massachusetts Avenue, Harrison Avenue, and East Newton Street are generally considered on-street bicycle routes in this area.

2.4.4 ACCESSIBILITY

All of the Project's main entrances will be located at ground level and will be universally accessible. The Project's interior renovation and expansion will facilitate universally accessible connections throughout the Project on every floor.

2.4.5 PARKING AND ACCESS

No new parking will be required to accommodate the Project program and uses.

2.5 OPEN SPACE AND LANDSCAPING

The existing GSDM building, which is part of a densely developed urban campus, will be expanded on two sides. Upgrades to the existing urban landscape and entry area will provide an additional entrance and a more welcoming and accessible entry experience than the current conditions.

A new roof at level 2 on the Albany Street and East Newton Street elevations, designed to be compatible with the new exterior of the building, will offer separation between the new patient entry and the renovated student /faculty/staff entrance. This porch-like design will offer ample space for outdoor seating, landscaping and an accessible route from street level to the building entrances. The plant material proposed will be colorful throughout all seasons, and will also be able to handle drought and salt tolerant conditions indicative of the urban environment.

2.6 COMPLIANCE WITH THE BUMC 2010 INSTITUTIONAL MASTER PLAN

2.6.1 CURRENT STATUS

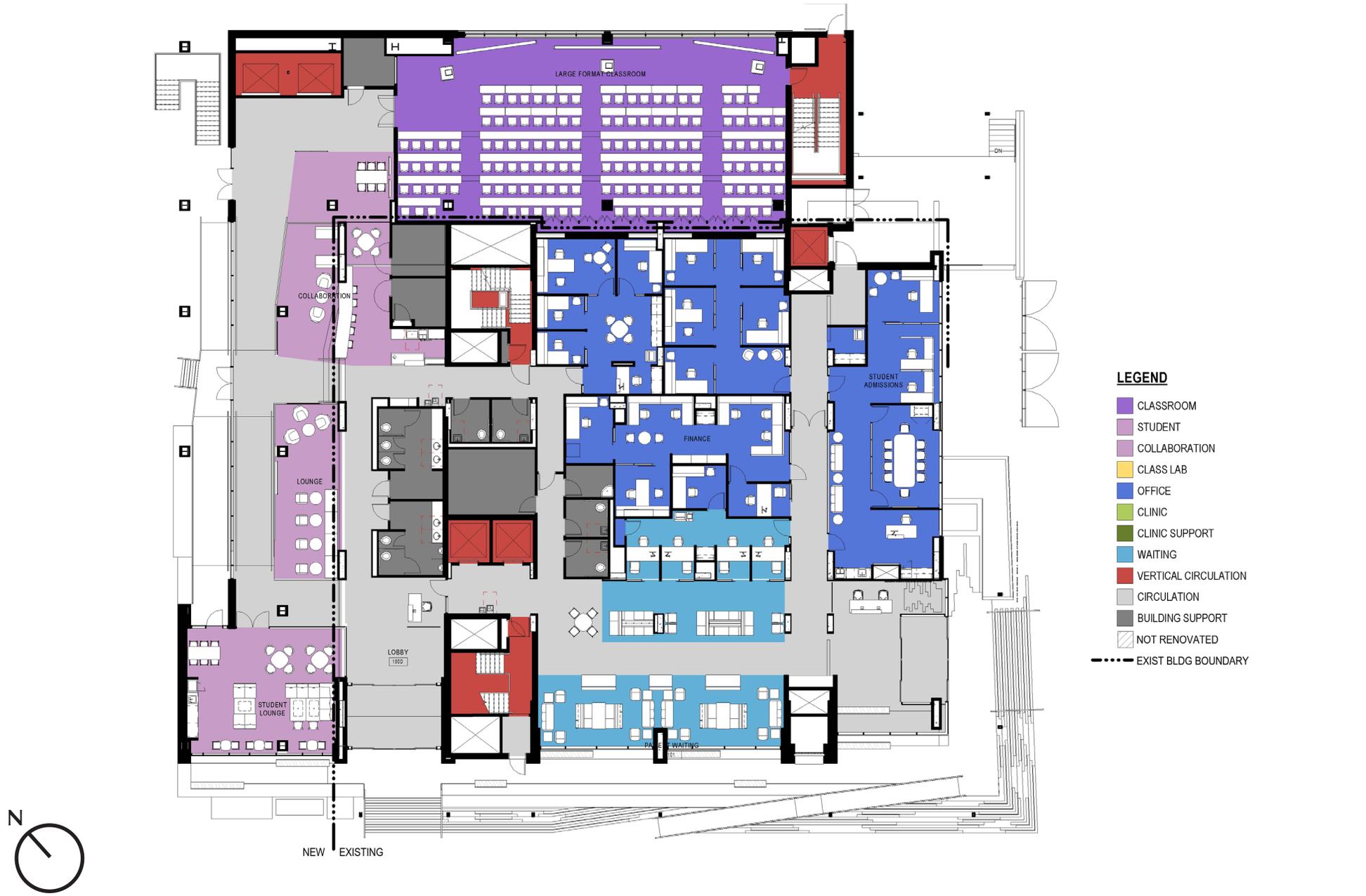
Boston University Medical Center is comprised of BMC and the BU Medical Campus, which includes three of Boston University's health science schools – the School of Medicine, the GSDM, and the School of Public Health.

2.6.2 PROPOSED AMENDMENT TO THE INSTITUTIONAL MASTER PLAN

Although the renovation of and addition to the GSDM will be considered a new institutional Project, the core function and mission of the School will remain consistent with the goals and objectives of the Institutional Master Plan. The Project will require the submittal of an Institutional Master Plan Project Notification Form to the BPDA under Article 80D of the Zoning Code.





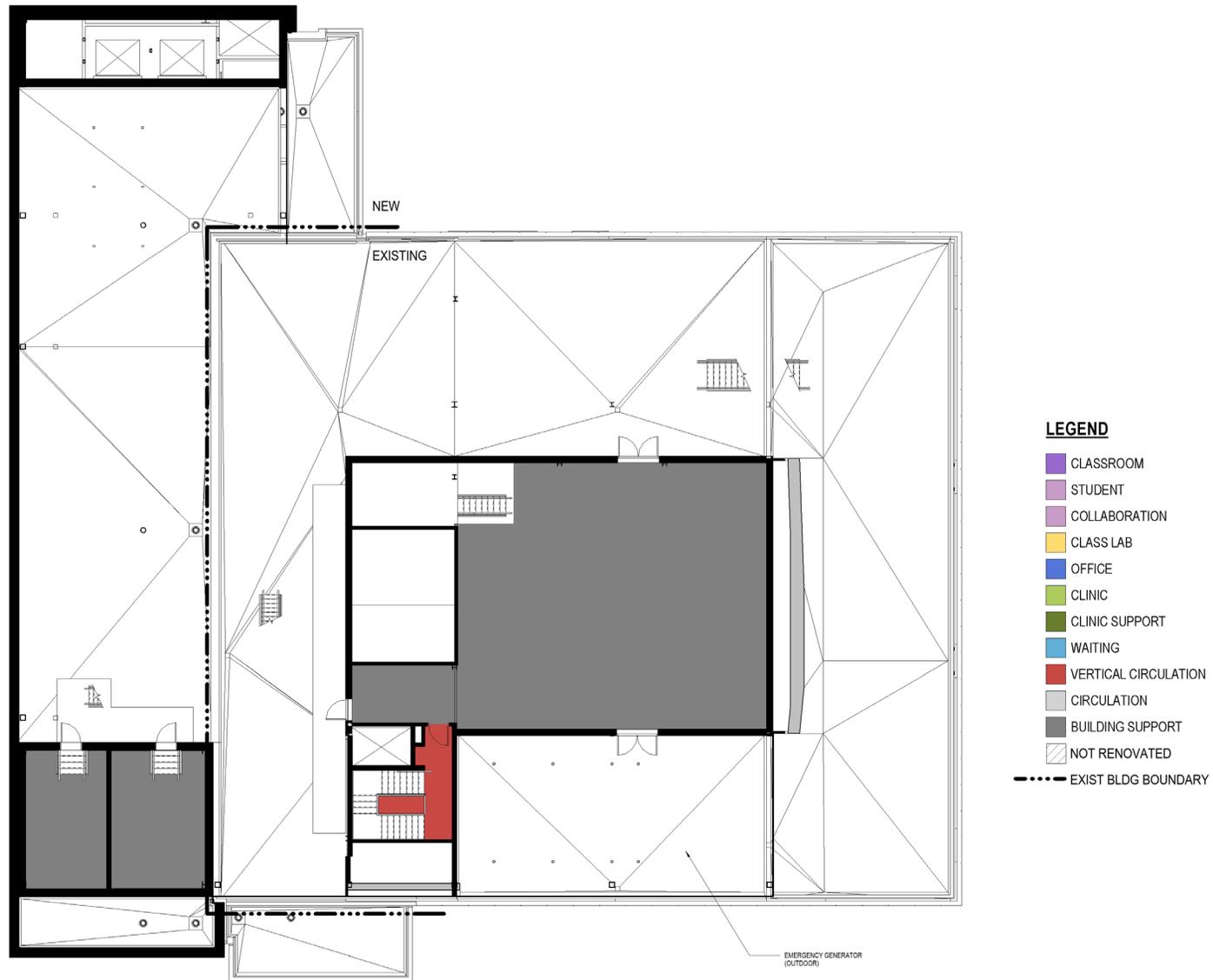












Chapter 3

URBAN DESIGN

CHAPTER 3: URBAN DESIGN

3.1 INTRODUCTION

Supporting the Proponent's desire to strengthen its position as an international leader in dental education, research, and patient care, the Project reinforces the connection between the GSDM and its urban context, including the population it serves. The Project Site accommodates a high volume of pedestrian traffic. The entrance to the existing building is located at the southwest corner of the Project Site along East Newton Street. This single entrance currently serves both the patient and academic communities, including students, faculty, and staff. The Project includes a second, dedicated patient entrance facing Albany Street. This second entrance will serve to reduce congestion, improve patient wayfinding, and relocate the front-door and visual identity of the GSDM to Albany Street in accordance with the Albany Corridor Plan.

A new canopy at level 2 on the Albany Street and East Newton Street elevations, designed to be compatible with the new exterior of the building, will offer separation between the new patient entry and the renovated student/faculty/staff entrance. This new porch-like design visually and physically connects the two entrances, wrapping the corner of the building and creating a transitional zone between the streets and the building. This further enhances the intersection by providing area for plantings and seating and by making a distinct gateway into the BUMC.

See Figure 3-1, Rendered Perspective Looking Northwest; Figure 3-2, Rendered Perspective Looking East; Figure 3-3, Rendered Perspective Looking West; Figure 3-4, South Elevation; Figure 3-5 East Elevation; Figure 3-6 North Elevation; Figure 3-7 West Elevation; and Figure 3-8 Landscape Plan.

3.2 MASSING

The existing building consists of a cafeteria section, which is one level above grade, and an academic/clinical building, which is seven levels above grade with a rooftop penthouse. A full basement contains mechanical, electrical, and support spaces. Level 1, the entry level, is 48" above grade. The roof elevation is approximately 103'-0" above grade.

The proposed addition, which requires the removal of the one-story cafeteria, extends as a seven-level bar along the northwest edge of the Project Site and a two-level bar along the northeast edge. The two-level northeast portion is located above the basement level. The seven-level northwest portion of the building addition will be topped with the electrical room and rooftop screen, obscuring rooftop mounted mechanical equipment. The overall composition comes together as a series of new and existing interlocking rectilinear forms,

with prominent glass volumes between the two. The new canopy covers the proposed porch, signifying entry and creating a sense of place for students to study or relax. The enlarged and renovated existing structure will include new and renovated restrooms, clinical spaces, classrooms, digital design labs, and a simulation learning center in addition to office space and much needed collaboration space.

Along the northwest side of the GSDM building, the portion of the Project Site which abuts the Newton Pavilion property contains mature locust trees as well as some understory ornamentals. This shared area contains picnic tables and bike racks for student and faculty use. A portion of the courtyard will be occupied by the proposed building addition. The entrance level along Newton Pavilion is set back under the overhanging floors above, and takes the form of a dynamic ramped entrance experience with opportunities for entry or gathering.

3.3 CHARACTER AND MATERIALS

The Project design will make a cohesive whole of disparate pieces: an original, three-story cast-in-place concrete building (1967), a four-story vertical precast concrete panel addition (1973) and the current proposed seven level addition. The design objective is to refresh and make cohesive the existing exterior while tying it seamlessly together with the proposed addition. Architectural language and materials along with site design language and materials will reactivate the building and streetscape, providing branding and identity while allowing them to be contextual. Materials are appropriate to this urban environment and consistent with the urban fabric. Overall the design, with its layered aesthetics and materials, intends to invoke a clean modern timelessness while also extending an inviting personality. Expanses of curtainwall will extend significant daylight into the building interior. Light grey, light weight terracotta panels will overclad the existing building. The addition is faced in brick, which matches the color and texture of the terracotta on the existing building façade. Wood tone phenolic accent panels highlight both new and existing fenestration.

Complimentary site materials consist of dark granite steps and a porch comprised of plank pavers that wraps the corner at the intersection of East Newton and Albany Streets. Landscaping and vegetation integrated into the porch will soften the threshold of the building and provide an activated and enlivened street front. Planters, site furnishings, and lighting will work in concert with the landscape and architecture creating a cohesive, contextual, and compelling building and site.

3.4 LANDSCAPE AND STREETScape

The Project optimizes an urban corner location, with proposed site and building construction extending to the property lines. The new cascading porch connects the existing grade with the GSDM building entrance while energizing the prominent building corner location. Ornamental plantings integrated into the porch will soften the building edges and, along with

new and updated signage and lighting, will provide visual interest. A walk between the building addition and the property line will allow pedestrian access to seating and a secondary student/faculty entrance. The northeast property boundary abuts the loading dock area which is currently covered with lawn, one mature tree and two small ornamental trees, and paving. Access, service, and loading functions to support the existing building presently occur at this location. The Project includes a reconfigured service area with a new access pattern that consolidates circulation. This area will also contain the code-required stormwater detention system. See Figure 3-8, Landscape Plan.

3.4.1 LANDSCAPE AND SITE TREATMENTS

New site landscaping installed within the property will be selected for efficient water use, hardiness, localized growing conditions, and growth habit. Three primary landscape installations are proposed:

- Landscape bed type 1 is primarily located in the planting pockets in the granite block staircase along East Newton Street and Albany Street. These areas will contain hardy perennials, including drought tolerant sedums and groundcovers that are able to withstand the stresses of the urban environment.
- Landscape bed type 2 at the larger landscape planting areas around the site will contain a greater mix of perennials, ornamental grasses, groundcovers, and small shrub plantings. These plant types will also focus on drought tolerant and native species as part of the plant palette.
- A new green space along Albany Street will include a new columnar tree, planting beds, and additional shrubs.

An irrigation system will be provided at all landscape beds, but not in grass areas. Because new construction is expected to achieve LEED Silver Certifiable status, the plant beds will be irrigated, as necessary, to establish and maintain a healthy landscape.

Brushed stainless steel planter walls are plates capable of holding back grade and providing areas for plantings. The planter walls will be of various heights, depending on the location. The brushed stainless steel planter curb will be a similar aesthetic to the planter wall, at a lower curb height of 4 inches.

Site Lighting and Amenities

Exterior lighting will focus on three primary goals: creating hierarchy of brightness at building entries, accentuating new insertions of architectural forms and site elements, and maximizing the exterior effect with use of interior brightness as seen through glazing. The primary patient entry will be the brightest illuminated area, followed by

the student entry. All illuminance levels will provide a high level of safety and visual comfort. Exterior stairs and ramps will be illuminated using a consistent handrail integrated fixture, while landscape and signage will be accented using linear lighting fixtures.

The custom site benches are envisioned as shaped plate steel that could be free-standing or attached to a wall or curb. These will be made of the same brushed stainless steel to allow for a seamless look between bench and planter wall. The top of the bench will be made of a sustainably harvested hardwood to allow for a comfortable seating surface.

Stainless steel decorative metal handrails will be located along the edges of ramps and staircases and will be a style that is similar to the pedestrian handrails located within high-profile areas of the building.

3.4.2 STREETScape

No new streetscape work is envisioned as a part of the Project. Planned improvements include restoration of perimeter sidewalks and adjacent paved and open areas, which will be reconstructed with sub-surface stormwater detention and new surfaces appropriate for service vehicle circulation. The proposed paving at the service area will be an integral color concrete in a pattern consistent with the porch design.

3.4.3 OFF-SITE IMPROVEMENTS

Directly abutting property to the northwest and northeast will require restoration and reconstruction as a result of the Project construction.

3.4.4 PEDESTRIAN IMPROVEMENTS

The Project dramatically improves wayfinding and pedestrian circulation around the building. A new public entry facing Albany Street will be identifiable and distinct from the student/faculty entry on East Newton Street. A new barrier-free ramp located along East Newton Street will serve both entries, and will be more visible and accessible than the current ramp. The new porch offers a transitional space along the Building frontage providing space for both circulation and gathering. New strategically located glazing visually connects the exterior with the interior supporting wayfinding and user comfort.

3.5 CONSISTENCY WITH AREA PLANS

The Project will maintain and enhance existing uses within the BUMC area. As described in Section 3.4, improvements to both the building exterior and landscape features will be

consistent and compatible with the existing GSDM uses and activities as well as with neighborhood uses.



Boston, Massachusetts

Rendered Perspective - Looking Northwest from the Intersection of Albany and East Newton

Figure 3-1
Source: SmithGroupJJR, 2017



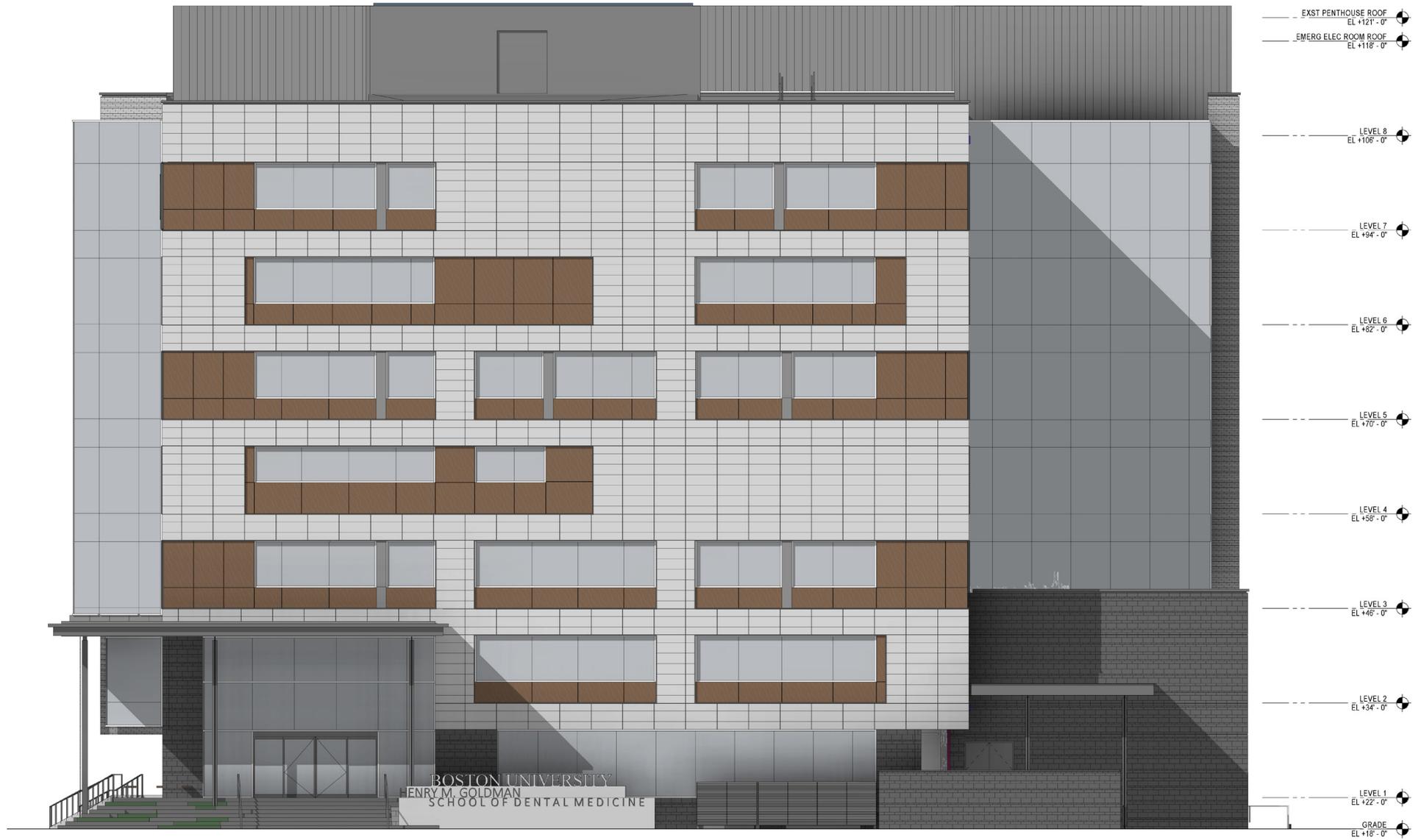
Boston, Massachusetts

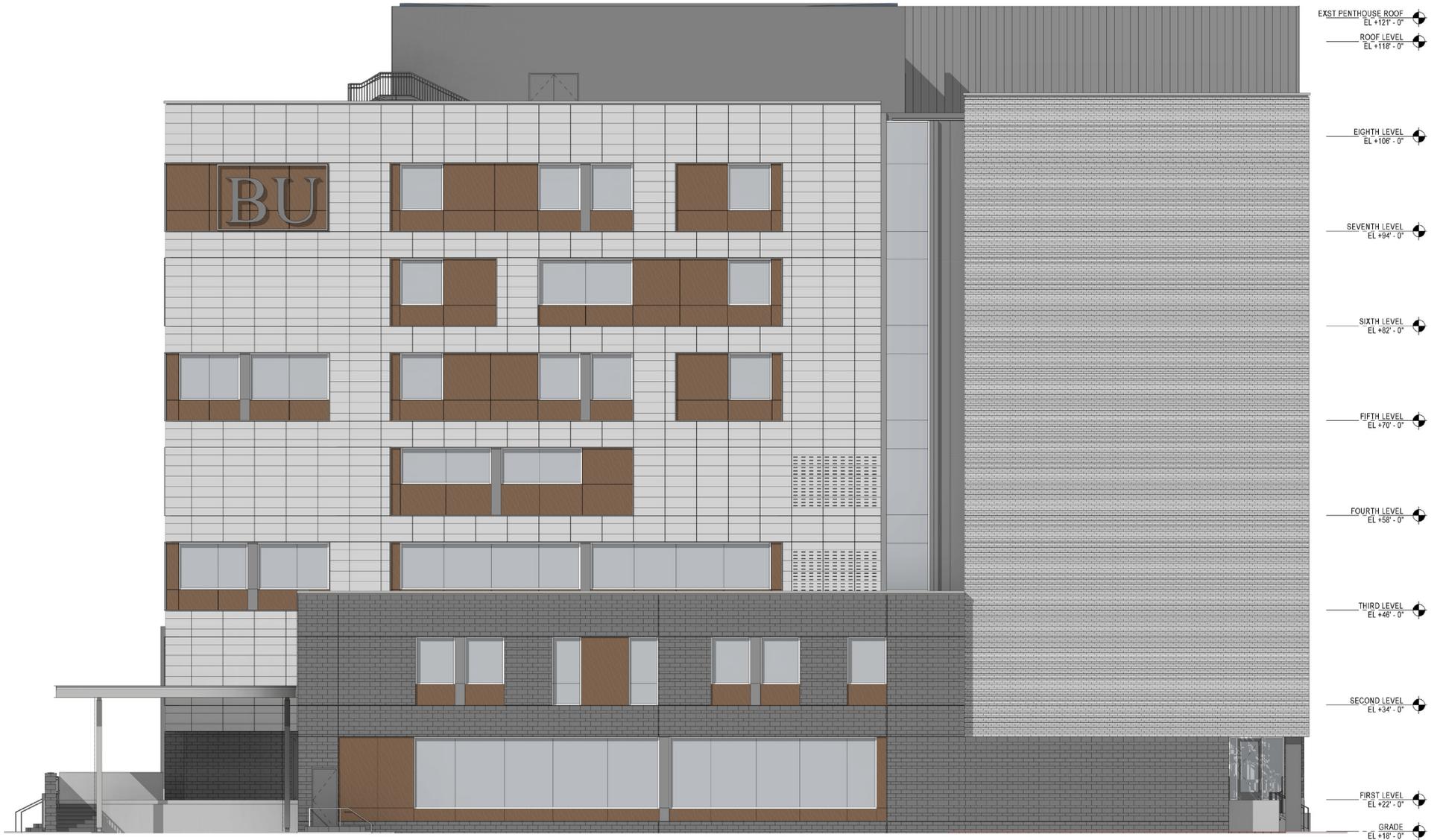
Figure 3-2
Rendered Perspective - Looking East from East Newton Street
Source: SmithGroupJJR, 2017



Boston, Massachusetts

Figure 3-3
Rendered Perspective - Looking West from Albany Street
Source: SmithGroupJJR, 2017











Chapter 4

SUSTAINABILITY

CHAPTER 4: SUSTAINABILITY

4.1 SUSTAINABLE DESIGN

The Project will incorporate sustainable design strategies and will target a minimum of Leadership in Energy and Environmental Design (“LEED”) Silver certification. The LEED rating system will be used as a framework to measure the various sustainable features of the Project. This system is divided into the following categories: Integrative Process, Location and Transportation, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation and Regional Priority Credits.

The Project has been registered under LEED NC V3, but will comply with the requirements of the City of Boston to address the current LEED Version 4 (“V4”). The Proponent has used a LEED V4 for BD+C: New Construction and Major Renovation Checklist to illustrate that the Project is currently tracking 55 LEED points. See Figure 4-1 and 4-2, LEED Checklist.

The Project will comply with Article 37 of the Boston Zoning Code, Boston’s Green Building Regulations. The purpose of Article 37 is to ensure that major building projects are planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to prepare for climate change; to promote a more sustainable city; and to enhance the quality of life in Boston. The narrative below demonstrates that the Project is in compliance with Article 37. A completed Climate Change Preparedness and Resiliency Questionnaire can be found in Appendix B. As the Project is in the early design process, some of these strategies are expected to evolve with the design of the building.

4.2 ARTICLE 37/LEED COMPLIANCE

4.2.1 INTEGRATIVE PROCESS

The project team will perform a preliminary “simple box” energy model analysis of the proposed building addition and existing building as well as a preliminary water budget analysis to inform design decisions and achieve synergies across disciplines and building systems.

4.2.2 LOCATION AND TRANSPORTATION

The Project is located in Boston’s South End, a dense, urban area with existing access to multiple public transportation options and local amenities. Many of the LEED Location and Transportation credits are attainable without any extra design features. Nearby shops, restaurants, and event venues are within walking distance of the Project. Access to public transportation contributes to the building users’ ability to maintain a car-free or reduced-car lifestyle.

LT Credit 2: Sensitive Land Protection

The Project involves the renovation and addition of a building constructed in the 1970's and used by the University as the home of the Dental School for more than 800 students. The addition will be constructed on a previously developed lot.

LT Credit 3: High Priority Site

Based on initial soil conditions, there is likelihood this site has contaminations, such as PCBS, that will require removal and site clean-up. The Project team understand the necessity for good soil conditions and will take efforts to ensure the whole site is clean.

LT Credit 4: Surrounding Density and Diverse Uses

The Project fulfills the density requirement through its urban location within the existing city infrastructure. Additionally, the project is located within one-half mile of greater than eight existing diverse uses, and has pedestrian access to these services.

LT Credit 5: Access to Quality Transit

The Project is within one-quarter mile of five Massachusetts Bay Transit Authority ("MBTA") bus lines including 8 (Kenmore), 10 (Copley), 47 (Central Square), CT1, and CT3 (Beth Israel). In addition, Boston University operates The BUS, a shuttle service connecting both campuses with 13 stops. The University is also a member of TranSCom, a Transportation Management Association ("TMA"), which provides additional transportation support services. TranSCom coordinates the transportation needs of the BUMC community by providing alternatives to single-occupancy driving, reducing traffic congestion and air pollution, and by enhancing accessibility to the Albany Street corridor.

LT Credit 7: Reduced Parking Footprint

The Project does not include any new parking.

4.2.3 SUSTAINABLE SITES

The Project is located on a previously developed site that will be evaluated for stormwater management and heat island reduction strategies.

SS Prerequisite 1: Construction Activity Pollution Prevention

The Project Site will be evaluated and an Erosion and Sedimentation Control plan will be developed for all construction activities associated with the Project. Implementation and compliance will be monitored and documented via inspection reports containing photos and/or narratives.

SS Credit 1: Site Assessment

The Project team will complete a site survey including existing topography, hydrology, climate and solar exposure as well as human use and health effects.

SS Credit 2: Open Space

The design calls for enhanced exterior spaces to provide for additional landscaping, hardscape, and seating to encourage activity around the exterior of the building, helping to connect public realm and interior activities.

SS Credit 4: Rainwater Management

The Project is located within the Groundwater Conservation Overlay District (GCOD) and will comply with the requirements of Article 32 of the Boston Zoning Code to the greatest extent practicable. Article 32 requires that proposed projects promote infiltration of rainwater by capturing no less than one inch across the portion of the surface area of the lot to be occupied by the proposed Project (or, in the case of a Substantial Rehabilitation, the lot area occupied by the structure to be substantially rehabilitated).

SS Credit 5: Heat Island Reduction

Greater than half of the exterior hardscape in the Project will consist of materials with a high solar reflectance index, including light colored concrete. The Project's roof areas will be covered with a combination of white Thermoplastic Polyolefin ("TPO"). The overall reflectance of the roof will exceed the LEED SSc7.2 requirement of SRI 78 minimum for 75% of the Project roof area.

SS Credit 6: Light Pollution Reduction

The Project team is evaluating a lighting concept for the Project that will hopefully provide for enhanced lighting for safety and security while at the same time not increasing light pollution in this dense neighborhood.

4.2.4 WATER EFFICIENCY

The Project will use low-flow fixtures to reduce the overall water use of the building, thus reducing the loads on the municipal water supply and wastewater systems.

WE Prerequisite 1: Outdoor Water Use Reduction

Drip irrigation and native plantings will reduce the landscape water demand by at least 50% from a calculated baseline case.

WE Prerequisite 2: Indoor Water Use Reduction

The Project will specify plumbing fixtures in the building to achieve a minimum 20 percent reduction in water use over an established baseline through low-flow waterclosets, low-flow showers and low-flow sinks.

WE Prerequisite 3: Building-Level Water Metering

The Site is currently metered and will continued to be monitored. Monitoring efforts influence financial analysis and sustainability behavioral change efforts to develop a culture of conservation.

WE Credit 1: Outdoor Water Use Reduction

Drip irrigation and native plantings will reduce the landscape water demand by at least 50% from a calculated baseline case.

WE Credit 2: Indoor Water Use Reduction

Water efficient fixtures in the addition will include low-flow plumbing fixtures which are estimated to yield a water use reduction of greater than 40%.

WE Credit 3: Cooling Tower Water Use

The Project team is designing mechanical systems that control water use, while at the same time avoiding corrosion and premature failure/replacement. Calculations are being run to understand cycles and demand to reduce water consumption.

WE Credit 4: Water Metering

Plans call for building wide domestic water usage and irrigation sub-metering.

4.2.5 ENERGY AND ATMOSPHERE

The Project will use energy efficient equipment and fixtures throughout the building and Project Site. In addition, the University has existing strategies and incentives in place throughout the campus to encourage building occupants to reduce their individual energy consumption including Green Office and Green Department Certification programs modeled on LEED. See: <http://www.bu.edu/sustainability/campus-resources/green-office/>.

EA Prerequisite 1: Fundamental Commissioning and Verification

A qualified commissioning agent will review the Project to ensure that the Project's energy related systems are installed, calibrated, and perform properly at peak efficiency.

EA Prerequisite 2: Minimum Energy Performance

The Project proposes to exceed the minimum energy performance standards (10% improvement in building performance over a baseline building performance rating). Installation of added insulation to the exterior walls and energy efficient double-glazed windows, among integrated energy efficient mechanical systems, will contribute to the Project's overall energy performance, which is expected to be a minimum of a 20% reduction from baseline building performance.

EA Prerequisite 3: Building-Level Energy Metering

The Project may achieve this prerequisite by installing whole-building energy metering and sharing building energy and water use data with the U.S. Green Building Council and the City of Boston through Portfolio Manager.

EA Prerequisite 4: Fundamental Refrigerant Management

Chillers are specified with R-134a refrigerant, which is an HFC (Hydrofluorocarbon).

EA Credit 1: Enhanced Commissioning

The Project will seek to reduce energy use, lower operating costs, increase user productivity, and verify that the systems perform in accordance with the Project requirements by engaging a Commissioning Agent. The Commissioning Agent will review the Design Development drawings and specifications and provide reviews of systems after performance verification is completed.

EA Credit 2: Optimize Energy Performance

A whole building energy simulation will be performed for the Project. The baseline model will be created in accordance with ASHRAE 90.1-2010, Appendix G, as required for an existing building renovation. Specific technologies and systems are anticipated to achieve the overall building efficiency are as follows:

- Boilers and domestic hot water heaters: The Project has specified high efficiency condensing units;
- Chillers: High efficiency magnetic bearing units with excellent part load efficiency are specified for the Project;
- Valance Units: Hydronic based system for heating and cooling will require no fan motors or filters at the terminal units to reduce operating and maintenance costs and take advantage of energy recovery at the air handlers;
- Dedicated Outside Air Systems ("DOAS") with Energy Recovery: 100% outside processing air handlers utilized to heat, cool, and dehumidify the Project fresh air before it is supplied to the space. DOAS also ensures accurate outside air

volumes are delivered. Systems capture waste heat and cooling from building exhaust systems by incorporating energy recovery wheels;

- Demand Control Ventilation: The first floor Variable Air Volume (“VAV”) handlers will adjust outside air intake flow rates by measuring indoor carbon dioxide levels in high occupant density spaces; modulate dryer exhaust and laundry room make-up air rate based on dryer demand;
- Variable Speed Drives: Variable Speed Drives will be provided for all major equipment associated with the Project;
- Premium Efficiency Motors: Premium efficiency motors are specified for large HVAC pumps and fans;
- ECM Motors: Electrically commutated motors (“ECMs”) specified for smaller HVAC pumps and fans;
- LED Lighting: The Project specifies LED lighting to reduce energy consumption; and
- Low Flow Plumbing Fixtures: The Project will utilize low flow plumbing fixtures to reduce hot water consumption.

EA Credit 3: Advanced Energy Metering

The Project Team is hoping to utilize the University’s third-party metering software system, SourceOne, to achieve this credit.

EA Credit 6: Enhanced Refrigerant Management

The Project Team is exploring options for achieving this credit.

EA Credit 7: Green Power and Carbon Offsets

The Project Team is exploring options for achieving this credit.

4.2.6 MATERIALS AND RESOURCES

By selecting sustainably produced materials and materials with recycled content, the Project will reduce the overall negative impact of resource use for the Project. During the construction phase, efforts will be made to reduce the waste produced for material production, material transportation, and waste disposal.

MR Prerequisite 1: Storage and Collection of Recyclables

Boston University maintains a robust campus-wide sustainability program, part of which includes a progressive recycling effort which resulted in a 37% diversion rate in 2016 and a 16% reduction in total waste from a 2005 baseline.

MR Prerequisite 2: Construction and Demolition Waste Management Planning

The Project will achieve a documented 75% diversion rate of construction, demolition, and land clearing waste from disposal in landfills. All subcontractors considered for the Project will have a current Construction Waste Management Plan that has been developed to fit the needs of this Project.

MR Credit 1: Building Life-Cycle Impact Reduction

The Project is not renovating all existing spaces, focusing on a targeted need and hopes to achieve this credit.

MR Credit 2: Building Product Disclosure and Optimization – Environmental Product Declarations

The Project Team is exploring options for achieving this credit.

MR Credit 3: Building Product Disclosure and Optimization – Sourcing of Raw Materials

The Project seeks to include 20% or greater total recycled content and 20% or more of the building materials from within a 500-mile radius of the Site. Additionally, the Proponent may seek to use Forest Stewardship Council Certified wood-based materials for at least 50% of the wood-based materials used in the Project.

MR Credit 4: Building Product Disclosure and Optimization – Materials Ingredients

The Project Team is exploring options for achieving this credit.

MR Credit 5: Construction and Demolition Waste Management

The Project will achieve at least a documented 75% diversion rate of construction, demolition, and land clearing waste from disposal in landfills. All subcontractors considered for the Project will have a current Construction Waste Management Plan that has been developed to fit the needs of this Project.

4.2.7 INDOOR ENVIRONMENTAL QUALITY

Given that the Project includes clinic space, Indoor Environmental Quality is particularly important to the Project. The Project seeks to improve the Indoor Environmental Quality by providing sufficient ventilation air and reducing the

indoor air contaminants that are used in building materials or introduced by building users.

IEQ Prerequisite 1: Minimum Indoor Air Quality Performance

The Project is mechanically ventilated and will be designed to meet the ventilation rates required by ASHRAE 62.1-2007.

IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

The Proponent has an existing policy that prohibits smoking in all campus facilities and enclosed workplace areas. This existing policy will apply to the Project. In addition, smoking will be prohibited within 25' of the building's exterior openings and air intakes.

IEQ Credit 1: Enhanced Indoor Air Quality Management Plan

Each air handling system includes an air flow measuring station to monitor the outdoor air delivered via mechanical ventilation. Efforts will be made in the Project to reduce the building occupants' exposure to hazardous particulates and chemical pollutants. A combination of permanent entry grates and seasonal walk-off mats will be employed at the building entry. The janitorial closets and any hazardous chemical storage rooms will have dedicated exhaust to reduce contamination of the air in surrounding corridors and rooms.

IEQ Credit 2: Low-Emitting Materials

The Project will use low-emitting adhesives and sealants, low-emitting paints and coatings, as well as low-emitting flooring and composite wood products to maintain air quality and ensure a healthy environment for construction workers and building occupants.

IEQ Credit 3: Construction IAQ Management Plan

An IAQ Management Plan will be developed prior to the start of work on the Project. It will be implemented during demolition, construction, and the equipment start-up phases to minimize the impacts of construction activities on air quality. All subcontractors considered for the Project will have a current IAQ Management Plan and Best Practices checklist which will be tailored to the Project needs. Implementation and compliance of IEQc3.1 and IEQc3.2 will be monitored with a report containing photographs and a narrative for submission at the conclusion of the Project.

IEQ Credit 4: Indoor Air Quality Assessment

The Proponent may pursue a full building flush in compliance with Option 1 of the LEED Reference Guide or air quality testing in accordance with Option 2.

IEQ Credit 5: Thermal Comfort

The Project is mechanically conditioned and ventilated. Care was taken to select air distribution devices which will limit drafts and thermal stratification.

System capacities have been determined using the following conditions:

- Summer Outside Temperature: 87°F/71°F Dry Bulb/Wet Bulb
- Winter Outside Temperature: 7°F Dry Bulb
- Summer Indoor Temperature: 75°F
- Winter Indoor Temperature: 72°F

IEQ Credit 6: Interior Lighting

Each individual workstation or enclosed office will have its own lighting controls. Not only do individual controls allow greater user comfort, they also can reduce the overall energy consumption of the building because rooms will not need to be lit if they are unoccupied. Shared multi-occupant spaces will have lighting controls to enable adjustments that meet group needs and preferences such as bi-level switching, scene controllers or multiple zones. Occupancy sensors will be installed in all occupied spaces.

IEQ Credit 8: Quality Views

The majority of regularly-occupied spaces in the Project have exterior windows and/or interior glazing that provide daylight and direct access to exterior views.

IEQ Credit 9: Acoustic Performance

The Project team is taking great effort to provide for occupant well-being, productivity, and care and hopes to achieve this credit.

4.2.8 INNOVATION

In addition to the credits listed above, the Project will incorporate other sustainable design features that will reduce its overall environmental impact. Some of these sustainable design features can be categorized into Innovation and Design credits.

ID Credit 1: Innovation

The Project is within close proximity to several MBTA bus lines and route stops that provide more than twice the number of daily trips required to achieve SS credit 4.1.

The Project will achieve an additional credit for Exemplary Performance for diverting more than 95% of construction, demolition, and land clearing waste from disposal in landfills.

The University will use active signage throughout the building to educate staff, students, and visitors about the sustainable design features included in the building. Additionally, an online case study will be developed to share knowledge for future projects at the University and beyond.

The University currently uses environmentally sensitive cleaning products to maintain facilities. This standard for cleaning supplies will be maintained in the Project.

The design team has implemented an integrative process to support high performance, cost-effective outcomes for the Project by analyzing key systems and interrelationships early in the design process.

ID Credit 2: LEED Accredited Professional

The design team includes LEED Accredited Professionals.

4.2.9 REGIONAL PRIORITY

The Project seeks to achieve four credits that are particularly important to the area in which the Project is located, specifically Boston’s South End neighborhood.

RP Credit 1: Optimize Energy Performance

The Project will use energy efficient equipment and fixtures throughout the building and Project Site. In addition, the University has existing strategies and incentives in place throughout the campus to encourage building occupants to reduce their individual energy consumption including Green Office and Green Department Certification programs modeled on LEED.

RP Credit 2: Rainwater Management

The Project is located within the Groundwater Conservation Overlay District (GCOD) and will comply with the requirements of Article 32 of the Boston Zoning Code to the greatest extent practicable. Article 32 requires that proposed projects promote infiltration of rainwater by capturing no less than one inch across the portion of the surface area of the lot to be occupied by the Project (or, in the case of a Substantial Rehabilitation, the lot area occupied by the structure to be Substantially Rehabilitated).

RP Credit 3: Indoor Water Use Reduction

Water efficient fixtures in the addition will include low-flow plumbing fixtures which are estimated to yield a water use reduction of greater than 40%.

RP Credit 4: High Priority Site

Based on initial soil conditions, there is likelihood this site has contaminations, such as PCBS, that will require removal and site clean-up. The Project team understand the necessity for good soil conditions and will take efforts to ensure the whole site is clean.

4.3 SUSTAINABLE PRACTICES

While certain challenges exist when renovating and expanding an aging building, a number of measures have been incorporated to address sea level rise and climate change.

Generator and emergency power distribution equipment has been moved to the roof penthouse. The location of the server room containing head end telecommunications equipment, which is presently located in the basement, has been moved to fourth floor.

4.4 CLEAN AND RENEWABLE ENERGY PRACTICES

The Proponent and Project Team are evaluating the feasibility of utilizing the roof area on the Project for photovoltaic panels. Due to the fact that the majority of the roof is comprised of the existing structure, and the remainder will be utilized for mechanical equipment, there are minimal practicable opportunities to add a system of this type to the roof of the building.

4.5 ENERGY MODEL

A Draft Energy Model will be provided under separate cover.

4.6 ENERGY EFFICIENCY ASSISTANCE

Boston University has Memoranda of Understandings with National Grid and Eversource to reduce natural gas and electricity consumption over three years. Incentives from Eversource for upgrading the entire facility lighting system to LED technology are also being explored. Providing automatic lighting controls is also appropriate for this Project. There may also be utility incentives for providing automatic lighting controls.



LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

BOSTON UNIVERSITY - Henry M. Goldman School of Dentistry

5/10/2017

Y ? N

1			Credit 1	Integrative Process		1
12	2	2	Location and Transportation		Possible Points:	16
			Credit 1	LEED for Neighborhood Development Location		16
1			Credit 2	Sensitive Land Protection		1
	2		Credit 3	High Priority Site		2
5			Credit 4	Surrounding Density and Diverse Uses		5
5			Credit 5	Access to Quality Transit		5
		1	Credit 6	Bicycle Facilities		1
1			Credit 7	Reduced Parking Footprint		1
		1	Credit 8	Green Vehicles		1
5	3	2	Sustainable Sites		Possible Points:	10
Y			Prereq 1	Construction Activity Pollution Prevention		Required
1			Credit 1	Site Assessment		1
		2	Credit 2	Site Development--Protect or Restore Habitat		2
	1		Credit 3	Open Space		1
2	1		Credit 4	Rainwater Management		3
2			Credit 5	Heat Island Reduction		2
	1		Credit 6	Light Pollution Reduction		1
6	4	1	Water Efficiency		Possible Points:	11
Y			Prereq 1	Outdoor Water Use Reduction		Required
Y			Prereq 2	Indoor Water Use Reduction		Required
Y			Prereq 3	Building-Level Water Metering		Required
1	1		Credit 1	Outdoor Water Use Reduction		2
4	1	1	Credit 2	Indoor Water Use Reduction		6
1	1		Credit 3	Cooling Tower Water Use		2
	1		Credit 4	Water Metering		1
12	2	19	Energy and Atmosphere		Possible Points:	33
Y			Prereq 1	Fundamental Commissioning and Verification		Required
Y			Prereq 2	Minimum Energy Performance		Required
Y			Prereq 3	Building-Level Energy Metering		Required
Y			Prereq 4	Fundamental Refrigerant Management		Required
3		3	Credit 1	Enhanced Commissioning		6
8		10	Credit 2	Optimize Energy Performance		18
	1		Credit 3	Advanced Energy Metering		1
		2	Credit 4	Demand Response		2
		3	Credit 5	Renewable Energy Production		3
1			Credit 6	Enhanced Refrigerant Management		1
	1	1	Credit 7	Green Power and Carbon Offsets		2

4	6	3	Materials and Resources	Possible Points: 13
Y			Prereq 1 Storage and Collection of Recyclables	Required
Y			Prereq 2 Construction and Demolition Waste Management Planning	Required
	2	3	Credit 1 Building Life-Cycle Impact Reduction	5
	2		Credit 2 Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit 3 Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit 4 Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit 5 Construction and Demolition Waste Management	2

7	5	4	Indoor Environmental Quality	Possible Points: 16
Y			Prereq 1 Minimum Indoor Air Quality Performance	Required
Y			Prereq 2 Environmental Tobacco Smoke Control	Required
1	1		Credit 1 Enhanced Indoor Air Quality Strategies	2
3			Credit 2 Low-Emitting Materials	3
1			Credit 3 Construction Indoor Air Quality Management Plan	1
	1	1	Credit 4 Indoor Air Quality Assessment	2
1			Credit 5 Thermal Comfort	1
1	1		Credit 6 Interior Lighting	2
		3	Credit 7 Daylight	3
	1		Credit 8 Quality Views	1
	1		Credit 9 Acoustic Performance	1

5	1	0	Innovation	Possible Points: 6
4	1		Credit 1 Innovation	5
1			Credit 2 LEED Accredited Professional	1

3	1	0	Regional Priority	Possible Points: 4
1			Credit 1 Regional Priority: Optimize Energy Performance - 8 Points	1
1			Credit 2 Regional Priority: Rainwater Management	1
1			Credit 3 Regional Priority: Indoor Water Use Reduction - 4 points	1
	1		Credit 4 Regional Priority: High Priority Site	1

55	24	31	Total	Possible Points: 110
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Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Chapter 5

TRANSPORTATION

CHAPTER 5: TRANSPORTATION

5.1 PROJECT DESCRIPTION

The Proponent is proposing to expand and renovate the GSDM, which is located at 100 East Newton Street within the BUMC.

The BUMC is located in the South End neighborhood of Boston. Regional vehicular access to the BUMC Campus via the north and south is provided directly via the Massachusetts Avenue Connector. At Massachusetts Avenue, the Connector joins Melnea Cass Boulevard, which provides a direct connection to the Longwood Medical and Academic Area. Local vehicular access is primarily from Harrison Avenue, Massachusetts Avenue, and Albany Street. East Concord Street and East Newton Street provide connections from the primary campus parking facilities (the 710 Albany Street and 610 Albany Street garages) to other facilities within the campus.

Although the existing building will increase in size by approximately 41,900 GFA, there is not expected to be a significant increase in the student or faculty population. The treatment chair count is expected to increase in number from approximately 169 to 175. Because there will not be a significant increase in the head count at the GSDM, especially during the commuting peak periods, the transportation impacts related to the Project are negligible.

The following is a description of the existing transportation conditions in the area, which are not expected to change or be measurably impacted due to the Project. The proposed transit, pedestrian, and bicycle improvements detailed in Section 4.0 of the BUMC 2013 IMP Amendment will accommodate all trips generated by the Project.

5.2 PEDESTRIAN ACCOMMODATIONS

The medical campus, with its treatment and academic functions, generates a significant number of pedestrian trips throughout the study area, including trips along and across many of the City streets and campus paths.

In general, sidewalks are provided along all roadways throughout the BUMC and are in good condition. Most sidewalks are 8–10 feet wide. Crosswalks are provided at all intersections. Pedestrian signal equipment is provided at the signalized study area intersections.

5.3 BICYCLE ACCOMMODATIONS

The existing pathways along Melnea Cass Boulevard (South Bay Harbor Trail) and the Southwest Corridor Park provide bicycle access to and from the medical area. The City of Boston has created marked bike lanes and marked shared-travel bike lanes on Massachusetts

Avenue and Albany Street. Albany Street, Massachusetts Avenue, Harrison Avenue, and East Newton Street are generally considered on-street bicycle routes in this area. In addition, the City and State are currently in the process of expanding the South Bay Harbor Trail from Albany Street to the South Boston Waterfront, which will provide an off road route to and from the north of the medical area.

As more fully described in Section 5.7, the Proponent, through its membership in TransComm, provides sheltered and secure bike parking throughout the campus, subsidized Hubway memberships, discounted bike helmets and free bike lights, and other promotional activities for bicycling.

5.3.1 BICYCLE SHARING SERVICES

Hubway is a bicycle sharing system in Metro Boston. Launched in July 2011, Hubway has more than 140 stations with 1,300 bicycles available throughout Boston, Brookline, Cambridge, and Somerville. The following four locations are near to and serve the BUMC and the Project Site, and are shown in Figure 5-1:

- Harrison Avenue and East Concord Street,
- Washington Street at Rutland Street,
- Washington Street at Lenox Street, and
- Washington Street at Waltham Street.

5.4 PUBLIC TRANSPORTATION

There are several public transportation services offered through the Medical Campus, including MBTA bus service, Silver Line, and Commuter Rail Service, as well as TransComm Shuttle Services. Existing public transportation service is not expected to be impacted by the Project.

5.4.1 MBTA SERVICES

Five MBTA bus routes currently provide public transit service to the Project Site. Major bus stops with shelters on the BUMC Campus are located on East Newton Street and East Concord Street between Harrison Avenue and Albany Street.

Boston's first Bus Rapid Transit service, the "Silver Line," has two routes within a quarter-mile walk from the Project Site on Washington Street at East Newton Street: SL4 and SL5. Both routes have a terminal at Dudley Square, with the SL4 continuing to South Station and the SL5 to Downtown Crossing.

The closest existing MBTA Commuter Rail stations are found at Back Bay Station and NewMarket Station, both less than a mile from the GSDM. South Station and Ruggles Station, which also offer commuter rail services, are located approximately 1.5 miles from the Project Site. Back Bay, Ruggles and South stations offer other services in addition to the commuter rail; Back Bay and Ruggles stations have access to the Subway Orange Line and South Station to the Subway Red Line and reliable bus services.

The nearby MBTA services are shown in Figure 5-2 and summarized in Table 5-1.

Table 5-1: MBTA Bus Service and Silver Line Bus Rapid Transit

Bus Route	Origin–Destination	Rush-hour Frequency (min)
CT #1	Central Square (Cambridge)–BUMC	20
CT #3	Beth Israel Hospital or BUMC–Andrew Station	20
8	Harbor Point/UMass–Kenmore	15–20
10	City Point–Copley Square	20
47	Central Square (Cambridge)–Broadway Station	8-10
SL4	Dudley Station–South Station	10
SL5	Dudley Station–Downtown Crossing	7-10

Sources: www.mbta.com, February 2017

5.4.2 TRANSCOMM SHUTTLE SERVICES

BUMC’s TMA founded Transportation Solutions for Commuters, Inc. (TranSComm) in 1991. The service brings more frequent and accessible public transportation to the Medical Center community and provides information on transportation services in the area.

Schedules are readily available at: www.transcomm.org. TranSComm operates between 15-30 passenger shuttles, including:

- VA Shuttles for employees and students travel from Boston Veterans Administration Medical Center (VA) in Jamaica Plain to the BUMC Campus;
- Evening shuttle travels on request from a central stop at 710 Albany Street to MBTA subway stations at Andrew, Broadway, Ruggles, Back Bay, and Copley stations, nearby South End neighborhood locations, and BUMC parking lots and garages;
- Inner Campus Shuttle, primarily for patients, travels on a continuous loop between institutions;

- Healthnet Shuttle, a free service, travels from Boston neighborhoods to Boston Medical Center (for patients only);
- Charles River Campus Shuttle travels from BU Charles River Campus in an hourly basis; and
- TranSComm allows South End residents to use its shuttle services at no cost.

5.5 PARKING

An inventory of the existing off-street and on-street parking in the vicinity of the Project was taken. The off-street parking and on-street parking is summarized in the sections below. Parking in the area is not expected to be impacted by the Project.

5.5.1 OFF-STREET PARKING

BUMC is served by approximately 3,420 spaces. Of those spaces, approximately 2,665 are provided in on-site garages, with the remaining spaces located at surface lots.

5.5.2 ON-STREET PARKING

As shown in Figure 5-3, parking in the quarter-mile surrounding the Project Site consists primarily of metered parking and resident permit only. Several areas around the Project Site are restricted to MBTA bus stops and loading zones.

5.5.3 CAR SHARING SERVICES

Car sharing services enable easy access to short-term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Pick-up/drop-off locations are typically in existing parking lots or other parking areas throughout neighborhoods as a convenience to users of the services. Nearby car sharing services provide an important transportation option and reduce the need for private vehicle ownership.

One major car sharing service with vehicle locations near the Project Site is Zipcar. There are currently four Zipcar locations within a quarter-mile walk of the Project Site. The nearest car sharing location to the Project Site is at East Newton Street/BioSquare Drive – BU Medical on-street.

The nearby car sharing locations within a quarter-mile of the Project Site are shown on Figure 5-4.

5.6 PROJECT IMPACTS

As stated above, although the Project will expand and renovate the existing building, the GSDM will not be increasing the number of students or faculty. However, the department is seeking to increase the number of treatment chairs by six. This addition will result in negligible vehicle trips.

Some minor transportation modifications will be necessary to accommodate the Project. The main pedestrian entrance to the building will be relocated from East Newton Street to Albany Street. A bus shelter and miscellaneous signal equipment serving the intersection of Albany Street and East Newton Street will be relocated. The GSDM will continue to use a loading dock in the existing location, accessed from Albany Street between East Newton Street and East Brookline Street. Figure 5-5 shows the Project Site Access and Circulation.

5.7 TRANSPORTATION DEMAND MANAGEMENT

BUMC continues to work to reduce the number of drive alone trips to the medical area, both through efforts of the individual institutions and through TranSComm, the area's active TMA. TranSComm, BMC, and BUMC have won several awards in recent years, including the 2016 Mayor's Silver Award for Bike Friendly Business, a Bicycle Friendly University Award from The League of American Bicyclists, and the "Pinnacle Award" for the Massachusetts Excellence in Commuter Options (ECO Awards). BUMC participates in several member sustainability committees, including BMC'S Green Committee, BUMC's Sustainability Committee, and Boston University's Sustainability Committee (Charles River Campus).

Due to the TDM efforts, existing employees and students at Boston University Medical Center have a significantly lower single vehicle auto use than the BTM mode share rates at only 16%. The remaining mode split reflect 5% of those who carpool, 19% who use public transit, 11% who cycle, and 19% who walk to BUMC. This rate reflects the strong transportation demand management program in effect.

Through TranSComm, BUMC will continue to encourage and assist its employees and students, as well as patients and visitors, to use many of the demand management and trip reduction programs offered:

- BU students can enroll in the 11% discounted MBTA's semester pass program through TranSComm.
- Full-time BU employees who work on the Medical Campus and do not currently have parking permits may sign up for a monthly MBTA pass pre-tax and a 35-50% transit subsidy program through payroll deduction. Up to \$230 per month is tax deductible.
- MBTA and shuttles schedules are posted.

- On-line transit and rideshare information is provided on the TranSComm Website: <http://www.bumc.bu.edu/transcomm/>
- Transit rider “Read & Ride” Library, Lending Umbrellas, and Bike Locks programs are provided for commuters in the TranSComm office.
- TranSComm works with the MBTA and BTB to improve bus service, wayfinding, and pedestrian safety around the campus.
- TranSComm works with Vision Zero Boston to improve traffic safety.
- TranSComm provides discounted \$5 bike helmets and free bike lights at the office to promote bicycle safety.
- BUMC provides 5 free shuttle services:
 - Inner Campus Shuttle for patients and visitors;
 - VA/Medical Center Shuttle for patients and medical staff;
 - Evening Shuttle to T stations and neighborhood within a mile for staff and students;
 - Boston University Shuttle (the BUS), a ten minute weekday service and thirty minute Saturday service for students, staff, and faculty; and
 - 610 Albany Street Shuttle to the employee parking garage.
- Since June 2007, preferential parking has been provided for Vanpool, Carpool/Hybrid, and Electric Vehicle program participants on the first level of the 610 Albany Garage.
- TranSComm launched new Guaranteed Ride Home program for vanpoolers, carpoolers, and MBTA pass program participants in 2016, ensuring that vanpool, carpoolers and transit users will have a ride home in case of emergency.
- TranSComm participates in NuRide, a free website and tool provided by MassDOT to reward travelers for taking “green” trips – i.e. walk, bike, telecommute, carpool, vanpool, subway, train, bus, or ferry trips, or even working a compressed week: <https://www.bumc.bu.edu/transcomm/nuride>.
 - Travelers log their transit, bus, or walk trips to work on the website and are rewarded with discounts to stores, restaurants, entertainment, etc. NuRide also serves as the Commonwealth’s rideshare database for finding vanpool and carpool partners.

- Gas-powered scooter parking for six scooters is provided in the 610 Albany Street Garage. Electric-powered scooters can also be accommodated in the bike cages.
- TranSComm offers sheltered and secured bicycle parking at several on-campus locations. There are currently 360 cyclists who use the bike cages.
- TranSComm participates and organizes the Annual MassCommute Bike Challenge Week, a free Cyclists' Luncheon, free Bike Safety Checkups and Workshops, and free Cyclists' Breakfasts.
- BUMC provides an on-site car-sharing service and two dedicated parking spaces for shared-use vehicles (Zipcar).
- In early 2017, two dual 240-volts stations were installed in the 610 Albany Street garage. TranSComm also received funding to install and upgrade four dual 240-volt electric vehicle (EV) charging stations on the ground floor of the 710 Albany Street Garage in December 2016. Each station can accommodate 2 vehicles for a total of 12 in both garages. The stations are open to the public in return for paying the appropriate parking fee. The BMC/BUMC community can charge vehicles with free electricity for up to four hours and pay \$10 per hour after the four hours of free charging. There are currently fifteen regular users of these stations at both garages. The stations are also used by patients and visitors at the 710 garage.
- TranSComm publishes a medical campus walking map and offers neighborhood walks for the South End's medical history, Discover Roxbury, and South of Washington Area (SOWA) at lunch time for employees and others. Besides designating short and long "neighborhood walking" loops covering areas like the Southwest Corridor Park, Discover Roxbury, Medical History, and the SOWA arts district, this map shows restaurants and community services such as ATM's and dry cleaners as well as the mileage from BUMC to the neighboring MBTA stations.
- In 2014, TranSComm subsidized Hubway membership at bronze level with a discounted rate at \$37.50 (regular rate \$85) per year for employee and students.
- BUMC, through TranSComm, publishes a periodic transportation newsletter and holds events to encourage its employees and students to use the alternative commuter transportation system. TranSComm also contributes a column in the MassCommute newsletters.

5.8 TRANSPORTATION MITIGATION MEASURES

The Proponent will continue to work with the City of Boston so that the Project efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle

use. As part of the construction process, the Project will reconstruct the sidewalks along the Project Site frontage where necessary.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (“TAPA”), a formal legal agreement between the Proponent and the Boston Transportation Department (“BTD”). The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed.

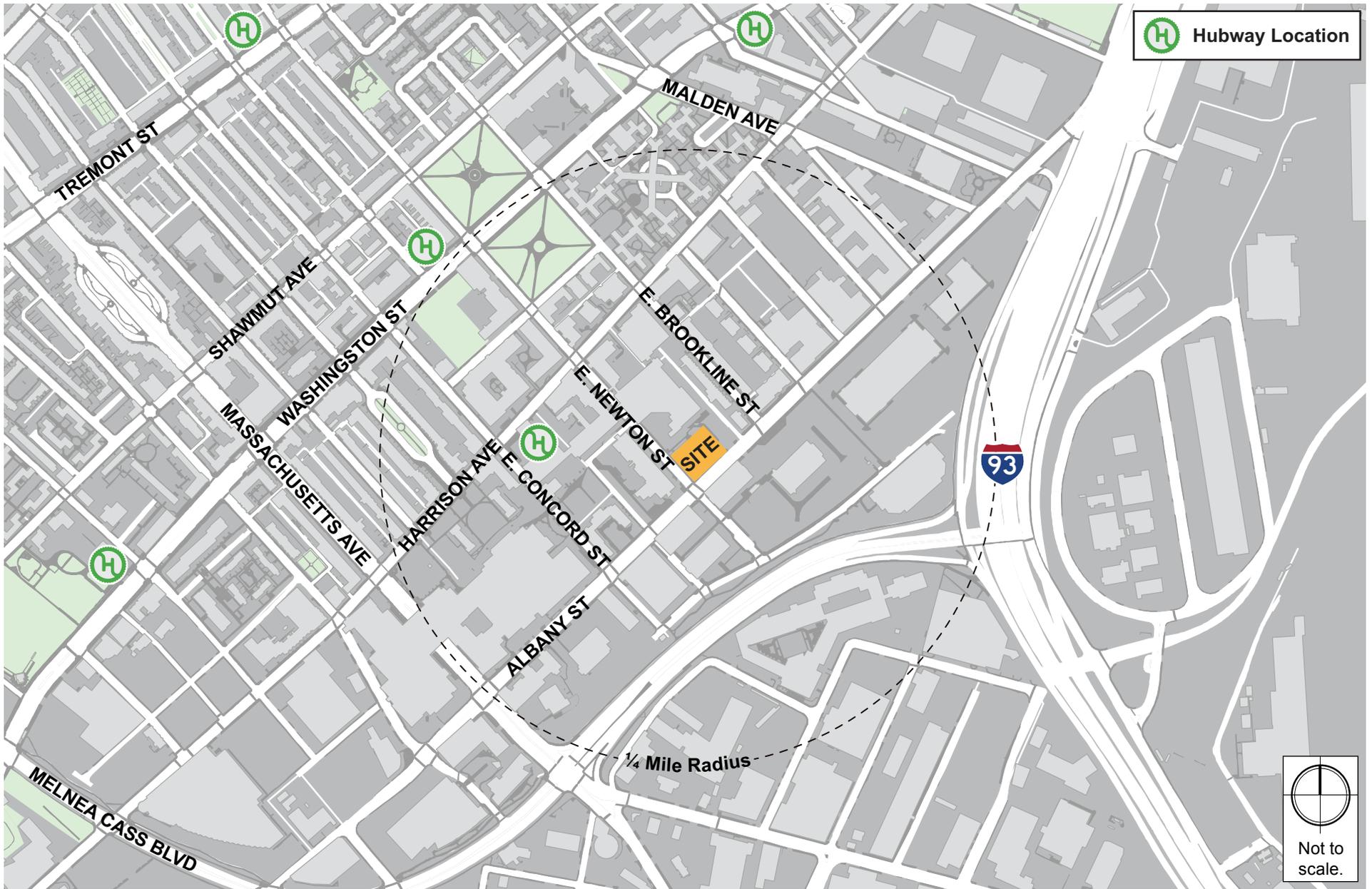
5.9 EVALUATION OF SHORT-TERM CONSTRUCTION IMPACTS

Most construction activities will be accommodated within the current Project Site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (“CMP”) to be filed with BTD in accordance with the City’s transportation maintenance plan requirements.

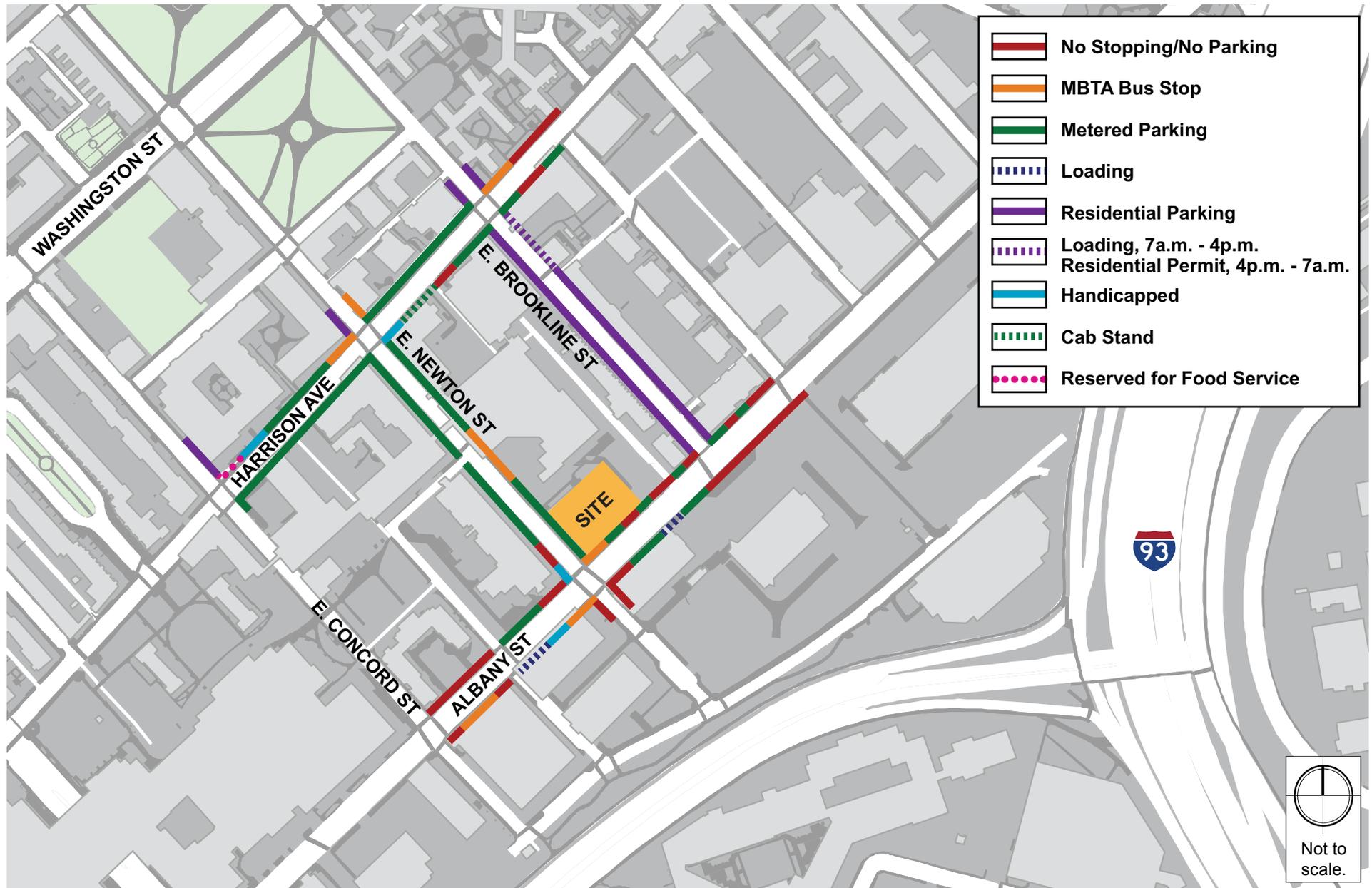
To minimize transportation impacts during the construction period, the following measures will be considered for the CMP:

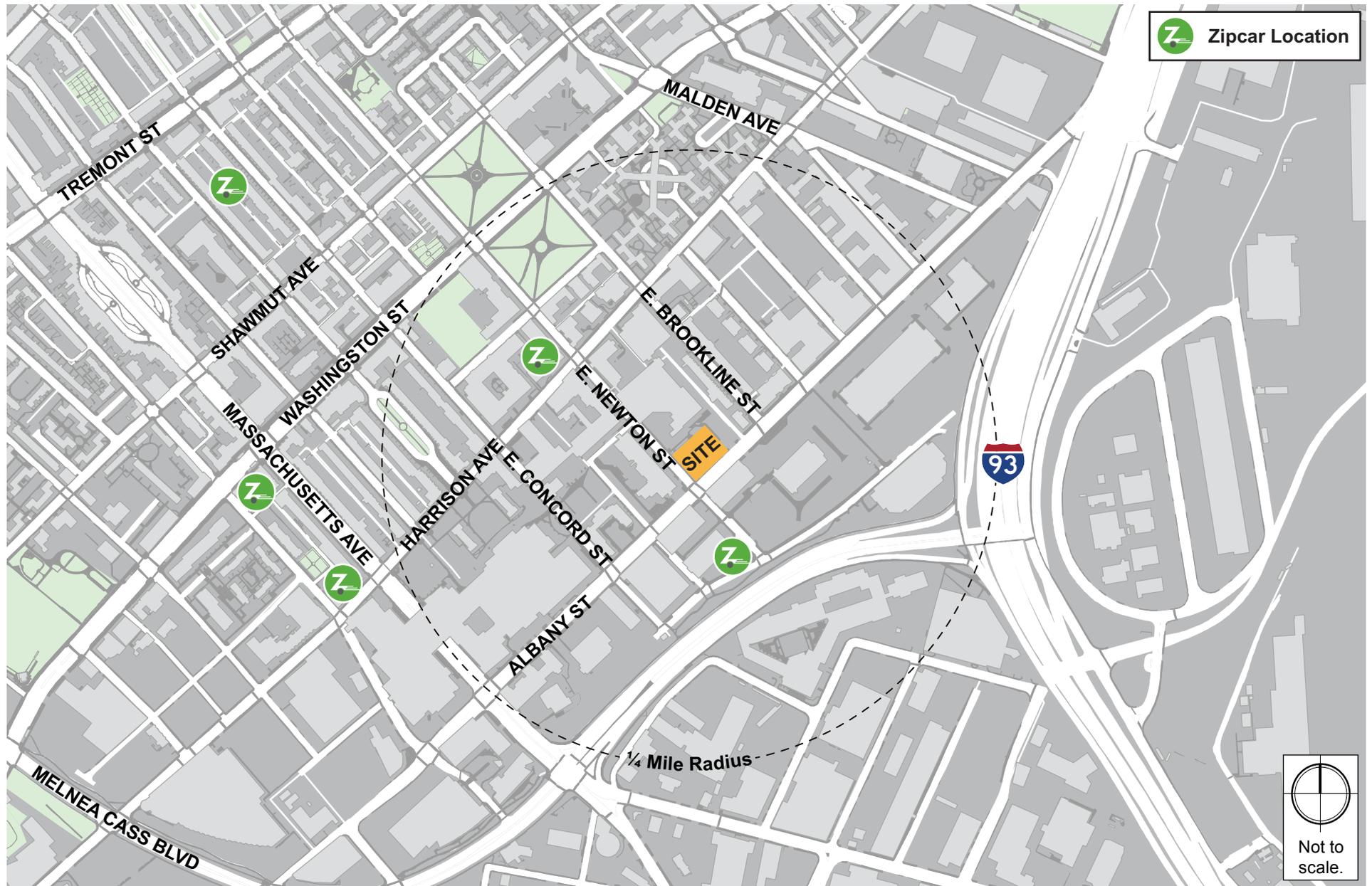
- Limited construction worker parking on-site,
- Encouragement of worker carpooling,
- Consideration of a subsidy for MBTA passes for full-time employees, and
- Providing secure spaces on-site for workers' supplies and tools so they do not have to be brought to the site each day.

The CMP to be executed with the City prior to commencement of construction will document all committed measures.











Chapter 6

ENVIRONMENTAL

CHAPTER 6: ENVIRONMENTAL

6.1 INTRODUCTION

The Project will be built in full compliance with local, state, and federal environmental regulations and will improve the existing environmental conditions of the Project Site. The Project will not create undue wind, shadow, noise, solar glare, or air quality impacts in the surrounding areas. A CMP will be prepared prior to commencement of construction to avoid and mitigate construction impacts.

6.2 WIND

The Project consists primarily of an interior renovation and exterior rehabilitation and expansion of the existing 7-story structure. The height and massing of the building will remain consistent with the existing building envelope and will result in no or de minimus alterations to the current impact on wind levels.

6.3 SHADOW

The Project will renovate and expand the existing structure on the Project Site. The height and massing of the GSDM building will remain consistent with the existing building envelope.

A shadow analysis was conducted for the Project to evaluate the potential shadow impacts in the vicinity of the Project Site as a result of the new 7-story addition and porch. Table 6-1, Shadow Study Dates and Times, identifies the dates and times for which the shadow conditions have been simulated. This section describes the shadow areas and their potential impacts on nearby properties. The results of the shadow analysis are illustrated in Figures 6-1 through 6-8, Shadow Studies.

Table 6-1: Shadow Study Dates and Times

Date	Time
Vernal Equinox – March 21 st	9:00 AM, 12:00 PM, 3:00 PM, 6:00 PM
Summer Solstice – June 21 st	9:00 AM, 12:00 PM, 3:00 PM, 6:00 PM
Autumnal Equinox – September 21 st , EDT	9:00 AM, 12:00 PM, 3:00 PM, 6:00 PM
Winter Solstice – December 21 st , EDT	9:00 AM, 12:00 PM, 3:00 PM, 6:00 PM

Vernal Equinox – March 21st

At 9:00 AM, a new shadow will be cast in the north-west direction onto the courtyard in front of the Newton Pavilion property owned by Boston Medical Center (the “Newton Pavilion property”).

At noon, a new shadow will be cast in the northern direction along the Newton Pavilion property.

At 3:00 PM, a new shadow will be cast in the north-east direction within the GSDM loading dock area.

At 6:00 PM, a sliver of a new shadow will be cast in the easterly direction across Albany Street.

Summer Solstice – June 21st

At 9:00 AM, a new shadow will be cast in the north-west direction onto the courtyard in front of the Newton Pavilion property.

At noon, a new shadow will be cast in the northern direction along the Newton Pavilion property.

At 3:00 PM, a new shadow will be cast in the north-east direction within the GSDM loading dock area.

At 6:00 PM, a new shadow will be cast in the easterly direction across Albany Street.

Autumnal Equinox – September 21st, EDT

At 9:00 AM, a new shadow will be cast in the north-west direction onto the courtyard in front of the Newton Pavilion property.

At noon, a new shadow will be cast in the northern direction along the Newton Pavilion property, owned by Boston Medical Center.

At 3:00 PM, a new shadow will be cast in the north-east direction onto the green space between Boston University and E. Brookline Street.

At 6:00 PM, no new shadow will be cast.

Winter Solstice – December 21st, EDT

At 9:00 AM, a sliver of a new shadow will be cast in the north-west direction onto the courtyard in front of the Newton Pavilion property.

At noon, a new shadow will be cast in the northern direction along the Newton Pavilion property.

At 3:00 PM, a sliver of a new shadow will be cast in the north-east direction.

At 6:00 PM, no new shadow will be cast.

Conclusions

The shadow study for the Project was completed using computer modeling to illustrate the new shadow created by the Project. The results of the analysis revealed that the Project will have a minor effect on the shadows cast around the Project Site throughout the year. The location of the Project Site is in a densely developed urban area. The new shadows will occur as a result of the proposed building addition, the addition of the porch roof, and the landscape treatments around the loading area.

6.4 DAYLIGHT

This Project will alter the massing of the current condition due to the addition on the north-west side. A minor amount of daylight will be reduced on the west elevation as shown in the shadow studies.

6.5 SOLAR GLARE

The Project's exterior materials consist of terracotta panels, clay coated brick, wood-look phenolic panels, aluminum curtain wall with low-e glazing, metal accent panels, and integrally colored ground face Concrete Masonry Units ("CMU"). The Project will not include reflective materials that will result in solar glare on the surrounding streets or sidewalks.

6.6 AIR QUALITY

The Project is not expected to adversely impact air quality in the vicinity of the Project Site. As no change to parking or traffic generation is anticipated as part of the Project, there will be no air quality impacts as a result of parking or traffic sources. Impacts to air quality as a result of building operations may improve as all major mechanical equipment will be updated and modernized with more efficient equipment.

6.7 NOISE

The Proponent does not anticipate an increase in noise impacts associated with the uses at the Project Site. The Boston Air Pollution Control Commission regulates noise in the City of Boston based on zoning and land use classification. The regulations define fixed noise limits for daytime and nighttime use of equipment serving the building (for institutional

areas, a maximum level of 60 decibels (“dBA”) for daytime use and 50 dBA for nighttime use is enforced). These levels are sound limits for equipment assessed at the boundaries of the Project. The limits apply to equipment that operates on a significant basis to serve the building, such as air conditioning equipment and fans. In addition to the overall sound level requirements, the regulations specify octave band frequency limits for daytime and nighttime periods.

The majority of the Project’s mechanicals will be located on the roof. The rooftop equipment is not expected to produce significant sound levels at the building property line. There will be a ground level compactor similar to the unit that is there now, which will keep the proposed noise volume at the same levels as the existing building operations generate.

6.8 FLOOD HAZARDS AND AREAS OF CRITICAL ENVIRONMENTAL CONCERN

In the past decade, climate change adaptation has gained national attention as a critical environmental factor that must be addressed in new development projects. In Boston, sea level rise has become a serious concern as recent weather patterns and projection modeling are demonstrating that the impact of storms on the City are likely to continue to intensify.

As part of its administration of the National Flood Insurance Program (NFIP), the Federal Emergency Management Agency (FEMA) publishes flood hazard maps, called Flood Insurance Rate Maps (FIRM). The purpose of a FIRM is to show the areas in a community that are subject to flooding and the risk associated with these flood hazards. The most recent FIRM maps for this area were revised in 2016 (Community Panel 25025C0076G). According to FEMA, the Project Site is not located in or near a FEMA flood zone.

No Areas of Critical Environmental Concern (ACEC) or State Certified Vernal Pools exist on the Site. Likewise, the Project Site is not included on the list of Estimated Habitats for Rare Wildlife.

6.9 GROUND WATER

The Project is located within the Groundwater Conservation Overlay District (GCOD), therefore the Project design will comply with GCOD and City standards by establishing design and construction methodologies that protect groundwater. Projects located within the GCOD are required to comply with Article 32 of the Boston Zoning Code, which requires that the project collect and infiltrate one-inch of stormwater over the project site and that the project results in no negative impact on groundwater levels to the greatest extent practicable. An engineers’ certification report will be submitted to demonstrate that the standards have been met. Methods to assure these standards include use of fully

waterproofed basement (walls and slab) for the portion of the structure that extends below groundwater levels. The Project will have no long term groundwater pumping.

Several groundwater monitoring wells were previously installed at and in the vicinity of the Project Site. Data obtained from previous wells indicate that groundwater levels range from El. 7 to El. 10 Boston City Base (“BCB”).

The proposed building addition includes one below-grade level. The foundation walls and basement mat slab will be waterproofed and supported on drilled minipiles that extend into rock. The structure will not cause the groundwater to raise, pond or be lowered in the surrounding area.

The Proponent will coordinate with the Boson Groundwater Trust (BGwT) in regard to groundwater monitoring prior to and during construction.

6.10 GEOTECHNICAL

Based on available test boring information obtained at the site, subsurface soil conditions underlying the proposed improvements are characterized by the following general soil profile:

Table 6-2: Existing Soil Conditions

Generalized Description	Approximate Elevation of Top of Layer (ft, BCB)
Fill	Ground Surface
Organic Deposits	El. 3 to El. 7
Sand and Silt Deposits (not always present)	El. 2 to El. -5
Marine Clay	El. 2 to El. -10
Glacial Till	El. -145
Bedrock (Cambridge Argillite)	El. -98 to -113

Note that in general, ground surface elevation varies between approximately El. 17 and 18.

Foundation Support and Below Grade Construction

The proposed building addition will be supported on minipiles that are drilled into the bedrock. The basement walls and foundation slab will be waterproofed.

A temporary lateral earth support system will be required to complete the excavation for the below grade space. The earth support system may be a relatively impermeable wall such as continuous interlocking steel sheet piles or a more permeable soldier pile and lagging wall. The excavation support wall will be extended into the underlying sand or marine clay deposit.

Temporary construction dewatering will be required inside the limits of the excavation support wall. Some of the groundwater pumped from the excavation will be recharged behind the excavation support wall. National Pollutant Discharge Elimination System permit for temporary construction dewatering will be obtained for discharge of dewatering effluent.

6.11 SOLID AND HAZARDOUS MATERIALS

In the future, site-specific information regarding environmental conditions will be obtained in order to evaluate the presence of oil and hazardous materials. Foundation construction for the new building will generate soil that requires off site transport. Chemical testing of the material will be required by receiving facilities to identify chemical constituents and any contaminants present. Chemical testing of the material will be conducted prior to construction in accordance with facility requirements.

Any material leaving the Project Site must be legally transported in accordance with local, state, and federal requirements. Due to physical properties of the clay material, it will likely be transported to facilities such as unlined landfills for use as daily cover. In addition, any regulated soil and/or groundwater conditions related to oil and hazardous materials will be managed in accordance with appropriate Massachusetts Department of Environmental Protection (“MA DEP”) regulatory requirements.

6.12 CONSTRUCTION IMPACTS

The following section describes impacts likely to result from the Project’s construction, and steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent has employed a construction manager who is responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies.

6.12.1 CONSTRUCTION ACTIVITY SCHEDULE

The construction period for the proposed Project will take place in three phases and is expected to last approximately 39 months beginning in January 2018. The Project will have an accelerated activity schedule with some shift work in the off-hours in order to mitigate construction impacts. The City of Boston Noise and Work Ordinance allows construction from 7:00 a.m. to 6:00 p.m., Monday through Friday, along with any approved exceptions. In order for the Project to comply with this ordinance and construct outside of the normal 7:00 a.m. to 6:00 p.m. weekday hours, the Proponent will seek a permit from the Commissioner of the Inspectional Service Department (“ISD”).

During each phase, the portion of the Project Site being worked on will be isolated and buffered in order to ensure that students and faculty working in other portions of the structures will experience minimal disruption. The Project phasing will allow for significantly less student displacement throughout the construction term than if the entire Project were under construction simultaneously.

6.12.2 PERIMETER PROTECTION/PUBLIC SAFETY

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked and lit to ensure pedestrian safety. The Proponent will continue to coordinate with all pertinent regulatory agencies and the BUMC and Boston University Community Task Force to ensure they are informed of any changes in construction activities.

6.12.3 CONSTRUCTION TRAFFIC IMPACTS

Potential truck routes have been proposed to minimize traffic impacts. Specific truck deliveries and routes will be confirmed with BTM through the CMP. See Figure 6-11 and 6-12 for Construction Logistics Plans.

6.12.4 CONSTRUCTION WORKER PARKING

Measures will be employed during construction to minimize the impact of construction workers on the transportation network. Mitigation measures include the following:

- No personal vehicles will be allowed to park at the Project Site.
- Jobsite personnel will be encouraged to utilize public transportation. Due to the proximity of the MBTA Silver Line and MBTA bus routes, a reasonable level of public transportation use is anticipated by workers.
- Lock-up facilities for work tools will be provided to make public transportation more convenient and desirable for workers.
- Terms and conditions related to workforce parking and public transportation use will be written into each subcontract.

These measures will be incorporated into the CMP for the Project, which will be reviewed by the Boston Transportation Department prior to commencement of construction activities.

Should some of the workers choose to drive to the Project Site, there is available parking at off-street, commercial parking lots owned by the University. The two closest commercial lots are located at 610 and 720 Albany Street. The lots are pay-on-entry facilities and are not currently fully utilized during the week. Because the construction workforce will arrive prior to a.m. peak traffic period and depart prior to the p.m. peak period, these trips are not expected to have an appreciable impact on the transportation system.

6.12.5 CONSTRUCTION AIR QUALITY

Construction activities may generate fugitive dust, which will result in a localized increase of airborne particle levels. Fugitive dust emission from construction activities will depend on such factors as the properties of the emitting surface (e.g. moisture content), meteorological variables, and construction practices employed.

To reduce emission of fugitive dust and minimize impacts on the local environment, the construction contractor will adhere to a number of strictly enforceable mitigation measures. These measures may include:

- Using wetting agents to control and suppress dust from construction debris,
- Ensuring that all trucks traveling to and from the site will be fully covered,
- Removing construction debris regularly,
- Monitoring construction practices closely to ensure any emissions of dust are negligible, and
- Cleaning streets and sidewalks to minimize dust and dirt accumulation.

6.12.6 CONSTRUCTION NOISE IMPACTS

Intermittent increases in noise levels will occur in the short-term during construction. Construction work will comply with the requirements of the City of Boston noise ordinance. To reduce the noise impacts of construction, especially if an accelerated schedule is activated, a number of noise mitigation measures will be included in the CMP. Some of the measures that may be taken to ensure a low level of noise emissions include:

- Initiating a proactive program for compliance with the City of Boston's noise limitations,
- Scheduling construction activities so as to avoid the simultaneous operation of the noisiest construction activities and reduce noise,

- Turning off all idling equipment, and
- Locating noisy equipment away from abutters and shielding the noise generator by distance or enclosure.

6.12.7 SEDIMENT CONTROL

During construction, erosion and sediment control measures will be implemented to minimize the transport of Site soils to off-site areas and the BWSC storm drain system. The existing catch basins will be protected with filter fabric or silt sacks to remove sediment from runoff. These controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

Other sediment controls, which will be implemented as required during construction, will include the following:

- Stacked hay bales and/or silt fence barriers will be installed at the base of the stockpiled soils and at erosion-prone areas throughout the construction phases of the Project.
- Erosion controls will be maintained and replaced as necessary to ensure their effectiveness.
- Where necessary, temporary sedimentation basins will be constructed to prevent the transport of sediment off-site.
- Measures to control dust will be implemented during excavation. All debris will be properly contained on the Site.

6.12.8 PEST AND RODENT CONTROL

The City of Boston enforces the requirements established under Massachusetts State Sanitary Code, 105 CMR 410.550. This policy establishes that the elimination of rodents is required for issuance of any building permits. During construction, rodent control service visits will be made by a certified rodent control firm to monitor the situation.

6.13 HISTORIC RESOURCES

The Project includes the interior renovation and exterior restoration and expansion of an existing building, which will improve the current institutional use as a teaching and dental education facility. The Project has been carefully designed to address the needs of Boston University while also restoring and rehabilitating elements of the structures in a fashion that

is compatible with its original state. No adverse impacts to the historic structures in the surrounding area will result from the Project.

6.13.1 HISTORIC RESOURCES ON THE PROJECT SITE

The original three-story reinforced concrete GSDM building, which was designed by The Architects' Collaborative ("TAC"), was constructed in 1967. TAC was founded in Cambridge, MA in 1945 by Walter Gropius. TAC is considered an important architectural firm in post-war modernist design, defined by minimalist modern aesthetic and identified as International Style or "Brutalist" Style. Their notable works during the period, including the GSDM, include International Style residential designs as well as numerous school buildings.

In 1973, the GSDM building received a single story cafeteria addition and four-story vertical addition, bringing the main building up to its current seven-story configuration. Although the addition utilized exposed precast concrete panel construction on steel frame, emulating the original building's exterior material expression, neither the original building nor the addition's exterior walls were insulated. Unfortunately, the addition dramatically changed the elegant and spare proportions of the original TAC-designed building. Also, the transition between the original structure and addition is recognizable and awkward. Finally, the addition introduced a random fenestration pattern which is in conflict with the organization and rhythm of the original four-story structure.

The new design proposes a homogeneous building-out of the discordant parts with an objective to refresh and make cohesive the existing exterior while tying it together with the proposed addition. Functionally, the design approach also allows for the introduction of insulation and vapor barriers that will dramatically improve the energy efficiency of the GSDM. Architectural language and materials along with site design language and materials nod to the existing building's architecture in color and texture while also retaining the context within Boston's urban fabric.

Strategically designed and located curtainwalls organize the building, identify entries, and subtly separate existing from addition. Overall, the design evokes a clean modern timelessness. Light grey, light weight terracotta panels will cover the existing building facade. The addition is clad in brick matching the color and texture of the terracotta. The scale of the two materials complements each other and understatedly references the building chronology. Wood finish phenolic accent panels highlight both new and existing fenestration with a holistically random pattern that helps to unify the previously unharmonious organization.

The resultant GSDM building will present an appropriately urban building that fits well into its Boston context while offering an inviting and understandable pedestrian experience.

6.13.2 HISTORIC RESOURCES IN THE VICINITY OF THE PROJECT SITE

An Area of Potential Effect (“APE”) of one-quarter mile has been analyzed for the purposes of identifying historic resources in the vicinity of the Project Site and assessing potential project-related impacts. A review of the Massachusetts Historical Commission (“MHC”) Inventory revealed 64 extant inventoried historic individual properties and all or portions of 7 MHC inventoried districts within the APE.

Of the individually inventoried resources, 13 fall within South End Landmark District Protection Area while the remaining 51 fall within the South End National Register District and the South End Landmark District. Five of the resources are designated on National Register as individual properties.

The Project, which is located in the South End Landmark District Protection Area, is not expected to have a negative impact on any of the historic resources in the APE. Although the Project Site is in close proximity to the southern edges of both the South End Landmark District and the South End District, and it is within the protection district, the height of the building will not be increased, and thus will not affect site-lines from within the South End’s historic neighborhood.

These resources are described in Table 6-3 and shown on Figures 6-9 and 6-10, Historic Resources in the Vicinity of the Project Site.

Table 6-3: Historic Resources

Name/ Location	Description of Resource/Designation	Impact of Project on Resource
Districts		
South End Landmark District	Boston Landmarks Commission District designated by the City of Boston in 1983.	No Impact
South End Landmark District Protection Area	Boston Landmarks Commission District designated as a protection area to protect view sheds to the above listed Landmarks Neighborhood District.	Neutral to Positive Impact
South End District	National Register District, encompassing 238 acres of, characterized by a cohesive and largely intact Victorian urban residential neighborhood.	No Impact
Lawrence Model Lodging Houses	National Register District composed of 5-story detached brick residential French Mansard lodging houses.	No Impact
East Brookline Streetscape	Streetscape of classic South End residential masonry bowfronts.	No Impact
Blackstone Square - Franklin Square Area	Two mid-19 th Century ornamental parks- Blackstone Square and Franklin Square, flanked by an area of masonry buildings.	No Impact

Name/ Location	Description of Resource/Designation	Impact of Project on Resource
Cathedral Veteran's Housing Project Complex	Mid-century masonry high-rise housing complex of nine buildings.	No Impact
Individually Inventoried Properties		
531-541 Albany St, Badger Woodworking Mill	Landmark District Protection Area	No Impact
39 Worcester Sq	Landmark District, National Register District	No Impact
37 Worcester Sq	Landmark District, National Register District	No Impact
18 Worcester Sq	Landmark District, National Register District	No Impact
731 Harrison Ave	Landmark District, National Register District, National Register Individual Property	No Impact
61-63 Wareham St, Badger Carpentry Shop	Landmark District Protection Area	No Impact
53-59 Wareham St	Landmark District Protection Area	No Impact
685 Albany St, Massachusetts Homeopathic Hospital	Landmark District Protection Area	No Impact
19 Worcester Sq	Landmark District, National Register District	No Impact
6 Worcester Sq	Landmark District, National Register District	No Impact
109 East Canton St	Landmark District, National Register Individual Property	No Impact
40 Worcester Sq	Landmark District, National Register District	No Impact
30-34 East Concord St	Landmark District, National Register District	No Impact
75-79 Wareham St	Landmark District Protection Area	No Impact
Washington St	Landmark District, National Register District	No Impact
32 Worcester Sq	Landmark District, National Register District	No Impact
81-87 Wareham St	Landmark District Protection Area	No Impact
Washington St	Landmark District, National Register District	No Impact
36 Worcester Sq	Landmark District, National Register District	No Impact
60 East Springfield St	Landmark District Protection Area	No Impact
12 Worcester Sq	Landmark District, National Register District	No Impact
21 Worcester Sq	Landmark District, National Register District	No Impact
27 Worcester Sq	Landmark District, National Register District	No Impact
26 Worcester Sq	Landmark District, National Register District	No Impact
11 East Newton St	Landmark District, National Register District	No Impact
10 Worcester Sq	Landmark District, National Register District	No Impact
34-36 East Newton St	Landmark District, National Register District	No Impact
7-9 Saint George St	Landmark District, National Register District	No Impact
615 Albany St	Landmark District Protection Area	No Impact

609-613 Albany St	Landmark District Protection Area	No Impact
15 Worcester Sq	Landmark District, National Register District	No Impact
23 Worcester Sq	Landmark District, National Register District	No Impact
16 Worcester Sq	Landmark District, National Register District	No Impact
575 Albany St	Landmark District Protection Area	No Impact
41 Worcester Sq	Landmark District, National Register District	No Impact
38 Worcester Sq	Landmark District, National Register District	No Impact
34 Worcester Sq	Landmark District, National Register District	No Impact
89 East Canton St	Landmark District, National Register Individual Property	No Impact
30 Worcester Sq	Landmark District, National Register District	No Impact
27 East Newton St	Landmark District, National Register District	No Impact
52 Plympton St	Landmark District Protection Area	No Impact
1472 Washington St	Landmark District	No Impact
29 Worcester Sq	Landmark District, National Register District	No Impact
42 Worcester Sq	Landmark District, National Register District	No Impact
717 Harrison Ave	National Register District	No Impact
79 East Canton St	Landmark District, National Register District, National Register Individual Property	No Impact
22 Worcester Sq	Landmark District, National Register District	No Impact
20 Worcester Sq	Landmark District, National Register District	No Impact
14 Worcester Sq	Landmark District, National Register District	No Impact
15 Saint George St	Landmark District, National Register District	No Impact
45-51 Wareham St	Landmark District Protection Area	No Impact
17 Worcester Sq	Landmark District, National Register District	No Impact
8 Worcester Sq	Landmark District, National Register District	No Impact
15 James St	Landmark District, National Register District	No Impact
65-69 Wareham St	Landmark District Protection Area	No Impact
761 Harrison Ave	Landmark District, National Register District	No Impact
28 Worcester Sq	Landmark District, National Register District	No Impact
71-73 Wareham St	Landmark District Protection Area	No Impact
99 East Canton St	Landmark District, National Register Individual Property	No Impact
31 Worcester Sq	Landmark District, National Register District	No Impact
33 Worcester Sq	Landmark District, National Register District	No Impact
35 Worcester Sq	Landmark District, National Register District	No Impact
25 Worcester Sq	Landmark District, National Register District	No Impact
24 Worcester Sq	Landmark District, National Register District	No Impact

9:00 am



12:00 pm



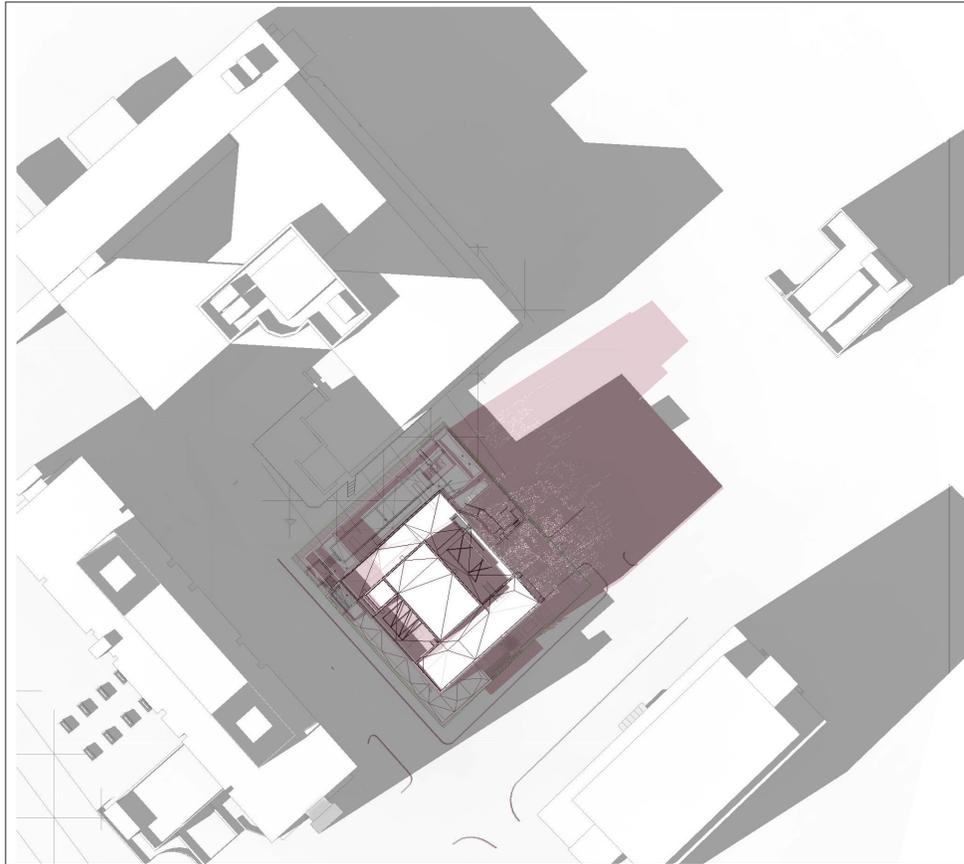
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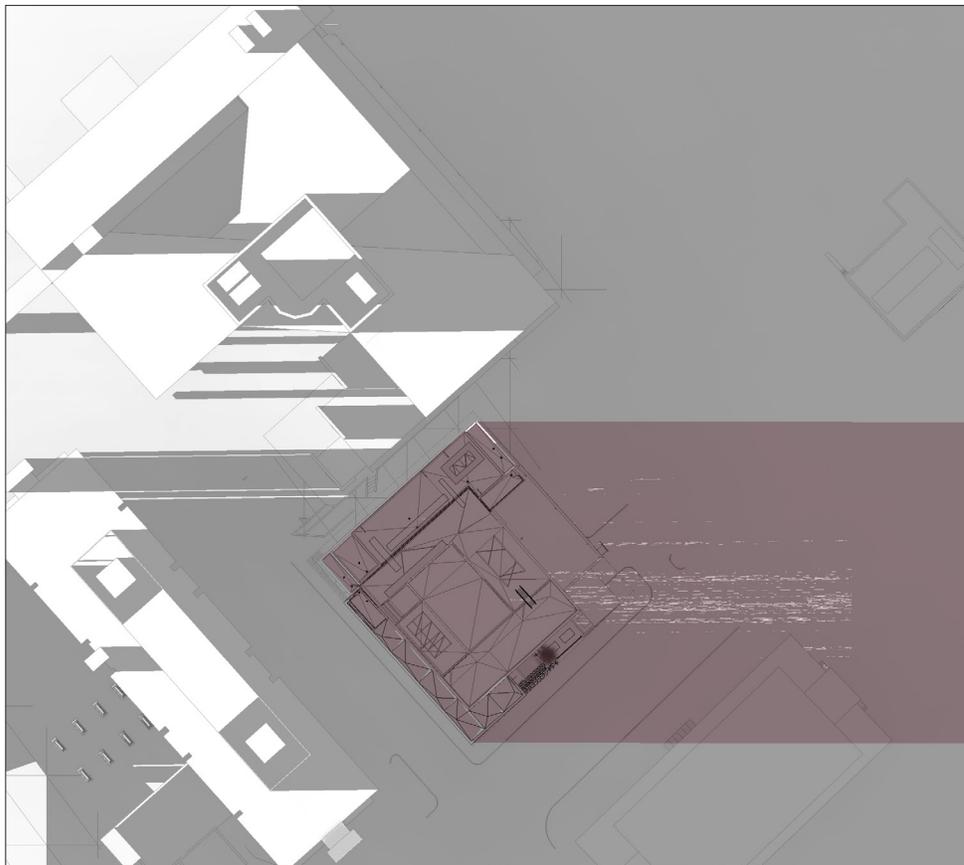
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Proposed New Dental School Shadow

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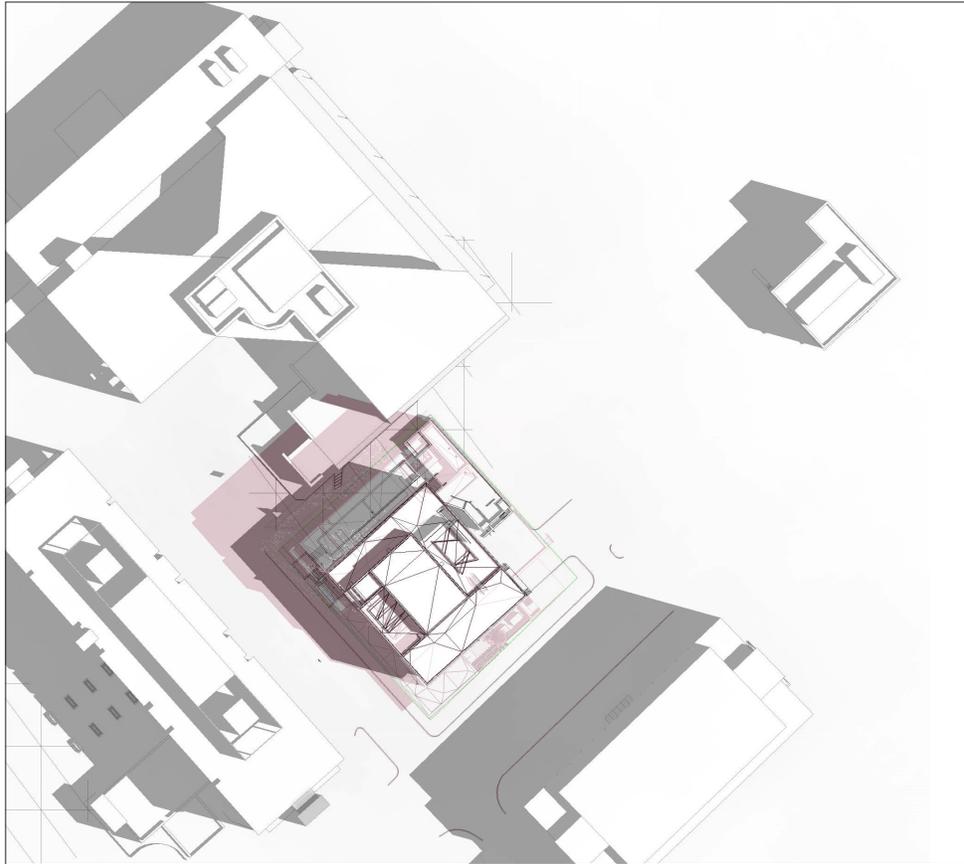


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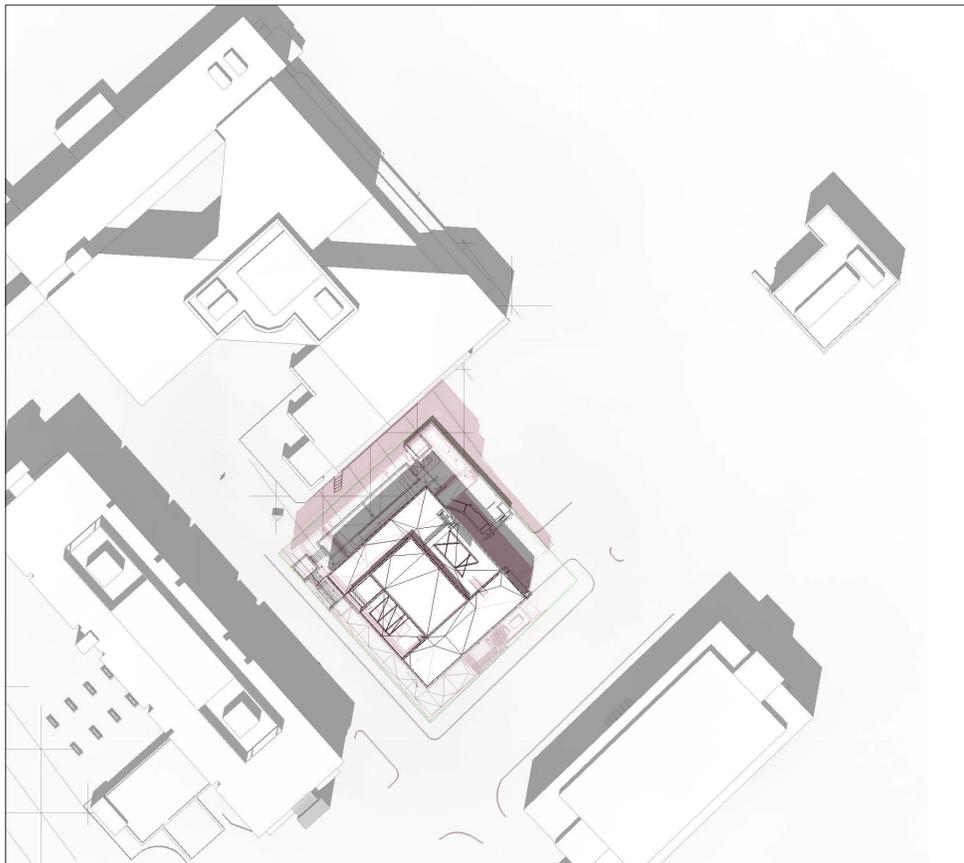


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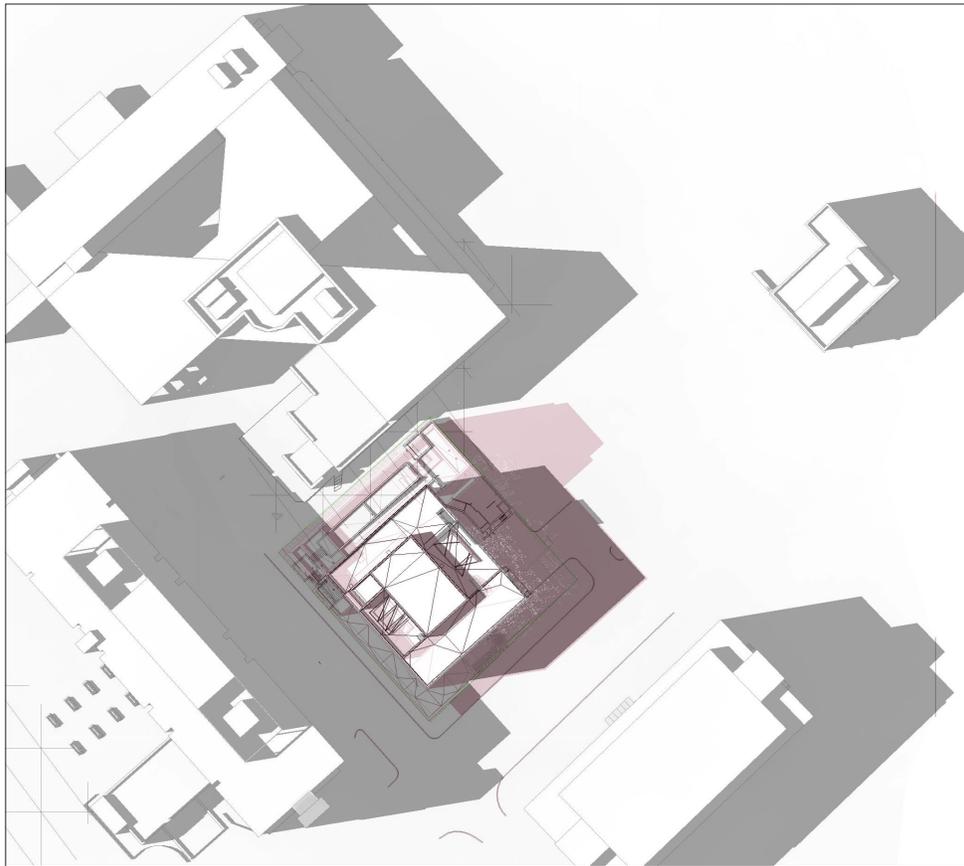
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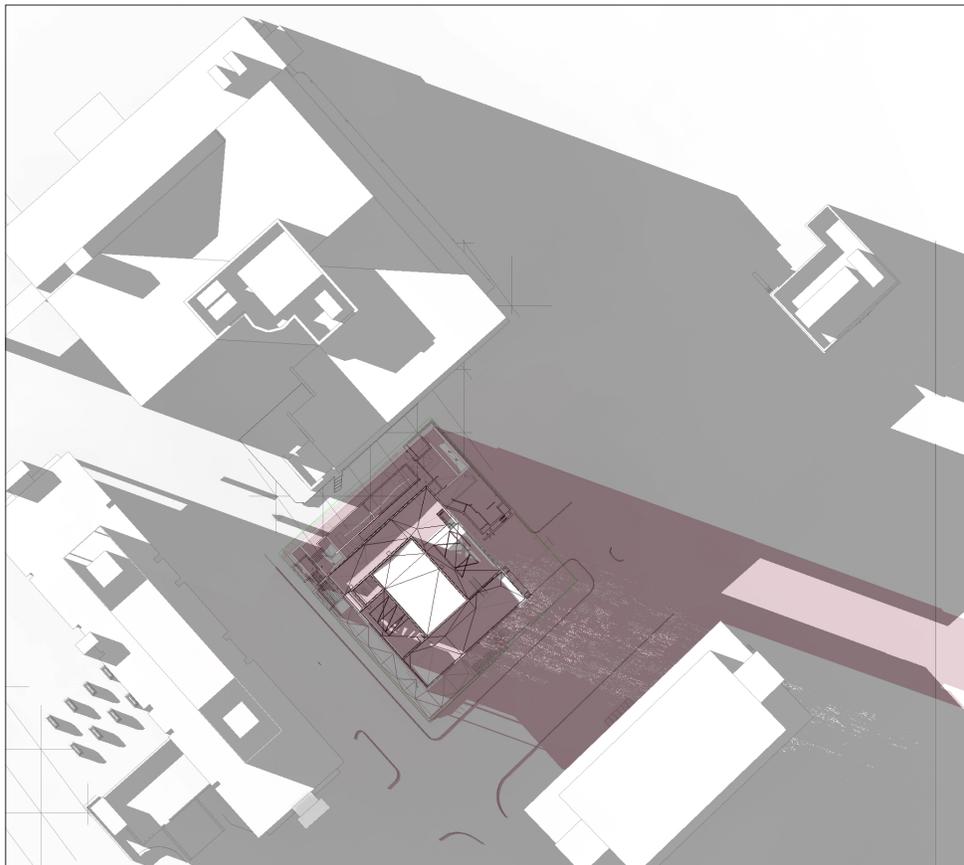
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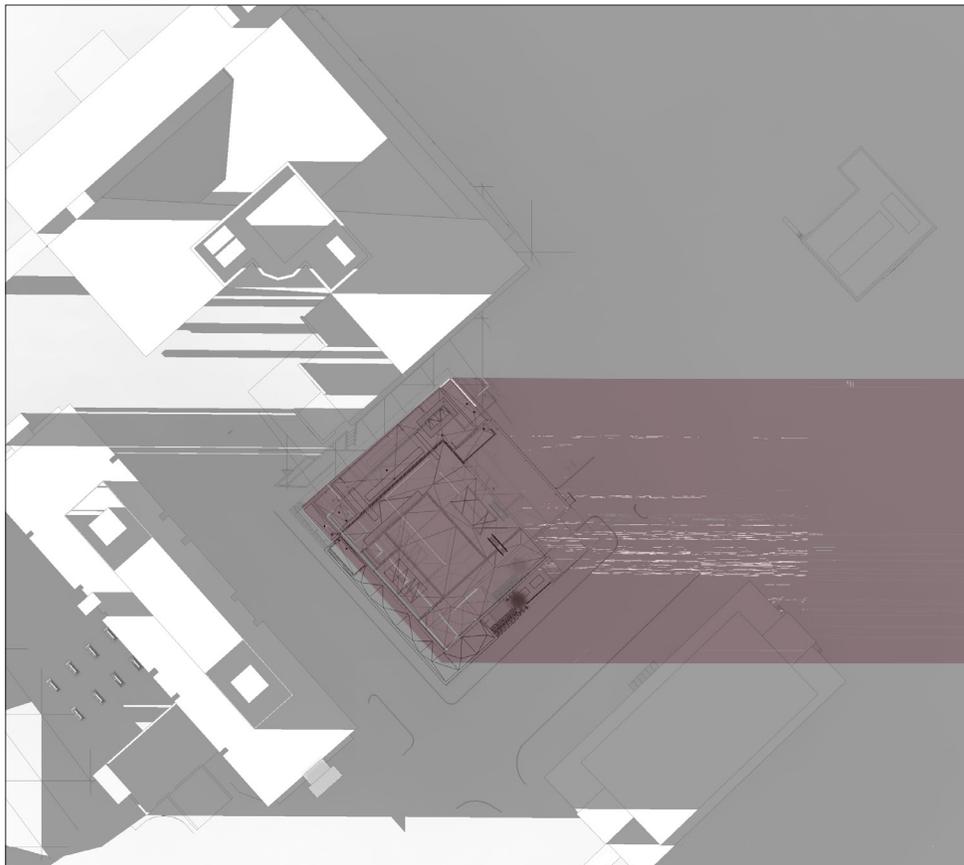
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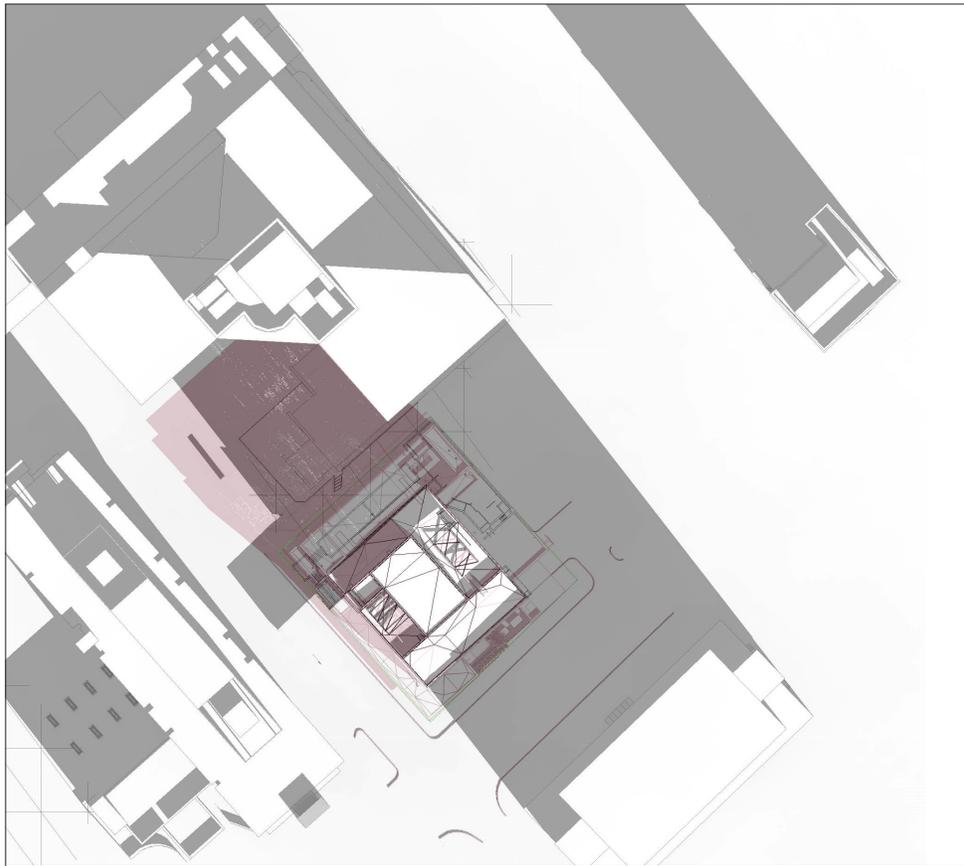


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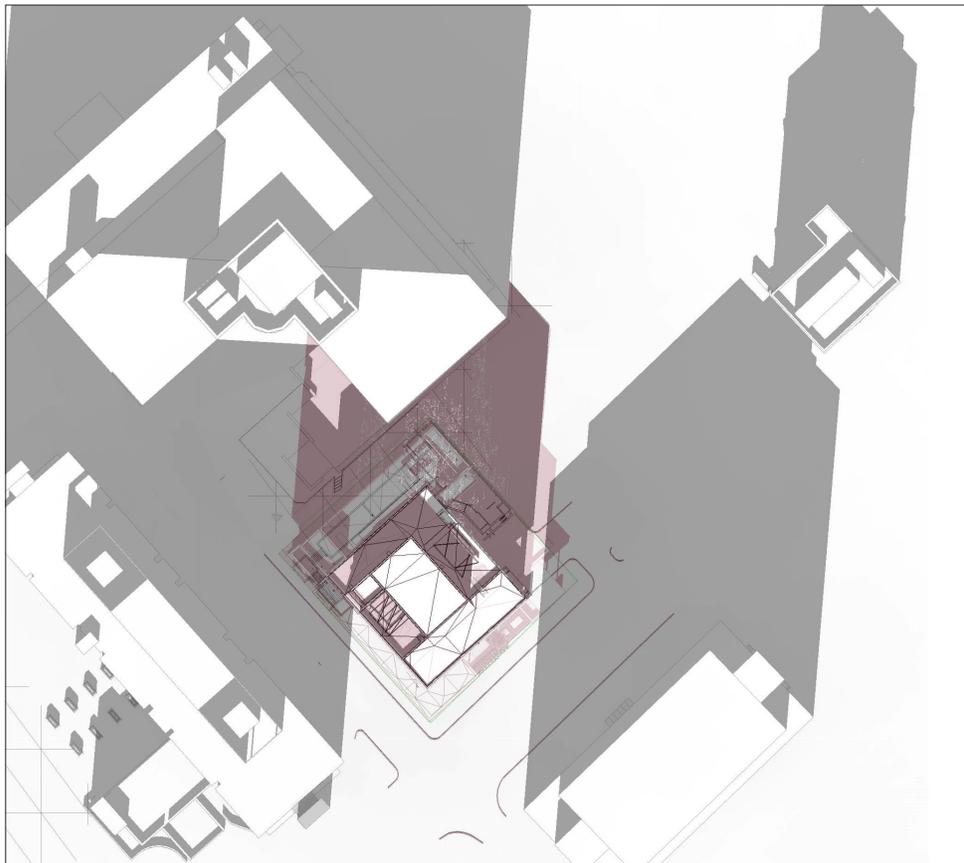


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12:00 pm



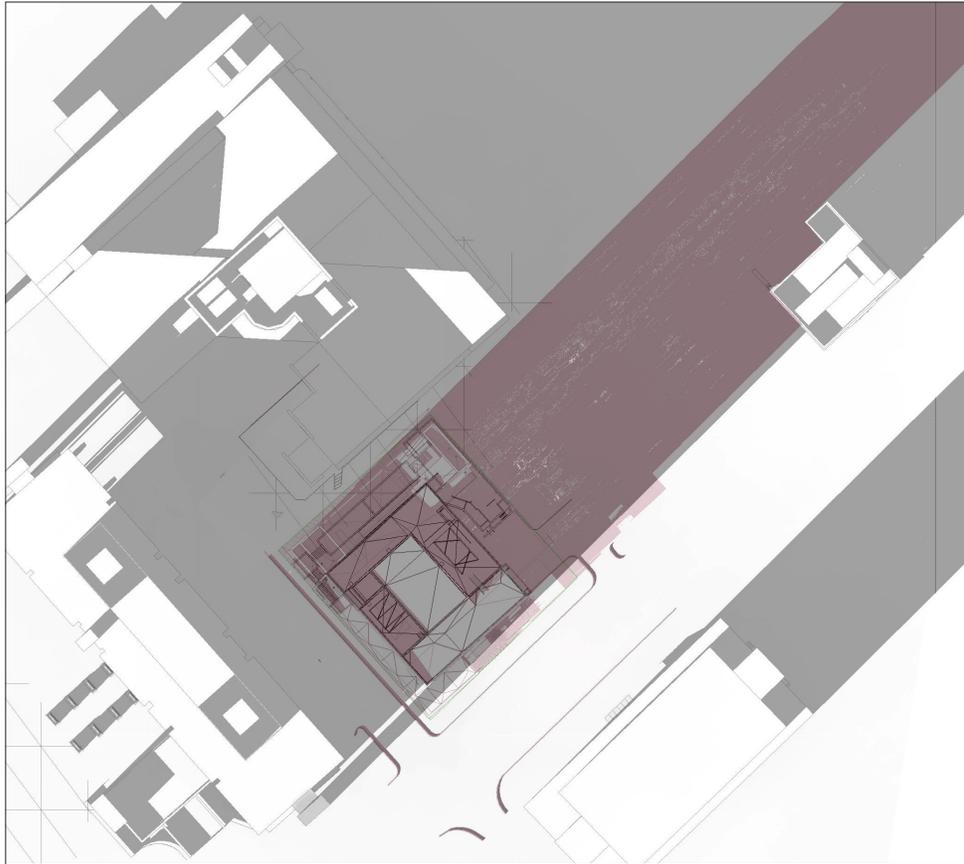
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Existing Shadow

Existing Dental School Shadow

Proposed New Dental School Shadow

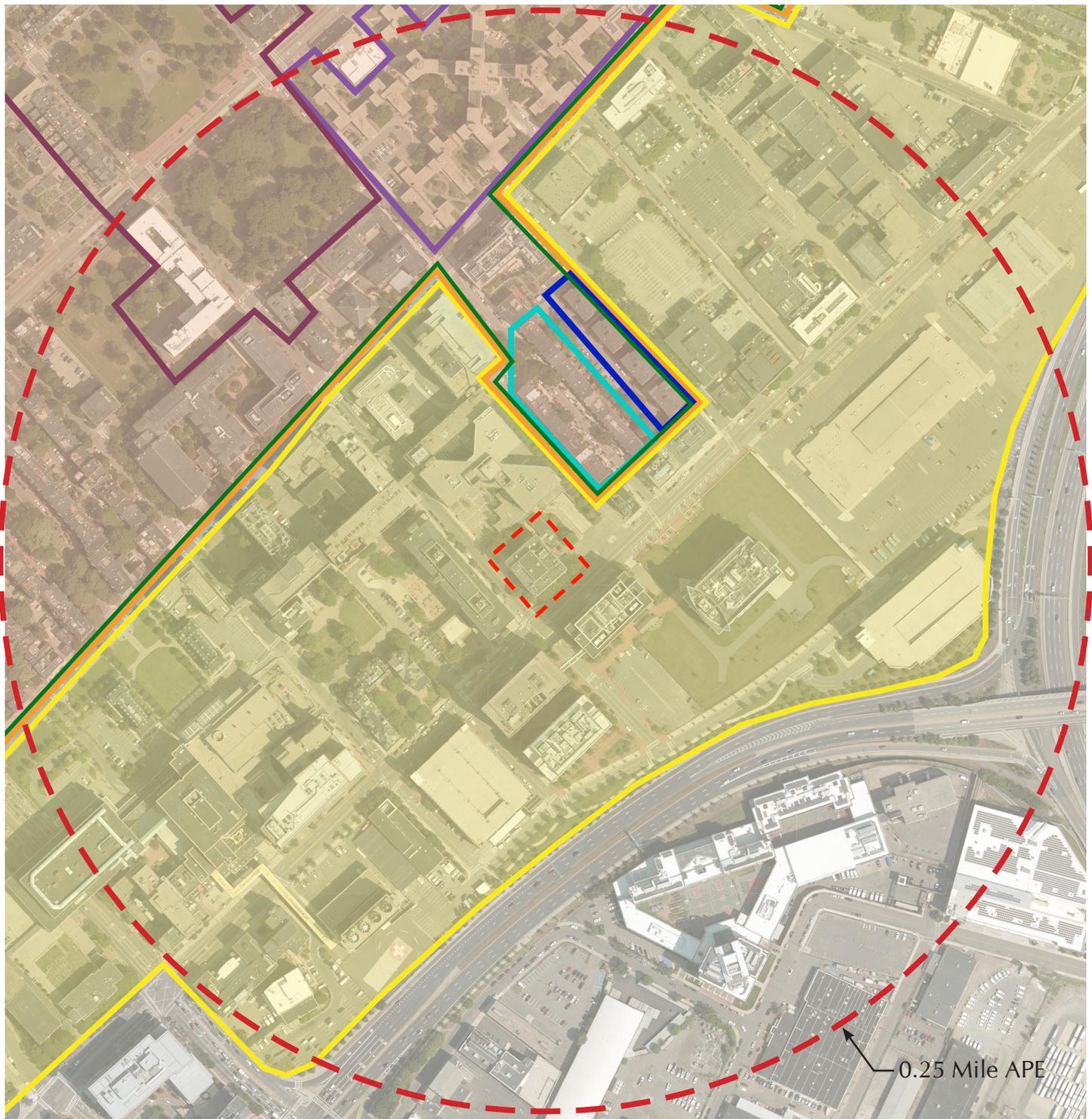
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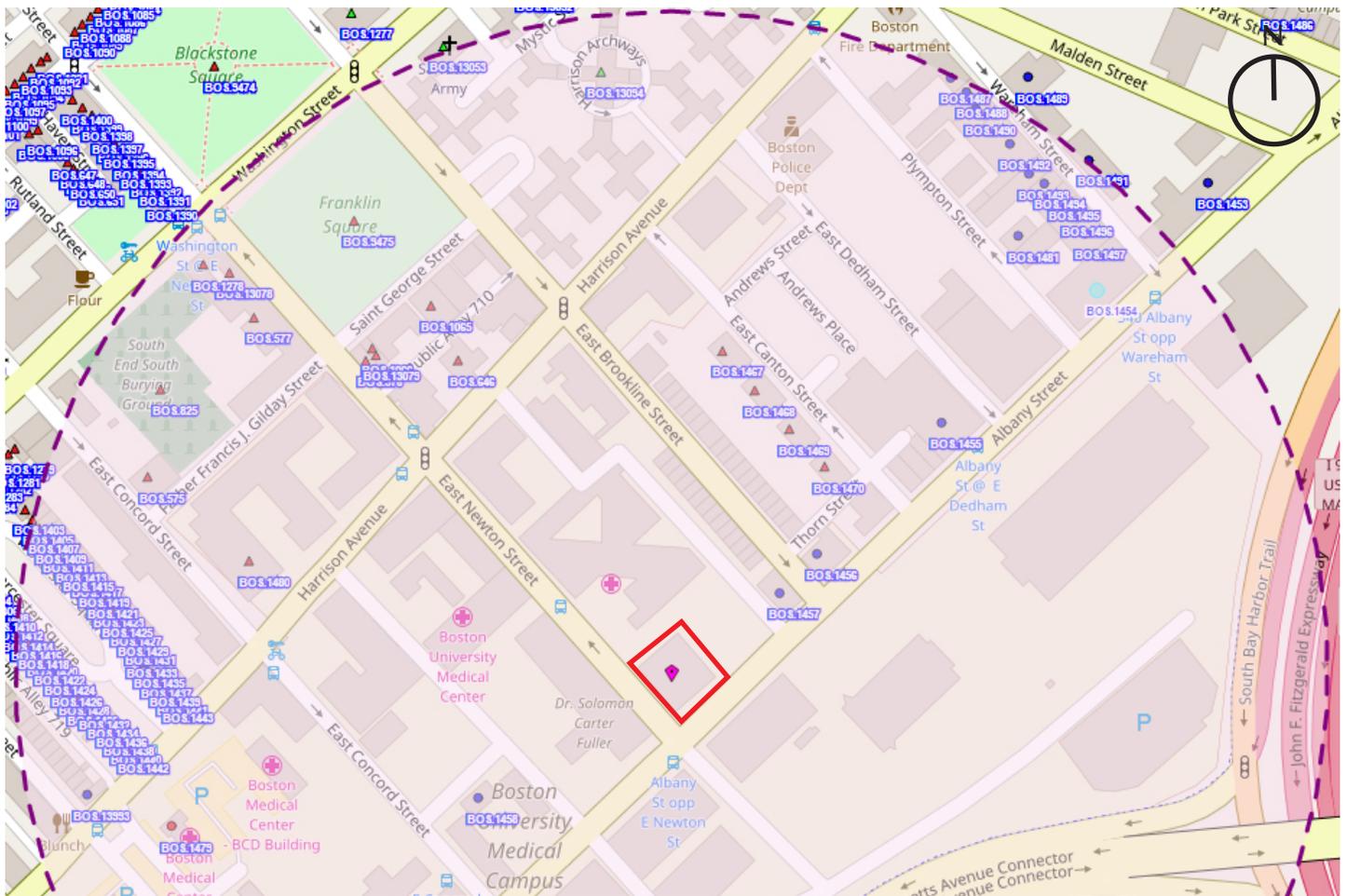
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-  Existing Dental School Shadow
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MACRIS Inventoried Areas and Districts

- South End Landmark District (City of Boston Landmarks Commission Local Historic District)
- South End Landmark District Protection Area ((City of Boston Landmarks Commission Local Historic District)
- South End District (National Register District)
- Lawrence Model Lodging Houses (National Register District)
- East Brookline Streetscape
- Blackstone Square- Franklin Square
- Cathedral Veteran's Housing Project Complex



1	BOS.575	30-34 East Concord St	23	BOS. 1426	25 Worcester Sq	45	BOS. 1458	685 Albany St
2	BOS. 576	34-36 East Newton St	24	BOS. 1427	26 Worcester Sq	46	BOS. 1467	79 East Canton St
3	BOS. 577	27 East Newton St	25	BOS. 1428	27 Worcester Sq	47	BOS. 1468	89 East Canton St
4	BOS. 646	731 Harrison Ave	26	BOS. 1429	28 Worcester Sq	48	BOS. 1469	99 East Canton St
5	BOS. 825	Washington St	27	BOS. 1430	29 Worcester Sq	49	BOS. 1470	109 East Canton St
6	BOS. 1065	7-9 Saint George St	28	BOS. 1431	30 Worcester Sq	50	BOS. 1479	717 Harrison Ave
7	BOS. 1066	15 Saint George St	29	BOS. 1432	31 Worcester Sq	51	BOS. 1480	761 Harrison Ave
8	BOS. 1407	6 Worcester Sq	30	BOS. 1433	32 Worcester Sq	52	BOS. 1481	52 Plympton St
9	BOS. 1409	8 Worcester Sq	31	BOS. 1434	33 Worcester Sq	53	BOS. 1490	45-51 Wareham St
10	BOS. 1411	10 Worcester Sq	32	BOS. 1435	34 Worcester Sq	54	BOS. 1492	53-59 Wareham St
11	BOS. 1413	12 Worcester Sq	33	BOS. 1436	35 Worcester Sq	55	BOS. 1493	61-63 Wareham St
12	BOS. 1415	14 Worcester Sq	34	BOS. 1437	36 Worcester Sq	56	BOS. 1494	65-69 Wareham St
13	BOS. 1416	15 Worcester Sq	35	BOS. 1438	37 Worcester Sq	57	BOS. 1495	71-73 Wareham St
14	BOS. 1417	16 Worcester Sq	36	BOS. 1439	38 Worcester Sq	58	BOS. 1496	75-79 Wareham St
15	BOS. 1418	17 Worcester Sq	37	BOS. 1440	39 Worcester Sq	59	BOS. 1497	81-87 Wareham St
16	BOS. 1419	18 Worcester Sq	38	BOS. 1441	40 Worcester Sq	60	BOS. 9475	Washington St
17	BOS. 1420	19 Worcester Sq	39	BOS. 1442	41 Worcester Sq	61	BOS. 13078	11 East Newton St
18	BOS. 1421	20 Worcester Sq	40	BOS. 1443	42 Worcester Sq	62	BOS. 13079	15 James St
19	BOS. 1422	21 Worcester Sq	41	BOS. 1454	531-541 Albany St	63	BOS. 13094	1472 Washington St
20	BOS. 1423	22 Worcester Sq	42	BOS. 1455	575 Albany St	64	BOS. 13993	60 E. Springfield St
21	BOS. 1424	23 Worcester Sq	43	BOS. 1456	609-613 Albany St			
22	BOS. 1425	24 Worcester Sq	44	BOS. 1457	615 Albany St			

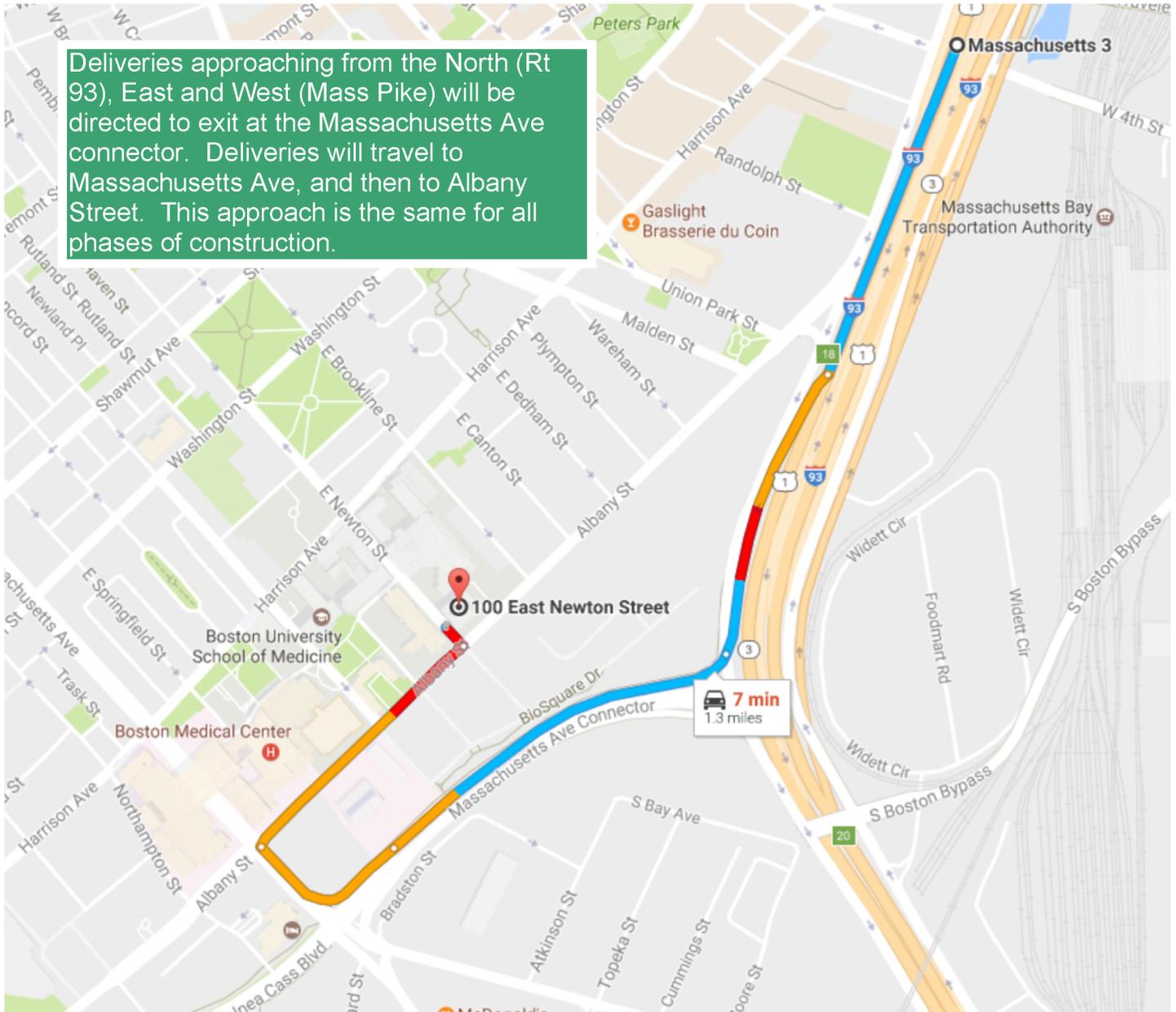
Boston, Massachusetts

Figure 6-10

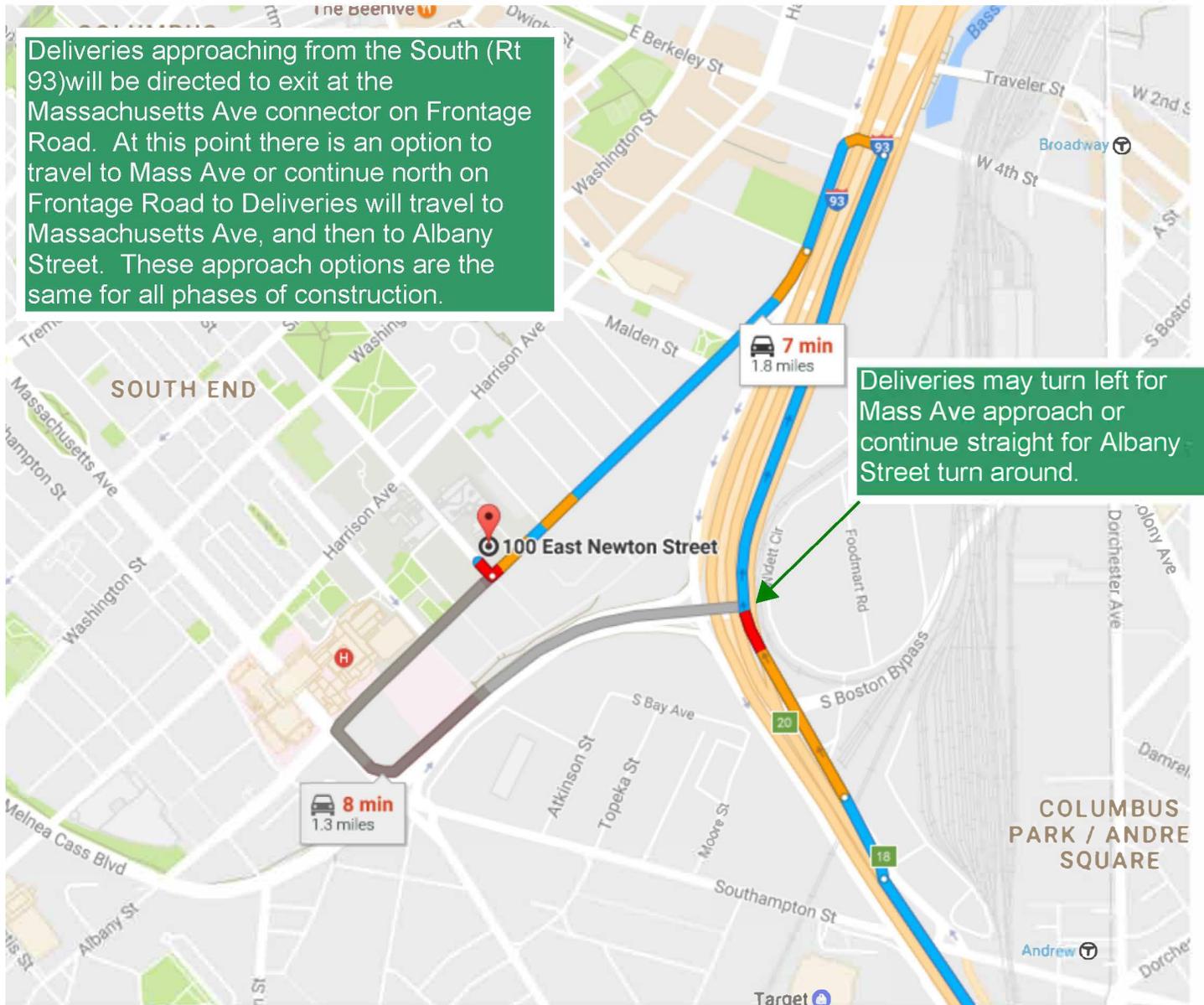
Historic Resources in the Vicinity of the Project Site

Source: Fort Point Associates, Inc., 2016

Delivery and Trucking logistics plan: Northern, Eastern and Western approach



Delivery and Trucking logistics plan: Southern approach



Chapter 7

INFRASTRUCTURE

CHAPTER 7: INFRASTRUCTURE

7.1 INTRODUCTION

This chapter outlines the existing utilities surrounding the Project Site, the connections required to provide service to the Project, and any impacts on the existing utility systems that may result from the construction of the Project. The following utility systems are discussed herein:

- District heating and cooling
- Sewer
- Domestic water
- Fire protection
- Drainage
- Electricity
- Telecommunications

The Project Site is located on a University-owned parcel of land comprised of approximately 25,500 square feet on the corner of East Newton Street and Albany Street in the South End of Boston. The existing footprint of the GSDM building will be expanded as a result of the Project. The existing use of the building as a dental school will be unaltered as a result of the Project.

7.2 HEATING AND COOLING SYSTEMS

7.2.1 CENTRAL HEATING PLANT

The Project will include a new steam line coming into the building with a new PRV station. It will then tap back into the existing central heating plant located in the existing mechanical room in the basement. The steam will also tie into the new central heating plant, located in additions basement (New mechanical room). The new steam-to-water heating plant will only serve the addition. The new heat exchangers and distribution pumps are located in the new mechanical room.

7.2.2 CENTRAL COOLING PLANT

The central cooling plant consists of one high efficiency water-cooled chiller utilizing variable speed magnetic bearing centrifugal compressors (TurboCor). The unit shall deliver 300-tons of cooling. Efficiency shall meet or exceed 0.604 KW/ton full load and 0.373 KW/ton IPLV. Distribution pumps are located in the basement. The existing central cooling plant will remain in place but will have a cross-connection to the new cooling plant.

7.3 WASTEWATER

The Project will not have significant impacts to the existing wastewater infrastructure at and around the Project Site. Wastewater generation is expected to be slightly greater than that of the existing condition. As the University regularly updates fixtures within its facilities, including those at the Site, with the installation of new low-flow fixtures as part of the Project, it is not expected to have a significant impact to the existing wastewater system.

7.3.1 EXISTING SEWER SYSTEM

The Boston Water and Sewer Commission (BWSC) owns and maintains the sewer system that services the City of Boston. The BWSC sewer system connects to the Massachusetts Water Resources Authority (MWRA) interceptors for conveyance, treatment, and disposal through the MWRA Deer Island Wastewater Treatment Plant.

Existing BWSC sanitary sewer and combined sewer mains are located in East Newton Street to the southwest of the site, Albany Street to the southeast of the site, and adjacent to the northeast side of the Project Site. The existing BWSC sanitary sewer system is shown in Figure 7-1.

Albany Street

There is a 66-inch x 68-inch BWSC combined sewer main that flows in a northeasterly direction in Albany Street. The combined sewer main ultimately discharges to the MWRA Deer Island Wastewater Treatment Plant for treatment and disposal.

East Newton Street

There is a 12-inch BWSC sewer main that flows in a southeasterly direction and connects to the 66-inch x 68-inch combined sewer main in Albany Street.

Northeast Side of Project Site

There is a 24-inch BWSC combined sewer main that flows in a southeasterly direction and connects to the 66-inch x 68-inch combined sewer main in Albany

Street, adjacent to the northeast side of the project site and outside of the project property line.

7.3.2 WASTEWATER GENERATION

The Project's sewage generation rates were estimated using the MassDEP State Environmental Code 310 CMR 15.00 and the proposed building program. The regulations at 310 CMR 15.00 lists typical sewage generation values for the proposed building use, as shown in Table 7-1. Typical generation values are conservative values for estimating the sewage flows from new construction. The regulations at 310 CMR 15.00 specify that sewage generation values are used to evaluate new sewage flows or an increase in flows to existing connections. Table 7-1 describes the change in sewage generation in gallons per day (gpd) due to the Project.

Table 7-1: Proposed Wastewater Generation

	Room Use	Size	310 CMR Value (gpd/unit)	Total Flow (gpd)
Existing	College (Staff)	419	65 gpd/person	27,235
	College	835	65/person	54,275
	Dentist Chairs	169 chairs	200 gpd/chair	33,800
	Total			115,310
Proposed	College (Staff)	425	65 gpd/person	27,235
	College	835	65/person	54,275
	Dentist Chairs	175 chairs	200 gpd/chair	35,000
	Total			116,510
	Net New Flow			1,200

The total sanitary flow for the Project is estimated to be 116,510 gpd, which correlates to a net addition of 1,200 gpd from the existing building.

7.3.3 SEWER CAPACITY AND IMPACTS

The Project's impact on the existing BWSC systems in Albany Street and East Newton Street was analyzed. The existing sewer system hydraulic capacity calculations are presented in Table 7-2.

Table 7-2: Sewer Hydraulic Capacity Analysis

Manhole (BWSC Number)	Dist. (feet)	Invert El. (up)	Invert El. (down)	Slope (%)	Dia-meter (inches)	Manning's Number	Flow Cap. (cfs)	Flow Cap. (MGD)
East Newton Street								
SMH 386 to SMH 388	327	3.75	1.98	0.5%	12	0.013	2.62	1.69
SMH 388 to SMH 389	54	1.98	1.35	1.2%	12	0.013	3.85	2.49
Minimum Flow Analyzed:							2.62	1.69
Albany Street								
SMH 198 to SMH 199	396	3.70	-4.24	2.0%	66x68	0.013	629.97	407.16
Minimum Flow Analyzed:							629.97	407.16
Adjacent to Site								
SMH 228 to SMH 227	101	5.50	5.00	0.5%	18	0.013	7.39	4.78
Minimum Flow Analyzed:							7.39	4.78

Notes:

1. Manhole numbers and inverts were taken from BWSC Sewer system Map no. 20J
2. Flow Calculations based on Manning Equation
3. Elevations refer to Boston City Base (BCB).

Results shown in Table 7-2 indicate the hydraulic capacity of the sanitary sewer in East Newton Street, the 66-inch x 68-inch combined sewer in Albany Street, and the 18-inch sewer running through the site. The minimum hydraulic capacity is 1.69 million gallons per day (MGD) or 2.62 cubic feet per second (cfs) for the 12-inch sewer line in East Newton Street, 629.97 MGD or 407.16 cfs for the 66-inch x 68-inch system in Albany Street, and 7.39 MGD or 4.78 cfs for the 18-inch system running through the site.

Based on an average daily flow estimate for the Project of 116,510 gpd or 0.117 MGD, an increase of 1,200 gpd or 0.001 MGD from the existing building, and with a factor of safety estimate of 10 (total estimate = 0.001 MGD x 10 = 0.01 MGD), sewer capacity issues are not anticipated due to the Project.

7.3.4 PROPOSED SEWER SYSTEM

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Project is expected to slightly increase sewer flows for the building. The existing sewer services for the existing building will be demolished and a new 12-inch sewer service for the Project will connect to the existing 66-inch x 68-inch BWSC combined sewer main located in Albany Street.

The Project will require a new sanitary sewer connection to the BWSC sewer system, as noted above. The connection to BWSC infrastructure will be reviewed as

part of the BWSC's site plan review process for the Project at the appropriate time in the design process. This review process will include a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts. Coordination with BWSC will include review and approval of the design, capacity, connections, and flow increases resulting from the proposed discharges to the combined sewer system.

7.4 DOMESTIC WATER SYSTEM

7.4.1 EXISTING WATER SYSTEM

Water for the Project Site is provided by the BWSC. There are five water systems within the City that provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high.

There are existing BWSC water mains located in East Newton Street and Albany Street. There is a 12-inch southern low main in the western side of Albany Street and a 12-inch southern high main in the eastern side of Albany Street. There is a 12-inch southern high main in East Newton Street that connects to the 12-inch southern high main in Albany Street (See Figure 7-2, Existing BWSC Water System).

The existing building is serviced by three water services serving both domestic water and building fire protection, which will be demolished. BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Site was requested by the Proponent. Hydrant flow data was available for one hydrant near the Site. The existing hydrant flow data is available in Table 7-3. As the design progresses, the Proponent will request new hydrant flow tests be conducted by BWSC adjacent to the Site.

Table 7-3: Existing Hydrant Flow Data

Date Of Test	Flow Hydrant Number	Static Hydrant	Pressure Zone	Elev. (ft.)	Static (psi)	Residual (psi)	Flow (gpm)
11/15/11	H190 – 88 East Newton Street	H190	SH	17.9	108	104	2456

Note: Data provided by BWSC, on February 8, 2017.

7.4.2 ANTICIPATED WATER CONSUMPTION

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described in the section above. A conservative factor of 1.1 (110%) is applied to the estimated average daily wastewater flows to account

for consumption, system losses, and other usages to estimate an average daily water demand for the office portions of the Project. The water demand for the Proposed Project is estimated to be 128,161 gpd. In total, the Project's estimated domestic water demand is estimated to increase by 1,320 gpd based on an increase in sewer flows of 1,200. The water for the Project will be supplied by the BWSC systems in Albany Street.

7.4.3 PROPOSED WATER SERVICE

The domestic water service for the Project will connect to the existing BWSC water main in Albany Street. A new cement lined ductile iron domestic water service will enter the basement level of the building with a domestic water meter for utility billing. This water service and meter will serve the existing building and proposed addition. A new cement lined ductile iron fire protection service will connect to a BWSC main in Albany Street.

The domestic and fire protection water service connections required for the Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connections will be reviewed as part of BWSC's Site Plan Review Process. This review will include sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

7.4.4 WATER SUPPLY CONSERVATION AND MITIGATION MEASURES

Efforts to reduce water consumption will be made. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, sensor operated faucets and toilets will be installed.

New water services will be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system.

7.5 STORM DRAINAGE

7.5.1 EXISTING STORM DRAINAGE SYSTEM

There are existing BWSC storm drain mains in East Newton Street and Albany Street. There is a 30-inch x 52-inch BWSC storm drain main in Albany Street, which flows in a northeasterly direction before ultimately connecting to the Roxbury Canal

Conduit. There is a 15-inch storm drain that increases to an 18-inch BWSC storm drain main flowing in a southeasterly direction in East Newton Street and connects to the 30-inch by 52-inch storm drain main in Albany Street.

Stormwater in East Newton Street is collected in existing BWSC catch basins, which flow to the existing 15-inch to 18-inch BWSC storm drain main in East Newton Street. Stormwater in Albany Street is collected in existing BWSC catch basins, which flow to the existing 30-inch x 52-inch BWSC storm drain main in Albany Street.

The existing BWSC storm drainage system is shown in Figure 7-3.

The Project Site is covered by the building, pedestrian walkways, landscaped areas, and a small driveway for loading dock access. Stormwater on the northern portion of the Project Site is collected in catch basins and drains to a private closed drainage system on the adjacent parcel. It is not clear how that system connects to the BWSC storm drainage system. The southern portion of the Project Site drains to catch basins in East Newton and Albany Streets, which are connected to BWSC storm drain mains. There is no known treatment of onsite stormwater.

7.5.2 PROPOSED STORM DRAINAGE SYSTEM

The Project is located within the Groundwater Conservation Overlay District (GCOD). Due to the constrained nature of the site, the Project Site will be designed to comply to the greatest extent practicable with the requirements of Article 32 of the Boston Zoning Code. Article 32 requires that proposed projects promote infiltration of rainwater by capturing no less than one inch across the portion of the surface area of the lot to be occupied by the Project (or, in the case of a Substantial Rehabilitation, the lot area occupied by the structure to be substantially rehabilitated).

Onsite drainage systems will be designed so that there will be no increase in the peak rate of stormwater discharge from the Project Site in the developed condition compared to the existing condition, to the greatest extent practicable. The Project will result in a slight increase in impervious area on the site due to the proposed building addition and improved pedestrian accommodations.

Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's site plan review process. The process will include a comprehensive design review of the proposed service connections and assessment of Project demands and system capacity.

7.5.3 MITIGATION MEASURES

The Project will not adversely affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of Site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales, and/or crushed stone to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

Necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Project will be in compliance with local and state stormwater management policies, as described below.

7.5.4 MASSDEP STORMWATER MANAGEMENT POLICY STANDARDS

In March 1997, MassDEP adopted a Stormwater Management Policy to address non-point source pollution. In 1997, MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40.

A brief explanation of each Policy Standard and the system compliance is provided below:

Standard 1

No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance

The proposed design will comply with this Standard. The design will incorporate the appropriate stormwater treatment and no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

Standard 2

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

Compliance

The pre-development stormwater discharge rates will be met as a result of the improvements associated with the Project to the greatest extent practicable.

Standard 3

For New Construction, loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. The standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance

The Project will comply with this standard to the greatest extent practicable.

Standard 4

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when: (a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; (b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and (c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Compliance

The proposed design will comply with this standard. Within the Project's limit of work, there will be building roof, paved sidewalk, and landscaped areas. Runoff from paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging to BWSC systems, to the greatest extent practicable.

Standard 5

For Land Uses with Higher Potential Pollutant Loads (LUHPPL), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the Proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c.21 §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance

The proposed design will comply with this standard. The Proposed Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6). The Project complies with this standard.

Standard 6

Stormwater discharges within Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “storm water discharge” as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Compliance

The proposed design will comply with this Standard. The Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard 7

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent possible. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance

The Project will comply with this standard. The Project will comply with the Stormwater Management Standards as applicable to the redevelopment.

Standard 8

Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

Compliance

The Project will comply with this standard. Sedimentation and erosion controls will be incorporated as part of the design of the Project and employed during construction.

Standard 9

A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance

The Project will comply with this standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Project and will assure proper maintenance and functioning of the stormwater management system.

Standard 10

All illicit discharges to the stormwater management system are prohibited.

Compliance

The Project will comply with this standard. No illicit connections will be proposed with the Project. Any existing illicit connections will be removed.

7.6 ELECTRICAL SERVICES

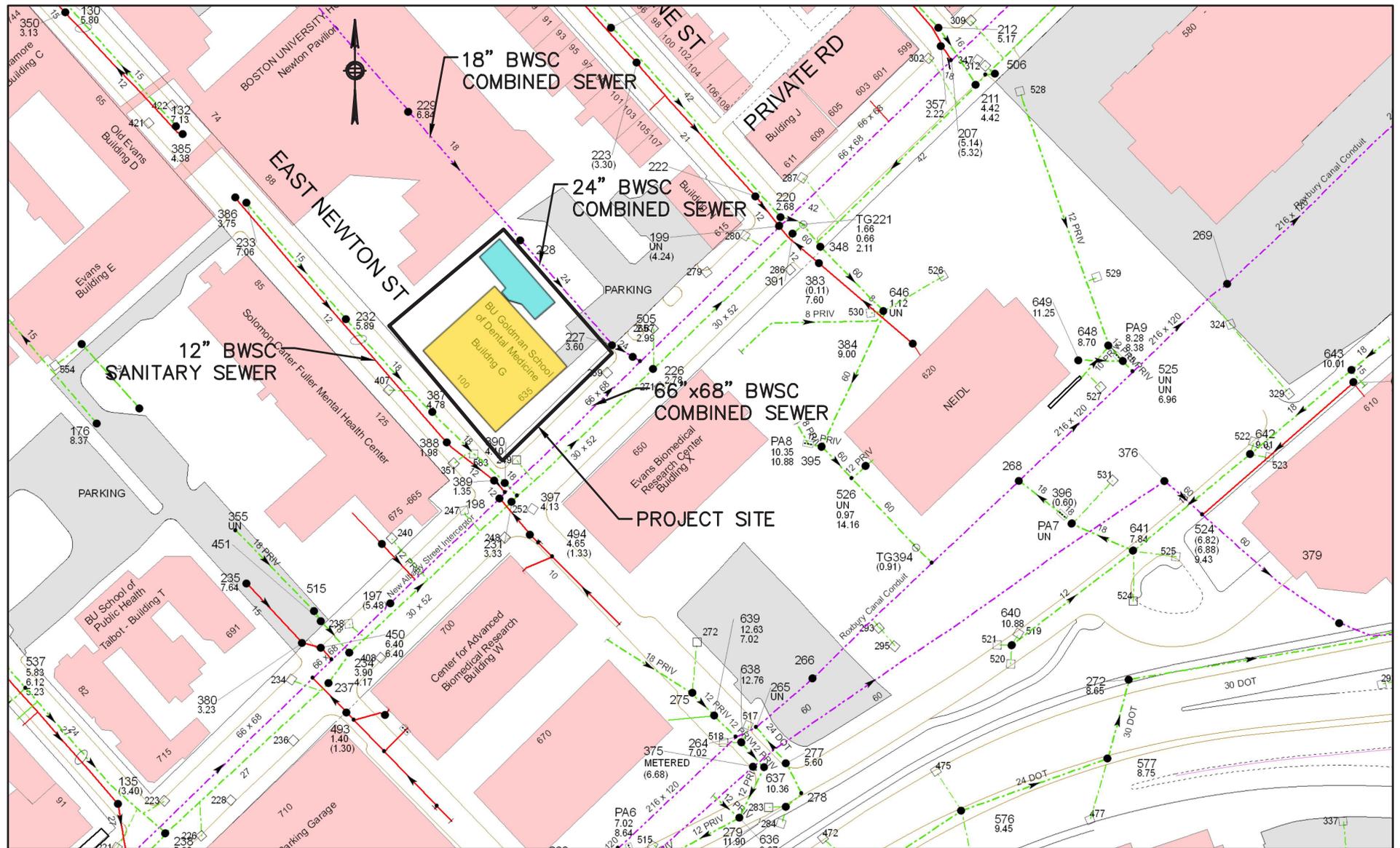
The building will receive a new secondary utility service from the local electric utility company. The utility will provide two (2) new primary circuits from Albany Street to a primary switch cabinet and pad mounted outdoor transformer. The transfer operation at the primary switch cabinet will be automatic. The pad mount transformer will be rated 2500 kVA, 13.8 kV – 480Y/277 V and will supply an indoor switchboard located in the basement. The switchboard will feed a combination of conduit/wire and vertical busway serving panelboards located in new stacked electrical room provided on each floor.

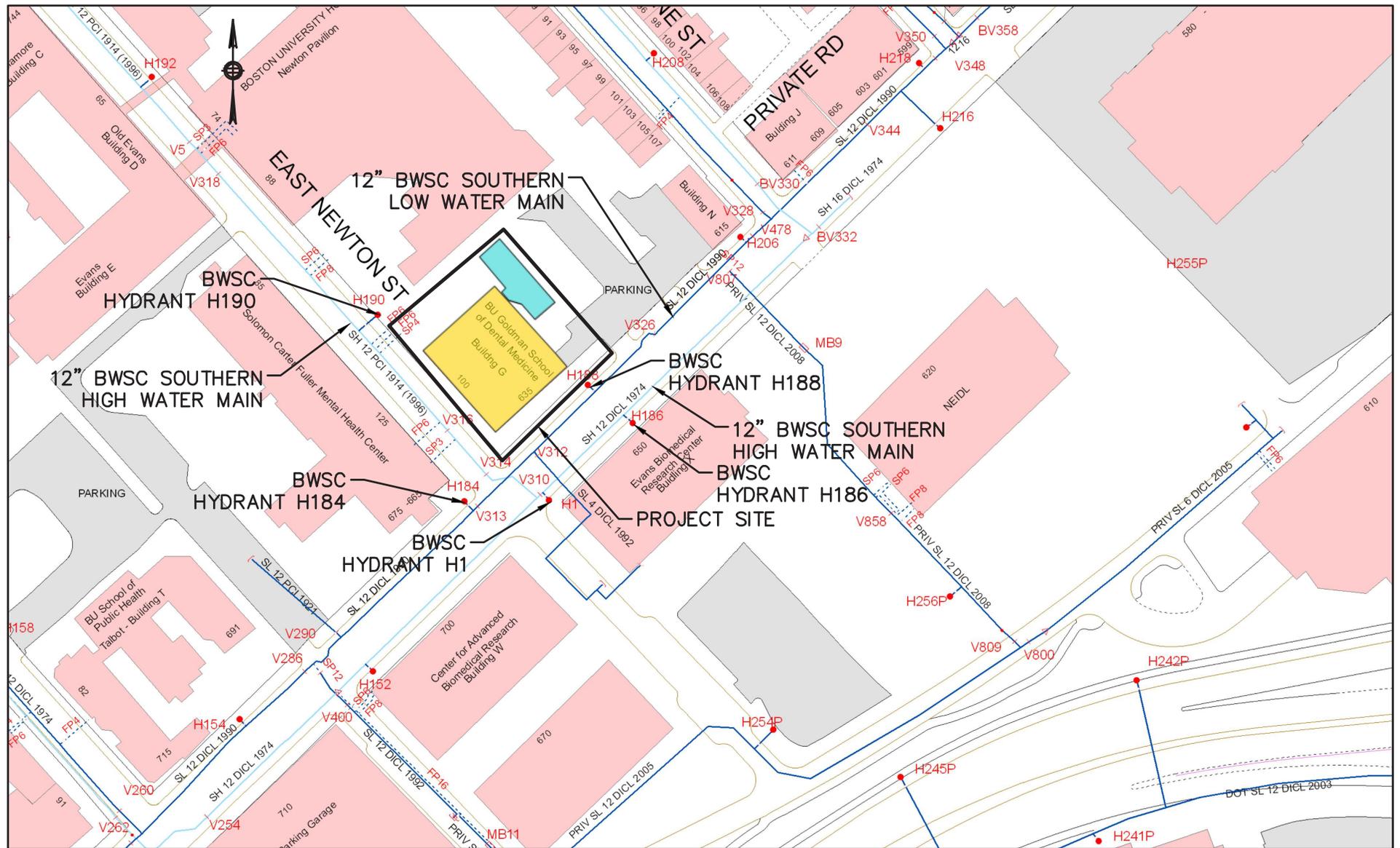
7.7 TELECOMMUNICATIONS SYSTEM

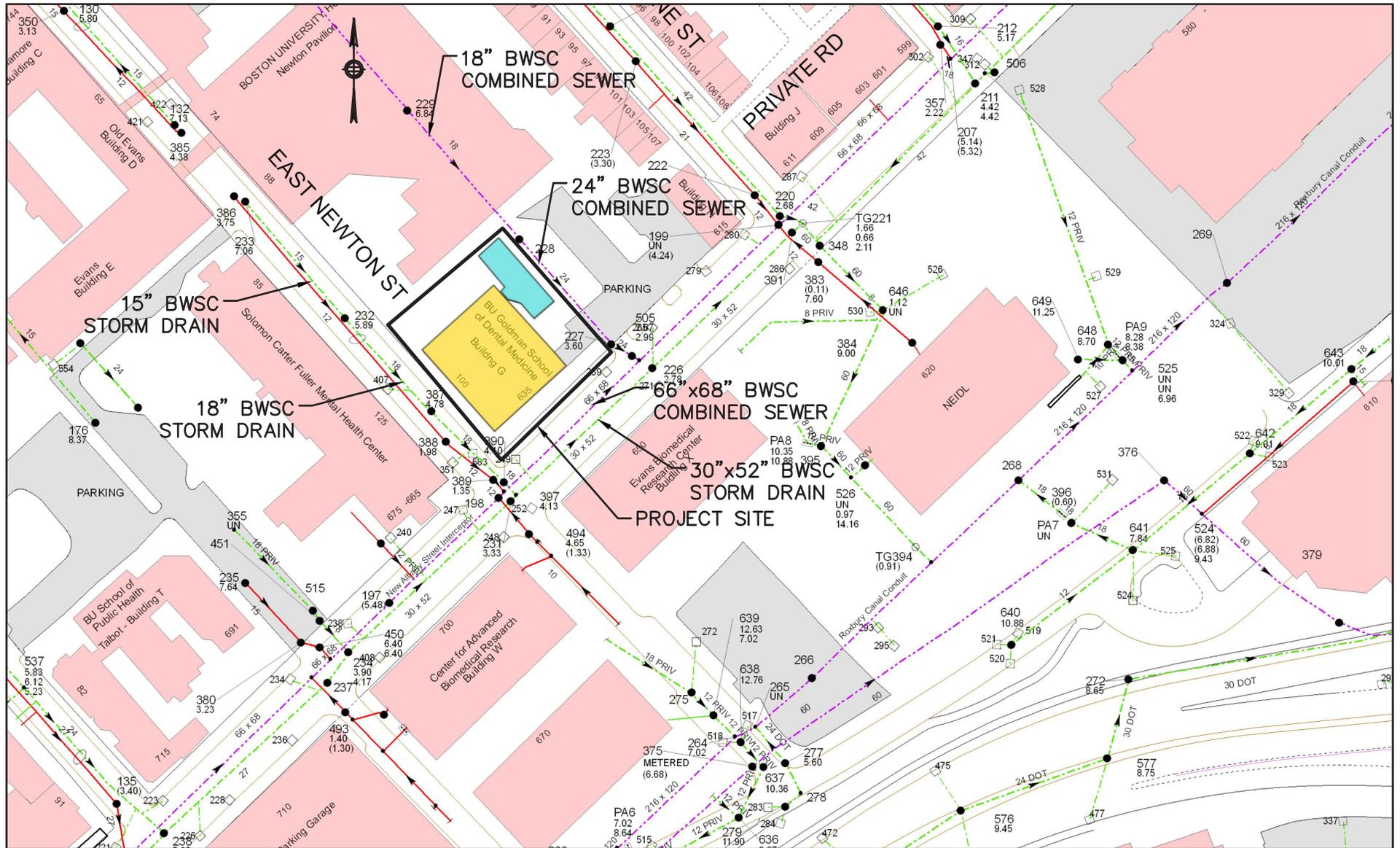
The telecommunications system in the building feeds into a new server room located on the fourth floor. The new server room serves as the distribution point. New intermediate distribution frame (“IDF”) rooms will be located on each floor of the building as well.

7.8 UTILITY PROTECTION DURING CONSTRUCTION

During construction, the City’s infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners and/or agencies. The contractor will also be required to provide adequate notification to the utility owner/operator prior to any work commencing on their utility. In the event a utility cannot be maintained in service during a switch-over to a temporary or permanent system, the contractor will be required to coordinate the shutdown with the utility owners/operators and Project abutters to minimize impacts and inconveniences accordingly.







Appendix 1

ACCESSIBILITY CHECKLIST

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
 - a. http://www.ada.gov/2010ADASTandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
 - a. <http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html>
3. Boston Complete Street Guidelines
 - a. <http://bostoncompletestreets.org/>
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
 - a. <http://www.cityofboston.gov/Disability>
5. City of Boston – Public Works Sidewalk Reconstruction Policy
 - a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
 - a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations

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- a. http://www.mbta.com/about_the_mbta/accessibility/

Project Information

Project Name:	Boston University Henry M. Goldman School of Dental Medicine
Project Address Primary:	100 East Newton Street, Boston, Massachusetts 02118
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Gary W. Nicksa, Senior Vice President for Operations, Boston University, nicksa@bu.edu, (617) 353-6500

Team Description

Owner / Developer:	Trustees of Boston University
Architect:	SmithGroup JJR
Engineer (building systems):	SmithGroup JJR
Sustainability / LEED:	SmithGroup JJR
Permitting:	Fort Point Associates, Inc.
Construction Management:	Turner Construction Company

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

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Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	Residential - Multi-unit, Four +	Institutional	Education
Commercial	Office	Retail	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	Patient Admissions and waiting area, Student entry and lounge, Classroom, as well as Student Admissions and staff offices		

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete
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Describe the building?

Site Area:	25,500 SF	Building Area:	134,210 GSF
Building Height:	104' Ft.- 6 inches	Number of Stories:	7 Flrs.
First Floor Elevation:	21.83' Elev.	Are there below grade spaces:	Yes

Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and proximate institutions such as, but not limited to hospitals, elderly and disabled housing, and general neighborhood information. The proponent should identify how the area surrounding the development is accessible for people with mobility impairments and should analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the development neighborhood and identifying characteristics.

This project is located within the Boston University Medical Campus at the intersection of East Newton and Albany Streets. The property is surrounded by the Newton Pavilion property owned by Boston Medical Center.

List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.

Route 47: on site
Routes 8, 10, CT1 and CT3: 302 feet

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List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.

Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.

Orange Line: 1.2 miles
Massachusetts Department of Mental Health, Boston University Medical Campus, and Boston Medical Center
Alumni Medical Library Boston Police-Back Bay South End Fitness Center

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?

If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.

Are the sidewalks and pedestrian ramps existing-to-remain? **If yes**, have the sidewalks and pedestrian ramps been verified as compliant? **If yes**, please provide surveyors report.

Is the development site within a historic district? **If yes**, please identify.

Yes
The existing walk and ramps are concrete and are in need of patching.
Yes. The sidewalks and pedestrian ramps have not at this time been verified as compliant. Verification and or corrections will be proposed as the Project design advances.
Yes: South End Landmarks District

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along

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a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org

The existing sidewalks within the right of way will remain as is. There is no proposed change to the existing size or material of the existing sidewalk.

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.

n/a

What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.

n/a

List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?

n/a

If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?

n/a

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?

n/a

If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?

n/a

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Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?

No onsite parking is provided: on street public parking is available

What is the total number of accessible spaces provided at the development site?

n/a

Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?

No

Where is accessible visitor parking located?

On street parking

Has a drop-off area been identified? **If yes,** will it be accessible?

No

Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.

Circulation and Accessible Routes:

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The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.

See Attached Accessible Route Diagram

Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.

Ramp along East Newton Street accesses both the Albany and East Newton Street entries. An additional ramp is provided at the student entrance along Newton Pavilion court.

Are the accessible entrance and the standard entrance integrated?

Yes

If no above, what is the reason?

Will there be a roof deck or outdoor courtyard space? **If yes**, include diagram of the accessible route.

No

Has an accessible routes way-finding and signage package been developed? **If yes**, please describe.

No: The signage package is still under development

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?

n/a

How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?

n/a

How many accessible units are being proposed?

n/a

Article 80 | ACCESSIBILITY CHECKLIST

Please provide plan and diagram of the accessible units.

n/a

How many accessible units will also be affordable? If none, please describe reason.

n/a

Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes**, please provide reason.

n/a

Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor’s Commission for Persons with Disabilities Advisory Board?

n/a

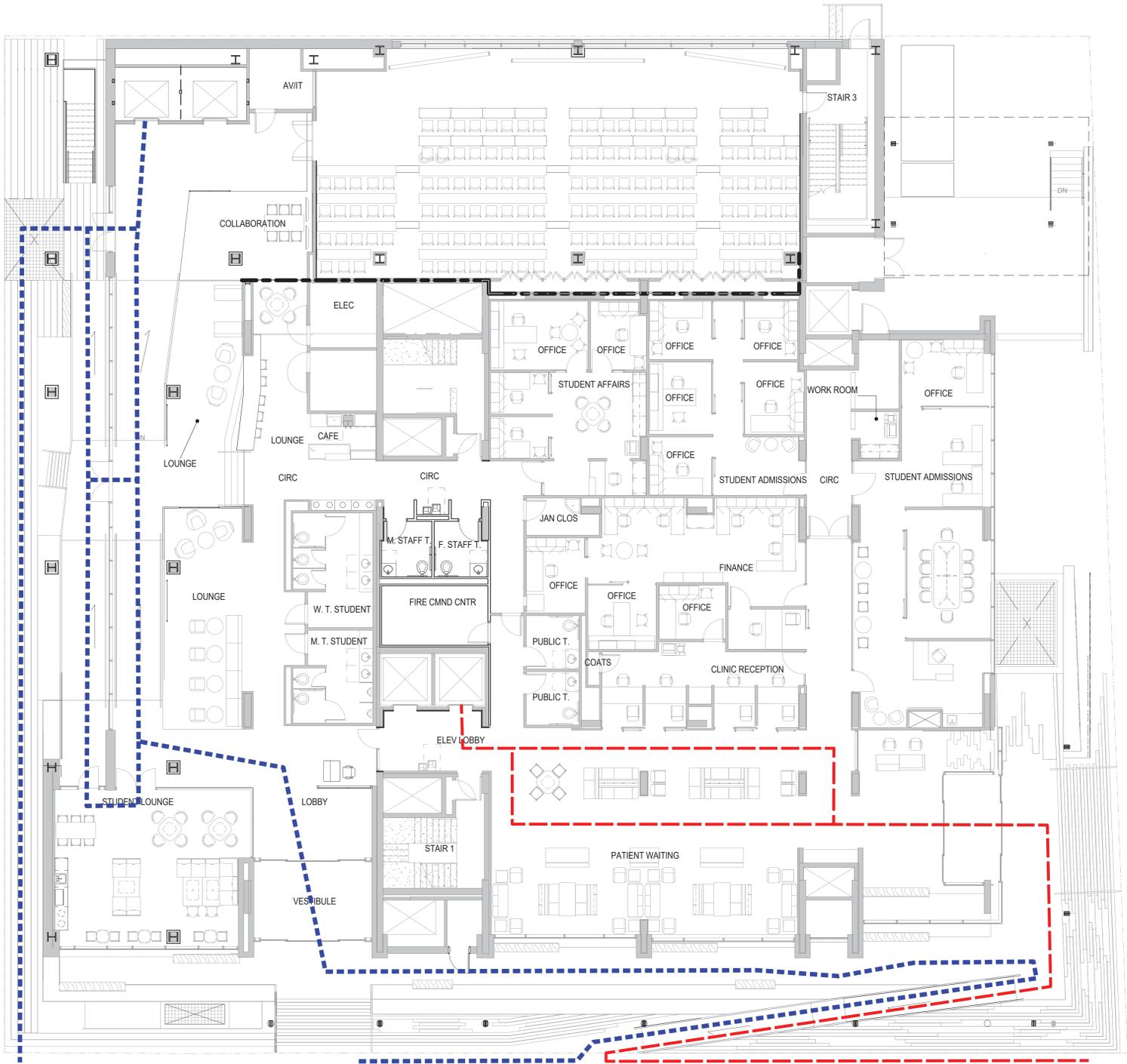
Did the Advisory Board vote to support this project? **If no**, what recommendations did the Advisory Board give to make this project more accessible?

n/a

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

patricia.mendez@boston.gov | Mayors Commission for Persons with Disabilities



- - - Patient Accessible Route
- - - Student/Staff Accessible Route

Appendix 2

CLIMATE CHANGE PREPAREDNESS AND RESILIENCY CHECKLIST

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at <http://www.cityofboston.gov/climate>

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (<http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/>)
3. Army Corps of Engineers guidance on sea level rise (<http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf>)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (<http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf>)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 ([http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf](http://www.bostonredevelopmentauthority.org/planning/Hotspot%20of%20Accelerated%20Sea-level%20Rise%202012.pdf))
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 ([http://www.greenribboncommission.org/downloads/Building Resilience in Boston SML.pdf](http://www.greenribboncommission.org/downloads/Building%20Resilience%20in%20Boston%20SML.pdf))

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current [Climate Change Preparedness & Resiliency Checklist](#).

Climate Change Resiliency and Preparedness Checklist

A.1 - Project Information

Project Name:	Boston University Henry. M. Goldman School of Medicine
Project Address Primary:	100 East Newton Street, Boston Massachusetts zip
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Gary W. Nicksa, Senior Vice President for Operations, Boston University, nicksa@bu.edu, (617) 353-6500

A.2 - Team Description

Owner / Developer:	Trustees of Boston University
Architect:	SmithGroup JJR
Engineer (building systems):	SmithGroup JJR
Sustainability / LEED:	SmithGroup JJR
Permitting:	Fort Point Associates, Inc.
Construction Management:	Turner Construction Company
Climate Change Expert:	SmithGroup JJR

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

PNF / Expanded PNF Submission	Draft / Final Project Impact Report Submission	BRA Board Approved	Notice of Project Change
Planned Development Area	BRA Final Design Approved	Under Construction	Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	Dental education
List the First Floor Uses:	Patient waiting, Administrative, Classroom

What is the principal Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete
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Describe the building?

Site Area:	25,500 SF	Building Area:	134,210 GSF
Building Height:	104 Ft.- 6 Inches	Number of Stories:	7 Floors
First Floor Elevation (reference Boston City Base):	21+ Elev.	Are there below grade spaces/levels, if yes how many:	Yes/ 1

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	Homes Midrise	Homes	Other
Select LEED Outcome:	Certified	Silver	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	2009, V3	Certified:	Silver

A.6 - Building Energy

What are the base and peak operating energy loads for the building?

Electric:	1500 (kW)	Heating:	2000 (kBtu/hr)
What is the planned building Energy Use Intensity:	220 kBtu/SF	Cooling:	215 (Tons)

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	650 (kW)	Heating:	0 (kBtu/hr)
		Cooling:	1 (Ton)

What is nature and source of your back-up / emergency generators?

Electrical Generation:	750 (kW)	Fuel Source:	Diesel
System Type and Number of Units:	Combustion Engine		1 (unit)

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years
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What is the full expected operational life of key building systems (e.g. heating, cooling, and ventilation)?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years
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What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years
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Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

<i>0/100 Deg.</i>

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

<i>95 Deg.</i>	<i>5 Days</i>	<i>6 Events / yr.</i>
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What Drought characteristics will be used for project planning – Duration and Frequency?

<i>30-90 Days</i>	<i>0.5 Events / yr.</i>
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What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

<i>45 Inches / yr.</i>	<i>4 Inches</i>	<i>0.5 Events / yr.</i>
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What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

<i>139 mph Peak Wind</i>	<i>Design 3 second gust</i>	<i>3% probability in 50 years</i>
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B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:

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How is performance determined:

Energy Model

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:

High performance building envelop	High performance lighting & controls	Building day lighting	EnergyStar equip. / appliances
High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating

Describe any added measures:

--

What are the insulation (R) values for building envelop elements?

Roof:	R = 35.0	Walls / Curtain Wall Assembly:	R = 10
Foundation:	R = 8.5	Basement / Slab:	R = 8.5
Windows:	U= 0.35 or 0.37	Doors:	U= 0.46

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
On-site Solar PV	On-site Solar Thermal	Wind power	None

Describe any added measures:

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Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	Connected to local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready
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Will the building remain operable without utility power for an extended period?

	Yes / No	If yes, for how long:	Days
If Yes, is building "Islandable?"			
If Yes, describe strategies:			

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	High Performance Building Envelop
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	High reflective roof materials	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	On-site retention systems & ponds	Infiltration galleries & areas	vegetated water capture systems	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

Describe site conditions?	<input type="text" value="No"/>	
Site Elevation – Low/High Points:	<input type="text" value="Approx. 17-18 Boston City Base"/>	
Building Proximity to Water:	<input type="text" value="Approx. 0.75 Mile"/>	
Is the site or building located in any of the following?		
Coastal Zone:	<input type="text" value="No"/>	Velocity Zone: <input type="text" value="No"/>
Flood Zone:	<input type="text" value="No"/>	Area Prone to Flooding: <input type="text" value="No"/>
Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?		
2013 FEMA Prelim. FIRMs:	<input type="text" value="No"/>	Future floodplain delineation updates: <input type="text" value="No"/>
What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?		
<input type="text" value="0.75 Miles"/>		

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	<input type="text" value="Ft."/>	Frequency of storms:	<input type="text" value="per year"/>
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C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	<input type="text" value="Boston City Base Elev.(Ft.)"/>	First Floor Elevation:	<input type="text" value="Boston City Base Elev. (Ft.)"/>
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Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

<input type="text" value="Yes / No"/>	If Yes, to what elevation	<input type="text" value="Boston City Base Elev. (Ft.)"/>
If Yes, describe:		

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1 st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention
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Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No

If yes, to what height above 100 Year Floodplain:

Boston City Base Elev. (Ft.)

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

Yes / No

If Yes, describe:

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Will the building remain occupiable without utility power during an extended period of inundation:

Yes / No

If Yes, for how long:

days

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

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C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:

Yes / No	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction
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Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:

Yes / No	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
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Describe additional strategies:

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Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:

Yes / No	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
	Potable water storage	Wastewater storage	

Describe any specific or additional strategies:

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Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov