Expanded Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code

125 Guest Street

Submitted to:
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Submitted by:
NB Development Group
221 North Beacon Street
Brighton, MA 02135

And

HYM Investment Group, LLC
One Congress Street, 10th Floor
Boston, MA 02114

Prepared by:
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

In Association with:
Elkus-Manfredi Architects
Goodwin Procter LLP
Howard/Stein-Hudson Associates, Inc.
Beals Associates, Inc.
WSP Global
McNamara/Salvia, Inc.
RWDI Inc.
Sanborn Head & Associates, Inc.

December 1, 2015

Expanded Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code

125 Guest Street

Submitted to:
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Submitted by:
NB Development Group
20 Guest Street
Brighton, MA 02135

And

HYM Investment Group, LLC
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Table of Contents

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

List of Appendices

List of Figures

List of Figures (Continued)

List of Figures (Continued)

List of Tables

List of Tables (Continued)

Chapter 1.0

Project Summary

1.0 PROJECT SUMMARY

1.1 Project Overview

NB Development Group, LLC and The HYM Investment Group, LLC (together, the "Proponent") proposes to construct a residential building (the "Project") with ground floor retail, dedicated residential parking and amenities on an approximately 81,665 square foot site located within Boston Landing at 125 Guest Street, which is at the intersection of Guest Street and Arthur Street in Brighton. The project site was formerly the B.L. Makepeace headquarters, with the building being demolished and the site cleared at the end of 2014. The site is planned to be redeveloped with an approximately 295-unit residential building, having roughly 16,000 square feet (sf) of ground floor retail fronting Guest Street. The Project will include approximately 155 dedicated residential parking spaces spread among one level of at-grade parking and one level of above grade parking, both floors hidden as a landscaped courtyard will act as a roof above the parking floors.

The addition of residential units to the Boston Landing development will help create and support a vibrant 24/7 neighborhood where people can now live where they work and play. By providing a continuous active street wall along Guest Street mirroring the north side of Guest Street with retail uses, streetscape improvements and landscaping, the Project will reinforce the developing Guest Street corridor and the vibrant pedestrian-oriented character of the district. Pedestrian activity will be generated and enhanced both by the double loaded retail and by the residents who call Boston Landing home. In addition to public realm benefits, the Project will also provide new housing, including affordable housing, construction and permanent jobs, and improved tax revenues for the City.

This Project Notification Form (PNF) is being submitted to the BRA to initiate review of the Project under Article 80B, Large Project Review, of the Boston Zoning Code.

1.2 Development Team

Address/Location:	125 Guest Street Brighton, MA 02135
Co-Developer:	NB Development Group, LLC 221 North Beacon Street Brighton, MA 02135 (617) 987-2500 Jim Halliday Keith Craig Jay Rourke

Co-Developer	The HYM Investment Group, LLC One Congress Street, 10th Floor Boston, MA 02114 (617) 248-8905 Thomas N. O'Brien David E. Bracken Michael Bannon
Architect:	Elkus Manfredi Architects 25 Drydock Avenue Boston, MA 02210 (614) 426-1300 David Manfredi, FAIA, LEED AP Mark Sardegna, AIA, LEED AP Emily Paparella AIA, LEED AP BD+C Maria Schroeder, AIA, LEED AP
Legal Counsel:	Goodwin Procter Exchange Place, 53 State Street Boston, MA 02109 (617) 570-1000 Lawrence E. Kaplan Martin R. Healey
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 David Hewett Talya Moked
Transportation and Parking Consultant	Howard/Stein-Hudson Associates, Inc 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Guy Busa Elizabeth Peart

Civil Engineer	Beals Associates, Inc. 2 Park Plaza, Suite 200 Boston, MA 02116 (617) 242-1120 Larry Beals Todd Morey
MEP Engineer	WSP Global 88 Black Falcon Avenue, Suite 210 Boston, MA 02210 (617) 210-1600 Tom Burroughs Nancy Gould
Geotechnical/ Environmental Consultant:	Sanborn Head & Associates, Inc. 1 Technology Park Drive Westford, MA 01886 (978) 392-0900 Stan Sadkowski, P.E.
Structural Engineer	McNamara/Salvia 160 Federal Street, 5th Floor Boston, MA 02110 Adam McCarthy John Matuszewski
Wind Consultant	Rowan Williams Davies & Irwin Inc. 650 Woodlawn Road West Guelph, Ontario, Canada N1K 1B8 Jordan Gilmour, P.E.
General Contractor	John Moriarty & Associates 3 Church Street Winchester, MA 01890 David Leathers Tom Scannell

1.3 Public Benefits

1.3.1 Project Benefits

The proposed Project will bring an architecturally distinctive mixed-use building to what is now an underutilized vacant lot. The Project will provide additional public benefits beyond the numerous benefits provided by the overall Boston Landing development. These benefits include housing creation, urban design and public realm improvements, job opportunities, expanded retail options, and additional tax revenues. Specific public benefits of the Project include:

Urban Design Benefits

- Creation of approximately 16,000 sf of ground floor retail space which will help generate pedestrian activity throughout the site and contribute further amenities to the neighbors in Allston and Brighton, to building residents and to office tenants.
- Complying with Article 37 of the Boston Zoning Code by being Leadership in Energy and Environmental Design (LEED) certifiable anticipated at the Silver level.

Economic and Community Benefits

- Creation of approximately 295 new residential units proximate to public transportation, specifically the new Boston Landing MBTA Commuter Rail station, which will be located across the street and is currently under construction by NB Development Group in partnership with the DOT and MBTA.
- Increasing the City's affordable housing stock in accordance with the Mayor's Executive Order Relative to Affordable Housing.
- Creation of approximately $1 million in annual tax revenues to the City of Boston by increasing the assessed value of the Property.
- Creation of approximately 325 construction jobs and approximately 70 new permanent jobs.

1.3.2 Boston Landing Benefits

Boston Landing is in the process of transforming what was once an abandoned industrial stockyard into a 1.76 million square-foot mixed-use district of residential, office, sports uses, hotel, and ground floor retail. As a project amenity, construction has also begun on a new MBTA commuter rail station, the Boston Landing at Allston Brighton Station on the Framingham/Worcester line, which will provide direct access to Boston's urban core, the Orange, Red, Green and Silver subway lines, as well as to Amtrak stops at South Station and Back Bay Station. Boston Landing has already completed or is in progress of completing

infrastructure and transportation improvements as outlined below, which benefit Allston-Brighton and the City as a whole. Additionally, Boston Landing has designed and developed over 1.4 acres of open public/green space, including Athletes Park at the newly developed New Balance World Headquarters, for neighborhood residents and visitors of Boston Landing to enjoy. Specific benefits of the Boston Landing development, completed or in progress, include:

Improvements within Boston Landing

- Full depth reconstruction of both Life Street and Guest Street, which includes construction of the streets in conformance with the City's guidelines, new 15 foot sidewalks, installation of bike lanes, street furniture, landscaping, and new lighting.
- Realignment of Life Street per future planning guidelines for North Beacon Street as it connects through Guest Street to the Service Road adjacent to the Turnpike.
- Completion of the Arthur Street extension and the construction of the Boston Landing at Allston Brighton MBTA commuter rail station "kiss n' ride".
- Completion of 50% of the Service Road along I-90 behind the newly constructed New Balance World Headquarters.
- Construction of the Boston Landing at Allston Brighton MBTA commuter rail station.

Improvements Outside of Boston Landing

- Installation of new ADA crosswalks outside of Boston Landing at Franklin Street and Appian Way.
- Construction of new lane configurations at the following intersections:
  - Brighton Avenue, Cambridge Street and North Beacon Street (Union Square);
  - North Beacon Street and Everett Street; and
  - North Beacon Street and Arthur Street.
- Construction of new ADA crosswalks and striping on Hano Street at Penniman Park.
- Design and implementation of bike lanes and lane reconfiguration on Market Street.
- Construction of a new traffic signal at the intersection of Cambridge Street and Denby Road, in conjunction with other safety improvements made to Cambridge Street by the city of Boston.

- Reconstructed and improved traffic signals at the intersection of Life Street, Etna Street, and North Beacon Street, which includes communication sent to the City's central nerve for timing purposes, ADA crossings, new crosswalks, and new curbing.

1.4 Preliminary Project Schedule

Construction is expected to commence in the fourth quarter of 2016 and last for approximately 24 months.

1.5 Consistency with Zoning

The Project site, is situated within Planning Development Area No. 87 ("PDA 87") and the Project site has been approved for a Multi-Family Dwelling or Dwellings Use, together with accessory parking and loading, as well as Restaurant Use, Retail Use and Service Use in the Third Amendment to the PDA 87 Master Plan.

In the Third Amendment, the proposed Project is stated to comprise up to 295,000 square feet of Gross Floor Area, exclusive of areas dedicated to parking and loading and exclusive of areas dedicated to Restaurant Use, Retail Use and Service Use, and up to 198 feet in height.

Boston Landing will file a Development Plan for the proposed Project for approval by the Boston Redevelopment Authority and the Boston Zoning Commission.

1.6 Legal Information

1.6.1 Legal Judgments Adverse to the Proposed Project

There are no legal judgments or actions pending concerning the Project

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

There have been no tax arrearages in Boston on property owned by Boston Landing LLC

1.6.3 Site Control/ Public Easements

Title to most of the property, and thus control of the site on which the Project will be constructed, is derived from three deeds, as follows:

a) Deed from Guest Street LLC recorded with the Suffolk County Registry of Deeds (the "Registry") in Book 48536, Page 179;

b) Deed from Trustees of B.L.M. Realty Trust, recorded with the Registry in Book 52654, Page 107; and

c) Deed from Boston Super Markets Associates Limited Partnership, filed with the Suffolk Registry District of the Land Court as Document No. 788771.

Public easements into, through or surrounding the Project site exist as follows:

a) Sewer easements taken by the City of Boston;

b) Water pipe easements granted to the City of Boston; and

c) Easements in Guest Street taken by the City of Boston for the purposes of laying out, constructing and extending.

1.7 Regulatory Controls and Permits

Table 1-1 presents a preliminary list of local, state, and federal permits and approvals that may be required for the Proposed Project. The list is based on current information about the Proposed Project and is subject to change as the design of the Project advances. Some of the permits listed may not be required, while there may be others not listed that will be needed.

Table 1-1 Preliminary List of Permits and Approvals

Agency	Approval
Boston	
Boston Redevelopment Authority	Article 80B Large Project Review Article 80C Planned Development Area Review
Boston Zoning Commission	Article 80C Planned Development Area Review
Boston Civic Design Commission	Design Review
Boston Water and Sewer Commission	Site Plan Review/General Service Application/Water and Sewer Connection Permits
Public Improvement Commission	Specific Repairs/Discontinuance (if required)
Boston Transportation Department	Construction Management Plan/Transportation Access Plan Agreement
Boston Committee on Licenses/Fire Department	Garage Permit/Storage of Inflammables/Fire Safety Permits
Boston Public Works Department	Curb Cut Permit(s)
Boston Inspectional Services Department	Building Permits

Table 1-1 Preliminary List of Permits and Approvals (Continued)

Agency	Approval
State	
Executive Office of Environmental Affairs	Massachusetts Environmental Policy Act Review
Department of Environmental Protection	Notice of Construction/Fossil Fuel
Massachusetts Historical Commission	Determination of No Adverse Effect (if necessary)
Executive Office of Transportation and Construction	Approval for Building Permit on Land Within or Adjacent to Railroad Corridor
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (if necessary)
Federal	
U.S. Environmental Protection Agency	NPDES Notice of Intent for Construction
Federal Aviation Administration	Determination of No Hazard to Air Navigation (for building and crane, if necessary)

1.8 Public Participation

Since the inception of the Boston Landing development planning process, the Proponent has continuously engaged the community, to listen to all concerns and desires for the development. To that end, the Proponent has conducted a transparent and comprehensive community outreach program and public review process. Over the past four years, this effort has included eight formal community meetings and 16 Impact Advisory Group (IAG) meetings. The Boston Landing development has been positively influenced through the BRA's community process and the Proponent looks forward to continuing the public dialogue through an open, transparent public review of the proposed residential Project.

Chapter 2.0

Project Description

2.0 PROJECT DESCRIPTION

This chapter describes the proposed Project in detail, including its location, Project site plan, and proposed building program.

2.1 Project Setting and Site

The Project consists of construction of a new residential/retail building on the approximately 81,665 sf site at 125 Guest Street in Brighton. The site is directly opposite the recently opened New Balance World Headquarters (100 Guest Street) and the future Boston Landing Hotel (180 Guest Street). The Project site is bordered by Arthur Street to the east and the future Hichborn Street Extension to the west. The Project site formerly housed the B.L. Makepeace headquarters. The Makepeace building was demolished at the end of 2014. Figure 2-1 presents an aerial locus of the Project site, and Figure 2-2 presents the Project in the context of the Boston Landing development.

2.2 Permitting History

2.2.1 BRA Review of Boston Landing

The Master Plan for Planned Development Area No. 87, Boston Landing, was approved by the Boston Redevelopment Authority on June 12, 2012, adopted by the Boston Zoning Commission (the BZC) as well as Map Amendment No. 549 on July 11, 2012, both effective on July 12, 2012 (the Original Master Plan). The Master Plan has since been amended four times:

- The First Amendment, approved by the BRA on September 13, 2012, adopted by the BZC on October 10, 2012, made corrections to language contained in the Original Master Plan by identifying the "Single Office Project" as a standalone project; specifying the location of above vs. below grade parking; correcting the total number of Proposed Projects from four to five; and adjusting the project's FAR.

- The Second Amendment, approved by the BRA on October 17, 2013, adopted by the BZC on November 20, 2013, changed the name of the development from "New Brighton Landing" to "Boston Landing"; modified the total land area of Boston Landing for street and roadway connections; and included new uses into the Boston Landing project.

- Third Amendment approved by the BRA on August 14, 2014, adopted by the BZC on September 3, 2014, added additional land to the Boston Landing project with the inclusion of 125 Guest Street; moved square footage associated with a sports use to the north side of Guest Street to allow for the construction of a new ice arena; reduced the square footage associated with a sports use on the south side of Guest Street; added a residential use to 125 Guest Street; and removed the "fitness use".

G:\Projects2\MA\Boston\3144\Makepeace_Residential\aerial_locus.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

125 Guest Street Boston, Massachusetts

BOSTON LANDING

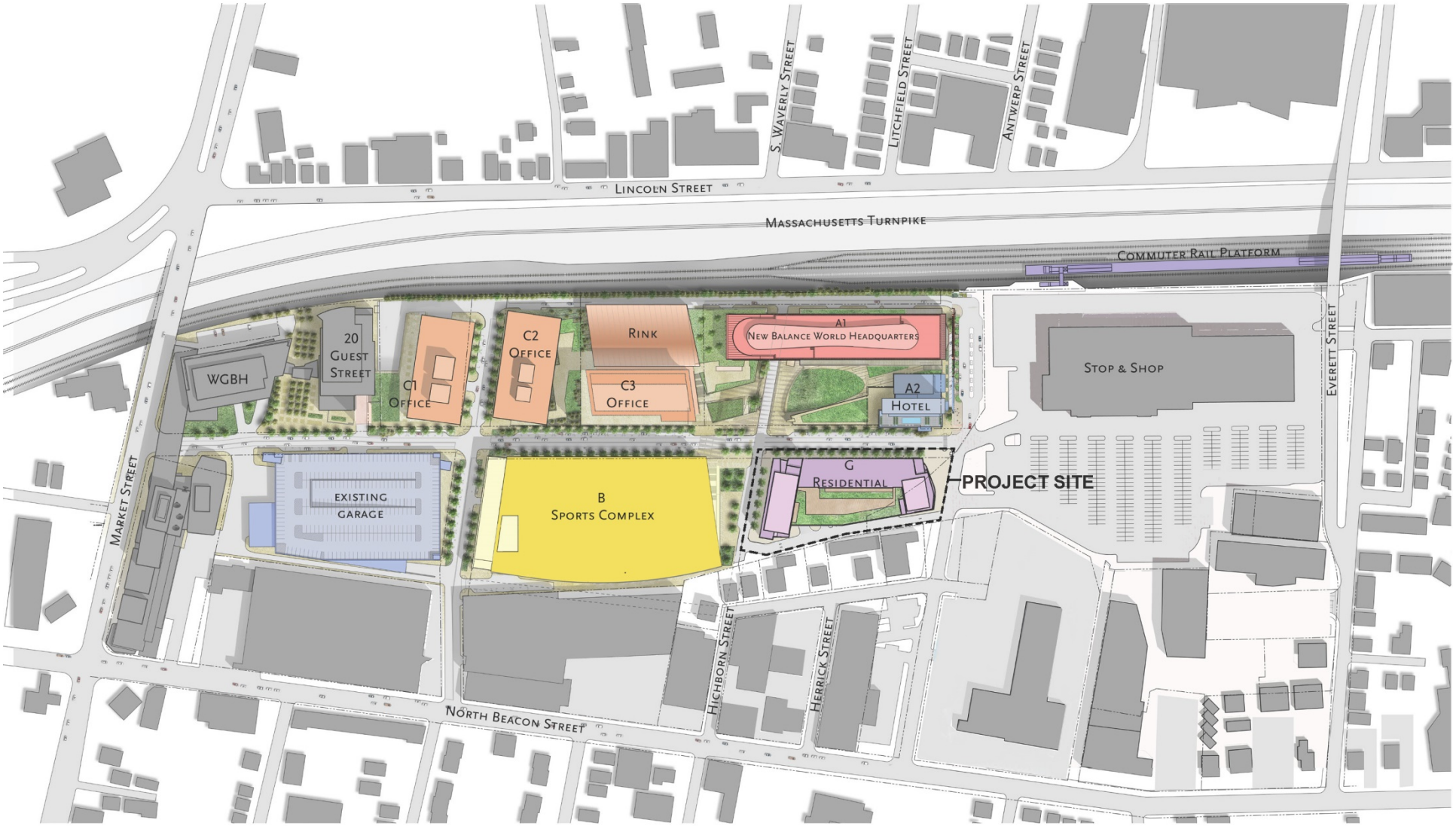
Epsilon ASSOCIATES INC.

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

Figure 2-1

Aerial Locus Map



125 Guest Street **Boston, Massachusetts**

Figure 2-2

Boston Landing Site Plan

- Fourth Amendment approved by the BRA on August 13, 2015, adopted by the BZC on December 9, 2015, added additional land, approximately 12,715 square feet, to the Boston Landing project area.

Concurrent to the above Master Plan Amendments, there are Development Plan approvals outlining the specific parameters of the entitled development sites of the Boston Landing Project.

2.2.2 Massachusetts Environmental Policy Act Review of Boston Landing

The Proponent filed an Expanded Environmental Notification Form (ENF) with a Request for a Waiver from a Mandatory Environmental Impact Report (EIR) on May 31, 2012. On July 27, 2012, the Secretary issued a Certificate on the ENF in which he declined the Waiver, but did allow for the preparation of a Single EIR in lieu of a 2-stage Draft and Final EIR.

The Proponent filed a Single EIR on December 17, 2012. On January 25, 2013, the Secretary issued a Certificate finding that the SEIR adequately and properly complied with MEPA, thus concluding the MEPA process at that time.

On September 19, 2014, the Proponent filed a Notice of Project Change (NPC) with the MEPA Office to inform the Secretary of two proposed minor changes to the project: 1) relocation of the proposed hockey rink arena from the B Block on the south of Guest Street to Building 3 in Block C on the north side of Guest Street; and 2) the removal of fitness use from the sports complex on B Block. The Proponent requested the Secretary to deem these changes insignificant. On October 1, 2014, the Secretary issued a Certificate finding that no additional MEPA review was required.

On September 30, 2014 the Proponent filed a second NPC with the MEPA Office to provide the Secretary with an update on the status of the proposed MBTA commuter rail station on the Framingham/ Worcester Line adjacent to the Project site. The NPC included information on the terms of the Proponent's Memorandum of Agreement (MOA) with the MBTA/MassDOT, as well as an update on the public review process and the design of the proposed MBTA commuter rail station. On November 7, 2014, the Secretary issued a Certificate finding that no additional MEPA review was required.

2.3 Proposed Project

The Project, as shown in Table 2-1, is an approximately 311,000 square-foot primarily residential building that includes approximately 295 residential units and approximately 16,000 sf of retail space on the ground floor. The remaining ground floor area of approximately 39,000 sf will be residential amenity spaces, including a lobby, mail room, fitness room, conference room, mechanical, vehicle and bike parking, loading dock, service and similar functions. The residential units will be a variety of sizes to meet a number of different needs, and will include studio, 1- bedroom, 2-bedroom and 3-bedroom units. The

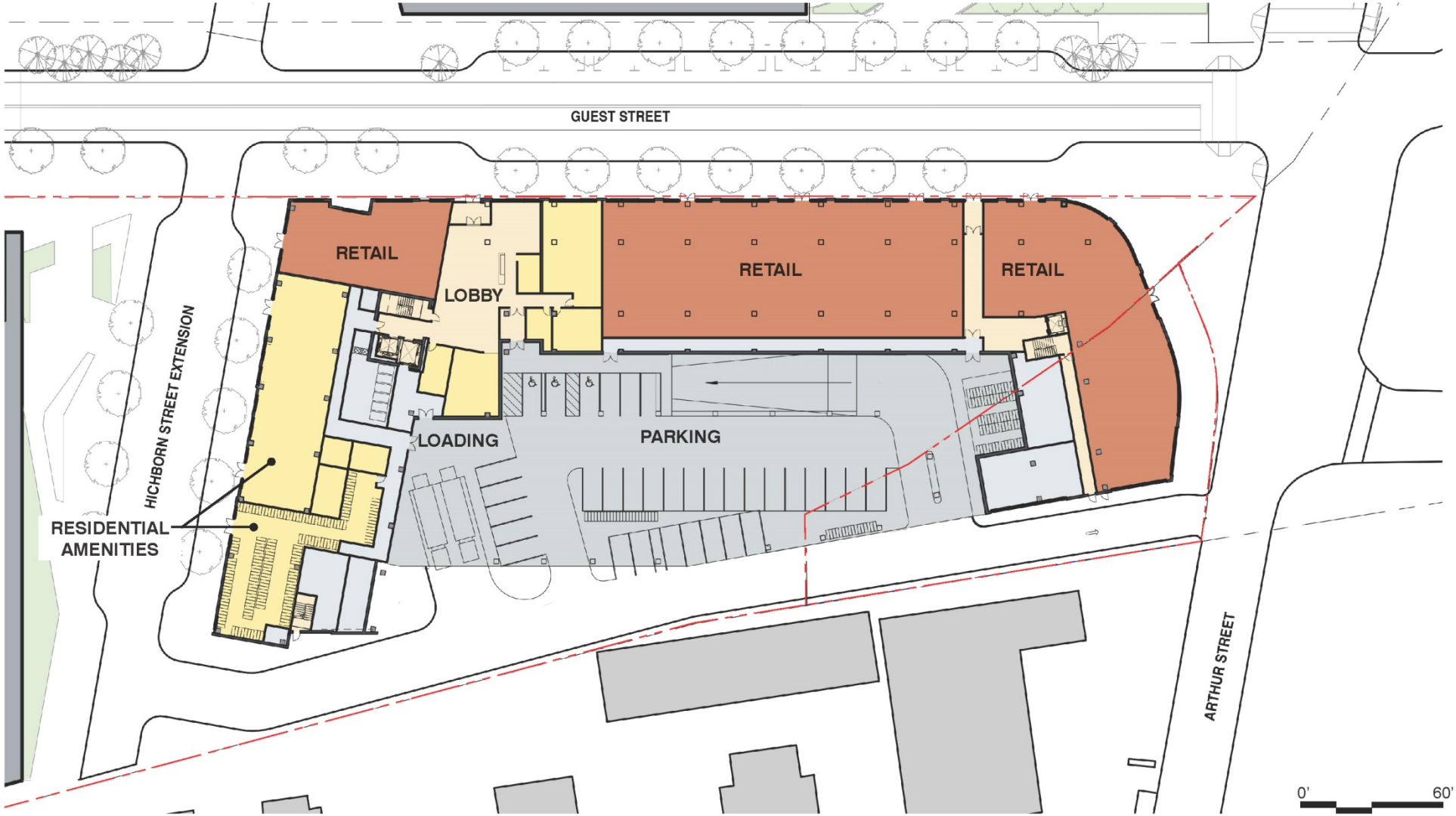
building will include one level of at-grade parking and one level of above grade for a total of approximately 155 parking spaces, which will all be dedicated to residents. The parking garage will also include secured, covered storage for approximately 300 resident bicycles. Parking and loading areas will be accessed by a service drive along the southern edge of the site. Additional resident parking will be available in existing parking structures at Boston Landing as demand requires. See Figures 2-3 through 2-12 for floor plans, section, and elevations.

Table 2-1 Project Program

Project Element	Approximate Dimension
Residential	295,000 sf / 295 units
Retail	16,000 sf
Total Square Footage	311,000 sf
Parking	155 spaces

The residential building will be six stories high along Guest Street and 17 stories high along future Hichborn Street Extension. In addition to the ground floor retail and amenities, the building will include an outdoor landscaped courtyard roof terrace located on the 3rd floor, which is anticipated to include a lounge area and potentially other activities.

Residents will access the building from the main lobby on Guest Street. Residents will also have key-card access to a second, albeit smaller lobby, further east on Guest Street for easy resident access to and from the Boston Landing at Allston Brighton Commuter Rail station. All retail spaces will have customer entries along Guest Street. The Project site is proximate to MBTA bus routes and will be less than a block away from the new commuter rail station, currently under construction. In addition to close proximity to transportation, residents will also benefit from its superior location and the nearby amenities such as the adjacent Stop & Shop supermarket, as well as the attractive Boston Landing campus amenities including 80,000 sf of ground floor retail and restaurants, the adjacent ice area (Warrior Ice Arena), Sports Complex, and NB Fitness, which is a 16,000 sf full-service fitness club located one block west on Guest Street.



125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

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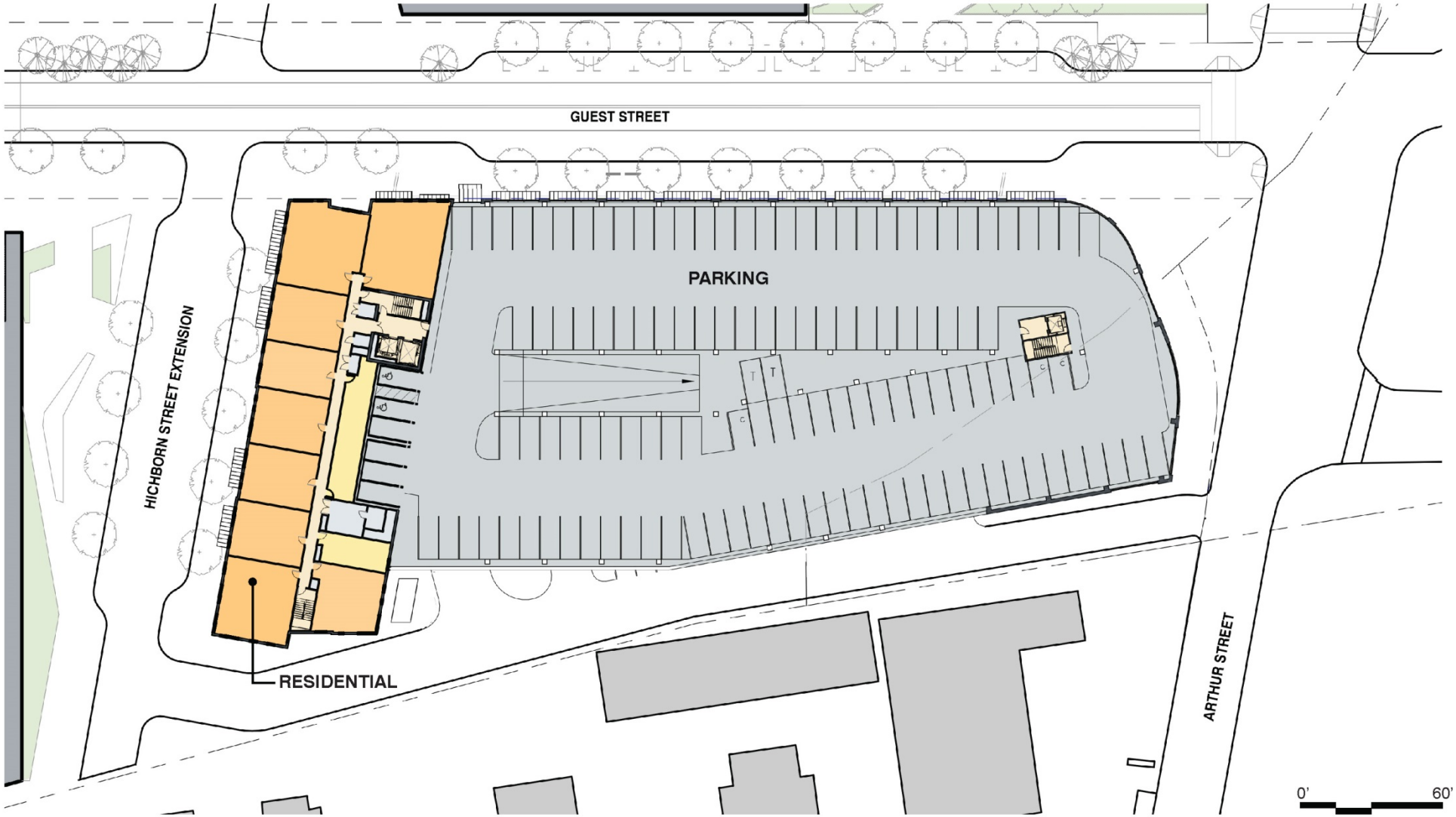
Figure 2-3

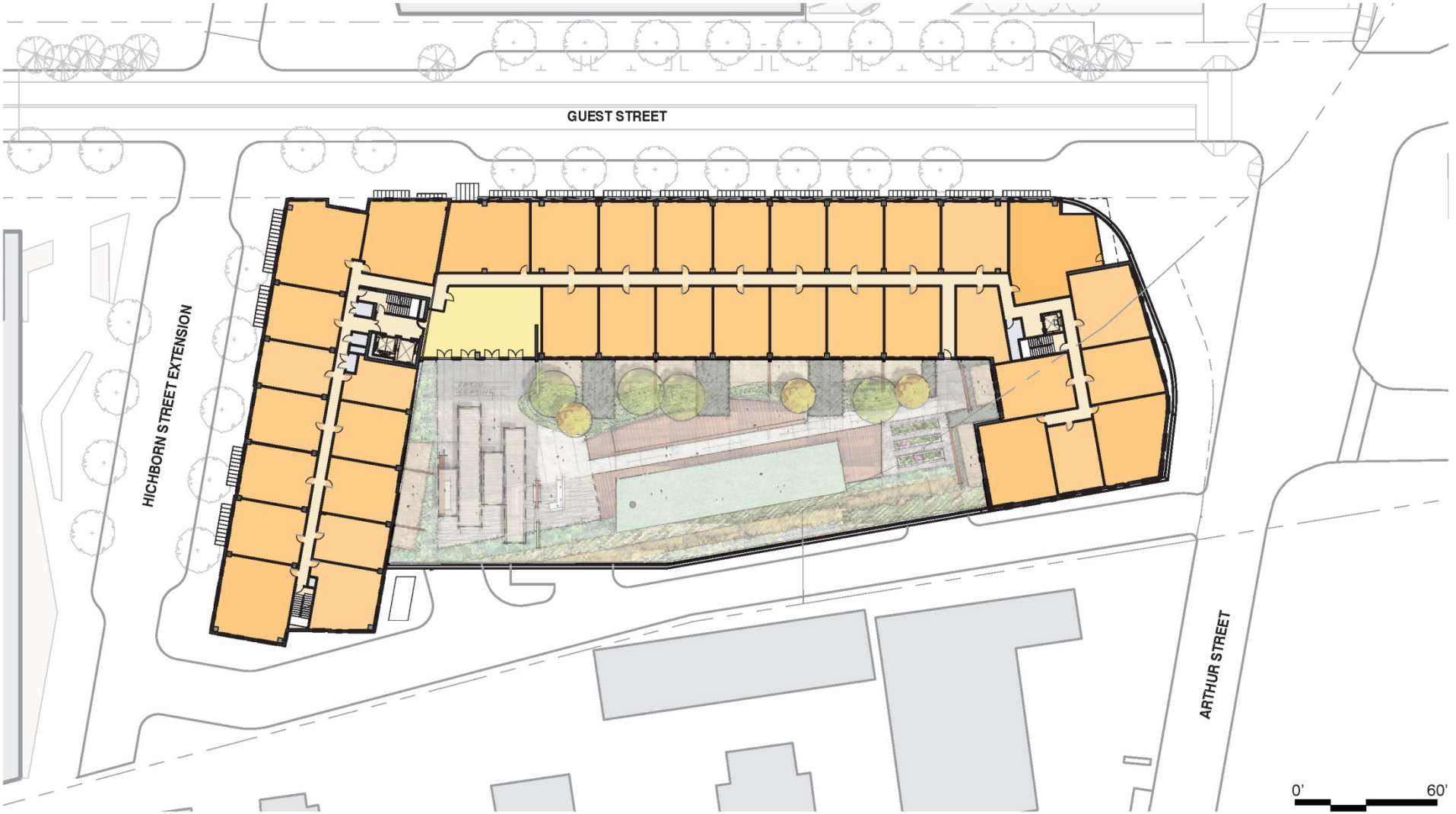
Level 1 Floor Plan



125 Guest Street **Boston, Massachusetts**

Figure 2-4

Level 2 Floor Plan



125 Guest Street **Boston, Massachusetts**

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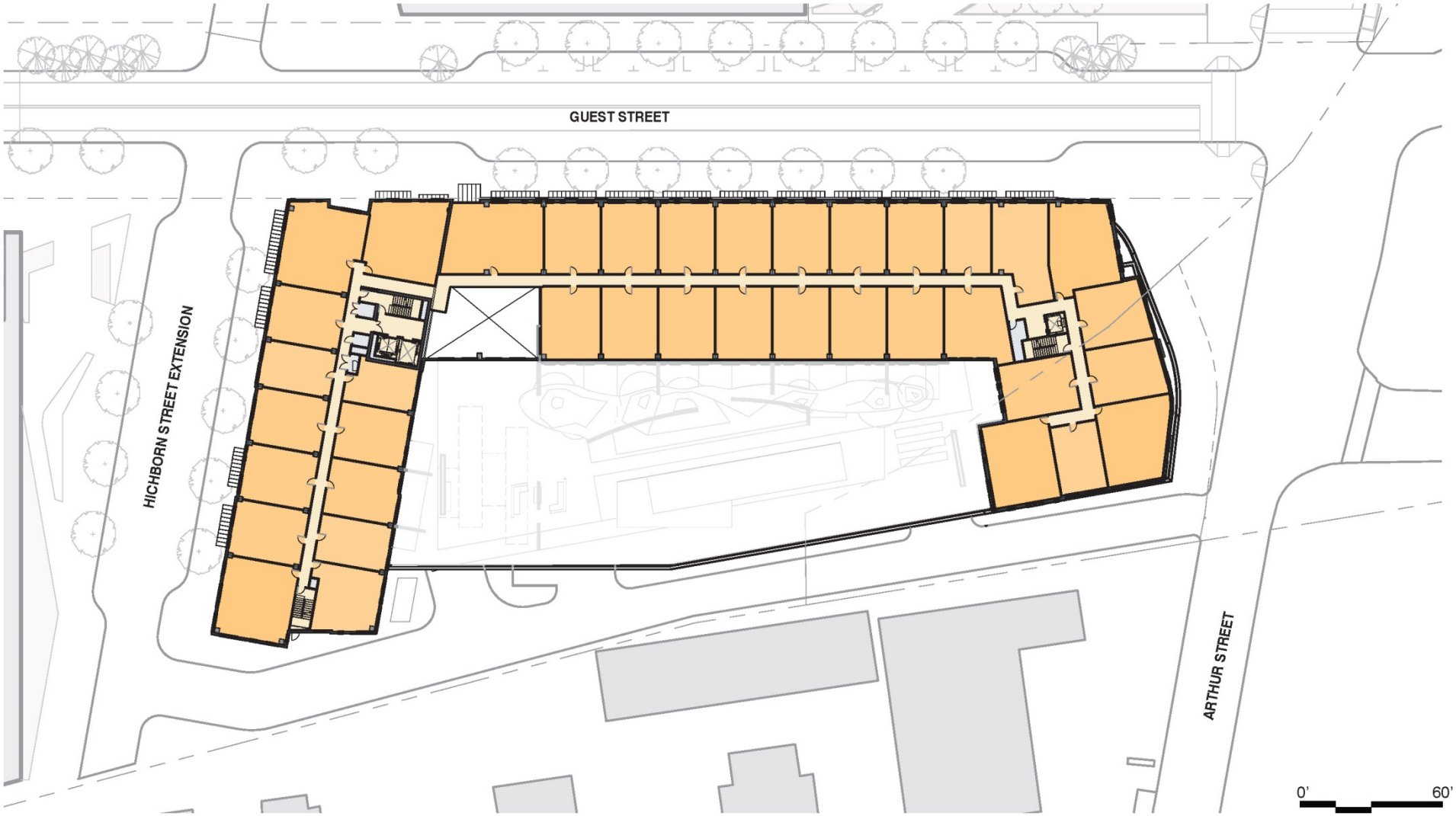
Figure 2-5

Level 3 Floor Plan



125 Guest Street **Boston, Massachusetts**

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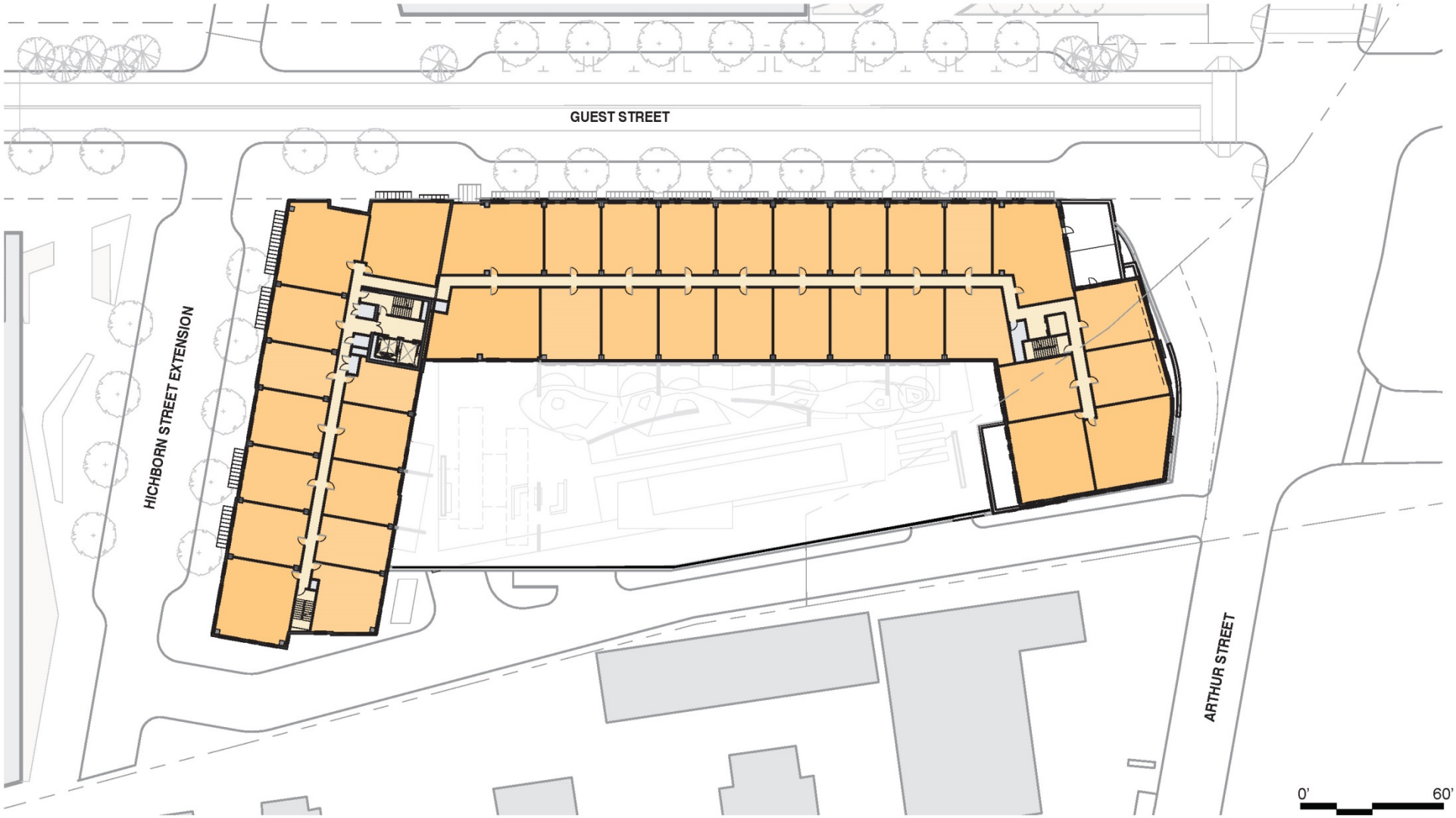
Figure 2-6

Levels 4 and 5 Floor Plan



125 Guest Street **Boston, Massachusetts**

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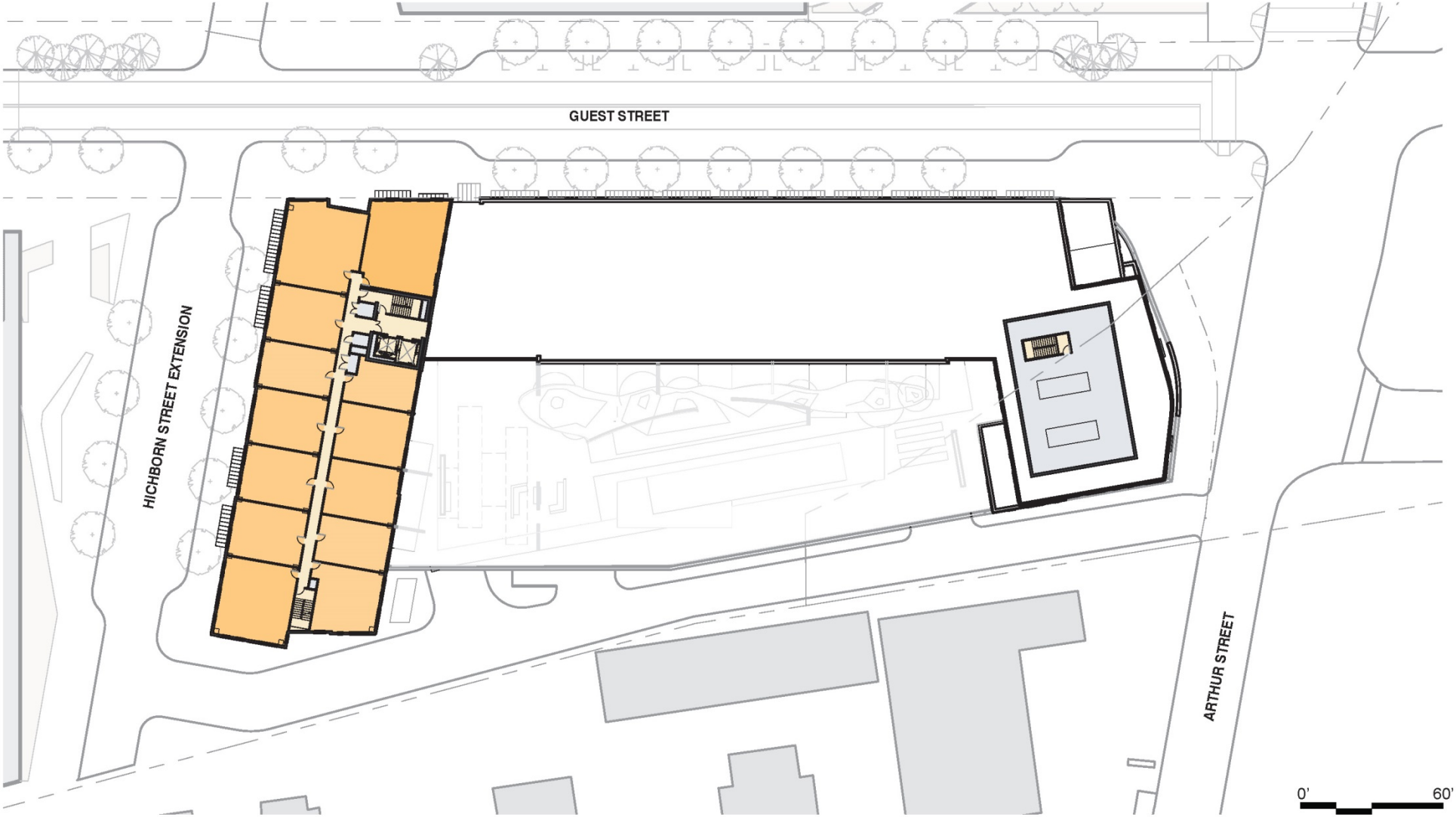
Figure 2-7

Level 6 Floor Plan



125 Guest Street Boston, Massachusetts

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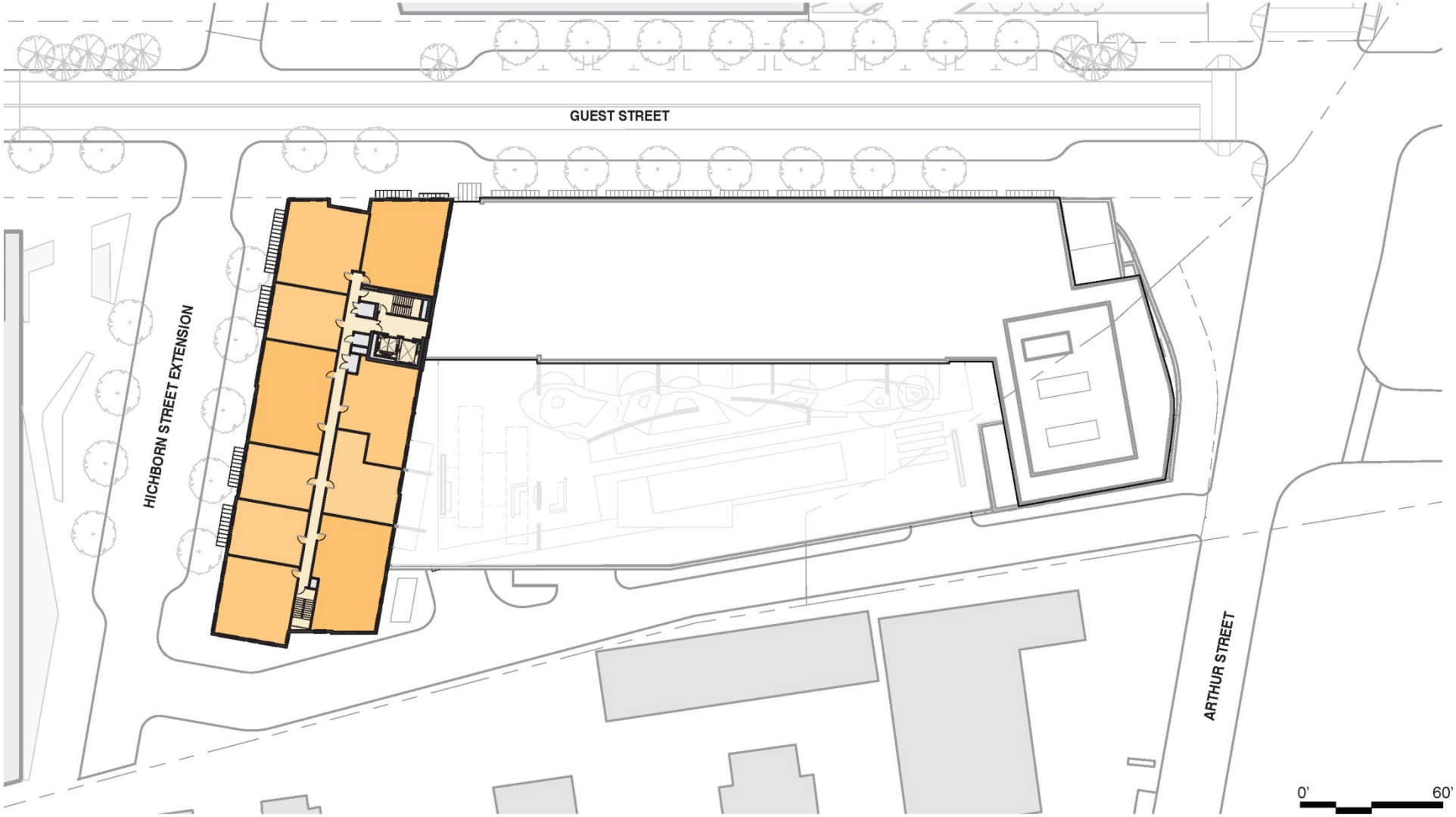
Figure 2-8

Typical Upper Level Floor Plan



125 Guest Street **Boston, Massachusetts**

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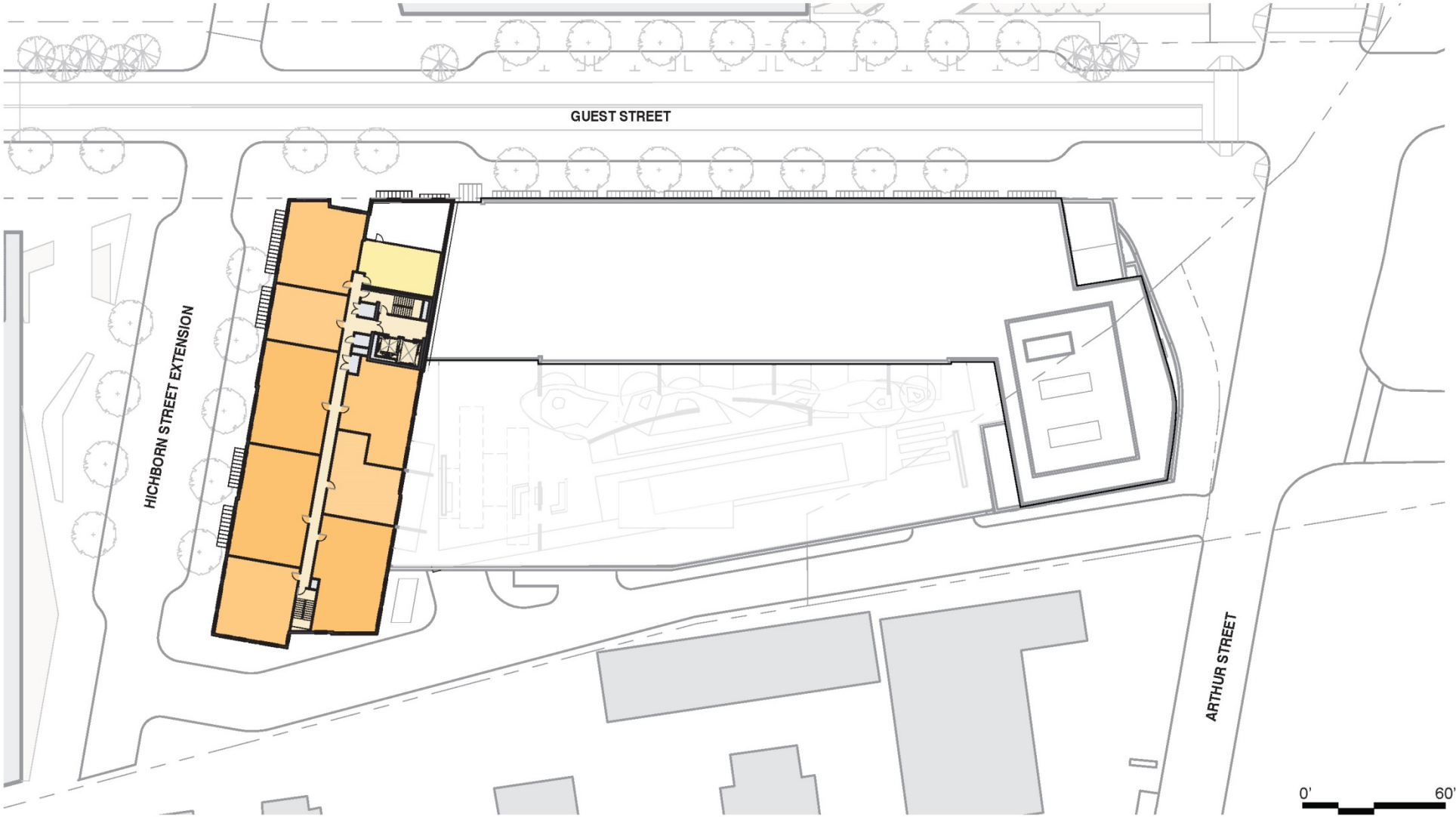
Figure 2-9

Level 16 Floor Plan



125 Guest Street **Boston, Massachusetts**

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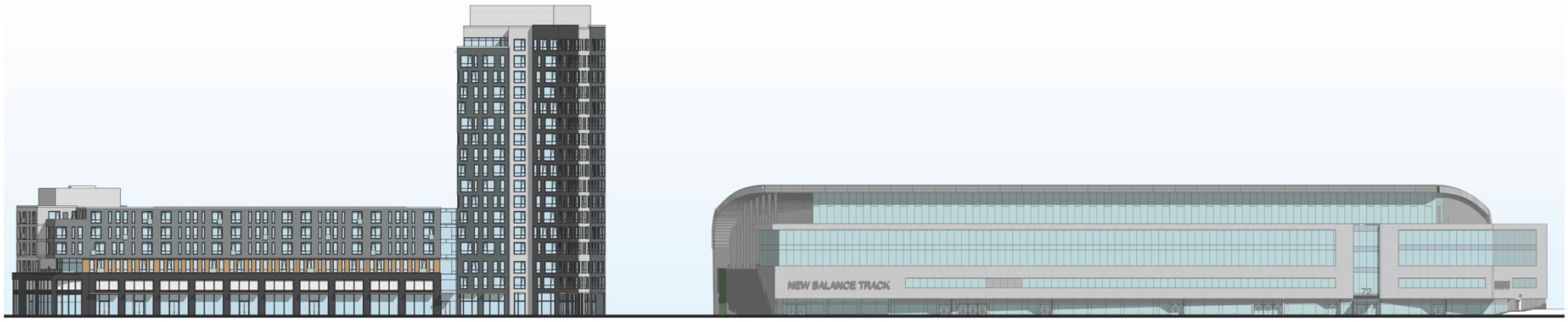
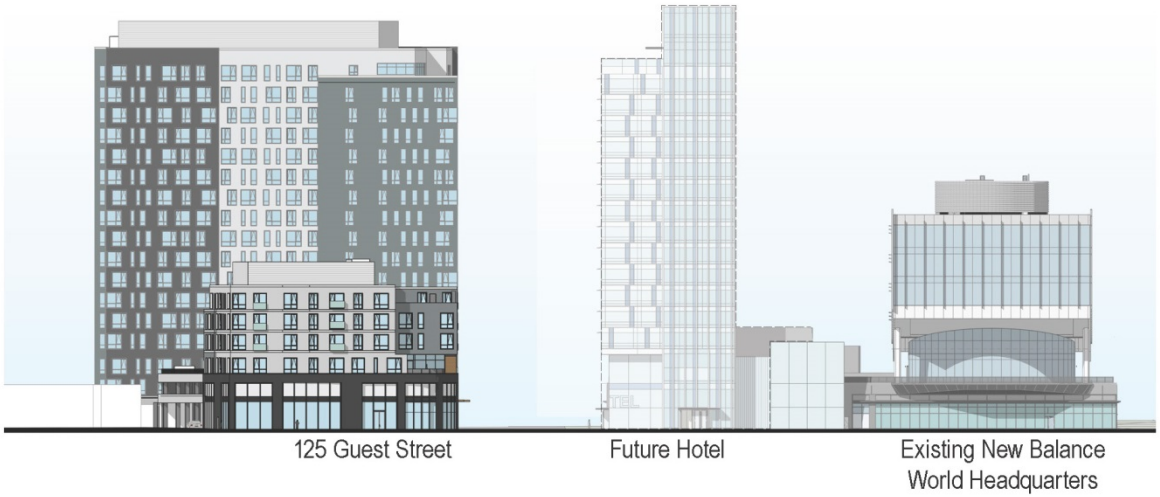
Figure 2-10

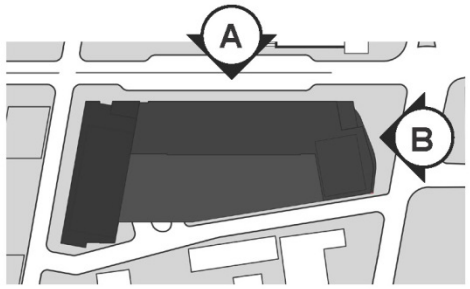
Level 17 Floor Plan



A. Guest Street Elevation (North)



B. Arthur Street Elevation (East)



Key

125 Guest Street Boston, Massachusetts

Figure 2-11

Building Elevations

C. New Balance Way/Hichborn Street Elevation

D. South Elevation

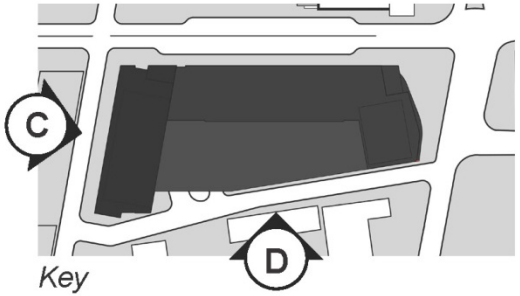


Figure 2-12
Building Elevations

Chapter 3.0

Transportation Component

3.0 TRANSPORTATION

3.1 Introduction

This section presents transportation conditions associated with the Project, which is part of Boston Landing in the Brighton neighborhood of Boston. The transportation study developed for the Boston Landing Planned Development Area (PDA) Master Plan (dated March 20, 2012 and approved by the Boston Redevelopment Authority (BRA) Board on June 12, 2012) was used as a foundation for the transportation analysis developed and presented in this section. The intersections studied will continue to operate at the same overall Level of Service as under the No-Build conditions during both the a.m. and p.m. peak hours. The Project will have minimal impact on the study area intersections or on public transportation or pedestrian facilities in the area.

3.1.1 Project Description

As shown in Figure 3-1, the Project site at 125 Guest Street will be part of the larger Boston Landing Master Plan area, which includes the New Balance World Headquarters building (occupied in September 2015), a hotel, three new office buildings, an ice rink, and sports complex.

The Project's development program, as summarized in Table 3-1, will include residential units, street level retail/restaurant space, and an above grade parking garage dedicated to residents.

Table 3-1 125 Guest Street Program

Land Use	Program
Residential	295 units
Retail/Restaurant	16,000 sf
Parking Spaces	Approximately 155 spaces

3.1.2 Methodology

In accordance with the Boston Transportation Department's (BTD's) *Transportation Access Plan Guidelines* (2001) and the *BRA Development Review Guidelines* (2006) this report describes roadway conditions, transportation issues, parking and loading, and transportation goals for the proposed Project.

125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

HOWARD STEIN HUDSON Engineers + Planners

Figure 3-1

Boston Landing Master Plan – Locus Map

In keeping with the commitments made during the 2012 approval process, the Proponent has conducted extensive roadway improvements to the Brighton Guest Street Planning Area resulting in temporary closure of roadway segments along Guest Street and Life Street. Data collected under these temporary conditions would not reflect typical travel patterns. For reference, descriptions of the study area roadways and intersections prior to recent construction are included in Section 3.2. Long-term impacts are evaluated for Year 2020, based on a five-year horizon from the current year (2015). By 2020, it is anticipated that all other planned development related to Boston Landing may be complete and associated transportation improvements may be constructed, although phasing may not be as originally conceived in the Master Plan. Major transportation mitigation items include: the new Boston Landing at Allston Brighton Commuter Rail station (under construction), the extension of Guest Street between Arthur Street and Everett Street, the extension of Arthur Street north of Guest Street (complete), completion of a new Service Drive parallel to Guest Street, the extension of Life Street to Service Drive, construction of a new intersection at Guest Street/Arthur Street, the signalization of Guest Street Extension/Everett Street, and numerous other intersection, roadway, and pedestrian upgrades in the area. In the 2012 permitting documents previously completed for Boston Landing, the Full Build Condition was established for the Year 2017 (the then existing year plus five years). The analysis in this study uses the earlier Year 2017 conditions as a basis for defining future Year 2020 conditions, but incorporates additional growth to appropriately reflect the longer time horizon.

No-Build (2020) Conditions, which include general background growth and additional vehicular traffic associated with specific planned developments near the Project site, are presented in Section 3.3. Build (2020) Conditions, which include specific travel demand forecasts for the Project, are presented in Section 3.4.

3.1.3 Study Area

The study area, shown in Figure 3-2, is comprised of the following six intersections:

- Guest Street/Market Street/Stockyard Driveway;
- North Beacon Street/Arthur Street/Wingate Driveway;
- North Beacon Street/Everett Street;
- Guest Street/Arthur Street/Stop & Shop Driveway;
- Guest Street Extension /Everett Street (proposed new intersection under future conditions); and
- Everett Street/Little Everett Street.

Under future Build Conditions, the new access/egress driveway on Guest Street is also included in the analysis.

125 Guest Street **Boston, Massachusetts**

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Figure 3-2

Study Area Intersections

3.2 Existing Conditions

This section describes area roadway, intersections, on-street parking, car-sharing, public transportation, and pedestrian and bicycle facilities. As described earlier, Existing Conditions intersection analysis has not been conducted in this study due to on-going street detours in the area.

3.2.1 Existing Roadway Conditions

The study area includes the following roadways, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning functional classifications:

Market Street - Market Street is a two to four lane collector roadway that traverses the study area in a general northeast-southwest direction between Cambridge Street and Birmingham Parkway. Market Street provides two 11- to 13-foot wide travel lanes per direction between North Beacon Street and Birmingham Parkway. South of North Beacon Street, Market Street provides one 11- to 24-foot wide travel lane per direction, with additional turning lanes provided at major intersections.

Sidewalks are provided continuously along both sides of Market Street, with crosswalks provided at signalized intersections. Land use along Market Street consists of a mix of commercial and residential properties.

North Beacon Street - North Beacon Street is a two-lane collector roadway that traverses the study area in a general east-west direction between Goodenough Street and Cambridge Street. North Beacon Street provides two 11 to 29.5-foot wide travel lanes separated by a double-yellow centerline (one lane per direction), with additional turning lanes provided at major intersections. Sidewalks are provided continuously along both sides of North Beacon Street, with marked crosswalks provided at signalized intersections. Land use along North Beacon Street consists of a mix of commercial, industrial, and residential properties.

Everett Street - Everett Street is a two-lane local roadway that traverses the study area in a general north-south direction between Beacon Street and Western Avenue. Everett Street provides two 13- to 14-foot wide travel lanes generally separated by a double-yellow centerline (one lane per direction). Sidewalks are generally provided along both sides of Everett Street, although sections between North Beacon Street and overpass have only narrow asphalt walkways with no curbs. Crosswalks are provided at Western Avenue and North Beacon Street. Land use along Everett Street consists primarily of residential properties, with commercial properties located proximate to Western Avenue and the Stop & Shop Supermarket situated adjacent to I-90.

Arthur Street – Arthur Street is a two-lane local roadway that traverses the study area in a general north-south direction between North Beacon Street and Guest Street. Arthur Street varies in width from approximately 26 feet at its northern end to approximately 40 feet at the southern end. Where Arthur Street meets North Beacon Street, it includes three lanes, a northbound through lane, a southbound right turn lane, and a southbound left turn lane. Sidewalks are provided along both sides of Arthur Street with a crosswalk provided at the intersection with North Beacon Street. Land use along Arthur Street consists of commercial and retail properties including Wolfers' Lighting, and Boston Volvo Village.

Guest Street – Guest Street is a two-lane local roadway that traverses the study area in a general east-west direction between Market Street and Arthur Street/Stop & Shop Supermarket driveway. Land use along Guest Street includes Brighton Landing, Boston Landing and, Stop & Shop Supermarket and other retail uses.. Currently, segments of Guest Street are under reconstruction. Potential improvements described in the Boston Landing Master Plan include the extension of Guest Street from Arthur Street through to Everett Street.

3.2.2 Existing Intersection Conditions

As a part of this assessment, the study area includes six intersections located along Guest Street, Arthur Street Market Street, North Beacon Street, and Everett Street.

Guest Street/Market Street/Stockyard Driveway is a signalized intersection with four approaches. The Market Street north and southbound approaches consist of two 11- to 12.5-foot wide general-purpose travel lanes. The Stockyard Restaurant driveway eastbound approach consists of a 12.5-foot wide general-purpose lane. The Guest Street westbound approach consists of an 11-foot wide shared left-turn/through lane and an 11-foot wide right-turn lane. Sidewalks are provided along both sides of Market Street and Guest Street. A marked crosswalk is provided across the south leg of Market Street and the Guest Street leg of the intersection. An MBTA bus stop and bus shelter is located on the east side of Market Street, south of Guest Street. A drop-off area with a 5-minute time limit is provided on the south side of Guest Street for the WGBH studios. "No Stopping Any Time" signs are posted along both sides of Market Street and along the north side of Guest Street.

North Beacon Street/Arthur Street/Wingate Driveway is a signalized intersection with offset approaches on Arthur Street and the Wingate driveway. The North Beacon Street east and westbound approaches consist of a 20-foot wide general-purpose travel lane. The Arthur Street southbound approach consists of 12-foot wide left and right-turn lanes. "No Stopping Any Time" signs are posted along both sides of North Beacon Street and Arthur Street. The Wingate at Brighton driveway is offset slightly to the east of Arthur Street and accommodates two-way travel. Sidewalks are provided along both sides of North Beacon Street and Arthur Street. A marked crosswalk is provided across the west leg of North Beacon Street and across Arthur Street.

North Beacon Street/Everett Street is a signalized intersection with three approaches, although a commercial driveway curb cut is located along the southern curb for entering vehicles only. The North Beacon Street east and westbound approaches consist of a 20-foot wide general-purpose travel lane. Everett Street consists of a 27.5-foot wide paved roadway that accommodates two-way travel. Right-Turns-On-Red are prohibited from Everett Street. Parking is permitted along the north side of North Beacon Street except on weekdays between 4:00 p.m. and 6:00 p.m. A "No Parking, Tow Zone" sign is posted on the east side of Everett Street. The KFC driveway accommodates vehicles entering the KFC parking lot (away from North Beacon Street). Sidewalks are provided along both sides of North Beacon Street and Everett Street. A marked crosswalk is provided across the west leg of North Beacon Street.

Guest Street/Arthur Street/Stop & Shop Supermarket Driveway is currently an unsignalized intersection with four approaches. The Guest Street eastbound approach consists of one 18.5-foot wide general-purpose travel lane. The east leg of Guest Street (driveway to the Stop & Shop Supermarket) consists of a 31-foot wide paved roadway that accommodates two-way travel. Vehicles traveling eastbound on Guest Street are under STOP-sign control. Arthur Street consists of a 40-foot wide paved roadway that accommodates two-way travel. Vehicles approaching Guest Street are under STOP-sign control. Sidewalks are provided along both sides of Guest Street, east of Arthur Street; along the south side of Guest Street, west of Arthur Street; and along both sides of Arthur Street. A marked crosswalk is provided across the west leg of Guest Street. MBTA bus stops and associated shelters are located on both sides of Arthur Street.

As a result of transportation improvement measures from Boston Landing and on-going discussions with adjacent property owners, this intersection would be improved, serving the existing approaches, a new Guest Street Extension approach, and the new Arthur Street extension. For study analysis purposes, it is anticipated that the future design will include a roundabout, which will provide safe and efficient operation for vehicles and pedestrians. This proposed improvement is incorporated into the Year 2020 Conditions. It should be noted that property needed to make this improvement is not under the control of the Proponent.

Everett Street/Little Everett Street is an unsignalized intersection with three approaches. The primary Everett Street north-south legs each have one travel lane and the approaches are uncontrolled. No parking is permitted along these approaches. The local "Little" Everett Street is a skewed northeast/southwest leg that connects to Braintree Street. The southwest approach on Little Everett Street is under STOP control. Parking is allowed along the west side of Little Everett. A marked crosswalk is provided across the northern approaches on this intersection. An advisory crosswalk sign and flashing yellow light alert drivers to the crosswalk.

Under planned transportation improvement measures from Boston Landing, Guest Street would be extended from Arthur Street through to Everett Street. The new intersection of Guest Street Extension at Everett Street would be signalized. As part of this proposed improvement, the existing intersection of Everett Street/Little Everett would also be signalized and the two intersections will be coordinated. These two proposed new signalized intersections are incorporated into the Year 2020 Conditions. It should be noted that property needed to extend Guest Street is not under the control of the Proponent.

3.2.3 Analysis Methodology

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. The study team calculated average delay and associated LOS at study area intersections using Trafficware's Synchro 9 software, which also evaluates the impact on traffic operations from closely spaced intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2010 Highway Capacity Manual (HCM). Because it is anticipated that the future design of Guest Street/Arthur Street will include a roundabout, SIDRA software for roundabouts was utilized. SIDRA models also use methodologies presented in the 2010 HCM.

Level of service and delay (in seconds) are based on intersection geometry and available traffic data for each intersection. BTD provided the intersection signal timing and phasing used in this analysis.

Table 3-2 summarizes the delay and LOS thresholds for signalized and unsignalized intersections, as defined in the HCM. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (unacceptable), with significant traffic delay. The threshold at LOS E/LOS F indicates that the intersection, or intersection approach, is theoretically at capacity. LOS D is generally considered acceptable in an urban environment, such as the Boston Landing study area, and below theoretical operating capacity.

Table 3-2 Level of Service Criteria

Level of Service	Average Stopped Delay (sec./veh.)	
	Signalized Intersection	Unsignalized Intersection
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

3.2.4 Parking

On-street parking regulations near the Project site were inventoried and are presented in Figure 3-3. Conditions along Guest Street and Life Street are not presented due to on-going Boston Landing construction. In general, no parking is permitted along Market Street, Arthur Street, and Everett Street, south of Adamson Street. On North Beacon Street, there is a mix of unrestricted parking, p.m. peak period restrictions, and no parking.

Nearby, at the corner of Guest Street and Life Street, is a, approximately 1,500 space parking garage for employees/visitors of tenants at 20 Guest Street, WGBH offices, Newbury Comics offices, and NB Fitness. It should be noted that the residential parking demand generated by the Project will be served entirely on the new site and will not need to use this existing parking garage or other planned parking facilities in the area. See Section 3.4.6 for a discussion of future parking.

3.2.5 Car Sharing

Car sharing, which is predominantly provided by Zipcar in the Boston area, supplies easy access to vehicular transportation for those who do not own cars. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. As shown in Figure 3-4, there are two car-sharing locations within a ¼-mile of the site.

3.2.6 Public Transportation

Within the study area, the MBTA operates four bus routes. Route 57 and Route 66 operate through Union Square along Cambridge Street and Brighton Avenue. Closer to the Project, transit is provided by Route 86 and Route 64 with stops located along Market Street, Guest Street, and North Beacon Street.

Public transportation within the study area is presented in Figure 3-5 and summarized in Table 3-3.

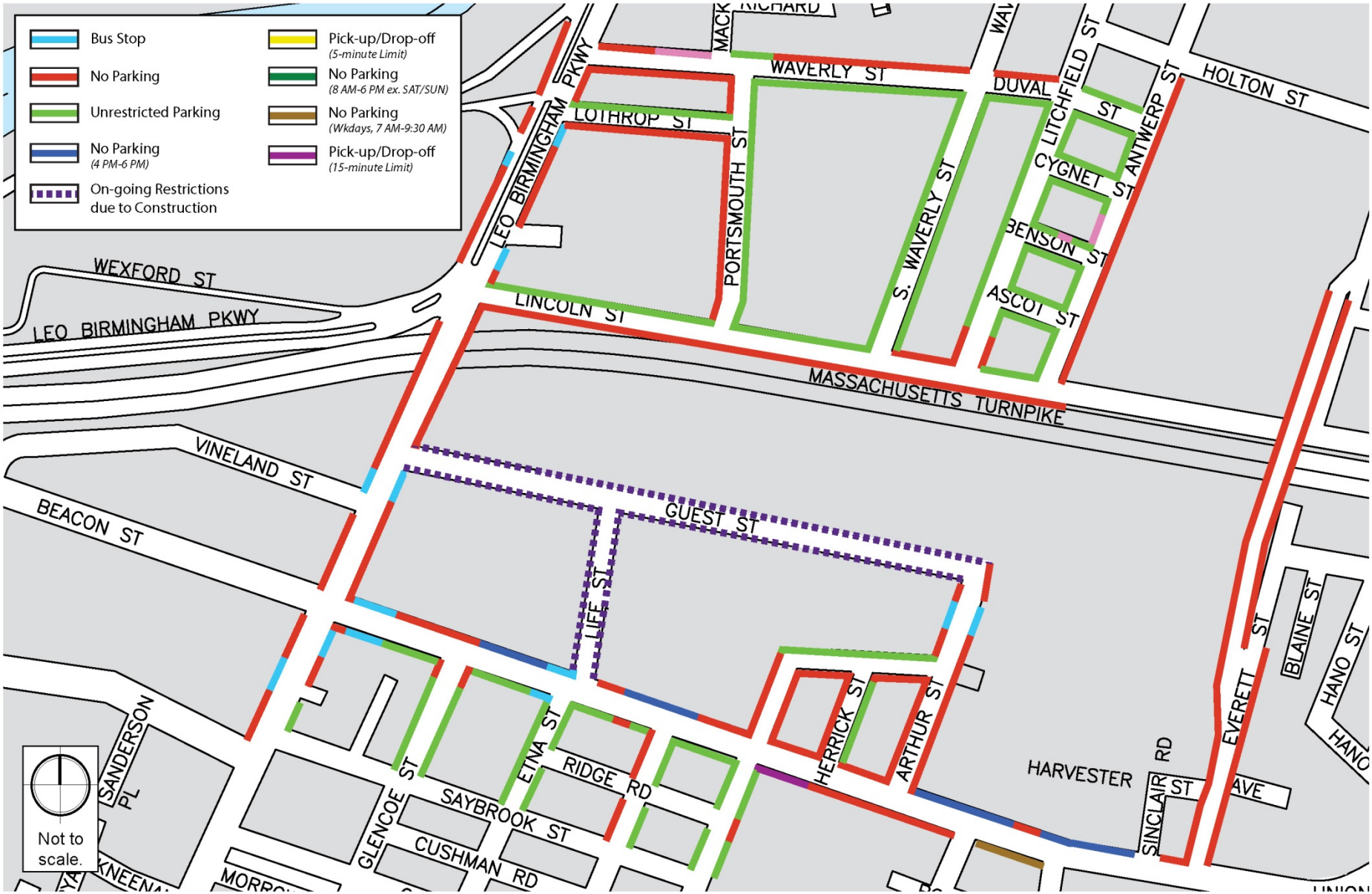

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Figure 3-3

Existing Curbside Regulations

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Figure 3-4

Car Sharing Locations

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Figure 3-5

Public Transportation in the Study Area

Table 3-3 Public Transportation in the Study Area

Route	Route Description	Rush-hour Headway (minutes)
Route 57	Watertown Square/Kenmore Square *via Newton Corner and Brighton Center*	5/6
Route 64	Oak Square/Central Square – via North Beacon Street and Cambridge Street.	18/28
Route 66	Harvard Square/Dudley Station – via Allston and Brookline Village	10
Route 86	Sullivan Square/Cleveland Circle – via Harvard Square and Market Street	13/18

Several additional MBTA services are available beyond the half-mile radius, at approximately 2/3 of a mile; however, this distance is generally considered further than what most people are willing to walk to access transit. These services include MBTA bus Routes 57 (Watertown Yard - Kenmore Station via Newton Corner & Brighton Center) and 65 (Brighton Center - Kenmore Station via Washington St., Brookline Village). Still further away at slightly over a mile is the B Branch of the MBTA Green Line at Harvard Avenue

A shuttle service currently operates between 20 Guest Street and nearby MBTA subway stations. Employees from New Balance, tenants of 20 Guest Street and the adjacent WGBH office/studio (One Guest Street) are permitted to use the shuttles. Service is provided by 14 passenger vans.

The Project site is directly adjacent to the MBTA Framingham/Worcester commuter rail line. In November 2013, NB Development Group and MassDOT reached an agreement to build a new commuter rail station near Everett Street, therefore restoring commuter rail service to this neighborhood. Under the agreement, NB Development is permitting, designing, and constructing the station. This station, which will be designated Boston Landing at Allston Brighton, is currently under construction.

3.2.7 Pedestrian and Bicycle Facilities

An inventory of sidewalks and crosswalks is provided in the intersection descriptions in Section 3.2.2. Sidewalks are generally provided along both sides of the study area roadways, with marked crosswalks provided at the signalized intersections.

Bicycle accommodations vary within the study area. Brighton and Allston have many City of Boston designated bicycle routes, but very few have physical bicycle accommodation facilities. There are some bicycle lanes on Washington Street in Brighton Center heading east to at least Sparhawk Street. Multi-use paths (pedestrians and bicyclists) are present along both sides of the Charles River, with designated bicycle routes (shared traveled way)

provided along the following streets: Cambridge Street, Washington Street, Faneuil Street, Arlington Street, Market Street, North Beacon Street, Birmingham Parkway, Lincoln Street, Western Avenue, and Everett Street. There are bicycle lanes along Market Street between Washington Street and Lincoln Street that were installed in 2012.

Hubway, which launched in July 2011, is a bicycle sharing system with more than 100 stations and 1,000 bicycles available throughout Boston, Brookline, Cambridge, and Somerville. As shown in Figure 3-6, two Hubway stations are located near the Project site.

3.3 Year 2020 No-Build Conditions

For transportation impact studies, it is standard practice to evaluate No-Build conditions (without project) and Build conditions (with project) and determine to what extent the traffic operations will be affected. Because these conditions are typically projected five years into the future, Year 2020 has been designated as the future design year.

3.3.1 No-Build (2020) Volumes

As described in Section 3.1.2, the analysis in this study uses the earlier Year 2017 conditions presented in the Boston Landing permitting documents as a basis for defining future Year 2020 conditions. Background growth was increased to appropriately reflect the longer time horizon.

Under Year 2020 No-Build Conditions, it is anticipated that all other buildings in the Boston Landing Master Plan will be constructed and occupied. As shown in Figure 3-1, these include the New Balance World Headquarters office building (occupied in September 2015), a new hotel, three new office buildings, a new ice rink, and sports complex.

A general background growth rate accounts for changes in demographics, auto usage and auto ownership. An annual background growth rate of 0.5% was applied to the Year 2017 volumes to account for growth between 2017 and 2020. A review of other local development plans showed that all background projects in the vicinity had already been included in the prior Boston Landing analysis, and therefore, no additional project specific growth is included in the Year 2020 Conditions.

The Year 2020 No-Build traffic volumes are shown Figure 3-7 and Figure 3-8, for the a.m. peak hour and p.m. peak hour, respectively.

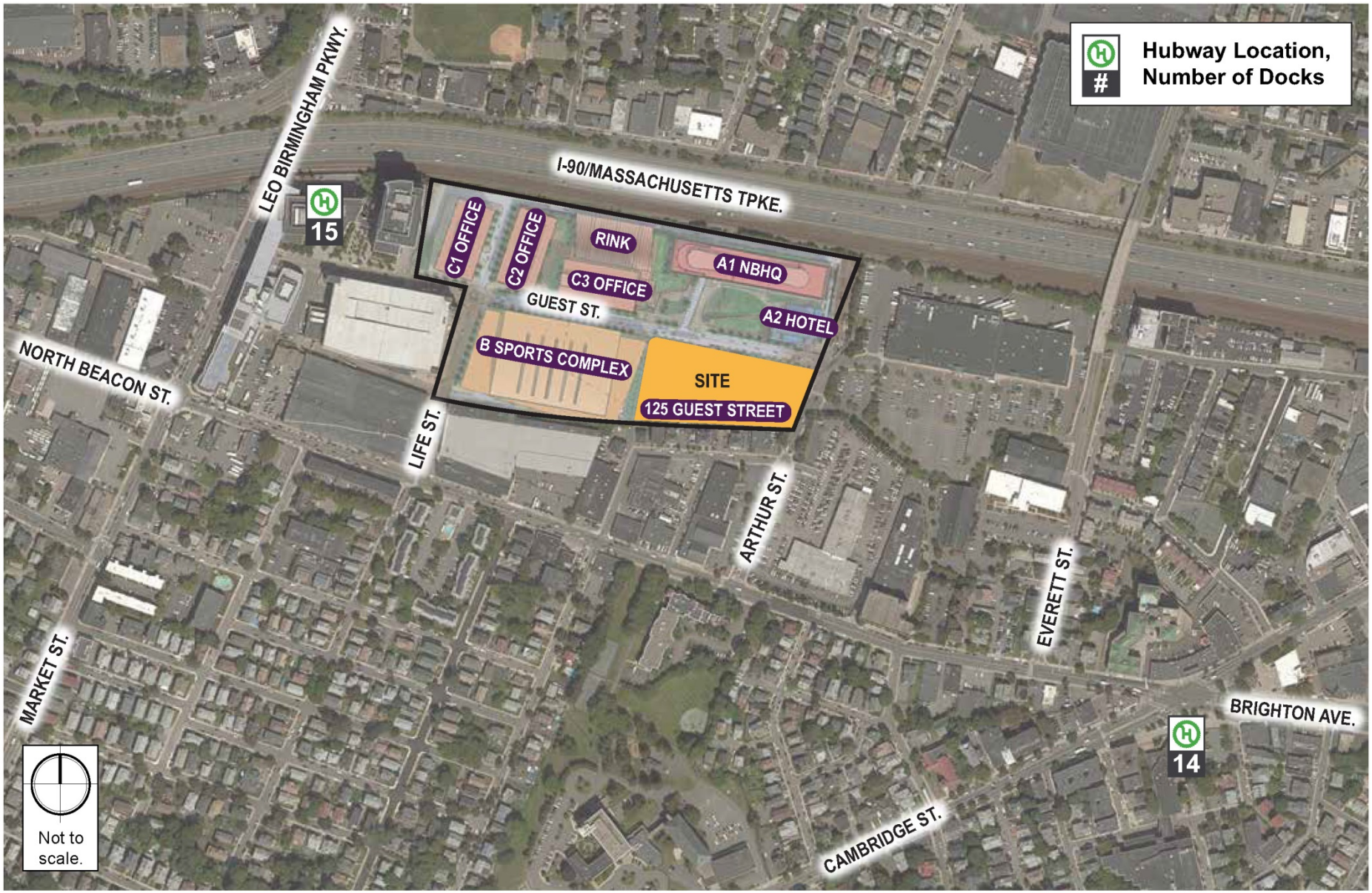

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Figure 3-6

Existing Bicycle Share Locations

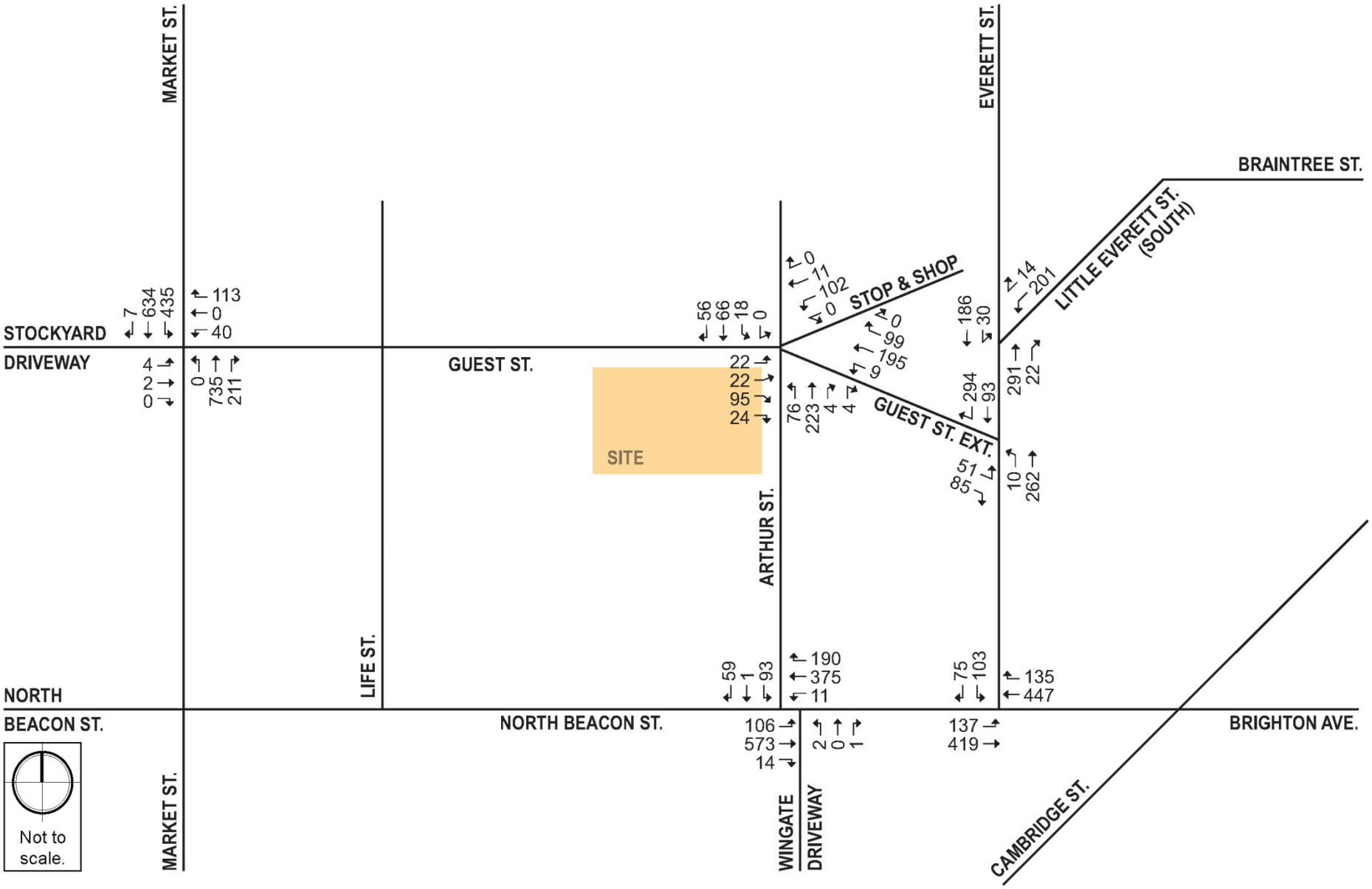

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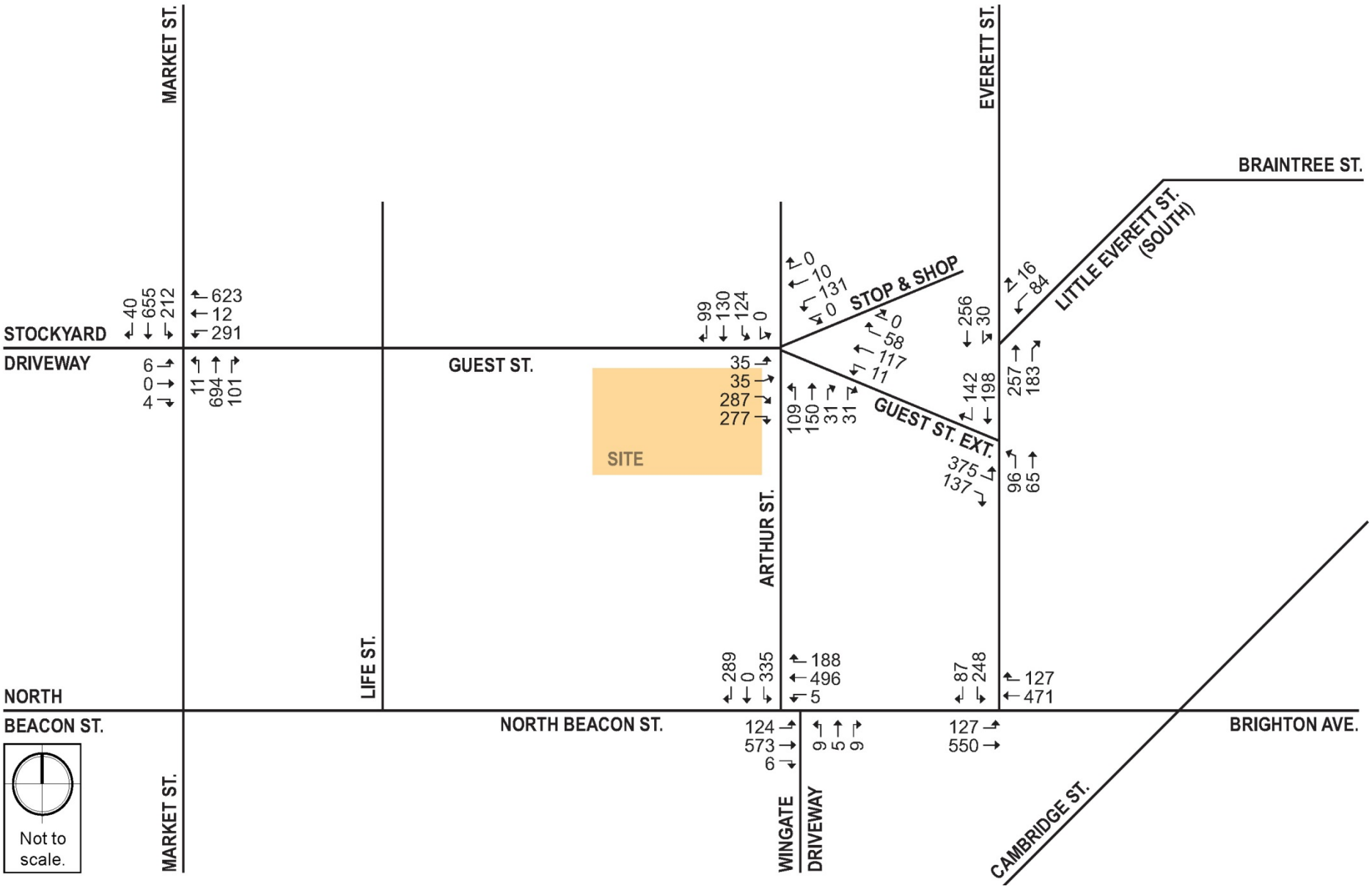
Figure 3-7

No-Build (2020) Condition Traffic Volumes, Weekday a.m. Peak Hour



125 Guest Street **Boston, Massachusetts**

Figure 3-8

No-Build (2020) Condition Traffic Volumes, Weekday p.m. Peak Hour

3.3.2 No-Build (2020) Roadway Improvements

By 2020, transportation improvements proposed at Boston Landing should be in place. For this Project's study area, key improvements include the new Boston Landing at Allston Brighton commuter rail station, the extension of Guest Street between Arthur Street and Everett Street, construction of a new intersection at Guest Street/Arthur Street, the signalization of Guest Street Extension/Everett Street, and numerous other intersection, roadway, and pedestrian upgrades in the area. These improvements, described in more detail below, have been incorporated in the Year 2020 analysis.

Guest Street Extension

The concept of extending Guest Street, from its intersection with Arthur Street through to Everett Street thus providing a connection to Braintree Street and on to Cambridge Street, was endorsed during the City's Brighton/Guest Street Area Planning Study. The intent of this improvement is to provide additional connectivity from the Guest Street corridor to the regional roadway network (I-90's Allston/Brighton interchange and Storrow Drive specifically) via Cambridge Street. This transportation corridor would parallel and complement North Beacon Street and divert traffic away from busy and congested intersections along that corridor, and in particular away from Union Square (Cambridge Street/Brighton Street/North Beacon Street). The new corridor could also provide a less busy travel route for bicycles in the area. Guest Street Extension is incorporated into the Year 2020 Conditions. It should be noted that property needed to make this improvement is not under the control of the Proponent.

Arthur Street Extension

The Proponent has constructed an extension of Arthur Street, north of Guest Street to serve Boston Landing's parking/loading and to facilitate drop-off/pick-up at the new commuter rail station.

Guest Street/Arthur Street Extension/Stop & Shop Driveway

Construction of the Arthur Street Extension and Guest Street Extension will make the Guest Street/Arthur Street intersection a true gateway to the Boston Landing development area, along with providing access to the new commuter rail station and continuing to serve the adjacent shopping plaza. On-going assessment of alternative improvements at this location has been undertaken by the Proponent and the anticipated improvement is to construct a new intersection, including roadway approaches from Guest Street eastbound, Arthur Street northbound, Guest Street Extension westbound, Stop and Shop driveway southwest bound and Arthur Street southbound. For study analysis purposes, it is anticipated that the future design will include a roundabout, which is incorporated into the Year 2020 Conditions. It should be noted that property needed to make this improvement is not under the control of the Proponent.

Guest Street/Everett Street

When Guest Street is extended, the new intersection of Guest Street Extension at Everett Street will be signalized. As part of this improvement, the existing intersection of Everett Street/Little Everett will also be signalized and the two intersections will be coordinated. ADA compliant pedestrian crossings will be installed at each location. These two new signalized intersections are incorporated into the Year 2020 Conditions.

3.3.3 No-Build (2020) Traffic Operations

The No-Build Condition intersection operations results are shown in Table 3-4 and Table 3-5 for the a.m. and p.m. peak hour, respectively. Synchro and SIDRA reports are provided in Appendix B.

Under 2020 No-Build Conditions, all study intersections will operate at LOS D or better. The only individual intersection approach to operate below LOS D is the southbound Everett Street approach at North Beacon Street, which will operate at LOS E during the a.m. peak hour.

Table 3-4 No-Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street/Market Street/Stockyard Driveway	**A**	**9.0**		
Stockyard EB left/thru/right	D	41.0	0.11	12
Guest WB left/thru	D	49.4	0.37	m49
Guest WB right	B	19.0	0.31	m65
Market NB left/thru | thru/right	A	7.3	0.42	185
Market SB left/thru | thru/right	A	6.7	0.98dl	130
North Beacon Street/Arthur Street/Wingate Driveway	**B**	**16.2**		
North Beacon EB left	A	6.5	0.17	63
North Beacon EB thru/right	A	8.7	0.46	398
North Beacon WB left/thru	B	16.5	0.36	259
North Beacon WB right	B	15.3	0.21	131
Wingate NB left/thru/right	A	0.0	0.02	0
Arthur SB left/thru	D	48.5	0.58	m71
Arthur SB right	D	46.8	0.41	m48
North Beacon Street/Everett Street	**B**	**11.5**		
North Beacon EB left/thru | thru	A	5.5	0.37	56
North Beacon WB thru	A	4.1	0.41	m66
North Beacon WB right	A	0.2	0.13	m0
Everett SB left/right	E	56.4	0.74	191

Table 3-4 No-Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street Extension/Everett Street	**B**	**16.0**		
Guest EB left	D	40.7	0.27	70
Guest EB right	B	12.6	0.35	45
Everett NB left/thru	B	11.7	0.32	139
Everett SB thru	A	2.7	0.10	m9
Everett SB right	C	20.9	0.59	96
Everett Street/Little Everett Street (South)	**C**	**26.0**		
Everett NB thru/right	B	10.8	0.36	211
Everett SB left/thru	C	25.5	0.39	196
Little Everett SW left/right	D	48.7	0.71	#276
Unsignalized Intersections				
Guest Street/Arthur Street/Stop & Shop Driveway				
Guest EB left/right	B	10.7	0.36	42
Guest WB left/thru	A	5.7	0.17	16
Guest WB right	A	4.8	0.03	2
Stop & Shop WB left/right	A	9.5	0.23	20
Arthur NB left/thru/right	A	7.5	0.21	20
Arthur SB left/thru/right	A	7.8	0.36	42

Light grey cell shading indicates LOS E or LOS F.

Table 3-5 No-Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street/Market Street/Stockyard Driveway	**C**	**24.1**		
Stockyard EB left/thru/right	A	0.1	0.03	0
Guest WB left/thru	D	42.9	0.79	#301
Guest WB right	C	30.7	0.87	#506
Market NB left/thru | thru/right	B	19.6	0.56	234
Market SB left/thru | thru/right	B	17.0	0.76	192
North Beacon Street/Arthur Street/Wingate Driveway	**C**	**24.4**		
North Beacon EB left	C	20.4	0.43	#104
North Beacon EB thru/right	C	28.2	0.69	#687
North Beacon WB left/thru	B	18.6	0.60	#584

Table 3-5 No-Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
North Beacon WB right	B	12.2	0.27	175
Wingate NB left/thru/right	D	48.6	0.43	30
Arthur SB left/thru	C	34.6	0.81	m191
Arthur SB right	C	21.6	0.63	m98
North Beacon Street/Everett Street	**B**	**18.7**		
North Beacon EB left/thru | thru	B	15.1	0.53	290
North Beacon WB thru	A	6.2	0.48	m80
North Beacon WB right	A	0.5	0.15	m1
Everett SB left/right	D	52.6	0.81	292
Guest Street Extension/Everett Street	**C**	**28.9**		
Guest EB left	D	52.1	0.82	#494
Guest EB right	A	6.7	0.27	51
Everett NB left/thru	B	18.5	0.29	118
Everett SB thru	A	3.0	0.28	17
Everett SB right	D	36.8	0.47	m115
Everett Street/Little Everett Street	**C**	**25.6**		
Everett NB thru/right	A	8.5	0.44	m124
Everett SB left/thru	D	44.1	0.65	#346
Little Everett SW left/right	D	47.8	0.46	130
Unsignalized Intersections				
Guest Street/Arthur Street/Stop & Shop Driveway				
Guest EB left/right	A	8.0	0.27	27
Guest WB left/thru	B	13.6	0.55	79
Guest WB right	A	9.5	0.39	41
Stop & Shop WB left/right	A	8.5	0.24	22
Arthur NB left/thru/right	B	13.0	0.53	75
Arthur SB left/thru/right	B	14.5	0.54	74

3.3.4 No-Build (2020) Public Transportation

In November 2013, NB Development Group and MassDOT reached an agreement to build a new commuter rail station near Everett Street, therefore restoring commuter rail service to this neighborhood. Under the agreement, NB Development is permitting, designing, and constructing the station. This station, which will be designated Boston Landing at Allston Brighton, is currently under construction.

3.3.5 No-Build (2020) Pedestrian and Bicycle Conditions

As the various components of the Boston Landing area are developed, the Proponent will improve, where feasible, the pedestrian environment adjacent to its buildings along the major east-west corridor of Guest Street as well as along the north-south corridor of Arthur Street.

Many upgrades to the pedestrian environment will occur as listed below:

North Beacon Street/Arthur Street

- Provide ADA compliant pedestrian crossings.

North Beacon Street/Everett Street

- Provide ADA compliant pedestrian crossings.

Guest Street/Arthur Street

- Reconfigure and construct a new intersection.
- Provide ADA compliant pedestrian crossings.

Guess Street Extension/Everett Street and Everett Street/Little Everett Street

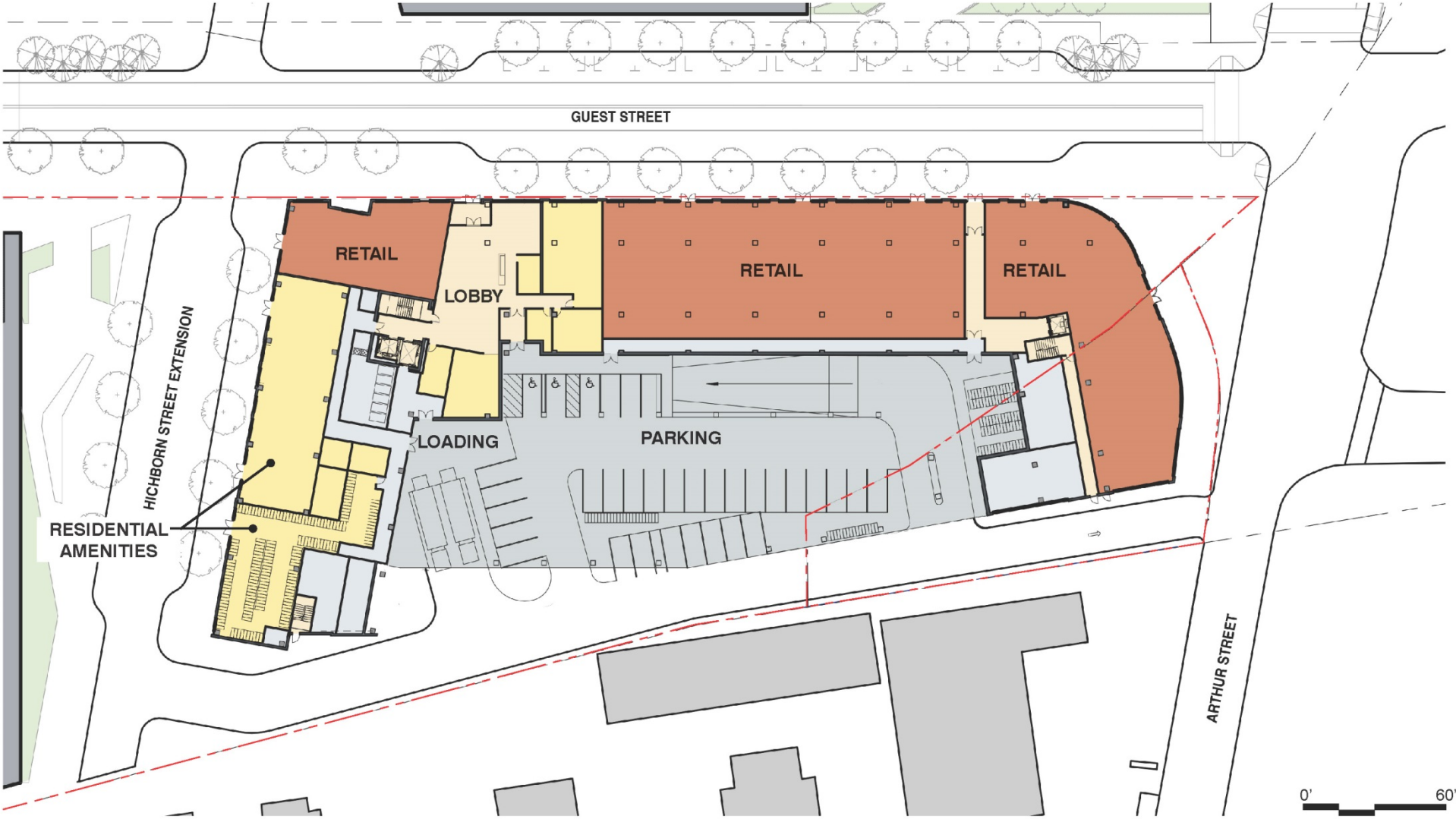
- Reconfigure intersections.
- Signalize and coordinate all intersection approaches.
- Provide ADA compliant pedestrian crossings.

The Proponent has committed to incorporating bicycle facilities in all roadway and intersection mitigation associated with Boston Landing. The Proponent supports the City's efforts in advancing bicycle travel by introducing bicycle lanes or other accommodations and safety improvements wherever possible.

Guest Street is being designed to be a complete street where possible and fully accommodate bicycle travel through designated bicycle lanes. Bicycle racks will be available for visitors along the Guest Street strip. Long-term bicycle storage will be provided for Boston Landing employees who commute by bicycle.

3.4 Year 2020 Build Conditions

As summarized in Table 3-1, the Project will contain approximately 295 residential units and approximately 16,000 sf of retail/restaurant space. The Project will provide approximately 155 residential parking spaces in an on-site garage. Figure 3-9 shows the ground floor site plan for the Project.



125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

HOWARD STEIN HUDSON
Engineers + Planners

Figure 3-9
Site Plan

3.4.1 Site Access and Circulation

The driveway to the parking garage of the residential building is located on the future Hichborn Street Extension. Garage access and egress will occur via the Hichborn Extension Street driveway. A service roadway will be located along the south side of the building with a curb-cut on Arthur Street.

Ground floor retail will be located along Guest Street. The residential lobby can be accessed via Guest Street and elevator access to the residential floors will be provided in the parking garage.

3.4.2 Trip Generation

Trip generation rates for the Project land uses was derived from the Institute of Transportation Engineers' (ITE) publication *Trip Generation* (9th edition, 2012), using the following Land Use Codes (LUC):

LUC 220 – Apartments. The residential apartment is defined as rental dwelling units located within the same building with at least three other dwelling units. This LUC does not distinguish whether apartments are low-rise, mid-rise, or high-rise; however, this LUC has a much higher sample size than other similar LUC's, providing for a more accurate estimate in trip generation. Trip generation estimates are based on average vehicular rates per dwelling unit.

LUC 820 - Retail/Shopping. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. Calculations of the number of trips use ITE's average rate per 1,000 sf.

LUC 831 - Quality Restaurant. This land use consists of eating establishments of high quality, with average turnover rates of at least one hour or longer. Generally, quality restaurants do not serve breakfast, some do not serve lunch, and all serve dinner. Calculations of the number of trips use ITE's average rate per 1,000 sf.

3.4.3 Travel Mode Shares

The BTD publishes vehicle, transit, and travel mode shares specific to each area of Boston. The Project site is located within BTD Area 17. As is standard practice, these specific neighborhood mode shares have been adopted and used to estimate the number of new vehicle-person trips, transit trips, and walk/bicycle trips generated by the Project.

Local vehicle occupancy rates (VOR) are adopted from the 2009 *National Household Travel Survey* and the 2010 U.S. Census and were used to convert vehicle-person trips to vehicle trips. The Project mode shares (by time of day and land use) and vehicle occupancy rates are shown in Table 3-6.

Table 3-6 Travel Mode Shares

Land Use	Direction	Vehicle Share	Transit Share	Walk/Bicycle Share	Vehicle Occupancy Rate
Daily					
Residential	In Out	43% 43%	26% 26%	31% 31%	1.1
Retail/Restaurant	In Out	52% 52%	8% 8%	40% 40%	1.8
a.m. Peak hour					
Residential	In Out	32% 40%	35% 24%	33% 36%	1.1
Retail/Restaurant	In Out	36% 40%	18% 14%	46% 46%	1.8
p.m. Peak hour					
Residential	In Out	40% 32%	24% 35%	36% 33%	1.1
Retail/Restaurant	In Out	39% 40%	14% 14%	47% 46%	1.8

Based on the land use trip rates, travel mode share assumptions, and local vehicle occupancy rates, the resulting transit, walk/bicycle, and vehicle trips were identified. The Project-generated vehicle trips are summarized in Table 3-7. Detailed trip generation information is provided in Appendix B.

3.4.4 Trip Distribution

Vehicular trip distribution was developed using origin-destination data from BTD for Area 17 and knowledge of the local area roadway network, including the proposed Guest Street Extension. Figure 3-10 shows the vehicle trip distribution pattern for Project trips entering the site driveway and Figure 3-11 shows the distribution of vehicles exiting the Project.

Figure 3-10

Trip Distribution Entering

125 Guest Street **Boston, Massachusetts**

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Figure 3-11
Trip Distribution Exiting

Table 3-7 Project Vehicle Trips by Land Use

Period	Residential	Retail/Restaurant	Total
Daily			
Entering	422	333	755
Exiting	422	333	755
a.m. Peak			
Entering	9	3	12
Exiting	49	1	50
p.m. Peak			
Entering	35	23	58
Exiting	13	20	33

3.4.5 Build (2020) Conditions Traffic Operations

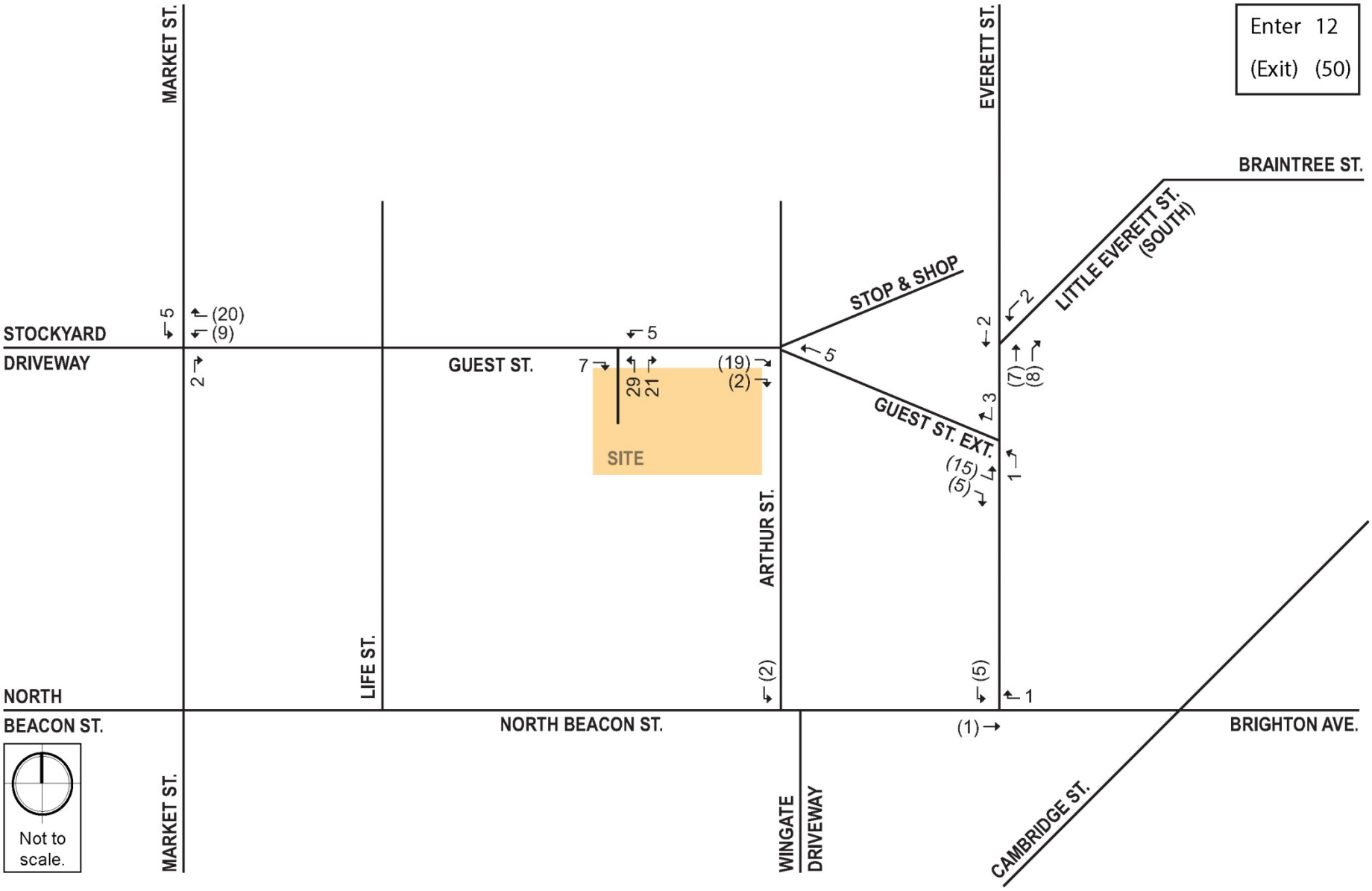
Using the distribution patterns shown in Figure 3-10 and Figure 3-11, and the vehicle trips shown in Table 3-7, the Project's new vehicle trips were assigned to the roadway network as shown in Figure 3-12 and Figure 3-13, for the a.m. peak hour and p.m. hour, respectively. The Year 2020 Build traffic volumes are shown Figure 3-14 and Figure 3-15, for the a.m. peak hour and p.m. peak hour, respectively.

Table 3-8 and Table 3-9 show the Year 2020 Build Conditions capacity analysis summary for the a.m. and p.m. peak hours, respectively. Synchro and SIDRA reports are provided in Appendix B.

With the additional Project trips, each overall intersection LOS is unchanged from No-Build Conditions. Only one approach worsens under Build conditions, the Guest Street eastbound approach at Everett Street will worsen from LOS D to LOS E during the p.m. peak hour. The overall intersection of Guest Street Extension/Everett Street will operate at LOS C.

The new site driveway at Guest Street will be unsignalized with STOP control for exiting driveway vehicles. All approaches will operate at LOS C or better.

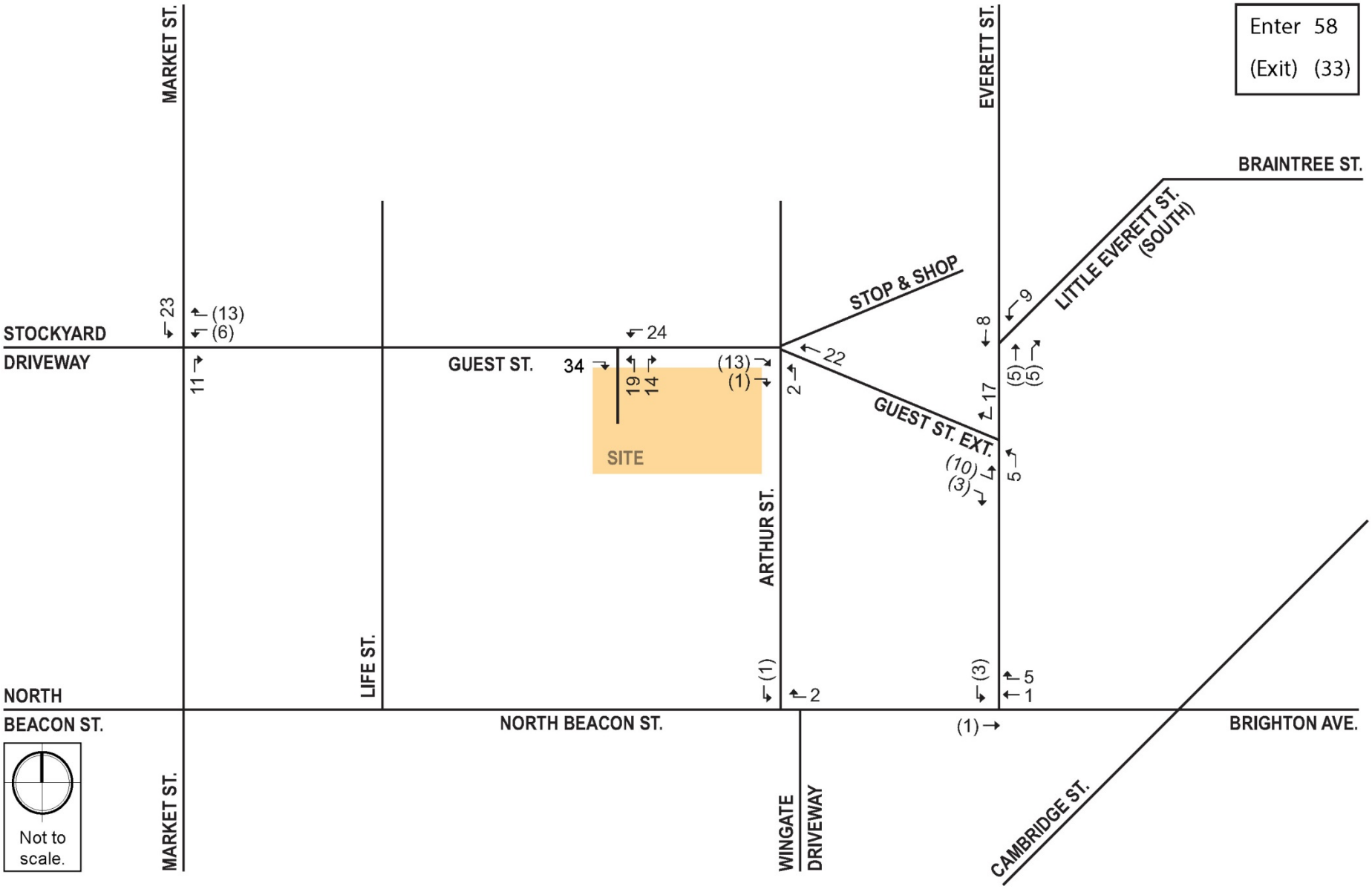
As determined through the analysis presented in this report, the proposed Project will not affect traffic operations in the study area.



125 Guest Street Boston, Massachusetts

Figure 3-12

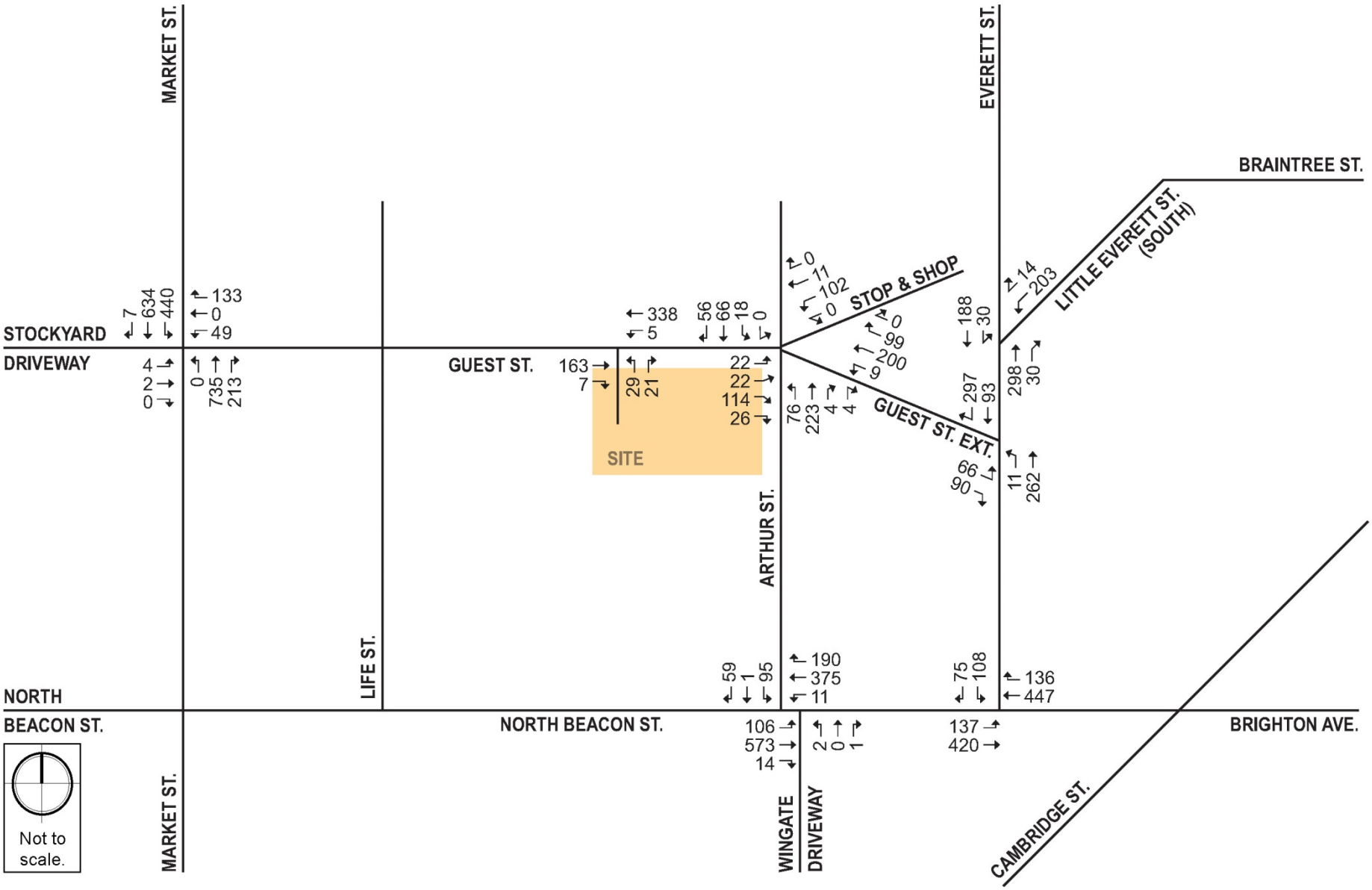
Project Generated Trips, a.m. Peak Hour



125 Guest Street Boston, Massachusetts

Figure 3-13

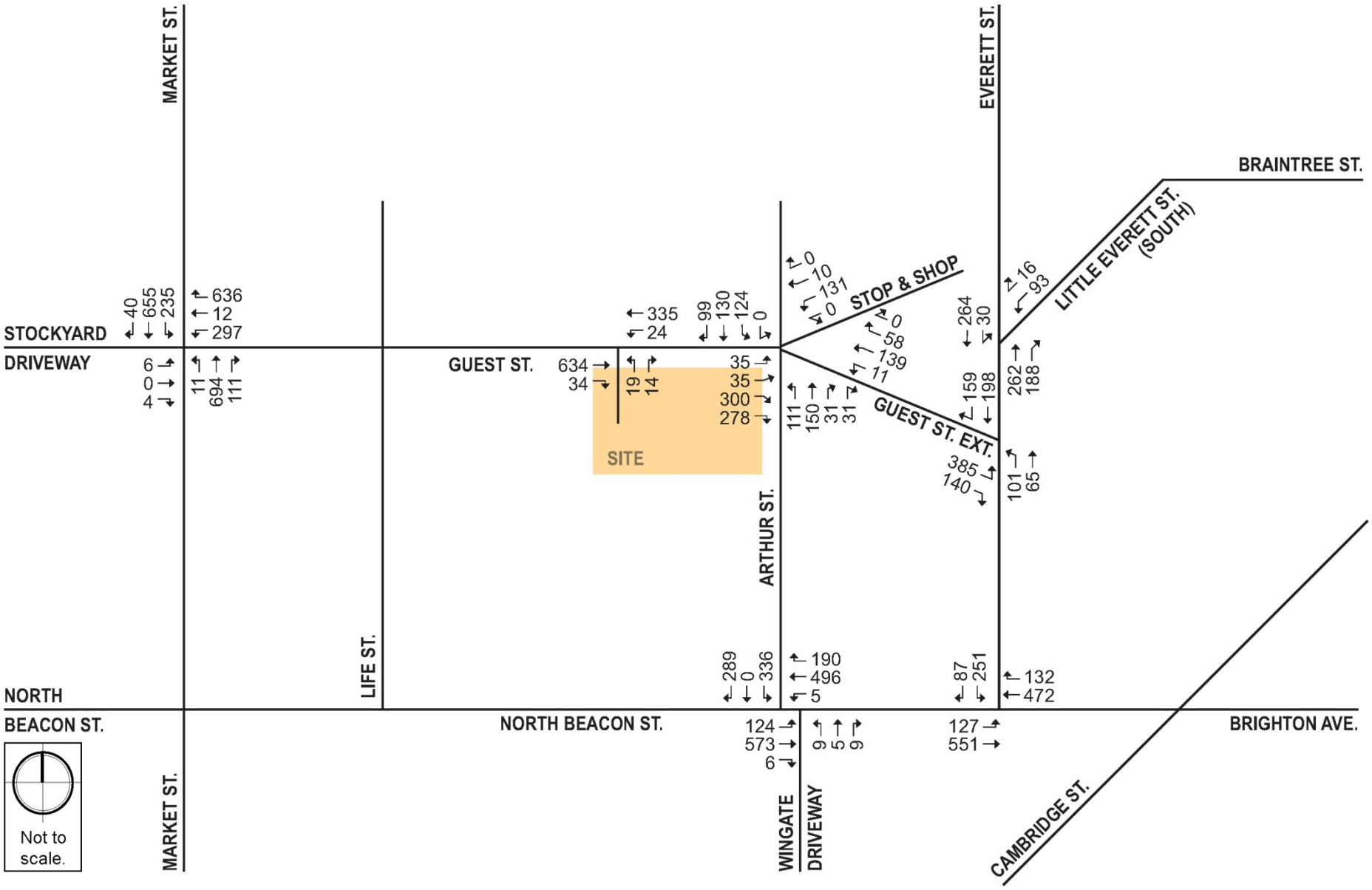
Project Generated Trips, p.m. Peak Hour



125 Guest Street Boston, Massachusetts

Figure 3-14

Build (2020) Condition Traffic Volumes, Weekday a.m. Peak Hour



125 Guest Street Boston, Massachusetts

Figure 3-15

Build (2020) Condition Traffic Volumes, Weekday p.m. Peak Hour

Table 3-8 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street/Market Street/Stockyard Driveway	**A**	**9.9**		
Stockyard EB left/thru/right	D	39.3	0.10	12
Guest WB left/thru	D	50.0	0.38	m55
Guest WB right	C	23.8	0.35	m76
Market NB left/thru | thru/right	A	7.9	0.43	197
Market SB left/thru | thru/right	A	7.7	1.00dl	145
North Beacon Street/Arthur Street/Wingate Driveway	**B**	**16.3**		
North Beacon EB left	A	6.5	0.17	63
North Beacon EB thru/right	A	8.7	0.47	398
North Beacon WB left/thru	B	16.5	0.36	258
North Beacon WB right	B	15.3	0.21	131
Wingate NB left/thru/right	A	0.0	0.02	0
Arthur SB left/thru	D	48.7	0.59	m72
Arthur SB right	D	47.0	0.40	m49
North Beacon Street/Everett Street	**B**	**11.8**		
North Beacon EB left/thru | thru	A	5.5	0.37	57
North Beacon WB thru	A	4.1	0.41	m65
North Beacon WB right	A	0.2	0.13	m0
Everett SB left/right	E	57.3	0.75	195
Guest Street Extension/Everett Street	**B**	**17.2**		
Guest EB left	D	41.3	0.33	86
Guest EB right	B	11.9	0.35	46
Everett NB left/thru	B	12.3	0.32	144
Everett SB thru	A	2.8	0.10	m9
Everett SB right	C	22.6	0.60	m97
Everett Street/Little Everett Street (South)	**C**	**26.6**		
Everett NB thru/right	B	10.7	0.38	213
Everett SB left/thru	C	26.2	0.40	202
Little Everett SW left/right	D	50.8	0.72	#288

Table 3-8 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Unsignalized Intersections				
Guest Street/Arthur Street/Stop & Shop Driveway				
Guest EB left/right	B	10.8	0.45	55
Guest WB left/thru	A	6.0	0.19	18
Guest WB right	A	4.8	0.04	2
Stop & Shop WB left/right	A	9.6	0.23	20
Arthur NB left/thru/right	A	7.5	0.22	20
Arthur SB left/thru/right	A	8.1	0.37	43
Guest Street/Site Driveway				
Guest EB thru/right	A	0.0	0.11	0
Guest WB left/thru	A	0.1	0.00	0
Site Driveway NB left/right	B	11.6	0.09	8

Table 3-9 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street/Market Street/Stockyard Driveway	**C**	**25.1**		
Stockyard EB left/thru/right	A	0.1	0.03	0
Guest WB left/thru	D	43.7	0.80	#310
Guest WB right	C	32.2	0.88	#525
Market NB left/thru | thru/right	B	19.8	0.57	237
Market SB left/thru | thru/right	B	18.4	0.79	198
North Beacon Street/Arthur Street/Wingate Driveway	**C**	**24.5**		
North Beacon EB left	C	20.5	0.43	#104
North Beacon EB thru/right	C	28.2	0.69	#687
North Beacon WB left/thru	B	18.6	0.60	#582
North Beacon WB right	B	12.3	0.27	178
Wingate NB left/thru/right	D	48.6	0.43	30
Arthur SB left/thru	C	34.9	0.81	m188
Arthur SB right	C	21.8	0.63	m96
North Beacon Street/Everett Street	**B**	**18.8**		
North Beacon EB left/thru | thru	B	15.2	0.54	289
North Beacon WB thru	A	6.2	0.48	m81
North Beacon WB right	A	0.5	0.15	m1
Everett SB left/right	D	53.1	0.82	294

Table 3-9 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (feet)
Signalized Intersection				
Guest Street Extension/Everett Street	**C**	**31.9**		
Guest EB left	E	57.9	0.85	#523
Guest EB right	A	6.8	0.28	53
Everett NB left/thru	B	18.7	0.30	121
Everett SB thru	A	3.0	0.27	15
Everett SB right	D	40.6	0.50	124
Everett Street/Little Everett Street (South)	**C**	**27.3**		
Everett NB thru/right	B	10.6	0.45	m116
Everett SB left/thru	D	44.6	0.65	339
Little Everett SW left/right	D	49.9	0.50	143
Unsignalized Intersections				
Guest Street/Arthur Street/Stop & Shop Driveway				
Guest EB left/right	A	8.5	0.31	31
Guest WB left/thru	B	14.2	0.56	84
Guest WB right	A	9.5	0.39	41
Stop & Shop WB left/right	A	8.7	0.25	22
Arthur NB left/thru/right	B	13.7	0.54	78
Arthur SB left/thru/right	C	15.0	0.55	76
Guest Street/Site Driveway				
Guest EB thru/right	A	0.0	0.43	0
Guest WB left/thru	A	0.9	0.03	2
Site Driveway NB left/right	C	19.9	0.13	11

Light grey cell shading indicates a worsening in LOS from No-Build (2020) Conditions that bring operations to LOS E or LOS F.

3.4.6 Build (2020) Conditions Parking

The Project will provide approximately 155 parking spaces in an above ground garage for residential tenants of the building. It should be noted, however, that other Boston Landing parking facilities will have capacity available on most weeknights and weekends, when office and sporting event parking demand is low. As necessary, the Proponent will consider designating additional overnight residential parking spaces within another nearby facility. Visitors to the retail/restaurant establishments in the Project will use available on-street parking or park in the public spaces available in other Boston Landing facilities. As presented earlier in the site plan in Figure 3-9, the access/egress driveway to the residential parking garage will be located on Guest Street. Drivers will continue along the driveway to the rear of the building to the garage entry/exit location.

Residential parking will be provided at 0.53 spaces/unit, or about 155 spaces (0.53 spaces/unit x 295 units). Because of the transit services available in the area, it is anticipated that many residents will forego auto ownership and rely on public transportation, particularly the MBTA's Framingham/Worcester commuter rail service at the new Boston Landing station, and nearby Zipcar service for many of their daily trips.

3.4.7 Build (2020) Conditions Public Transportation

Based on the transit mode shares presented above, the future transit trips associated with the Project were estimated as shown in Table 3-10.

Table 3-10 Project Public Transportation Trips by Land Use

Period	Residential	Retail/Restaurant	Total
Daily			
Entering	288	105	393
Exiting	288	105	393
a.m. Peak			
Entering	12	3	15
Exiting	33	1	34
p.m. Peak			
Entering	24	15	39
Exiting	16	12	28

The Project will generate approximately 49 new transit trips during the a.m. peak hour and 67 trips during the p.m. peak hour. It is anticipated that this modest level of new transit trips can be absorbed on the transit services in the area.

3.4.8 Build (2020) Conditions Pedestrian and Bicycle Conditions

Based on the walk/bicycle mode shares presented above, the future trips associated with the Project were estimated, as shown in Table 3-11.

Table 3-11 Project Pedestrian/Bicycle Trips by Land Use

Period	Residential	Retail/Restaurant	Total
Daily			
Entering	344	465	809
Exiting	344	465	809
a.m. Peak			
Entering	11	6	17
Exiting	49	3	52
p.m. Peak			
Entering	36	50	86
Exiting	15	42	57

With the Project, there will be about 69 new walk/bicycle trips into and out of the Project site during the a.m. peak hour, and 143 during the p.m. peak hour. Over the course of the day, these trips include residents walking or bicycling to/from local places of employment and residents walking to/from retail and restaurant establishments within the immediate area. This level of new pedestrian and bicycle activity will not affect the pedestrian environment in the area.

3.4.9 Build (2020) Conditions Loading and Service Accommodations

The Project will have two loading bays located internal to the building, with access provided along the service roadway on the southern side of the site. Residential move-in/move-out activity will occur at these loading bays and be managed by an on-site transportation coordinator. Based on the mix of retail, restaurant, and residential uses, the Project will generate approximately seven deliveries per day. See Appendix B for detailed delivery vehicle trip generation. It is anticipated that most of these deliveries will occur between 7:00 a.m. and 5:00 p.m. However, whenever possible, loading and service activities will be requested to occur during off-peak hours. Given the number of available delivery bays and the projected number of deliveries, sufficient loading capacity is provided in the Project. While some deliveries will be via truck, most will occur via cars/vans.

Note that trash trips are not included in the number of daily deliveries. Trash trips generally occur between 5:00 a.m. and 7:00 a.m. and do not coincide with the regular delivery activity at the loading docks.

3.5 Travel Demand Management Measures

The Proponent, through the permitting process for the Boston Landing development, has already committed to implementing a travel demand management (TDM) program that supports the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak periods. TDM will be facilitated by the mixed-use nature of the Boston Landing Master Plan development and further enhanced by the introduction of residential units at 125 Guest Street. Having residents within the Boston Landing site will add patrons within walking distance to local restaurants and retail establishments both along the Guest Street corridor and in the adjacent neighborhoods.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study and any other responsibilities, such as TDM measures, that are agreed to by both the Proponent and the BTD. Many TDM measures that were included in the Boston Landing permitting documents will be applied to the Project. In particular, the Proponent will provide orientation packets to new residential tenants and management will work with tenants as they move in/move out to coordinate loading activity.

As outlined in permitting documents for the Boston Landing project, TDM measures for the entire site will continue to include:

- Car-Sharing Service: The Proponent will promote the use of the nearby Zipcar station at 140 North Beacon Street. If merited, the Proponent will explore establishing a new Zipcar location at the Project.

- Car Pool/Van Pool Parking: The Proponent will provide preferential parking spaces in Project garages for employee car pools and vanpools.

- Transit Passes: The Proponent will encourage commercial tenants to subsidize transit passes for their employees.

- Commuter Tax Benefit Program: The Proponent will encourage tenants to treat employee payments for transit passes as a pre-tax deduction from paychecks.

- Orientation Packets: The Proponent will provide orientation packets to new residential and commercial tenants containing information on available transportation choices, including transit routes and schedules. On-site management will work with new commercial tenants to help facilitate transportation for new arrivals and residential tenants to coordinate move in/move out activities.

- Transportation Coordinator: The Proponent will designate a Transportation Coordinator to oversee loading and service activities, and provide alternative transportation materials to tenants. Individual loading dock managers will be stationed at commercial building loading docks to oversee deliveries on-site.

- Bicycle Amenities: The Proponent will provide bicycle racks in secure, sheltered areas for tenants' employees. Additional bicycle parking will be provided on the sidewalks within Boston Landing, near main building entrances.

- Shared Bicycle Program: The Proponent will continue to sponsor the Hubway bicycle sharing throughout the City. The Proponent will make prospective tenants aware of the program in selling or leasing space, and assist tenants in registering for the program.

- Web Site: The Proponent will design and implement a Project web site that will include public transportation information for visitors.

Chapter 4.0

Environmental Review Component

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Pedestrian Level Winds

4.1.1 Introduction

A pedestrian wind study was conducted for the proposed residential building at 125 Guest Street in Brighton. The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas around the study site and provide recommendations for minimizing adverse effects.

The study involved wind simulations on a 1:400 scale model of the proposed building and surroundings. These simulations were then conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. The criteria recommended by the Boston Redevelopment Authority (BRA) were used in this study. The following sections describe the methods and present the results of the wind tunnel simulations.

Wind conditions at a majority of the locations studied are predicted to remain comfortable for walking or better, and three of the ten off-site locations that are uncomfortable in the No-Build configuration are improved to comfortable for walking or better in the Build configuration. At locations to the west of the Project, uncomfortable mean wind speed conditions are predicted. As the design progresses, potential mitigation measures to improve wind conditions at these locations will be studied and implemented.

4.1.2 Background

Major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The channeling of wind through gaps between buildings and the acceleration of wind around corners of buildings may also cause increases in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper level winds, resulting in no significant changes to the local pedestrian level wind environment. The most effective way to assess potential pedestrian level wind impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger

winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

4.3.3 Methodology

Information concerning the site and surroundings was derived from: information on surrounding buildings and terrain; site plans, and elevations of the proposed development provided by the design team. The following configurations were simulated:

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

As shown in Figures 4.1-1 and 4.1-2, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1600 foot radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modeled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 130 specially designed wind speed sensors that were 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 5 feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were 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 were then combined with long term meteorological data, recorded during the years 1983 through 2013 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.

Figures 4.1-3 through 4.1-5 present "wind roses", summarizing the seasonal and annual wind climates in the Boston area respectively, based on the data from Logan International Airport. The wind roses, in Figures 4.1-3 and 4.1-4, are based on all observed wind readings for the given season. The left wind roses in Figure 4.1-3 for example, summarize the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year are from the west northwest, northwest, west, southwest and east. In the case of strong winds, however, the most common wind direction is northeast and west.

On an annual basis (Figure 4.1-5) the most common wind directions are those between southwest and northwest. Winds from the east and east-southeast are also relatively common. In the case of strong winds, northeast and west-northwest are the dominant wind directions.

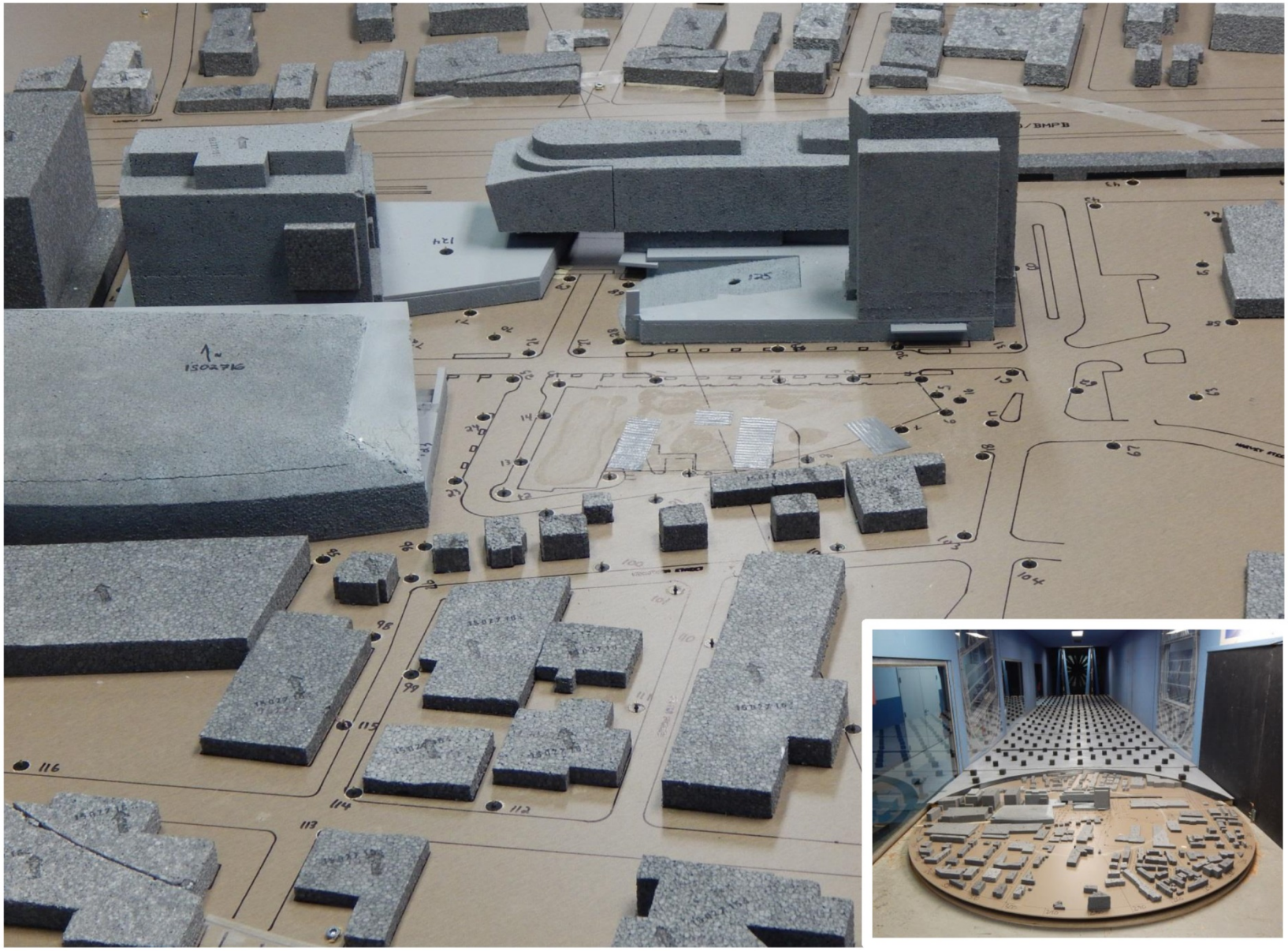


Figure 4.1-1

Wind Tunnel Study Model – No-Build

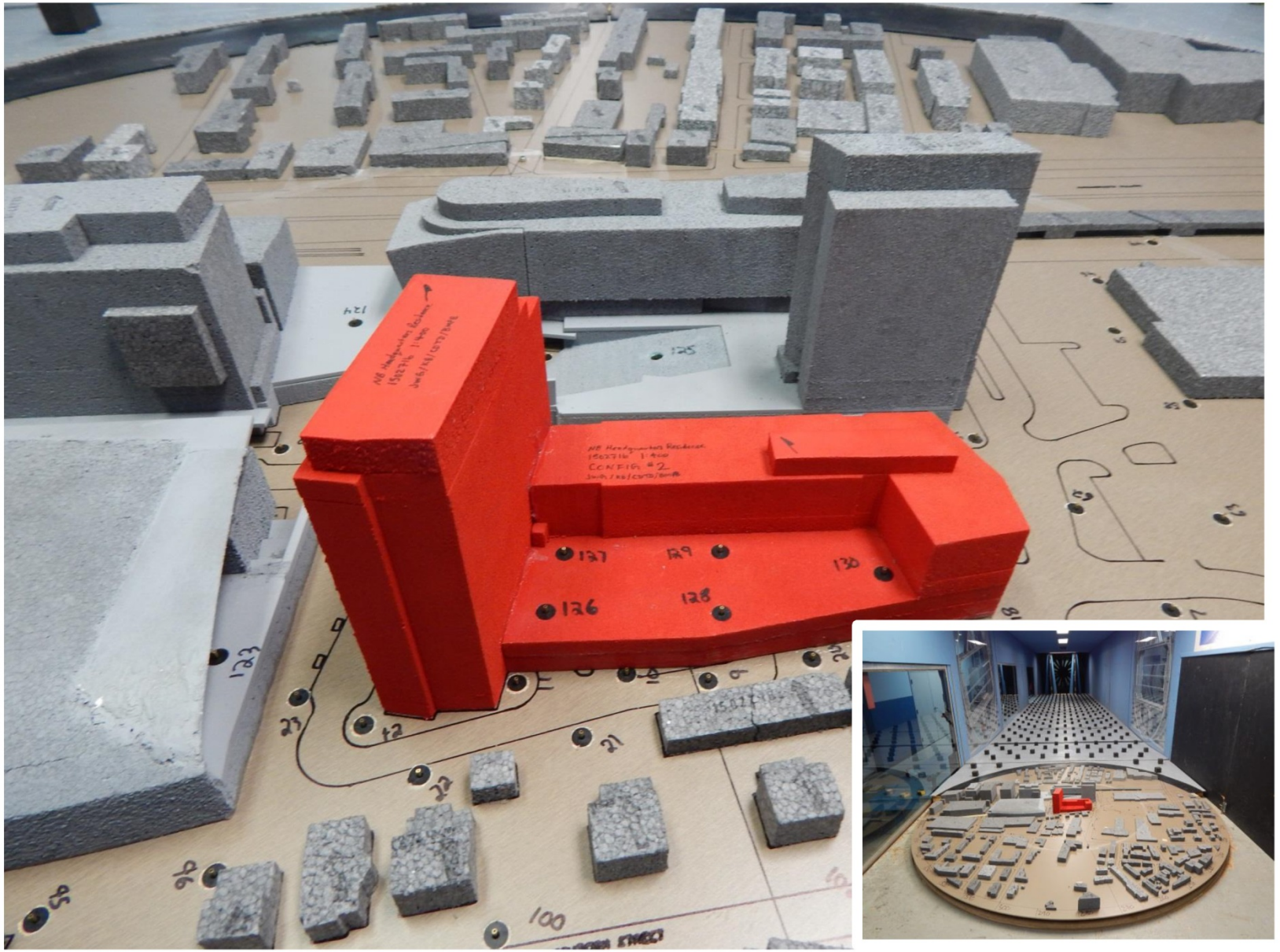
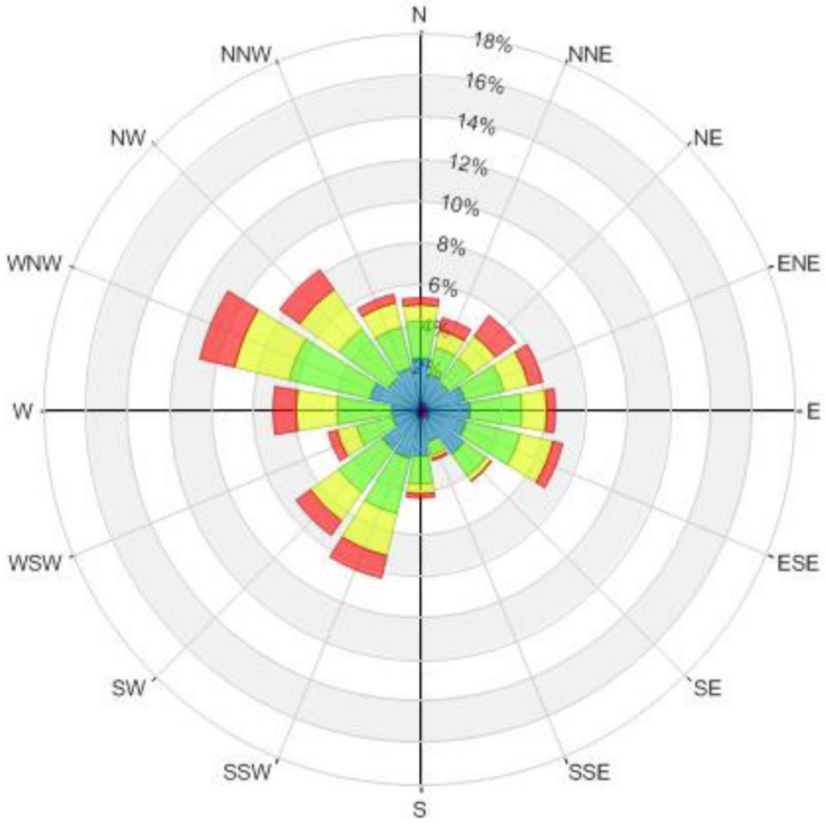
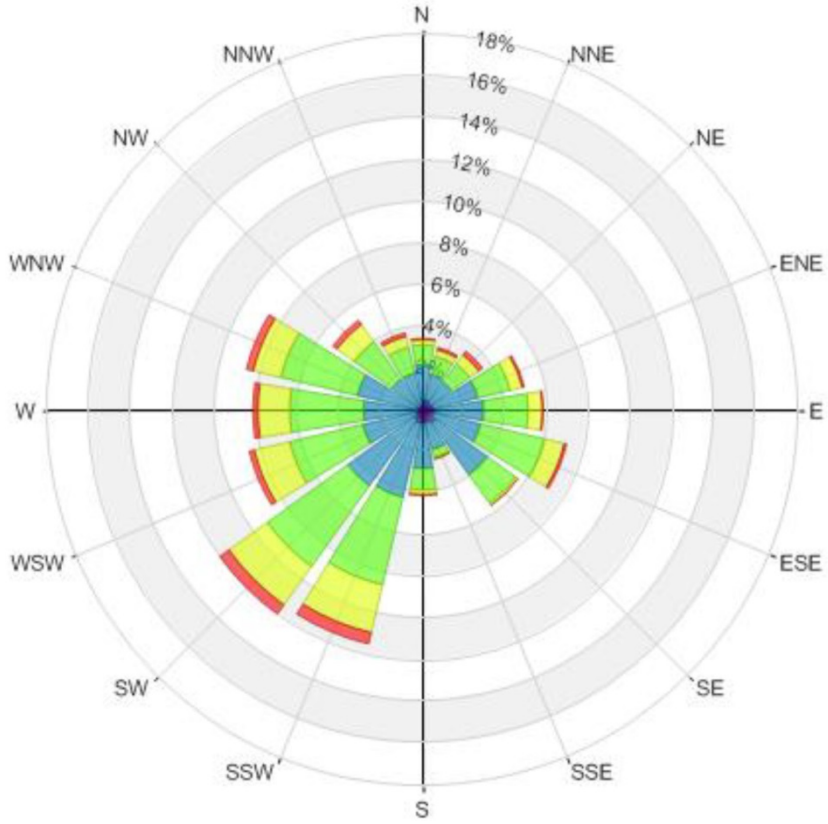


Figure 4.1-2

Wind Tunnel Study Model – Build



Spring
(March - May)

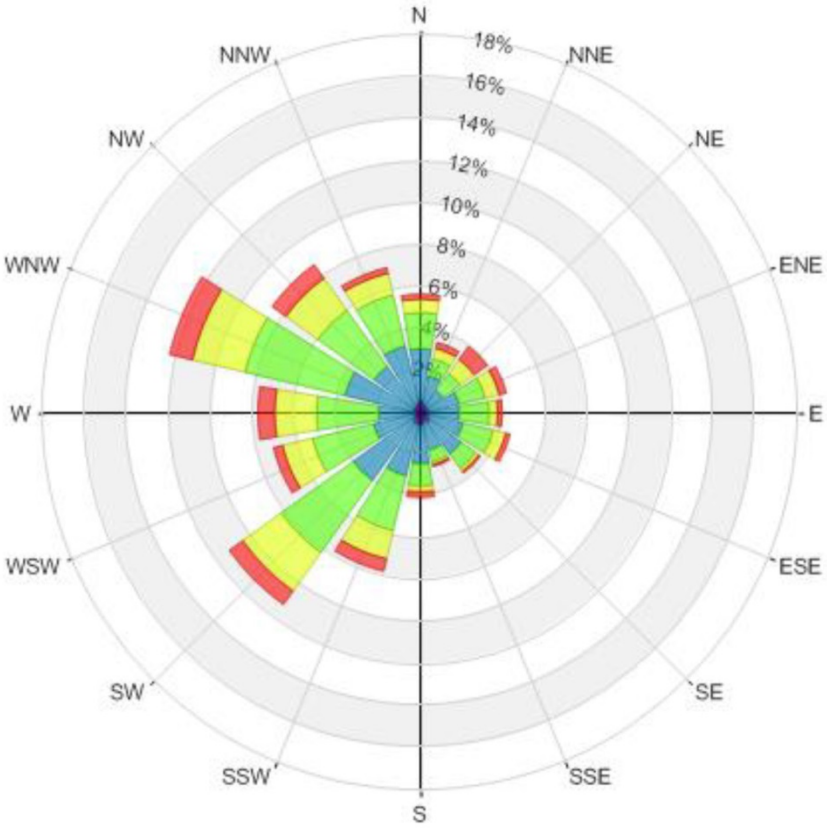


Summer
(June - August)

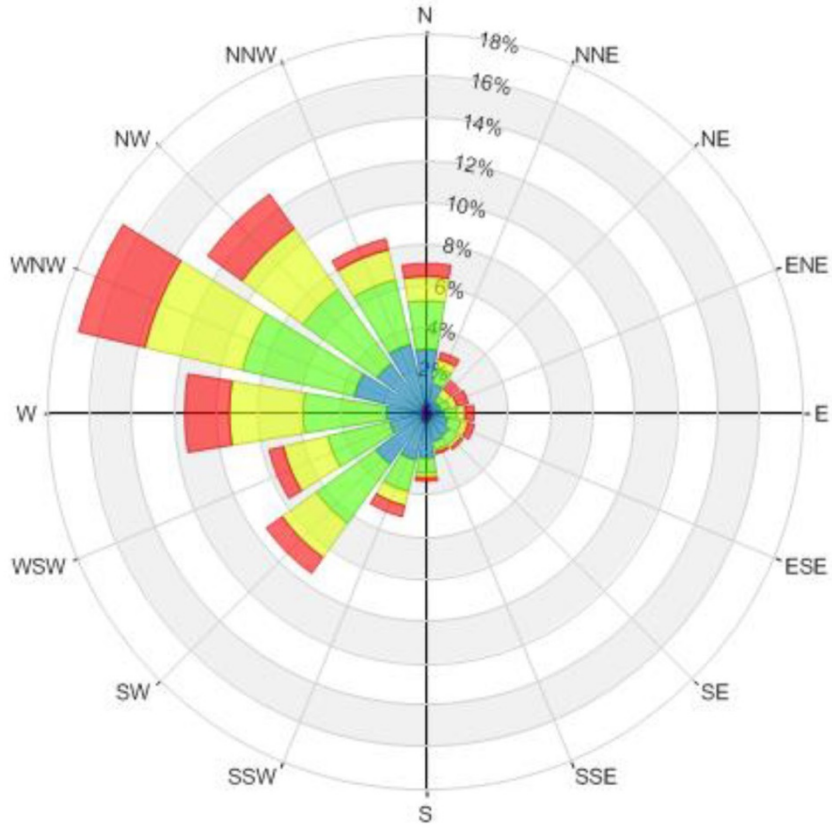
Wind Speed (mph)	Probability (%) Spring	Summer
Calm	2.0	2.1
1-5	5.5	7.4
6-10	27.5	36.6
11-15	33.5	36.4
16-20	20.7	14.6
>20	10.8	3.0

Figure 4.1-3

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1973-2011)



Fall
(September - November)

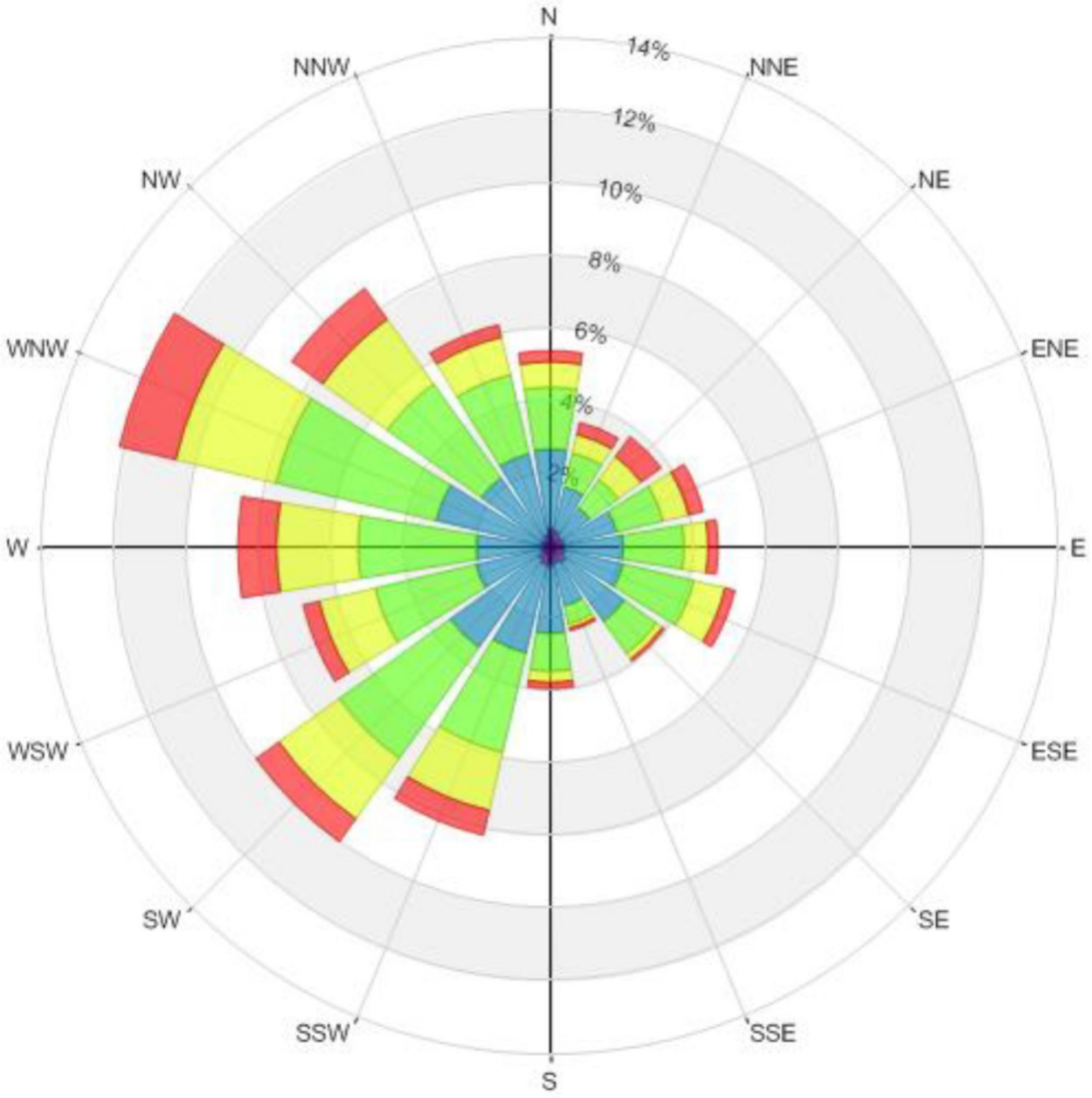


Winter
(December - February)

Wind Speed (mph)	Probability (%) Fall	Winter
Calm	2.3	1.8
1-5	6.9	5.3
6-10	32.7	26.1
11-15	33.9	31.8
16-20	16.8	21.8
>20	7.3	13.2

Figure 4.1-4

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1973-2011)



Wind Speed (mph)	Probability (%)
Calm	2.0
1-5	6.3
6-10	30.8
11-15	33.9
16-20	18.5
>20	8.6

Annual Winds

Figure 4.1-5

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1973-2011)

This study involved state of the art measurement and analysis techniques to predict wind conditions at the study 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 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.

4.3.4 Pedestrian Wind Comfort 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 +1.5 times the root mean square wind speed) of 31 mph 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 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows:

Table 4.1-1 Boston Redevelopment Authority Mean Wind Criteria*

Level of Comfort	Wind Speed
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 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

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

4.1.5 Results

Table 1 in Appendix C presents the mean and effective gust wind speeds for each season as well as annually. Figures 4.1-6 and 4.1-7 show the wind comfort conditions at each wind measurement location based on the annual winds for each of the configurations tested. Figure 4.1-8 illustrates the sensor locations that have experienced a change in the comfort category between the No Build and Build configurations. Typically the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below.

A total of 130 sensors were used in the model. The data from sensors 126 through 130 were not applicable for the No Build Configuration as these sensors were located on the proposed building. The placement of wind measurement locations was based on our experience and the understanding of pedestrian usage of the site, and has been reviewed by the design team. Generally, wind conditions suitable for walking are appropriate for sidewalks, walkways and parking lots; wind speeds comfortable for standing are preferred for building entrances where pedestrians are more apt to linger; and lower wind speeds comfortable for sitting or standing are desired for outdoor amenity spaces.

4.1.5.1 No-Build Configuration

On an annual basis, mean wind speeds comfortable for walking or better were predicted at most on-site locations (1 through 30) as represented in Figure 4.1-6.

Most off-site locations (31 through 122) were predicted to have mean wind speeds generally comfortable for walking or better (see Figure 4.1-6). A total of ten locations (31, 33, 41, 61, 69, 77, 78, 81, 83, and 84) on off-site sidewalks showed uncomfortable mean speeds on an annual basis. Three locations located on off-site podiums (123 through 125) showed conditions of sitting, uncomfortable and walking respectively.

All locations passed the effective gust criterion on an annual basis (Figure 4.1-9).

4.1.5.2 Build Configuration

On-Site Entrances and Sidewalks (Locations 1 through 4, and 9 through 31)

On an annual basis the mean wind speeds were comfortable for walking or better, with the exception of Locations 15 and 23 through 28, where uncomfortable mean wind speed conditions are predicted (Figure 4.1-7). Wind conditions predicted at Locations 23 through 29 situated to the west of the proposed development are likely the result of channeling and downwashing wind flows from the west, which intercept the tall tower of the proposed Project and are directed towards grade level.

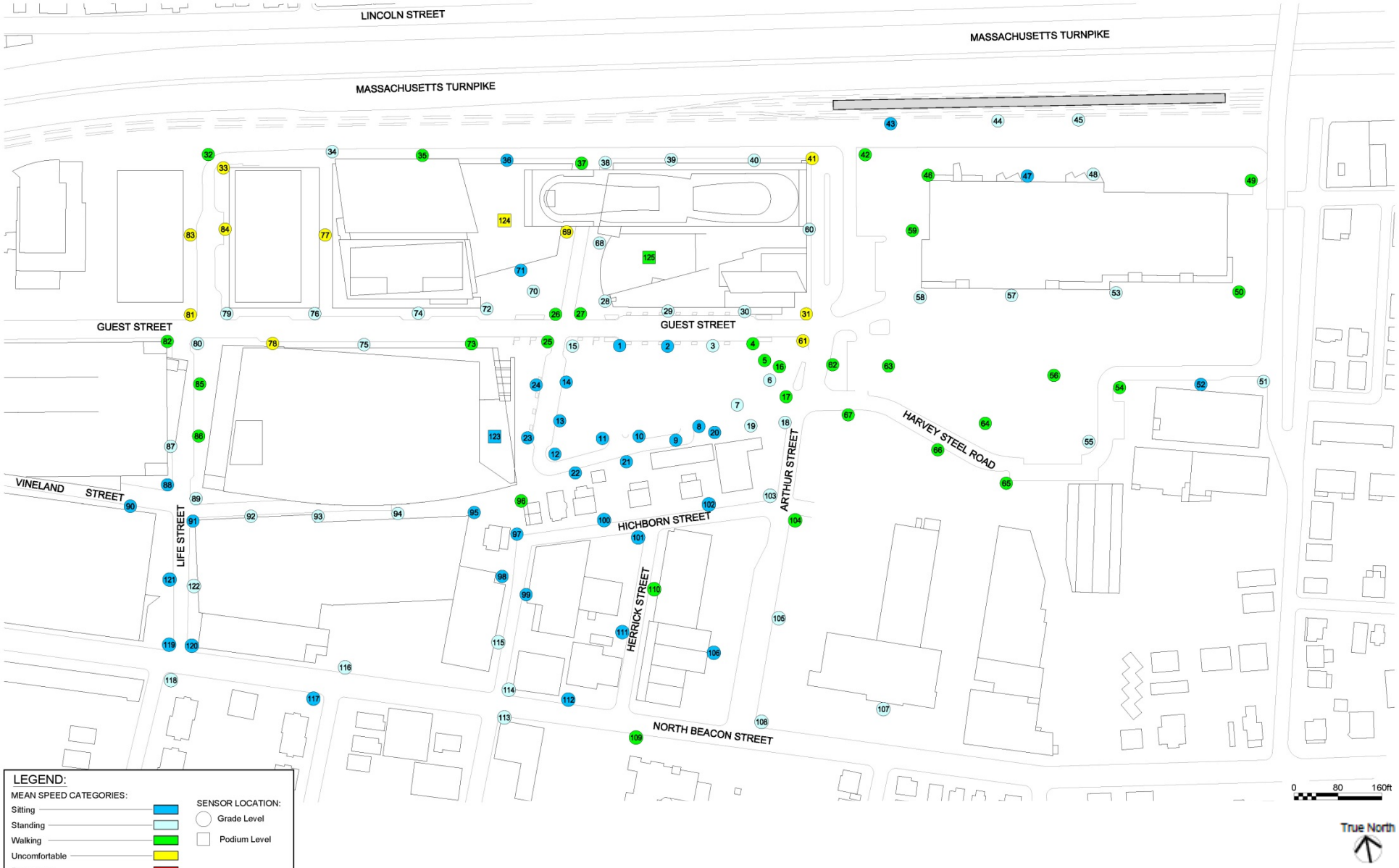


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Figure 4.1-6

Pedestrian Wind Conditions – Mean Speed – No-Build

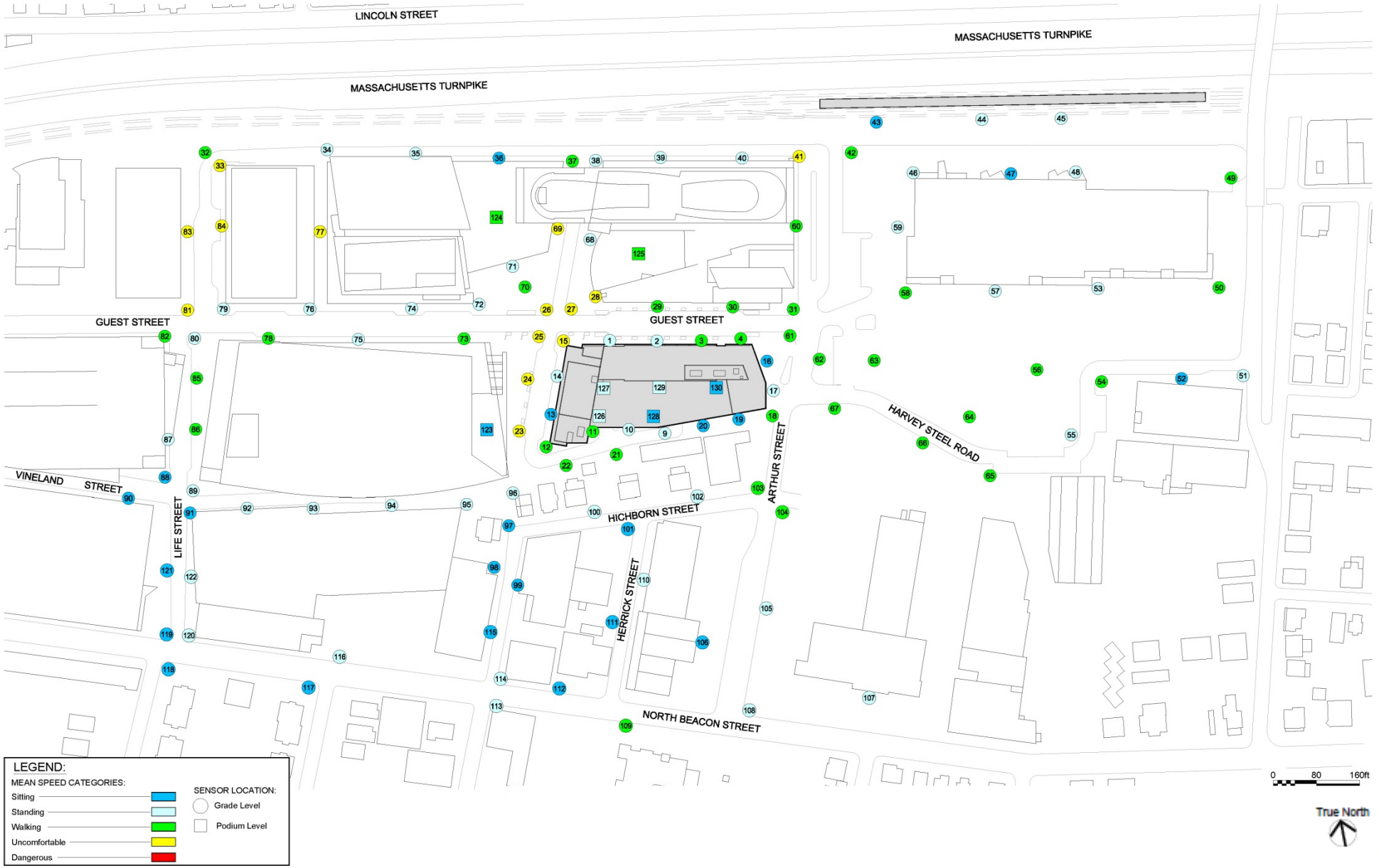

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Figure 4.1-7

Pedestrian Wind Conditions – Mean Speed – Build

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Figure 4.1-8

Pedestrian Wind Conditions – Category Change – No-Build to Build

125 Guest Street Boston, Massachusetts

Figure 4.1-9

Pedestrian Wind Conditions – Effective Gust – No-Build

As the design of the building progresses, the Project will be refined to incorporate design solutions that will improve wind conditions. Potential measures for reducing the wind speed conditions include landscaping street trees with marcescent trees that maintain their foliage on an annual basis, canopies, and wind screens. These potential mitigation measures will be studied with additional wind tunnel testing to determine the most effective solution to improve wind conditions.

The effective gust criterion was met on an annual basis for all on-site locations with the exception of locations 15, and 24 through 27 (Figure 4.1-10). The use of mitigation measures as mentioned above will assist in reducing these effective gust exceedances. It should be noted that these effective gust criteria exceedances were marginal exceedances of the criterion of 31mph, with all exceedances varying by no more than 10%.

Off-Site Areas (Locations 31 through 125)

Wind conditions on most off-site areas are generally expected to be comfortable for walking or better, similar to the No-Build configuration. On an annual basis, the number of uncomfortable Locations was reduced from ten (Locations 31, 33, 41, 61, 69, 77, 78, 81, 83, and 84) for the No-Build configuration, to seven (Locations 33, 41, 69, 77, 81, 83, and 84) for the Build configuration (Figure 4.1-7). Off-site amenity space locations showed similar conditions to the No-Build configuration.

All off-site locations, similar to the No-Build configuration, met the effective gust criterion.

Above Grade Amenity Space (Locations 126 through 130)

Wind conditions at the podium level are predicted to be comfortable for standing and sitting on an annual basis and meet the effective gust criterion annually.

4.1.6 Conclusion

Wind conditions at a majority of the Locations studied are predicted to remain comfortable for walking or better, and three of the ten off-site Locations that are uncomfortable in the No-Build configuration are improved to comfortable for walking or better in the Build configuration. At Locations to the west of the Project, uncomfortable mean wind speed conditions are predicted. As the design progresses, potential mitigation measures to improve wind conditions at these Locations will be studied and implemented.

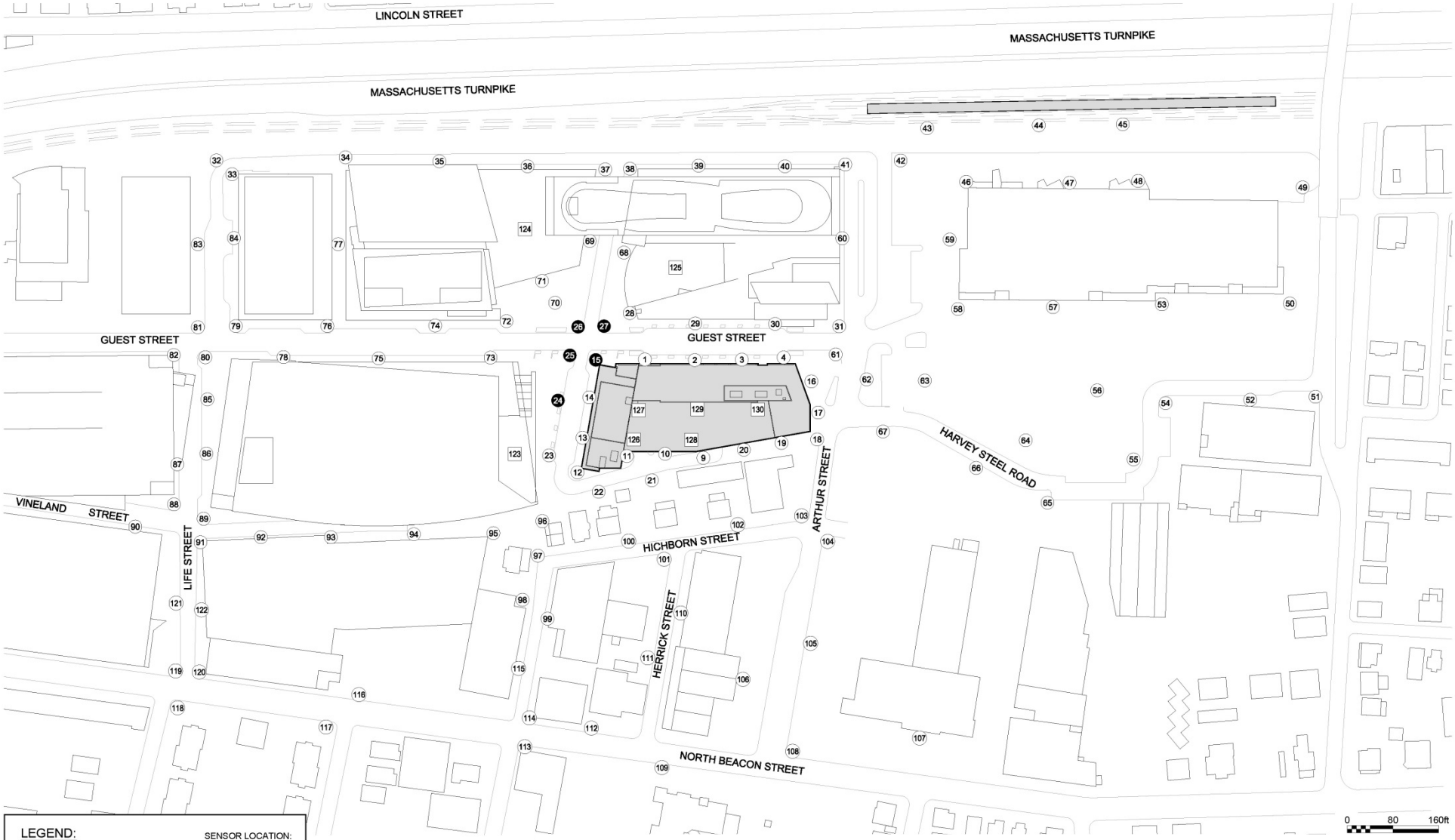

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Figure 4.1-10

Pedestrian Wind Conditions – Effective Gust – Build

4.2 Shadow Impacts

4.2.1 Introduction and Methodology

A shadow impact analysis was conducted to assess potential shadow impacts from the Project. The study looked at the following four times of the year:

1. Spring Equinox (March 21) at 9:00 a.m., 12:00 noon, and 3:00 p.m.
2. Summer Solstice (June 21) at 9:00 a.m., 12:00 noon, 3:00 p.m. and 6:00 p.m.
3. Autumnal Equinox (September 21) at 9:00 a.m., 12:00 noon, 3:00 p.m. and 6:00 p.m.
4. Winter Solstice at 9:00 a.m., 12:00 noon, and 3:00 p.m.

The shadow analysis presents the existing shadow and new shadow that would be created by the Proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project site. It should be noted that the model used for the analysis does not include trees, which can block new shadow from the proposed buildings during much of the year during certain time periods. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 4.2-1 to 4.2-14 at the end of this section.

New Shadow will generally be limited to the immediately surrounding streets and sidewalks. The Project will not cast new shadow on open spaces beyond the boundaries of the Boston Landing development. During most of the time periods studies, new shadow will not be cast onto nearby bus stops.

4.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, shadow from the Project will be cast in a northwesterly direction. New shadow will be cast onto the future Hichborn Street Extension and its sidewalks, as well as onto Guest Street and its sidewalks. New shadow will be cast onto a small portion of the open space to the east of the 80 Guest Street office building. No new shadow will be cast onto nearby bus stops or other open spaces.

As the day progresses, the shadows become shorter, falling to the north. At 12:00 p.m., shadow will be cast onto the future Hichborn Street Extension and its sidewalks, and onto Guest Street and its sidewalks. New shadow will be cast onto a small portion of the open space to the south of the New Balance World Headquarters building. No new shadow will be cast onto nearby bus stops or other open spaces.

At 3:00 p.m., shadow will extend to the northeast. New shadow from the Project will fall onto Guest Street at its sidewalks, a portion of Arthur Street and its sidewalks, and onto a small portion of the open space to the south of the New Balance World Headquarters building. New shadow will fall on the bus stops on Arthur Street to the east of the Project site.

No new shadow shall be cast on the existing Hichborn Street and its associated properties.

4.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, shadow will be cast in a westerly direction. New shadow from the Project will be limited to the future Hichborn Street Extension and its sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

As the day progresses, the shadows become shorter and swing to the north. At 12:00 p.m., new shadow will be cast onto the future Hichborn Street Extension and portions of its sidewalks, and onto a portion of Guest Street and its southern sidewalk. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., shadow will extend to the northeast. New shadow from the Project will fall onto a portion of Guest Street and its sidewalks, and onto Arthur Street and its western sidewalk. New shadow will be cast onto the bust stop on Arthur Street adjacent to the Project site. No new shadow will be cast onto nearby open spaces.

At 6:00 p.m., shadow will be cast to the east. New shadow from the Project will be cast onto Arthur Street and its sidewalks, as well as onto a portion of the Stop & Shop parking lot. Shadow will be cast onto the bus stops on Arthur Street to the east of the Project site. No new shadow will be cast onto nearby open spaces.

No new shadow shall be cast on the existing Hichborn Street and its associated properties.

4.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, shadow will be cast to the northwest onto the future Hichborn Street Extension and its sidewalks, and onto portions of Guest Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 12:00 p.m., shadow will be cast to the northwest onto the future Hichborn Street Extension and its sidewalks, and onto Guest Street and its sidewalks. New shadow will be cast onto a small portion of the open space to the east of the 80 Guest Street office building. No new shadow will be cast onto nearby bus stops or other open spaces.

At 3:00 p.m., shadow will extend to the northeast. New shadow from the Project will be cast onto Guest Street and its sidewalks, and onto a portion of Arthur Street and its western

sidewalk. New shadow will be cast onto a portion of the open space to the south of the New Balance World Headquarters building, and onto the bus stop on the western side of Arthur Street adjacent to the site.

At 6:00 p.m., much of the area is under existing shadow. New shadow from the Project will be cast to the east. The new shadow will extend across a small portion of Arthur Street and its sidewalks, onto a portion of the Stop & Shop parking lot, and onto a portion of Everett Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

No new shadow shall be cast on the existing Hichborn Street and its associated properties.

4.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. The sun angle during the winter is lower than in any other season, causing the shadows in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m., the morning sun will cast new shadow from the Project to the northwest. New shadow will be cast onto the future Hichborn Street Extension and its sidewalks, and onto Guest Street and its sidewalks. New shadow will be cast onto the open space adjacent to the C3 office building. No new shadow will be cast onto bus stops or other open spaces.

At 12:00 p.m., shadow will extend to the north. New shadow will be cast onto the future Hichborn Street Extension and its sidewalks, and onto Guest Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., shadows elongate and extent northeast. The Project will cast shadow along Guest Street and its sidewalks, onto Arthur Street and its sidewalks, and onto a small portion of the Stop & Shop parking lot. New shadow will be cast onto the portions of open space to the south of the New Balance World Headquarters that are not under existing shadow. New shadow may be cast onto the bus stop on the western side of Arthur Street adjacent to the site.

No new shadow shall be cast on the existing Hichborn Street and its associated properties.

4.2.6 Conclusions

Typical of an urban area, some new shadow will be cast on the surrounding streetscapes and may also be periodically cast on the Arthur Street bus stops adjacent to the Project site. No new shadow from the Project will be cast onto public open spaces beyond the boundaries of the Boston Landing development. It should be noted that during ten of the fourteen time periods studied, shadow is limited to the Boston Landing project area, solely controlled by the Proponent.

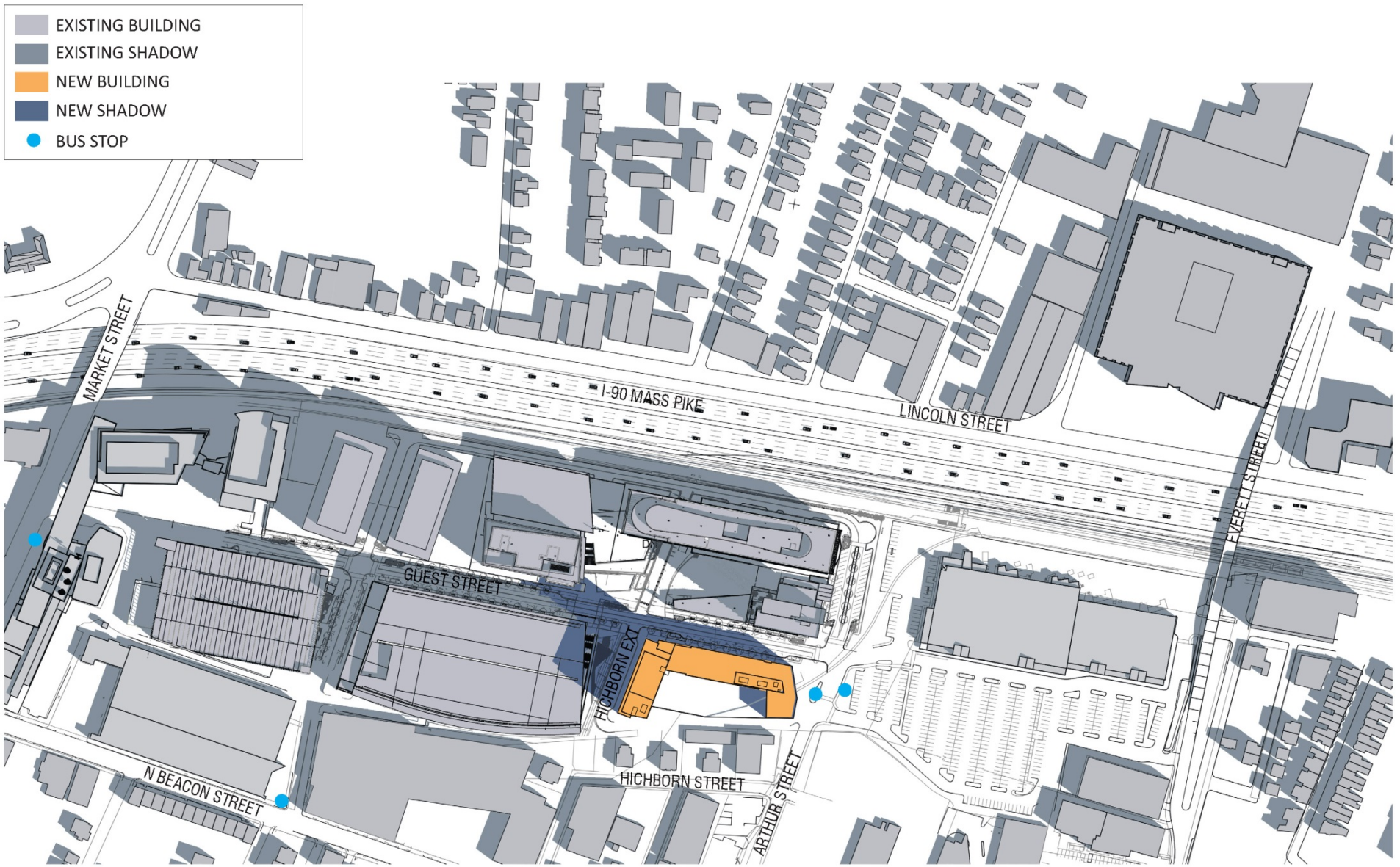

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Figure 4.2-1

Shadow Study – March 21, 9 a.m.

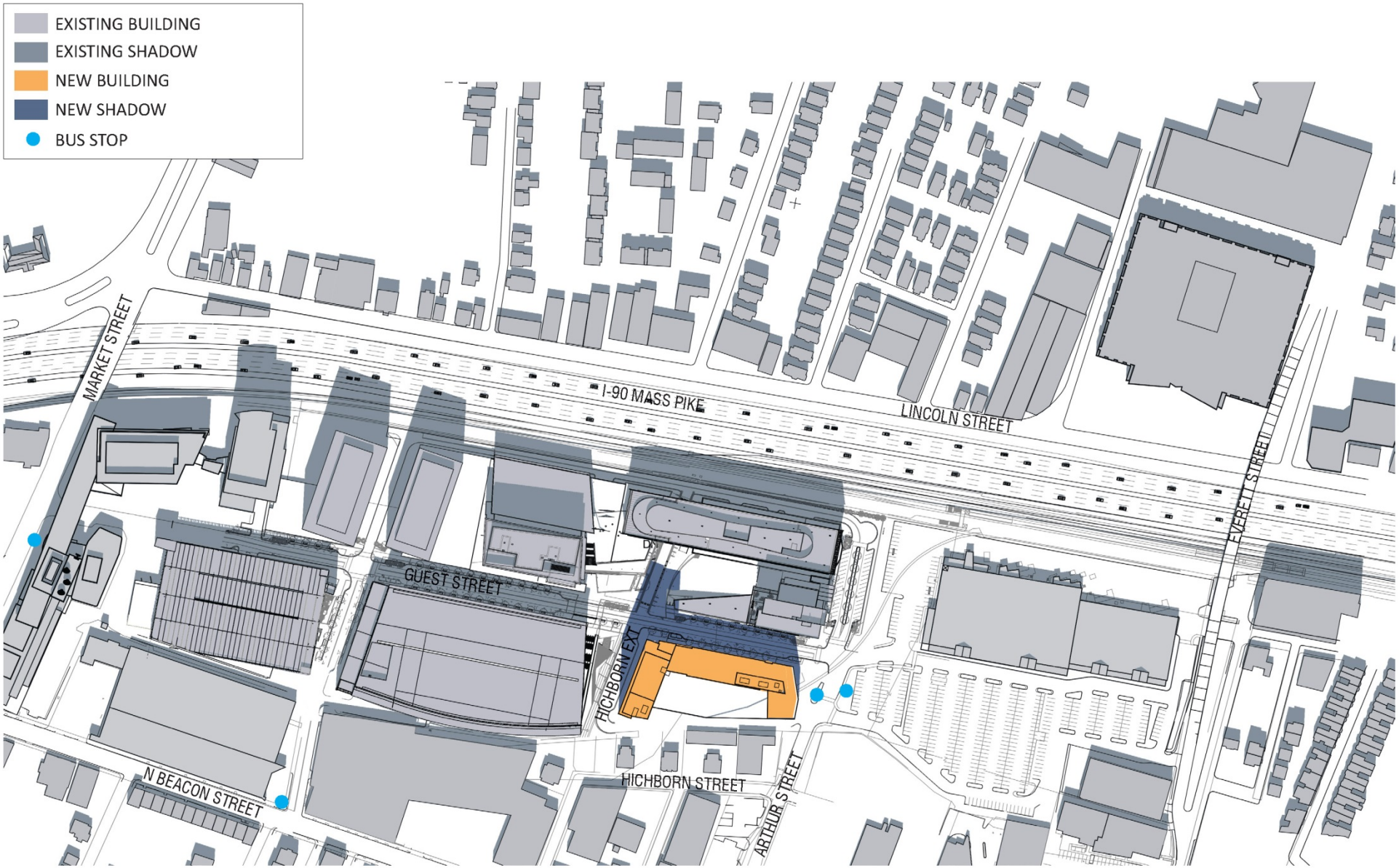

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Figure 4.2-2

Shadow Study – March 21, 12 p.m.

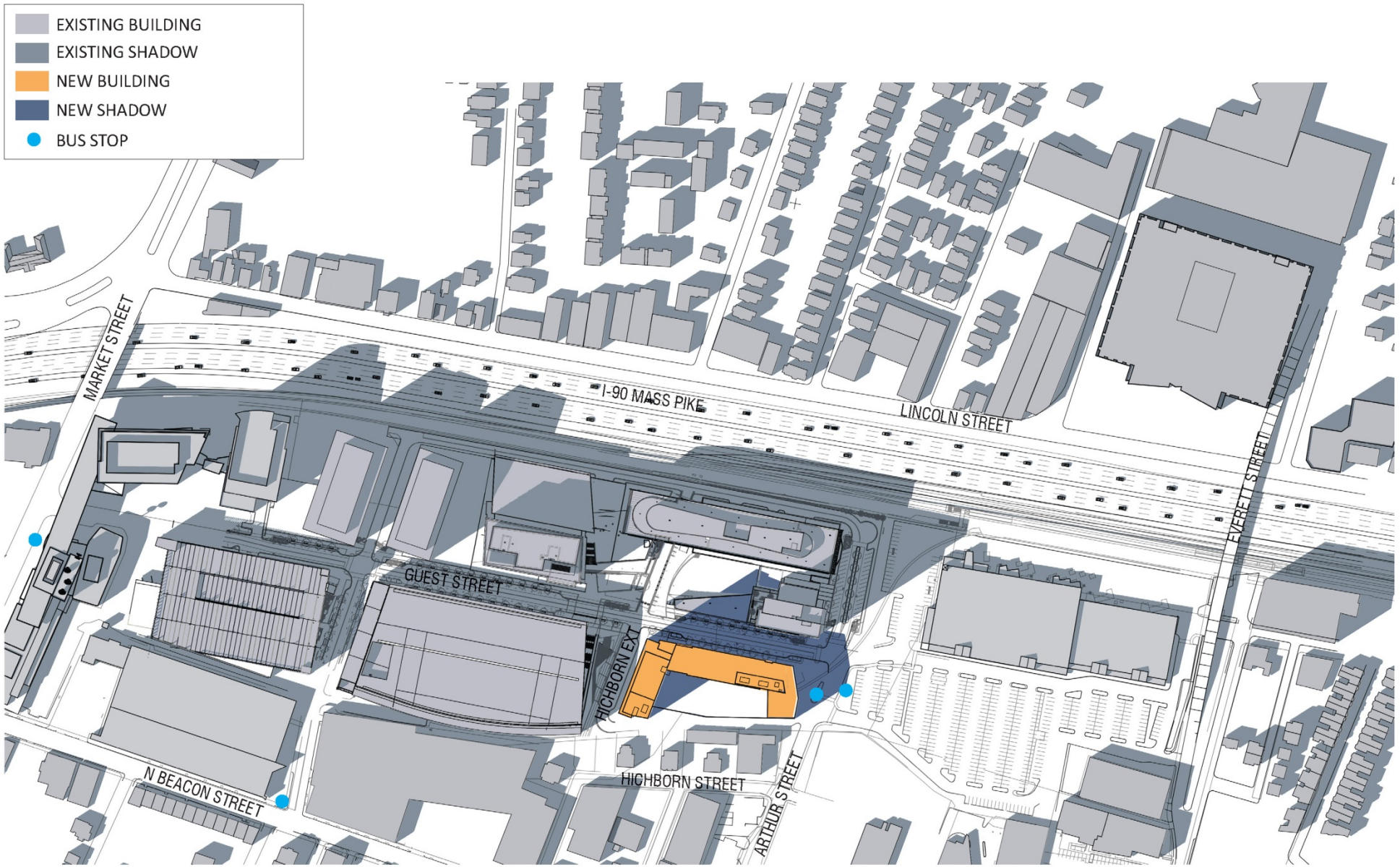

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Figure 4.2-3

Shadow Study – March 21, 3 p.m.

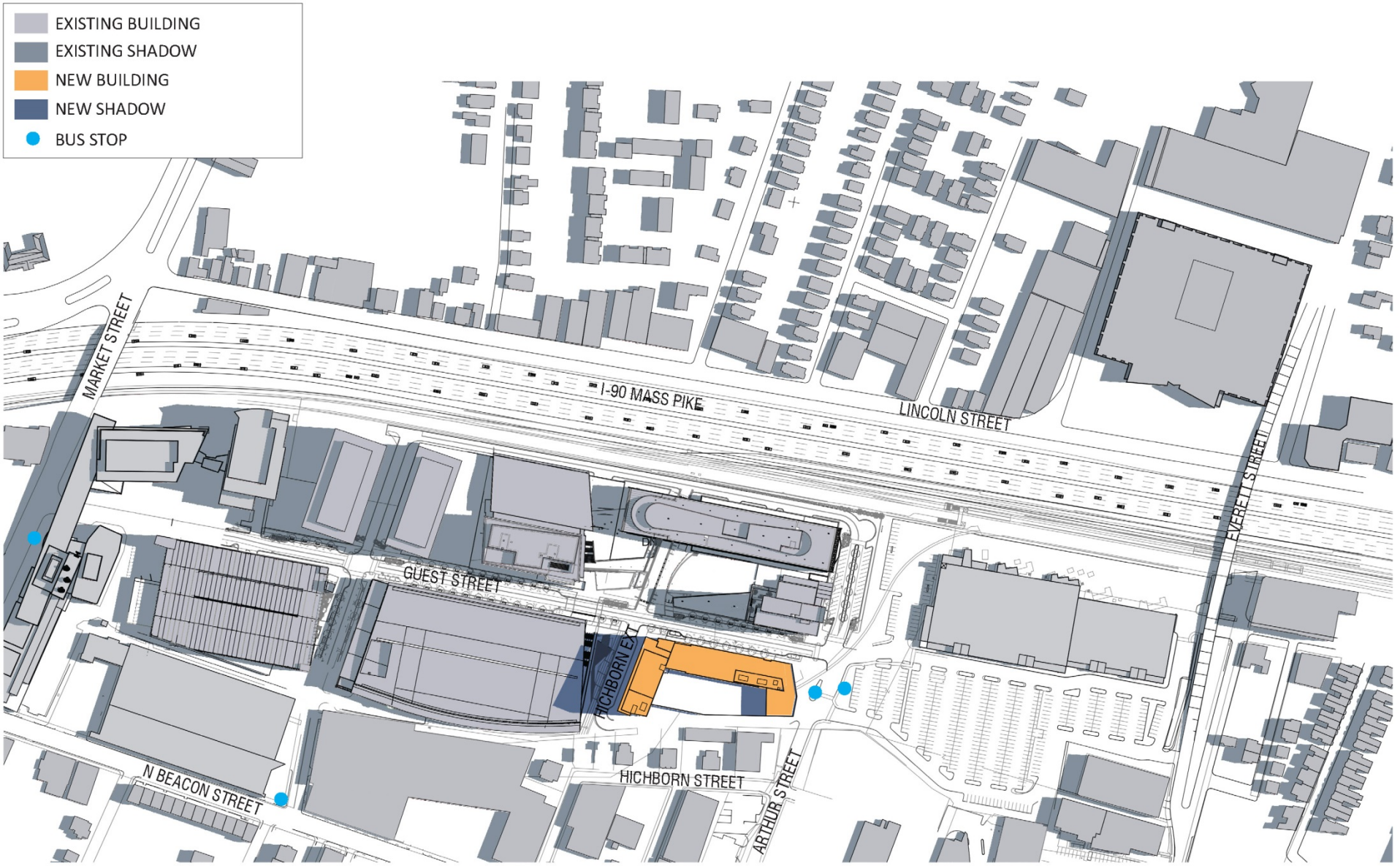

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Figure 4.2-4

Shadow Study – June 21, 9 a.m.

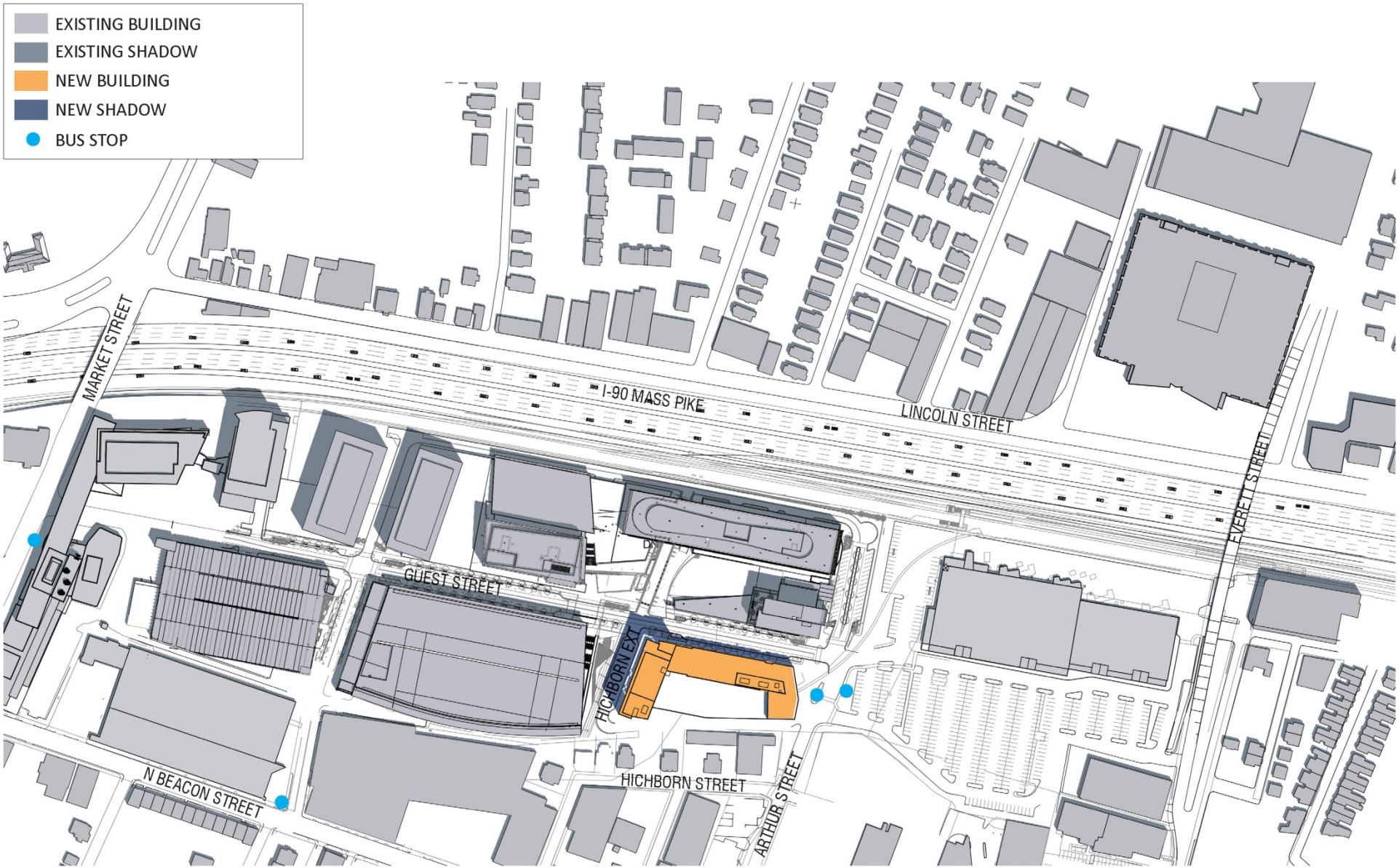

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Figure 4.2-5

Shadow Study – June 21, 12 p.m.

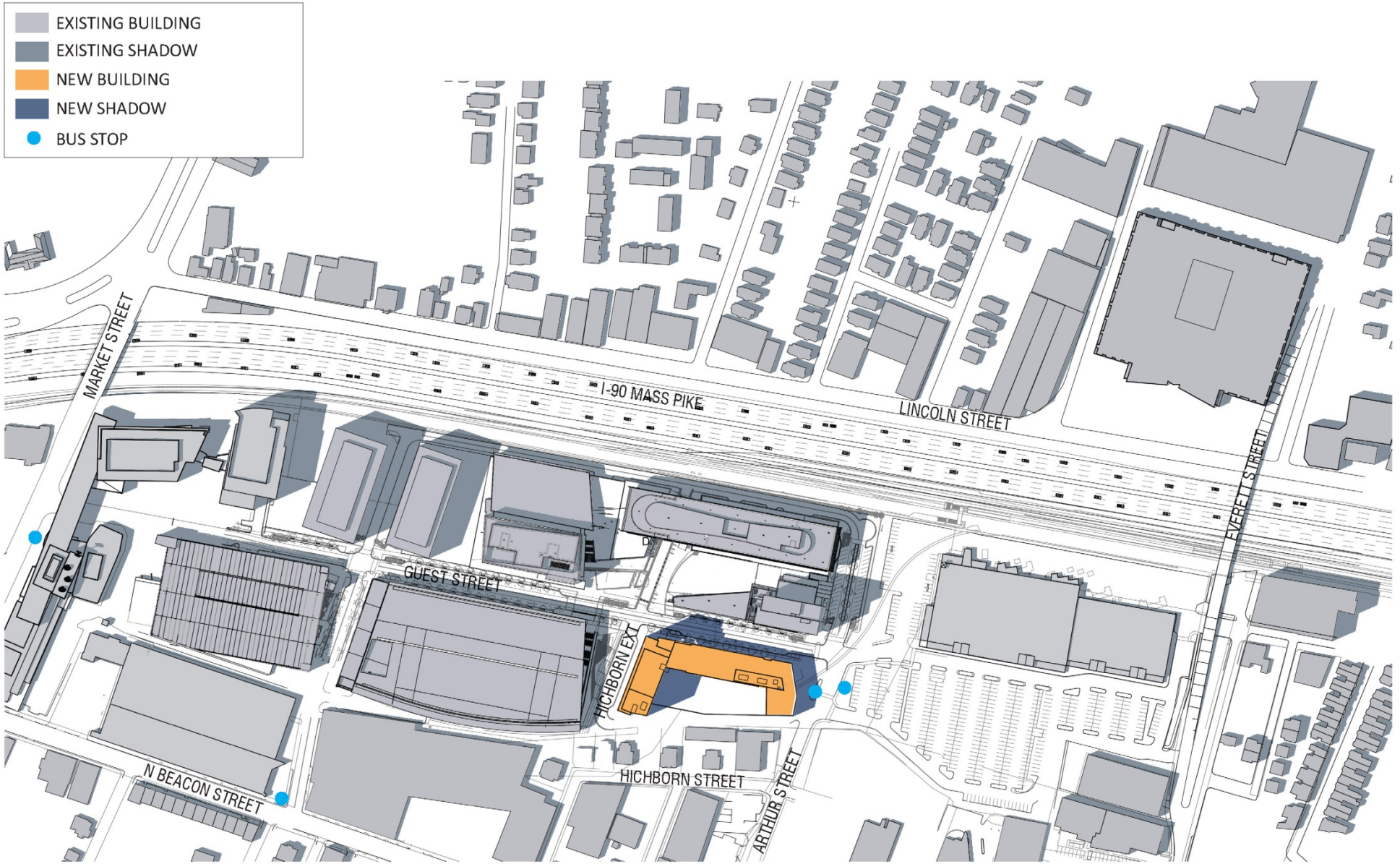

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Figure 4.2-6

Shadow Study – June 21, 3 p.m.

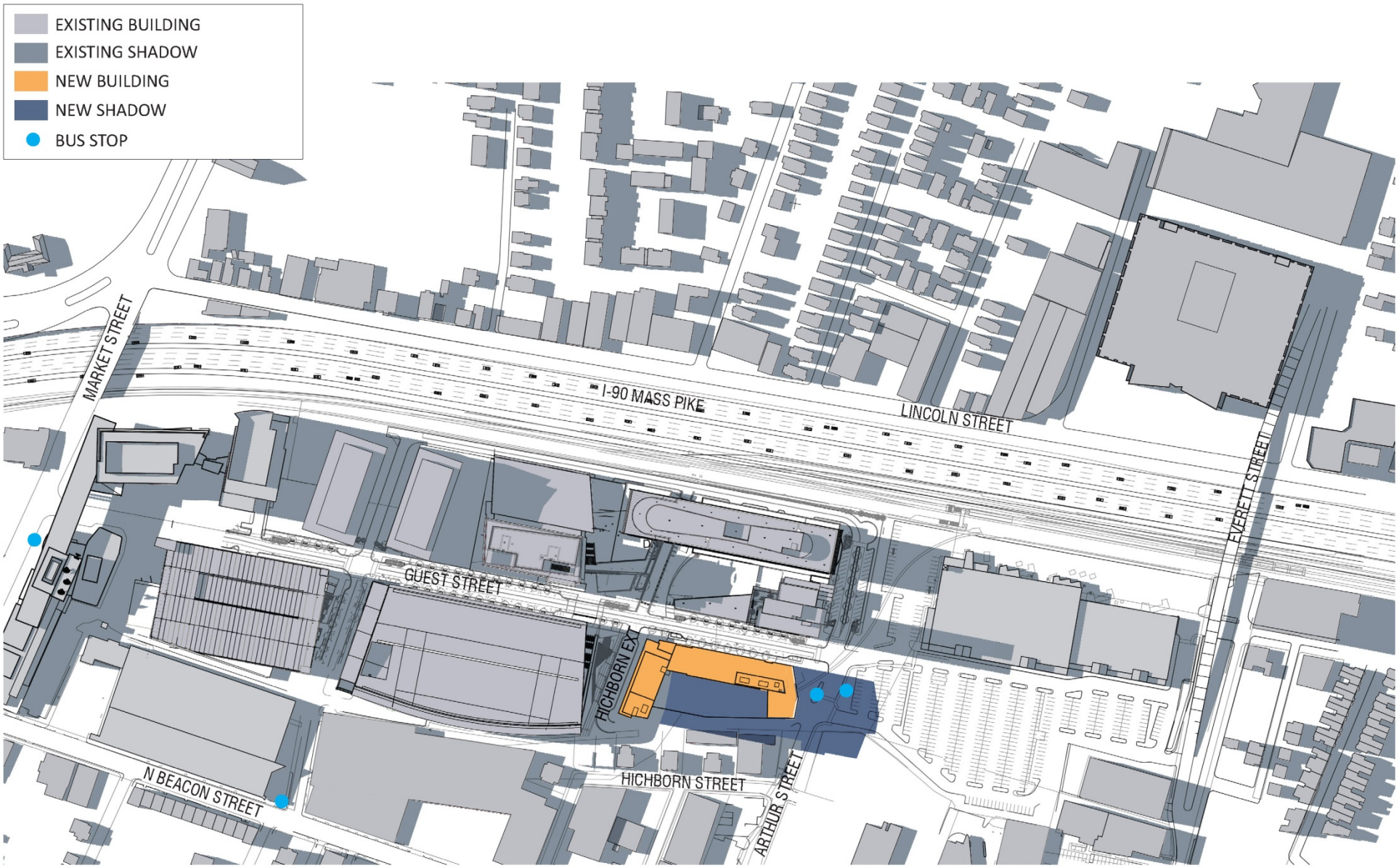

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Figure 4.2-7

Shadow Study – June 21, 6 p.m.

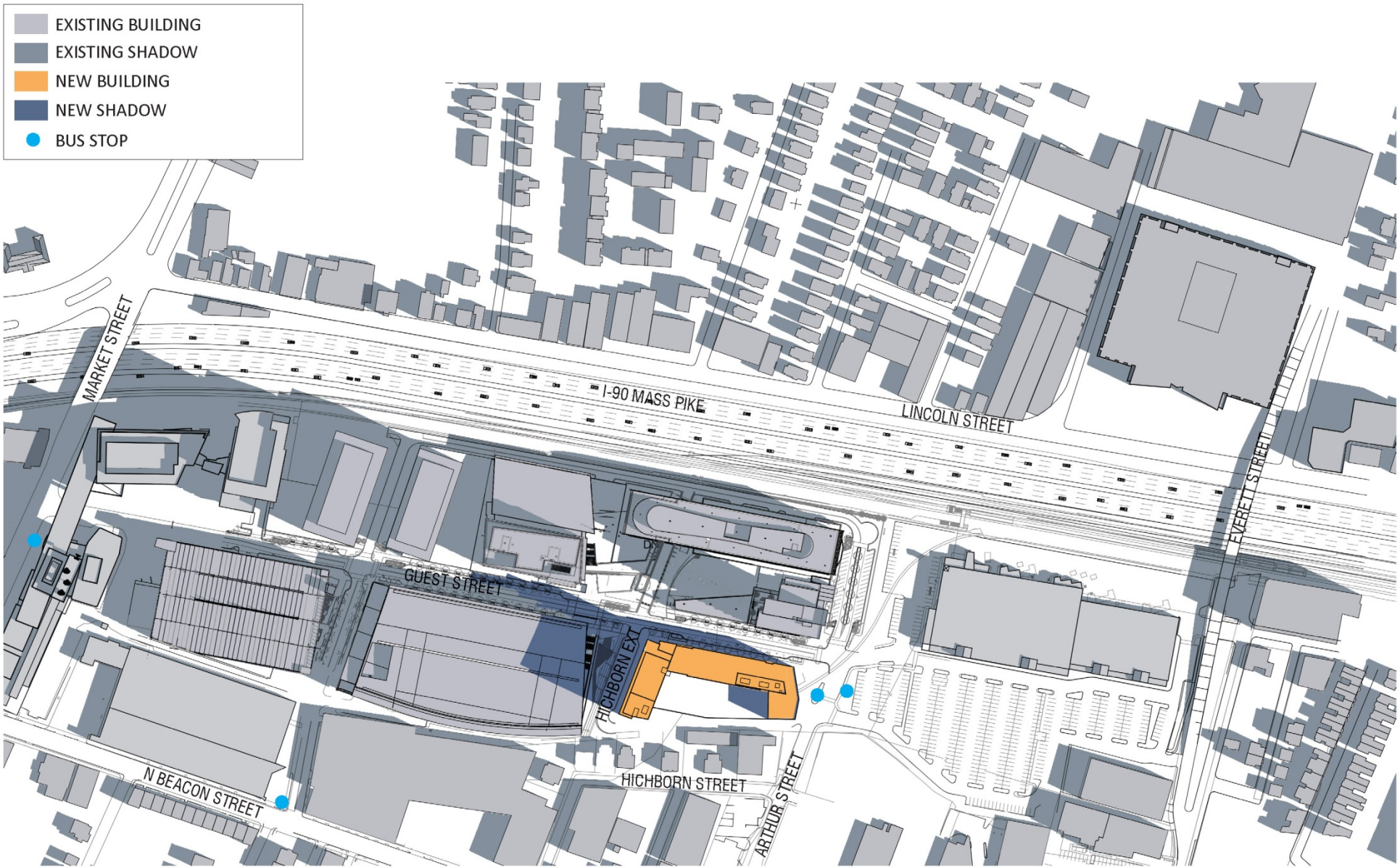

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Figure 4.2-8

Shadow Study – September 21, 9 a.m.

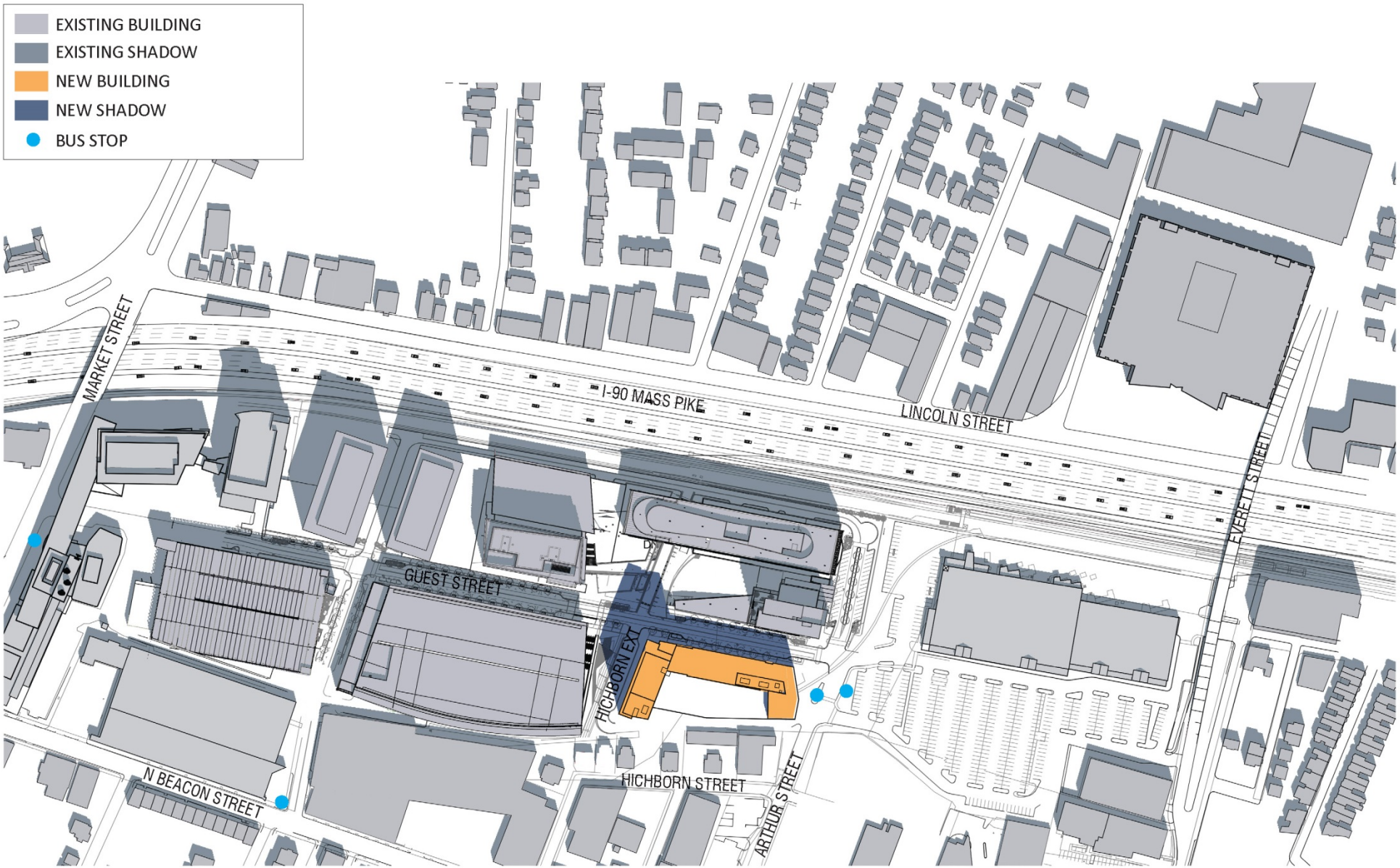

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Figure 4.2-9

Shadow Study – September 21, 12 p.m.

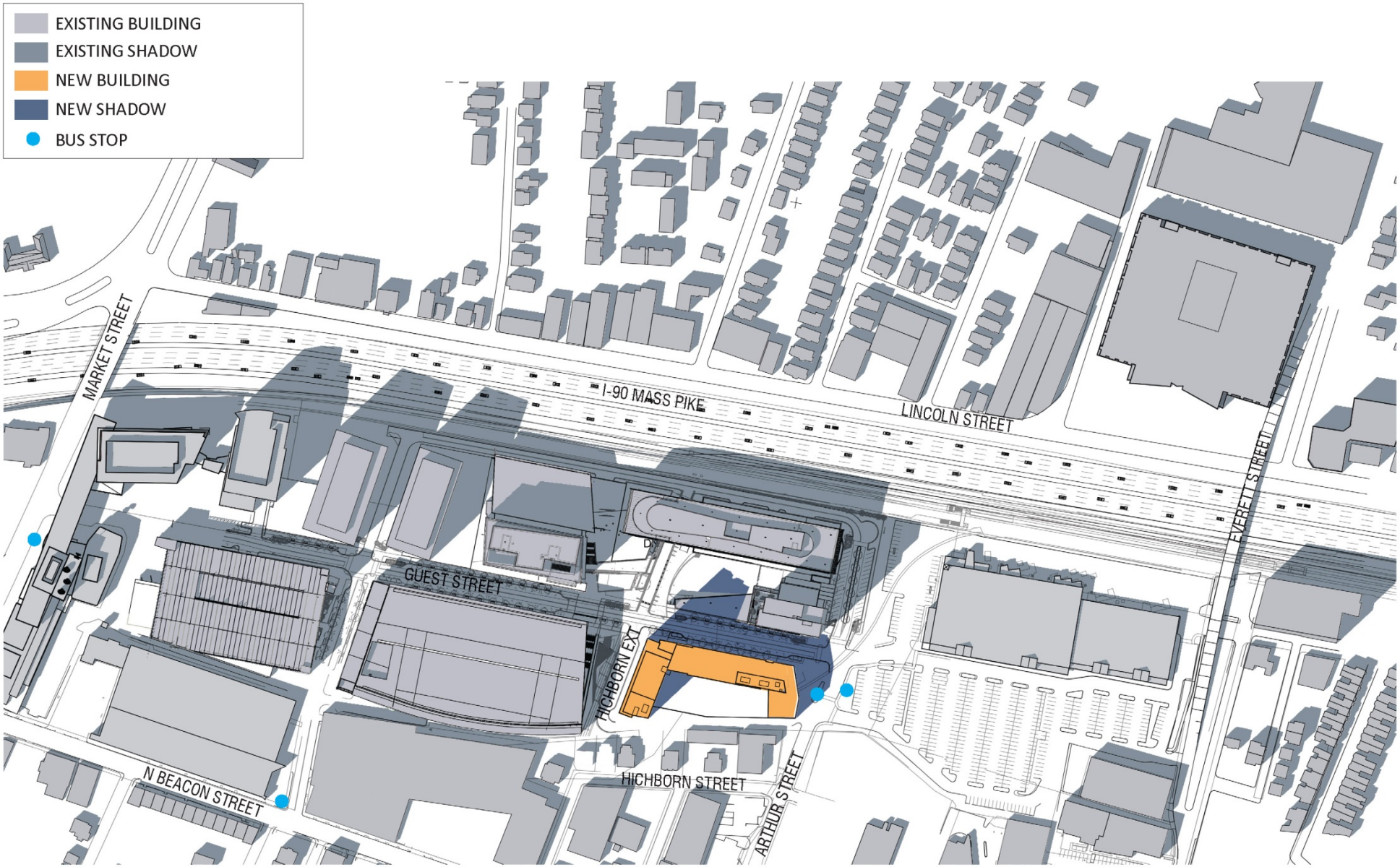

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Figure 4.2-10

Shadow Study – September 21, 3 p.m.

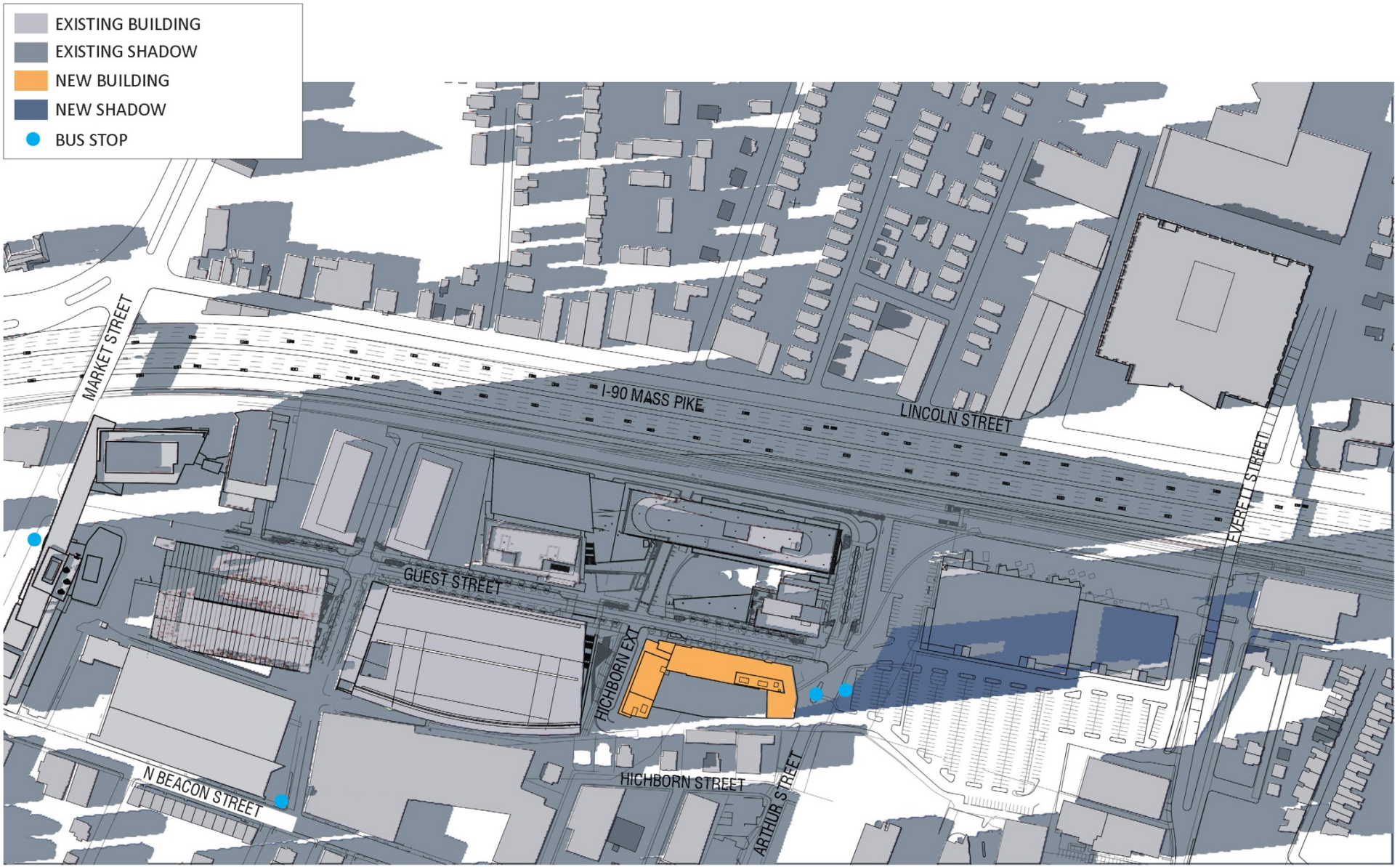

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Figure 4.2-11

Shadow Study – September 21, 6 p.m.

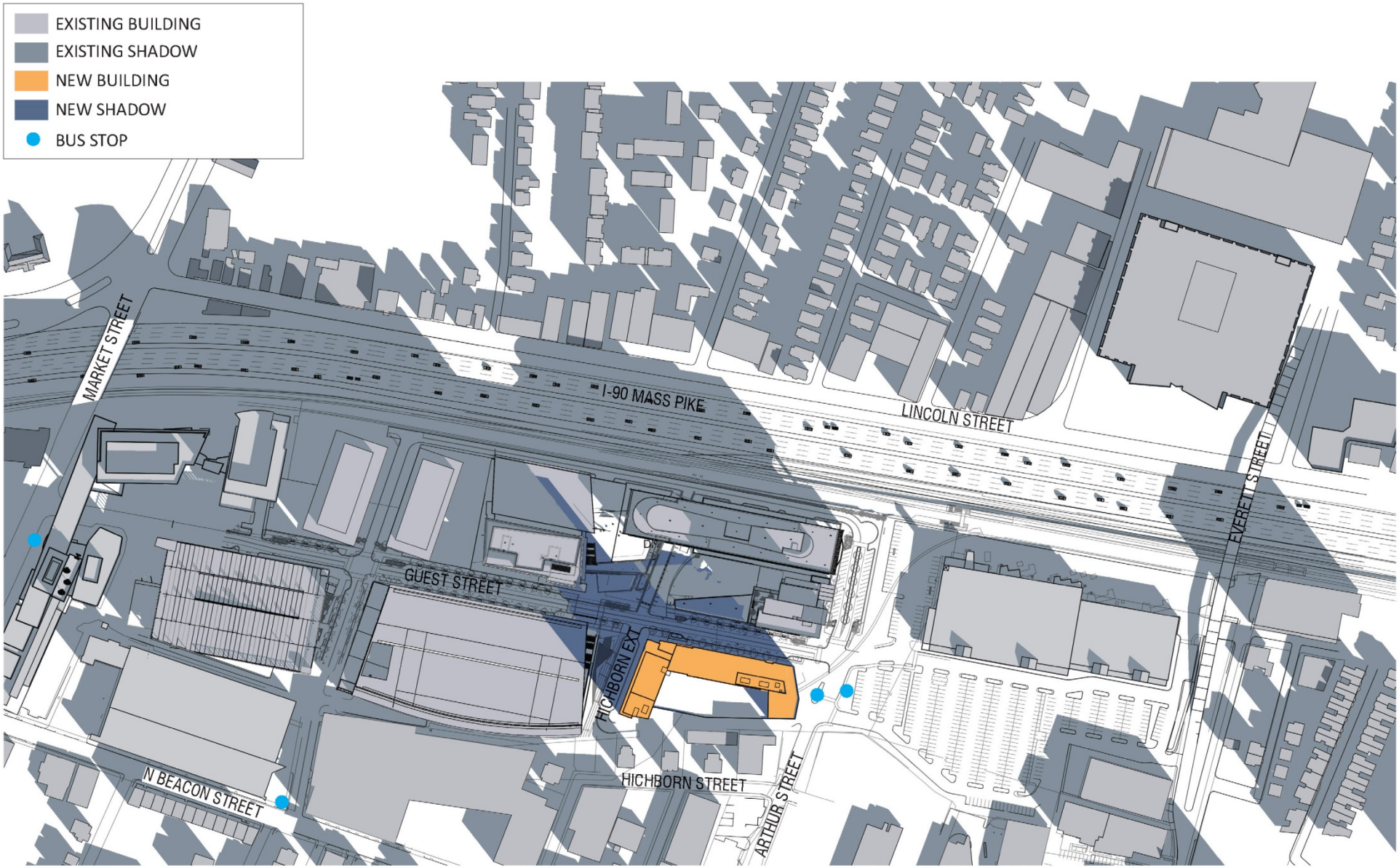

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Figure 4.2-12

Shadow Study – December 21, 9 a.m.

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Figure 4.2-13

Shadow Study – December 21, 12 p.m.

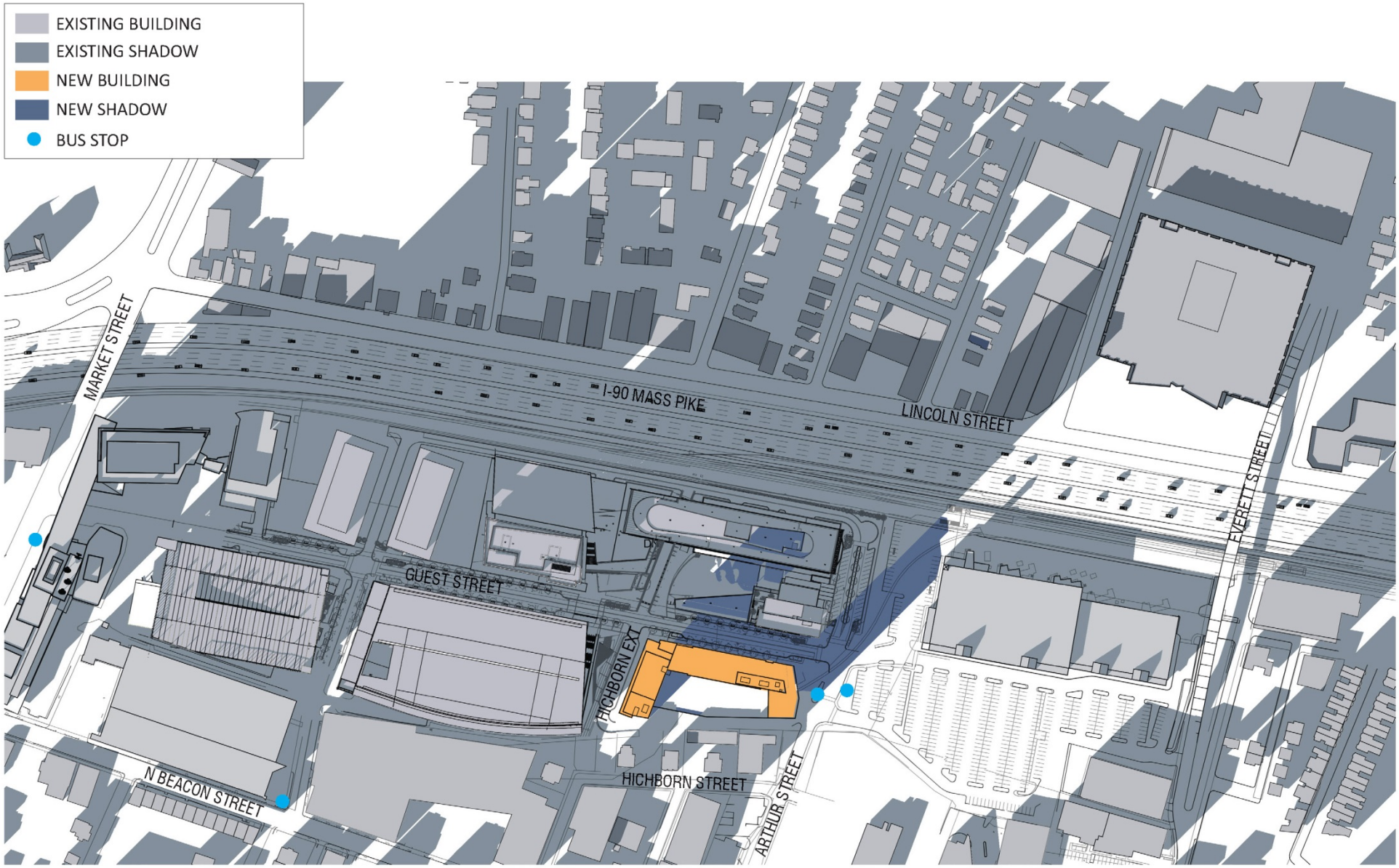

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Figure 4.2-14

Shadow Study – December 21, 3 p.m.

4.3 Daylight Analysis

4.3.1 Introduction

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of a project site. A daylight analysis for the Project considers the proposed conditions, as well as the surrounding area.

A daylight analysis for the proposed Project considers the proposed conditions in relation to the daylight obstruction values of the overall development. Because the Project site is currently vacant, the proposed Project will increase daylight obstruction; however, the resulting conditions will be typical of the area.

4.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[2]. This program measures the percentage of sky-dome that is obstructed by a project and is a useful tool in evaluating the net change in obstruction from existing to build conditions at a specific site.

Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets or pedestrian ways centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. The BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0 to 100 percent based on the width of the view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building; the lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

The proposed Project is one element of the greater Boston Landing development, with each building in various phases of construction or design. An Expanded PNF filed in May 2012 for the Boston Landing project (known as New Brighton Landing at the time of submission) included an analysis of the existing context and proposed conditions. Results from that analysis are included as the area context for comparison to the proposed Project.[3]

---

[2] Method developed by Harvey Bryan and Susan Stuebing, computer program developed by Ronald Fergle, Massachusetts Institute of Technology, Cambridge, MA, September 1984.

[3] *New Brighton Landing*, Boston, Massachusetts, Expanded Project Notification Form, Epsilon Associates, Inc., et al., May 25, 2012.

Three viewpoints were chosen to evaluate daylight obstruction for the proposed conditions. Because the Project site is currently undeveloped, there is no existing daylight obstruction on the site. The viewpoints and area context viewpoints were taken in the following locations and are shown on Figure 4.3-1:

- **Viewpoint 1** – View from Guest Street facing south toward the Project site.
- **Viewpoint 2** – View from Arthur Street facing west toward the Project site.
- **Viewpoint 3** – View from the future Hichborn Street Extension facing east toward the Project site.
- **Area Context Viewpoint AC1** – View from Guest Street facing north toward the Block C office buildings.
- **Area Context Viewpoint AC2** – View from Guest Street facing north toward the New Balance World Headquarters and hotel.
- **Area Context Viewpoint AC3** – View from Guest Street facing south toward the Block B sports complex.
- **Area Context Viewpoint AC4** – View from Life Street facing east toward the Block B sports complex.

4.3.3 Results

The results for each viewpoint under each alternative condition are described in Table 4.3-1. Figure 4.3-2 and Figure 4.3-3 illustrate the BRADA results for each analysis.

G:\Projects2\MA\Boston\3144\Makepeace_Residential\viewpoints.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

125 Guest Street Boston, Massachusetts

BOSTON LANDING

Epsilon ASSOCIATES INC.

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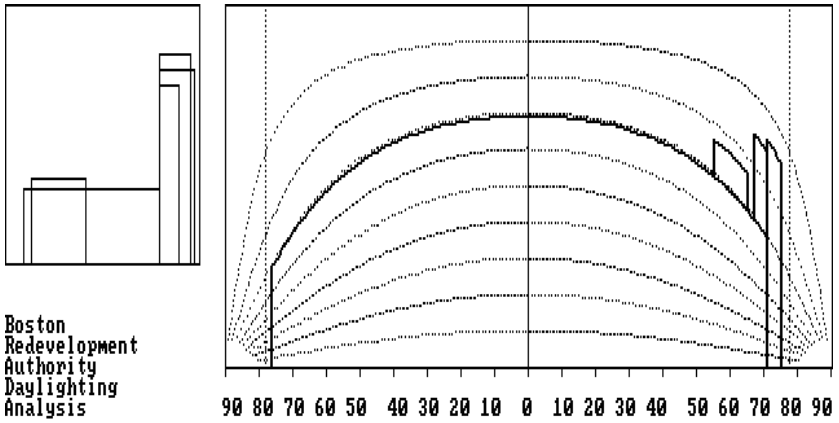
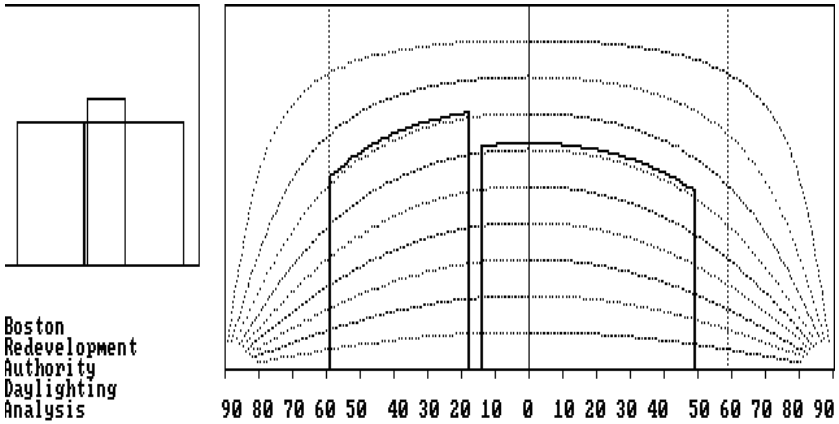
Figure 4.3-1

Viewpoint Location Map



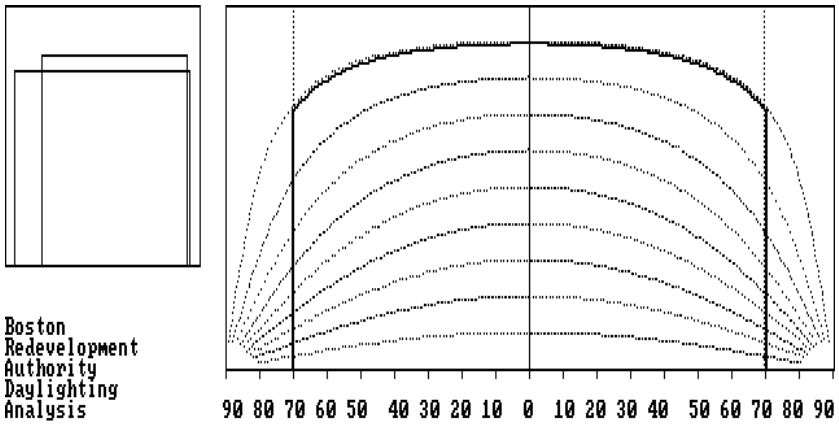
Obstruction of daylight by the building is 69.0 %

Viewpoint 1 – View from Guest Street facing south toward the Project site.



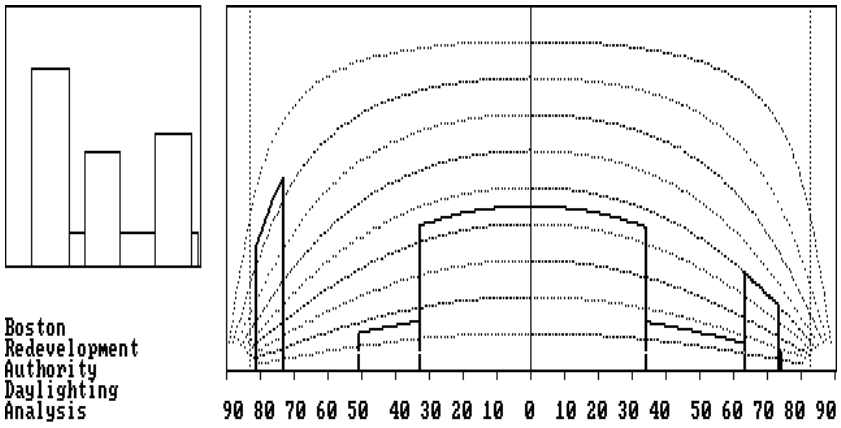
Obstruction of daylight by the building is 58.4 %

Viewpoint 2 – View from Arthur Street facing west toward the Project site.



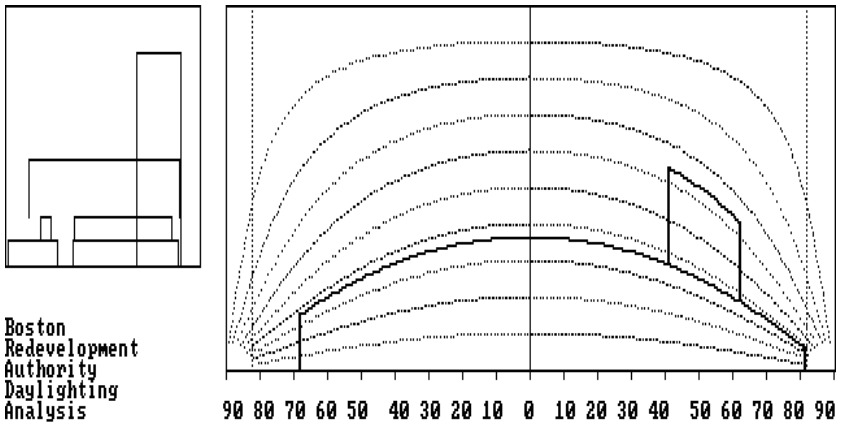
Obstruction of daylight by the building is 89.8 %

Viewpoint 3 – View from Hichborn Street facing east toward the Project site.



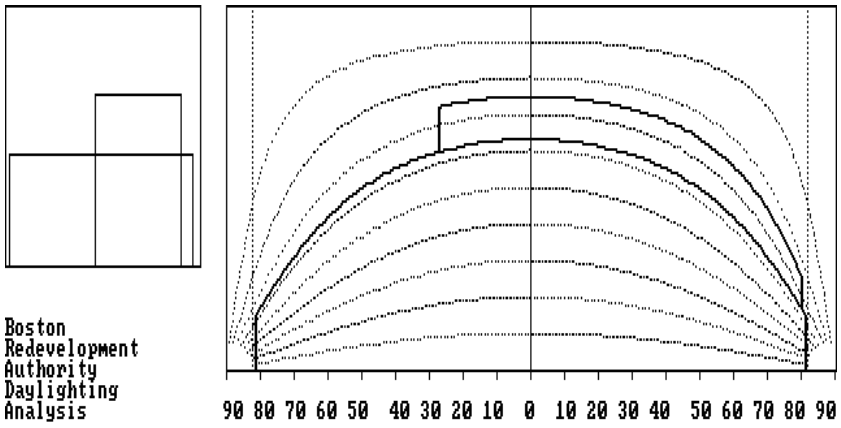
Obstruction of daylight by the building is 26.8 %

Area Context Viewpoint AC1 – View from Guest Street facing north toward the Block C office buildings.



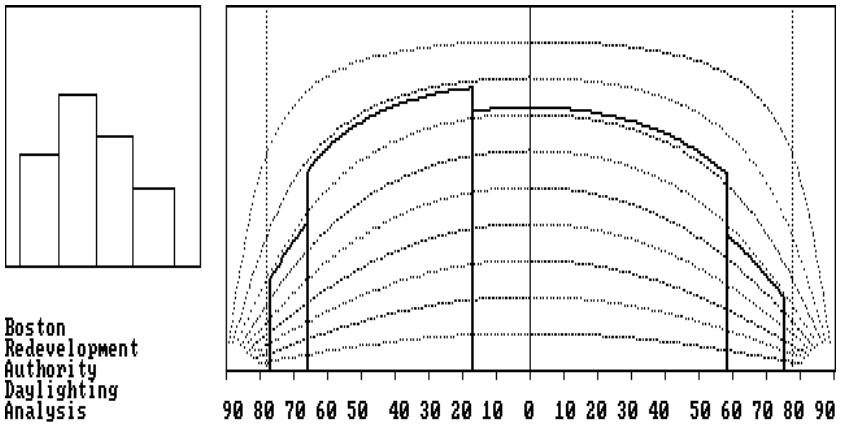
Obstruction of daylight by the building is 36.2 %

Area Context Viewpoint AC2 – View from Guest Street facing north toward the New Balance World Headquarters and hotel.



Obstruction of daylight by the building is 69.4 %

Area Context Viewpoint AC3 – View from Guest Street facing south toward the Block B sports complex.



Obstruction of daylight by the building is 70.9 %

Area Context Viewpoint AC4 – View from Life Street facing east toward the Block B sports complex.

Table 4.3-1 Daylight Obstruction Values

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from Guest Street facing south toward the Project site	N/A	69%
Viewpoint 2	View from Arthur Street facing west toward the Project site	N/A	58.4%
Viewpoint 3	View from future Hichborn Street Extension facing east toward the Project site	N/A	89.8%
Area Context Points			
AC1	View from Guest Street facing north toward the Block C office buildings	26.8%	N/A
AC2	View from Guest Street facing north toward the New Balance World Headquarters and hotel	36.2%	N/A
AC3	View from Guest Street facing south toward the Block B sports complex	69.4%	N/A
AC4	View from Life Street facing east toward the Block B sports complex	70.9%	

Guest Street – Viewpoint 1

Guest Street runs along the northern edge of the Project site. Viewpoint 1 was taken from the center of Guest Street looking directly south toward the Project site. The development of the Project will result in a daylight obstruction value of 69 percent. Since the Project site is currently undeveloped, this is an increase over existing conditions. However, the daylight obstruction value is consistent with the Area Context buildings.

Arthur Street – Viewpoint 2

Arthur Street runs along the eastern edge of the Project site. Viewpoint 2 was taken from the center of Arthur Street looking directly west toward the Project site. The development of the Project will increase the daylight obstruction value to 58.4 percent, which is consistent with the Area Context buildings.

Hichborn Street Extension – Viewpoint 3

Hichborn Street Extension will run along the western edge of the Project site. Viewpoint 3 was taken from the center of Hichborn Street Extension looking directly east toward the Project site. The development of the Project will increase the daylight obstruction value at this viewpoint to 89.8 percent because this viewpoint faces the tallest portion of the building. This is higher than the area context viewpoints, but is typical of urban areas.

4.3.4 Conclusions

Overall, the daylight obstruction values will be similar to daylight obstruction values for the surrounding area, with the exception of the view from the future Hichborn Street Extension which will have a higher daylight obstruction value than the surrounding area. The daylight obstruction values are consistent with similar urban areas.

4.4 Solar Glare

The Project materials are still being studied and glazing of the windows will be determined as the design progresses. Due to the type of potential glass and glazing used, solar glare impacts are not currently anticipated.

4.5 Air Quality Analysis

The Boston Redevelopment Authority requires that project-induced impacts to ambient air quality be addressed. A microscale analysis is used to determine the effect on air quality of the increase in traffic generated by the Project. This microscale analysis may be required for a project at intersections where 1) project traffic would impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the project will generate 3,000 or more new average daily trips (ADT) on roadways providing access to a single location.

The proposed Project does not generate 3,000 ADT, nor does it increase traffic volumes by 10 percent or 100 vehicles per hour. As discussed in Chapter 2, all intersections studied will continue to operate at the same LOS as under the No Build conditions during both the a.m. and p.m. peak hours. Therefore, no quantitative analysis is required. Given the generally well-operating intersections, and the small increases in volume at the worst intersections, it is expected that there would be no violations of the NAAQS for CO at any intersections associated with Project-related traffic.

It is expected that the majority of stationary sources (boilers, engines, etc) would be subject to the MassDEP's Environmental Results Program (ERP). The ERP regulation applies to new emergency generators greater than 37 kW. The regulation is similar to the boiler ERP in that new engines are subject to emission standards, recordkeeping, certification, and compliance with the MassDEP noise policy. Since the generator maximum rating capacity will be greater than the ERP limit of 37 kW, it will be subject to the ERP program. Per the ERP, the generator owner will limit operation of the generator to less than 300 hours per year and submit a certification form to MassDEP within 60 days of installation.

4.6 Solid and Hazardous Waste

4.6.1 Hazardous Waste

The Project site is subject to the Massachusetts Contingency Plan (MCP) due to presence of impacted soil and groundwater above applicable standards. Constituents of concern include low-level chlorinated volatile organic compounds (CVOCs) in groundwater, as well as metals and polycyclic aromatic hydrocarbons (PAHs) in soil at concentrations exceeding MCP Reportable Concentrations (RCs). As such, the excavated soils will be pre-characterized prior to off-site disposal or off-site re-use. Soil and groundwater will be managed and disposed of in accordance with a Release Abatement Measure (RAM) Plan and local, State and Federal regulations. Groundwater will be managed and disposed of in accordance with the RAM Plan, and as specified below.

It is anticipated that water generated during construction will be re-charged to the ground surface, or discharged off-site. Groundwater will be treated with solids removal utilizing a primary clarifier, a fractionalization tank and/or a system of bag filters. Additional treatment such as carbon treatment and other treatment options may be required to meet the applicable effluent discharge standards.

Prior to construction and off-site discharge of groundwater, a Notice of Intent (NOI) for a National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) will be submitted to the US EPA to support treatment and off-site discharge of groundwater generated during construction. Treated effluent will be discharged to the Boston Water and Sewer Commission (BWSC) storm drains in accordance with the applicable local, State and Federal regulations.

4.6.2 Operation Solid and Hazardous Waste Generation

The Project will generate solid waste typical of residential and restaurant/retail uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Recyclable materials will be recycled through a program implemented by building management. The Project will generate approximately 368 tons of solid waste per year.

With the exception of household hazardous wastes typical of residential developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials.

4.6.3 Recycling

A dedicated recyclables storage and collection program will facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills. The recycling program will be fully developed in accordance with LEED standards as described in Chapter 5.

4.7 Noise Impacts

4.7.1 Introduction

A sound level impact assessment was conducted which includes an evaluation of historical sound level data collected during a previous baseline monitoring program (performed in 2012) to represent current ambient sound levels in the vicinity of the Project site, computer modeling to predict operational sound levels from mechanical equipment associated with the Project, and a comparison of future Project sound levels to applicable City of Boston Zoning District Noise Standards.

This analysis, which is consistent with BRA requirements for noise studies, indicates that with appropriate noise controls, predicted sound levels from the Project will comply with local noise regulations.

4.7.2 Noise Terminology

There are several ways in which sound (noise) levels are measured and quantified, all of which use the logarithmic decibel (dB) scale. The following section defines the noise terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities observed in the environment. A property of the decibel scale is that the sound pressure levels of two distinct sounds are not purely additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a three-decibel increase (53 dB), not a doubling (100 dB). Thus, every three-decibel change in sound level represents a doubling or halving of sound energy. Related to this is the fact that a change in sound level of less than three dB is generally imperceptible to the human ear.

Another property of the decibel scale is that if one source of noise is 10 dB (or more) louder than another source, then the total combined sound level is simply that of the louder source (i.e., the quieter source contributes negligibly to the overall sound level). For example, a source of sound at 60 dB plus another source at 47 dB is 60 dB.

The sound level meter used to measure noise is a standardized instrument.[4] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks), which most closely approximates how the human ear responds to sound as a function of frequency, and is the accepted scale used for community sound level measurements. Sounds are frequently reported as detected with the

[4] *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

A-weighting network of the sound level meter in dBA. A-weighted sound levels emphasize the middle frequencies (i.e., middle pitched—around 1,000 Hertz sounds), and de-emphasize lower and higher frequencies.

Because the sounds in our environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds, exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment, A-weighted sound-level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value of 0 to 100 percent. Several sound-level metrics that are commonly reported in community noise studies are described below.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.
- L_{50} is the median sound level, the sound level in dBA exceeded 50 percent of the time during the measurement period.
- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.
- L_{max} is the maximum instantaneous sound level observed over a given period.
- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises.

By employing various noise metrics, it is possible to separate prevailing, steady sounds (the L90) from occasional louder sounds (L10) in the noise environment. This analysis treats all noise sources from the Project as though the emissions will be steady and continuous, described most accurately by the L90 exceedance level.

In the design of noise controls, which do not function quite like the human ear, it is important to understand the frequency spectrum of the noise source of interest. The spectra of noises are usually stated in terms of octave-band sound pressure levels, in dB, with the octave frequency bands being those established by standard (American National Standards Institute (ANSI) S1.11, 1986). To facilitate the noise-control design process, the estimates of

noise levels in this analysis are also presented in terms of octave-band sound pressure levels. Octave-band measurements and modeling are used in assessing compliance with the City of Boston noise regulations.

4.7.3 Noise Regulations and Criteria

The City of Boston has both a noise ordinance and noise regulations. Chapter 16 §26 of the Boston Municipal Code sets the general standard for noise that is unreasonable or excessive: louder than 50 decibels between the hours of 11:00 p.m. and 7:00 a.m., or louder than 70 decibels at all other hours. The Boston Air Pollution Control Commission (APCC) has adopted regulations based on the city's ordinance - "Regulations for the Control of Noise in the City of Boston", which distinguish among residential, business, and industrial districts in the city. In particular, APCC Regulation 2 is applicable to the sounds from the Project and is considered in this noise study.

Table 4.7-1 below presents the "Zoning District Noise Standards" contained in Regulation 2.5 of the APCC "Regulations for the Control of Noise in the City of Boston," adopted December 17, 1976. These maximum allowable sound pressure levels apply at the property line of the receiving property. The "Residential Zoning District" limits apply to any lot located within a residential zoning district or to any residential use located in another zone except an Industrial Zoning District, according to Regulation 2.2. Similarly, per Regulation 2.3, business limits apply to any lot located within a business zoning district not in residential or institutional use.

Table 4.7-1 City Noise Standards - Maximum Allowable Sound Pressure Levels

Octave-band Center	Residential Zoning District		Residential Industrial Zoning District		Business Zoning District	Industrial Zoning District
Frequency (Hz)	Daytime (dB)	All Other Times (dB)	Daytime (dB)	All Other Times (dB)	Anytime (dB)	Anytime (dB)
32	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
A-Weighted (dBA)	**60**	**50**	**65**	**55**	**65**	**70**

Notes:
1. Noise standards from Regulation 2.5 "Zoning District Noise Standards", City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.
2. All standards apply at the property line of the receiving property.
3. Sound pressure levels (dB and dBA) based on a reference pressure of 20 micro-Pascals.
4. Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily, except Sunday.

4.7.4 Background Conditions

A background sound level survey was previously conducted in 2012 to characterize the ambient "baseline" acoustical environment within the vicinity of the Project. The current sound environment is assumed to be comparable to 2012 when the measurements were taken. Noise sources in the vicinity of the Project site included and are expected to currently include: vehicular traffic (including trucks) on Interstate-90 (I-90) and local roadways, pedestrian traffic, nearby mechanical equipment located in and on surrounding buildings, and the general city soundscape.

4.7.4.1 Noise Monitoring Methodology

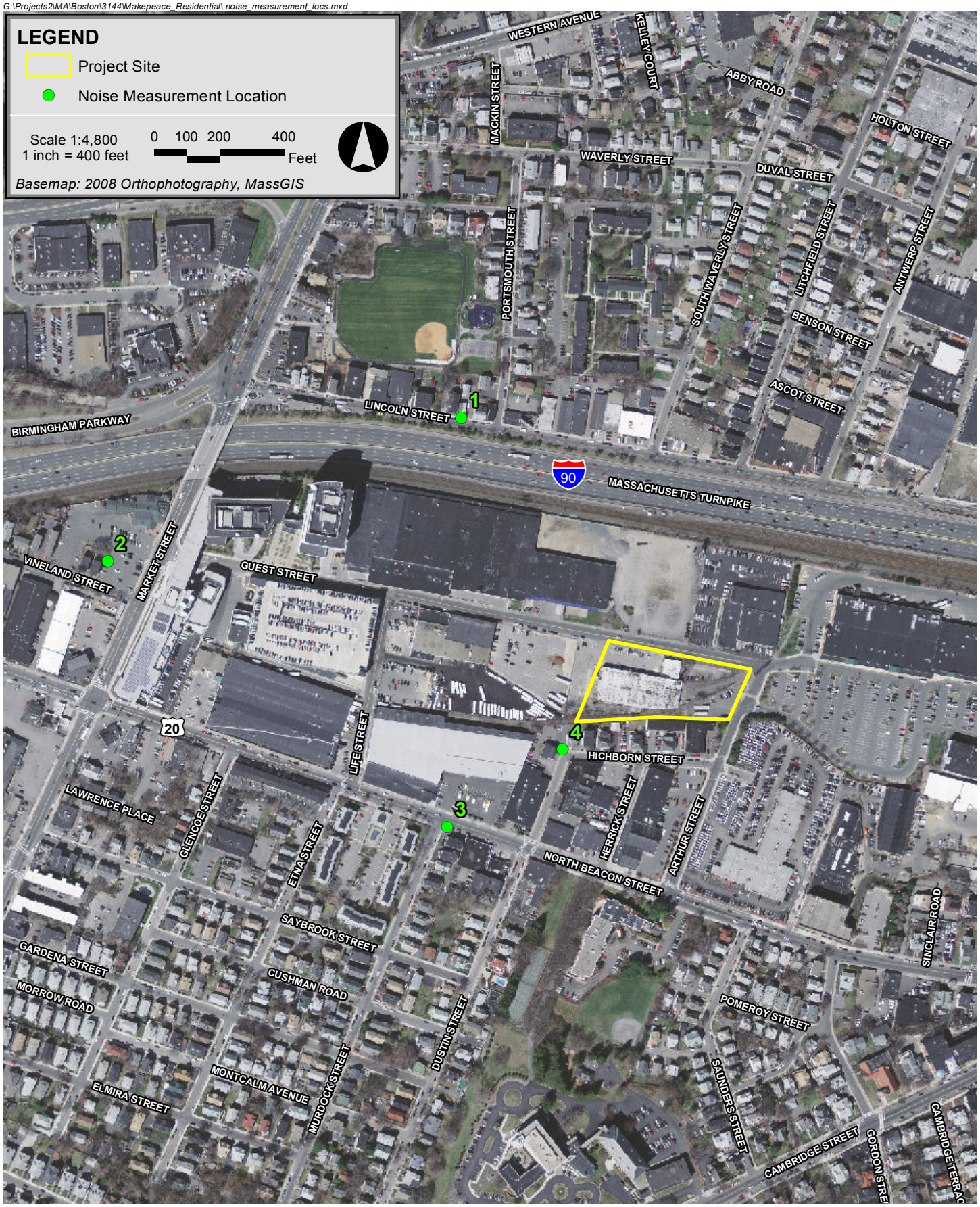
Noise impacts from the Project on the community will be greatest when background noise levels are the lowest. The study performed in 2012 was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to avoid peak traffic conditions. Sound level measurements were made on Thursday, March 15, 2012 during the daytime (12:00 p.m. to 2:30 p.m.) and on Friday, March 16, 2012 during nighttime hours (12:00 a.m. to 2:00 a.m.). All measurements were 20 minutes in duration.

Sound levels were measured at publicly accessible locations at a height of five feet (1.5 meters) above ground level, under low wind conditions, and with dry roadway surfaces. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a General Tools digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the ambient sound levels in the area and to estimate the noise sensitivity at properties near the Project site.

4.7.4.2 Noise Monitoring Locations

The selection of the noise monitoring locations was based upon a review of zoning and land use in the Project area. Four noise monitoring locations were selected as representative sites to obtain a sampling of the ambient baseline sound environment. These measurement locations are depicted on Figure 4.7-1 and described below.

- **Location 1** is adjacent to the residence on Lincoln Street, representative of sound-sensitive receptors north of I-90 and of the Project.
- **Location 2** is adjacent to two residential buildings in a restaurant parking lot at the corner of Market Street and Vineland Street, representative of sound-sensitive receptors west of the Project.
- **Location 3** is near residences on North Beacon Street which is south of the Project, representative of sound-sensitive receptors south of the Project.



125 Guest Street Boston, Massachusetts

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

Epsilon ASSOCIATES INC.

Figure 4.7-1

Noise Measurement Locations

- **Location 4** is located near a residence on Hichborn Street at the southeast corner of the Project, representative of the closest sound-sensitive receptors south of the Project.

4.7.4.3 Noise Monitoring Equipment

A Larson Davis Model 831 sound level meter equipped with a PCB PRM831 Type I preamplifier, a PCB 377B20 half-inch condenser microphone, and manufacturer-provided windscreen was used to collect background sound pressure level data. This instrumentation meets the "Type 1 - Precision" requirements set forth in ANSI S1.4 for acoustical measuring devices. Statistical descriptors (L_{eq}, L_{90}, etc.) were calculated for each 20-minute sampling period with octave-band sound levels corresponding to the same data set processed for the broadband levels.

The measurement equipment was calibrated in the field before and after the surveys with a Larson Davis CAL200 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. The meter was calibrated and certified as accurate to standards set by the National Institute of Standards and Technology. This calibration was conducted by an independent laboratory within the previous 12 months of the measurement program.

4.7.4.4 Measured Background Noise Levels

Baseline noise monitoring results are presented in Table 4.7-2, and summarized below:

- The daytime residual background (L_{90}) measurements ranged from 50 to 70 dBA;
- The nighttime residual background (L_{90}) measurements ranged from 43 to 55 dBA;
- The daytime equivalent level (L_{eq}) measurements ranged from 55 to 73 dBA;
- The nighttime equivalent level (L_{eq}) measurements ranged from 49 to 65 dBA;

4.7.5 Future Conditions

4.7.5.1 Overview of Potential Project Noise Sources

The Project will consist of the redevelopment of the parcel located within Boston Landing at 125 Guest Street. The site, formerly occupied by the B.L. Makepeace headquarters, will be redeveloped with an approximately 295-unit residential building. The primary sources of continuous sound exterior to the Project will consist of ventilation, heating, cooling, and emergency power noise sources. Multiple noise sources will be located on the rooftops and there will be exhaust fans which will discharge along the southern facade of the building at the loading dock.

Table 4.7-3 provides an anticipated list of the major sources of sound within the Project. Sound power levels used in the acoustical modeling of each piece of equipment are presented in Table 4.7-4. Sound power level data were provided by the manufacturer of each piece of equipment except for the emergency generator. The sound power levels for the components of the emergency generator were calculated using the sound-pressure levels provided by the manufacturer at reference distances.

Table 4.7-2 Summary of Measured Background Noise Levels – March 15, 2012 (Daytime) & March 16, 2012 (Nighttime)

Loc. ID	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	L_{90} Sound Pressure Levels by Octave-Band Center Frequency								
								31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
			dBA	dBA	dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
1	Day	1:48 PM	73	89	75	73	70	64	67	66	61	60	67	64	54	42
2	Day	12:17 PM	63	89	63	61	59	62	62	58	53	53	56	50	40	27
3	Day	12:46 PM	69	88	73	65	54	57	58	56	52	49	50	46	36	25
4	Day	1:13 PM	55	79	56	52	50	56	56	52	46	44	47	41	28	20
1	Night	1:28 AM	65	77	68	62	55	53	57	50	46	46	52	47	32	19
2	Night	12:55 AM	57	71	60	54	49	62	62	58	53	53	56	50	40	27
3	Night	12:28 AM	62	77	66	52	43	48	51	47	42	38	38	33	23	19
4	Night	12:02 AM	49	67	51	46	44	48	50	46	42	38	41	35	22	19

Note: Sound pressure levels are rounded to the nearest whole decibel.

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Thursday, March 15, 2012	46 °F	46%	Clear	NE @ 2-9 mph
Nighttime	Friday, March 16, 2012	39 °F	70%	Clear	S @ 0-5 mph

Table 4.7-3 Modeled Noise Sources

Noise Source	Quantity	Approximate Location	Size/Capacity
Transformer Room Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	1,500 CFM
Fitness Room Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	1,000 CFM
Leasing Room Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	1,200 CFM
Trash Room Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	800 CFM
Fire Pump Room Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	1,500 CFM
Loading Dock Exhaust Fan	1	Southern façade at loading dock; 10′ AGL	1,500 CFM
Penthouse Exhaust Fan	1	Roof (~213′ tier)	800 CFM
Kitchen Exhaust Fan	2	1 on High Rise Roof (~195′ tier) & 1 on Low Rise Roof(~73′ tier)	3,500 CFM
Cooling Tower	1	High Rise Roof (~195′ tier)	630-ton
High Rise Energy Recovery Unit	2	High Rise Roof (~195′ tier)	2,500 / 2,763 CFM
Low Rise Energy Recovery Unit	2	Low Rise Roof (~73′ tier)	5,100 / 5,100 CFM
Emergency Generator	1	High Rise Roof (~195′ tier)	800 kW

Table 4.7-4 Modeled Sound Power Levels per Noise Source

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Transformer Room Exhaust Fan[1]	73	75[11]	75	73	73	71	66	64	59	54
Fitness Room Exhaust Fan[2]	82	78[11]	78	83	76	82	75	71	68	63
Leasing Room Exhaust Fan[3]	77	73[11]	73	73	75	72	70	71	69	66
Trash Room Exhaust Fan[4]	77	75[11]	75	77	74	77	71	68	64	58
Fire Pump Room Exhaust Fan[5]	78	78[11]	78	78	78	77	70	68	63	57
Loading Dock Exhaust Fan[5]	78	78[11]	78	78	78	77	70	68	63	57
Penthouse Exhaust Fan[6]	77	75[11]	75	77	74	77	71	68	64	58
Kitchen Exhaust Fan[7]	91	91[11]	91	89	90	90	85	81	79	75
Cooling Tower[8]	92	101[11]	101	100	91	89	87	83	78	80
High Rise Energy Recovery Unit – Supply[9]	82	79[11]	79	79	78	78	77	74	72	67
High Rise Energy Recovery Unit – Return[9]	86	79[11]	79	76	83	85	81	78	74	69
Low Rise Energy Recovery Unit – Supply[9]	88	79[11]	79	81	84	85	83	80	77	74

Table 4.7-4 Modeled Sound Power Levels per Noise Source (Continued)

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Low Rise Energy Recovery Unit – Return[9]	96	82[11]	82	84	91	90	93	87	83	78
Emergency Generator – Mechanical[10]	116	108[11]	108	113	112	111	113	109	105	100
Emergency Generator – Exhaust[10]	121	85[11]	85	111	121	117	116	115	106	87

Notes:
Sound power levels do not include mitigation identified in Table 4.7-5.

1. Cook 150SQN-B 1,500 CFM fan
2. Cook 100SQN-B 1,000 CFM fan
3. Cook 120SQN-B 1,200 CFM fan
4. Cook 100SQN-B 800 CFM fan
5. Cook 135SQN-B 1,500 CFM fan
6. Cook 100SQN-B 800 CFM fan
7. Cook 150 CPS-A 3,500 CFM fan
8. Evapco UT-217-712 2-cell cooling tower
9. Ziehl-abegg unit
10. Caterpillar 800 kw generator

The Project includes various noise-control measures in order to achieve compliance with the applicable noise regulations. As the design progresses, it is anticipated that mechanical equipment may change; however, appropriate measures will be taken to ensure compliance with the City Noise Standards. Mitigation in the form of a silencer will be installed on each of the exhaust fans located in the loading dock area. In addition, a silencer will be installed on each of the kitchen exhaust fans. The sound levels from the cooling towers on the high roof and the energy recover units (ERUs) on the low roof will be mitigated either through a sound mitigation package supplied by the vendor or through the selection of quieter equipment from an alternate manufacturer. The emergency generator sound levels will be controlled using an enclosure with an exhaust silencer. To further limit impacts from the standby generator, its required periodic, routine testing will be conducted during daytime hours, when background sound levels are highest. A summary of the noise mitigation proposed for the Project is presented below in Table 4.7-5.

Table 4.7-5 Attenuation Values Applied to Mitigate Each Noise Source

Noise Source	Form of Mitigation	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Transformer Room Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Fitness Room Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Leasing Room Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Trash Room Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Fire Pump Room Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Loading Dock Exhaust Fan	Silencer[1]	1[6]	3	7	15	26	29	26	21	17
Kitchen Exhaust Fan	Silencer[2]	1[6]	2	5	9	11	13	11	10	8
Cooling Tower	Alternative/Modified Unit[3]	0	0	2	3	5	8	8	5	2
Low Rise Energy Recovery Units	Alternative/Modified Unit[3]	0	0	0	2	5	11	12	11	4
Emergency Generator – Mechanical	Enclosure[4]	11	22	18	26	40	39	43	45	47
Emergency Generator – Exhaust	Silencer[5]	5[6]	10	25	29	30	31	37	41	38

Notes:
1. Vibro-Acoustics Silencer Model RD-LV-F8, 36″ length.
2. Vibro-Acoustics Silencer Model RD-HV-F1, 36″ length.
3. The Proponent will consult with the manufacturer to identify mitigation options to achieve at least the attenuation values presented or select a unit from an alternate manufacturer meeting the mitigated modeled sound levels.
4. Pritchard Brown enclosure.
5. Silex HP-CI-12 silencer.
6. Estimated sound level reduction.

4.7.5.2 Noise Modeling Methodology

The noise impacts associated with the Project were predicted at the nearest receptors using the Cadna/A noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a more refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The Cadna/A software allows for octave band calculation of noise from multiple noise sources, as well as computation of diffraction around building edges.

4.7.5.3 Future Sound Levels – Nighttime

The analysis of sound levels at night considered all of the mechanical equipment without the emergency generator running, to simulate typical nighttime operating conditions at nearby receptors. Eight modeling locations were included in the analysis. Locations A through D are similar to measurement Locations 1 through 4. Four additional modeling locations, E, F, G, and H were added for additional residential uses in the vicinity of the Project. The modeling receptors, which correspond to the residential uses in the community are depicted in Figure 4.7-2. The predicted exterior Project-only sound levels range from 16 to 46 dBA at nearby receptors. The City of Boston Residential limits have been applied to each of these locations. Predicted sound levels from Project-related equipment are within the broadband and octave-band nighttime limits under the City Noise Standards at the modeling locations. The evaluation is presented in Table 4.7-6.

Table 4.7-6 Comparison of Future Predicted Project-Only Nighttime Sound Levels to the City of Boston Limits

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	26	39	37	33	28	24	20	13	1	0
B	Residential	16	30	29	25	17	15	8	0	0	0
C	Residential	39	47	47	46	38	37	33	28	20	1
D	Residential	40	49	46	41	40	39	36	28	22	10
E	Residential	45	57	55	53	48	43	38	31	28	24
F	Residential	39	45	43	41	42	38	33	26	19	11
G	Residential	42	49	48	46	45	40	36	29	23	18
H	Residential	46	55	55	52	48	44	40	33	28	24
City of Boston Limits	Residential	50	68	67	61	52	46	40	33	28	26

125 Guest Street Boston, Massachusetts

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NB DEVELOPMENT GROUP

BOSTON LANDING

Epsilon ASSOCIATES INC.

Figure 4.7-2

Noise Modeling Locations

4.7.5.4 Future Sound Levels – Daytime

As noted above, the emergency generator will only operate during the day for brief, routine testing when the background sound levels are high, or during an interruption of power from the electrical grid. A second analysis combined noise from the Project's mechanical equipment and its emergency generator to reflect worst-case conditions. The sound levels were calculated at the same receptors as in the nighttime analysis, and then were evaluated against daytime limits. The predicted exterior Project-only daytime sound levels range from 17 to 46 dBA at nearby receptors. Predicted sound levels from Project-related equipment are within the daytime broadband and octave-band limits under the City Noise Standards at each of the modeling locations. This evaluation is presented in Table 4.7-7.

Table 4.7-7 Comparison of Future Predicted Project-Only Daytime Sound Levels to City Noise Standards

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	27	40	37	34	29	25	20	13	1	0
B	Residential	17	32	29	27	20	16	9	0	0	0
C	Residential	41	48	47	48	43	39	36	30	20	1
D	Residential	41	50	46	42	41	40	36	28	22	10
E	Residential	45	57	55	53	48	43	38	31	28	24
F	Residential	39	46	43	41	42	38	33	26	19	11
G	Residential	42	49	48	46	45	41	36	29	23	18
H	Residential	46	55	55	52	48	44	40	33	28	24
City of Boston Limits	Residential	60	76	75	69	62	56	50	45	40	38

4.7.6 Conclusions

Baseline noise levels were measured in the vicinity of the Project during the day and at night. At these and additional locations, future Project-only sound levels were calculated based on information provided by the manufacturers of the expected mechanical equipment. Project-only sound levels were compared to applicable limits.

Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise-control measures, will be at or below the octave-band requirements of City Noise Standards. The predicted sound levels from Project-related equipment, as modeled, are expected to remain below 50 dBA; therefore, within the nighttime residential zoning limits for the City of Boston at the nearest residential receptors. The results indicate that the Project can operate without significant impact on the existing acoustical environment.

At this time, while the mechanical equipment and noise controls have been refined, they are still conceptual in nature. During the final design phase of the Project, mechanical equipment and noise controls will be specified and designed to meet the applicable broadband limit and the corresponding octave-band limits of the City Noise Standards.

4.8 Storm Drainage System

4.8.1 Existing Storm Drainage System

The existing property is nearly 100 percent impervious, comprised mainly of a former building pad and paved parking areas. While there are a few landscaped areas scattered across the property, they are very small and not contiguous.

The majority of the runoff from the property was previously collected through a series of catch basins and roof drains that discharged to the Boston Water and Sewer Commission (BWSC) storm drain in Guest Street. Following building demolition, all storm drain connections to the street were cut and capped at the property line.

Stormwater at the site currently flows across the ground surface to low lying areas where it pools or enters existing storm drainage structures within the property.

4.8.2 Proposed Storm Drainage System

The Project proposes an overall integrated approach to stormwater management that will utilize low impact development techniques as well as emerging technologies to enhance the quality of the storm water runoff and reduce the volume of runoff that will enter the BWSC system. Due to the location of the Project site within the Charles River watershed, phosphorus reduction will be a key element in treating the storm water runoff that will be generated by the Project.

Deep sump catch basins are one of the most common features of storm drainage systems, and will be used throughout the surface parking areas on site. These structures typically function mainly as collection devices to capture runoff; however, there are minor water quality benefits that can be gained through their use. The deep sump catch basins used for this Project will include hooded outlet pipes that will assist in collection of floatable debris and pollutants prior to discharge to the municipal system.

In addition to deep sump catch basins, there may be areas where slotted trench drains are required. These devices are strictly collection devices for runoff and provide no water quality benefits. Typical locations for these devices include truck loading docks and other locations where shallow drainage collection devices are necessary.

Oil/grit separators will be included in the overall design where stormwater runoff requires treatment and cannot be treated through other techniques. These separators may consist of standard components or proprietary devices such as a Stormceptor.

The stormwater runoff that is generated by the Project will be collected through the structures listed above and directed to a subsurface infiltration system designed to infiltrate the first inch of runoff. Any stormwater in excess of the infiltration system's design capacity will be discharged to the existing storm drain system within Guest Street. There will be modest opportunities to introduce rain gardens and recharge areas within the sidewalk along the access drive to the west of the proposed building. This will help reduce the quantity of runoff generated as well as enhance the quality of the runoff by removing sediment and pollutants.

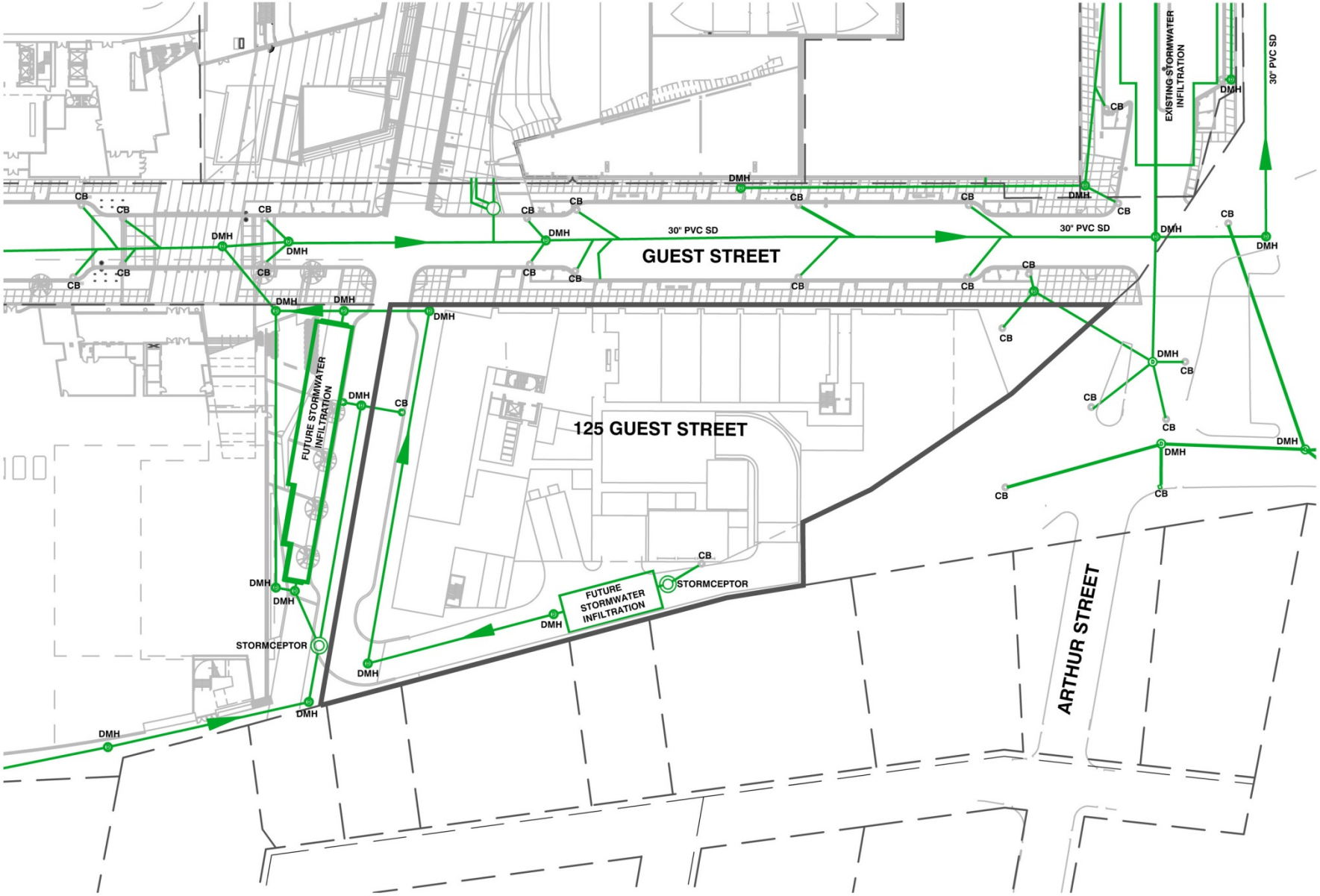
The storm drain system for the Project will be designed in accordance with BWSC design standards and requirements. Site Plan Approval will be required for the connections to the BWSC storm drain system. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared which will include spill contingency plans, short term and long term operation and maintenance information and construction operations discussions, all relating to the stormwater management of the Project. See Figure 4.8-1 for the proposed stormwater system.

4.8.3 Maintenance Measures

Maintenance and cleaning of the various components of the storm drainage system plays an integral role in ensuring the longevity and effectiveness of the system. In addition to maintenance, public awareness of several of the system components will be important to the overall success of the system.

Frequent mechanical sweeping will help to remove excess sediment and debris which could otherwise be introduced into the stormwater collection system. Each stormwater inlet location should be stenciled to indicate that the structure ultimately discharges to the Charles River.

Rain gardens, tree filter boxes, a subsurface infiltration system and other low impact features will have a maintenance schedule for inspections and corrective procedures as required to allow them to function as intended.



125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

BEALS · ASSOCIATES INC.
2 PARK PLAZA, SUITE 200, BOSTON, MA 02116
PHONE: 617-242-1120 FAX: 617-242-1190

Figure 4.8-1

Stormwater System

4.8.4 Phosphorus Total Maximum Daily Load (TMDL)

The Project site discharges stormwater through a series of underground storm drain lines owned by BWSC that ultimately flow to the Everett Street system and the outfall into the Charles River. As part of the ongoing efforts to improve the quality of the Charles River, limits have been placed on the pollutant loading that can be conveyed to the river from permitted discharges. The TMDL goal that has been established for the Charles River is a 65 percent reduction in the total phosphorus load that is discharged to the water body.

The 65 percent phosphorus reduction goal can be achieved for this Project as follows (all phosphorus reduction percentages have been adopted from Final TMDL for Nutrients in Lower Charles.

- Total Site Area = 1.6 acres (currently nearly 100 percent impervious with no water quality treatment)
- Entire Roof Area (approx. 1.1 acres) treated through Stormceptor - 82 percent phosphorous reduction
- Entire Pavement Area (approx. 0.5 acres) treated through deep sump catch basins - 25 percent phosphorous reduction
- Entire Pavement Area (approx. 0.5 acres) treated through Stormceptor - 82 percent phosphorous reduction

Based on these figures, it is anticipated that the Project can achieve approximately 83 percent reduction in phosphorus loading compared to the present day scenario. As the design evolves toward the final stages, it is expected that these exact figures will be revised, but the goal of achieving a 65 percent phosphorus reduction can be demonstrated by this exercise.

It should also be noted that several water quality credits have not been included in the above analysis. These items include:

- Street Sweeping – up to eight percent reduction
- Catch Basin Cleaning – two percent reduction
- Leaf Litter Pickup – up to a five percent reduction

While these additional measures do not provide large phosphorus reductions, they do represent actions that could be incorporated into the final Project if necessary. The analysis presented is conservative in that it does not include these measures.

4.8.5 Operations and Maintenance Manual

During the permit application process with BWSC, the Proponent will prepare a Stormwater Management System Operation and Maintenance Manual that will include descriptions and locations of all stormwater system devices. The manual will also include a specific schedule for observation and maintenance of the various system components. The manual will be submitted concurrently with the final stormwater design calculations and analysis.

4.8.6 Final Stormwater Design Calculations

Upon completion of the design development phase of the Project, the engineer will provide a complete set of stormwater design calculations that will address the relevant portions of local, state, and federal regulations. These calculations will include a written summary which demonstrates compliance with the Massachusetts Stormwater Management Regulations and Policy and will also include detailed calculations regarding compliance with the current TMDL that has been established for the Charles River. The document will be stamped by a Massachusetts Registered Professional Engineer.

4.8.7 DEP Stormwater Management Policy Standards

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

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

Standard #1 – No New Untreated Discharges: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance: The Project will discharge excess stormwater runoff to the municipal system within Guest Street. The runoff from the site will be treated prior to entering the municipal system.

Standard #2 – Peak Rate Attenuation: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

Compliance: The Project will reduce the rates of runoff to a point at or below the pre-developed rates for the site. Attenuation of peak flows will be achieved through a combination of the use of vegetated areas as well as infiltration practices designed to meet or exceed Boston Water and Sewer Commission regulations.

Standard #3 – Recharge: 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. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Project will feature an infiltration system that will be designed to infiltrate a minimum of one-inch of runoff from all impervious surfaces within the site. Similar to the overall Boston Landing development, these systems are designed to meet or exceed Boston Water and Sewer Commission regulations for stormwater discharges. Annual recharge rates will be exceeded by this system.

Standard #4 – Water Quality: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

a) *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*

b) *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*

c) *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

Compliance: Water quality goals for the Project will be met with a combination of techniques. Deep sump catch basins with hoods will trap large floatables from entering the overall system. Once downstream of the catch basins, the runoff will enter a premanufactured sediment removal chamber that will remove up to 80% of the remaining sediment from the runoff. The final device in the treatment will be the infiltration system that will be installed to attenuate runoff in accordance with Boston Water and Sewer Commission regulations. Other BMPs such as vegetation practices and infiltration of clean roof runoff will be employed in the development scheme as secondary water quality measures.

Standard #5 – Land Uses with Higher Potential Pollutant Loads (LUHPPLs): 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.

Compliance: This Standard does not apply to the Project. The Project does not constitute a land use that would be considered a Land Use with Higher Potential Pollutant Loads (LUHPPL).

Standard #6 – Critical Areas: 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.

Compliance: This Standard does not apply to the Project. The Project does not discharge stormwater runoff to a Zone II or Interim Wellhead Protection Area of a public water supply, nor does it discharge to any other critical area. The project discharges to a municipal storm drain system.

Standard #7 – Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable: 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.

Compliance: As a redevelopment project, the Standards described above have all either been met, or in some cases, do not apply or should be waived. Each individual Standard has been addressed through this narrative.

Standard #8 – Construction Period Pollution Prevention and Erosion and Sedimentation Control: 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.

Compliance: A complete Stormwater Pollution Prevention Plan (SWPPP) will need to be prepared during the overall permitting phase of the project and will be filed with Boston Water and Sewer Commission prior to construction commencement.

Standard #9 – Operation and Maintenance Plan: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance: A long-term Stormwater Operation and Maintenance plan will be developed for this site. This plan will contain detailed information regarding the methods and frequencies for inspection and maintenance of the stormwater management control features of the site and will be provided to Boston Water and Sewer Commission prior to construction.

Standard #10 – Prohibition of Illicit Discharges: All illicit discharges to the stormwater management system are prohibited.

Compliance: The Project proposes no illicit discharges to the storm drain system.

4.9 Flood Hazard Zones/ Wetlands

The Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") indicates the FEMA Flood Zone Designations for the site areas (City of Boston, Community-Panel Number, 25025C0057G, September 25, 2009). The map for the proposed Project Site shows the Proposed Project is located in a Zone X, an area determined to be outside the 0.2 percent annual chance of flooding; therefore, flooding is not a concern. There are no wetland resource areas on or near the site.

4.10 Geotechnical Impacts

4.10.1 Subsurface Conditions

Based on the subsurface explorations advanced at the Project site, the subsurface conditions below the Project site generally consist of the following (listed from the ground surface down):

- Approximately 4 to 12 feet of loose, urban fill, with discontinuous layers of organic silt and peat associated with the filling of the former Charles River flood plain.

- A natural sand deposit consisting of varying amounts of sand and silt extending to a depth of approximately 15 to more than 20 feet below ground surface.

- Boston Blue Clay (BBC) underlies the natural sand deposit. Below the BBC, glacial deposits consisting of glacio-lacustrine and glacial till are typically present above bedrock. Bedrock is estimated at depths of 100 feet or greater below ground surface.

4.10.2 Groundwater

Groundwater is anticipated to be between 9 to 11 feet below existing grade across the site or roughly between El. 23 and 24 ft in reference to the Boston City Base (BCB) datum. Groundwater flows easterly across the site.

4.10.3 Proposed Construction

The building will likely be supported by either shallow spread footings following ground improvement of the existing fill and organics soils, or by an intermediate foundation system, such as pressure injected footings (PIFs). The lowest floor level will be constructed as a slab-on-grade or structural slab depending on the foundation system selected. Other foundation types may be evaluated based on availability of materials, cost, and other factors.

Due to the presence of chlorinated volatile organic compounds (CVOCs) in groundwater below the site, a vapor barrier and venting system (sub-slab depressurization system, or SSDS) will be installed below occupied spaces at the ground floor level. The SSDS will consist of a network of pipe and stone below a physical barrier layer. The system will collect and convey sub-slab vapor from below the slab, and exhaust it through exit points on the roof of the building.

4.11 Construction Impacts

4.11.1 Introduction

A Construction Management Plan (CMP) in compliance with the City's Construction Management Program will be submitted to the Boston Transportation Department (BTD) once final plans are developed and the construction schedule is fixed. The construction contractor will be required to comply with the details and conditions of the approved CMP.

Proper pre-planning with the City and neighborhood will be essential to the successful construction of the Project. Construction methodologies, which ensure public safety and protect nearby residences and businesses, will be employed. Techniques such as

barricades, walkways and signage will be used. The CMP will include routing plans for trucking and deliveries, plans for the protection of existing utilities, and control of noise and dust.

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the construction.

The Proponent intends to follow the guidelines of the City of Boston and the MassDEP, which direct the evaluation and mitigation of construction impacts.

4.11.2 Construction Methodology/Public Safety

Construction methodologies that ensure public safety and protect nearby tenants will be employed. Techniques such as barricades and signage will be used. Construction management and scheduling will minimize impacts on the surrounding environment and will include plans for construction worker commuting and parking, routing plans for trucking and deliveries, and the control of noise and dust.

As the design of the Project progresses, the Proponent will meet with BTD to discuss the specific location of barricades, the need for lane closures, pedestrian walkways, and truck queuing areas. Secure fencing, signage, and covered walkways may be employed to ensure the safety and efficiency of all pedestrian and vehicular traffic flows. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to protect pedestrians and ensure their safety. Public safety for pedestrians on abutting sidewalks will also include covered pedestrian walkways when appropriate. If required by BTD and the Boston Police Department, police details will be provided to facilitate traffic flow. These measures will be incorporated into the CMP which will be submitted to BTD for approval prior to the commencement of construction work.

4.11.3 Construction Schedule

The Proponent anticipates that the Project will commence construction in the fourth quarter of 2016 and last for approximately 24 months.

Typical construction hours will be from 7:00 am to 6:00 pm, Monday through Friday, with most shifts ordinarily ending at 3:30 pm. No activity will occur before 7:00 am. If longer hours, additional shifts, or Saturday work is required, the construction manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 pm to ensure the structural integrity of the finished product; certain components must be completed in a single pour, and placement of concrete cannot be interrupted.

4.11.4 Construction Staging/Access

Access to the site and construction staging areas will be provided in the CMP.

Although specific construction and staging details have not been finalized, the Proponent and its construction management consultant will work to ensure that staging areas will be located to minimize impacts to pedestrian and vehicular flow. Secure fencing and barricades will be used to isolate construction areas from pedestrian traffic adjacent to the site. Construction procedures will be designed to meet all Occupational Safety and Health Administration (OSHA) safety standards for specific site construction activities.

4.11.5 Construction Mitigation

The Proponent will follow City and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts. As part of this process, the Proponent and construction team will evaluate the Commonwealth's Clean Air Construction Initiative.

A CMP will be submitted to BTD for review and approval prior to issuance of a Building Permit. The CMP will include detailed information on specific construction mitigation measures and construction methodologies to minimize impacts to abutters and the local community. The CMP will also define truck routes which will help in minimizing the impact of trucks on City and neighborhood streets.

"Don't Dump - Drains to Charles River" plaques will be installed at storm drains that are replaced or installed as part of the Project.

4.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 325 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 50 percent of the total employee work hours be for Boston residents, at least 25 percent of total employee work hours be for minorities and at least 10 percent of the total employee work hours be for women. The Proponent will enter into jobs agreements with the City of Boston.

To reduce vehicle trips to and from the construction site, minimal construction worker parking will be available at the site and all workers will be strongly encouraged to use public transportation and ridesharing options. The general contractors will work aggressively to ensure that construction workers are well informed of the public transportation options serving the area. Space on-site will be made available for workers' supplies and tools so they do not have to be brought to the site each day.

4.11.7 Construction Truck Routes and Deliveries

Truck traffic will vary throughout the construction period, depending on the activity. The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. Construction truck routes to and from the site for contractor personnel, supplies, materials, and removal of excavations required for the development will be coordinated with BTD. Traffic logistics and routing will be planned to minimize community impacts. Truck access during construction will be determined by the BTD as part of the CMP. These routes will be mandated as a part of all subcontractors' contracts for the development. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity.

"No Idling" signs will be included at the loading, delivery, pick-up and drop-off areas.

4.11.8 Construction Air Quality

The Proponent will strive to minimize diesel emissions during construction of the proposed development and will seek to ensure that contractors comply with all applicable federal and state regulations (including MassDEP regulations at 310 CMR 7.09) related to air quality and construction vehicle emissions.

Specific measures to be taken to reduce diesel emissions and other construction related air quality impacts include the following measures:

- Using equipment retrofitted with diesel emissions control devices to the greatest extent practicable. The majority of the heavy equipment that has been operating on the site thus far has been retrofitted with diesel emissions control devices.

- Maintaining an "idle free" work zone of fossil fuel trucks and equipment by providing supplemental electrical hoisting and pumping equipment along with "just-in-time" delivery methods. On-site idling is limited to five minutes. "Do Not Idle" signs will be posted at appropriate locations.

- Locating combustion engines away from sensitive receptors such as fresh air intakes, air conditioners and windows.

- Using Ultra Low Sulfur Diesel for all trucks and construction machinery as required by the U.S. EPA.

Short-term air quality impacts from fugitive dust may be expected during excavation and the early phases of construction. Plans for controlling fugitive dust during demolition, excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The

construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts, pursuant to this Article 80 approval. These measures are expected to include:

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing spoils on the construction site;
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on the site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

4.11.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project. Increased community sound levels, however, are an inherent consequence of construction activities. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

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

- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

4.11.10 Construction Vibration

All means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

4.11.11 Construction Waste

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

4.11.12 Protection of Utilities

Existing public and private infrastructure located within the public right-of-way will be protected during construction. The installation of proposed utilities within the public way will be in accordance with the MWRA, BWSC, Boston Public Works, Dig Safe, and the governing utility company requirements. All necessary permits will be obtained before the commencement of the specific utility installation. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer and drain facilities will be reviewed by BWSC as part of its site plan review process.

4.11.13 Rodent Control

A rodent extermination certificate will be filed with each building permit application for the Project. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for each phase of the Project, in compliance with the City's requirements.

4.11.14 Wildlife Habitat

The Project Site is in an established urban neighborhood. There are no wildlife habitats in or adjacent to the Project Site.

Chapter 5.0

Sustainable Design and Climate Change Preparedness

5.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE PREPAREDNESS

5.1 Sustainable Design

The Project's location within a heavily urbanized area means that it will have only minimal impact on existing infrastructure. Because of its proximity to mass transit as well as vehicular access to highways, the Project supports the objectives of smart growth (i.e., new development at existing nodes of excellent transportation facilities).

Energy conservation and other sustainable design measures will be integral to the Project. The building will employ, where possible, energy and water efficient features for mechanical, electrical, architectural, and structural systems and assemblies. Sustainable design elements relating to building energy management systems, lighting, recycling, conservation measures, regional building materials, and clean construction vehicles will be included, as practicable.

To comply with Article 37 of the Code, the Proponent intends to measure the results of their sustainability initiatives using the framework of the Leadership in Energy and Environmental Design (LEED) rating system. As new construction for hotel, residential, retail and restaurant uses, the Project will use the LEED V3 NC 2009 (New Construction) to show compliance with Article 37. The LEED rating system tracks the sustainable features of a project by achieving points in the following categories: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation in Design.

A LEED checklist is included at the end of this section, and shows the credits the Project anticipates achieving. The checklist will be updated regularly as the design develops and engineering assumptions are substantiated. Presently, 51 points have been targeted, not including any of the potential Boston Zoning Code Article 37 points. Please note that this is an initial credit checklist and applicable credits may change as the building design advances. Points that are still being studied and marked as "maybe" on the LEED checklist are italicized below.

Sustainable Sites

The Project site is located in the Brighton neighborhood of Boston, a dense urban neighborhood with access to multiple MBTA bus lines and will be one block away from the Boston Landing commuter rail station scheduled to be completed in 2016.

Prerequisite 1: Construction Activity Pollution Prevention. The Project construction documents will include erosion and sedimentation control guidance for onsite implementation by the Construction Manager (CM). The CM is required to implement a

compliant erosion and sedimentation control plan that meets local requirements and the U.S. Environmental Protection Agency (EPA) Construction General Permit (Phase I and II) of the National Pollutant Discharge Elimination System (NPDES) Program.

Credit 1: Site Selection. The Project site is a previously developed urban parcel in a densely developed neighborhood. The parcel does not meet any of the prohibited development site criteria.

Credit 2: Development Density. The Project meets the criteria for Option 2, Community Connectivity. The immediate neighborhood has more than ten services with pedestrian access including a grocery store, restaurants, playgrounds and childcare facilities.

Credit 3: Brownfield Redevelopment. A comprehensive hazardous materials survey will be conducted prior to construction. Hazardous materials abatement will be performed in accordance with applicable, locale, state and federal regulations, as necessary.

The Project site is subject to the Massachusetts Contingency Plan (MCP) due to the presence of impacted soil and groundwater above applicable standards. Constituents of concern include low-level chlorinated volatile organic compounds (CVOCs) in groundwater, as well as, metals and polycyclic aromatic hydrocarbons (PAHs) in soil at concentrations exceeding MCP Reportable Concentrations (RCs). As such, the excavated soils will be pre-characterized prior to off-site disposal or off-site reuse. Soil and groundwater will be managed and disposed of in accordance with the Release Abatement Measure (RAM) Plan and local, State and Federal regulations. Groundwater will be managed and disposed of in accordance with the RAM Plan.

Credit 4.1: Alternative Transportation – Public Transportation Access. There are several bus routes that run in close proximity to the site and/or will originate at the new commuter rail station located less than 1 mile away. The Project complies with Option 2; it is located within 1/4-mile (400 meter) walking distance (measured from a main building entrance) of one or more stops for two or more public bus routes. Additionally, there is a new commuter rail station under construction that will be one block away from the Project.

Credit 4.2: Alternative Transportation – Bicycle Storage and Changing Rooms. Exterior bike storage locations for visitors, retail transients and employees will be incorporated into the site design. The residents will have access to a minimum of 295 covered and enclosed secure bike storage locations within the ground floor parking structure. The Project team is exploring providing two shower/changing rooms for employees. Additionally 22 exterior short-term bike storage locations may be provided.

The 22 exterior bike racks for the visitors and employees meets the 5% required quantity for full time employees, retail visitors, and estimated visitors to the building tenants.

The quantity of secure interior bike storage locations for total building residents exceeds the 15% requirement for residential projects. There is one bike storage location provided for each residential unit.

Credit 4.3: Alternative Transportation – Low-Emitting and Fuel-Efficient Vehicles. The parking structure will include parking spaces for low-emitting/fuel-efficient vehicles and electric vehicle (EV) charging stations for 5% of the total parking capacity of the on-site parking.

Credit 4.4: Alternative Transportation – Parking Capacity. The quantity of parking spaces provided for the Project does not exceed the quantity required by the local zoning regulations. The infrastructure for a ride share program will be implemented for the building residents, including a safe drop off area and ride boards.

Credit 5.2: Site Development – Maximize Open Space. The amount of open space provided will likely meet the credit requirements. Compliance confirmation will be dependent on the final location of the LEED Project Boundary. The open space includes landscaped terraces, street tree landscaping, pedestrian oriented hardscape and a vegetated roof.

Credit 6.1 and 6.2: Stormwater Design. A stormwater management system will be designed to address the rate, volume, and quality of stormwater runoff leaving the site. The Project will employ a subsurface infiltration system designed to infiltrate a minimum of 1″ of runoff over the entire Project area. The Project will also feature low impact design techniques such as landscaped areas and tree filter boxes to further reduce the volume and pollutant loading of the runoff leaving the site. The proposed stormwater design will result in a runoff volume reduction of greater than 25% for the 2-year design storm, and reductions of varying extent for all larger precipitation events.

Additionally, the Project is located within the Charles River watershed, therefore total suspended solids (TSS) reduction is critical prior to the release of stormwater to the storm drain system. TSS reduction will be achieved through the use of deep sump catch basins and a Stormceptor water quality unit.

Credit 7.1: Heat Island Effect – Non-roof. All parking provided is located within the footprint of the building and below the landscaped courtyard.

Credit 7.2: Heat Island Effect – Roof. The Project will specify and install a TPO roof membrane that is an energy star compliant roof material, with an SRI value of 78 or greater. It will be used in combination with a vegetated roof plaza located over the second level of parking.

Water Efficiency

The Project will specify low flow and high efficiency plumbing fixtures within the residential units to reduce the amount of potable water used throughout the building. The irrigation system will be disconnected after an 18 month establishment period.

Prerequisite 1 and Credit 3: Water Use Reduction. Through the specification of low-flow, high-efficiency plumbing fixtures, the Project will exceed the required 20% annual potable water use reduction and will target reducing the annual potable water use by over 30%.

Credit 1.2: Water Efficient Landscaping. The landscape design for the roof terrace shall endeavor to include predominantly native shrub, ornamental grass and groundcover plantings. The plant palette and soil depth respond to the amount of available sunlight across the roof throughout the year. To limit the amount of additional irrigation, drought tolerant native and adapted species have been selected where possible. The irrigation design for the vegetated roof reduces potable water use demand for irrigation by over 50%. The irrigation design for the at-grade plantings will also be designed to reduce potable water use for irrigation by over 50%.

Energy and Atmosphere

The building systems will be designed to optimize energy performance and reduce energy consumption. The Project will have a central condenser water plant and a central boiler plant with high efficiency equipment. The residential units will be mechanically ventilated and have operable windows for convenience. The targeted lighting power density will be below minimum code requirements. A Building Management System (BMS) will be provided to control and monitor all central mechanical equipment only such as mechanical/electrical room ventilation, and corridor ventilation units.

Prerequisite 1: Fundamental Commissioning. A third party commissioning agent, (CxA) will be engaged by the owner for purposes of providing basic commissioning services for the building energy related systems including HVAC & R, lighting and domestic hot water systems. The CxA will verify the building systems are installed, calibrated and perform to the building owners project requirements through verification and performance reviews of the systems to be commissioned. The commissioning agent will provide a summary report.

The following systems will be included in the commissioning scope of work:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems;
- HVAC controls;
- Lighting controls; and
- Domestic hot water systems.

Prerequisite 2 and Credit 1: Energy Performance. This prerequisite will be met through a high performing building envelope with a maximum of 40% glazing, efficient mechanical equipment and low lighting power density targets. Applicable appliances installed in the apartment units including microwave, dishwasher, refrigerator, and clothes washer, will be evaluated for Energy Star ratings.

To document the anticipated annual energy use savings, the Project will develop a whole building energy simulation. The preliminary energy model results currently indicate an approximate 12% improvement in annual operating energy cost when compared to the baseline building performance as calculated using the rating method in Appendix G of ANSI/ASHREA/IESNA Standard 90.1-2007 The energy model will be updated at milestone document releases during the design phases of the Project.

Prerequisite 3: Fundamental Refrigerant Management. The specifications for refrigerants used in the building HVAC & R systems will NOT permit the use of CFC based refrigerants. The proposed design of the HVAC systems will achieve this prerequisite. The ERV units, Heat Pump units and Split AC units use refrigerant type 410A.

Credit 3: Enhanced Commissioning. The Proponent may engage the commissioning agent for additional commissioning services to ensure additional systems are operating at anticipated levels and meet the requirements of this credit.

Credit 5: Measurement and Verification. The Project plans to pursue this credit for one credit point through compliance with MPR #6 Option 3 - Third Party Data Source:

The owner will establish an Energy Star Portfolio Manager account to enable the USGBC to review whole building energy and water use for five years after occupancy.

Credit 6: Green Power. The Proponent is exploring the possibility of purchasing 'green power' for a 2-year period with a renewable energy contract to provide a minimum of 35% of the building's electricity from renewable sources.

Materials and Resources

The Project will specify materials and products with recycled content, and those made with certified wood and regionally procurable products to the extent possible. Throughout the construction phase of the Project, the Construction Management team will endeavor to divert Construction and Demolition (C&D) waste from area landfills and procure materials that are made with FSC-certified wood, have recycled content and/or are harvested, extracted and manufactured within 500 miles of the Project site.

Prerequisite 1: Storage and Collection of Recyclables. The storage of collected recyclables is accommodated in a dedicated trash and recycling room on the ground floor of the Project adjacent to the loading dock area. The residents and retail tenants will be independently responsible for bringing their collected recyclables to the central trash/recycling room. They will be transported off site by a contracted waste management company on a regular basis.

Credit 2: Construction Waste Management. The Project manual will include direction for the CM to develop and implement a Construction Waste Management Plan (CWMP). The CM will endeavor to divert as much demolition debris and construction waste from area landfills as possible with a minimum diversion rate target of 75% overall.

Credit 4: Recycled Content. The technical specifications will require certain materials and/or products to include pre- and/or post-consumer recycled content. The Project will endeavor to achieve a target threshold of 10% of the materials and products installed to be materials with recycled content based on overall Project materials costs. *The construction manager will be required to track the submitted and installed materials with a goal of achieving the 20% recycled content materials threshold for an additional LEED point.*

Credit 5: Regional Materials. The technical specifications will require applicable materials and products to be extracted, harvested, recovered and manufactured within a 500 mile radius of the site. The Project will endeavor to meet a threshold of 10% of the materials and products installed to be regional materials. *The construction manager will be required to track the submitted and installed materials and products with a goal to achieve the 20% threshold.*

Credit 7: Certified Wood. The Project specifications will include direction for wood materials to be from FSC certified forests and from compliant manufacturers and millwork shops. The construction manager will track the submitted and installed wood materials and products with a goal to achieve the 50% (by cost) threshold based on overall wood materials costs.

Indoor Environmental Quality

The interior air quality will be monitored during the construction phase of the Project and prior to occupancy. Low emitting materials, (low VOC), will be used throughout construction to maintain and improve air quality. The building residents will be able to maintain a comfortable interior environment through access to thermal and lighting controls. The residential units are laid out to maximize exposure to daylight and views.

Prerequisite 1: Minimum Indoor Air Quality. The Project will be designed to meet ASHRAE 62.1 Ventilation rate requirements for each mechanically ventilated space.

Prerequisite 2: Environmental Tobacco Smoke (ETS) Control. The entire building and the associated site will be non-smoking. This policy will be enforced through posted signage.

Credit 1: Outdoor Air Delivery Monitoring. The Project ventilation approach will include permanent airflow measuring stations to ensure adequate outdoor airflow is continually provided to densely occupied spaces.

Credit 3.1: Construction Indoor Air Quality Management Plan – During Construction. The Project manual will include direction for the CM to develop and implement a compliant Indoor Air Quality Management Plan for the construction phase of the Project to meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter3). The permanently installed air handlers will not be operated during construction.

Credit 4.1: Low-Emitting Materials – Adhesives and Sealants. The technical specifications for adhesives and sealants used inside the building envelope will include requirements for compliance with the low VOC criteria for adhesives and sealants as established in the South Coast Air Quality Management District (SCAQMD) Rule #1168.

Credit 4.2: Low-Emitting Materials – Paints and Coatings. The technical specifications will include requirements for paints and coatings to meet low-VOC criteria for paints and coatings in accordance with applicable sections of Green Seal Standard GS-11, Green Seal Standard GC-03 and SCQAMD Rule #1113.

Credit 4.3: Low-Emitting Materials – Flooring Systems. The technical specifications will include compliant flooring materials that meet the applicable requirements of FloorScore certification or the Carpet Rug Institute Green label program.

Credit 4.4: Low-Emitting Materials – Composite Wood. The technical specifications will include composite wood and agrifiber products that contain no added urea-formaldehyde.

Credit 5: Indoor Chemical and Pollutant Source Control. The Project team will endeavor to include the appropriate design measures to minimize and control the entry of pollutants into the building and to contain chemical use areas. Circulation spaces, lobbies and amenity spaces will be served by dedicated air handling units which will include MERV 13 final filtration media. Regularly used building entries will have entrance way systems to capture dirt and particulate matter entering the building and the design of janitors closets will be compliant.

Credit 6.1: Controllability of Systems – Lighting. Residential lighting controls will be as follows: Entries, kitchens and baths will have switched fixtures and the living room and bedrooms will be provided with switched controlled receptacles. Offices and similar back of house spaces will be provided with occupancy sensors. Electrical and mechanical rooms will be provided with a local switch control. Residential corridors, amenity spaces, fitness center and lobby will be provided with occupancy sensors.

Credit 6.2: Controllability of Systems – Thermal Comfort. The bedrooms will have operable windows and there will be at least one thermostat per unit; the total percentage of individual controls will exceed the required 50%. All living rooms in the apartment have thermostats. Each multi-occupant area on first floor is provided with an individual thermostat. Total percentage of multi-occupant areas having thermal control is 100%.

Credit 7.1: Thermal Comfort – Design. The residential thermal controls will include thermostats and operable windows. All multi occupant amenity spaces will be provided with a minimum of one control. Management office spaces will have thermostats.

Credit 8.2: Daylight and Views – Views. The residential units will have large windows with ample access to daylight and views. It is expected that 90% of the regularly occupied areas will have a view to the exterior.

Innovation in Design

The team has identified several possible ID credits listed below, (limited to five ID credits total):

Credit 1.1: Exemplary Performance – SSc4.1 Alternative Transportation. The Project is located within ¼ mile of two or more bus stops that provide over 200 transit rides per day including weekends.

Credit 1.2: Exemplary Performance – SSc7.2 Heat Island Effect, Roof. The Project provides 100% of parking under cover.

Credit 2: LEED Accredited Professional. There are several LEED APs on the Project team.

Regional Priority Credits

The USGBC has identified the following credits as Regional Priority credits for the project site: SSc3, SSc6.1, SSc7.1, SSc7.2, EAc2, and MRc1.1. The Project anticipates meeting the base credit requirements for SSc3, SSc6.1, SSc7.1 and SSc7.2

5.2 Climate Change Preparedness

5.2.1 Introduction

The Project team examined two areas of concern related to climate change: drought conditions and increased number of high-heat days. Due to the Project's location, elevation and topography, the Project Site is not considered susceptible to the impacts of a reasonably-assumed sea level rise. It is also unlikely to experience extreme flooding in the case of large storms. However, the Project will be designed to adapt to extreme weather events, should the need arise.

Specifically, the building will be equipped with on-site backup electrical generators that will allow the building to remain occupied for an extended period of time. These generators and other mission critical services will be raised several floors above the ground plane to ensure that they remain operational even in the case of flooding.

A copy of the preliminary Climate Change Checklist is included in Appendix D.

5.2.2 Drought Conditions

Under a global high emissions scenario that would increase the potential climate change impacts, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, the landscape design is anticipated to incorporate native and adaptive plant materials which require low or no irrigation and are known for their ability to withstand adverse conditions. Plumbing fixtures will be specified to achieve a reduction in water use through low-flow water-closets, low-flow showers, and low-flow sinks.

5.2.3 High Heat Days

The Intergovernmental Panel on Climate Change (IPCC) has predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from the current five-to-twenty days annually, to thirty-to-sixty days annually[1]. Energy conservation and other energy management building systems will be integral components of the Project.

The Project design will incorporate a number of measures to minimize the impact of high temperature events. The building will feature a high efficiency building envelope, the building's exterior skin will be tuned to its solar orientation, and the Project will specify a high albedo roof to minimize the heat island effect.

[1] IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Avery, M. Tignor, and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, UK, and New York, 996 pp.

LEED for New Construction and Major Renovation 2009
Project Scorecard

Project Name: Boston Landing Residential
Project Address: 125 Guest Street
Date : 11/18/15

Phase	Yes	?	No		LEED Goal:
	23	1	2	**Sustainable Sites**	26

C	Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
D	1			Credit 1	**Site Selection**	1
D	5			Credit 2	**Development Density & Community Connectivity**	5
D	1			Credit 3	**Brownfield Redevelopment**	1
D	6			Credit 4.1	**Alternative Transportation,** Public Transportation Access	6
D		1		Credit 4.2	**Alternative Transportation,** Bicycle Storage & Changing Rooms	1
D	3			Credit 4.3	**Alternative Transportation,** Low-Emitting & Fuel-Efficient Vehicles	3
D	2			Credit 4.4	**Alternative Transportation,** Parking Capacity	2
C			1	Credit 5.1	**Site Development,** Protect or Restore Habitat	1
D	1			Credit 5.2	**Site Development,** Maximize Open Space	1
D	1			Credit 6.1	**Stormwater Design,** Quantity Control	1
D	1			Credit 6.2	**Stormwater Design,** Quality Control	1
C	1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
D	1			Credit 7.2	**Heat Island Effect,** Roof	1
D			1	Credit 8	**Light Pollution Reduction**	1

Yes	?	No		
4	1	5	**Water Efficiency**	10

D	Y			Prereq 1	**Water Use Reduction, 20%** Reduction	Required
D	2		2	Credit 1	**Water Efficient Landscaping**	4
D			2	Credit 2	**Innovative Wastewater Technologies**	2
D	2	1	1	Credit 3	**Water Use Reduction**	2 to 4

Yes	?	No		
2	8	24	**Energy & Atmosphere**	35

C	Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
D	Y			Prereq 2	**Minimum Energy Performance**	Required
D	Y			Prereq 3	**Fundamental Refrigerant Management**	Required
D	1	5	13	Credit 1	**Optimize Energy Performance**	1 to 19
D			7	Credit 2	**On-Site Renewable Energy**	1 to 7
C		1		Credit 3	**Enhanced Commissioning**	2
D			2	Credit 4	**Enhanced Refrigerant Management**	2
C	1		2	Credit 5	**Measurement & Verification**	3
C		2		Credit 6	**Green Power**	2

Yes	?	No		
4	3	7	**Materials & Resources**	14

D	Y			Prereq 1	**Storage & Collection of Recyclables**	Required
C			3	Credit 1.1	**Building Reuse - Maintain Existing Walls, Floors, and Roof**	1 to 3
C			1	Credit 1.2	**Building Reuse - Maintain 50% of Interior Non-Structural Elements**	1

C	1			Credit 2.1	**Construction Waste Management,** Divert 50% from Disposal	1
C	1			Credit 2.2	**Construction Waste Management,** Divert 75% from Disposal	1
C			1	Credit 3.1	**Materials Reuse, 5%**	1
C			1	Credit 3.2	**Materials Reuse,10%**	1
C	1			Credit 4.1	**Recycled Content, 10%** (post-consumer + ½ pre-consumer)	1
C		1		Credit 4.2	**Recycled Content, 20%** (post-consumer + ½ pre-consumer)	1
C	1			Credit 5.1	**Regional Materials, 10%** Extracted, Processed & Manufactured Regionally	1
C		1		Credit 5.2	**Regional Materials, 20%** Extracted, Processed & Manufactured Regionally	1
C			1	Credit 6	**Rapidly Renewable Materials**	1
C		1		Credit 7	**Certified Wood**	1

Yes	?	No		
10	1	4	**Indoor Environmental Quality**	15

D	Y			Prereq 1	**Minimum IAQ Performance**	Required
D	Y			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
D	1			Credit 1	**Outdoor Air Delivery Monitoring**	1
D			1	Credit 2	**Increased Ventilation**	1
C	1			Credit 3.1	**Construction IAQ Management Plan,** During Construction	1
C			1	Credit 3.2	**Construction IAQ Management Plan,** Before Occupancy	1
C	1			Credit 4.1	**Low-Emitting Materials,** Adhesives & Sealants	1
C	1			Credit 4.2	**Low-Emitting Materials,** Paints & Coatings	1
C	1			Credit 4.3	**Low-Emitting Materials,** Flooring Systems	1
C	1			Credit 4.4	**Low-Emitting Materials,** Composite Wood & Agrifiber Products	1
D		1		Credit 5	**Indoor Chemical & Pollutant Source Control**	1
D	1			Credit 6.1	**Controllability of Systems,** Lighting	1
D	1			Credit 6.2	**Controllability of Systems,** Thermal Comfort	1
D	1			Credit 7.1	**Thermal Comfort,** Design	1
D			1	Credit 7.2	**Thermal Comfort,** Verification	1
D			1	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
D	1			Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

Yes	?	No		
4	2	0	**Innovation & Design Process**	6

D	1			Credit 1.1	**Innovation in Design: Exemplary Performance SSc4.1**	1
D	1			Credit 1.2	**Innovation in Design: Exemplary Performance SSc7.1**	1
D	1			Credit 1.3	**Innovation in Design: To be determined**	1
D		1		Credit 1.4	**Innovation in Design: To be determined**	1
C		1		Credit 1.5	**Innovation in Design: To be determined**	1
D	1			Credit 2	**LEED® Accredited Professional**	1

Yes	?	No		
4	0	0	**Regional Priority Credits**	4

SSc3, SSc6.1, sSc7.1, SSc7.2, EAc2, MRc1.1

1			Credit 1.1	**Regional Priority Credit: SSc3**	1
1			Credit 1.2	**Regional Priority Credit: SSc6.1**	1
1			Credit 1.3	**Regional Priority Credit: SSc7.1**	1
1			Credit 1.4	**Regional Priority Credit: SSc7.2**	1

Yes	?	No		
51	16	42	**Project Totals (Certification Estimates)**	110

Not Certified Certified: 40-49 points, **Silver:** 50-59 points, **Gold:** 60-79 points, **Platinum:** 80+ points

Chapter 6.0

Urban Design

6.0 URBAN DESIGN

6.1 Vision

Boston Landing is a 1.76 million square-foot transit-oriented, mixed-use district of residential, office, sports uses, hotel, and ground floor retail with over 1.4 acres of publicly accessible open spaces, active pedestrian streets and distinguished architectural character. The Project site, located on Guest Street, will play a vital role in the development by generating the continuous activity to support a vibrant 24/7 neighborhood where people can live where they work and play.

6.2 Existing Urban Context

Boston Landing is a development in the neighborhood known as the Allston Brighton Guest Street district. Defined by the rail lines to the north, Market Street to the west, North Beacon to the south and Everett Street to the east, the area remained relatively unchanged for almost century. During the nineteenth century, the district grew around the robust commercial railroad transportation system owned and operated by the Boston and Albany Railroad Company. Connectivity to the rail yard spawned significant industrial activity, particularly the meat processing industry. Prior to the introduction of the Massachusetts Turnpike (I-90) in the 1960's, the district was dominated by large stockyard buildings with footprints in the excess of four acres and building facades exceeding 500 linear feet. By the time the Massachusetts Turnpike was constructed, the stockyards were gone and the district had been transformed into an area defined by warehouse and light industrial uses. Due to its industrial nature, the district never developed a true urban street grid. Instead, it primarily relied on service roads and driveways to provide access to the industrial buildings that dominated the area.

The Boston Landing development has created a new urban fabric by strengthening the street grid, providing open space and improving the pedestrian experience. The development is composed of a mix of uses including three office buildings, 80,000 sf of retail, hotel, New Balance World Headquarters, sports facility, public ice arena and Boston Bruins new training facility (Warrior Ice Arena), 16,000 sf fitness club (NB Fitness), both below-grade and above-grade parking, and the new Boston Landing at Allston Brighton MBTA Commuter Rail Station. The architectural character exemplifies a forward-thinking, innovative, and contemporary approach that will create a distinctive identity for the neighborhood. The residential building will bring '24-7' life to the area, contributing to a dynamic, 'live-work-play' urban neighborhood.

6.3 Urban Design Principles

The design of the Project embodies several key urban design principles specific to the Guest Street district and the Project site, which include:

- Increase connectivity of the district with improved pedestrian, bicycle and vehicular access into, through and around the site.
- Encourage connectivity to public transportation.
- Foster an active, pedestrian friendly Guest Street corridor.
- Realize building forms that recognize and respond to the scale and character of the surrounding uses within the district.
- Create a variety of uses which encourage commercial and residential activity.
- Continue the development of an urban street grid throughout the district.

6.4 Architecture and Building Massing

The Project will introduce high-quality architecture consistent with the guidelines of the Development. The geometry of the building will provide a strong urban street wall along Guest Street, Arthur Street and the future Hichborn Street Extension. The ground floor will include continuous glazed retail and active uses along Guest Street. The retail base will be reinforced with projecting architectural elements to mark entries and provide signage for retail tenants (see Figure 6-1).

The building massing will respond to the context of the surrounding buildings and express appropriate scale. Divided into two parts, a lower horizontal podium and a tower will front Guest Street with the long side of the tower oriented along the future Hichborn Street Extension. The tower will be articulated with vertical breaks and projections. The podium will include horizontal setbacks and varying projections on the end of the building near Arthur Street (see Figure 6-2). The building facades will be composed using varying shades of brick and metal cladding and will be animated by a variety of window types (see Figure 6-3).

6.5 Public Realm

The Project is located on Guest Street between Hichborn Street Extension to the west and Arthur Street to the east. The Project will reinforce the Guest Street corridor and the vibrant pedestrian-oriented character of the district by providing a continuous street wall along Guest Street, street-level retail and active uses, streetscape improvements and landscaping. Pedestrian activity will be both enhanced and generated by retail at the street level and by residents who will live in the apartments above. Residents and retail guests will have access to Athletes Park opposite the Project site on Guest Street and the Boston Landing MBTA Commuter Rail Station. Arthur Street will provide pedestrian linkage to the neighborhood to the south.

The Guest Street corridor is the focal point of the district as a whole. The streetscape will include two vehicular travel lanes, two bicycle lanes, parallel parking, and wide pedestrian friendly sidewalks along both sides of the street. The Project will include active street level uses along Guest Street including retail, restaurants, and residential amenities and entries. The street will be well landscaped with trees and street furniture. The street scape along the future Hichborn Street Extension and Arthur Street, at the Project site, will be consistent with the Boston Landing Streetscape Guidelines and the Boston Transportation Department's Complete Streets guidelines.

125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

ELKUS | MANFREDI ARCHITECTS

Figure 6-1

View of Guest Street Looking West

125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

ELKUS | MANFREDI ARCHITECTS

Figure 6-2

View from Arthur Street

125 Guest Street Boston, Massachusetts

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

ELKUS | MANFREDI ARCHITECTS

Figure 6-3

View to the North from Arthur Street

Chapter 7.0

Historic and Archaeological Resources

7.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This section identifies and describes the existing buildings on and within the vicinity of the Proposed Project site and evaluates the potential impacts that the Proposed Project may have on these resources.

7.1 Buildings on the Proposed Project Site

A review of the Massachusetts Historical Commission (MHC) and Boston Landmarks Commission (BLC) files indicates the Project site does not contain any structures that are listed in the State or National Register of Historic Places, listed as Boston Landmarks, or included in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inventory).

The Project encompasses an approximately 81,665 sf site that was the former location of the B.L. Makepeace headquarters. The ca. 1955 industrial building was the subject of an Article 85 (Demolition Delay) application (No. 15.386D1859) by the owner, Boston Landing LLC, to demolish the building. On September 11, 2014, the BLC determined that the building was not a significant structure under the Criteria for determining significance in Section 85-5.3(a-e) of the Demolition Delay ordinance. The demolition was undertaken at the end of 2014.

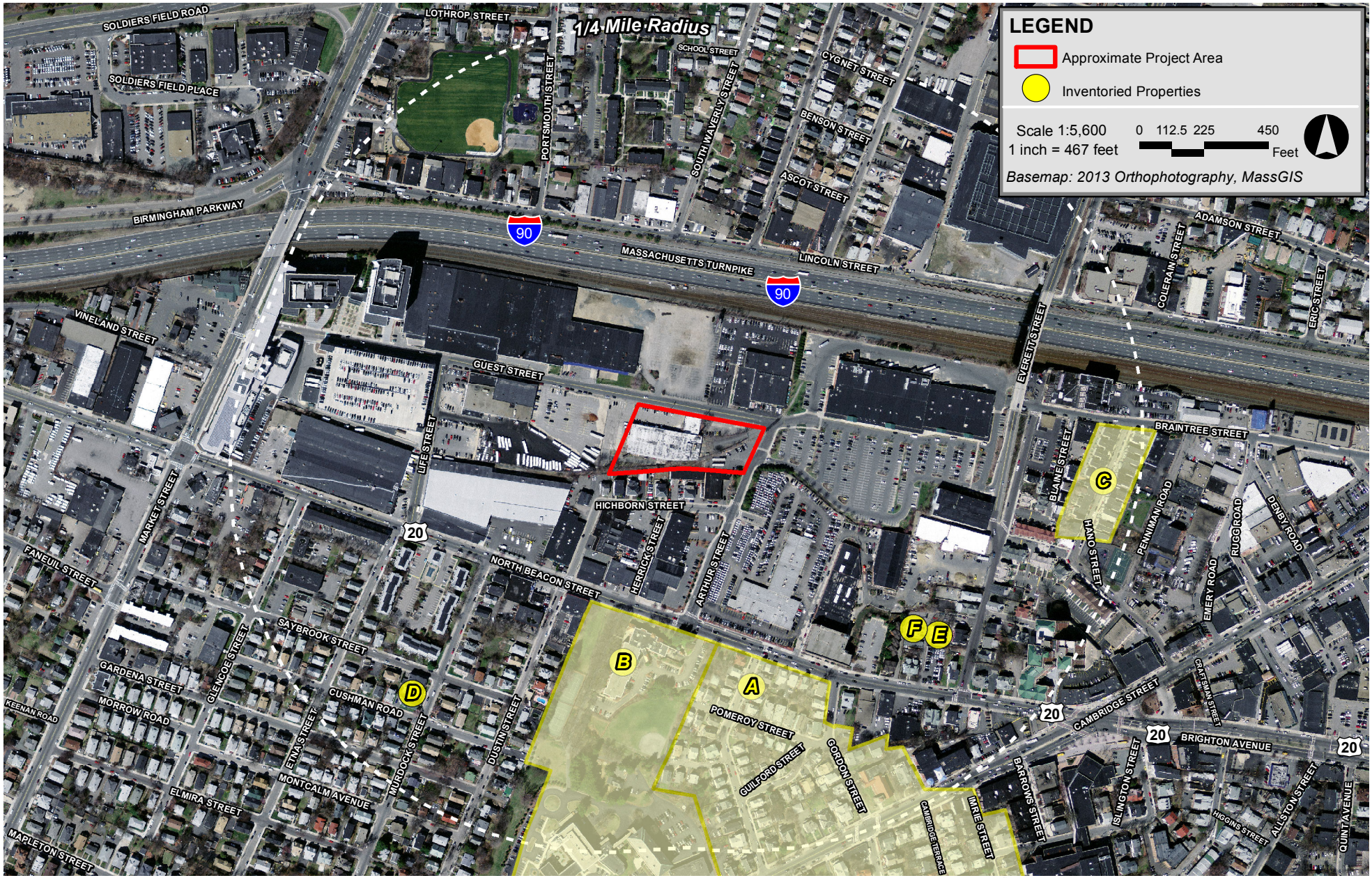
7.2 Historic Resources in the Proposed Project Vicinity

A review of the MHC and BLC files identified two inventoried areas and three inventoried properties within an approximately one-quarter mile radius of the Project site. The Allston Heights Area, Hano Street Area, and Mount Saint Joseph Academy, listed in the Inventory, are located south of the Project site on the opposite side of North Beacon Street. The former Alexander Fraser triple-decker at 112 Murdock Street is located south of the Project site. The Thomas Sinclair House at 1 Sinclair Road and the Jedediah Tracy House at 2 Sinclair Road are located to the southeast of the Project site. The properties are listed in Table 7.1 and identified on Figure 7.1.

Table 7-1 Historic Resources in the Vicinity of the Project

Map ID	Property	Address
Properties included in the Inventory of Historic and Archaeological Assets of the Commonwealth		
A	Allston Heights Area	North Beacon, Cambridge, Ridgemont Streets
B	Mount Saint Joseph Academy	North Beacon, Rooney, Cambridge Streets
C	Hano Street Area	Hano Street
D	Alexander Fraser House	112 Murdock Street
E	Thomas Sinclair House	1 Sinclair Road
F	Jedediah Tracy House	2 Sinclair Road

G:\Projects2\MA\Boston\3144\2015 MXD's\historic_resources_UPDATED_2015_10_14.mxd



125 Guest Street Boston, Massachusetts

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

Epsilon ASSOCIATES INC.

Figure 7-1
Historic Resources

7.3 Archaeological Resources

The Project site consists of a previously developed urban parcel. No archaeological resources have been identified on the Project site. Due to previous development activities and disturbances, it is not anticipated that the site contains significant archaeological resources.

7.4 Impacts to Historic Resources

Historic resources in the vicinity of the Project area are limited to two inventoried areas and three inventoried properties. The areas and properties are separated from the Project site by industrial development and residential neighborhoods to the south and east. The proposed Project is not anticipated to have any direct or indirect construction, noise, wind, or shadow impacts on significant historic resources in the vicinity of the site.

7.4.1 Urban Design

The Project is an approximately 311,000 sf, 17-story mixed-use U-shaped building that will include approximately 16,000 sf of retail space on the ground floor and 295 residential units on the upper floors. The remaining ground floor area of approximately 39,000 sf will include residential amenity spaces, including a lobby, mail room, fitness room, conference room, mechanical vehicle and bike parking, loading dock, service and similar functions. The Project will include approximately 155 dedicated residential parking spaces spread among one level of at-grade parking and one level of above-grade parking, both floors hidden as a landscaped courtyard will act as a roof above the parking floors.

This building is located within a transitional zone between the larger scale industrial buildings along the Massachusetts Turnpike, and the smaller two-to-four-story residential buildings in the Allston and Brighton neighborhoods. The Project has been designed to take into consideration the industrial characteristics of the surrounding area, but will be executed in a manner that clearly reads as new construction. The introduction of ground floor commercial space, combined with the addition of street trees and sidewalks along Guest Street will enhance the overall pedestrian experience.

7.5 Status of Project Reviews with Historical Agencies

Boston Landmarks Commission Review

The submission of this PNF initiates review of the Project by the BLC under the City's Article 80 Review process.

Boston Landmarks Commission Article 85 Review

On September 11, 2014, the BLC staff determined that the former commercial building at 125 Guest Street was not a significant building under the Criteria for determining significance in Section 85-5.3 (a-e) of the Demolition Delay Ordinance (Article 85, Chapter 665 of the Acts of 1956 as amended). No further review by the BLC under Article 85 is required.

Massachusetts Historical Commission State Register Review

At this time, no state or federal funding, licensing, permits and/or approvals requiring review by the Massachusetts Historical Commission (MHC) are anticipated. However, if a state or federal action is identified as required for the Project, a MHC Project Notification Form will be filed for the Project in compliance with State Register Review (950 CMR 71.00) and/or Section 106 of the National Historic Preservation Act (36 CFR 800).

Chapter 8.0

Infrastructure

8.0 INFRASTRUCTURE

This section discusses the existing and proposed utility infrastructure systems that will support the Project. As part of the overall Boston Landing project, all utilities within Guest Street have been completely upgraded and re-built.

The proposed Project is located on the site of the former B.L. Makepeace headquarters building. The former utility service connections for the building have been capped at the street line and will not be used for the proposed Project.

This section will discuss the following utility infrastructure systems:

- Sanitary Sewer Service
- Water Service
- Electrical Service
- Telecommunications Service
- Gas Service

8.1 Wastewater

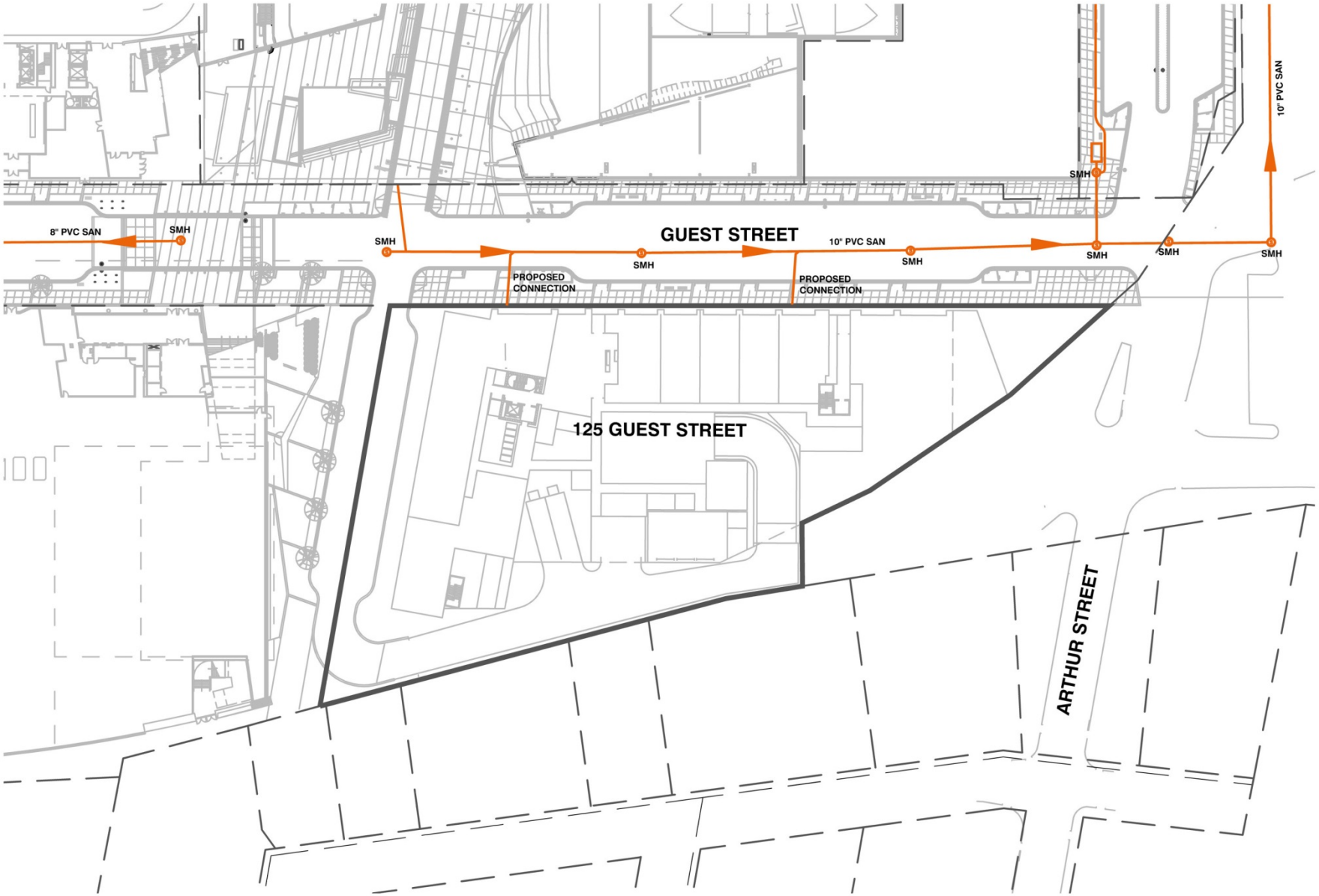
8.1.1 Existing Sanitary Sewer System

The Project site is served by a 10-inch gravity sanitary sewer main within the Guest Street right-of-way. This main flows in an easterly direction to the intersection of Guest Street and Arthur Street, which then turns north for a short distance, and then finally turns easterly behind the existing Stop & Shop building.

The main transitions from a 12-inch to a 15-inch pipe during the easterly run behind Stop & Shop. This main connects to a 28-inch by 42-inch brick structure that flows northerly within Everett Street, crosses under the MBTA tracks and the Massachusetts Turnpike, and continues to the north.

The existing sewer main is owned and operated by the Boston Water and Sewer Commission (BWSC). The main conveys sanitary flows to the system owned and operated by the Massachusetts Water Resources Authority (MWRA) which carries the flow to the Deer Island Wastewater Treatment Plant for final treatment and disposal.

The sanitary sewer infrastructure in the vicinity of the Project area is shown on Figure 8-1.



125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

BEALS · ASSOCIATES INC.

2 PARK PLAZA, SUITE 200, BOSTON, MA 02116
PHONE: 617-242-1120 FAX: 617-242-1190

Figure 8-1

Sanitary Sewer System

8.1.2 Project-Generated Sanitary Sewer Flow

The Project will consist of a new residential building with street-level retail and restaurants. The building will have a dedicated sanitary sewer service connection to the main. The property currently produces zero flow to the system, as the former on-site building has been demolished and no connections to the system currently exist. Table 8-1 below summarizes the new sanitary flows that are anticipated for the Project.

Table 8-1 Wastewater Generation

Proposed Use	Size/Total	Unit Flow	Total Flow
1-Bed Residential	224 units	110 gpd/unit	24,640 gpd
2-Bed Residential	55 Units	220 gpd/unit	12,100 gpd
3-Bed Residential	16 Units	330 gpd/unit	5,280 gpd
Retail[1]	5,000 sf	50 gpd/1000 sf	250 gpd
Restaurant	300 seats	35 gpd/seat	10,500 gpd
Subtotal			**52,770 gpd**

1 - The breakdown of retail and restaurant space has not yet been determined. In order to provide a conservative estimate of sanitary sewer flows, a program with the maximum amount of restaurant space was utilized.

The wastewater generation calculations are based on the requirements of 310 CMR 15.203 Massachusetts Department of Environmental Protection State Environmental Code. This document provides guidelines on calculating wastewater flows. While these flows are generally considered conservative values for new construction given current technologies in water demand and wastewater generation, they are the accepted standard for determination of permitting thresholds and hydraulic capacity design.

The above table indicates that the Project will increase the existing wastewater flow to the system by approximately 52,770 gallons per day.

8.1.3 Sanitary Sewer Connection

As noted above, the Project will direct wastewater flow to the existing BWSC main that runs easterly along Guest Street, behind the Stop & Shop building, and into the larger main within Everett Street. In order to connect to the system, BWSC will require Site Plan Approval for the new building.

8.1.4 Exterior Grease Traps

The Project will feature several restaurants in the street-level space along Guest Street. Cooking grease that gets washed off cooking appliances and kitchenware can cause significant issues in building drains and sanitary sewers if not collected properly. The BWSC regulations governing the use of sanitary and combined sewers and storm drains require properly installed and maintained grease traps in all food service establishments. Article 111, Section 15 of these regulations state that "Grease traps shall be required on sewers into which significant amounts of animal or vegetable fat, oil or grease may be discharged…" The Proponent is committed to installing external grease traps to capture and treat these types of wastes prior to discharge to the sanitary sewer main. These components have been installed throughout the Boston Landing project in all buildings containing food service establishments. The grease traps will feature a gasketed frame and cover to help prevent odor as well as an external vent that will be routed back through the building to vent at a discreet location.

8.1.5 Parking Garage Floor Drains

The parking structure for the proposed Project will feature one level of at-grade parking with a second level of above-grade parking. These areas will be drained via a series of floor drains that will be tied to laterals and directed to Oil Traps. The discharge from the Oil Traps will be directed to an ejector pit pump chamber which will direct the wastewater to the sanitary sewer system. It is anticipated that each floor of the garage structure will require one to two individual pump chambers.

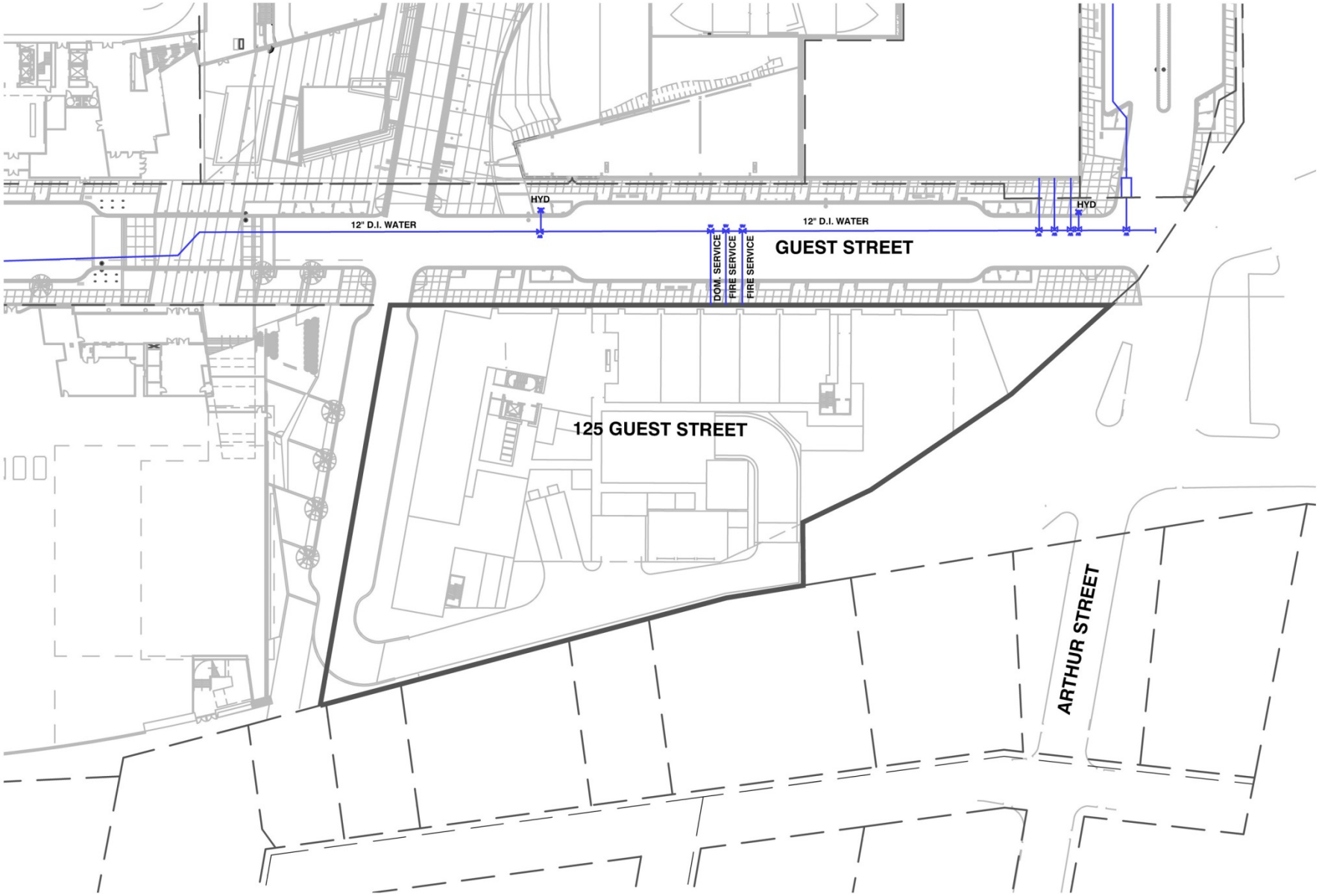
8.2 Water System

8.2.1 Existing Water Service

The water main servicing the property is owned and operated by BWSC. Water is purchased and supplied from MWRA. The MWRA water supply is considered an unlimited source from the Quabbin Reservoir in Central Massachusetts. Water to the Project vicinity is delivered via the BWSC Low Pressure System for Brighton. Guest Street is serviced by a 12-inch ductile iron main that is capped at the eastern end of Guest Street, just west of the railroad track spur adjacent to the Stop & Shop parcel.

The water infrastructure in the vicinity of the Project area is shown on Figure 8-2.

There are currently two hydrants along Guest Street in the vicinity of the Project site. Prior to Guest Street reconstruction, a former hydrant at the eastern end of Guest Street (located near the current easternmost hydrant) was tested by BWSC on October 17, 2012 with the following results:



125 Guest Street **Boston, Massachusetts**

THE HYM INVESTMENT GROUP, LLC

NB DEVELOPMENT GROUP

BOSTON LANDING

BEALS · ASSOCIATES INC.

2 PARK PLAZA, SUITE 200, BOSTON, MA 02116
PHONE: 617-242-1120 FAX: 617-242-1190

Figure 8-2
Water System

- Static Pressure: 64 psi
- Residual Pressure: 36 psi
- Total Flow 1,098 gpm
- Calculated Flow @ 20 psi: 1,402 gpm

8.2.2 Anticipated Water Consumption

The overall Project's estimated domestic water consumption can be calculated by applying a factor of 1.1 to the estimated wastewater generation calculations presented above. This will result in an additional 10% consumption that can be attributed to building cooling systems, overall system losses, and other consumption that is not converted into wastewater. The results of these calculations are presented below.

Table 8-2 Estimated Domestic Water Consumption from Proposed Uses

Proposed Use	Wastewater Flow	Scale Factor	Estimated Water Consumption
1-Bed Residential	24,640 gpd	x1.1	27,104 gpd
2-Bed Residential	12,100 gpd	x1.1	13,310 gpd
3-Bed Residential	5,280 gpd	x1.1	5,808 gpd
Retail[1]	250 gpd	x1.1	275 gpd
Restaurant	10,500 gpd	x1.1	11,550 gpd
Subtotal			**58,047 gpd**

1 - The breakdown of retail and restaurant space has not yet been determined. In order to provide a conservative estimate of sanitary sewer flows, a program with the maximum amount of restaurant space was utilized.

BWSC capacity will be confirmed during the Site Plan Approval process.

8.2.3 Proposed Water Service

The domestic water service to the proposed building will be tapped off the existing main within Guest Street. The service will have an individual meter that will be installed with meter transmitting units in accordance with BWSC's Automatic Meter Reading System. The exact size and location of the service will be determined during the final design and Site Plan Approval process.

Fire protection to the building will also be tapped from the Guest Street main. It is anticipated that the building will utilize an 8-inch fire service. The building exterior will also feature Siamese Connections for additional fire protection.

All services, both domestic and fire protection shall have backflow prevention devices.

8.2.4 Water Supply Conservation and Mitigation Measures

In order to minimize water consumption, the building will utilize low consumption plumbing fixtures including low flow water closets and showers, aerated faucets in lavatories, and sensor operated devices in public areas.

8.3 Electrical Service

Electrical service for the Project will be provided by Eversource from a completely rebuilt underground power network within the Guest Street right-of-way. A utility-owned pad-mounted transformer will be installed for the building with underground primary and secondary cables feeding the proposed structure. Switchgear will be located in the electrical room within the building. Capacity issues are not anticipated for the Project.

8.3.1 Energy Conservation

The proposed building will be highly energy efficient; designed and constructed to Leadership in Energy and Environmental Design (LEED) standards. While specific design details have yet to be determined, the Project team is committed to providing a highly functional project that incorporates current technologies to maximize energy efficiency.

8.4 Natural Gas

The Project site is served by low pressure natural gas mains within Guest Street owned by National Grid. The proposed building will have an individual service that will provide energy to the heating, cooling and water heating units. These units will be high efficiency Energy Star compliant units and will be designed to function in accordance with the LEED design criteria.

8.5 Telecommunications Systems

Verizon provides telephone service in the Project area. As part of the overall Boston Landing project, all telephone service has been relocated underground. During the final design of the residential building, the applicant will work with Verizon to determine the proper sizing and number of pairs for the conduit and cables for the building. As with other utilities, capacity is not anticipated to be an issue.

Cable television and internet services are provided by Comcast and RCN in the Project area. Like the telephone services, all lines have recently been relocated underground. The building will have service connections to these lines that will be designed by the applicant in consultation with Comcast and RCN.

8.6 Utility Protection During Construction

Prior to any excavation or construction, the contractor will notify all utility owners and DigSafe. During construction, existing infrastructure will be protected using sheeting, shoring, temporary relocations and construction staging as required. The contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners, BWSC, Boston Public Works and other necessary agencies. The contractor will also be required to provide adequate notification to the utility owner prior to any work commencing on their utility. Also, in the event that a utility cannot be maintained in service during a switch over to a temporary or permanent system, the contractor will be required to coordinate the shutdown with the utility owners and Project abutters to minimize impacts and inconveniences accordingly.

Chapter 9.0

Coordination with other Governmental Agencies

9.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

9.1 Architectural Access Board Requirements

The Project will comply with the requirements of the Massachusetts Architectural Access Board and be designated to comply with the standards of the Americans with Disabilities Act. See Appendix E for the Accessibility Checklist.

9.2 Massachusetts Environmental Policy Act (MEPA)

Boston Landing has undergone Massachusetts Environmental Policy Act (MEPA) review. On May 31, 2012 the Proponent filed an Expanded Environmental Notification Form (ENF) with a Request for a Waiver from a Mandatory Environmental Impact Report (EIR). On July 27, 2012, the Secretary issued a Certificate on the ENF in which he declined the Waiver, but did allow for the preparation of a Single EIR in lieu of a 2-stage Draft and Final EIR. The Proponent filed a Single EIR on December 17, 2012 which was noticed in the Environmental Monitor on December 19, 2012. The comment period ended on January 18, 2013. On January 25, 2013, the Secretary issued a Certificate finding that the SEIR adequately and properly complied with MEPA, thus concluding the MEPA process at that time.

On September 19, 2014, the Proponent filed a Notice of Project Change (NPC) with the MEPA Office to inform the Secretary of two minor proposed changes to the project: 1) relocation of the proposed hockey rink arena from the B Block on the south of Guest Street to Building 3 in Block C on the north side of Guest Street; and 2) the removal of fitness use from the sports complex on B Block. The Proponent requested the Secretary to deem these changes insignificant. On October 1, 2014, the Secretary issued a Certificate finding that no additional MEPA review was required.

On September 30, 2014 the Proponent filed a second NPC with the MEPA Office to provide the Secretary with an update on the status of the proposed MBTA commuter rail station on the Framingham Worcester Line adjacent to the Project site. The NPC included information on the terms of the Proponent's Memorandum of Agreement (MOA) with the MBTA/MassDOT, as well as an update on the public review process and the design of the proposed MBTA commuter rail station. On November 7, 2014, the Secretary issued a Certificate finding that no additional MEPA review was required.

The Proponent will file a third NPC with the MEPA office to inform the Secretary of the addition of the 125 Guest Street component to the Boston Landing project.

9.3 Massachusetts Historical Commission

The Proponent does not anticipate that the Project will require any state or federal licenses, permits or approvals, and does not anticipate utilizing any state or federal funds. Therefore, review by the Massachusetts Historical Commission (MHC) is not anticipated at this time. In the event that state or federal licenses, permits, approvals or funding is involved, the Proponent will file an MHC Project Notification Form to initiate review of the Project.

9.4 Boston Civic Design Commission

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

Appendix A

Site Survey

BEALS ASSOCIATES
2 PARK PLAZA SUITE 200 BOSTON, MA 02116
PHONE: 617-242-1120

Boston Landing

Public/Private Infrastructure

Prepared For:
Boston Landing, LLC
20 Guest Street, Suite 400
Brighton, MA 02135

EXISTING CONDITIONS

PROJECT NUMBER: C-574.07

DATE: NOVEMBER 9, 2015

REVISIONS:

SCALE: 1" = 20'

DRAWING NAME:
G-BLOCK EXISTING CONDITIONS PLAN

DRAWING NUMBER:
1 of 1

Appendix B

Transportation Appendix

Available Upon Request

Appendix C

Wind

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
1	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	15	15%	Standing	25	19%	Acceptable
		Summer	12	20%	Sitting	19	27%	Acceptable
		Fall	15	25%	Standing	23	21%	Acceptable
		Winter	17	42%	Walking	27	42%	Acceptable
		Annual	15	25%	Standing	25	32%	Acceptable
	C	Spring	15	15%	Standing	25	19%	Acceptable
		Summer	12	20%	Sitting	19	27%	Acceptable
		Fall	15	25%	Standing	24	26%	Acceptable
		Winter	17	42%	Walking	27	42%	Acceptable
		Annual	15	25%	Standing	25	32%	Acceptable
2	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	17	31%	Walking	26	24%	Acceptable
		Summer	14	40%	Standing	20	25%	Acceptable
		Fall	16	33%	Walking	24	20%	Acceptable
		Winter	16	23%	Walking	25	19%	Acceptable
		Annual	16	33%	Walking	24	20%	Acceptable
	C	Spring	17	31%	Walking	26	24%	Acceptable
		Summer	13	30%	Standing	20	25%	Acceptable
		Fall	15	25%	Standing	24	20%	Acceptable
		Winter	16	23%	Walking	25	19%	Acceptable
		Annual	15	25%	Standing	24	20%	Acceptable
3	A	Spring	15		Standing	24		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	18	20%	Walking	27	12%	Acceptable
		Summer	14	17%	Standing	20		Acceptable
		Fall	17	21%	Walking	25		Acceptable
		Winter	18	12%	Walking	27		Acceptable
		Annual	17	13%	Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
4	A	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	19		Walking	28		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
	C	Spring	20		Uncomfortable	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
5	A	Spring	19		Walking	27		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	11	-42%	Sitting	18	-33%	Acceptable
		Summer	9	-36%	Sitting	14	-30%	Acceptable
		Fall	10	-41%	Sitting	17	-32%	Acceptable
		Winter	11	-39%	Sitting	18	-31%	Acceptable
		Annual	11	-35%	Sitting	17	-32%	Acceptable
	C	DATA NOT AVAILABLE						
6	A	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14	-12%	Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	21		Acceptable
	C	DATA NOT AVAILABLE						
7	A	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	14	17%	Standing	20	18%	Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	C	DATA NOT AVAILABLE						
8	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	DATA NOT AVAILABLE						
9	A	Spring	11		Sitting	18		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	20	82%	Uncomfortable	28	56%	Acceptable
		Summer	17	112%	Walking	23	77%	Acceptable
		Fall	19	90%	Walking	27	69%	Acceptable
		Winter	22	100%	Uncomfortable	30	67%	Acceptable
		Annual	20	100%	Uncomfortable	28	65%	Acceptable
	C	Spring	14	27%	Standing	21	17%	Acceptable
		Summer	12	50%	Sitting	17	31%	Acceptable
		Fall	13	30%	Standing	20	25%	Acceptable
		Winter	15	36%	Standing	22	22%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14	40%	Standing	20	18%	Acceptable
10	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	16	33%	Walking	23	21%	Acceptable
		Summer	14	56%	Standing	19	27%	Acceptable
		Fall	16	45%	Walking	22	22%	Acceptable
		Winter	17	42%	Walking	25	32%	Acceptable
		Annual	16	45%	Walking	23	28%	Acceptable
	C	Spring	15	25%	Standing	22	16%	Acceptable
		Summer	13	44%	Standing	19	27%	Acceptable
		Fall	14	27%	Standing	21	17%	Acceptable
		Winter	16	33%	Walking	24	26%	Acceptable
		Annual	15	36%	Standing	22	22%	Acceptable
11	A	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	16	45%	Walking	25	32%	Acceptable
		Summer	14	56%	Standing	22	57%	Acceptable
		Fall	15	50%	Standing	24	41%	Acceptable
		Winter	16	45%	Walking	25	39%	Acceptable
		Annual	15	50%	Standing	24	41%	Acceptable
	C	Spring	17	55%	Walking	26	37%	Acceptable
		Summer	16	78%	Walking	24	71%	Acceptable
		Fall	17	70%	Walking	25	47%	Acceptable
		Winter	18	64%	Walking	26	44%	Acceptable
		Annual	17	70%	Walking	25	47%	Acceptable
12	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	18	38%	Walking	26	30%	Acceptable
		Summer	15	50%	Standing	21	40%	Acceptable
		Fall	18	64%	Walking	25	39%	Acceptable
		Winter	19	58%	Walking	27	42%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	18	50%	Walking	25	39%	Acceptable
	C	Spring	18	38%	Walking	26	30%	Acceptable
		Summer	15	50%	Standing	21	40%	Acceptable
		Fall	17	55%	Walking	25	39%	Acceptable
		Winter	19	58%	Walking	27	42%	Acceptable
		Annual	18	50%	Walking	25	39%	Acceptable
13	A	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	11	22%	Sitting	17	21%	Acceptable
		Fall	12		Sitting	20	11%	Acceptable
		Winter	13	18%	Standing	21	17%	Acceptable
		Annual	12		Sitting	20	11%	Acceptable
	C	Spring	12		Sitting	20		Acceptable
		Summer	10	11%	Sitting	17	21%	Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13	18%	Standing	21	17%	Acceptable
		Annual	12		Sitting	20	11%	Acceptable
14	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	12	20%	Sitting	18	20%	Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	16	33%	Walking	23	15%	Acceptable
		Annual	14	17%	Standing	22	16%	Acceptable
	C	Spring	15	15%	Standing	22		Acceptable
		Summer	12	20%	Sitting	18	20%	Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	16	33%	Walking	23	15%	Acceptable
		Annual	14	17%	Standing	22	16%	Acceptable
15	A	Spring	15		Standing	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	23		Acceptable
	B	Spring	24	60%	Uncomfortable	34	42%	Unacceptable
		Summer	20	67%	Uncomfortable	27	50%	Acceptable
		Fall	23	64%	Uncomfortable	32	45%	Unacceptable
		Winter	26	62%	Uncomfortable	37	54%	Unacceptable
		Annual	24	71%	Uncomfortable	34	48%	Unacceptable
	C	Spring	24	60%	Uncomfortable	33	38%	Unacceptable
		Summer	20	67%	Uncomfortable	27	50%	Acceptable
		Fall	23	64%	Uncomfortable	32	45%	Unacceptable
		Winter	26	62%	Uncomfortable	36	50%	Unacceptable
		Annual	23	64%	Uncomfortable	33	43%	Unacceptable
16	A	Spring	19		Walking	28		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	13	-32%	Standing	22	-21%	Acceptable
		Summer	10	-29%	Sitting	17	-15%	Acceptable
		Fall	12	-33%	Sitting	20	-20%	Acceptable
		Winter	12	-37%	Sitting	20	-26%	Acceptable
		Annual	12	-33%	Sitting	20	-23%	Acceptable
	C	Spring	13	-32%	Standing	20	-29%	Acceptable
		Summer	11	-21%	Sitting	18		Acceptable
		Fall	12	-33%	Sitting	19	-24%	Acceptable
		Winter	12	-37%	Sitting	20	-26%	Acceptable
		Annual	12	-33%	Sitting	19	-27%	Acceptable
17	A	Spring	19		Walking	28		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	25		Acceptable
	C	Spring	15	-21%	Standing	22	-21%	Acceptable
		Summer	11	-21%	Sitting	16	-20%	Acceptable
		Fall	13	-28%	Standing	20	-20%	Acceptable
		Winter	14	-22%	Standing	21	-19%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13	-28%	Standing	20	-20%	Acceptable
18	A	Spring	17		Walking	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	C	Spring	21	24%	Uncomfortable	28	17%	Acceptable
		Summer	15	25%	Standing	20	11%	Acceptable
		Fall	19	27%	Walking	25	14%	Acceptable
		Winter	19	19%	Walking	26	13%	Acceptable
		Annual	19	27%	Walking	25	14%	Acceptable
19	A	Spring	15		Standing	22		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	C	Spring	12	-20%	Sitting	18	-18%	Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11	-21%	Sitting	18		Acceptable
		Winter	12	-20%	Sitting	19	-14%	Acceptable
		Annual	11	-21%	Sitting	18	-14%	Acceptable
20	A	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	17	42%	Walking	24	20%	Acceptable
		Summer	14	56%	Standing	20	33%	Acceptable
		Fall	16	33%	Walking	23	28%	Acceptable
		Winter	17	31%	Walking	25	25%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	16	33%	Walking	23	21%	Acceptable
	C	Spring	11		Sitting	17	-15%	Acceptable
		Summer	10	11%	Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	11	-15%	Sitting	18		Acceptable
		Annual	11		Sitting	17	-11%	Acceptable
21	A	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	16	33%	Walking	24	26%	Acceptable
		Summer	13	18%	Standing	19	19%	Acceptable
		Fall	16	33%	Walking	23	28%	Acceptable
		Winter	18	38%	Walking	26	37%	Acceptable
		Annual	16	33%	Walking	24	33%	Acceptable
	C	Spring	16	33%	Walking	23	21%	Acceptable
		Summer	13	18%	Standing	19	19%	Acceptable
		Fall	15	25%	Standing	22	22%	Acceptable
		Winter	17	31%	Walking	25	32%	Acceptable
		Annual	16	33%	Walking	23	28%	Acceptable
22	A	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	18	38%	Walking	27	42%	Acceptable
		Summer	15	36%	Standing	21	31%	Acceptable
		Fall	18	50%	Walking	26	44%	Acceptable
		Winter	21	62%	Uncomfortable	30	58%	Acceptable
		Annual	19	58%	Walking	27	50%	Acceptable
	C	Spring	19	46%	Walking	27	42%	Acceptable
		Summer	15	36%	Standing	21	31%	Acceptable
		Fall	18	50%	Walking	27	50%	Acceptable
		Winter	21	62%	Uncomfortable	30	58%	Acceptable
		Annual	19	58%	Walking	27	50%	Acceptable
23	A	Spring	10		Sitting	17		Acceptable
		Summer	7		Sitting	12		Acceptable
		Fall	9		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	9		Sitting	16		Acceptable
	B	Spring	21	110%	Uncomfortable	30	76%	Acceptable
		Summer	17	143%	Walking	23	92%	Acceptable
		Fall	20	122%	Uncomfortable	28	75%	Acceptable
		Winter	23	130%	Uncomfortable	32	88%	Unacceptable
		Annual	21	133%	Uncomfortable	29	81%	Acceptable
	C	Spring	21	110%	Uncomfortable	29	71%	Acceptable
		Summer	17	143%	Walking	23	92%	Acceptable
		Fall	20	122%	Uncomfortable	28	75%	Acceptable
		Winter	22	120%	Uncomfortable	31	82%	Acceptable
		Annual	20	122%	Uncomfortable	29	81%	Acceptable
24	A	Spring	11		Sitting	18		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	24	118%	Uncomfortable	33	83%	Unacceptable
		Summer	19	138%	Walking	26	100%	Acceptable
		Fall	23	130%	Uncomfortable	33	106%	Unacceptable
		Winter	26	136%	Uncomfortable	36	112%	Unacceptable
		Annual	24	140%	Uncomfortable	33	106%	Unacceptable
	C	Spring	23	109%	Uncomfortable	33	83%	Unacceptable
		Summer	19	138%	Walking	26	100%	Acceptable
		Fall	23	130%	Uncomfortable	32	100%	Unacceptable
		Winter	25	127%	Uncomfortable	35	106%	Unacceptable
		Annual	23	130%	Uncomfortable	32	100%	Unacceptable
25	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	24	50%	Uncomfortable	35	40%	Unacceptable
		Summer	20	54%	Uncomfortable	28	40%	Acceptable
		Fall	24	50%	Uncomfortable	33	43%	Unacceptable
		Winter	27	59%	Uncomfortable	37	42%	Unacceptable
		Annual	24	50%	Uncomfortable	34	42%	Unacceptable
	C	Spring	24	50%	Uncomfortable	34	36%	Unacceptable
		Summer	20	54%	Uncomfortable	27	35%	Acceptable
		Fall	23	44%	Uncomfortable	32	39%	Unacceptable
		Winter	26	53%	Uncomfortable	37	42%	Unacceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	24	50%	Uncomfortable	34	42%	Unacceptable
26	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	24	50%	Uncomfortable	35	40%	Unacceptable
		Summer	20	54%	Uncomfortable	28	40%	Acceptable
		Fall	24	50%	Uncomfortable	33	43%	Unacceptable
		Winter	27	59%	Uncomfortable	37	42%	Unacceptable
		Annual	24	50%	Uncomfortable	34	42%	Unacceptable
	C	Spring	24	50%	Uncomfortable	34	36%	Unacceptable
		Summer	20	54%	Uncomfortable	27	35%	Acceptable
		Fall	23	44%	Uncomfortable	32	39%	Unacceptable
		Winter	26	53%	Uncomfortable	37	42%	Unacceptable
		Annual	24	50%	Uncomfortable	34	42%	Unacceptable
27	A	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	24	41%	Uncomfortable	33	32%	Unacceptable
		Summer	20	43%	Uncomfortable	27	42%	Acceptable
		Fall	23	44%	Uncomfortable	32	39%	Unacceptable
		Winter	26	44%	Uncomfortable	36	38%	Unacceptable
		Annual	24	41%	Uncomfortable	33	38%	Unacceptable
	C	Spring	23	35%	Uncomfortable	32	28%	Unacceptable
		Summer	20	43%	Uncomfortable	27	42%	Acceptable
		Fall	23	44%	Uncomfortable	31	35%	Acceptable
		Winter	25	39%	Uncomfortable	35	35%	Unacceptable
		Annual	23	35%	Uncomfortable	32	33%	Unacceptable
28	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	21	50%	Uncomfortable	29	32%	Acceptable
		Summer	18	64%	Walking	24	41%	Acceptable
		Fall	20	54%	Uncomfortable	28	33%	Acceptable
		Winter	23	53%	Uncomfortable	32	39%	Unacceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	21	62%	Uncomfortable	29	38%	Acceptable
	C	Spring	20	43%	Uncomfortable	29	32%	Acceptable
		Summer	17	55%	Walking	24	41%	Acceptable
		Fall	20	54%	Uncomfortable	28	33%	Acceptable
		Winter	22	47%	Uncomfortable	31	35%	Acceptable
		Annual	20	54%	Uncomfortable	28	33%	Acceptable
29	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	19		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	22	57%	Uncomfortable	33	43%	Unacceptable
		Summer	17	55%	Walking	25	32%	Acceptable
		Fall	20	54%	Uncomfortable	30	43%	Acceptable
		Winter	21	62%	Uncomfortable	31	41%	Acceptable
		Annual	20	54%	Uncomfortable	30	43%	Acceptable
	C	Spring	20	43%	Uncomfortable	30	30%	Acceptable
		Summer	16	45%	Walking	23	21%	Acceptable
		Fall	19	46%	Walking	28	33%	Acceptable
		Winter	20	54%	Uncomfortable	31	41%	Acceptable
		Annual	19	46%	Walking	29	38%	Acceptable
30	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	17	13%	Walking	25		Acceptable
		Summer	14	17%	Standing	20		Acceptable
		Fall	17	13%	Walking	24		Acceptable
		Winter	19	12%	Walking	27		Acceptable
		Annual	17	13%	Walking	25		Acceptable
	C	Spring	17	13%	Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
31	A	Spring	24		Uncomfortable	31		Acceptable
		Summer	19		Walking	26		Acceptable
		Fall	22		Uncomfortable	30		Acceptable
		Winter	24		Uncomfortable	32		Unacceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	22		Uncomfortable	30		Acceptable
	B	Spring	21	-12%	Uncomfortable	29		Acceptable
		Summer	16	-16%	Walking	22	-15%	Acceptable
		Fall	19	-14%	Walking	27		Acceptable
		Winter	21	-12%	Uncomfortable	29		Acceptable
		Annual	19	-14%	Walking	27		Acceptable
	C	Spring	20	-17%	Uncomfortable	28		Acceptable
		Summer	15	-21%	Standing	21	-19%	Acceptable
		Fall	18	-18%	Walking	26	-13%	Acceptable
		Winter	20	-17%	Uncomfortable	28	-12%	Acceptable
		Annual	19	-14%	Walking	26	-13%	Acceptable
32	A	Spring	18		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	C	Spring	18		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
33	A	Spring	22		Uncomfortable	31		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	29		Acceptable
	B	Spring	24		Uncomfortable	32		Unacceptable
		Summer	17		Walking	23		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	C	Spring	22		Uncomfortable	31		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	20		Uncomfortable	28		Acceptable
34	A	Spring	16		Walking	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	17		Walking	25		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	17		Walking	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
35	A	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
36	A	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	19		Acceptable
	C	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
37	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	18		Walking	23		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	20		Uncomfortable	27		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	17	-15%	Walking	24	-11%	Acceptable
		Summer	14	-22%	Standing	20	-13%	Acceptable
		Fall	16	-16%	Walking	23	-12%	Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17	-11%	Walking	23	-12%	Acceptable
	C	Spring	17	-15%	Walking	24	-11%	Acceptable
		Summer	15	-17%	Standing	20	-13%	Acceptable
		Fall	17	-11%	Walking	23	-12%	Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17	-11%	Walking	23	-12%	Acceptable
38	A	Spring	16		Walking	25		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	15		Standing	24		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	23		Acceptable
	C	Spring	15		Standing	24		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
39	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	15		Standing	22		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	14		Standing	22		Acceptable
	C	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	14		Standing	22		Acceptable
40	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
41	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	B	Spring	21		Uncomfortable	28		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	C	Spring	21		Uncomfortable	28		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	22		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	21		Uncomfortable	28		Acceptable
42	A	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	17		Walking	26		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
	C	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
43	A	Spring	13		Standing	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	12		Sitting	17		Acceptable
		Summer	9		Sitting	13	-13%	Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
44	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	18		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	18		Acceptable
45	A	Spring	15		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	16		Walking	22		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
	C	Spring	15		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	17		Walking	23		Acceptable
		Annual	15		Standing	21		Acceptable
46	A	Spring	19		Walking	27		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	16	-16%	Walking	23	-15%	Acceptable
		Summer	14	-18%	Standing	20	-17%	Acceptable
		Fall	15	-17%	Standing	22	-15%	Acceptable
		Winter	16	-16%	Walking	23	-15%	Acceptable
		Annual	15	-17%	Standing	22	-15%	Acceptable
	C	Spring	15	-21%	Standing	22	-19%	Acceptable
		Summer	13	-24%	Standing	19	-21%	Acceptable
		Fall	14	-22%	Standing	21	-19%	Acceptable
		Winter	15	-21%	Standing	23	-15%	Acceptable
		Annual	15	-17%	Standing	22	-15%	Acceptable
47	A	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
48	A	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	15		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	C	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	15		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
49	A	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	B	Spring	18		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	C	Spring	18		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19		Walking	26		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	17		Walking	24		Acceptable
50	A	Spring	19		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	C	Spring	18		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
51	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	C	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
52	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	11		Sitting	17		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
53	A	Spring	13		Standing	19		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	13		Standing	18		Acceptable
54	A	Spring	18		Walking	25		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	C	Spring	19		Walking	25		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
55	A	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	17		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	15		Standing	22		Acceptable
	B	Spring	14	-12%	Standing	21		Acceptable
		Summer	11		Sitting	16	-11%	Acceptable
		Fall	13	-13%	Standing	20		Acceptable
		Winter	15	-12%	Standing	22		Acceptable
		Annual	14		Standing	20		Acceptable
	C	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
56	A	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
	C	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
57	A	Spring	15		Standing	19		Acceptable
		Summer	13		Standing	16		Acceptable
		Fall	14		Standing	19		Acceptable
		Winter	15		Standing	20		Acceptable
		Annual	14		Standing	19		Acceptable
	B	Spring	9	-40%	Sitting	15	-21%	Acceptable
		Summer	8	-38%	Sitting	13	-19%	Acceptable
		Fall	9	-36%	Sitting	14	-26%	Acceptable
		Winter	9	-40%	Sitting	15	-25%	Acceptable
		Annual	9	-36%	Sitting	14	-26%	Acceptable
	C	Spring	14		Standing	18		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	14		Standing	18		Acceptable
		Winter	14		Standing	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	18		Acceptable
58	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	17	13%	Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	18	12%	Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	C	Spring	17	13%	Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	18	12%	Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
59	A	Spring	18		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	15	-17%	Standing	22	-12%	Acceptable
		Summer	13	-19%	Standing	18	-18%	Acceptable
		Fall	14	-18%	Standing	21	-12%	Acceptable
		Winter	15	-17%	Standing	22	-15%	Acceptable
		Annual	14	-18%	Standing	21	-12%	Acceptable
	C	Spring	15	-17%	Standing	22	-12%	Acceptable
		Summer	12	-25%	Sitting	18	-18%	Acceptable
		Fall	14	-18%	Standing	21	-12%	Acceptable
		Winter	15	-17%	Standing	22	-15%	Acceptable
		Annual	14	-18%	Standing	21	-12%	Acceptable
60	A	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	15		Standing	23		Acceptable
	C	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
61	A	Spring	22		Uncomfortable	31		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	20		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	19	-14%	Walking	29		Acceptable
		Annual	18	-14%	Walking	28		Acceptable
	C	Spring	21		Uncomfortable	31		Acceptable
		Summer	17		Walking	26		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	29		Acceptable
62	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	19		Walking	26		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	C	Spring	17	-15%	Walking	25		Acceptable
		Summer	13	-13%	Standing	20		Acceptable
		Fall	16	-11%	Walking	23		Acceptable
		Winter	16	-16%	Walking	25		Acceptable
		Annual	16	-11%	Walking	23		Acceptable
63	A	Spring	17		Walking	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	23		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
	C	Spring	17		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
64	A	Spring	17		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	17		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
65	A	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	16		Walking	22		Acceptable
66	A	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	17		Walking	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
67	A	Spring	18		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	C	Spring	18		Walking	25		Acceptable
		Summer	15	15%	Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	24		Acceptable
		Annual	17		Walking	23		Acceptable
68	A	Spring	13		Standing	22		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	14	17%	Standing	22		Acceptable
		Winter	15		Standing	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	22		Acceptable
	C	Spring	15	15%	Standing	23		Acceptable
		Summer	12	20%	Sitting	18		Acceptable
		Fall	14	17%	Standing	22		Acceptable
		Winter	16	14%	Walking	25		Acceptable
		Annual	15	15%	Standing	23		Acceptable
69	A	Spring	22		Uncomfortable	28		Acceptable
		Summer	17		Walking	22		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	23		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	B	Spring	21		Uncomfortable	28		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	22		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
	C	Spring	21		Uncomfortable	28		Acceptable
		Summer	17		Walking	22		Acceptable
		Fall	20		Uncomfortable	26		Acceptable
		Winter	22		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
70	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	19	27%	Walking	29	21%	Acceptable
		Summer	15	15%	Standing	23	15%	Acceptable
		Fall	18	29%	Walking	28	27%	Acceptable
		Winter	21	40%	Uncomfortable	31	29%	Acceptable
		Annual	19	36%	Walking	29	32%	Acceptable
	C	Spring	19	27%	Walking	28	17%	Acceptable
		Summer	15	15%	Standing	22		Acceptable
		Fall	18	29%	Walking	27	23%	Acceptable
		Winter	21	40%	Uncomfortable	31	29%	Acceptable
		Annual	19	36%	Walking	28	27%	Acceptable
71	A	Spring	12		Sitting	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	12		Sitting	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	19		Acceptable
	B	Spring	15	25%	Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	15	25%	Standing	22		Acceptable
		Annual	14	17%	Standing	21	11%	Acceptable
	C	Spring	14	17%	Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	15	25%	Standing	22		Acceptable
		Annual	14	17%	Standing	21	11%	Acceptable
72	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
	C	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
73	A	Spring	16		Walking	23		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
	B	Spring	19	19%	Walking	27	17%	Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18	12%	Walking	25	14%	Acceptable
		Winter	18		Walking	26	13%	Acceptable
		Annual	18	12%	Walking	25	14%	Acceptable
	C	Spring	19	19%	Walking	26	13%	Acceptable
		Summer	16		Walking	21		Acceptable
		Fall	18	12%	Walking	24		Acceptable
		Winter	18		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	18	12%	Walking	24		Acceptable
74	A	Spring	14		Standing	21		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	15		Standing	21		Acceptable
	C	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	15		Standing	21		Acceptable
75	A	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	14	17%	Standing	18		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	18	12%	Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
76	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	20		Acceptable
	C	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	20		Acceptable
77	A	Spring	22		Uncomfortable	30		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	24		Uncomfortable	31		Acceptable
		Annual	22		Uncomfortable	29		Acceptable
	B	Spring	22		Uncomfortable	29		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	C	Spring	22		Uncomfortable	29		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
78	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	32		Unacceptable
		Annual	20		Uncomfortable	29		Acceptable
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	21		Uncomfortable	31		Acceptable
		Annual	19		Walking	29		Acceptable
	C	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	31		Acceptable
		Annual	19		Walking	29		Acceptable
79	A	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	C	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
80	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	24		Acceptable
	C	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
81	A	Spring	22		Uncomfortable	30		Acceptable
		Summer	20		Uncomfortable	26		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	22		Uncomfortable	30		Acceptable
		Summer	20		Uncomfortable	27		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	C	Spring	22		Uncomfortable	30		Acceptable
		Summer	19		Walking	26		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	22		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	21		Uncomfortable	29		Acceptable
82	A	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	C	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
83	A	Spring	22		Uncomfortable	31		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	22		Uncomfortable	31		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	C	Spring	22		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
84	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	20		Uncomfortable	28		Acceptable
	C	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
85	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
	C	Spring	17		Walking	26		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
86	A	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
	C	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
87	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13	-13%	Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
88	A	Spring	12		Sitting	20		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	20		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
	C	Spring	12		Sitting	20		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	20		Acceptable
89	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13		Standing	19		Acceptable
90	A	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	15		Acceptable
		Annual	9		Sitting	15		Acceptable
	B	Spring	10	11%	Sitting	16		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	10	11%	Sitting	15		Acceptable
	C	Spring	10	11%	Sitting	16		Acceptable
		Summer	9	12%	Sitting	14		Acceptable
		Fall	10	11%	Sitting	15		Acceptable
		Winter	11		Sitting	16		Acceptable
		Annual	10	11%	Sitting	15		Acceptable
91	A	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	10		Sitting	16		Acceptable
		Summer	7	-12%	Sitting	12		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	9		Sitting	16		Acceptable
	C	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	10		Sitting	17		Acceptable
92	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13		Standing	19		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
93	A	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	14		Standing	20		Acceptable
	C	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
94	A	Spring	14		Standing	19		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	15		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	C	Spring	13		Standing	18		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	19		Acceptable
		Annual	13		Standing	18		Acceptable
95	A	Spring	11		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	11		Sitting	16		Acceptable
	B	Spring	13	18%	Standing	19	19%	Acceptable
		Summer	11	22%	Sitting	16	23%	Acceptable
		Fall	13	18%	Standing	18	12%	Acceptable
		Winter	14	17%	Standing	19	12%	Acceptable
		Annual	13	18%	Standing	18	12%	Acceptable
	C	Spring	13	18%	Standing	18	12%	Acceptable
		Summer	11	22%	Sitting	16	23%	Acceptable
		Fall	12		Sitting	18	12%	Acceptable
		Winter	13		Standing	19	12%	Acceptable
		Annual	13	18%	Standing	18	12%	Acceptable
96	A	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	14	-18%	Standing	22		Acceptable
		Summer	11	-15%	Sitting	17		Acceptable
		Fall	13	-13%	Standing	21		Acceptable
		Winter	14	-18%	Standing	23		Acceptable
		Annual	13	-19%	Standing	21		Acceptable
	C	Spring	14	-18%	Standing	22		Acceptable
		Summer	11	-15%	Sitting	17		Acceptable
		Fall	13	-13%	Standing	21		Acceptable
		Winter	14	-18%	Standing	22		Acceptable
		Annual	13	-19%	Standing	21		Acceptable
97	A	Spring	10		Sitting	15		Acceptable
		Summer	7		Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	14		Acceptable
	B	Spring	11		Sitting	17	13%	Acceptable
		Summer	9	29%	Sitting	13		Acceptable
		Fall	11	22%	Sitting	16	14%	Acceptable
		Winter	13	30%	Standing	18	12%	Acceptable
		Annual	11	22%	Sitting	17	21%	Acceptable
	C	Spring	11		Sitting	17	13%	Acceptable
		Summer	9	29%	Sitting	13		Acceptable
		Fall	11	22%	Sitting	16	14%	Acceptable
		Winter	12	20%	Sitting	18	12%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	11	22%	Sitting	17	21%	Acceptable
98	A	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	9		Sitting	13		Acceptable
		Winter	10		Sitting	14		Acceptable
		Annual	9		Sitting	13		Acceptable
	B	Spring	9		Sitting	13		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8	-11%	Sitting	13		Acceptable
		Winter	9		Sitting	14		Acceptable
		Annual	8	-11%	Sitting	13		Acceptable
	C	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	9		Sitting	13		Acceptable
		Winter	10		Sitting	15		Acceptable
		Annual	9		Sitting	14		Acceptable
99	A	Spring	12		Sitting	18		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
100	A	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	14	17%	Standing	21	11%	Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	15	15%	Standing	23	15%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14	17%	Standing	21	11%	Acceptable
	C	Spring	14	17%	Standing	22	16%	Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14	17%	Standing	21	11%	Acceptable
		Winter	15	15%	Standing	23	15%	Acceptable
		Annual	14	17%	Standing	21	11%	Acceptable
101	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	19	12%	Acceptable
		Summer	10	11%	Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20	11%	Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	10	11%	Sitting	14		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	20	11%	Acceptable
		Annual	12		Sitting	18		Acceptable
102	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
103	A	Spring	16		Walking	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	15		Standing	21		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
	C	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
104	A	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
105	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
	C	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	15		Standing	22		Acceptable
106	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	12		Sitting	17		Acceptable
	B	Spring	13		Standing	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	13		Standing	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	18		Acceptable
		Annual	12		Sitting	17		Acceptable
107	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	14		Standing	21		Acceptable
	C	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	14		Standing	20		Acceptable
108	A	Spring	15		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	21		Acceptable
	C	Spring	15		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
109	A	Spring	18		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	19		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	26		Acceptable
	C	Spring	19		Walking	26		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	21		Uncomfortable	28		Acceptable
		Annual	19		Walking	26		Acceptable
110	A	Spring	16		Walking	21		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	15		Standing	20		Acceptable
		Winter	17		Walking	22		Acceptable
		Annual	16		Walking	21		Acceptable
	B	Spring	17		Walking	22		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	16		Walking	21		Acceptable
		Winter	18		Walking	24		Acceptable
		Annual	17		Walking	22		Acceptable
	C	Spring	16		Walking	21		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	15		Standing	20		Acceptable
		Winter	17		Walking	22		Acceptable
		Annual	15		Standing	21		Acceptable
111	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	11		Sitting	17		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10	11%	Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	10	-17%	Sitting	16	-16%	Acceptable
		Summer	8	-11%	Sitting	13		Acceptable
		Fall	9	-18%	Sitting	15	-12%	Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
112	A	Spring	12		Sitting	17		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	17		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	17		Acceptable
113	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	15	15%	Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16	14%	Walking	23		Acceptable
		Annual	14		Standing	21		Acceptable
	C	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	14		Standing	20		Acceptable
114	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	20		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
115	A	Spring	13		Standing	19		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	11	-15%	Sitting	18		Acceptable
		Summer	10	-17%	Sitting	15	-12%	Acceptable
		Fall	11	-15%	Sitting	17	-11%	Acceptable
		Winter	12	-14%	Sitting	19		Acceptable
		Annual	11	-15%	Sitting	17	-11%	Acceptable
116	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	15		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13		Standing	19		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
117	A	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
118	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
119	A	Spring	10		Sitting	15		Acceptable
		Summer	9		Sitting	12		Acceptable
		Fall	10		Sitting	14		Acceptable
		Winter	11		Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	10		Sitting	15		Acceptable
	B	Spring	10		Sitting	14		Acceptable
		Summer	8	-11%	Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	15		Acceptable
		Annual	10		Sitting	14		Acceptable
	C	Spring	11		Sitting	15		Acceptable
		Summer	9		Sitting	12		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	16		Acceptable
		Annual	10		Sitting	15		Acceptable
120	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	C	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
121	A	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
	C	Spring	12		Sitting	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	20		Acceptable
122	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	13		Standing	21		Acceptable
	C	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
123	A	Spring	8		Sitting	13		Acceptable
		Summer	6		Sitting	9		Acceptable
		Fall	7		Sitting	11		Acceptable
		Winter	8		Sitting	13		Acceptable
		Annual	7		Sitting	12		Acceptable
	B	Spring	10	25%	Sitting	16	23%	Acceptable
		Summer	8	33%	Sitting	13	44%	Acceptable
		Fall	10	43%	Sitting	15	36%	Acceptable
		Winter	10	25%	Sitting	16	23%	Acceptable
		Annual	10	43%	Sitting	15	25%	Acceptable
	C	Spring	10	25%	Sitting	16	23%	Acceptable
		Summer	8	33%	Sitting	13	44%	Acceptable
		Fall	10	43%	Sitting	15	36%	Acceptable
		Winter	10	25%	Sitting	16	23%	Acceptable
		Annual	10	43%	Sitting	15	25%	Acceptable
124	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	20		Uncomfortable	28		Acceptable
	C	Spring	20		Uncomfortable	28		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
125	A	Spring	19		Walking	26		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	14	-26%	Standing	21	-19%	Acceptable
		Summer	11	-15%	Sitting	16	-16%	Acceptable
		Fall	13	-19%	Standing	19	-17%	Acceptable
		Winter	13	-19%	Standing	20	-17%	Acceptable
		Annual	13	-19%	Standing	19	-17%	Acceptable
	C	Spring	18		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
126	A	DATA NOT AVAILABLE						
	B	Spring	13		Standing	22		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	C	Spring	13		Standing	22		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
127	A	DATA NOT AVAILABLE						
	B	Spring	14		Standing	22		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build – Base Scheme
C – Build – Alternate Scheme

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Mean Speed and Effective Gust Categories – Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	13		Standing	21		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
128	A	DATA NOT AVAILABLE						
	B	Spring	13		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	C	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
129	A	DATA NOT AVAILABLE						
	B	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	C	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
130	A	DATA NOT AVAILABLE						
	B	Spring	13		Standing	23		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	22		Acceptable
	C	Spring	10		Sitting	17		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build – Base Scheme	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Build – Alternate Scheme	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Appendix D

Climate Change Preparedness Questionnaire

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:	125 Guest Street
Project Address Primary:	125 Guest Street
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Keith Craig/Director/NB Development Group/kcraig@nbdevelopment.com Thomas N. O'Brien/Managing Director/The HYM Investment Group/tobrien@hyminvestments.com

A.2 - Team Description

Owner / Developer:	NB Development Group and The HYM Investment Group
Architect:	Elkus Manfredi Architects
Engineer (building systems):	WSP Global
Sustainability / LEED:	The Green Engineer
Permitting:	Epsilon Associates
Construction Management:	
Climate Change Expert:	

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Residential, retail
List the First Floor Uses:	*Retail, restaurants, residential amenities, parking*

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

☐ Wood Frame	☐ Masonry	☑ Steel Frame	☐ Concrete

Describe the building?

Site Area:	*81,665 SF*	Building Area:	*311,000 SF*
Building Height:	*198 Ft.*	Number of Stories:	*17 Flrs.*
First Floor Elevation (reference Boston City Base):	*33 Elev.*	Are there below grade spaces/levels, if yes how many:	*No*

A.5 - Green Building

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

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

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

Registered:	*Yes*	Certified:	*Yes / No*

A.6 - Building Energy-

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

Electric:	*2,500 (kW)*	Heating:	*5 (MMBtu/hr)*
What is the planned building Energy Use Intensity:	*32.9 (kWh/SF)*	Cooling:	*630 (Tons/hr)*

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

Electric:	*800 (kW)*	Heating:	*1 (MMBtu/hr)*
		Cooling:	*20 (Tons/hr)*

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

Electrical Generation:	*800 (kW)*		Fuel Source:	*Diesel*
System Type and Number of Units:	☑ Combustion Engine	☐ Gas Turbine	☐ Combine Heat and Power	*1 (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	☐ 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?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

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

8/91 Deg.	Based on ASHRAE Fundamentals 2013 99.6% heating; 0.4% cooling

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

95 Deg.	*5 Days*	*6 Events / yr.*

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

30-90 Days	*0.2 Events / yr.*

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

45 Inches / yr.	*4 Inches*	*0.5 Events / yr.*

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?

130 Peak Wind	*10 Hours*	*0.25 Events / yr.*

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:	*19.3%*
How is performance determined:	Energy model using eQuest v3.65 with ASHRAE 90.1-2010 baseline case

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

Select all appropriate:				
	☑ High performance building envelop	☑ High performance lighting & controls	☐ Building day lighting	☐ EnergyStar equip. / appliances
	☑ High performance HVAC equipment	☑ Energy recovery ventilation	☐ No active cooling	☐ No active heating
Describe any added measures:				

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

Roof:	*R = 25*	Walls / Curtain Wall Assembly:	*R = 15*
Foundation:	*R = N/A*	Basement / Slab:	*F-0.54*
Windows:	*R = 2.6 / U =0.38*	Doors:	*R = 0.5*

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:				

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

Select all appropriate:	☑ Connected to local distributed electrical	☐ Building will be Smart Grid ready	☐ Connected to distributed steam, hot, chilled water	☐ Distributed thermal energy ready

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

	No

Describe site conditions?

Site Elevation – Low/High Points:	*33 Boston City Base Elev.(Ft.)*
Building Proximity to Water:	*2,200 Ft.*

Is the site or building located in any of the following?

Coastal Zone:	*No*	Velocity Zone:	*No*
Flood Zone:	*No*	Area Prone to Flooding:	*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:	*No*	Future floodplain delineation updates:	*No*

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

2,180 Ft.

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

Sea Level Rise:	*3 Ft.*	Frequency of storms:	*0.25 per year*

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

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

☐ Systems located above 1st Floor.	☑ Water tight utility conduits	☐ Waste water back flow prevention	☐ Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

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

Yes / No	If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

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

Yes / No

If Yes, describe:

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

Yes / No	If Yes, for how long:	*days*

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

C.4 - Building Resilience and Adaptability

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

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

Select appropriate:	*Yes / No*	☐ Hardened / Resilient Ground Floor Construction	☐ Temporary shutters and or barricades	☐ Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

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

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

Select appropriate:	*Yes / No*	☐ Solar PV	☐ Solar Thermal	☐ Clean Energy / CHP System(s)
		☐ Potable water storage	☐ Wastewater storage	☐ Back up energy systems & fuel
Describe any specific or additional strategies:				

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

Appendix E

Accessibility Checklist

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

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

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

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

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

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

Accessibility Analysis Information Sources:

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

Article 80 | ACCESSIBILTY CHECKLIST

Project Information

Project Name:	125 Guest Street
Project Address Primary:	125 Guest Street
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Keith Craig/Director/NB Development Group/kcraig@nbdevelopment.com Thomas N. O'Brien/Managing Director/The HYM Investment Group/tobrien@hyminvestments.com

Team Description

Owner / Developer:	NB Development Group and The HYM Investment Group
Architect:	Elkus Manfredi Architects
Engineer (building systems):	WSP Global
Sustainability / LEED:	The Green Engineer
Permitting:	Epsilon Associates
Construction Management:	

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:

Article 80 | ACCESSIBILTY CHECKLIST

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)	*Retail, restaurants, residential amenities, parking*			

What is the Construction Type – select most appropriate type?

	Wood Frame	Masonry	☑Steel Frame	Concrete

Describe the building?

Site Area:	*81,665 SF*	Building Area:	*311,000 SF*
Building Height:	*198 Ft.*	Number of Stories:	*6 and 17 Flrs.*
First Floor Elevation:	*33 Elev.*	Are there below grade spaces:	*No*

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.	Boston Landing is a recently redeveloped district defined by the rail lines to the north, Market Street to the west, North Beacon to the south and Everett Street to the east. Boston Landing is vibrant transit-oriented urban district including mixed uses, publicly accessible open spaces, active pedestrian streets and distinguished architectural character. The Boston Landing Residential Project site is located on Guest Street and will play a vital role in the district by generating the continuous activity necessary for a 'live-work-play' district.

List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	MBTA Bus Routes 64 and 86
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Boston Housing Authority, 266 N Beacon St
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.	*[I do not think so. Team to determine exactly how this is defined]*

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.	A portion of the existing sidewalk is new construction consisting of concrete, while another portion of the sidewalk is temporary asphalt pavement
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 portion of the sidewalk that is new construction will remain while the remainder of the proposed sidewalks will be new construction.
Is the development site within a historic district? **If yes,** please identify.	No.

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	Yes.
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Guest Street is considered a Neighborhood Main Street, while Arthur Street and Hichborn Street are considered Neighborhood Connector Streets
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Guest Street – Total Width 15'-6", Furnishing Zone 6'-6", Pedestrian 9'-0" Arthur Street – Varies with minimum total width being 17'-10" Hichborn Street – Total width 14'-6", Furnishing Zone 6'-6", Pedestrian 8'-0"
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?	Furnishing Zone: Permeable Concrete Unit Pavers, Tree Pits / Grates, Rain Gardens, Granite edging and banding Pedestrian Zone: Concrete pavement with flush granite banding Proposed materials are in the public 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?	No
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	Yes
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-	Guest Street – Potential Café space 4' – right of way clearance 5'

of-way clearance be?	

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?	149
What is the total number of accessible spaces provided at the development site?	5 Accessible spaces will be provided per MAAB
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No
Where is accessible visitor parking located?	Accessible visitor parking has not yet been determined.
Has a drop-off area been identified? **If yes,** will it be accessible?	Drop-off location is not yet determined. It will be accessible.
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.	Level 2 elevator lobbies and Level 1 main lobby are both accessible per MAAB. Refer to Level 1 and 2 Plans

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.	All building entries and sidewalks will be accessible per MAAB
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	All resident and retail entries and circulation elements will be accessible per MAAB.
Are the accessible entrance and the standard entrance integrated?	Yes. All entries are accessible.
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. The roof deck design is yet to be developed but will be fully accessible per MAAB.
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No. Signage package will comply with MAAB.

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?	295
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	All units are planned to be for rent. 13% will be affordable per the BRA Inclusionary Development Program.

Article 80 | ACCESSIBILTY CHECKLIST

How many accessible units are being proposed?	15 units will be Group 2A per MAAB (5% of total units). The remaining 280 units will be Group 1 per MAAB.
Please provide plan and diagram of the accessible units.	The units are not yet designed but will be proportionally distributed the building per MAAB requirements.
How many accessible units will also be affordable? If none, please describe reason.	The final count is yet to be determined, but the Group 2 units will be proportionally distributed throughout the building per MAAB.
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.	No. All units will be designed to comply with MAAB Group 1 or Group 2A.
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No.
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	

Thank you for completing the Accessibility Checklist!

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

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities