PROJECT NOTIFICATION FORM

SUBMITTED PURSUANT TO ARTICLE 80 OF THE BOSTON ZONING CODE

THE BACK BAY / SOUTH END GATEWAY PROJECT

SUBMITTED TO:

BOSTON REDEVELOPMENT AUTHORITY
ONE CITY HALL SQUARE
BOSTON, MA 02201

SUBMITTED BY:

BP HANCOCK LLC
THROUGH ITS AFFILIATE:
BOSTON PROPERTIES LIMITED PARTNERSHIP
800 BOYLSTON STREET, SUITE 1900
BOSTON, MA 02199

PREPARED BY:

VHB

IN ASSOCIATION WITH:

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AHA CONSULTING ENGINEERS, INC
ARUP
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MARCH 29, 2016

Boston Properties

March 29, 2016

Brian Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Re: Project Notification Form
The Back Bay / South End Gateway Project

BOSTON, MA
NEW YORK, NY
SAN FRANCISCO, CA
WASHINGTON, D.C.

Dear Director Golden:

BP Hancock LLC, through its affiliate, Boston Properties Limited Partnership (the "Proponent"), is pleased to submit to the Boston Redevelopment Authority ("BRA") pursuant to Article 80B of the Boston Zoning Code, the enclosed ten copies of the Project Notification Form ("PNF") for The Back Bay / South End Gateway Project, which includes the redevelopment of four distinct air rights development parcels situated above and adjacent to the MBTA's Back Bay / South End Station (the "Project").

The Project is conceived as a holistic and transformative, mixed-use, transit-oriented redevelopment which will revitalize an underutilized urban site and transform the adjacent public realm, integrate and connect the surrounding Back Bay, South End, and Bay Village historic neighborhoods, and create an attractive and appealing place worthy of this prominent location within the City of Boston.

The Project's design is responsive to the planning principles and goals outlined in the recently adopted Stuart Street Zoning District and it offers myriad benefits to the surrounding community, the adjacent neighborhoods, and the City, including but not limited to:

- High-quality architecture and a diverse mix of uses thoughtfully designed and located adjacent to a multi-modal transit hub.
- Significant public realm improvements within the Project's site activated by continuous high-quality street frontage and engaging ground floor uses.
- New accessible connections to the Station, increasing neighborhood connectivity and improving public safety.
- New and diverse retail opportunities for neighborhood residents, transit customers and the public at large.
- A variety of new high-quality housing opportunities, including the creation of affordable housing, consistent with the applicable Inclusionary Development Policy of the City of Boston.
- Innovative new workplace opportunities for a variety of business types.
- Approximately $16 million in new real estate tax revenues for the City of Boston.

- Approximately 2,500 construction jobs and approximately 3,400 permanent jobs across all four air rights parcels.
- Approximately $5,500,000 in housing linkage and $1,100,000 in jobs linkage payments made pursuant to the terms and provisions of Section 80B-7 of the Boston Zoning Code.

The Project is comprised of up to approximately 1.26 million square feet of mixed-use redevelopment, consisting of a new office building with ground floor retail, two new residential buildings, a one to two-story vertical retail expansion of the existing Station building, and the partial redevelopment of the existing 100 Clarendon Street Parking Garage. This transformational development will deliver up to approximately 575,000 square feet of commercial office space, up to approximately 100,000 square feet of retail and restaurant space, and up to approximately 600 residential units, in addition to Project-related parking, loading and service uses, as well as improved access to the existing on-site public transit services.

Our vision for the Project will deliver significant social, economic and public realm improvements, representing further significant commitment by Boston Properties to the City of Boston. We look forward to working collaboratively with you, interested members of the community, including a Citizen's Advisory Committee, when appointed, your staff, and other City and State agencies to undertake Article 80 review of the Project.

Requests for copies of the PNF should be directed to Seth Lattrell at (617)607-2973 or via email at slattrell@vhb.com. If you have any questions or need any additional information, please don't hesitate to contact me or Melissa Schrock, Senior Project Manager, Boston Properties, at (617) 236-3300 or via email at mcantalupa@bostonproperties.com or mschrock@bostonproperties.com.

Sincerely,

Michael A. Cantalupa,
Senior Vice President, Boston Properties, Inc.

Cc: Teresa Polhemus, BRA
David Carlson, AIA BRA
Heather Campisano, BRA
Jonathan Greeley, BRA
Lauren Shurtleff, BRA
Christopher Tracy, BRA
Melissa Schrock, Boston Properties
Mary Marshall, Nutter, McClennen & Fish LLP
Seth Lattrell, VHB

The Back Bay / South End Gateway Project

Boston, Massachusetts

SUBMITTED TO **Boston Redevelopment Authority**
One City Hall Square
Boston, MA 02201

PROPONENT **BP Hancock LLC**
Through its affiliate **Boston Properties Limited Partnership**
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Boston, MA 02199

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March 29, 2016

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General Information and Project Description

This chapter provides an overview of the existing site conditions and describes the Project and its anticipated public benefits. It also outlines the relevant regulatory context, identifies the anticipated required permits and approvals, and describes the Project's approach to obtaining City of Boston zoning approvals. A description of the ongoing public agency and community outreach process is also provided, along with information on the Project Team and relevant legal information.

1.1 Introduction

BP Hancock LLC, through its affiliate, Boston Properties Limited Partnership (the "Proponent"), is pleased to submit this Project Notification Form ("PNF") to the Boston Redevelopment Authority ("BRA") to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and Enabling Act (the "Code"). Concurrently with the submission of this PNF, the Proponent is also filing an Environmental Notification Form ("ENF") to initiate review in accordance with the Massachusetts Environmental Policy Act ("MEPA") M.G.L. c. 30, Sections 61-62I and the regulations promulgated thereunder set forth at 301 CMR 11.00.

1.1.1 The Project and Project Site

This review is required in connection with the permitting and approval of a proposed mixed-use redevelopment project encompassing four distinct sites and comprising up to approximately 1.26 million square feet, and consisting of a new office building with ground floor retail, two new residential buildings, a one to two-story vertical retail expansion of the existing Back Bay/South End Massachusetts Bay Transportation Authority's ("MBTA") Station building (the "Station") and the partial redevelopment of the existing 100 Clarendon Street Parking Garage (the "Garage"); as described more fully in Section 1.3, the transformational development will deliver up to approximately 575,000 square feet of commercial office space, up to approximately 100,000 square feet of retail and restaurant space, and up to

approximately 600 residential units, in addition to project-related parking, loading and service uses, as well as improved access to existing on-site public transit services (the "Project").

Located primarily over active transportation infrastructure, including the I-90 Extension of the Massachusetts Turnpike (the "I-90") and the track and concourse levels of the Station, the Project is roughly bounded by Dartmouth Street to the west, Stuart Street and Trinity Place to the north, Trinity Place and Clarendon Street to the east, and the southern property line of the Station to the south (the "Project Site" or "Site"). The approximately 5.2 acre Project Site is shown in **Figures 1.1 and Figures 1.2a-b**. The Proponent occupies and utilizes the majority of the Project Site pursuant to an existing Ground and Air Rights Lease with the Commonwealth of Massachusetts Department of Transportation ("MassDOT") ("MassDOT Lease") which authorizes four future ground and air rights development parcels as shown in **Figure 1.2c** in part over I-90 and the Station, and in part over a modest amount of terra firma (the "Air Rights Development Parcels"). The precise vertical and horizontal dimensions of the Air Rights Development Parcels will be finalized in consultation with MassDOT as the design of the Project is further advanced, and the Project Site will be adjusted accordingly.

1.1.2 Project Vision

The Project is conceived as a holistic and transformative transit-oriented redevelopment centered around the Station. As shown on **Figure 1.5,** located a block from Copley Square and in proximity to some of Boston's most iconic architecture, including 200 Clarendon (formerly known as the John Hancock Tower), Trinity Church and the Boston Public Library, the Project offers a considerable opportunity to rejuvenate an underutilized urban site and transform the adjoining public realm, create an attractive and appealing place worthy of its prominent location and become an asset to the vibrant Back Bay and South End neighborhoods and the City.

By introducing a mix of uses in appropriate and carefully considered locations, the Project will reinforce the mixed-use character of the existing area, while also creating a sustainable development centered on an important transit node, thereby encouraging the use of alternative means of transportation. The proposed buildings flanking the Station are designed to interconnect with it and provide new pedestrian-friendly accessible entrances from both Clarendon and Stuart Streets, improving transit customer experience and creating permeability through the Project Site for the surrounding neighborhoods.

The third most frequented MBTA station in the City, the Station serves both Orange Line customers and regional commuters from four different commuter rail lines, and also serves longer range travelers coming from Washington, D.C., New York City and Chicago. As a result, it functions as a "front door" into Boston and the adjacent historic neighborhoods and, for many people, may be their first introduction to the City. Unfortunately, the Station has suffered from years of deferred maintenance, rendering it dirty, dim, and confusing to navigate. Its present condition creates an unwelcoming environment for commuters and visitors alike.

In response and in parallel with the Proponent's efforts to develop the Air Rights Development Parcels, as part of a separate but related project in coordination with the MBTA, the Proponent has assumed property management responsibilities for, and has committed to delivering a multimillion dollar renovation and restoration of the Station Concourse, including a contribution that could be used toward the improvement of the track-level ventilation system, demonstrating the Proponent's commitment to improving the neighborhoods, the Project Site, and Boston's transportation network. Currently being designed by the Proponent and the consultant team and in consultation with the multiple rail services serving the Station, the planned renovation project will dramatically improve the customer experience by: improving air quality; restoring the architecture to its original condition; creating new and expanded waiting areas; introducing new lighting and temperature control measures to improve passenger comfort; clarifying signage and wayfinding components; improving access and egress to and from the Station; completely renovating the public restrooms; and creating additional retail amenities for transit customers and the neighborhood, all the while preserving the Station's original architectural expression (the "Station Concourse Improvements"). Presently anticipated to begin in 2017, current conceptual images of the Station Concourse Improvements can be seen in Appendix B.

1.1.3 Information Presented

In Chapter 2 – *Urban Design* and Chapter 3 – *Sustainability and Green Building*, this PNF provides an analysis of the urban design and sustainability aspects of the Project, which will continue to be refined and developed throughout the review process with City and State agencies and the community. In order to inform public agencies and neighborhood residents about the Project, its potential impacts, and proposed mitigation measures, Chapters 4 through 7 discuss traffic and transportation impacts and mitigation strategies, potential environmental impacts and mitigation strategies, including possible temporary construction-related impacts, infrastructure needs, and nearby historic resources. The extent of short-term and long-term impacts resulting from the Project along with appropriate mitigation measures will continue to be assessed as the design advances.

Furthermore, additional studies are currently underway to assess potential environmental impacts. These include a comprehensive air quality analysis and greenhouse gas assessment, a transportation analysis, and a quantitative pedestrian level wind study. These studies will be shaped by public and agency comments received on the PNF and the concurrently filed ENF. Results will be reported in the Draft and Final Project Impact Report ("DPIR" and "FPIR") and Draft and Final Environmental Impact Report ("DEIR" and "FEIR").

1.2 Site Context and Existing Conditions

The Project Site is located between Boston's Back Bay and South End neighborhoods and, for many decades, has been the site of significant transportation infrastructure, principally consisting of a major Boston railroad station and a primary multi-lane interstate highway and

associated on-ramp. The Station site originally housed a New York, New Haven and Hartford Railroad station which opened there in the 1880's, and has been redeveloped several times until the current Station, designed by Kallmann, McKinnell and Wood, opened in 1987. The current Station structure occupies approximately half of the Station site between Dartmouth and Clarendon Streets; the other portion of the Station site being occupied by a bus drop-off located on top of a concrete deck bridging the seven rail lines below. The Site's significance as a transportation node was further reinforced with the construction of I-90 in the 1950's, which, within the footprint of the Project Site, runs below the 8-story concrete Garage, completed in 1970. Serving as entry and exit points to the Garage are two concrete drums located on terra firma. See **Figure 1.3** for existing site conditions and **Figures 1.4a-d** for existing site photographs.

The existing transportation uses, together with the Site's location on concrete decking above I-90 and the railroad tracks, serve to isolate it from the adjacent neighborhoods. This isolated condition has the tendency to create an urban blight due to the potential for deferred maintenance because of the difficulty of accessing and repairing this infrastructure coupled with the limited on-site activity during non-rush hour periods. Accordingly, the Proponent may explore the possibility of utilizing urban redevelopment mechanisms, approvals or funding established pursuant to M.G.L. Chapter 121A and 121B for tax stabilization and title clearing purposes and/or I-Cubed funding for infrastructure updates.

The Project Site presents significant challenges to redevelopment given that it is, in part, in public ownership and is almost entirely located on, over or adjacent to varied and intricate transportation infrastructure, the functionality of which will need to be maintained during construction of the Project. Although redevelopment has occurred all around it, the majority of the Project Site has not been substantially altered since its original development in the 1970's and 1980's. As described in further detail in Chapter 6 - *Infrastructure*, the engineering challenges resulting from the impact of I-90, the Station, the Orange Line, and the commuter and passenger rail lines, all of which traverse the Project Site, limit its development potential and require extensive and expensive foundation systems and complex and protracted construction management strategies.

Despite the major financial, engineering, and logistical challenges, the Project Site is uniquely situated in the heart of one of Boston's most significant cultural and mixed-use downtown areas and the Project offers a unique opportunity to animate and dramatically improve an existing underdeveloped, and yet, critical, city block and to help reconnect the Back Bay, South End and Bay Village neighborhoods, to both the Project Site and each other.

The Proponent is genuinely committed to creating intelligent transit-oriented development and has a record of successfully executing projects on or adjacent to significant urban public transit notes including: The Prudential Center; The Hub on Causeway; Kendall Center in Kendall Square; Times Square Tower in New York City; and Salesforce Tower in San Francisco.

1.2.1 I-90 On-Ramp

Located beneath the Garage, the Project Site also contains a westbound on-ramp to I-90 (the "On-Ramp") which is accessed from Clarendon Street by way of a MassDOT-controlled service road. The Project offers an alternative design that contemplates the closure of the On-Ramp, which would be subject to review by MassDOT.

The potential On-Ramp closure may offer additional benefits and, as such, the Proponent has prepared two development schemes for the affected portion of the Project. Both schemes have nearly identical development programs and, therefore, very similar anticipated environmental impacts. The potential On-Ramp closure as well as the two development schemes and their potential impacts and benefits are further described in Section 1.3, Chapter 2 – *Urban Design* and Chapter 4 - *Transportation*. The Proponent will work with MassDOT, the City of Boston, and the community to fully consider the potential impacts and benefits of the On-Ramp closure.

1.3 Project Description

As described above, the Proponent occupies and utilizes the Project Site pursuant to the MassDOT Lease, which authorizes future air rights development and subdivides the Project Site into four (4) Air Rights Development Parcels. As illustrated in **Figure 1.2c,** these Air Rights Development Parcels combined with the limited adjacent terra firma controlled by the Proponent, create the following four (4) parcels: Garage West Parcel, Garage East Parcel, Station East Parcel and Station West Parcel. Consistent with this parcelization, the Project has been planned and designed as four distinct but interconnected components as shown in **Figure 2.1** and described as follows:

- **Garage West Parcel** includes the demolition of the westernmost parking drum and a portion of the existing Garage and the construction of a new 26-story building containing a new pedestrian connection to the Station, approximately 575,000 square feet[1] of commercial office space, up to approximately 27,000 square feet of ground floor retail fronting on Dartmouth and Stuart Streets, and approximately 200,000 gross square feet of reconstructed parking Garage. The reconfigured Garage will contain parking spaces to serve all uses in the Project as described further in Chapter 4 – *Transportation*.

▼

[1] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

The potential closure of the On-Ramp, as described above, primarily affects the Garage West Parcel and, therefore, two development alternatives have been prepared. The first scheme assumes the On-Ramp will remain open (the "Garage West Base Scheme") and the second scheme assumes the On-Ramp will be closed (the "Garage West Alternate Scheme"). These alternatives are reviewed in detail in Chapter 2 – *Urban Design* and Chapter 4 – *Transportation*.

With the demolition of the existing Garage entry and exit drums (described above and below), a new replacement Garage exit will be needed to avoid negative traffic impacts to the surrounding neighborhoods as explained in Chapter 4 – *Transportation*. The location of the new Garage exit is dependent on whether or not the On-Ramp remains open and the two possible alternative exit locations are described in detail in Chapter 2 – *Urban Design*.

- **Garage East Parcel** involves the demolition of the easternmost parking drum and the construction of a new 28-story residential building containing approximately 240 residential units comprising approximately 215,000 square feet along the eastern end of the existing Garage, which is to remain. Irrespective of the potential On-Ramp closure, it is anticipated that the existing vehicular access from Clarendon Street passing under the Garage will remain, and therefore, only one scheme for this parcel is presented.

- **Station East Parcel** is located on the existing bus drop-off and involves the relocation of the drop-off function to an off-site location, as well as the removal of the existing MBTA ventilation tower in order to construct a new 34-story building of approximately 377,000 square feet, containing a new entrance to the Station and convenient access to the Orange Line, approximately 8,500 square feet of ground and second floor retail space and approximately 360 residential units. In addition, with the construction of the Station East Parcel, the Project currently anticipates the reactivation of the Commuter Rail head house located on the south side of Columbus Avenue in order to provide redundant elevators to Tracks 1/3 and Track 2, if determined to be feasible.

- **Station West Parcel** entails a vertical expansion of the existing Station to create between approximately 30,000 and 65,000 square feet of additional retail opportunities serving both the adjacent neighborhoods and transit customers using the Site. To be responsive to possible future market demand, the Project Team has considered two options – a one-story addition which adds a single level to either side of the central Station hall (the "Station West Base Scheme"), and a two-story addition, which also adds a second level bridging over the central Station hall (the "Station West Alternate Scheme"). Both schemes are reviewed in detail in Chapter 2 – *Urban Design* and throughout this PNF.

It should be noted that the Station West Alternate Scheme is not related to the potential On-Ramp closure considered in the Garage West Alternate Scheme. Regardless of the ultimate development strategy for the Garage West Parcel, the Station West Parcel could be developed under either its Base or Alternate Scheme.

1.3.1 Development Program

The proposed development program is provided in **Table 1.3** below:

TABLE 1.3 PROPOSED DEVELOPMENT PROGRAM

	Garage West (base)	Garage West (alternate)	Garage East	Station East	Station West (base)	Station West (alternate)
Lot Area	68,235	68,235	52,919	38,902	64,387	64,387
Total (SF)[1]	598,312	603,557	214,588	377,279	29,450	64,550
Height (FT) [2]	365	365	298	388	46	69.5
Office (SF)	574,024	576,638	-	-	-	-
Retail (SF)	24,288	26,919	-	8,536	29,450	64,550
Residential (SF)	-	-	214,558	368,743	-	-
Residential Units	-	-	240	360	-	-
Garage (SF)[3]	196,170	199,700	-	-	-	-
Parking (Spaces)	Up to 2,013 spaces to be provided Site-wide under all alternatives					
FAR[4]	8.77	8.85	4.05	9.70	0.46	1.00
FAR Total (across all sites): 5.43[5]						

[1] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

[2] Unless labeled otherwise all heights provided herein are determined in accordance with the provisions of Article 2 of the Code to be the vertical distance from grade to the top of the structure of the last occupied floor

[3]Garage areas are provided in gross square feet, and represent only the areas of the reconstructed parking Garage.

[4]Floor Area Ratio.

[5] FAR Total provided is for Base Scheme only. FAR total for Alternate Schemes is 5.61

1.3.2 Schedule

The Proponent submitted a Letter of Intent to the BRA on December 30, 2015. Throughout the coming months, the Proponent expects to work diligently with the community and City and State agencies to complete the Article 80B Large Project Review process. The Proponent

anticipates commencing the development of one or more of portions of the Project in mid-2017.

1.3.3 Summary of Public Benefits

The Project will substantially revitalize the Project Site and serve to integrate and connect the surrounding Back Bay, South End, and Bay Village historic neighborhoods through the creation of a vibrant, mixed-use and transit-oriented development. The Project will deliver numerous public benefits, including considerable urban design and public realm improvements, a mix of new job opportunities, and new tax revenues.

Additional public benefits for the surrounding neighborhoods and the City of Boston will include, but not be limited to, the following:

Urban Design and Public Realm Benefits

- The Project will create a high-quality continuous street frontage activated by vibrant and engaging ground floor uses, such as retail and restaurant spaces, and residential and commercial building lobbies. Through the use of glass facades wherever possible, the Project will provide transparency and create an inviting and safe ground-level experience for pedestrians.
- With the development of the two Garage Parcels, the Project anticipates the removal of two existing concrete parking drums and the rationalization of the existing service and parking area located under the Garage at the rear of abutting properties along Stuart Street, greatly improving the street-level experience.
- A significantly upgraded streetscape will be provided, including new sidewalks, street lighting, landscaping and other public amenities along Dartmouth, Stuart and Clarendon Streets, consistent with the BTD's Complete Streets guidelines.
- With the development of the Garage West Parcel, the Project will create a new indoor, weather-protected accessible through-block connection and entrance to the Station from Stuart Street, flanked by new retail improvements, thus increasing neighborhood connectivity and improving public safety within the district.
- With the development of the Garage West Parcel, the Project will create a new accessible drop-off lane along Stuart Street, in proximity of the future Station entrance.
- With the development of the Station East Parcel, the Project will create a new indoor, weather-protected accessible through-block connection and entrance to the Station from Clarendon Street, flanked by new retail improvements, thus increasing neighborhood connectivity and improving public safety within the district.
- With the development of the Station East Parcel, the Project will create a new landscaped pedestrian plaza off of Clarendon Street, including an accessible drop-off lane serving both the Project and the Station.

- With the development of the Station West Parcel, the Project will create a new and accessible drop-off lane along Dartmouth Street in proximity to the existing Station entrance.
- With the development of the Station East Parcel, improved accessibility to the Station will be provided through the addition of redundant elevators to the MBTA Orange Line and Commuter Rail tracks, where feasible.
- The Project reinforces the urban "high spine" planning strategy, while designing the buildings to minimize wind and shadow impacts on surrounding neighborhood public space resources, such as Copley Square, the Southwest Corridor Park, and Frieda Garcia Park.

Social and Economic Benefits

- Provide innovative new workplace opportunities for a variety of business types.
- Provide new and diverse retail opportunities for neighborhood residents, transit customers and the public at large.
- Provide a variety of new high-quality housing opportunities, including the creation of affordable housing, consistent with the applicable Inclusionary Development Policy of the City of Boston.
- Generate approximately $16 million in new real estate tax revenues for the City of Boston.
- Create approximately 2,500 construction jobs and approximately 3,400 permanent jobs across all four Air Rights Development Parcels.
- Contribute approximately $5,500,000 in housing linkage and $1,100,000 in jobs linkage payments in accordance with the terms and provisions of Section 80B-7 of the Boston Zoning Code.

Transportation Benefits

- Through a related project, the Proponent has begun making significant functional and aesthetic improvements to, and has assumed property management responsibilities of, the Station Concourse in an effort to dramatically improve customer experience, comfort, and safety.
- The Project exemplifies transit-oriented development by developing high density housing, retail and office uses above and adjacent to a multi-model transit hub served by multiple public transportation services, including MBTA Commuter Rail, Orange line and local bus routes, and AMTRAK, resulting in a high proportion of transit-trips rather than vehicle-trips.
- The capture of internal trips between different uses will result in the reduction of vehicle trips and opportunities to limit parking through sharing of parking spaces for different users by time of day.
- The Project will incorporate bicycle accommodations in compliance with BTD's guidelines to encourage bicycling, as well as walking, as strong transportation modes.

- The Project will implement a robust program of Transportation Demand Management ("TDM") strategies to take full advantage of its multiple mobility options and its synergy with the surrounding vibrant mixed-use neighborhoods.
- Due to the measures cited above as well as the capacity of the existing Garage and potential modifications to its operations resulting from the Project, no new net parking is proposed as part of the Project.

Environmental Benefits

- Sustainability is a key principle of the Project as it revitalizes an underutilized urban site, uses land efficiently by increasing density in proximity to public transportation, and encourages the use of alternative modes of transportation.
- In addition to compliance with Article 37, the Project will certify each building under the Leadership in Energy and Environmental Design® ("LEED") rating system which provides verification of green building design.
- Verification and benchmarking of ongoing energy and water performance will also be possible through the enrollment of each building in ENERGY STAR Portfolio manager and EnerNOC's Energy Intelligence Software (EIS) platform.
- By utilizing sustainable design strategies and exceeding Code-required performance minimums, the Project will maximize the conservation of energy, water and other resources and minimize impacts to regional infrastructure and water resources.
- The Project will investigate the feasibility of clean and renewable energy sources, including photovoltaic panels, wind turbines, and a cogeneration system.
- Through the incorporation of a variety of sustainable design strategies, the Project will promote health and wellness, assist in improving air and water quality, and reduce the urban heat island effect.
- By designing for resilience, the Project seeks to integrate climate change adaptations that reduce vulnerability given future climate scenarios and natural events such as flooding, severe precipitation and heat.
- Implementation of a treatment train of Best Management Practices ("BMPs") to improve water quality, reduce runoff volumes, and reduce peak discharge rates of runoff in comparison to pre-development conditions.
- Provision for groundwater recharge by installing a recharge system designed to infiltrate clean stormwater runoff, in accordance with the standards articulated by the GCOD requirements.
- Provision of phosphorous removal for stormwater runoff from the Project Site, in accordance with BWSC design guidelines for projects that discharge to the Charles River Watershed.

1.4 Regulatory Context

This section lists the anticipated permits and approvals as well as the local planning and regulatory controls applicable to the Project.

1.4.1 Anticipated Permits/Approvals

Table 1.4 lists the permits and approvals from federal, state and local governmental agencies, which are anticipated to be required for the Project. It is possible that only some of the permits and approvals identified below will be required, and also that there are other permits and approvals which will be identified in the course of approval of the Project.

TABLE 1.4 - LIST OF ANTICIPATED PERMITS AND APPROVALS

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration	▪ Determinations of No Air Hazard to Air Navigation
U.S. Environmental Protection Agency	▪ NPDES[1] General Permit
Commonwealth of Massachusetts	
Department of Transportation ("MassDOT")	▪ Indirect/Direct Access Permit ▪ Permit for Construction in accordance with M.G.L. c. 40, Section 54A (if required) ▪ MBTA approvals and/or consent (if required) ▪ Finalization and execution of Air Rights Lease(s)
Executive Office of Administration and Finance	▪ Approval of Infrastructure Investment Incentive Program funding (in coordination with Mass Development and the City of Boston)
Department of Public Safety Department of Environmental Protection	▪ Building Permits or Approvals (as required) ▪ Fossil Fuel Utilization Permit ▪ Pre-Construction Notice
Executive Office of Energy and Environmental Affairs (MEPA Office)	▪ Review under the Massachusetts Environmental Policy Act and Public Benefits Determination.
Massachusetts Historical Commission	▪ State Register Review, including Determination of No Adverse Effect or Memorandum of Agreement ▪ Section 106 Review (if required)
Massachusetts Water Resources Authority	▪ Construction Dewatering Permit (if required) ▪ Temporary Construction Dewatering Permit (if required) ▪ Sewer Use Discharge Permit (if required)
Architectural Access Board	▪ Variance for existing sidewalk grades (if required)
City of Boston	
Boston Air Pollution Control Commission	▪ Parking Freeze Permit Modification
Boston Civic Design Commission	▪ Review and approval pursuant to Article 28 of the Boston Zoning Code
Boston Public Safety Commission, Committee on Licenses	▪ Parking Garage Permit ▪ License for Storage of Inflammables
Boston Fire Department	▪ Fuel storage permit

Boston Inspectional Services Department	▪ Building Permit (Long Form) ▪ Demolition Permit ▪ Certificate of Occupancy
Boston Landmarks Commission	▪ Review pursuant to Article 85 of the Boston Zoning Code for demolition of the Garage (if required)
Boston Parks and Recreation Commission	▪ Commission approval, in accordance with City Ordinance 7-4.11[2] (if required)
Boston Public Improvement Commission/ Department of Public Works	▪ License for installation of groundwater monitoring wells ▪ Specific Repair Approvals ▪ Discontinuances (if required) ▪ Permit for sign, awning, hood, canopy, or marquee, or other incursion over public right of way (as required) ▪ Street Layout (as required) ▪ Street and Sidewalk Occupation Permits ▪ Tieback/Earth Excavation Approvals (if required) ▪ Air Rights Discontinuance (if required)
Boston Redevelopment Authority	▪ Review under Article 80, including Large Project Review, as required pursuant to Article 80B of the Zoning Code and PDA[3] Review, as required pursuant to Article 80C of the Zoning Code ▪ Green Building Report(s) and Resiliency Checklist(s) as Part of Article 80 Review ▪ Development Impact Project Agreement(s) pursuant to Article 80B-7 of the Boston Zoning Code ▪ Cooperation Agreement(s) ▪ Affordable Housing Agreement(s) ▪ Boston Residents Construction Employment Plan Agreement(s) ▪ Certification(s) of Consistency and Compliance ▪ M.G.L. c. 121A approval and attendant documentation and agreements (as required) ▪ M.G.L. c. 121B approval (as required)
Office of Jobs and Community Service	▪ Permanent Employment Agreement
Boston Employment Commission	▪ Boston Residents Construction Employment Plan Agreement(s)
Boston Public Works Department	▪ Curb Cut Permits ▪ Street Opening Permits ▪ Street/Sidewalk Occupancy Permits
Boston Transportation Department	▪ Transportation Access Plan Agreement ▪ Review and approval of a Construction Management Plan
Boston Water and Sewer Commission	▪ Sewer Extension/Connection Permit ▪ Sewer Use Discharge Permit ▪ Site Plan Approval ▪ Consent to construction or easement (if required) ▪ Temporary Construction Dewatering Permit ▪ Cross Connection/Backflow Prevention Approval

Boston Zoning Commission	▪ Zoning Approval subject to BRA recommendation and approval under Article 80C of the Zoning Code, including PDA Modification Approval
Boston Zoning Board of Appeal	▪ Zoning and Building Code variance(s) (if required)
Boston Departments & Agencies	▪ Comments for Article 80B review ▪ General Operational Permits, Licenses (if required)

1. NPDES National Pollutant Discharge Elimination System
2. Because the Project Site is located within 100 feet of Frieda Garcia Park and the Southwest Corridor
3. PDA Planned Development Area

With respect to the possible On-Ramp closure, if it determined to be feasible, MassDOT will make the required filings with the Federal Highway Authority ("FHWA") allowing the Proponent to determine which Garage West Scheme will be pursued. Neither this approval action nor the permits and approvals required to implement the Station Concourse Improvements are considered part of this Project for the purposes of determining the required permits and approvals.

1.4.2 City of Boston Zoning

The majority of the Project Site is located within the recently enacted Stuart Street District established in accordance with Article 48 of the Code and as set forth on Zoning Map 1S. According to Zoning Map 1S, this portion of the Project Site is located in Area 4 of the Stuart Street District, and in part within an area designated as a Planned Development Area ("PDA"). Specifically, this portion of the Project Site, and the site of the adjacent office building owned by the Proponent and known as and numbered 200 Clarendon Street are located within PDA No. 2, which was first established in July, 1968 as later amended in August, 1982. A small triangular shaped piece of the Project Site, located near the intersection of Clarendon Street and Columbus Avenue and currently vacant, is within the Community Commercial ("CC") Zoning Subdistrict of the South End Neighborhood Zoning District established in accordance with Article 64 of the Code as set forth on Zoning Map 1P. The entire Project Site is within the Groundwater Conservation Overlay District ("GCOD") and the Restricted Parking Overlay District ("RPOD").

Given a number of factors, especially the size of the Project Site, the scale and complexity of the Project, mix of uses, possible multiple ownerships, number of parcels, and timeframe for completion of construction and development contemplated, amending and restating PDA No. 2 is the most appropriate method to obtain the required zoning approval for the Project in accordance with the Code. The Development Plan for PDA No. 2, as further amended and restated, will set forth the relevant use, dimensional and other requirements applicable to the development of the Project in full compliance with the Code, including any relief which may be required from any of the above-referenced Overlay Districts. The Project as described herein is generally consistent with the planning goals and requirements which would otherwise be applicable to development in the Stuart Street District without the benefit of the PDA No. 2 which is operative here. Discussions with the BRA Staff have indicated that this approach to

project permitting is appropriate. PDA Plan approval of the Project in accordance with Article 80C will be coordinated with Large Project Review in accordance with Article 80B of the Code.

Given the location of the Project Site within Downtown Boston, as that term is understood in accordance with the provisions of Section 85-2 of the Code, and the partial demolition of the existing Garage, review of such demolition in accordance with the provisions of Article 85 of the Code may be required. The need for Article 85 review will be determined through consultation with Boston Landmarks Commission staff in accordance with the provisions of Section 85-5 of the Code. If such review is required, it will be coordinated with the Article 80B and 80C approvals required for the Project.

1.5 Four Parcel Approach to Severable Project Phases

The Proponent is undertaking a comprehensive review of the Project's impacts in accordance with Article 80B and MEPA, so that these impacts, if any, can best be evaluated and mitigated. As noted above Section 1.3 and described in greater detail in Chapter 2 – *Urban Design* herein, although the impacts analysis and major discretionary permits for the Project will be obtained in one comprehensive review process on both the state and City level, the Proponent contemplates the development of the Project in as many as four (4) Air Rights Development Parcels, containing a mix of uses. Each of these Air Rights Development Parcels may in the future be owned and developed by individual developers who will execute the required City agreements, abide by the relevant City and State approval and permit requirements, and obtain the requisite certifications of consistency and/or compliance as the case may be. After the major discretionary permits for the Project have been obtained, the development of each of these Air Rights Development Parcels may proceed as the Proponent (which term shall include each and every successor(s) in interest to the original Proponent) in its sole discretion determines is appropriate due to market conditions or other factors.

1.6 Agency Coordination and Community Outreach

Over the last several months, the Proponent has been meeting with abutters, neighborhood groups, community leaders, business owners, elected officials, City and State regulatory agencies, and other stakeholders to seek input and feedback as they have created the Project's redevelopment plan. The Proponent is fully committed to maintaining an open dialogue and will continue to engage the public throughout the review and approval processes.

1.7 Development Team

Table 1.7 identifies the members of the design and consulting team (the "Project Team") and provides their primary contact information.

TABLE 1.7 – DEVELOPMENT TEAM CONTACT INFORMATION

DEVELOPMENT TEAM CONTACT INFORMATION	
Proponent	BP Hancock LLC c/o Boston Properties Limited Partnership 800 Boylston Street, Suite 1900 Boston, MA 02199 617.236.3300 *Contact: Michael Cantalupa, Melissa Schrock*
Legal Counsel	Nutter McClennen & Fish Seaport West 155 Seaport Boulevard Boston, MA 02210 617.439.2000 *Contact: Mary Marshall, James Ward*
Permitting & Transportation	VHB 99 High Street, 10th Floor Boston, MA 02110 617.728.7777 *Contact: Mark Junghans, Seth Lattrell*
Civil	WSP | Parsons Brinckerhoff 75 Arlington Street Boston, MA 02116 617.348.2950 *Contact: Andy Boyd*
Survey	Feldman Land Surveyors 112 Shawmut Avenue Boston, MA 02118 617.357.9740 *Contact: Paul Foley*
Sustainable Design	ARUP 955 Massachusetts Avenue Cambridge, MA 02139 617.864.2987 *Contact: Brian Swett*
Geotechnical Engineer & Environmental Engineer	Haley & Aldrich 465 Medford Street, Suite 2200 Boston, MA 02129 Tel: 617.886.7400 *Contact: Rebecca Higgins*

Residential Market Consultant	The Collaborative Companies 20 Park Plaza, Suite 833 Boston, MA 02116 617.236.0060 *Contact: Sue Hawkes*
Community Engagement	The Strategy Group 40 Court Street, 11th Floor Boston, MA 02108 617.263.3311 *Contact: Susan Tracy, David Newman*
Public Relations	Denterlein 3 Post Office Square, Suite 701 Boston, MA 02109 617.482.0042 *Contact: Geri Denterlein, Diana Pisciotta*
Code Compliance	JENSEN HUGHES 1661 Worcester Road, Suite 501 Framingham, MA 01701 508.620.8900 *Contact:* Eric H. Cote, PE
GARAGE WEST / GARAGE EAST / STATION EAST DEVELOPMENT TEAM	
Architect	Pelli Clarke Pelli Architects 322 8th Avenue 11th Floor New York, NY 10001 212.417.9496 *Contact: Rafael Pelli*
Structural Engineer	Magnusson Klemencic Associates 1301 Fifth Avenue, Suite 3200 Seattle, WA 98101 206.292.1200 *Contact: Ron Klemencic, Peter Somers* WSP | Parsons Brinckerhoff 75 Arlington Street Boston, MA 02116 617.348.2950 *Contact: Mohammad Haidar*
MEP Engineer	Bard, Rao + Athanas Consulting Engineers 10 Guest Street, 4th Floor Boston, MA 02135 617.254.0016 *Contact: Allan Ames, Kenneth Moore*

STATION WEST DEVELOPMENT TEAM

Architect	Arrowstreet, Inc. 10 Post Office Square Boston, MA 02109 617.623.5555 *Contact: Jim Batchelor, Claes Andreasen*
Structural Engineer	McNamara Salvia 160 Federal Street, 5th Floor Boston, MA 02110 617.737.0040 *Contact: Adam McCarthy*
MEP Engineer	AHA Consulting Engineers, Inc. 700 Technology Square, Suite 402 Cambridge, MA 02139 781.372.3000 *Contact: Dan Campia*

1.8 Legal Information

1.8.1 Legal Judgments or Actions Pending Concerning the Proposed Project

The Proponent is not aware of any legal judgments or pending legal actions concerning the Project.

1.8.2 History of Tax Arrears on Property Owned in Boston by the Proponent

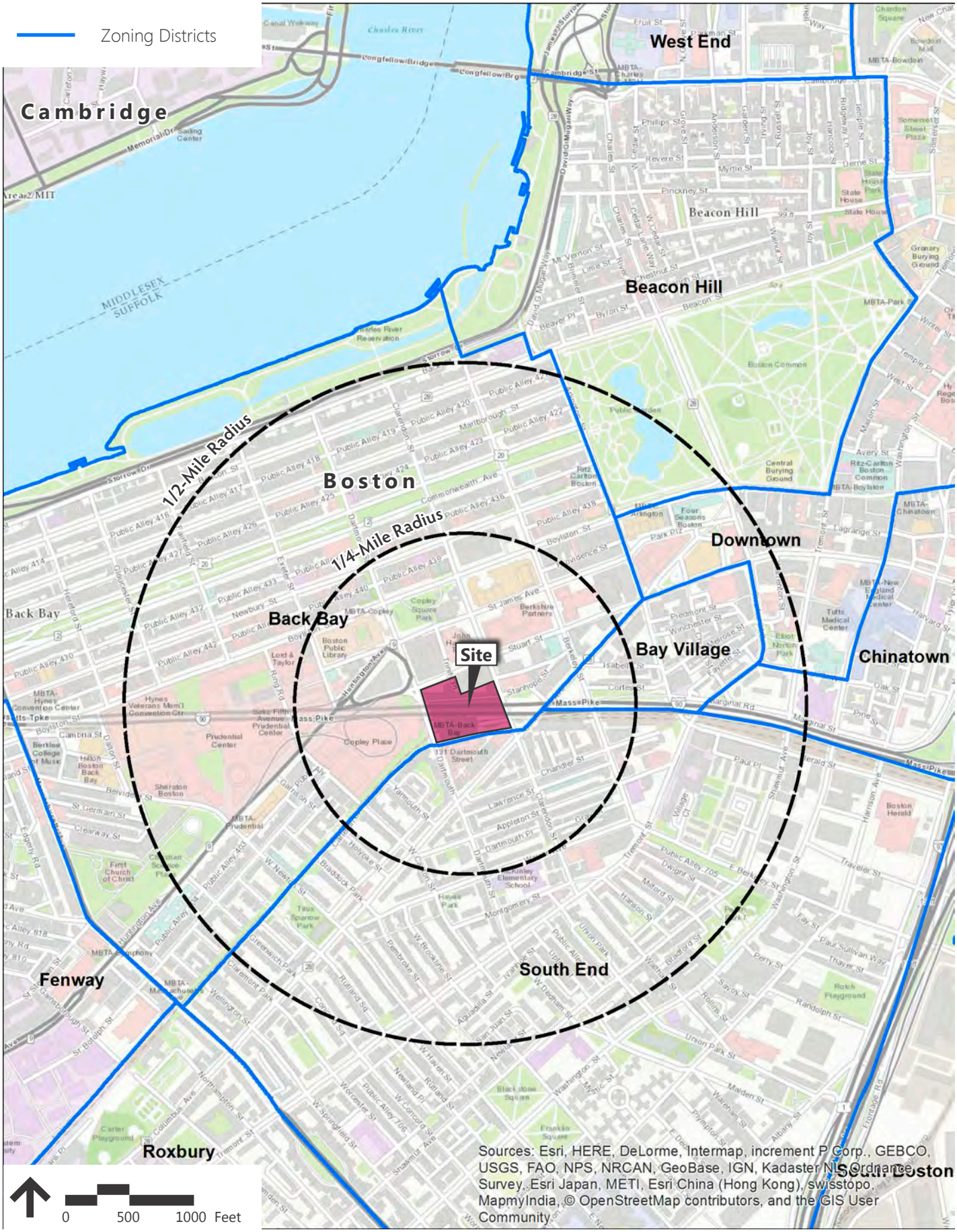
The Proponent does not own any property which is in arrears on the payment of taxes due and owing to the City of Boston.

1.8.3 Site Control/Public Easements

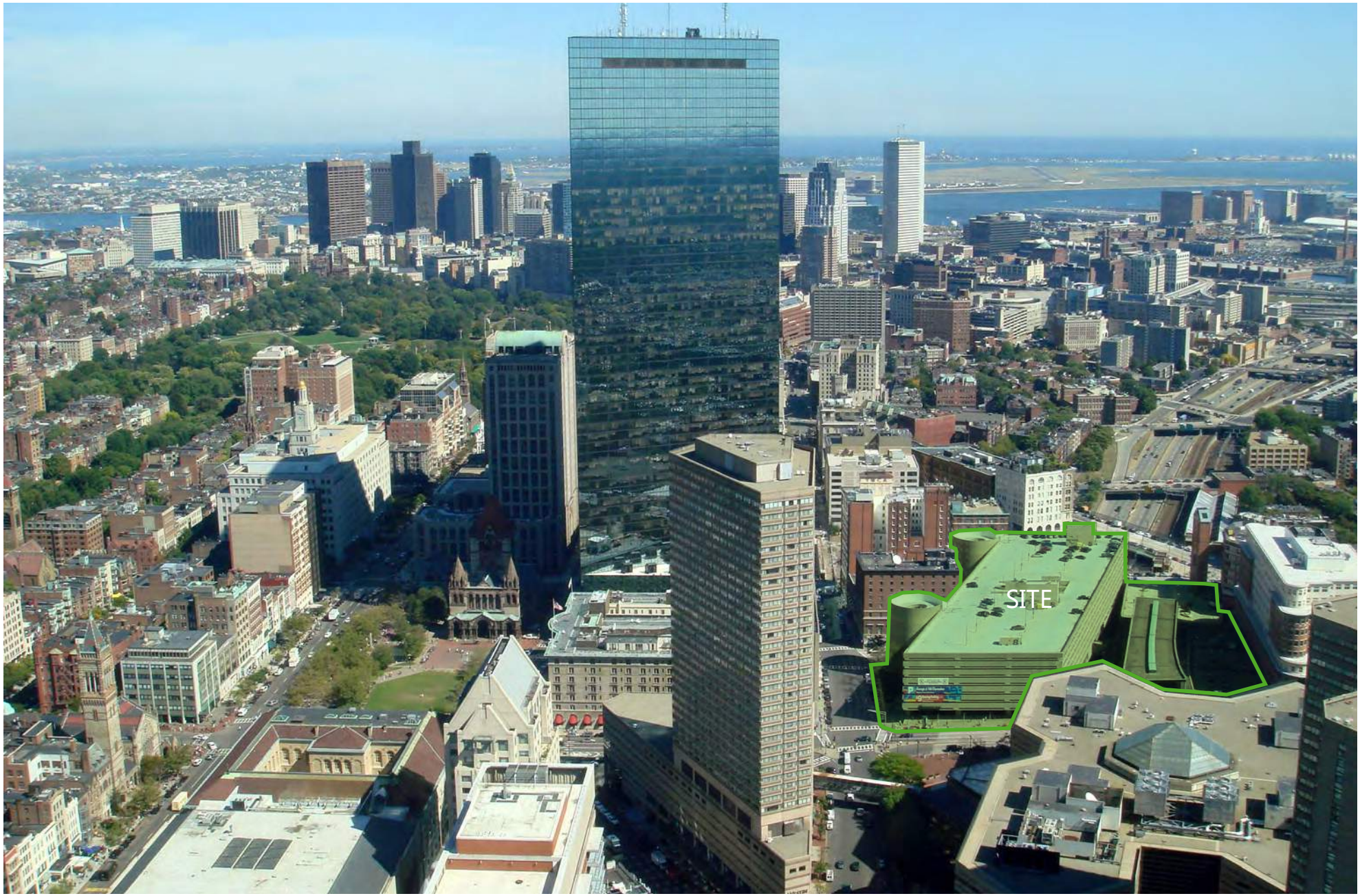
The Project Site is owned in fee by each of the following: the Commonwealth of Massachusetts acting by and through MassDOT; the MBTA, and the Proponent. The conveyance by each of MassDOT's and the MBTA's interests in the Project Site to the Proponent to enable the development of each of the Air Rights Development Parcels is the subject of the MassDOT Lease, defined and described above.

There are easements which provide for continued rail service and trackage rights within the Project Site. There is a water line easement from MassDOT to the City of Boston, acting by and through the Boston Water and Sewer Commission ("BWSC") which affects a portion of the Project Site. These rights and easements to public or quasi-public parties will be observed and amended or modified as appropriate.

Others private parties have rights of passage, shared facilities and utilities, loading and parking on portions of the Project Site, which rights will be observed, amended or modified as appropriate to enable the Project to proceed.



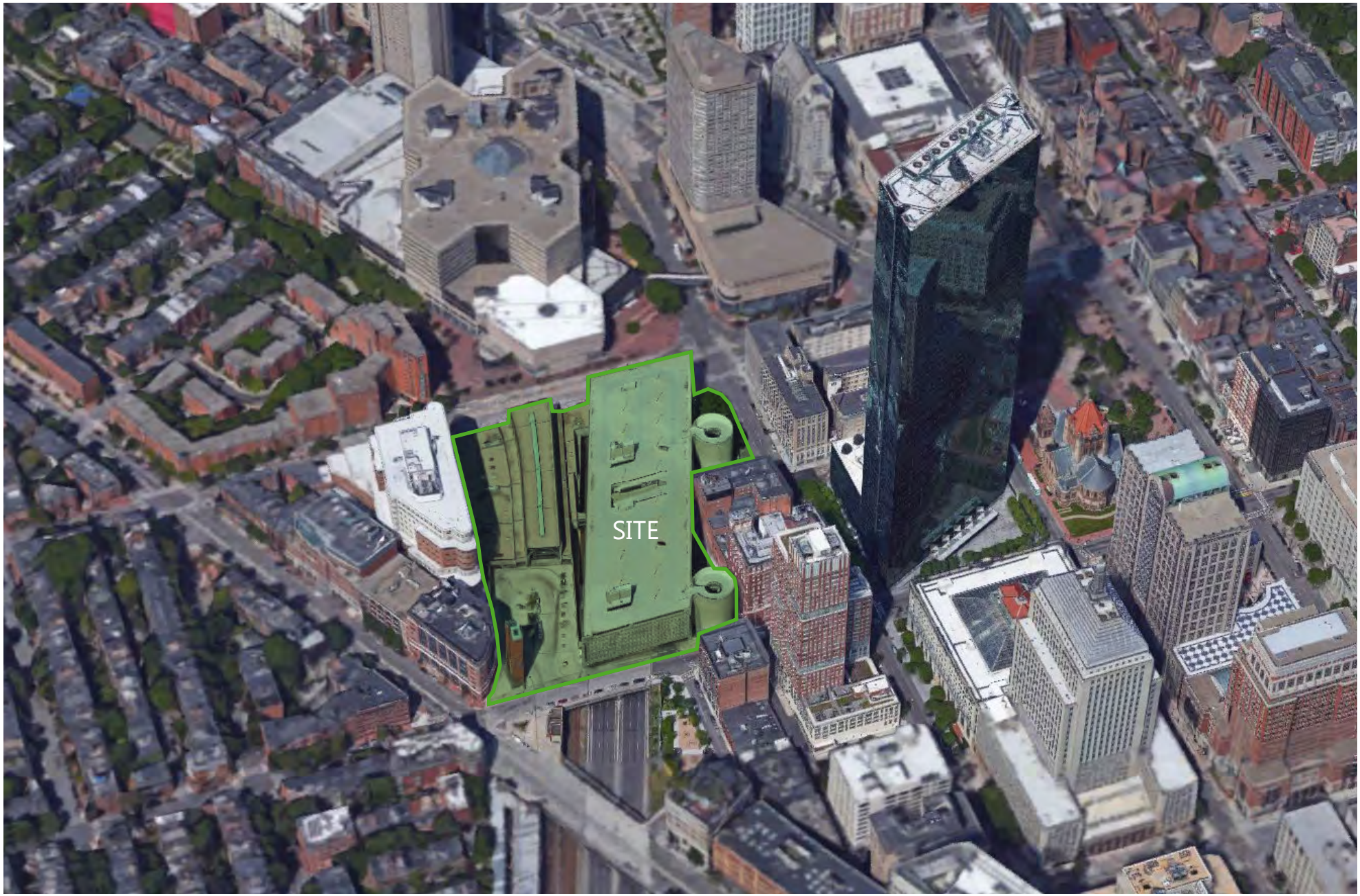
Source: ESRI World Topo Map



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

PROJECT SITE CONTEXT
AERIAL PHOTO FROM PRUDENTIAL TOWER

Figure 1.2a

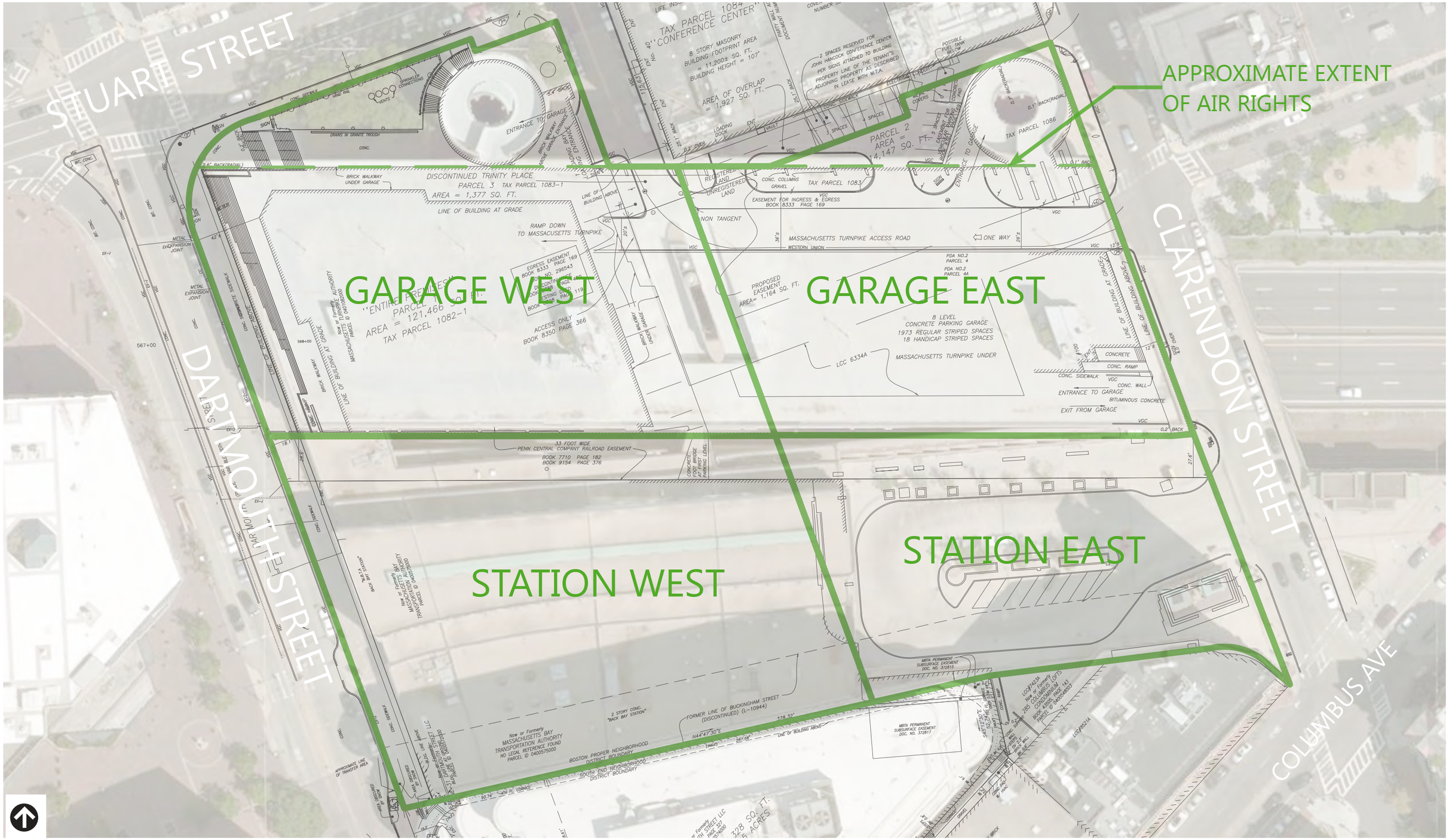


Aerial Image: Google Maps

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

PROJECT SITE CONTEXT
AERIAL PHOTO VIEW LOOKING TO THE NORTHWEST

Figure 1.2b



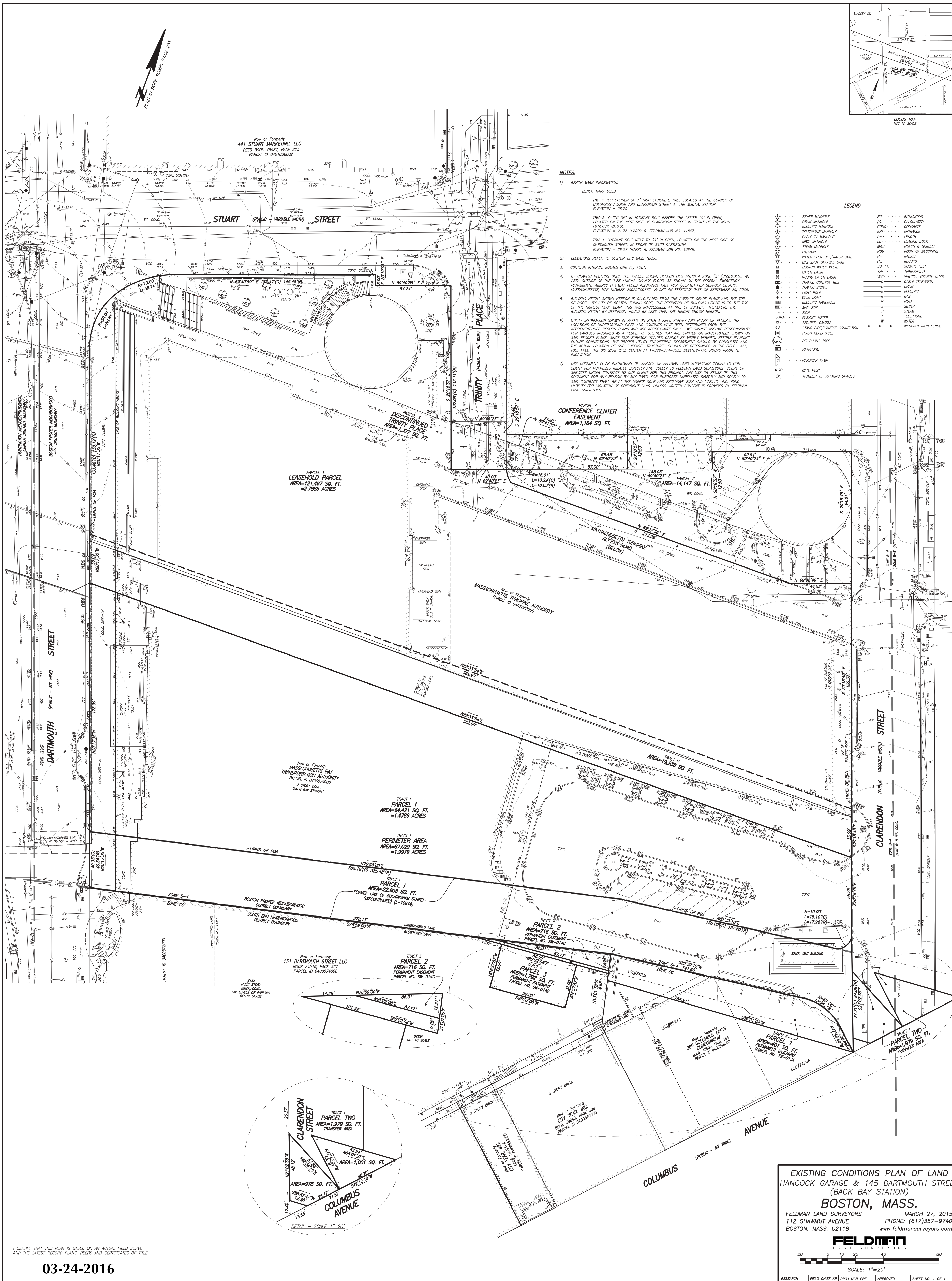
THE BACK BAY / SOUTH END GATEWAY PROJECT

BOSTON PROPERTIES

AIR RIGHTS DEVELOPMENT PARCELS CONCEPTUAL DIAGRAM

Figure 1.2c

ARROWSTREET



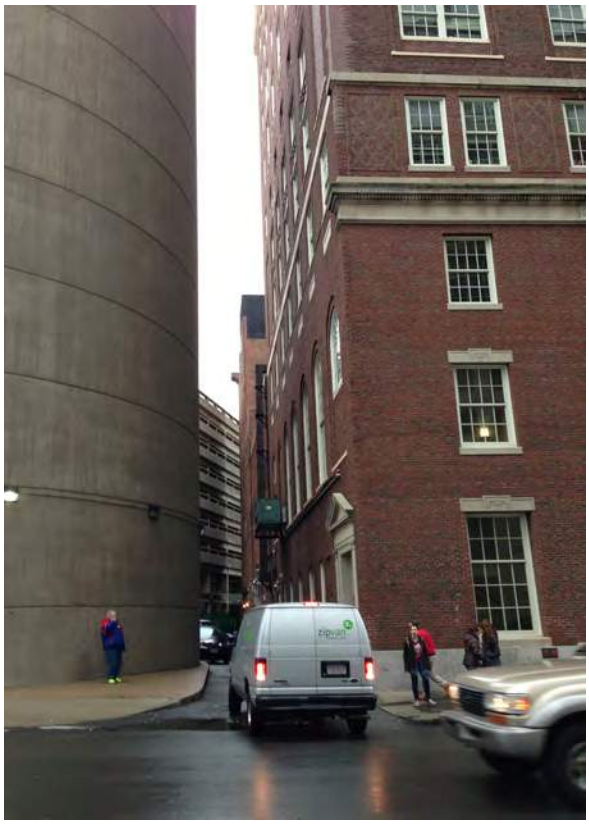
Furnished by Feldman Land Surveyors

Source: Bing Maps/PCPA

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING SITE PHOTOGRAPHS
GARAGE WEST

Figure 1.4a

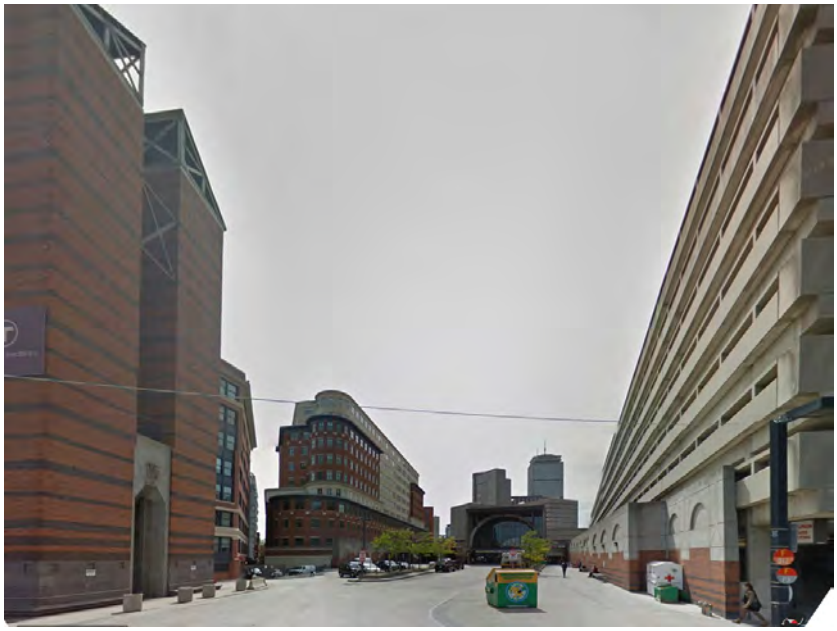


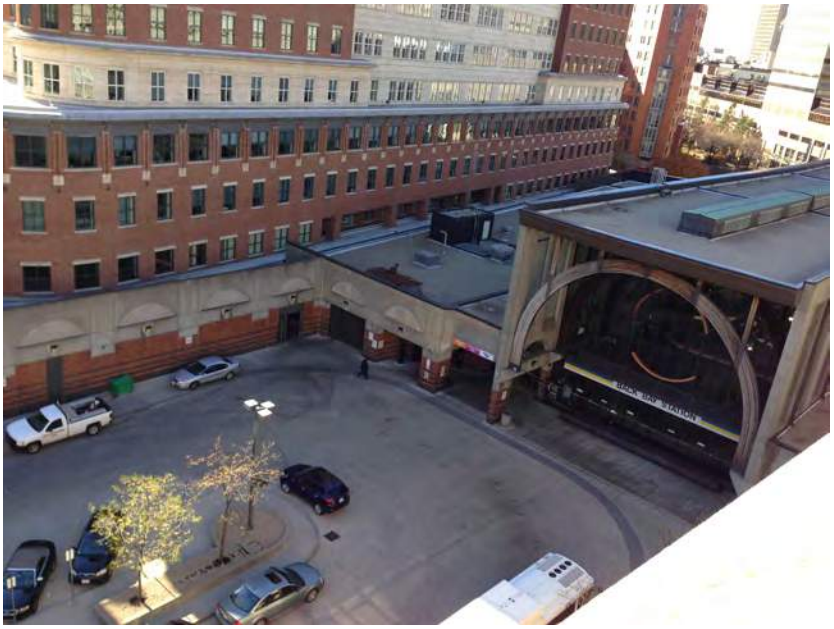
Source: Bing Maps/PCPA

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING SITE PHOTOGRAPHS
GARAGE EAST

Figure 1.4b





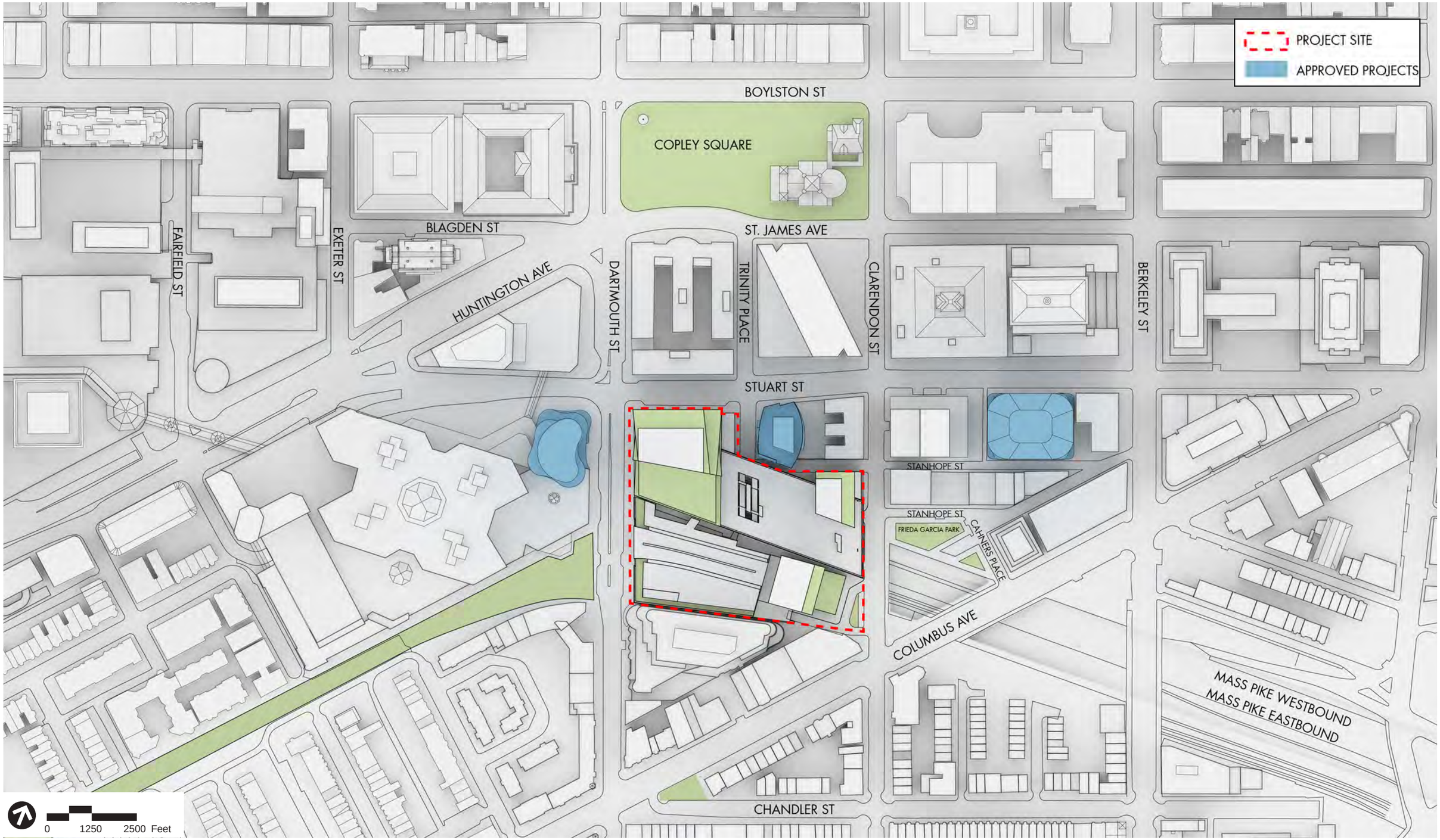
Source: Google Maps/PCPA

Source: Arrowstreet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING SITE PHOTOGRAPH
STATION WEST

Figure 1.4d



THE BACK BAY / SOUTH END GATEWAY PROJECT

BOSTON PROPERTIES

PROPOSED PROJECT SITE PLAN

Figure 1.5

ARROWSTREET

2

Urban Design

This chapter describes the existing urban context of the Project Site, and discusses the planning principles and design goals for the Project. It also describes the urban design characteristics (i.e., height and massing) and public realm improvements, including landscaping, for the Project. Supporting graphics include view perspectives, building floorplans, building sections, building elevations, and massing diagrams.

2.1 Introduction

The Project represents a substantial design and functional upgrade to the Project Site and offers significant public realm improvements for the adjacent neighborhoods. The Site is presently home to the 8-story concrete Garage and the Station building. Although neighboring parcels have been recently redeveloped or are planned for redevelopment, the Project Site has remained relatively untouched since its initial construction, largely due to the challenges imposed by the fact that it spans I-90 and seven commuter and passenger rail lines serving the Station. The Project will reinforce improvements resulting from surrounding completed and planned developments, and will support the City's planning strategies for the area.

The Project Site is located in large part within the Stuart Street Zoning District, which is bounded by St. James Avenue to the north, Dartmouth Street to the west, Columbus Avenue to the south and Arlington Street to the east, and also within the South End Neighborhood Zoning District. The Stuart Street Zoning District was the result of a multi-year planning process involving multiple area stakeholders, organized to propose development guidelines and zoning recommendations for the Stuart Street corridor. Although the Project is seeking approval as an amendment to PDA No. 2[1], it has also been designed to be respectful of the spirit of the Stuart Street Zoning District by:

[1] As set forth in greater detail in Section 1.4.2, zoning compliance for the Project as determined by PDA No.2 approval, is appropriate.

- Designing the buildings to be responsive to the height and Floor Area Ratio (FAR) regulations;
- Designing the buildings to conform to the 2-hour shadow limitation on Copley Square;
- Designing the buildings to minimize wind and shadow impacts on the surrounding neighborhood and civic and historic resources;
- Creating a vibrant street level pedestrian experience;
- Creating innovative new workplace opportunities for a variety of business types connected to multiple transportation modes;
- Designing multiple ground level pedestrian through-block connections to create permeability through the Site, and connectivity to the surrounding Back Bay and South End and Bay Village neighborhoods.

2.2 Key Findings and Benefits

The Project provides a number of benefits to both the immediate neighborhoods and the City of Boston, such as improving retail vitality, providing first class office space and high quality residential space in this highly visible and accessible location. The design for each of the four (4) Air Rights Development Parcels will dramatically improve the character of the public realm and neighborhood access at many levels, and the area will be significantly enhanced by the urban design and architectural character of the Project. A summary of the key urban design benefits is below:

- The Project will create a high-quality continuous street frontage activated by vibrant and engaging ground floor uses, such as retail and restaurant spaces, and residential and commercial building lobbies. Through the use of glass facades wherever possible, the Project will provide transparency and create an inviting and safe ground-level experience for pedestrians.
- With the development of the two Garage Parcels, the Project anticipates the removal of two existing concrete parking drums and the rationalization of the existing service and parking area located under the Garage at the rear of abutting properties along Stuart Street, greatly improving the street-level experience.
- A significantly upgraded streetscape will be provided, including new sidewalks, street lighting, landscaping and other public amenities along Dartmouth, Stuart and Clarendon Streets, consistent with the BTD's Complete Streets guidelines.
- With the development of the Garage West Parcel, the Project will create a new indoor, weather-protected accessible through-block connection and entrance to the Station from Stuart Street, flanked by new retail improvements, thus increasing neighborhood connectivity and improving public safety within the district.
- With the development of the Garage West Parcel, the Project will create a new accessible drop-off lane along Stuart Street, in proximity of the future Station entrance.

- With the development of the Station East Parcel, the Project will create a new indoor, weather-protected accessible through-block connection and entrance to the Station from Clarendon Street, flanked by new retail improvements, thus increasing neighborhood connectivity and improving public safety within the district.
- With the development of the Station East Parcel, the Project will create a new landscaped pedestrian plaza off of Clarendon Street, including an accessible drop-off lane serving both the Project and the Station.
- With the development of the Station West Parcel, the Project will create a new and accessible drop-off lane along Dartmouth Street in proximity to the existing Station entrance.
- With the development of the Station East Parcel, improved accessibility to the Station will be provided through the addition of redundant elevators to the MBTA Orange Line and Commuter Rail tracks, where feasible.
- The Project reinforces the urban "high spine" planning strategy, while designing the buildings to minimize wind and shadow impacts on surrounding neighborhood public space resources, such as Copley Square, the Southwest Corridor Park, and Frieda Garcia Park.

2.3 Neighborhood Context

As described in Chapter 1 and illustrated in **Figure 1.2c,** the Project Site is roughly bounded by Dartmouth Street to the west, Stuart Street and Trinity Place to the north, Trinity Place and Clarendon Street to the east, and the southern property line of the Station to the south. It is subdivided into four (4) Air Rights Development Parcels: Garage West Parcel and Garage East Parcel, which together encompass the current extent of the Garage plus a small amount of adjacent terra firma; Station East Parcel, over the existing bus drop-off; and Station West Parcel, over the existing Station building.

Garage West Parcel and Garage East Parcel:

As illustrated in **Figures 1.4a and 1.4b**, the Garage West and Garage East Parcels are currently dominated by an 8-story Garage, a concrete structure completed in 1970. The Garage sits on top of a structural deck that spans above both the eastbound and the westbound sections of I-90. Two full height concrete drums of approximately 70' feet in diameter, adjacent to Trinity Place and Clarendon Street, act as entry to and exit from the Garage, respectively. In addition, adjacent to the existing bus drop-off, a full service entry and exit point provides access to and from Clarendon Street. Structurally, the Garage is divided into three (3) sections, separated by expansion joints. The proposed design assumes the demolition of the westernmost section, as well as both drums, in order to provide terra firma for the structural cores of the proposed buildings. The structural deck spanning I-90 has a significant effect on the existing pedestrian experience along Dartmouth, Stuart, and Clarendon Streets. Stairs, concrete planters, and concrete walls define the majority of the current street wall in this area. Retail storefronts facing Dartmouth Street are deeply recessed from the face of the Garage above, and appear

dark and inactive, accessible by a stair and a ramp bridging the height difference from the side walk, which is up to six (6) feet. The Stuart Street sidewalk is dominated by a concrete wall that is up to 13 feet tall, and the Garage entry drum at the intersection with Trinity Place. The existing pedestrian experience along Clarendon Street is characterized by the Garage exit drum located south of the YWCA building, the MassDOT-controlled service road leading to the I-90 On-Ramp, a small retail storefront located above street level at deck level and the full service Garage entry and exit previously described.

Access to the current through-block connection from Stuart Street to the Station is limited and not designed to be accessible. The 13-foot height difference from the Stuart Street sidewalk to passageway level is only bridged by a stair at the corner of Dartmouth and Stuart Streets and another stair adjacent to the Garage entry drum. This passageway, which provides access to the Garage and Station, has a "back of house" character, with no retail storefronts or other active uses flanking it, and it partly overlooks the MassDOT service road and the commuter rail tracks below.

Station East Parcel and Station West Parcel:

As shown in **Figure 1.4c,** the Station East Parcel is home to the existing bus drop-off along Clarendon Street and is surrounded by the concrete Garage façade to the north, the Station building to the west, 285 Columbus Avenue and 131 Dartmouth Street to the south, and is dominated by the MBTA ventilation tower located in the southeast corner of the parcel. The ground floors of the abutting buildings to the South are designed as back of house / loading areas. The bus drop-off itself is on a concrete deck spanning the seven rail lines below. It contains a few MBTA dedicated parking spaces and is characterized by hard concrete and paved surfaces.

As illustrated in **Figure 1.4d**, the Station West Parcel is currently occupied by the Station building, designed by Kallmann, McKinnell and Wood, and opened in 1987. The Station contains seven commuter and passenger rail lines and serves MBTA Orange Line customers, four Commuter Rail lines (Franklin Line, Needham Line, Providence/Stoughton Line, Framingham/Worcester Line), as well as long-distance AMTRAK travelers. Conceived as a major transportation hub for the adjacent Back Bay, South End, and Bay Village neighborhoods, the Station building is constructed of concrete, glass, brick, and signature glulam wood arches supporting the main Station Concourse.

2.4 Planning Principles and Design Goals

The Project is planned to be a vibrant mixed-use development, combining high-quality sustainable architecture with a design that complements the urban fabric at multiple scales. See **Figures 2.1a-h** for renderings of the proposed Project.

At the city scale, the Project will reinforce the urban "high spine" planning principle which seeks to allow economic development and growth, while simultaneously preserving the

character of the adjacent historic neighborhoods by concentrating new development between them. Along with other new developments proposed at Copley Place, 40 Trinity and 380 Stuart Street, the Project's addition of the commercial building at the intersection of Dartmouth and Stuart Streets, as well as the two residential buildings along Clarendon Street, will strengthen the existing high spine. Although being planned and designed holistically, the buildings will be visually distinct and will contribute to the varied skyline of Boston.

At the same time, at the neighborhood scale, the Project is responsive to the planning goals highlighted in the Stuart Street Zoning District, including designing the buildings to be sensitive to the wind and shadow impacts on sidewalks and nearby public open spaces, such as Copley Square, the Southwest Corridor Park and Frieda Garcia Park. The vertical expansion of the Station will give it a more appropriate scale in relationship to proposed and existing buildings surrounding the Station, including 131 Dartmouth Street and Tent City.

At the pedestrian scale, the podium of the commercial building at the Garage West Parcel as well as the low-rise portion of the residential building at the Garage East Parcel will define a pedestrian-friendly street wall and complement existing proportions and urban alignments of the surrounding buildings. The existing formless corner at Dartmouth and Stuart Streets, as well as the space currently occupied by the Garage exit drum, will be infilled with thoughtfully scaled street frontage. On the Station East Parcel, the existing gap in the urban fabric created by the expansive and largely vacant bus drop-off will be significantly improved, creating an active and continuous façade along Clarendon Street. In order to foster a positive pedestrian experience, neighborhood connectivity and convenience, and support public safety, the Project provides permeability throughout the Project Site wherever possible. With the development of the Garage West Parcel, the Project anticipates delivering a new through-block connection that provides a new accessible entrance to the Station and Garage from Stuart Street. The Station East Parcel will also provide a new appropriately-scaled Station entrance from Clarendon Street, serving essentially as an extension of the existing Station Concourse.

2.5 Design Concept and Development

Garage West Parcel:

The 26-story building is steel construction and consists of a 13-story mixed-use podium, and a 13-story commercial high-rise. The building is located at the corner of Dartmouth and Stuart Streets. Due to the limited amount of terra firma and the shallowness of the site, the building's structural core is oriented in an east-west direction, which also allows for the maximization of active ground floor space along Stuart Street. The building is designed not to place any additional loads on the deck spanning I-90, by transferring building loads symmetrically back to the core.

The podium contains ground floor retail, five (5) levels of reconstructed and architecturally screened parking and seven (7) commercial office floors. At the street level, two (2) office

lobbies are provided, one at the corner of Dartmouth and Stuart Streets and the other further to the east along Stuart Street. The separate lobbies allow building access to be separated into a high-rise lobby and a low-rise lobby, should the building be tenanted in that manner. Farther to the east and also accessed from Stuart Street is the entry to the public through-block connector to the Station and a retail/restaurant space at the corner of Stuart Street and Trinity Place.

Due to the change in grade around this Parcel, the second level above Stuart Street can be accessed directly from Dartmouth Street, close to the Station. This level sits above the I-90 deck and houses approximately 23,000 square feet of new retail and restaurant space in addition to the continuation of the through-block connector to the Station. New parking levels at the intermediate podium floors connect to the existing Garage levels, allowing the use of the existing internal ramps for circulation. The last seven floors of the podium are designed for office use and the feasibility for an office roof deck on top of the podium is being explored by the Project Team.

The east-west oriented, 13-story high-rise portion of the building is centered around the structural core, ensuring workspaces will be optimized for daylight and views. The massing is broken down by inset floors located every fifth floor and the resulting undulating, cantilevered facades create a dynamic architectural composition, while unifying the podium and the high-rise elements into a cohesive design. In addition, both of these façade design strategies, along with the podium itself, are intended to help disseminate wind captured by the building façade and mitigate its impact at the street level. At the top, the building is set back to respect the 2-hour shadow limitation on Copley Square (calculated collectively across all sites), allowing for an office amenity deck with views towards the Charles River.

In addition, the Project Team is exploring the feasibility of a bridge connection across Trinity Place between the through-block connector at the Garage West Parcel and the second floor of the proposed 40 Trinity building. A potential future expansion of this bridge across Stuart Street to connect to the 200 Clarendon building may also be explored.

I-90 Ramp and Garage West Base and Alternate Schemes

As described in Chapter 1, with the demolition of the existing Garage entry and exit drums, a new replacement exit to the Garage will be needed to minimize traffic impacts to the surrounding neighborhoods, explained in detail in Chapter 4. In order to address this issue, and, due to the potential closure of the On-Ramp, two schemes are presented for the development of the Garage West Parcel.

In the Garage West Base Scheme, shown in plan-view in **Figures 2.2a-h** and section-view in **Figures 2.3a and 2.3d,** where the On-Ramp remains open, a new Garage exit ramp opens on to Dartmouth Street just north of the Station. In this scheme, the building's loading dock must be located closer to Stuart Street, creating more of a visual presence for loading operations and resulting in a smaller retail space at the corner of Trinity Place and Stuart Street.

In the Garage West Alternate Scheme, where the On-Ramp is closed, it becomes possible to locate a new Garage exit ramp within the space of the aforementioned service road, as shown in plan-view in **Figures 2.2i-p,** and section-view in **Figures 2.3e-g**. Since the On-Ramp is closed, there will be no traffic conflicts with vehicles accessing the On-Ramp from Clarendon Street.

This alternate Garage exit ramp location is superior from a pedestrian environment perspective, as it will not create conflicts with pedestrians entering and exiting the Station along Dartmouth Street. In addition, the building's loading dock can be tucked further into the Site, limiting its visual presence from Stuart Street. The through-block pedestrian connection to the Station and the retail space at the corner of Trinity Place and Stuart Street also become more viable. In addition to these urban design and pedestrian environment benefits, with the On-Ramp closure, a number of additional safety-related improvements could be made, including providing: an emergency pull off in the I-90 tunnel; emergency pedestrian egress from the tunnel; and additional ventilation equipment within the tunnel.

Garage East Parcel:

The 28-story residential building is concrete construction and is located at Clarendon Street, south of the existing YWCA building, at the intersection of Trinity Place. The building's façade along Clarendon Street aligns with existing street wall of abutting properties and the building's structural core sits on a small amount of terra firma nestled between the YWCA and the Garage. As a result, the first eight (8) levels of the building have small floor plates.

The residential lobby at the ground floor faces Clarendon Street, while the loading dock is located at the rear of the building, adjacent to the loading areas of abutting properties. Above the Garage, the building's footprint extends beyond the terra firma portion of the site and is supported by six (6) mega columns threaded through the existing Garage. This requires a substantial structural transfer floor to support the residential levels above. At the top of the building, the floor plate is set back along the east and the north, allowing for a residential amenity deck and respecting the 2-hour shadow limitation on Copley Square. See **Figures 2.2a-h** for plan-view and **Figures 2.3c-d** for section-view.

Station East Parcel:

The 34-story residential building is steel construction and sits between the existing Station building and Clarendon Street. The building's location on the site is driven by the fact that there is no terra firma at the parcel and the structure for the building must be threaded through the existing concrete deck and land in the platforms between the rail lines below. The building is designed with a central core, allowing all elevations to have activated and transparent facades.

At the ground level, entrances are provided for the residential lobby, the new civic entrance to the Station from Clarendon Street, and a direct, accessible connection to the Orange Line. All

of these uses are fronted by a new vehicular drop-off lane and a new landscaped pedestrian plaza off Clarendon Street. Inside, the pedestrian passageway to the Station is lined with retail and creates a cohesive connection to the existing Station. A shared loading dock serving both the Station and the Station East residential building is proposed at the southwest corner of the parcel, facing existing back of house and loading docks of the abutting buildings.

Due to the severe constraints of building over active rail lines, a significant structural transfer floor occupies the entire second level within the footprint of the high-rise portion of the building. To create an inviting street presence, a second level of retail is proposed as part of a 2-story podium extension that brings the building closer to Clarendon Street. The third floor of the high-rise contains residential amenity uses and is connected to an outdoor residential roof garden overlooking Clarendon Street. The floors above contain residential units. At the top, the building is set back along the east, allowing for the creation of a residential amenity deck with views toward Downtown Boston and the harbor. The building has no shadow impact on Copley Square. See **Figures 2.2a-h** for plan-view and **Figures 2.3b-c** for section-view.

Station West Parcel:

The vertical expansion of the Station is steel construction and is conceived as a one to two-story retail addition above the existing Station building. A single story addition is planned in the Station West Base Scheme, however, as an alternative, a two-story addition is considered in the Station West Alternate Scheme. In either case, this new addition would be accessed directly from the existing Station Concourse by a combination of new stairs, elevators, and/or escalators and the signature arched façade of the Station would be retained as an important civic gesture.

Under the Station West Base Scheme, the new second story addition would be built above the north and south arcades of the existing Station and, therefore, would be separated by the volume of the existing central Station hall and linked by new bridges spanning the Station Concourse. Should market demand for retail space prove strong, under the Station West Alternate Scheme, a third floor addition would be constructed spanning the existing central Station hall and offering a large continuous space for an appropriate retail tenant. Along Dartmouth Street, each additional new floor is designed to step back from the floor below it. The resultant exterior spaces created by the stepped form will create potential new outdoor space, further activating the Station with seating and landscaping overlooking the street. For the Station West Base Scheme, see **Figures 2.2a-d** for plan-view and **Figures 2.3a-b** for section-view. For the Station West Alternate Scheme, see **Figures 2.2q-r** for plan view and **Figures 2.3g-h** for section-view.

A future potential bridge connection across Dartmouth Street to connect to the Station expansion may also be explored.

2.5.1 Height and Massing

Garage West Parcel:

As described above, the commercial building consists of a 13-story podium, and a 13-story high-rise. The podium is set back approximately 18 feet from the property line at Dartmouth Street to align with existing neighboring street wall conditions. No setbacks are required or provided along Stuart Street and the podium street wall is consistent with that of neighboring buildings. The podium extends approximately 198 feet along Dartmouth Street, and approximately 230 feet along Stuart Street. The typical podium floor plate is approximately 46,000 gross square feet in both the Garage West Base and Alternate Schemes.

In the Garage West Base Scheme, the location of the On-Ramp translates to a slightly trapezoidal structural core and high-rise building floor plates. The typical high-rise floor plates range from approximately 22,000 to 26,000 gross square feet and the west façade is approximately 120 feet and the north façade is approximately 193 feet in length. The total building area is approximately 598,000[2] square feet and the FAR is approximately 8.77.

In the Garage West Alternate Scheme, the structural core is regularized and the high-rise building floor plates are rectangular. The typical high-rise floor plates range from approximately 23,000 to 26,000 gross square feet, and the east and west façades are approximately 135 feet, while the north and south façades are approximately 193 feet in length. The total building area is approximately 603,500 square feet and the FAR is approximately 8.85.

In both the Garage West Base and Alternate Schemes, the building height is approximately 365[3] feet.

See **Figures 2.5a-c** for the massing under the Garage West Base Scheme and **Figures 2.5d-f** for the Garage West Alternate Scheme. See **Figures 2.4a-b** for Base Scheme elevations from Stuart and Clarendon Streets**.**

Garage East Parcel:

The footprint of the building base is set on the property line, aligning with the street wall created by the existing adjacent properties. The east façade is approximately 65 feet in length along Clarendon Street and the north façade is approximately 105 feet and is set back 30 feet

▼

[2] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

[3] Unless labeled otherwise all heights provided herein are determined in accordance with the provisions of Article 2 of the Code to be the vertical distance from grade to the top of the structure of the last occupied floor

from the existing YWCA building (doubling the current distance of 15 feet to the face of existing Garage drum).

Above the existing garage, a 15-foot setback is provided from Clarendon Street for the high-rise portion of the building and the footprint expands toward the south to be approximately 130 feet along Clarendon Street, approximately 97 feet at the west façade, and approximately 90 feet at the north and south facades.

The floor plate is approximately 4,800 gross square feet at the base and approximately 10,000 gross square feet on a typical high-rise floor. The building rises 28 stories to a height of approximately 298 feet. The total building area is approximately 214,500 square feet, and the FAR is approximately 4.05.

See **Figures 2.5a-c** for the Garage East massing and **Figure 2.4c** for the elevation from Clarendon Street.

Station East Parcel:

The two-story podium is approximately 40 feet tall and is set back approximately 39 to 64 feet from Clarendon Street making the east façade at the street level approximately 95 feet in length.

The high-rise portion of the building is set back approximately 89 to 119 feet from Clarendon Street, with east and west facades of approximately 114 feet and north and south facades of approximately 105 feet in length. The typical high-rise floor plate is approximately 12,000 gross square feet, the total building area is approximately 377,000 square feet, and the FAR is approximately 9.70. The building height is approximately 388 feet.

See **Figures 2.5a-c** for Station East massing and **Figure 2.4c** for elevation-view from Clarendon Street.

Station West Parcel:

The height and massing of both the Station West Base Scheme and the Station West Alternate Scheme are designed to contribute to the Dartmouth streetscape. In the Station West Base Scheme, the single-story addition is approximately 29,500 square feet and 46 feet above Dartmouth Street with an FAR of approximately 0.46. In the Station West Alternate Scheme, the two-story addition is approximately 64,500 square feet and approximately 69.5 feet above Dartmouth Street with an FAR of 1.00.

See **Figures 2.5a-c** for the massing of Station West Base Scheme and **Figure 2.5g** for Station West Alternate Scheme. See **Figure 2.4a** for the Base Scheme elevation-view from Dartmouth Street.

2.5.2 Character and Exterior Materials

Garage West Parcel (Commercial):

The commercial office lobbies will use double-height transparent glass, blurring the boundaries between indoor and outdoor and activating the streetscape.

Architecturally, both the podium and the high-rise portion of the building break down the massing by combining several floors into multi-story stacks, which creates unity but also allows the building to express the various uses through different façade characteristics. For example, podium-level parking floors, which are all above street level, will be architecturally screened to mask the parking decks and integrate those levels into the overall building design.

At the high-rise portion of the building, the stacks shift in east-west direction, some corners pushing in, some out, reinforcing the visual concept of stacked components. Apart from the visual effect, outdoor terraces may be created at setback floors, and the shifting volumes are anticipated to help with wind mitigation. The exterior wall of the upper podium and high-rise portion of the building is anticipated to be a high quality unitized, curtain wall system. The curtain wall will have vision glass with high performance low-e coatings, and will be low in reflectivity and high in light transmittance.

Garage East and Station East Parcels (Residential):

The residential lobbies facing Clarendon Street will use full height transparent glass to activate the façades and enliven the adjacent sidewalks. The patterned façades evoke movement and are further textured by the addition of balconies and multi-story cut outs. The exterior walls will consist of a high performance enclosure, which may include glass, masonry, and/or metal panels. Vision glass will have high performance low-e coatings and will be low in reflectivity and high in light transmittance.

Station West Parcel (Retail):

The addition is designed to be minimal and light, integrating with the surrounding future structures, and allowing the original Station building to maintain its architectural identity. The materials for the addition will be primarily glass and metal panel, detailed to respect the rhythm of the existing building, but also to read as a sensitive and yet, modern, intervention.

2.5.3 Signage

Garage West Parcel (Commercial): Office lobby entrances will be thoughtfully designed with canopies and building identification signage appropriate for the building scale. Office tenant identification signage may also be provided for low-rise and high-rise anchor tenants. Retail signage will be thoughtfully located and designed to generate an inviting streetscape.

Appropriate identification signage will mark the entrance to the through-block connection to the Station.

Garage East and Station East Parcels (Residential): Residential lobby entrances will be scaled appropriately, and canopies and signage elements will be designed to complement the architectural identity of the buildings. Retail signage will be thoughtfully located and designed to generate an inviting streetscape. Appropriate identification signage will mark the entrance to the through-block connection to the Station at the Station East Parcel.

Station West Parcel (Retail): At the ground level, existing Station identification and retail tenant signage will remain or be modified, as necessary, to comply with MBTA wayfinding requirements. New retail signage at the vertical expansion will be thoughtfully located and designed to generate an inviting streetscape.

2.6 Site Design

The design strategy for the Project Site proposes the use of clean, modern lines that create a series of clearly defined pedestrian corridors and spaces. The design focuses on creating pedestrian-oriented sidewalks and streets and the orderly lines and materials are intended to organize pedestrian and vehicular circulation. See **Figures 2.6a-b** for Site landscaping plans.

To reinforce the connection between the new buildings and the public way, the Project will rehabilitate the perimeter sidewalks and enhance the public realm to incorporate the BTD Complete Streets design principles. These principles include clearly defined pedestrian routes, bicycle facilities, landscaping and permeable edges, where possible. These strategies will improve public accessibility and better support stormwater management.

2.5.4 The Pedestrian Realm

The pedestrian realm will provide a number of conveniences and amenities for pedestrians throughout the Site. The streetscape is comprised of three components; the furnishing zone, pedestrian zone, and frontage zone. Key elements include grades, cross slopes, comfortable walk widths, passing space, vertical clearance, comfortable accessible surfaces, store front elements and street amenities.

The pedestrian realm begins with detectable warnings at the corner ramps where they meet the crosswalks. Corner treatments will include enhanced paving and a clustering of amenities. The furnishing zone from back of curb to the edge of the walking path will be unit pavers and will include benches, waste and recycling receptacles, light poles, street trees, street planting, and parking meters. The pedestrian zone will be neatly paved in concrete, free of obstructions and have a comfortable and compliant slope, wherever feasible. Where applicable, a frontage zone will be provided to include a buffer for pedestrians as well as potential sidewalk cafes, retail displays and store entrances. A consistent family of materials will be selected to provide a cohesive palette.

On Dartmouth Street, trees contained in low, raised planters located within the furnishing zone will provide a continuous green canopy and cover for pedestrians. At the entrance to the Station, special paving that extends the interior flooring pattern will create an arrival plaza, drawing pedestrians into the station and engaging the retail. Accessible drop-offs will be included on both sides of the pedestrian crossing and entry to the station. As pedestrians move north toward Stuart Street, special care will be used to provide warning and guidance for pedestrians traversing the garage exit, as shown in the Garage West Base Scheme.

On Stuart Street, the office building lobby will be highlighted with special paving. A vehicular drop-off will be provided to service the office building, Station connection and retail amenities. There will be landscape zones flanking the vehicular drop-off, buffering the intersections and crosswalks from the pedestrian zones. Enhanced paving may continue across Trinity Place, creating a pedestrian-friendly crossing and further buffering the loading and service areas from Stuart Street.

On Clarendon Street, the sidewalk along the existing garage will be expanded and partially covered by the second floor Garage overhang. Walking south, this pedestrian way will open to a larger arrival plaza and vehicular drop-off serving the Station as well as the residential tower at the Station East Parcel. This plaza features enhanced paving, extending the interior flooring of the station, creating a comfortable pedestrian experience while allowing for vehicular access separated from Clarendon Street with a generous landscape treatment.

2.5.5 On-Street Parking

Although no on-street parking is anticipated, three separate and distinct drop-off zones are anticipated to be provided around the Site. These locations are intended to provide convenience for public transit users, office tenants and residents.

2.5.6 Streetscape Lighting

Lighting is key to the safety and comfort of an active, vibrant evening and night streetscape. Streetscape lighting and proper light levels will be provided throughout the public realm. This will be achieved through a mixture of different light sources including vehicular light poles, pedestrian light poles and illuminated bollards, along with accent lighting in key areas throughout the Site.

2.5.7 Plant Selection

The landscaping will consist of trees and plant materials suited for the New England climate. Plant materials will be carefully selected to provide interest year-round, through all seasons. Special consideration will also be given to accommodating plant life in the urban condition of the City.

2.5.8 Complete Streets

The Project incorporates the fundamental goals of the BTD Complete Streets guidelines throughout the Site. This includes providing a multimodal level of service that informs the roadway design ensuring that streets are shared by all users and not dominated by cars. The Project is evaluating green initiatives to manage stormwater run-off and smart technologies to improve the everyday user's experience and convenience.

2.7 Accessibility

The Project will significantly improve accessibility around the Project Site, and address the goals outlined in the Accessibility Checklist provided in Appendix C, at various levels:

In connection with the development of the Garage West Parcel:

- A new accessible through-block connection between Stuart Street and the Station will be provided, including escalators as well as an elevator, to connect the Stuart Street sidewalk to the Station Concourse. Currently only two stairs, one at the corner of Dartmouth Street and the other hugging the existing Garage drum, bridge the up to 13-foot grade difference in this area;
- The existing concrete wall along Stuart Street (up to 13 feet tall) will be replaced by the commercial building lobby, a public entrance to the Station, and a retail/restaurant space at the corner of Stuart Street and Trinity Place;
- A new drop-off lane will be provided along Stuart Street.
- The transition between the sidewalk and the retail level above the I-90 deck level along Dartmouth Street (an up to six-foot height difference) will be reconfigured to include an improved ramp element, planters, seating, and modified stairs;

In connection with the development of the Station East Parcel:

- The development will bring the street wall closer to Clarendon Street, with access at grade to the Station, the Orange Line, and the residential building. A new drop-off lane, which will be embedded into a landscaped plaza, will jointly serve these entrances;
- The new accessible Orange Line entrance off Clarendon Street, and is anticipated to include a new elevator and stair directly to the track level;
- Where feasible, new elevators to Tracks 1/3 and 2 at the existing head house on the south side of Columbus Avenue may be provided;

In connection with the development of the Station West Parcel:

- A new drop-off lane will be provided along Dartmouth Street in front of the Station.

It is anticipated that 5% of the units in the Garage East Parcel and Station East Parcel residential buildings will be designed to be accessible, in compliance with 521 CMR.

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM SOUTHWEST CORRIDOR PARK
GARAGE WEST BASE SCHEME AND STATION WEST BASE SCHEME

Figure 2.1a

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM SOUTHWEST CORRIDOR PARK
GARAGE WEST ALTERNATE SCHEME AND STATION WEST BASE SCHEME

Figure 2.1b

ARROWSTREET
Pelli Clarke Pelli Architects

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM SOUTHWEST CORRIDOR PARK
GARAGE WEST ALTERNATE SCHEME AND STATION WEST ALTERNATE SCHEME

Figure 2.1c

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM DARTMOUTH STREET
STATION WEST BASE SCHEME

Figure 2.1d

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM DARTMOUTH STREET
STATION WEST ALTERNATE SCHEME

Figure 2.1e

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM STUART & DARTMOUTH STREET
GARAGE WEST BASE SCHEME

Figure 2.1f

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

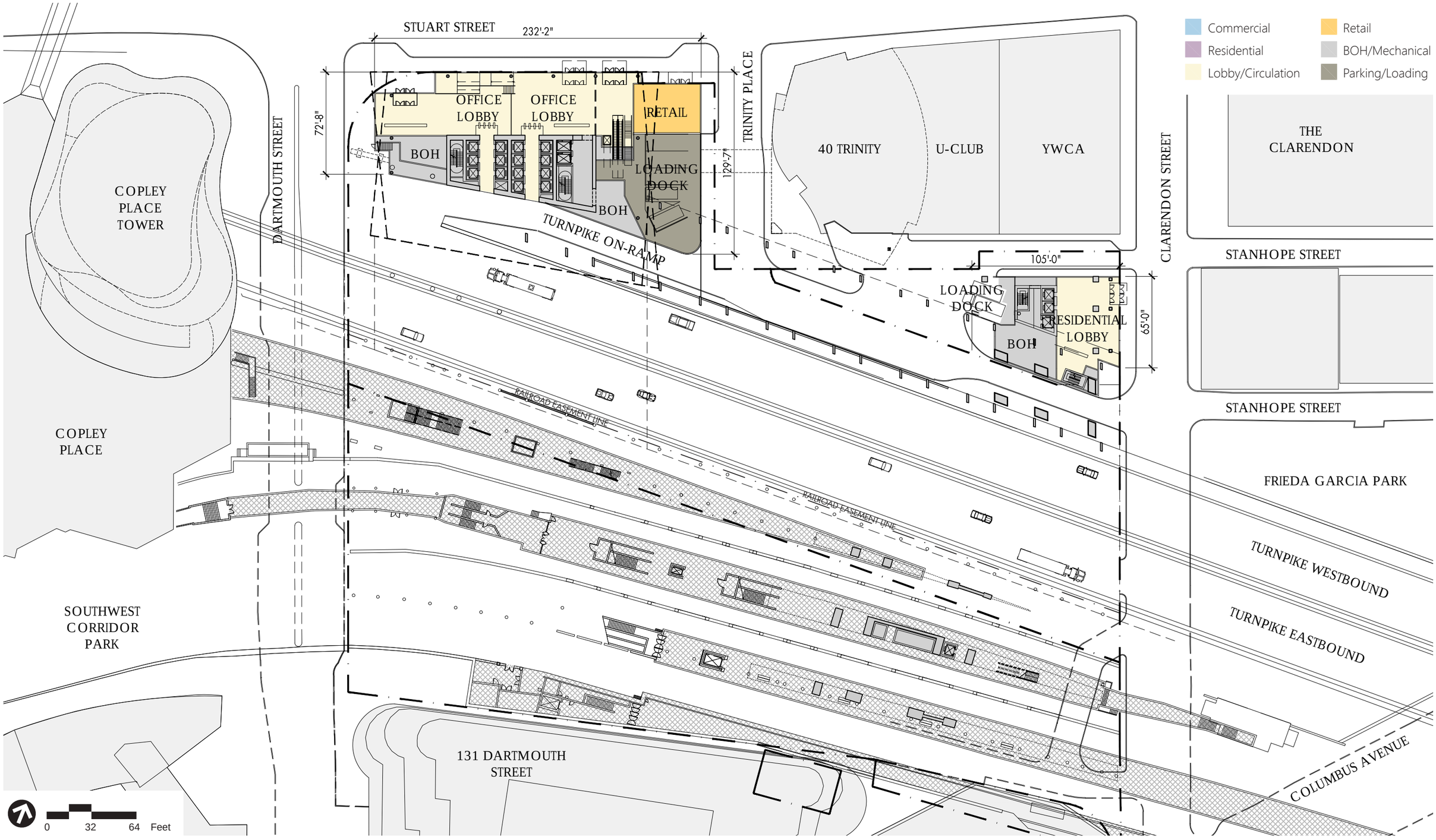
VIEW FROM COLUMBUS AVE

Figure 2.1g

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW FROM CLARENDON STREET
STATION EAST

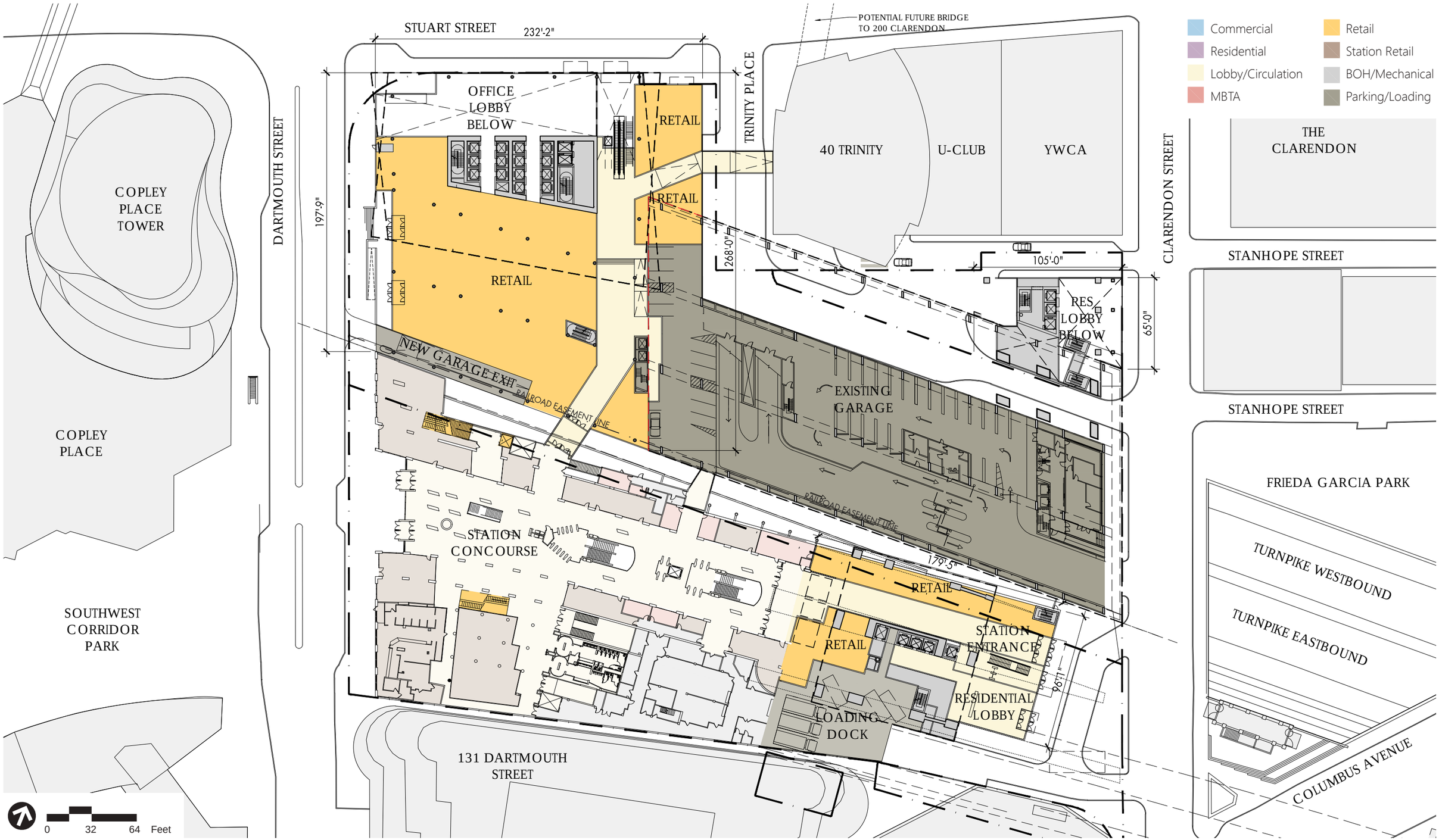
Figure 2.1h



THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: STUART ST LEVEL • GE: CLARENDON ST LEVEL • SE: PLATFORM LEVEL • SW: PLATFORM LEVEL

Figure 2.2a

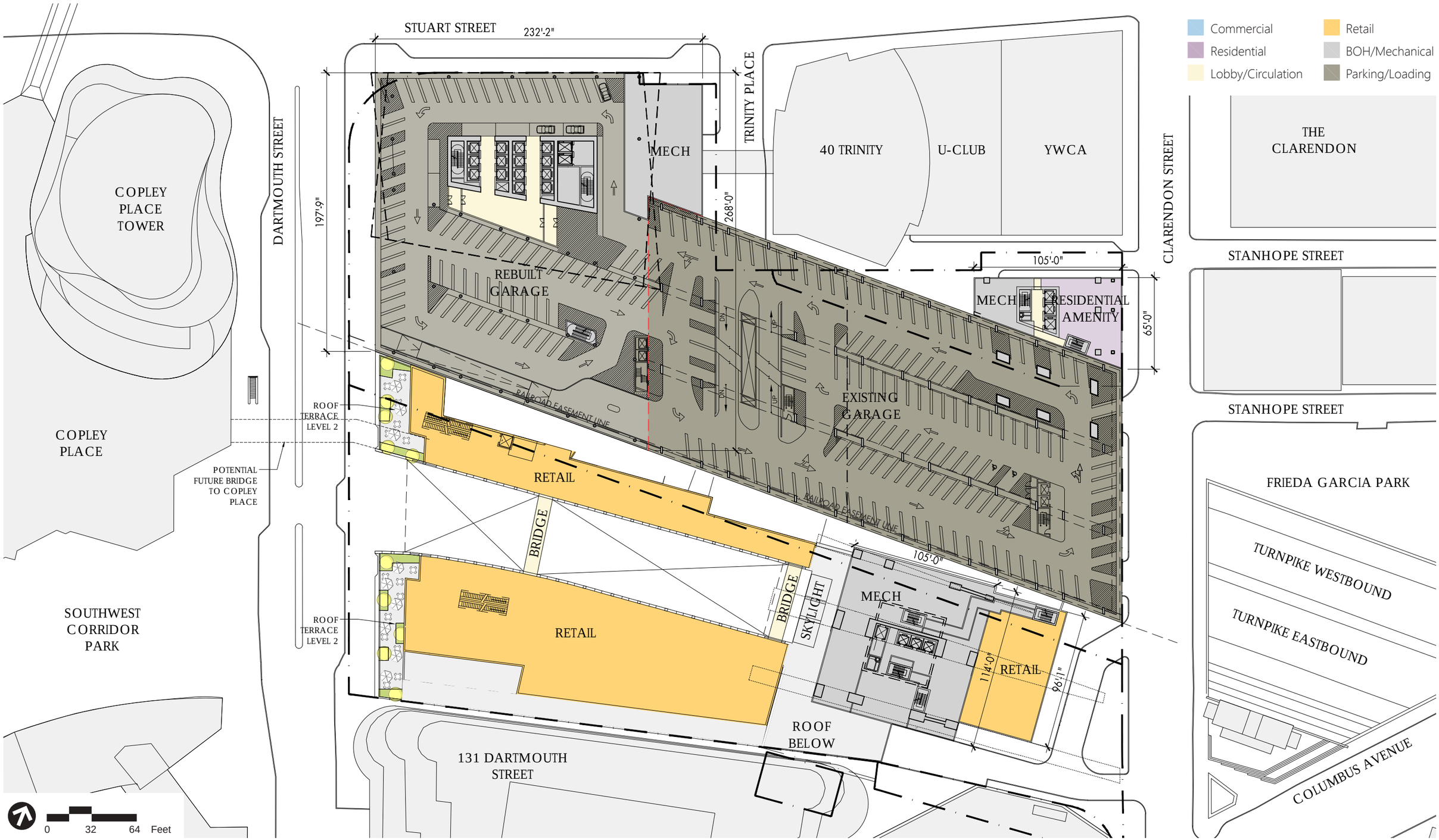


THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: DECK LEVEL • GE: UPPER LOBBY • SE: DECK LEVEL • SW: CONCOURSE LEVEL

Figure 2.2b

ARROWSTREET

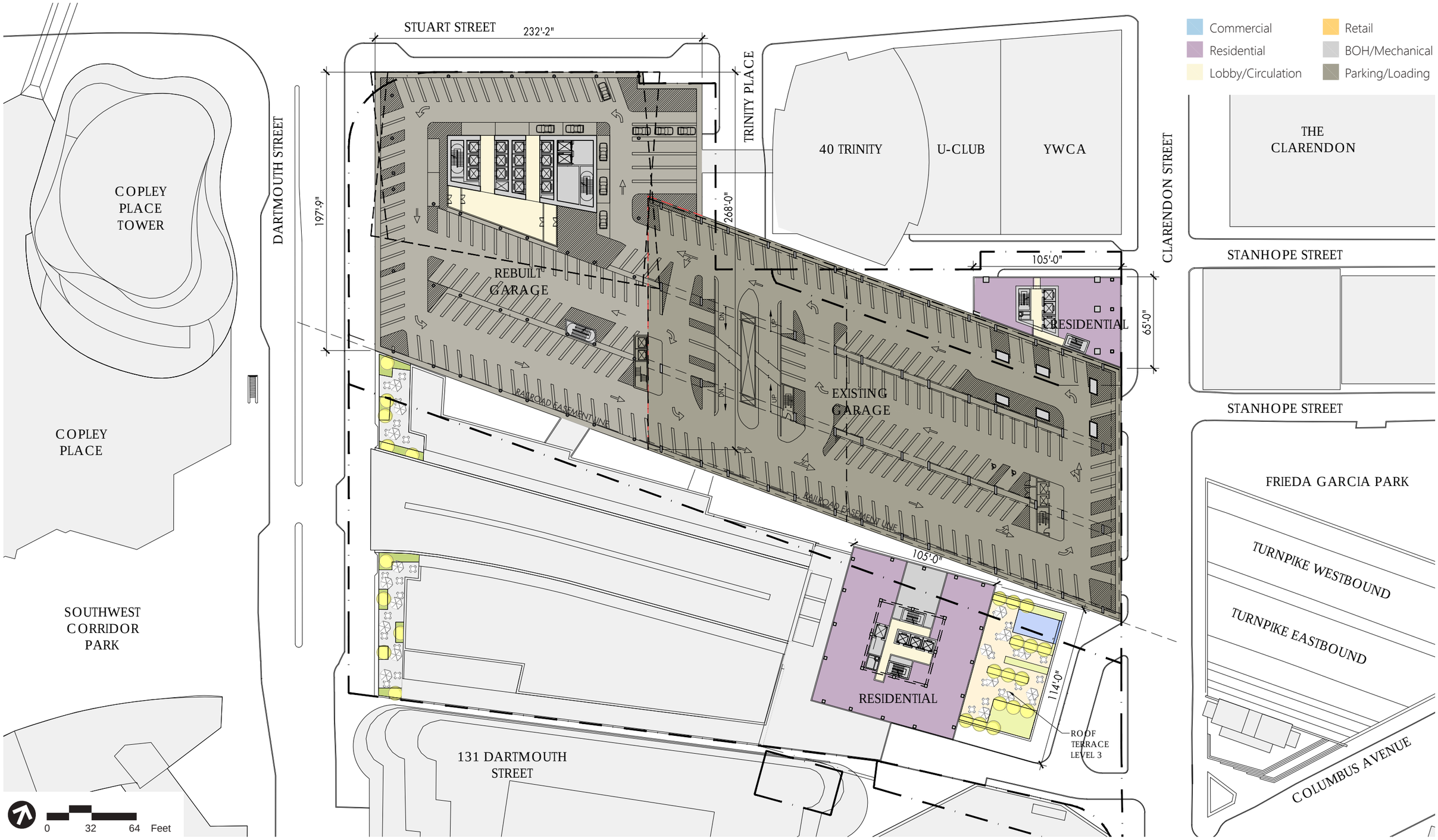


THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: LEVEL 2 • GE: LEVELS 2-3 • SE: LEVEL 2 • SW: LEVEL 2

Figure 2.2c

ARROWSTREET



THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 4-6 • GE: LEVELS 4-7 • SE: LEVELS 4-5 • SW: ROOF

Figure 2.2d

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 8-11 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2e

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 18-21 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2f

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

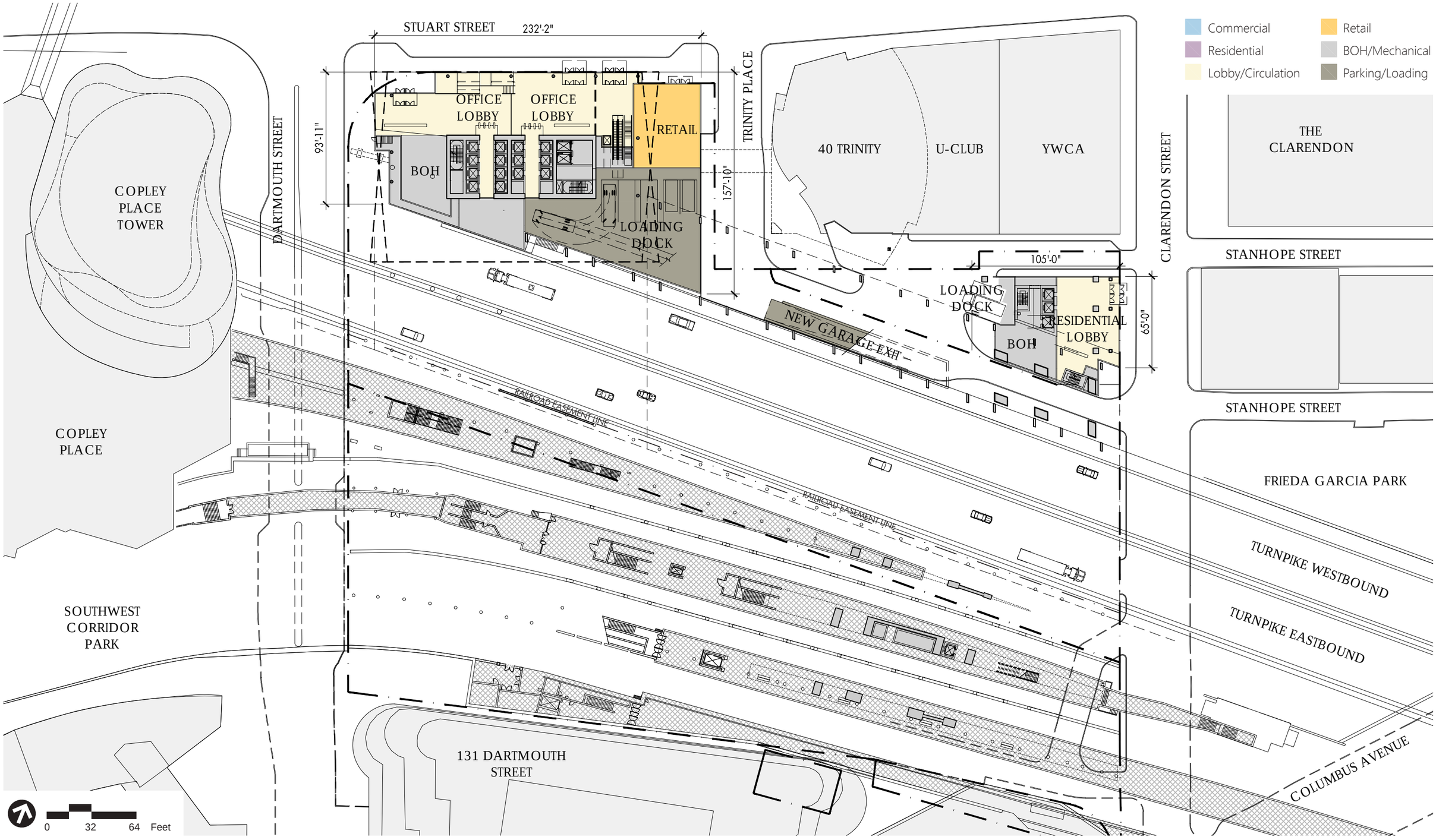
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 23-25 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2g

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME
GW: ROOF • GE: ROOF • SE: ROOF • SW: ROOF

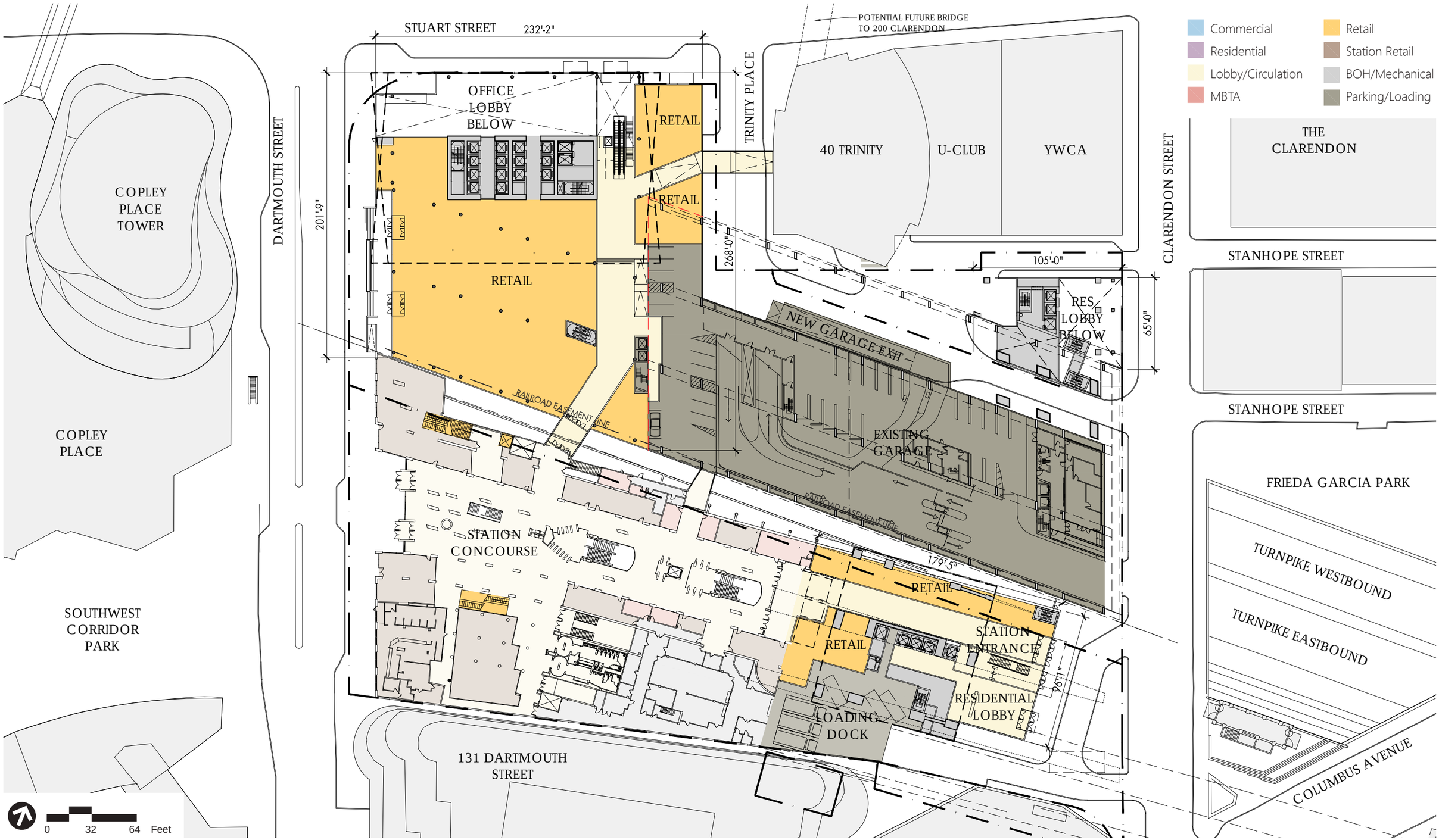
Figure 2.2h



THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: STUART ST LEVEL • GE: CLARENDON ST LEVEL • SE: PLATFORM LEVEL • SW: PLATFORM LEVEL

Figure 2.2i

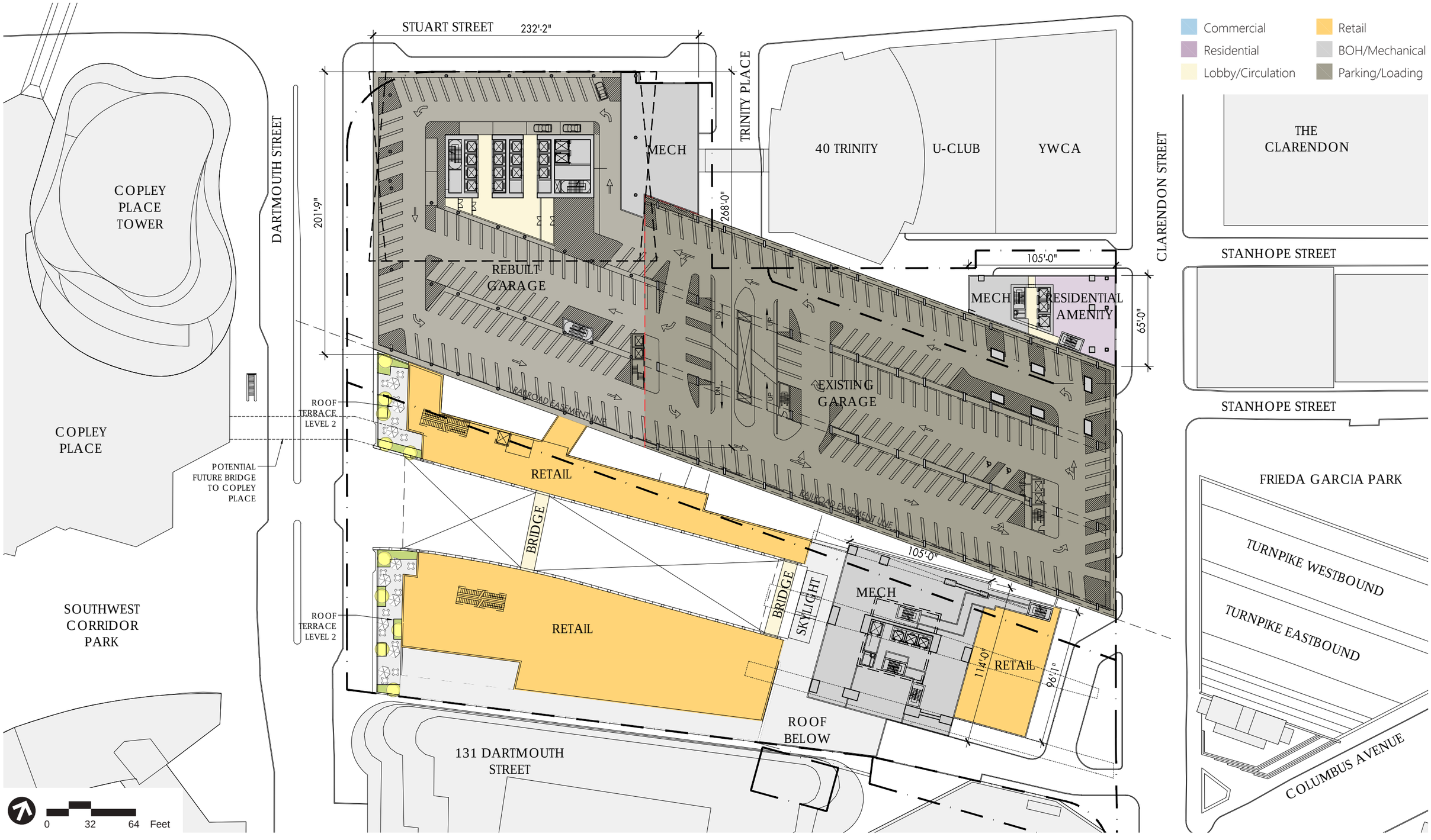


THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: DECK LEVEL • GE: UPPER LOBBY • SE: DECK LEVEL • SW: CONCOURSE LEVEL

Figure 2.2j

ARROWSTREET

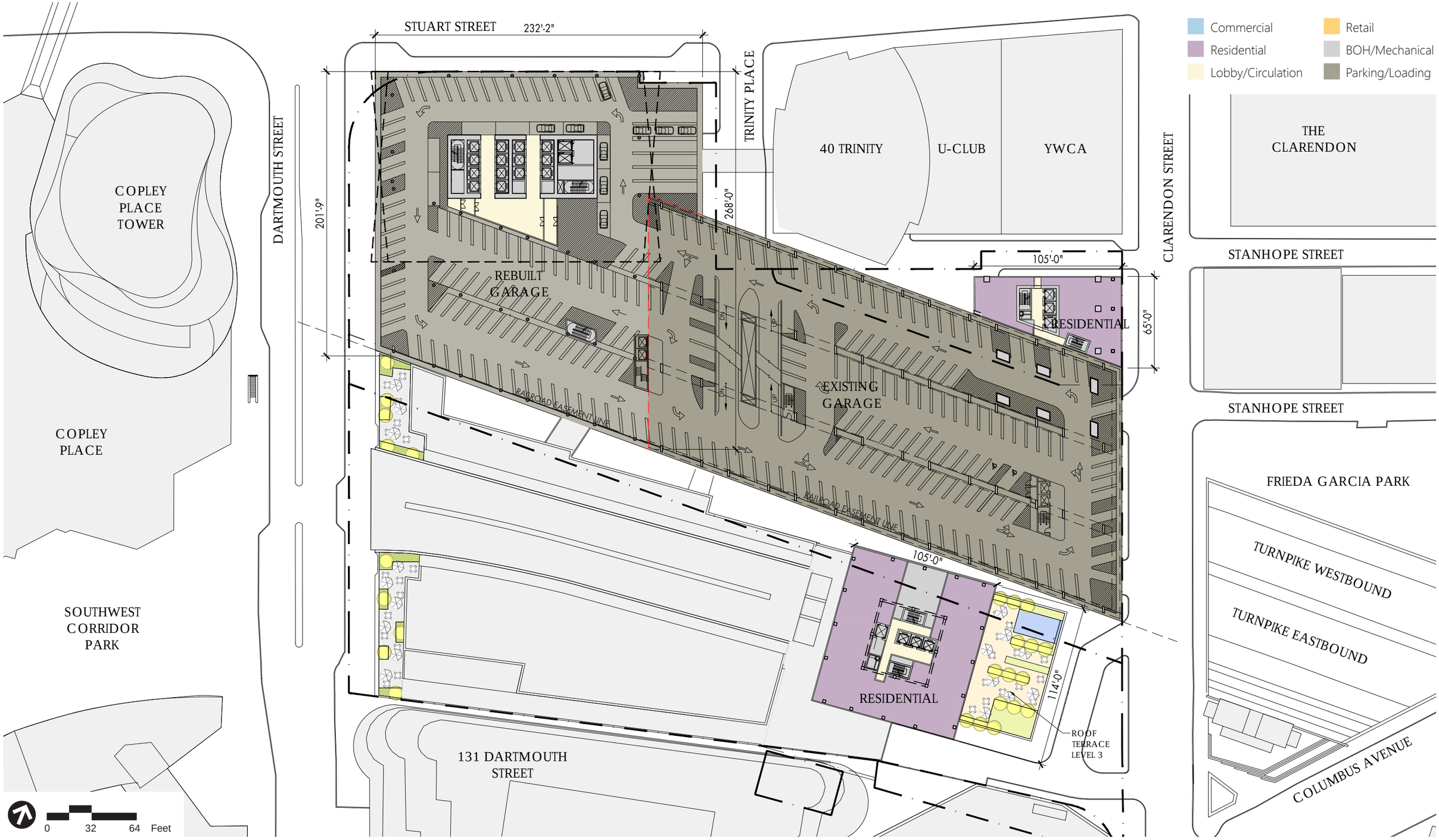


THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: LEVEL 2 • GE: LEVELS 2-3 • SE: LEVEL 2 • SW: LEVEL 2

Figure 2.2k

ARROWSTREET



THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 4-6 • GE: LEVELS 4-7 • SE: LEVELS 4-5 • SW: ROOF

Figure 2.2l

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 8-11 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2m

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 18-21 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2n

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

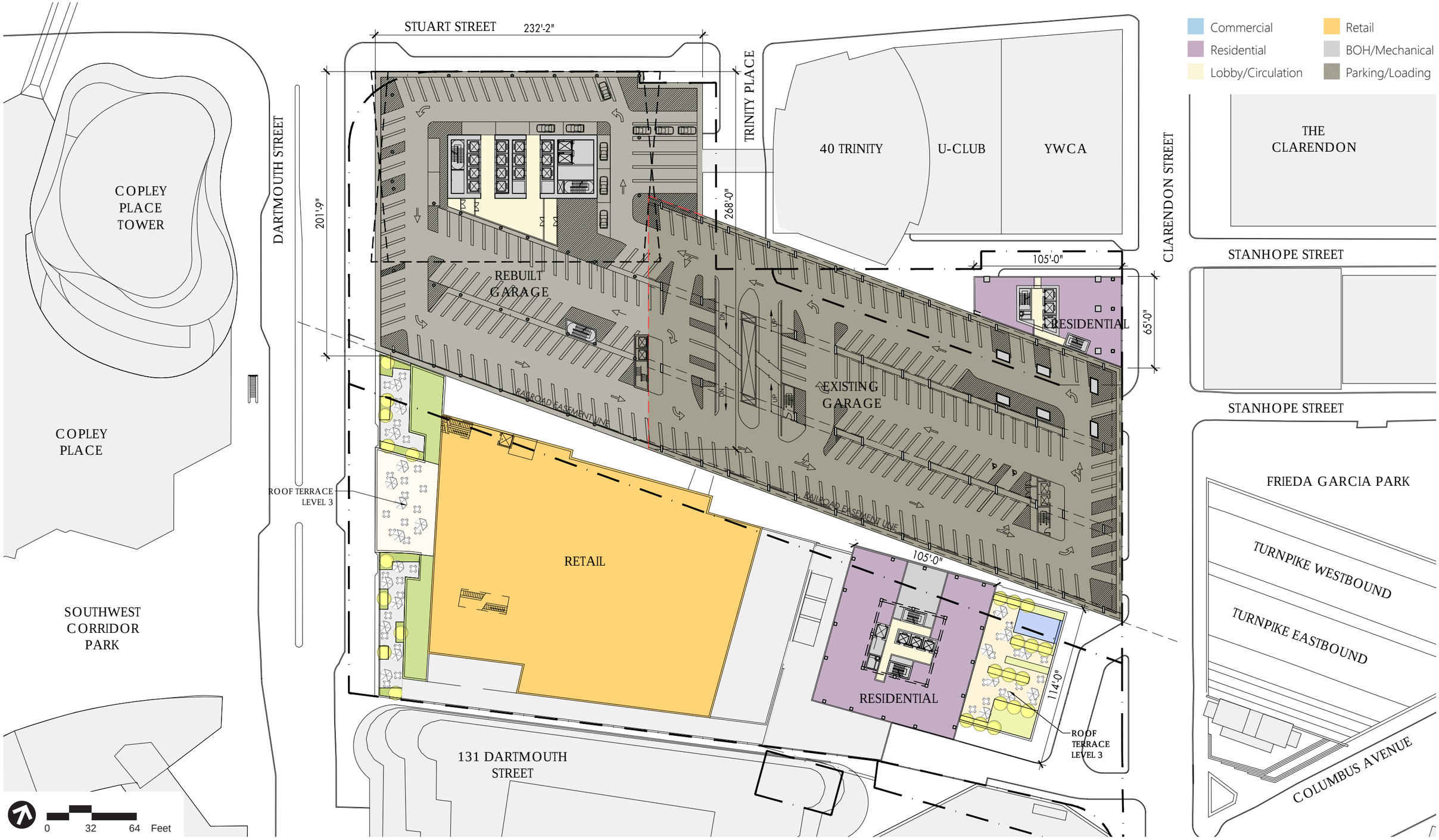
GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: LEVELS 23-25 • GE: LEVELS 10-27 • SE: LEVELS 6-34 • SW: ROOF

Figure 2.2o

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME
GW: ROOF • GE: ROOF • SE: ROOF • SW: ROOF

Figure 2.2p



THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

STATION WEST ALTERNATE SCHEME
GW: LEVELS 4-6 • GE: LEVELS 4-7 • SE: LEVEL 4-5 • SW: LEVEL 3

Figure 2.2q

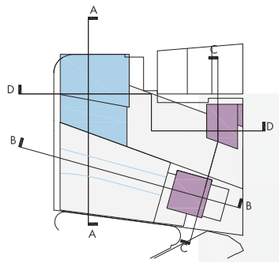
ARROWSTREET

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

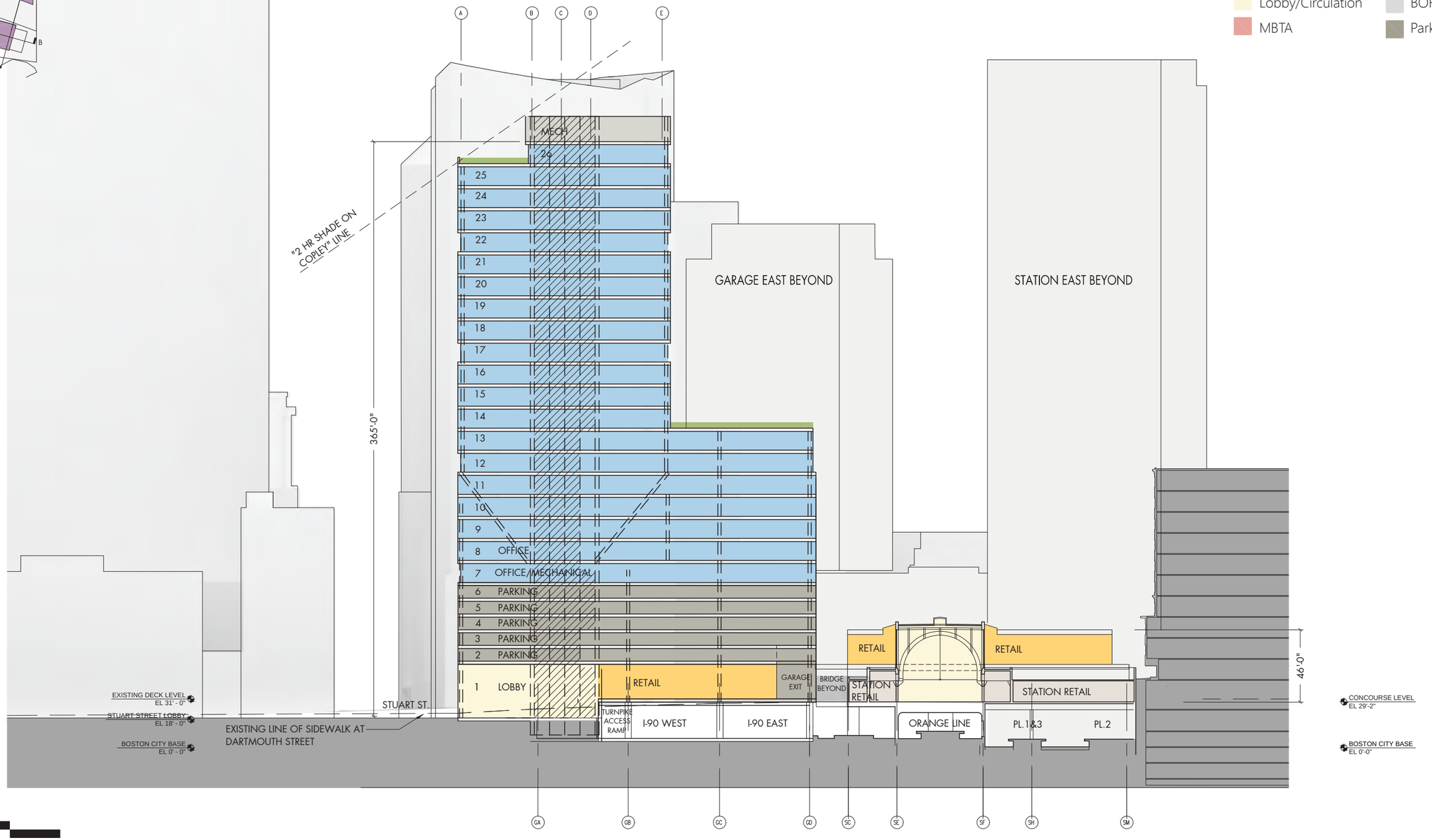
STATION WEST ALTERNATE SCHEME
SW: ROOF

Figure 2.2r

ARROWSTREET



Commercial
Residential
Lobby/Circulation
MBTA
Retail
Station Retail
BOH/Mechanical
Parking/Loading



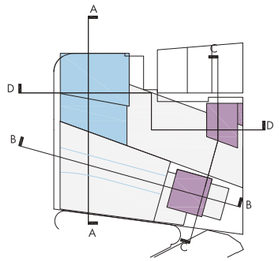
0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION A-A
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME

Figure 2.3a

ARROWSTREET



Commercial
Residential
Lobby/Circulation
Retail
BOH/Mechanical
Parking/Loading

GARAGE WEST BEYOND

MECHANICAL/ROOF DECK
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17 MECHANICAL/RES
16
15
14
13
12
11
10
9
8
7
6
5
4
3 AMENITY FLOOR

388'-0"

RETAIL BEYOND
BRIDGE
BRIDGE
46'-0"
STRUCTURAL / MECHANICAL
RETAIL
RETAIL
RESIDENTIAL LOBBY / STATION ACCESS
ORANGE LINE ACCESS
40'-0"
DROP OFF
CLARENDON STREET
OPEN TO TRACKS BELOW
COLUMBUS AVENUE
DARTMOUTH STREET
BACK BAY STATION
CONCOURSE LEVEL
EL 29'-2"
STATION EAST DECK
EL 29'-0"
ORANGE LINE PLATFORM
BOSTON CITY BASE
EL 0'-0"
BOSTON CITY BASE
EL 0'-0"

S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16

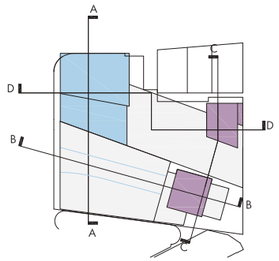
0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

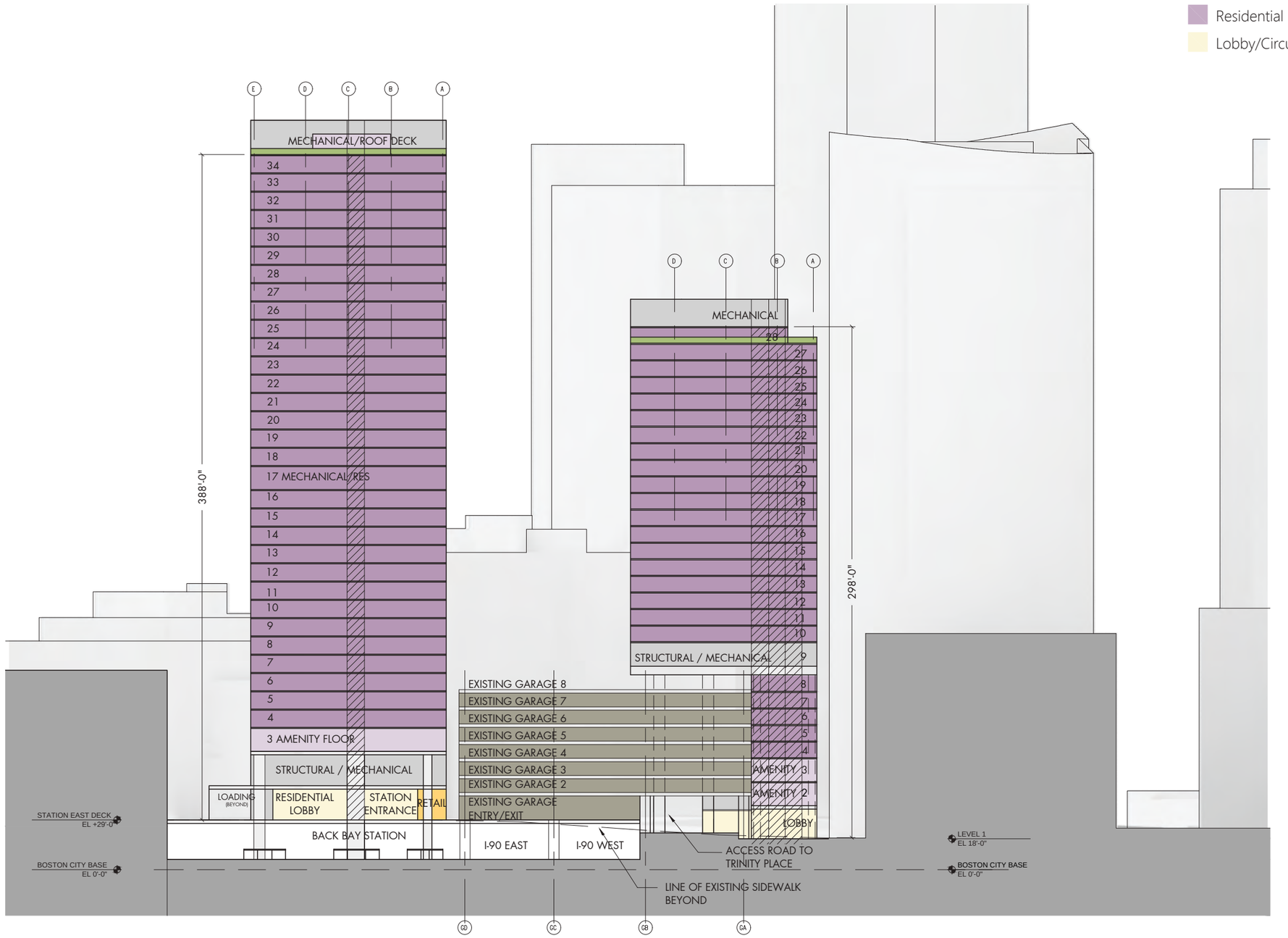
SECTION B-B
STATION WEST BASE SCHEME

Figure 2.3b

ARROWSTREET



Commercial
Residential
Lobby/Circulation
Retail
BOH/Mechanical
Parking/Loading

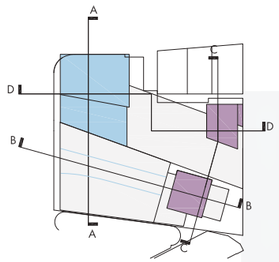


0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION C-C

Figure 2.3c



Commercial
Residential
Lobby/Circulation
Retail
BOH/Mechanical
Parking/Loading

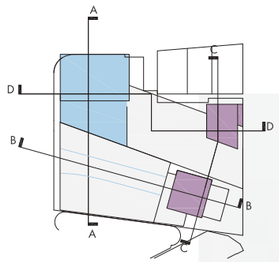
MECH
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8 OFFICE
7 OFFICE
MECHANICAL
6 PARKING
5 PARKING
4 PARKING
3 PARKING
2 PARKING
1 RETAIL
RETAIL THROUGH-BLOCK CONNECTION
365'-0"
DECK LEVEL EL 31' - 0"
STUART STREET LOBBY EL 18' - 0"
BOSTON CITY BASE EL 0' - 0"
DARTMOUTH STREET
LINE OF STUART STREET BEYOND
TURNPIKE ACCESS RAMP
FUTURE DEVELOPMENT
40 TRINITY PLACE
MECHANICAL
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
MECHANICAL TRANSFER LEVEL
9
298'-0"
EXISTING GARAGE - PARKING 8
EXISTING GARAGE - PARKING 7
EXISTING GARAGE - PARKING 6
EXISTING GARAGE - PARKING 5
EXISTING GARAGE - PARKING 4
EXISTING GARAGE - PARKING 3
EXISTING GARAGE - PARKING 2
EXISTING GARAGE - PARKING 1
EXISTING I-90 ACCESS RAMP BEYOND
GARAGE WEST LOBBY EL 18'-0"
MASS TURNPIKE EL 6'-0"
BOSTON CITY BASE EL 0'-0"
1 2 3 4 5 6
G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22

0 32 64 Feet

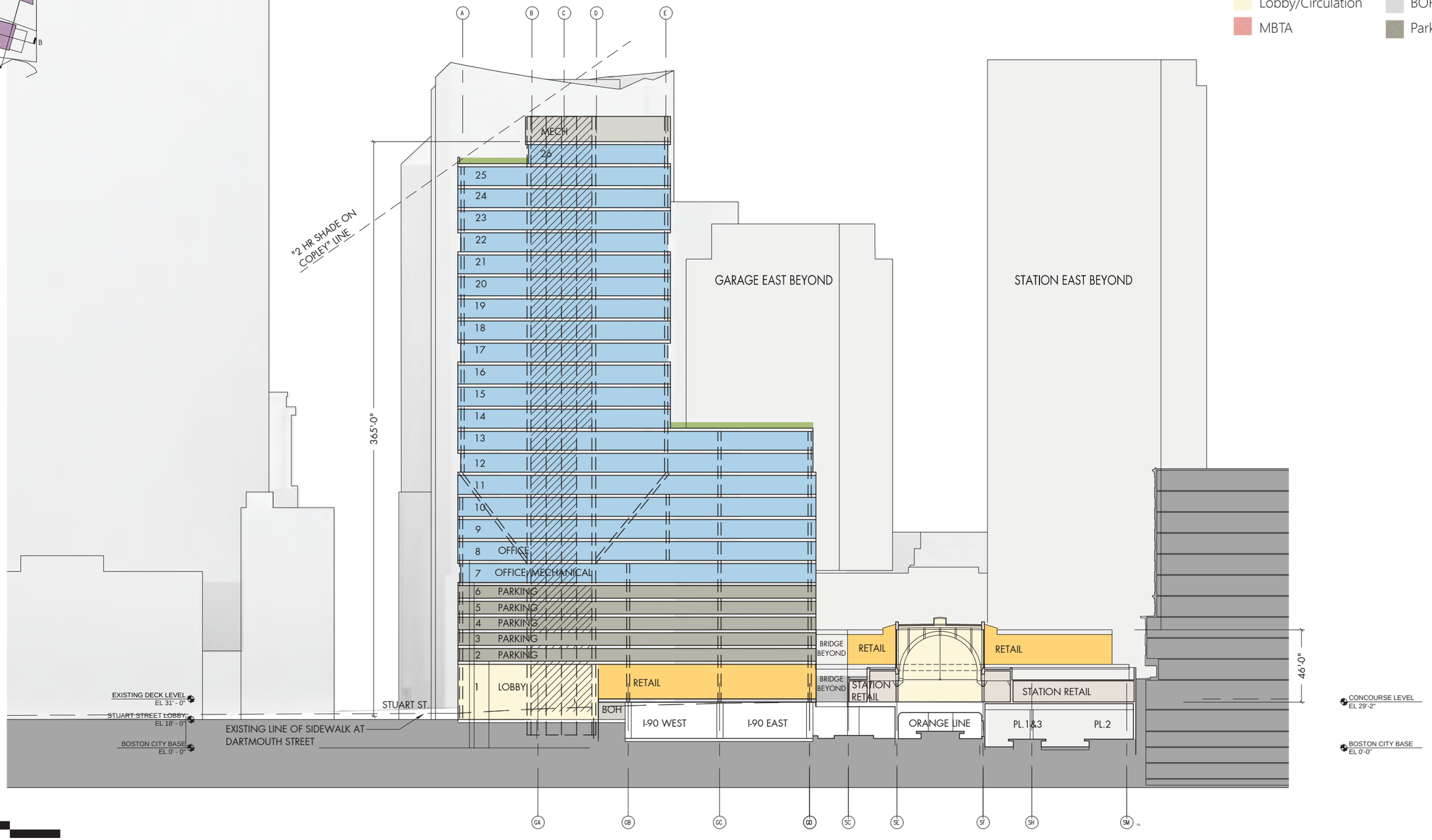
THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION D-D
GARAGE WEST BASE SCHEME

Figure 2.3d



Commercial
Residential
Lobby/Circulation
MBTA
Retail
Station Retail
BOH/Mechanical
Parking/Loading



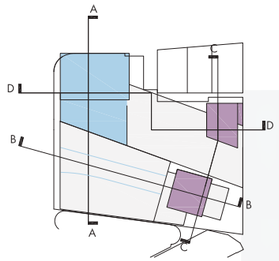
0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION A-A
GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME

Figure 2.3e

ARROWSTREET



Commercial
Residential
Lobby/Circulation
Retail
BOH/Mechanical
Parking/Loading

MECH
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8 OFFICE
7 OFFICE
MECHANICAL
6 PARKING
5 PARKING
4 PARKING
3 PARKING
2 PARKING
1 RETAIL
RETAIL THROUGH-BLOCK CONNECTION
BOH
LOADING
365'-0"

FUTURE DEVELOPMENT
40 TRINITY PLACE

MECHANICAL
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
MECHANICAL TRANSFER LEVEL
9
298'-0"

EXISTING GARAGE - PARKING 8
EXISTING GARAGE - PARKING 7
EXISTING GARAGE - PARKING 6
EXISTING GARAGE - PARKING 5
EXISTING GARAGE - PARKING 4
EXISTING GARAGE - PARKING 3
EXISTING GARAGE - PARKING 2
EXISTING GARAGE - PARKING 1

DECK LEVEL EL 31' - 0"
STUART STREET LOBBY EL 18' - 0"
BOSTON CITY BASE EL 0' - 0"
DARTMOUTH STREET
LINE OF STUART STREET BEYOND
CLARENDON STREET
GARAGE WEST LOBBY EL 18'-0"
MASS TURNPIKE EL 6'-0"
BOSTON CITY BASE EL 0'-0"

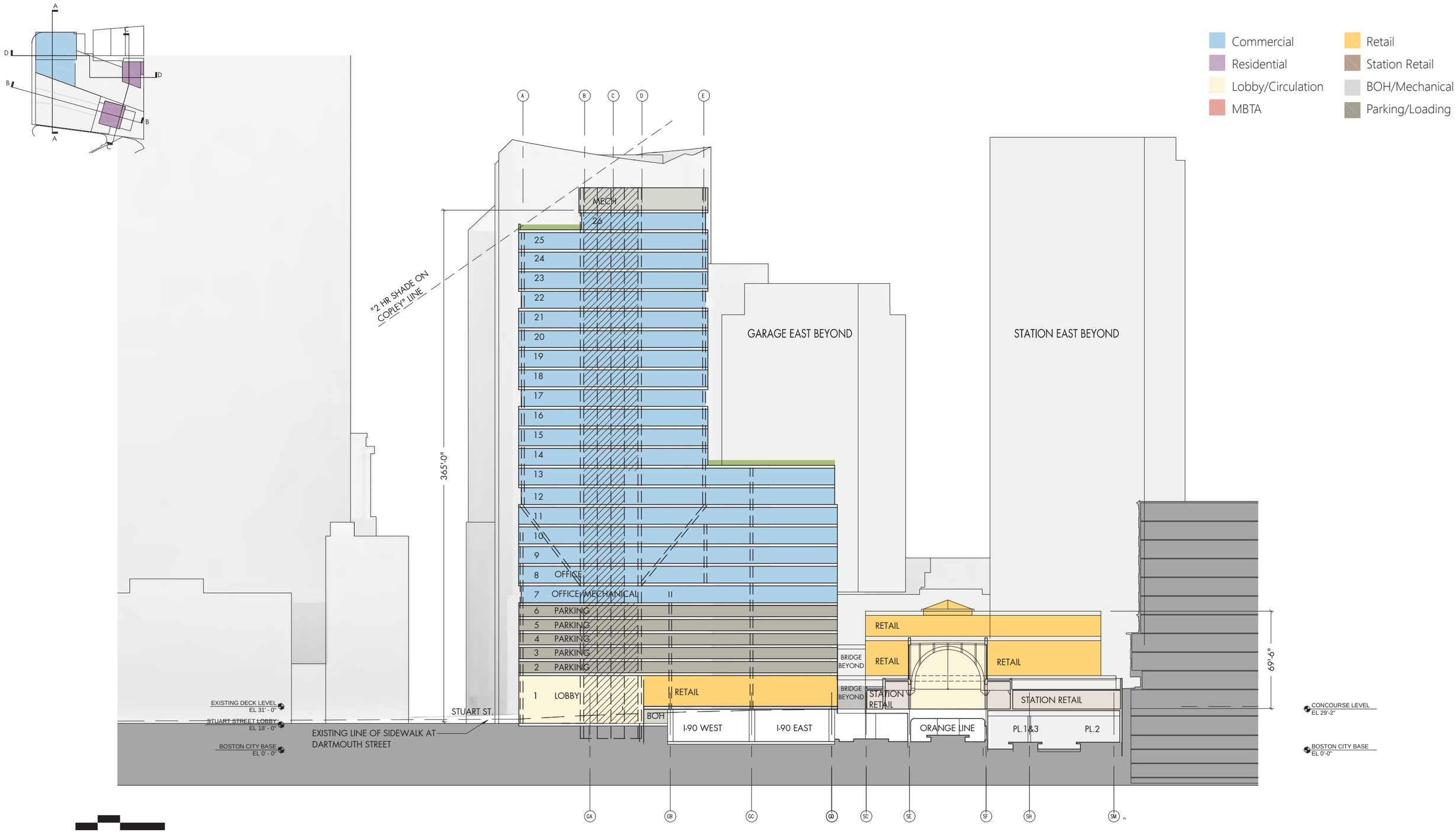
1 2 3 4 5 6
G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11 G12 G13 G14 G15 G16 G17 G18 G19 G20 G21 G22

0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION D-D
GARAGE WEST ALTERNATE SCHEME

Figure 2.3f

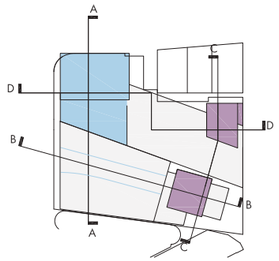


THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SECTION A-A
GARAGE WEST ALTERNATE SCHEME + STATION WEST ALTERNATE SCHEME

Figure 2.3g

ARROWSTREET



Commercial
Residential
Lobby/Circulation
Retail
BOH/Mechanical
Parking/Loading

GARAGE WEST BEYOND

MECHANICAL/ROOF DECK
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17 MECHANICAL/RES
16
15
14
13
12
11
10
9
8
7
6
5
4
3 AMENITY FLOOR

388'-0"

RETAIL
RETAIL BEYOND
BRIDGE
BRIDGE
69'-6"
STRUCTURAL / MECHANICAL
RETAIL
RETAIL
RESIDENTIAL LOBBY / STATION ACCESS
ORANGE LINE ACCESS
40'-0"
DROP OFF
CLARENDON STREET
OPEN TO TRACKS BELOW
COLUMBUS AVENUE
DARTMOUTH STREET
BACK BAY STATION
CONCOURSE LEVEL
EL 29'-2"
STATION EAST DECK
EL 29'-0"
ORANGE LINE PLATFORM
BOSTON CITY BASE
EL 0'-0"
BOSTON CITY BASE
EL 0'-0"

1 2 3 4 5
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16

0 32 64 Feet

THE BACK BAY / SOUTH END GATEWAY PROJECT

BOSTON PROPERTIES

SECTION B-B
STATION WEST ALTERNATE SCHEME

Figure 2.3h

ARROWSTREET

COPLEY SQUARE ST JAMES AVE STUART STREET GARAGE WEST STATION WEST

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

ELEVATION - DARTMOUTH STREET
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME

Figure 2.4a

ARROWSTREET

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

ELEVATION - STUART STREET
GARAGE WEST BASE SCHEME

Figure 2.4b

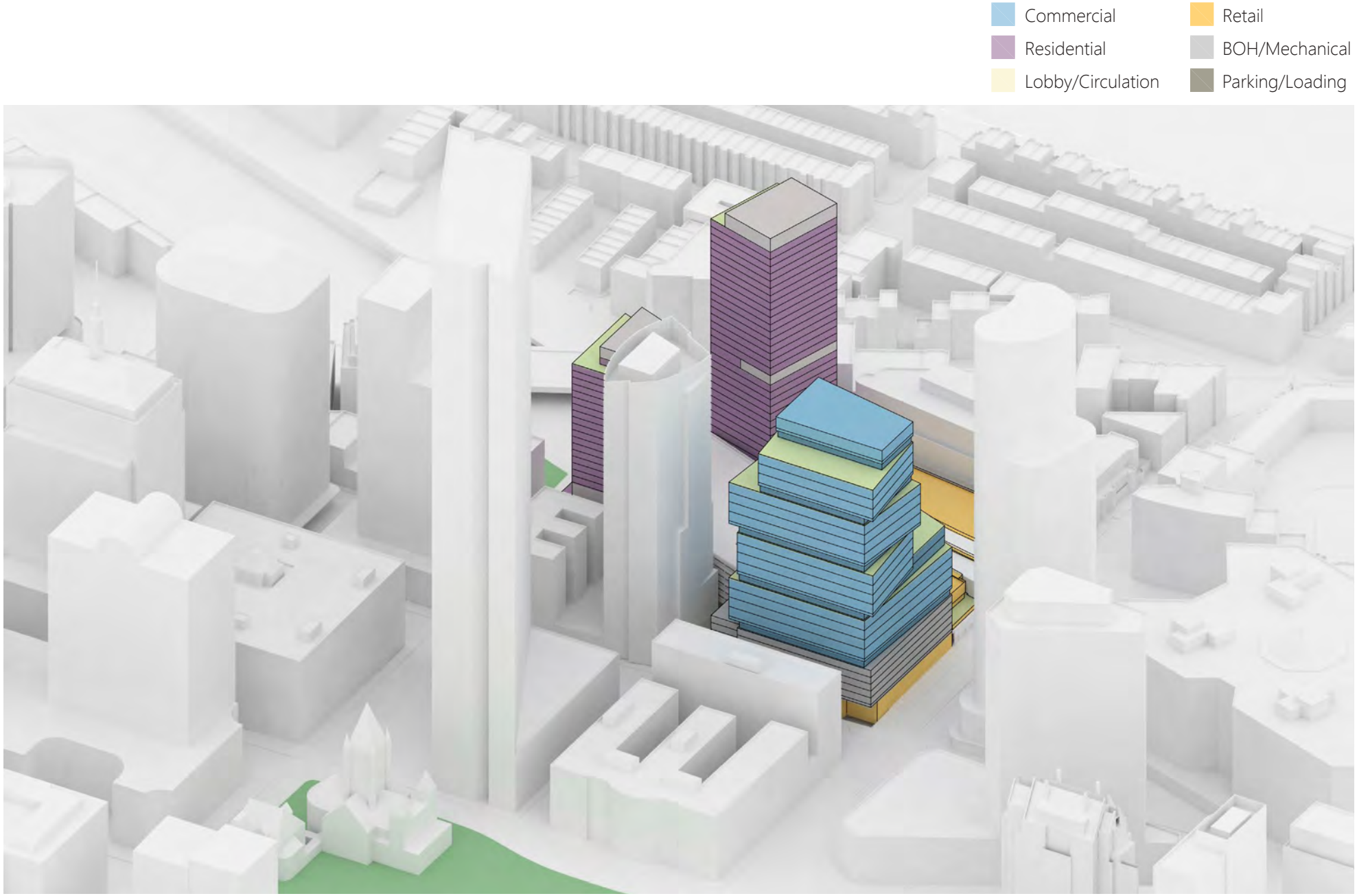
ARROWSTREET

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

ELEVATION - CLARENDON STREET

Figure 2.4c

ARROWSTREET



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

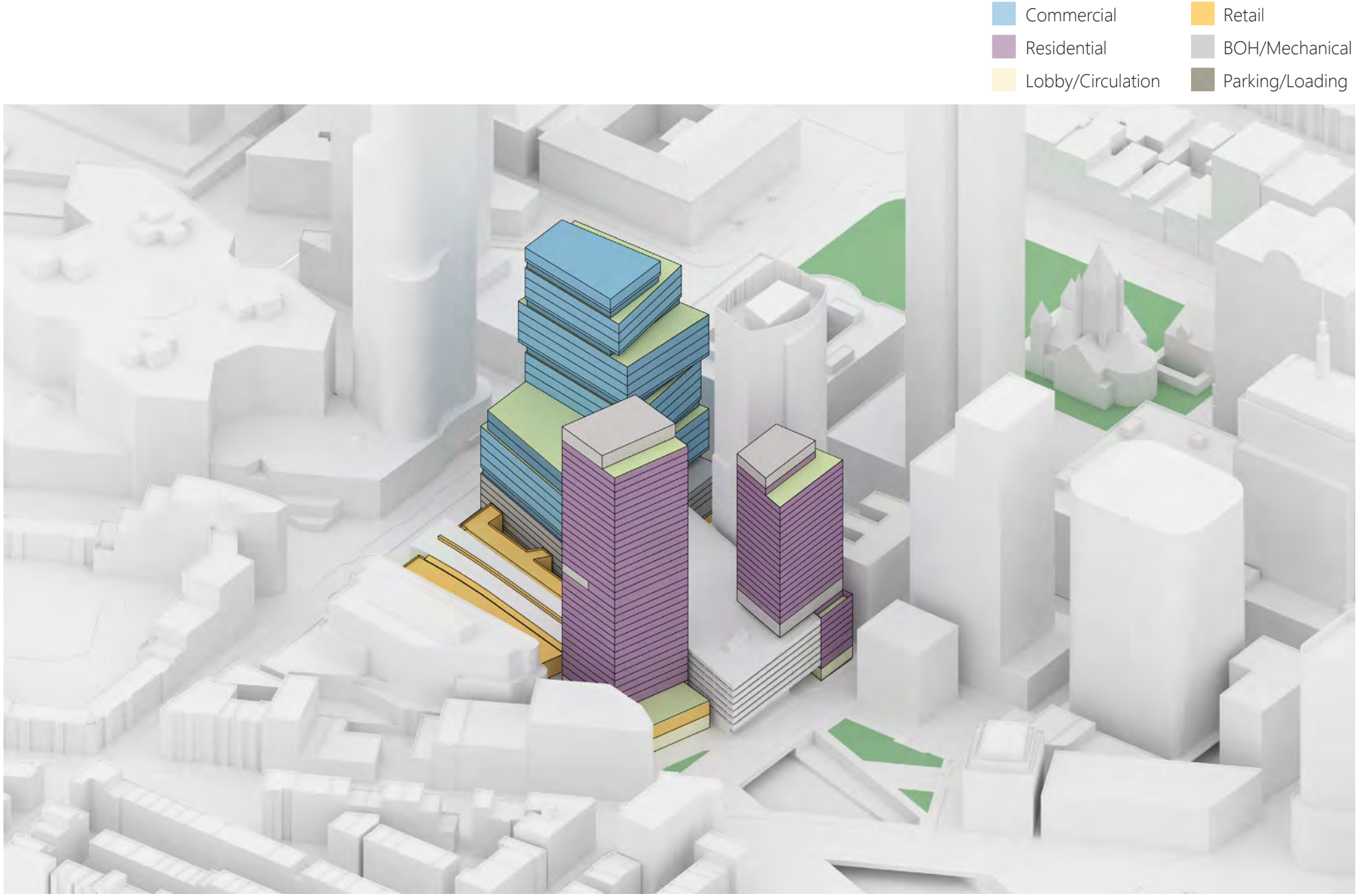
VIEW TO THE SOUTHEAST
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME

Figure 2.5a

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW TO THE NORTHEAST
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME

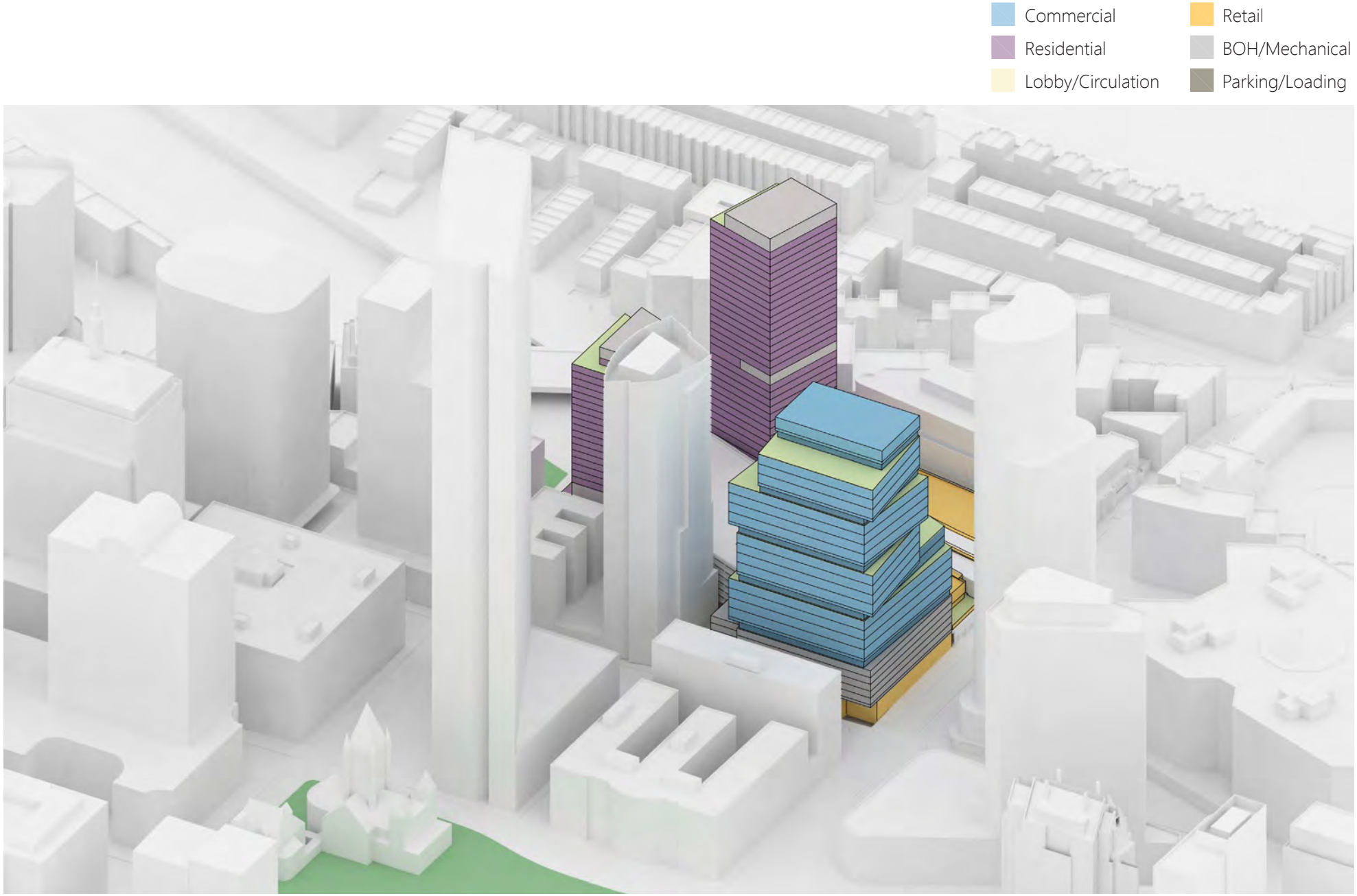
Figure 2.5b



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW TO THE NORTHWEST
GARAGE WEST BASE SCHEME + STATION WEST BASE SCHEME

Figure 2.5c



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

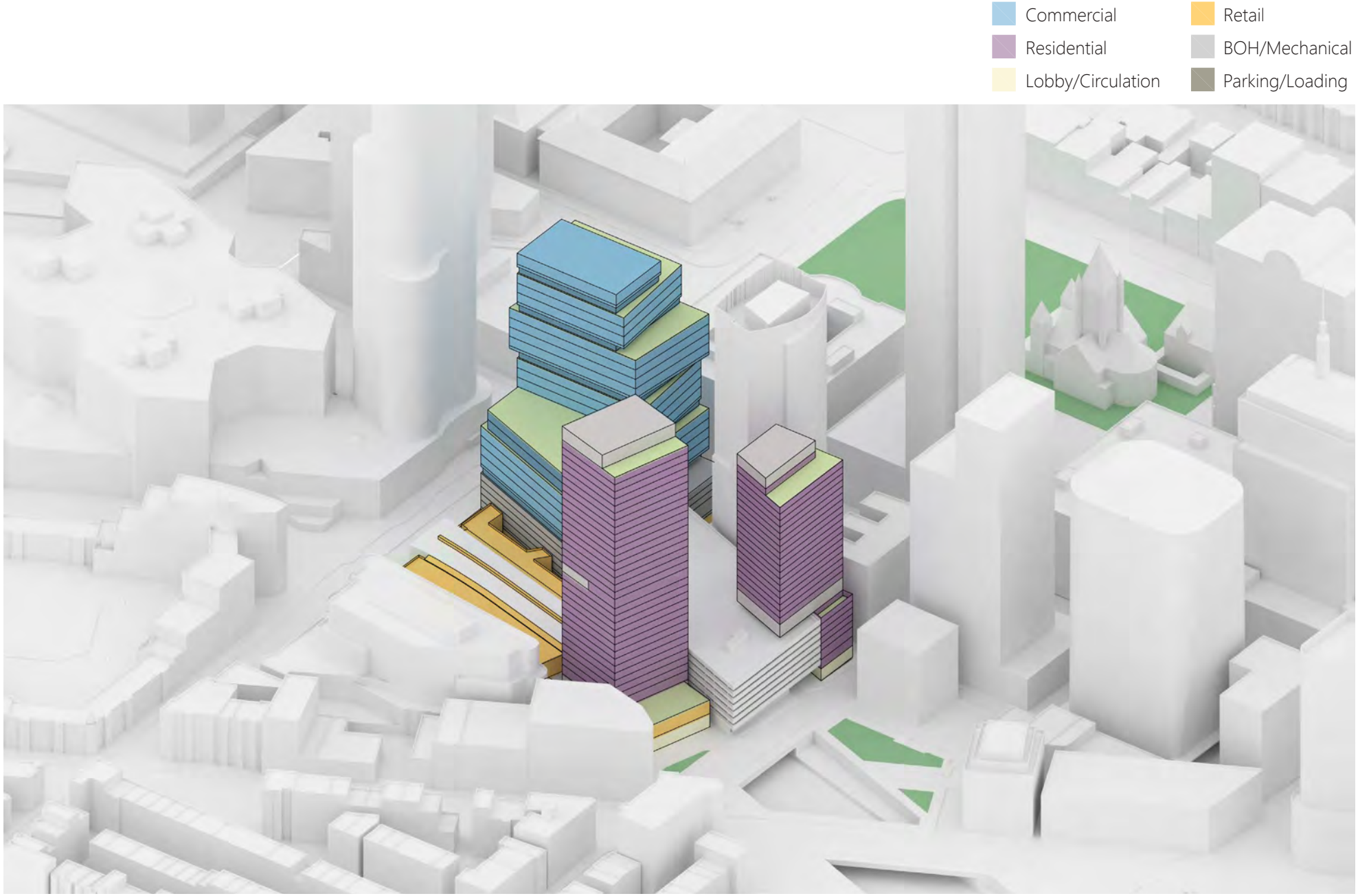
VIEW TO THE SOUTHEAST
GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME

Figure 2.5d

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW TO THE NORTHEAST
GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME

Figure 2.5e



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

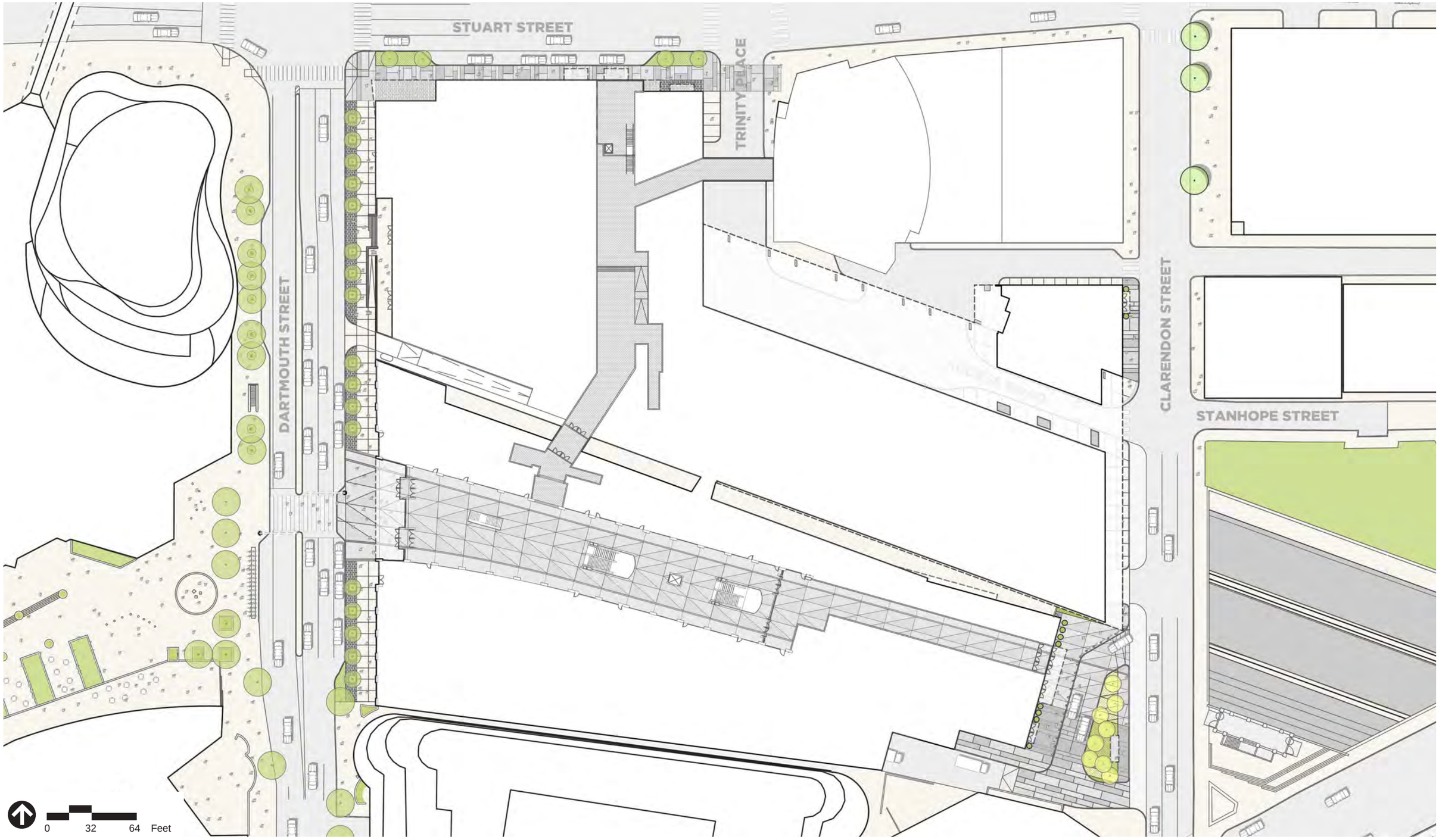
VIEW TO THE NORTHWEST
GARAGE WEST ALTERNATE SCHEME + STATION WEST BASE SCHEME

Figure 2.5f

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

VIEW TO THE NORTHEAST
GARAGE WEST ALTERNATE SCHEME + STATION WEST ALTERNATE SCHEME

Figure 2.5g



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

LANDSCAPING PLAN
GARAGE WEST BASE SCHEME

Figure 2.6a

OJB
LANDSCAPE ARCHITECTURE

STUART STREET
TRINITY PLACE
DARTMOUTH STREET
CLARENDON STREET
STANHOPE STREET
0 32 64 Feet

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

LANDSCAPING PLAN
GARAGE WEST ALTERNATE SCHEME

Figure 2.6b

OJB
LANDSCAPE ARCHITECTURE

3

Sustainability and Green Building

This chapter provides preliminary information regarding the Project's sustainability, green building and climate resiliency strategies. It identifies the proposed US Green Building Council's ("USGBC") Leadership in Energy and Environmental Design® ("LEED") rating system and outcome, describes building-specific strategies for each LEED category and explains how key credits may be achieved. It also discusses a framework for considering present and future climate conditions in design of the Project.

3.1 Introduction

Under MEPA, the Project is considered a "redevelopment" project, offering the benefit of reusing and adapting an existing urban site. The Proponent is committed to building a livable, sustainable and forward-thinking Project, and has a proven track record of being a regional leader in developing sustainable commercial real estate, including: 77 4th Avenue in Waltham, the first speculative green office building in New England (LEED Gold); Atlantic Wharf, the first green skyscraper in Boston (LEED Platinum); and, 888 Boylston Street, currently under construction (LEED Platinum Anticipated).

The Project aims to:

- Revitalize an underutilized urban site by using land efficiently.
- Improve pedestrian access and encourage the use of multimodal, low emissions transportation.
- Promote health and wellness with green infrastructure to support walkability and improve air and water quality.
- Exceed minimum energy performance requirements.
- Incorporate clean and renewable energy sources to the extent feasible.
- Minimize impact on municipal water supply by reducing potable water consumption.
- Minimize impacts on stormwater systems and improve stormwater and effluent quality.
- Efficiently use materials and resources during construction and in operation.

The Project Team will use the USGBC's LEED rating system as a model for incorporating sustainable design strategies into the Project, and will also study the feasibility of implementing features of the International WELL Building Institute's (IWBI) WELL Building Standard, which seeks to optimize indoor environments for occupant health and wellbeing. As the Project's design progresses, the Proponent will continue to research and consider additional green building strategies. Where appropriate, for each Air Rights Development Parcel, green strategies for the operation of each parcel will be implemented on a parcel by parcel basis.

3.2 Key Findings and Benefits

- Sustainability is a key principle of the Project as it revitalizes an underutilized urban site, uses land efficiently by increasing density in proximity to public transportation, and encourages the use of alternative modes of transportation.
- In addition to compliance with Article 37, the Project will certify each building under the LEED rating system which provides verification of green building design.
- Verification and benchmarking of ongoing energy and water performance will also be possible through the enrollment of each building in ENERGY STAR Portfolio manager and EnerNOC's Energy Intelligence Software (EIS) platform.
- By utilizing sustainable design strategies and exceeding Code-required performance minimums, the Project will maximize the conservation of energy, water and other resources and minimize impacts to regional infrastructure and water resources.
- The Project will investigate the feasibility of clean and renewable energy sources, including photovoltaic panels, wind turbines, and a cogeneration system.
- Through the incorporation of a variety of sustainable design strategies, the Project will promote health and wellness, assist in improving air and water quality, and reduce the urban heat island effect.
- By designing for resilience, the Project seeks to integrate climate change adaptations that reduce vulnerability given future climate scenarios and natural events such as flooding, severe precipitation and heat.

3.3 Regulatory Context

Article 37 Green Buildings

Through Article 37 – Green Buildings, the City of Boston encourages major building projects to be "planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston." Any project that is subject to Article 80, Large Project Review is also subject to the requirements of Article 37.

An interdisciplinary committee, the "Boston Interagency Green Building Committee," consisting of at least one representative from certain city agencies, including the BRA, Boston

Environment Department ("BED"), BTD, the Inspectional Services Department and the Mayor's Office advises the BRA on a proposed project's compliance with Article 37.

Appendix A of Article 37 lists "Boston Green Building Credits," which are credits that may be included in the calculation toward achieving a LEED certifiable project. These credits were developed by the City and are intended to address local issues unique to development within Boston. The credits include the following categories: Modern Grid; Historic Preservation; Groundwater Recharge; and Modern Mobility.

Massachusetts Stretch Energy Code

As part of the Green Communities Act of 2008, Massachusetts developed an optional building code, the "Stretch Energy Code", which gives cities and towns the ability to choose stricter energy performance in buildings than the state building code. Codified by the Board of Building Regulations and Standards as 780 CMR Appendix 115.AA of the Massachusetts Building Code, the Stretch Energy Code is an appendix to the Massachusetts Building Code, based on further amendments to the International Energy Conservation Code ("IECC").[1] The Stretch Energy Code increases the energy efficiency requirements for new construction in municipalities that adopt it. For the City of Boston, the Stretch Energy Code was adopted and became mandatory on July 1, 2011.

The Stretch Energy Code will be revised when the 9th edition of the IECC is adopted by Massachusetts, which is expected to be on July 1, 2016, with a six month concurrency period. The revised Stretch Energy Code will be incorporated in to the Massachusetts Building Code (780 CMR) in Appendix 115.AA. It will require that all new buildings over 100,000 square feet and new supermarkets, laboratories, and conditioned warehouses over 40,000 square feet demonstrate energy use per square foot of at least 10 percent below the energy requirements of ASHRAE 90.1-2013 Appendix G Performance Rating Method on either a site or source energy basis. Given the anticipated adoption of the revised Stretch Energy Code in 2016, the Project incorporates these new requirements in its basis of design.

3.4 Sustainability Approach

The Project incorporates a holistic approach to sustainability that promotes livability and economic development, while simultaneously mitigating the external impacts of energy, water, waste, and emissions. It seeks to track sustainable features and demonstrate compliance with Article 37 through the LEED rating system, for which the Project will register under the current 2009 version.

1 The International Energy Conservation Code (IECC) is a building energy code created by the International Code Council. It is a model code adopted by many state and municipal governments in the United States for the establishment of minimum design and construction requirements for energy efficiency, and is updated on a three year cycle. On July 1, 2016, Massachusetts is expected to adopt the 9th edition of the international building energy code, IECC 2015, with Massachusetts amendments as approved by the Board of Building Regulations and Standards.

In addition, consideration will be given to studying the following sustainability strategies:

- Minimized impact on the grid by exceeding minimum energy use performance requirements, incorporating a demand response capable of minimizing electricity use during peak periods, incorporating on-site energy storage and designing efficient HVAC systems, as further described in Section 3.4.3.
- Incorporation of clean and renewable energy sources, including photovoltaic panels, wind turbines and a cogeneration system, to the extent feasible.
- Incorporation of high efficiency lighting, maximizing LED integration and lighting power density reduction.
- Minimized impact on municipal water supply by reducing potable water consumption through low-flow fixtures and the use of non-potable water for irrigation or no permanent irrigation system.
- Minimized impact on stormwater systems and regional water resources through treatment and groundwater recharge, as described in Chapter 6.
- Strategies for rainwater harvesting will be explored for potential implementation in order to further reduce domestic water usage and stormwater runoff.
- Incorporation of green roofs, where feasible, to help reintroduce habitat, minimize stormwater run-off and mitigate the heat island effect.
- Mitigation of the heat island effect through use of hardscape materials with a low solar reflectance.
- Verification and benchmarking of ongoing energy and water performance by enrolling buildings in ENERGY STAR Portfolio Manager and EnerNOC's EIS platform
- Reduced emissions from vehicles through prioritizing parking from low-emitting and fuel efficient vehicles and providing bicycle storage.
- Efficient use of materials and resources during construction and in operation to be achieved from the use of materials with high recycled content and/or regionally sourced materials.
- Maximized diversion rate of construction waste from landfills.
- Implementation of an ongoing recycling strategy that addresses multiple waste streams.
- Good indoor air quality through demand controlled ventilation and use of interior finish materials that are low-emitting and/or do not off-gas VOCs.
- Consideration of user thermal comfort and reduced glare by designing facades based on their solar orientation.
- Maximized exterior views and daylighting through the use of approximately 65% vision glass in commercial areas and 55% vision glass in residential areas.
- WELL Building Standard feasibility assessment.
- Mitigation of the impact of climate change, e.g. flood, precipitation and heat, through designing for resilience.

3.4.1 Preliminary Energy Model

The preliminary energy model demonstrates energy use reduction in compliance with the to-be-adopted Stretch Energy Code, (referencing ASHRAE 90.1-2013), as well as energy cost savings from ASHRAE 90.1-2007, which is the baseline referenced in LEED 2009. The preliminary results are below:

TABLE 3.4-1 PRELIMINARY ENERGY MODEL RESULTS

	EUI (kBtu / sf-year)	% Energy Use Savings [Energy Code]	% Energy Cost Savings [ASHRAE 90.1-2007 LEED 2009 Baseline]
Office (Garage West)	61	21% (90.1-2013 Stretch Code)	24%
Residential (Garage East / Station East)	63	20% (90.1-2013 Stretch Code)	19%
Retail (Station West)	120-220	Complies (90.1-2013 Chapter 11 Energy Cost Budget Method)	14%
Combined	63-65	20% (90.1-2013 Stretch Code)	21%

3.4.2 Energy Efficiency Measures

The energy savings calculated in the preliminary energy model were based on several key energy conservation measures for the Project.

For the office building at Garage West Parcel, modeled energy conservation measures include:

- High efficiency condensing boilers to meet space heating demands
- Dedicated outside air system with energy recovery
- Floor-by-floor VAV reheat units serving chilled beams
- Premium efficiency water-cooled chiller plant with variable frequency drives
- Low lighting power densities to be achieved from efficient LED lighting

For the residential buildings at Garage East and Station East Parcels, modeled energy conservation measures include:

- High efficiency vertical stacked water source heat pumps connected to condensing boilers and cooling towers
- High efficiency condensing boilers to meet space heating and domestic hot water demands
- Dedicated outside air system with energy recovery serving heat pumps

For the retail building at the Station West Parcel, modeled energy conservation measures include:

- High efficiency condensing boilers for meeting space heating demands
- Premium efficiency cooling towers with variable frequency drives
- 46% window to wall ratio with insulated shadow box or spandrel
- 15% skylight to roof ratio

As the Project's design develops, the Project Team will consider further load reduction where possible through additional strategies such as mixed-mode ventilation and highly insulated envelopes. While the energy strategy for each Air Rights Development Parcel is being developed independently, the Project will also consider how cogeneration could be implemented as an efficient energy source that improves overall operating efficiency by recovering waste heat. To maximize its feasibility cogeneration will be analyzed for site-wide implementation at the full build condition. If cogeneration is deemed feasible at the site-wide level, each Parcel could be designed to be future-ready for implementation when the development of all Air Rights Development Parcels is complete.

3.4.3 Clean and Renewable Energy Analysis

Where feasible, clean and renewable energy systems will be considered based on strategic and site specific analysis to minimize the environmental impact of the Project. Consideration will also be given to financial metrics such as return on investment as part of a triple bottom line approach to sustainability.

To assess the potential of implementing renewable energy, consideration will be given to both solar photovoltaic panels and wind. In exploring the feasibility of using photovoltaic panels, the Project Team will consider the roof surfaces available and calculate the potential for energy generation for several different types of solar technologies based on local weather. For wind, the team will consider building-integrated wind turbines and estimate their potential to generate energy based on an analysis of wind site conditions.

3.4.4 LEED Certification

The Proponent intends to register and certify each of the four Air Rights Development Parcels under the appropriate LEED rating system. **Table 3.4-2** shows which LEED version will be pursued for each of the Parcels, as well as their preliminary rating at this early stage of design. As the Project design advances, it is anticipated that additional credits may be confirmed, allowing for the rating levels to be maximized.

TABLE 3.4-2 LEED RATING SCHEMES BY PARCEL

Parcel	LEED Rating System	Preliminary Rating
Garage West Parcel	LEED 2009 for Core and Shell	Gold
Garage East Parcel	LEED 2009 for New Construction and Major Renovations	Silver
Station East Parcel	LEED 2009 for New Construction and Major Renovations	Silver
Station West Parcel	LEED 2009 for Core and Shell	Silver

Preliminary LEED scorecards have been prepared for each of the Air Rights Development Parcels and the results are presented in **Figure 3.1a-d**. **Table 3.4-3** below provides a summary of LEED compliance for each of the credit categories for the Project.

TABLE 3.4-3 LEED SUMMARY TABLE

	GARAGE WEST PARCEL	GARAGE EAST PARCEL	STATION EAST PARCEL	STATION WEST PARCEL
Sustainable Sites	- Located in a dense, urban area - Well served by multi-modal public transport - Stormwater quantity and quality control - Minimizes heat island effect through material selection	- Located in a dense, urban area - Well served by multi-modal public transport - Stormwater quantity and quality control - Minimizes heat island effect through material selection	- Located in a dense, urban area - Well served by multi-modal public transport - Stormwater quantity and quality control - Minimizes heat island effect through material selection	- Located in a dense, urban area - Well served by multi-modal public transport - Stormwater quantity and quality control - Minimizes heat island effect through material selection
Water Efficiency	- Water efficient Landscaping - Low-flow fixtures	- Water efficient Landscaping - Low-flow fixtures	- Water efficient Landscaping - Low-flow fixtures	- Water efficient Landscaping - Low-flow fixtures
Energy and Atmosphere	- High efficiency mechanical equipment with condensing boilers, active chilled beams, dedicated outside air, and heat recovery - Low lighting power densities to be achieved from efficient LED lighting - Efficient building envelope	- High efficiency mechanical equipment including condensing boilers, a water-cooled chiller plant, dedicated outside air, and heat recovery - Operable windows - Efficient building envelope	- High efficiency mechanical equipment including condensing boilers, a water-cooled chiller plant, dedicated outside air, and heat recovery - Operable windows - Efficient building envelope	- High efficiency mechanical equipment with heat recovery - Low lighting power densities to be achieved from efficient LED lighting - Efficient building envelope
Materials and Resources	- High landfill diversion rate - Materials with high recycled content and regionally sourced	- High landfill diversion rate - Materials with high recycled content and regionally sourced	- High landfill diversion rate - Materials with high recycled content and regionally sourced	- High landfill diversion rate - Materials with high recycled content and regionally sourced

Indoor Environmental Quality	- Minimized glare through high performance façade - Good indoor air quality through demand controlled ventilation and low VOC materials -Maximized views and daylighting	- Minimized glare through high performance façade - Good indoor air quality through demand controlled ventilation and low VOC materials -Maximized views and daylighting	- Minimized glare through high performance façade - Good indoor air quality through demand controlled ventilation and low VOC materials -Maximized views and daylighting	- Good indoor air quality through demand controlled ventilation and low VOC materials
Innovation and Design Process	- Resilient design - Exemplary performance in development density and connection to public transit - Green cleaning policy	- Resilient design - Exemplary performance in development density and connection to public transit - Green cleaning policy	- Resilient design - Exemplary performance in development density and connection to public transit - Green cleaning policy	- Resilient design - Exemplary performance in development density and connection to public transit - Green cleaning policy
Regional Priority Credits	- Reduction in quantity of stormwater runoff - Reduction in heat island effect for both the roof and hardscaped areas (non-roof)	- Reduction in quantity of stormwater runoff - Reduction in heat island effect for both the roof and hardscaped areas (non-roof)	- Reduction in quantity of stormwater runoff - Reduction in heat island effect for both the roof and hardscaped areas (non-roof)	- Reduction in quantity of stormwater runoff - Reduction in heat island effect for both the roof and hardscaped areas (non-roof)

3.5 Climate Change Preparedness and Resiliency

As required for all Large Project Review projects, the Project Team has considered anticipated changes in climate and completed the BRA Climate Change Resiliency and Preparedness Checklist, which is provided in Appendix C.

The checklist reflects the commitment of the Proponent to mitigate the impacts of climate change by considering a variety of strategies including:

- Low-carbon building design achieved through passive strategies;
- Energy-efficient equipment;
- Back-up generators that can provide power to critical systems;
- On-site renewable energy;
- High albedo materials that minimize the urban heat-island effect;
- Rainwater harvesting to accommodate increased rain fall; and
- Fortification of structure and utilities against extreme storm events.

The Project seeks to adopt resilient design best practices, which requires planning today for the future risks of climate change. The Project will be designed for climate change preparedness, rising sea levels, more frequent severe storms, and more weather events. The following sections further describe how climate change has been considered in the early stages of the Project's design.

3.5.1 Flood Hazard

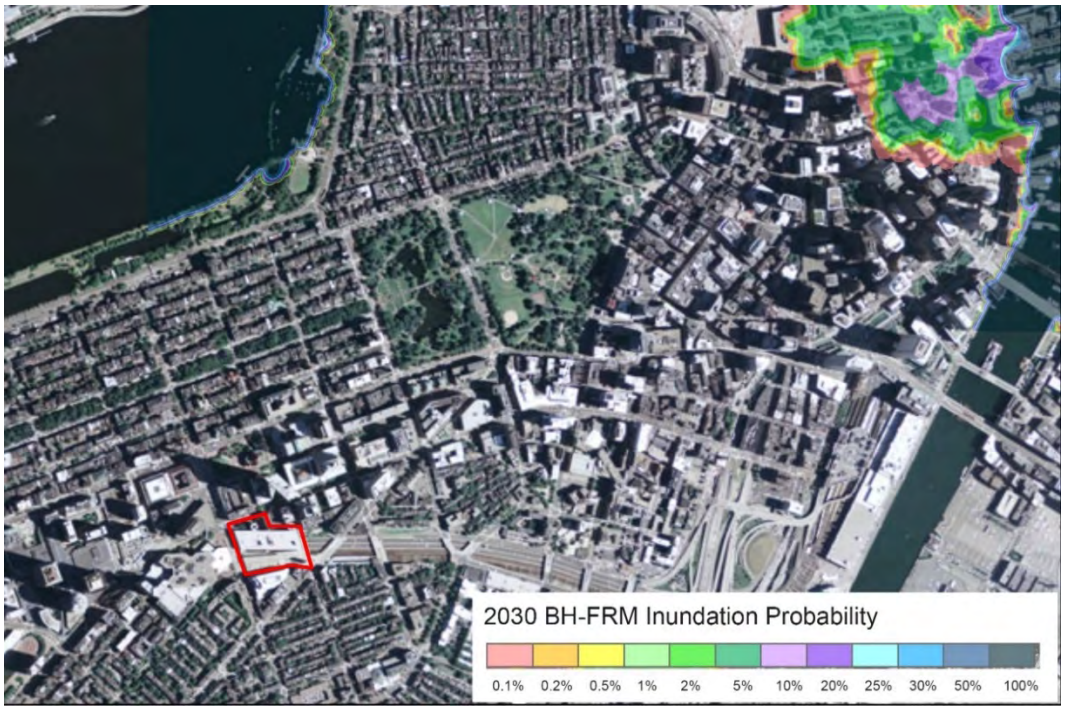
Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), for Suffolk County, the Project Site is not located in a current special flood hazard area, floodway area, or other flood area.

3.5.2 Addressing Sea Level Rise

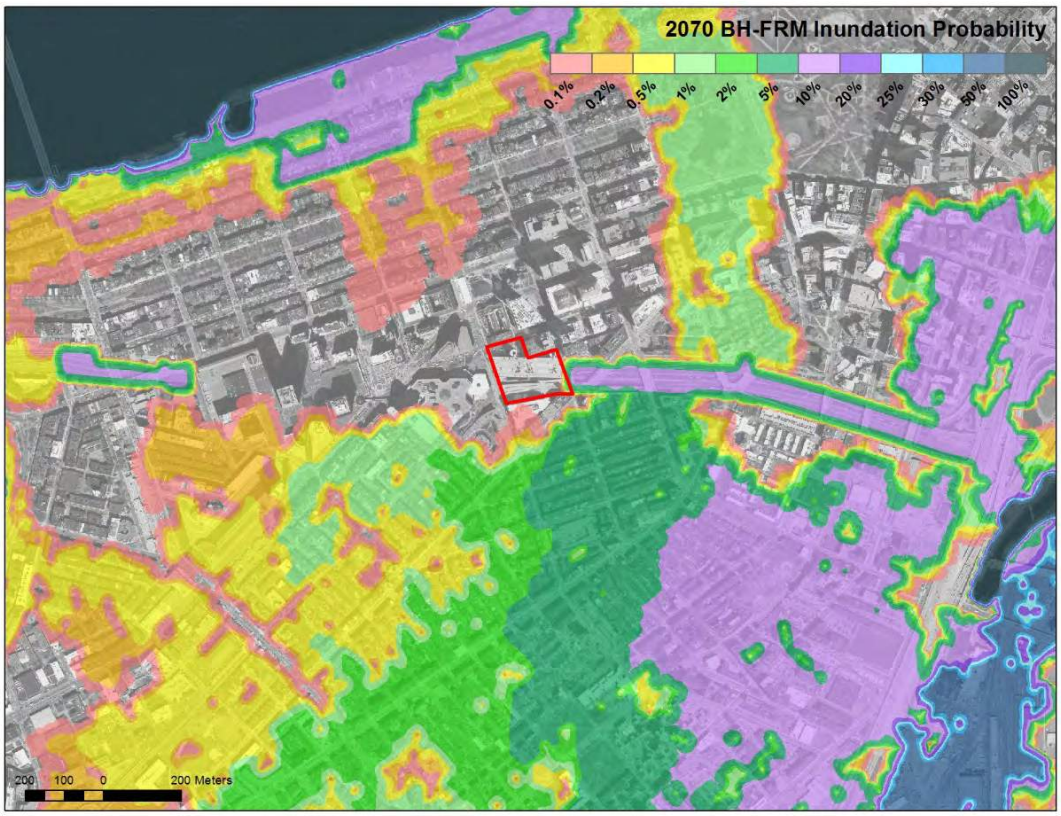
The potential results of climate change, including rising sea levels and more frequent extreme storms increase the probability of coastal and riverine flooding and enlarge the 100-year floodplain. Utilizing the Coastal Flood Exceedance maps published in the *MassDOT-FHWA Pilot Project Report: Climate Change and Extreme Weather, Vulnerability Assessments and Adaptation Options for the Central Artery/Tunnel (June 2015)*, the Project Site is not at high risk of inundation from sea level rise during its design life.

The following two maps show the 2030 (top) and 2070 (bottom) inundation probabilities from the high emissions scenario of the same flood risk model, developed by the Woods Hole Group. These maps show that there will be no flooding due to sea level rise in 2030 at or near the Project Site. In 2070, the projections also show minimal risk to the Project Site despite the potential flooding of I-90 which could result in severe flooding of regional transportation systems. To protect against flood risk, however minimal, the Project is studying locating critical

building systems above grade and may consider the possibility of implementing flood barriers, if necessary, at the appropriate future time.



2030 Inundation Probability



2070 Inundation Probability

3.5.3 Addressing Extreme Weather Events

Climate change is expected to result in more extreme weather events, including higher year round average temperatures, higher peak temperatures, and increased periods of extended peak temperatures. The Project will study the feasibility of implementing the following non-mechanical strategies to support building functionality and use during an extended interruption of utility services and infrastructure:

- Optimized solar orientation;
- Operable windows for natural ventilation in residential areas;
- Water storage capacity; and
- High performance building envelopes.

As detailed in Section 3.4.1, the preliminary energy modeling for the Project indicates energy savings above and beyond the minimum required by the new Stretch Energy Code. By reducing energy demand, the Project will reduce its GHG emissions associated with the building energy sources for both current and future weather and thereby reduce its impact on climate change.

The Project has taken specific measures to manage stormwater and protect against extreme conditions. The Project will investigate minimizing the risk of inundation in the event of extreme rain events through strategies such as on-site retention systems, infiltration galleries and areas, vegetated roofs, and rainwater harvesting.

Additionally, to protect against high winds, the Project has a hardened building structure and infrastructure, buried utilities, and protective landscapes.

LEED 2009 for Core and Shell Development

Project Checklist

Project Dartmouth: Garage West

Y	?	N			
24	2	2	**Sustainable Sites**	Possible Points:	**28**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
2			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	2
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
1			Credit 9	Tenant Design and Construction Guidelines	1
6	4		**Water Efficiency**	Possible Points:	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
4			Credit 3	Water Use Reduction	2 to 4
18	6	12	**Energy and Atmosphere**	Possible Points:	**37**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
9	4	8	Credit 1	Optimize Energy Performance	3 to 21
		4	Credit 2	On-Site Renewable Energy	4
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
3			Credit 5.1	Measurement and Verification—Base Building	3
2			Credit 5.2	Measurement and Verification—Tenant Submetering	3
	2		Credit 6	Green Power	2

Y	?	N			
4	4	5	**Materials and Resources**	Possible Points:	**13**
Y			Prereq 1	Storage and Collection of Recyclables	
		5	Credit 1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 5
2			Credit 2	Construction Waste Management	1 to 2
	1		Credit 3	Materials Reuse	1
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Certified Wood	1
6	5	1	**Indoor Environmental Quality**	Possible Points:	**12**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3	Construction IAQ Management Plan—During Construction	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
	1		Credit 6	Controllability of Systems—Thermal Comfort	1
1			Credit 7	Thermal Comfort—Design	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
4	2		**Innovation and Design Process**	Possible Points:	**6**
1			Credit 1.1	Exemplary Performance SSc2 Development Density	1
1			Credit 1.2	Exemplary Performance SSc4.1 Public Transportation	1
	1		Credit 1.3	Exemplary Performance MRc2 Construction Waste Management	1
	1		Credit 1.4	Innovation in Design: Green Building Education	1
1			Credit 1.5	Innovation in Design: Green Cleaning Policy/Program	1
1			Credit 2	LEED Accredited Professional	1
3		1	**Regional Priority Credits**	Possible Points:	**4**
		1	Credit 1.1	On-site renewable energy	1
1			Credit 1.2	Stormwater design - quantity control	1
1			Credit 1.3	Heat island effect - nonroof	1
1			Credit 1.4	Heat island effect - roof	1

Y	?	N			
65	23	21	**Total**	Possible Points:	**110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED 2009 for New Construction and Major Renovations

Project Checklist

Project Dartmouth: Garage East

Y	?	N			
21	3	2	**Sustainable Sites**	Possible Points:	**26**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
	1		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
4	6		**Water Efficiency**	Possible Points:	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4
11	5	19	**Energy and Atmosphere**	Possible Points:	**35**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4	3	12	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
3			Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2
5	5	4	**Materials and Resources**	Possible Points:	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
1	1		Credit 3	Materials Reuse	1 to 2

Y	?	N			
			Materials and Resources, Continued		
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1
9	5	1	**Indoor Environmental Quality**	Possible Points:	**15**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
	1		Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
4	2		**Innovation and Design Process**	Possible Points:	**6**
1			Credit 1.1	Exemplary Performance SSc2 Development Density	1
1			Credit 1.2	Exemplary Performance SSc4.1 Public Transportation	1
	1		Credit 1.3	Exemplary Performance MRc2 Construction Waste Management	1
	1		Credit 1.4	Innovation in Design: Green Building Education	1
1			Credit 1.5	Innovation in Design: Green Cleaning Policy/Program	1
1			Credit 2	LEED Accredited Professional	1
3		1	**Regional Priority Credits**	Possible Points:	**4**
		1	Credit 1.1	On-site renewable energy	1
1			Credit 1.2	Stormwater design - quantity control	1
1			Credit 1.3	Heat island effect - nonroof	1
1			Credit 1.4	Heat island effect - roof	1

Y	?	N			
57	26	27	**Total**	Possible Points:	**110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED 2009 for New Construction and Major Renovations

Project Checklist

Project Dartmouth: Station East

Y	?	N			
21	3	2	**Sustainable Sites**	Possible Points:	**26**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
	1		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
4	6		**Water Efficiency**	Possible Points:	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4
11	5	19	**Energy and Atmosphere**	Possible Points:	**35**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4	3	12	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
3			Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2
5	5	4	**Materials and Resources**	Possible Points:	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
1	1		Credit 3	Materials Reuse	1 to 2

Y	?	N			
			Materials and Resources, Continued		
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1
9	5	1	**Indoor Environmental Quality**	Possible Points:	**15**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
	1		Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
4	2		**Innovation and Design Process**	Possible Points:	**6**
1			Credit 1.1	Exemplary Performance SSc2 Development Density	1
1			Credit 1.2	Exemplary Performance SSc4.1 Public Transportation	1
	1		Credit 1.3	Exemplary Performance MRc2 Construction Waste Management	1
	1		Credit 1.4	Innovation in Design: Green Building Education	1
1			Credit 1.5	Innovation in Design: Green Cleaning Policy/Program	1
1			Credit 2	LEED Accredited Professional	1
3		1	**Regional Priority Credits**	Possible Points:	**4**
		1	Credit 1.1	On-site renewable energy	1
1			Credit 1.2	Stormwater design - quantity control	1
1			Credit 1.3	Heat island effect - nonroof	1
1			Credit 1.4	Heat island effect - roof	1

Y	?	N			
57	26	27	**Total**	Possible Points:	**110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

LEED 2009 for Core and Shell Development

Project Checklist

Project Dartmouth: Station West

Y	?	N			
22	4	2	**Sustainable Sites**	Possible Points:	**28**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
	2		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	2
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
1			Credit 9	Tenant Design and Construction Guidelines	1
5	5		**Water Efficiency**	Possible Points:	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
3	1		Credit 3	Water Use Reduction	2 to 4
9	11	17	**Energy and Atmosphere**	Possible Points:	**37**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4	4	13	Credit 1	Optimize Energy Performance	3 to 21
		4	Credit 2	On-Site Renewable Energy	4
2			Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
3			Credit 5.1	Measurement and Verification—Base Building	3
	3		Credit 5.2	Measurement and Verification—Tenant Submetering	3
	2		Credit 6	Green Power	2

Y	?	N			
3	5	5	**Materials and Resources**	Possible Points:	**13**
Y			Prereq 1	Storage and Collection of Recyclables	
		5	Credit 1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 5
2			Credit 2	Construction Waste Management	1 to 2
	1		Credit 3	Materials Reuse	1
1	1		Credit 4	Recycled Content	1 to 2
	2		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Certified Wood	1
4	7	1	**Indoor Environmental Quality**	Possible Points:	**12**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3	Construction IAQ Management Plan—During Construction	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
	1		Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
	1		Credit 6	Controllability of Systems—Thermal Comfort	1
	1		Credit 7	Thermal Comfort—Design	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
4	2		**Innovation and Design Process**	Possible Points:	**6**
1			Credit 1.1	Exemplary Performance SSc2 Development Density	1
1			Credit 1.2	Exemplary Performance SSc4.1 Public Transportation	1
	1		Credit 1.3	Exemplary Performance MRc2 Construction Waste Management	1
	1		Credit 1.4	Innovation in Design: Green Building Education	1
1			Credit 1.5	Innovation in Design: Green Cleaning Policy/Program	1
1			Credit 2	LEED Accredited Professional	1
3		1	**Regional Priority Credits**	Possible Points:	**4**
		1	Credit 1.1	On-site renewable energy	1
1			Credit 1.2	Stormwater design - quantity control	1
1			Credit 1.3	Heat island effect - nonroof	1
1			Credit 1.4	Heat island effect - roof	1

Y	?	N			
50	34	26	**Total**	Possible Points:	**110**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

4

Transportation and Parking

This chapter provides an overview of the Project's transportation characteristics. In addition, potential impacts, positive and negative, are identified based on preliminary evaluation which will be the subject of detailed analysis to be presented in the DPIR and DEIR based on further discussion with MassDOT and BTD. The following sections describe vehicle and transit site access, Project travel characteristics, trip generation by mode, and parking. In addition, a proposed transportation impact study area for the DEIR and DPIR analyses is identified.

4.1 Introduction

The Project Site is truly transit-oriented, being located directly adjacent to and over the Station with immediate access to multiple public transportation services, including MBTA Commuter Rail, Orange Line and local bus routes, and AMTRAK (see Section 4.4 for details of services). In addition, it enjoys excellent local and regional roadway access due to its central location in Back Bay and the proximity of one ramp from I-90 eastbound and several ramps to I-90 westbound.

The mix of residential, commercial and retail uses in the Project will benefit from excellent transit accessibility, resulting in a high proportion of transit-trips rather than vehicle-trips. Further, the capture of internal trips between different Project uses will result in the reduction of vehicle trips and opportunities to control parking demand through sharing of parking spaces for different users by time of day. Accordingly, no new parking is proposed as part of the Project, and the Garage will maintain the ability to provide up to the existing permitted capacity of 2,013 spaces should it be warranted to meet demand.

Additionally, the Project will implement a robust program of TDM strategies to take full advantage of its multiple mobility options and its synergy with the surrounding vibrant mixed-use neighborhoods. An important component of the TDM plan will be the incorporation of additional bicycle accommodations within the Garage or elsewhere within the Project Site in compliance with BTD guidelines to encourage bicycling, as well as walking, as a strong transportation mode.

4.1.1 I-90 On-Ramp

As described in Section 1.2, the elimination of the existing I-90 On-Ramp located below the Garage West Parcel is being considered due to design and safety issues relating to its merge in the I-90 mainline. Closure of the On-Ramp may be feasible because it is one of three westbound on-ramps to I-90 serving this portion of the Back Bay, and it currently carries approximately 10% of the total daily traffic using the three ramps. Closure of the On-Ramp would require detailed analysis by MassDOT, consultation with the City of Boston and review by the FHWA through the submission of an Interchange Modification Report (IMR).

Although the Garage West Base Scheme assumes that the I-90 On-Ramp remains open, for the purpose of the PNF and ENF, it is prudent to also consider the impacts of the Project in the event that the I-90 On-Ramp is closed. Therefore, the Proponent has developed a Garage West Alternate Scheme. Both the Garage West Base Scheme and the Garage West Alternate Scheme are described in the following sections.

4.2 Key Findings and Benefits

- Through a related project, the Proponent has begun making significant functional and aesthetic improvements to, and has assumed property management responsibilities of, the Station Concourse in an effort to dramatically improve customer experience, comfort, and safety.
- The Project exemplifies transit-oriented development by developing high density housing, retail and office uses above and adjacent to a multi-model transit hub served by multiple public transportation services, including MBTA Commuter Rail, Orange line and local bus routes, and AMTRAK, resulting in a high proportion of transit-trips rather than vehicle-trips.
- The capture of internal trips between different uses will result in the reduction of vehicle trips and opportunities to limit parking through sharing of parking spaces for different users by time of day.
- The Project enjoys excellent local and regional roadway access due to its central location in Back Bay and the proximity of several ramp connections to I-90.
- The Project will incorporate bicycle accommodations in compliance with BTD's guidelines to encourage bicycling, as well as walking, as strong transportation modes.
- The Project will implement a robust program of TDM strategies to take full advantage of its multiple mobility options and its synergy with the surrounding vibrant mixed-use neighborhoods.
- Due to the measures cited above as well as the capacity of the existing Garage and potential modifications to its operations resulting from the Project, no new net parking is proposed as part of the Project.

4.3 Parking Garage Ingress/Egress

The existing parking Garage on the Project Site is served by an entry/exit driveway located on Clarendon Street accessible by all users, and a pair of drum speed-ramps limited to parking pass holders only. The entry drum (located on the Garage West Parcel) is accessed from Stuart Street via Trinity Place, and the exit drum (located on the Garage East Parcel) connects to the MassDOT service road from Clarendon Street (under the Garage), which in turn leads to the I-90 On-Ramp and also connects to Stuart Street via Trinity Place.

The primary routes for users arriving from and departing to the regional roadway network at the existing Garage access points are presented in **Figure 4.1**. As shown, the Project Site benefits from strong connections with I-90 to and from the west. In addition to the locations of its access points, the distribution of Garage trips is significantly influenced by the overall prevailing one-way street circulation in this part of Back Bay and South End.

It is worth noting that the Garage driveway on Clarendon Street, while limited to right-turns because of the one-way direction of Clarendon Street, is normally controlled by a police detail during the weekday evening peak period when most Garage trips are exiting. During the morning peak period, when most Garage trips are entering, a Garage staff member normally controls the driveway. Although there is a need to manage traffic movements at times, the primary reason for manual control is because of the high level of pedestrian activity at the driveway due to its proximity to the Station.

As described in detail in Chapter 2, the entry and exit speed-ramp drums will be eliminated to allow for the development of the Garage West and Garage East Parcels. With the removal of the exit drum when the Garage East Parcel is developed, the direct connection from the Garage to the I-90 On-Ramp is severed, although the I-90 On-Ramp may remain open for traffic accessing it from Clarendon Street, pending potential MassDOT actions regarding the On-Ramp as described above.

With the future Project, the primary routes for users arriving from and departing to the regional roadway network under the Garage West Base Scheme are presented in **Figure 4.2**. As shown, trips currently using the entry drum may continue on Stuart Street and simply turn right on Clarendon Street to access the existing Garage driveway. However, once the Garage East Parcel is developed, vehicles currently using the exit drum will no longer have a direct connection to I-90 and will need to find another route to access I-90 westbound or Trinity Place/Stuart Street. Directing those trips to the existing exit on Clarendon Street would subject them to more circuitous routing to reach both I-90 westbound and Trinity Place/Stuart Street, and may result in additional traffic passing through the South End neighborhood. To address this potential negative impact, the Garage West Base Scheme includes a new exit ramp connection to Dartmouth Street where trips can reach both I-90, via the Huntington Avenue on-ramp, and Trinity Place/Stuart Street directly.

In the Garage West Alternate Scheme, described in detail in Chapter 2, the I-90 On-Ramp would be closed. Under this scenario, it would be feasible to introduce a new exit ramp from the Garage connecting to the MassDOT service road and Trinity Place. The routes for users arriving from and departing to the regional roadway network under the Garage West Alternate Scheme are presented in **Figure 4.3**. As shown, vehicles currently using the entry drum may continue on Stuart Street and simply turn right on Clarendon Street to access the existing Garage driveway, similar to the Base Scheme. Vehicles currently using the exit drum will be able to use the new Garage exit ramp to reach Trinity Place via the service road, from where they can easily access Stuart Street or the Huntington Avenue I-90 on-ramp. Here too, the new Garage exit ramp in the Garage West Alternate Scheme will also avoid diverting all exit-ramp users to Clarendon Street and the potential negative traffic impacts to the South End neighborhood, described above. In addition, it is thought that this alternate location for a new garage exit ramp offers less pedestrian conflicts than the exit onto Dartmouth Street in the Garage West Base Scheme.

4.4 Trip Generation

4.4.1 Unadjusted ITE Trips

As required for inclusion in the ENF, trip generation for the Project was based initially on the Institute of Transportation Engineers (ITE) trips rates without adjustment for local mode share and vehicle occupancy characteristics. The results of this analysis are presented in **Table 4.3-1** which includes daily (24-hour) and peak hour (morning and evening) trips. It should be noted that, while the unadjusted trips are required to be included in the ENF, they are largely based upon non-urban data and do not represent the actual vehicle trips expected to be generated by the Project. The trips generated by the Project are more appropriately determined by applying mode share characteristics for this location in Back Bay, as described in Section 4.3.3.

The morning and evening peak hours are the busiest continuous 1-hour during the weekday morning and evening commuter periods, respectively. The morning peak hour in the study area occurs between 8:00 – 9:00 AM, although the peak for the existing Garage itself occurs slightly later between 8:15 – 9:15 AM. The evening peak hour in the study area occurs between 4:45 – 5:45 PM, although the peak for the existing Garage itself occurs between 5:00 – 6:00 PM.

TABLE 4.3-1 UNADJUSTED ITE VEHICLE TRIPS (BASE SCHEMES)

	Daily	AM Peak Hour	PM Peak Hour
Garage West Office			
In	3,166	788	145
Out	3,166	107	710
Total	6,332	895	855
Garage West Retail			
In	519	14	43
Out	519	9	47
Total	1,038	23	90
Garage East Residential			
In	798	24	97
Out	798	98	52
Total	1,596	122	149
Station West Retail			
In	629	18	52
Out	629	11	57
Total	1,258	28	109
Station East Residential			
In	1,197	37	145
Out	1,197	147	78
Total	2,394	184	223
Station East Retail			
In	182	5	15
Out	182	3	16
Total	364	8	31
Total Office Trips			
In	3,166	788	145
Out	3,166	107	710
Total	6,332	895	855
Total Residential Trips			
In	1,995	61	242
Out	1,995	245	130
Total	3,990	306	372
Total Retail Trips			
In	1,330	37	111
Out	1,330	23	120
Total	2,660	60	231
Total Trips Base Schemes			
In	**6,490**	**886**	**498**
Out	**6,490**	**375**	**960**
Total	**12,980**	**1,261**	**1,458**
Total Trips Alternate Schemes	**14,620**	**1,302**	**1,602**

Source: ITE Trip Generation Handbook 9th Edition;
LUC 710 – Office (average rate); LUC 220 - Apartment (average rate), LUC 820 – Shopping Center (average rate)

4.4.2 Mode Share Assumptions

Mode shares were established from US Census data for this location to determine travel characteristics for the Project. The mode shares by use for the Project are presented in **Table 4.3-2**.

TABLE 4.3-2 MODE SHARES

Mode	Office	Residential	Retail
Vehicles	30%	19%	30%
Rideshare	7%	4%	7%
Transit	51%	31%	51%
Walk	9%	37%	9%
Bike	1%	3%	1%
Other	2%	6%	2%

Source: U.S. Census Bureau, American Community Survey 2006-2010 Five-year estimates; Census Tracts 106, 703, 707 Suffolk County, Massachusetts

4.4.3 4.3.3 Adjusted **Project** Trips

To convert the unadjusted ITE Project trips to actual numbers of expected Project trips by mode, the local mode shares and vehicle occupancy ratios for each land use were applied to the unadjusted ITE trips.

As shown in **Table 4.3-3**, the Project is expected to generate just under 4,200 daily (24-hour) vehicle trips, with just over 340 vehicle trips being made in both the morning and evening peak hours. This level of actual vehicle trip generation reflects the Project's location in an existing urban environment.

It is worth noting that the current trip generation associated with the existing garage are largely associated with off-site land uses and is not generated by the existing on-site uses, whereas the projected future vehicle trips shown here, which will use the garage, will be generated by the Project itself located on the Site.

TABLE 4.3-3 ADJUSTED PROJECT TRIPS (BASE SCHEMES)

	AVO[1]	Vehicle	Transit	Walk	Bike	Other
Daily (24-hour)						
Office						
IN		1,042	1,824	322	36	72
OUT		1,042	1,824	322	36	72
TOTAL	1.27	2,084	3,648	644	72	144
Retail						
IN		648	1,133	200	23	44
OUT		648	1,133	200	23	44
TOTAL	1.27	1,296	2,266	400	42	88
Residential						
IN		400	699	834	68	135
OUT		400	699	834	68	135
TOTAL	1.30	800	1,398	1,668	136	270
Total IN		2,090	3,599	1,346	125	249
Total OUT		2,090	3,599	1,346	125	249
TOTAL 2-Way		4,180	7,198	2,692	250	498
AM Peak Hour						
Office						
IN		249	435	77	9	17
OUT		25	43	8	1	2
TOTAL	1.27	274	478	85	10	19
Retail						
IN		6	11	3	0	0
OUT		1	2	0	0	0
TOTAL	1.27	7	13	3	0	0
Residential						
IN		12	22	25	2	4
OUT		48	83	99	8	16
TOTAL	1.3	60	105	124	10	20
Total IN		267	467	104	11	21
Total OUT		74	128	107	9	18
TOTAL 2-Way		341	595	211	20	39
PM Peak Hour						
Office						
IN		43	75	13	1	3
OUT		218	383	68	8	15
TOTAL	1.27	261	458	81	9	18
Retail						
IN		27	47	9	0	2
OUT		17	30	6	0	0
TOTAL	1.27	44	77	15	0	2
Residential						
IN		23	41	49	4	8
OUT		16	28	33	3	5
TOTAL	1.30	39	69	82	7	13
Total IN		93	163	71	5	13
Total OUT		251	441	107	11	20
TOTAL 2-Way		344	604	178	16	33

[1] Average Vehicle Occupancy calculated using information from the U.S. Census Bureau, American Community Survey 2006-2010 Five-year estimates; Census Tracts 106, 703, 707 Suffolk County, Massachusetts

Note: Total Vehicle Trips for the Alternate Schemes are 4,974 Daily, 360 AM Peak Hour, 414 PM Peak Hour

4.5 Transit Service

The Project Site is extremely well served by public transportation, including the following:

Back Bay Station:	MBTA Orange Line
	Four (4) MBTA Commuter Rail Lines
	AMTRAK, serving NYC, Washington, D.C., and Chicago
Copley Square Station:	MBTA Green Line
MBTA Bus Routes:	9, 10, 39, 43, 55, 170, 502 Express, 503 Express, 504 Express

The transit services are summarized in **Table 4.4-1**, and presented in **Figures 4.4 and 4.5**. **Figure 4.4** shows the Project Site in the context of the wider MBTA system, while **Figure 4.5** shows the MBTA services, including bus stop locations, in the immediate vicinity of the Project Site.

The Proponent is working with the MBTA on the relocation of the Bus 39 stop in conjunction with the development of the Station East Parcel. Several alternate locations which would continue to provide access to the Station are currently being reviewed. The DPIR will include an update on the refinement of this review, and a description of the recommended proposal. No re-location of Bus 39 is proposed until the Station East Parcel is actually developed.

TABLE 4.4-1 TRANSIT SERVICE SUMMARY

Transit Service	Origin – Destination	Major Stops	Nearest Stop to Project Site	Peak Hour Headway (minutes)	Hours of Service
Commuter Rail Services					
Franklin Line	Forge Park/I-495 – South Station	Back Bay Station Ruggles Station	Back Bay Station	20 – 40	Weekdays: 4:00 AM – 12:50 AM Saturday: 6:30 AM – 12:30 AM Sunday: 10:40 AM – 12:20 AM
Needham Line	Needham Heights – South Station	Back Bay Station Ruggles Station Forest Hills Station	Back Bay Station	30 – 40	Weekday: 6:05 AM – 11: 10 AM Saturday: 7:10 AM – 12:00 AM Sunday: No Service
Providence/Stoughton Line	Wickford Junction – South Station	Route 128 Station Ruggles Station Back Bay Station	Back Bay Station	10-30	Weekday: 4:50 AM – 1: 10 AM Saturday: 6:35 AM – 12:15 AM Sunday: 11:05 AM – 12:15 AM
Framingham/Worcester Line	Worchester/Union Station – South Station	Yawkey Station Back Bay Station	Back Bay Station	5-35	Weekday: 4:20 AM – 1:30 AM Weekend: 6:40 AM – 12:30 AM
MBTA Subway Services					
Orange Line	Oak Grove Station – Forest Hills Station	North Station Downtown Crossing Station Back Bay Station Ruggles Station	Back Bay Station	6	Weekday: 5:16 AM – 12:35 AM Saturday: 5:16 AM – 1:50 AM Sunday: 6:00 AM – 12:35 AM
Green Line B Branch	Boston College – Park Street	Park Street Station Copley Kenmore	Copley Square Station	7	Weekday: 5:01 AM – 12:52 AM Saturday: 4:45 AM – 2:10 AM Sunday: 5:20 AM – 12:48 AM
Green Line C Branch	Cleveland Circle – North Station	Park Street Station Copley Kenmore	Copley Square Station	6	Weekday: 5:01 AM – 12:46 AM Saturday: 4:50 AM – 1:46 AM Sunday: 5:30 AM – 12:48 AM
Green Line D Branch	Riverside – Park Street	Park Street Station Copley Fenway	Copley Square Station	7	Weekday: 4:56 AM – 12:49 AM Saturday: 4:55 AM – 1:49 AM Sunday: 5:25 AM – 12:45 AM
Green Line E Branch	Lechmere – Heath Street	Park Street Station Copley Kenmore	Copley Square Station	6	Weekday: 5:01 AM – 12:53 AM Saturday: 5:01 AM – 2:04 AM Sunday: 5:35 AM – 12:47 AM

Transit Service	Origin – Destination	Major Stops	Nearest Stop to Project Site	Peak Hour Headway (minutes)	Hours of Service
MBTA Bus Services					
Route 9	City Point – Copley Square	Brookline Ave Huntington Ave E Berkeley Street	Saint James Ave @ Dartmouth Street	5 – 10	Weekday: 5:13 AM – 1:14 AM Saturday: 5:10 AM – 1:14 AM Sunday: 6:00 AM – 1:12 AM
Route 10	City Point – Copley Square	Back Bay Station Andrew Station JFK/UMass Station	Back Bay Station	20 – 25	Weekday: 4:55 AM – 1:31 AM Saturday: 6:15 AM – 1:14 AM Sunday: 6:00 AM – 1:11 AM
Route 39	Forest Hills Station – Back Bay Station	Copley Symphony Station Longwood Ave	Back Bay Station	6 – 10	Weekday 4:42 AM – 2:44 AM Saturday: 4:37 AM – 2:47 AM Sunday: 5:45 AM – 1:17 AM
Route 43	Ruggles Station – Park & Tremont Streets	Park Street Station Park Plaza Tufts Medical Center	Tremont Street @ Dartmouth Street	10 – 18	Weekday: 5:00 AM – 12:52 AM Saturday: 5:20 AM – 1:06 AM Sunday: 6:15 AM – 1:01 AM
Route 55	Jersey & Queensberry Sts. – Copley Square or Park & Tremont Streets	Arlington Station Prudential Station Fenway Park	Saint James Ave @ Dartmouth Street	15 – 30	Weekday 4:56 AM – 11:10 PM Saturday: 6:00 AM – 11:11 PM Sunday: 8:15 AM – 11:09 PM
Route 170	Central Square, Waltham – Dudley Square	Central Square, Waltham Back Bay Station Dudley Station	Back Bay Station	25 – 60	Weekday: 6:15 AM – 7:48 AM & 3:55 PM – 6:11 PM Weekend: No Service
Route 502 Express	Watertown – Copley Square	Watertown Yard Washington St @ Bacon St Saint James Ave @ Dartmouth Street	Saint James Ave @ Dartmouth Street	6 – 12	Weekday: 6:45 AM – 7:22 PM Weekend: No Service
Route 503 Express	Brighton Center – Copley Square via Oak Square & Mass Turnpike	Winship St @ Union St Park St @ Elmwood St Saint James Ave @ Dartmouth Street	Saint James Ave @ Dartmouth Street	15 – 35	Weekday: 6:40 AM – 7:29 PM Weekend: No Service
Route 504 Express	Watertown/Newton Corner – Downtown via Mass Turnpike	Washington St @ Bacon St Stuart St @ Dartmouth St Federal St @ Franklin St	Stuart Street @ Dartmouth Street	10 – 15	Weekday: 6:20 AM – 8:09 PM Saturday: 7:30 AM – 8:04 PM Sunday: No Service

4.7 Parking

As allowed under the Downtown Parking Freeze Permit and Private Parking Space Exemption issued by the Boston Air Pollution Control Commission (APPC), the existing Garage can accommodate up to 2,013 parking spaces. As permitted, the Garage is currently subject to certain parking lease commitments and additionally provides a limited amount of parking to the general public. As described in Chapters 1 and 2 of this PNF, the Project will require the partial demolition and reconstruction of the existing Garage in order to accommodate the future proposed uses on the Garage West and Garage East Parcels. In its reconstructed state, under a managed parking scenario the Garage will have the ability to provide up to the existing permitted capacity of 2,013 spaces, maintaining the existing allowed up to 576 spaces which have been permitted for use by the general public.

However, building upon the strongly transit-oriented nature of the Project's location and in response to local transportation goals, the Project will seek to minimize dependence on auto travel, and will implement a comprehensive package of TDM strategies to reduce auto trips and parking demand. As part of TDM, and management of the Garage in general, the proposed parking supply will reflect the limited parking ratios and incorporation of shared parking between residential and commercial uses that is currently being employed at similar urban, mixed-use, transit-oriented developments throughout the City of Boston.

The projected parking supply for the Project is based on the following preliminary ratios:

Office:	0.4 spaces per KSF
Retail:	0.4 spaces per KSF
Residential:	0.4 spaces per unit

The resulting parking program for the Project is summarized in **Table 4.6-1** below.

TABLE 4.6-1 PARKING RATIOS

Land Use	Size[1]	Parking Ratio	Parking Spaces
Office	574,024 SF[2]	0.4 spaces per KSF	230
Residential	600 units	0.4 spaces per unit	180[3]
Retail	62,274 SF[2]	0.4 spaces per KSF	25
Project Sub-total			**435***
Existing commitments			992
Permitted public parking[4]			Up to 576
Total			**Up to 2,013**

[1] Garage West and Station West Base Schemes

[2] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA

No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

[3] Assumes 25% shared residential spaces

[4] As allowed under the APPC

* Under the alternate schemes (i.e. the Garage West and Station West Alternate Schemes), office parking would be 231 spaces, and retail parking would be 40 spaces, bringing the Project sub-total increase to 445 spaces.

Based on the above analysis and the planned layout for the future parking structure, the re-constructed Garage will be able to accommodate a sufficient number of striped parking spaces to support the proposed Project uses, as well as providing flexibility under a managed parking scenario to continue to offer a limited number of public parking spaces up to the permitted maximum of 2,013.

4.8 Proposed Study Area

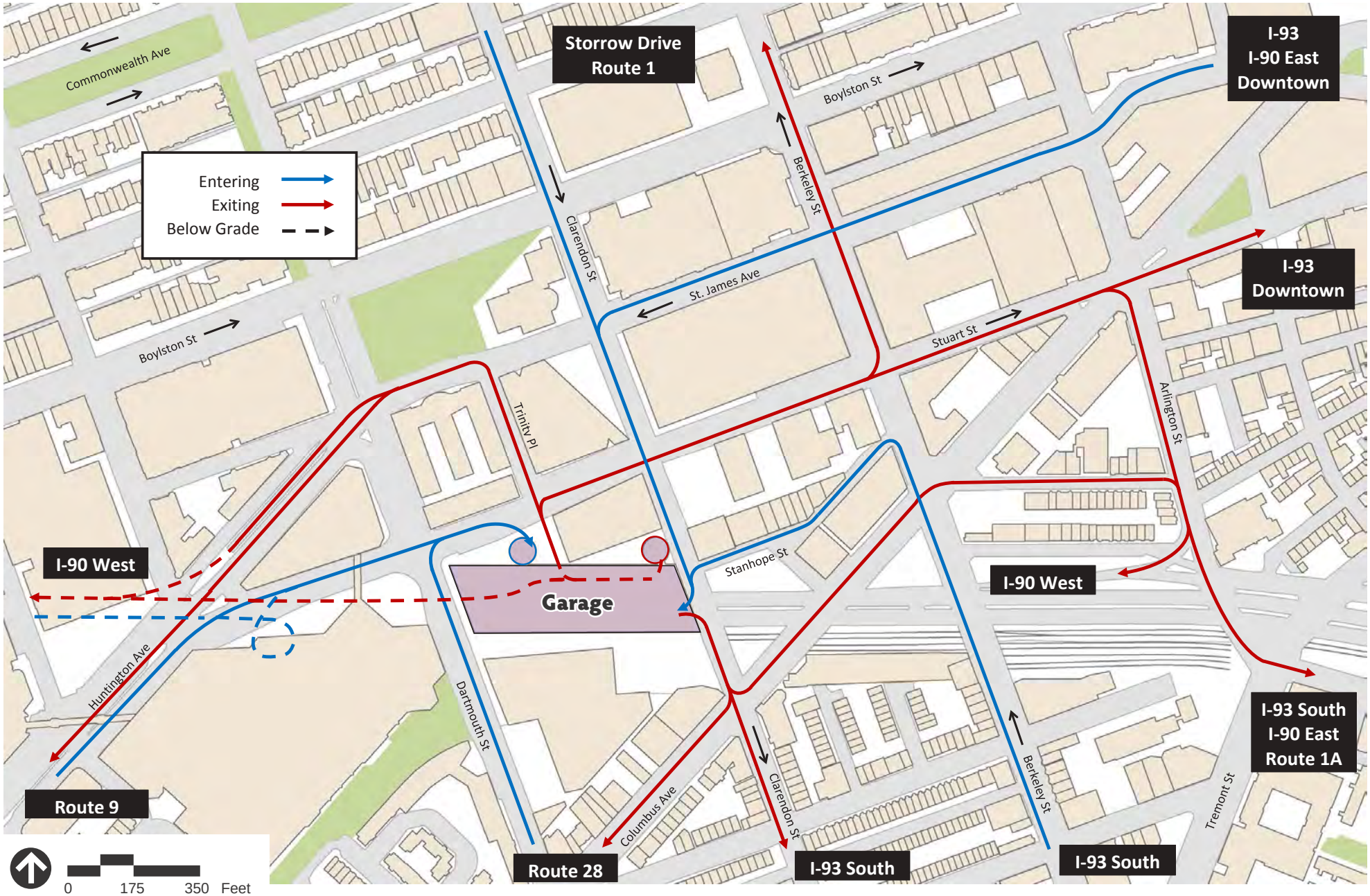
The EIR/PIR analyses will be performed and presented in accordance with the current Guidelines for Transportation Impact Studies (TIS), based on a detailed scope of analysis to be coordinated with and approved by MassDOT and BTD. Based on a functional evaluation of Project trips and their potential impact to the roadway network, a study area comprising the following 20 surface street intersections is proposed, as presented in **Figure 4.6**:

1. Boylston St/Clarendon St
2. Boylston St/Berkeley St
3. St. James Ave/Dartmouth St
4. St. James Ave/Trinity Place *(unsignalized)*
5. St. James Ave/Clarendon St
6. St. James Ave/Berkeley St
7. St. James Ave/Arlington St
8. Huntington Ave/Exeter St/Stuart St
9. Stuart St/Dartmouth St
10. Stuart St/Trinity Place
11. Stuart St/Clarendon St
12. Stuart St/Berkeley St
13. Stuart St/Arlington St
14. Clarendon St/Stanhope St *(unsignalized)*
15. Clarendon St/Back Bay Station *(unsignalized)*
16. Columbus Ave/Dartmouth St
17. Columbus Ave/Clarendon St
18. Columbus Ave/Cahners Place *(unsignalized)*
19. Columbus Ave/Berkley St
20. Arlington St/Marginal Rd/I-90 On-Ramp

In addition, the EIR/PIR analyses will include an operational analysis for the I-90 mainline including the merge sections for the Arlington Street, Clarendon Street and Huntington Avenue on-ramps.

The operational analysis at the study area intersections will examine level of service (LOS), delay and queuing under Existing and Future conditions for a 7-year time horizon as required by MassDOT. Year 2023 Future conditions analyses will include general background growth as well as planned projects expected to be completed in this time-frame, and will comprise No Build conditions (without the Project) and Build conditions (with the Project). The Build analysis will include projected conditions for both the Garage West and Station West Base Schemes and Alternate Schemes.

The proposed study area covers a wide area in order to capture the potential impacts of the Project itself, with or without the I-90 On-Ramp remaining open. Crash/safety analysis will be performed at any high-crash locations identified in the study area.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Exiting
Below Grade
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Route 1
I-93
I-90 East
Downtown
I-93
Downtown
I-90 West
Garage
I-90 West
I-93 South
I-90 East
Route 1A
Route 9
Route 28
I-93 South
I-93 South
Commonwealth Ave
Boylston St
Boylston St
Berkeley St
Clarendon St
St. James Ave
Stuart St
Arlington St
Trinity Pl
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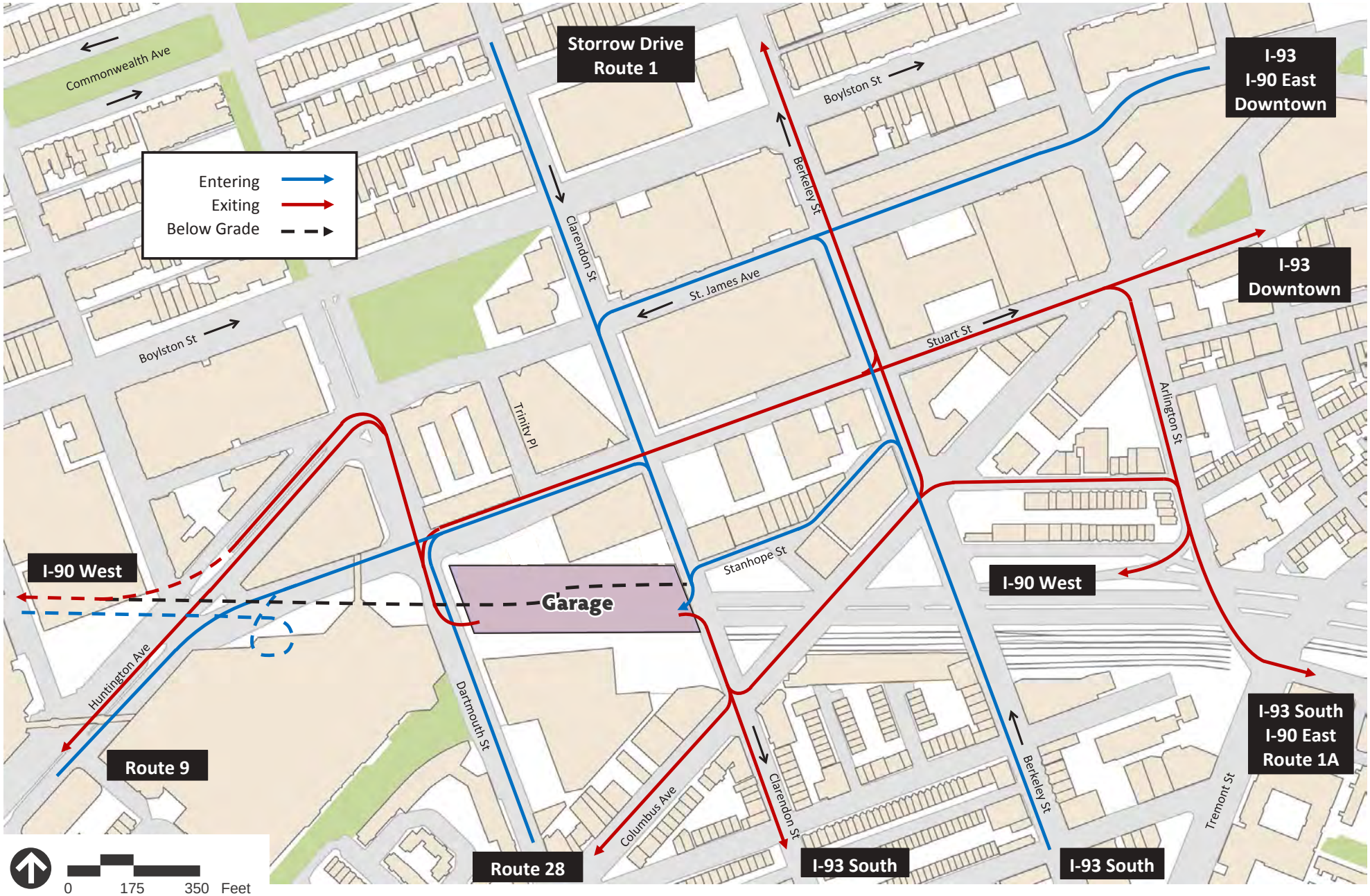

Source Info

PROJECT DARTMOUTH

BOSTON PROPERTIES

Future Parking Garage Access
Garage West Base Scheme

Figure 4.2

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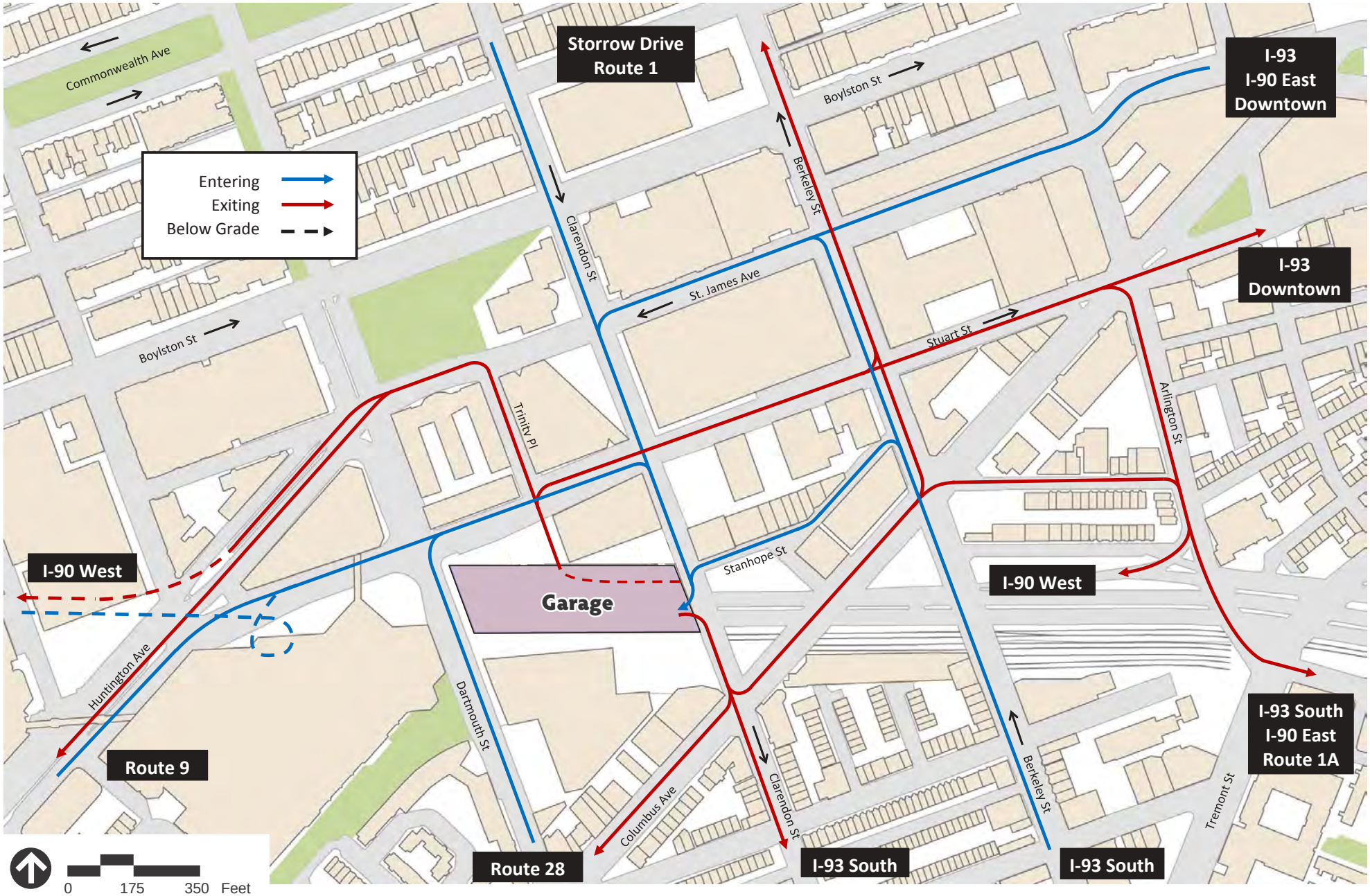
Entering
Exiting
Below Grade
Storrow Drive
Route 1
I-93
I-90 East
Downtown
I-93
Downtown
I-90 West
I-90 West
Garage
Route 9
Route 28
I-93 South
I-93 South
I-93 South
I-90 East
Route 1A
Commonwealth Ave
Boylston St
Boylston St
Berkeley St
Clarendon St
St. James Ave
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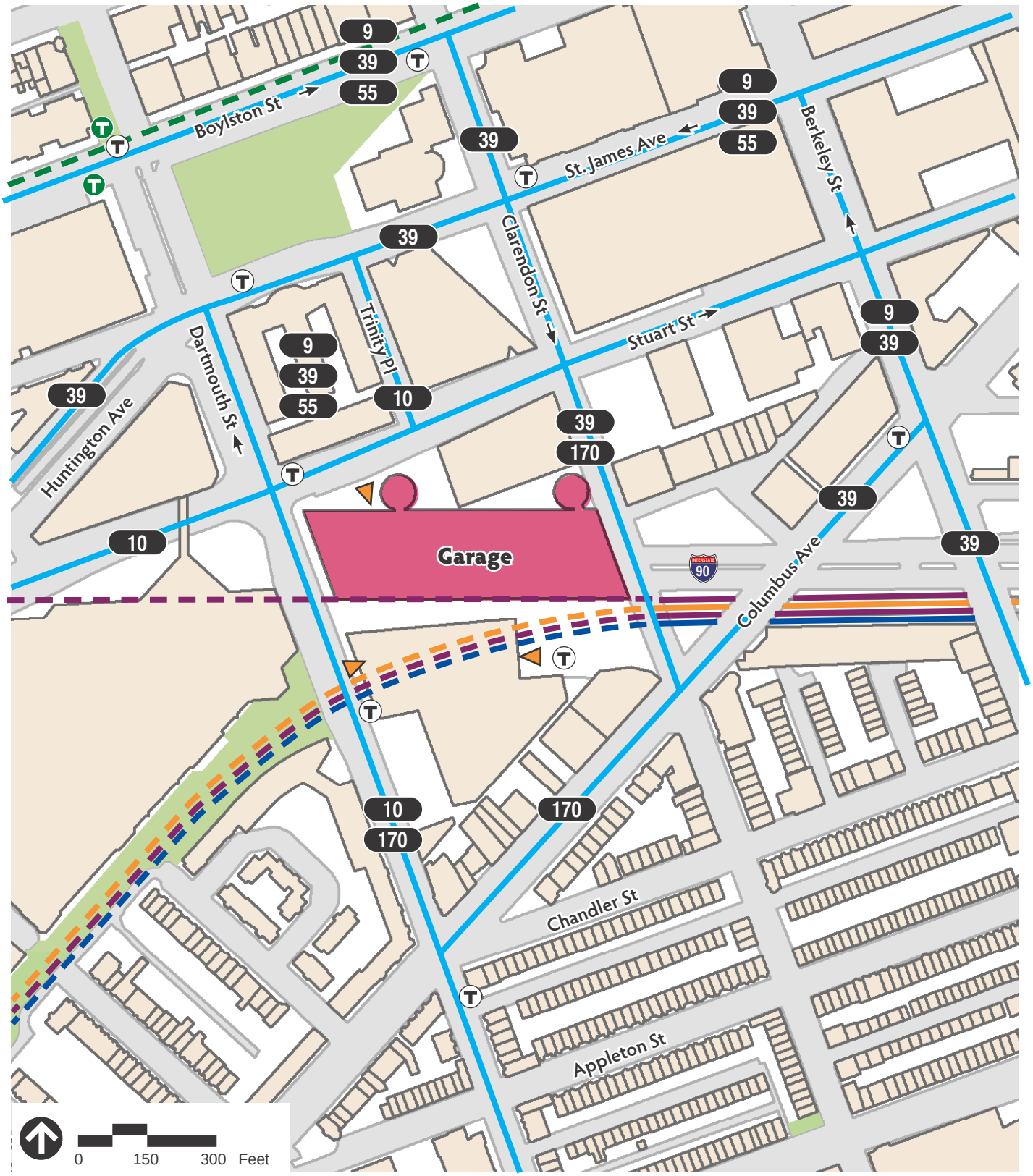
Source Info

Source: MBTA.com

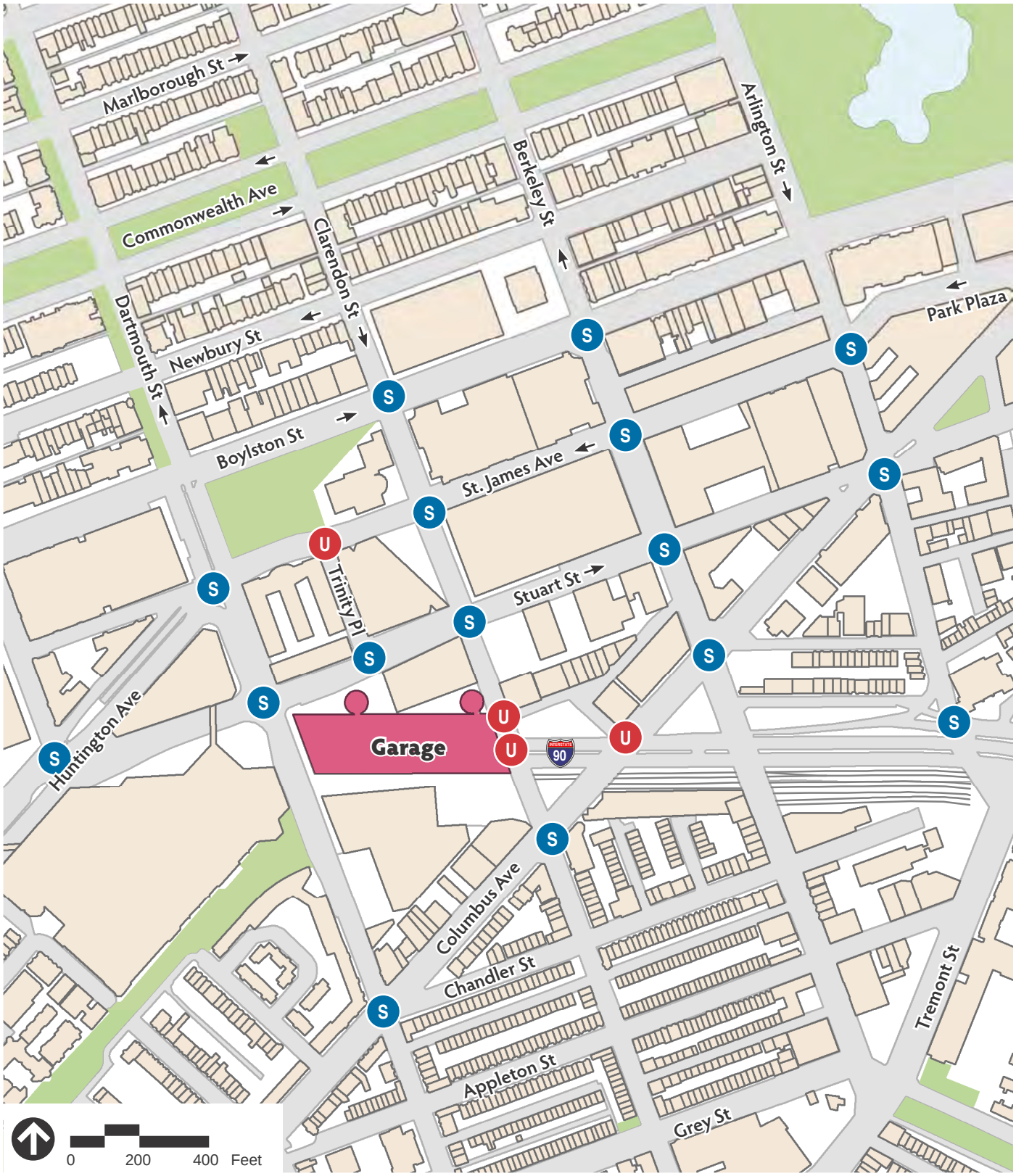


PROJECT DARTMOUTH

BOSTON PROPERTIES

Public Transportation Site Context

Figure 4.5



PROJECT DARTMOUTH

BOSTON PROPERTIES

Proposed Study Area

Figure 4.6

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5

Environmental Protection

5.1 Introduction

This chapter presents information on the environmental conditions in the vicinity of the Project Site and the potential changes that may occur as a result of the Project. A key goal of the Project is to redevelop the Project Site for more efficient and improved uses, while avoiding or minimizing potential adverse environmental impacts.

As discussed in more detail below, the Project-related impacts, which are to be expected in any development of this scale, are counterbalanced by the significant benefits for the adjacent neighborhoods and the City, including the realization of many of the City's planning goals expressed in the recently enacted Stuart Street Zoning District. The following sections identify Project impacts and discuss steps that have been or will be taken through design and management to avoid, minimize and/or mitigate adverse effects. Temporary construction-period impacts will be managed to minimize disruption to the surrounding neighborhoods.

In compliance with the Article 80 Large Project Review guidelines of the Code, this Project will address potential environmental impacts in the following categories:

- Pedestrian Wind
- Shadow
- Daylight
- Solar Glare
- Air Quality / Greenhouse Gas
- Water Quality
- Noise
- Solid and Hazardous Waste
- Groundwater
- Geotechnical
- Construction

Where the current state of the design allows, this PNF provides a full assessment of Project impacts; however, where additional information is needed, initial assessments are provided with an outline of the more detailed analyses to be addressed in the subsequent DPIR and DEIR as public and agency input is received and the design further develops. The Proponent looks forward to working through the Article 80 process with the BRA and the community to further refine the Project and its associated benefits.

5.2 Key Findings and Benefits

The analysis of potential environmental impacts resulting from the Project include the following conclusions:

- Shadow – Shadow impacts have been minimized to the extent practicable to avoid noticeable pedestrian impacts, and are in compliance with the specific requirements of the Stuart Street Zoning District, including the 2-hour shadow limitation on Copley Square.

- Daylight – The Project will result in a modest reduction in the visible skydome when viewed from adjacent sidewalks compared to existing conditions. Such changes are consistent with the Project's urban context.

- Water Quality – The Project will meet all applicable stormwater management standards to the extent practicable by implementing a treatment train of Best Management Practices to improve water quality.

- Hazardous Materials – The Project Site does not contain any known reported releases of oil and hazardous materials and no related impacts are anticipated.

- Groundwater – The potential for groundwater impacts at the Site is limited by the small amount of terra firma affected and no impacts are anticipated due to the lack of substantive excavation proposed.

- Geotechnical – The geotechnical engineer and contractor will work closely together throughout the excavation and foundation construction to avoid adverse impacts on adjacent structures and infrastructure during the installation of the foundation elements. Soil disturbance and vibration will be limited by low displacement foundation elements.

- Construction – The Project has been designed to avoid, minimize and mitigate potential construction-related impacts. The Project Team will work with the City to reduce potential construction period impacts.

Potential environmental impacts associated with the following have not yet been examined in detail and will be fully described in the DPIR and DEIR.

- Wind
- Solar Glare
- Air Quality / Greenhouse Gas
- Noise

5.3 Wind

The Project will require a quantitative (wind tunnel) analysis comparing existing and proposed conditions pursuant to the Section B.1 of the BRA Development Review Guidelines because it includes one or more buildings greater than 150 feet high.

The Proponent has commenced a detailed quantitative analysis in accordance with this requirement, and is working closely with architect and wind engineers to proactively incorporate wind mitigation techniques into the design of the buildings. The techniques employed include undulating facades, podium elements, recessed entries at street level, canopies and other architectural elements, and the incorporation of building-level and street-level vegetation. A complete report of the results will be presented in the DPIR. The following sections provide an overview of the regulatory criteria and methodology to be used in this analysis.

5.3.1 Methodology

Information concerning the Site and surroundings will be derived from information on surrounding buildings and terrain, as well as site plans and elevations of the Project provided by the Project Team. The following configurations of surroundings will be simulated:

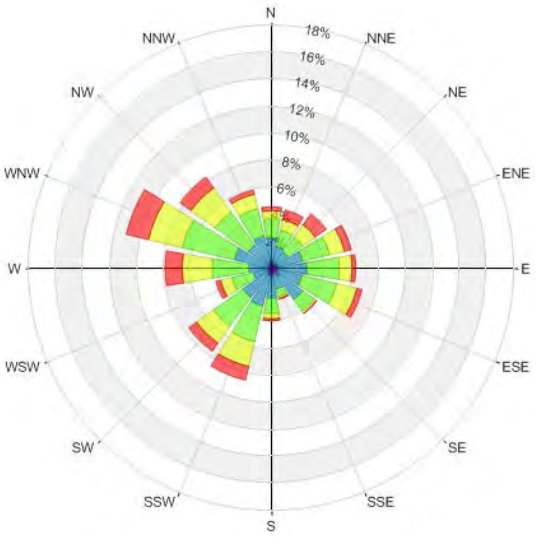
> No Build Configuration: includes all existing and BRA-approved surrounding buildings; and,
>
> Build Configuration: includes the proposed Project and all existing and BRA-approved surrounding buildings.

The wind tunnel model will include the Project and all relevant surrounding buildings and topography within a 1,600-foot radius of the Site. The mean speed profile and turbulence of the natural wind approaching the modelled area will be also simulated in the boundary layer wind tunnel. The scale model will be equipped with approximately 153 specially designed wind speed sensors that are connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full scale height of five feet above grade in pedestrian areas throughout the study site. The BRA-approved locations of the wind speed sensors are shown in **Figure 5.1**. Wind speeds will be measured for 36 wind directions, in 10-degree increments, starting from true north. The measurements at each sensor location are recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results will then be combined with long term meteorological data, recorded during the years 1995 to 2015 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis will be performed separately for each of the four seasons and for the entire year.

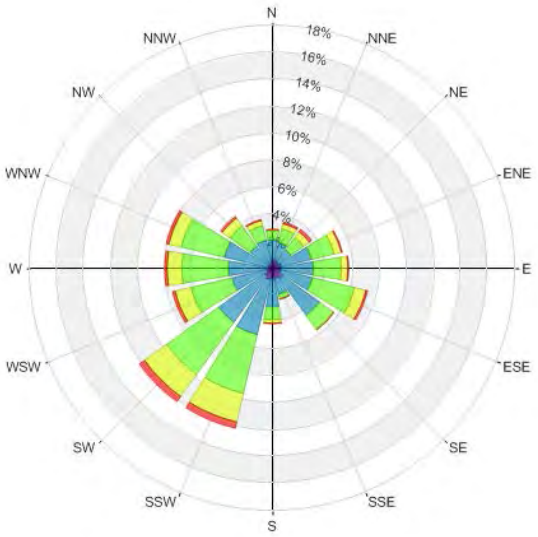
The "wind roses" presented below summarize the annual and seasonal wind climates in the Boston area, based on the data from Boston Logan International Airport. The wind rose for spring, for example, summarizes the wind data from March, April, and May. In general, as

indicated by the red and yellow color bands on the wind rose, the prevailing winds at this time of year are from the west-northwest, northwest, west, south-southwest and southwest. In addition to these directions, winds are also prevalent from the east-southeast and east-northeast direction.

Wind Roses

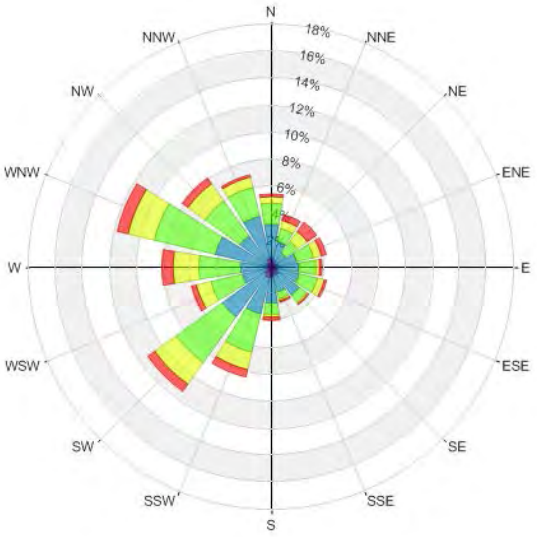


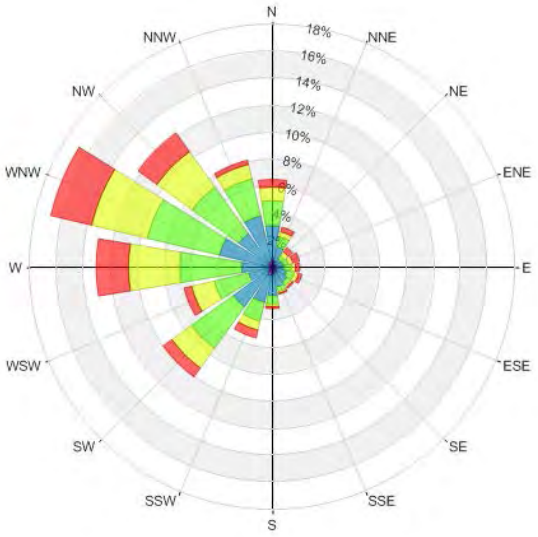
Spring
(March-May)



Summer
(June-August)

Wind Speed (mph)	Probability (%) Spring	Summer
Calm	2.8	3.1
1-5	6.7	9.5
6-10	28.8	38.8
11-15	32.7	34.4
16-20	19.1	11.7
>20	9.9	2.5





Fall
(September-November)

Winter
(December-February)

Probability (%)

Wind Speed (mph)	Fall	Winter
Calm	3.4	2.6
1-5	8.5	6.5
6-10	34.7	28.0
11-15	32.3	30.8
16-20	14.4	19.7
>20	6.6	12.3

Annual Winds

Probability (%)

Wind Speed (mph)	Spring
Calm	2.8
1-5	6.7
6-10	28.8
11-15	32.7
16-20	19.1
>20	9.9

On an annual basis the most common wind directions are those between southwest and northwest. Winds from the east-southeast are also relatively common. In the case of strong winds, west-northwest and southwest are the dominant wind directions.

This study involves state of the art measurement and analysis techniques to predict wind conditions at the Site. Nevertheless, some uncertainty remains in predicting wind comfort, and this must be kept in mind. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Also, unforeseen future changes in the Project area, such as the construction or removal of buildings, can affect the conditions experienced at the Site. Finally, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (one percent of the time). Higher wind speeds will occur but on a less frequent basis.

Pedestrian Wind Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed plus 1.5 times the root-mean-square wind speed) of 31 miles per hour should not be exceeded more than one percent of the time. The second set of criteria used by the BRA to determine the acceptability of specific locations is based on the work of Melbourne[1]. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed). They are defined in **Table 5.3-1**:

Table 5.3-1 BRA Mean Wind Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 and ≤ 27 mph
Comfortable for Walking	> 15 and ≤ 19 mph
Comfortable for Standing	> 12 and ≤ 15 mph
Comfortable for Sitting	< 12 mph

* Applicable to the hourly mean wind speed exceeded one percent of the time.

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 miles per hour. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

5.4 Shadow Study

5.4.1 Regulatory Context

An analysis of the shading impact under the No-Build and Build Conditions is a requirement of the Article 80, Large Project Review (Section 80B-2(c) of the Code). The shading analysis was prepared in accordance with the requirements of Section B.2. of the BRA Development Review Guidelines, with the additional requirements established by the recently enacted Stuart Street Zoning District. For a conservative projection of shadow impacts, the analysis utilizes a worst case scenario, which includes the Garage West Base Scheme and the Station West Alternate Scheme. This combination of schemes results in the largest shadow impact to adjacent public spaces.

▼

[1] Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions", Journal of Industrial Aerodynamics, 3 (1978) 241 - 249.

5.4.2 Methodology

A shadow impact analysis was conducted at regular time intervals to investigate the effect that the Project will have throughout the year. In order to represent a variety of shadow conditions at various times of the day, and times of the year, 3 time intervals (9:00AM, 12:00PM, 3:00PM) are represented for the Vernal Equinox (March 21st, see **Figure 5.2a**), Summer Solstice (June 21st, see **Figure 5.2b**), Autumnal Equinox (September 21st, see **Figure 5.2c**), and Winter Solstice (December 21st, see **Figure 5.2d**). 6:00PM has been added to the June 21st shadow study. This study takes into consideration Daylight Savings Time ("DST"), and therefore times are presented in Eastern Standard Time ("EST") and Eastern Daylight Time ("EDT"). The study shows both existing shadows in and around the Site, and the limited shadow impact of the Project. The analysis focuses on the shadow cast onto existing pedestrian areas, open spaces, and sidewalks adjacent to and in the vicinity of the Project Site.

Special consideration and analysis has been given to Copley Square, with an additional section illustrating that the Project casts no more than two (2) hours of shadow on the Square between the hours of 8:00 am to 2:30pm on any given day from March 21 to October 21 (**see Figure 5.2e**).

Table 5.4-1 shows the solar azimuth and altitude data. Times are listed as EST and EDT, as appropriate. The data reflects a latitude of 42.358° and a longitude of -71.06°.

TABLE 5.4-1 SOLAR AZIMUTH AND ALTITUDE DATA

Date	Time	Azimuth *	Altitude **
March 21 EDT	9:00 AM	112.59	23.61
March 21 EDT	12:00 PM	161.17	46.69
March 21 EDT	3:00 PM	223.5	39.26
June 21 EDT	9:00 AM	93.51	39.95
June 21 EDT	12:00 PM	149.52	68.8
June 21 EDT	3:00 PM	246.32	56.48
June 21 EDT	6:00 PM	280.71	23.83
September 21 EDT	9:00 AM	115.54	25.89
September 21 EDT	12:00 PM	166.28	47.2
September 21 EDT	3:00 PM	227.1	37.14
October 21 EDT	10:09 AM	140.54	27.83
October 21 EDT	11:19 AM	159.15	34.33
October 21 EDT	11:53 AM	169.14	36.04
October 21 EDT	12:37 PM	182.53	36.62
December 21 EST	9:00 AM	141.93	14.34
December 21 EST	12:00 PM	184.36	24.12
December 21 EST	3:00 PM	224.96	10.1

*Azimuth is measured in degrees clockwise from North

**Altitude is measured in degrees up from the horizon

5.4.3 Results

The incremental shadows produced are consistent with the existing urban shadow pattern, are moderate in relation to shadows cast by the taller structures surrounding the Project Site, and are not expected to have any noticeable effect on pedestrian use patterns.

March 21

The future No-Build and net new shadows associated with the Project for March 21 are illustrated in **Figure 5.2a**. March 21 is the Vernal Equinox, when the length of daytime and nighttime are equal. The sun rises on March 21 at 6:45 AM EDT in the southeastern sky and sets at 6:57 PM EDT.

At 9:00 AM EDT, the Garage West building casts shadows towards the McKim Building of the Boston Public Library and shades portions of Dartmouth, Stuart, and Blagden Streets. The Station West building casts incremental new shadows onto Dartmouth Street, without casting any new shadows onto the sidewalks. The Station East building shadows and the Garage East building shadows remain largely within the Project Site.

At 12:00 noon EDT, the sun is in the south-southeasterly sky and shadows are cast nearly in line with the street grid. The Garage West building shades adjacent portions of Stuart Street. The Garage East building shadows, the Station East building shadows, and the Garage West building shadows remain largely within the Project Site.

At 3:00 PM EDT, the sun is in the southwestern sky and shadows are cast to the northeast. The net new shadows cast by the Garage West building shade a portion of Stuart Street towards the 200 Clarendon building. The Garage East building casts a small incremental new shadow on Stanhope Street. The Station East building casts an incremental new shadow onto Stanhope Street, Frieda Garcia Park, Cahners Place, as well as small areas of I-90. The Station West shadow remains entirely within the Project Site.

On March 21, no new shadows are cast by the Project on Copley Square.

June 21

The future No-Build and net new shadows associated with the Project for June 21 are illustrated in **Figure 5.2b**. June 21 is the Summer Solstice and the longest day of the year. The sun rises at 5:08 AM EDT in the southeastern sky and sets at 8:25 PM EDT.

At 9:00 AM EDT, the Garage West building casts shadows to the west-northwest, shading the southern portion of the Stuart Street/Dartmouth Street intersection, including some adjacent sidewalks. The shadows cast by the Garage East building reach a small portion of Trinity Place, south of Stuart Street. Both the Station East building and the Station West building cast some new shadows onto Dartmouth Street, including sidewalks.

At 12:00 noon EDT, the sun is in the southern sky and casts the shortest shadows of the day. The Garage West building's shadows extend to the northern side of Stuart Street and a portion of the Dartmouth Street sidewalk at this intersection. The Garage East building casts limited shadow onto Trinity Place. The shadows cast by the Station East building and the Station West building remain within the Project Site.

At 3:00 PM EDT, the sun is in the western sky and shadows are cast east-northeast. The Garage West building casts a new shadow on portions of the southern sidewalk along Stuart Street, as well as a small portion on Trinity Place south of Stuart Street. The Garage East building casts shadows onto Stanhope Street and a portion of Frieda Garcia Park. The Station East building adds shadow to a portion of Clarendon Street north of the Columbus Avenue intersection, including the adjacent sidewalks, as well as areas of I-90. Shadows cast by the Station West building remain within the project site.

At 6:00 PM EDT, the sun is in the west-northwestern sky and shadows are cast toward the east-southeast. Much of the shadow cast by the Project is absorbed by the existing No-Build condition shadows. The Garage West building casts new shadow on Columbus Avenue, as well as a portion of I-90 and the rail lines. The Garage East building shades a small portion of Columbus Avenue, as well as I-90 and the rail lines. The Station East building casts a new shadow on rooftops in the South End. The Station West building shadows remain largely within the project site.

On June 21, no new shadows are cast by the Project on Copley Square.

September 21

The future No-Build and net new shadows associated with the Project on September 21 are depicted on **Figure 5.2c.** September 21 is the autumnal equinox and the daytime and nighttime hours are equal. The sun rises at 6:31 AM EDT in the southeastern sky and sets at 6:42 PM EDT. The shadows cast on this date are almost identical to those on March 21, the Vernal Equinox.

At 9:00 AM EDT, the Garage West building casts shadows towards the McKim Building of the Boston Public Library and shades portions of Dartmouth, Stuart, and Blagden Streets. The Station West building casts incremental new shadows onto Dartmouth Street, casting new shadows onto only a small area the Dartmouth Street sidewalks. The Station East building shadows and the Garage East building shadows remain within the Project Site.

At 12:00 noon EDT, the sun is in the southern sky and shadows are cast to the north-northwest, nearly aligned with the street grid. The Garage West building shades adjacent portions of Stuart Street. New shadows of the Garage East building, the Station East, and the Garage West building remain largely within the Project Site.

At 3:00 PM EDT, the sun is in the southwestern sky and shadows are cast to the northeast. New shadows cast by the Garage West building shade a small portion of Stuart Street and

Clarendon Street. The Garage East building casts a small incremental new shadow on Stanhope Street. The Station East building casts a new shadow onto Stanhope Street, Frieda Garcia Park, Cahners Place, as well as areas of I-90. The Station West shadow remains entirely within the Project Site.

On September 21, no new shadows are cast by the Project on Copley Square.

December 21

The future No-Build and net new shadows associated with the Project on December 21 are depicted on **Figure 5.2d.** December 21 is the Winter Solstice and the shortest day of the year. The sun is at its lowest inclination above the horizon at each hour of the day. Even low buildings cast long shadows in northerly latitudes such as Boston's. The sun rises at 7:10 AM EST and sets at 4:15 PM EST.

At 9:00 AM EST, the Garage West building casts a shadow in a northwestern direction extending toward Newbury Street filling in gaps in the heavily shaded urban landscape. The net new shadows cast by this building will cover a small portion of the western sidewalk along Dartmouth Street, as well as the intersection with Blagden Street and Huntington Avenue. Small sidewalk portions of Boylston Street and Newbury Street will also be shaded, but the majority of new net shadows will land on existing buildings, creating minimal adverse effects on the pedestrian environment. The new incremental net shadow cast by the Garage East building will reach a small portion of Boylston Street and Copley Square. The Station East building shadow will shade a portion of the Dartmouth / Boylston Street intersection as well as the Dartmouth / Newbury Street Intersection, but will not add any new shadows to Copley Square. The Station West building shadows remain within the project site.

At 12:00 noon EST, the sun is in the southern sky and shadows are cast nearly due north. The incremental shadows cast by the Garage West building include a small portion of the northern Stuart Street sidewalk, and a small portion of the northeastern corner of Copley Square, which is already largely in shadow under the No-Build Condition. Net new shadows cast by the Garage East building and the Station East building will land on existing buildings.

By 3:00 PM EST, the shadows cast by the No-Build Condition and the Project are long and extend in the northeast direction. The net new shadows cast by the Garage West building will fall on existing building rooftops. No net new shadows are cast by the Garage East building. The net new shadows cast by the Station East will include a narrow band along Stanhope Street near its intersection with Berkeley Street. Other additional shadows will cover portions of existing buildings, and are not expected to alter pedestrian activity in the area. The Station West building shadows remain within the project site.

October 21

The future No-Build and net new shadows associated with the Project on October 21 are depicted on **Figure 5.2e.** On October 21 the sun rises at 7:05 AM EDT and sets at

5:52 PM EDT. Expected shadows cast on this date were examined to identify the duration of Project-generated shadows cast on Copley Square. It is important to note that the Project has been designed to account for the 2-hour limitation collectively across all Project components. As such, only the Garage West building has any shadow impact on Copley Square. This detailed analysis identified two intervals during the morning hours where new shadows were cast on Copley Square – between 10:09 AM and 11:19 AM EDT and between 11:53 AM and 12:37 PM EDT.

At 10:09 AM EDT, the net new shadows cast by the Garage West building will enter Copley Square adjacent to Dartmouth Street approximately mid-block between Boylston Street and St. James Avenue. By 11:19 AM EDT the new shadows will be entirely behind those cast by the Fairmont Copley Plaza Hotel. The duration of new shadow cast on Copley Square at this time is limited to one hour and ten minutes.

At 11:53 AM EDT, the shadow from the Garage West building will emerge from behind the Fairmont Copley Plaza on the north side of St. James Avenue opposite Trinity Place and will last approximately 44 minutes, until 12:37 PM EDT.

The total duration of the net new shadows cast on Copley Square by the Project are expected to last approximately one hour and 54 minutes total, in compliance with the requirements specified in the Stuart Street Zoning District regulations.

5.5 Daylight Study

The following section describes the anticipated effect on daylight coverage at the Site as a result of the Project. An analysis of the percentage of skydome obstructed under the No-Build and Build Conditions is a requirement of Article 80 (Section 80B-2(c)). The daylight analysis was prepared using the BRA's Daylight Analysis Program ("BRADA") and has been completed in accordance with the requirements of Article 80. The results of the analysis are presented in **Figures 5.3a-c**.

5.5.1 BRADA Software

The BRADA program was developed in 1985 by the Massachusetts Institute of Technology to estimate the pedestrian's view of the skydome taking into account the massing and building materials used. The software approximates a pedestrian's view of a site based on input parameters such as: location of viewpoint, length and height of buildings and the relative reflectivity of the building facades. The model typically uses the midpoint of an adjacent right-of-way or sidewalk as the analysis viewpoint. Based on these data, the model calculates the perceived skydome obstruction and provides a graphic depicting the analysis conditions.

The model inputs were taken from a combination of the BRA City model, an existing conditions survey, and schematic design plans prepared by the Project's architects. As described above, the BRADA software considers the relative reflectivity of building facades

when calculating perceived daylight obstruction. Highly reflective materials are thought to reduce the perceived skydome obstruction when compared to non-reflective materials. For the purposes of this daylight analysis, the building facades are considered non-reflective, resulting in a conservative estimate of daylight obstruction.

5.5.2 Viewpoints

The following viewpoints were used for this daylight analysis:

- **Dartmouth Street** – This viewpoint is located on the centerline of Dartmouth Street, centered on the western side of the Site adjacent to the Station West Parcel.
- **Stuart Street** – This viewpoint is located on the centerline of Stuart Street between Trinity Place and Dartmouth Street along the northern side of the Project.
- **Clarendon Street** – This viewpoint is located on the centerline of Clarendon Street, centered on the eastern side of the Project adjacent to the Garage East Parcel.

These points represent existing and proposed building façades when viewed from the adjacent public way.

5.5.3 Results

Daylight Existing/No-Build Conditions

Under the Existing/No-Build Condition, a large portion of the skydome is already obstructed due to the existing structures in close proximity to the study point. The existing skydome visible based on the viewpoint, ranging from approximately 43 percent at the Dartmouth Street study point, 67 percent on the Stuart Street study point, and 71 percent at the Clarendon Street study point. As depicted in the figures, the substantial massing of the Garage and 40 Trinity building are strong contributions to the existing skydome obstructions

Daylight Build Conditions

The Project-related daylight impacts for the viewpoints are presented in **Figure 5.3a-c**. Under the Proposed Conditions, the viewpoints along the three roadways are expected to experience an increase in skydome obstruction due to the increased height and massing of the new buildings, as would be expected when increasing the density of an urban site. The increase in skydome obstruction will be offset by substantial improvements to the public realm which are anticipated to improve the overall pedestrian experience as compared to existing conditions.

Skydome obstruction impacts are as follows:

- **Dartmouth Street –** The skydome obstructed from the Dartmouth Street study point will increase from 42.9 percent to 85.1 percent resulting from the proposed buildings on the Garage West and Station West Parcels (**Figure 5.3a**). While the 40 Trinity building is shown in the massing diagram, the BRADA model predicts that it would not be visible from the study point due to the height and closer proximity of the Garage.

The increased skydome obstruction resulting from Garage West building is clearly shown in **Figure 5.3a**.

- **Stuart Street –** The skydome obstructed at the Stuart Street study point will increase from 66.4 percent to 74.0 percent resulting from the new building on the Garage West Parcel (**Figure 5.3b**). Neither the Station East, nor Station West buildings are visible from the study point.

- **Clarendon Street** – The skydome obstructed from the Clarendon Street study point will increase from 70.7 percent to 79.9 percent at the study point resulting from the construction of the Garage East building (**Figure 5.3c**). The Station East building is not visible due to the massing of the Garage.

5.6 Solar Glare Approach

The City of Boston BRA Development Guidelines require projects undergoing Large Project Review to analyze the potential impacts from solar glare on the following areas to identify the potential the potential for visual impairment or discomfort due to reflective spot glare:

- Potentially affected streets
- Public open spaces
- Pedestrian areas

Furthermore, projects must consider the potential for solar heat buildup in any nearby buildings receiving reflective sunlight from the Project, if applicable.

A detailed review of these potential impacts on the Project area from solar glare will be included in the DPIR when the Project's design has further advanced and materials have been selected.

5.7 Air Quality/Greenhouse Gas Approach

The following section presents a summary of the parameters for a preliminary energy model that have been developed for the Project. The DPIR and DEIR will follow the guidelines set out for the City and MEPA processes for air quality and greenhouse gas ("GHG") assessments. It is anticipated that the air quality analysis will include a mesoscale regional analysis (VOC and NOx), a mobile source GHG analysis, and a microscale (hotspot) air quality assessment. The regulations and requirements and anticipated related analysis are described in more detail below.

5.7.1 Energy Assessment/Greenhouse Gas Analysis

A preliminary energy assessment has been completed that estimates the anticipated energy use of the Project, consistent with Article 37 of the Code, Green Building/Climate Change[2]. It is anticipated that a full GHG assessment of the buildings will be prepared for future filings. The assessment will include estimated emissions of carbon dioxide ("CO_2") from Project-related stationary CO_2 sources, such as fuel burning, and estimated building electrical/gas consumption, as required by the *MEPA Greenhouse Gas Emissions Policy and Protocol* (the "MEPA GHG Policy").[3] This analysis will identify and describe the feasible measures to minimize stationary source GHG emissions for the Project. Compliance with the MEPA GHG Policy requires a commitment to energy reduction measures. The Proponent and Project Team will continue to evaluate and incorporate sustainable design, including energy conservation measures throughout the design process in order to meet future requirements. The following presents a summary of the preliminary energy analysis conducted for the Project.

The purpose of the preliminary energy analysis is to:

- Outline energy conservation measures ("ECMs") assumed to be included in the design
- Evaluate the performance of the current design with regards to meeting the Stretch Energy Code
- Estimate energy cost savings and EAc1 points for LEED 2009

Based on preliminary analysis, **Table 5.7-1** presents estimated energy use intensities ("EUI"), energy savings under the Stretch Energy Code and LEED 2009 energy cost savings and points for the Project.

▼

2 City of Boston Zoning Code Article 37, Green Building/Climate Change, Preparedness and Resiliency Review Procedures and Submittal Requirements, September 1, 2015.

3 MEPA Greenhouse Gas Policy and Protocol, Executive Office of Energy and Environmental Affairs, effective November 1, 2007 (revised version effective May 5, 2010).

TABLE 5.7-1 ESTIMATED EUI & ENERGY SAVINGS AND COST

	EUI (kBtu / sf-year)	% Energy Use Savings [Energy Code]	% Energy Cost Savings [ASHRAE 90.1-2007 LEED 2009 Baseline]
Office (Garage West)	61	21% (90.1-2013 Stretch Code)	24%
Residential (Garage East / Station East)	63	20% (90.1-2013 Stretch Code)	19%
Retail (Station West)	120-220	Complies (90.1-2013 Chapter 11 Energy Cost Budget Method)	14%
Combined	63-65	20% (90.1-2013 Stretch Code)	21%

Source: BR+A

[1] Results apply to both one-story Station West Base Scheme and two-story Station West Alternate Scheme.

[2] Restaurant and retail energy consumption is heavily dependent on the type of restaurant and retail space and its corresponding usage schedules and equipment and lighting loads. Since this is a core and shell addition, and these specific details are not currently known, an EUI range has been provided.

[3] An actual fit-out must be included in the LEED submission, including full HVAC design and complete lighting design achieving minimum 30% interior lighting power density savings over ASHRAE 90.1-2007 Building Area Method.

[4] LEED 2009 points are calculated assuming all buildings combined would be certified under the New Construction rating system.

For the office building at Garage West Parcel, modeled energy conservation measures include:

- High efficiency condensing boilers to meet space heating demands
- Dedicated outside air system with energy recovery
- Floor-by-floor VAV reheat units serving chilled beams
- Premium efficiency water-cooled chiller plant with variable frequency drives
- Low lighting power densities to be achieved from efficient LED lighting

For the residential buildings at Garage East and Station East Parcels, modeled energy conservation measures include:

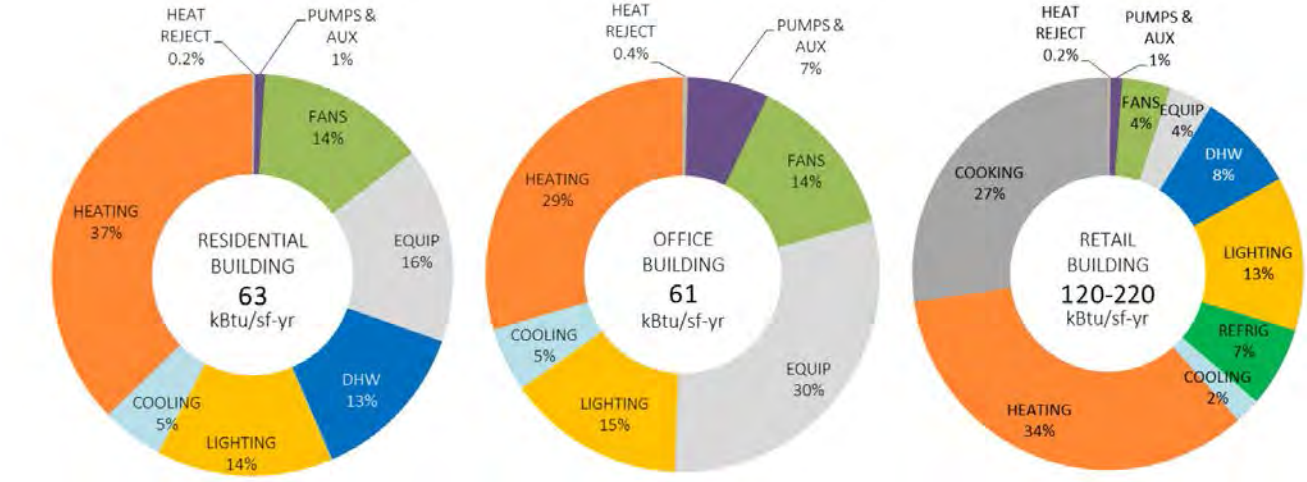
- High efficiency vertical stacked water source heat pumps connected to condensing boilers and cooling towers
- High efficiency condensing boilers to meet space heating and domestic hot water demands
- Dedicated outside air system with energy recovery serving heat pumps

For the retail building at the Station West Parcel, modeled energy conservation measures include:

- High efficiency condensing boilers for meeting space heating demands
- Premium efficiency cooling towers with variable frequency drives
- 46% window to wall ratio with insulated shadow box or spandrel
- 15% skylight to roof ratio

Energy Model Results: Annual Consumption & Cost

Annual energy consumption by end-use is shown in the charts below. Additionally, a summary of energy consumption by source and total energy cost is provided in **Table 5.7-2** below.



Source: BR+A Preliminary Energy Analysis Report, March 9, 2016.

TABLE 5.7-2 ESTIMATED ENERGY CONSUMPTION

ENERGY METRIC	UNIT	RESIDENTIAL (GARAGE EAST)	RESIDENTIAL (STATION EAST)	COMMERCIAL (GARAGE WEST)	RETAIL (STATION WEST)	COMBINED
Total Electricity Consumption	MMBtu/yr	8,500	13,600	30,200	1,900	**54,200**
Total Natural Gas Consumption	MMBtu/yr	7,500	12,200	15,300	4,500	**39,400**
Total Energy Consumption	MMBtu/yr	16,000	25,800	45,400	6,400	**93,600**
Total Energy Cost	$/yr	$660,500	$1,062,000	$1,555,000	$141,400	**$3,419,000**
Building Site Energy Use Intensity	kBtu/sf	63	63	61	220	**65**

Source: BR+A

Future Stationary Source CO_2 Emissions

The approach to and results of the building energy model for each Air Rights Development Parcel use is presented below. Energy savings and associated emissions reductions are developed by comparing the proposed Project to an alternative that assumes minimum compliance with the ASHRAE 90.1-2013 requirements (the "Base Case"). The GHG analysis conducted was based on the energy use modeling presented above. The noteworthy improvements for each use are also presented below. Specific improvements may be subject

to design modification, as needed, to achieve the GHG emissions reduction based on the final building program and design. The Project was split into three areas for modeling purposes: Residential, Office, and Retail.

Residential

Energy modeling considered the two residential components of Garage East and Station East Parcels in the analysis. These components are split out below to show specific energy use of each parcel.

Table 5.7-3 provides a summary of the proposed improvements assumed for the residential buildings including an approximately 250,000 gross square foot building at Garage East Parcel and an approximately 430,000 square foot building at Station East Parcel. Key energy saving features include more efficient building materials (building envelope), a high efficiency HVAC system, Energy Recovery Heat Pumps and low power density lighting. In addition, Energy Star efficient equipment can be used by final tenants to further electricity savings, although Energy Star equipment has not been accounted for in this analysis.

Table 5.7-3: Residential Key Model Assumptions

Summary of Key Assumptions for Energy Model	Design Case
Building Envelope (Construction Assemblies)	
Walls	Opaque U-0.055; Spandrel/Shadow Box U-0.200
Roof	U-0.032
Fenestration and Shading	
Fenestration Area	55%
Vertical Glazing	Insulated with low e-coating curtain wall- U-0.39
HVAC (Air-side)	
HVAC System	Dedicated Outside Unit with Energy Recovery Heat Pumps
Primary Heating	Water Source Heat Pumps to Condensing Boilers
Exhaust Air Energy Recovery	Total Energy Recovery Wheel
HVAC (Water-side)	
Service Hot Water Type	Condensing Hot Water Heater
Lights	
Interior Lighting	0.51 W/sf Lighting Power Density

The total estimated annual electricity use and natural gas consumption, and associated emissions for the residential uses are presented in **Table 5.7-4.** For Garage East, under the Base Case, the CO_2 emissions are estimated to be 1,686 tons per year. With the currently proposed building design and system improvements, the estimated energy use reduction for Garage East is 24.5 percent, which equates to a 20.3 percent reduction in stationary source CO_2 emissions when compared to the Base Case. The stationary source CO_2 emissions percent reduction for the residences combined under the Design condition was quantified as follows: 343 tpy/1,686 tpy = 0.203 x 100 = 20.3%.

Reduction % = Emissions Reductions Due to Project Improvements (End Use Savings)
Project-Generated Emissions (Base Case Emissions)

This methodology is applied consistently to the remaining buildings to determine the percent reduction of stationary source emissions.

The CO_2 emissions for Station East are estimated to be 2,708 tons per year under the Base Case. With the currently proposed building design and system improvements, the estimated energy use reduction for Station East is 24.3 percent, which equates to a 20.2 percent reduction in stationary source CO_2 emissions when compared to the Base Case.

Table 5.7-4: Residential Stationary Source CO_2 Emissions

	Energy Consumption			CO_2 Emissions		
	Electricity (MWh/yr)	**Natural Gas** (MBtu/yr)	**Total** (MBtu/yr)	**Electricity** (tons/ yr)[1]	**Natural Gas** (tons/ yr)	**Total** (tons/ yr)
			Garage East			
Base Case	2,726	11,900	21,200	989	696	1,686
Design Case	2,491	7,500	16,000	904	439	1,343
End-Use Savings	**235**	**4,400**	**5,200**	**85**	**257**	**343**
Percent Savings			**24.5%**			**20.3%**
			Station East			
Base Case	4,367	19,200	34,100	1,585	1,123	2,708
Design Case	3,986	12,200	25,800	1,447	714	2,161
End-Use Savings	**381**	**7,000**	**8,300**	**138**	**409**	**547**
Percent Savings			**24.3%**			**20.2%**

1 tons/yr = short tons per year

Note: Garage East and Station East result in 34.7% energy savings when comparing the Design case to a Base Case modeled on ASHRAE 90.1-2007

Office

Table 5.7-5 presents a summary of the improvements that were included in the energy model for the Garage West building. There will be one up to approximately 720,000 gross square foot office building in the full build out condition. Key energy savings features include more efficient building materials (building envelope), high efficiency HVAC systems including chillers and energy recovery systems, high efficiency condensing boilers, and daylight dimming in perimeter spaces for lighting savings.

Table 5.7-5: Office Building Key Model Assumptions

Summary of Key Assumptions for Energy Model	Design Case
Building Envelope (Construction Assemblies)	
Walls	Opaque U-0.055; Spandrel/Shadow Box U-0.200
Roof	U-0.032
Fenestration and Shading	
Fenestration Area	65%
Vertical Glazing	Insulated with low e-coating curtain wall- U-0.39
HVAC (Air-side)	
HVAC System	Dedicated outside unit with energy recovery active chilled beams
Fan System Operation	During occupied hours
Primary Cooling Source	On-site Chiller Plant
Primary Heating Source	On-site Condensing Boiler Plant
Exhaust Air Energy Recovery	Total Energy Recovery Wheel
HVAC (Water-side)	
Service Hot Water	Gas-fired hot water heater
Lights	
Interior Lighting	0.6 W/sf Lighting Power Density Daylight Dimming Controls in perimeter spaces

The total estimated annual electricity use and natural gas consumption, and associated emissions for an individual office building and the total office energy use are presented in **Table 5.7-6**. Under the Base Case, the CO_2 emissions are estimated to be 4,980 tons per year. With the currently proposed building design and system improvements, the estimated energy use reduction for the new office building is approximately 21.1 percent, which equates to a 17.5 percent reduction in stationary source CO_2 emissions when compared to the Base Case.

Table 5.7-6: Office Building Stationary Source CO_2 Emissions

	Energy Consumption			CO_2 Emissions		
Individual Building	**Electricity** (MWh/yr)	**Natural Gas** (MBtu/yr)	**Total** (MBtu/yr)	**Electricity** (tons/ yr)[1]	**Natural Gas** (tons/ yr)	**Total** (tons/ yr)
			Garage West			
Base Case	9,818	24,200	57,700	3,564	1,416	4,980
Design Case	8,851	15,300	45,500	3,213	895	4,108
End-Use Savings	**967**	**8,900**	**12,200**	**351**	**521**	**872**
Percent Savings			**21.1%**			**17.5%**

1 tons/yr = short tons per year

Note: Garage West results in 30.2% energy savings when comparing the Design case to a Base Case modeled on ASHRAE 90.1-2007

Retail

Table 5.7-7 presents a summary of the improvements that were included in the energy model for the retail space at the Station West Parcel estimated to be approximately 32,000 gross square feet to 69,000 gross square feet. Energy modeling was conducted based on the upper limit of the estimated EUI range. Key energy savings features include high efficiency HVAC systems, high efficiency condensing boilers, and a more efficient building envelope.

Table 5.7-7: Retail Key Model Assumptions

Summary of Key Assumptions for Energy Model	Design Case
Building Envelope (Construction Assemblies)	
Walls	Opaque U-0.055; Spandrel/Shadow Box U-0.200
Roof	U-0.032
Fenestration and Shading	
Fenestration Area	46%
Vertical Glazing	Insulated with low e-coating curtain wall- U-0.39
HVAC (Air-side)	
HVAC System	Dedicated Outside Unit with Energy Recovery Heat Pumps
Fan System Operation	Retail: 8am-9pm; Restaurant: 11am-1am
Primary Cooling Source	Water Source Heat Pumps
Primary Heating Source	Water Source Heat Pumps to Condensing Boilers
Exhaust Air Energy Recovery	Total Energy Recovery Wheel
HVAC (Water-side)	
Service Hot Water Type	Condensing Hot Water Heater
Lights	
Interior Lighting	Retail: 1.26 W/sf; Restaurant: 1.01 W/sf

The total estimated annual electricity use and natural gas consumption, and associated emissions for the retail space is presented in **Table 5.7-8**. Under the Base Case, the CO_2 emissions are estimated to be 499 tons per year. With the currently proposed building design and system improvements, the estimated energy use reduction for Station West is approximately 7.2 percent, which equates to a 6.8 percent reduction (34 tpy) in stationary source CO_2 emissions when compared to the Base Case.

Table 5.7-8: Retail Stationary Source CO_2 Emissions

	Energy Consumption			CO_2 Emissions		
	Electricity (MWh/yr)	Natural Gas (MBtu/yr)	Total (MBtu/yr)	Electricity (tons/ yr)[1]	Natural Gas (tons/ yr)	Total (tons/ yr)
			Station West			
Base Case	586	4,900	6,900	213	287	499
Design Case	557	4,500	6,400	202	263	465
End-Use Savings	**29**	**400**	**500**	**11**	**24**	**34**
Percent Savings			**7.2%**			**6.8%**

1 tons/yr = short tons per year

Note: Station West results in 12.3% energy savings when comparing the Design case to a Base Case modeled on ASHRAE 90.1-2007

Overall Project Emissions (Full Build)

The total estimated annual electricity use and natural gas consumption, and associated emissions for the Project (all buildings combined, or full build out) are presented in **Table 5.7-9**. This table includes the energy consumption and CO_2 emissions for the two residential components (Garage East and Station East), the office building at Garage West, and the retail expansion at Station West. Under the Base Case, the CO_2 emissions for the Project are estimated to be 9,873 tons per year. With the currently proposed building design and system improvements, the estimated CO_2 emissions are 8,077 tons per year which is a savings of 1,796 tons per year. The equivalent estimated energy use reduction for the Project is

approximately 21.9 percent, which equates to an approximately 18.2 percent overall reduction in stationary source CO_2 emissions when compared to the Base Case. The reduction in stationary source CO_2 emissions is consistent with the projected Massachusetts Stretch Energy Code.

Table 5.7-9: Stationary Source CO_2 Emissions for the Overall Project (Full Build)

	Energy Consumption (MBtu)			CO_2 Emissions (tons/yr)[1]		
	Base Case	Design Case	Percent Savings	Base Case	Design Case	Percent Reduction
Residential (Garage East)	21,200	16,000	24.5%	1,686	1,343	20.3%
Residential (Station East)	34,100	25,800	24.3%	2,708	2,161	20.2%
Office (Garage West)	57,700	45,500	21.1%	4,980	4,108	17.5%
Retail (Station West)	6,900	6,400	7.2%	499	465	6.8%
Total	**119,900**	**93,700**	**21.9%**	**9,873**	**8,077**	**18.2%**

1 tons/yr = short tons per year

Note: The project results in 31.4% energy savings when comparing the Design case to a Base Case modeled on ASHRAE 90.1-2007

5.7.2 Air Quality Microscale Study

As presented in the Chapter 4 - *Transportation*, the Project is expected to generate just under 4,200 daily vehicle trips, with just over approximately 340 vehicle trips being made in the morning and evening peak hours. The objective of the microscale analysis will be to determine if the proposed Project will interfere with the attainment or maintenance of the Massachusetts and/or National Ambient Air Quality Standards ("NAAQS") established by the Federal Clean Air Act Amendments ("CAAA"). Massachusetts has developed a State Implementation Plan ("SIP") to demonstrate compliance with the CAAA. The SIP contains project level criteria that require that an adequate air quality study be prepared in consultation with the air quality regulatory agencies and that the results of the study demonstrate that:

- Proposed projects will not result in new CO violations, and
- Proposed projects will not result in any existing CO violations being increased.

It is anticipated that a qualitative or quantitative assessment of the air quality impacts of the Project will be conducted once the traffic impacts are determined. If any CO violations are predicted, mitigation measures will be developed and tested to meet the SIP and CAAA criteria.

5.7.3 Greenhouse Gas Mobile Source Analysis

Consistent with the MEPA GHG Policy, the Project anticipates presenting a mobile source analysis in the DPIR estimating the area-wide GHG emissions from vehicle traffic for a period of one year.

5.7.4 Air Quality Ozone Regional Analysis

The Massachusetts Department of Environmental Protection ("MassDEP") has established guidelines that define the modeling and review criteria for air quality studies prepared

pursuant to review under MEPA. These guidelines require that mesoscale analyses be prepared for proposed development projects to determine the change in Project-related ozone precursor emissions. The MassDEP criteria require that proposed development projects include all reasonable and feasible emission reduction mitigation measures if the ozone emissions from the Build Condition are greater than the No-Build Condition. Massachusetts has incorporated this criterion into the SIP.

The predominant source of ozone precursor emissions anticipated are from Project-related traffic. Ozone is not directly emitted by motor vehicles, but is generated when VOC's and NOx emissions from motor vehicles, stationary sources and area sources react in the atmosphere with sunlight and heat. Project-related ozone impacts are determined by assessing the changes in VOC and NOx emissions of motor vehicles. An air quality study will be prepared for the DPIR to demonstrate compliance with the SIP criteria. The air quality study will show the Project's change in daily (24-hour period) VOC and NOx emissions. The Project will incorporate reasonable and feasible mitigation measures to reduce VOCs and NOX emissions for the build condition.

5.8 Water Quality

The Project will comply with the MassDEP Stormwater Management Standards and will improve water quality by collecting and treating stormwater runoff through a series of structural Best Management Practices ("BMPs") designed to remove oil, floatables, and Total Suspended Solids ("TSS"). Clean runoff from the Garage West and Garage East Parcels (and potentially portions of the Station East and Station West Parcels) will be directed to recharge systems designed to infiltrate stormwater runoff in order to replenish groundwater and provide phosphorous removal. Chapter 6 – *Infrastructure* provides a complete description of the existing and proposed stormwater management systems, to the extent these systems are designed, and provides a summary of the Project's compliance with the Stormwater Management Standards.

5.9 Noise

The noise impact assessment evaluated the existing noise conditions associated with the Project. The following sections discusses noise fundamentals, noise impact criteria, and the existing noise conditions. A noise monitoring program was developed to determine existing ambient sound levels in the vicinity of the Project Site. The analysis indicates that the existing ambient sound levels exceed the City of Boston noise standards.

5.9.1 Noise Fundamentals

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, communication, work or recreation. How people perceive sound depends on several measurable physical characteristics, which include the following:

- Intensity - Sound intensity is often equated to loudness.
- Frequency - Sounds are comprised of acoustic energy distributed over a variety of frequencies. Acoustic frequencies, commonly referred to as tone or pitch, are typically measured in Hertz. Pure tones have all their energy concentrated in a narrow frequency range.

Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (zero dB) to the threshold of pain (120 dB). Because sound levels are measured in dB, the addition of two sound levels is not linear. Adding two equal sound levels creates a 3 dB increase in the overall level. Research indicates the following general relationships between sound level and human perception:

- A 3 dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.
- A 10 dB increase is a tenfold increase in acoustic energy but is perceived as a doubling in loudness to the average person.

The human ear does not perceive sound levels from each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A-weighted [dB(A)] is used to evaluate environmental noise levels. **Table 5.9-1** presents a list of common outdoor and indoor sound levels.

TABLE 5.9-1 COMMON OUTDOOR AND INDOOR SOUND LEVELS

Outdoor Sound Levels	Sound Pressure (μPa)[1]		Sound Level dB(A)[2]	Indoor Sound Levels
	6,324,555	-	110	Rock Band at 5 m
Jet Over Flight at 300 m		-	105	
	2,000,000	-	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		-	95	
	632,456	-	90	Food Blender at 1 m
Diesel Truck at 15 m		-	85	
Noisy Urban Area—Daytime	200,000	-	80	Garbage Disposal at 1 m
		-	75	Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	-	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		-	65	Normal Speech at 1 m
	20,000	-	60	
Quiet Urban Area—Daytime		-	55	Quiet Conversation at 1 m
	6,325	-	50	Dishwasher Next Room
Quiet Urban Area—Nighttime		-	45	
	2,000	-	40	Empty Theater or Library
Quiet Suburb—Nighttime		-	35	
	632	-	30	Quiet Bedroom at Night
Quiet Rural Area—Nighttime		-	25	Empty Concert Hall
Rustling Leaves	200	-	20	
		-	15	Broadcast and Recording Studios
	63	-	10	
		-	5	
Reference Pressure Level	20	-	0	Threshold of Hearing

Source: *Highway Noise Fundamentals*. Federal Highway Administration, September 1980.

1 μPA – MicroPascals, which describe pressure. The pressure level is what sound level monitors measure.

2 dB(A) – A-weighted decibels, which describe pressure logarithmically with respect to 20 μPa (the reference pressure level).

A variety of sound level indicators can be used for environmental noise analysis. These indicators describe the variations in intensity and temporal pattern of the sound levels. The following is a list of the most common sound level descriptors:

- L90 is the sound level which is exceeded for 90 percent of the time during the time period. The L90 is generally considered to be the ambient or background sound level.
- Leq is the A-weighted sound level, which averages the background sound levels with short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.

5.9.2 City of Boston Noise Impact Criteria

The City of Boston has developed noise standards that establish noise thresholds deemed to result in adverse impacts. Under Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts and Title 7, Section 50 of the City of Boston Code, the Air Pollution Control Commission of the City of Boston has adopted Regulations for the Control of Noise in the City of Boston. These regulations establish allowable sound levels based upon the land use affected by a proposed development. **Table 5.9-2** summarizes the allowable sound levels that should not be exceeded.

TABLE 5.9-2 CITY OF BOSTON NOISE STANDARDS BY ZONING DISTRICT

Land Use Zone District	Daytime (7:00 AM – 6:00 PM)	All Other Times (6:00 PM – 7:00 AM)
Residential	60 dB(A)	50 dB(A)
Residential/Industrial	65 dB(A)	55 dB(A)
Business	65 dB(A)	65 dB(A)
Industrial	70 dB(A)	70 dB(A)

Source: Regulations for the Control of Noise in the City of Boston, Air Pollution Control Commission.

With a mix of residential and commercial uses in the vicinity of the Project Site, the assessment focused on the noise standards for a residential zoning district as it is the more stringent criteria. The existing more sensitive receptors in proximity to the Project Site include the Tent City Apartments (130 Dartmouth Street), the residences at One Back Bay Apartments (135 Clarendon Street) and the YWCA/Hotel 140 (140 Clarendon Street) and the planned residences at 40 Trinity and Copley Place. Residential receptor locations would be considered impacted if experiencing sound levels exceeding 60 dB(A) during the daytime periods (7:00 AM to 6:00 PM) and 50 dB(A) during the nighttime conditions (6:00 PM to 7:00 AM). The noise analysis for the Project used these standards to evaluate existing conditions. These standards will also be used to evaluate if the Project will generate sound levels that result in adverse impacts.

5.9.3 Existing Noise Conditions

A noise monitoring program was conducted to establish existing ambient conditions. The existing sound levels were measured using a Type 1 sound analyzer (Larson Davis 831). Measurements were conducted at two locations on January 14, 2015; Dartmouth Street south of Stuart Street and Clarendon Street south of Stuart Street, as shown in **Figure 5.4**. Measurements were conducted between 10:00 AM and 11:00 AM to represent a typical weekday daytime period and between 4:00 AM and 5:00 AM to represent the nighttime period.

The existing measured sound level data are summarized in **Table 5.9-3.** The measured L90 sound levels range from approximately 61 dB(A) to approximately 70 dB(A) during the daytime period and from approximately 52 dB(A) to approximately 54 dB(A) during the nighttime

period. These sound levels are representative of a typical active urban area. The results of the noise monitoring program indicate that the existing sound levels within the study area are currently slightly above the City of Boston's daytime standard of 60 dB(A) and nighttime standard of 50 dB(A). Based on field observations, the dominant noise sources included vehicular traffic traveling along the local roadways and I-90. In addition, noise from mechanical equipment operating at nearby buildings was also audible even though masked by the traffic noise.

TABLE 5.9-3 EXISTING MEASURED L90 SOUND LEVELS, DB(A)

	City of Boston Residential District Noise Criteria		Measured Leq. Sound Levels	
Location	Daytime	Nighttime	Daytime	Nighttime
M1 – Dartmouth Street	60	50	61	52
M2 – Clarendon Street	60	50	70	54

Source: VHB, Inc.

5.9.4 Conclusion of Existing Noise Conditions

The noise analysis evaluated the existing conditions in the vicinity of the Project. This assessment determined that the sensitive receptor locations (residential use) in the vicinity of the Project Site currently experience sound levels exceeding the City of Boston's noise criteria during the daytime and nighttime periods. The dominant noise sources contributing to the existing sound levels in the study area is vehicular traffic traveling along nearby roadways.

5.9.5 Proposed Development Noise Analysis

The sound levels determined as part of this assessment of existing conditions will be used as the basis for evaluating the potential noise impacts associated with the future operations of the Project. As part of the DPIR, further noise analysis will be conducted to demonstrate that the Project will comply with the appropriate noise regulations. If necessary, the Project will incorporate noise mitigation measures to minimize noise impacts associated with the Project in order to meet the applicable noise standards.

Since the Project is in the early stages of the design process, the specific details related to the potential mechanical equipment are unknown at this time. However, the mechanical equipment associated with the Project may include building heating and ventilation systems and/or emergency backup generators for life safety purposes (such as powering emergency exit lighting). During the design and selection process, the appropriate low-noise mechanical equipment will be selected, including noise mitigation measures, such as acoustical enclosures, penthouse, and/or acoustical screening. The mechanical systems would be strategically located, utilizing the building layout and design (such as building height) to provide noise attenuation. The Project will incorporate the necessary noise attenuation measures to comply with City of Boston's noise criteria at the sensitive receptor locations. Additionally, the installation of an emergency generator would also be required to adhere to MassDEP's

regulations that such equipment be certified and registered. As part of the permitting process, the Project will be required to meet additional noise requirements described in MassDEP regulations under 310 CMR 7.00. As such, the sound levels associated with the Project's mechanical equipment is expected to be negligible at the surrounding sensitive receptor locations.

5.10 Solid and Hazardous Waste

The Proponent conducted an ASTM Phase I Preliminary Site Assessment for the Project area in January 2015, specifically at the existing Garage and Station. No chemical testing of soil or groundwater was conducted as part of this assessment. No previous data on soil and groundwater quality was discovered during the assessment. Prior to construction of the Garage, historic uses of the property included a print shop, bowling alley, railroad right-of-way, and railroad station, auto repair garages. The Station site has been occupied by various railroad stations since the 1800's.

No reported releases of oil or hazardous materials have occurred within the limits of the Project Site. Portions of the Site are underlain by urban fill, which is ubiquitous throughout Boston. As is typical of this material, it is anticipated that the urban fill will be impacted by metals, PAHs, petroleum hydrocarbons, and other compounds at concentrations above Massachusetts Contingency Policy ("MCP") Reportable Concentrations. Elevated concentrations of petroleum hydrocarbons, volatile organic compounds ("VOCs"), polycyclic aromatic hydrocarbons ("PAHs"), and metals have been detected in soil at parcels adjacent to the Site. The constituents are associated with historic use from the area's former and current railway activities and historic site filling.

The Garage is listed as a Resource Conservation and Recovery Act Conditionally Exempt Small Quantity Generator ("RCRA-CESQG") of ignitable hazardous wastes. According to previous reports this hazardous waste generation was in connection with John Hancock's reproduction/graphics department formerly located at the Garage. Violations were not identified in connection with hazardous waste generation at the Site. The hazardous waste generator designation is not anticipated to adversely affect the Site based on the current RCRA-CESQG status and the lack of RCRA generator violations and releases associated with this status.

Back Bay Dry Cleaners, a tenant located along Dartmouth Street on the ground floor of the Station, is listed on the US Historic Cleaner database (2002-2012) and Drycleaner databases (present day). The listing on the Drycleaner database indicated the following about the dry cleaning facility: "Classification Type: Non-applicability classification – still in business but not using perc [tetrachloroethene]." On December 5, 2014, Haley & Aldrich interviewed Back Bay Dry Cleaner personnel about their on-site operations. Personnel stated that no dry cleaning was conducted on-site and that the facility operated solely as a drop-off/pick-up location.

Based on current operations, and the lack of reported releases associated with the dry cleaning business, Back Bay Dry Cleaners is not anticipated to adversely affect the Site.

In accordance with normal practices, the Proponent will be conducting testing to characterize and classify the soil to be generated from foundation spoils, for off-site removal to appropriate facilities. Materials excavated during construction of the Project will be managed in accordance with applicable regulatory requirements including, if necessary, a Release Abatement Measure ("RAM") Plan under the MCP.

5.11 Groundwater

Groundwater levels in the vicinity of the Site are monitored by the Boston Groundwater Trust ("BGwT") in observation wells typically located in the public sidewalks. Groundwater levels reported by the BGwT in wells near the Site between 1999 and 2015 have ranged from Elevation 2 to Elevation 7 above the Boston City Base ("BCB").

Groundwater levels in the area could be influenced by leakage into and out of sewers, storm drains and other below-grade structures, as well as environmental factors such as precipitation, season, and temperature. As discussed further in Chapter 6 - *Infrastructure*, the Project Site is located within the GCOD, and will therefore provide a recharge system designed to infiltrate clean runoff and replenish the groundwater table to the extent feasible.

5.12 Geotechnical

5.12.1 Site Conditions

The Site is abutted by 40 Trinity, University Club, the YWCA Building and Stuart Street to the north; 131 Dartmouth Street and 285-287 Columbus Avenue to the south; Copley Place Mall and Dartmouth Street to the west; and 33-35 Stanhope Street, 131 Clarendon Street and Clarendon Street to the east. Below-grade structures that are located adjacent to and below the Site include: I-90, MBTA Orange Line and Commuter Rail lines, and Amtrak rail lines.

Buildings in the vicinity of the Site are supported on a variety of foundation systems, including deep end-bearing concrete drilled shafts and H-piles bearing in glacial deposits or bedrock, and wood piles and belled concrete caissons founded in the upper marine clay. Municipal utilities are present beneath surrounding streets and sidewalks.

5.12.2 Subsurface Soil and Bedrock Conditions

Based on available subsurface data, subsurface soil strata present at the Site are listed below in **Table 5.12-1**, in order of increasing depth below ground surface:

TABLE 5.12-1 SUBSURFACE CONDITIONS

Generalized Strata	Approx. Range in Thickness (ft)
Miscellaneous Fill	7 to 37
Organic Deposits	5 to 46
Marine Clay	29 to 92
Glacial Till	1 to 19
Bedrock (Depth)	92 to 145 ft
Bedrock (Top Elev, BCB)	El. -80 to -120

5.12.3 Proposed Construction

The foundation support requirements for the three new high-rise buildings are still under design; however based on available information and the currently planned heights of the proposed structures, we anticipate the following foundation types:

- Garage West Parcel (26-story office) – The new high-rise structure is planned to be supported on reinforced concrete Drilled Shaft foundations, and Drilled-in Micropiles extending into bedrock. The podium structure replacing the existing Garage will be supported on the existing Garage foundations, consisting of a combination of drilled concrete shafts and driven precast concrete piles.

- Garage East Parcel (28-story residential) - planned to be supported on a combination of Drilled Shaft foundations, and Drilled-in Micropiles extending into bedrock.

- Station East Parcel (34-story residential) - planned to be supported on a combination of Drilled Shaft foundations and Drilled-In Micropiles extending into bedrock.

- Station West Parcel (additional retail level(s) over the Station) – planned to be supported by existing foundations. No new foundations are anticipated to be needed.

The above-noted foundation types are low displacement elements which reduce the potential for soil disturbance and vibrations during installation.

Excavation will be performed locally for foundation elements and cap beams or grade beams to a depth of approximately eight (8) feet below street grades (about Elevation 8 BCB). Additionally, a temporary lateral earth support system may be required to complete construction for the below grade structures.

Temporary dewatering may be required during construction to remove groundwater or stormwater. A temporary construction dewatering permit will be obtained from governing agencies prior to discharge of temporary dewatering effluent from the Site. Testing of the effluent will be conducted prior to and during discharge to confirm compliance with all permit requirements.

5.12.4 Mitigation Measures

Mitigation measures will be incorporated into the design and construction of the Project to limit potential adverse impacts, including the following:

- The Project Team will conduct studies, prepare designs and specifications, and monitor the contractor's performance for conformance to the Project's contract documents with specific attention to protecting nearby structures and facilities, and reducing impacts to groundwater levels.

- The proposed foundation system will consist of LBEs which are installed within slurry-filled trenches; as well as drilled foundations consisting of drilled shafts and micropiles. Each of these foundation types will minimize vibrations, noise, and soil disturbances (compared to driven foundations).

- Performance criteria will be established in the Project specifications for the system with respect to movements, and the construction sequence of the foundations. The contractor will be required to plan, employ, and modify as necessary, construction methods and take all necessary steps during the work to protect nearby buildings and other facilities.

- Performance criteria will be established for maintenance of groundwater levels during construction in the vicinity of the Project. The contractor will be required to implement necessary steps during the work to not lower groundwater levels outside the limits of the Site. The feasibility of recharging temporary dewatering effluent into the ground will be investigated during the design of the Project.

- Geotechnical instrumentation will be installed and monitored before and during the foundation installation portion of the work to observe the performance of the adjacent buildings and structures.

5.13 Construction Impacts

The following section generally describes the potential temporary impacts resulting from construction activities and proposed mitigation measures anticipated to reduce these impacts. As design progresses, construction mitigation will be reviewed and refined by appropriate regulatory agencies through the development and submission of a parcel specific Construction Management Plan ("CMP"). The overall duration of construction for the Project will be dependent on the sequencing of the various phases.

5.13.1 Site Preparation and Water Quality

During construction, measures will be implemented to minimize water quality impacts and avoid impacts to adjacent properties. A plan to control construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and any land

disturbance activities will be developed and implemented in accordance with the National Pollutant Discharge Elimination System ("NPDES") General Permit requirements. Additionally, construction dewatering discharges will be controlled and discharged in accordance with the state and local dewatering standards.

5.13.2 Groundwater

Construction dewatering will be required to remove groundwater during the pile cap, grade beam and elevator pit excavation and construction. A Remediation General Permit ("RGP") will be obtained from the US Environmental Protection Agency ("EPA") to facilitate discharge of groundwater generated during Project dewatering operations into the storm drain system in the vicinity of the Project Site. Likewise, a Dewatering Permit will also be obtained from the City of Boston Water and Sewer Commission. These permits will determine the level of treatment required prior to discharge.

5.13.3 Soil Management

The Project will retain a Licensed Site Professional ("LSP") to manage the environmental aspects of the Project, including proper management and/or disposal of contaminated soil and groundwater encountered during construction. Prior to general excavation, the soils anticipated to be excavated will be evaluated for environmental contaminants and characterized in accordance with current MassDEP policies and procedures.

5.13.4 Traffic Management and Logistics

Construction traffic will be properly managed to eliminate significant impacts on traffic conditions, pedestrians and area businesses and residents during construction. In advance of any activity taking place on the Site, a site-specific CMP will be developed for each parcel to address construction activities and site management to the satisfaction of the BTD. The following elements will be addressed in the CMP:

- Designation of truck routes for deliveries
- Pedestrian walkways indicating temporary crosswalks, delineated walkways around the Site, and areas of overhead protection where deemed necessary
- Existing Station public access points
- Existing Garage access points
- Temporary way-finding signage to guide the public through the modified configuration
- Site enclosure fencing and gates
    - Gates for construction traffic to facilitate vehicles entering and exiting the Site with the flow of traffic on the adjacent streets
    - Site enclosure fencing on top of concrete barriers to provide a solid barrier for public protection
- Location and sizing of staging areas for on-site storage of construction materials
    - Concrete pump and truck staging locations for concrete placement

    - Construction hoist locations with loading dock and truck placement
    - Tower crane placement with designated offloading zones
    - Construction waste and debris management dumpster locations
- Police detail officer traffic and site access gate management
- Locations of Boston Fire Department access and temporary construction standpipe fire department connections
- Definition of work hours
    - Standard project hours for the majority of the work
    - Select activities requiring deviation from the City of Boston allowable construction hours will be minimized and identified, following city off hour permit criteria, where required
    - Due to the work being located over and around active rail and highway infrastructure, off hour work is anticipated and will be coordinated for these areas with MassDOT and the MBTA

5.13.5 Construction Trip Generation and Worker Parking

The number of workers required during construction will vary based on Project phasing and possible overlap of the multiple parcels, with a minimum peak project workforce of up to 350 workers on a daily basis. Because the workforce will arrive and depart prior to peak commuter traffic periods, the workforce trips are not expected to have a large impact on the area's transportation system. Construction workers will be strongly encouraged to arrive at the Site via public transportation. There will be no construction parking available at the Project Site for the workforce.

5.13.6 Truck Routes and Volumes

The vehicular access to the Project Site during the construction period will vary during different periods of the schedule. The peak phase of the deliveries will be during the erection of the structure and placement of the floor slabs, where a maximum of up to 50 delivery trucks per building per day may be anticipated. Less than half of that amount would be expected per building during the remaining portions of the schedule. Police details will be assigned to all active gate locations on days with active deliveries to ensure that vehicles are not impacting traffic operations.

5.13.7 Construction Air Quality/Dust Control

Construction activities may result in a slight, short-term increase in air pollution emissions. The primary source of potential construction emissions is from dust resulting from construction operations, and emissions from the construction machinery.

To minimize dust emissions from construction activities, water will be sprayed on any active demolition activities and on the Site itself when atmospheric conditions cause drying of the Site. Any material spoils generated from excavation on-site will be covered while stored on-site, and material management will dictate generated spoils be removed from the Project Site

on a regular basis. All demolition will be performed in a manner where elements are removed in-tact through "deconstruction" methodology, whenever possible. The construction-related air-quality impact from dust would be of relatively short duration, as the scheduled time for demolition would be short in comparison to the overall construction schedule. During the building construction debris netting will be installed around the building's perimeter until the façade construction encloses each floor, keeping any dust and debris contained to the building itself. Other specific activities such as spray on fireproofing where structural steel is used for the primary structure will be contained within debris tarps moved up through the building as the work progresses.

In addition to the above preventative measures, all vehicular egress locations around the Site will be equipped with vehicle wash stations and stone tracking mats. The tracking mats will be monitored and maintained to control buildup of particles to ascertain their effectiveness. Street and sidewalk sweeping procedures will also be deployed on a regular basis when vehicular traffic is exiting the Site.

Emission controls from construction vehicles and machinery would include proper maintenance and reduced idling on-site. Through the enforcement of the State's anti-idling laws, including the installation of anti-idling signage, the vehicle emissions are not anticipated to have any substantive impact on ambient air quality. In addition, the Proponent is committed to meeting the requirements of the DEP State Revolving Fund for diesel construction equipment. These require that all non-road diesel equipment rated 50 horsepower or greater that will be used on a construction site meet EPA's Tier 4 emission limits or be retrofitted with appropriate emission reduction equipment. Emission reduction equipment includes EPA-verified, CARB-verified or DEP- approved diesel oxidation catalysts or diesel particulate filters.

5.13.8 Construction Noise

The construction activity associated with the Project may temporarily increase nearby sound levels due to the use of construction equipment. Construction machinery will be used intermittently throughout the Project's construction phases, primarily during daytime periods. Efforts to use the least intrusive equipment will be implemented, where practical, such as the use of electric tower cranes for the erection of the building structures. The Project maintain compliance with the City of Boston noise control regulations for construction throughout the project duration.

5.13.9 Odor Control During Construction

Odor issues are not anticipated due to the lack of organic soils on the Site, however such soils are encountered, the Project Team will undertake appropriate mitigation measures to control the odor associated with their removal, such as:

- Cut and cover utility trenches whenever possible
- Protection of excavated materials with plastic sheathing to encapsulate odors
- Removal of excavated materials from the Site in a covered vehicle on a frequent basis

5.13.10 Rodent Control During Construction

The City of Boston has declared that the infestation of rodents in the city as a serious problem. In order to control this infestation, the City enforces the requirements established under the Massachusetts State Sanitary Code, Chapter 211, 105 CMR 410.550 and the State Building Code, Section 108.6. Policy Number 87-4 (City of Boston) established that preparation of a program for the extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation, and basement rehabilitation. The Proponent will prepare and adhere to a rodent control program prior to demolition and on a regular basis throughout the duration of construction.

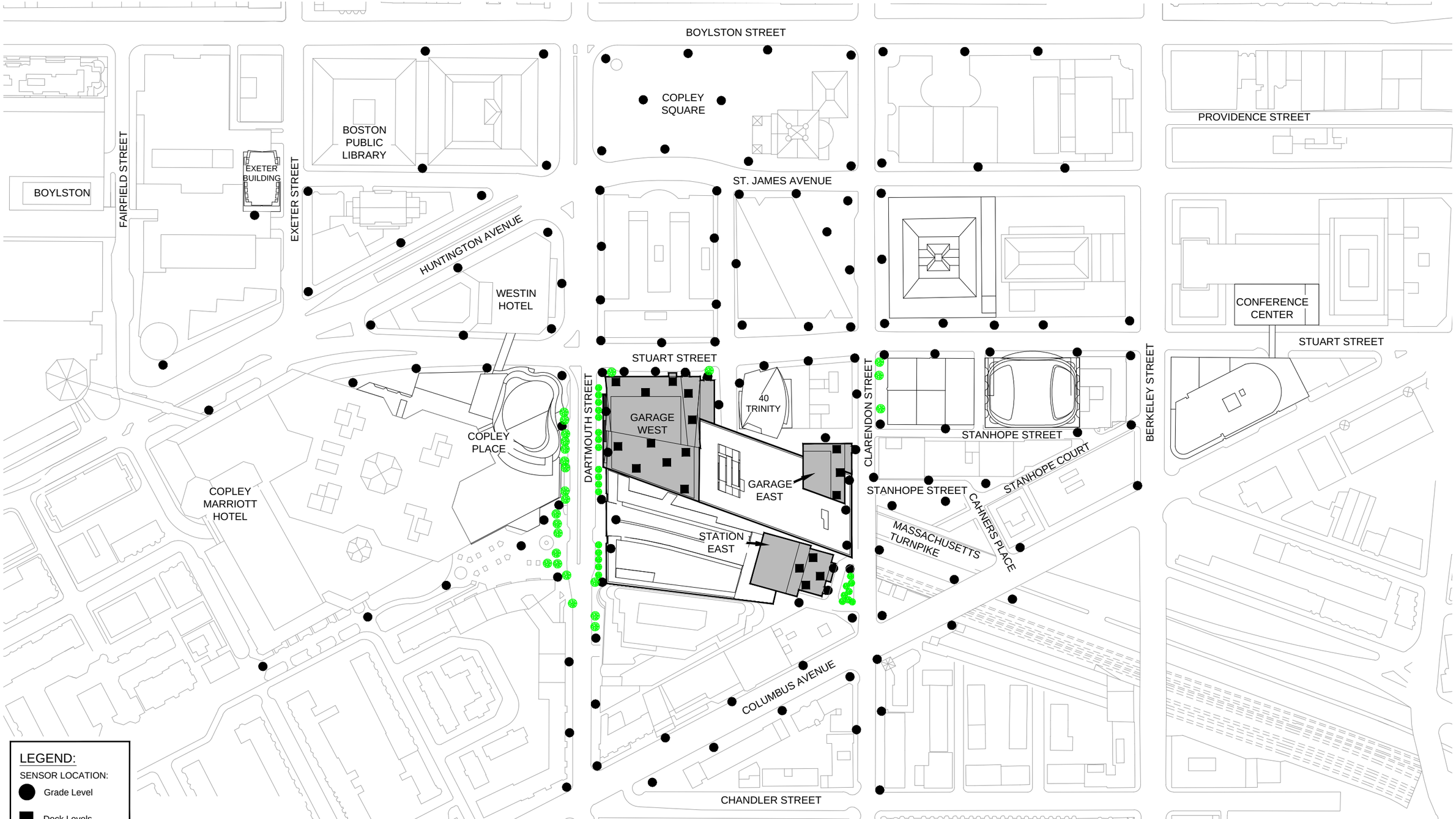
5.13.11 Public Safety During Construction

Prior to the beginning of construction, the Construction Manager will produce a Site Specific Safety Plan to be reviewed and approved by the City as well as all other agencies impacted in conjunction with the CMP.

The entire perimeter of the construction site will be protected with a construction fence with debris net on top of concrete barriers to separate the construction activities and general public. Vehicular gates will be provided for construction traffic in alignment with the flow of traffic on perimeter roads to allow safe entrance and exiting for construction vehicles. Police details will be employed at the construction gates to assist in managing vehicular and pedestrian traffic. Coordination with the Boston Police Department will be essential in providing safe travel routes for pedestrians during peak construction periods.

Sidewalks around the Site perimeter will be maintained during construction, and overhead protection will be utilized in areas where the new construction is in close proximity to the general public. Netting at the building perimeter will be installed at all sides of the building as the structure progresses, and the netting will be jumped up to maintain a close proximity to the work above as the structure rises. Debris netting will be installed vertically at the perimeter of all floors until the building envelope is installed to contain any material during windy conditions.

As the Project will be constructed around and within an existing transportation station, designated access points to the Station will be installed and managed throughout the duration of the Project. These will include primary as well as emergency access and egress routes. All work within and adjacent to the existing facilities will be coordinated with all permit requirements and work procedures inclusive of any and all monitoring and safety procedures dictated by the MBTA, MassDOT, Amtrak and other governing authorities.


BOYLSTON STREET
BOYLSTON
FAIRFIELD STREET
EXETER BUILDING
BOSTON PUBLIC LIBRARY
COPLEY SQUARE
PROVIDENCE STREET
EXETER STREET
HUNTINGTON AVENUE
WESTIN HOTEL
ST. JAMES AVENUE
CONFERENCE CENTER
STUART STREET
DARTMOUTH STREET
GARAGE WEST
40 TRINITY
COPLEY PLACE
CLARENDON STREET
BERKELEY STREET
STANHOPE STREET
STANHOPE COURT
GARAGE EAST
COPLEY MARRIOTT HOTEL
STATION EAST
MASSACHUSETTS TURNPIKE
CAHNERS PLACE
COLUMBUS AVENUE
CHANDLER STREET
LEGEND:
SENSOR LOCATION:
Grade Level
Deck Levels

Source: RWDI

9:00 AM EDT

12:00 PM EDT

3:00 PM EDT

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

SHADOW IMPACT STUDY
MARCH 21 EQUINOX

Figure 5.2a

9:00 AM EDT

12:00 PM EDT

3:00 PM EDT

6:00 PM EDT

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

SHADOW IMPACT STUDY
JUNE 21 SOLSTICE

Figure 5.2b

9:00 AM EDT

12:00 PM EDT

3:00 PM EDT

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

SHADOW IMPACT STUDY
SEPTEMBER 21 EQUINOX

Figure 5.2c

9:00 AM EST

12:00 PM EST

3:00 PM EST

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

SHADOW IMPACT STUDY
DECEMBER 21 EQUINOX

Figure 5.2d

10:09 AM EDT - SHADOW BEGINS

11:19 AM EDT - SHADOW GOES BEHIND FAIRMONT COPLEY PLAZA

START:
10:09AM
END:
11:19AM
1:10 HR

START:
11:53AM
END:
12:37PM
44 MIN

TOTAL
1:54 HR

11:53 AM EDT - SHADOW EMERGES FROM BEHIND FAIRMONT COPLEY PLAZA

12:37 PM EDT - SHADOW LEAVES COPLEY SQUARE

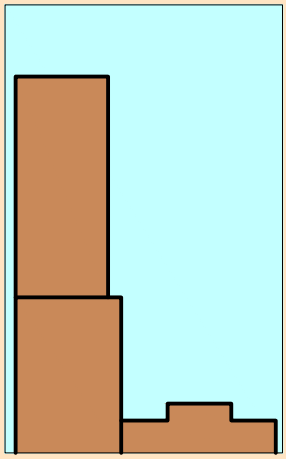
THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

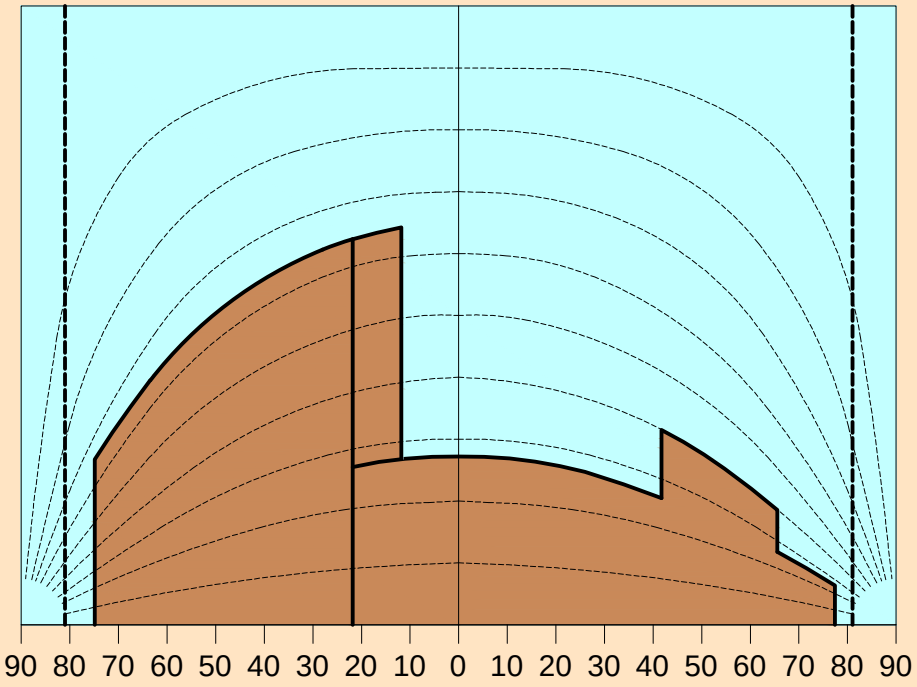
SHADOW IMPACT STUDY
OCTOBER 21ST - SHADING ON COPLEY SQUARE

Figure 5.2e

Existing

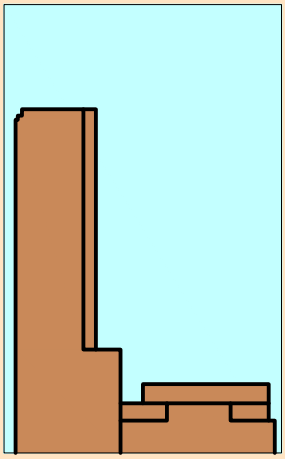
Obstruction of
Skyplane = 42.9%

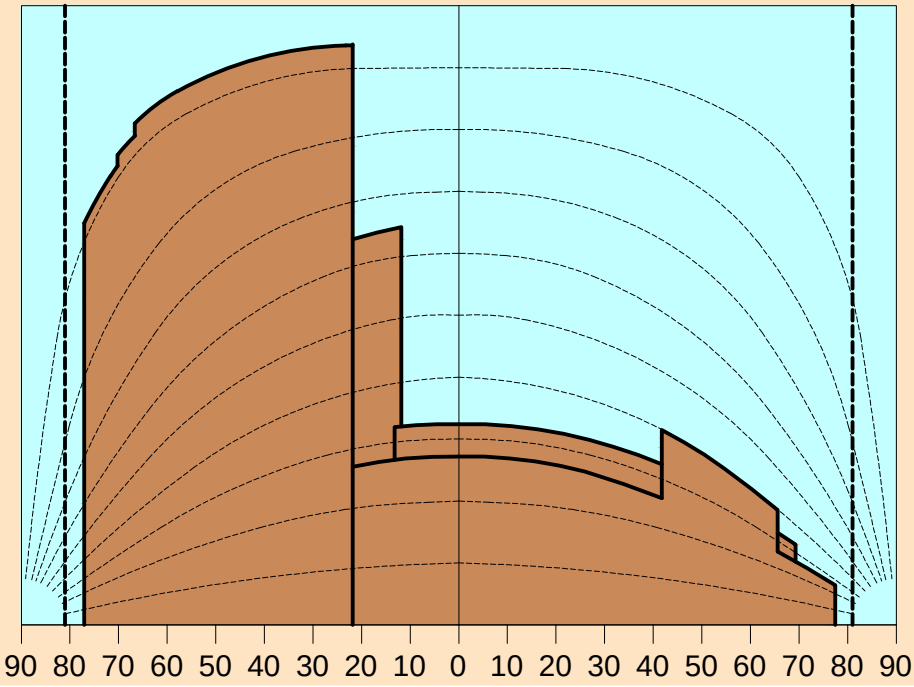




Proposed

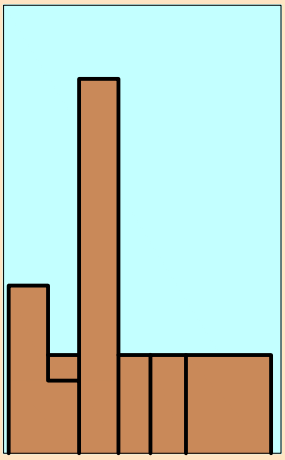
Obstruction of
Skyplane = 85.1%

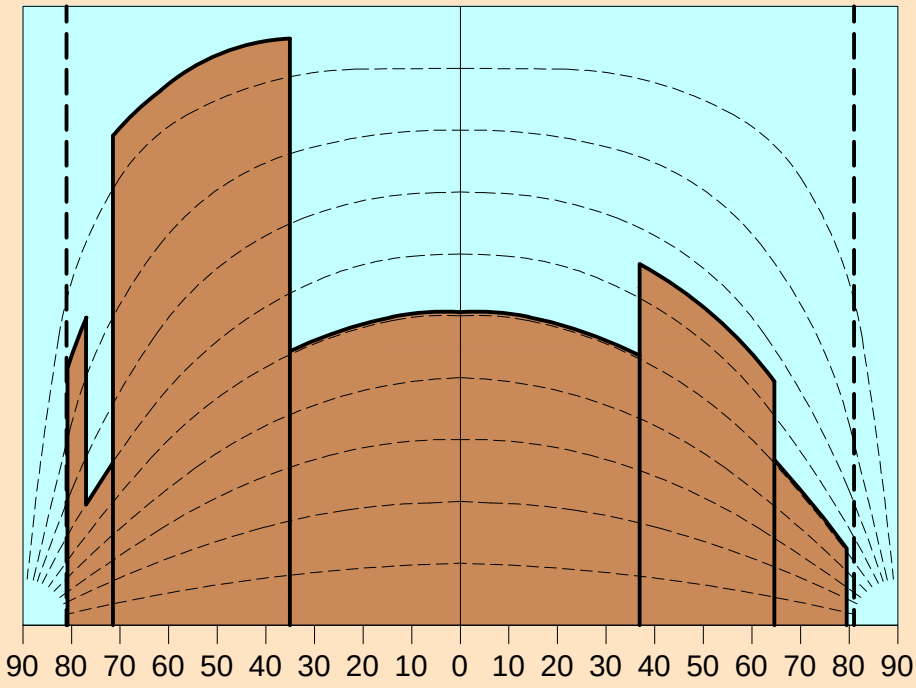




Existing

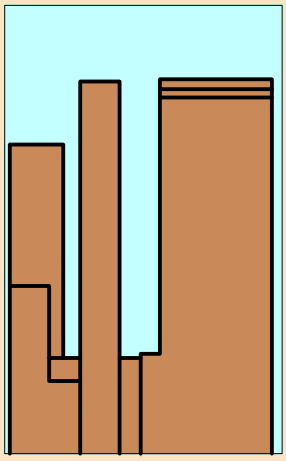
Obstruction of
Skyplane =66.4%

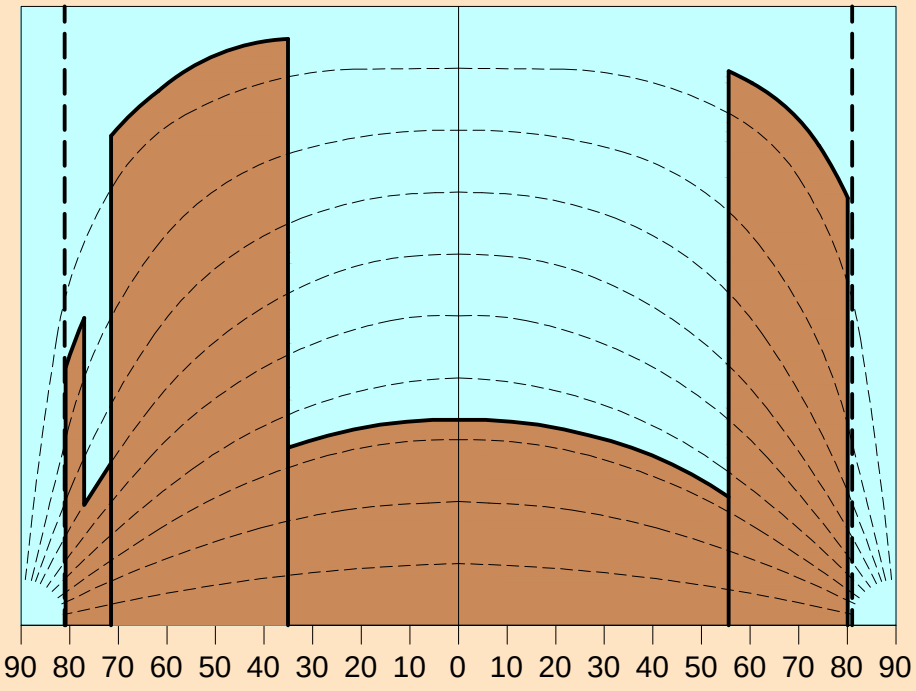




Proposed

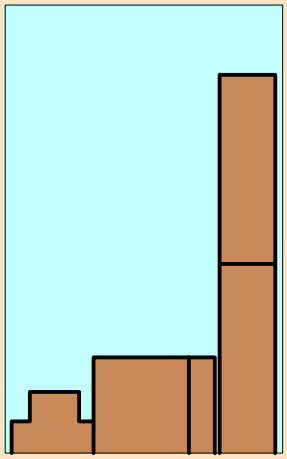
Obstruction of
Skyplane = 74.0%

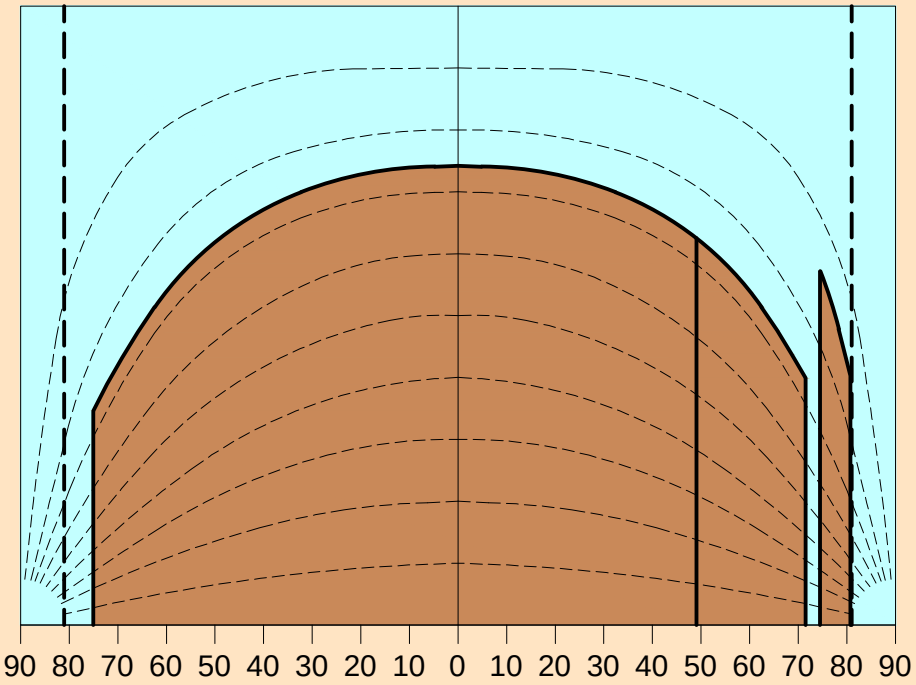




Existing

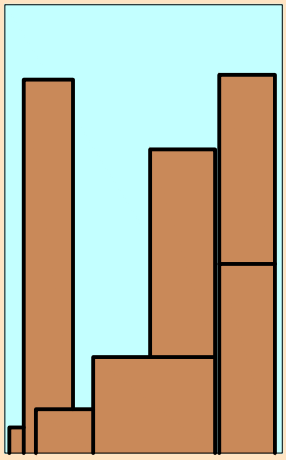
Obstruction of
Skyplane = 70.7%

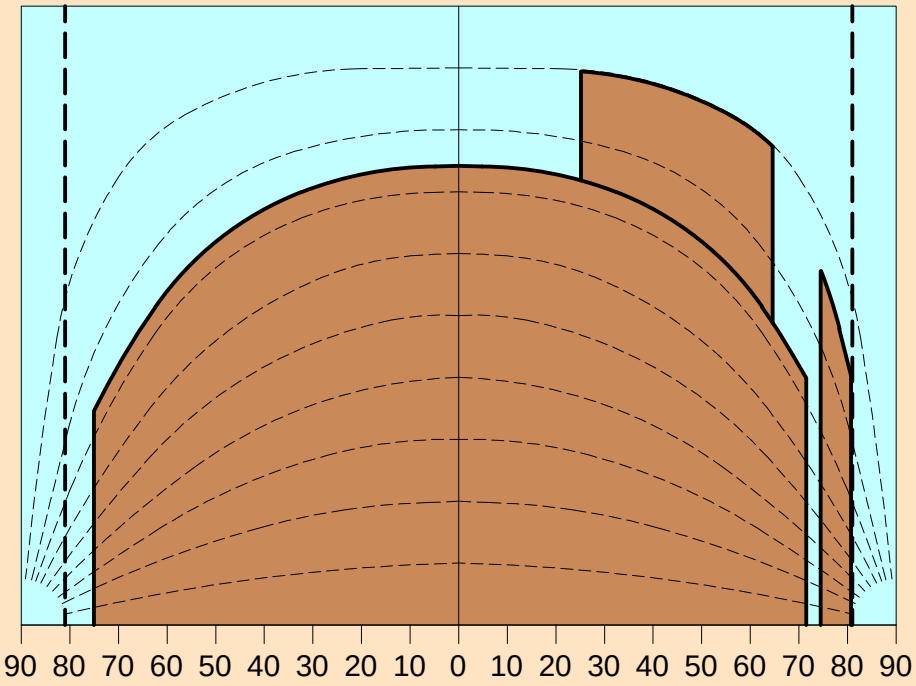


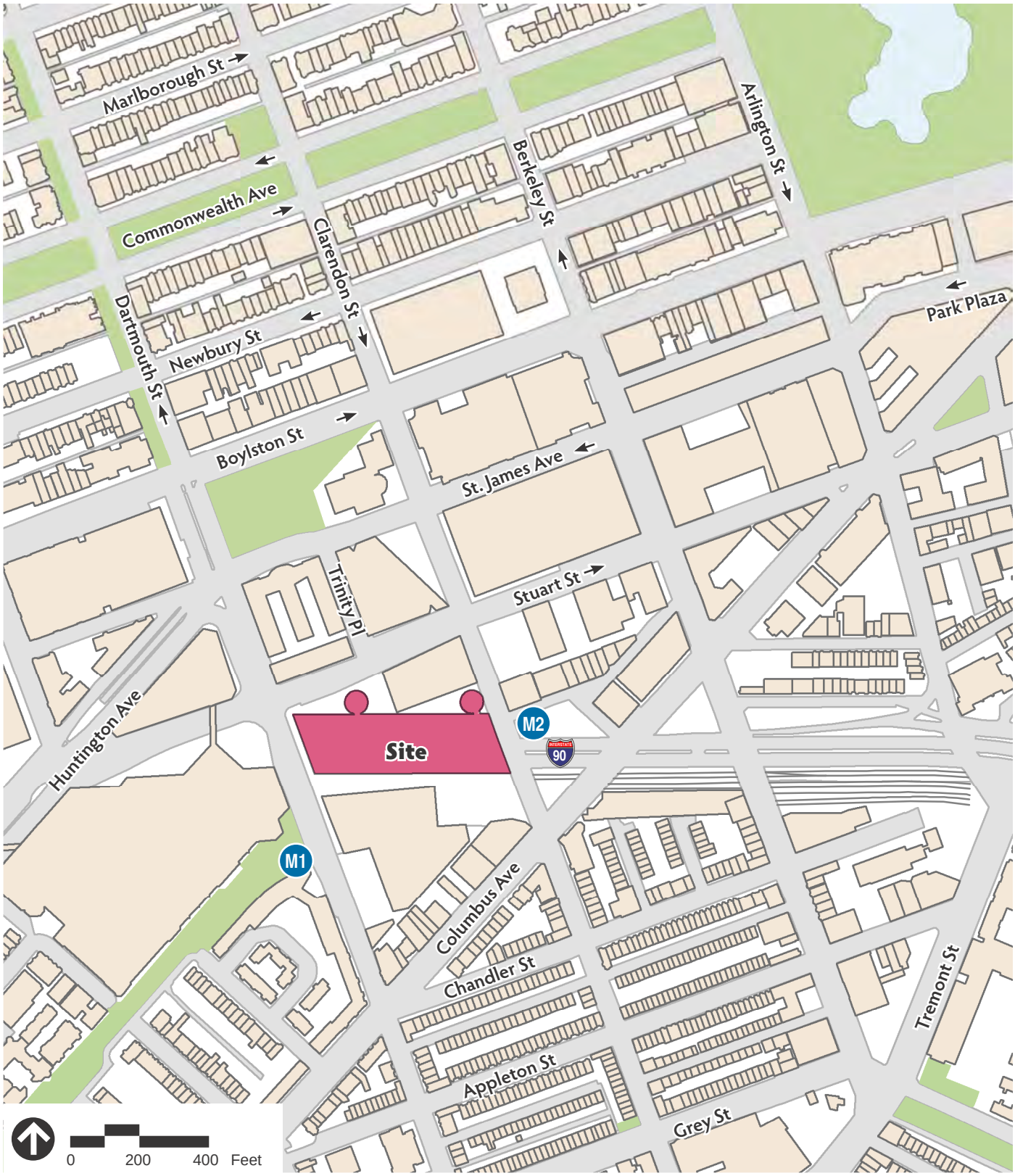


Proposed

Obstruction of
Skyplane = 79.9%







Source:

PROJECT DARTMOUTH

BOSTON PROPERTIES

Noise Monitoring Locations

Figure 5.4

vhb

6

Infrastructure

This chapter describes the infrastructure systems that will support the Project. The following utility systems are evaluated: stormwater management; sanitary sewage; domestic water and fire protection; natural gas; electric; and telecommunications.

6.1 Introduction

The Project will connect to existing utility systems available in public streets adjacent to the Project Site. These utility systems include those owned or managed by BWSC, MassDOT, the MBTA, private utility companies, and on-site infrastructure systems. As design of the Project progresses, the availability and capacity of the existing utility systems will be assessed and coordinated with the applicable utility authorities and providers.

The Proponent will coordinate the design of the proposed utility connections with BWSC, MassDOT, the MBTA and applicable private utility providers. All utility connections will be designed to minimize adverse effects to the existing systems and surrounding areas. The Proponent will acquire the appropriate utility permits and approvals prior to construction.

6.1.1 Complexities Associated with Air-Rights Construction

Approximately three quarters of the Project Site is located on the Air Rights Development Parcels founded over major transportation facilities, including I-90, the Station, the MBTA Orange Line and Commuter Rail lines, and AMTRAK rail lines. In addition, the Project Site contains the Garage, and an off-street bus drop off for the MBTA Bus Route 39.

The existing transportation infrastructure elements listed above present intricate and costly design, engineering, and construction challenges for the Project. The key challenges include:

- Maintaining the functionality and operations of and minimizing disturbances to the existing transportation infrastructure during construction of the Project.
- Establishing the interface between existing infrastructure to remain and the proposed building elements for the Project.

- Air rights construction and severe lack of terra firma requiring extensive and expensive foundation systems.
- Complexity for establishing utility corridors and connections, loading and service facilities, and vehicular and pedestrian access points for the Project.
- Extensive construction period monitoring.

6.2 Key Findings and Benefits

The key findings and benefits relative to the utility systems include:

- Construction of the Project will incorporate a stormwater management and treatment system that will be designed to achieve the following goals:
  - Compliance with the MassDEP Stormwater Management Standards, in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00).
  - Implementation of a treatment train of Best Management Practices ("BMPs") to improve water quality, reduce runoff volumes, and reduce peak discharge rates of runoff in comparison to pre-development conditions.
  - Provision for groundwater recharge by installing a recharge system designed to infiltrate clean stormwater runoff, in accordance with the standards articulated by the GCOD requirements.
  - Provision of phosphorous removal for stormwater runoff from the Project Site, in accordance with BWSC design guidelines for projects that discharge to the Charles River Watershed.

6.3 Regulatory Context

The following section outlines the regulatory framework required for utility connection reviews and standards. A complete list of the anticipated state and local permits associated with the Project is included in Chapter 1 – *General Information and Project Description*. Relative to infrastructure, the Project will require:

- Site Plan approval from BWSC for all storm drainage, sanitary sewer, and water service connections to BWSC infrastructure.
- MassDOT approval for all storm drainage connections to the MassDOT system.
- MBTA approval for all storm drainage connections to the MBTA system.
- Boston Fire Department review and approval regarding the fire protection measures, including Siamese connections, hydrants, and standpipes.
- Design and coordination of proposed energy systems (natural gas and electric) with the respective system owners.
- Authorization for excavation from the Boston Public Works Department ("BPWD"), through the street opening permit process, for any new utility connections or existing connections to be capped or removed.

6.4 Stormwater Management

The following section outlines the existing and proposed stormwater management infrastructure systems for the Project.

6.4.1 Existing Storm Drain Systems

BWSC, MassDOT, and the MBTA own and maintain the storm drainage lines in the vicinity of the Project Site. BWSC infrastructure is separated into two systems, north and south, that discharge to two distinct outfalls: the Charles River and the Fort Point Channel. The MassDOT system discharges to the Fort Point Channel. The MBTA infrastructure is separated into two systems, east and west, that discharge to two distinct outfalls: the Fort Point Channel and the Deer Island Waste Water Treatment Plant. Service is provided via the following systems (see **Figures 6.1a-b**):

Garage West Parcel

- A 12-inch BWSC storm drain line exists within Dartmouth Street along the Garage West parcel frontage. This storm drain line directs flows northward towards Stuart Street where it combines with an 18-inch storm drain line located in Stuart Street west of Dartmouth Street. The storm drain flows continue northward towards Copley Square and ultimately discharge to the Charles River.
- A 15-inch BWSC storm drain line exists within Stuart Street along the Garage West parcel frontage. This storm drain line directs flows eastward towards Trinity Place where it combines with an 18-inch storm drain line located in Stuart Street, east of Trinity Place, and an 18-inch x 18-inch storm drain line located in Trinity Place, south of Stuart Street. The storm drain flows continue northward towards Copley Square and ultimately discharge to the Charles River.
- An 18-inch x 18-inch BWSC storm drain line exists within Trinity Place along the Garage West parcel frontage. This storm drain line directs flows northward towards Stuart Street where it combines with the 15-inch and 18-inch storm drain lines located in Stuart Street. The storm drain flows continue northward towards Copley Square and ultimately discharge to the Charles River.
- Stormwater runoff from the western portion of the Garage is collected in a series of downspouts that discharge to two header pipe systems, located at the northern and southern limits of the Garage, that range in size from 6-inches to 10-inches. The header pipe systems convey flows to an existing 48-inch MassDOT storm drain line within the I-90 westbound mainline. The storm drain flows continue eastward and ultimately discharge to the Fort Point Channel.

Garage East Parcel

- A 15-inch BWSC storm drain line exists within Clarendon Street along the Garage East parcel frontage. This storm drain line directs flows northward towards Stuart Street where it combines with an 18-inch storm drain line located in Stuart Street, east of

Clarendon Street. The storm drain flows continue eastward along Stuart Street and ultimately discharge to the Charles River.

- Stormwater runoff from the eastern portion of the Garage is collected in a series of downspouts that discharge to two header pipe systems, located at the northern and southern limits of the Garage, that range in size from 6-inches to 10-inches. The header pipe systems convey flows to an existing 48-inch MassDOT storm drain line within the I-90 westbound mainline. The storm drain flows continue eastward and ultimately discharge to the Fort Point Channel.
- Stormwater runoff from the I-90 access road is collected in a series of catch basins within the access road that discharge to the existing 18-inch x 18-inch BWSC drain line within Trinity Place. This storm drain line is described in the subsection above.

Station East Parcel

- No storm drain lines exist along the frontage for the Station East parcel. The Station East parcel fronts on the bridge section of Clarendon Street.
- A 15-inch BWSC storm drain line exists within Clarendon Street, north of the Station East parcel. This storm drain line is described in the subsection above.
- An 18-inch BWSC storm drain line exists within Columbus Avenue, west of Clarendon Street and south of the Station East parcel. This storm drain line directs flows eastward towards Clarendon Street and then southward along Clarendon Street through the Back Bay and ultimately discharges to the Fort Point Channel.
- Stormwater runoff from the existing bus loop for the Station is collected in a series of catch basins that discharge directly to a 12-inch MBTA storm drain line below the bus loop. This storm drain line directs flows eastward within the MBTA Tunnel and ultimately discharges to the Fort Point Channel.

Station West Parcel

- A 15-inch BWSC storm drain line exists within Dartmouth Street, south of the Station West parcel. This storm drain line directs flows southward towards Columbus Avenue and then eastward along Columbus Avenue through the Back Bay and ultimately discharges to the Fort Point Channel.
- Stormwater runoff from the existing roof of the Station is collected internally in a series of downspouts that discharge to an 8-inch MBTA storm drain line below the Station. This storm drain line directs flows westward to the 30-inch to 36-inch MBTA storm drain lines within the MBTA Tunnel and ultimately discharges to the Deer Island Waste Water Treatment Plant.

6.4.2 Proposed Drainage Conditions

The Project will require Site Plan Review and approval from BWSC and approval from MassDOT and the MBTA. The Proponent will coordinate with BWSC, MassDOT, and the MBTA on the design of and capacity for proposed connections to their storm drain systems.

Proposed storm drain connections are anticipated to be provided as follows:

Garage West Parcel

- Stormwater runoff from the majority of the Garage West parcel, which will be comprised of new roof area for the Garage West building, will discharge to the MassDOT system located within I-90. Prior to discharging to the MassDOT system:
    - Stormwater runoff will first be directed to structural BMPs designed to improve water quality through trapping oil, floatables, and Total Suspended Solids ("TSS"), then
    - Clean runoff will be directed to a recharge system designed to infiltrate stormwater runoff in order to replenish groundwater and provide phosphorous removal
- Surface runoff from the public sidewalks along the Garage West parcel frontages will discharge to existing BWSC storm drain systems within Dartmouth Street, Stuart Street, and Trinity Place.

Garage East Parcel

- Stormwater runoff from the majority of the Garage East parcel, which will be comprised of new roof area for the Garage East building and existing garage area, will discharge to the MassDOT system located within I-90. Prior to discharging to the MassDOT system:
    - Stormwater runoff will first be directed to structural BMPs designed to improve water quality through trapping oil, floatables, and TSS, then
    - Clean runoff will be directed to a recharge system designed to infiltrate stormwater runoff in order to replenish groundwater and provide phosphorous removal
- Surface runoff from the public sidewalks along the Garage East parcel frontages will discharge to existing BWSC storm drain systems within Clarendon Street and the I-90 access road.

Station East Parcel

- The Station East parcel is entirely located on the Air Rights Development Parcel over the Station track level. Stormwater runoff from the majority of the Station East parcel, which will be comprised of new roof area for the Station East building, will ultimately discharge to the existing MBTA system below the bus drop-off. Prior to discharging to the existing MBTA system:
    - Stormwater runoff will first be directed to structural BMPs designed to improve water quality through trapping oil, floatables, and TSS, then
    - Clean runoff will be directed to a recharge system, located to the south of the Station East parcel, designed to infiltrate stormwater runoff in order to replenish groundwater and provide phosphorous removal

- Overflow from the recharge system will discharge to the existing MBTA system

- Surface runoff from the proposed pick-up/drop-off area and entrance plaza for the Station East building will first be directed to structural BMPs designed to improve water quality through oil, floatables, and TSS removal. Then, clean runoff will likely discharge to the existing MBTA storm drain system below.
- Surface runoff from the public sidewalk along the Station East parcel frontage will discharge to existing BWSC storm drain systems within Clarendon Street and Columbus Avenue.

Station West Parcel

- Existing storm drain connections for the existing Station roof will remain.
- Stormwater runoff from the new roof area for the Station West Air Rights Development Parcel, which is entirely located over the Station track and concourse levels, will first be directed to structural BMPs designed to improve water quality through oil, floatables, and TSS removal. Then, clean runoff will discharge either to the existing MBTA storm drain system below the existing Station or be directed to the proposed Garage West recharge system.

6.4.3 MassDEP Stormwater Management Standards

The Project will comply with the Stormwater Management Standards as established in the Massachusetts Stormwater Handbook issued by MassDEP in 1997 and revised in 2008. A brief explanation of each standard and the Project compliance is provided below:

- *Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*
  - The proposed design will fully comply with Standard 1. All proposed stormwater conveyances for the Project will not discharge untreated stormwater directly to or cause erosion or scour to wetlands or receiving waters.
- *Standard 2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*
  - The proposed design will fully comply with Standard 2. As a result of the improvements associated with the Project, the post-development peak discharges rates will not exceed the pre-development peak discharge rates.
- *Standard 3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type.*
  - The proposed design will fully comply with Standard 3. Stormwater recharge will be provided through a subsurface infiltration system.

- *Standard 4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids ("TSS"). This Standard is met when: a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*
  - The proposed design will fully comply with Standard 4. Stormwater runoff will be captured in a series of deep-sump hooded catch basins and/or directed to proprietary particle separators to provide 80% TSS removal prior to discharging to the existing BWSC, MassDOT, and MBTA drainage systems.
- *Standard 5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*
  - The proposed design will comply with Standard 5 to the maximum extent practicable. The Project is considered a land use with higher potential pollutant loads ("LUHPPL"), generating more than 1,000 vehicle trips per day, and therefore will be designed with BMPs sized to treat the one-inch Water Quality Volume. However, due to the site constraints – including urban conditions, congestion of existing underground utilities and infrastructure, air rights development, and the severe lack of terra firma – the use of proprietary particle separators as primary treatment for runoff from the Project Site will be necessary. Therefore, the Project will be seeking relief from the pre-treatment and structural BMP requirements of this Standard under the provisions of Standard 7.
- *Standard 6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply*

with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

- The proposed design will fully comply with Standard 6. The Project is not located within and will not discharge untreated stormwater to a critical area, as defined by Standard 6.

- *Standard 7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*
  - The Project is a redevelopment and therefore will be designed to comply only to the maximum extent practicable for the pretreatment and structural BMP requirements of Standard 5. The Project will be designed to fully comply with all other Standards.
- *Standard 8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*
  - The proposed design will fully comply with Standard 8. The Project will disturb more than one (1) acre of land and is therefore required to obtain coverage under the EPA NPDES Construction General Permit. As required under the permit, a Stormwater Pollution Prevention Plan ("SWPPP") will be developed and submitted before any land disturbances occur.
- *Standard 9: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*
  - The proposed design will fully comply with Standard 9. An O&M Plan, including long-term BMP operation requirements, will be prepared for the Project to ensure proper maintenance and functioning of the proposed stormwater management system.
- *Standard 10: All illicit discharges to the stormwater management system are prohibited.*
  - The proposed design will fully comply with Standard 10. There will be no illicit connections associated with the proposed Project.

6.4.4 Compliance with Boston Zoning Code Article 32: Groundwater Conservation Overlay District

The Project Site is located within the GCOD, as established by Article 32 of the Code. The Project will include facilities to capture stormwater runoff and direct it to infiltration systems consistent with the requirements of Article 32, with the goal of replenishing the groundwater table.

However, approximately three quarters of the Project Site is located on the Air Rights Development Parcel located over transportation facilities and infrastructure that are at an elevation below the desired groundwater recharge elevation. Therefore, it may not be possible to infiltrate the first inch of runoff over the entire post-development impervious area.

To provide groundwater recharge, to the maximum extent practicable, the proposed stormwater management system will include recharge chambers or wells designed to infiltrate runoff over a 72-hour period.

In addition, the proposed recharge system will provide stormwater treatment in the form of phosphorous removal, in accordance with BWSC design guidelines for projects that discharge stormwater runoff via a BWSC outfall.

6.5 Sanitary Sewage

The following section outlines the existing and proposed sanitary sewage infrastructure systems for the Project.

6.5.1 Existing Sewer Systems

BWSC owns and maintains the sanitary sewer lines in the vicinity of the Project Site and service is provided via the following systems (see **Figures 6.2a-b**):

Garage West Parcel

- A 12-inch sanitary sewer line exists within Dartmouth Street along the Garage West parcel frontage. This sanitary sewer line flows northward towards Stuart Street where it combines with an 18-inch x 66-inch sanitary sewer line located in Stuart Street west of Dartmouth Street. The sanitary sewer flows continue northward towards Copley Square and ultimately to the Deer Island Waste Water Treatment Plant.
- A 10-inch sanitary sewer line exists within Stuart Street along the Garage West parcel frontage. This sanitary sewer line flows eastward towards Trinity Place where it combines with an 18-inch x 36-inch sanitary sewer line located in Stuart Street, east of Trinity Place, and an 18-inch x 33-inch sanitary sewer line located in Trinity Place, south of Stuart Street. The sanitary sewer flows continue northward towards Copley Square and ultimately to the Deer Island Waste Water Treatment Plant.
- An 18-inch x 33-inch sanitary sewer line exists within Trinity Place along the Garage West parcel frontage. This sanitary sewer line flows northward towards Stuart Street where it combines with the 10-inch and 18-inch x 36-inch sanitary sewer lines located in Stuart Street. The sanitary sewer flows continue northward towards Copley Square and ultimately to the Deer Island Waste Water Treatment Plant.
- A 6-inch sanitary sewer connection exists between the Garage and the 10-inch sanitary sewer line within Stuart Street.

Garage East Parcel

- An 18-inch x 18-inch sanitary sewer line exists within Clarendon Street along the Garage East parcel frontage. This sanitary sewer line flows northward towards Stuart Street where it combines with a 12-inch sanitary sewer line located in Stuart Street,

east of Clarendon Street. The sanitary sewer flows continue eastward along Stuart Street and ultimately to the Deer Island Waste Water Treatment Plant.

Station East Parcel

- No sanitary sewer lines exist along the frontage for the Station East parcel. The Station East parcel fronts on the bridge section of Clarendon Street.
- An 18-inch x 18-inch sanitary sewer line exists within Clarendon Street, north of the Station East parcel. This sanitary sewer line is described in the subsection above.
- A 10-inch sanitary sewer line exists within Columbus Avenue, west of Clarendon Street and south of the Station East parcel. This sanitary sewer line flows eastward towards Clarendon Street and then southward along Clarendon Street through the Back Bay and ultimately to the Deer Island Waste Water Treatment Plant.

Station West Parcel

- A 10-inch sanitary sewer line exists within Dartmouth Street along the Station West parcel frontage. This sanitary sewer line flows southward towards Columbus Avenue and then westward along Columbus Avenue through the Back Bay and ultimately to the Deer Island Waste Water Treatment Plant.
- A 6-inch sanitary sewer connection exists between the Station and the 10-inch sanitary sewer line within Dartmouth Street.

6.5.2 Proposed Sewage Generation

Based on the current building program, the Project is expected to increase the sanitary sewer discharge from the Project Site by between 158,418 to 170,484 gallons per day (gpd). It is anticipated that BWSC will require Inflow and Infiltration ("I/I") removal and/or mitigation since the proposed discharge rate exceeds 15,000 gpd.

Existing and proposed sewer generation rates are provided in **Tables 6.5-1 and 6.5-2** below for the Project.

TABLE 6.5-1 PROJECT – BASE SCHEME: NET NEW SEWAGE GENERATION

Project Parcel	Program Type	Units	Generation Rate (gpd)	Generation (gpd)
New Project-Related Sewage Generation				
Garage West	Office	574,024 sf	75/1,000 sf	43,052
Garage West	Retail	18,216 sf	50/1,000 sf	911
Garage West	Restaurant	111 seats	35/seat	3,885
Garage West	Fast Food	142 seats	20/seat	2,840
Garage East	Residential	324 bedrooms	110/bedroom	35,640
Station East	Retail	6,402 sf	50/1,000 sf	321
Station East	Restaurant	39 seats	35/seat	1,365
Station East	Fast Food	50 seats	20/seat	1,000
Station East	Residential	565 bedrooms	110/bedroom	62,150
Station West	Retail	22,088 sf	50/1,000 sf	1,105
Station West	Restaurant	135 seats	35/seat	4,725
Station West	Fast Food	172 seats	20/seat	3,440
TOTAL				160,434
Existing Sewage Generation to be Removed				
Garage West	Medical Office	23,633 sf	75/1,000 sf	1,773
Garage West	Bank	3,233 sf	75/1,000 sf	243
TOTAL				2,016
NET NEW				**158,418**

Notes:

1. Based on Massachusetts State Environmental Code (Title 5) 310 CMR 15.203.
2. gpd = gallons per day; sf = square feet

TABLE 6.5-2 PROJECT – ALTERNATE SCHEME: NET NEW SEWAGE GENERATION

Project Parcel	Program Type	Units	Generation Rate (gpd)	Generation (gpd)
New Project-Related Sewage Generation				
Garage West	Office	576,638 sf	75/1,000 sf	43,248
Garage West	Retail	20,190 sf	50/1,000 sf	1,010
Garage West	Restaurant	123 seats	35/seat	4,305
Garage West	Fast Food	157 seats	20/seat	3,140
Garage East	Residential	324 bedrooms	110/bedroom	35,640
Station East	Retail	6,402 sf	50/1,000 sf	321
Station East	Restaurant	39 seats	35/seat	1,365
Station East	Fast Food	50 seats	20/seat	1,000
Station East	Residential	565 bedrooms	110/bedroom	62,150
Station West	Retail	48,413 sf	50/1,000 sf	2,421
Station West	Restaurant	296 seats	35/seat	10,360
Station West	Fast Food	377 seats	20/seat	7,540
TOTAL				172,500
Existing Sewage Generation to be Removed				
Garage West	Medical Office	23,633 sf	75/1,000 sf	1,773
Garage West	Bank	3,233 sf	75/1,000 sf	243
TOTAL				2,016
NET NEW				**170,484**

Notes:

1. Based on Massachusetts State Environmental Code (Title 5) 310 CMR 15.203.
2. gpd = gallons per day; sf = square feet

6.5.3 Proposed Sewage Connections

The Project will require Site Plan Review and approval from BWSC. The Proponent will coordinate with BWSC on the design of and capacity for proposed connections to their sanitary sewer systems.

Proposed sanitary sewage connections will likely be provided as follows:

Garage West Parcel

- Sanitary sewer service for the Garage West parcel will likely connect to the 18-inch x 33-inch sanitary sewer line that exists within Trinity Place.
- The 6-inch sanitary sewer connection between the existing 100 Clarendon Street Garage and the 10-inch sanitary sewer line within Stuart Street will be cut and capped at the main.

Garage East Parcel

- Sanitary sewer service for the Garage East parcel will likely connect to the 18-inch x 18-inch sanitary sewer line that exists within Clarendon Street.

Station East Parcel

- Sanitary sewer service for the Station East parcel will likely connect to either the 18-inch x 18-inch sanitary sewer line that exists within Clarendon Street or the 10-inch sanitary sewer line that exists within Columbus Avenue.
- Proposed sanitary sewer service connections will require coordination with the MBTA deck structure and the MassDOT bridge structure on Clarendon Street.

Station West Parcel

- Existing sanitary sewer service connections for the track and concourse levels of the Station will remain.
- Additional new sanitary sewer service connections for the Station West Air Rights Development Parcel will connect to one of the following:
    - Existing 10-inch sanitary sewer line within Dartmouth Street,
    - Existing 10-inch sanitary sewer line within Stuart Street through the Garage West development, or
    - Existing 18-inch x 18-inch sanitary sewer line within Clarendon Street through the Station East development.

6.6 Domestic Water and Fire Protection

The following section outlines the existing and proposed water infrastructure systems for the Project.

6.6.1 Existing Water Supply Systems

BWSC owns and maintains the water supply mains in the vicinity of the Project Site. Service is provided through two distribution systems designated as Southern High Service ("SH") and Southern Low Service ("SL"). The SH service is intended to supply water for building fire protection systems. SL service is intended to supply water for domestic use and fire hydrant demand.

Water service is provided via the following systems (see **Figures 6.3a-b**):

Garage West Parcel

- A 10-inch SH water main exists within Stuart Street along the Garage West parcel frontage. The pipe material is pit-cast iron ("PCI") installed in 1912 and relined in 2010.
- A 12-inch SH water main exists within Trinity Place along the Garage West parcel frontage. From Stuart Street, this water main continues southward towards the I-90 access road then eastward along the access road to Clarendon Street, thus creating a loop between Stuart Street and Clarendon Street. The pipe material is PCI installed in 1921; no relining date is listed.

- A 6-inch water service connection exists between the Garage and the 10-inch SH water main within Stuart Street. This 6-inch connection splits to provide both 6-inch fire protection and 6-inch sprinkler service to the Garage.
- A 4-inch domestic water service connection exists between the Garage and the 10-inch SH water main within Stuart Street.
- An existing hydrant (H92) is located on the north side of Stuart Street across the street from the Garage West parcel frontage.
- An existing hydrant (H90) is located on the east side of Trinity Place across the street from the Garage West parcel frontage.

Garage East Parcel

- A 12-inch SH water main exists within Clarendon Street along the Garage East parcel frontage. The pipe material is PCI installed in 1921; no relining date is listed.
- A 12-inch SH water main exists within the I-90 access road adjacent to the Garage East parcel. This water main loop is described in the subsection above.
- An existing hydrant (H120) is located on the west side of Clarendon Street along the Garage East parcel frontage.

Station East Parcel

- No water service lines exist along the frontage for the Station East parcel. The Station East parcel fronts on the bridge section of Clarendon Street.
- A 12-inch SH water main exists within Clarendon Street, north of the Station East parcel. This water main is described in the subsection above.
- A 20-inch SH water main exists within Columbus Avenue, south of the Station East parcel. The pipe material is PCI installed in 1874 and relined in 1972.
- A 12-inch SL water main exists within Columbus Avenue, south of the Station East parcel. The pipe material is ductile iron cement lined ("DICL") installed in 1992.
- An existing hydrant (H86) is located on the west side of Clarendon Street at the Columbus Avenue intersection near the Garage East parcel frontage.

Station West Parcel

- A 12-inch SL water main exists within Dartmouth Street along the Station West parcel frontage. This main connects to a 12-inch SL water main in Columbus Avenue. The pipe material is PCI installed in 1901 and relined in 1972.
- A 6-inch fire protection service connection exists between the Station and the 12-inch SL water main within Dartmouth Street. The pipe material is DICL installed in 1981.
- A 4-inch domestic water service connection exists between the Station and the 12-inch SL water main within Dartmouth Street. The pipe material is DICL installed in 1980.
- An existing hydrant (H68) is located on the west side of Dartmouth Street across the street from the Station West parcel frontage.

6.6.2 Proposed Water Demand and Connections

The Project will require Site Plan Review and approval from BWSC. The Proponent will coordinate with BWSC on the design of and capacity for proposed connections to their water systems.

Proposed water service connections will likely be provided as follows:

Garage West Parcel

- Water service for the Garage West parcel will likely connect to either the 10-inch SH water main that exists within Stuart Street or the 12-inch SH water main that exists within Trinity Place.
- Redundant fire protection connections will be required for the proposed high-rise commercial building.
- The 6-inch fire protection and 4-inch domestic water service connections between the existing Garage and the 12-inch SH water main within Stuart Street will be cut and capped at the main.
- Water service for the portion of the Garage to remain will likely connect to the 12-inch SH water main that exists within Clarendon Street.

Garage East Parcel

- Water service for the Garage East parcel will likely connect to the 12-inch SH water main that exists within Clarendon Street.
- Redundant fire protection connects will be required for the proposed high-rise residential building.

Station East Parcel

- Water service for the Station East parcel will likely connect to one of the following:
    - Existing 12-inch SH water main within Clarendon Street,
    - Existing 12-inch SL water main within Columbus Avenue.
- Proposed water service connections will require coordination with the MBTA deck structure and the MassDOT bridge structure on Clarendon Street.
- Redundant fire protection connects will be required for the proposed high-rise residential building.

Station West Parcel

- Existing water service connections for the track and concourse levels of the Station will remain.
- Additional new water service connections for the Station West Air Rights Development Parcel will likely be provided from the Garage West or Station East buildings.

6.7 Other Utilities

The following section outlines the existing private utility systems for the Project.

6.7.1 Natural Gas Service

Natural gas is provided by National Grid in the vicinity of the Project Site. Natural gas is provided via the following systems:

Garage West Parcel

- A 12-inch gas main exists within Stuart Street along the Garage West parcel frontage.
- A gas main, size unknown, exists within Trinity Place along the Garage West parcel frontage, but will be confirmed as design develops.
- Natural gas service for the Garage West parcel will likely connect to the gas main that exists within Trinity Place.
- Natural gas service for the portion of the Garage to remain will likely connect to the 8-inch gas main that exists within Clarendon Street.

Garage East Parcel

- An 8-inch gas main exists within Clarendon Street along the Garage East parcel frontage.
- Natural gas service for the Garage East parcel will likely connect to the gas main that exists within Clarendon Street.

Station East Parcel

- No natural gas service lines exist along the frontage for the Station East parcel. The Station East parcel fronts on the bridge section of Clarendon Street.
- An 8-inch gas main is known to exist within Clarendon Street, north of the Station East parcel, and natural gas service is anticipated to exist within Columbus Avenue, south of the Station East parcel, but will be confirmed as design develops.
- Natural gas service for the Station East parcel will likely connect to either the 8-inch gas main that exists within Clarendon Street or to the gas main that is anticipated to exist within Columbus Avenue.
- Proposed natural gas service connections will require coordination with the MBTA deck structure and the MassDOT bridge structure on Clarendon Street.

Station West Parcel

- Natural gas service is anticipated to exist within Dartmouth Street along the Station West parcel frontage, and will be confirmed as design develops.
- A 3-inch natural gas service connection and meter assembly exist at the southwest corner of the Station

- Existing natural gas service connections for the track and concourse levels of the Station will remain.
- Additional new natural gas service connections for the Station West Air Rights Development Parcel will likely be provided from the Garage West or Station East buildings.

As the energy system designs for the proposed buildings are further developed, the Proponent will coordinate service connection locations and system requirements with National Grid to ensure adequate capacity for natural gas service is available to serve the Project. Final design and installation of natural gas services will similarly be coordinated with National Grid.

6.7.2 Electric Service

Electric service is provided by Eversource Energy in the vicinity of the Project Site. Electric service is provided via the following systems:

Garage West Parcel

- Electric service exists within Dartmouth Street, Stuart Street, and Trinity Place along the Garage West parcel frontage.
- Electric service for the Garage West parcel will likely connect to the electric system that exists within Stuart Street and reinforce the system within Trinity Place.
- Electric service for the portion of the Garage to remain will likely connect to the electric system that exists within Clarendon Street.

Garage East Parcel

- Electric service exists within Clarendon Street and the I-90 access road along the Garage East parcel frontage.
- Electric service for the Garage East parcel will likely connect to the electric system that exists within Clarendon Street.

Station East Parcel

- Electric service exists within the sidewalk on the east side of Clarendon Street along the Station East parcel frontage. However, it is anticipated that this electric service is only intended for street lighting.
- Electric service is known to exist within Clarendon Street, north of the Station East parcel, and electric service is anticipated to exist within Columbus Avenue, south of the Station East parcel, but will be confirmed as design develops.
- Electric service for the Station East parcel will likely connect to either the electric system that exists within Clarendon Street or to the electric system that is anticipated to exist within Columbus Avenue.
- Proposed electric service connections will require coordination with the MBTA deck structure and the MassDOT bridge structure on Clarendon Street.

Station West Parcel

- Electric service exists within Dartmouth Street along the Station West parcel frontage.
- Existing electric service connections for the track and concourse levels of Back Bay Station will remain.
- Additional new electric service connections for the Station West Air Rights Development Parcel will likely be provided from the Garage West or Station East buildings.

As the electric system designs for the proposed buildings are further developed, the Proponent will coordinate service connection locations and system requirements with Eversource Energy. On-site transformer facilities are required and will be subject to design and construction approval from Eversource Energy. Final design and installation of electric services and components will similarly be coordinated with Eversource Energy.

6.7.3 Telecommunication Service

Telecommunication service is provided via the following systems:

Garage West Parcel

- Telecommunication services exist within Stuart Street and Trinity Place along the Garage West parcel frontage.
- Telecommunication services for the Garage West parcel will likely connect to the telecommunication systems that exist within Stuart Street.

Garage East Parcel

- Telecommunication services exist within Clarendon Street along the Garage East parcel frontage.
- Telecommunication services for the Garage East parcel will likely connect to the telecommunication systems that exist within Clarendon Street.

Station East Parcel

- No telecommunication services exist along the frontage for the Station East parcel. The Station East parcel fronts on the bridge section of Clarendon Street.
- Telecommunication services are known to exist within Clarendon Street, north of the Station East parcel, and are anticipated to exist in Columbus Avenue, south of the Station East parcel, but will be confirmed as design develops.
- Telecommunication service for the Station East parcel will likely connect to either the telecommunication system that exists within Clarendon Street or to the telecommunication system that is anticipated to exist within Columbus Avenue.
- Proposed telecommunication service connections will require coordination with the MBTA deck structure and the MassDOT bridge structure on Clarendon Street.

Station West Parcel

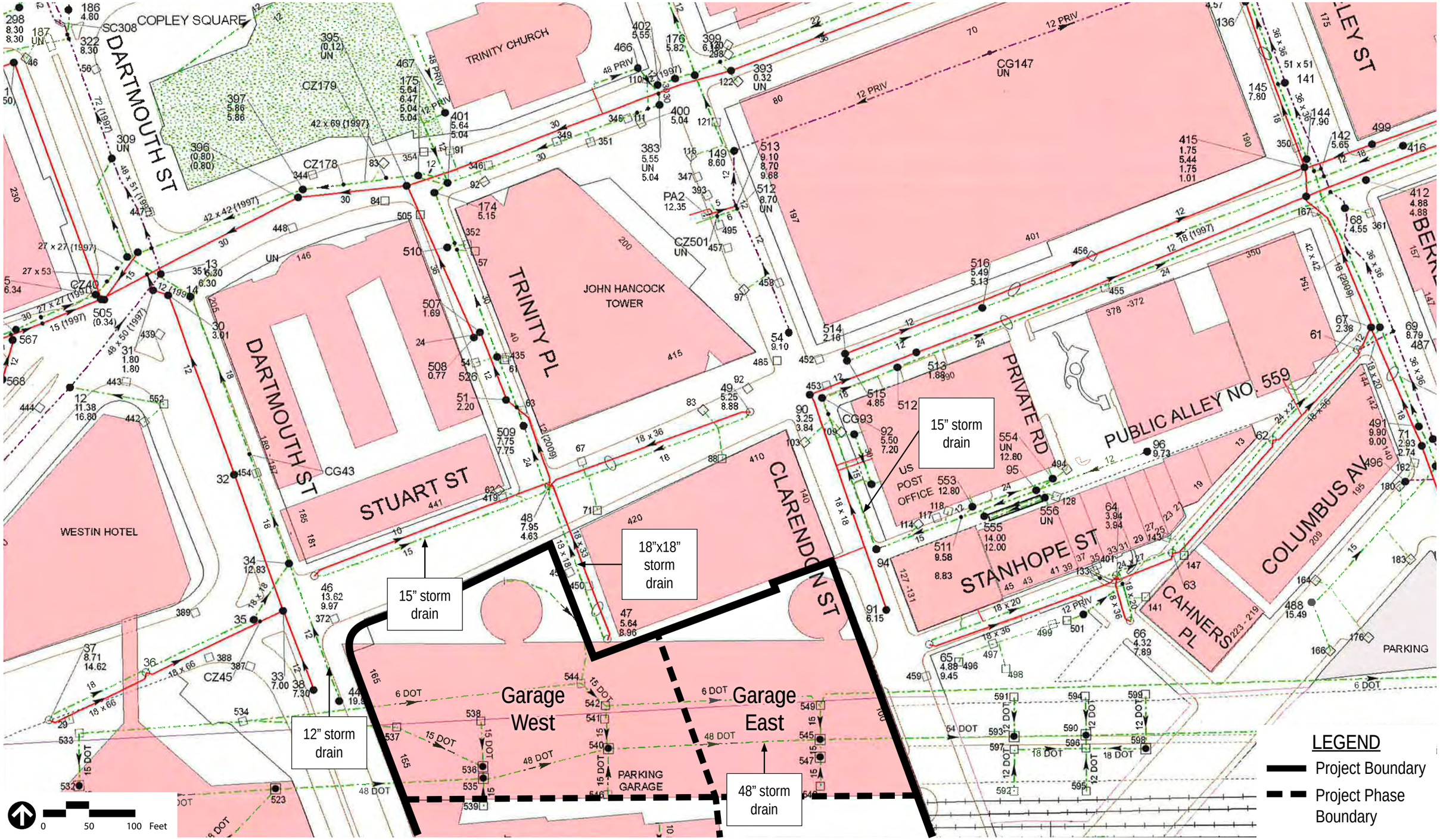
- Telecommunication services exist within Dartmouth Street along the Station West parcel frontage.
- Existing telecommunication connections for the track and concourse levels of Back Bay Station will remain.
- Additional new telecommunication service connections for the Station West Air Rights Development Parcel will likely be provided from the Garage West or Station East buildings.

The Proponent will select private telecommunications companies to provide telephone, cable TV and data services. Upon selection of a provider or providers, the Proponent will coordinate service connection locations and system requirements and obtain appropriate approvals.

6.7.4 Protection of Utilities During Construction

Existing public and private utility infrastructure within the public ways in the vicinity of the Project Site will be protected during construction of the Project. The installation of proposed utility service lines and connections within public ways will be in accordance with BWSC, MassDOT, the MBTA, Boston Public Works Department, the Dig-Safe Program, and applicable private utility company requirements. Specific methods for constructing proposed utilities where they are near to, or connect with, existing storm drain, sanitary sewer, or water facilities will be reviewed by BWSC as part of their Site Plan Review process.

The Proponent will continue to coordinate with BWSC, MassDOT, the MBTA, and applicable private utility companies to ensure safe and coordinated utility operations in connection with the Project. All necessary permits will be obtained before the commencement of any work.



Source: Boston Water and Sewer Commission

Continued on Sheet 2 of 2

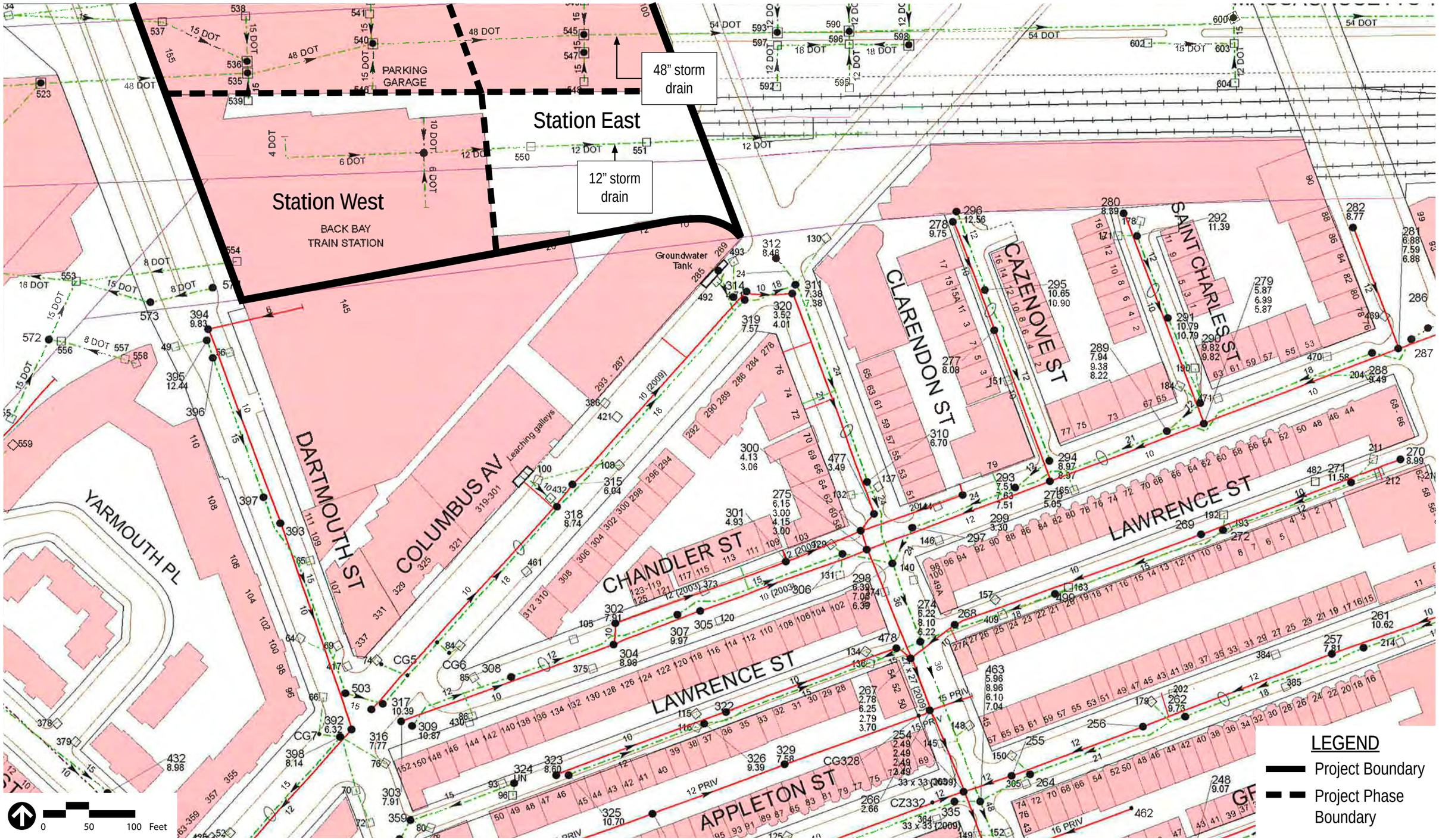
THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING STORM DRAINAGE SYSTEMS
SHEET 1 OF 2

Figure 6.1a

WSP | PARSONS BRINCKERHOFF

Continued from Sheet 1 of 2



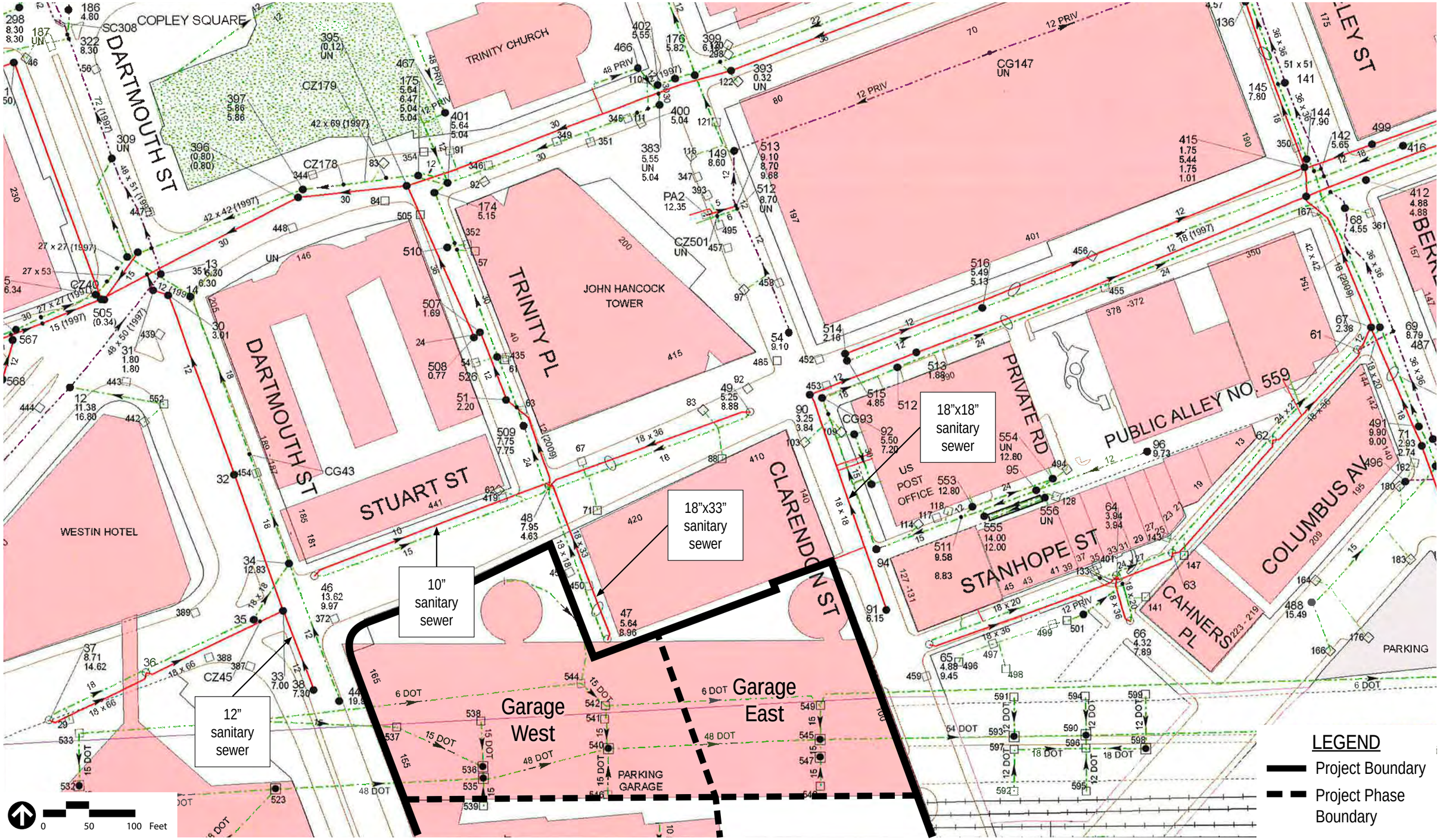
Source: Boston Water and Sewer Commission

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING STORM DRAINAGE SYSTEMS
SHEET 2 OF 2

Figure 6.1b

WSP | PARSONS BRINCKERHOFF



Source: Boston Water and Sewer Commission

Continued on Sheet 2 of 2

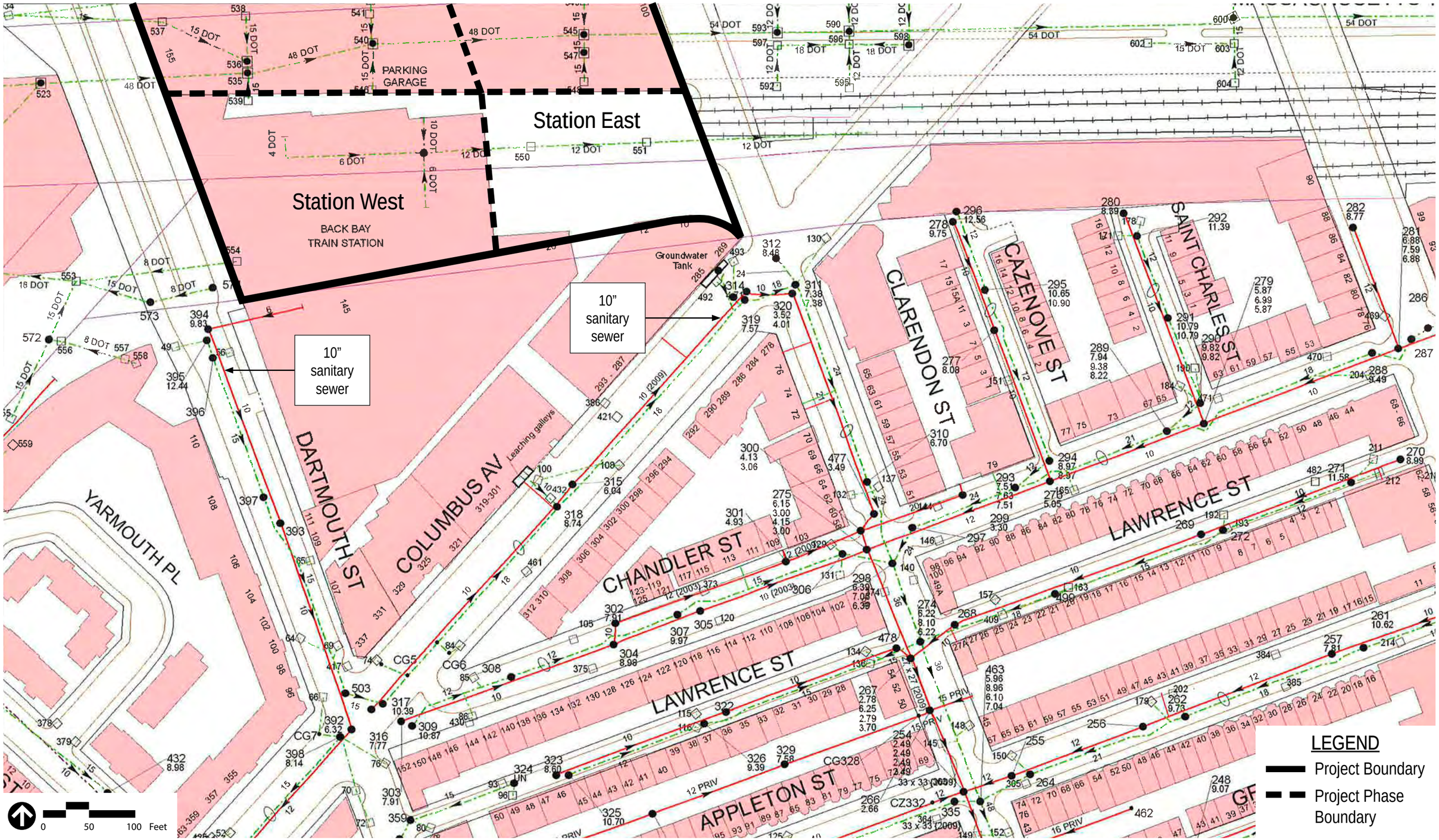
THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING SANITARY SEWER SYSTEMS
SHEET 1 OF 2

Figure 6.2a

WSP | PARSONS BRINCKERHOFF

Continued from Sheet 1 of 2



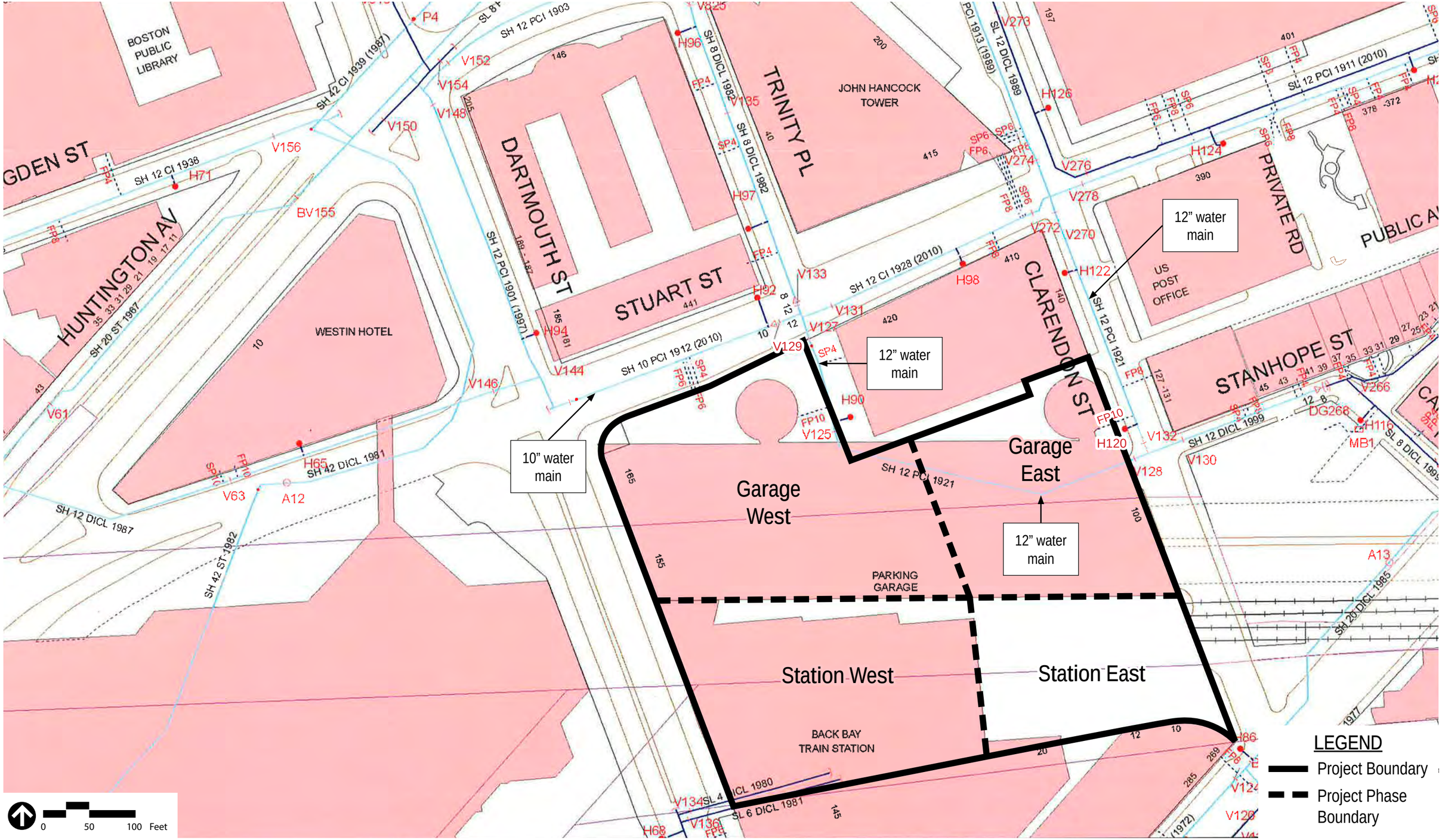
Source: Boston Water and Sewer Commission

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING SANITARY SEWER SYSTEMS
SHEET 2 OF 2

Figure 6.2b

WSP | PARSONS BRINCKERHOFF



Source: Boston Water and Sewer Commission

Continued on Sheet 2 of 2

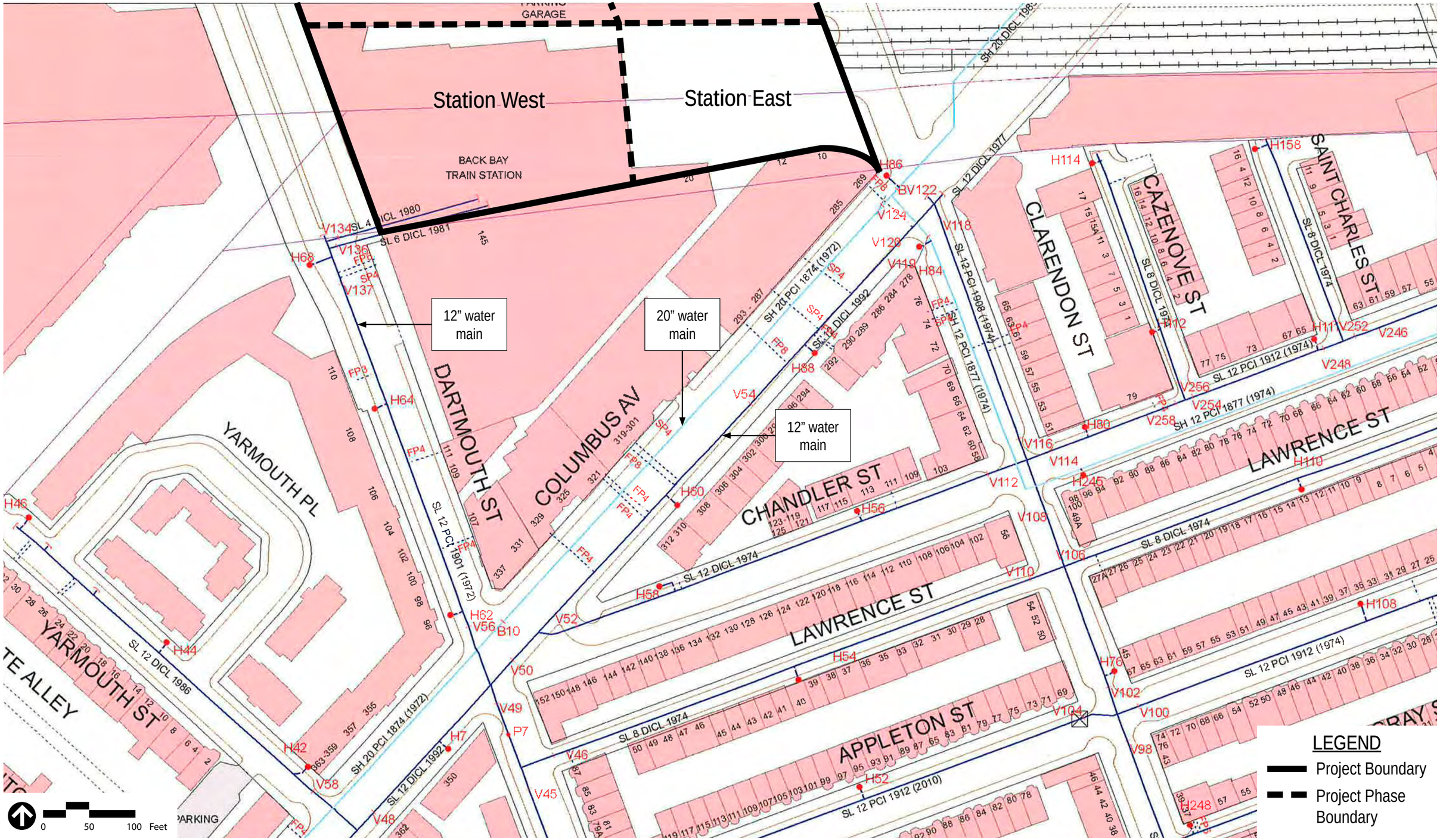
THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING WATER SUPPLY SYSTEMS
SHEET 1 OF 2

Figure 6.3a

WSP | PARSONS BRINCKERHOFF

Continued from Sheet 1 of 2



Source: Boston Water and Sewer Commission

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

EXISTING WATER SUPPLY SYSTEMS
SHEET 2 OF 2

Figure 6.3b

WSP | PARSONS BRINCKERHOFF

7

Historic Resources

7.1 Introduction

This chapter identifies properties located within and in close proximity to the Project Site that are listed in the National and State Registers of Historic Places and/or included in the Inventory of Historic and Archaeological Assets of the Commonwealth. The chapter also describes potential Project effects to these properties, as well as Project-related benefits.

7.2 Historic Context

The Project Site is located in an area that combines some of Boston's most well-known historic landmarks with some of its tallest examples of 20th century architecture. The site is part of "The High Spine," a 1960s planning concept proposed by the Boston Society of Architects' Committee on Civic Design, which envisioned a corridor of tall skyscrapers linking Back Bay to the harbor. Today, peaks of the proposed spine are evident at the Prudential Center complex, 200 Clarendon (formerly known as the John Hancock Tower, constructed in 1976), and the Financial District. In the vicinity of the Project Site, the corridor occupies the space between the historic neighborhoods of the Back Bay and South End, and in proximity to the Bay Village Historic District, concentrating two centuries of architecture in an active, varied environment.

7.3 Historic Resources

The Project Site contains one existing building, the 100 Clarendon Street Garage (formerly known as the Hancock Garage, built in 1970), which is included in the Massachusetts Historical Commission's ("MHC") Inventory of Historic and Archaeological Assets of the Commonwealth (the "Inventory"). Within a ¼-mile radius of the Project Site are five State and National Register-listed and eligible districts, 11 individually designated properties, and five inventoried properties.

7.3.1 Resources within the Project Site

Hancock Garage, 100 Clarendon Street (BOS.2366)

Completed in 1970, the Garage is an eight-story concrete parking garage with storefronts along the west side, and commercial activities along the eastern side. It occupies the air rights directly above I-90, running the full length of the block on the south side of Stuart Street between Clarendon and Dartmouth Streets, adjacent to the Station. The building is included in the Inventory (BOS.2366).

The Garage was constructed for the John Hancock Life Insurance Company, who, at the time of the Garage's construction, occupied its second tower, located to the northeast of the Project Site on the east side of Clarendon Street. In 1976, the company completed its hallmark 60-story skyscraper located opposite the Garage on the north side of Stuart Street. According to the building permit, the Garage was designed by the Boston engineering firm of Nichols, Norton, and Zaldastani, established by John Nichols and Paul Norton in 1940, who were joined by Dr. Othar Zaldastani in 1952.

The Garage building has a parallelogram footprint, with two cylindrical speed ramp towers on the north side. It is strictly utilitarian in appearance, with long, uninterrupted bands of concrete marking each story. Concrete piers support the ground level. On Clarendon Street, driveways mark each corner of the façade, providing access to the Garage and On-Ramp to I-90, while on Dartmouth Street, the upper stories overhang a pedestrian arcade with deeply recessed glazed storefronts. The storefronts are raised above street level, accessed by a full-length set of concrete steps; due to the slope of the Site, the number of steps varies from over a dozen at the north end of the Dartmouth Street façade to only three at the south end. On the south side, the building adjoins the Station.

7.3.2 Resources in the Vicinity of Project Site

The area surrounding the Project Site has been heavily documented, resulting in several listed and inventoried historic resources (**Table 7.3-1; Figure 7.1**). Nearly all of the historic resources located within a ¼-mile radius of the Project Site contribute to a National Register-listed historic district, a National Register-eligible historic district, and/or a local historic district. Some of the resources within these districts also have an individual designation, as a National Historic Landmark, a National Register individually-listed property, and/or a Boston Landmark.

TABLE 7.3-1 HISTORIC RESOURCES IN THE VICINITY OF THE PROJECT SITE

No.	Resource Name	Location	MHC Inventory No.	Designation
A	Back Bay Architectural District	N/A	BOS.BW	LHD
B	Back Bay Historic District	N/A	BOS.BT/ NR #73001948	NRDIS
C	Park Square-Stuart Street Historic District	N/A	BOS.ZF	INV
D	South End District/South End Landmark District	N/A	BOS.AB/BOS.AC / NR #73000324	NRDIS, LHD
E	St. Botolph Street Area/ Architectural Conservation District	N/A	BOS.BV	NRDOE, LHD
F	Bay Village Historic District	N/A	BOS.BQ	LHD
1	New Old South Church	645 Boylston Street	BOS.2953/NR # 70000690	NRIND, NRDIS, NHL, LHD
2	Boston Public Library (McKim Building)	700 Boylston Street	BOS.2624/NR #73001948	NRIND, NRDIS, NHL, LL
3	Boston Public Library (Johnson Building)	700 Boylston Street	BOS.2625	NRDIS, LL
4	Trinity Church	206 Clarendon Street	BOS.2623/NR #70000733	NRIND, NRDIS, NHL
5	Trinity Rectory	Clarendon Street/Newbury Street	BOS.2694/NR # 72000150	NRIND, NRDIS, LHD
6	Berkeley Building	414-426 Boylston Street	BOS.2615	NRDIS, LL
7	YWCA Boston	140 Clarendon Street	BOS.2368/NR # 04000119	NRIND
8	Youth's Companion Building	140-144 Berkeley Street/195-215 Columbus Avenue	BOS.2377/NR #74000393	NRIND
9	Armory of the First Corps of Cadets	97-105 Arlington Street/130 Columbus Avenue	BOS.2371	NRIND, LL
10	Cyclorama Building (Boston Center for the Arts)	543-547 Tremont Street	BOS.1446/NR # 73000318	NRIND, NRDIS, LHD
11	First Baptist Church	110 Commonwealth Avenue	BOS.3472/NR # 72000146	NRIND, NRDIS, LHD
12	Boylston Apartments	780 Boylston Street	BOS.2628	INV
13	N/A	760 Boylston Street	BOS.2627	INV

No.	Resource Name	Location	MHC Inventory No.	Designation
14	Hotel Lenox	Boylston Street/61 Exeter Street	BOS.2626	INV
15	District 4 Fire House	200 Columbus Avenue	BOS.2378	INV

NRIND National Register of Historic Places, Individual Listing
NRDIS National Register of Historic Places, District
NHL National Historic Landmark
NRDOE Determined eligible for listing in the National Register by the Keeper of the Register (State Register of Historic Places)
LHD Local Historic District (State Register of Historic Places)
LL Boston Local Landmark (State Register of Historic Places)
INV Listed in the Inventory of Historic and Archaeological Assets of the Commonwealth, no current designation

Back Bay Historic District (BOS.BT/ NR #73001948)/Back Bay Architectural District (BOS.BW)

North of the Project Site is the nationally-registered **Back Bay Historic District**, a largely residential area constructed during the late 19th century on newly-filled tidal flats on the south bank of the Charles River. While recognized for its dense concentration of complementary high-style brownstones arranged in a strict grid pattern, the district also boasts a number of institutional buildings, hotels, apartment buildings, and commercial buildings, as well as public spaces such as the Commonwealth Avenue Mall and Copley Square. The predominantly residential portion of the district, located north of Copley Square, has also been designated as a local historic district, the **Back Bay Architectural District**.

The historic districts (both National Register and local) have a number of buildings that are individually listed in the National Register. Several are also National Historic Landmarks and/or Boston Landmarks. Many of these individually designated buildings are situated around Copley Square, which is one block north of the Project Site. **Trinity Church (BOS.2623/NR #70000733)**, H.H. Richardson's most famous work, was constructed 1872-1877, with the porches completed by Richardson's successor in the 1890s. The Greek cross plan church has a massive central tower and features the rusticated polychrome stone, heavy arches, bands of windows, and decorative flashing that would come to define the Romanesque Revival, or "Richardsonian Romanesque," style. Artistic highlights also include stained glass windows by John La Farge and William Morris Studios, and sculpture by Daniel Chester French and Augustus Saint-Gaudens. It is a National Historic Landmark and a Boston Landmark. Located on the west side of Copley Square, the Boston Public Library is composed of two quite different but complementary sections, the 1895 **McKim Building (BOS.2624/NR #73001948)**, which is a National Historic Landmark and a Boston Landmark, and the 1971 **Johnson Building (BOS.2625)**, a Boston Landmark. The original building is one of the earliest executions of the Renaissance Revival style by the nationally recognized firm of McKim, Mead and White, with elaborate decoration on the exterior and interior. Similarly, Philip Johnson is one of the 20th century's best-known architects, and his addition created a contemporary response to the 19th century design. The 1874 **New Old South Church (BOS.2953/NR**

#70000690), a Gothic Revival style church executed in Roxbury puddingstone, was designed by Cummings and Sears. It features a soaring campanile on the front façade and is decorated with sandstone bands and tracery, wrought iron screens, and has an ornamental slate tile roof. The church is a National Historic Landmark.

North of Copley Square, the historic district contains two more individually-listed H.H. Richardson designs. The **Trinity Rectory (BOS.2694/NR # 72000150)**, located one block north of Copley Square, was built in 1880 and includes carved reliefs and a Syrian arch over a deeply recessed main entrance. The **First Baptist Church (BOS.3472/NR # 72000146)**, located at the north edge of the ¼-mile radius, was completed in 1871. It features several of Richardson's Romanesque design elements, and a tall tower with a carved frieze by Frederic Auguste Bartholdi. One block east of Copley Square is the **Berkeley Building (BOS.2615)**, a Boston Landmark. This 1905 Beaux Arts building designed by Codman and Despradelle features five-story arched bays across the façade executed in architectural terra cotta.

South End District (BOS.AB/NR #73000324)/South End Landmark District (BOS.AC)

Another 19th century residential historic district is located just south of the Project Site, the nationally-registered **South End District**. The district was similarly developed on filled land, surrounding Washington Street, the original route along the Boston Neck. It is characterized by streetscapes of relatively uniform bow-front rowhouses, several of which are along tree-lined streets surrounding open parks. The district is also home to a number of churches, which served the population as it evolved from an exclusive, high-income neighborhood to a more diverse community of multi-family homes during the late 19th and early 20th centuries. The boundaries of the National Register district largely coincide with those of the **South End Landmark District**, a local historic district, with variations mostly occurring on the southeast side where the local historic district encompasses a larger area.

Both the National Register historic district and the local historic district include the **Cyclorama (BOS.1446/NR #73000318)**, which is also individually listed in the National Register. Designed by the well-known firm Cummings and Stearns, it was constructed in 1884 to house the monumental painting, "The Battle of Gettysburg," in the round. The current façade was added in the early 20th century, when the building served as the Boston Flower Exchange.

Saint Botolph Architectural Conservation District (BOS.BV)

The **Saint Botolph Architectural Conservation District**, another residential neighborhood constructed on filled land, was developed nearly entirely during the last two decades of the 19th century. It became associated with a population of artists, writers, and craftspeople who taught, worked, and lived in the area. The district is a designated local historic district, is listed in the State Register, and has been determined National Register-eligible by the Keeper of the Register.

Bay Village Historic District (BOS.BQ)

The **Bay Village Historic District** is a predominantly intact early 19th-century residential district comprised of two- to three-story red brick row houses set on raised granite basements. Developed largely between 1825-1840, the area was constructed on former mudflats. The district is a designated local historic district and is listed in the State Register.

Inventoried Properties

The ¼-mile radius also includes five properties included in the Inventory. Directly north and east of the Project Site is the **Park Square – Stuart Street Historic District**. The commercial district comprises dozens of buildings that illustrate the area's growth as a business and institutional hub during the years following the American Civil War, into the mid- and late-20th century. The district is especially notable for its concentration of buildings designed by some of Boston, New York, and Chicago's most prominent firms. The area includes three buildings individually listed in the National Register. The **YWCA Boston building (BOS.2368/NR #04000119)** was constructed in 1924 for this rapidly growing organization. The 13-story brick and limestone building contained residential units, classrooms, recreational facilities, an auditorium, offices, and dining facilities. The **Youth's Companion Building (BOS.2377/NR #74000393)** is a five-story Romanesque Revival style building completed in 1892 for the popular literary magazine's publisher. The **Armory of the First Corps of Cadets (BOS.2371)**, another Romanesque Revival style building, was completed in 1897. The building is also a Boston Landmark.

At the west end of the radius are the 1964 **Boylston Apartments (BOS.2628)**, the 1965 department store building at **760 Boylston Street (BOS.2627)**, and the 1901 **Hotel Lenox (BOS.2626)**. At the east end of the radius is the 1970 **District 4 Fire House (BOS.2378)**.

7.3.3 Archaeological Resources

There are no known archaeological resources within the Project Site that are listed in the State and National Registers or included in the Inventory. Prior to the construction of the original buildings on the site during the 19th century, the Project Site was filled land with a depth of 20-25 feet. In addition, a portion of the site is constructed on Air Rights Development Parcels over I-90; therefore, it is unlikely that the Project will affect previously unidentified archaeological resources.

7.4 Potential Impacts to Historic Resources

7.4.1 Urban Design

As described in Chapter 2, the Project has been designed to reinforce the planning and design strategies developed as part of the Stuart Street Zoning District. The guidelines resulting from the multi-year Stuart Street Planning Study support the design of high-quality, continuous street frontage and the creation of new workplace and residential spaces in this central urban

area that respect the neighborhood context. While the Project will be authorized as an amendment to PDA No. 2, consistent with the intent of the Stuart Street Zoning District, the Project will considerably enhance the architectural character of this area, which is highly trafficked by local residents and visitors alike. The Project includes improved civic access to the Station, which is an important city gateway to rail, subway, and bus lines.

The Project responds to the urban-scale design goals of the "High Spine" corridor with the introduction of a commercial high-rise building on Dartmouth Street and two residential high-rises near Clarendon Street, complementing existing High Spine proportions and reinforcing existing urban alignments. At the street level, the Project includes significant, appropriately scaled streetscape improvements, including bringing the street wall closer to Clarendon Street, and creating street level retail and lobby spaces as part of a new active streetscape along Dartmouth, Stuart and Clarendon Streets, where this highly-visible pedestrian environment is currently characterized by deeply-recessed retail storefronts, Garage speed ramps and driveways, and a mostly vacant bus drop off. The demolition of the large, imposing concrete speed ramp along Clarendon Street in favor of a residential lobby will create greater distance between the building on the Garage East Parcel and the adjacent YWCA building, giving the building greater street presence.

The design of the Project utilizes modern glass storefront systems in the commercial and residential building lobbies, in order to create and reinforce connections between the exterior and interior environments. The full-height glass walls will be low in reflectivity while maintaining high visibility. Exterior wall materials, which may include glass, masonry, and/or metal panel, will be modern and sustainable without competing with the existing urban fabric. Along Dartmouth and Stuart Streets, façade areas on reconstructed parking levels will be architecturally screened and designed to be harmonious with the commercial podium. The Project is not expected to introduce materials that are incompatible with the current streetscape and skyline, as visible from these properties.

7.4.2 Shadow

A shadow impact analysis was conducted for the Project, consistent with both Section 80B-2(c) of the Code and the guidance provided by the recently enacted Stuart Street Zoning District. The results of the shadow analysis are provided in Chapter 5 – *Environmental Protection*. All shadow impacts have been minimized to the maximum extent practicable to avoid any noticeable effect on pedestrian use patterns, including no more than 2 hours of shadow on Copley Square between 8am to 2:30pm on any given day from March 21 to October 21, as specified in the the Stuart Street Zoning District regulations.

7.4.3 Wind

The Project Team has commenced a quantitative wind tunnel analysis to compare existing and proposed pedestrian level wind conditions, and anticipates providing a complete report of the results in the DPIR. Pedestrian level wind mitigation is imbedded throughout the design of the Project. The Proponent is committed to providing a high quality pedestrian experience.

7.4.4 Geotechnical

The Project Site is abutted by the YWCA building, which is on the Inventory as noted above, and is in close proximity to the Back Bay Historic District and the South End District. As explained in 5.12 although the foundation support requirements are still under design, the anticipated foundation types are low displacement and installed within slurry-filled trenches or drilled, which will minimize potential for soil disturbance and vibration during construction. Additional geotechnical considerations will also be required due to the transportation infrastructure below the Air Rights Development Parcels (I-90, MBTA Orange and Commuter Rail lines, AMTRAK).

The Project Team will monitor the contractor's conformance to Project documents intended to protect nearby structures and minimize groundwater level impacts outside the Project Site. Given the nature of the Project Site as described in Chapter 5, no impacts to groundwater are anticipated. Performance criteria will be established to monitor soil movement and groundwater during construction, and the contractor will be required to modify construction methods to protect nearby buildings, if necessary.

7.5 Regulatory Context

7.5.1 Boston Landmarks Commission (BLC) Article 80 Review

Submission of this PNF initiates review of the Project by the BLC under the Article 80 review process.

7.5.2 Boston Landmarks Commission Article 85 Review

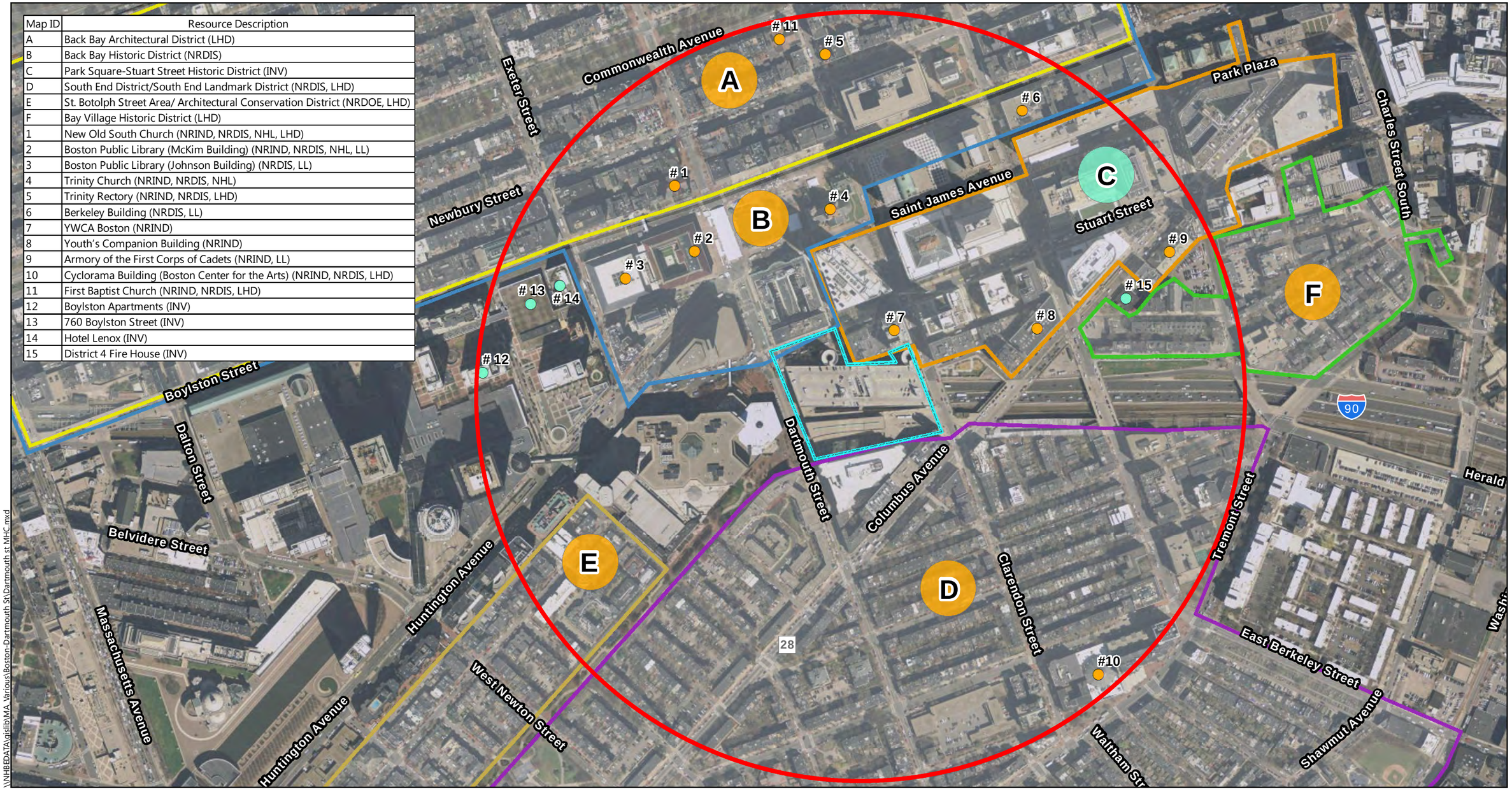
As discussed in Chapter 1, review of the partial demolition of the Garage in accordance with the provisions of Article 85 of the Code may be required. The need for Article 85 review will be determined through consultation with Boston Landmarks Commission staff in accordance with the provisions of Section 85-5 of the Code. If such review is required, it will be coordinated with the Article 80B and 80C approvals required for the Project.

7.5.3 Massachusetts Historical Commission Review

The MHC has review authority over projects requiring state or federal funding, licensing, permitting, and/or approvals, in order to evaluate potential direct or indirect impacts to properties listed in, or eligible for listing in, the National and State Registers of Historic Places,

in compliance with State Register Review requirements (M.G. L. Chapter 9, Sections 27-27c, as amended by Chapter 254 of the Acts of 1988) and Section 106 of the National Historic Preservation Act of 1966 (if necessary). The submittal of the ENF will initiate MHC's review of the Project, and the Proponent will also provide a copy of this PNF to the MHC for additional context.

Map ID	Resource Description
A	Back Bay Architectural District (LHD)
B	Back Bay Historic District (NRDIS)
C	Park Square-Stuart Street Historic District (INV)
D	South End District/South End Landmark District (NRDIS, LHD)
E	St. Botolph Street Area/ Architectural Conservation District (NRDOE, LHD)
F	Bay Village Historic District (LHD)
1	New Old South Church (NRIND, NRDIS, NHL, LHD)
2	Boston Public Library (McKim Building) (NRIND, NRDIS, NHL, LL)
3	Boston Public Library (Johnson Building) (NRDIS, LL)
4	Trinity Church (NRIND, NRDIS, NHL)
5	Trinity Rectory (NRIND, NRDIS, LHD)
6	Berkeley Building (NRDIS, LL)
7	YWCA Boston (NRIND)
8	Youth's Companion Building (NRIND)
9	Armory of the First Corps of Cadets (NRIND, LL)
10	Cyclorama Building (Boston Center for the Arts) (NRIND, NRDIS, LHD)
11	First Baptist Church (NRIND, NRDIS, LHD)
12	Boylston Apartments (INV)
13	760 Boylston Street (INV)
14	Hotel Lenox (INV)
15	District 4 Fire House (INV)



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0 200 400 800 Feet

Legend

- 1/4 Mile Radius
- Site Location
- Historic Resources
- Inventoried Resources

MHC Designation Codes

NRIND	National Register of Historic Places, Individual Listing
NRDIS	National Register of Historic Places, District
NRDOE	Determined eligible for listing in the National Register by the Keeper of the Register (State Register of Historic Places)
NHL	National Historic Landmark
LHD	Local Historic District (State Register of Historic Places)
LL	Boston Local Landmark (State Register of Historic Places)
INV	Listed in the Inventory of Historic and Archaeological Assets of the Commonwealth, no current designation

Project Dartmouth, Boston MA

Massachusetts Historical Commission
Inventoried and Listed Properties (1/4-Mile Radius)

8

Project Certification

This PNF has been submitted to the Boston Redevelopment Authority, as required by Article 80B of the Zoning Code, on the 29th of March, 2016.

Proponent
BP Hancock LLC *through its affiliate*
Boston Properties Limited Partnership

Michael Cantalupa
Senior Vice President of Development

Preparer
VHB

Seth Lattrell
Environmental Planner

APPENDIX A: Letter of Intent

Boston Properties

MICHAEL A. CANTALUPA
Senior Vice President - Development

December 29, 2015

2015 DEC 30 A 11:21
BRA

Brian P. Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

BOSTON, MA
NEW YORK, NY
SAN FRANCISCO, CA
WASHINGTON, D.C.

Re: Letter of Intent with Respect to the Development of Certain Air and Ground Lease Parcels – Garage and Back Bay Station – 165 and 145 Dartmouth Street

Dear Director Golden:

On behalf of our affiliate, BP Hancock LLC, Boston Properties is pleased to submit this Letter of Intent in accordance with the Executive Order Relative to the Provision of Mitigation by Development Projects in Boston. BP Hancock LLC is a party to a long term lease (the "Lease") whose terms contemplate the future development of four ground and air rights parcels (the "Parcels") as described below.

Boston Properties has spent considerable time evaluating an optimum plan for the development of the Parcels in and over the existing parking garage known as and numbered 165 Dartmouth Street (the "Garage") and Back Bay Station at 145 Dartmouth Street (the "Station"), which collectively comprise a significant portion of the block bounded by Dartmouth Street, Stuart Street, Clarendon Street and Columbus Avenue (such portion referred to herein as the "Project Site"). Boston Properties has recently assumed property management responsibilities for the Station Concourse ("Concourse"), and has embarked upon a concerted effort to improve the Concourse's appearance and customer experience.

Boston Properties' vision for the future development of the Project Site includes significant functional and aesthetic improvements to the Concourse, a contribution towards the improvement of the track-level ventilation at the Station; and the transformation of the Project Site into a mixed-use office, retail, restaurant, commercial, and residential development of approximately 1.4 million square feet constructed on the Parcels, in and over the existing Garage and Station (the "Project"). Boston Properties will invest significant capital into the 1970's era Garage and the Station, resulting in a transit oriented development which will integrate the Project, the Garage and the Station into the Back Bay and surrounding neighborhoods.

The Project will obtain zoning entitlements by virtue of an amendment to the existing PDA No. 2 to authorize the Project within the Project Site. The Project's design is responsive to the BRA's goals as set forth in the recently adopted Stuart Street Planning Guidelines. Boston Properties intends to file a Project Notification Form to initiate review of the Project in accordance with Article 80B of the Boston Zoning Code within the next few months.

We look forward to working with you, interested members of the community, including an Impact Advisory Group, or Citizen's Advisory Committee, as appropriate, when appointed, your staff and other City and State agencies to undertake Article 80 review of this Project. Our vision for the redevelopment and repurposing of the Garage and Station air and ground lease parcels will deliver significant social, economic and public realm improvements in the heart of Back Bay, and represent further significant commitment by Boston Properties to the City of Boston.

Please do not hesitate to contact me at 617-236-3342 or Melissa Schrock at 617-236-3328 should you have any questions.

Very truly yours,

Michael A. Cantalupa, Senior Vice President, Boston Properties, Inc.

cc: Teresa Polhemus, BRA
David Carlson, AIA BRA
Heather Campisano, BRA
Jonathan Greeley, BRA
Melissa Schrock, Boston Properties

APPENDIX B: Station and Concourse Improvements

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

BACK BAY STATION RENOVATION
VIEW FROM DARTMOUTH STREET

Appendix Figure 1.1a
ARROWSTREET

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

BACK BAY STATION RENOVATION
INTERIOR VIEW 1

Appendix Figure 1.1b
ARROWSTREET

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

BACK BAY STATION RENOVATION
INTERIOR VIEW 2

Appendix Figure 1.1c
ARROWSTREET

THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

BACK BAY STATION RENOVATION
INTERIOR VIEW 3

Appendix Figure 1.1d
ARROWSTREET

APPENDIX C: BRA Checklists

Article 80 | ACCESSIBILTY CHECKLIST

Project Information

Project Name:	**The Back Bay / South End Gateway Project**
Project Address Primary:	**145 Dartmouth St. and 165 Dartmouth St., also known as 100 Clarendon St.**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Melissa Schrock, Senior Project Manager, Development** **Boston Properties, Inc.** **mschrock@bostonproperties.com** **617-236-3300**

Team Description

Owner / Developer:	**BP Hancock LLC, owner through its affiliate Boston Properties Limited Partnership**
Architect:	**Pelli Clarke Pelli Architects –** Garage West, Garage East, Station East **Arrowstreet, Inc.** – Station West
Engineer (building systems):	**Bard, Rao + Athanas Consulting Engineers –** Garage West, Garage East, Station East **AHA Consulting Engineers.** – Station West
Sustainability / LEED:	**ARUP**
Permitting:	**VHB**
Construction Management:	**Turner Construction Company**

Project Permitting and Phase

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

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

Building Classification and Description

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

Residential – One to Three Unit	**Residential - Multi-unit, Four +**	Institutional	Education
Commercial	**Office**	**Retail**	Assembly

	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	**Garage West:** lobby, retail, public transit access and back of house **Garage East:** lobby and back of house **Station East:** lobby, retail, public transit access and back of house **Station West**: lobby, retail, public transit access and back of house			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	**Steel Frame** (Garage West, Station West, Station East)	**Concrete** (Garage East)

Describe the building?

The Project is comprised of up to approximately 1.26 million square feet of mixed use redevelopment across four Air Rights Development Parcels (Garage West Parcel, Garage East Parcel, Station East Parcel and Station West Parcel), consisting of a new office building with ground floor retail, two new residential buildings, a one to two-story vertical retail expansion of the existing Back Bay/South End Station building, and the partial redevelopment of the existing 100 Clarendon Street Parking Garage.

Site Area:	***Garage West: 68,235 sf*** ***Garage East: 52,919 sf*** ***Station East: 38,902 sf*** ***Station West: 64,387 sf***	Building Area:[1] **(for Base Schemes)**	***Garage West: 598,312 sf*** ***Garage East: 214,588 sf*** ***Station East: 377,279 sf*** ***Station West: 29,450 sf***
Building Height: [2]	***Garage West: 365'*** ***Garage East: 298'*** ***Station East: 388'*** ***Station West: 46' to 69.5'***	Number of Stories:	***Garage West: 26*** ***Garage East: 28*** ***Station East: 34*** ***Station West: 1 to 2***
First Floor Elevation (reference Boston City Base):	***Garage West: 17.5-22' (Stuart St.) and 31' on (Dartmouth St.)*** ***Garage East: 18'*** ***Station East: 29'*** ***Station West: 29'***	Are there below grade spaces/levels, if yes how many:	***There will not be below grade spaces at the Garage East, Station East, or Station West Parcels. There may be a partial basement level at the Garage West Parcel for services uses.***

[1] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

[2] Unless labeled otherwise all heights provided herein are determined in accordance with the provisions of Article 2 of the Code to be the vertical distance from grade to the top of the structure of the last occupied floor

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	The Project is located at the edge of Boston's Back Bay and South End Neighborhoods. The immediately adjacent areas of Back Bay are dominated by large scale commercial office and retail uses within buildings dating from the early 20th century to the more modern Hancock Tower and Copley Place Mall. The adjacent areas of the South End neighborhood are dominated by low-rise row residential housing and tree-lined streets typical of its mature residential nature. The Project area also contains open space uses such as the exterior plaza at the Copley Place Mall (soon to be reconfigured), the nearby Copley Square and the wide sidewalks adjacent to the Boston Public Library. The existing sidewalks and pedestrian ramps are cast-in-place concrete that are in fair to poor condition. In two specific locations, due to the bridge sections of Dartmouth and Clarendon Streets spanning I-90 and the rail lines, the existing sidewalks are not ADA compliant as they exceed the maximum allowable cross slope. This occurs at the Dartmouth Street/Stuart Street intersection and along the western side of Clarendon Street between the MassDOT-controlled service road and the entrance to the Garage.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	The Project Site is located over and adjacent to the Back Bay / South End Station with immediate access to multiple public transportation services, including MBTA Commuter Rail, Orange Line and local bus routes, and AMTRAK.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	The nearest known public housing/elderly facility is 70 St. Botolph St., approximately 0.25 miles southwest of the Site. The closest known public school is the Snowden International School, approximately 0.2 miles north of the site.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	Boston Public Library, YWCA, Trinity Church, Back Bay Station

Surrounding Site Conditions – Existing:

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

Are there sidewalks and pedestrian ramps existing at the development site?	**Yes**
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	**The existing sidewalks and pedestrian ramps are cast-in-place concrete that are in fair to poor condition. In two specific locations, due to the interface between the bridge sections of Dartmouth and Clarendon Streets spanning I-90 rail lines, the existing sidewalks are not ADA compliant as they exceed the maximum allowable cross slope. This occurs at the Dartmouth Street/Stuart Street intersection and along the western side of Clarendon Street between the MassDOT-controlled service road and the entrance to the Garage.**
Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian ramps been verified as compliant? If yes, please provide surveyors report.	**The hardscape and streetscape improvements at the Dartmouth Street Station entrance are anticipated to be upgraded as part of another project. All other areas within the Project scope will include reconstructed, code-compliant sidewalks and pedestrian ramps. Therefore, the existing sidewalks and pedestrian ramps have not been verified by a surveyor for compliance.**
Is the development site within a historic district? If yes, please identify.	**No. The Project Site is not located within any existing historic district but is adjacent to Back Bay Historic District and the Park Square Stuart Street Historic District (inventoried), and is in proximity to the South End District/South End Landmark District, the Bay Village Historic District, and the St. Botolph Street Area/Architectural Conservation District**

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	**The proposed sidewalks at the Project Site will comply with the BTD Complete Streets Guidelines.**

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	The current sidewalk design is at a conceptual level but is anticipated to meet the Downtown Commercial and/or Downtown Mixed Use standards.
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Along Dartmouth Street, the sidewalk typically maintains 21 feet from curb to structure. This dimension includes an 8-foot furnishing zone from back of curb, where street trees, parking meters, lighting, trash receptacles, and other streetscape elements are to be located. The pedestrian zone along Dartmouth Street varies from 8-foot clear to 13-foot clear. Where appropriate, a 2-3 foot wide frontage zone will be included. Along Stuart Street, a vehicular lay-by is provided to service the office building and entrance to the Station through-block connector. In this area, there is no furnishing zone and the pedestrian zone is a minimum of 10-foot clear. This area also includes planting buffers at each end of the lay-by to increase pedestrian safety. Along Clarendon Street, a minimum 8-foot clear pedestrian path of travel is provided. An enhanced pedestrian zone and increased width is provided at the proposed entry to the Station, where a vehicular drop-off is also provided.
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?	Proposed materials for the sidewalks will likely include unit pavers for the furnishing zones and cast-in-place concrete for the pedestrian and frontage zones. Unit pavers may also be used to enhance building entries and other special areas within the pedestrian zone. These materials will be located on both private property and within the City of Boston pedestrian right-of-way.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	The extent to which an easement or other authorization is required from PIC will be determined as the Project plans advance during the public review process.
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	These details will be determined as the design advances.
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	These details will be determined as the design advances.

Proposed Accessible Parking:

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

What is the total number of parking spaces provided at the development site parking lot or garage?	**The Garage will provide up to the existing permitted capacity of 2013 spaces.**
What is the total number of accessible spaces provided at the development site?	**To be determined as the design advances, however, the Project will fully comply with all state and local regulatory requirements.**
Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	**No on-street accessible parking spaces are anticipated to be required and none are proposed at this time.**
Where is accessible visitor parking located?	**Accessible visitor parking will be available within the Garage at the Project Site.**
Has a drop-off area been identified? If yes, will it be accessible?	**Yes, accessible drop-off areas are planned along Stuart Street, Dartmouth Street, and off Clarendon Street in proximity to Station and lobby entrances.**
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	**Please see figure attached.**

Circulation and Accessible Routes:

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

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

Provide a diagram of the accessible route connections through the site.	**Please see figure attached.**
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	**Entryways are anticipated to include a combination of flush connections, stairs, ramps and elevators to provide ADA compliant access to all individuals.**
Are the accessible entrance and the standard entrance integrated?	**As currently designed, the accessible and standard entrances are anticipated to be integrated.**
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	**Yes. Roof decks are presently planned at all parcels. See attached figure.**
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	**No. At this early stage of design, accessible routes and way-finding signage packages have not yet been developed.**

Accessible Units: (If applicable)

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

What is the total number of proposed units for the development?	**The Garage East building includes approximately 240 residential units and the Station East building includes approximately 360 residential units.**
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	**The mix of rental vs. for-sale units in the Garage East and Station East residential buildings will be determined as the project design advances.**
How many accessible units are being proposed?	**The number of accessible units at the Project will be determined as the project advances, however, as required by 521 CMR, it is anticipated that 5% will be designed to be accessible.**

Article 80 | ACCESSIBILTY CHECKLIST

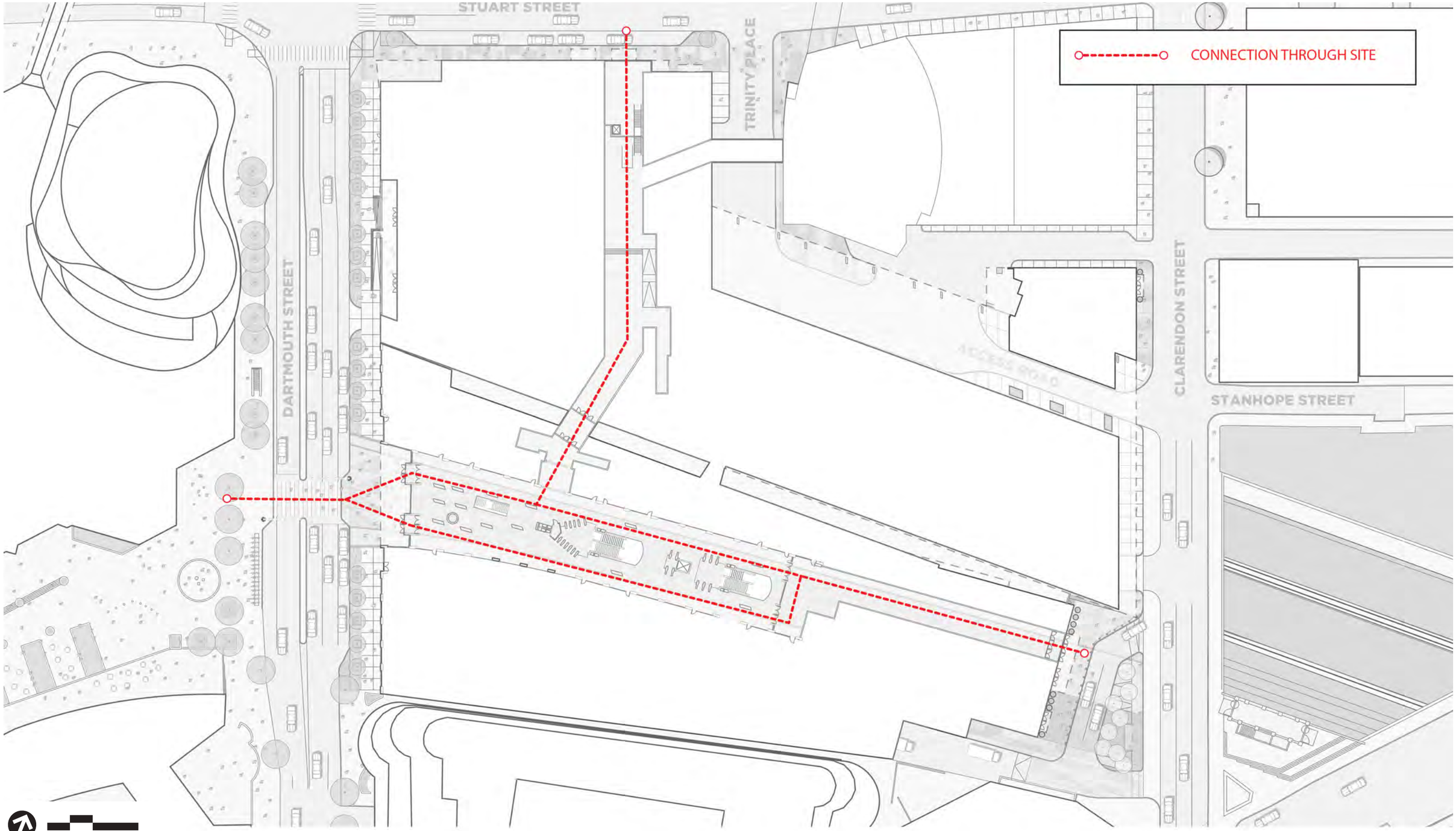
Please provide plan and diagram of the accessible units.	**These details will be determined as the Project design advances.**
How many accessible units will also be affordable? If none, please describe reason.	**The number of affordable accessible residential units will be determined as the Project design advances.**
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	**The interior building design is early in its development, however, it is not anticipated that either residential units or common space will have any architectural barriers.**
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	**The Project has not yet presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board. The Project Team will meet with the Board as the Project design advances and is fully committed to delivering a Project that is ADA compliant.**
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	**The Project has not yet been reviewed by the Advisory Board.**

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

ACCESSIBILITY DIAGRAM

Accessibility Checklist - Figure 01

ARROWSTREET



THE BACK BAY / SOUTH END
GATEWAY PROJECT
BOSTON PROPERTIES

ACCESSIBILITY DIAGRAM
THROUGH SITE CONNECTION

Accessibility Checklist - Figure 02

ARROWSTREET

THE BACK BAY / SOUTH END GATEWAY PROJECT
BOSTON PROPERTIES

ACCESSIBILITY DIAGRAM
ROOF DECK ACCESS

Accessibility Checklist - Figure 03

ARROWSTREET

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	**The Back Bay / South End Gateway Project**
Project Address Primary:	**145 Dartmouth St. and 165 Dartmouth St., also known as 100 Clarendon St.**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Melissa Schrock, Senior Project Manager, Development** **Boston Properties, Inc.** **mschrock@bostonproperties.com** **617-236-3300**

A.2 - Team Description

Owner / Developer:	**BP Hancock LLC, owner through its affiliate Boston Properties Limited Partnership**
Architect:	**Pelli Clarke Pelli Architects –** Garage West, Garage East, Station East **Arrowstreet, Inc.** – Station West
Engineer (building systems):	**Bard, Rao + Athanas Consulting Engineers –** Garage West, Garage East, Station East **AHA Consulting Engineers.** – Station West
Sustainability / LEED:	**ARUP**
Permitting:	**VHB**
Construction Management:	**Turner Construction Company**
Climate Change Expert:	**ARUP**

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description – **Building descriptions assume Base Schemes**

List the principal Building Uses:	**Office, retail, residential and parking**
List the First Floor Uses:	**Garage West**: lobby, retail, public transit access and back of house **Garage East:** lobby and back of house **Station East:** lobby, retail, public transit access and back of house **Station West:** lobby, retail, public transit access and back of house

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

Wood Frame	Masonry	**Steel Frame** (Garage West, Station West, Station East)	**Concrete** (Garage East)

Describe the building? **The Project is comprised of up to approximately 1.26 million square feet of mixed-use redevelopment across four Air Rights Development Parcels (Garage West Parcel, Garage East Parcel, Station East Parcel and Station West Parcel), consisting of a new office building with ground floor retail, two new residential buildings, a one to two-story vertical retail expansion of the existing Back Bay/South End Station building, and the partial redevelopment of the existing 100 Clarendon Street Parking Garage.**

Site Area:	***Garage West: 68,235 sf*** ***Garage East: 52,919 sf*** ***Station East: 38,902 sf*** ***Station West: 64,387 sf***	Building Area:[1] **(for Base Schemes)**	***Garage West: 598,312 sf*** ***Garage East: 214,588 sf*** ***Station East: 377,279 sf*** ***Station West: 29,450 sf***
Building Height:[2]	***Garage West: 365'*** ***Garage East: 298'*** ***Station East: 388'*** ***Station West: 46' to 69.5'***	Number of Stories:	***Garage West: 26*** ***Garage East: 28*** ***Station East: 34*** ***Station West: 1 to 2***
First Floor Elevation (reference Boston City Base):	***Garage West: 17.5-22' (Stuart St.) and 31' on (Dartmouth St.)*** ***Garage East: 20'*** ***Station East: 29'*** ***Station West: 29'***	Are there below grade spaces/levels, if yes how many:	***There will not be below grade spaces at the Garage East, Station East, or Station West Parcels. There may be a partial basement level at the Garage West Parcel for services uses.***

A.5 - Green Building

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

Garage West: LEED 2009 for Core and Shell – **GOLD**

Garage East: LEED 2009 for New Construction and Major Renovations – **SILVER**

Station East: LEED 2009 for New Construction and Major Renovations – **SILVER**

Station West: LEED 2009 for Core and Shell – **Silver**

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

Registered: **Yes** / *No*

Certified: **Yes** / *No*

[1] Unless labeled otherwise, all areas provided herein are described in gross floor area as such term is used in the definition of "Floor Area Ratio" in Article 2 of the Code; therefore, such areas specifically exclude floor area devoted to garage use, whether or not in the basement of a building or serving residential uses, mechanical equipment, storage, service and loading areas, and areas serving as access to, egress from or use by public transit services. Please note that given the fact that the majority of the Project Site is on and over air rights, it is not possible to reconstruct parking spaces beneath one or more of the buildings, and thus this filing and PDA No.2 as amended will expressly exclude the square footage allocated to such parking for the purposes of calculating FAR.

[2] Unless labeled otherwise all heights provided herein are determined in accordance with the provisions of Article 2 of the Code to be the vertical distance from grade to the top of the structure of the last occupied floor

A.6 - Building Energy

Garage West

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

Electric:	*11.6 MW*	Heating:	*16,210 mbh*
What is the planned building Energy Use Intensity:	*61*	Cooling:	*2,200 tons*

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

Electric:	*2 MW*	Heating:	*10,000 mbh*
		Cooling:	*0 tons*

Garage East

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

Electric:	*4.6 MW*	Heating:	*5,000 mbh*
What is the planned building Energy Use Intensity:	*63*	Cooling:	*800 tons*

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

Electric:	*1.5 MW*	Heating:	*3,600 mbh*
		Cooling:	*0 tons*

Station East

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

Electric:	*6 MW*	Heating:	*7,310 mbh*
What is the planned building Energy Use Intensity:	*63*	Cooling:	*1,300 tons*

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

Electric:	*1.5 MW*	Heating:	*6,000 mbh*
		Cooling:	*0 tons*

Station West

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

Electric:	*3 MW*	Heating:	*5,000 mbh*
What is the planned building Energy Use Intensity:	*120-220*	Cooling:	*400 tons*

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

Electric:	*None (no generator)*	Heating:	*None (no generator)*
		Cooling:	*None (no generator)*

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

Electrical Generation:	*Electrical generation = peak electric demands of critical systems*		Fuel Source:	*Diesel*
System Type and Number of Units:	**Combustion Engine**	Gas Turbine	Combine Heat and Power	*Single (Units)*

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years | ***(60 yrs)***	75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

What time span of future Climate Conditions was considered?

Near term: 2030 for SLR and storm surge; span of 2015-2045 for temperature and precipitation.
Longer term: 2070 for SLR and storm surge; span of 2055-2085 for temperature and 2030, 2050, 2100 for precipitation.

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

There are several sources that could be consulted with respect to projected temperature changes. They include the 2007 NECIA UCS report, EEA's Climate Adaptation Report (2011), the National Climate Assessment (2014) and Katharine Hayhoe's downscaled projections (2013) for the City of Cambridge, which included Boston-specific data, among others. In all of these, there is a general trend showing an increase in annual temperature, including both increases during the summer and winter months. Of these increases, those seen during the summer months will present the greatest challenges in terms of cooling loads and associated energy demands. Therefore, this project will focus on the summer peak temperatures and heat waves.

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

The City of Cambridge study provides downscaled data that provides a more robust baseline with respect to localized projections than the larger, more regionalized studies that were presented in the NECIA, EEA and NCA reports. Katharine Hayhoe's work predicted the following change in temperature under low and high emission scenarios for the 2030 (2015-2045) and 2070 (2055-2085) time horizons when compared to the present-day baseline (1971-2000). In those compilations, the following trends are observed:

Temp Changes	1971-2000	2030-low	2030-high	2070-low	2070-high
Annual Temp	50	53.3	53.5	55.8	58.7
Summer Temp	70.6	74.5	74.8	77.4	80.6
Winter Temp	29.8	32.2	33	34.6	38
Days >90 per year	11	29	31	47	68
Days >100 per year	<1	2	2	6	16

Assuming there are 90 days of summer within the June, July and August time frame, then by 2030, a third of the summer would have temps over 90; by 2070 under the low emission scenario, this would increase to nearly 50% and as much as 66% under the high emission scenario.

While there has been no study on the direct increase in heat waves during this time, a first order approximation is that those would increase concurrently with the increase in the number of days above 90 degrees F. Given that there are currently 1-2 heatwaves per summer in this area historically, one could project a similar increase in heatwaves based on the percent of days above 90 degrees – perhaps as many as 2-4 in 2030s and 6-8 in 2070s.

What Drought characteristics will be used for project planning – Duration and Frequency?

The Northeast has been trending towards a much wetter climate over the last 50 years in MA (Hayhoe et al, 2013; NCA, 2014). Since 1958, there has been a 74% increase in the frequency of extreme precipitation events both in terms of rain and snow. This trend is expected to continue (IBID). Based on that data, drought is not considered to be concern for this project.

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

The Project anticipates using the precipitation projections that were used in the recent BWSC Wastewater and Storm Drainage System Facility Plan (2015). Several joint workshops between BWSC, City and Cambridge and other entities were held to vet these numbers with those developed as part of the City of Cambridge Vulnerability Assessment study to ensure a level of standardization / compatibility across the Charles River. While there were some slight differences in the two methodologies (e.g., different projection horizons and GCMs were used), the two approaches yielded very similar results, providing independent verification of the projections and additional confidence in the recommended design storms.

	Total Storm Volume (inches)			Peak Hourly Intensities (inches per hour)		
Scenario Year	2035	2060	2100	2035	2060	2100
Medium (B2)	5.55	5.76	6.08	1.76	1.83	1.93
Precautionary (A1F1)	5.60	6.03	6.65	1.78	1.91	2.11

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

There is still significant uncertainty with respect to how wind patterns and intensities will change with respect to future climatological conditions. Some models predict that a warming would lessen the difference in air mass temperatures, others show a decrease in atmospheric wind shear aspects – both

of which would potentially lead to less intense wind events. Other models predict an increase in wind intensities based on the increase of energy in the atmosphere. El Nino/La Nina add another layer of complexity to the projections. Based on this uncertainty, current wind design criteria are adopted for the Project.

B.2 - Mitigation Strategies

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

Building energy use below code:	Garage West: 21%* Garage East: 20%* Station East: 20%* Station West: complies with 90.1-2013 ECB *reference code = new 2016 Stretch Energy Code
How is performance determined:	Preliminary Energy Model

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

Select all appropriate:	High performance building envelope	High performance lighting & controls	Building day lighting	EnergyStar equip. / appliances
	High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:	See Section 3.4 of the PNF narrative			

What are the insulation ® values for building envelope elements?

	Garage West	Garage East	Station West	Station East
Foundation (R value)	7.5 (continuous)	7.5 (continuous)	N/A	7.5 (continuous)
Windows (R Value / U Value)	R=2.56 / U= 0.39	R=2.56 / U= 0.39	R=2.56 / U= 0.39	R=2.56 / U= 0.39
Walls / Curtain Wall (R value)	18.18 (opaque) 5 (spandrel)	18.18 (opaque) 5 (spandrel)	18.18 (opaque) 5 (spandrel)	18.18 (opaque) 5 (spandrel)
Basement / Slab (R value)	15 (for 24")	15 (for 24")	N/A	15 (for 24")
Doors (R Value)	2	2	2	2

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

	On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
	On-site Solar PV	On-site Solar Thermal	Wind power	None
Describe any added measures:	The measures noted above will be explored for their feasibility as the project design develops.			

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

Select all appropriate: **The Project will consider implementation of these strategies where feasible.**	Connected to local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

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

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

Select all appropriate:	**Solar oriented – longer south walls**	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	**Operable windows (Residential only)**	**Natural ventilation**	**Building shading**
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	**Waste water storage capacity**	**High Performance Building Envelope**
Describe any added measures:	**The measures noted above will be explored for their feasibility as the project design develops.**			

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

Select all appropriate:	**High reflective paving materials**	**Shade trees & shrubs**	**High reflective roof materials**	**Vegetated roofs**
Describe other strategies:	**The measures noted above will be explored for their feasibility as the project design develops.**			

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

Select all appropriate:	**On-site retention systems & ponds**	**Infiltration galleries & areas**	vegetated water capture systems	**Vegetated roofs**
Describe other strategies:	**Rainwater Harvesting** **The measures noted above will be explored for their feasibility as the project design develops.**			

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

Select all appropriate:	**Hardened building structure & elements**	**Buried utilities & hardened infrastructure**	**Hazard removal & protective landscapes**	Soft & permeable surfaces (water infiltration)
Describe other strategies:	**The measures noted above will be explored for their feasibility as the project design develops.**			

–C - Sea-Level Rise and Storms

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

C–1 - Location Description and Classification:

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

Yes / No	***There is no risk posed in the near term as evidenced in the 2030 flood map provided. The 2070 high emissions scenario from the Woods Hole Group's Boston Harbor Flood Risk Model shows that the site has minimal risk of flooding. This reflects a scenario in which the Charles River Dam fails, regional infrastructure is inundated and indicates the need for a regional discussion to mitigate the impact of flood pathways in the event of dam failure. The Project will explore locating critical building systems above grade and the possibility of implementing flood barrier, if necessary, at the appropriate future time.***

Describe site conditions? **The Project Site is outside the floodplain.**

Site Elevation – Low/High Points:	***Garage West:*** High: EL 31 @ entrances to Harvard Vanguard / Eastern Bank; Low: EL 14 @ entrance to Mass Pike Access Ramp @ intersection with Trinity Place ***Garage East:*** High: EL 28 along Clarendon Street; Low: EL 15 along Access Road @ intersection with Trinity Place ***Station East:*** High: EL 29 @ entrance to Back Bay Station along bus loop; Low: EL 27 along Clarendon Street ***Station West:*** High: EL 29 @ entrance to Back Bay Station along Dartmouth Street; Low: EL 27 along Dartmouth Street Elevations refer to Boston City Base (BCB) as shown on the Existing Conditions Plan of Land prepared by Feldman Land Surveyors, dated March 27, 2015.
Building Proximity to Water:	***Approx. 0.5 miles to Charles River***

Is the site or building located in any of the following? (based on existing)

Coastal Zone:	*Yes /* No	Velocity Zone:	*Yes /* No
Flood Zone:	*Yes /* No	Area Prone to Flooding:	*Yes /* No

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes /* No	Future floodplain delineation updates:	*Yes /* No

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

Approx. 0.5 miles

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

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

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