

Institutional Master Plan Notification Form Project Notification Form

BRIGHAM AND WOMEN'S FAULKNER HOSPITAL



Submitted to:
Boston Planning & Development Agency
One City Hall Square
Boston, MA 02201

Submitted by:
Brigham and Women's Faulkner Hospital
1153 Centre Street
Boston, MA 02130

Prepared by:
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

In Association with:
NBBJ
Nutter McClennen & Fish
VHB

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Table of Contents

Table of Contents

1.0	INTRODUCTION AND GENERAL INFORMATION	1-1
1.1	Introduction	1-1
1.2	Mission and Objectives	1-2
1.3	Existing Campus Description	1-2
	1.3.1 BWFH Campus and Facilities	1-2
	1.3.2 BWFH Leased Facilities	1-5
1.4	Employment	1-5
1.5	Public Benefits	1-5
1.6	Project Team	1-9
2.0	PROJECT DESCRIPTION	2-1
2.1	Program Need	2-1
2.2	Proposed Project	2-2
	2.2.1 Project Description	2-2
	2.2.2 Schedule	2-4
2.3	Campus Additions and Improvements	2-4
2.4	Future Leases	2-4
2.5	Consistency with Zoning	2-4
	2.5.1 Existing Zoning for the BWFH Campus	2-4
	2.5.2 Existing Zoning for the 1245 Centre Street Site	2-5
	2.5.3 Proposed Zoning for the BWFH Campus and the 1245 Centre Street Site	2-5
2.6	Anticipated Permits and Approvals	2-5
2.7	Legal Information	2-7
	2.7.1 Legal Judgments Adverse to the Proposed Project	2-7
	2.7.2 History of Tax Arrears on the Properties	2-7
	2.7.3 Evidence of Site Control/Nature of Public Easements	2-7
3.0	ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS	3-1
3.1	Transportation	3-1
	3.1.1 Existing Transportation Network	3-1
	3.1.1.1 Pedestrian Facilities	3-1
	3.1.1.2 Bicycle Accommodations	3-4
	3.1.1.3 Transit	3-4
	3.1.1.4 Roadway Network	3-6
	3.1.1.5 Loading/Service	3-8
	3.1.1.6 Ambulances	3-8
	3.1.1.7 Transportation Network Companies (TNCs) and Taxicabs	3-9
	3.1.1.8 Parking	3-9

Table of Contents (Continued)

	3.1.1.9	Transportation Demand Management	3-10
	3.1.1.10	1245 Centre Street	3-11
3.1.2		Trip Generation	3-11
3.1.3		Existing BWFH Traffic	3-11
3.1.4		Future Trip Generation	3-12
	3.1.4.1	ITE Trip Generation Estimate	3-13
3.1.5		Conclusion	3-14
3.2		Wind	3-14
3.3		Shadow	3-15
3.4		Daylight	3-15
3.5		Solar Glare	3-15
3.6		Air Quality	3-15
3.7		Noise	3-15
3.8		Solid and Hazardous Waste	3-15
	3.8.1	Hazardous Waste Conditions	3-15
	3.8.2	Operational Solid and Hazardous Wastes	3-16
3.9		Geotechnical and Groundwater Impacts	3-16
	3.9.1	Subsurface Soil and Groundwater Conditions	3-16
	3.9.2	Preliminary Foundation Design Recommendations	3-16
3.10		Flood Zones and Wetlands	3-17
3.11		Construction Impacts	3-17
	3.11.1	Construction Air Quality	3-17
	3.11.2	Construction Noise	3-18
	3.11.3	Construction Waste Management	3-18
3.12		Rodent Control	3-19
3.13		Wildlife Habitat	3-19
3.14		Sustainability	3-19
3.15		Urban Design	3-24
3.16		Historic and Archaeological Resources	3-25
	3.16.1	Historic Resources on the Campus	3-25
	3.16.2	Historic Resources in the Project Vicinity	3-25
	3.16.3	Archaeological Resources Within the Campus	3-26
	3.16.4	Consistency with Historic Reviews	3-26
	3.16.4.1	Boston Landmarks Commission	3-26
	3.16.4.2	Massachusetts Historical Commission	3-28
3.17		Infrastructure	3-28
	3.17.1	Sanitary Sewer	3-28
	3.17.1.1	Existing System Conditions	3-28
	3.17.1.2	Future Wastewater Generation and System Modifications	3-28

Table of Contents (Continued)

3.17.2	Water Supply	3-29
3.17.2.1	Existing System Conditions	3-29
3.17.2.2	Future Water Demand and System Modifications	3-29
3.17.3	Stormwater Drainage	3-29
3.17.3.1	Existing System Conditions	3-29
3.17.3.2	Future Stormwater Flows	3-29
3.17.4	Electrical Service	3-30
3.17.4.1	Existing System Conditions	3-30
3.17.4.2	Future Electrical Requirements	3-30
3.17.5	Chilled Water	3-30
3.17.5.1	Existing System Conditions	3-30
3.17.5.2	Future Chilled Water Requirements	3-30
3.17.6	Natural Gas	3-30
3.17.6.1	Existing System Conditions	3-30
3.17.6.2	Future Natural Gas Requirements	3-30
3.17.7	Telecommunications	3-31
3.17.7.1	Existing Systems	3-31
3.17.7.2	Future System Connections	3-31
4.0	COORDINATION WITH OTHER GOVERNMENTAL AGENCIES	4-1
4.1	Architectural Access Board Requirements	4-1
4.2	Massachusetts Environmental Policy Act (MEPA)	4-1
4.3	Massachusetts Historical Commission	4-1
4.4	Boston Landmarks Commission	4-1
4.5	Boston Civic Design Commission	4-1

List of Appendices

Appendix A	Survey
Appendix B	Climate Change Questionnaire
Appendix C	Preliminary Energy Model
Appendix D	Accessibility Checklist
Appendix E	Smart Utilities Checklist

List of Figures

Figure 1-1	Existing Campus Site Plan	1-4
Figure 1-2	Proposed IMP Area	1-6
Figure 2-1	Existing Campus Plan and Project Location	2-8
Figure 2-2	Hospital Main Entrance	2-9
Figure 2-3	Main Entry and Location of Inpatient Addition	2-10
Figure 2-4	Existing West Parking Garage	2-11
Figure 2-5	Existing East Parking Garage	2-12
Figure 2-6	Future Campus Plan	2-13
Figure 2-7	Basement Floor Plan	2-14
Figure 2-8	First Floor Plan	2-15
Figure 2-9	Second Floor Plan	2-16
Figure 2-10	Third Floor Plan	2-17
Figure 2-11	Fourth Floor Plan	2-18
Figure 2-12	Fifth Floor Plan	2-19
Figure 2-13	Sixth Floor Plan	2-20
Figure 2-14	Inpatient Addition Building Section	2-21
Figure 2-15	View of Inpatient Addition Looking Southwest	2-22
Figure 2-16	View of Replacement West Garage	2-23
Figure 3-1	Site Location Map	3-2
Figure 3-2	BWFH Campus Pedestrian and Bicycle Circulation	3-3
Figure 3-3	Existing MBTA Transit Routes and BWFH Shuttle Stops	3-5
Figure 3-4	BWFH Campus Vehicular Circulation	3-7
Figure 3-5	Historic Resources	3-27

List of Tables

Table 1-1	BWFH Owned Buildings and Uses	1-3
Table 1-2	Leased Space	1-5
Table 2-1	Proposed Project Program	2-2
Table 2-2	Preliminary List of Anticipated Permits and Approvals	2-5
Table 3-1	Existing BWFH Campus Parking Inventory	3-10
Table 3-2	Existing BWFH Traffic Volumes	3-12
Table 3-3	Existing BWFH Campus and Proposed Project Program	3-12
Table 3-4	New Project-Generated Vehicle Trips Generated Based on Square Footage	3-13
Table 3-5	BTZD Zone 19 Mode Shares for All Purpose Trips	3-14
Table 3-6	State and National Register-Listed Properties and Historic Districts	3-26

Chapter 1

Introduction and General Information

1.0 INTRODUCTION AND GENERAL INFORMATION

1.1 Introduction

Brigham and Women's Faulkner Hospital (BWFH, or the Hospital) is a 171-bed non-profit, community teaching hospital located in Jamaica Plain, Boston. The Hospital offers comprehensive medical, surgical and psychiatric care as well as complete emergency, ambulatory and diagnostic services. Its largest inpatient services are internal medicine, cardiology, psychiatry, pulmonary, orthopedics, gastroenterology and general/gastrointestinal surgery. In the last year, BWFH performed approximately 11,000 surgical procedures, discharged 12,000 inpatients, served 30,000 Emergency Department patients, and had 200,000 outpatient visits.

Founded in 1900, BWFH has a long history of meeting the healthcare needs of residents of surrounding communities. The Hospital first opened to patients in 1903 in a three-story brick building complex as a free hospital for residents of the area of Boston formerly known as West Roxbury, now Jamaica Plain. For health benefits, it was located on a seven-acre site on a hill overlooking the grounds of the Arnold Arboretum. In its first year of operation, the Faulkner Hospital had capacity for 30 medical and surgical inpatients; and it recorded treating 514 patients in the first 20 months (approximately 300 per year). In 1976, a new inpatient building opened on an expanded 17-acre campus. BWFH is an affiliated hospital of Brigham and Women's Hospital and its non-profit parent corporation Partners HealthCare System, Inc.

Today, the Hospital's inpatient facilities, which have not been expanded since 1976, limit its ability to care for patients and restrict its ability to employ new technologies. BWFH continuously operates at high levels of occupancy during the weekdays, limiting its ability to accept additional patients, and its narrow inpatient floors – designed more than 40 years ago – do not provide sufficient space for today's technologies and patient care protocols.

To address the Hospital's need for expanded inpatient facilities, BWFH is proposing an Inpatient Addition with 78 new single inpatient beds, as well as clinical support and ambulatory space; the Hospital also is proposing replacement of the existing large parking structure on campus, an addition to an existing smaller parking structure, and a new driveway from Allandale Street to the replacement garage to improve vehicular circulation (collectively, the "Proposed Project", and individually "Project Component").

BWFH is pleased to submit this Institutional Master Plan Notification Form/Project Notification Form (IMP/NF/PNF) to the Boston Redevelopment Authority, doing business as Boston Planning & Development Agency (herein, the "BPDA"). With this submission, BWFH is initiating the process for approval of an Institutional Master Plan (IMP) pursuant to Article 80D of the Boston Zoning Code (the Code) and initiating Large Project Review under Article 80B of the Code to enable the development of the Proposed Project.

1.2 Mission and Objectives

BWFH's mission is to attain excellence in patient care services, provided in a learning environment with dignity, compassion and respect.

BWFH has full accreditation from The Joint Commission, which accredits and certifies more than 15,000 health care organizations and programs in the United States. The Joint Commission's accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards.

The Hospital's affiliation with Brigham and Women's Hospital (BWH), located about three miles away in the Longwood Medical and Academic Area, dates back to 1998 when the boards of each hospital voted to merge while retaining their separate hospital licenses. "The merger allowed the Faulkner to continue its teaching focus by establishing BWH integrated residency programs in Internal Medicine and General Surgery. Importantly, the BWH made significant commitments to bring expanded and new programs to the Faulkner campus."¹ The BWH mission is to maintain and restore health through leadership in compassionate care, scientific discovery, and education.

1.3 Existing Campus Description

1.3.1 *BWFH Campus and Facilities*

The BWFH campus is located in the Jamaica Plain neighborhood of Boston. It is bounded generally by Centre Street to the east, Whitcomb Avenue to the north, and Allandale Street to the south. A residential neighborhood accessed along Malcolm Road lies to the northwest. The campus totals approximately 17.3 acres. The BWFH campus contains the following structures:

- ◆ Main Building, with 434,000 square feet (sf), comprised of the 1976 inpatient building and a 1995 medical office building addition;
- ◆ Belkin House, with 32,500 sf;
- ◆ Two above-ground parking garages: East Parking Garage, with 139 parking spaces, and West Parking Garage, with 580 parking spaces.

BWFH's properties are listed in Table 1-1 and shown on Figure 1-1. Appendix A includes a survey of the campus.

¹ Marcus, Cara, *The Hospital on the Hill: A History of the Faulkner Hospital, Brigham and Women's Faulkner Hospital Library Services*, 2015.

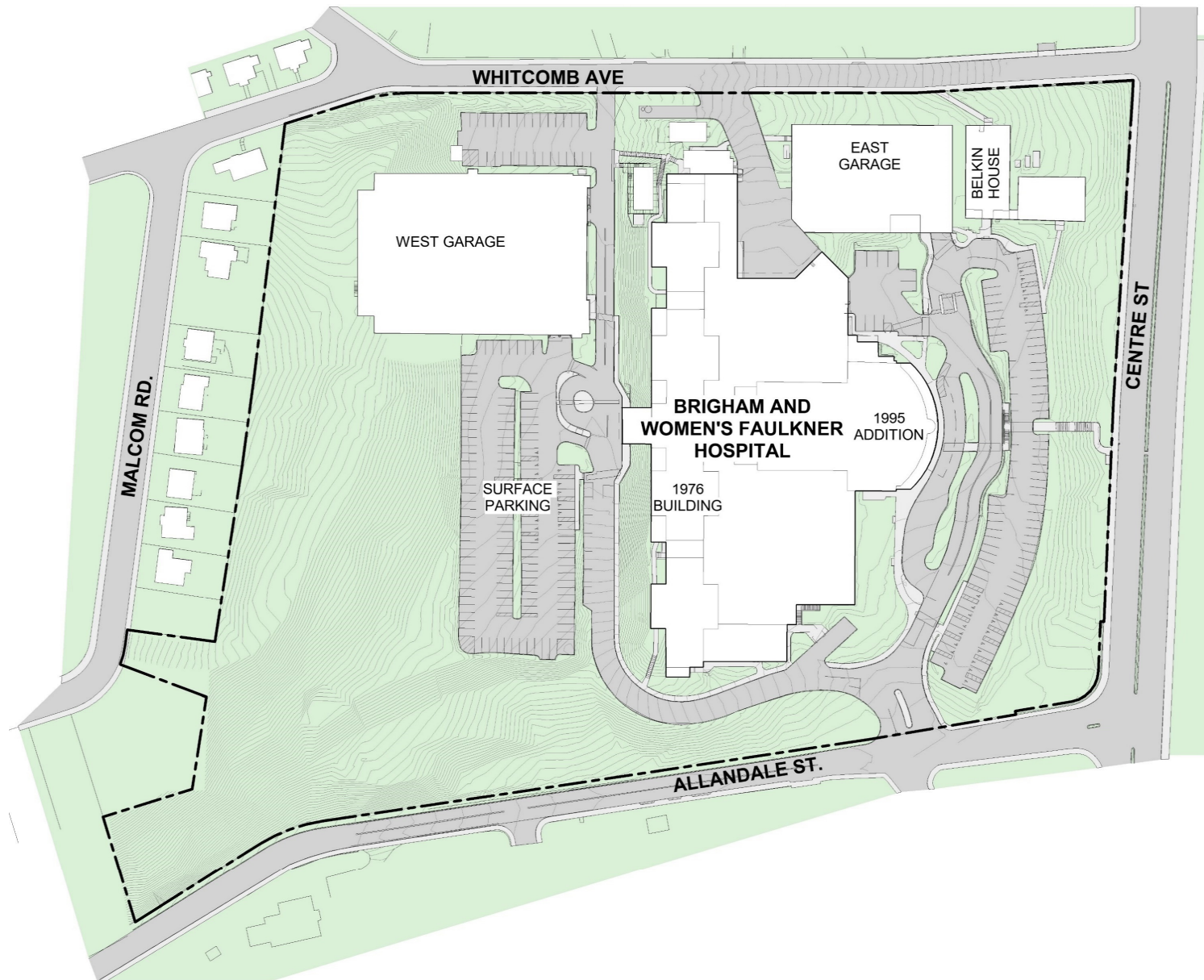
Table 1-1 BWFH Owned Buildings and Uses

Building Name	Address	Current Uses ¹	Construction Date(s)	Approximate Gross Floor Area Hospital (sf) ²	Structured Parking Spaces	Stories Above Grade	Stories Below Grade	Building Height ³
Faulkner Hospital (Main Building)	1153 Centre Street	Inpatient Clinical, Ambulatory Clinical, Admin/Support Services, Ancillary Clinical Services, Cafeteria, Retail	1976 Main Building / 1995 Addition	434,000	-	5	2	East: 71'6" West: 67'2"
Belkin House	1153 Centre Street	Ambulatory Clinical, Administrative/Support Services, Ancillary Clinical Services	1965	32,500	-	2	0	42'
East Garage	1153 Centre Street	Parking	2004	-	139	3	1	22'
West Garage	1153 Centre Street	Parking	1973	-	580	5	0	33'
TOTAL				466,500	719			
1245 Centre Street	1245 Centre Street	Administrative Offices, Storage, Parking	1954 North Wing / 1979 South Wing	51,525	0	3	0	31'

¹ This table lists the primary functions located within each building at the present time. Hospital sub-uses are frequently relocated within buildings to respond to case mix and service changes and to accommodate on-going renovations.

² As defined in the Boston Zoning Code. For floor area ratio purposes, square footages do not include parking space within a garage or other structure which is accessory to the Hospital, whether or not beneath a building.

³ To top of last occupiable floor.



Brigham and Women's Faulkner Hospital Boston, Massachusetts

BWFH also owns a property at 1245 Centre Street in West Roxbury, formerly known as the *Spaulding Nursing and Therapy Center, West Roxbury*. This property houses an approximately 51,525-sf building on a 3.5-acre site, and is currently used for administrative offices, storage, and parking.

Together, the BWFH campus and property at 1245 Centre Street are proposed to be the BWFH IMP Area (see Figure 1-2).

1.3.2 BWFH Leased Facilities

BWFH leases three small spaces in the surrounding area for administrative space, ambulatory and clinical care, as shown on Table 1-2. BWFH also leases space at three locations nearby for staff parking.

Table 1-2 Leased Space

Property Address	Use	SF	Expiration
891 Centre Street	Administrative offices	6,200	5/31/2021
1337 Hyde Park Avenue	Ambulatory Clinical	3,760	12/31/2019
1832 Centre Street	Ambulatory Clinical	7,690	12/31/2020
Trinity Church, 1195 Centre Street	Parking	n/a	-
Forest Hills, 3841 Washington Street	Parking	n/a	-
Highlands Lot, 27 Corey Street	Parking	n/a	-

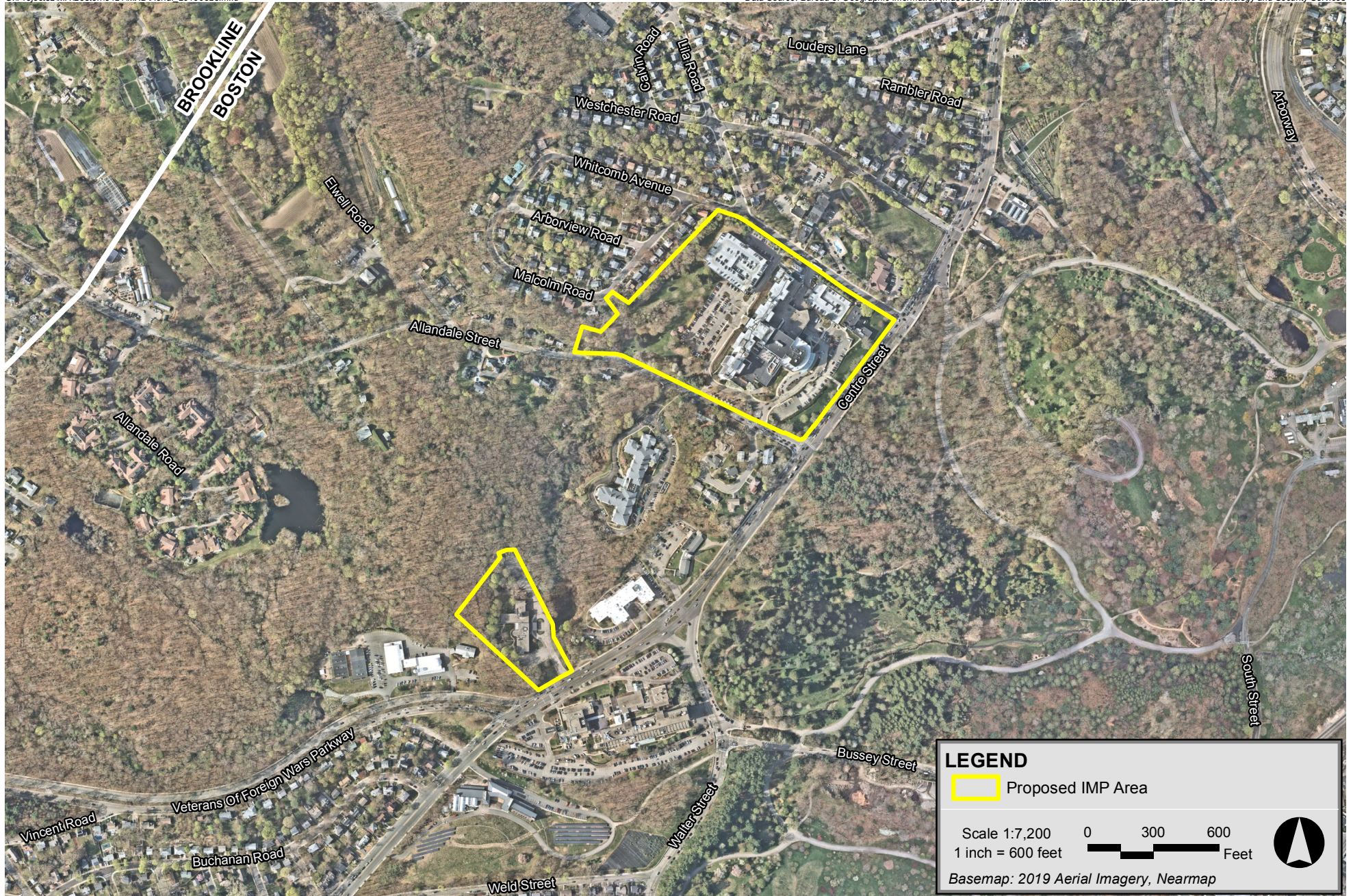
1.4 Employment

BWFH has a direct workforce of almost 1,600 employees. Of this total, approximately 38 percent are Boston residents.

1.5 Public Benefits

The BWFH community benefit mission is:

- ◆ To evaluate the health status of service area neighborhoods of West Roxbury, Roslindale, Hyde Park and Jamaica Plain, and respond to identified needs.
- ◆ To pay particular attention to health and wellness concerns affecting children in local schools, the elderly, women, and diverse populations who may experience health disparities, among others.
- ◆ To provide a wide variety of free health screenings and immunizations, health education programs, and other services related to important health issues affecting communities served.



Brigham and Women's Faulkner Hospital Boston, Massachusetts

- ◆ To seek community participation in and feedback about BWFH’s community benefits efforts, by involving community members in the Hospital’s planning and evaluation processes, and by keeping the lines of communication open.
- ◆ To engage in meaningful, active collaboration with a broad range of community residents, schools, service organizations, businesses, government agencies and others, to stay abreast of community needs, and to pool knowledge and resources in addressing those needs.
- ◆ To periodically review and assess community benefits goals, services, and outcomes to ensure that they remain relevant to issues affecting surrounding communities, and to allocate or reallocate community benefits resources, as needed.

Key Accomplishments

Various BWFH community benefit initiatives have served thousands of residents over the past two years, including:

- ◆ Providing hundreds of seniors with opportunities to exercise, explore, connect and learn about fitness, safety and health;
- ◆ Providing stroke education, medication safety, health education programs, and free preventative health screenings;
- ◆ Developing a food insecurity resource program for the Hospital waiting areas and physician offices;
- ◆ Serving thousands of children, teachers, parents, and staff by school partnership activities, including a new weekly healthy food “backpack” program for food insecure families;
- ◆ Initiating trauma-informed yoga classes for violence survivors as part of the Hospital’s domestic violence intervention efforts;
- ◆ Hiring local students to participate in the Summer Jobs Program, as well as offering job shadow opportunities to local students; and
- ◆ Working in close collaboration with community groups on a variety of health issues, such as senior safety, transportation barriers, food insecurity and health and wellness education.

Plans for Future Programs

BWFH continues to work with its community partners to implement its 2017-2019 community benefit plan, as defined by a 2016 community health needs assessment, that focuses on:

1. Chronic Disease;
2. Substance Abuse;
3. Food Insecurity, Healthy Eating and Active Living;
4. Domestic Violence; and
5. Social Determinants of Health (Language, Poverty, Education, Access and Youth Engagement).

Additional public benefits are described below.

Strengthening the Community Hospital

With construction of the Proposed Project, BWFH will be able to preserve its important role as a community healthcare resource for years to come.

Funding Important Programs

The Proposed Project will fund important community health and wellness programs.

Economic Benefits

The Proposed Project is expected to result in approximately 300 permanent jobs, and also will create approximately 250 construction jobs. BWFH will continue to contribute significantly to the City's economic health.

Payment in Lieu of Taxes

In 2018, BWFH made a \$1.14 million Payment in Lieu of Taxes contribution to the City of Boston, half in cash and half in community benefit spending.

Distributed Care for Improved Access

The Proposed Project will improve healthcare service, access and convenience for the community, providing the right care in the right location.

1.6 Project Team

Proponent:	Brigham and Women's Faulkner Hospital 1153 Centre Street Boston, MA 02130 (617) 983-7588 David McCready, President David Goldberg, Executive Director, Communications and Community Relations
Architect:	NBBJ 1 Beacon Street Boston, MA 02108 (617) 378-4800 Tom Sieniewicz George Takoudes
Permitting Consultant:	Epsilon Associates, Inc. 3 Mill & Main Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Geoff Starsiak
Legal Counsel:	Nutter McClennen & Fish LLP 155 Seaport Boulevard Boston, MA 02210 (617) 439-2000 Mary Marshall
Transportation Consultant / Civil Engineer:	Vanasse Hangen Brustlin, Inc. 99 High Street, 10 th Floor Boston, MA 02110 (617) 728-7777 David Bohn Howard Moshier

Chapter 2

Project Description

2.0 PROJECT DESCRIPTION

2.1 Program Need

BWFH has determined that its facilities require improvement and expansion to continue to provide the first-class care its patients deserve and expect. In particular, the Hospital's inpatient facilities require expansion to continue to serve growing patient populations and to meet current care standards; and the Hospital's parking facilities need replacement – due to age and condition – and expansion to meet patient and visitor demand.

BWFH's inpatient facilities have not been expanded since 1976, and currently limit its ability to meet patient demand. BWFH continuously operates at high levels of occupancy during the weekdays, limiting its ability to accept additional patients who may be better served in the Hospital's community setting rather than in the Longwood Medical and Academic Area or other urban hospital settings.

Over the past several years, BWH and BWFH have successfully developed a strategy for treating patients at a lower cost at BWFH by transferring patients from the BWH emergency department to be admitted at BWFH when appropriate and feasible. Treating more of these patients in a community setting is limited, however, by BWFH's capacity to accept these patients. Currently BWFH is only able to accept these patients 41% of the time. In addition, capacity constraints are exacerbated by the increasingly complex patients seeking care in Massachusetts, a common situation across Boston's Academic Medical Centers.

In addition to needing inpatient beds to address capacity issues, BWFH's inpatient facilities need to be expanded to allow for new technologies, to right size support spaces, and to improve workflow and operations. The existing inpatient structure's narrow floorplates – designed more than 40 years ago – do not provide sufficient space for today's technologies and patient care protocols. Changes in the model of care and new technologies require spaces that can provide areas for efficient workflow and treatment.

In the years following the inpatient building's opening in 1976, BWFH gradually removed inpatient beds from service to accommodate the space needs of additional technologies, higher staffing levels, clinical care provision, and operational and infrastructure support. As a result, inpatient bed capacity dropped from 259 beds in 1976 to 130 beds in 1998, when Faulkner Hospital affiliated with BWH. Over the last 20 years, BWFH has brought previously licensed beds back into service to accommodate demand, resulting in its current total of 171 beds.

Improvements related to parking and circulation on the BWFH campus are also required. The on-campus parking system typically operates near or at capacity between 10:30 a.m. and 3:30 p.m. on weekdays. This situation exists despite the Hospital leasing approximately 252 off-site parking spaces for staff use (shuttles to the BWFH campus are provided).

The West Parking Garage (constructed in 1973) is also at the end of its useful life and requires significant annual capital investment just to maintain safety and functionality. Replacement of the West Parking Garage would allow for new parking spaces to be created to accommodate current and future demand. The East Parking Garage (constructed in 2004 with structural capacity for up to four additional levels) similarly operates at or near capacity during peak hours.

2.2 Proposed Project

2.2.1 Project Description

To meet the needs described in Section 2.1, BWFH's Proposed Project includes three Project Components: a new inpatient addition to the Hospital's Main Building (the "Inpatient Addition"); construction of three new parking levels on the East Parking Garage (the "East Parking Garage Addition"); and the demolition of the West Parking Garage and construction of a replacement parking garage, with an additional driveway to Allandale Street (the "Replacement West Garage"). The locations of the Project Components are shown on Figure 2-1 at the end of this chapter. Figures 2-2 to 2-5 provide photographs of the existing conditions. Figures 2-6 to 2-16 at the end of this chapter include a proposed site plan, floor plans, section and preliminary massing views of the Proposed Project. Table 2-1 provides a summary of the Proposed Project.

Table 2-1 Proposed Project Program

Project Element	Approximate Dimension
Inpatient Addition	
Total Beds	78
Number of Stories	5
Height	72 feet
Total SF	98,000 sf
East Parking Garage Addition	
New Stories	3
Height	55 feet
Net New Parking Spaces	171
Replacement West Garage	
Stories of New Garage	3 above ground/2 below ground
Height of New Garage	34 feet at West Entrance
New Garage Parking Spaces	952
New Surface Parking Spaces	91
Garage Parking Spaces Eliminated	-580
Surface Parking Spaces Eliminated	-131
Net New Parking Spaces	332

Inpatient Addition

The Inpatient Addition is proposed to be constructed in a vacant space on the southern side of the Main Building. The first floor will provide space for additional radiology equipment (including a new magnetic resonance imaging [MRI] machine) and an extended recovery/post-procedure recovery unit. The second floor is planned to house an outpatient Endoscopy clinic as well as clinical support space. The top three floors (3, 4 and 5) will house 26 inpatient beds each. The single inpatient rooms will allow BWFH to treat additional patients in an environment with more space for families and clinicians. In total, the five-story addition will include approximately 98,000 sf with 78 new beds.

The Inpatient Addition will meet many of BWFH's needs, including:

- ◆ The new inpatient rooms will be designed to meet new regulatory and practice standards which provide additional space to increase patient safety and dedicated family zones to support comfortable visitation and communication with visitor, patients and providers. The addition will connect to the Main Building on each floor to join patients, visitors, staff and support services.
- ◆ The new post procedure recovery area will allow providers to care for patients without admitting them to an inpatient bed. This will improve the patient experience by creating capacity on inpatient units for patients who require longer recovery time. This will also improve the patient flow through the Hospital by avoiding the need to admit the patient to inpatient units, that are often at or above capacity, or blocking rooms to recover patients who may not need inpatient level care.
- ◆ Space to allow BWFH to develop programs and services that embrace advances in technology and medicine to provide an alternative, lower cost setting to treat patients.
- ◆ A design that will improve the employee experience by right sizing support spaces and optimizing workflows to improve the wellbeing of providers and staff.

East Parking Garage Addition

The East Parking Garage Addition includes the construction of three new parking levels on the existing garage, adding approximately 171 parking spaces. As noted above, the garage was constructed with capacity for up to four additional parking levels. In addition, a new bridge will connect the East Parking Garage to the Main Building, providing patients and visitors a weather-protected connection between the Main Building and parking. The addition will increase the parking capacity on campus and improve Hospital circulation for patients.

Replacement West Garage

The Replacement West Garage entails construction of an approximately 952-space parking garage on the site of an existing 131-space surface parking lot. The new garage will be set into the hill to reduce its height and visual appearance. The existing 580-space West Parking Garage will be demolished and replaced with an approximately 91-space surface parking lot. To improve campus circulation, an additional driveway will connect the Replacement West Garage to Allandale Street. The new garage will increase parking capacity on campus, while its sustainable roof with solar panels will extend the longevity of the garage and improve the Hospital's sustainability.

2.2.2 *Schedule*

Construction of the Replacement West Garage is anticipated to start in the third quarter of 2020, with completion after 20 months. Construction of the Inpatient Addition is anticipated to start at the end of 2020 and be completed after 24 months. Construction of the East Parking Garage Addition is anticipated to start 2024 with completion after 18 months.

2.3 Campus Additions and Improvements

Over the 10-year term of the IMP, BWFH anticipates that an additional 10,000 sf of campus additions may occur. The specific location or uses are not currently known.

2.4 Future Leases

BWFH does not currently anticipate leasing additional clinical space during the term of the IMP. Temporary parking in off-site locations may be leased to enable on-campus construction activities and to support ongoing Hospital operations.

2.5 Consistency with Zoning

2.5.1 *Existing Zoning for the BWFH Campus*

The BWFH campus is within the Faulkner Hospital Neighborhood Institutional Subdistrict of the Jamaica Plain Neighborhood Zoning District, subject to the zoning controls set forth in Article 55 of the Code and as shown on Map 9A of the Zoning Maps for the City of Boston. A portion of the Hospital is also located within the Allandale Street Greenbelt Protection Overlay District (GPOD) and the Centre Street GPOD, established in accordance with Section 55-27 of the Code as shown on Map 9A, subject to regulation in accordance with the provisions of Article 29 of the Code. A small parcel owned by BWFH is currently located within the One Family Residential, Minimum Lot Area of 9000 sf (1F-9000) Zoning Subdistrict and the Neighborhood Design Overlay District of the Jamaica Plain Neighborhood District.

2.5.2 Existing Zoning for the 1245 Centre Street Site

The 1245 Centre Street Site is located in its entirety within the “Bakalar/Allandale Woods Conservation Protection Subdistrict” (CPS) of the West Roxbury Neighborhood Zoning District, the zoning controls for which are set forth in Article 56 of the Code.

2.5.3 Proposed Zoning for the BWFH Campus and the 1245 Centre Street Site

In accordance with Article 80D of the Boston Zoning Code, upon adoption of the BWFH IMP, the BWFH campus will be included within the BWFH IMP Overlay District and described in and subject to the provisions of the BWFH IMP. The BWFH IMP will allow for the development and use of the BWFH campus for Hospital Use as that term is defined in Section 2A of the Code, including inpatient, clinical, office, laboratory and research and parking uses. Once approved, the BWFH IMP and the BWFH IMP Overlay District will authorize the construction of the Proposed Project and Project Components thereof, as fully in compliance with all the relevant provisions of the Code. The development and use of the Proposed Project will be deemed to be allowed as of right and determined to be in compliance with all relevant provisions of the Code, including dimensional, parking, loading and other special districts without the need for further relief.

The BWFH IMP and BWFH IMP Overlay District will also be applicable to the 1245 Centre Street Site and will authorize the continued use and occupancy for the 1245 Centre Street Site for Hospital Use, in connection with BWFH use of the BWFH campus.

2.6 Anticipated Permits and Approvals

Table 2-2 includes a preliminary list of local, state and federal permits and approvals that may be required for the Proposed Project. This list is based upon current information about the Proposed Project, and is subject to change as the design and program of the Proposed Project evolves. Some of the permits and approvals listed may not be required, while there may be others not listed that will be needed.

Table 2-2 Preliminary List of Anticipated Permits and Approvals

AGENCY		APPROVAL	
<u>Local</u>			
Boston Planning & Development Agency		Article 80 Large Project Review; Execution of Agreements under Article 80B Large Project Review; Certification of Compliance; Institutional Master Plan Adequacy Determination and Certification of Consistency; Zoning Map Amendment	
Boston Zoning Commission / Mayor		Institutional Master Plan Approval in accordance with Article 80D; Zoning Map Amendment	

Table 2-2 Preliminary List of Anticipated Permits and Approvals (Continued)

AGENCY		APPROVAL
<u>Local (continued)</u>		
Boston Employment Commission		Compliance with Boston Residents Construction Employment Ordinance
Boston Civic Design Commission		Design Review (as required)
Boston Transportation Department		Construction Management Plan; Transportation Access Plan Agreement
Boston Public Safety Commission Committee on Licenses		Inflammables Storage Permit/Garage License (as required)
Public Improvement Commission		Specific Repair Plan approval and License for changes to the public right of way (if required)
Boston Water and Sewer Commission		Site Plan Review; Water and Sewer Connection Permits; Cross Connection Backflow Prevention Approval (as required); Temporary Construction Dewatering Permit (as required)
Public Works Department		Curb Cut and Street/Sidewalk Opening Permits
Boston Inspectional Services Department		Demolition Permit; Building/Occupancy Permits
Interagency Green Building Council		Article 37 Compliance
Boston Parks and Recreation Department		Review of Construction within 100 feet of a park or parkway (if required)
Inspectional Services Department		Building and occupancy permits
Executive Office of Energy and Environmental Affairs (MEPA Office)		Review under the Massachusetts Environmental Policy Act
Department of Environmental Protection		Notice of Demolition/Construction; Pre-Asbestos Removal Notice (as required); Environmental Results Program
Department of Conservation and Recreation		Access Permit (if required)
Department of Public Health		Determination of Need
Massachusetts Historical Commission		State Register Review
Massachusetts Water Resources Authority		Temporary Construction Dewatering Permit (issued jointly with BWSC, as required); Sewer Use Discharge Permit (as required)
<u>Federal</u>		
Environmental Protection Agency		National Pollutant Discharge Elimination System Permit
Federal Aviation Administration		Determination of No Hazard to Air Navigation (if required)

2.7 Legal Information

2.7.1 *Legal Judgments Adverse to the Proposed Project*

The Proponent is not aware of any legal judgments that are adverse to the Proposed Project.

2.7.2 *History of Tax Arrears on the Properties*

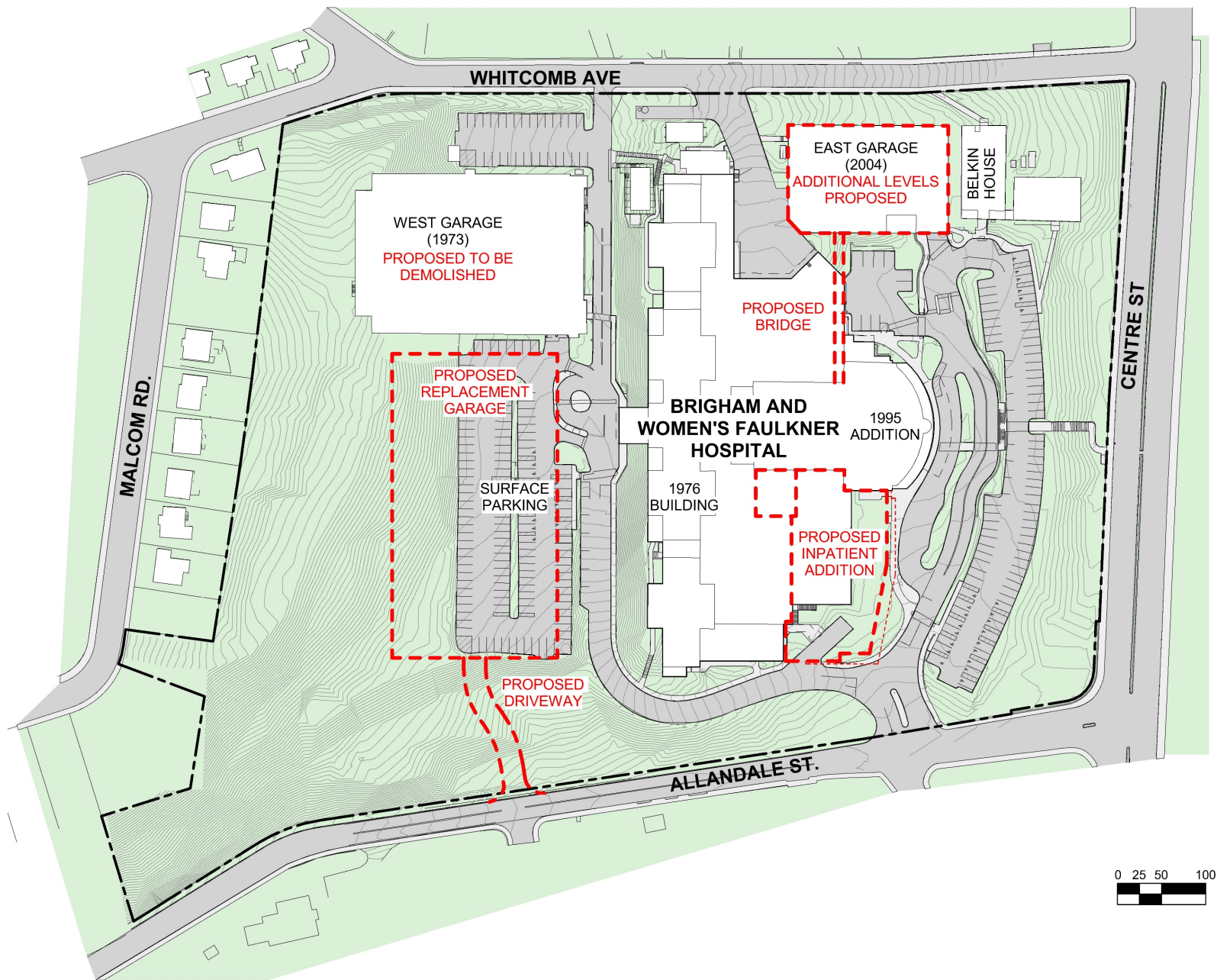
The Proponent is not aware of any real estate taxes due and outstanding for either the BWFH campus or the 1245 Centre Street Site.

The legal title to the BWFH campus is owned by “The Faulkner Hospital, Inc.”

The legal title to the 1245 Centre Street Site is held by “The Brigham and Women’s Faulkner Hospital, Inc.”

2.7.3 *Evidence of Site Control/Nature of Public Easements*

As noted above, the BWFH campus is owned by The Faulkner Hospital, Inc. and 1245 Centre Street is owned by The Brigham and Women’s Faulkner Hospital, Inc.



Brigham and Women's Faulkner Hospital Boston, Massachusetts



Brigham and Women's Faulkner Hospital Boston, Massachusetts



Brigham and Women's Faulkner Hospital Boston, Massachusetts



Brigham and Women's Faulkner Hospital Boston, Massachusetts



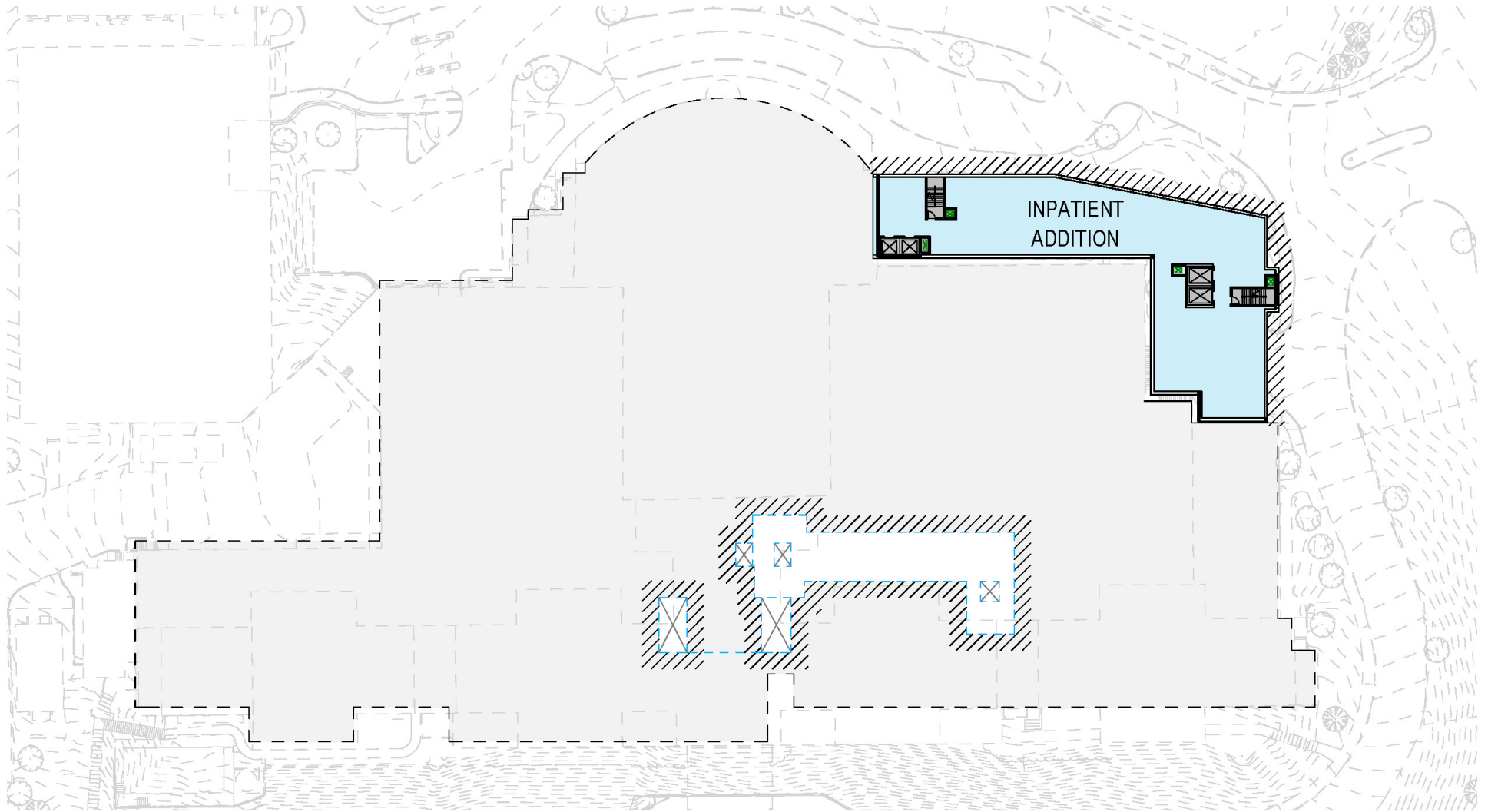
Brigham and Women’s Faulkner Hospital Boston, Massachusetts



Figure 2-5
Existing East Parking Garage

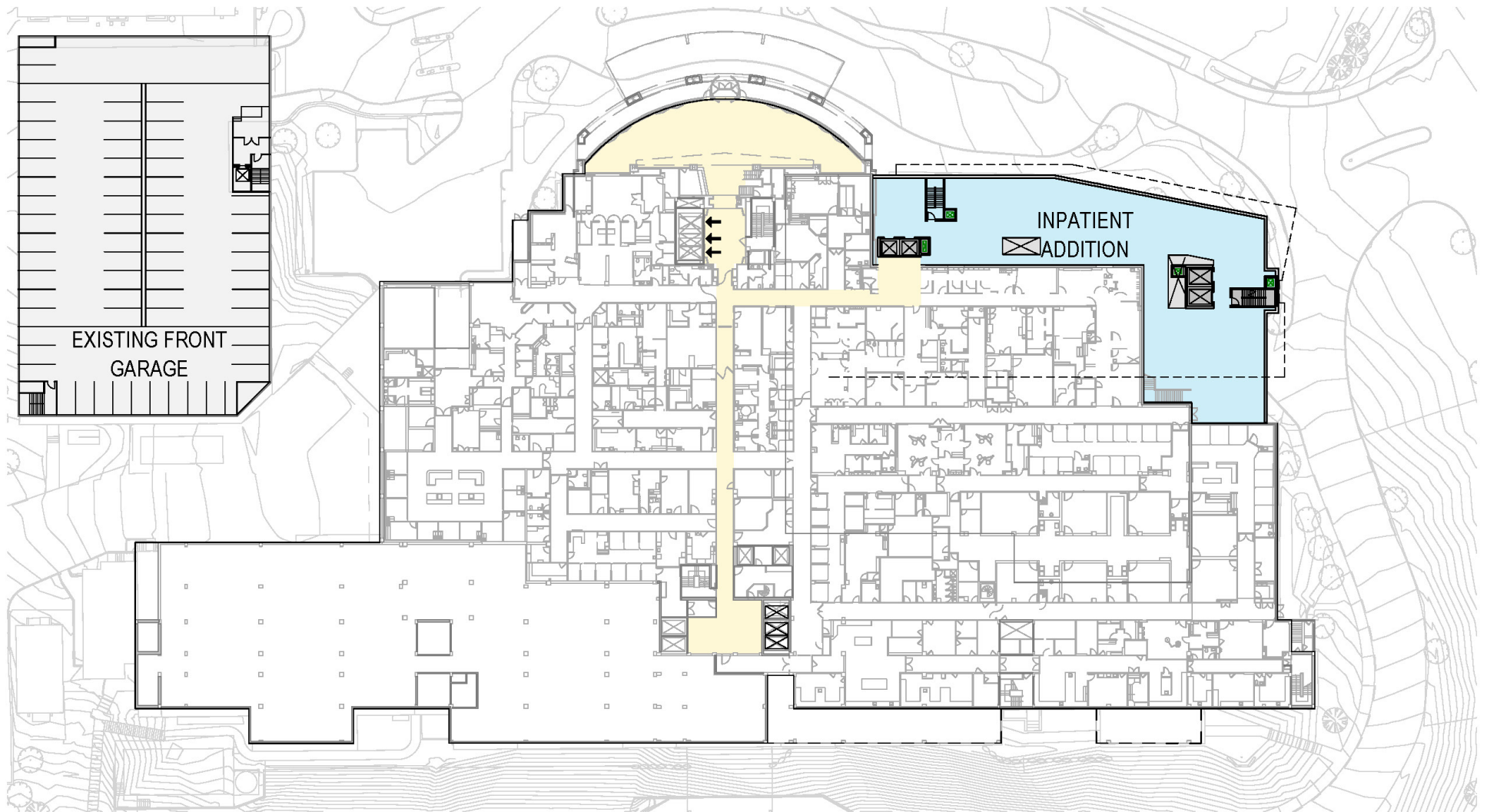


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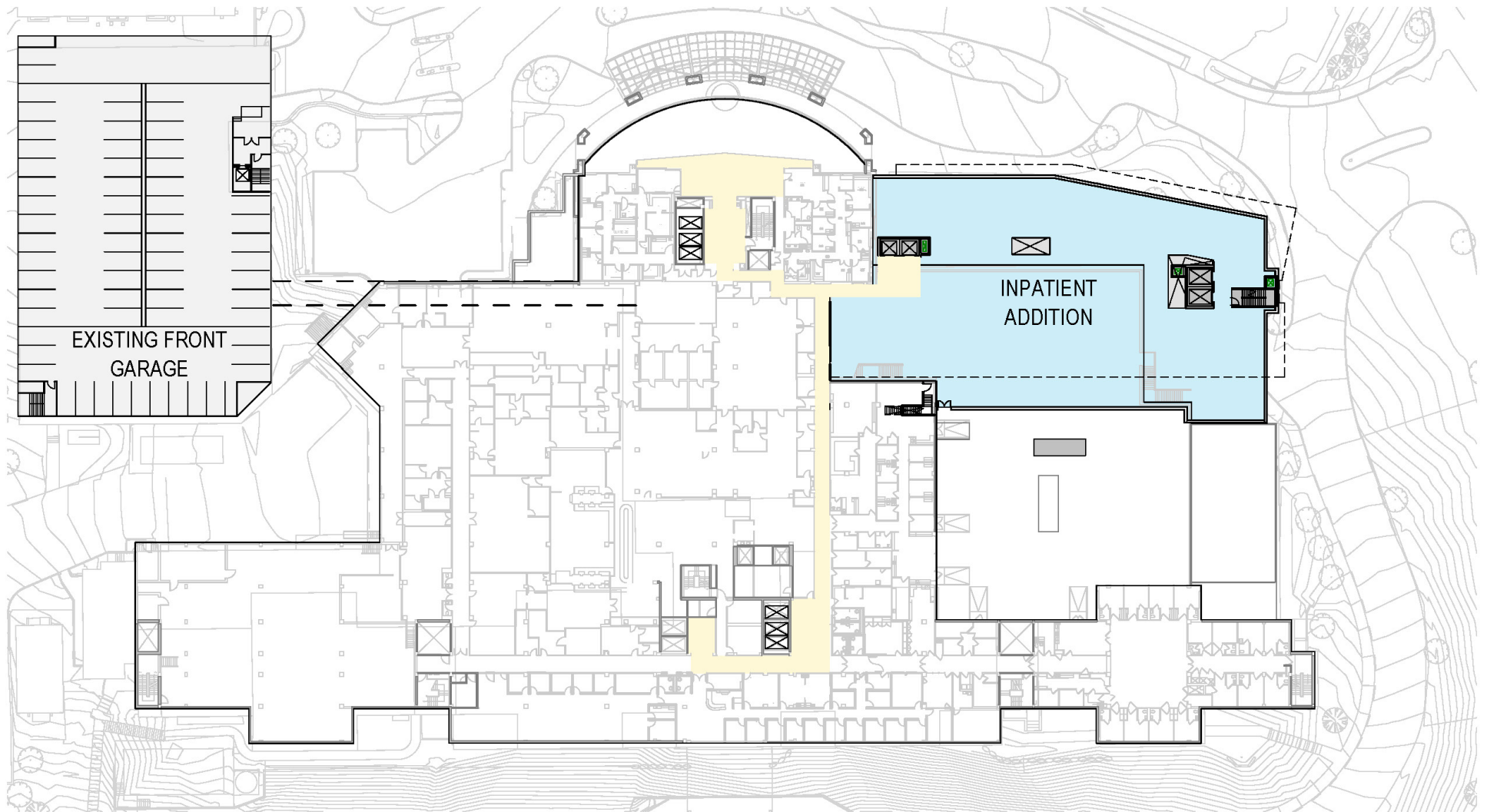
SCALE: 1" = 60'-0"

Brigham and Women's Faulkner Hospital Boston, Massachusetts



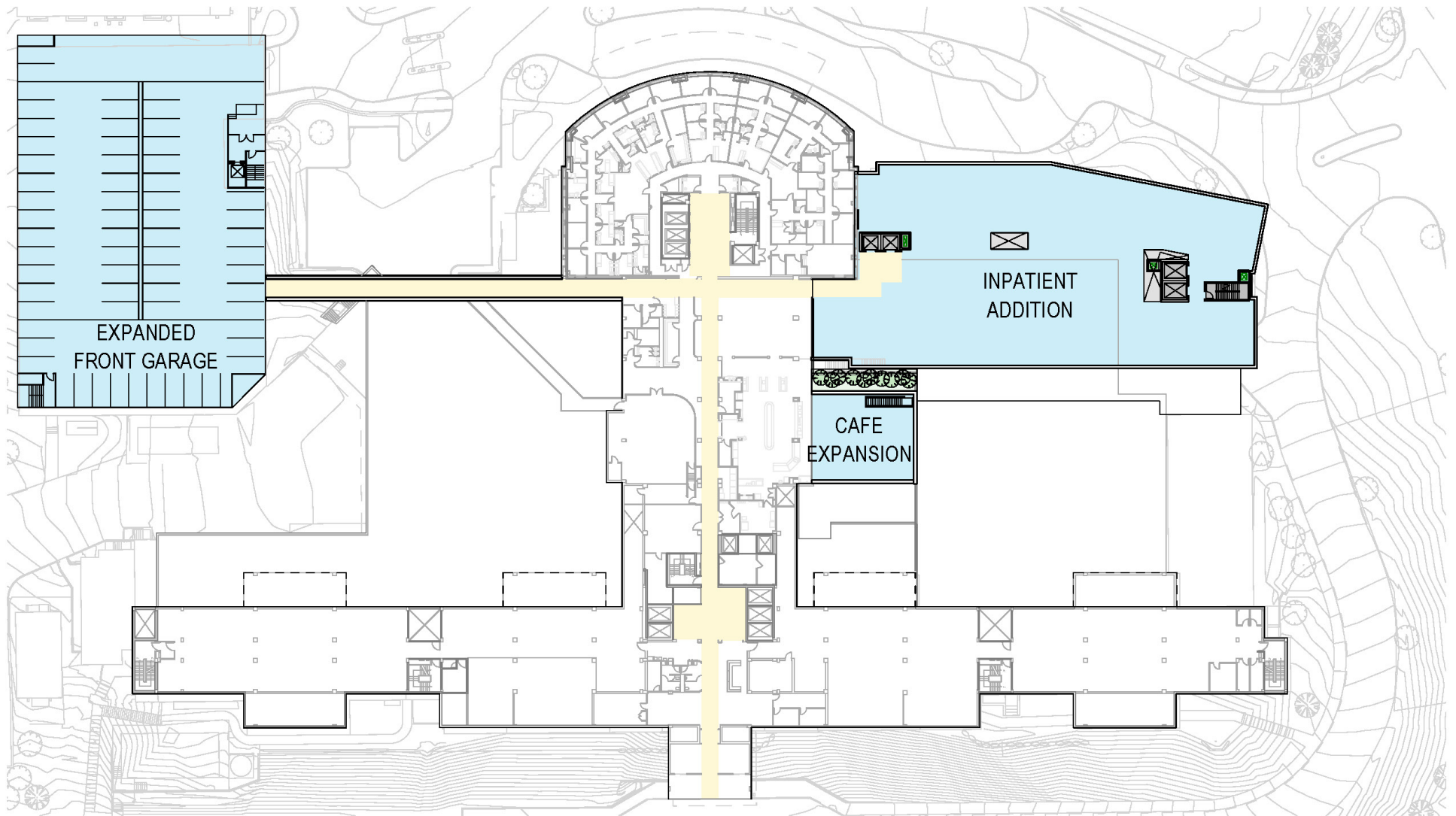
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Brigham and Women's Faulkner Hospital Boston, Massachusetts



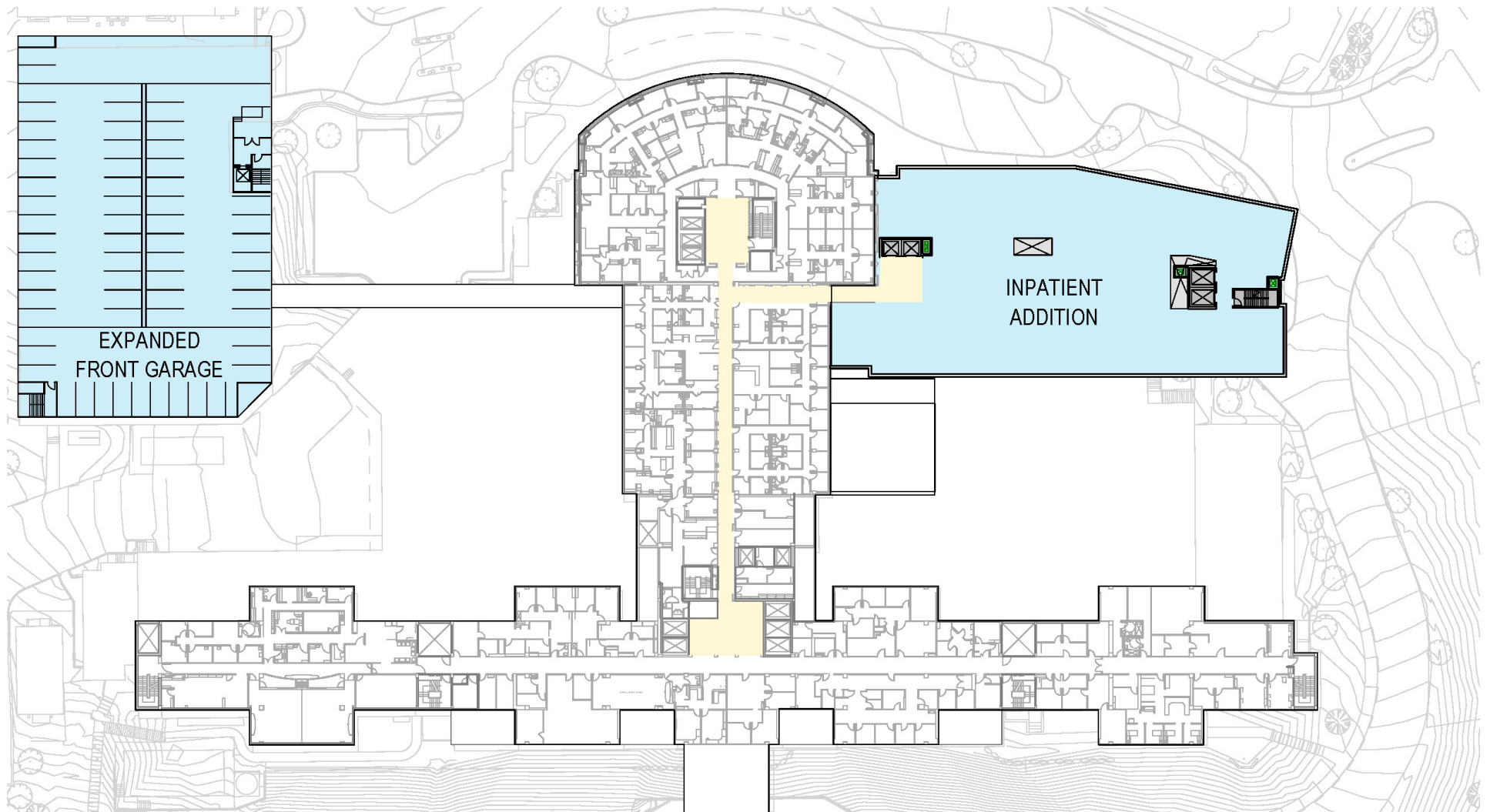
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Brigham and Women's Faulkner Hospital Boston, Massachusetts



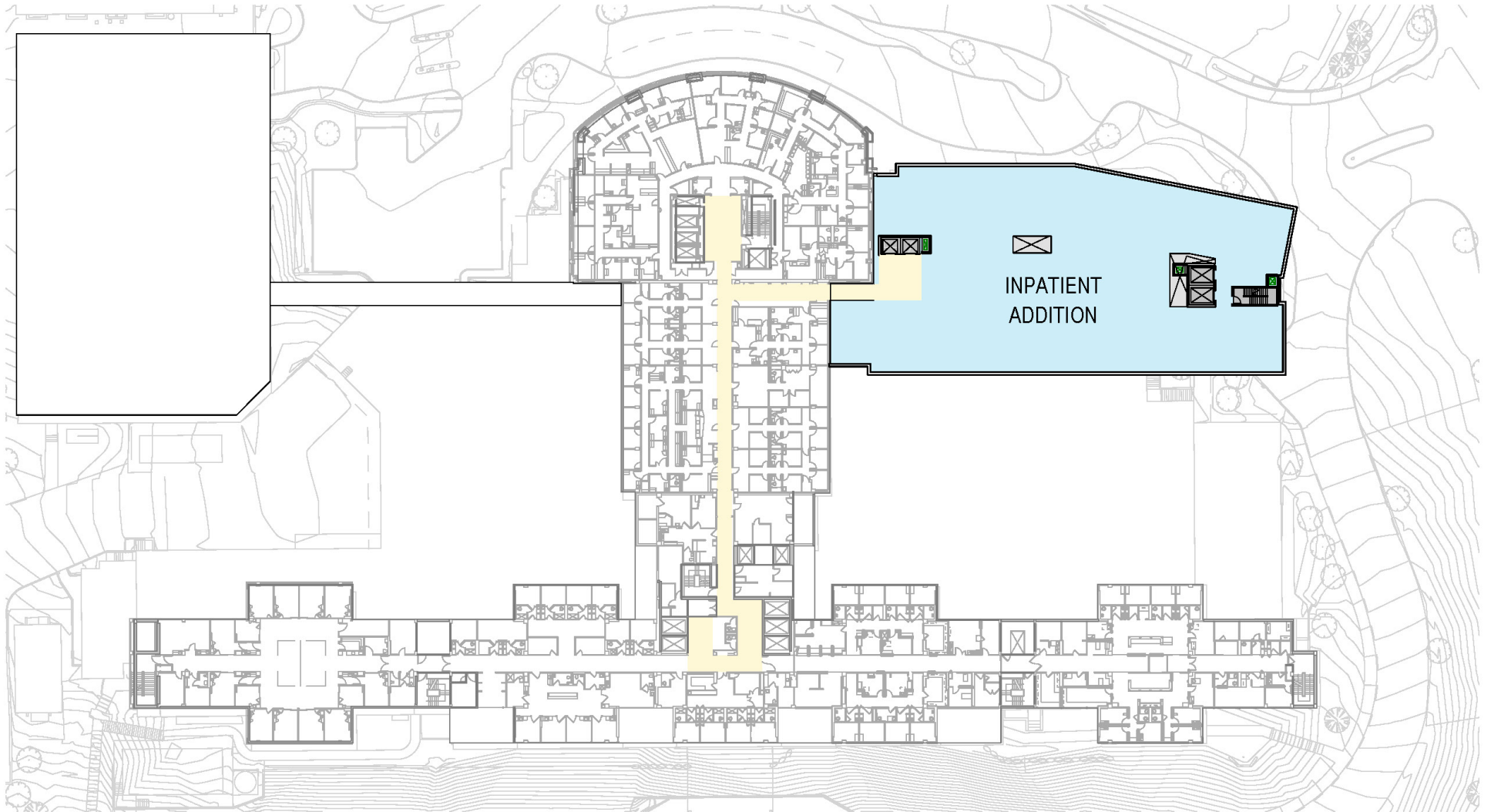
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Brigham and Women's Faulkner Hospital Boston, Massachusetts



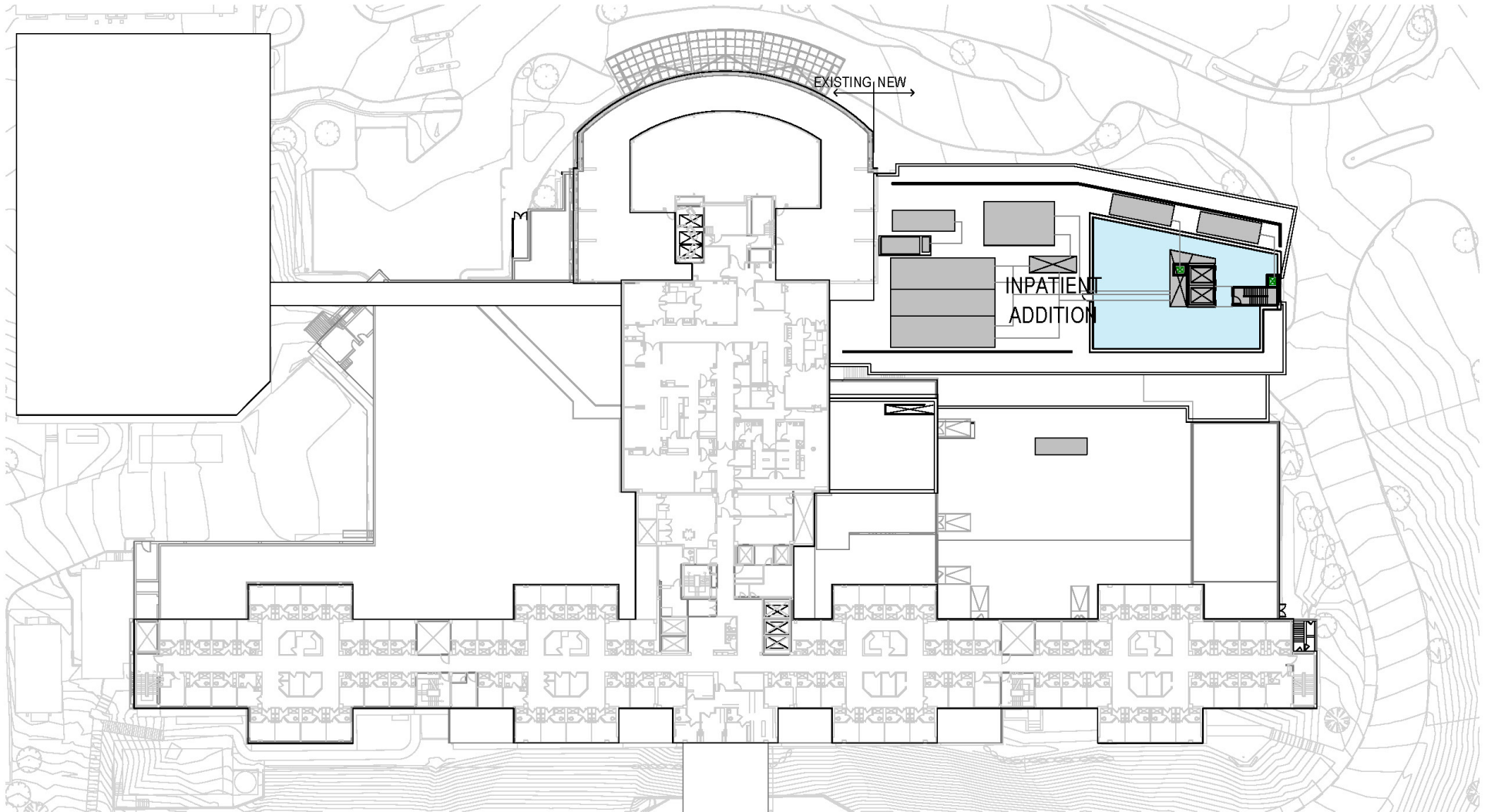
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Brigham and Women's Faulkner Hospital Boston, Massachusetts



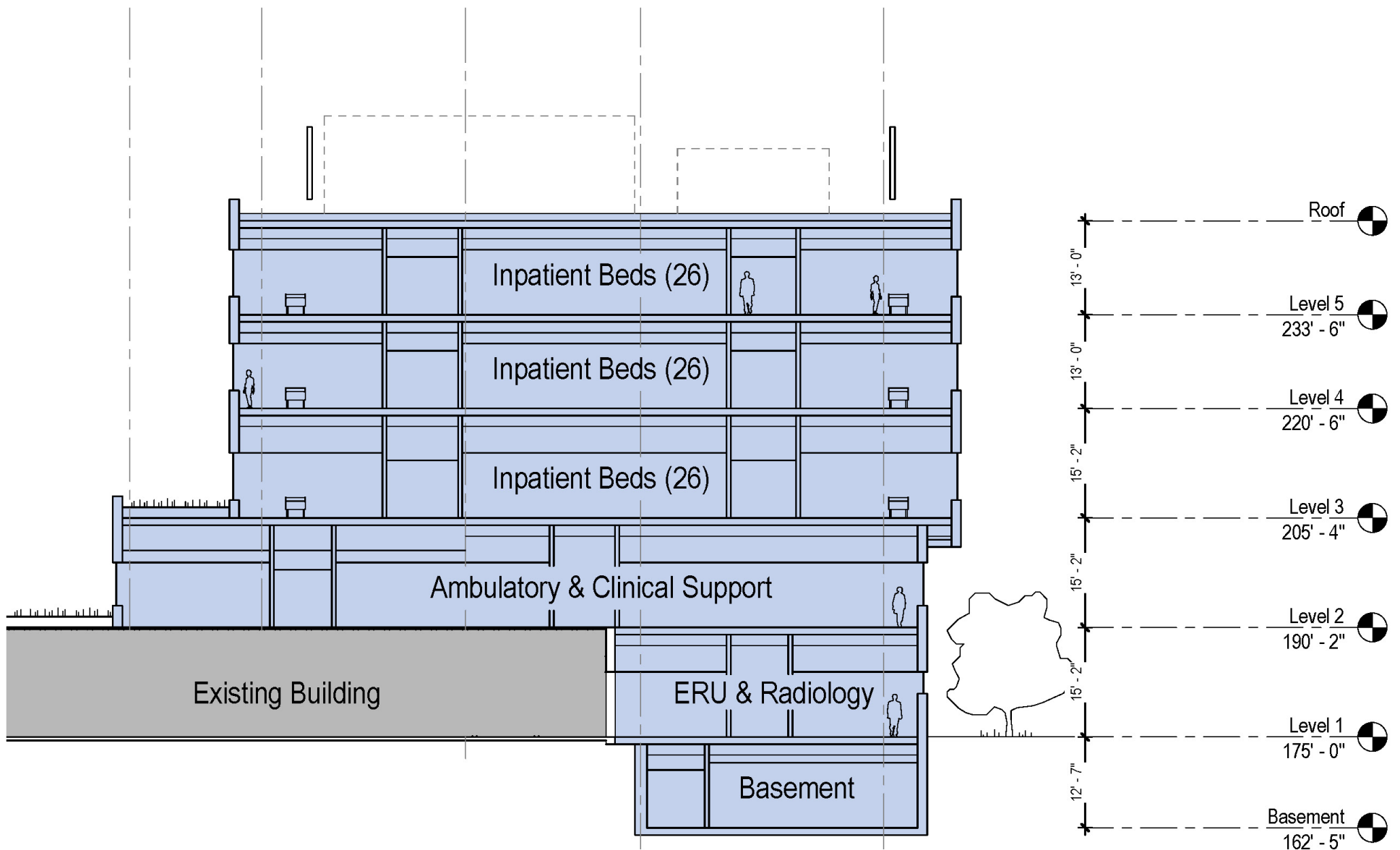
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Brigham and Women's Faulkner Hospital Boston, Massachusetts



SCALE: 1" = 60'-0"

Brigham and Women's Faulkner Hospital Boston, Massachusetts





Brigham and Women's Faulkner Hospital Boston, Massachusetts



Brigham and Women's Faulkner Hospital Boston, Massachusetts

Chapter 3

Assessment of Development Review Components

3.0 ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS

3.1 Transportation

This section presents an overview of the existing BWFH transportation system and a summary of the Proposed Project from a transportation perspective. This section describes area roadways, parking, patient pick-up/drop-off patterns, loading activities, shuttle bus patterns, and transportation demand management (TDM) measures that are actively employed by the Hospital. This section also provides a preliminary estimate of the trips that could result from the Proposed Project. This section does not contain a detailed assessment of the transportation effects of the Proposed Project. That assessment will be developed and included within the Hospital's forthcoming Institutional Master Plan (IMP) and Draft Project Impact Report (DPIR).

3.1.1 Existing Transportation Network

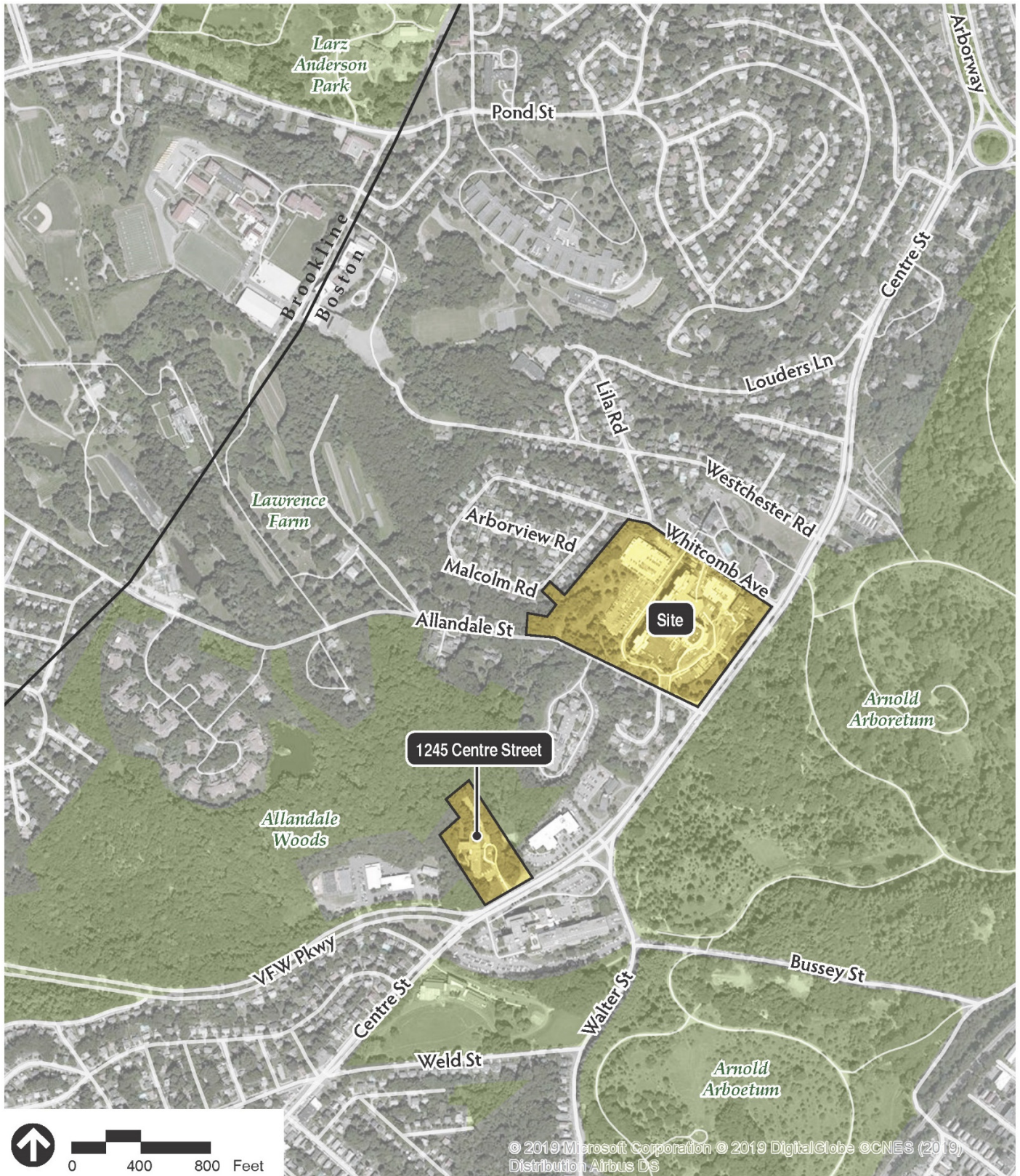
Figure 3-1 illustrates the location of the BWFH campus and the surrounding area. The components of the transportation system, including pedestrian and bicycle facilities; public and private transit access and availability; on-campus loading/service, ambulance, and taxicab/ridesharing; vehicular circulation in and around the BWFH campus; and parking facilities are addressed in this section. Existing TDM programs that BWFH offers are also detailed.

3.1.1.1 Pedestrian Facilities

Pedestrian facilities throughout the campus include sidewalks along the Hospital side of the main circulation road serving the front and rear of the campus. Marked crosswalks are provided at eight locations, including at the crossing from the surface parking lots and parking garages to the Main Building. Figure 3-2 illustrates the existing pedestrian circulation pattern throughout the campus and within the area near BWFH.

The pedestrian facilities outside the campus, along Centre Street, include sidewalks along each side of this roadway as well as marked crosswalks at most of the nearby intersections. The signalized intersection on the southern end of the campus (Centre Street at Allandale Street) features a pedestrian signal, crosswalks, and walk/don't walk indicators. To the south of campus, sidewalks are provided along the south side of Allandale Street. To the north of campus, sidewalks are provided along both sides of Whitcomb Avenue.

Pedestrians are further accommodated in the surrounding area by pathways through the Arnold Arboretum and Bussey Brook Meadow. These pathways connect the MBTA's Forest Hills Station and two MBTA bus routes (Route 35-Dedham Mall Route and Route 37-Baker Street/Vermont Street Route) to Centre Street and the BWFH campus. Other pedestrian circulation that serves the campus are along Centre Streets, Allandale Street, and Whitcomb Avenue.

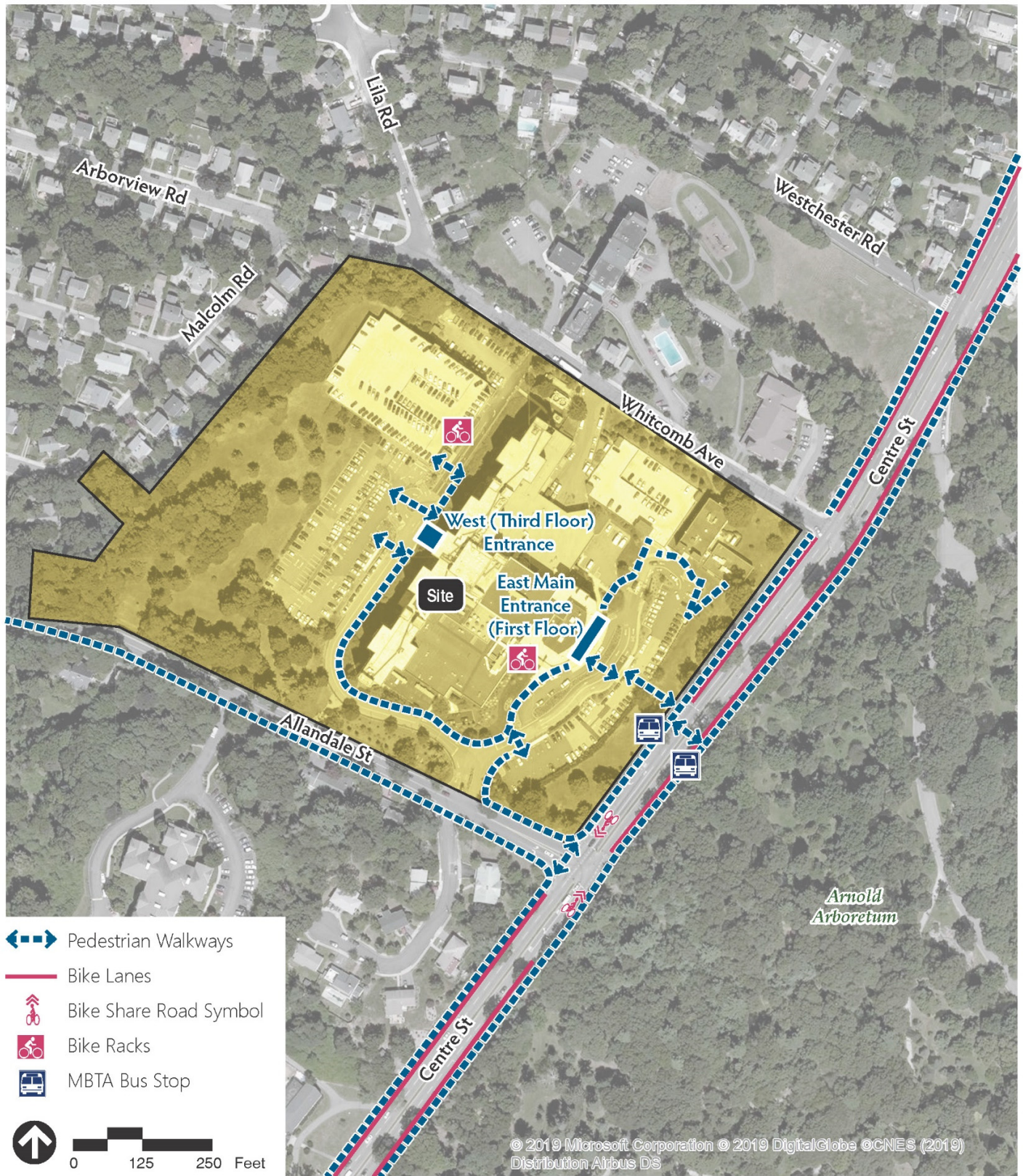


Source: Bing Aerial, MassGIS

Brigham and Women's Faulkner Hospital Boston, Massachusetts



Figure 3-1
Site Location Map



Source: Bing Aerial

Brigham and Women's Faulkner Hospital Boston, Massachusetts



Figure 3-2
Pedestrian and Bicycle Circulation

Pedestrians are able enter the BWFH campus from the east side, along Centre Street from the BWFH bus stop, or from the southern side along Allandale Street. Both access points provide pathways or sidewalks to the East Main Entrance located on the first floor of the Main Building, which serves as the primary center of pedestrian activity for the Hospital, and includes pick-up/drop-off activity, valet services, and circulation to and from the on-campus east parking facilities and bus stop on Centre Street. The third-floor entrance on the west side of the Hospital (the West Entrance), which includes a shuttle pick-up/drop-off area, and access from the on-campus west parking facilities, is also a busy pedestrian location.

3.1.1.2 Bicycle Accommodations

BWFH currently provides outdoor bicycle storage racks for its employees, patients, and visitors on the campus. There are outdoor bicycle storage facilities located adjacent to the East Main Entrance at the building's south corner, and approximately six covered spaces on the third floor of the West Garage. To encourage employees to bike to work, BWFH provides showers and lockers for employee use on the fourth floor and in the operating room area of the Hospital. Figure 3-2 illustrates the existing bicycle accommodations throughout the campus and within the vicinity of BWFH.

3.1.1.3 Transit

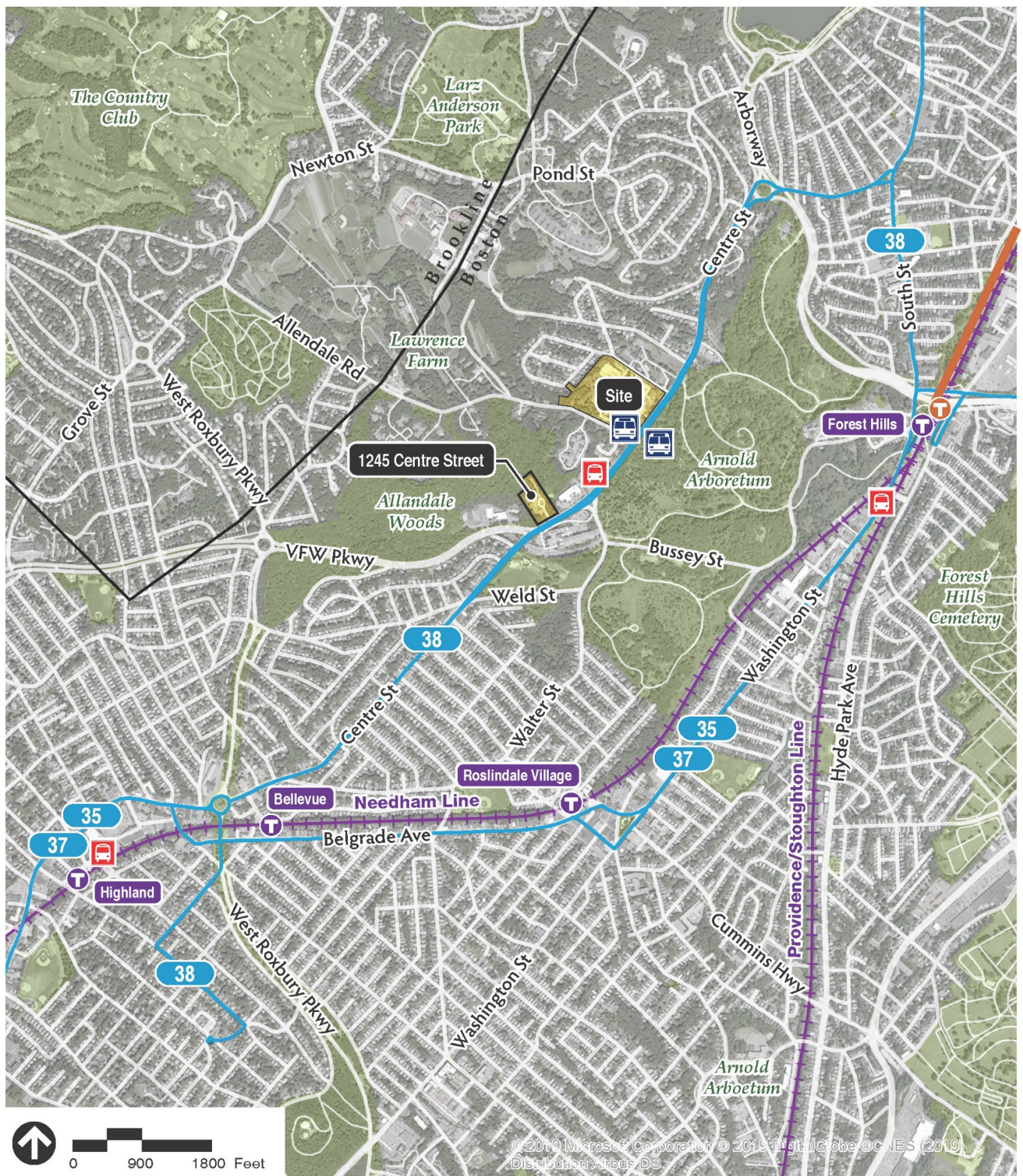
Figure 3-3 illustrates the MBTA transit routes in the area and station stops, along with BWFH shuttle stops.

MBTA

The BWFH campus is served by three MBTA bus routes and one subway station located within a mile of campus. The MBTA bus routes include:

- ◆ Route 35 – Dedham Mall to Forest Hills;
- ◆ Route 37 – Baker Street and Vermont Street to Forest Hills; and
- ◆ Route 38 – Wren Street to Forest Hills.

The Forest Hills MBTA Station is located within a mile of the campus. The station serves the Orange Line providing connections to the Red Line at Downtown Crossing, to the Blue Line at State Street, to the Green Line at North Station, and to the Silver Line at Tufts Medical Center. Forest Hills Station also provides access to the Needham Heights commuter rail line serving communities north and west of the BWFH campus.



Source: Bing Aerial, MassGIS

- MBTA Bus Route
- ++++ MBTA Commuter Rail
- MBTA Orange Line
-  MBTA Bus Stop at Faulkner Hospital
-  BWFH Shuttle Stops

Brigham and Women's Faulkner Hospital Boston, Massachusetts



Figure 3-3
Existing MBTA Transit Routes and BWFH Shuttle Stops

In 2018, the MBTA undertook a major modernization of the Forest Hills Station. The project included expansion of the upper bus way, installation of a larger busway canopy, improved busway entrances and exits, a new station entrance on Casey Highway that will lead to the station platform, and pedestrian and bicycle paths from Washington Street, past the station and along the Arborway. Construction in the area is nearing completion.

BWFH Shuttles

BWFH provides free shuttle bus service for its employees that connects BWFH to off-site employee parking facilities, nearby transit hubs (Forest Hills and Highland Station on the Needham Line), and the BWH main campus in the Longwood Medical and Academic Area (LMA) (a distance of about 3.5 miles). The shuttles operate from 6:00 a.m. to about 10:30 p.m.

The shuttle service is an important part of Hospital operations and is very effective at reducing employee automobile trips to the campus. The shuttle service provided by BWFH is also an integral part of the Hospital's TDM program.

3.1.1.4 Roadway Network

The BWFH campus is bordered by Centre Street to the east, Allandale Street to the south and Whitcomb Avenue to the north. The Jamaica Hills neighborhood is located to the west of the campus. Figure 3-4 depicts the existing roadway network and campus vehicular circulation patterns.

- ◆ Allandale Street is a two-way, two lane roadway traveling east-west connecting Centre Street to Grove Street in Brookline. Adjacent to the Hospital, Allandale Street is under the jurisdiction of the City of Boston. Sidewalks are provided on the south side of Allandale Street and truck exclusion signage is prominently posted near its intersection with Centre Street. As noted above, the primary campus driveway connects directly to Allandale Street. The majority of BWFH vehicular traffic accesses the campus after passing through the signalized intersection of Allandale Street and Centre Street.
- ◆ Whitcomb Avenue is a two-way, two lane roadway which connects Centre Street to the network of local neighborhood roadways to the west. Sidewalks are provided on both sides of Whitcomb Avenue. Whitcomb Avenue is under the jurisdiction of the City of Boston. The two secondary campus driveways connect directly to Whitcomb Avenue. Contractor and delivery vehicles access the campus by passing through the unsignalized intersection of Whitcomb Avenue and Centre Street.



Brigham and Women's Faulkner Hospital Boston, Massachusetts

- ◆ Centre Street is a two-way, four lane roadway traveling north-south connecting the Arborway to West Roxbury Parkway. Centre Street is under the Commonwealth's Department of Conservation and Recreation (DCR) jurisdiction. Sidewalks and bike lanes are provided on both sides of the roadway near the campus. Centre Street intersects with Allandale Street at a signalized intersection and with Whitcomb Avenue at an unsignalized intersection. Centre Street has been improved with the addition of extensive pedestrian crossing warning signage and pushbutton RRFB devices (rectangular rapid flash beacons). Additionally, a school zone with a 20 mph limit is in place for the Italian Home for Children just north of the BWFH campus on Centre Street between Westchester Street and Whitcomb Avenue.

The primary access to and egress from the BWFH campus is provided by a driveway on Allandale Street, located approximately 200 feet west of its intersection with Centre Street. Two secondary driveway access and egress points are provided on Whitcomb Avenue. One driveway is for emergency and contractor entry only and it is gated and generally locked. The second driveway on Whitcomb Avenue provides access to the campus loading dock.

Once on campus via the Allandale Street entrance, the campus roadways that carry the vehicular traffic split. One roadway provides access to the East Main Entrance, the ambulance bays, Belkin House, the East Parking Garage and surface lot. The East Main Entrance's curbside access to the building is from this roadway. A separate roadway provides access to the West Entrance on level 3, the West Parking Garage and surface lots.

3.1.1.5 Loading/Service

There is one loading area serving the BWFH campus that is accessed from Whitcomb Avenue and features three loading bays plus additional truck waiting areas. The loading dock also serves as the site for waste collection/removal from the campus. Goods and deliveries are transported from the loading area throughout the Hospital. Figure 3-4 denotes the loading dock area and the driveway on Whitcomb Avenue.

3.1.1.6 Ambulances

The BWFH Emergency Department on the east side of the Hospital is accessed via the main campus driveway on Allandale Street. There are four covered ambulance bays, and an adjacent unmarked area also used by ambulances drivers. This area has the capacity to accommodate six to eight ambulances. BWFH serves as an ambulance hub where ambulances wait for emergency calls and, while there, they can be cleaned and restocked, along with providing a meeting and break space for emergency medical technicians. Departing ambulances use the campus roadway passing by the East Main Entrance to the driveway at Allandale Street. Figure 3-4 denotes the ambulance bays.

3.1.1.7 Transportation Network Companies (TNCs) and Taxicabs

TNCs are becoming an increasingly used mode of transportation in the city as more patients, visitors, and staff are choosing to travel to and from the Hospital using a ride sharing service. There are no designated pick-up and drop-off areas specifically marked for TNCs, but the majority of the TNC vehicles use the curbside at the East Main Entrance to pick-up or drop-off passengers.

Some patients and visitors choose to take taxicabs to get to and from the Hospital. These vehicles, along with MBTA Ride and private patient transportation services, typically use the East Main Entrance on Level 1.

3.1.1.8 Parking

The following sections detail BWFH's parking supply and the current utilization of the Hospital parking. The BWFH campus has two on-site parking garages and three on-site surface lots, as well as three additional off-site lots for employee parking. There are currently 959 on-site spaces used by a mix of patients, visitors, and employees; 41 of these are designated as handicap parking spaces, located in the West and East Surface Lots and Garages. There are approximately 252 additional off-site spaces used by BWFH employees. As described earlier, an extensive, free shuttle service is provided to transport employees to and from off-site parking areas. In total there are 1,211 parking spaces serving the BWFH campus.

An inventory of available parking areas is provided in Table 3-1. The table includes the location and total parking space supply for each lot or garage. Figure 3-4 illustrates the on-campus parking facilities.

The two on-site garages and two of the on-site surface lots are the primary large parking facilities for Hospital patients and visitors. Spaces in these garages and surface lots are heavily used on weekdays. The on-campus parking system typically operates at or near capacity between 10:30 a.m. and 3:30 p.m. on weekdays. Based on data provided by BWFH for October 2018, the off-site employee parking lots operate at approximately 90 percent of capacity during an average weekday.

To help better serve its patients waiting for parking, BWFH provides a free valet parking service that operates at the East Main Entrance curb. Valets park patient/visitor vehicles in designated areas within the East Garage. In the valet areas of the garage, vehicles can be stacked allowing more vehicles to be parked than designated spaces. Because the East Main Entrance is popular with BWFH patients, it can become very busy and congested at times. During the IMP process, BWFH expects to examine this area to determine if physical or operational improvements there are possible.

Table 3-1 Existing BWFH Campus Parking Inventory

Location	Spaces
On-Campus	
East Garage	139
East Surface Lot	80
West Admin Surface Lot	29
West Garage	580
West Surface Lot	131
<i>Sub-Total On-Campus</i>	<i>959</i>
Off-Campus (Employees)	
Trinity Church Lot, 1195 Centre St., West Roxbury	72
Forest Hills Lot, 3841 Washington St., Roslindale	120
MBTA Highland Lot, 27 Corey St., West Roxbury	60
<i>Sub-Total Off-Campus</i>	<i>252</i>
Total Parking	1,211

Total on-site handicap parking = 41 spaces (they are included in each facility listed in the table above).

The table above does not include approximately 80 parking spaces provided at 1245 Centre Street which generally serve users of that building and BWFH contractors

3.1.1.9 Transportation Demand Management

Maintaining an effective TDM program is part of the operations at BWFH. The shuttle service provided by BWFH is an integral part of the BWFH TDM program. It provides connections to Forest Hills Station, Highland Station, off-site employee parking lots, and the BWH main campus. The proximity to bike lanes and pedestrian facilities provides additional mode choices for employees as well as for some of BWFH's patients and visitors.

BWFH's TDM program includes:

- ◆ **Employee Off-Site Parking** – Over the years, the number of BWFH employees and patients has grown while the supply of campus parking spaces has remained generally the same. The parking system provided on campus is intended to be used primarily for patient and visitor parking. Because of the restricted supply of parking, most new employees are assigned off-site parking if they require parking.
- ◆ **Free Shuttle Service** – As described earlier, BWFH operates a free shuttle bus service that links the BWFH campus with Forest Hills Station, Highland Station on the Needham Line, the BWH main campus in the LMA, and off-site employee parking areas.
- ◆ **Subsidized Transit Passes** – BWFH provides subsidized monthly passes to any employee. The subsidy is now 50 percent of the cost of each pass with no maximum.

- ◆ **Carpool/Vanpool Incentives** – BWFH provides carpool and vanpool parking spaces on campus, and the parking rate is split among the participants.
- ◆ **Bicycling Incentives** – As noted earlier, on the campus BWFH provides six covered spaces on the third floor of the West Garage, along with several bike racks located adjacent to the East Main Entrance. Shower and locker facilities are available for employee use.
- ◆ **On-site Dining Facilities** – There are two dining facilities within the Hospital: a café located on Level 1 near the East Main Entrance, and a cafeteria located on Level 3. These on-site conveniences and other amenities such as ATMs at BWFH help reduce the need for mid-day trips and help make it easier for people to rely on transit.
- ◆ **Transportation Coordinator** – BWFH has a designated on-site transportation coordinator who administers the TDM program. The coordinator is responsible for assisting employees with commuting alternatives and promoting TDM alternatives.

BWFH intends to continue to offer the services described above to the new employees added as a result of the Proposed Project.

3.1.1.10 1245 Centre Street

BWFH owns and operates the building located at 1245 Centre Street. It operates as a free-standing building and provides off-campus support space for administrative and office uses as needed. No changes in the uses at this location are envisioned as part of the Proposed Project.

As noted in the footnote to Table 3-1, the 1245 Centre Street site includes approximately 80 surface parking spaces which serve the users/staff at that building. BWFH also allows BWFH contractors to park service vehicles in this facility as space for them on the campus is very limited.

3.1.2 Trip Generation

For this IMPNF/PNF trip rates contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual (Tenth Edition, September 2017) were used to estimate the expected increase in vehicle trips that would be generated by the Proposed Project. Typically, ITE data is used as a guideline for estimating traffic increases associated with new developments. For the upcoming BWFH IMP and DPIR, trip generation rates based on existing campus travel patterns are expected to be reviewed and studied in more detail as part of the IMP process.

3.1.3 Existing BWFH Traffic

An initial and limited traffic data collection program was conducted over several weekdays in December 2018 and in April 2019. As part of this initial data collection, vehicles entering and exiting the campus were counted at different times over several days.

Table 3-2 indicates the observed morning and afternoon peak hour volumes entering and exiting the campus from Allandale Street. The table indicates that the morning and afternoon peak hour volumes are generally similar, but the afternoon volumes are higher.

Table 3-2 Existing BWFH Traffic Volumes

	Trips to/from Hospital Site¹	Trips to/from Hospital Site²
Morning Peak	December 2018	April 2019
In	364	311
Out	138	177
<i>Total</i>	<i>502</i>	<i>488</i>
Afternoon Peak		
In	275	139
Out	296	365
<i>Total</i>	<i>570</i>	<i>504</i>

¹ Based on average weekday data from December 11-13, 2018

² Based on average weekday data from April 24, 2019

3.1.4 Future Trip Generation

Preliminary projected trip generation estimates for the Proposed Project have been developed based on the proposed net new square footage on the BWFH campus. Table 3-3 summarizes the size of the existing BWFH campus as well as the anticipated increases resulting from the Proposed Project.

Table 3-3 Existing BWFH Campus and Proposed Project Program

	Building Size by Square Footage¹	Building Size by Number of Beds	On-Site Parking Spaces
Existing BWFH Campus	440 ksf	171 beds	959 ²
Proposed Project	98 ksf	78 beds	503 spaces
Future Growth On Campus	10 ksf	N/A ³	N/A
Future BWFH Campus (Total)	548 ksf	249 beds	1,462 spaces

¹ Only the size of the proposed building program is included in the second column above. The size of the proposed parking facilities (measured in square feet) is not included when making trip generation estimates.

² As shown in Table 3-1 BWFH currently relies on approximately 252 off-site parking spaces in three different facilities to help accommodate staff parking needs.

³ N/A – Not applicable

3.1.4.1 ITE Trip Generation Estimate

To estimate the projected trip generation for the Proposed Project, VHB relied on published trip generation rates from the ITE Trip Generation Manual (10th Edition) using Land Use Code (LUC) 610 – Hospital. These rates were applied to the existing and future building size to estimate the trip generation for each condition. The differences between the existing and future trip generation represents the projected number of additional trips that are anticipated to be generated by the Proposed Project using the ITE rates as a basis. A summary of the estimated new “unadjusted” vehicle trips during both the morning and afternoon peak hours, as well as on a daily basis, for the Proposed Project is presented below in Table 3-4.

Typically, for Boston projects the neighborhood’s mode split is used to modify/adjust the ITE based trip forecast. This adjustment is intended to reflect transit usage and walk/bike trips that are not represented in the ITE data.

The second column in Table 3-4 shows the “adjusted” trip estimate. The first step to convert unadjusted vehicle trips into adjusted vehicle trips is by calculating the number of total person trips. The Federal Highway Administration’s 2017 National Household Travel Survey Summary of Travel Trends provides national vehicle occupancy rates (VOR) of 1.67 for all purpose trip types. This VOR was applied to the unadjusted vehicle trips to calculate the estimated number of person trips generated by the Hospital.

The next step involved refining the net new person trips by considering the range of travel choices, including public transportation, walking, and private vehicles. The Boston Transportation Department (BTD) has created a database for mode shares for specific neighborhoods within the City of Boston. These areas are referred to as zones and the BWFH is located within BTD Zone 19 which includes the Jamaica Plain neighborhood, southeast of Centre Street and the Brook Farm neighborhood. The BTD mode shares for Zone 19 are summarized in Table 3-5. These mode shares were applied to the net new person trips to calculate person trips by mode.

Table 3-4 New Project-Generated Vehicle Trips Generated Based on Square Footage

Estimated using ITE Trip Generation Rates		
	Unadjusted Trips ¹	Adjusted Trips ²
AM Peak		
In	54	42
Out	26	18
Total	80	60
PM Peak		
In	29	20
Out	62	48
Total	91	68

Table 3-4 New Project-Generated Vehicle Trips Generated Based on Square Footage (Continued)

Estimated using ITE Trip Rates		
	Unadjusted Trips ¹	Adjusted Trips ²
Daily		
In	318	251
Out	318	251
Total	635	502

¹ ITE Trip Generation Manual Edition 10, Sept. 2017, Land Use Code 610, Hospital.

² Adjustments based on BTM Zone 19 mode shares.

Table 3-5 BTM Zone 19 Mode Shares for All Purpose Trips

	Mode	AM	PM	Daily
Exiting Site	<i>Auto</i>	73%	80%	82%
	<i>Transit</i>	18%	7%	7%
	<i>Walk</i>	9%	13%	11%
Entering Site	<i>Auto</i>	80%	73%	82%
	<i>Transit</i>	7%	18%	7%
	<i>Walk</i>	13%	9%	11%

The final step to calculating the net new adjusted vehicle trips is to convert vehicle person trips back to vehicle trips by applying the VOR previously discussed. Table 3-4 summarizes the net new adjusted vehicle trips. It shows an estimated 60 new morning peak hour trips, 68 new evening peak hour trips and an estimated 502 new daily trips. This ITE based approach offers a preliminary estimate of the expected traffic increases associated with the Proposed Project. The IMP and DPIR will include a closer look at the potential traffic generation created by the Proposed Project.

3.1.5 Conclusion

This transportation section is intended to serve as an initial base of information on transportation conditions at BWFH. The transportation analysis that will be conducted as part of the Hospital's IMP and DPIR through the Article 80 process will provide more detail and analysis on the expected transportation impacts of the Proposed Project.

3.2 Wind

The heights of the proposed buildings will be similar to or less than the existing building heights on the BWFH campus. Therefore, due to the proposed building heights in relation to their surroundings, the Proposed Project is not anticipated to have a significant impact on pedestrian level winds.

3.3 Shadow

The location of the Inpatient Addition and Replacement West Garage, and the steep grade change on the west side of the campus, will result in most new shadow from these structures being cast on the BWFH campus. The East Parking Garage Addition is anticipated to create new shadow on the campus, as well as new shadow during some time periods onto Whitcomb Avenue.

3.4 Daylight

The purpose of a daylight analysis is to estimate the extent to which a proposed project affects the amount of daylight reaching public streets in the immediate vicinity of a project site. The Proposed Project abuts Allandale Street, Whitcomb Avenue and Centre Street, a major thoroughfare through the Jamaica Plain neighborhood of Boston. However, the Proposed Project is located within the BWFH campus, and is set back from the street edges. Therefore, daylight impacts from the Proposed Project are anticipated to be minimal.

3.5 Solar Glare

The Proposed Project is not anticipated to be constructed with highly reflective materials and is not anticipated to impact surrounding streets.

3.6 Air Quality

Potential long-term air quality impacts will be limited to emissions from Project-related mechanical equipment and pollutant emissions from vehicular traffic generated by the development of the Proposed Project.

Any new stationary sources will be reviewed by the Massachusetts Department of Environmental Protection (MassDEP) during permitting under the Environmental Results Program, as required. It is expected that all stationary sources will be small, and any impacts from stationary sources would be minimal.

3.7 Noise

During operations, the Proposed Project's mechanical equipment is not expected to result in a perceptible change in noise levels. These impacts, and the Proposed Project's compliance with the City of Boston Noise Ordinance, will be studied in the DPIR.

3.8 Solid and Hazardous Waste

3.8.1 Hazardous Waste Conditions

While not anticipated, there is a chance that during construction, excavated soils may be encountered which contain levels of chemical constituents which will require special handling and disposal.

Future evaluations of specific site environmental conditions will be undertaken related to proposed construction at individual locations. During excavation, soils will be managed for off-site disposal in accordance with current regulations and policies of the MassDEP. Surplus excavated material will be disposed off-site by the selected contractor at approved off-site facilities in accordance with applicable local, state, and federal laws and regulations. Characterization of soil and groundwater is planned at the appropriate stage of the design process to further evaluate site environmental conditions and soil management requirements for each building. Off-site reuse and/or disposal of the excavated fill soils will require the use of Material Shipping Records and Bills of Lading to track the disposition of the excavated material.

Demolition debris (existing West Parking Garage demolition and selective demolition for Inpatient Addition) will be disposed of at a properly licensed solid waste disposal facility. If encountered, asbestos-containing materials or other hazardous materials will be treated as a special waste in accordance with the Massachusetts Contingency Plan and addressed and disposed of accordingly.

3.8.2 *Operational Solid and Hazardous Wastes*

BWFH currently has a campus-wide waste collection and removal system in place. It is anticipated that the system will be expanded to include the Proposed Project, and solid waste will be similar to the wastes produced by the existing building on the BWFH campus. Recyclable material will be collected and removed by the same systems currently in place.

3.9 Geotechnical and Groundwater Impacts

3.9.1 *Subsurface Soil and Groundwater Conditions*

Based on the recent and historic subsurface data, the BWFH campus is underlain by a miscellaneous fill material (one to seven feet thick) placed over natural dense glacial till soils. The thickness of the glacial till varies across the campus, with depth to bedrock (bottom of glacial till) ranging between 4.5 and 106 feet below ground surface. Groundwater levels were observed to vary from about 5 and 13 feet below ground surface.

3.9.2 *Preliminary Foundation Design Recommendations*

The proposed Replacement West Garage and Inpatient Addition are anticipated to be supported on spread footings with a slab-on-grade. The footings will bear in glacial till or bedrock. Based on the depth of excavation planned for the Replacement West Garage, temporary excavation support will be required to enable installation of foundations and permanent structure. It is anticipated that this excavation support system will consist of soil nails and shotcrete wall installed in lifts as excavation progresses.

The geotechnical impacts from the proposed construction will be presented in the DPIR. An analysis of existing subsurface conditions, groundwater levels, potential for ground movement and settlement during excavation and potential impact on adjacent buildings and utilities for each building will be included.

3.10 Flood Zones and Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the site located in the City of Boston – Community Panel Number 25025C0067G, effective September 25, 2009, indicates the FEMA Flood Zone Designations for the site area. The map shows that the Proposed Project is located in a Zone X, “Areas determined to be outside the 0.2% annual chance floodplain.”

The site does not contain wetlands.

3.11 Construction Impacts

The proximity of City streets and the critical importance of maintaining Hospital operations 24-hours per day necessitate careful attention to construction activities, including deliveries, hours of construction, and construction-related impacts. Planning with the City and neighborhood will be essential to the successful development of the Proposed Project.

A Construction Management Plan (CMP) will be submitted to the BTD for review and approval prior to issuance of a building permit for each Project Component, as required. The CMP will define truck routes which will help in minimizing the impact of trucks on area streets.

Construction methodologies that ensure public safety and protect nearby businesses will be employed. Techniques such as barricades, walkways, painted lines, and signage will be used as necessary. Construction management and scheduling – including plans for construction worker commuting and parking, routing plans and scheduling for trucking and deliveries, protection of existing utilities, maintenance of fire access, and control of noise and dust – will minimize impacts on the surrounding environment.

Throughout construction of the Project Components, a secure perimeter will be maintained around each site to protect the public from construction activities.

3.11.1 Construction Air Quality

Short-term air quality impacts from fugitive dust may be expected during demolition, excavation and the early phases of construction. Plans for controlling fugitive dust during demolition, excavation and construction include mechanical street sweeping, wetting portions of the Project Component sites during periods of high wind, and careful removal of debris by covered trucks. The construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts. These measures are expected to include:

- ◆ Using wetting agents on areas of exposed soil on a scheduled basis;
- ◆ Using covered trucks;
- ◆ Minimizing spoils on the construction sites;

- ◆ Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- ◆ Minimizing storage of debris on the construction sites; and
- ◆ Periodic street and sidewalk cleaning with water to minimize dust accumulations.

3.11.2 *Construction Noise*

The Hospital is committed to mitigating noise impacts from the construction of the Proposed Components. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

- ◆ Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy;
- ◆ Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- ◆ Muffling enclosures on continuously running equipment, such as air compressors and welding generators;
- ◆ Replacing specific construction operations and techniques by less noisy ones where feasible;
- ◆ Selecting the quietest of alternative items of equipment where feasible;
- ◆ Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- ◆ Turning off idling equipment; and
- ◆ Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

3.11.3 *Construction Waste Management*

The Hospital will take an active role with regard to the reprocessing and recycling of construction waste. The disposal contract(s) will include specific requirements that will ensure that construction procedures allow for the necessary segregation, reprocessing, reuse and recycling of materials when possible. For those materials that cannot be recycled, solid waste will be transported in covered trucks to an approved solid waste facility, per MassDEP Regulations for Solid Waste Facilities, 310 CMR 16.00. This requirement will be specified in the disposal contract. Construction will be conducted so that materials that may be recycled are segregated from those materials not recyclable to enable disposal at an approved solid waste facility.

3.12 Rodent Control

Rodent inspection monitoring and treatment are required before, during, and at the completion of all construction work for the Proposed Project, in compliance with the City's requirements. Regular service visits during the construction processes are also required.

3.13 Wildlife Habitat

The Project Component sites are within a fully developed hospital campus and, as such, the Project will not impact wildlife habitats.

3.14 Sustainability

BWFH is an existing not-for-profit teaching community hospital that offers a full spectrum of health services. Above all, BWFH values the experiences and wellness of their patients, staff and surrounding neighbors. In order to achieve this mission, sustainable design and resiliency strategies will be essential to the Proposed Project. The Hospital is committed to reducing consumption of energy, harmful materials, and creating a culture of change toward environmental and human health on its campus.

As required under Article 37 of the Code, projects that are subject to Article 80B, Large Project Review, shall be U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) certifiable. For purposes of LEED, the LEED site includes the Inpatient Building and Replacement West Garage (the "LEED project"). The LEED project will demonstrate compliance with Article 37 using the LEED for New Construction v4 for Healthcare Facilities rating system. The LEED rating system tracks the sustainable features of a project by achieving points in 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 LEED project is preliminarily targeting 55 points in the LEED Silver range; the number of points achieved once the LEED project is constructed may be more or less than 55, but will at minimum show compliance with Article 37. The final inclusion of these strategies will be dependent on design development, further calculations, and Project team decisions.

Below is a summary of each LEED category; a preliminary LEED checklist is included at the end of this section. The checklist will be updated regularly as the design develops and engineering assumptions are substantiated.

Integrative Process

An integrative process throughout the various design phases is essential to the development of high-performance and cost-effective project outcomes. The design team will engage in a series of sustainability charrettes and review preliminary energy models to identify strategies for energy reduction as the design progresses. Water use reduction calculations will also be performed early in the design process to help the design team make informed decisions to meet the LEED project's sustainability goals.

Location and Transportation

The LEED project's developed location, relative density and existing infrastructure dictate achievable points. One credit will be achieved for Sensitive Land Protection for being located on a previously developed site. Another credit will be achieved for Surrounding Density and Diverse Uses due to the surrounding dwelling unit density. The LEED project is served by two BWFH shuttle buses and two MBTA bus routes with stops located within a quarter-mile walking distance. However, due to infrequency of service on weekends, the LEED project will achieve only one point for Access to Quality Transit. Bicycle storage and showers are being integrated into the design, and adjacent streets are accessible to bicyclists. The Reduced Parking Footprint credit is under consideration and needs further analysis of institutional needs.

Sustainable Sites

The LEED project addresses issues related to site ecology in numerous ways. The LEED prerequisite, Construction Activity Pollution Prevention, will be followed to reduce pollution from construction activities. A Phase I Environmental Site Assessment will also be conducted as part of the prerequisite for Environmental Site Assessment. An in-depth multidisciplinary Site Assessment will be completed during early stages of design. The design will dedicate at least 30% of the LEED-specific site area to open and partially vegetated outdoor spaces. Places of Respite, both indoor and outdoor, will be provided for patients, visitors and staff. A large portion of the site is currently permeable to rainwater and a further analysis of rain event data is needed to determine compliance with the requirements for the Rainwater Management credit. The Heat Island Reduction credit will be achieved through the selection of light colored roofs and any new paved surfaces, as well as, vegetated landscaping. Strategies to reduce light pollution will also be investigated as the development of the site design progresses.



LEED v4 for BD+C: Healthcare

Project Checklist

Project Name: Brigham & Women's Faulkner Hospital Bed Tower

Date: 06/12/2019

Y ? N

Y		Prereq	Integrative Project Planning and Design	Required
1		Credit	Integrative Process	1

5	1	#	Location and Transportation	9
		9	Credit LEED for Neighborhood Development Location	9
1			Credit Sensitive Land Protection	1
		2	Credit High Priority Site	2
1			Credit Surrounding Density and Diverse Uses	1
1		1	Credit Access to Quality Transit	2
1			Credit Bicycle Facilities	1
	1		Credit Reduced Parking Footprint	1
1			Credit Green Vehicles	1

5	1	3	Sustainable Sites	9
Y			Prereq Construction Activity Pollution Prevention	Required
Y			Prereq Environmental Site Assessment	Required
1			Credit Site Assessment	1
		1	Credit Site Development - Protect or Restore Habitat	1
1			Credit Open Space	1
	1	1	Credit Rainwater Management	2
1			Credit Heat Island Reduction	1
1			Credit Light Pollution Reduction	1
1			Credit Places of Respite	1
		1	Credit Direct Exterior Access	1

3	3	4	Water Efficiency	11
Y			Prereq Outdoor Water Use Reduction	Required
Y			Prereq Indoor Water Use Reduction	Required
Y			Prereq Building-Level Water Metering	Required
1	1		Credit Outdoor Water Use Reduction	1
1	1	3	Credit Indoor Water Use Reduction	7
1	1		Credit Cooling Tower Water Use	2
		1	Credit Water Metering	1

15	6	3	Energy and Atmosphere	35
Y			Prereq Fundamental Commissioning and Verification	Required
Y			Prereq Minimum Energy Performance	Required
Y			Prereq Building-Level Energy Metering	Required
Y			Prereq Fundamental Refrigerant Management	Required
5			Credit Enhanced Commissioning	6
6	4		Credit Optimize Energy Performance	20
1			Credit Advanced Energy Metering	1
		2	Credit Demand Response	2
1	1	1	Credit Renewable Energy Production	3
1			Credit Enhanced Refrigerant Management	1
1	1		Credit Green Power and Carbon Offsets	2

9	6	2	Materials and Resources	19
Y			Prereq Storage and Collection of Recyclables	Required
Y			Prereq Construction and Demolition Waste Management Planning	Required
Y			Prereq PBT Source Reduction- Mercury	Required
	3		Credit Building Life-Cycle Impact Reduction	5
1	1		Credit Building Product Disclosure and Optimization - Environmental Product Declarations	2
1		1	Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	1		Credit Building Product Disclosure and Optimization - Material Ingredients	2
1			Credit PBT Source Reduction- Mercury	1
2			Credit PBT Source Reduction- Lead, Cadmium, and Copper	2
1	1		Credit Furniture and Medical Furnishings	2
		1	Credit Design for Flexibility	1
2			Credit Construction and Demolition Waste Management	2

11	2	3	Indoor Environmental Quality	16
Y			Prereq Minimum Indoor Air Quality Performance	Required
Y			Prereq Environmental Tobacco Smoke Control	Required
2			Credit Enhanced Indoor Air Quality Strategies	2
3			Credit Low-Emitting Materials	3
1			Credit Construction Indoor Air Quality Management Plan	1
1		1	Credit Indoor Air Quality Assessment	2
1			Credit Thermal Comfort	1
1			Credit Interior Lighting	1
1		1	Credit Daylight	2
1	1		Credit Quality Views	2
	1	1	Credit Acoustic Performance	2

6	0	0	Innovation	6
5			Credit Innovation	5
1			Credit LEED Accredited Professional	1

0	1	0	Regional Priority	4
	1		Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1
			Credit Regional Priority: Specific Credit	1

55	20	27	TOTALS	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

Water Efficiency

Numerous strategies will be investigated for water use reduction at the site. Currently, the site uses limited irrigation and relies primarily on rainwater. The site landscape design will specify planting strategies that do not require extensive irrigation. Further study is required to determine if Cooling Tower Water Use reduction is achievable. Low flow water fixtures and fittings will be specified where permitted by health and safety regulations to limit use of potable water within the building as much as possible. Water metering will not be feasible for the Inpatient Addition due to limited scope of uses to be metered.

Energy and Atmosphere

Numerous strategies are being investigated to address energy use reduction for the Inpatient Addition. A range of energy reduction options are being evaluated for energy saving measures, including: triple glazed windows and heat recovery. The percent of energy reduction and number of Optimize Energy Performance credits will be determined based on the chosen energy saving measures. Additionally, the design specifications will include Enhanced Commissioning services to ensure the building systems and envelope are actually performing as designed. Solar photovoltaic (PV) panels are being considered as a source of renewable energy production on-site in addition to the purchase of green power.

Materials and Resources

Materials will be carefully considered for the LEED project as they are integral to the Healthier Hospitals Initiative. Dedicated recycling areas will be included in the design to meet the Storage and Collection of Recyclables prerequisite. During construction, a Construction Waste Management plan will be developed and implemented to divert materials away from landfills with the goal of diverting at least 75 percent of the waste stream. Specification of products and furnishings for the building will consider multiple health, safety and wellness factors, including mercury, lead, cadmium and copper content, material ingredients and the availability of Environmental Product Disclosures. The design team will also specify furnishings with sustainable building value

Indoor Environmental Quality

Given the healthcare nature of the Inpatient Addition and the importance of maintaining appropriate infection control measures, indoor air quality is a high-priority intrinsic concern. The detailed development of the design will explore both engineered solutions (e.g., pressurized entry vestibules) and physical solutions (e.g., low volatile organic compound [VOC] emitting materials) that can help to maintain a healthy indoor environment. The design will focus on providing Interior Lighting (and shading) controls and Quality Views for both the inpatient and ambulatory spaces. Thermal Comfort controls, access to Daylight, and Acoustics are also important

considerations and will be studied further as the design team strives to enhance the patient, family, and staff experience in the building. During construction, the contractor will be required to maintain a robust Construction Indoor Air Quality Management Plan.

Innovation

There are numerous LEED Accredited Professionals on the design team, so an additional credit will be earned for this. The team is planning to pursue three pilot credits, including Assessment and Planning for Resilience, Designing with Nature (Biophilic Design for Indoor Environment), and Inclusive Design, as these resonate with the Inpatient Addition's regional and programmatic priorities.

Regional Priority

Regional Priority Credits, (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. The Inpatient Addition's priority credits that will be studied further include Renewable Energy Production, Energy Performance Optimization, Building Lifecycle Impact Reduction and Rainwater Management.

Energy Conservation and Greenhouse Gas Reduction

Since the Inpatient Addition is an addition to an existing building on a previously developed site, there is little flexibility on building orientation; but the team will attempt to maximize performance of the new building envelope and mechanical systems.

The campus's current off-site energy source is via a green power purchasing plan. All of the Hospital's electricity procured in the competitive market comes from clean power generators, largely hydro. Also, in August, a wind farm in Antrim, NH will start producing clean power, and the Hospital is contracted for 75% of its production, power and RECs. The Hospital has also made several long-term commitments for onsite solar PV installations. The Proposed Project team is considering a PV array on site, as well as providing a future PV ready zone to help further reduce greenhouse gas emissions.

The Hospital has an existing, recently upgraded (2018), combined heating/power (cogeneration) energy plant that supplies all primary heating and near full campus electrical power to the existing facility, and will supply the Inpatient Addition. The cogeneration system includes two 800 kW reciprocating engine generators with associated heat recovery steam generators (HRSGs) to capture thermal energy from the equipment exhaust and plate-and-frame style heat exchangers to capture thermal energy from the engine jacket cooling systems.

The Inpatient Addition's envelope will be designed for winter (and summer) comfort and energy efficiency. Intended strategies beyond code include additional thermal insulation, optimized fenestration solar heat gain performance, reduction of thermal bridging, and commissioning for airtightness and thermal performance.

Building infrastructure system design for the expansion is intended to include the following strategies for energy efficiency and conservation. All energy efficiency options/improvement will be analyzed in the ongoing design via a hour-by-hour energy simulation model to predict performance improvements and develop life cycle costs.

- ◆ Lighting systems with LED light source and occupancy and daylighting-based controls systems.
- ◆ Active chilled beam terminal units are being considered for all patient rooms and variable air volume terminal units for ambulatory and radiology spaces. Chilled beam air supply/exhaust systems with dual total energy (enthalpy) type heat recovery to preheat incoming primary ventilation air with leaving exhaust air.
- ◆ Air handlers utilizing airside free-cooling in the winter for any areas requiring year-round cooling (i.e., economizer systems).
- ◆ Energy for all air handler, fans, and pump systems optimized via variable speed drive controllers and automated pressure reset controls.
- ◆ Primary cooling equipment intended to be high-efficiency centrifugal, water-cooled, chillers; chiller and associated heat rejection (cooling tower) provided with variable speed drive motors.
- ◆ Primary heating being extended from existing building heat recovery cogeneration systems that provide building power and heat (recovery heat from both reciprocating generator exhaust and engine jacket cooling).
- ◆ Direct digital control-based building automation system will monitor, manage, and control all energy equipment. The system will incorporate setback controls (ventilation rate and space temperature) to lower energy use in unoccupied areas.

Appendix B includes the Climate Change Questionnaire.

3.15 Urban Design

The BWFH's 17 landscaped acres create significant buffers between the Hospital facilities and neighboring institutional and residential uses. The interior location of the Project Component sites on the BWFH campus will limit the physical and visual impact of the Proposed Project on the

surrounding area. The existing setbacks from Centre Street and Whitcomb Avenue will remain as they are today and, in some locations, the amount of building visible from the surrounding streets will be reduced.

The Inpatient Addition will have little visual impact on surrounding streets due to its setback of approximately 80 feet from Allandale Street and the large sloped lawn on Centre Street. The height of the Inpatient Addition will match the adjacent building and is lower than the 1972 portion of the existing building. The façade will be an improvement over the current blank wall of the building it is replacing.

Following demolition of the West Parking Garage, the site of the former garage will be replaced with a well-landscaped surface parking lot which terraces to the northwest, ensuring there is a buffer between it and the wooded area behind the homes on Malcolm Street. The existing surface parking lot off Whitcomb Avenue will remain as it exists today, surrounded by a substantial visual buffer of a hedgerow and trees.

The Replacement West Garage is proposed in the approximate location of the existing surface parking lot in the southwest portion of the campus. The Replacement West Garage will be shorter than the existing garage and will be constructed into the slope of the site to minimize its visibility. From Whitcomb Avenue on the northwest only one and a half to two stories of the garage will be visible from a distance, and it will be integrated with the landscaping through surrounding planting. Along Allandale Street, newly planted landscaping will create a buffer between the roadway and the Replacement West Garage, which will be set back from Allandale Street a minimum of 100 feet.

Views of the East Parking Garage Addition will be partially shielded by the existing adjacent building, Belkin House. The existing row of trees and landscaping also will present a barrier to full views of the expanded garage.

3.16 Historic and Archaeological Resources

3.16.1 *Historic Resources on the Campus*

There are no historic resources located within the campus listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

3.16.2 *Historic Resources in the Project Vicinity*

Historic resources in the vicinity of the campus include portions of the Arnold Arboretum to the south, the Adams-Nervine Asylum to the northeast, and the Brandegee Estate to the northwest which are all listed on the State and National Registers of Historic Places.

Table 3-6 lists State and National Register-listed properties and historic districts located within a quarter mile radius of the campus. Figure 3-5 depicts the locations of these properties and historic districts.

Table 3-6 State and National Register-Listed Properties and Historic Districts

Historic Resource	Address	Designation
Arnold Arboretum	Roughly bounded by the Arborway, Centre Street, Peters Hill Road, and NY, NH, V& H Railroad	NHL, NRIND
Lewis -Dawson Farmhouse	1080 Centre Street	LL, NHL, NRIND
Arnold Arboretum – Bonsai House	Arborway – Arnold Arboretum	NHL, NRIND
Brandegee Estate	165 Allandale Street	NRIND, NRMRA
Adams-Nervine Asylum	992-1020 Centre Street	LL NRDIS
NRIND	Individually listed on the National Register of Historic Places	
NRMRA	National Register Multiple Resource Area	
NRDIS	National Register Historic District	
NHL	National Historic Landmark	
LL	Local Landmark	

3.16.3 Archaeological Resources Within the Campus

A review of Massachusetts Historical Commission's (MHC) online archaeological base maps was conducted on May 10, 2019 indicating that one pre-contact site (19-SU-43) is located in the vicinity of the Proposed Project. As the Proposed Project will be located within an existing developed area, impacts to archaeological resources are not anticipated. As the Proposed Project advances, the BWFH will consult with MHC in accordance with M.G.L., Chapter 9, Sections 26-27C (50 CMR 71.00), as necessary, to assess potential impacts to significant historic and archeological resources. If impacts associated with the Proposed Project are identified, BWFH will work with MHC and interested parties in developing appropriate measures to mitigate impacts to those resources related to the Proposed Project.

3.16.4 Consistency with Historic Reviews

3.16.4.1 Boston Landmarks Commission

In the City of Boston, complete or partial demolition of properties greater than 50 years old are subject to review in accordance with the Boston Landmarks Commission (BLC) Article 85 (Demolition Delay) ordinance. The West Parking Garage was constructed in 1973, therefore, BLC's Article 85 (Demolition Delay) review will not be required.



Brigham and Women's Faulkner Hospital Boston, Massachusetts

3.16.4.2 Massachusetts Historical Commission

Since it is anticipated that the Proposed Project will require state permits or utilize state funding, the Proposed Project will be subject to review by MHC under State Register Review (950 CMR 71.00). MHC review will be initiated through the submission of an Environmental Notification Form under MEPA. If any federal funding, licenses, permits and/or approvals are required, the Proposed Project will also be subject to review under Section 106 of the National Historic Preservation Act. At this time, no federal action is anticipated.

3.17 Infrastructure

This section describes the existing infrastructure systems used by BWFH at its campus, as well as future demands and proposed system modifications. The infrastructure systems addressed include: sanitary sewer, water supply, stormwater drainage, electrical service, chilled water, natural gas, steam and telecommunications.

Future demands are based on the Proposed Project proposed during the term of the IMP. As described in Section 2.2, there are three Projects Components, the Inpatient Addition, the East Parking Garage Addition and the Replacement West Garage. In the following sections, these Project Components are evaluated for potential impacts to infrastructure systems.

3.17.1 Sanitary Sewer

3.17.1.1 Existing System Conditions

The Boston Water and Sewer Commission (BWSC) owns and maintains the sewer lines in the public ways that service BWFH. Existing sewer lines within the campus are maintained by BWFH.

Sanitary sewer systems in the nearby public streets and campus service roads are separate from stormwater collection systems. BWFH is serviced by existing BWSC sanitary sewers in Allandale Street (10-inch), Centre Street (10-inch), and Whitcomb Avenue (10-inch). Wastewater flows from BWFH to the Southwest Corridor Interceptor. These flows discharge to the Ward Street Headworks, then via the Boston Main Drain, to the Columbus Park Headworks and finally to the Massachusetts Water Resources Authority (MWRA) Deer Island Wastewater Treatment Plant for treatment and disposal.

3.17.1.2 Future Wastewater Generation and System Modifications

The proposed Inpatient Addition will contain approximately 78 beds. Based on wastewater generation rates established by the Massachusetts Department of Environmental Protection (310 CMR 15.203) of 200 gallons per day per bed, the Inpatient Addition is expected to generate approximately 15,600 gallons per day of sewage. The Inpatient Addition is expected to discharge to the sanitary sewer in Allandale Road. The Replacement West Garage is not expected to contain occupiable space. The covered portions of the garage will have floor drains directed to an oil/gas

separator, which is expected to discharge to the existing sanitary sewer in Allandale Road. The East Parking Garage Addition will use an existing sanitary sewer connection to Whitcomb Avenue. All proposed connections will be submitted to BWSC for review and approval.

3.17.2 *Water Supply*

3.17.2.1 Existing System Conditions

Existing water service for domestic use and fire protection is supplied from water systems owned and operated by the BWSC. Water is delivered to the area through an interconnected network of water distribution systems, designated by BWSC as the Southern Extra High Service. The SEH system serves small areas in Jamaica Plain, West Roxbury and Hyde Park.

The campus is serviced by existing BWSC water mains in Centre Street (12-inch SEH) and Whitcomb Avenue (12-inch SEH) and has two master water meters. BWFH owns and maintains the water mains within their campus.

3.17.2.2 Future Water Demand and System Modifications

Water demand for the Inpatient Addition is based upon an expected sewage generation rate of 15,600 gallons per day plus an additional 10% for consumption, system losses and other usage. The Inpatient Addition's estimated water demand is 17,200 gallons per day. The Inpatient Addition will connect to the campus water distribution system. All proposed connections will be submitted to BWSC for review and approval.

The Replacement West Garage is not currently expected to require any domestic water. However, it may require a new fire protection service from an 8-inch BWSC main in Allandale Street. The East Parking Garage Addition is not expected to require any new service connections.

3.17.3 *Stormwater Drainage*

3.17.3.1 Existing System Conditions

BWSC owns and maintains the majority of the stormwater drainage systems servicing the BWFH campus. The system servicing the campus consists of a 10-inch to 12-inch storm drain in Whitcomb Avenue, a 12-inch to 24-inch storm drain and 18-inch storm drain in Centre Street, and a 24-inch storm drain in Allandale Street. Additionally, BWFH owns and maintains a stormwater drainage system in its properties (discharging to Centre Street, Whitcomb Avenue and Allandale Street).

3.17.3.2 Future Stormwater Flows

Stormwater flows discharged from the Project Component sites are anticipated to be reduced in accordance with BWSC requirements. Conceptually, the Proposed Project is contemplating groundwater recharge systems as the primary stormwater management system to reduce stormwater runoff and improve runoff water quality as required by BWSC. Sizing of stormwater

management systems will be based on a 1.25-inch equivalent volume in accordance with BWSC and BPDA Smart Utilities Policy requirements. The Hospital is conducting the geotechnical testing required to support the design of a recharge system and further system details will be presented in the DPIR. All stormwater management systems provided for the Inpatient Addition and Replacement West Garage will be submitted to BWSC for Site Plan Approval.

3.17.4 *Electrical Service*

3.17.4.1 Existing System Conditions

Eversource currently provides the existing electrical service at BWFH. Electrical manholes are located on Whitcomb Avenue, Centre Street and Allandale Street.

3.17.4.2 Future Electrical Requirements

It is anticipated that the Proposed Project will be obtaining electric service from the internal campus distribution system.

3.17.5 *Chilled Water*

3.17.5.1 Existing System Conditions

Currently, BWFH produces chilled water in a central plant internal to the campus.

3.17.5.2 Future Chilled Water Requirements

The Inpatient Addition is expected to use chilled water produced in the existing central plant.

3.17.6 *Natural Gas*

3.17.6.1 Existing System Conditions

National Grid has a network of natural gas mains servicing the BWFH campus. Existing 12-inch gas mains exist in Centre Street and Allandale Street, as well as a 6-inch main in Whitcomb Avenue on the northern edge of the campus. Two services are used by the campus: a 6-inch service coming from the 6-inch main on Whitcomb Avenue and a service from the 12-inch main in Centre Street.

3.17.6.2 Future Natural Gas Requirements

As currently envisioned, the Proposed Project will not require new service connections to the National Grid system.

3.17.7 *Telecommunications*

3.17.7.1 Existing Systems

There is existing telecommunication infrastructure in Whitcomb Avenue, Centre Street and Allandale Street via overhead wire and underground fiber optic services.

3.17.7.2 Future System Connections

The Proposed Project is not expected to require new telecommunications connections.

Chapter 4

Coordination With Other Governmental Agencies

4.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

4.1 Architectural Access Board Requirements

The Proposed Project will comply with the requirements of the Massachusetts Architectural Access Board and will be designed to comply with the standards of the Americans with Disabilities Act. Appendix D includes the Accessibility Checklist.

4.2 Massachusetts Environmental Policy Act (MEPA)

The Proposed Project will be subject to review under the Massachusetts Environmental Policy Act since the Proposed Project requires a Determination of Need from the Department of Public Health, and the Proposed Project will exceed a review threshold for Transportation. The Proponent will submit an Environmental Notification Form to the MEPA office.

4.3 Massachusetts Historical Commission

MHC has review authority over projects requiring state or federal funding, licensing, permitting and/or approvals that may have direct or indirect impacts to properties listed in the State Register of Historic Places. MHC review will be initiated through the submission of an Environmental Notification Form in compliance with MEPA.

4.4 Boston Landmarks Commission

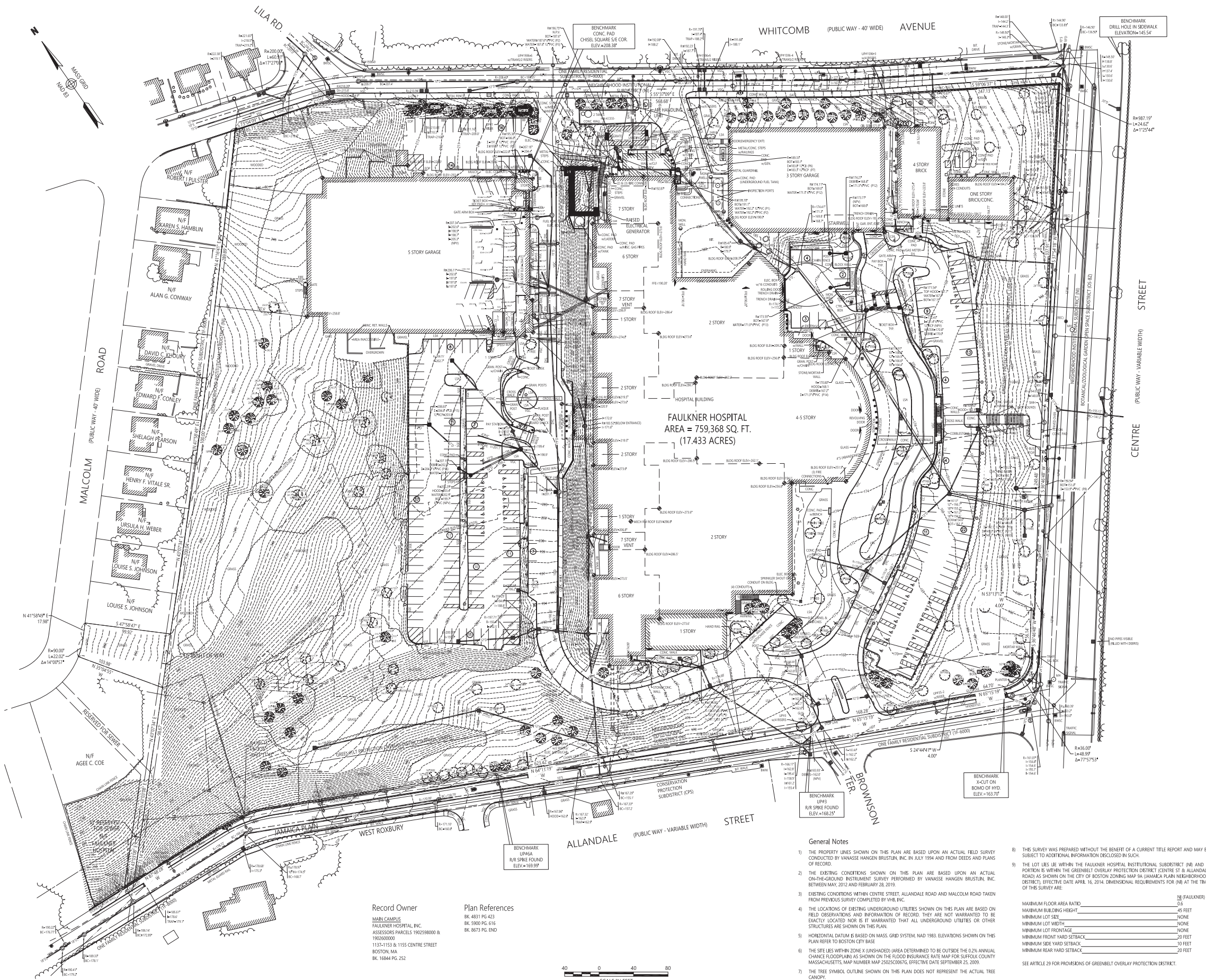
Review under Article 85 of the Boston Zoning Code is not anticipated as the parking garage to be demolished is less than 50 years old.

4.5 Boston Civic Design Commission

The Proposed Project will comply with the provisions of Article 28 of the Boston Zoning Code. This PNF will be submitted to the Boston Civic Design Commission by the BPDA as part of the Article 80 process.

Appendix A

Survey



vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

- Legend**
- DRAIN MANHOLE
 - CATCH BASIN
 - SEWER MANHOLE
 - ELECTRIC MANHOLE
 - TELEPHONE MANHOLE
 - MANHOLE
 - HANDHOLE
 - WATER GATE
 - FIRE HYDRANT
 - GAS GATE
 - BOLLARD w/LIGHT
 - STREET SIGN
 - LIGHT POLE
 - UTILITY POLE
 - GUY POLE
 - GUY WIRE
 - MONITORING WELL
 - FLOOD LIGHT
 - WELL
 - MARSH
 - DOOR/ENTRANCE
 - FTE FINISHED FLOOR ELEVATION
 - CNO COULD NOT OPEN
 - NPV NO PIPES VISIBLE
 - DYL DOUBLE YELLOW LINE
 - DWL DASHED WHITE LINE
 - SYL SINGLE WHITE LINE
 - LSA LANDSCAPED AREA
 - EDGE OF PAVEMENT
 - CONCRETE CURB
 - VERTICAL GRANITE CURB
 - SLOPED GRANITE EDGE
 - BITUMINOUS CURB
 - METAL GUARDRAIL
 - WOOD FENCE
 - CHAIN LINK FENCE
 - SEWER LINE
 - OVERHEAD WIRE
 - UNDERGROUND ELECTRIC
 - TELEPHONE LINE
 - GAS LINE
 - WATER LINE
 - STONE WALL
 - TREE LINE
 - 100'-FT BUFFER ZONE
 - 100'-FT RIVER FRONT AREA
 - 200'-FT RIVER FRONT AREA
 - LIMIT MEAN ANNUAL HIGH WATER
 - LIMIT OF BANK
 - VEGETATED WETLAND BOUNDARY

Faulkner Hospital
1153 Centre Street
Jamaica Plain, Massachusetts

Rev	Revision	Date	Appr'd
5	ADDITIONAL SURVEY/CONVERTED TO NAD83	5/1/19	CDR
4	ADDITIONAL SURVEY	5/19/17	CDR
3	GARAGE ENTRANCE/EXIT SURVEY	3/19/13	CDR
2	APPROX. GREENBELT OVERLAY DISTRICT	10/19/12	CDR
1	BUILDING ROOF ELEVATIONS & UPDATES	5/30/12	CDR

May 14, 2012

Existing Conditions
Plan of Land

Sv-1

Record Owner
MAIN CAMPUS
FAULKNER HOSPITAL, INC.
ASSESSORS PARCELS 1902580000 & 1902600000
1137-1153 & 1155 CENTRE STREET
BOSTON, MA
BK. 18844 PG. 252

Plan References
BK. 4831 PG. 423
BK. 5900 PG. 616
BK. 8673 PG. END

General Notes

- THE PROPERTY LINES SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL FIELD SURVEY CONDUCTED BY VANASSE HANGEN BRUSTLIN, INC. IN JULY 1994 AND FROM DEEDS AND PLANS OF RECORD.
- THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY VANASSE HANGEN BRUSTLIN, INC. BETWEEN MAY, 2012 AND FEBRUARY 28, 2019.
- EXISTING CONDITIONS WITHIN CENTRE STREET, ALLANDALE ROAD AND MALCOLM ROAD TAKEN FROM PREVIOUS SURVEY COMPLETED BY VHB, INC.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON FIELD OBSERVATIONS AND INFORMATION OF RECORD. THEY ARE NOT WARRANTED TO BE EXACTLY LOCATED NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES OR OTHER STRUCTURES ARE SHOWN ON THIS PLAN.
- HORIZONTAL DATUM IS BASED ON MASS. GRID SYSTEM, NAD 1983. ELEVATIONS SHOWN ON THIS PLAN REFER TO BOSTON CITY BASE.
- THE SITE LIES WITHIN ZONE K (UNSHADED) AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR SUFFOLK COUNTY MASSACHUSETTS, MAP NUMBER MAP 2502SC0007, EFFECTIVE DATE SEPTEMBER 25, 2009.
- THE TREE SYMBOL OUTLINE SHOWN ON THIS PLAN DOES NOT REPRESENT THE ACTUAL TREE CANOPY.
- THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT AND MAY BE SUBJECT TO ADDITIONAL INFORMATION DISCLOSED IN SUCH.
- THE LOT LIES IN THE FAULKNER HOSPITAL INSTITUTIONAL SUBDISTRICT (IN) AND A PORTION IS WITHIN THE GREENBELT OVERLAY PROTECTION DISTRICT (CENTRE ST & ALLANDALE ROAD) AS SHOWN ON THE CITY OF BOSTON ZONING MAP 9A (JAMAICA PLAIN NEIGHBORHOOD DISTRICT), EFFECTIVE DATE APRIL 16, 2014. DIMENSIONAL REQUIREMENTS FOR (IN) AT THE TIME OF THIS SURVEY ARE:

MAXIMUM FLOOR AREA RATIO	0.5 (FAULKNER)
MAXIMUM BUILDING HEIGHT	45 FEET
MINIMUM LOT SIZE	NONE
MINIMUM LOT WIDTH	NONE
MINIMUM LOT FRONTAGE	NONE
MINIMUM FRONT YARD SETBACK	20 FEET
MINIMUM SIDE YARD SETBACK	10 FEET
MINIMUM REAR YARD SETBACK	20 FEET

SEE ARTICLE 29 FOR PROVISIONS OF GREENBELT OVERLAY PROTECTION DISTRICT.

Appendix B

Climate Change Questionnaire

Boston Planning & Development Agency Climate Resiliency Report Summary



Submitted: 07/25/2019 08:28:42

A.1 - Project Information

Project Name:	Brigham and Women's Faulkner Hospital		
Project Address:	1153 Centre Street		
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)		
Filing Contact:	Geoff Starsiak	Epsilon Associates gstarsiak@epsilonassociates.com	978-897-7100
Is MEPA approval required?	Yes	MEPA date:	

A.2 - Project Team

Owner / Developer:	Brigham and Women's Faulkner Hospital
Architect:	NBBJ
Engineer:	Fitzmeyer & Tocci
Sustainability / LEED:	NBBJ
Permitting:	Epsilon Associates
Construction Management:	

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Hospital
List the First Floor Uses:	Hospital
List any Critical Site Infrastructure and or Building Uses:	Hospital

Site and Building:

Site Area (SF):	768430	Building Area (SF):	98000
Building Height (Ft):	72	Building Height (Stories):	5
Existing Site Elevation – Low (Ft BCB):	154	Existing Site Elevation – High (Ft BCB):	263
Proposed Site Elevation – Low (Ft BCB):	154	Proposed Site Elevation – High (Ft BCB):	263
Proposed First Floor Elevation (Ft BCB):	175	Below grade spaces/levels (#):	1

Article 37 Green Building:

LEED Version - Rating System:	LEED v4 BD+C Healthcare	LEED Certification:	Yes
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Boston Planning & Development Agency Climate Resiliency Report Summary



Proposed LEED rating:

Silver

Proposed LEED point score (Pts.):

55

Building Envelope:

When reporting R values, differentiate between R discontinuous and R continuous. For example, use “R13” to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	30	Exposed Floor :	10.4
Foundation Wall:	7.5	Slab Edge (at or below grade):	7.5
Vertical Above-grade Assemblies (%’s are of total vertical area and together should total 100%):			
Area of Opaque Curtain Wall & Spandrel Assembly:	0	Wall & Spandrel Assembly Value:	0.064
Area of Framed & Insulated / Standard Wall:	70	Wall Value:	R13 + R7.5c.i.
Area of Vision Window:	30	Window Glazing Assembly Value:	0.38
		Window Glazing SHGC:	0.4
Area of Doors:	<1	Door Assembly Value :	0.37 and 0.77

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined

For this filing – describe how energy loads & performance were determined	Energy model			
	Annual Electric (kWh):	970476	Peak Electric (kW):	325
	Annual Heating (MMbtu/hr):	6666	Peak Heating (MMbtu):	3471
	Annual Cooling (Tons/hr):	47468	Peak Cooling (Tons):	220
	Energy Use - Below ASHRAE 90.1 - 2013 (%):		Have the local utilities reviewed the building energy performance?:	No
	Energy Use - Below Mass. Code (%):	12.6	Energy Use Intensity (kBtu/SF):	116

Back-up / Emergency Power System

Electrical Generation Output (kW):	1600	Number of Power Units:	2
System Type (kW):	Reciprocating	Fuel Source:	Diesel

Emergency and Critical System Loads (in the event of a service interruption)

Electric (kW):	600	Heating (MMbtu/hr):	2500
		Cooling (Tons/hr):	250

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons): 578

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Building energy performance targets have been set as a programmatic requirement. Each phase will include modeling to inform options for reduced energy use from both architecture and infrastructure systems to continue refinement toward performance EUI targets. Life cycle cost analysis shall be used to inform and make decisions on final options.

Describe building specific passive energy efficiency measures including orientation, massing, building envelop, and systems:

The building envelope will be designed for winter (and summer) comfort and energy efficiency. Likely strategies beyond code include additional thermal insulation, optimized fenestration solar heat gain performance, reduction of thermal bridging, and commissioning for airtightness and thermal performance.

Describe building specific active energy efficiency measures including high performance equipment, controls, fixtures, and systems:

Lighting systems will include all LED fixtures and occupancy & daylighting-based controls systems. Active chilled beam terminal units are being considered for all patient rooms and variable air volume terminal units for ambulatory and radiology spaces. Chilled beam air supply/exhaust systems shall be provided with dual total energy (enthalpy) type heat recovery to preheat incoming primary ventilation air with leaving exhaust air. All air handlers shall utilize airside free-cooling in the winter for any areas requiring year-round cooling (i.e., economizer systems). Energy for all air handler, fans, and pump systems will be optimized via variable speed drive controllers and automate pressure reset controls. Primary cooling for the building will be via high-efficiency centrifugal, water-cooled, chillers; chiller and associated heat rejection (cooling tower) will be provided with variable speed drive motors. Primary heating will be extended from existing building heat recovery cogeneration systems that provide building power and heat (recovery heat from both generator exhaust and engine jacket cooling). Direct digital control-based building automation system will monitor, manage, and control all energy equipment. System will incorporate setback controls (ventilation rate and space temperature) to lower energy use in unoccupied areas. All energy efficiency options/improvement will be analyzed in the ongoing design via hour-by-hour energy simulation model to predict performance improvements and develop life cycle costs.

Describe building specific load reduction strategies including on-site renewable energy, clean energy, and storage systems:

The current design is proposing to include solar photovoltaic systems on the top level of the proposed new parking garage. This system will feed electrical energy directly into the building power systems to offset energy required from local electrical utility. Options for storage of photovoltaic derived energy via local battery unit(s) is also being considered and evaluated.

Boston Planning & Development Agency

Climate Resiliency Report Summary



Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

The Owner purchases 100% carbon free electricity across the campus and will continue to do so. The facility has an existing, recently upgraded (2018), combined heating/power (cogeneration) energy plant that supplies all primary heating and near full campus electrical power to the existing facility and proposed new Inpatient Building. The cogeneration system includes two 800 kW, reciprocating engine generators with associated heat recovery steam generators (HRSGs) to capture thermal energy from the equipment exhaust and plate-and-frame style heat exchangers to capture thermal energy from the engine jacket cooling systems. Steam and heating hot water, generated from the cogeneration system, will be supplied to the Inpatient Building to further increase the thermal heat recovery utilization of the cogeneration plant.

Describe any energy efficiency assistance or support provided or to be provided to the project:

Local electric utility will be coordinated with and involved in the project to evaluate all energy conservation/reduction measures for probable utility incentive funding. Design of all energy systems will be coordinated with available incentive programs to optimize incentive funds for project.

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

Currently the campus purchases 100% carbon free electricity. Design incorporates several energy efficiency measures that directly reduce the site level energy use and therefore reduce site level GHG emissions. Following are strategies being incorporated or considered that have significant GHG emissions reduction potential:

- Chilled beam-based patient room terminal units (for heating/cooling) supplied with primary air via energy recovery ventilation/exhaust units.
- Free cooling of building in cool outdoor time periods via airside economizer systems/controls incorporated into the HVAC systems.
- Optimized use of cogeneration (combined heat/power) systems thermal heat recovery.
- Incorporation of photovoltaic energy collection panels into the project's parking garage roof.

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2° F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 - Extreme Heat - Design Conditions

Temperature Range - Low (Deg.): 5.9

Annual Heating Degree Days: 5854

Temperature Range - High (Deg.): 101.6

Annual Cooling Degree Days: 796

Boston Planning & Development Agency

Climate Resiliency Report Summary



What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90° (#):	30	Days - Above 100° (#):	6
Number of Heatwaves / Year (#):	6	Average Duration of Heatwave (Days):	5

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

Design for site and neighborhood cooling will include high SRI roofs and landscaping at the perimeter of the project.

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

The building design has several measures incorporated into the design of infrastructure systems to mitigate increased exterior ambient temperature and humidity periods. Following are additional details on the proposed measures:

- Primary cooling for the building is provided by two, fully redundant, high-efficiency chillers each served by redundant heat rejection equipment (cooling towers) and redundant pumping equipment. These redundant systems inherently provide additional capacity for use (now and in the future) to bolster combined system overall capacity.
- Patient room handling is proposed to be served by chilled beam air systems that are supplied air via redundant air handlers. Similar to the primary cooling above, the additional air handler capacity can be enlisted for use during extended/increase heat wave time periods.
- Similar to the patient rooms air handlers, the air handlers for the ambulatory radiology floors are designed with redundancy/capacity; these units incorporate internal N+1 redundancy for fans, cooling coils, and heating coils.
- The system design for mechanical and electrical systems incorporates provisions for connection of expanded capacity equipment in the future. This concept includes future system taps, pipe/duct design for increase capacity, and dedicated building space for future equipment mounting.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

The building mechanical and electrical systems incorporate several features to enable the facility to function during extended utility interruptions. Following are details regarding these features:

- Backup emergency power systems. The building has both dedicated emergency generator system for critical loads and additional onsite power generation via cogeneration systems. The sum of these two systems has adequate capacity to serve all critical loads for the Inpatient Building for a minimum of a 96-hour outage; longer outages require only the supply of additional generator fuel.
- The patient room chilled beam terminal units have inherent passive capacity (inducted automatically) of approximately 30 percent with just the provision of chilled water and heating hot water to the units. This provides available heating and cooling to the patient rooms even upon total failure of the

primary and redundant air handlers.

- The proposed photovoltaic solar collector panels on the project's parking garage roof can provide electrical energy to the building grid during extended utility power outages.

The building is being provided with non-mechanical features to also support increased functionality during extended utility outage. These features include:

- Considering operable windows at building perimeter than can be opened by facility personnel/users to allow emergency fresh air ventilation/cooling.
- Maximized daylight views to increase building footprint daytime usability during emergency utility outages.

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25". There is a significant probability that this will increase to at least 6" by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

D.1 - Extreme Precipitation - Design Conditions

What is the project design
precipitation level? (In. / 24 Hours)

6

Describe all building and site measures for reducing storm water run-off:

The design team is contemplating groundwater recharge systems as the primary stormwater management system in a manner to reduce stormwater runoff and improve runoff water quality as required by BWSC. The currently expected sizing of stormwater management systems will be based on a 1.25-inch equivalent volume in accordance with BWSC requirements.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

The systems will provide internal bypasses to allow stormwater to be conveyed in the event extreme precipitation burdens the planned systems. The building critical power systems (normal and emergency power) are being located at the top of the facility to provide resiliency from a flood event (both natural and from building water systems failures).

Boston Planning & Development Agency Climate Resiliency Report Summary



E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA Special Flood Hazard Area?

What Zone:

What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?

Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see [SLR-FHA online map](#))?

If you answered YES to either of the above questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)?

What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?

What are the Site Elevations at Building (Ft BCB)?

First Floor Elevation (Ft BCB):

What is the Accessible Route Elevation (Ft BCB)?

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Boston Planning & Development Agency

Climate Resiliency Report Summary



Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

Thank you for completing the Boston Climate Change Checklist!

For questions or comments about this checklist or Climate Change best practices, please contact:
John.Dalzell@boston.gov

Appendix C

Preliminary Energy Model

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.1 - General Information

Simulation Program: TRACE™ 700 v6.3.4
Principle Heating Source: Purchased Heat
Energy Code Used: TRACE™ 700 v6.3.4
Weather File: Boston, MA (Reduced Year)
Climate Zone: 5A
New Construction Percent: 100 %
Existing Renovation Percent: 0 %
Quantity of Floors: 6
Proposed: Alternative 2 - Proposed
Baseline: Alternative 1 - Baseline

Section 1.2 - Space Summary

Building Use (Occupancy Type)	Space Area (ft²)	Regularly Occupied Area (ft²)	Unconditioned Area (ft²)
Mechanical	3,177.00	3,177.00	0.00
Clean Storage	5,601.00	5,601.00	0.00
Corridor	18,370.00	18,370.00	0.00
Pre/Post	2,345.00	2,345.00	0.00
Nurse Station	19,968.00	19,968.00	0.00
Endoscopy	2,211.00	2,211.00	0.00
Patient Room	27,552.00	27,552.00	0.00
Imaging	3,340.00	3,340.00	0.00
Observation	2,537.00	2,537.00	0.00
Waiting	3,377.00	3,377.00	0.00
Total	88,478.00	88,478.00	0.00

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.3 - Advisory Messages

Advisory Messages	Baseline Building (0 deg rotation)	Proposed Building
Number of hours heating load not met:	0	4
Number of hours cooling load not met:	0	0
Total	0	4

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Exterior Wall Construction	90.1-10 Min Wall Nonres Zone 4-8 U-factor: 0.054 Btu/h·ft²·°F	90.1-13 Min Wall Nonres Zone 5 U-factor: 0.064 Btu/h·ft²·°F
Roof Construction	90.1 Roof White U-factor: 0.027 Btu/h·ft²·°F Reflectivity: 0.60	90.1-13 Min Roof Nonres Zone 4-6 U-factor: 0.032 Btu/h·ft²·°F Reflectivity: 0.30
Window-to-gross wall ratio	28.0 %	28.0 %
Fenestration Type	90.1-2013 Window Zone 4-6 Metal Fixed U-factor: 0.320 Btu/h·ft²·°F SHGC: 0.34 Visible Transmissivity: 0.440	90.1-2013 Window Zone 4-6 Metal Fixed U-factor: 0.380 Btu/h·ft²·°F SHGC: 0.39 Visible Transmissivity: 0.440
Interior Light Power Density	Lighting Compliance: Building Area Method Daylighting Controls: No Building: 0.80 W/ft²	Lighting Compliance: Building Area Method Daylighting Controls: No Building: 1.20 W/ft²
Interior Light Power Density	Room Type: Mechanical - 0.80 W/ft² Clean Storage - 0.80 W/ft² Corridor - 0.80 W/ft² Pre/Post - 0.80 W/ft² Nurse Station - 0.80 W/ft²	Room Type: Mechanical - 1.20 W/ft² Clean Storage - 1.20 W/ft² Corridor - 1.20 W/ft² Pre/Post - 1.20 W/ft² Nurse Station - 1.20 W/ft²
Interior Light Power Density	Room Type: Endoscopy - 0.80 W/ft² Patient Room - 0.80 W/ft² Imaging - 0.80 W/ft² Observation - 0.80 W/ft² Waiting - 0.80 W/ft²	Room Type: Endoscopy - 1.20 W/ft² Patient Room - 1.20 W/ft² Imaging - 1.20 W/ft² Observation - 1.20 W/ft² Waiting - 1.20 W/ft²
Slab-on-grade or Exposed Floor	09059 Base Exposed Floor Exposed Floor U-Factor: 0.080 Btu/h·ft²·°F	09059 Base Exposed Floor Exposed Floor U-Factor: 0.080 Btu/h·ft²·°F
Receptacle Elec Eq Power Density	0.38 W/ft²	0.38 W/ft²
HVAC System Type	RTU-3 Active Chilled Beams Uses: Enth Econ, Heat recov Supply vol: 17621 cfm Fan power: 47.28 kW	RTU-3 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 48717 cfm Fan power: 102.69 kW

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
HVAC System Type	RTU-2 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 14947 cfm Fan power: 31.51 kW	RTU-2 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 16382 cfm Fan power: 34.50 kW
HVAC System Type	RTU-1 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 11079 cfm Fan power: 23.55 kW	RTU-1 Variable Volume Reheat (30% Min Flow Default) Uses: Enth Econ Supply vol: 12081 cfm Fan power: 25.63 kW
Cooling Equipment	Plant: LTCHW Type: WC Centrifugal Chilled Beam Category: Water-cooled chiller Clg Cap: Design Engy Rate: 0.56 kW/ton	Plant: Cooling plant - 001 Type: 90.1-13 Min Cent 300-400 tons Path B Category: Water-cooled chiller Clg Cap: Design Engy Rate: 0.595 kW/ton
Cooling Equipment	Plant: HTCHW Type: 90.1-13 Min Cent 300-400 tons Path B Category: Water-cooled chiller Clg Cap: Design Engy Rate: 0.595 kW/ton	
Chilled Water Pump	Type: 90.1-13 Min Var Vol Chilled Water Pump Full load consumption: 22 Watt/gpm Quantity: 2	Type: 90.1-13 Min Var Vol Chilled Water Pump Full load consumption: 22 Watt/gpm
Condenser Water Pump	Type: 90.1-13 Min Var Vol Cond Water Pump Full load consumption: 22 Watt/gpm Quantity: 2	Type: 90.1-13 Min Var Vol Cond Water Pump Full load consumption: 22 Watt/gpm
Heat Rejection Parameters	Type: 90.1 Min Cooling Tower HR Type: Cooling tower (DOE) Energy Consumption: 0.063700 kW/ton Quantity: 2	Type: 90.1 Min Cooling Tower HR Type: Cooling tower (DOE) Energy Consumption: 0.063700 kW/ton
Heating Equipment	Plant: DHW Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient	Plant: DHW Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient
Heating Equipment	Plant: HHW Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient	Plant: HHW Type: Purchased District Steam Category: Boiler Capacity: Design Energy Rate: 100 Percent efficient
Hot Water Pump	Type: Heating water circ pump Full load consumption: 1 hp	Type: Heating water circ pump Full load consumption: 1 hp

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.4 - Comparison of Proposed Design Versus Baseline Design

Input Parameter	Proposed Design Input	Baseline Design Input
Hot Water Pump	Type: 90.1-13 Min Var Vol HW Pump Full load consumption: 19 Watt/gpm	Type: 90.1-13 Min Var Vol HW Pump Full load consumption: 19 Watt/gpm
Thermal Energy Storage	No	No

Section 1.5 - Energy Type Summary (Proposed)

Energy Type	Utility Rate Description	Units
Electric Consumption	Typical New England Utility	kWh
Electric Demand	Typical New England Utility	kW
Purchased Steam	Typical New England Utility	therms

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.6 Baseline Performance - Performance Rating Method Compliance

End Use	Process	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baseline (180 deg rotation)	Baseline (270 deg rotation)	Baseline Design
Space Heating	No	Electricity	Energy Use (kWh)	2,317	2,297	2,273	2,310	2,300
			Demand (kW)	0.3	0.3	0.3	0.3	0.3
Space Cooling	No	Electricity	Energy Use (kWh)	93,922	93,616	91,609	94,001	93,287
			Demand (kW)	112.8	118.8	105.0	113.4	112.5
Pumps	No	Electricity	Energy Use (kWh)	43,107	43,469	43,494	43,015	43,271
			Demand (kW)	27.7	29.0	25.8	27.3	27.5
Heat Rejection	No	Electricity	Energy Use (kWh)	31,202	31,802	30,489	31,356	31,212
			Demand (kW)	20.5	21.3	20.1	20.8	20.7
Fans - Interior	No	Electricity	Energy Use (kWh)	714,902	709,042	736,562	722,966	720,868
			Demand (kW)	162.4	163.6	155.0	163.1	161.0
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	108,608	108,608	108,608	108,608	108,608
			Demand (kW)	31.5	31.5	31.5	31.5	31.5
Interior Lighting	No	Electricity	Energy Use (kWh)	458,983	458,983	458,983	458,983	458,983
			Demand (kW)	95.2	95.2	95.2	95.2	95.2
Space Heating	No	Purchased Steam	Energy Use (therms)	66,250	68,200	68,616	65,990	67,264
			Demand (therms)	19.0	19.2	19.6	19.1	19.2
Baseline Energy Totals:			Energy Use (MMBtu/yr)	11,584.2	11,761.4	11,885.5	11,586.2	11,704.3
			Process (MMBtu/yr)	370.7	370.7	370.7	370.7	370.7

Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Space Heating	No	Electricity	Energy Use (kWh)	1,429
			Demand (kW)	0.2
Space Cooling	No	Electricity	Energy Use (kWh)	124,819
			Demand (kW)	83.0
Pumps	No	Electricity	Energy Use (kWh)	25,767
			Demand (kW)	27.2
Heat Rejection	No	Electricity	Energy Use (kWh)	28,063
			Demand (kW)	16.3

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Section 1.6 Proposed Performance - Performance Rating Method Compliance

End Use	Process	Proposed Design Energy Type	Units of Annual Energy & Peak Demand	Proposed Design
Fans - Interior	No	Electricity	Energy Use (kWh)	375,555
			Demand (kW)	102.8
Receptacle Equipment	Yes	Electricity	Energy Use (kWh)	108,608
			Demand (kW)	31.5
Interior Lighting	No	Electricity	Energy Use (kWh)	305,989
			Demand (kW)	63.4
Space Heating	No	Purchased Steam	Energy Use (therms)	69,187
			Demand (therm)	11.7
Proposed Energy Totals:			Energy Use (MMBtu/yr)	10,230.09
			Process (MMBtu/yr)	370.67

LEED Energy Performance Summary Report

By FITZEMEYER AND TOCCI

Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Baseline Case

Energy Type	Baseline Cost (0° rotation)	Baseline Cost (90° rotation)	Baseline Cost (180° rotation)	Baseline Cost (270° rotation)	Average
Electric Consumption	\$217,954	\$217,171	\$220,801	\$219,184	\$218,778
Purchased Steam	\$74,200	\$76,384	\$76,850	\$73,909	\$75,336

Table 1.6 Table EAp2-9 Energy Cost Summary (Manual Cost Input) - Proposed Case

Energy Type	Proposed Cost
Electric Consumption	\$145,533
Purchased Steam	\$77,490

Proposed building economic cost improvement over baseline building: 24.17 %

Proposed building energy reduction over baseline building: 12.6 %

Appendix D

Accessibility Checklist

Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA) Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BPDA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
http://www.ada.gov/2010ADASTandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
<http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html>
3. Massachusetts State Building Code 780 CMR
<http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html>
4. Massachusetts Office of Disability – Disabled Parking Regulations
<http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf>
5. MBTA Fixed Route Accessible Transit Stations
http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
<http://bostoncompletestreets.org/>
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. **Accessible Route** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. **Accessible Group 2 Units** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. **Accessible Guestrooms** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. **Inclusionary Development Policy (IDP)** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: <http://www.bostonplans.org/housing/overview>
5. **Public Improvement Commission (PIC)** – The regulatory body in charge of managing the public right of way. For more information visit: <https://www.boston.gov/pic>
6. **Visitability** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.



Article 80 | ACCESSIBILITY CHECKLIST

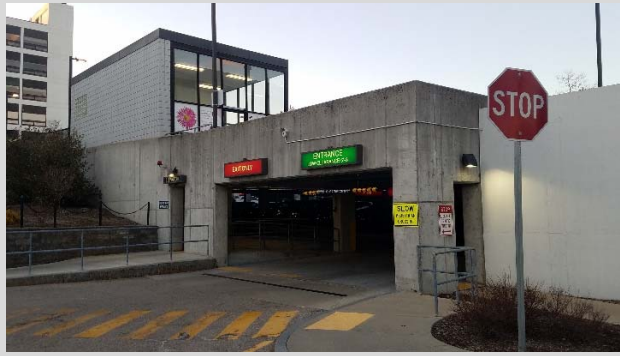
1. Project Information: <i>If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.</i>			
Project Name:	Brigham & Women's Faulkner Hospital Inpatient Addition		
Primary Project Address:	1153 Centre Street		
Total Number of Phases/Buildings:	3 Buildings: Inpatient Addition (this checklist), Front Garage, and Rear Garage		
Primary Contact (Name / Title / Company / Email / Phone):	Malaina Bowker		
Owner / Developer:	Brigham & Women's Faulkner Hospital		
Architect:	NBBJ		
Civil Engineer:	VHB		
Landscape Architect:	KMDG		
Permitting:	Epsilon Associates		
Construction Management:	TBD		
At what stage is the project at time of this questionnaire? Select below:			
	PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:
Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? <i>If yes, identify and explain.</i>	No		
2. Building Classification and Description: <i>This section identifies preliminary construction information about the project including size and uses.</i>			
What are the dimensions of the project?			
Site Area:	768,430 SF	Building Area:	98,000 GSF
Building Height:	72 FT.	Number of Stories:	5 Flrs.
First Floor Elevation:	175'-0" Ft BCB	Is there below grade space:	<u>Yes</u> / No

Article 80 | ACCESSIBILITY CHECKLIST

What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	Residential - Multi-unit, Four +	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:		Clinical services		
3. Assessment of Existing Infrastructure for Accessibility: <i>This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.</i>				
Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	<p>The project is located in the Jamaica Plain Neighborhood of Boston at the intersection of Centre St. and Allandale St. To the east is the Arnold Arboretum. To the south is Allandale Woods, Springhouse Senior Living, and some residential. To the west is residential. To the north is residential and the Italian Home for Children.</p> <p>The project site experiences topographical change, dropping ~109' from the high point in the north corner to the low point in the south.</p>			
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	<p>Bus: The Centre St @ Faulkner Hospital stop, serving route 38, is located on the edge of the site. Paths are provided to the entrance of the hospital. The route 38 bus route provides access to the Orange Line and the Needham Commuter rail, which are 1.6 miles away by road.</p>			
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	<p>Springhouse Senior living, Italian Home for Children are across from the site. Further to the south is the Sophia Snow Place senior living center and the Little Blessings Daycare and preschool.</p>			
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	<p>The Arnold Arboretum</p>			
4. Surrounding Site Conditions – Existing: <i>This section identifies current condition of the sidewalks and pedestrian ramps at the development site.</i>				

Article 80 | ACCESSIBILITY CHECKLIST

<p>Is the development site within a historic district? If yes, identify which district:</p>	<p>No</p>
<p>Are there sidewalks and pedestrian ramps existing at the development site? If yes, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:</p>	<p>Yes</p> <p>Rear Sidewalks Along Accessible Route that are Existing to Remain is listed below. From the new rear garage to the main entry will be mainly new sidewalks.</p> <p>Dimensions: 5' min Slopes: ~level and aligned with building entry Material: Concrete</p> <p>Front Entry Sidewalks Along Accessible Route (Existing to remain)</p> <p>Dimensions: 5' min Slopes: Max slope 1:15 Material: Concrete</p>
<p>Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? If yes, provide description and photos:</p>	<p>Sidewalks at the rear of the campus will be both new and existing. Detectable warning surfaces are likely to be replaced and moved. Sidewalks at the front of the campus are existing to remain. See below photos for locations of detectable warnings.</p>  



5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? **If yes**, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.

To be determined as the landscape design further progresses.

What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:

To be determined as the landscape design further progresses.

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?

To be determined as the landscape design further progresses. They will be on private property.

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? **If yes**, what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?

No

Article 80 | ACCESSIBILITY CHECKLIST

If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	N/A
Will any portion of the Project be going through the PIC? If yes , identify PIC actions and provide details.	Yes, for the driveway curb cut on Allandale Street.
6. Accessible Parking: <i>See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations.</i>	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	Existing is 959 spaces. The new total will be 1,462; a net gain of 503 spaces. The new rear garage will contain 952 spaces. The expanded front garage will contain 310, a net gain of 171.
What is the total number of accessible spaces provided at the development site? How many of these are “Van Accessible” spaces with an 8 foot access aisle?	The final count is to be determined as the parking layout develops, but will adhere to the requirements of 521 CMR 23.00.
Will any on-street accessible parking spaces be required? If yes , has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No
Where is the accessible visitor parking located?	There are two existing groups at the front entry. A new grouping will be provided within the new rear parking garage to replace those removed by demolishing the existing rear surface lot.
Has a drop-off area been identified? If yes , will it be accessible?	Yes. Both drop-offs are existing and are accessible.
7. Circulation and Accessible Routes: <i>The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability-with neighbors.</i>	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Both entry ways into the hospital are flush.

Article 80 | ACCESSIBILITY CHECKLIST

Are the accessible entrances and standard entrance integrated? If yes , describe. If no , what is the reason?	Yes. The concrete sidewalk is level.
If project is subject to Large Project Review/Institutional Master Plan , describe the accessible routes way-finding / signage package.	Signage will be developed as the design progresses.
8. Accessible Units (Group 2) and Guestrooms: (If applicable) <i>In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.</i>	
What is the total number of proposed housing units or hotel rooms for the development?	
If a residential development , how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	
If a residential development , how many accessible Group 2 units are being proposed?	
If a residential development , how many accessible Group 2 units will also be IDP units? If none , describe reason.	
If a hospitality development , how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? If yes , provide amount and location of equipment.	

Article 80 | ACCESSIBILITY CHECKLIST

Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. If yes , provide reason.	
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? If yes , describe:	
9. Community Impact: <i>Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.</i>	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	To be determined as the project progresses.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	No common or social spaces are proposed. Waiting rooms provided within the project will be accessible, but are intended for visitors of patients, not social spaces.
Are any restrooms planned in common public spaces? If yes , will any be single-stall, ADA compliant and designated as “Family”/ “Companion” restrooms? If no , explain why not.	No common or social spaces are proposed. Restrooms in waiting rooms will be single stall and ADA compliant.
Has the proponent reviewed the proposed plan with the City of Boston	No

Article 80 | ACCESSIBILITY CHECKLIST

Disability Commissioner or with their Architectural Access staff? If yes , did they approve? If no , what were their comments?	
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? If no , what recommendations did the Advisory Board give to make this project more accessible?	No
10. Attachments <i>Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.</i>	
Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. Overall site plan is provided	
Provide a diagram of the accessible route connections through the site, including distances. Floor plans of Hospital Levels 1 and 3, and parking garage level G are provided.	
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) N/A	
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. N/A	
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. <ul style="list-style-type: none"> • • • • 	

This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and

Article 80 | ACCESSIBILITY CHECKLIST

welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

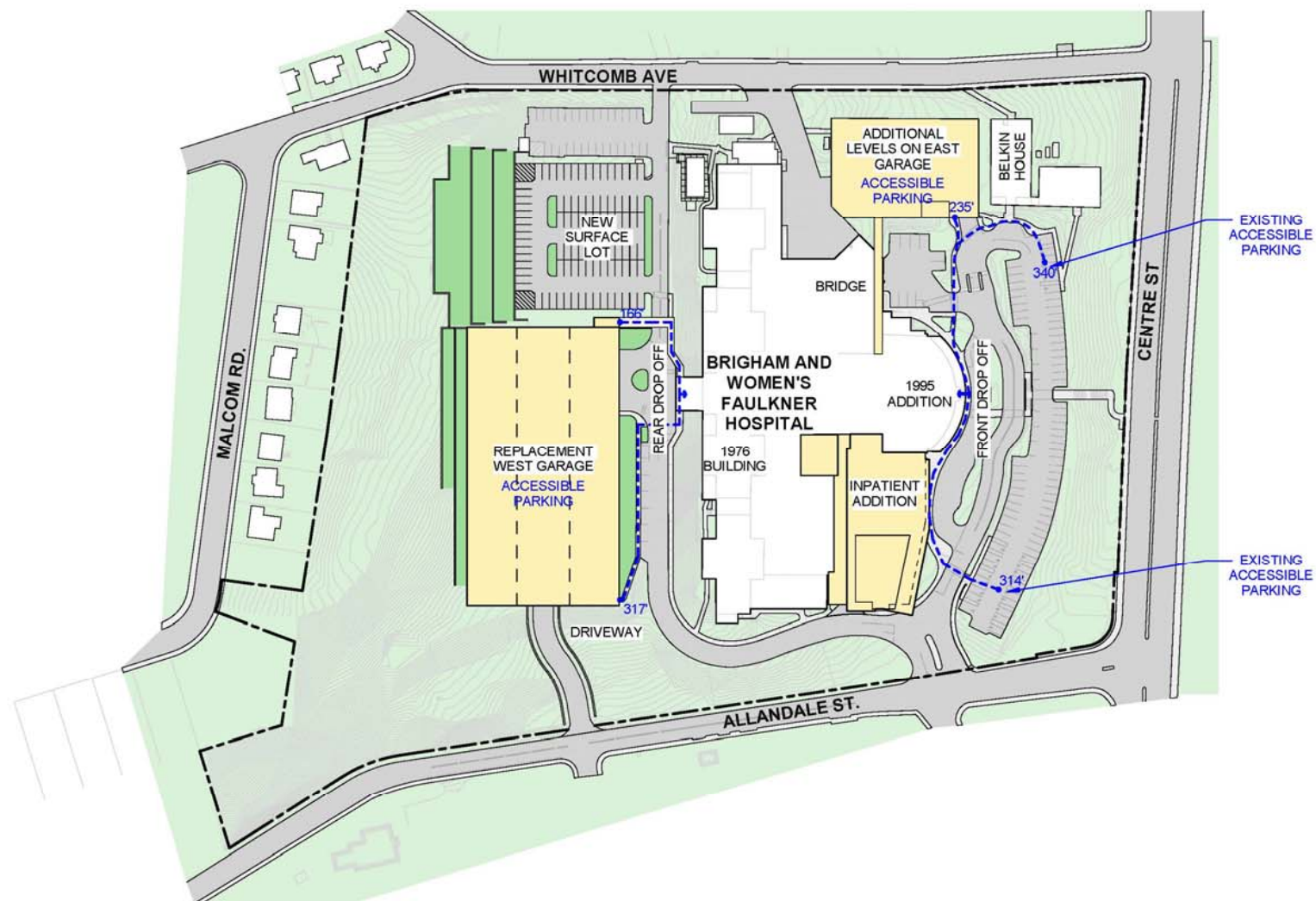
The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

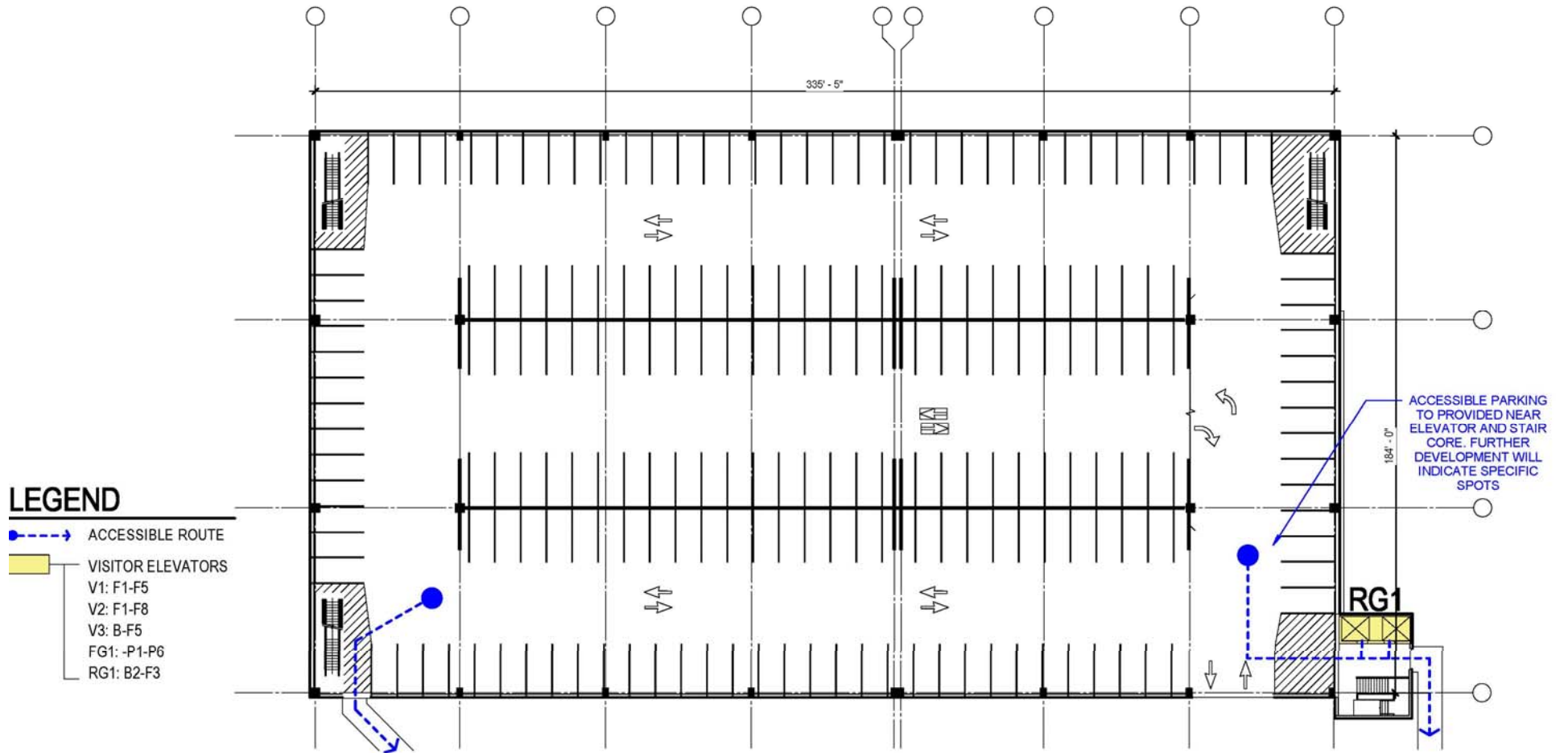
Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682



LEGEND

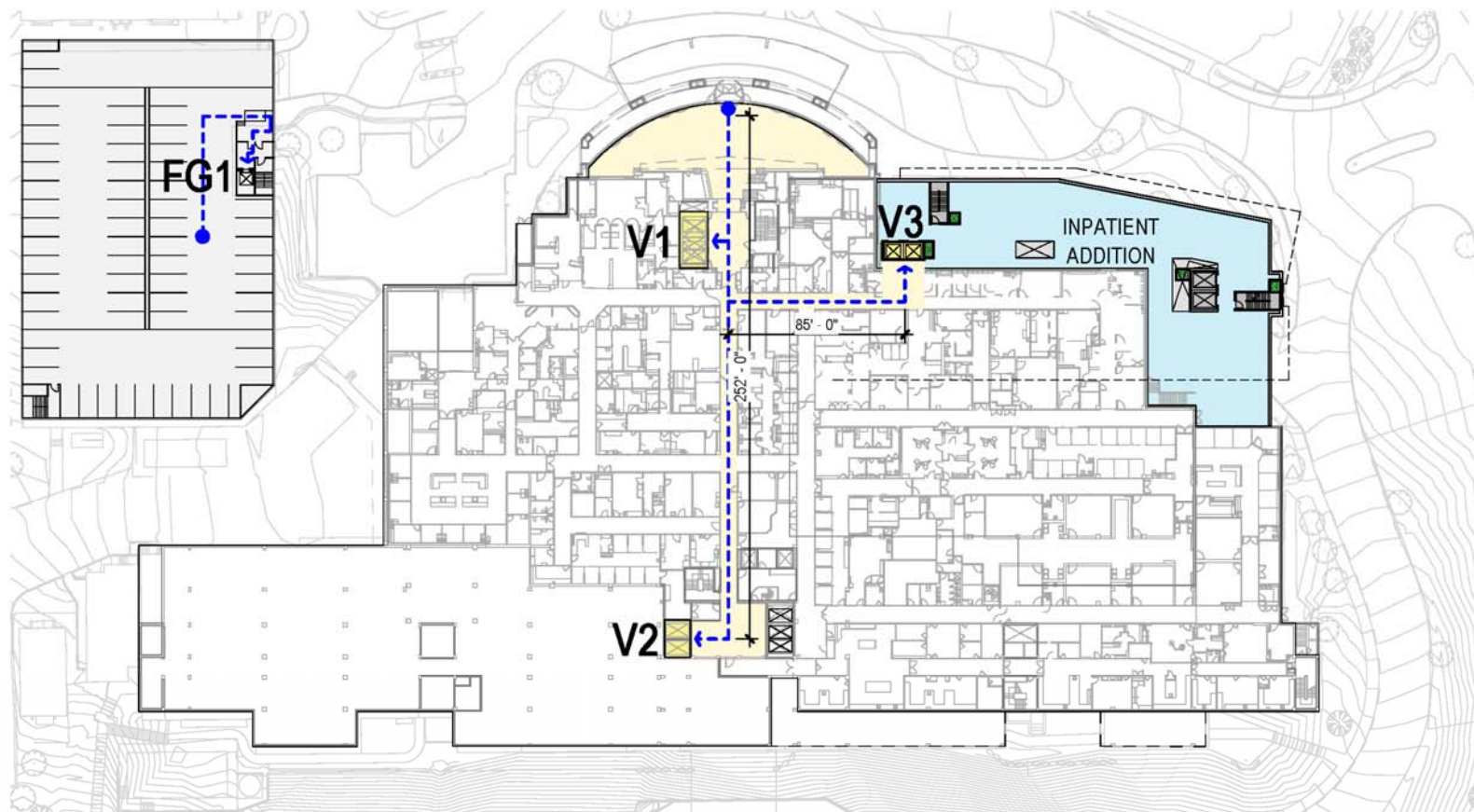
- --- → ACCESSIBLE ROUTE
- VISITOR ELEVATORS
 - V1: F1-F5
 - V2: F1-F8
 - V3: B-F5
 - FG1: -P1-P6
 - RG1: B2-F3







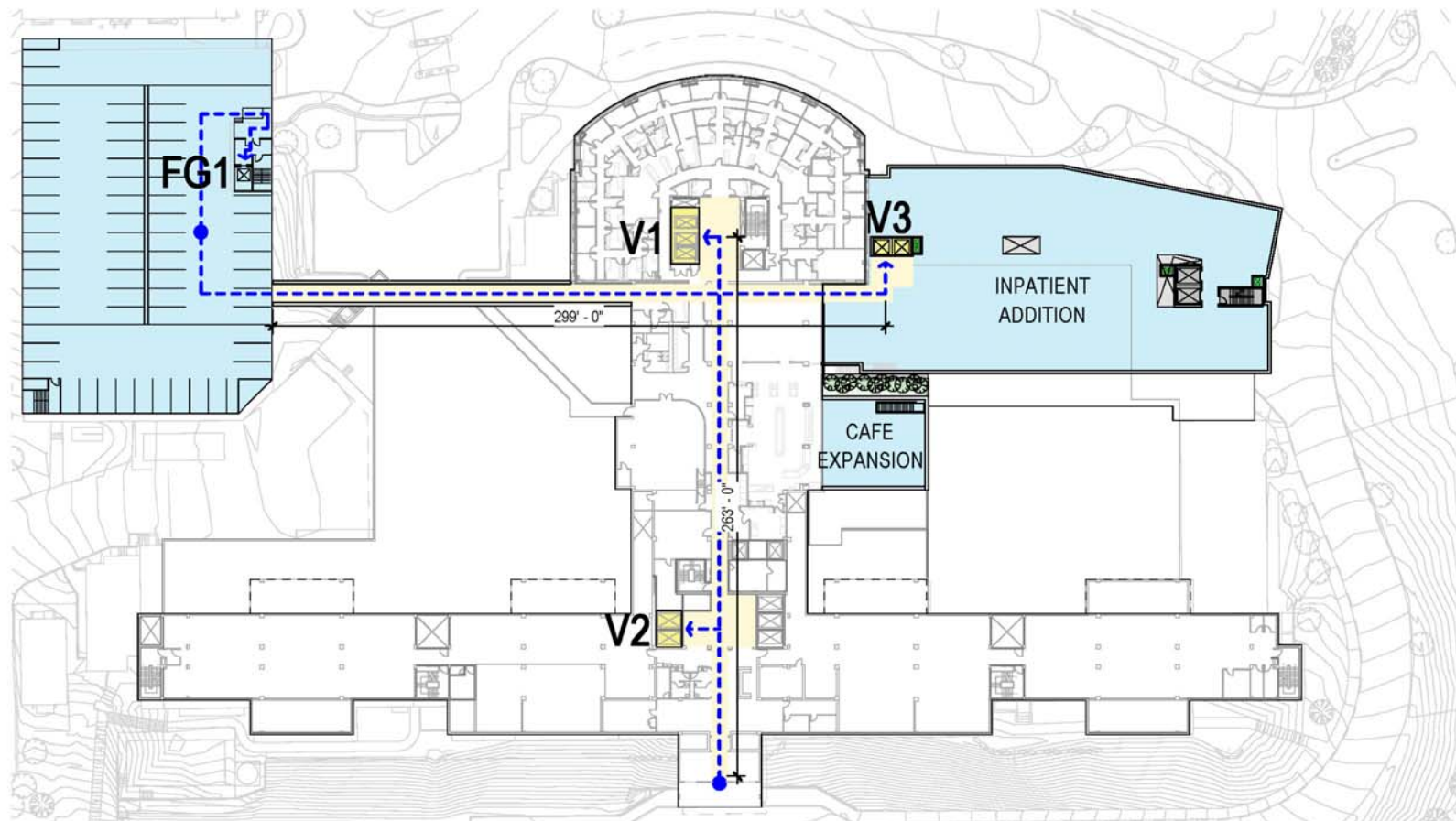
LEGEND

-  ACCESSIBLE ROUTE
-  VISITOR ELEVATORS
 - V1: F1-F5
 - V2: F1-F8
 - V3: B-F5
 - FG1: -P1-P6
 - RG1: B2-F3



LEGEND

-  ACCESSIBLE ROUTE
-  VISITOR ELEVATORS
 - V1: F1-F5
 - V2: F1-F8
 - V3: B-F5
 - FG1: -P1-P6
 - RG1: B2-F3



Appendix E

Smart Utilities Checklist



Boston Smart Utilities Checklist

Date Submitted:

07/25/2019 12:34:37

Submitted by:

gstarsiak@epsilonassociates.com

Background

The Smart Utilities Checklist will facilitate the Boston Smart Utilities Steering Committee's review of:

- a) compliance with the Smart Utilities Policy for Article 80 Development Review, which calls for the integration of five (5) Smart Utility Technologies (SUTs) into Article 80 developments
- b) integration of the Smart Utility Standards

More information about the Boston Smart Utilities Vision project, including the Smart Utilities Policy and Smart Utility Standards, is available at:

[www.http://bostonplans.org/smart-utilities](http://bostonplans.org/smart-utilities)

Note: Any documents submitted via email to manuel.esquivel@boston.gov will not be attached to the pdf form generated after submission, but are available upon request.

Part 1 - General Project Information

1.1 Project Name

Brigham and Women's Faulkner Hospital

1.2 Project Address

1153 Centre Street

1.3 Building Size (square feet)

98000

**For a multi-building development, enter total development size (square feet)*

1.4 Filing Stage

Initial Filing (i.e., PNF)

1.5 Filing Contact Information

1.5a Name

Geoff Starsiak



Boston Smart Utilities Checklist

1.5b Company	Epsilon Associates
1.5c E-mail	gstarsiak@epsilonassociates.com
1.5d Phone Number	9788977100

1.6 Project Team

1.6a Project Owner/Developer	Brigham and Women's Faulkner Hospital
1.6b Architect	NBBJ
1.6c Permitting	Epsilon Associates
1.6d Construction Management	

Part 2 - District Energy Microgrids

Fill out this section if the proposed project's total development size is equal to or greater than 1.5 million square feet.

Note on submission requirements timeline:

Feasibility Assessment Part A should be submitted with PNF or any other initial filing.

Feasibility Assessment Part B should be submitted with any major filing during the Development Review stage (i.e., DPIR)

District Energy Microgrid Master Plan Part A should be submitted before submission of the Draft Board Memorandum by the BPDA Project Manager (Note: Draft Board Memorandums are due one month ahead of the BPDA Board meetings)

District Energy Microgrid Master Plan Part B should be submitted before applying for a Building Permit

Please email submission to manuel.esquivel@boston.gov

2.1 Consultant Assessing/Designing District Energy Microgrid (if applicable)

2.2 Latest document submitted

Boston Smart Utilities Checklist

2.3 Date of latest submission

2.4 Which of the following have you had engagement/review meetings with regarding District Energy Microgrids? (select all that apply)

2.5 What engagement meetings have you had with utilities and/or other agencies (i.e., MA DOER, MassCEC) regarding District Energy Microgrids? (Optional: include dates)

2.6 Additional Information

Part 3 - Telecommunications Utilidor

Fill out this section if the proposed project's total development size is equal to or greater than 1.5 million square feet OR if the project will include the construction of roadways equal to or greater than 0.5 miles in length.

Please submit a map/diagram highlighting the sections of the roads on the development area where a Telecom Utilidor will be installed, including access points to the Telcom Utilidor (i.e., manholes)

Please email submission to manuel.esquivel@boston.gov

3.1 Consultant Assessing/Designing Telecom Utilidor (if applicable)

3.2 Date Telecom Utilidor Map/Diagram was submitted

3.3 Dimensions of Telecom Utilidor (include units)

Boston Smart Utilities Checklist

3.3a Cross-section (i.e., diameter,
width X height)

3.3b Length

**3.4 Capacity of Telecom Utilidor (i.e.,
number of interducts, 2 inch (ID) pipes,
etc.)**

**3.5 Which of the following have you had
engagement/review meetings with
regarding the Telecom Utilidor? (select all
that apply)**

**3.6 What engagement meetings have you
had with utilities and/or other agencies
(i.e., State agencies) regarding the Telecom
Utilidor? (Optional: include dates)**

3.7 Additional Information

Part 4 - Green Infrastructure

Fill out this section if the proposed project's total development size is equal to or greater than 100,000 square feet.

Please submit a map/diagram highlighting where on the development Green Infrastructure will be installed.

Please email submission to manuel.esquivel@boston.gov

**4.1 Consultant Assessing/Designing Green
Infrastructure (if applicable)**

VHB

**4.2 Date Green Infrastructure
Map/Diagram was submitted**

Boston Smart Utilities Checklist

4.3 Types of Green Infrastructure included in the project (select all that apply)

Infiltration Chambers

4.4 Total impervious area of the development (in square inches)

19907600

4.5 Volume of stormwater that will be retained (in cubic inches)*

24884500

**Note: Should equal to at least "Total impervious area (entered in section 4.4)" times "1.25 inches"*

4.6 Which of the following have you had engagement/review meetings with regarding Green Infrastructure? (select all that apply)

4.7 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Green Infrastructure? (Optional: include dates)

none

4.8 Additional Information

Part 5 - Adaptive Signal Technology (AST)

Fill out this section if as part of your project BTDA will require you to install new traffic signals or make significant improvements to the existing signal system.

Please submit a map/diagram highlighting the context of AST around the proposed development area, as well as any areas within the development where new traffic signals will be installed or where significant improvements to traffic signals will be made.

Please email submission to manuel.esquivel@boston.gov

5.1 Consultant Assessing/Designing Adaptive Signal Technology (if applicable)

Boston Smart Utilities Checklist

5.2 Date AST Map/Diagram was submitted

5.3 Describe how the AST system will benefit/impact the following transportation modes

5.3a Pedestrians

5.3b Bicycles

5.3c Buses and other Public Transportation

5.3d Other Motorized Vehicles

5.4 Describe the components of the AST system (including system design and components)

5.5 Which of the following have you had engagement/review meetings with regarding AST? (select all that apply)

5.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding AST? (Optional: include dates)

5.7 Additional Information

Part 6 - Smart Street Lights

Fill out this section if as part of your project PWD and PIC will require you to install new street lights or make significant improvements to the existing street light system.

Please submit a map/diagram highlighting where new street lights will be installed or where improvements to street lights will be made.

Please email submission to manuel.esquivel@boston.gov



Boston Smart Utilities Checklist

6.1 Consultant Assessing/Designing Smart Street Lights (if applicable)

6.2 Date Smart Street Lights Map/Diagram was submitted

6.3 Which of the following have you had engagement/review meetings with regarding Smart Street Lights? (select all that apply)

6.4 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Smart Street Lights? (Optional: include dates)

6.5 Additional Information

Part 7 - Smart Utility Standards

The Smart Utility Standards set forth guidelines for planning and integration of SUTs with existing utility infrastructure in existing or new streets, including cross-section, lateral, and intersection diagrams. The Smart Utility Standards are intended to serve as guidelines for developers, architects, engineers, and utility providers for planning, designing, and locating utilities. The Smart Utility Standards will serve as the baseline for discussions on any deviations from the standards needed/proposed for any given utility infrastructure.

Please submit typical below and above grade cross section diagrams of all utility infrastructure in the proposed development area (including infrastructure related to the applicable SUTs).

Please submit typical below and above grade lateral diagrams of all utility infrastructure in the proposed development area (including infrastructure related to the applicable SUTs).

Please email submission to manuel.esquivel@boston.gov



Boston Smart Utilities Checklist

7.1 Date Cross Section Diagram(s) was submitted

7.2 Date Lateral Diagram(s) was submitted

7.3 Additional Information