Project Notification Form

The Factory at 46 Wareham

46 Wareham Street

Boston, MA

THE FACTORY

AT 46 WAREHAM

SUBMITTED BY

Holland Development, LLC
519 Albany Street
Boston, MA 02118

PREPARED BY

Vanasse Hangen and Brustlin, Inc.
99 High Street
10th Floor
Boston, MA 02110

IN ASSOCIATION WITH

Hacin + Associates
DeCelle-Burke Associates
LaCasse Law, LLC

July 2014

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Submitted by **Holland Development, LLC**
519 Albany Street
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Prepared by **VHB/Vanasse Hangen Brustlin, Inc.**
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DeCelle-Burke Associates
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July 2014

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Project Description

Introduction

The Holland Company, as manager of Holland Development, LLC (the "Proponent"), proposes to develop The Factory at 46 Wareham – a proposed mixed-use development to be constructed as an adaptive renovation/addition to the existing building at 46 Wareham Street in the South End neighborhood of the City of Boston. As currently planned, the new space will include 42 residential units and 9,400 square feet of ground floor retail space with 52 below-grade parking spaces (the "Project").

The Holland Company, originally founded in 1965 as a building and remodeling contractor, specializes in all aspects of residential and commercial construction. Beginning with a focus on craftsmanship, the firm quickly built a reputation throughout Boston's historic neighborhoods for blending traditional structures with contemporary details and amenities, while maintaining architectural character of the neighborhood.

Holland Development mirrors the high standards and services developed over the years, but with a focus on multi-unit residential buildings. The Holland Company and Holland Development have developed, or are in the process of developing, over 120,000 SF of residential units in Boston's historic neighborhoods. Completed development projects include The Bradley Mansion on Commonwealth Avenue, while The Jordan Lofts at 477 Harrison Avenue and 451 Marlborough are currently under construction.

The Project is subject to Large Project Review under Article 80B of the City of Boston Zoning Code and Enabling Act. Accordingly, the Proponent submits this expanded Project Notification Form (PNF), including the substantive components that are required for Large Project review such as urban design, transportation, and environmental impacts.

Project Description

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Existing Site Conditions

The Project site is an approximately 16,555 square foot (0.38 acre) land parcel in the South End neighborhood of Boston, as shown in **Figure 1-1**, Site Location Map. The site is bound by Wareham Street to the south, surface parking to the east and north, and an industrial/office building at 30 Wareham to the west.

A four story, 30,231 square foot warehouse building, currently partially occupied by Samos Imex Corp: Importers & Distributors of Quality Food is located on the Project site. Under existing conditions, the building is drastically underutilized with only 2 full time employees in the entire building. The windows of the first two floors of the building have been removed and replaced with concrete cinderblocks and plywood.

A shared access driveway is provided at the west edge of the site. The driveway provides access to the existing parking and loading area at the rear of the building. The existing site survey is shown in **Figure 1-2**.

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Project Description and Program

The approximately 62,215 square foot mixed-use building will include approximately 9,400 square feet of ground floor retail space, five floors of residential unit (42 total units), and a single level of below grade parking for approximately 52 vehicles. **Figure 1-3** presents the proposed site plan. **Table 1-1** presents the proposed building program.

Table 1-1
Proposed Building Program

Use / Unit Type	Number of Units	Gross Square Feet (GSF)
Retail	-	9,400
Residential / One Bedroom	23	17,827
Residential / Two Bedroom	17	19,763
Residential / Three Bedroom	2	3,035
Grand Total	42	50,225

Source: Holland Companies, June 2014

The existing building is to be partially demolished leaving the front and west façade of the building in place and connected to the new construction. Three additional levels will be added to the existing building, bringing its total height to 69 feet. Additional building plans and sections are provided in Chapter 3, *Urban Design*.

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Site and Access Improvements

The proposed site plan for The Factory at Wareham is illustrated in Figure 1-3. The Project site will be accessed via the existing shared driveway on Wareham Street. Parking for 52 vehicles will be provided on-site within a single level garage (1 parking space per unit and 1 space per 1,000 square feet of retail space).

Pedestrian access to the residential units will be located on the southeast corner of the building, separate from the pedestrian entrance to the ground floor retail. The residential entrance will be secured and provide access to the elevators and stairways that access the below grade parking and the upper levels of the building. Indoor bicycle storage will be provided on the garage level of the building. Outdoor bicycle racks will be provided on the northwest corner of the site, adjacent to basement egress stairs.

A ramp leading to the below-grade parking will be located at the rear northeast corner of the building with access from the shared driveway at the west of the Project site. Deliveries, such as mail packages, take-out food, and flowers will occur at the building entrances on Wareham Street supported by the existing commercial on-street parking adjacent to the Project site. Trash will be collected within the building and wheeled to the street for removal on a regular basis. Retail deliveries and resident move-in/move-out activity will be managed curbside within the existing commercial loading on Wareham Street.

As the site plan develops, pavement markings, ADA/AAB compliant sidewalks, pedestrian ramps, signage, and landscaping will all be incorporated to provide safe, convenient, and accessible connections within the Project site.

In addition, removal of existing perimeter fencing will be explored to improve pedestrian access through the site. This potential future connection is consistent with the BRA request for enhanced vehicular and pedestrian connections to improve walkability.

Public Review Process

The Proponent contacted local public and elected officials before commencing public meetings to present concepts for the Proposed Project. The Proponent met with the Urban Design staff of the Boston Redevelopment Authority (BRA) on April 16, 2014 to discuss building massing and related design themes prior to the filing of this expanded PNF.

On May 6, 2014, the Proponent submitted a Letter of Intent to the BRA Director in accordance with the "Executive Order of Mayor Thomas M. Menino Relative to the Provision of Mitigation by Development Projects in Boston[1]" (Executive Order).

[1] *Executive Order of Mayor Thomas M. Menino Relative to the Provision of Mitigation by Development Projects in Boston*, October 10, 2000, as amended by Executive Order dated April 3, 2001.

The purpose of the Executive Order is to provide for the review of Project impacts and proposed mitigation by an Impact Advisory Group (IAG). The IAG consists of Mayor-appointed individuals including residents, business owners, and designees of relevant community organizations. Additionally, a public meeting will be advertised in the Boston Herald and held at a convenient location to inform local residents about the Proposed Project, and to solicit comments to better respond to community concerns.

The City is in the process of establishing an IAG for the Project. The Proponent will be meeting with this group at the earliest convenience.

Additionally, the Proponent has met with representatives from four local community groups and several neighborhood property owners over the past two month. The group meetings include the following:

- March 25, 2014: Blackstone/Franklin Square Neighborhood Association (BFSNA)
- May 7, 2014: Newmarket Business Association
- May 13, 2014: 90 Wareham Street Condo Association
- May 21, 2014: 27 Wareham Street Condo Association
- June 17, 2014: BFSNA
- June 19, 2014: South End Business Alliance
- June 24, 2014: Old Dover Neighborhood Association

Project Benefits

The Proposed Project will provide the following community benefits to the City and to the South End neighborhood:

- Promote new businesses and jobs by providing a combination of 42 residential units;
- Increase affordable housing stock by designating 5 residential units as Affordable Housing;
- Provide 42 residential parking spaces in an off-street parking garage on a 1.0 space per unit ratio for all new units;
- Meet or exceed the Boston Residents Job Policy;
- Improve the public realm with an enhanced façade and pedestrian way along Wareham Street adjacent to the Project site;
- Revitalize an underutilized existing building and urban area;
- Reduce surface parking and maneuvering areas;
- Introduce a potential new tenant, the Boston Arts and Crafts Society, which has expressed an interest in relocating from Newbury Street to join the growing South End arts community; and,
- Introduce high-quality architecture and diverse styles, while preserving key historic building components to provide a subtle transformative effect for this neighborhood.

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Employment

The Proposed Project will create construction-related jobs and retain permanent employment opportunities.

Construction Employment

The construction of the Project will contribute directly to the local economy by providing numerous employment opportunities. An Employment Plan/Quarterly Work Force Projection Table (the "Plan") will be submitted in accordance with the Boston Residents Job Policy. The Plan will provide that the company will make best efforts to have at least 50 percent of the total employee work hours for the Project be performed by Boston residents, at least 25 percent of such hours be performed by minorities, and at least 10 percent of such hours be performed by women. Construction will generate approximately 15 full-time equivalent construction jobs.

Permanent Employment

Demand generated by The Factory at Wareham development will require expansion of The Holland Company's team to employ approximately 3 new full-time equivalent job in property management and maintenance. The ground floor retail will employ approximately 10 full-time equivalent jobs.

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Economic Benefit

The Proposed Project is estimated to cost approximately $8 million and will have several economic benefits for the City. Financing will likely come from a well-known local bank.

The proposed residential units will provide middle-market housing in a tight urban market.

The building will expand the City's tax base with a building with an $8 million assessed value replacement cost which will increase the taxable value of the property significantly. The resulting annual tax liability significantly increases the amount paid by the current use.

Summary of Findings

This section summarizes study findings, including transportation and environmental protection. Infrastructure evaluation and a discussion regarding historic resources are also presented. Overall, as described below, the Project is not expected to have significant environmental impacts.

Transportation

Additional traffic generated by the Project will produce limited impacts to the surrounding transportation infrastructure and is expected to have minimal effect on Level of Service at the study area intersections during the peak commute hours. Key findings from this transportation study include the following:

- The Project site is well served by transportation infrastructure, including access to the Massachusetts Turnpike and Interstate 93, and within walking distance to multiple MBTA bus routes and the Silver Line.
- The Project's parking will be limited to one space per residential unit and ten accessory parking spaces for the ground floor retail tenant, minimizing the use of neighborhood parking by the future building tenants.
- Loading and service will occur within the designated commercial loading zone on Wareham Street adjacent to the Project site. Resident move-in/move-out operations will be coordinated and permitted through the Boston Transportation Department as required.
- The Proponent will provide covered bicycle storage capacity on site in accordance with the City of Boston Bicycle Guidelines. The Project will also include a public bicycle rack to support ground floor retail space and visitors.
- The Proponent will provide orientation packets to the residential tenants informing them of the opportunities to use public transportation and other alternative modes of transportation to minimize single occupancy vehicle travel.
- The Proponent will encourage future ground floor retail tenants to implement proactive transportation demand management measures to its employees to encourage the use of transit and other alternative forms of transportation.

Environmental Protection

The Project is not expected to generate significant environmental impacts as compared to the existing condition. The Project will improve stormwater runoff quality and quantity, and the aesthetic character of the Project site and the surrounding area.

Details of each of these environmental components are provided in Chapter 5, *Environmental Protection*.

Wind

Given the limited height (not to exceed 70 feet at the building's highest point) of the proposed development, the Project does not warrant conduct of a quantitative wind study. As designed, the Project will not result in any vertical deflection of upper level winds, which typically result from buildings of 200 feet in height or more.

Shadow

The Proposed Project is not expected to greatly increase the shadow produced relative to the existing building on the site. During the fall and winter months, it is expected that the shadow will extend to Malden Street and the buildings on the north side of Malden Street.

Daylight

A minimal increase of 5% daylight obstruction will occur along the Wareham Street sidewalk adjacent to the Project site.

Solar Glare

Solar glare impacts on neighbors and adjacent roadways are not anticipated due to proposed building designs not including large areas of reflective glass or other materials that would contribute to solar glare.

Water Quality and Conservation

The Proposed Project will not impact the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the discharge of site materials off-site and to BWSC systems.

All dewatering will be conducted in accordance with all applicable MWRA and BWSC discharge permits. Once completed, the Project will be in compliance with all local and state stormwater management policies.

Flood Hazard Zones/Wetlands

The Project site is completely developed and contains no wetland areas.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the site, Map Number 25025C0079G, indicates the Project site is outside of the 0.2 percent annual floodplain (commonly referred to as the 500 year flood limit) identifying it as an area of minimal flooding.

Groundwater & Geotechnical Conditions

The Project is located in the Groundwater Conservation Overlay District (GCOD) as outlined in Article 32 of the City of Boston Zoning Code. Accordingly, the Project will be recharging rainwater into the ground and will not negatively impact groundwater levels on site or adjacent lots as required in Article 32.

Solid and Hazardous Materials

There are no known hazardous waste conditions on site. An investigation of the site and existing building will be conducted prior to beginning construction to confirm the absence of contaminated or hazardous materials. If such materials are found, the removal and disposal of any contaminated materials will fully comply with the Massachusetts Contingency Plan (MCP).

Air Quality

It is anticipated that the Proposed Project will comply with the requirements of the City of Boston, the Massachusetts State Implementation Plan (SIP), and the U.S. Environmental Protection Agency (EPA) criteria for residential receptors. Carbon monoxide concentrations are expected to fall below the National Ambient Air Quality Standards (NAAQS).

Noise

The noise analysis evaluated the sound levels associated with the redevelopment of 46 Wareham Street Project. This analysis determined the maximum Project sound levels are all lower than the existing daytime and nighttime sound levels, are below the City of Boston's daytime noise impact criteria, and are slightly higher than the City's nighttime noise impact criteria. The Project's rooftop mechanical equipment will generate sound levels that are below the existing daytime and nighttime sound levels and will not result in a perceptible increase in the existing sound levels

Construction Impact

Construction for the Proposed Project is expected to last approximately 16 months, with occupancy expected in 2016. Typical construction hours will be from 7:00 AM to 3:30 PM, Monday through Friday. The Proponent will require its contractor to construct the Project in

compliance with all applicable City, State, and Federal regulations governing noise, dust, and traffic maintenance. In addition, the Proponent will develop a Construction Management Plan with the Boston Transportation Department to address pedestrian and vehicular access concerns.

Rodent Control

The City of Boston has declared that the infestation of rodents in the City is a serious problem. In order to control this infestation, the City enforces the requirements established in the Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550 and the State Building code, Section 108.6 Policy Number 87-4 (City of Boston). These regulations established that extermination of rodents should be required for issuance of permits for demolition, excavation, foundation, and basement rehabilitation. The Proponent will develop a rodent control program prior to construction commencement.

Historical Resources

The Project Site is located within the South End Landmark Protection Area (BOS.AD), which was established in 1983 to protect views of the adjacent South End Landmark District, ensure that new development adjacent to the Landmark District is compatible, and to protect light and air circulation within the district. The one-quarter mile study radius also includes properties within the National Register-listed South End Historic District (NR #73000324, BOS.AB), and the South End Landmark District (BOS.AC), which is a local historic district. Also located within the study radius are the Lawrence Model Lodging Houses (NR #83000606, BOS.AF), which are within the South End Landmark District but are also listed individually in the National Register; the East Brookline Streetscape (BOS.AJ), which has been determined eligible for the National Register; the South End Industrial District (BOS.AH), which has been found eligible for the National Register; and the South End Industrial Survey Area (BOS.RK).

Sustainability

New development projects over 50,000 SF must comply with green building standards and sustainable design features as described in Article 37 of the City's zoning code. The Proponent is committed to incorporating numerous design elements into the building construction to respond to environmental concerns, reduce energy consumption, reduce water use, and increase recycling.

A LEED for New Construction and Major Renovations checklist is included in Chapter 5, *Environmental Component*, computing the green building points defined by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building rating system.

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Infrastructure Systems

Utility connections supporting the Project will be designed and constructed in accordance with City, State, and Federal standards. The Proponent will coordinate with the following agencies throughout the design and construction process:

- Boston Water and Sewer Commission (BWSC) will review any modifications of on- and off-site water, sewer, and drainage systems through the site plan review process. This process includes a comprehensive design review of the proposed service connections, assessment of system demands, capacity and established or updating of service accounts;
- Boston Fire Department (BFD) will review the Project with respect to fire protection measures such as siamese connections and standpipes;
- Design of the Site access, hydrant locations, and energy systems will be coordinated with the respective system owners; and,
- New utility connections will be authorized by the Boston Public Works Department through the street opening permit process, as required.

Source: Arcmap Bing Aerial Datalayer, Boston, Massachusetts

Site Location Map

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A Hacin + Associates [architecture + design]

the HOLLAND COMPANIES Design & Construction

Figure
1-1

Source: DeCelle, Burke & Associates, Inc.

Existing Site Survey

SITE PLAN
scale: NTS

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
1-3

2

General Information

Applicant Information

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Development Team

The Proponent has assembled a development team of experts familiar with the City's review and approval processes.

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John Holland, AIA, VP

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Legal Information

Legal Judgments or Actions Pending Concerning the Proposed Project

There are no legal judgments or actions pending in any court of the Commonwealth of Massachusetts concerning the property at 46 Wareham Street in Boston. There is no record of any lis pendens concerning the property issued by any court.

History of Tax Arrears on Property Owned in Boston by Development Entity

There are no unpaid property taxes on property owned in Boston by the developer of this Project.

Evidence of Site Control Over Entire Project Area

The developer, Holland Development, currently has the property under agreement pursuant to a Purchase and Sale Agreement that contains a provision authorizing Holland Development to pursue permitting and approval of the property prior to closing the purchase transaction. Such

approvals include zoning relief if necessary, Article 80B Large Project Review, and any other ancillary proceedings required to fully permit the Proposed Project.

Nature and Extent of Any and All Public Easements

The property is subject to and has the benefit of the provision of a party wall agreement between Linden Realty Company and Katherine F. A. Johnson, dated April 11, 1924, file and registered with the Suffolk County Registry of Deeds, Land Court Division, as document no. 53870.

To the extent the property is included within the limits of an 18' passageway as shown on a subdivision plan drawn by Walter C. Bates, C.E., dated April 10, 1920, as approved by the Land Court, filed in the Land Registration Office as Plan No. 5796-B, a copy of a portion of which is filed with Certificate of Title No. 11855, it is subject to its use as part of the same, and there is appurtenant to the property the rights to use the whole of said 18' passageway in common with Lot A as shown on the subdivision plan.

Regulatory Controls and Permits

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Current Zoning

The property is located in the South End Neighborhood District governed by Article 64 of the Boston Zoning Code. It is further located in the Economic Development Area [EDA] South established by Article 64-14(3).

It is located within two overlay districts: (1) Groundwater Conservation Overlay District [GCOD] governed by Article 32 of the Boston Zoning Code; and (2) Restricted Parking Overlay District [RPOD] governed by Article 3-1A(c) of the Boston Zoning Code.

The property is located within the South End Landmarks Protection Area.

The Project includes ground floor commercial space with residential use on the floors above. In the EDA South sub-district in the South End Neighborhood District, residential uses are Conditional ["C"] uses.

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Proposed Uses and Dimensional Requirements

A breakdown of the various use and dimensional zoning requirements is located in **Table 2-1** below**.** Article 64 and the applicable Tables C and G govern the use and dimensional requirements for this project.

Table 2-1
Project vs. Zoning Requirements Comparison Table

Applicable Requirements	District	Proposed Project
Use – ground floor commercial and residential on upper floors	C	Conditional Use - Residential
Maximum Floor Area Ratio (FAR)	4.0	3.7
Maximum Building Height	100'	69'9"
Minimum Lot Size	None Required	16,752
Minimum Usable Open Space – SF per Dwelling Unit	50 [2,100 required for 42 units]	5,418 for 42 residential units provided
Minimum Lot Width	None Required	-
Minimum Lot Frontage	None Required	-
Minimum Front Yard Setback	None Required	-
Minimum Side Yard Setback	None Required	-
Minimum Rear Yard Setback	20'	20'
Off-Street Parking Spaces	29.4 Required	52 Provided

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Article 80B

The Project is subject to the Code's Article 80B Large Project Review process since the proposed gross floor area exceeds 50,000 square feet of new development. The Proponent has commenced Large Project Review under Article 80B of the Boston Zoning Code with the filing of a Letter of Intent with the Boston Redevelopment Authority ("BRA") on May 6, 2014, which indicates the Proponent's intention to file an Expanded Project Notification Form in connection with the Proposed Project. The Proponent has reached out to and met with City agencies, neighborhood representatives and groups, elected officials, and other interested parties over the last few months.

This Expanded Project Notification Form ("PNF") presents details about the Proposed Project and provides an analysis of transportation, environmental protection, infrastructure, and other components of the Proposed Project, in order to inform City agencies and neighborhood residents about the Project, its potential impacts, and mitigation proposed to address those potential impacts.

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Project Schedule

The following provides a preliminary assessment of the construction schedule for the Proposed Project:

- Project Review, Approval, & Permitting — Summer 2014 – Fall 2014
- Site Enabling — Fall 2014
- Site Excavation — Fall 2014 – Winter 2015
- Construction — Spring 2015 – Summer 2016
- Building Occupancy — Fall 2016

It is anticipated that the Project site work will commence by Fall 2014. The Project includes scaffolding and anchoring the exterior walls that will be retained with the Proposed Project followed by a partial demolition of the building and excavation of the proposed below-grade parking garage area. The entire construction schedule is anticipated to be approximately 16 months with completion scheduled by Summer 2016 and the building opening in late Fall 2016.

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State and Local Permits and Other Approvals Anticipated

The Proponent will seek the following state and local permits and will take the following actions in notification of relevant agencies in the months prior to obtaining a Building Permit (See **Table 2-2**).

Table 2-2
Anticipated Permits and Approvals

Agency Name	Permit or Action*
Commonwealth of Massachusetts	
Massachusetts Department of Environmental Protection, Division of Water Pollution Control	Sewer Connection Permit [if applicable]
Massachusetts Department of Environmental Protection, Division of Air Quality Control	Notice of Commencement of Demolition and Construction [if applicable]
City of Boston	
Boston Redevelopment Authority	Article 80B Review; BRA Board Approval and Related Cooperation Agreement; Affordable Housing Agreement; Boston Permanent Employment Agreement.
Boston Zoning Board of Appeal	Conditional use permits for GCOD; RPOD; and residential use component.
South End Landmarks District Commission	Protection Area guidelines review
Boston Civic Design Commission	Schematic Design Review, if needed
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Department of Public Works/ Public Improvements Commission	Street Opening Permit; Street/Sidewalk Occupancy Permit.
Boston Water and Sewer Commission	Water and Sewer Connection Permit; GCOD Recommendation Letter
Public Improvement Commission	Vertical Discontinuance or License for Canopy
Boston Public Safety Committee on Licenses	Fuel Storage Permit for underground parking garage.
Boston Department of Inspectional Services	Building Permits; Certificates of Occupancy; Other Construction-related Permits

The table above sets forth a preliminary list of permits and approvals from state and local governmental agencies, which are presently expected to be required for the Project, based on Project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits or actions may be needed all of which may become evident during Project design and development.

3
Urban Design

This chapter describes the urban context, the proposed architectural design, pedestrian amenities, and landscape treatment for the proposed Project.

Urban Context

The proposed Project site is located within the “Back Streets” sub-area of the South End neighborhood. The area, as delineated in the Harrison-Albany Corridor Strategic Plan of June 2012 (hereafter referred to as the "Strategic Plan"), is located just south of the SOWA district with Harrison Avenue to the west, the Southeast Expressway viaduct and Frontage Road to the east, and East Canton Street to the south.

The Proposed Project site is currently occupied by a 19th Century mill building [ca. 1870] that once housed the New England Organ Company. The building sits along Wareham Street, a street with a consistent industrial character housing a number of other former mill buildings of similar use and vintage, lining both sides of the street. Immediately to the north and east of the site, the building is surrounded by surface parking.

In keeping with the Strategic Plan’s Vision Statement for the Back Streets area, the Proposed Project will renovate and maintain the building’s most architecturally significant existing façades along the south and west sides of the building allowing the Proposed Project to maintain its relationship to the fabric of the surrounding context. The strong rhythms of windows and bays as well as the material palette of brick and metal are consistent with the building’s historic setting.

Design Development

The design of the Proposed Project adds a series of architecturally distinct volumes above and behind the existing building to create an interlocking composition of building forms defined by materials characteristic of this historic and industrial setting. Three additional floors and a rear building addition are each set back from the historic street facing facades, allowing the

visual integrity of the original building to be maintained. The predominant cornice line and strong rhythm of windows and structural bays along Wareham Street remains an important part of the existing streetscape. Upper floor additions are clad in a dark metal panel system and are highly modulated with semi-recessed balconies and projecting terraces with views of the city beyond. At the rear of the site, a new brick base building expression carries the height and scale of the original building around the site, providing a strong, contextual base for the more contemporary additions above.

Height and Massing

The proposed building will rise to 6-stories with setbacks at the fourth and sixth floors and is approximately 70 feet in height from the average grade of the site. This building height is in line with the zoning changes developed within the Harrison Albany Corridor Study and is considerably below the allowable 100' height limit. As described above, the building massing is articulated as distinct volumes that each reflects the scale of other buildings in the surrounding area and the mixed use character of the project itself, including ground level retail/gallery space with live-work units and conventional housing above; the building massing is also designed to allow the building to fit carefully into its neighborhood context from all sides of the project, including views from Wareham Street, Malden Street, Albany Street and Harrison Avenue.

Character and Materials

The red and brown brick of the historic facades will be restored and complemented by new areas of red brick, granite, zinc and metal panel. Materials have been applied to the proposed building's volumes to both articulate the project's massing and maintain the robust industrial character of the area. The existing rhythm of windows and piers on the historic facades will be extended down to the street to allow at grade access and a dramatic, taller series of storefront windows and doors along the length of the entire property. A long, continuous metal canopy is proposed to visually unify the new metal storefronts and building entries along Wareham Street as well as to provide cover for pedestrians and reduce solar gain on the Southwest facing storefronts.

Site Signage

Signage for "The Factory at Wareham", a building address and a potential tenant sign would all be incorporated into a new street facing canopy.

Open Space

In keeping the "Type C: Back Streets" Streetscape Guidelines defined in the Strategic Plan, the Proposed Project will have new sidewalks to enhance the safety and quality of pedestrian environments in the neighborhood. Generous balconies and terraces on the project's upper floors provide open space for residents. The rear patio space will provide additional usable open space for building residents.

Parking and Loading

The 52 vehicle spaces are located on site within a below-grade parking garage with access at the rear of the building. Vehicle access to the garage will be via a single 20 foot ramp at the rear northeast corner of the building. An elevator and stairwell will be provided with access to the ground floor lobby for all parkers and to the upper building floors for all residents with security access. Parking is to be provided for use by residents and patrons/employees of the retail/gallery space only.

Deliveries, such as mail packages, take-out food, and flowers, will occur at the building entrances on Wareham Street supported by the existing commercial on-street parking adjacent to the Project site. The trash bins will be located within the building and wheeled to the street for removal on a regular basis. Retail deliveries and resident move-in/move-out activity will be managed curbside within the commercial loading on Wareham Street.

Site Access and Circulation

Pedestrian access to the building is from Wareham Street, with a secure entrance for residents and a public entrance to the retail space. Access to the garage is from the existing shared driveway at the west of the site with the ramp at the rear of the building. Move-in operations will be on-street by permit from the Boston Transportation Department.

SITE PLAN
scale: NTS

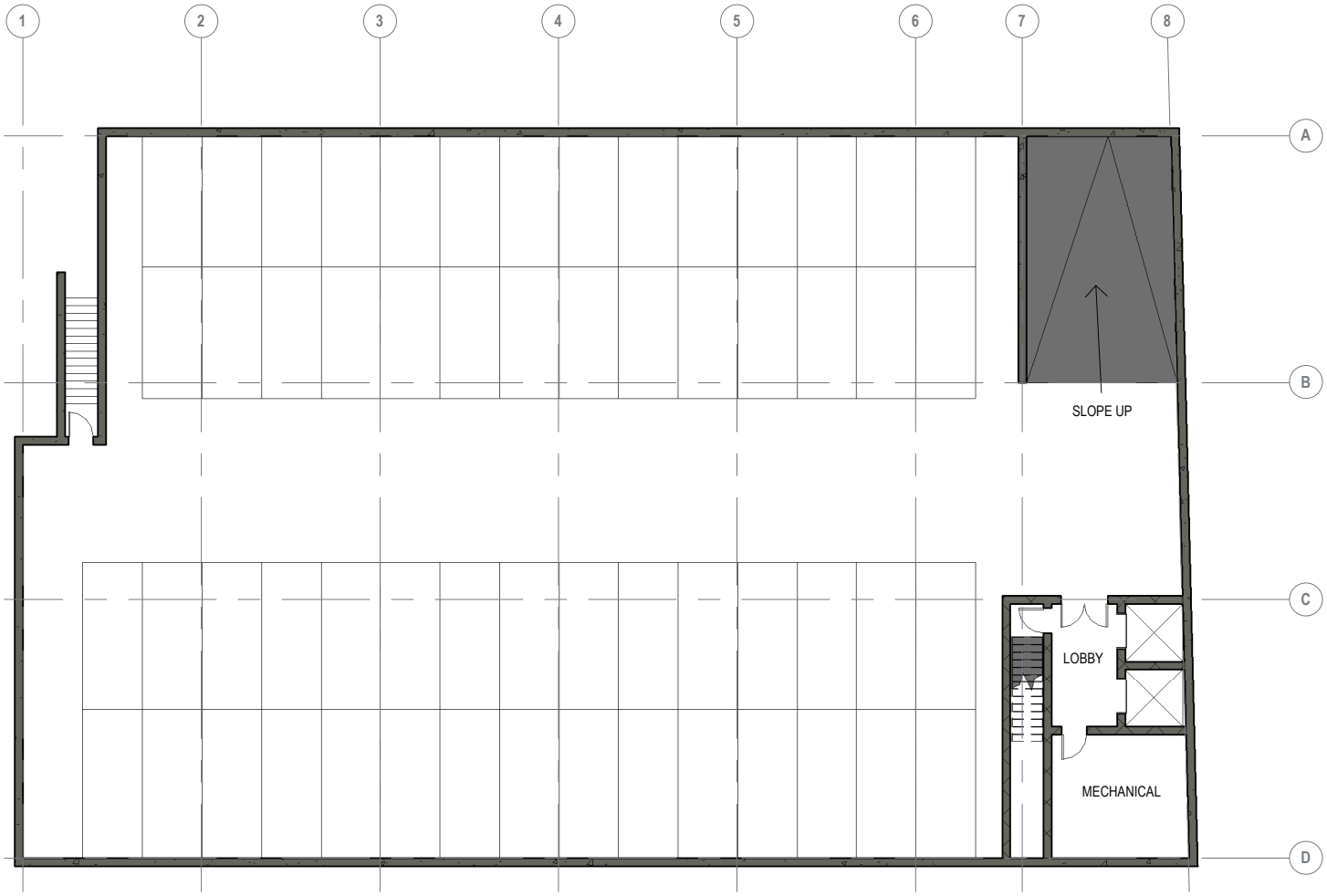
THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-1



Basement Floor Plan

THE FACTORY
AT 46 WAREHAM

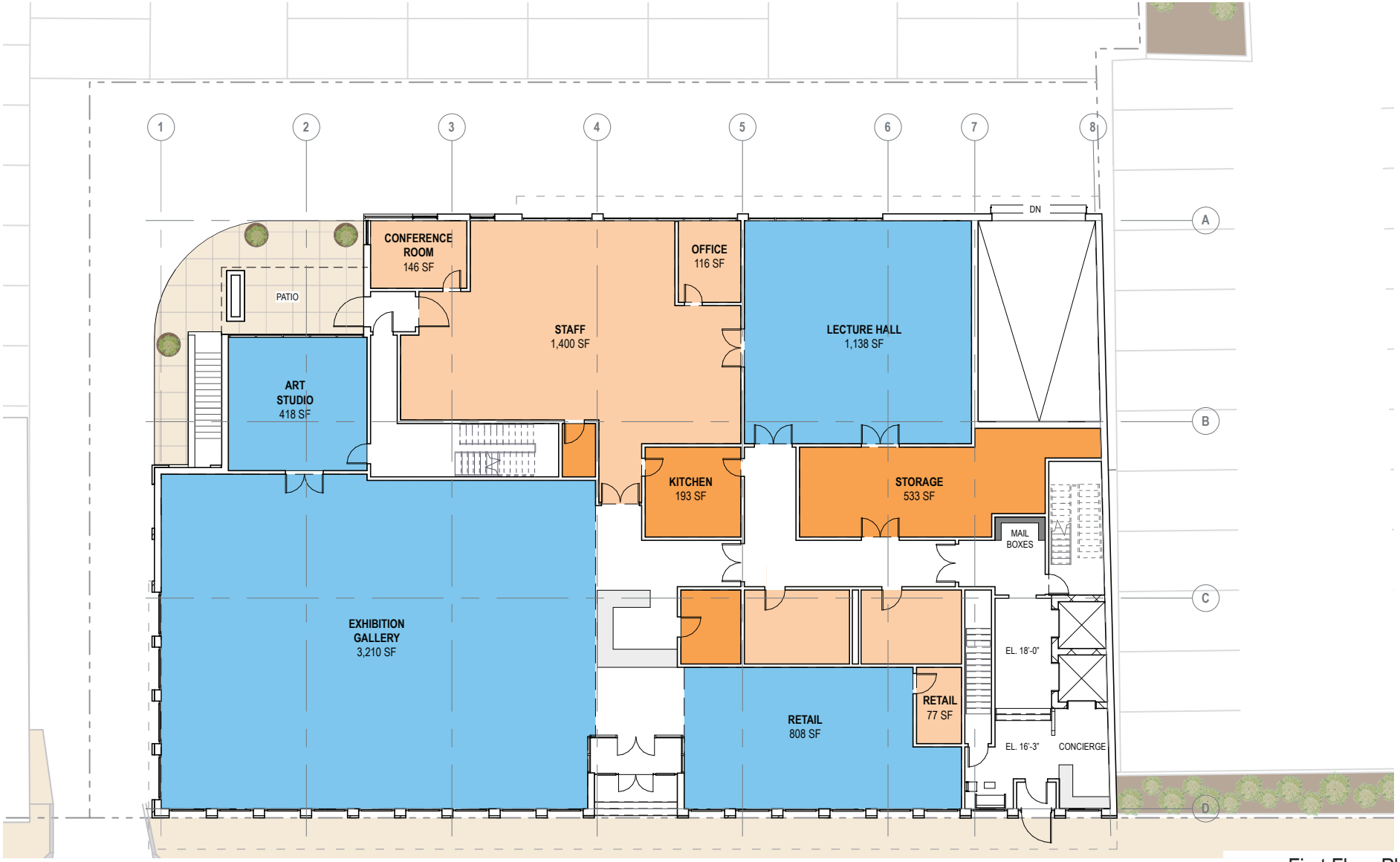
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-2



First Floor Plan

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-3

Second Floor Plan

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-4

Third Floor Plan

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-5

Fourth Floor Plan

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-6

Fifth Floor Plan

THE FACTORY
AT 46 WAREHAM

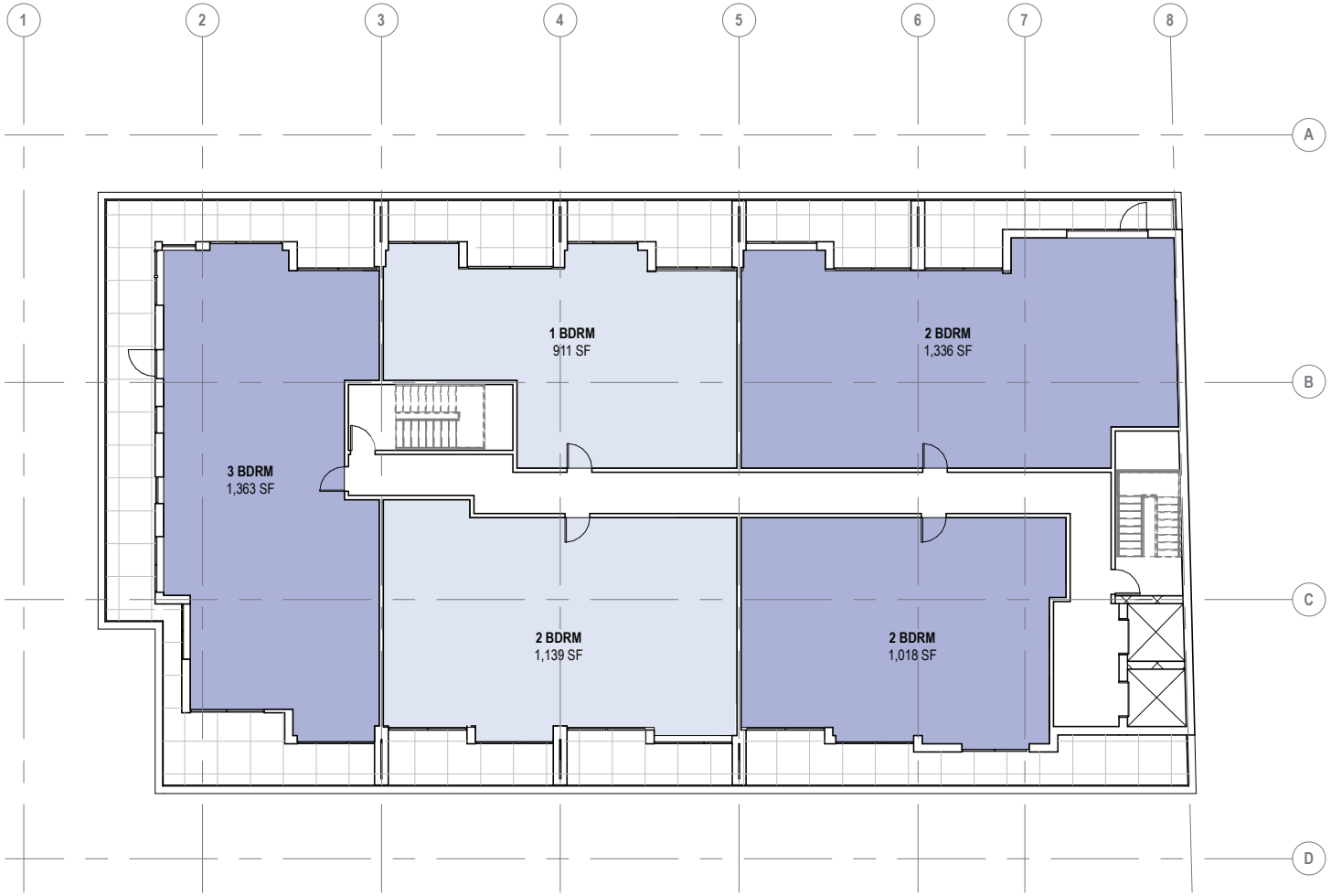
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-7



Sixth Floor Plan

THE FACTORY
AT 46 WAREHAM

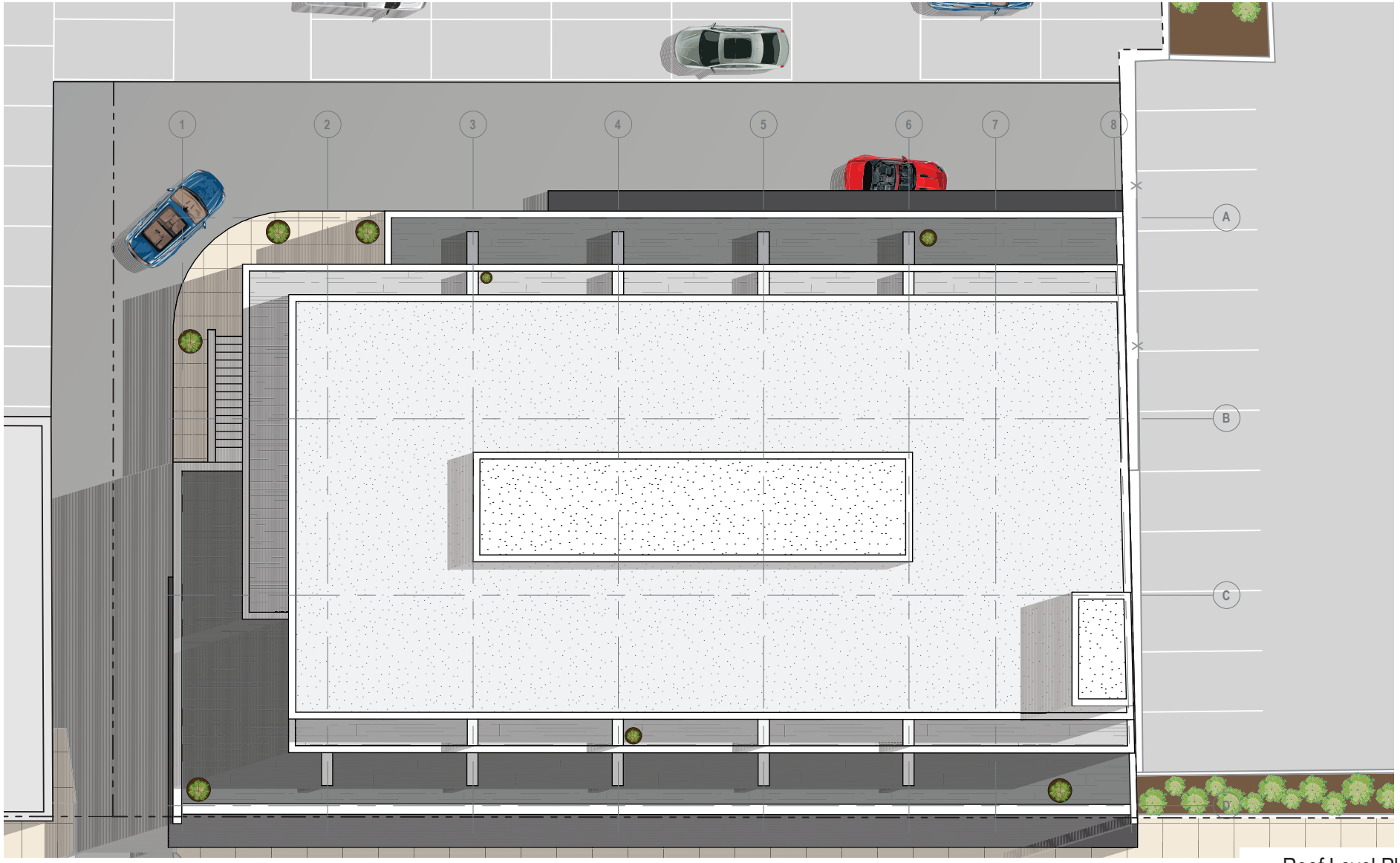
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

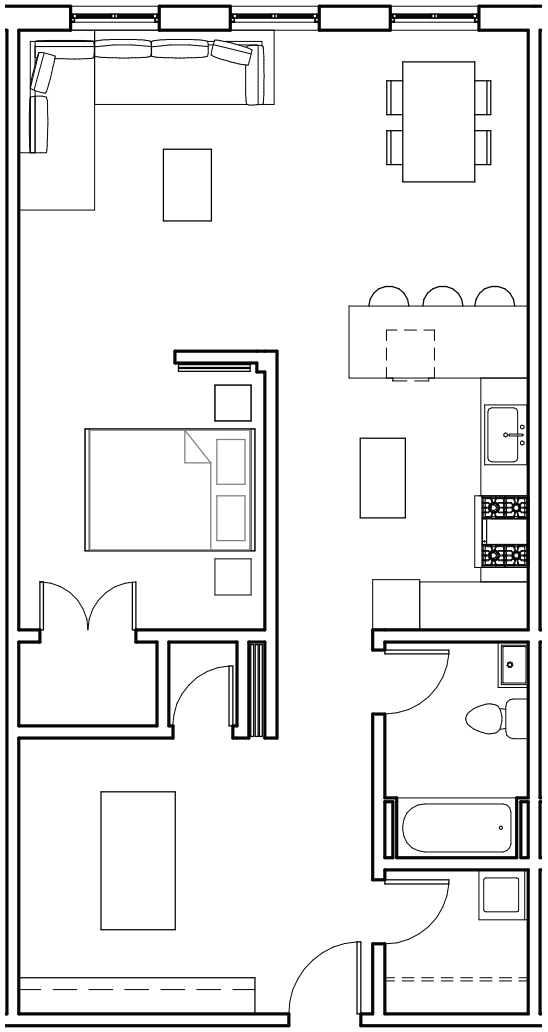
H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

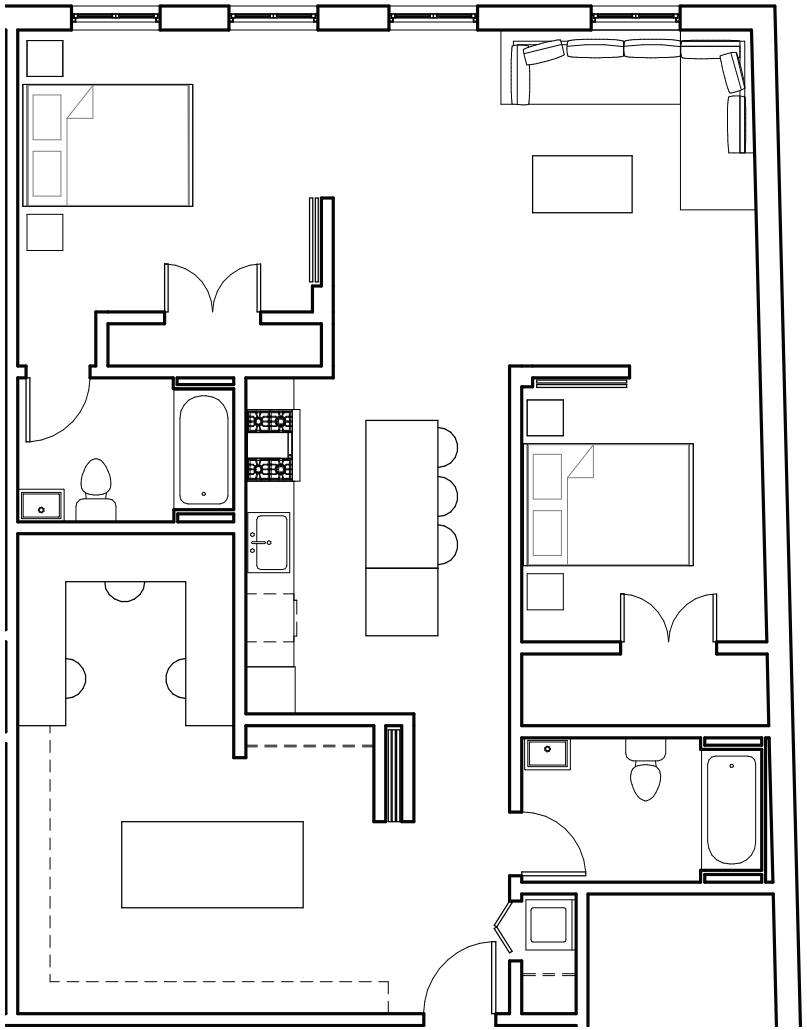
Figure
3-8



Roof Level Plan



Typical 1-Bdrm Unit



Typical 2-Bdrm Unit

THE FACTORY
AT 46 WAREHAM

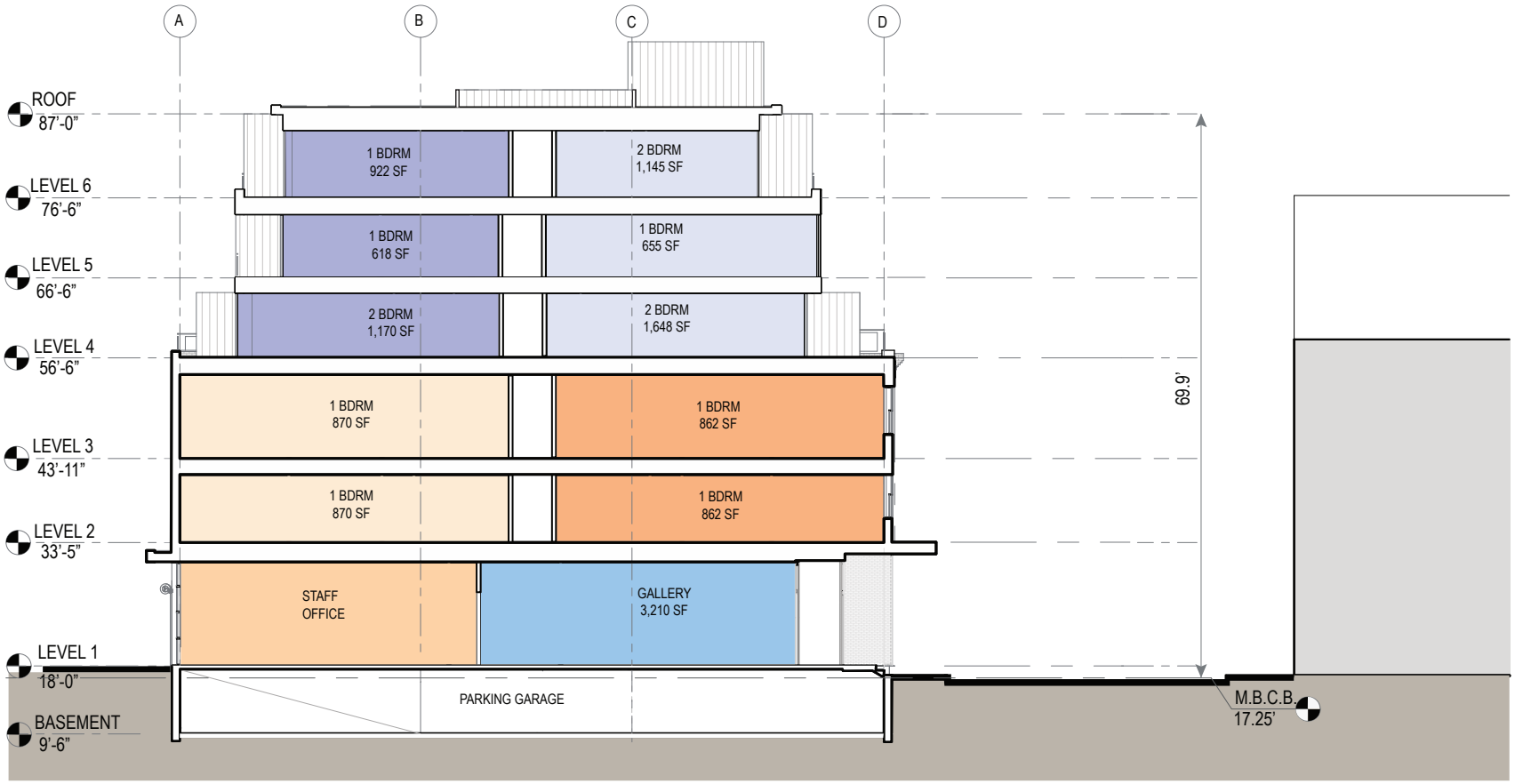
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A Hacin + Associates [architecture + design]

the HOLLAND COMPANIES Design & Construction

Figure
3-10



N/S Cross Section

THE FACTORY
AT 46 WAREHAM

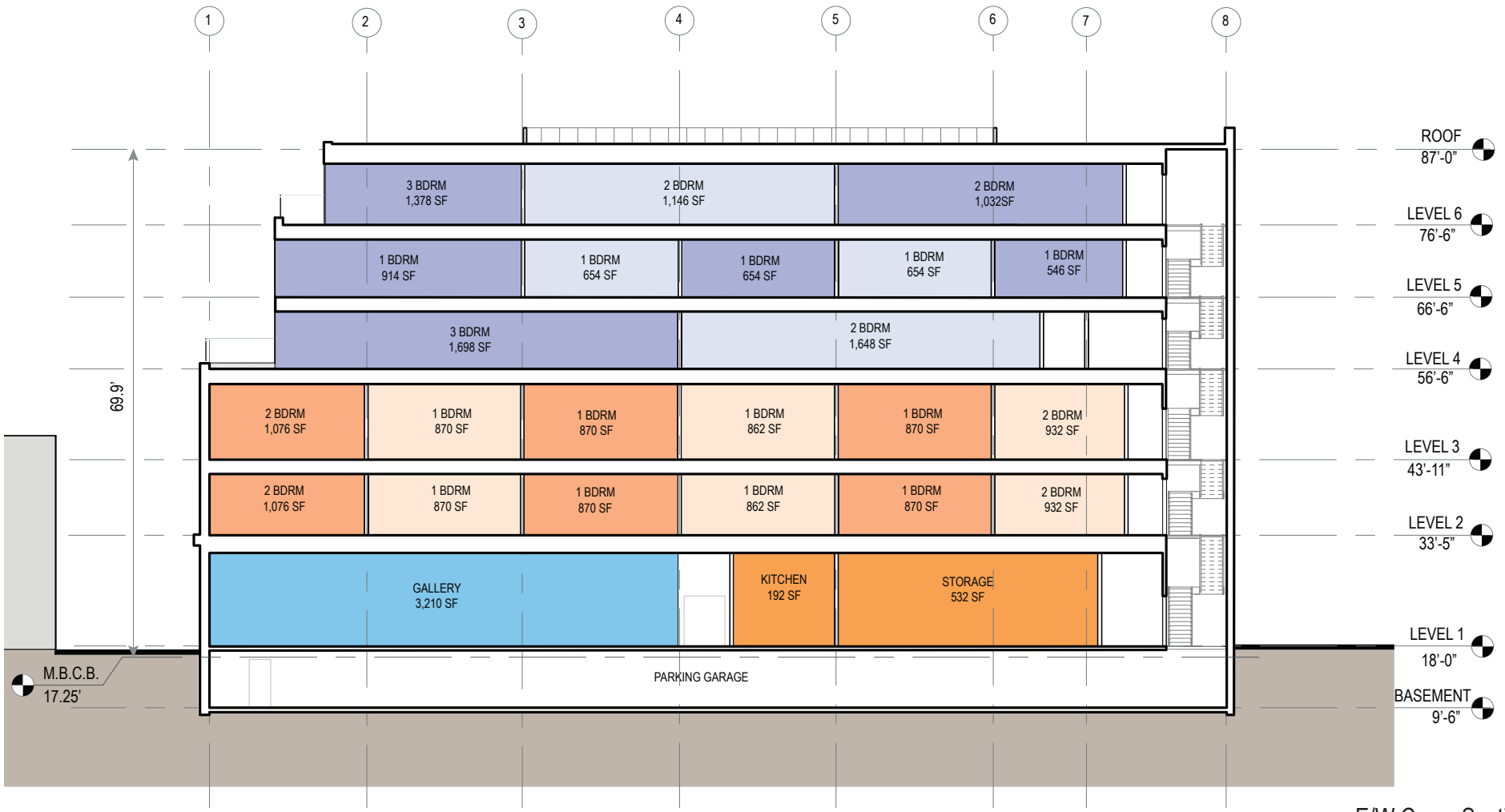
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-11



E/W Cross Section

THE FACTORY
AT 46 WAREHAM

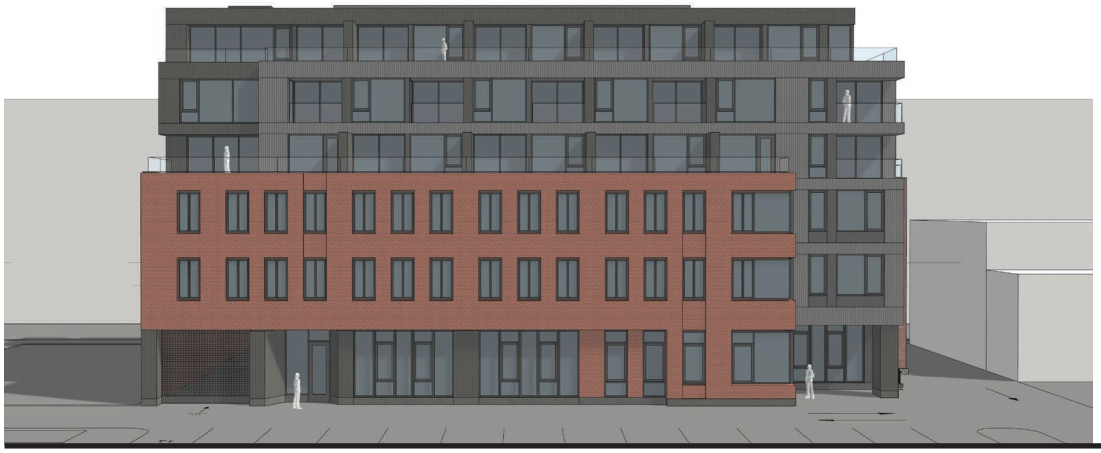
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

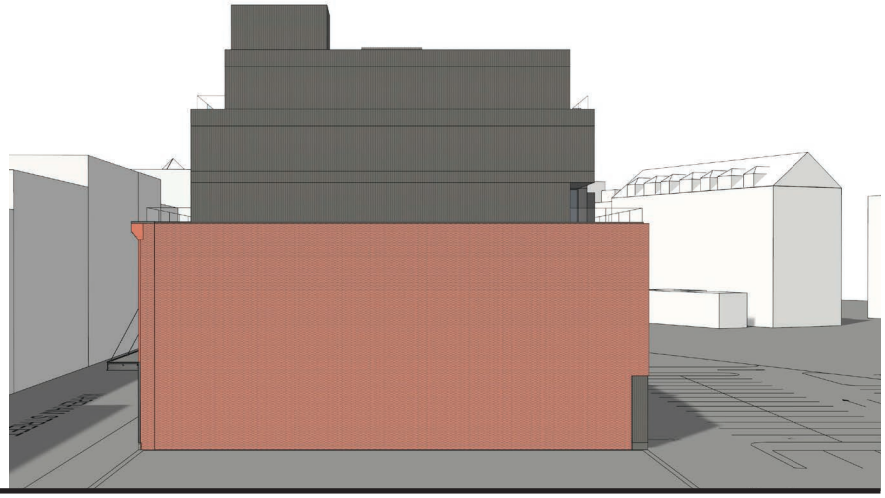
H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-12



NORTH ELEVATION



EAST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

Building Elevations

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-13

View of South Facade from the Southwest

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-14

View of South/East Facade from the Southeast

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-15

View of North/West Facade from the Northwest

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
3-16

4
Transportation

Introduction

This chapter provides a detailed and comprehensive evaluation of the existing and proposed transportation conditions with and without the Proposed Project, as described previously in Chapter 1, *Project Description.* The transportation analysis identifies transportation-related impacts, captures the detailed operational characteristics, and provides a basis for determining to what extent, if any, Project related traffic is likely to affect the wider transportation network. **Figure 4-1** provides an illustrative site plan of the ground floor of the Project, indicating important transportation features.

Project Overview

The Project is located in the Back Streets neighborhood of the South End. The site is bound by Wareham Street to the south, surface parking to the east and north, and an industrial/office building (30 Wareham Street) to the west. The Project site currently includes a 4-story warehouse housing Samos Imex Corp: Importers & Distributors of Quality Food with dedicated loading at the rear/north side of the building.

The Project consists of five floors of residential units, ground floor retail, and a 52-space below grade parking garage. The building program is shown in **Table 4-1**.

Table 4-1
Proposed Project Program

Land Use	Proposed Program	
Retail	9,400	SF
Residential	42	Units
Parking Spaces	52	Spaces

Source: Holland Company, June 2014

Summary of Findings

Key findings from this transportation study include the following:

- The Project generated traffic will not produce a significant impact to the study area intersections.
- The Project site is well served by transportation infrastructure, including access to the Massachusetts Turnpike and Interstate 93, and within walking distance to multiple MBTA bus routes and the Silver Line.
- The Project's parking will be limited to one space per residential unit and ten accessory parking spaces for the ground floor retail tenant, minimizing the use of neighborhood parking by the future building tenants.
- Loading and service will occur within the designated commercial loading zone on Wareham Street adjacent to the Project site. Resident move-in/move-out operations will be coordinated and permitted through the Boston Transportation Department as required.
- The Proponent will provide covered bicycle storage capacity on site in accordance with the City of Boston Bicycle Guidelines. The Project will also include a public bicycle rack to support ground floor retail space and visitors.
- The Proponent will provide orientation packets to the residential tenants informing them of the opportunities to use public transportation and other alternative modes of transportation to minimize single occupancy vehicle travel.
- The Proponent will encourage future ground floor retail tenants to implement proactive transportation demand management measures to its employees to encourage the use of transit and other alternative forms of transportation.

Study Methodology

The analysis presented in this expanded PNF provides a detailed description of the Project's transportation characteristics and evaluates impacts to the transportation infrastructure. The transportation analysis presented in this chapter conforms to the Boston Transportation Department (BTD) Transportation Access Plans Guidelines.

The transportation analysis includes the impacts of the Project-related trips based on Institute of Transportation (ITE) trip generation rates and the application of local travel characteristics established in *Access Boston 2000-2010. Synchro 6* software was used to facilitate the evaluation of traffic operations based on 2000 Highway Capacity Manual (HCM)[1] methodologies.

[1] 2000 Highway Capacity Manual, Transportation Research Board, Washington D.C. (2000).

■

Traffic Study Area

The following intersections were identified for detailed analysis as it is anticipated that Project-related vehicle trips may potentially impact traffic operations at these locations. As shown in **Figure 4-2**, the four study area intersections are as follows:

1. Malden Street / Wareham Street
2. Malden Street / Albany Street
3. Wareham Street / Site Driveway
4. Wareham Street / Albany Street

■

Analysis Conditions

The transportation analysis considers three analysis scenarios:

- 2014 Existing Condition;
- 2019 No-Build Condition assuming no change to the Project site, but accounts for planned transportation infrastructure improvements and background growth associated with increased regional growth and specific planned development projects; and,
- 2019 Build Condition assuming the same No-Build Condition background growth and infrastructure changes, but including the Project-related traffic.

All analysis conditions include an assessment of the morning and evening peak hours.

Existing Transportation Conditions

This section describes existing transportation conditions, including an overview of roadway conditions, transit operations, pedestrian and bicycle facilities, on-street parking, and general site conditions.

■

Roadways

Wareham Street is a local one-way roadway traveling in the southeast direction. The roadway provides one general travel lane and parking on both sides. A sidewalk is provided on the north side of the roadway and portions of the south side. Malden Street is an urban minor arterial roadway that runs east-west within the study area from Harrison Avenue to Albany Street. Malden Street and Wareham Street both provide a connection for the South End to Albany Street, which provides connections to Melnea Cass Boulevard, the Massachusetts Turnpike, and Interstate 93. Albany Street is an urban minor arterial roadway that runs north-

south within the study area, providing one travel lane in either direction as well as bicycle lanes and parking on either side of the roadway.

■

Study Area Intersections

Malden Street / Wareham Street is an unsignalized T-intersection with Wareham Street operating as one-way travel departing the intersection traveling in the southeast direction. Malden Street approaches provide one travel lane in each direction. A sidewalk is provided on all intersection approaches with a crosswalk across the Wareham Street leg only. Parking is provided on both sides of Wareham Street and Malden Street.

Albany Street /Malden Street is an unsignalized T-intersection with three approaches. Albany Street from the north provides one travel lane, and from the south provides two travel lanes. Malden Street approaching the intersection from the west and provides one travel lane in each direction. Each travel lane has a bicycle sharrow marking indicating shared travel lane for vehicles and bicycles. Parallel parking is provided on the south side of Malden Street at the approach to the intersection. A crosswalk is provided across the Malden Street leg. Albany Street is striped as two lanes in the northbound direction with a bicycle sharrow in the right-most lane and parallel parking along the eastern curb. In the southbound direction, Albany Street is a single travel lane with a bicycle lane and parallel parking at the approach and departure of the intersection.

Albany Street /Wareham Street is a T-intersection with Albany Street running north/south and Wareham Street as the south-eastbound approach. Albany Street has a single through lane in either direction with a bicycle lane and parking on either side. Wareham Street has one single general purpose lane that can operate as two lanes at the intersection. A crosswalk is provided across the Wareham Street approach.

■

Data Collection

Manual turning movement counts (TMCs) and an Automatic Traffic Recorder (ATR) count were used to assess existing traffic conditions. TMCs were conducted at all the study area intersections during the morning (7:00 AM – 9:00 AM) and evening (4:00 PM – 6:00 PM) peak periods. An ATR was placed on Wareham Street just west of the Project site for forty-eight hours. The TMCs were collected on Thursday, May 8, 2014 and the ATR was placed from May 7 through May 8, 2014. The raw count data are included in the Transportation Appendix.

The intersection TMCs were used to establish traffic networks for the 2014 Existing Condition. From the turning movement counts, the study area's traffic peak hours were determined to be 7:30 – 8:30 AM and 4:00 – 5:00 PM. Existing Condition weekday peak hour traffic volumes are shown in **Figure 4-3**. The hourly volumes on Wareham Street from 6:00 AM to 8:00 PM are presented in **Table 4-2**.

Table 4-2
ATR Data Summary

Time	Wareham Street Eastbound
6:00 AM	43
7:00 AM	75
8:00 AM	100
9:00 AM	95
10:00 AM	111
11:00 AM	107
12:00 PM	80
1:00 PM	83
2:00 PM	91
3:00 PM	126
4:00 PM	121
5:00 PM	125
6:00 PM	83
7:00 PM	55

Source: PDI May 7 & 8, 2014

■

Pedestrians and Bicycles

Pedestrian and bicycle activity was recorded with the TMCs at each of the Study Area intersections. The peak hour volumes for pedestrian and bicycles are presented in **Figure 4-4** and **Figure 4-5**, respectively.

The pedestrian and bicycle activity within the area is lower than seen within Downtown Boston. However, with the increased amenities to both, it is becoming a more popular form of transportation in the Back Streets of the South End neighborhood. The City's Hubway bike share network has increased within the area and shared lane markings are provided on many streets within the study area, providing more opportunity to use a bicycle to travel. The closest Hubway station to the Project site is located at the intersection of Washington Street and Waltham Street.

■

Crash Analysis

Crash data were investigated and quantified for the Study Area. The data were obtained from the Massachusetts Department of Transportation (MassDOT) for the most recent three-year period available (2009-2011) for the study intersections. Crash results are summarized in **Table 4-3**.

The City of Boston is located within the MassDOT District 6, which is comprised of several communities within the greater Boston area. The average intersection crash rate for District 6 signalized intersections is 0.76 crashes per million entering vehicles (MEV). The average for unsignalized intersections in District 6 is 0.58 crashes per MEV. District 6 has a slightly lower average than the Statewide Average of 0.80 crashes per MEV for signalized intersections and 0.60 crashes per MEV for unsignalized intersections.

Over the three year period, all intersections within the Study Area had lower crash rates than the MassDOT District 6 and Statewide averages. A detailed summary of all the crashes by type are included in the **Appendix**.

Table 4-3
Intersection Crash Summary 2009-2011

Intersection	Intersection Type	Total Crashes	Crash Rate*
Albany Street at Malden Street	Unsignalized	2	0.10
Albany Street at Wareham Street	Unsignalized	1	0.06

Source: MassDOT crash data, 2009-2011
* Crashes per Million Entering Vehicles

■

Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) currently provides Silver Line, express bus and local bus services within the Project Study Area. The following provides a brief outline of the transit services within walking distance (1/4 mile) of the Project Site. **Figure 4-6** shows these transit options.

- ***Silver Line 4 – Dudley Station – South Station at Essex Street via Washington Street –*** This bus rapid transit line runs from South Station via Essex Street and Washington Street to Dudley Station. The nearest station to the Project site is Washington Street and Union Park northwest of the site. The route operates from 5:20 AM to 12:52 AM on weekdays, with 9 minute headways during peak periods.
- ***Silver Line 5 – Dudley Station – Downtown Crossing at Temple Place via Washington Street –*** This bus rapid transit line travels from Downtown Crossing Station via Tremont Street and Washington Street to Dudley Station. The nearest stop to the Project site is Washington Street and Union Park northwest of the site. The route operates from 5:15 AM to 1:13 AM on weekdays, with 7 minute headways during peak periods.
- ***Express Bus #170 – Central Square, Waltham – Dudley Square –*** This route provides service from Waltham Common, around Prospect Hill Park, to Dudley Station via I-90 and Washington Street. The closest bus stop is W Dedham Street and Washington Street to the west of the Project site. This route runs four times per weekday at 6:15 AM, 6:40 AM, 3:55 PM, and 4:55 PM.
- ***Express Bus #275 – Boston Medical Center or Downtown Boston – Long Island via Expressway and Neponset River Bridge –*** This route travels from the Long Island Health Campus through Moon Island and Squantum to Boston Medical Center via I-93. The closest stop to the Project Site is Harrison Ave at E Berkley Street. This route runs

approximately every 20 minutes from 4:41 AM to 8:00 AM and from 3:10 PM to 10:00 PM on weekdays.

- ***Route #8 – Harbor Point/UMass – Kenmore Station via B.U. Medical Center and Dudley Station –*** This route travels from the UMass Boston Busway through Dudley Station, Ruggles Station, and B.U. Medical Center via local roadways to Kenmore Station. The nearest stop is located west of the Project site at Harrison Ave opposite Plympton Street. The route operates from 5:15 AM to 12:56 AM on weekdays with 15 to 30 minute headways during peak periods.
- ***Route #10 – City Point – Copley Square via Andrew Station and B.U. Medical Center –*** This route travels from City Point Bus Terminal though Andrew Station, B.U. Medical Center, and Dudley Station via local roads to Townsend Street and Warren Street. The nearest stop is located west of the Project site at Harrison Ave opposite Plympton Street. The route operates from 4:55 AM to 1:31 AM on weekdays with 15 to 20 minute headways during peak periods.
- ***Route #15 – Kane Square or Fields Corner Station – Ruggles Station via Uphams Corner –*** This route travels from Haymarket Station through Dudley Station and Dorchester via local roads to Mattapan Station. The nearest stop is located northwest of the Project site at Washington Street and Union Park. The route operates from 4:28 AM to 1:17 AM on weekdays with 8 minute headways during peak periods.
- ***Route #47 – Central Square, Cambridge – Broadway Station via B.U. Medical Center, Dudley Station, and Longwood Medical Area –*** This route travels from Central Square in Cambridge through Ruggles Station and Dudley Station via local roads to Broadway Station. The nearest stop is located south of the Project Site at 540 Albany Street opposite Wareham Street. The route operates from 5:15 AM to 1:24 AM on weekdays with 20 minute headways during peak periods.

■

Existing Parking

Existing curb regulations in the vicinity of the Project site primarily include South End Resident Permit parking and 2-hour metered parking as shown in **Figure 4-7**. On-street parking along the northern side of Wareham Street consists of metered parking the length of the street with a commercial loading zone in front of the Project site. Albany Street, east of the Project site is mostly 2-hour metered parking within a ¼ mile radius of the site. Harrison Avenue, west of the site has ample South End Resident Permit parking with 8:00 AM – 6:00 PM visitor parking north of the site. Minor cross streets to the north and south of the site consist mostly of South End Resident Permit parking, metered parking, and commercial loading zones.

Future Transportation Conditions

Two future conditions scenarios were evaluated for a five-year horizon (2019) in order to assess potential Project related traffic impacts: the No-Build and Build Conditions. These future conditions are summarized in the sections below.

■

No-Build Condition

The 2019 No-Build Condition was developed to evaluate future transportation conditions in the traffic study area without the Project. In accordance with BTD guidelines, this future year analysis represents a five-year horizon (2019) from the Existing Condition (2014). The No-Build Condition provides insight into future traffic conditions resulting from regional growth as well as traffic generated by specific planned projects that are expected to affect the local roadway network. Any roadway infrastructure projects planned for this period are also incorporated into the analysis.

Background Growth

A background growth rate of half a percent (0.5%) per year was applied to the existing traffic volumes in the morning and evening peak hours. This growth rate accounts for regional growth outside of the study area neighborhood and traffic from projects without specific traffic forecasts at the time the traffic model was developed.

In addition to the background growth rate, traffic projections and infrastructure changes for several specific projects were incorporated in the development of the No-Build Condition. These include the following:

- Boston University Medical Center IMP – The Institutional Master Plan includes the Administration and Clinical Building (219,000 sf), Entergy Facility (38,500 sf), the Moakley Cancer Center Addition (27,800 sf), New Inpatient Building Phase 1 (78,800 sf), and the New Impatient Building Phase II (323,000 sf).
- 600 Harrison – Mixed-use development with 160 dwelling units, approximately 3,600 square feet of ground floor retail and a below-grade parking garage containing approximately 236 spaces.
- BioSquare II – A 195,000 square feet research building, part of the larger BioSquare I development.
- 477-481 Harrison Avenue – Redevelopment of a 9,735 +/- square feet land area into 18 residential units.

Figure 4-8 represents the 2019 No-Build Condition morning and evening peak hour traffic volumes.

■

Build Condition

The 2019 Build Condition traffic projections comprise of the previously described No-Build volumes with the addition of projected traffic volumes for the Project.

The 2019 Build Condition assumes construction of the following:

- 42 residential units;
- 9,400 square feet of retail; and,
- 52 on-site parking spaces.

Site Access and Circulation

Access to the site will be provided via the existing shared site driveway located to the west of the building. Access to the below-grade parking garage will be provided off-street at the rear of the building.

Project-Generated Trips

The Institute of Transportation Engineers (ITE) trip rates for Land Use Code (LUC) 220 Residential Apartment and LUC 820 Retail were used as a basis for Project trip generation.

ITE vehicle trip generation rates are based on trip rates derived from surveys of similar land uses in generally auto-oriented, suburban locations. Standard average vehicle occupancies (AVO) of 1.78 persons per vehicle were applied to the ITE retail trip rates and 1.13 persons per vehicle were applied to the ITE residential trip rates to derive person trips. AVO rates used are from the 2009 National Household Travel Survey.

The projected person trips for the Project are presented in **Table 4-4**.

Table 4-4
Project Person Trip Generation Summary

	ITE Trips	Person Trips
Weekday Daily		
In	336	507
Out	336	507
Total	672	1,014
Morning Peak Hour		
In	10	15
Out	20	25
Total	30	40
Evening Peak Hour		
In	33	48
Out	27	42
Total	60	90

Source: Institute of Transportation Engineers *Trip Generation 9th Edition*

To reflect the appropriate environment with pedestrian facilities and access to transit service, mode share characteristics based on BTD Zone 15, were applied.

The mode shares for the Project are summarized in **Table 4-5**.

Table 4-5
Project Mode Split

	Auto	Transit	Bike/ Walk/ Other
Residential	57%	17%	26%
Retail	53%	12%	35%

Source: Weekday Daily BTD mode share data for Area 15 for residential and retail

The final projected vehicle, transit and walk/bike trips are presented in **Table 4-6**. Note that the Proposed Project is estimated to generate only approximately 14 vehicle trips during the morning peak hour and 28 vehicles trips during the evening peak hour.

Table 4-6
Project Vehicle Trip Generation Summary

	Transit Trips	Walk/ Bike/ Other Trips	Vehicle Trips
Weekday Daily			
In	69	163	184
Out	69	163	184
Total:	138	326	368
Morning Peak Hour			
In	2	5	5
Out	4	7	12
Total:	6	12	17
Evening Peak Hour			
In	7	15	18
Out	6	14	15
Total:	12	29	33

Vehicle Trip Distribution

The vehicle trip distribution for residential trips is based on BTD Zone 15 distribution rates for the Project's specific location. The distribution and assignment of Project vehicle trips to the roadway network is presented in **Figure 4-9**, and the Project generated vehicle turning movements for the morning and evening peak hours are presented in **Figure 4-10**.

As shown, the Project is expected to generate only 17 vehicle trips during the morning peak hour, and 33 vehicle trips during the evening peak hour. These volumes were added to the No-Build Condition volumes to develop the 2019 Build Condition volumes as presented in **Figure 4-11**.

Pedestrians and Bicycles

Additional pedestrian and bicycle activity is expected to occur during the morning and evening peak hours. An additional 12 trips during the morning peak hour and 29 trips during the evening peak hour are expected.

In accordance with the City of Boston's Off-Street Bicycle Parking Guidelines, bicycle storage will be provided for building tenants. Short-term bicycle storage will also be provided at the rear of the building.

Project Parking

The Proposed Project includes the development of 52 parking spaces. Each residential unit will be provided a single parking space and the ground floor retail space is provided 10 spaces based on a 1 space to 1,000 square feet of space. The parking spaces will be available only to the residents and visitors to the building.

Service and Loading

Deliveries, such as mail packages, take-out food, and flowers, will occur at the building entrances on Wareham Street supported by the existing commercial on-street parking adjacent to the Project site. The trash bins will be located within the building and wheeled to the street for removal on a regular basis. Retail deliveries and resident move-in/move-out activity will be managed curbside within the commercial loading on Wareham Street. Residents will be required to obtain BTD permits as necessary.

Transportation Demand Management

Consistent with the City's goals to reduce auto-dependency, the Project will proactively incorporate TDM measures to encourage alternative modes of transportation. The following is a list of potential elements the Proponent will incorporate to encourage alternative modes of transportation:

- **Bicycle Storage Spaces**: In accordance with BTD guidelines, the Proponent will provide one secure storage space per residential unit (42 spaces), one outdoor space per five residential units (8 space), 0.3 secure/covered spaces per 1,000 square feet of retail employees (3 spaces), and 2 outdoor bicycle spaces for the retail patrons. Bicycle racks, signs, and parking areas will conform to BTD standards and be sited in safe, secure locations.
- **Orientation Packets:** The Proponent will provide orientation packets to new residents containing information on the available transportation choices within the area, including transit routes and schedules.
- **Transportation Coordinator**: The Proponent will designate a transportation coordinator to manage loading and service activities, move-in/move-out activities, and provide alternative transportation materials to residents.
- **Transportation Access Plan Agreement (TAPA)**: A TAPA will be entered into between the Proponent and the BTD codifying the specific transportation measures and agreements between the Proponent and the City of Boston.

Traffic Operations Analysis

Consistent with BTD's guidelines, *Synchro 6* software was used to measure Level of Service (LOS) operations at the study area intersections. LOS is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection.

LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worse operating conditions. LOS D is typically considered acceptable. LOS E indicates that vehicles experience significant delay and queuing while LOS F suggests unacceptable delays for the average vehicles. The analysis of unsignalized intersections provides a level of service for the minor street approach which will experience the most delay at the intersection.

Table 4-7, below, presents the level of service threshold criteria as defined in the 2010 Highway Capacity Manual.

Table 4-7
Level of Service Criteria

Level of Service	Unsignalized Intersection Control Delay (sec/veh)
LOS A	0-10
LOS B	> 10-15
LOS C	> 15-25
LOS D	> 25-35
LOS E	> 35-50
LOS F	> 50

Source: 2010 HCM

Adjustments were made to the Synchro model to include characteristics of each intersection, such as geometry, signal timings, heavy vehicles, bus operations, parking activity, and pedestrian crossings. The LOS results of the analysis are summarized for each intersection in **Table 4-8** for the Existing, No-Build, and Build Conditions. Detailed Synchro results are presented in the Appendix.

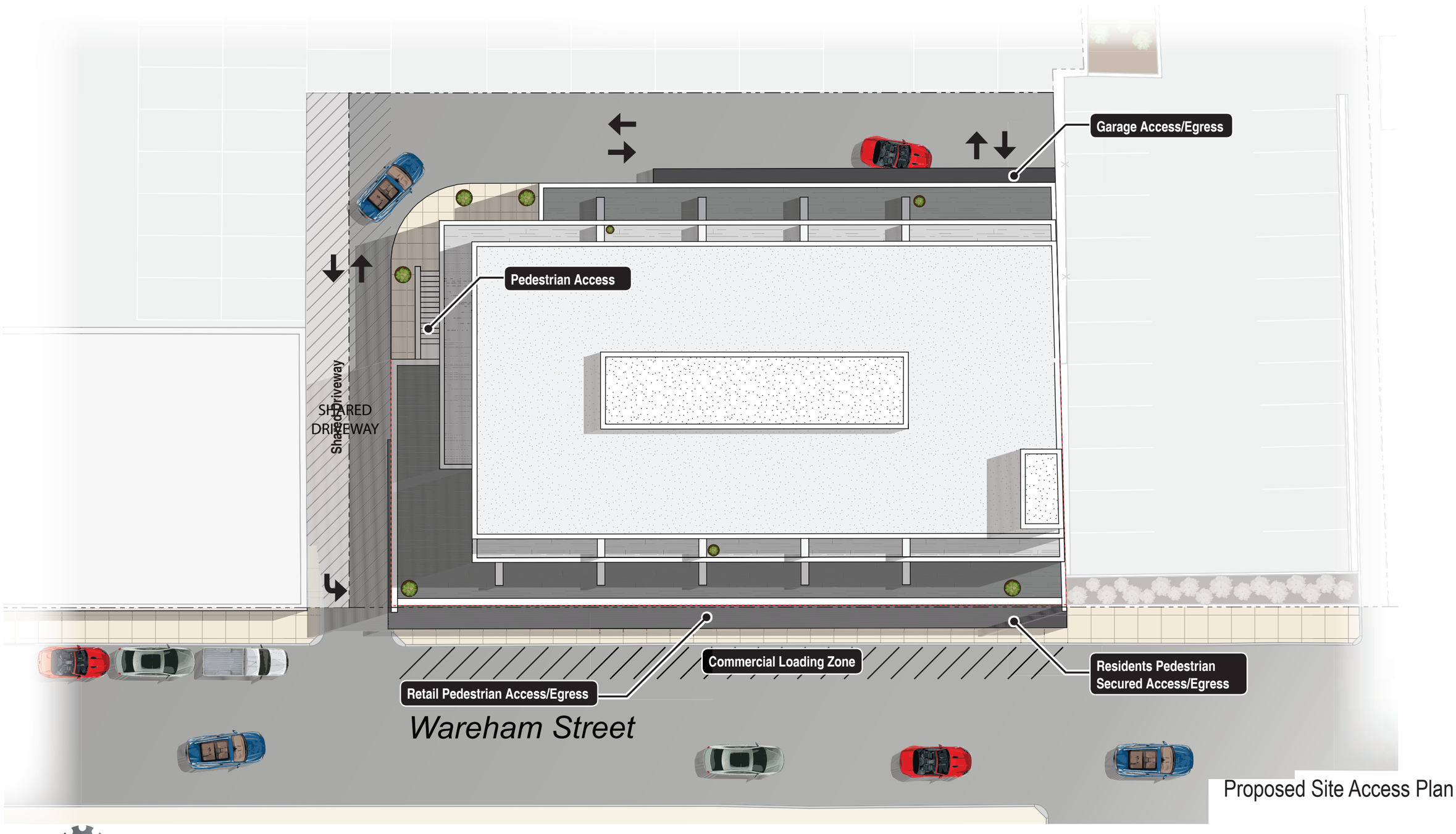
The traffic model includes a conservative approach to future traffic trends by forecasting an increase in background traffic and assigning specific known development projects to the study area as required by the BTD.

As shown in the results table, the LOS analysis for the 2019 Build Condition indicates that the redevelopment of the Project site and its associated traffic will not have a significant impact to the unsignalized intersections within the study area. As can be expected in an urban area, several of the study area intersections operate with long delays on their minor street approach, even without the Project.

All intersections operate at an acceptable LOS D or better, except for Malden Street/Albany Street intersection which fails during the AM and PM peak hours, and Wareham Street/Albany Street intersection which fails during the PM peak hour, with and without the Project in place.

Table 4-8
Intersection Level of Service Summary

Intersection	Morning Peak Hour Operations			Evening Peak Hour Operations		
	Existing	No-Build	Build	Existing	No-Build	Build
Malden St / Wareham St	A	A	A	A	A	A
Malden St / Albany St	F	F	F	F	F	F
Wareham St / Site Driveway	A	A	A	A	A	A
Wareham St / Albany St	C	D	D	F	F	F



Proposed Site Access Plan

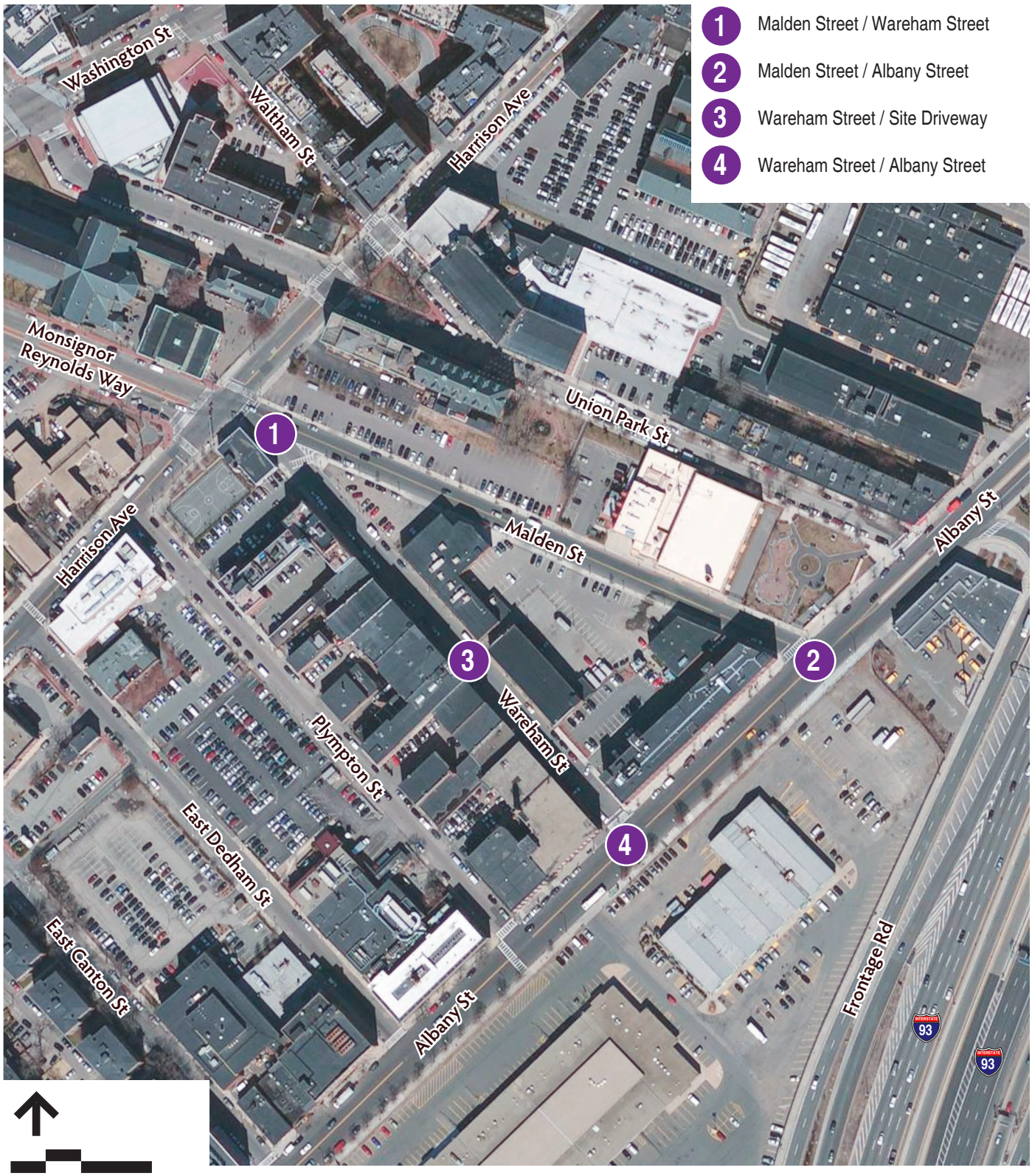
THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

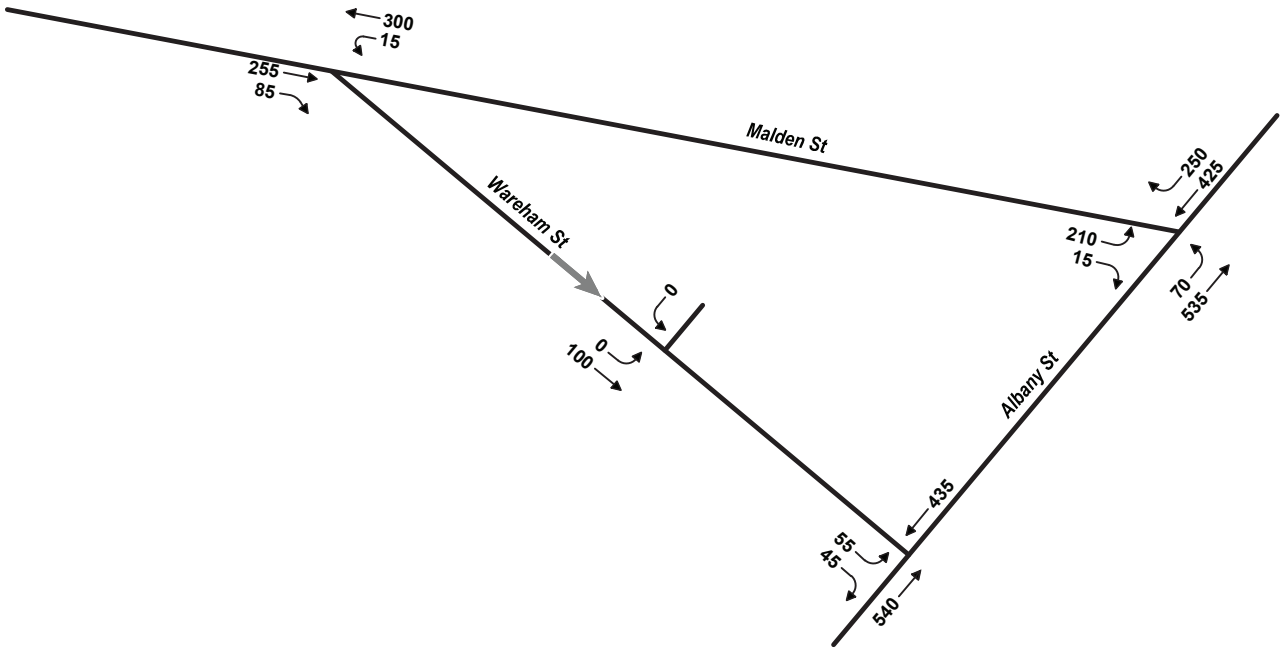
the HOLLAND COMPANIES
Design & Construction

Figure
4-1

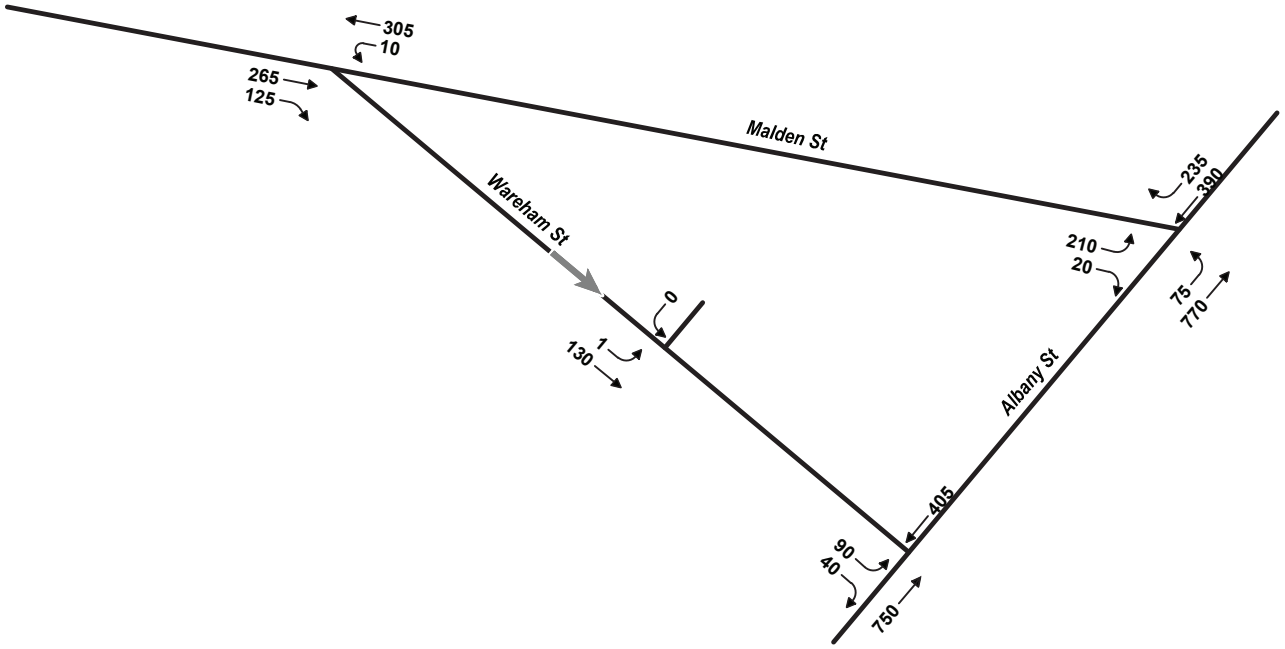


Source: Arcmap Bing Aerial Datalayer, Boston, Massachusetts

Study Area Intersections

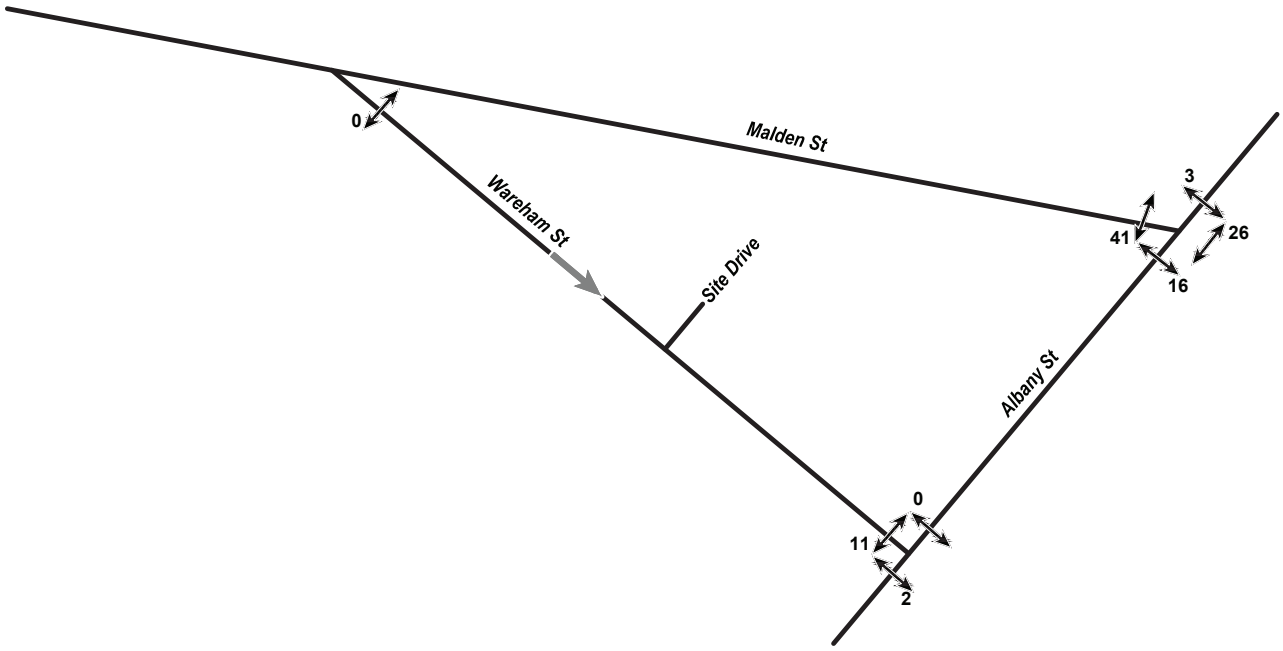


AM Peak Hour

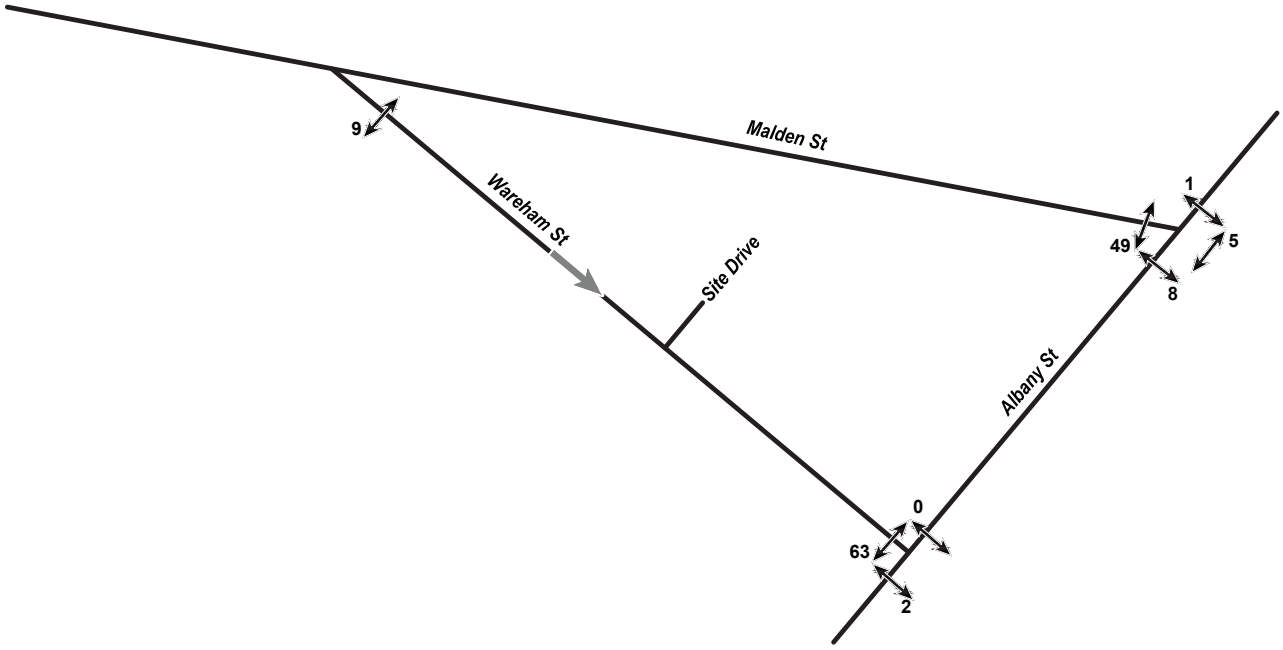


PM Peak Hour

2014 Existing Conditions
Peak Hour Traffic Volumes

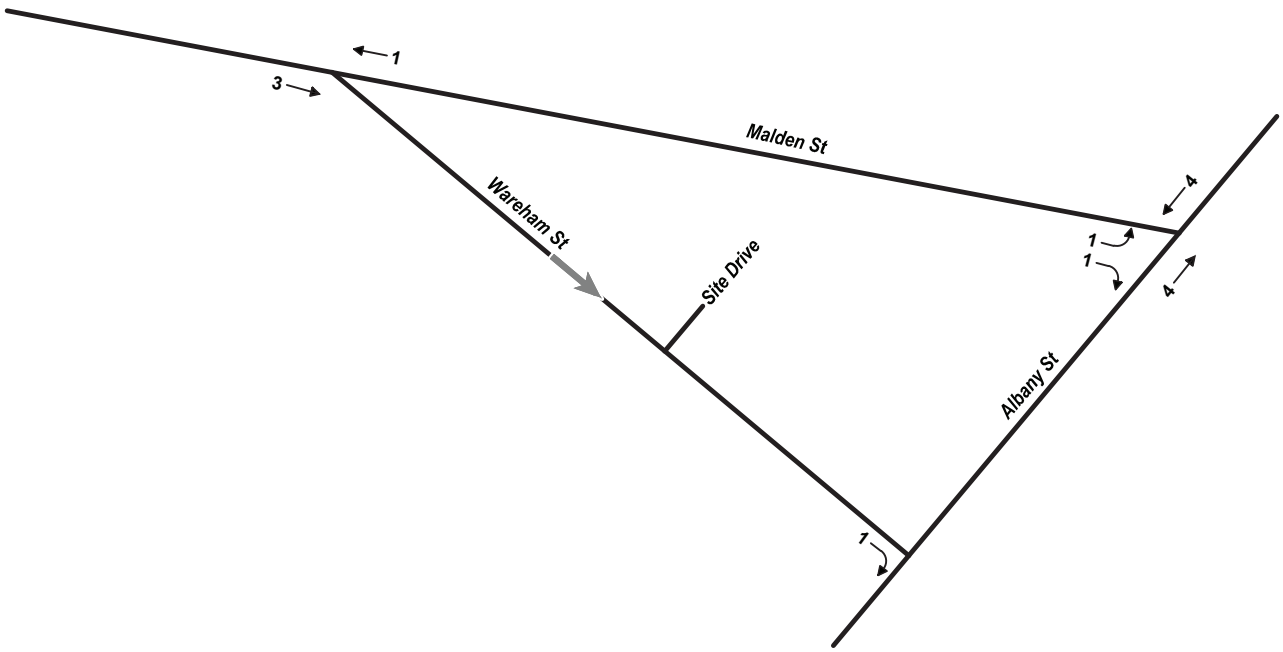


AM Peak Hour

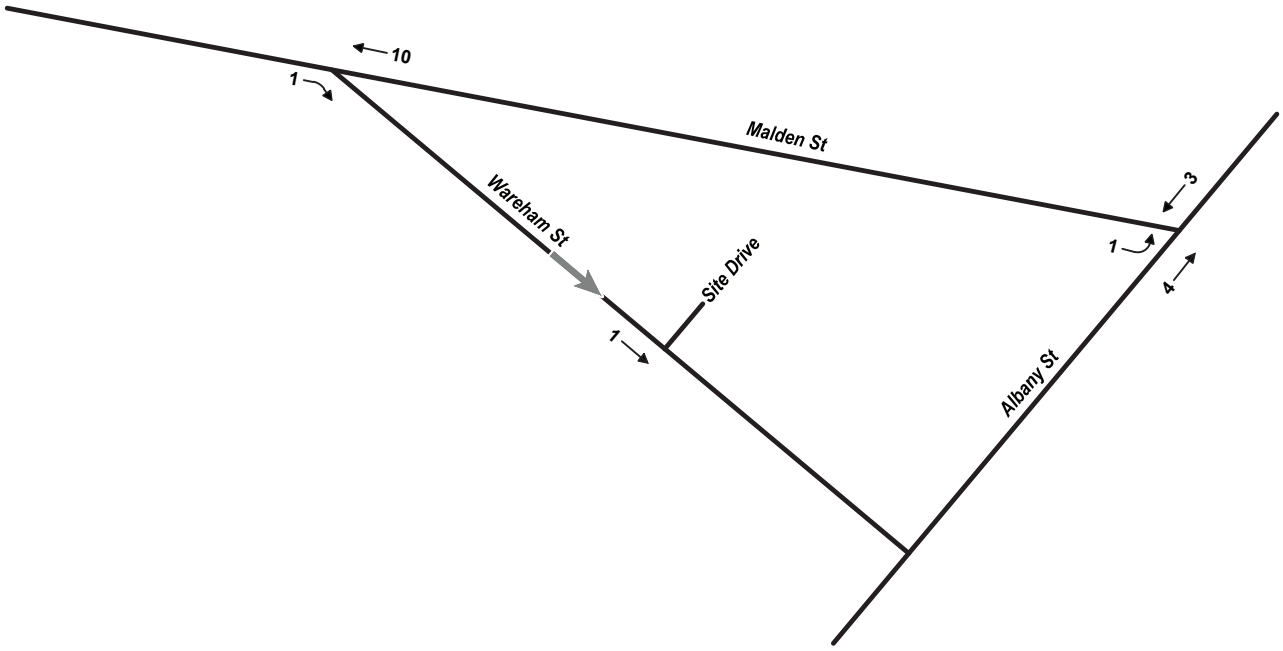


PM Peak Hour

2014 Existing Conditions
Peak Hour Pedestrian Volumes

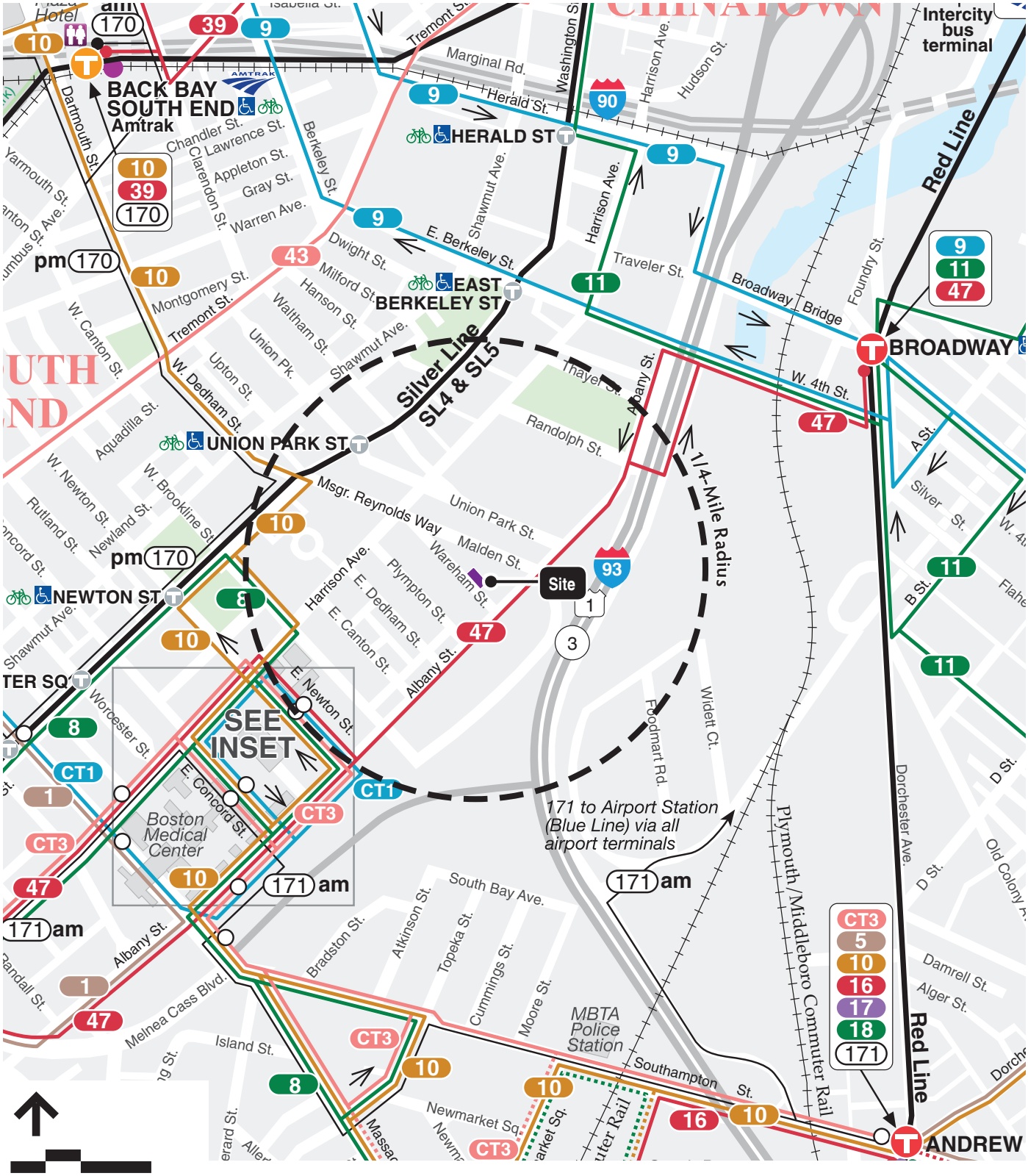


AM Peak Hour



PM Peak Hour

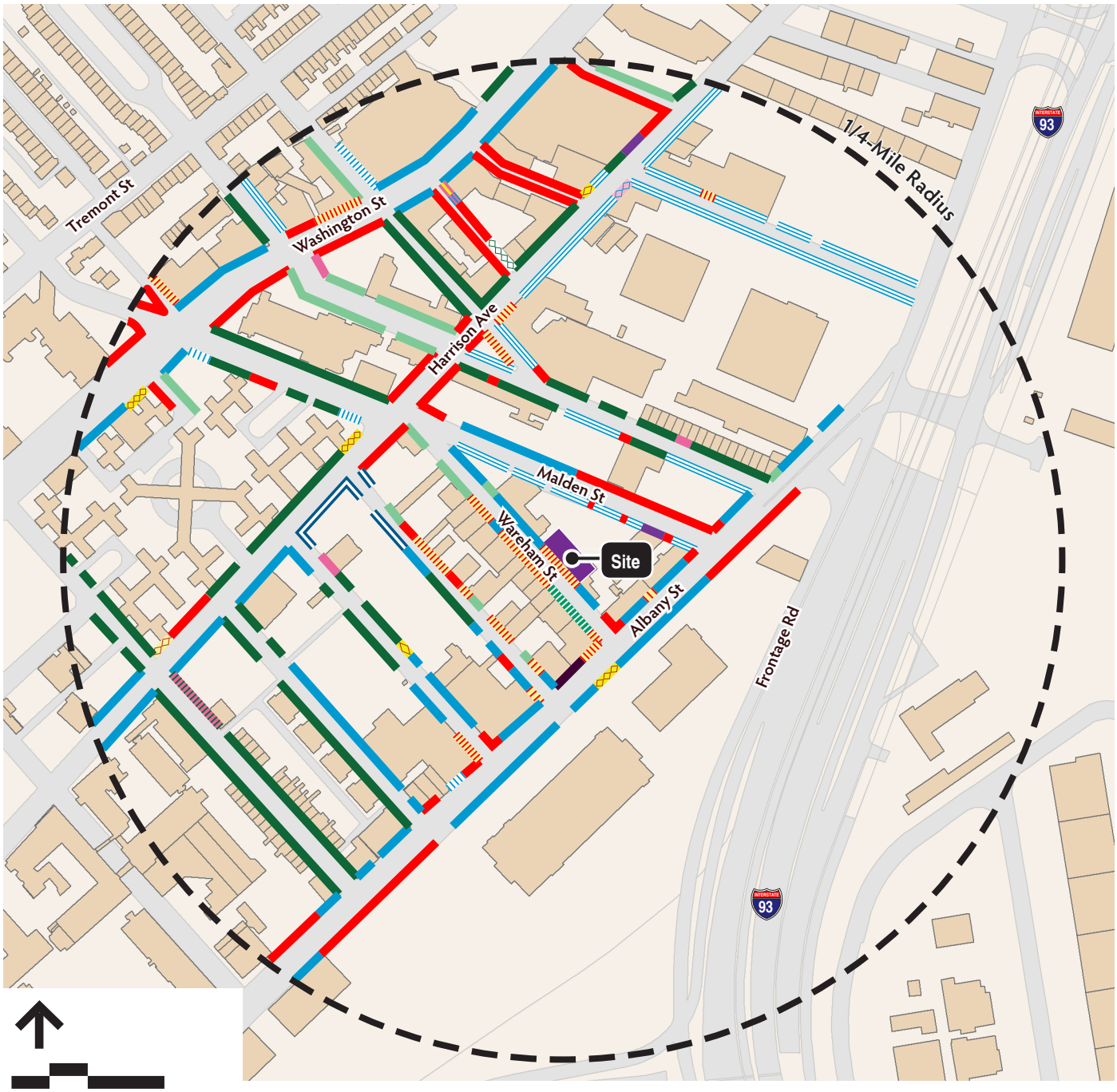
2014 Existing Conditions
Peak Hour Bike Volumes



Source: MBTA.com

Public Transportation

- No Stopping
- Loading Zone
- Metered Parking (2-Hour Limit)
- Reserved Parking
- Unrestricted
- 2-Hour South End Parking (Except Resident Sticker)
- Pick-Up/Drop-Off (15-Minute Limit)
- Resident Permit Parking Only
- Handicapped
- Bus Stop
- Police Vehicles
- 4-Hour Parking
- Visitor Parking (2-Hour Limit) Mon-Sat, 8am-6pm
- 2-Hour Parking
- Building Resident Only
- Commerce Bank Business Only
- 7-11 Employee Parking
- 4am-7pm Resident Permit Parking 7am-4pm Commercial Parking (Loading Zone)



On-Street Parking

THE FACTORY AT 46 WAREHAM

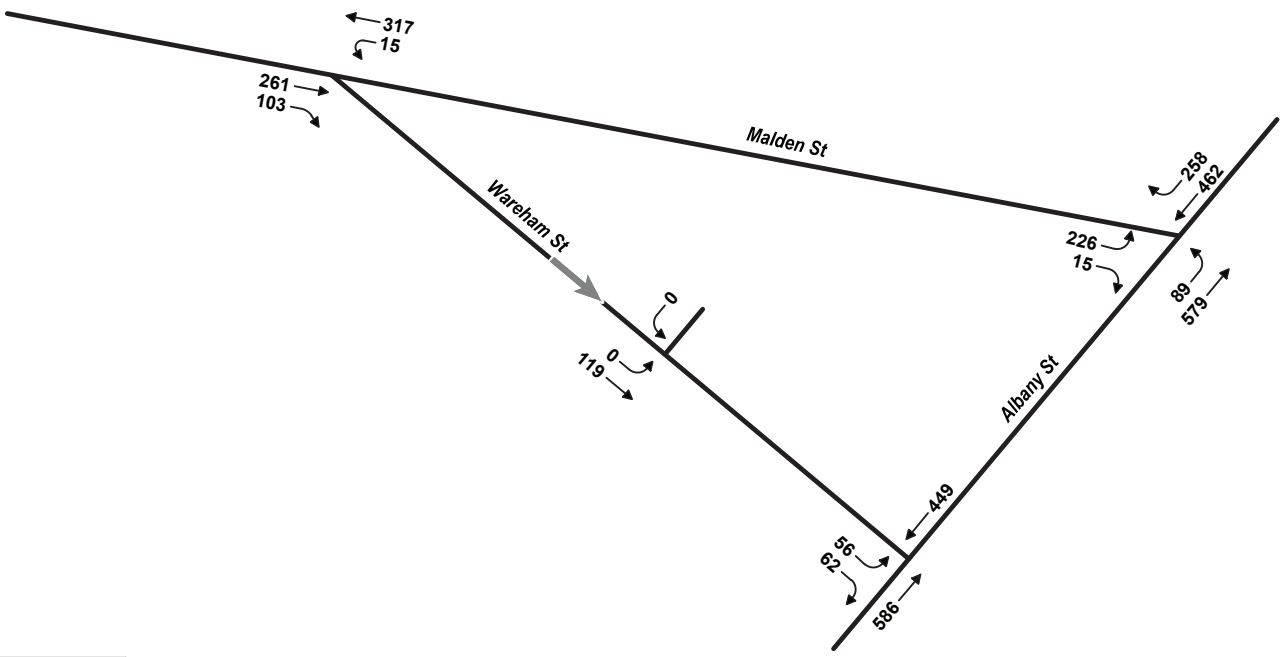
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

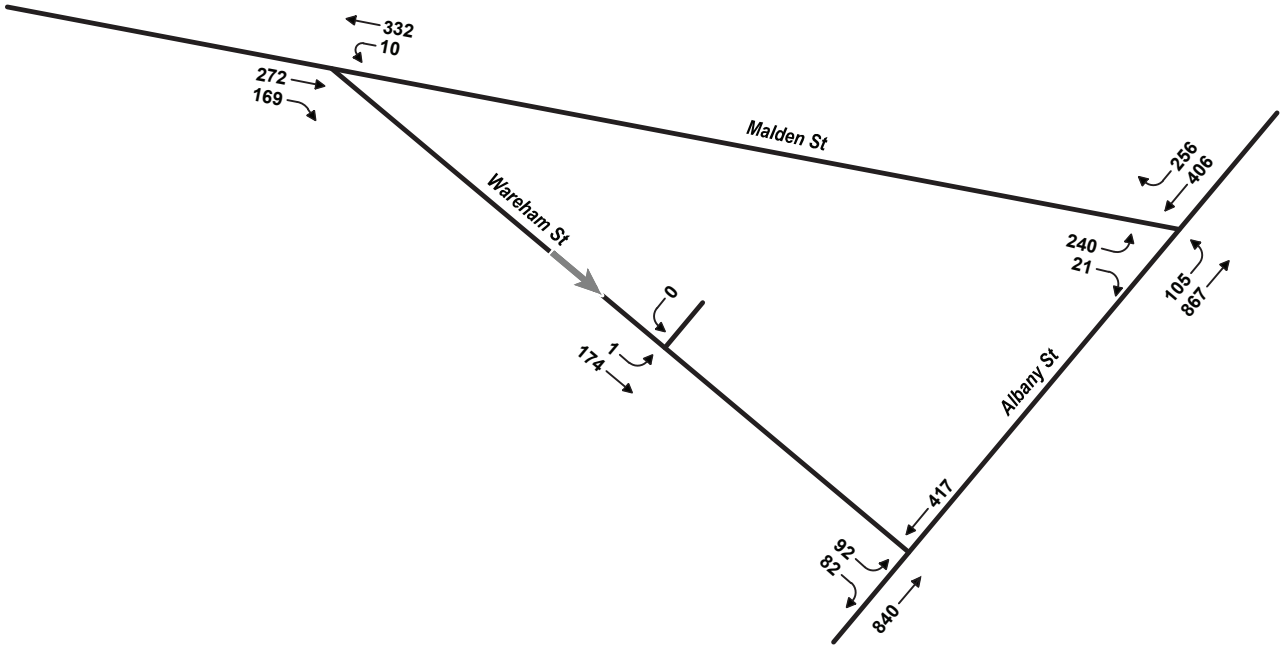
H+A Hacin + Associates [architecture + design]

the HOLLAND COMPANIES Design & Construction

Figure 4-7

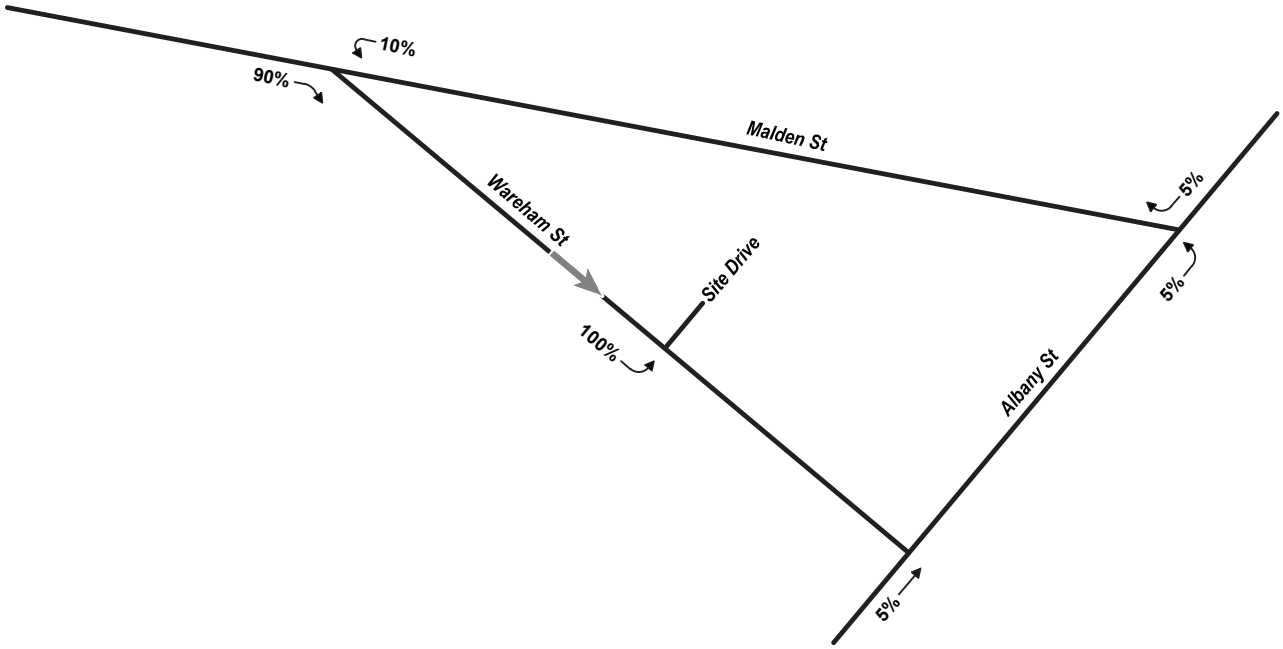


AM Peak Hour

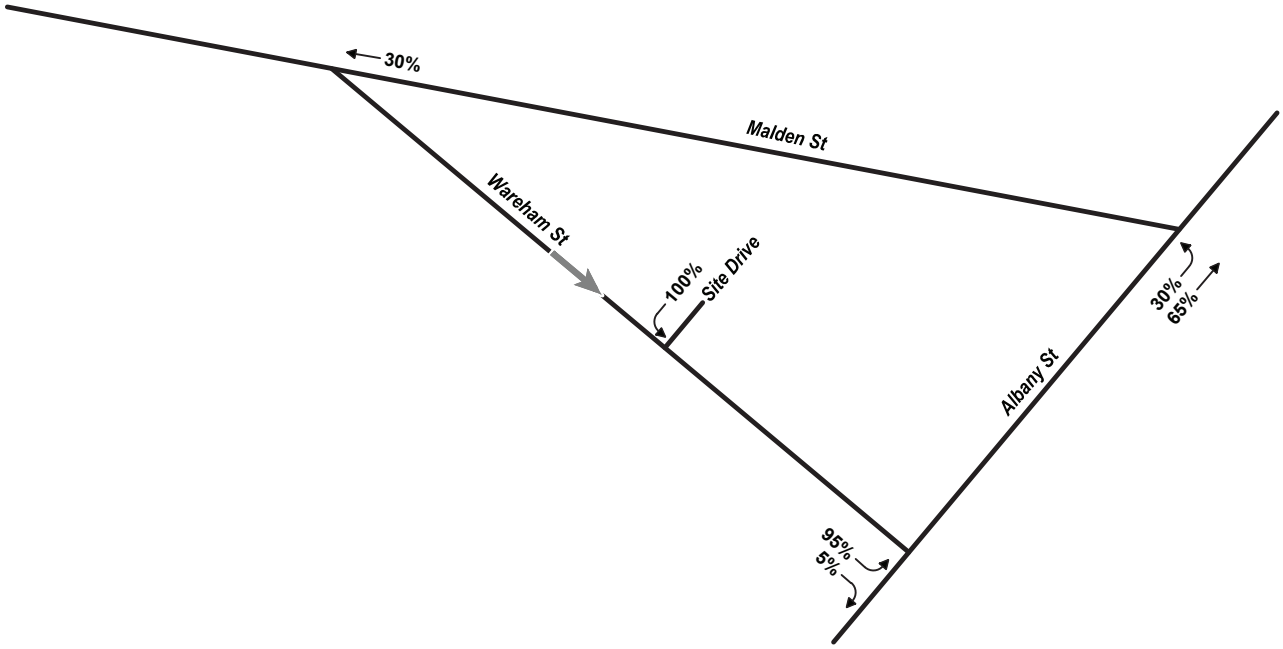


PM Peak Hour

2019 No-Build Conditions
Peak Hour Traffic Volumes

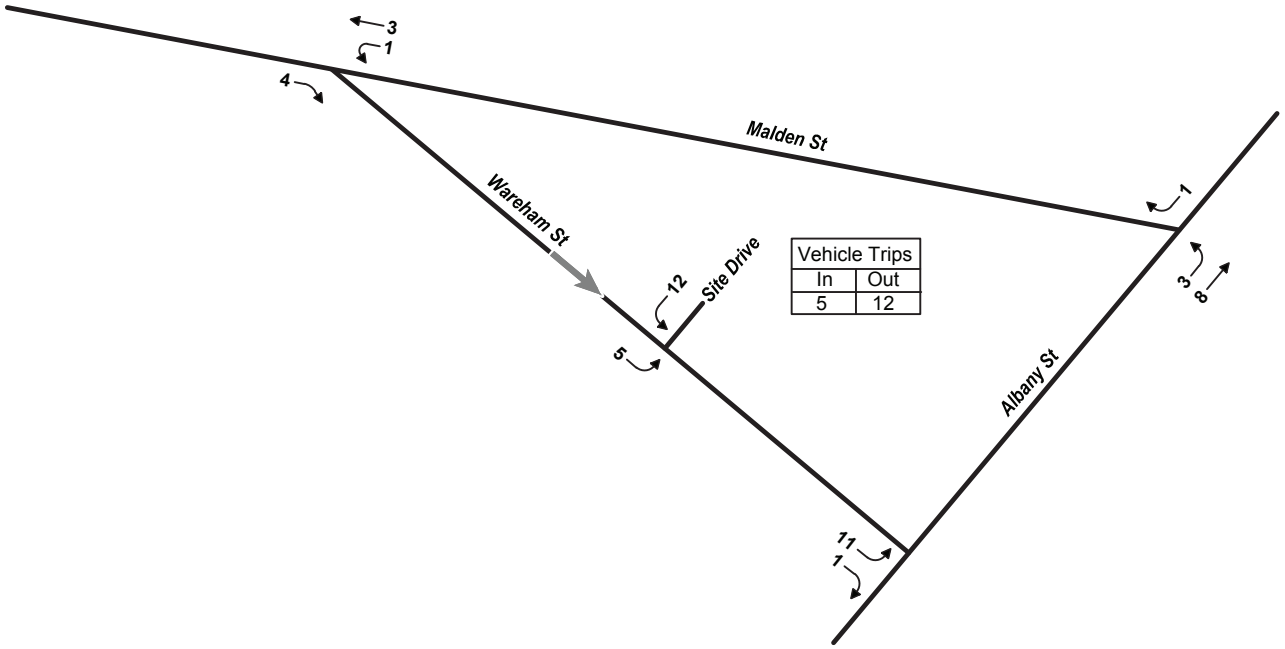


Inbound Distribution

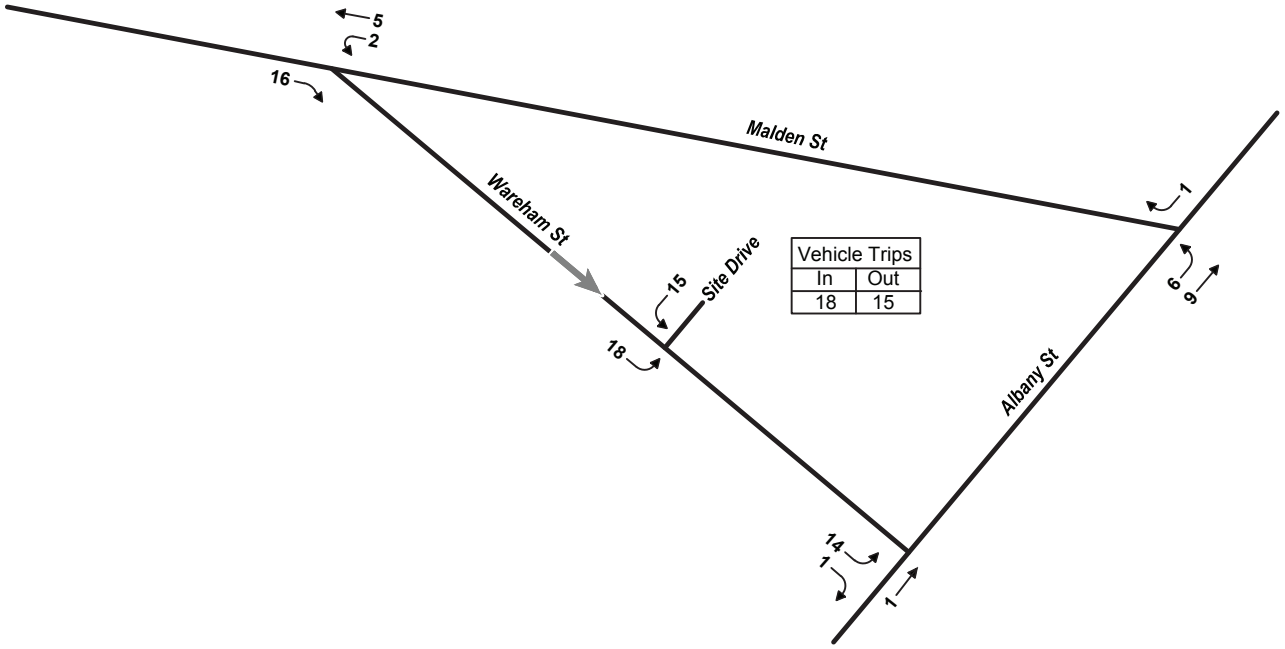


Outbound Distribution

Project Vehicle Trip Distribution

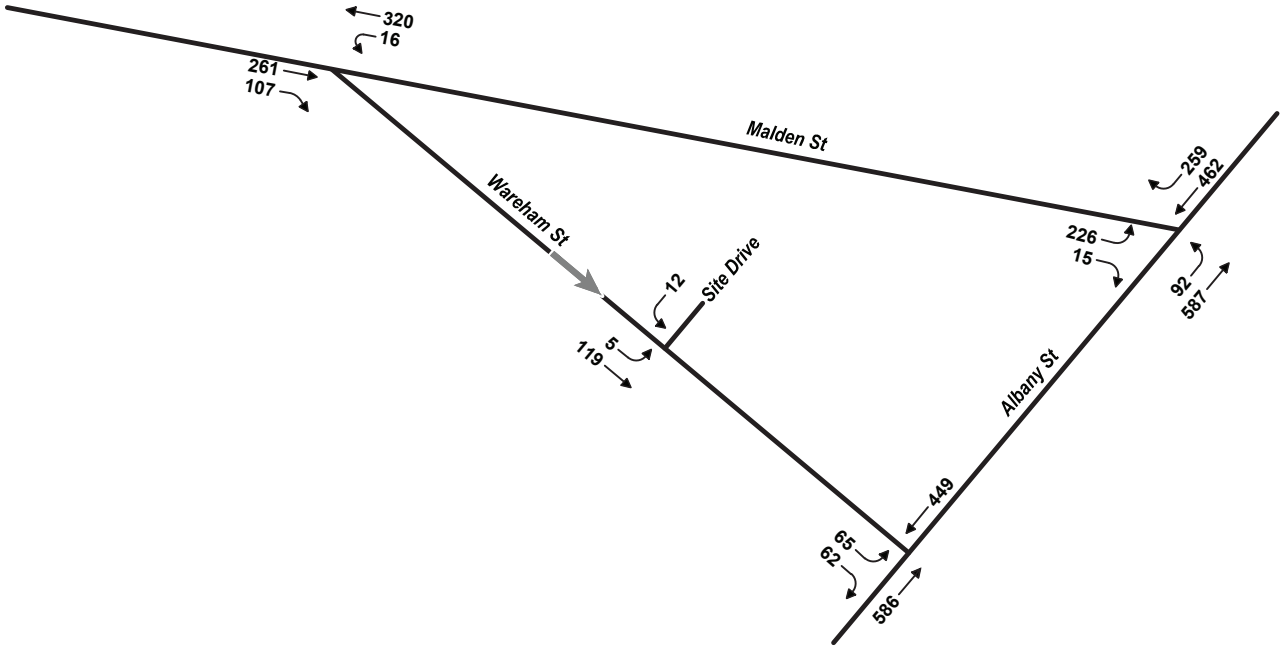


AM Peak Hour

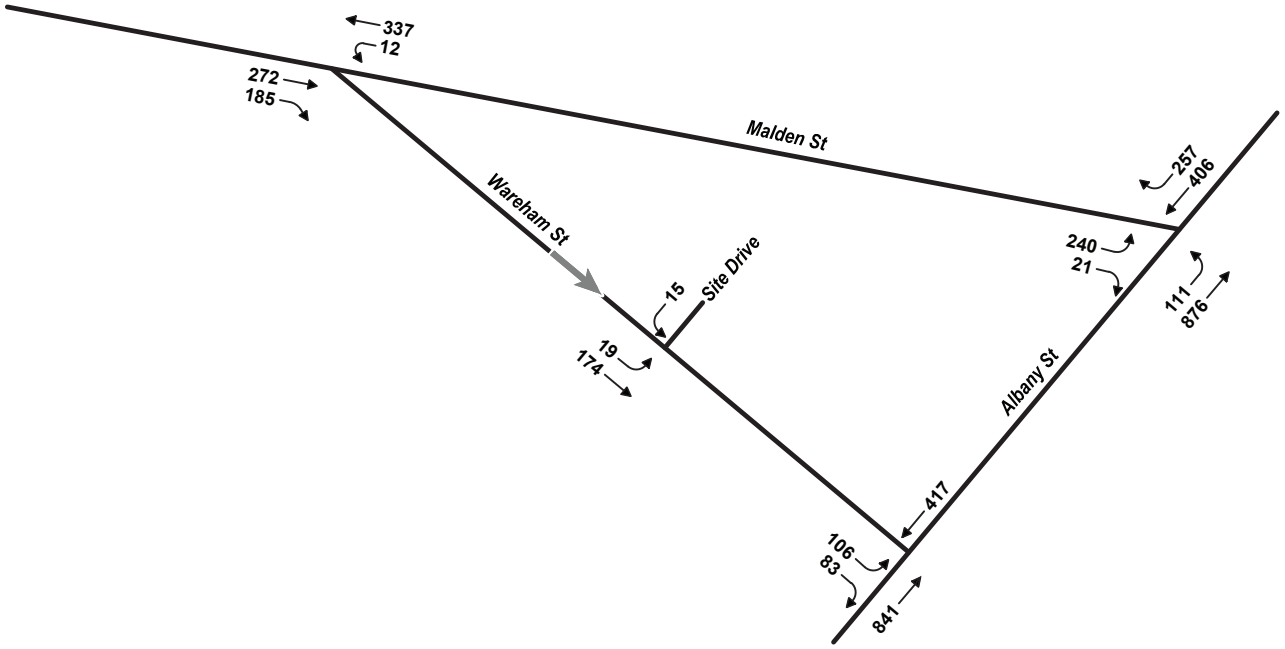


PM Peak Hour

Project Generated Vehicle Trips



AM Peak Hour



PM Peak Hour

2019 Build Conditions
Peak Hour Traffic Volumes

5

Environmental Component

This chapter presents the findings of technical studies that were conducted to determine the direct or indirect impact to the environment reasonably attributed to the proposed Project as described in Chapter 1, *Project Description.* The categories of environmental impacts for which studies and mitigation are addressed herein include wind, shadow, daylight, solar glare, air quality, solid and hazardous waste, noise, flood hazards/wetlands, geotechnical and groundwater analysis, construction impacts, rodent control, historic resources, and sustainable design.

Overall, as described below, the Proposed Project will not have significant environmental impacts, and in several instances will enhance existing conditions on and around the Project site. The neighborhood context relative to surrounding building heights is shown in **Figure 5-1** for reference.

Wind

Given the limited height (not to exceed 70 feet at the building's highest point) of the proposed development, the Project does not warrant conduct of a quantitative wind study. As designed, the Project will not result in any vertical deflection of upper level winds, which typically result from buildings of 200 feet in height or more. The Project, as proposed, is not expected to result in pedestrian level wind increases in the vicinity of the Project or result in adverse wind conditions or velocities in access of acceptable levels.

Shadow Analysis

The following is in reference to the shadow study images shown in **Figure 5-2** through **Figure 5-5**. The proposed site is located on a triangular block defined by Malden Street to the north, Albany Street to the east, and Wareham Street to the south. Existing structures bordering the site to the east and south are similar in height to the proposed structure. Surface parking lots are immediately adjacent to the site on the north and east.

The footprint of the existing 3 story structure is outlined as a solid red line, and the existing shadows are illustrated as a dashed red line. The footprint and massing of the proposed structure is shown in blue, and the net new shadows are highlighted in orange.

■

March 21

At 9 AM, the proposed building's shadow extends in a northwesterly direction, casting shade onto the sidewalk of Wareham Street, the southeast face of the adjacent building, the shared drive lane between the site and adjacent building, and the parking lot of the adjacent building. Adjacent streets and buildings are minimally impacted.

At 12 PM, the shadow is cast in a northerly direction, falling on the adjacent surface parking lot. No adjacent buildings or streets are impacted.

At 3 PM, the proposed building's shadow is cast in a northeasterly direction, falling across the adjacent surface parking lot, and just touching the sidewalk of Malden Street.

■

June 21

At 9AM, the proposed building's shadow is cast towards the northwest, extending into the shared drive lane and the southeast face of the abutting building.

At 12 PM, the shadow extends in a northerly direction, but does not extend beyond the building property line.

At 3 PM, the shadow is cast towards the northeast, falling on the adjacent surface parking lots.

At 6 PM, the shadow extends in an easterly direction onto adjacent surface parking lots. The shadow is also cast on the northwest face of the adjacent 6 story structure.

■

September 21

At 9 AM, the shadow is again cast in a northwesterly direction into the shared drive lane and onto the southeast face of the abutting structure.

At 12 PM, the proposed building's shadow extends in a northerly direction, falling onto adjacent surface parking lots.

At 3 PM, the shadow is cast in a northeasterly direction, falling onto adjacent surface parking lots. The most northern corner of the shadow just touches the sidewalk of Malden Street, while the eastern corner falls onto the first story of the southwest corner of the abutting 2 story structure.

■

December 21

At 9 AM, the shadow extends towards the northwest, across the southeast face and roof of the abutting 3 story structure.

At 12 PM, the building shadow extends north, across adjacent surface parking lots. The shadow extends into and across Malden Street, consistent with the adjacent buildings.

At 3 PM, the proposed building's shadow is cast in a northeasterly direction. The shadow extends across adjacent surface parking lots and Malden Street, and onto the southern face and roof of the abutting 3 story industrial structure.

■

Conclusions

The proposed building site is located within an urban, triangular block, with two of the three street walls comprised of structures similar in scale to the proposed building. The third edge is currently surface parking. Due to the location and scale of existing structures, the proposed building has minimal impacts on surrounding buildings, streets, and open spaces. Building faces impacted by shadows of the proposed structure are minimal, and those buildings are generally industrial in nature. The majority of new shadows that are cast by the proposed building fall onto open, surface parking lots.

Daylight Analysis

The following section describes the Proposed Project's anticipated effect on daylight obstruction at the site. The analysis was prepared using the BRA's Daylight Analysis Program and has been completed in accordance with the requirements of Article 80 of the City of Boston Zoning Code. The results of the analysis are presented in **Figure 5-6**.

■

Regulatory Context

Article 80, Section B(2)(c), Large Project Review – Environmental Component anticipates the potential need for a proponent to describe the percentage of skyplain obstructed in the no-build and build conditions. While this requirement is typically formalized in the BRA's Scoping Determination, this PNF anticipates the potential for this analysis to be included in the BRA scope and provides the results in this section.

Methodology

The Proposed Project was analyzed utilizing the Boston Redevelopment Authority Daylighting Analysis (BRADA) computer program.[1] 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 each of the proposed buildings that abut a public way. 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 each respective viewpoint that is studied.

The BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0 percent to 100 percent. BRADA calculates this obstruction value based on the width of 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.

Potential daylight impacts were analyzed from the public roadway adjacent to the site, Wareham Street.

Analysis Summary

The result of the daylight analysis is presented in Figure 5-6. The existing building causes 61.3% daylight obstruction from Wareham Street primarily due to the proximity to the street edge. The Proposed Project, with the use of the existing streetwall for the first three floors of the building, will result in 66.4% daylight obstruction. As described in Chapter 3, *Urban Design*, the Proposed Project will be built using the existing façade and the additional levels will be stepped back from the edge of the existing streetwall.

Solar Glare

The impacts of solar glare on neighbors and adjacent roadways are not anticipated due to the proposed building design which will not include large areas of reflective glass or other materials that would contribute to solar glare.

[1] Method developed by Harvey Bryan and Susan Stuebing, computer program developed by Ronald Fergle, Massachusetts Institute of Technology, Cambridge, MA, September 1985.

Water Quality and Conservation

The proposed Project will not impact the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the discharge of site materials off-site and to BWSC systems. Existing catch basins will be fitted with filter fabric, haybales and/or crushed stone to provide sediment removal from runoff. These controls will be maintained throughout construction until all disturbed areas have been stabilized.

Dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once completed, the Project will be in compliance with local and state stormwater management policies.

The Proposed Project's water demand estimate for domestic services is based on the Proposed Project's estimated sewage generation, described above. Using a conservative additive factor of 10% to the sewage flows the estimated daily water demand for the proposed Project is 7973 GPD. This water will be supplied by the BWSC. All efforts to reduce water consumption from the proposed Project will be made. Aeration Fixtures and appliances will be utilized to maximize water conservation. Sensor operated faucets and toilets will be utilized in public areas.

Wetlands and Flood Hazard

The Federal Emergency Management (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the Project Site (Suffolk County, Community-Panel Number 25025C0079G). This designation is illustrated in **Figure 5-7**. The map shows that the Proposed Project site is located outside the 0.2 percent annual chance floodplain (commonly referred to as the 500 year flood limit), identifying it as an area of minimal flooding.

Geotechnical and Groundwater Analysis

The Proposed Project site is currently occupied by a 22,725 S.F., 3-story, brick and wood beam mill building. The current structure includes an existing basement level. Existing foundation walls supporting the portion of the building to be renovated will be examined and repaired as necessary. A study of subsurface conditions will be conducted as the design process progresses, and prior to commencement of construction.

The Proposed Project is located in the Groundwater Conservation Overlay District (GCOD) as outlined in Article 32 of the City of Boston Zoning Code. Due to its location in the GCOD, the Project will be recharging rainwater into the ground and will not negatively impact groundwater levels on site or adjacent lots as required in Article 32.

The Project will be built so that it does not require pumping of groundwater, therefore the Project is not anticipated to have an adverse impact on groundwater levels within or adjacent to the site.

The Proponent will coordinate with the Boston Groundwater Trust to protect groundwater levels in the area.

Solid and Hazardous Materials

The current building was constructed in 1870's and was home to the New England Organ Company from 1876-1892. Over the next century, the building housed a number of wood-working businesses. The building is currently utilized as a warehouse for a food importation and distribution business.

There are no known hazardous waste conditions on the site. An investigation of the site and existing building will be conducted prior to beginning construction to confirm the absence of contaminated soils, groundwater, asbestos, lead paint, and other hazardous materials. If such materials are found, the removal and disposal of any contaminated materials will fully comply with the Massachusetts Contingency Plan (MCP).

Air Quality

Article 80 may require an evaluation of impacts on air quality from any significant stationary or mobile sources associated with the Proposed Project. The Proponent is prepared to address this requirement if necessary with a microscale analysis in accordance with the protocol/modeling procedures typically required by the BRA to determine conformance with the National Ambient Air Quality Standards (NAAQS). Due to the size of the Project and the minimal increase in vehicles to the surrounding study area intersections, it is not anticipated that there will be a significant impact to air quality in the area.

The U.S. Environmental Protection Agency (EPA) has established the NAAQS as the criteria for evaluating air quality impacts on residential and other sensitive receptors. The air quality analysis evaluates carbon monoxide concentrations at sensitive receptor locations and demonstrates that the Proposed Project will not interfere with the attainment or maintenance of the Massachusetts State Implementation (SIP) and NAAQS for carbon monoxide.

■

Air Quality Standards

The 1990 Clean Air Act Amendments (CAAA) resulted in states being categorized as attainment and non-attainment areas, based upon the severity of their air quality problems. The Proposed Project is located in an area that has been designated as a Carbon Monoxide Maintenance area. The U.S. Environmental Protection Agency (EPA) has established the

NAAQS for carbon monoxide to protect the public health. The Commonwealth of Massachusetts has adopted the same standards as those set by the EPA, and applies these NAAQS when evaluating impacts. The NAAQS for carbon monoxide is 35 parts per million (ppm) for a 1 hour period and 9 ppm for an 8-hour period, each not to be exceeded more than once per year.

The predominant source of air pollution anticipated from the Proposed Project is emissions from Project related motor vehicle traffic, which directly emit carbon monoxide. These impacts can be estimated by modeling carbon monoxide concentrations that are then compared to the NAAQS. The Massachusetts Department of Environmental Protection (DEP) has developed modeling guidelines to ensure that proposed projects satisfy the CAAA and SIP requirements. The DEP guidelines require that proposed projects located in carbon monoxide maintenance areas demonstrate that no violations of the NAAQS for carbon monoxide will be created in areas where no violations currently exist, and that carbon monoxide reductions will occur in areas where violations currently exist.

Noise

The purpose of this section is to present the noise evaluation associated with the redevelopment of 46 Wareham Street Project in Boston, Massachusetts. The approximately 62,215 square foot mixed-use building will include approximately 9,400 square feet of ground floor retail space, five floors of residential unit (42 total units), and a single level of below grade parking for approximately 52 vehicles. The noise analysis included noise monitoring to determine existing sound levels and noise modeling to calculate future sound levels associated with the potential mechanical equipment. The noise evaluation discusses noise background, the City of Boston's noise standards, noise analysis methodology, and a comparison to the City's noise criteria.

Noise Background

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

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

Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (0 dB) to the threshold of pain (120 dB). Since sound levels are measured in dB, the

addition of two sound levels is not linear. Adding two equal sound levels generates a 3 dB increase in the overall sound level. A 0 dB to 3 dB change in sound levels is not perceivable by the human ear. Research indicates the following general relationships between sound level and human perception:

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

The human ear does not perceive sound levels from each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A-weighted [dB(A)] is used to evaluate environmental noise levels. **Table 5-1** presents a list of common outdoor and indoor sound levels.

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

- L_{10} is the sound level which is exceeded for 10 percent of the time during the time period. During a 100 minute period, the L_{10} would be the sound level which was exceeded by other sound levels for 10 minutes.
- Leq is the A-weighted sound level, which averages the background sound levels with short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.
- Lmax is the maximum sound level measured during a time period.

Table 5-1
Common Outdoor and Indoor Sound Levels

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

Source: *Highway Noise Fundamentals*. Federal Highway Administration, September 1980.
*μPA – MicroPascals, which describe pressure. The pressure level is what sound level monitors measure.
**dB(A) – A-weighted decibels, which describe pressure logarithmically with respect to 20 μPa (the reference pressure level).

■

City of Boston Noise Standards

The City of Boston has developed noise standards that establish noise thresholds deemed to result in adverse impacts. The noise analysis for the Project used these standards to evaluate whether the proposed development will generate sound levels that result in adverse impacts.

Under Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts and the City of Boston Code, Ordinances, Title 7, Section 50, the Air Pollution Control Commission of the City of Boston has adopted Regulations for the Control of Noise in the City of Boston.[2] These regulations establish allowable sound levels based upon the land use affected by the proposed development. **Table 5-2** summarizes the noise standard for the various land uses. These allowable sound levels should not be exceeded during the corresponding time periods.

▼

[2] Regulations for the Control of Noise in the City of Boston, *City of Boston Air Pollution Control Commission.*

Table 5-2
City of Boston Zoning District Noise Standards, dB(A)

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

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

For a residential zoning district, the noise level affecting residential uses shall not exceed the Residential Noise Standard. The residential land use noise standard is 60 dB(A) for daytime periods (7:00 AM to 6:00 PM) and 50 dB(A) for nighttime conditions (6:00 PM to 7:00 AM).

The City of Boston's regulations on construction sound levels state that operation of any construction devices, excluding impact devices, may not exceed L_{10} sound level is in excess of 75 dB(A) or the Lmax sound level is in excess of 86 dB(A) at residential land uses.

■

Noise Analysis Methodology

The noise analysis evaluated the potential sound level impacts associated with the Proposed Project's operations, such as rooftop mechanical equipment. The noise analysis included measurements of existing ambient background sound levels and an evaluation of potential sound levels associated with the proposed mechanical equipment. The study area was evaluated and the sound levels at the sensitive receptor locations were calculated.

A noise monitoring program was developed to measure existing ambient background sound levels on a typical weekday daytime and nighttime period. The noise analysis calculated the maximum potential sound levels at the sensitive receptor locations using the manufacturer's technical specifications for the mechanical equipment. The sensitive receptor locations included nearby residential buildings. The analysis assumed sound level reductions due to distance, the propagation of sound due to the ground type, and the sound blockages from the surrounding buildings.

The Proposed Project includes a 150 kW emergency generator for building life safety, which was included in the noise evaluation. In addition, the Proponent will address the appropriate Department of Environmental Protection (DEP) air permitting (Environmental Result Program; Self-Certification) during the design process. The DEP regulations (310 CMR 7.00.) include noise requirements that will result in the implementation of noise mitigation measures, such as acoustic enclosures and exhaust silencers.

■

Receptor Locations

The noise analysis included evaluation of the study area to identify sensitive receptor locations that have outdoor activities and that might be sensitive to noise associated from the Project. The noise analysis identified two sensitive receptor locations in the vicinity of the Project. The analysis evaluated the following receptor locations:

R1 – Nearest residential on Wareham Street (The 27), and
R2 – Nearest residential on Union Park Street (89 Union Park Street).

These receptor locations, selected based on land use considerations, represent the most sensitive locations in the vicinity of the Project site. **Figure 5-8** depicts the receptor locations used in the noise analysis.

■

Existing Conditions

A noise monitoring program was conducted to establish existing sound levels. The existing sound levels were measured using a Type 1 sound analyzer (Larson Davis LxT). Measurements were conducted during the weekday daytime (2:00 PM to 4:00 PM) and late night (12:00 PM to 2:00 AM) periods at sensitive receptor areas in May 2014.

The existing measured Leq sound levels range from 63 dB(A) to 64 dB(A) during the daytime period and range from 53 dB(A) to 57 dB(A) during the nighttime period. These sound levels are typical of an urban area. The results of the noise monitoring program indicates that the sound levels within the study area exceed the City's residential district daytime and nighttime noise standard of 60 dB(A) and 50 dB(A), respectively. The measured sound level data under existing conditions was dominated by noise from mechanical equipment from adjacent buildings, roadway traffic on I-93, and local roadways. The existing measured sound level data are presented in **Table 5-3**.

Table 5-3
Existing Sound Levels, dB(A)

	Boston Noise Criteria		Measured Existing Sound Levels	
Monitoring Location*	**Daytime**	**Nighttime**	**Daytime**	**Nighttime**
M1 - Wareham Street	60	50	**64**	**57**
M2 - Malden Street	60	50	**63**	**53**

Source: Vanasse Hangen Brustlin, Inc.
* See Figure 5-8 for monitoring locations.
Bold values exceed noise criteria.

■

Project Impacts

The noise analysis evaluated sound levels associated with potential mechanical equipment, which included air cooled chiller, air handling unit, exhaust fan, and an emergency generator. The noise analysis calculated the maximum potential sound levels at the sensitive receptor locations using the manufacturer's technical specifications for the mechanical equipment. Applying the properties of sound propagation over hard ground, the noise analysis projected sound levels to sensitive receptor locations from each of the mechanical equipment to determine the overall maximum sound level that would be experienced at the sensitive receptor locations. The analysis assumed sound level reductions due to distance, ground type, and building blockages. The sensitive receptor locations included the nearby residential buildings on Wareham Street and Union Park Street.

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Noise Analysis Results

The noise analysis calculated the maximum sound levels, with the operation of the Proposed Project's mechanical equipment. The maximum existing daytime sound levels ranged from 63 dB(A) to 64 dB(A), which exceeds the City's daytime noise impact criteria of 60 dB(A). The maximum Project's daytime sound levels ranged from 52 dB(A) to 53 dB(A), which meet the City's noise impact criteria. The maximum existing nighttime sound levels ranged from 53 dB(A) to 57 dB(A), which also exceeds the City's nighttime noise impact criteria of 50 dB(A). The maximum Project's nighttime sound levels ranged from 52 dB(A) to 53 dB(A), which exceeds the City's nighttime noise impact criteria, but are lower than the existing nighttime sound levels. The Project's daytime and nighttime sound levels will not result in a noticeable change in the existing sound levels. All of the sound levels are presented in **Table 5-4**.

Table 5-4
Project Sound Levels, dB(A)

	Existing		Project Generated Sound Levels		City of Boston Noise Impact Criteria	
Receptor Location*	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1 – The 27	**64**	**57**	53	**53**	60	50
R2 – 89 Union Park Street	**63**	**53**	52	**52**	60	50

Source: Vanasse Hangen Brustlin, Inc.
* See Figure 5-8 for receptor locations.
Bold values exceed noise criteria.

■

Conclusion

The noise analysis evaluated the sound levels associated with the redevelopment of 46 Wareham Street Project. The Project is located in an urbanized area where the sensitive receptor locations currently experience existing sound levels that exceed the City's daytime and nighttime noise impact criteria. This analysis determined the maximum Project sound levels are all lower than the existing daytime and nighttime sound levels, are below the City of Boston's daytime noise impact criteria, and are slightly higher than the City's nighttime noise impact criteria. The Project's rooftop mechanical equipment will generate sound levels that are below the existing daytime and nighttime sound levels and will not result in a perceptible increase in the existing sound levels.

Construction Impacts

This section describes the anticipated methods and impacts of construction related to the Proposed Project. A Construction Management Plan (CMP) will be submitted to the Boston Transportation Department. This plan will comply with the City of Boston's Construction Management Program. The CMP includes detailed information regarding construction activities, materials to be used, staging areas, parking, truck routes, air quality and noise impacts, and mitigation measures, and other subject matter as it relates to construction. In particular, the CMP will demonstrate the intent to maintain public safety throughout the construction period. Techniques such as barricades, defined temporary walkways, signage, and other protective measures will be put in place. The CMP will also highlight actions to be taken to accommodate worker parking, truck routes and staging, protection of utilities, and the control of noise and dust.

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Construction Schedule

The following provides a preliminary assessment of the construction schedule for the Proposed Project:

- Project Review, Approval, & Permitting — Summer 2014 – Fall 2014
- Site Enabling — Fall 2014
- Site Excavation — Fall 2014 – Winter 2015
- Construction — Spring 2015 – Summer 2016
- Building Occupancy — Fall 2016

It is anticipated that the Project site work will commence by Fall 2014. The Project includes scaffolding and anchoring the exterior walls that will be retained with the Proposed Project followed by a partial demolition of the building and excavation of the proposed below-grade parking garage area. The entire construction schedule is anticipated to be approximately 16 months with completion scheduled by Summer 2016 and the building opening in late Fall 2016.

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Construction Noise Impacts and Mitigation

The construction activity associated with the Proposed Project may temporarily increase nearby sound levels due to the use of heavy machinery. Heavy machinery is expected to be used intermittently throughout the Project's construction phases, typically during daytime periods. The construction activities that will generate the highest sound levels may include demolition, site excavation and grading, and construction of the foundation for the proposed building. The City of Boston noise control regulation considers construction sound levels to be an impact to residential land uses if the L_{10} sound level is in excess of 75 dB(A) or the Lmax sound level is in excess of 86 dB(A). A construction management program will be developed with the City of Boston to ensure that the noise regulation is met.

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Construction Air Quality

Areas of exposed soils will be vegetated or paved as soon as practicable to minimize the length of exposure time. Exposed areas susceptible to wind will be mulched or seeded as early as feasible in the construction process to further reduce dust emissions. Runoff will be controlled to prevent sediments from entering the storm drain system.

Construction activities may generate dust, which will result in localized increase in airborne particle levels. Fugitive dust emissions from construction activities will depend on such factors as the properties of the emitting surfaces (e.g., moisture content and volume of spills), metrological and variables and construction practices employed. To limit the creation of airborne dust and minimize impacts on the local environment, the contractor will employ dust control measures in accordance with applicable local, state, and federal requirements. Dust control measures which may be implemented by the contractor include:

- Use of standard dust control such as watering-down the exposed ground surfaces or spreading hygroscopic salts will be employed to control and suppress dust that originates from construction related activities.

- Covering of soil subgrades with crushed stone where heavy equipment will be traveling.
- All trucks leaving the site shall be securely covered.
- The contractor shall clean debris from the construction area and surrounding streets on a routine basis.
- Mechanical sweeping will occur as needed.
- Wheel wash locations will be provided as necessary.
- Contaminated soils that are stockpiled onsite will be securely covered with polyethylene sheeting.
- All contractor and sub-contractor-operated diesel-powered non-road construction equipment with engine horsepower (HP) ratings of 60 HP and above, which is used on the Project for a period in excess of 30 days, shall be retrofitted with Emission Control Devices in order to reduce diesel emissions.
- In addition, all motor vehicles and construction equipment shall comply with all pertinent City, State, and Federal regulations covering exhaust emission control and safety.
- The reduction of emissions of volatile organic compounds (VOCs), carbon monoxide (CO), and particulate matter (PM) from diesel-powered equipment shall be accomplished by installing Retrofit Emission Control Devices.

The acceptable Retrofit Emission Control Devices for the Project shall consist of oxidation catalysts that (1) are included on the Environmental Protection Agency (EPA) Verified Retrofit Technology List; and (2) are verified by EPA or certified by the manufacturer to provide a minimum emissions reduction of 42 percent for VOCs, 31 percent for carbon monoxide and 20 percent for particulate matter. Attainment of the required reduction in particulate matter emissions can also be accomplished by using less polluting clean fuels (e.g. PuriNOx).

In addition to installing the required emission control devices, the contractor will also use methods to control nuisance odors associated with diesel emissions from construction equipment including without limitation the following:

- Turning off diesel combustion engines on construction equipment not in active use, and on trucks that are idling while waiting to load or unload material for five minutes or more.
- Locating diesel equipment away from the general public and sensitive receptors (e. g., fresh air intakes, air conditioners, and windows).

The Proponent will provide contractors with information promoting the Clean Air Construction Initiative (CACI). This initiative encourages the use of available, state-of-the-art diesel exhaust control technology on diesel-powered construction and industrial vehicles and equipment in an effort to substantially reduce harmful diesel particulate emissions, oxides of nitrogen (NOx), toxic hydrocarbons, odor, and smoke.

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Construction Water Quality

Local dewatering may be required to construct utilities and facilitate other deeper excavations. On-site recharge in accordance with the MCP at 310 CMR 40.0045 is planned as the primary approach for construction dewatering discharge. Discharge to municipal storm drains under a NPDES Remediation General Permit (RGP) will be implemented in the event that subsurface geology cannot accept dewatering flows. Effluent from dewatering efforts may include groundwater, precipitation, and surface water runoff. If needed, a dewatering effluent treatment system will be designed and operated by the contractor. Discharge water quality sampling and analyses will be conducted to monitor compliance with the NPDES RGP.

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Construction Traffic

As with every construction project, some level of traffic impacts can be anticipated. The construction trip generation due to workers and trucks is described in more detail below.

Construction Trip Generation and Worker Parking

Personnel will arrive at the job site either by public transportation or by personal vehicles. Personal vehicles will be allowed to park at the Project construction site as conditions permit in designated areas only. No personal vehicles will be allowed to park in the adjacent neighborhood. Because the workforce will arrive and depart prior to peak commuter traffic periods, these trips are not expected to have a measurable impact on the area's transportation system.

Truck Routes and Volumes

The vehicular access to the Project site during the construction period will be from Wareham Street via the site's existing curb cut. The construction work is not anticipated to generate a high volume of truck traffic along Wareham Street. Since Wareham Street currently contains several industrial and commercial uses, a slight increase in truck traffic will likely be unnoticed along the roadway.

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Rodent Control

The Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550 and the State Building Code, Section 108.6, Policy Number 87-4 (City of Boston) states that extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation and basement rehabilitation. In compliance with the City's requirements, a rodent extermination

certificate will be filed with the Proponent's building permit application to the City of Boston and a rodent control program will be developed prior to construction.

The rodent control program will include inspection and extermination in all areas of the Project site, including the interior of the existing buildings, prior to commencement of work. During construction, regular inspections will be made in order to maintain effective rodent control levels. The Proponent will establish a post-construction pest management program that requires the use of preventive methods outlined in the program to ensure that the buildings are not infested with rodents

Historical Resources

This section identifies properties that are either in the *Inventory of Historic and Archaeological Assets of the Commonwealth* or listed in the State Register of Historic Places that are within the Project site or are within close proximity.

Research Summary

A site file search at the Massachusetts Historical Commission (MHC) was completed to identify previously inventoried or listed resources located in the Project site and those in close proximity. Above-ground resources were identified within a one-quarter mile radius of the Project site, but no previously recorded archaeological sites were found (**Figure 5-9**). A field visit was also conducted to assess the current integrity of the building and the surrounding area (Photographs are provided in the attached Appendix).

The Project Site is located within the South End Landmark Protection Area (BOS.AD), which was established in 1983 to protect views of the adjacent South End Landmark District, ensure that new development adjacent to the Landmark District is compatible, and to protect light and air circulation within the district. The one-quarter mile study radius also includes properties within the National Register-listed South End Historic District (NR #73000324, BOS.AB), and the South End Landmark District (BOS.AC), which is a local historic district. Also located within the study radius are the Lawrence Model Lodging Houses (NR #83000606, BOS.AF), which are within the South End Landmark District but are also listed individually in the National Register; the East Brookline Streetscape (BOS.AJ), which has been determined eligible for the National Register; the South End Industrial District (BOS.AH), which has been found eligible for the National Register; and the South End Industrial Survey Area (BOS.RK). Each of these resources is discussed in more detail below.

Historic Context

The Project site is within an area that was first developed during the late 19th century as an industrial and commercial neighborhood. Atlas and Sanborn maps show that the entire area

between Harrison Avenue east to the South Bay was characterized in the 19th and 20th centuries by large brick factory and warehouse buildings, interspersed with rows of smaller, attached service shops and offices. The area specifically became associated with piano and furniture-making factories, which were still operating in the neighborhood into the mid-20th century.

Most of the housing for workers in these factories was located north of East Berkeley Street, in an area known as the "New York Streets" section of the South End. The New York Streets section was completely redeveloped for light industrial and manufacturing use in the late 1950s as part of the City's urban renewal initiative. East of Harrison Avenue remains residential, with the mid-19th century brick rowhouse streetscapes that characterize the South End.

Above Ground Resources

There are numerous properties within one-quarter mile of the Project Site that are included in the *Inventory of Historic and Archaeological Assets of the Commonwealth* and the State Register of Historic Places. Several of these properties are included in the South End Landmark District, which is a local historic district and National Register-listed district, and the South End Landmark Protection Area. Additional inventoried areas located within the one-quarter mile radius often overlap one another, and many individually inventoried buildings are included in these same areas and districts. Please note that individually inventoried properties within an inventoried area or listed district are not discussed separately, and are not individually noted on Figure 5-9.

46 Wareham Street

The 3-story brick industrial building at 46 Wareham Street is located within the South End Landmark Protection Area (see discussion below). It has been documented on a MHC inventory form (BOS.1491) and included in the MHC *Inventory of Historic and Archaeological Assets of the Commonwealth*. An MHC eligibility determination associated with the Central Artery project (April 18, 1990) determined that the building was eligible for the National Register as part of the South End Industrial District (BOS.AH; see discussion below).

The building is 3-stories tall and includes a basement level; an original mansard roof was removed, but the date of the removal cannot be determined. According to the MHC inventory form, the building was constructed during the 1870s by John J. McNutt along with a wood working shop on the adjacent property to the west. George McLaughlin and Thomas F. Scanlan moved their New England Organ Company to 46 Wareham Street c. 1876, while McNutt continued to own the Novelty Wood Works next door. Sanborn maps show that planing, sawing, cabinet work, finishing, varnishing, and polishing took place in the main factory building, with an engine room and lumber storage in a rear addition. A series of dry houses were sited in the L created by the main building and rear addition, detached from the

main building. The factory closed in 1892 and since then the building has been used by several different businesses, primarily woodworking and furniture shops.

National Register-Listed Properties

South End Historic District

The South End Historic District (BOS.AB; NR #73000324), is a 238-acre district located south of the Massachusetts Turnpike that was added to the National Register on May 8, 1973. It is described as "the largest remaining Victorian urban residential neighborhood in the United States." The neighborhood was planned in 1848 and constructed over the next three decades on partially filled land, and attracted well-to-do businessmen and their families. A mixture of architectural styles including the Greek Revival, Renaissance Revival and Second Empire are united by the mostly consistent use of the brick bow front rowhouses with Mansard roof, and the brick flat-fronted row house featuring an oriel on the façade, lending a visual cohesiveness to the area. These long, dense blocks of brick row houses are interspersed with urban squares and long parks, designed as respite from the urban environment.

Lawrence Motel Lodging Houses

These four boarding houses (BOS.AF) are located at 79-109 East Canton Street, and were individually listed as a group in the National Register (NR# 83000606) in 1983. They are also located within the larger National Register-listed South End Historic District (NR #73000324). The boarding houses were funded as philanthropic low-rent housing by the Lawrence Trust, named after Abbott Lawrence, a lawyer and the namesake of Lawrence, Massachusetts. They were designed by Boston architects Charles K. Kirby and William Goodwin and constructed between 1874 and 1892.

Locally Designated Properties

South End Landmark District

The South End Landmark District (BOS.AC) is a local historic district (LHD) established on November 14, 1983, and its boundaries are nearly identical to, but are slightly larger than, that of the National Register District of similar name discussed above (South End Historic District, NR #73000324). The major area of deviation between the local historic district and the National Register District is on the east boundary; the LHD includes a large area between Pembrook Street, Tremont Street, and West Dedham Street. Other boundary differences include a number of small areas near the perimeter of the South End Landmark District, which are not included in the South End Historic District (NR #73000324).

South End Landmark Protection Area

The 1870s building at 46 Wareham Street, which is proposed for alteration as part of the Project, is within the South End Landmark Protection Area ("Protection Area," BOS.AD). This area was established November 14, 1983 at the same time as the South End Landmark District, but has no form on file at MHC, despite being assigned an inventory number. The

Protection Area is in the *Inventory of Historic and Archaeological Assets of the Commonwealth*, but is not listed in the State Register of Historic Places. The South End Landmark District Commission reviews certain types of work within the Protection Area, including demolition, land coverage, structure height, landscape, and topography.

The Protection Area is adjacent to the east of the South End Historic District, extending east to Albany and Frontage Roads, north to the Massachusetts Turnpike, and south to Massachusetts Avenue and Northampton Street. The area contains 38 individually inventoried properties located within a one-quarter mile radius of the Project Site.

Inventoried Properties

South End Industrial District

The South End Industrial District (BOS.AH) has no form on file at MHC, but has been found eligible for the National Register. Inventory forms for individual properties noted as within this area include an MHC determination that indicates the South End Industrial District was determined eligible on April 18, 1990 in conjunction with MHC review of effects from the Central Artery project. Otherwise, the precise extent of its boundaries is unknown, as are the criteria used for the eligibility determination.

According to the MHC inventory database, there are 31 inventoried properties included in this area that are located within a one-quarter mile radius of the Project Site. Because the same 31 properties are also located in the Protection Area, it can be assumed that the South End Industrial District roughly overlaps with the Protection Area.

East Brookline Streetscape and the East Brookline Street Historic District

Although there is no form or map for the East Brookline Street Historic District (BOS.AI), it is likely that the area is generally consistent with the East Brookline Streetscape (BOS.AJ). The latter is the only set of continuous bowfront rowhouses that are located outside of the South End Landmark District, but which are within the much more industrial Protection Area. The area was determined to be eligible for the National Register as a district on April 13, 1990. One building (615 Albany Street, BOS.1457) located both within the quarter-mile study radius and the East Brookline Street Historic District (BOS.AI) was not included in the East Brookline Streetscape (BOS.AJ), representing the only apparent inconsistency between the two areas.

South End Industrial Survey Area

The South End Industrial Survey Area (BOS.RK) generally overlaps the north portion of the Protection Area, and consists of several large brick manufacturing buildings, many of which were associated with the furniture and piano-making industries for which the South End was known during the late 19th and early 20th centuries. There are 18 properties located within the quarter-mile radius which are included in this area. All of these properties are also located within the Protection Area (BOS.AD), and nearly all of these properties are also noted as

being within the South End Industrial District (BOS.AH), indicating a large overlap among these three areas/districts. No eligibility determination has been rendered for this area.

Cathedral of the Holy Cross Roman Catholic Church

This religious complex (BOS.SA) includes a cathedral, rectory, convent, grammar school, and high school, constructed between 1861 and 1946. The area is wholly contained within the National Register-listed South End District (NR #73000324) and the South End Landmark District, (BOS.AC).

Cathedral Veterans' Housing Project Complex

This public housing project (BOS.SB) was constructed in 1950-1951 as part of Boston's urban renewal program. The set of nine apartment buildings was designed by Harold Field Kellogg, the first director of the Boston Redevelopment Authority. It is located within the South End Landmark District (BOS.AC).

Archeological Resources

There are no previously recorded archaeological sites within a one-quarter mile radius of the Project site.

Sustainable Practices

City of Boston Green Building Requirements

Article 80 provides that new development projects over 50,000 SF must comply with green building standards and sustainable design features as described in Article 37 of the City's zoning code. The Proponent is committed to incorporating numerous design elements into the building construction to respond to environmental concerns, reduce energy consumption, reduce water use, and increase recycling.

A LEED for New Construction and Major Renovations checklist is included in this PNF as **Figure 5-10** computing the green building points defined by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building rating system.

Project LEED Team

The Proponent has engaged the following LEED accredited professionals to join with the Project design team to maximize the green design elements of the building and its site design.

Paul Baccala, LEED AP
John Holland, LEED Associate

Description of LEED Checklist

The Project will utilize the LEED for New Construction and Major Renovations as it is a major renovation project. The following section is a synopsis of LEED prerequisites and potential credits under review for the project.

Sustainable Sites

Construction Activity Pollution Prevention

The Proponent will comply with the National Pollutant Discharge Elimination System (NPDES) program as established by the EPA.

Development Density & Community Connectivity

The Project will redevelop a previously developed site in a dense urban neighborhood along Wareham Street and will meet the community connectivity option for this credit.

Alternative Transportation: Public Transportation Access

The Project site is located within ¼-mile of bus stops on Washington Street, Harrison Avenue, and Albany Street that are served by eight MBTA bus lines. The project will also be served by Boston Public Schools school bus system.

Alternative Transportation: Bicycle Use

The Project will provide covered bicycle storage facilities for securing bicycles for 15% of the building occupants.

Stormwater Design: Quantity Control

A stormwater management plan will be implemented for the project such that the post-development site runoff peak rate and volume both decrease by 25% from existing conditions in the two-year 24-hour storm event.

Heat Island Effect: Non-roof

All parking for the building will be located underneath the building, minimizing heat island effect.

Heat Island Effect: Roof

The new building's roof may feature a white/light color EPDM roof membrane. These roof membranes are highly reflective and reduce solar radiation.

Water Efficiency

Water Efficient Landscaping

No potable water is used to irrigation, and so achieves the 50% reduction in irrigation water use. Furthermore, the project will not incorporate any type of irrigation system.

Water Use Reduction; 35%

Low flow toilet, urinals, and low flow faucets will be employed to reduce water usage. System will target a reduction in water consumption by 35% from a code required system.

Energy & Atmosphere

Fundamental Commissioning of Building Energy Systems

A commissioning agent will be hired as part of the design team to achieve this prerequisite as well as the additional commissioning credit.

Minimum Energy Performance

The Project is expect to achieve 32% over the ASHRAE 90.1-2010 (see EA Credit 1), meeting the minimum energy performance. Energy efficiency will be achieved by improved building envelope, increased insulation at walls and roof, improved windows at all locations, high efficiency lighting for all spaces, daylight harvesting to reduce lighting energy need, and a high efficiency HVAC system including condensing boilers, heat recovery wheels, and dehumidification ventilation system. HVAC design will be based on 9 month use for the mixed-use building to reduce the overall size of the HVAC units and increased operation efficiency. HVAC systems will be monitored and controlled by a building energy management system. Occupancy sensors will be used to reduce energy consumption for lighting systems. High efficiency motors will be incorporated with variable-frequency drives whenever possible. The expected total saving will be in the range of 26-32% better than the ASHRAE 90.1-2010.

Fundamental Refrigerant Management

New HVAC systems will not utilize CFC refrigerants and will use HFC only; no ozone depleting refrigerants are used in the new cooling systems.

Optimize Energy Performance

Through whole building energy simulation, the building is expected to produce a 26% energy cost saving as compared with the baseline building performance rating.

Green Power

The proponent will sign a two-year contract for renewable energy to provide at least 35% of the building's electrical use.

Materials & Resources

Storage and Collection of Recyclables

A dedicated recycling collection/storage area will be located within the trash room to facilitate the recycling program.

Regional Materials: 20%

The project team will specify building materials that have been extracted, harvested, or recovered, as well as manufactured within 500 miles of the project site.

Indoor Environmental Quality

Prerequisites

The Project will meet the minimum requirements of the Massachusetts Building Code and ASHRAE 62.1-2010 for ventilation and indoor air quality. Smoking will be prohibited within 25 feet of entries, outdoor air intakes and operable windows. The HVAC system will be designed to meet the ASHRAE Handbook, Chapter 47, requirement under Option 3.

Construction IAQ Management Plan – During Construction

Construction specifications will require the contractor to submit an IAQ plan for the construction period to protect the HVAC system and prevent moisture and contaminants from contact with carpeting, ceiling tiles, and other absorptive surfaces.

Construction IAQ Management Plan – Before Occupancy

After construction ends, prior to occupancy and with all interior finishes installed, a building flush-out will be performed with new filters, supplying a total air volume of 14,000 cubic feet of outdoor air per square foot of the floor area while maintaining an internal temperature of 60°F and relative humidity no higher than 60%.

Low-Emitting Materials

Adhesives and sealants with low VOC content limits will be specified for use in the project.

Controllability of Systems - Lighting

Each area will be locally switched and designed for multi-level controls. All regularly occupied spaces will have an occupancy sensor to turn off lights when unoccupied. Daylight sensors will be installed in each room where there is natural light available. The overall lighting control system will be in conformance with the requirements of this credit.

Controllability of Systems – Thermal Comfort

Individual comfort controls will be provided for at least 50% of the building occupants to enable adjustments to meet individual needs and preferences. Operable windows will be used in conjuncture with comfort controls to provide additional ventilation naturally.

Daylight and Views – Views

Ninety-percent (90%) of all regularly occupied areas throughout the building will have a direct line of sight to the outdoor environment via vision glazing

Innovation & Design Process

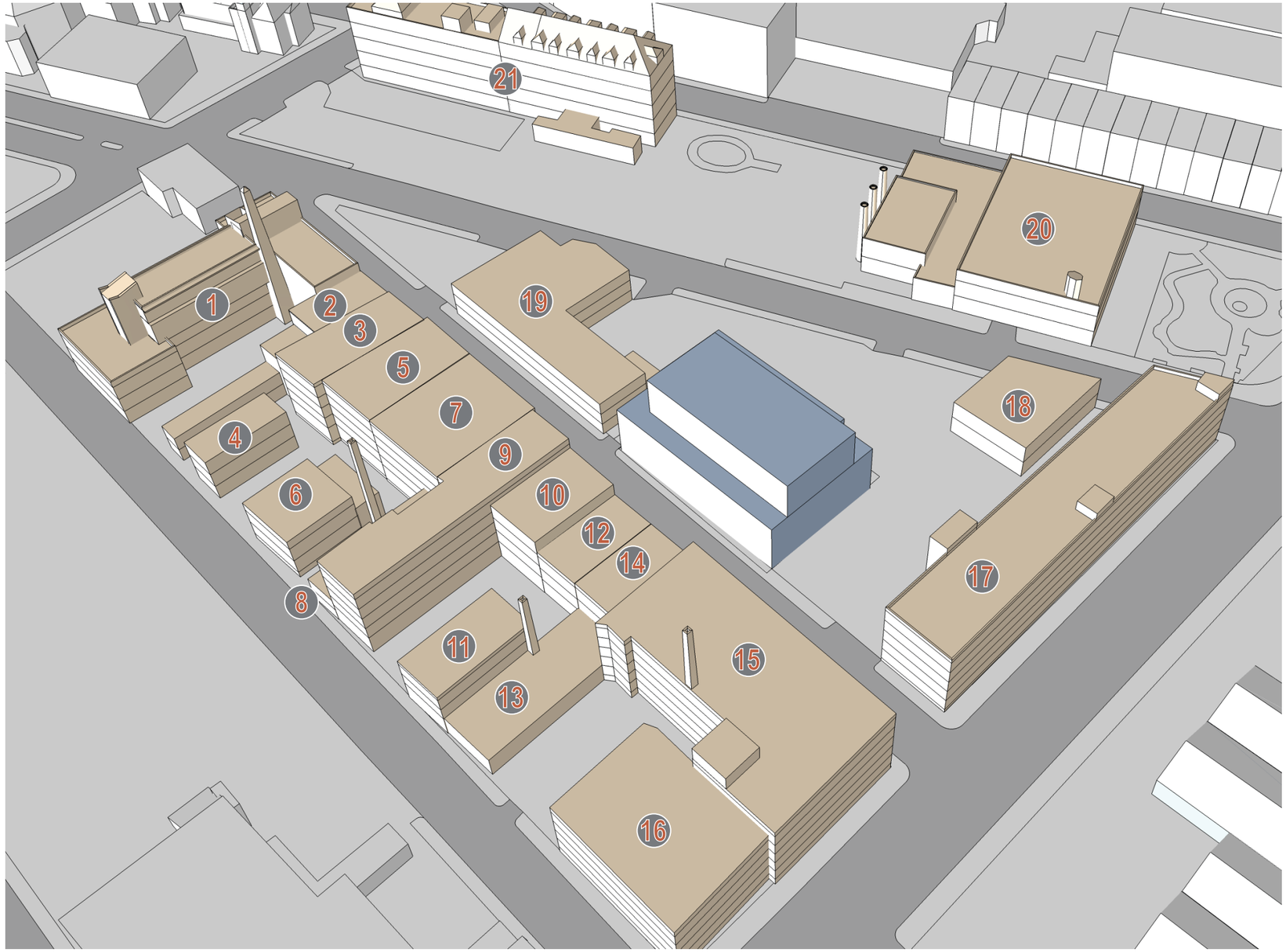
LEED Accredited Professional

The Project design team has at least one LEED AP in each of the major disciplines.
Add COB extra credit point for preserving existing façade

Regional Priority Credit

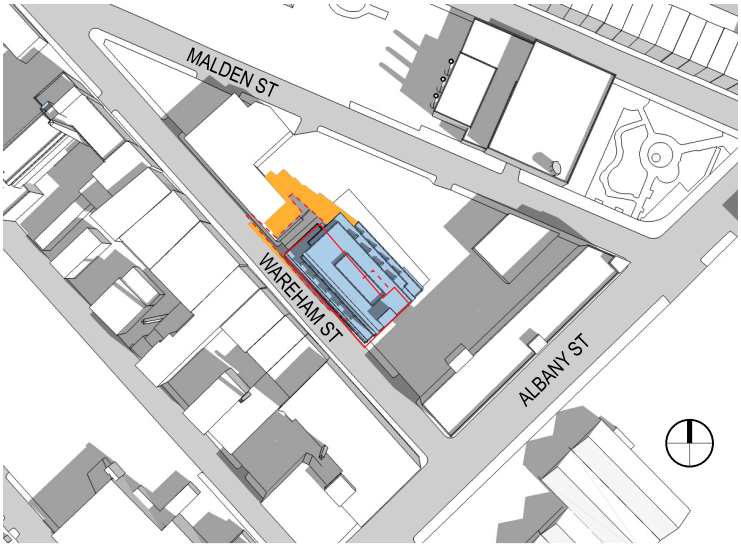
Article 37 – Historical Preservation

The Project involves the historic renovation of an existing structure and will comply with applicable historic preservation regulations and design guidelines.



1	27 Wareham St	*5 Stories*
2	35 Wareham St	*4 Stories*
3	45 Wareham St	*5 Stories*
4	34 Plympton St	*3 Stories*
5	47 Wareham St	*5 Stories*
6	40 Plympton St	*2 Stories*
7	49 Wareham St	*1 Stories*
8	42 Plympton St	*2 Stories*
9	61 Wareham St	*5 Stories*
10	65 Wareham St	*4 Stories*
11	52 Plympton St	*3 Stories*
12	71 Wareham St	*4 Stories*
13	56 Plympton St	*1 Stories*
14	75 Wareham St	*3 Stories*
15	91 Wareham St	*5 Stories*
16	64 Plympton St	*4 Stories*
17	519 Albany St	*5.5 Stories*
18	129 Malden St	*2 Stories*
19	30 Wareham St	*3 Stories*
20	120 Malden St	*2.5 Stories*
21	89 Union Park St	*5 Stories*

Neighborhood Context



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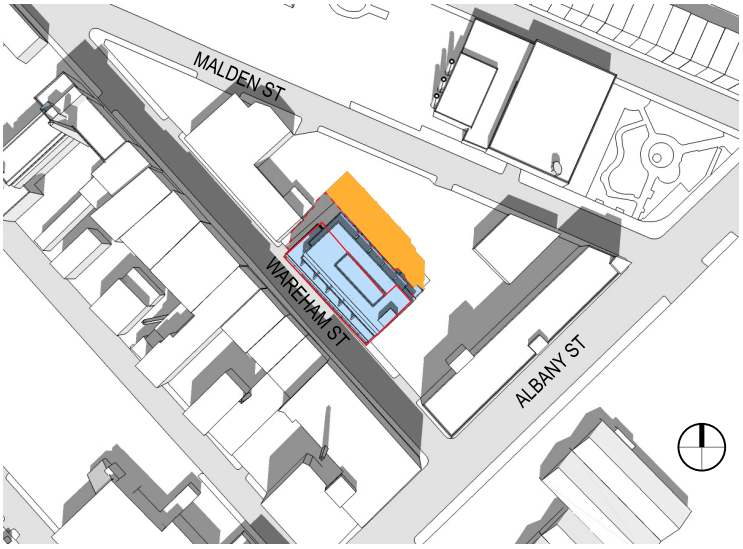

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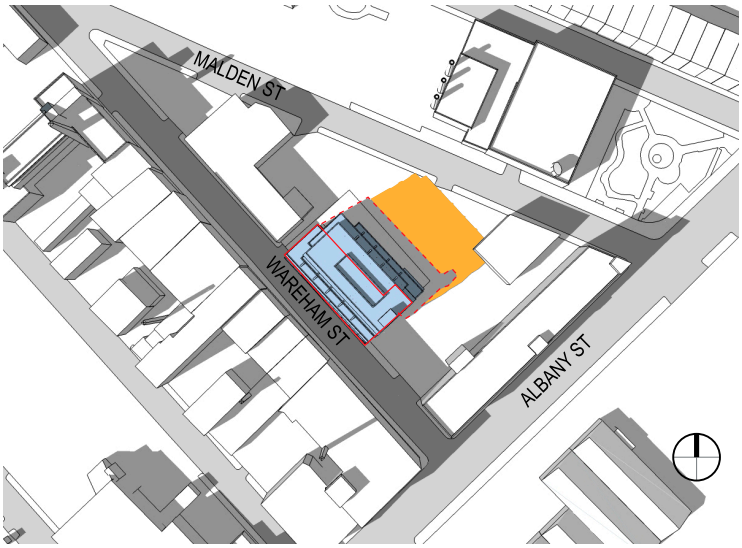

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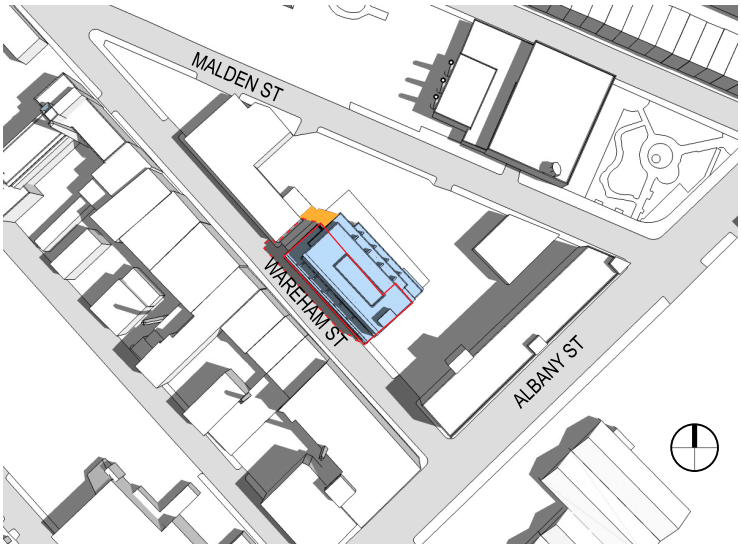
EXISTING BUILDING

EXISTING SHADOWS

NET NEW SHADOWS

Shadow Study: March 21



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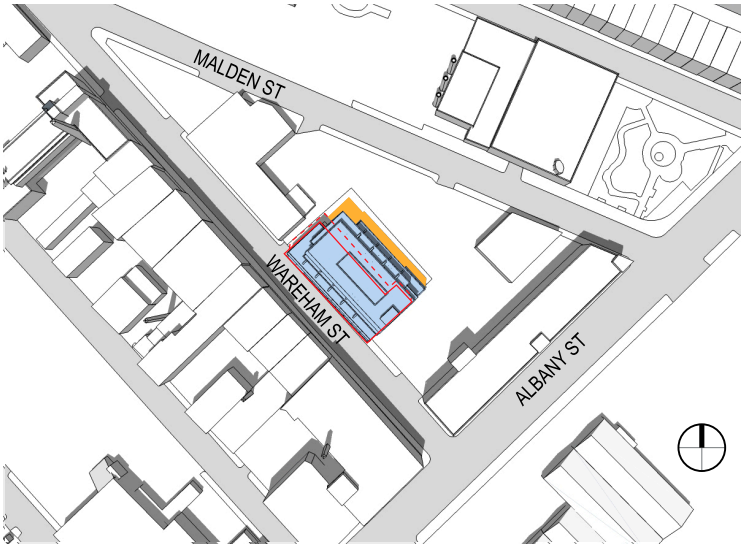

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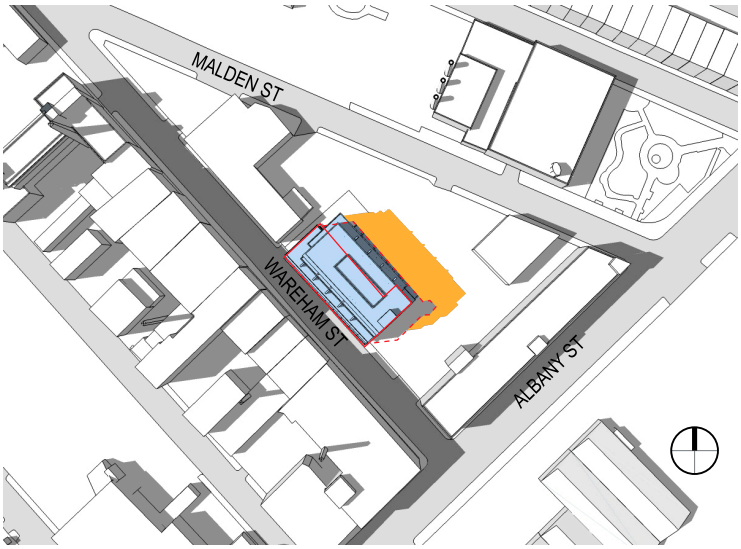

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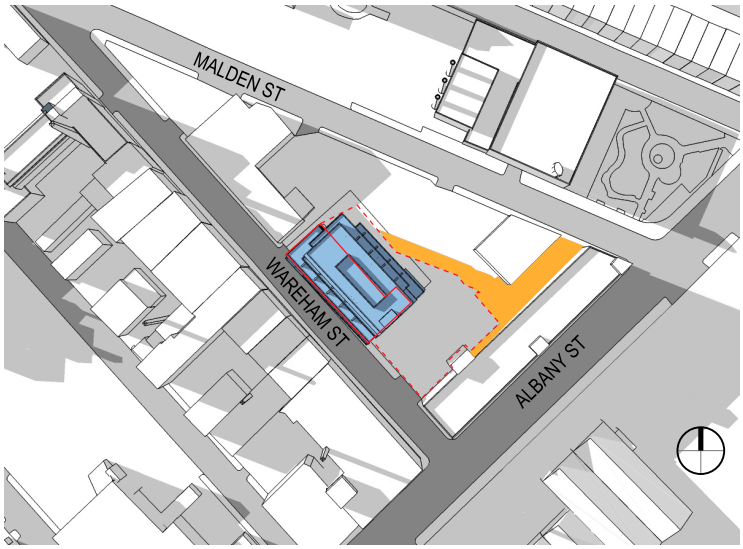


6 PM

EXISTING BUILDING

EXISTING SHADOWS

NET NEW SHADOWS

Shadow Study: June 21

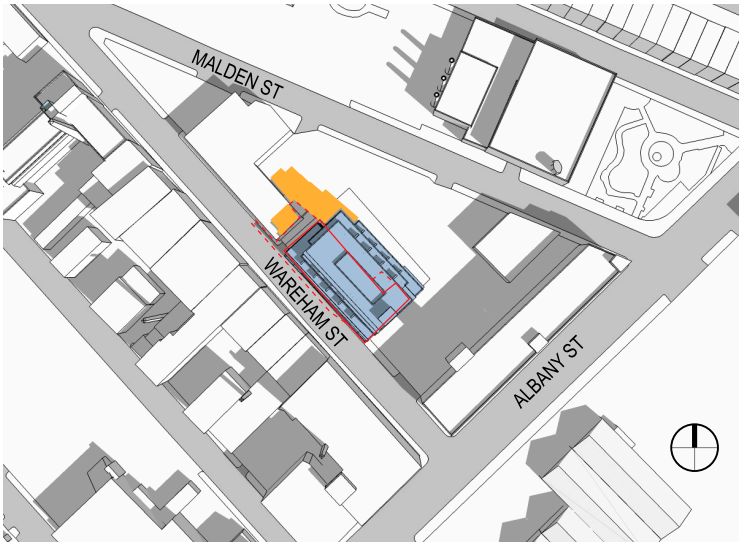
THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A
Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
5-3



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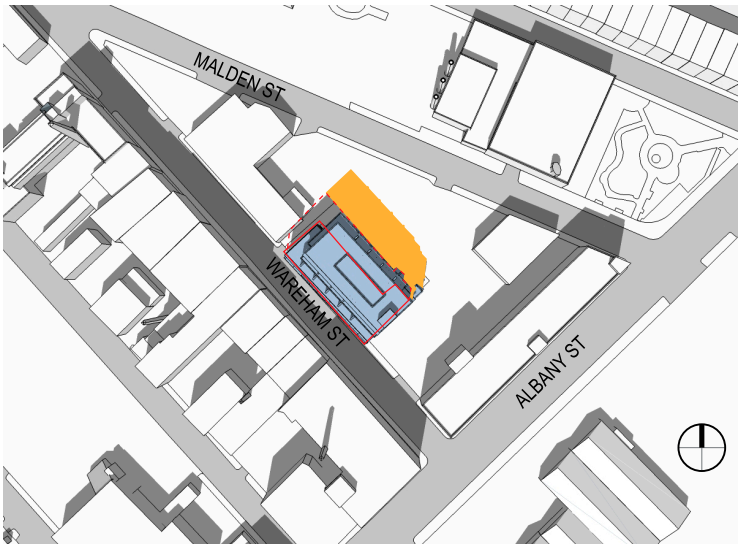

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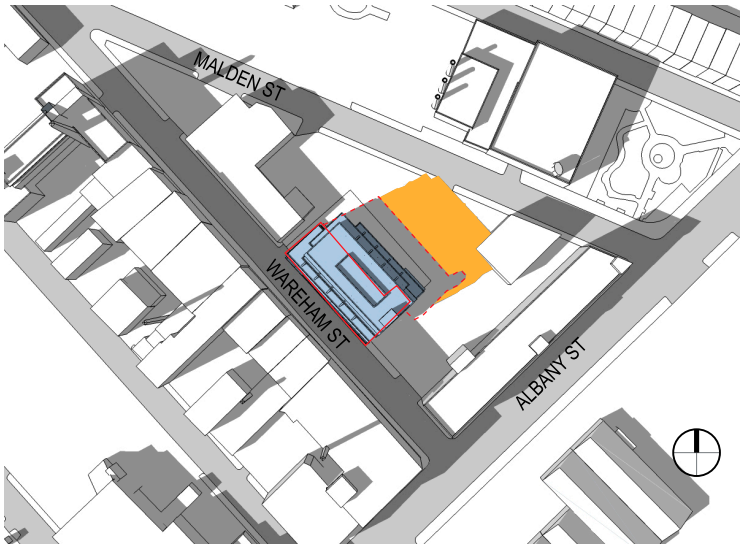


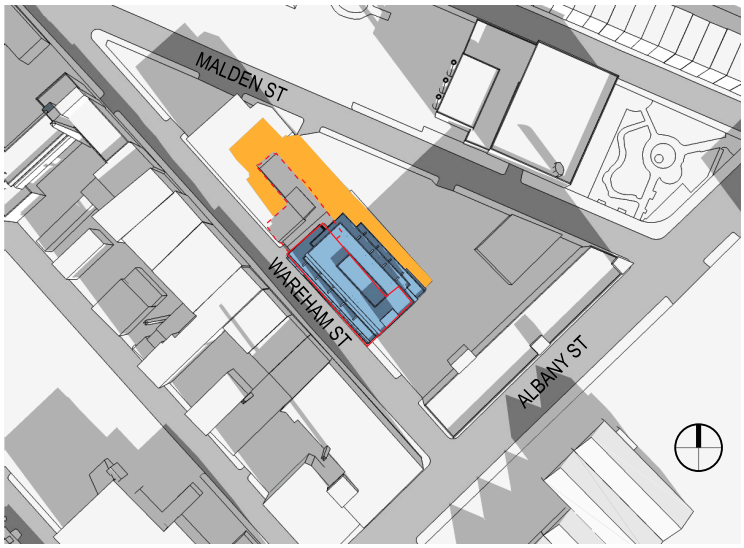
3 PM

EXISTING BUILDING

EXISTING SHADOWS

NET NEW SHADOWS

Shadow Study: September 21



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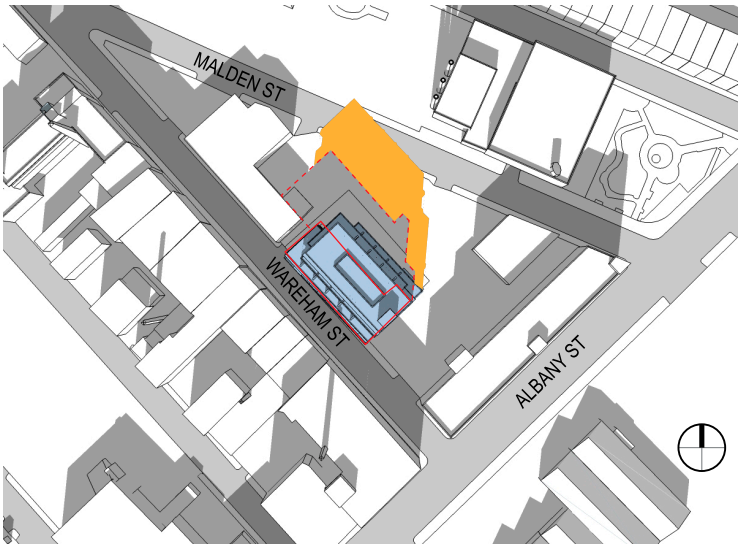

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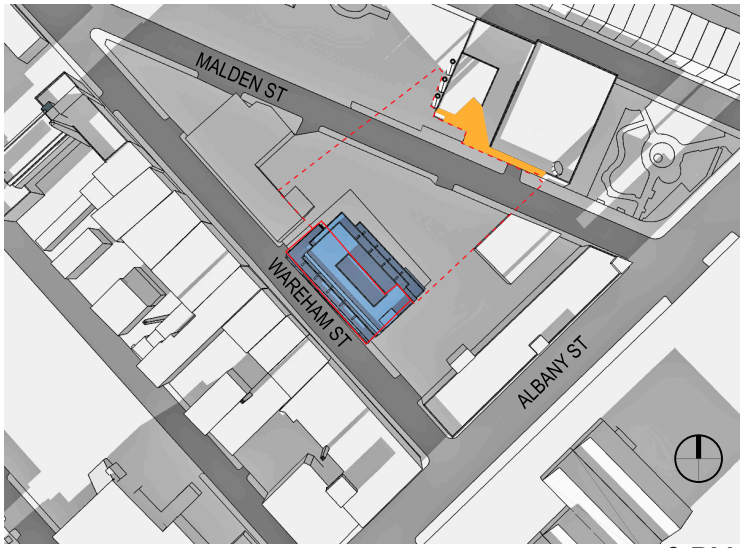


3 PM

EXISTING BUILDING

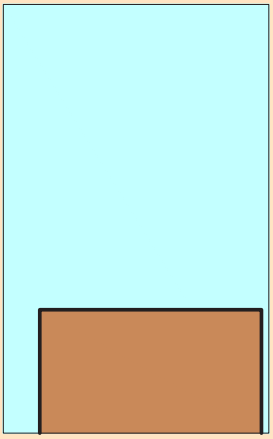
EXISTING SHADOWS

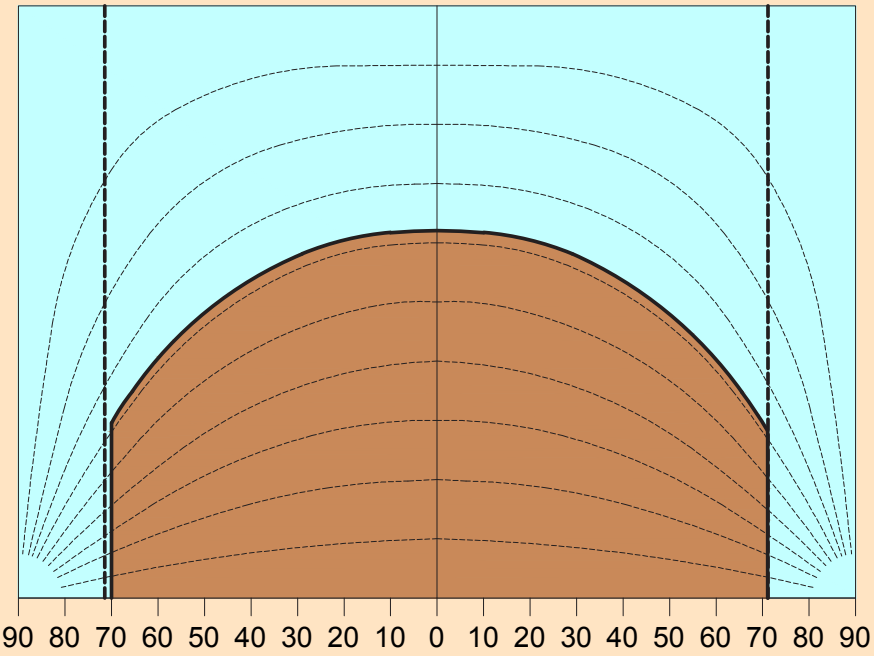
NET NEW SHADOWS

Shadow Study: December 21

Existing

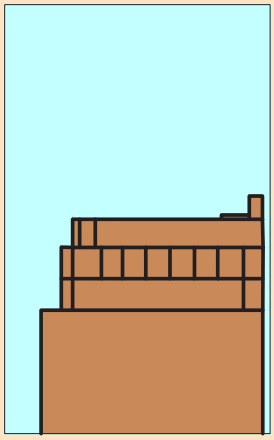
Obstruction of
Skyplane = 61.3%

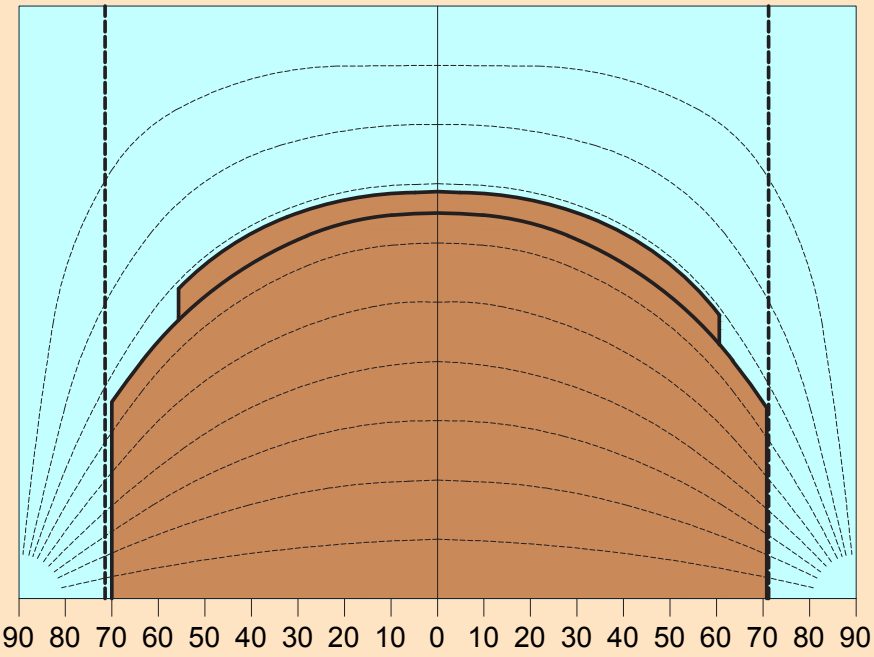




Proposed

Obstruction of
Skyplane = 66.4%

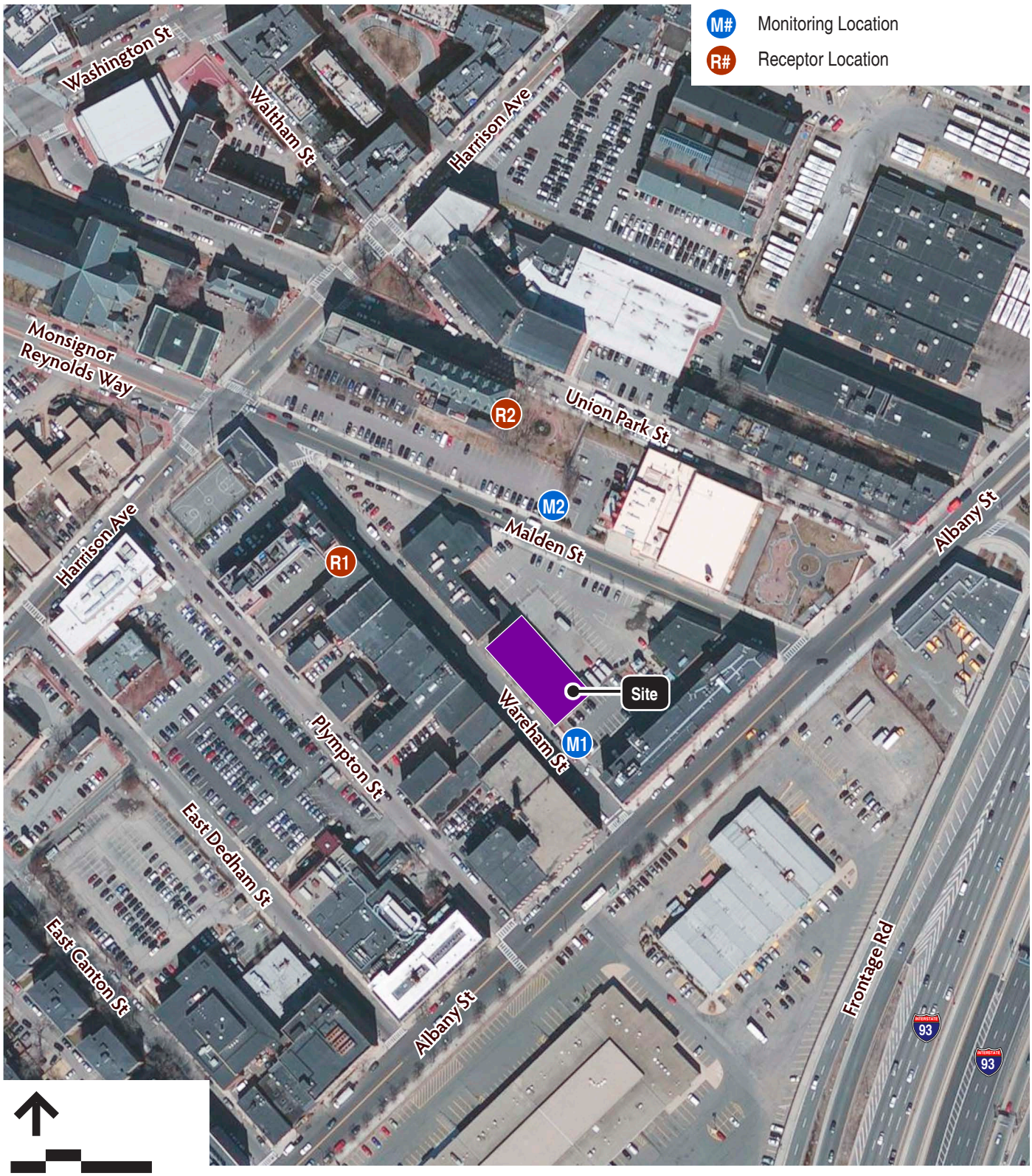




Daylight Analysis: Wareham Street

Source: Arcmap Bing Aerial Datalayer, MassGIS Q3Flood Poly Boston, Massachusetts

FEMA Map



Source: Arcmap Bing Aerial Datalayer, Boston, Massachusetts

Noise Monitoring/Receptor Locations

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET
SOWA DISTRICT, BOSTON, MA

H+A Hacin + Associates [architecture + design]

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Figure
5-8

Source: Arcmap Bing Aerial Datalayer, Boston, Massachusetts

Historic Resources

LEED 2009 for New Construction and Major Renovations

Project Checklist

46 Wareham Street Boston MA

#######

Sustainable Sites — Possible Points: 26

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

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
4			Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
2			Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
10			Credit 1	Optimize Energy Performance	1 to 19
		1	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
		2	Credit 4	Enhanced Refrigerant Management	2
		3	Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y			Prereq 1	Storage and Collection of Recyclables	
		1	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
	1		Credit 2	Construction Waste Management	1 to 2
		1	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
		1	Credit 4	Recycled Content	1 to 2
2			Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
		1	Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

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

Innovation and Design Process — Possible Points: 6

			Credit 1.1	Innovation in Design: Specific Title	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: Stormwater Design - Quantity Control	1
1			Credit 1.2	Regional Priority: Heat Island Effect - Non-roof	1
1			Credit 1.3	Regional Priority: Heat Island Effect - Roof	1
1			Credit 1.4	Regional Priority: Article 37 - Historical Preservation	1

Total — Possible Points: 110

48	11	24	Certified 40 to 49 points · Silver 50 to 59 points · Gold 60 to 79 points · Platinum 80 to 110

LEED Checklist

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

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Figure 5-10

6

Infrastructure Systems Component

Introduction

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

- Sewer
- Domestic water
- Fire protection
- Drainage
- Electricity
- Natural Gas

The Proposed Project includes the partial demolition of the existing warehouse building and construction of a six story mixed-use building with an underground parking garage and associated site improvements.

Sewer Infrastructure

There are existing Boston Water & Sewer Commission (BWSC) sanitary sewer mains located in Wareham Street. There is a 12 inch BWSC sanitary sewer main in Wareham Street. This line connects to a 66 inch by 68 inch main known as the New Albany Street Interceptor. This discharge is ultimately conveyed to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

Sanitary Sewage from the existing building at 46 Wareham Street is currently connected to the 12 inch main in Wareham Street. All existing sanitary connections will be cut and capped prior to any demolition of the existing structure.

■

Wastewater Generation

Sanitary sewage generated from the Proposed Project will be connected to the 12 inch main in Wareham Street. The connection will be reviewed and approved by the BWSC Engineering Department as part of the design process and BWSC site plan approval.

The Proposed Projects sewage generation rates were estimated using the Massachusetts Division of Water Pollution Control Sewer System Extension and Connection Permit Program – 310 CMR 15.00. 310 CMR 15.0 lists the typical generation values for specific uses. These values are generally conservative for estimating sewage flow for new construction.

Proposed Sewage Usage:

Table 6-1
Existing and Future Sewer Generation

Program Type	Units	Generation Rate	Sewer Generation (GPD)
Existing			
Warehouse	29,828 SF	5 GPD / 100 SF	1,492 GPD
Total			**1,492 GPD**
Proposed			
Residential	42 Units / 63 Bedrooms	110 GPD / Bedroom	6,930 GPD
Retail	9,400 SF	50 GPD / 1,000 SF	470 GPD
Total			**7,400 GPD**
Net Increase			***5,908 GPD***

■

Sewage Capacity & Impacts

Proposed Conditions

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Proposed project is expected to generate 7248 GPD which will only require BWSC approval and no approvals from Massachusetts Department of Environmental Protection.

The sewer services will connect to the 12 inch main in Wareham Street.

All improvements and connections to BWSC infrastructure will be reviewed as part of the site plan review process for the proposed Project. This process includes an in depth design review

of the proposed connections, a project demand and system capacity review and the establishment of service accounts.

Water Infrastructure

Water to the site is provided by the BWSC. There is a 12-inch southern low main in Wareham Street. The existing building is serviced by this main and all services to the building will be cut and capped prior to any demolition of the existing structure

■

Water Consumption

The proposed Project's water demand estimate for domestic services is based on the proposed Project's estimated sewage generation, described above. Using a conservative additive factor of 10% to the sewage flows the estimated daily water demand for the proposed Project is 7973 GPD. This water will be supplied by the BWSC. All efforts to reduce water consumption from the Proposed Project will be made. Aeration Fixtures and appliances will be utilized to maximize water conservation. Sensor operated faucets and toilets will be utilized in all public areas.

Water services will be installed in accordance with all applicable Local, State and Federal codes and standards. Backflow preventers will be installed on both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC Automatic Meter Reading (AMR) system

■

Existing Water Capacity & Impacts

Fire flow testing has not yet been conducted. BWSC will be contacted to schedule and conduct a fire flow test as the design progresses.

Proposed Project

Domestic and fire protection service connections shall meet applicable City and State codes and standards. Compliance will be part of the BWSC Site Plan Review process. This review includes, but is not limited to, sizing of domestic and fire protection services, meter sizing, backflow prevention design and fire protection location design that conforms to BWSC and Boston Fire Department requirements.

Proposed Impacts

No water capacity issues are anticipated as a result of the Proposed Project.

Stormwater

There is an existing drainage system in Wareham Street that starts as a 15 inch main that increases to an 18 inch main in front of 46 Wareham Street then increases to a 21 inch main that flows to a 36inch main in Albany Street. The stormwater ultimately drains to Boston Harbor.

■

Proposed Project

The Proposed Project is located in the Groundwater Conservation Overlay District (GCOD). All roof runoff, paved and landscape areas will be treated and recharged into an under slab groundwater recharge field. This field will have an overflow connected to the 21 inch main of the BWSC system. The existing site is 100% impervious and the Proposed Project will actually reduce the impervious area. The project will maintain or reduce the existing peak rates and volumes of runoff. No significant rate or volume mitigation is anticipated.

■

Water Quality Impact

The Proposed Project will not impact the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the discharge of site materials off-site and to BWSC systems. Existing catch basins will be fitted with filter fabric, hay bales and/or crushed stone to provide sediment removal from runoff. These controls will be maintained throughout construction until all disturbed areas have been stabilized.

All dewatering will be conducted in accordance with all applicable MWRA and BWSC discharge permits. Once completed, the project will be in compliance with local and state stormwater management policies.

■

DEP Stormwater Management Policy Standards

The Project complies with the following Standards:

Standard 1

No New stormwater conveyances discharge untreated stormwater directly to the waters of the Commonwealth;

Standard 2

Post Development peak discharge rates are less than pre-development;

Standard 3

The recharge volume required for this project is exceeded.

Standard 4

The catch basins in conjunction with the deep sump manholes provide the 80% average annual post-construction load removal of Total Suspended Solids (TSS).

Standard 5

This project is not associated with Higher Potential Pollutant Loads.

Standard 6

This project will not discharge untreated stormwater to a sensitive or any other Area.

Standard 7

The project is re-development and compliance with the Stormwater Management Standards is required to the maximum extent practicable. The Proposed Project complies with the Stormwater Management Standards applicable for the re-development

Standard 8

Sedimentation and erosion controls will be incorporated into the project.

Standard 9

An Operation and Maintenance Plan and long term BMP will be prepared for the Proposed Project and will assure proper maintenance of the system.

Standard 10

All illicit discharges to the stormwater management system are and will be prohibited.

It is our belief that the project complies with the Stormwater Management Standards to the maximum extent practicable. The Project as proposed will protect the Abutters in the short term through proper construction and erosion protection techniques. It will also protect the Abutters form long term impacts due to the increase in vegetative cover and the increase in stormwater flow quality.

Protection Proposed During Construction

All public and private infrastructure located on or adjacent to the Proposed Project will be protected during construction. All work in in the public way will be in accordance with BWSC, Boston Public Works, Dig-Safe and other applicable utility companies' requirements. All necessary permits will be obtained prior to the commencement of work.

The proponent will coordinate with BWSC and all utility companies to ensure a coordinated utility operation throughout construction.

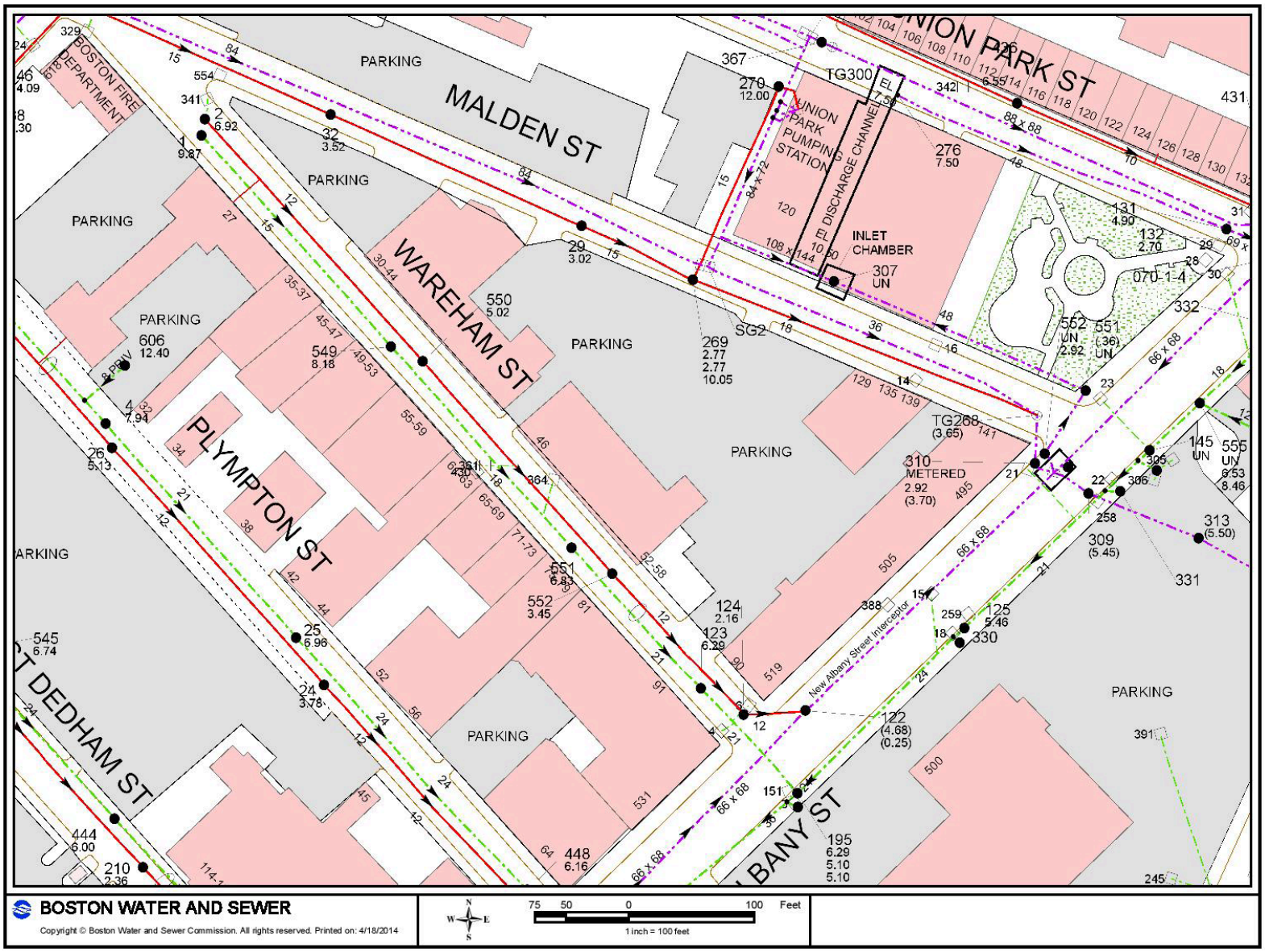
Conservation of Resources

State Building Code requires water conserving fixtures. Low flow toilets and restricted flow faucets will help in reducing the domestic water demand on the existing distribution system. Sensor operated sinks with water conserving aerators and sensor operated toilets in all restrooms will be incorporated into the design of the building.

Proposed Energy Usage & Impacts

The electrical, space heating, and energy systems for the proposed project have not yet been designed. Electrical power supply design will be coordinated with NSTAR as the project design progresses. Natural gas requirements and services will be coordinated with National Grid.

Energy conservation measures will be incorporated into the building design and construction. The proponent will investigate the design and installation of energy efficient lighting and heating/cooling systems in the design of the building.



Existing Sewer and Drain System

THE FACTORY
AT 46 WAREHAM

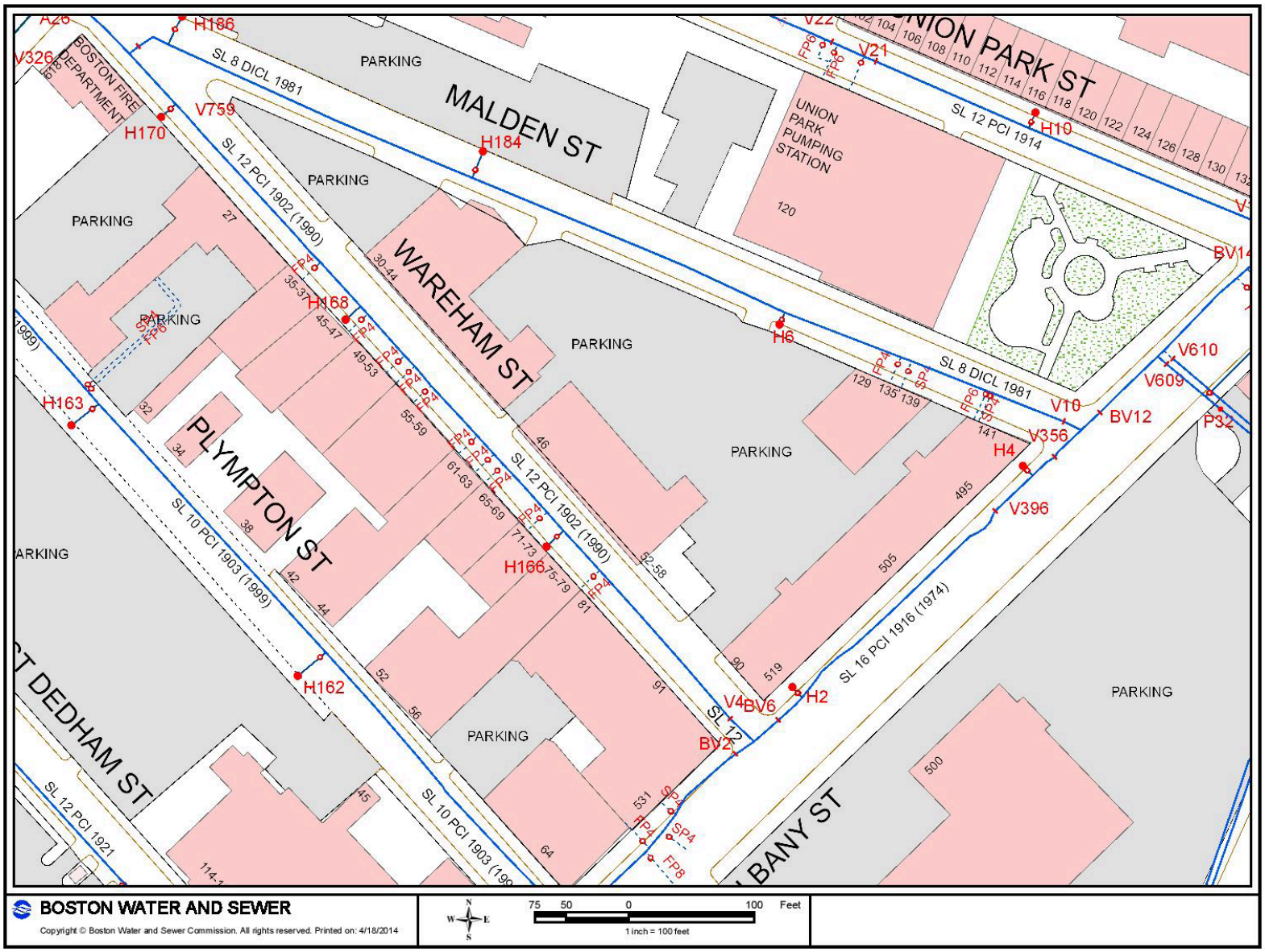
46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

Hacin + Associates [architecture + design]

the HOLLAND COMPANIES
Design & Construction

Figure
6-1



Existing Water System

THE FACTORY
AT 46 WAREHAM

46 WAREHAM STREET

SOWA DISTRICT, BOSTON, MA

H+A Hacin + Associates [architecture + design]

the HOLLAND COMPANIES Design & Construction

Figure
6-2

7

Project Certification

This Expanded PNF has been submitted to the Boston Redevelopment Authority, as required by Article 80 of the Zoning Code, on the 7th day of July 2014.

Proponent

Holland Development, LLC

John Holland
President

Preparer

Vanasse Hangen Brustlin, Inc.

Karen Wynne
Senior Project Manager

The Factory at 46 Wareham
PNF Appendix Material

Appendix A

Climate Change Preparedness & Resiliency Checklist

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	The Factory at 46 Wareham
Project Address Primary:	46 Wareham St., Boston, MA 02118
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	John Holland, President, Holland Development, LLC John.holland@thehollandcompanies.com

A.2 - Team Description

Owner / Developer:	John Holland, Holland Development
Architect:	Hacin + Associates
Engineer (building systems):	RW Sullivan
Sustainability / LEED:	Holland Development
Permitting:	Holland Construction
Construction Management:	Holland Construction
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:	Mixed Use/ Commercial & residential
List the First Floor Uses:	*Commercial & residential lobby*

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

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*16,752 SF*	Building Area:	*62,215SF*
Building Height:	*69'-9" Ft.*	Number of Stories:	*7 Flrs.*
First Floor Elevation (reference Boston City Base):	*17.25'*	Are there below grade spaces/levels, if yes how many:	Yes / No / *Number of Levels 1*

A.5 - Green Building

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

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

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

Registered:	*Yes / No*	Certified:	*Yes / No*

A.6 - Building Energy

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

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
What is the planned building Energy Use Intensity:	*(kbut/SF or kWh/SF)*	Cooling:	*(Tons/hr)*

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

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
		Cooling:	*(Tons/hr)*

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

Electrical Generation:	*(kW)*		Fuel Source:	
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	*(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?

Deg.

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

Deg.	*Days*	*Events / yr.*

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

Days	*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?

Inches / yr.	*Inches*	*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?

Peak Wind	*Hours*	*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:	%
How is performance determined:	

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* =	Walls / Curtain Wall Assembly:	*R* =
Foundation:	*R* =	Basement / Slab:	*R* =
Windows:	*R* = / *U* =	Doors:	*R* = / *U* =

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	Building will be Smart Grid ready	Connected to distributed steam,	Distributed thermal energy

electrical		hot, chilled water	ready

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

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

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

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	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?

Yes / No

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base*

	16.1 - 18.2 Elev.(Ft.)
Building Proximity to Water:	*2,000 Ft.*

Is the site or building located in any of the following?

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

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

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

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

500 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:	*Ft.*	Frequency of storms:	*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:				

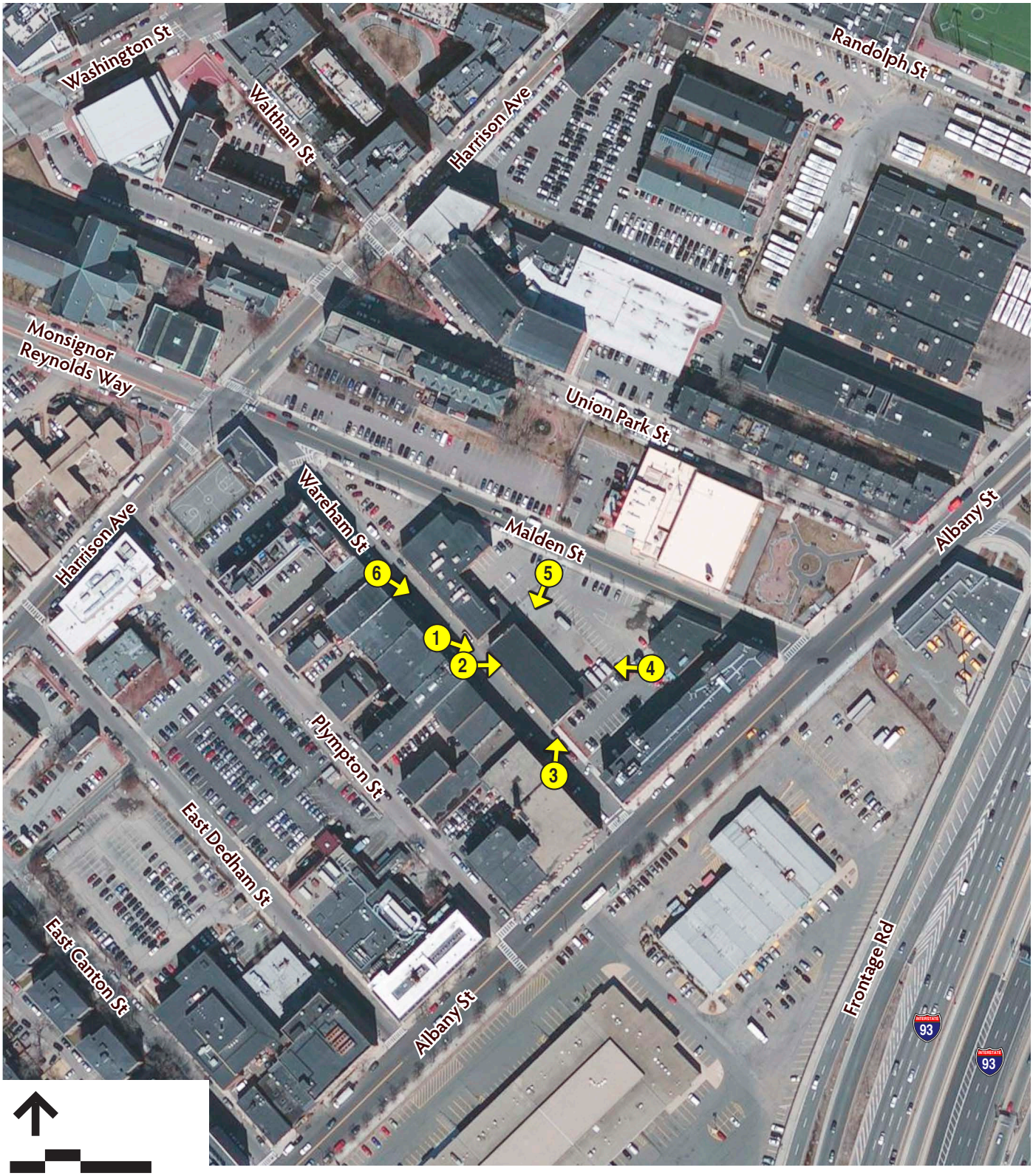
Has the building been planned and designed to accommodate future resiliency enhancements?

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 B
Historic Resources Photographs



Source: Arcmap Bing Aerial Datalayer, Boston, Massachusetts

Vanasse Hangen Brustlin, Inc.

Site Photos Location Map

Figure

1. New England Organ Co., 46 Wareham Street, Boston, MA. View of 46 Wareham, on left hand side of photo, Photographer facing SE, May 2014.

2. New England Organ Co., 46 Wareham Street, Boston, MA. View of west side and partial south side (front) of building, Photographer facing E, May 2014.

3. New England Organ Co., 46 Wareham Street, Boston, MA. View of partial south (front) and east side of building, Photographer facing NW, May 2014.

4. New England Organ Co., 46 Wareham Street, Boston, MA. View of east and partial rear (north) side of building, Photographer facing SW, May 2014.

5. New England Organ Co., 46 Wareham Street, Boston, MA. View of rear (north) and partial west elevations, Photographer facing SE, May 2014.

6. New England Organ Co., 46 Wareham Street, Boston, MA. View of Wareham Street, with 46 Wareham at left rear of photo, Photographer facing SE, May 2014.

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