178-197 Gardner Street, West Roxbury

Multi-Family Residential Development

PROJECT NOTIFICATION FORM

June 7, 2019

Submitted Pursuant to Article 80B of the Boston Zoning Code

SUBMITTED BY:

West Brighton Acquisitions, LLC
94 Grayfield Avenue
West Roxbury, MA 02132

SUBMITTED TO:

boston planning & development agency

Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

PREPARED BY:

MLF CONSULTING LLC

Mitchell L. Fischman ("MLF") Consulting LLC
41 Brush Hill Road
Newton, MA 02461

IN ASSOCIATON WITH:

Khalsa Design Inc.
McDermott Quility & Miller LLP
CK Strategies
VERDANT Landscape Architecture.
Howard Stein Hudson
Tech Environmental, Inc.
Soden Sustainability Consulting
CLEAResult
McPhail Associates, LLC
Green Seal Environmental, Inc.

DESIGN KHALSA

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28 STATE STREET, SUITE 802
BOSTON, MA 02109

30 ROWES WHARF, SUITE 600
Boston, MA 02110

June 7, 2019

Mr. Brian Golden, Director
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attn: Ms. Aisling Kerr, Project Manager

RE: Project Notification Form
Proposed Multi-Family Residential Development
178-197 Gardner Street, West Roxbury

Dear Director Golden:

On behalf of West Brighton Acquisitions, LLC (the "Proponent"), as developer of a real property assemblage at 178, 189 and 197 Gardner Street in West Roxbury comprising of approximately 1.4 acres of land (62,451 square feet) (the "Project Site"), we are pleased to submit this Project Notification Form ("PNF") for the Proponent's proposed multi-family residential development to the Boston Planning and Development Agency ("BPDA") in accordance with the Article 80B-2 Large Project Review requirements of the City of Boston Zoning Code (the "Code").

The development seeks to revitalize and convert non-descript industrial and residential property at this transitional location off of the VFW Parkway in West Roxbury, into a multi-family residential development of approximately 96,000 gross square feet of floor area, with a variety of townhouse home-ownership units and rental apartments, on-site parking and related improvements in landscaping, pedestrian, vehicular access and design (the "Proposed Project"). The overall residential program will include 18 three-bedroom townhouses for home-ownership with separate deck area/open space, garage and driveway parking (for 36 spaces) along with a new mid-rise apartment building consisting of 70 rental units, 70 on-site parking spaces, on-site amenities, patios, decks and landscaped open space. Investments in new sidewalk connectivity and public realm updates will also be further explored with the City, as part of the Proposed Project. The Project Site is also ideally situated within a short walk to the City's Millennium Park and adjacent Children's Happy Day School on Gardner Street

Consistent with the policy goals of Mayor Walsh's 2030 Housing Plan, the Proposed Project will also assist in addressing the shortage of both market-rate and affordable housing, while accommodating families with a portion of new home-ownership opportunities. In addition to its market-rate units, the Proposed Project will comply with the City's Inclusionary Development Policy for on-site affordable units.

The Project Site is located within the Community Commercial ("CC") subdistrict of the West Roxbury Neighborhood District (Article 56 of the Code), which requires a Conditional Use Permit for the proposed multi-family residential uses by the Boston Zoning Board of Appeal. The Proposed Project is presently designed to be in substantial conformity with the dimensional requirements of the Code.

In accordance with BPDA requirements, the public notice for the PNF submission appears in the June 7, 2019, edition of the *Boston Herald*.

The Proposed Project will exceed the 50,000 square foot size threshold of Article 80 for a project within a Boston neighborhood, and therefore requires several additional filings pursuant to Large Project Review regulations.

A Letter of Intent to File a Project Notification Form was filed with the BPDA on April 16, 2019 (attached hereto as **Appendix "A"**).

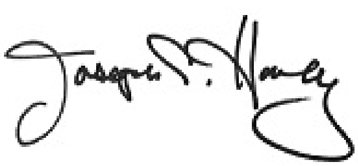
In support of the Article 80 Large Project Review process, the Proponent has conducted, and continues to undertake extensive community outreach with nearby residents, property owners, and abutters of the Project Site, including meetings and discussions with elected representatives and other officials including property owners along Gardner Street and Charles Park Road. The Proponent also presented the project to the West Roxbury Neighborhood Council's Zoning Committee at two (2) separate meetings, most recently on May 21, 2019.

On behalf of the entire project team, we would like to thank you and the BPDA staff assigned to the 178-197 Gardner Street Project, particularly Project Manager, Aisling Kerr, and reviewing BPDA Urban and Landscape Designers, Alexa Pinard, Michael Cannizzo, and Jill Zick, as well as the BPDA transportation planners for their invaluable assistance to date in helping the development team to shape the Proposed Project and in completing this comprehensive PNF filing.

We look forward to continuing the Large Project Review process and advancing the Proposed Project through public review with the cooperation of the BPDA, other City officials, members of the Impact Advisory Group, and the West Roxbury community.

In accordance with BPDA requirements, please find attached ten (10) copies of the PNF plus a CD containing the electronic PNF file to be uploaded to the BPDA's online portal for public review. Please also note that this correspondence and related submission constitutes a petition for action by the City, made in writing and required to be a matter of public record.

Very truly yours,



Partner - Joseph P. Hanley, Esq.
McDermott Quilty & Miller, LLP

PUBLIC NOTICE

The Boston Redevelopment Authority ("BRA"), d/b/a Boston Planning & Development Agency ("BPDA"), pursuant to Article 80A and Article 80B of the Boston Zoning Code ("Code"), hereby gives notice that West Brighton Acquisitions, LLC (the "Proponent") has submitted a Project Notification Form for Large Project Review ("PNF") on June 7, 2019, to the BPDA for a multi-family residential development at 178-197 Gardner Street in the West Roxbury neighborhood of Boston. The proposal is for the construction of 88 units in a combined multi-building residential development of approximately 96,000 gross square feet, including 18 townhouse-homeownership units and 70 rental-apartment units, on-site parking for up to 106 spaces, on-site bicycle storage rooms for approximately 88 bicycles and related landscape improvements, new pedestrian and vehicle access, and high-quality design (collectively, the "Proposed Project"). The combined project site includes approximately 1.4 acres (62,451 square feet) on four parcels of land on both sides of Gardner Street including two parcels along the Charles Park Road frontage (the "Project Site"). Approvals are requested of the BPDA pursuant to Article 80. In the required Scoping Determination for this PNF, the BPDA may waive further review pursuant to Section 80B-5.3(d), if, after reviewing public comments, the BPDA finds that such PNF adequately describes the Proposed Project's impacts. The PNF may be reviewed at the Office of the Secretary of the BPDA, Room 910, Boston City Hall, One City Hall Square, Boston, MA 02201, between 9:00 AM and 5:00 PM, Monday through Friday except legal holidays. A copy of the PNF has been placed on reserve and available for review at the West Roxbury Branch - Boston Public Library, 1961 Centre Street, West Roxbury, MA 02132 during scheduled business hours. Public comments on the PNF, including the comments of public agencies, should be submitted by email to: aisling.kerr@boston.gov or in writing to: Ms. Aisling Kerr, Project Manager, BPDA, One City Hall Square, Boston, MA 02201 by July 8, 2019, at the close of business.

BOSTON REDEVELOPMENT AUTHORITY
Teresa Polhemus, Executive Director/Secretary
June 7, 2019

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APPENDICES

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

West Brighton Acquisitions, LLC (the “Proponent”), which has secured development rights to the real estate property assemblage at 178, 189, and 197 Gardner Street, is submitting, this Project Notification Form (“PNF”) for a townhouse and multi-family development project in the West Roxbury neighborhood in accordance with the Article 80 requirements of the Boston Zoning Code (“Code”).

The project seeks to revitalize and convert approximately 1.4 acres of non-descript industrial and residential property at this transitional location off of the VFW Parkway into a multi-building residential development of approximately 96,000 gross square feet, with a variety of townhouse-homeownership and rental-apartment units, on-site parking and related landscape improvements, new pedestrian and vehicle access, and high quality design (the “Proposed Project”). The overall residential program will include 18 three-bedroom townhouses, each with its own deck area/open space, garage and driveway parking. In addition, a new mid-rise apartment building is proposed consisting of 70 units, 106 on-site parking spaces (including 18-tandem spaces in the townhouse units), on-site amenities, and patios, decks and landscaped open areas. Investments in new sidewalk connectivity and public realm updates will also be further explored with the City, as part of the Proposed Project.

The overall project site includes four parcels of land on both sides of Gardner Street with a combined land area of 62,451 square feet, including two adjacent parcels totaling 36,194 square feet along the Charles Park Road frontage (the “Project Site”). The Project Site abuts the former International House of Pancakes (IHOP) restaurant location, now Oak Row Apartments, which was developed with extensive public input and support by the Proponent’s principal, Peter Davos of West Roxbury. Please see **Figures 1-1** thru **1-7**.

The Project Site is located within the Community Commercial (“CC”) sub-district of the West Roxbury Neighborhood District (Article 56 of the Code), which requires a Conditional Use Permit for the proposed multi-family residential use by the Boston Zoning Board of Appeal.

A Letter of Intent to File a Project Form was filed with the Boston Redevelopment Authority for the proposed residential project on April 16, 2019 (See **Appendix A**).

The nearby neighborhood is a mix of office, industrial and retail uses and includes the City’s Millennium Park, West Roxbury High School playing fields, and adjacent Children’s Happy Day School. Nearby retail uses include a large Home Depot Store, a restaurant and a variety store. The Needham Branch MBTA commuter rail runs close by, with the nearest station in West Roxbury within a mile of the Project Site. The MBTA No. 36 bus route runs close to the Project site along Charles River Road, and provides connection between the Veterans Administration (VA) Hospital and Forest Hills Station via Belgrade Avenue and Centre Street.

178 & 189-197 Gardner Street

Figure 1-1. Project Locus
178 & 189-197 Gardner Street Multifamily Development

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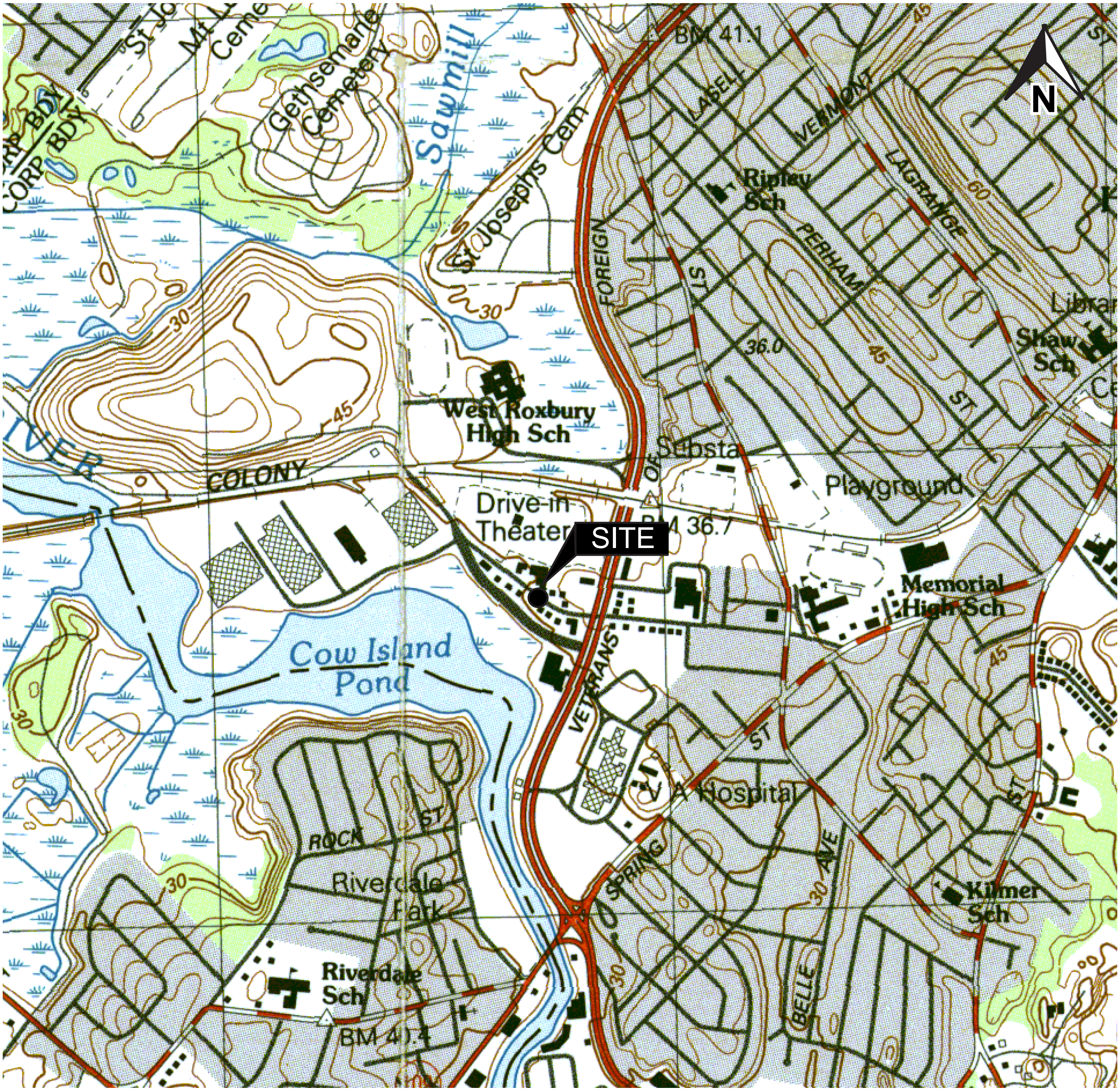
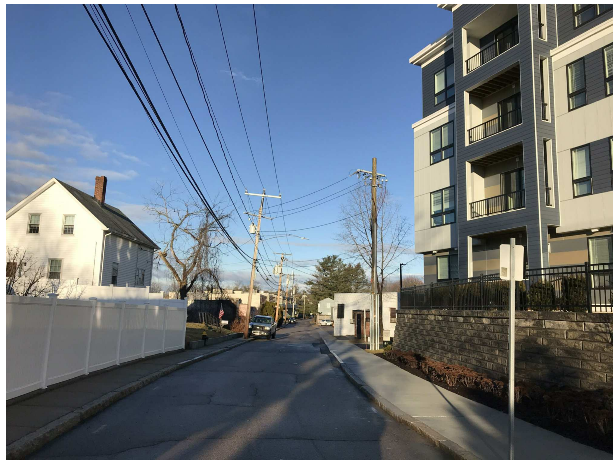


Figure 1-2. USGS Map
178 & 189-197 Gardner Street Multifamily Development



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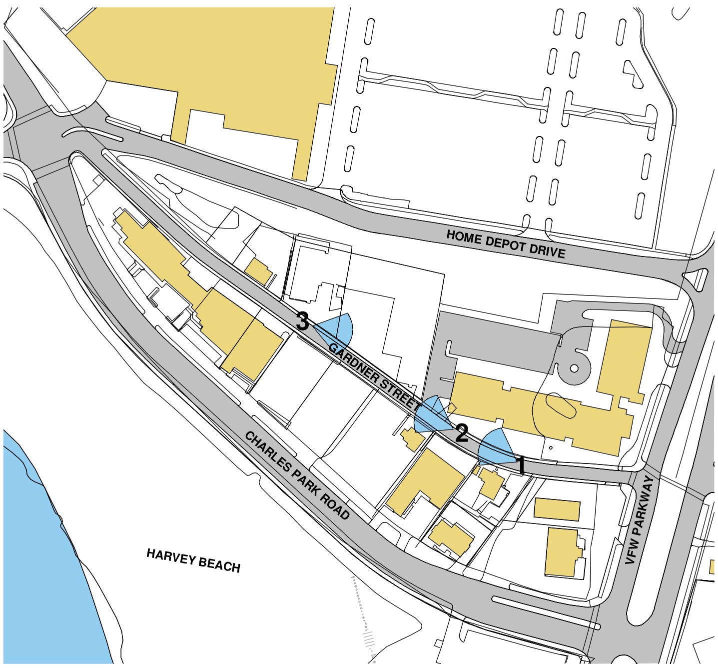

DESIGN KHALSA	Architect **KHALSA DESIGN INC** 17 Ivaloo Street, Suite 400, Somerville, MA 02143 Tel: 617-591-8682 www.TKGEAST.com COPYRIGHT KDI © 2019	**WEST BRIGHTON ACQUISITIONS LLC** **West Roxbury Residences** 178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132	EXISTING PHOTOS Project number **18111** Date **05/30/2019** Drawn by **WC** Checked by **JSK** **1-3** Scale **1" = 300'-0"**

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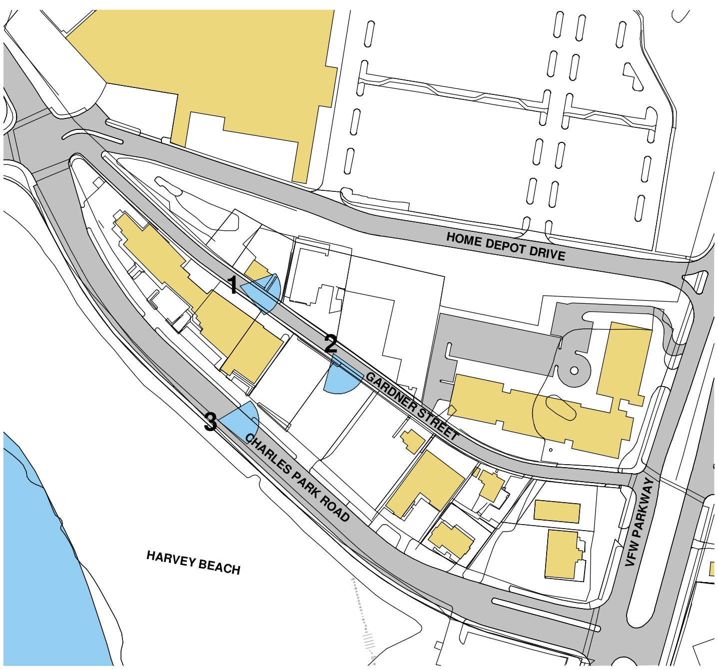

DESIGN KHALSA	**Architect** **KHALSA DESIGN INC** 17 Ivaloo Street, Suite 400, Somerville, MA 02143 Tel: 617-591-8682 www.TKGEAST.com COPYRIGHT KDI © 2019	**WEST BRIGHTON ACQUISITIONS LLC** **West Roxbury Residences** 178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132	EXISTING PHOTOS Project number **18111** Date **05/30/2019** Drawn by **Author** Checked by **Checker**	1-4 Scale **1" = 300'-0"**

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Figure 1-5. Existing Site Photos

Existing Home next to Surface Parking Lot Along Gardner Street

Existing House Adjacent to 189-197 Gardner Street

Figure 1-6. Existing Site Photos

Existing Onsite Building at 189-197 Gardner Street

View from Commercial Stores Across Gardner Street to Oak Row Apartments

Figure 1-7. Existing Site Photos

Children's Happy Day School Opposite on Charles Park Road

View of Oak Row Apartments from Across VFW Parkway

1.2 Detailed Project Description

1.2.1 Existing Conditions Plan

The overall project site includes four-parcels of land (178, 189, and 197 Gardner Street) on both sides of Gardner Street with a combined land area of 62,451 square feet, including two adjacent parcels totaling 36,194 square feet along the Charles Park Road frontage (the "Project Site"). The larger land area at 189 and 197 Gardner Street includes industrial properties recently utilized by a plastic manufacturer and construction contractor. The smaller parcels to the south at 178 Gardner Street include paved parking areas and no-descript residential structures (see **Figure 1-8**. Existing Conditions Plan).

1.2.2 Detailed Project Program

The Proposed Project includes approximately 96,000 gross square feet, with a variety of townhouse homeownership and rental apartment units, on-site parking and related landscape improvements, new pedestrian and vehicle access, and high-quality design (the "Proposed Project"). The overall residential program will include 18 three-bedroom townhouses for homeownership, each with its own deck area/open space, garage, and driveway parking for additional tandem spaces. In addition, a new mid-rise apartment building is proposed consisting of 70 rental units, 70 on-site garage and on-site parking spaces, and on-site amenities, patios, decks and landscaped open areas. See Approximate Project Dimensions in **Table 1-1** below.

Table 1-1. Approximate Project Dimensions of Proposed Project

Lot Area	**1.4 acres (62,451 sq, ft.)**
Gross Building Area (GSF)	**96,000 GSF**
Floor Area Ratio (F.A.R.)	**1.54 F.A.R.**
No. of Floors	**4- Floors**
Height*	**45-Feet**
No. of Residential Units • **Townhouses (Ownership)** • **Apartment (Rental)**	 **18-Units** **70-Units**
Parking Spaces (Garage)	**106-Spaces****

*Height from average front grade.

** Includes 18 tandem parking spaces in the townhouses behind each garage.

The breakdown of townhouse ownership units at 178 Gardner Street include 18 three-bedroom units. The 70 apartment rental units at 189-197 Gardner Street include 31 one-bedroom units, 20 one-bedroom + units, and 19 two-bedroom units, all totaling 89-bedrooms.

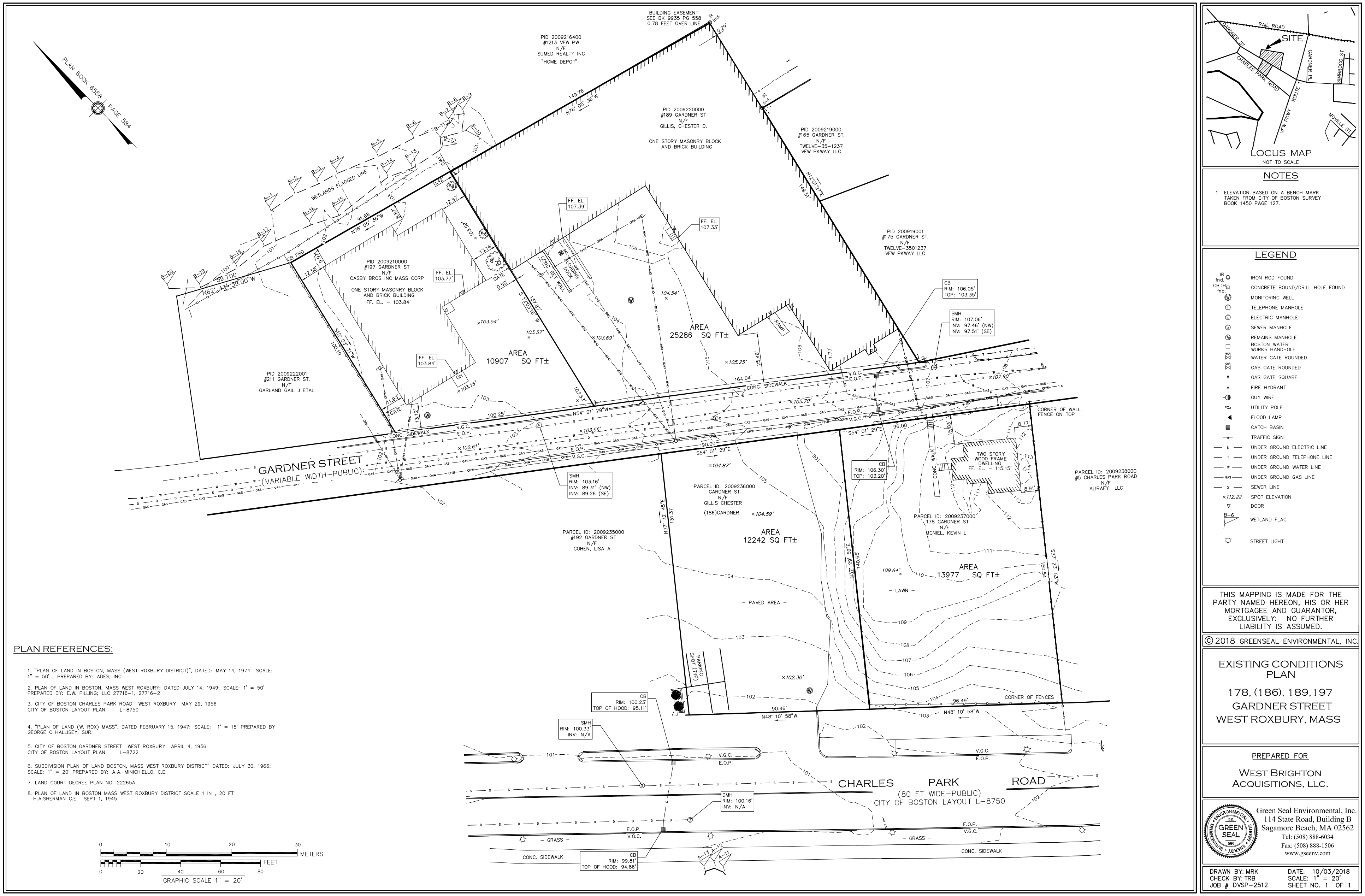

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Figure 1-8. Existing Conditions

The Site circulation plan is designed to create a safe and pleasant entry to the Proposed Project from Gardner Street and Charles Park Road. The rental apartments' garage will be accessed from Gardner Street and the townhouses will be accessed from Charles Park Road. Service vehicle access will be provided from Gardner Street and Charles Park Road for the respective buildings.

1.3 Summary of Project Impacts and Mitigation

1.3.1 Urban Design

Playing a pivotal role in the continued urban transition of West Roxbury, the design of the proposed apartment building & adjacent townhouse development requires an innovative approach which is also financially feasible. The apartment building is sited between the larger Oak Row Apartments to the east, Home Depot retail store to the north, and smaller scale office & residential buildings to the south & west. The townhouses are sited across from the apartment building with smaller office buildings to the west, a day-care center to the east, and open space to the south. While occupying a large area, the buildings are designed to mitigate their impact on the existing urban fabric of the neighborhood by negotiating different scales and urban configurations.

The design of the proposed development also addresses multiple scales, different edge conditions of the surrounding neighborhood context, different ways of reacting to public space, and accompanying material and façade articulations to reinforce the scales of these interactions. The apartment building at 189-197 Gardner Street has an "L" shaped massing to alleviate the impact that it has on the surrounding neighborhood fabric. The wider portion of the building abuts the Oak Row Apartments and acts as an edge between the larger scale development & smaller massing. The front façade along Gardner Street has a highly developed pedestrian-oriented terraced landscape & gathering area. The townhouse development at 178 Gardner Street has two separate massings fronting on Gardner Street and Charles Park Road, with vehicular circulation between the massings.

In order to maximize ceiling heights, large windows and open floor plans, the economic ramifications of various structural systems were assessed in close collaboration with contractors and consultant members of the project team. This effort resulted in a straightforward, wood frame construction over an underground parking structure of steel and concrete. The mechanical solution avoids ventilation louvers on the exterior facades and the plumbing stacks are aligned vertically thereby addressing the necessary economy and efficiency of this building type. The efficiency of the building design not only provides a larger budget for interesting architectural elements, but also sets aside funds for addressing sustainable design within the building.

1.3.2 Landscape Design

The landscape design for the apartment building establishes a large south-facing outdoor seating area for residents to gather and socialize. The landscape proposal includes flowering and distinctive upright growing trees that will complement and contrast with the horizontal characteristics of the building floors. The ground plane is proposed to include an assortment of perennials, ornamental grasses and groundcovers.

The landscape design for the townhouse development includes entry gardens with stoops for establishing a social environment along the street edge on Gardner Street, and similar outdoor covered porches for the south facing townhouses on Charles Park Road that will overlook the parkland on the edge of the Cow Island Pond (Charles River).

1.3.3 Sustainable Design

189-197 Gardner Street (Apartments)

The apartment project will demonstrate compliance with the LEED Certifiability Requirements. Further study over the coming weeks and months will determine, and confirm final credit achievement. At this stage in the project, the team is tracking 53 YES credits and 11 MAYBE credits. See **Figure 3-43** at the end of **Section 3.0.**

178 Gardner Street (Townhouses)

The Project will demonstrate compliance with the LEED Certifiability Requirements. Further study over the coming weeks and months will determine and confirm final credit achievement. At this stage in the project we are tracking 57 YES credits. See **Figures 3-44** and **3-45** at the end of **Section 3.0.**

1.3.4 Pedestrian Level Wind Conditions

The height of the proposed structure will not exceed 45 feet. Wind conditions are expected to be similar to that of the adjacent Oak Row apartment complex along Gardner Street which is 4-stories.

1.3.5 Shadow Impact Analysis

Khalsa Design Inc., the Project's architect, prepared a shadow study to assess the potential shadow impacts of the Project on the surrounding neighborhood contained in detail in **Section 4.1**. The 4-story rental apartments' shadow impacts are generally contained within the development site except during the early mornings at 9:00 AM when shadow extends along Gardner Street to the adjacent residence opposite the Pizzeria Uno HQ, and at later times during the day where the shadow will extend to the Home Depot access driveway area. New shadow for the townhouses will fall on the adjacent Pizzeria Uno parking lot during the same 9:00 AM time period and will be contained within the development footprint or fall on Gardner Street during later times during the day. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings. The proposed project height is within the allowable height maximum of 45-feet in the applicable West Roxbury zoning district.

1.3.6 Daylight Analysis

Although the Proposed Project would cause an increase in daylight obstruction when compared to the existing vacant site conditions, the Proposed Project was designed to be of a similar massing to existing Oak Row apartment complex along Gardner Street, and is within the allowable height maximum of 45-feet in the applicable West Roxbury zoning district.

1.3.7 Solar Glare

It is not expected that the Proposed Project will include the use of reflective glass or other reflective materials on the building facades that would result in adverse impacts from reflected solar glare. The extent of glass will be similar to the nearby Oak Row Apartments completed by the architect for this proposal.

1.3.8 Air Quality Analysis

Tech Environmental, Inc., the Project's air quality consultant, conducted analyses to evaluate the existing air quality in the Project area, predict the worst-case air quality impacts from the Project's enclosed parking garage, and evaluate the potential impacts of Project-generated traffic on the air quality at the most congested local intersections (See **Section 4.2**).

Recent representative air quality measurements from the Massachusetts Department of Environmental Protection (DEP) monitors reveal that the existing air quality in the Project area is in compliance with Massachusetts and National Ambient Air Quality Standards (NAAQS) for all of the criteria air pollutants.

The worst-case air quality impacts from the Project's parking garage will not have an adverse impact on air quality. The maximum one-hour and eight-hour ambient CO impacts from the parking garage, at all locations around the Project site, including background CO concentrations, are predicted to be safely in compliance with the NAAQS for CO.

A microscale air quality analysis was not performed for the Proposed Project due to the estimated Project trip generation having minimal impacts on the overall delays at the three intersections. Therefore, the motor vehicle traffic generated by the project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project. The air quality in the Project area will remain safely in compliance with the NAAQS for CO after the Project is built.

1.3.9 Noise Analysis

Tech Environmental, Inc., the Project's noise consultant, conducted a noise study to determine whether the operation of the proposed Project will comply with the Massachusetts DEP Noise Policy and City of Boston Noise Regulations (See **Section 4.3**).

This acoustical analysis involved five steps: (1) establishment of pre-construction ambient sound levels in the vicinity of the Site; (2) identification of potential major noise sources; (3) development of noise source terms based on manufacturer specifications (where available) and similar project designs; (4) conservative predictions of maximum sound level impacts at sensitive locations using industry standard acoustic methodology; and (5) determination of compliance with applicable City of Boston noise regulations, ordinances and guidelines and with the DEP Noise Policy.

Nighttime ambient baseline sound level (L_{90}) monitoring was conducted at four locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime L_{90} measured in the Project area was 43.6 dBA.

The potential significant sources of exterior sound from the Project have been identified as:

- Ninety-two (92) rooftop air conditioning units

The 178-197 Gardner Street project will not create a noise nuisance condition and will fully comply with the most stringent sound level limits set by the Massachusetts DEP Noise Policy and City of Boston Noise Regulations.

To minimize the sound level at nearby residences, the following noise mitigation specifications will be incorporated into the final engineering design of the Proposed Project, as necessary, to comply with the applicable sound level criteria:

- Specification of low-noise rooftop air conditioning units.

1.3.10 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 6.5**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will result in an increase in impervious area, but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1-inch over the site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

1.3.11 Solid and Hazardous Waste

Solid Waste

During the preparation of the Site, debris including asphalt, trash, and demolition debris will be removed from the Project Site. The Proponent will ensure that waste removal and disposal during construction and operation will be in conformance with the City and DEP's Regulations for Solid Waste.

In order to meet the requirements for the Boston Environmental Department and the LEED™ rating system, the Project will include space dedicated to the storage and collection of recyclables, including dedicated dumpsters at the loading area. The recycling program will meet or exceed the City's guidelines, and provide-areas for waste paper and newspaper, metal, glass, and plastics (21 through 27, co-mingled).

Geo-Environmental Considerations

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 12-feet below existing grade. It is estimated that construction for the below-grade level will generate about 4,000 cubic yards (cy) of excess fill and 10,000 cy of excess natural soil to be disposed or reused off-site.

Based on the results of the preliminary chemical testing performed on selected samples of the fill material at the site by McPhail Associates, LLC the fill and natural soil are anticipated to be Unregulated in accordance with the provisions of the Massachusetts Contingency Plan (310 CMR 40.0000). Additional information is presented in **Section 4.5.2.**

1.3.12 Geotechnical and Foundation Considerations

The project site contains four (4) separate parcels identified as the 178 Gardner Street, 189 Gardner Street, 197 Gardner Street, and Gardner Street (Parcel #2009236000). The properties identified as 189 and 197 Gardner Street consist of adjoining parcels located on the north side of Gardner Street, with 197 Gardner Street located along the west side of 189 Gardner Street. The parcels identified as 178 Gardner Street and Gardner Street (Parcel #2009236000) consist of adjoining parcels located on the south side of Gardner Street, with Gardner Street (Parcel #2009236000) located along the west side of the 178 Gardner Street.

The proposed redevelopment of the project site will consist of a multi-building residential development consisting of approximately eighteen (18) three-bedroom townhouse style buildings and a seventy (70) unit mid-rise apartment building. The lowest levels of the townhouse style building are currently proposed to be located at or slightly above the proposed finish grades. The lowest level of the mid-rise apartment building will be located one level below grade corresponding to about 9.5 feet below the proposed finish ground surface and will consist of a parking garage and mechanical space. See **Section 4.6** for additional information.

1.3.13 Construction Impacts Analysis

Section 4.7 describes impacts likely to result from the Proposed Project's construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager that will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant, McPhail Associates LLC, will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

Construction is expected to commence in the 2nd quarter 2020 and will require approximately 18 months to complete.

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Most construction activities will be accommodated within the current site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan to be filed with the Boston Transportation Department (BTD) in accordance with the City's transportation maintenance plan requirements. To minimize transportation impacts during the construction period, there will be limited construction worker parking on-site, carpooling will be encouraged, secure on-site spaces will be provided for workers' supplies and tools so they do not have to be brought to the site each day, and subsidies for MBTA passes will be considered. The Construction Management Plan to be executed with the City prior to commencement of construction will document all committed measures.

1.3.14 Wetlands/Flood Hazard Zone

The townhouse portion of the existing Project Site is within the 100-foot buffer of the nearby Cow Island Pond on the other side of Charles Park Road, a wetland resource area regulated by the Massachusetts Wetland Protection Act. Based on the Preliminary Flood Insurance Rate Maps (FIRM) for Suffolk County No. 25025C0068G, effective 09/25/09, the Project site is not located in a special flood hazard area, floodway area, or other flood area. The closest flood area is the Zone AE along the Cow Island Pond on the other side of Charles Park Road.

1.3.15 Historic Resources Component

According to files at the Massachusetts Historical Commission, there are no structures listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth on-site. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see **Section 5.0**).

1.3.16 Infrastructure Systems Component

An infrastructure system's analysis (**Section 6.0**) was completed by Howard Stein Hudson Associates ("HSH"), the Project's Civil Engineer. The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project. This section describes the existing sewer, water, and drainage systems surrounding the site and explains how these systems will service the development. This analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

1.3.17 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by HSH for the proposed Project in conformance with the BTD Transportation Access Plan Guidelines (2001). The study analyzes existing conditions within the Project study area, as well as conditions forecast to be in place under the seven-year planning horizon to 2026.

1.3.18 Response to Climate Change Questionnaire

Please see **Appendices E1** and **E2** for the Proponent's Response to the City of Boston's Climate Change Questionnaire.

1.3.19 Response to City of Boston Access Guidelines

Please see **Appendices F1** and **F2** for the Proponent's Response to the City of Boston's Accessibility Guidelines.

1.3.20 Response to BPDA Broadband Questionnaire

Please see **Appendix G** for the Proponent's Response to the BPDA Broadband Questionnaire.

1.3.21 Response to Boston Smart Utilities Checklist

Please see **Appendix H** for the Proponent's Response to the Boston Smart Utilities Checklist,

The proposed project is not required to file information under "Green Infrastructure" as the projects is not greater than 100,000 SF.

With regard to "Adoption of signal technology", based on expected low vehicle project traffic impact, we are not at this time expecting that new traffic signals will be stipulated as mitigation in the Transportation Access Plan Agreement (TAPA) by BTD. If so, the Proponent will detail its response to BTD in the TAPA.

With regard to "Smart Street Lights", the Project has as yet to retain a MEP to outline specifics requested by the guidelines.

2.0 GENERAL INFORMATION

2.1 Applicant Information

2.1.1 Project Proponent

The Project Proponent, West Brighton Acquisitions, LLC, includes principal Peter V. Davos and his family members. As a life-long West Roxbury resident, Mr. Davos is an experienced and respected local real estate developer and property manager. With over 60-years of experience, he is a third-generation builder, and he and his family have developed hundreds of units of quality residential housing in Boston, including the development of 80 units at the newly built Oak Row Apartments on the adjacent 1235 VFW Parkway property. They currently manage over 140,000 square feet of residential and commercial property in the Boston Metro area. As a community and neighborhood-minded developer committed to quality design and craftsmanship, two of Mr. Davos' recent real estate developments in the City earned him neighborhood praise and industry accolades, including the BRAGB Prism award for a 26-unit residential development in 2007 on Bigelow Street in Boston's Brighton neighborhood, and an additional BRAGB Prism award for the development of two single-family houses in Boston's West Roxbury neighborhood.

Project Name	178-197 Gardner Street, West Roxbury
Property Owner / Developer	**West Brighton Acquisitions, LLC** 94 Grayfield Avenue West Roxbury, MA 02132 Peter V. Davos DavosBoston@comcast.net Tel: 617-719-8668]
Article 80 Permitting Consultant	**Mitchell L. Fischman Consulting ("MLF Consulting") LLC** 41 Brush Hill Road Newton, MA 02461 Tel: 781-760-1726 Mitchell L. Fischman - Principal mitchfischman@gmail.com Yvette Niwa yvetteniwa.mlfconsulting@gmail.com

Legal Counsel / Outreach	**McDermott Quilty & Miller LLP** 28 State Street, Suite 802 Boston, MA 02109 Tel: 617-946-4600 Joseph Hanley, Esq. - Partner jhanley@mqmllp.com Nicholas J. Zozula, Esq. – Senior Associate nzozula@mqmllp.com
Public Strategy Support	**CK Strategies** 233 Haverhill Street No. Reading, MA 01864 Chris Keohan ckeohan@ckstrategies.com Cell: 617-892-2765
Architect	**Khalsa Design Inc.** 17 Ivaloo Street, Suite 400 Somerville, MA 02143 Jai Singh Khalsa jkhalsa@tkgeast.com Tel: 617-591-8682 ext. 201 William Chalfant wchalfant@tkgeast.com Tel: 617-591-8682 ext. 206 Evan Stellman estellman@tkgeast.com Tel: 617-591-8682 ext. 213
Landscape Architect	**VERDANT Landscape Architecture** 318 Harvard Avenue, Suite 25 Brookline, MA 02446 Tel: 617-735-1180 Blair Hines, Principal bh@verdantla.com Erin Fitch, Landscape Designer ef@verdantla.com

Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Brian J. Beisel, PTP bbeisel@hasassoc.com Michael White mwhite@hasassoc.com
Civil Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Rick Latini, P.E. rlatini@hshassoc.com James Downing, P.E. jdowning@hshassoc.com
Sustainability Consultants	**Soden Sustainability Consulting** 19 Richardson Street Winchester, MA 01890 Tel: 617-372-7857 Colleen Ryan Soden, LEED AP BD+C colleen@sodensustainability.com **CLEAResult** 50 Washington Street, Suite 3000 Westborough, MA 01581 Mike Schofield mike.schofield@clearesult.com Tel: 508-365-3205 x 1304
Noise and Air Consultant	**Tech Environmental, Inc.** Hobbs Brook Office Park 303 Wyman Street, Suite 295 Waltham, MA 02451 Marc C. Wallace mwallace@techenv.com Tel: 781-890-2220 x30

Geotechnical/ Environmental / 21E Engineer	**McPhail Associates, LLC** 2269 Massachusetts Avenue Cambridge, MA 02140 Harry Berlis HJB@mcphailgeo.com Tel: 617-868-1420
Surveyor	**Green Seal Environmental, Inc.** 114 State Road, Building B Sagamore Beach, MA 02652 www.gseenv.com Tel: 508-888-6034
Construction Commencement	2nd Quarter 2020
Construction Completion	4th Quarter 2021
Status of Project Design	Schematic

2.1.2 Legal Information

Legal Judgments or Actions Pending Concerning the Proposed Project

None.

History of Tax Arrears on Property Owned in Boston by the Applicant

There is no current or past history of tax arrears on property owned by the Proponent.

Nature and Extent of Any and All Public Easements

The Site is bounded by utility easements for sewer, electric, telephone and gas. Additionally, there are utilities that cross the Site.

2.2 Public Benefits

The Proposed Project will provide substantial public benefits to the City of Boston and the West Roxbury neighborhood in particular. The Proposed Project provides for:

- Creating 88 total units of much-needed residential housing, including 18 three-bedroom townhouses for *homeownership* at 178 Gardner Street between Gardner Street and Charles Park

Road, and 70 apartment *rental* units in a mid-rise building at 189-197 Gardner Street located between Gardner Street and Home Depot Drive (and directly behind the newly built Oak Row Apartments). In accordance with the City's Inclusionary Development Policy (IDP), 11 of these units will be designated affordable (along with an additional IDP contribution of 0.44 units);

- Introducing additional residents and homeowners who will provide support to the local community and utilize local businesses;
- Encouraging other alternative modes of transport such as the use of bikes and Zip Cars;
- Revitalize and convert approximately 1.4 acres of non-descript industrial and residential property at a transitional location with a variety of residential housing and related improvements in landscaping, pedestrian and vehicular access and design, while also improving environmental conditions on the existing site;
- Introducing street trees, widened sidewalks and other streetscape amenities to improve and enhance the pedestrian landscape and experience with investments in new connectivity and public realm updates to be further explored with the City;
- Establishing a premier example of sustainable construction and development;
- Creating additional construction jobs;
- Closing or significantly downsizing existing curb-cuts along Gardner Street and Charles Park Road; and
- Adding new annual property taxes for the City of Boston.

2.3 Regulatory Controls and Permits

2.3.1 Zoning Overview

The Project Site is located within the Route 1 Community Commercial (CC) sub-district of the West Roxbury Neighborhood District which is subject to Article 56 of the Code. As a result, the Proposed Project therefore requires a Conditional Use Permit for the proposed multi-family dwelling residential Use from the City of Boston Zoning Board of Appeal (ZBA). The Project Site is not within any overlay districts per the Zoning Code; however, the Site is subject to City Ordinance 7.4-11 and the Proposed Project requires Design Review by the Boston Parks and Recreation Department due to the Site's proximity to the Havey Beach Park and recreation area on the other side of Charles Park Road. The determination of off-street parking and loading for the Proposed Project will be reviewed by the BPDA as stipulated by Article 80 and Article 56, Section 56-39 of the Code pertaining to the West Roxbury Neighborhood District. The Proposed Project is presently designed in conformance with the dimensional requirements of the Code.

2.3.2 Boston Zoning Code – Use Requirements

The Proposed Project will include residential space and accessory uses thereto. The proposed Multi-Family dwelling residential Use is a Conditional Use within the Community Commercial

(CC) Neighborhood Business Subdistrict of the West Roxbury Neighborhood District. Additionally, any “accessory offices” to the residential use are Allowed Uses within the CC Subdistrict.

2.3.3 Boston Zoning Code – Dimensional Requirements

The Proposed Project will include approximately 96,000 gross square feet of floor area. As referenced above, the Proposed Project is located within the Route 1 Community Commercial (CC) Subdistrict of the West Roxbury Neighborhood District. The CC Subdistrict allows for a maximum building height of 45 feet, a rear yard minimum setback of 40 feet, and a Maximum Floor Area Ratio (FAR) of 2.0 pursuant to Article 56 -Table F of the Code. The Proposed Project’s building heights will not exceed the maximum allowed height of 45 feet, includes a rear yard setback of 49’1” for the 70 unit apartment building proposed at 189-197 Gardner Street and a rear yard setback of 42’2” for the 18 townhouses proposed at 178 Gardner Street, and a proposed FAR of 1.82 for the 70 unit apartment building proposed at 189-197 Gardner Street and a proposed FAR of 1.31 for the 18 townhouses proposed at 178 Gardner Street, which are in accordance with those dimensional requirements permitted by the Code. Note that, with regard to the 178 Gardner Street parcel which is a through lot fronting on both Gardner Street and Charles Park Road, Article 56-40 (9) of the Zoning Code is applicable because it is considered a “through lot” such that the Front Yard Setback requirements and not the Rear Yard Setback requirements, apply.

In addition, the CC Subdistrict requires no Minimum Lot Size, Minimum Lot Width, Minimum Lot Frontage, Minimum Front Yard (other than conformance with Section 56-36.1, Street Wall Continuity, which does not apply to a proposed project for a residential use, such as the Proposed Project), or Minimum Side Yard. The Proposed Project shall therefore comply with the dimensional regulations and requirements as set forth in Article 56 of the Code.

For a project that is subject to Article 80 Large Project Review, required off-street parking spaces and off-street loading facilities are expected to be determined as a part of the Large Project Review in accordance with the provisions of Article 80 of the Zoning Code. While the parking for the Proposed Project will be determined by Article 80 Large Project Review, the Proposed Project will provide a combination of 70 garage and surface parking spaces for the 70-unit apartment building proposed at 189-197 Gardner Street, and 36 garage and surface parking spaces for the townhouses proposed at 178 Gardner Street for a total of 106 parking spaces. Design elements of the Proposed Project will also be reviewed pursuant to Large Project Review.

Table 2-1. Route 1 Community Commercial (CC) Subdistrict - Dimensional Requirements

Dimensional Element	Community Commercial (CC) Subdistrict	189-197 Gardner Street Apartment Building (1)	178 Gardner Street Townhouses (1)	Zoning Relief Required ?
Minimum Lot Size	None	36,194 SF	26,257 SF	No
Max. Floor Area Ratio	2.0	1.82	1.30	No
Max. Building Height	45 feet	44 feet	32 feet	No
Min. Usable Open Space per DU	N/A	150 sf / DU	917 sf / DU	No
Min. Lot Width	None	241.44 feet	186 feet	No
Min. Lot Frontage	None	264.04 feet	186 feet	No
Min. Front Yard	None (*See Section 56-36.1, Street Wall Continuity)*	3’ 10”	11’3” to 14’3”	No
Min. Side Yard	None	10’ 7”	4’3.5” to 6’3”	No
Min. Rear Yard	40 feet	49’ 1”	N/A - None (4)	No
Min. Number of Parking and Loading Spaces	(3)	70 parking spaces; 0 loading spaces	36 parking spaces; 0 loading spaces	(3)

1. The Proposed Project dimensions described in this above table may change as the Proposed Project undergoes design review with the BRA.
2. Special yard requirements along Charles River: No part of a building or structure shall be located closer to the Charles River than the greater of: (a) forty (40) feet, measured from the top of the riverbank as defined by the Commonwealth of Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40, as amended) and regulations issued thereunder by the Commonwealth of Massachusetts and the City of Boston Conservation Commission; or (b) any setback distance required by an Order of Conditions issued by the City of Boston Conservation Commission.
3. Required off-street parking and loading spaces are determined through Art. 80’s BRA’s Large Project Review process.
4. Rear Yards of Through Lots. The Front Yard requirements of this Article, and not the Rear Yard requirements, shall apply to that part of a Rear Yard that is also a Street Line, except in the case of a Rear Yard that abuts a Street less than twenty (20) feet in width.

Table 2-2. Preliminary List of Permits or Other Approvals Which May be Sought

Agency Name	Permit or Action*
Federal or State Agencies	
U.S. Environmental Protection Agency	Notice of Intent for EPA Construction Activities General Discharge Permit with associated SWPPP, If Required
MA Department of Conservation and Recreation	Possible Sidewalk Repair Plan; Curb-Cut Permit; Street/Sidewalk Occupancy Permit; Permit for Street Opening, If Required
MA Department of Environmental Protection, Division of Water Pollution Control	Sewer Connection Self Certification
MA Department of Environmental Protection, Division of Air Quality Control	Fossil Fuel Permit, If Required; Notice of Asbestos Removal; Notice of Commencement of Demolition and Construction
Local Agencies	
Boston Planning and Development Agency	Article 80 Review, Design Review and Execution of Related Agreements; Section 80B-6 Certificate of Compliance; BPDA Board Authorization
Boston Parks Commission	Proposed Project within 100 feet of Park Subject to City Ordinance 7.4-11
Boston Conservation Commission	Potential Review of a Proposed Building within 100 feet of a Wetland (Cow Island Pond/Charles River)
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Department of Public Works Public Improvements Commission	Possible Sidewalk Repair Plan; Curb-Cut Permit; Street/Sidewalk Occupancy Permit; Permit for Street Opening; Discontinuances
Boston Fire Department	Permits for Demolition; Approval of Fire Safety Equipment
Boston Water and Sewer Commission	Approval for Sewer and Water and Connections; Construction Site Dewatering; and Storm Drainage

Boston Department of Inspectional Services	Building Permits; Certificates of Occupancy; Site Cleanliness Permit; Other Construction-Related Permits
Boston Zoning Board of Appeal	Conditional Use Permit for Multifamily Residential Use
Boston Landmarks Commission	Article 85 Demolition Delay Application for demolition of existing buildings on site

*This is a preliminary list based on project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits may be needed.

2.4 Public Review Process and Agency Coordination

In support of the required Article 80 Large Project Review process, the Proponent has conducted, and will continue to conduct, productive community outreach with neighbors and abutters of the Site, including meetings and discussions with the elected representatives and officials from the area, and with the residents and property owners of the adjacent Gardner Street and Charles Park Road neighborhoods.

Initial outreach to date has included an informal neighborhood meeting hosted by the Proponent on December 13, 2018, at a local restaurant near the Site, to present its preliminary plans and discuss public reviews required by the BRA for the Proposed Project, followed by initial project presentations to the Zoning Committee of the West Roxbury Neighborhood Council on January 15, 2019, and May 21, 2019, respectively.

The Proponent has also discussed the Proposed Project with representatives of the Boston Planning and Development Agency ("BPDA") prior to filing this Project Notification Form in order to identify issues/concerns as well as design requirements related to the Project.

In accordance with Article 80 requirements, an Impact Advisory Group ("IAG") has been formed to review the Proposed Project's filings, and BRA-sponsored neighborhood meetings will be scheduled to review the PNF and receive community comments on the Proposed Project during the PNF public review period.

The Proponent will continue to meet with public agencies, neighborhood representatives, local business organizations, abutting property owners, and other interested parties, and will follow the requirements of Article 80 pertaining to the public review process.

2.5 Development Impact Payment ("DIP") Status

Based on current schematic design plans, it is not anticipated that Development Impact Payments ("DIP"), in accordance with Article 80B-7 of the Code, will be required as the Proposed Project is expected to be below the 100,000 gsf threshold for non-residential uses where DIP is required.

3.0 URBAN DESIGN AND SUSTAINABILITY COMPONENT

3.1 Urban Design Overview

Playing a pivotal role in the continued urban transition of West Roxbury, the design of the proposed apartment building & adjacent townhouse development requires an innovative approach which is also financially feasible. The apartment building is sited between the larger Oak Row Apartments to the east, a Home Depot retail store to the north, and smaller scale office & residential buildings to the south & west. The townhouses are sited across from the apartment building with smaller office buildings to the west, a day care to the east, and open space to the south. While occupying such a vast area, the buildings are designed to mitigate their impact on the existing urban fabric of the neighborhood by negotiating different scales and urban configurations.

The design of these two developments addresses multiple scales, different edge conditions of the surrounding neighborhood context, different ways of reacting to public space, and accompanying material and façade articulations to reinforce the scales of these interactions. The apartment building at 189-197 Gardner Street has an “L” shaped massing to alleviate the impact that it has on the surrounding neighborhood fabric. The wider portion of the building abuts the Oak Row Apartments and acts as an edge between the larger scale development & smaller massing. The front façade along Gardner Street has a highly developed pedestrian-oriented terraced landscape & gathering area. The Townhouse Development at 178 Gardner Street has two separate massings fronting Gardner Street and Charles Park Road with vehicular circulation between the massings.

In order to maximize ceiling heights, large windows, and open floor plans, the economic ramifications of various structural systems were assessed in close collaboration with contractors and consultant members of the team. This effort resulted in a straightforward, wood frame construction over an underground parking structure of steel and concrete. The mechanical solution avoids ventilation louvers on the exterior facades and the plumbing stacks are aligned vertically addressing the necessary economy and efficiency of this building type. The efficiency of the building design not only provides a larger budget for interesting architectural elements, but also sets aside funds for addressing sustainable design within the building.

The Urban Design and Sustainability figures, including the two 2009 LEED Checklists, are included at the end of this section (**Figures 3-1** thru **3-45**).

3.2 Building Design

3.2.1 Apartments (189-197 Gardner Street)

The proposed 189-197 Gardner Street project is a four-story residential apartment style building incorporating a total of 70 units. In addition to the residences, the building includes a community room, fitness room, garage and surface vehicular parking, and a bicycle room along with a dog washing station. The Proponent has already made several presentations of the Project’s conceptual design to the neighborhood and BPDA as part of the refinements for its schematic design drawings. A ramp down to the rear surface parking & subterranean enclosed parking is the sole vehicular circulation, which occupies the easternmost portion of the site. The main entry of the building is accessed through a terraced garden with gathering areas for occupants to create a pleasant environment for guests and an attractive feature for pedestrians in the neighborhood.

The massing, rhythm of the bays, and materiality of the building responds to the adjacent Oak Row Apartments. The base of the building will consist of a similar horizontal material with the upper floors being clad with similar materials.

3.2.2 Townhouses (178 Gardner Street)

The townhouse development is designed to enhance the neighborhood scale from the streetscape. This is achieved by breaking up the body of the main massing into smaller vertical elements the replicate the rhythm of a smaller neighborhood streetscape. The rhythm is accentuated by varying roof heights, raised stoops with planter beds, two-story bay projections, and varying colors. Vehicular access to this project is provided via a driveway to Charles Park Road. This allows for the frontage along Gardner Street to be primarily occupied by yards, gardens, & stoops, which enhances the pedestrian experience.

The Proponent is committed to adopting materials that are consistent with the surrounding context.

3.3 Landscape Design

The Proposed Project's Landscape Design intends to achieve <u>five</u> goals:

3.3.1 Improve the Public Way

<u>Apartments (189-197 Gardner Street)</u>

- The project proposed to install curbing and construct a new 7-foot wide sidewalk along Gardner Street that replaces an existing 3-feet concrete sidewalk that is flush with the roadway and parking area within the site.

- Street trees, flowering and ornamental trees will be planted adjacent to the sidewalk on the project property that will shade the sidewalk and enhance the public way.

<u>Townhouses (178 Gardner Street)</u>

- The project expands the existing sidewalk along Gardner street from 4 feet to 7 feet. New street tree and flowering tree plantings are proposed within private property that will shade the sidewalk and enhance the streetscape.

- The design proposes to construct a new 7-foot public sidewalk setback 5-feet from the curb line along Charles Park Road to increase the area for street tree planting. Two rows of Oak trees are proposed on each side of the new sidewalk that will enhance the parkway character of Charles Park Road and provide a shaded sidewalk.

3.3.2 Create Inviting Residential Entrances

Apartments (189-197 Gardner Street)

- Seat walls enclose and define a garden court that provides an inviting entry for residents and visitors. Accent upright growing trees and flowering trees establish a strong landscape character to the landscape in front of the apartment building. The entry court also provides public seating along the edge of Gardner Street.

Townhouses (178 Gardner Street)

- The townhouses fronting on Gardner Street will each have picket fence enclosed dooryard gardens, including flowering vines, shrub and ground cover plantings along with flowering and shade trees.

- The townhouses facing Charles River Road are placed behind a retaining wall that creates a plinth that is planted with shrubs and flowering trees to provide separation between the small entry porches and the parkway landscape.

3.3.3 Enrich Residential Life

Apartments (189-197 Gardner Street)

- A large south-facing outdoor seating area establishes an area for residents to gather and socialize. Flowering and distinctive upright growing trees both complement and contrast with the horizontal characteristics of the building floors. The ground plane includes an assortment of perennials, ornamental grasses, and groundcovers.

Townhouses (178 Gardner Street)

- The entry gardens for the townhouses facing Gardner Street include covered stoops that establish a neighborly environment along the street. Similarly, the covered porches along Charles Park Road foster social interaction of residents.

- The townhouse buildings enclose an inner courtyard that is designed as a 'woonerf'-- a space designed for activity and social interaction– not just for maneuvering and parking cars. The arrangement of permeable pavements breaks up the larger space with stormwater planters acting to screen parked cars.

3.3.4 Provide Privacy Plantings and Screening

Apartments (189-197 Gardner Street)

- Columnar shade tree and evergreen tree plantings as well as fencing along the east property line mitigates impact of the apartment building on the adjacent apartment building.

Townhouses (178 Gardner Street)

- Evergreen screening plantings and fencing along both the east and west property lines mitigate the visual impact of the buildings on adjacent neighbors.

3.3.5 Incorporate Sustainable Design Elements in the Landscape

Apartments & Townhouses (189-197 & 178 Gardner Street)

- In coordination with the project civil engineer, Howard Stein Hudson, the project incorporates both permeable pavements and stormwater planters that mitigate the impact of stormwater on the environment. Native tree, shrub, and ground covering plantings are used throughout the project. The plant list emphasize species that are drought-tolerant and able to prosper in an urban setting.

  The plant list also utilizes flowering species that support pollinating insects and provide fruit and seeds for birds.

- In limited locations, non-native showy ornamental varieties have been selected that are not invasive to add colorful accents where needed.

3.4 Sustainable Design/Energy Conservation

The project is comprised of three separate buildings. The 189-197 Gardner Street Apartment Building is approximately 81,844 SF. There are also two townhouse buildings that are located across the street are 178 Gardner Street. These are 40,096 SF and 32,394 SF. These buildings are also under 4 stories and must pursue LEED Homes certification. Please see the narratives for the apartments building and townhouses below.

3.4.1 Sustainability/Green Building Design Approach: 189-197 Gardner St. Apartments

To meet the requirements of Article 37, the following section describes how the Project complies with the LEED Building Design & Construction v4 criteria.

The Project will demonstrate compliance with the LEED Certifiably Requirements. Further study over the coming weeks and months will determine and confirm final credit achievement. At this stage in the project we are tracking 53 YES credits and 11 Maybe credits. See **Figure 3-43** at the end of this section.

Overview

Sustainability informs every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The Project embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure while access to public transit will reduce dependence on single-occupancy vehicle trips and minimize transportation impacts.

The LEED v4 for Building Design and Construction (BD&C) rating system tracks the sustainable features of a Project by achieving points in following categories: Integrative Process; Location & Transportation; Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

Integrative Process

The Proponent and Project team are committed to an integrated design approach using early modeling and extensive design team coordination to achieve synergies across disciplines and building systems.

Location and Transportation

The Location and Transportation credit category encourages development on previously developed land, minimizing a building's impact on ecosystems and waterways, regionally appropriate landscaping, and smart transportation choice.

The Project site has been previously developed, meeting the criteria for the sensitive land protection credit. The Project site is also located on a brownfield where soil or groundwater contamination has been identified, and where the local, state, or national authority requires its remediation. The Project team will perform remediation to the satisfaction of that authority.

The Project site area exceeds the density requirements of 22,000 SF/acre and is in a neighborhood with several amenities within 0.5 miles of the Project site. The Project is providing bicycle facilities and showers for the occupants of the building.

The parking is reduced by more than 40% earning the Reduced Parking Footprint Credit. The project is also designed to comply with the Green Vehicles credit.

Sustainable Sites

The development of sustainable sites is at the core of sustainable design. Sustainable Site design provides quality open space with active landscape elements that can both mitigate stormwater and provide shade and thermal comfort for the building occupants.

The Project will evaluate Low Impact Development (LID) Strategies to promote infiltration for quality stormwater management. The Project will attempt to meet the 80th percentile of rainfall retained on site for the Rainwater Management credit.

The building roof and all hardscape material will comply with the SRI standards set forth by LEED and achieve both Heat Island credits. All exterior lighting fixtures will comply with the Light Pollution Reduction credit, but we will confirm this in the next submission.

As required by LEED, the Project will create and implement an erosion and sedimentation control plan for all construction activities associated with the Project. The plan will conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.

The Project is developing the site assessment credit that will demonstrate the relationships between the Project site features and topics, Topography, Hydrology, Climate, Vegetation, Soils, Human use.

Water Efficiency

Buildings are major users of our potable water supply and conservation of water preserves a natural re-source while reducing the amount of energy and chemicals used for sewage treatment. The goal of the Water Efficiency credit category is to encourage smarter use of water, both inside and outside.

Water reduction is typically achieved through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside. To satisfy the requirements of the Indoor Water Use Reduction Prerequisite and credit, the Project will incorporate water conservation strategies that include low-flow plumbing fixtures for water closets and faucets. To satisfy the requirements of the Outdoor Water Use Reduction Prerequisite and credit, the landscape will be designed to reduce potable water use by at least 50% and the design will only have plant material that is native and adaptive.

The Project is targeting significant indoor water use reduction from the baseline. All newly installed toilets, lavatory faucets, kitchen sinks and showerheads that are eligible for labeling will be low-flow and have the Water Sense label.

The Project will also install permanent water meters that measure the total potable water use for the building and associated grounds in addition to water meters for two or more of the following water sub-systems, as applicable to the project: irrigation, indoor plumbing fixtures and fittings, domestic hot water and the boiler for additional metering.

Metering data will be compiled into monthly and annual summaries, and the resulting whole-project water usage data will be shared with USGBC.

Energy & Atmosphere

According to the U.S. Department of Energy, buildings use 39 percent of the energy and 74 percent of the electricity produced each year in the United States. The Energy and Atmosphere credit category encourages a wide variety of energy strategies: commissioning; energy use monitoring; efficient design and construction; efficient appliances, systems and lighting; the use of renewable and clean sources of energy, generated on-site or off-site; and other innovative practices.

Fundamental Commissioning and Enhanced Commissioning will be pursued for the Project. Envelope Commissioning will also be evaluated as an alternative.

A whole-building energy simulation was performed for the Project. This is included in **Appendix E-1.** Points were calculating using EA pilot credit 95 – Alternative Energy Performance Metric, the average of the energy cost and carbon emissions savings is 20.8%, resulting in 8 LEED points.

The Project team will continue to analyze efficiency measures during the design process and account for the results in design decision making. The team will use energy simulation of efficiency opportunities and past energy simulation analyses for similar buildings. The Project will also prove compliance with the Stretch Code, which requires a minimum of 10 percent improvement over ASHRAE Standard 90.1–2013.

The Project will evaluate installing new building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc.).

The Project will also evaluate incorporating clean/renewable energy production. A solar study will be provided in the coming weeks.

As required by LEED, the Project will not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems. The Project will target the use of refrigerants used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change.

The Proponent is evaluating engaging in a contract for 50 percent and perhaps 100 percent of the Project's energy from green power, carbon offsets, or renewable energy certificates (RECs).

Materials & Resources

During both construction and operations, buildings generate tremendous waste and use many materials and resources. The Materials & Resources credit category encourages the selection of sustainable materials, including those that are harvested and manufactured locally, contain high-recycled content, and are rapidly renewable. It also promotes the reduction of waste through building and material reuse, construction waste management, and ongoing recycling programs.

As required by LEED, the Project will provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials will include mixed paper, corrugated cardboard, glass, plastics, and metals. The Project will also take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

To comply with both the prerequisite and credit requirements related to construction waste management, the Project will develop and implement a construction and demolition waste management plan that will identifying at least five materials (both structural and nonstructural) targeted for diversion and approximate a percentage of the overall Project waste that these materials represent. The Project will divert a minimum of 75 percent of the total construction and demolition material; diverted materials will include at least four material streams.

Careful material selection will be performed for the Project. The Project will evaluate products that have Environmental Product Declarations (EPDs), Sourcing of Raw Materials and Material Ingredients disclosures to meet the LEED Criteria.

Indoor Environmental Quality

The U.S. Environmental Protection Agency estimates that Americans spend about 90 percent of their day in-doors, where the air quality can be significantly worse than outside. The Indoor Environmental Quality credit category promotes strategies that can improve indoor air through low emitting materials selection and increased ventilation. It also promotes access to natural daylight and views.

As required by LEED, the Project will meet the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata), or a local equivalent, whichever is more stringent. Also, during building operations the Proponent will institute a No Smoking Policy to prohibit the use of all tobacco products inside the building and within 25 feet of the building entrance, air intakes, and operable windows.

The Project will provide entryway systems, interior cross-contamination prevention, and filtration. The Project will develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building, meeting or exceeding all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3. The Project will follow strict IAQ guidelines and protect absorptive materials stored on-site from moisture damage. The Project also will pursue either a building flush out or air quality testing.

The Project will meet the thermal comfort criteria both for controllability and the ASHRAE 55 standards

Daylight is being evaluated for energy efficiency opportunities and benefits for the occupants. The Project will also evaluate the ability to provide views with a direct line of sight to the outdoors for at least 75 percent of all regularly occupied floor area. These credits are not included in our YES column until further study is completed.

Innovation and Design Process

The Innovation in Design and Innovation in Operations credit categories provide additional points for projects that use new and innovative technologies, achieve performance well beyond what is required by LEED credits, or utilize green building strategies that are not specifically addressed elsewhere in LEED. This credit category also rewards projects for including a LEED Accredited Professional on the team to ensure a holistic, integrated approach to design, construction, operations and maintenance. The following five credits are being pursued and/or evaluated for the project:

- Innovation in Design- Exemplary Performance-Heat Island
- Innovation in Design: Education & Outreach
- Innovation in Design: Green Housekeeping & Integrated Pest Management
- Innovation in Design: Thermal Comfort Survey
- Innovation in Design: Hardscape Maintenance and Sustainable Purchasing
- Innovation in Design: LEED Accredited Professional

Regional Priority

The Project anticipates achieving the following regional priority credits.

- Regional Priority: Indoor Water Use Reduction (yes)
- Regional Priority: High Priority Site (yes)
- Regional Priority: Optimize Energy Performance (yes)
- Regional Priority: Renewable Energy Production (maybe)

3.4.2 *LEED HOMES - Townhouses 178 Gardner Street*

Sustainability/Green Building Design Approach

To meet the requirements of Article 37, the following section describes how the Project complies with the LEED Building Design & Construction v4 Homes and Multifamily Low-rise criteria.

The Project will demonstrate compliance with the LEED Certifiably Requirements. Further study over the coming weeks and months will determine and confirm final credit achievement. At this stage in the project we are tracking 57 YES credits. See **Figures 3-44** and **3-45** at end of this section.

Location and Transportation

The townhouse development will be located at 178 Gardner Street in West Roxbury. It is located near the Charles River, but the proposed site is outside of the FEMA designated Flood Zone. The project will earn credit for Site Selection because it is an Infill Development on a Previously Developed site. The project also receives credit for Access to Open Space for its location, within a ½-mi walking distance of Havey Beach and Millennium Park. The project also satisfies the LEED threshold for maximum credit on Compact Development, with 18 townhouses on 0.53 acres produces a density rate of 34 dwelling units per acre. Maximum credit for proximity to Community Resources will also be achieved, as well as 1 point for Access to Transit. The project is located near bus stops serving the 36 & 52 routes.

Sustainable Sites

The project team for Gardner Street will develop an Erosion and Sedimentation Control plan to meet the LEED prerequisite for Construction Activity Pollution Prevention and will develop a landscape plan and plant list that contains no invasive plants, as recognized by the Massachusetts Invasive Plant Advisory Group. The project will earn credit in this category for Rainwater Management by infiltrating stormwater on site. It will also implement measures to satisfy the Non-Toxic Pest Control requirements, including solid concrete foundations, maintaining a 6” space between grade and non-masonry siding, sealing all joints and penetrations, and discharging rainwater and condensate at least 24” from the house.

Water Efficiency

The building will either be equipped with a water meter for each unit. The project team is committed to water conservation. Following the Prescriptive Path, 6 out of 10 possible points are expected to be achieved. Reductions in Indoor Water Use will be achieved through the installation of low-flow, Water Sense labeled bathroom fixtures (0.5 gpm lavatory faucets, 1.5 gpm showerheads) and Energy Star qualified washing machines. This project will seek to limit turf grass to less than 60% of the landscaped area and specify native or adapted plants for at least 25% of landscaped area, in order to reduce Outdoor Water Use.

Energy and Atmosphere

The townhouse units will satisfy LEED Minimum Energy Performance requirements by meeting the Energy Star Homes standards. Each unit will be individually metered for both gas and electric and homeowners will be provided materials educating them about their systems and their green features and benefits. The project will earn 22.5 points under Annual Energy Use by meeting the MA Stretch Code required HERS Index 55 or below. Additional points are awarded through the LEED Home Size Adjustment. The individual responsible for HVAC will be credentialed by the Energy Star program.

Materials and Resources

In order to comply with LEED prerequisites in this category, this project will specify and enforce that any tropical hardwoods used in the building are FSC-certified. The construction team will comply with the Water Management System builder requirements, and the Green Rater will provide verification for an additional point. Another half point will be awarded for using locally sourced aggregate in all concrete.

Indoor Environmental Quality

The project is designed to meet all ASHRAE 62.2 requirements. Units will include both continuous whole house ventilation and local exhaust systems at kitchens and baths ducted to outdoors. The project will only specify sealed combustion equipment and will seal all penetrations to the garage to minimize pollutants in order to promote healthy Indoor Air Quality. Appropriate MERV-rated filters will be used throughout the building. Units will be compartmentalized to prevent migration of pests and odors between apartments. Credit in this category will be earned by providing Enhanced Ventilation for both whole house and local exhaust systems. Space conditioning systems will feature multiple air handlers to improve balancing of distribution. The townhouses will not include fireplaces in the units. Paints and sealants will be low-VOC and comply with CA Section 01350 requirements.

Innovation

The Gardner St Residences will earn Exemplary Performance credit in the Location & Transportation – Community Resources category, as a result of having 20+ community resources within a ½-mile walking distance.

Regional Priority

Regional Priority credit is awarded for earning at least 20 points under the Annual Energy Use credit, as well as in the Nontoxic Pest Control credit.

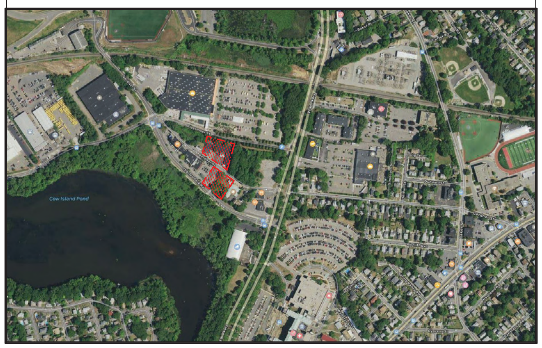
3.5 Urban Design Drawings

Urban design drawings and renderings depicting the Proposed Project and the LEED 2009 Checklists include:

Sheet List

Sheet Number	Sheet Name	Date
3-1	Cover Sheet	05/30/2019
3-2	Project Locus Plan	05/30/2019
3-3	Existing Site Photos	05/30/2019
3-4	Locus Map	05/30/2019
3-5	Proposed Development Site Plan	05/30/2019
3-6	189-197 Gardner Street Site Plan	05/30/2019
3-7	178 Gardner Street Site Plan	05/30/2019
3-8	Proposed Development Aerial View	05/30/2019
3-9	Proposed Development Aerial View	05/30/2019
3-10	Proposed Development Aerial View	05/30/2019
3-11	Birds Eye View from Southwest	05/30/2019
3-12	189 Gardner St Perspective From SW Corner	05/30/2019
3-13	View Up Gardner St from SE Corner	05/30/2019
3-14	189 Gardner St Perspective from NE Corner	05/30/2019
3-15	178 Gardner St Exterior Perspectives	05/30/2019
3-16	189-197 Gardner Street Landscape Plan	05/30/2019
3-17	189-197 Gardner Street Planting Plan	05/30/2019
3-18	178 Gardner Street Landscape Plan	05/30/2019
3-19	178 Gardner Street Planting Plan	05/30/2019
3-20	Overall Project Landscape Plan	05/30/2019
3-21	Landscape Cross Sections	05/30/2019
3-22	Landscape Cross Sections	05/30/2019
3-23	189-197 Gardner Street-Garage Level	05/30/2019
3-24	189-197 Gardner Street-Ground Level Plan	05/30/2019
3-25	189-197 Gardner Street-Second Floor Plan	05/30/2019
3-26	189-197 Gardner Street-Third Floor Plan	05/30/2019
3-27	189-197 Gardner Street-Fourth Floor Plan	05/30/2019
3-28	189-197 Gardner Street-Roof Floor Plan	05/30/2019
3-29	189-197 Gardner Street-Exterior Elevations	05/30/2019
3-30	189-197 Gardner Street-Exterior Elevations	05/30/2019
3-31	178 Gardner Street-Garage Level Plan	05/30/2019
3-32	178 Gardner Street-First Floor Plan	05/30/2019
3-33	178 Gardner Street-Second Floor Plan	05/30/2019
3-34	178 Gardner Street-Third Floor Plan	05/30/2019
3-35	178 Gardner Street-Roof Plan	05/30/2019
3-36	178 Gardner Street-Exterior Elevations	05/30/2019
3-37	178 Gardner Street-Exterior Elevations	05/30/2019
3-38	178 Gardner Street-Exterior Elevations	05/30/2019
3-39	189-197 Gardner Street-Gross Area Plan	05/30/2019
3-40	189-197 Gardner Street-Rentable Area Plan	05/30/2019
3-41	178 Gardner Street-Gross Area Plan	05/30/2019
3-42	178 Gardner Street-Rentable Area Plan	05/30/2019

PROJECT LOCUS



PROJECT: RIVERS EDGE APARTMENTS

PNF SUBMISSION SET: 05/30/2019

PROJECT ADDRESS:
178, 189-197 GARDNER STREET
WEST ROXBURY, MA 02132

OWNER
WEST BRIGHTON ACQUISITIONS, LLC
94 GRAYFIELD AVENUE
WEST ROXBURY, MA 02132
T: 617-323-0964

ARCHITECT
KHALSA DESIGN INC.
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CIVIL ENGINEER
HOWARD STEIN HUDSON
11 BEACON STREET, SUITE 1010
BOSTON, MA 02108
T: 617-482-7080

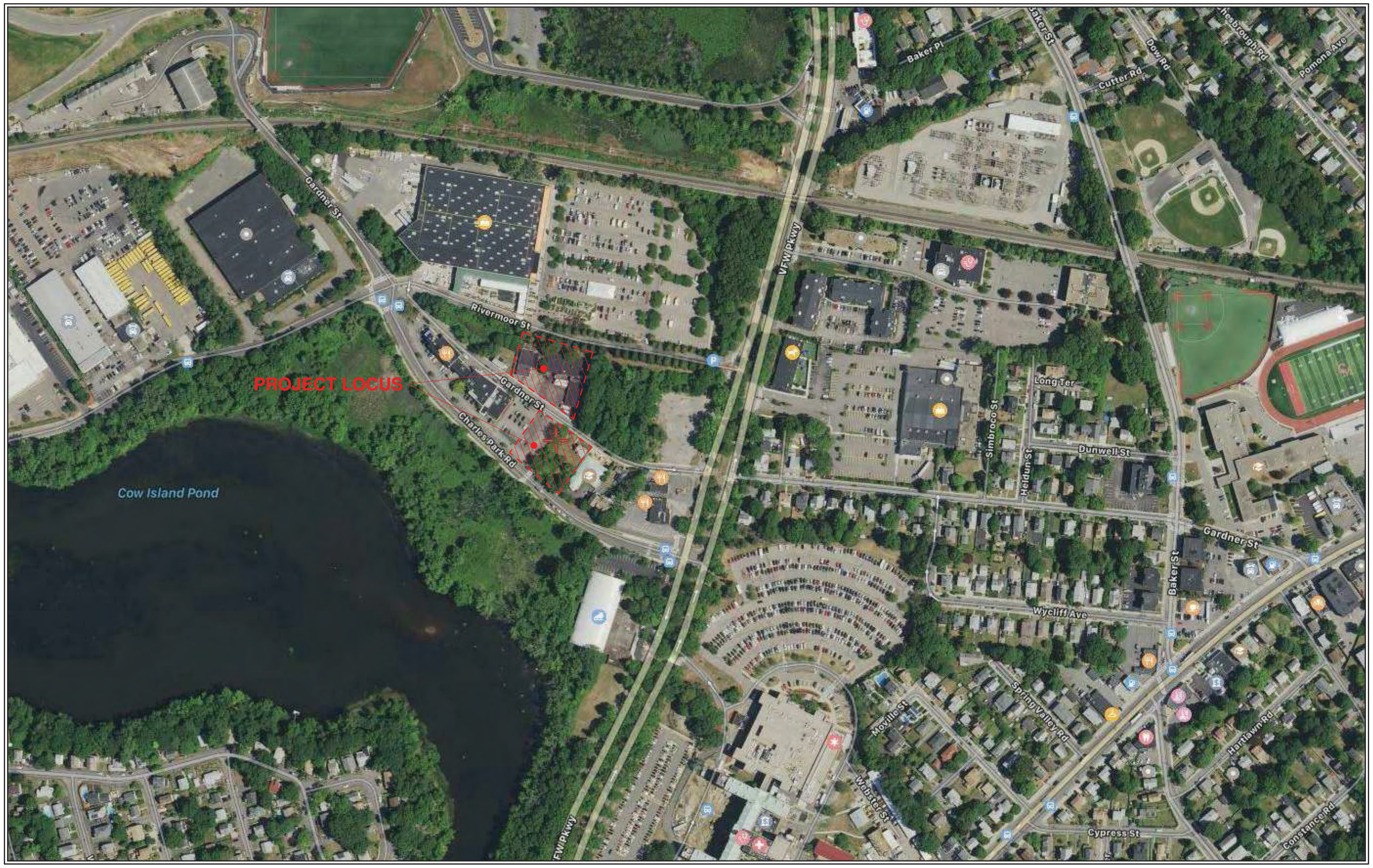
LANDSCAPE ARCHITECT
VERDANT LANDSCAPE ARCHITECTURE
318 HARVARD STREET, SUITE 25
BROOKLINE, MA 02446
T: 617-735-1180

SUSTAINABILITY
SODEN SUSTAINABILITY CONSULTING
19 RICHARDSON STREET
WINCHESTER, MA 01890
T: 617-372-7857

PERMITTING
MITCHEL L. FISCHMAN CONSULTING LLC
41 BRUSH HILL ROAD
NEWTON, MA 02461
T: 781-760-1726

GEOTECHNICAL/ ENVIRONMENTAL
MCPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
T: 617-868-1420

LEGAL
MCDERMOTT QUILTY & MILLER LLP
28 STATE STREET, SUITE 802
BOSTON, MA 02109
T: 617-946-4600



178, 189-197 GARDNER STREET AND CHARLES PARK ROAD, WEST ROXBURY, MA

FIGURE 1. PROJECT LOCUS- 178, 189-197 GARDNER STREET AND CHARLES PARK ROAD

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Project Locus Plan

Project number	18111
Date	05/30/2019
Drawn by	WC
Checked by	JSK

3-2

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EXISTING AERIAL VIEW

GARDNER STREET VIEW

GARDNER STREET VIEW

EXISTING MANUFACTURING BUILDING- GARDNER ST

EXISTING MANUFACTURING BUILDING- GARDNER ST

GARDNER STREET VIEW

GARDNER STREET VIEW LOOKING TOWARDS CHARLES PARK ROAD

CHARLES PARK ROAD VIEW

CHARLES PARK ROAD VIEW

DESIGN KHALSA

KHALSA DESIGN INC.

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Existing Site Photos

Project number	18111	3-3
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Locus Map

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker

3-4

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Proposed Development Site Plan

Project number	18111	3-5
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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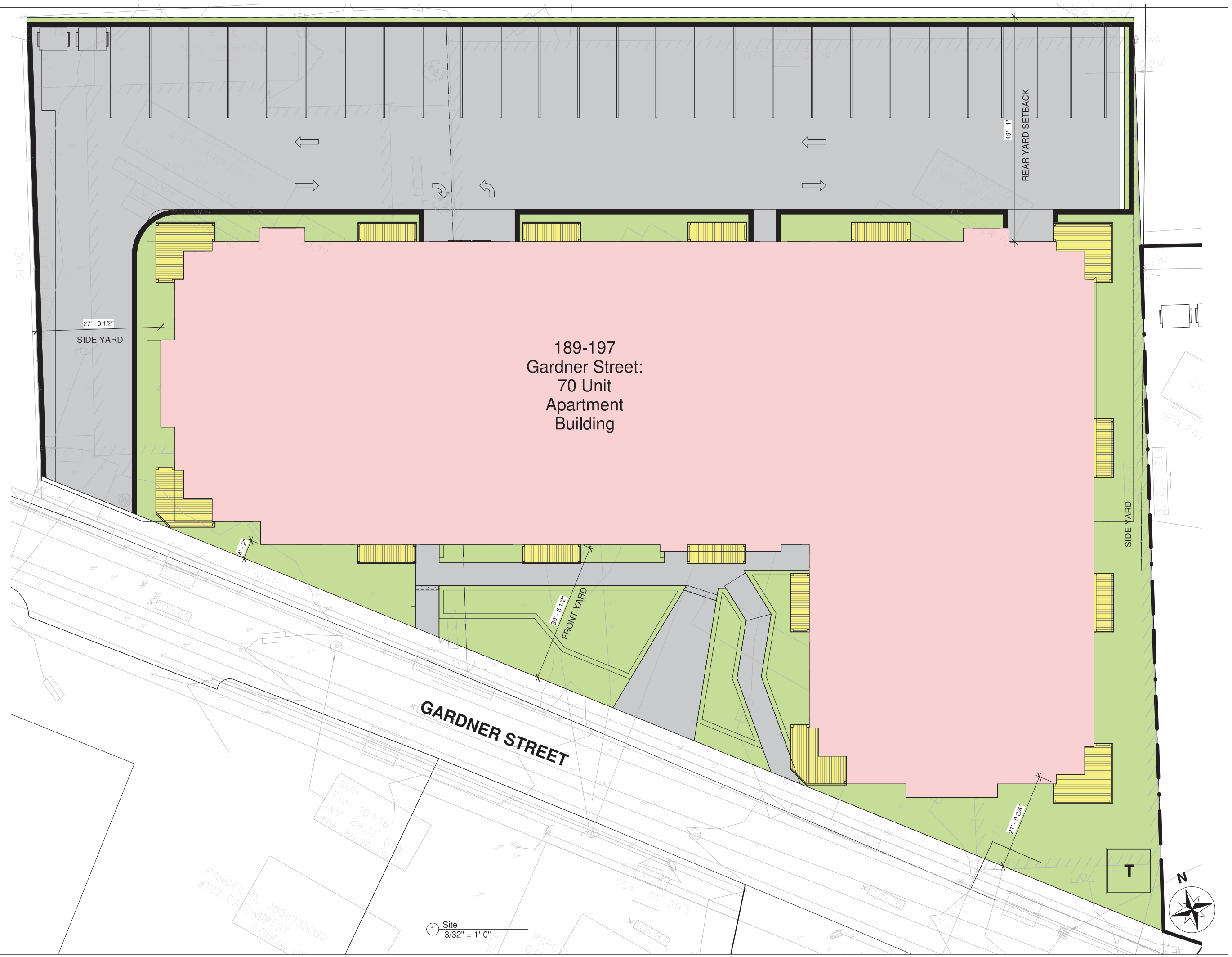

ZONING ANALYSIS

189-197 GARDNER STREET - CC DISTRICT

LOT SIZE: 36,194 SF
ALLOWABLE FAR IN CC DISTRICT: 2.0 (72,388 SF) PROPOSED: (1.82) (65,912 SF)

MAX HEIGHT: 4 STORIES / 45'-0"

PROPOSED 70 DWELLING UNITS

SETBACK REQUIREMENTS:

FRONT: NONE	PROPOSED: 4'-2" (L)	30'-5 1/4" (M)	3'-10" (R)
SIDE: NONE	PROPOSED: 26'-11-1/2" (L)	10'-7" (R)	
REAR: 40'-0"	PROPOSED: 49'-1"		

PARKING REQUIREMENTS:
1.5 PARKING SPACES / DWELLING UNIT

PROPOSED PROJECT HAS 70 PARKING SPACES
44 GARAGED SPACES / 26 SPACES AT GRADE

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street Site Plan

Project number	18111	3-6
Date	05/30/2019	
Drawn by	WC	
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ZONING ANALYSIS

178 GARDNER STREET - CC DISTRICT

LOT SIZE: 26,257 SF (COMBINED)
ALLOWABLE FAR IN CC DISTRICT: 2.0 (52,514 SF) PROPOSED: 1.3 (34,395 SF)

MAX HEIGHT: 4 STORIES / 45'-0"

PROPOSED 18 TOWNHOMES

SETBACK REQUIREMENTS:

FRONT: NONE	PROPOSED: 14'-3" GARDNER ST AVG	11'-3" CHARLES PARK ROAD AVG
SIDE: NONE	PROPOSED: 6'-3" (L)	4'-3-1/2" / 38'-3" (R)
REAR: 40'-0"	PROPOSED: 42'-2"	

PARKING REQUIREMENTS:
1 PARKING SPACES / DWELLING UNIT

PROPOSED PROJECT HAS 18 GARAGED SPACES & 18 TANDEM SPACES BEHIND EACH GARAGE. TOTAL OF 36 PARKING SPACES

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street Site Plan

Project number	18111	3-7
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale 3/32" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Proposed Development Aerial View

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker

3-8

Scale

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PROPOSED 18 TOWNHOMES (178 GARDNER STREET)

PROPOSED 70-UNIT APARTMENT BUILDING (189 GARDNER STREET)

EXISTING OAK ROW APARTMENTS

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SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Proposed Development Aerial View

Project number	18111	3-9
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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EXISTING OAK ROW APARTMENTS

PROPOSED 18 TOWNHOMES (178 GARDNER STREET)

PROPOSED 70-UNIT APARTMENT BUILDING (189 GARDNER STREET)

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SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Proposed Development Aerial View

Project number	18111	3-10
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

Birds Eye View from Southwest

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker

3-11

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189 Gardner St Perspective From SW Corner

Project number	18111	3-12
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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KHALSA

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

View Up Gardner St from SE Corner

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker

3-13

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189 Gardner St Perspective from NE Corner

Project number	18111	3-14
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale

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CHARLES PARK ROAD VIEW

GARDNER STREET VIEW

CHARLES PARK ROAD VIEW

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner St Exterior Perspectives

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker
Scale	

3-15

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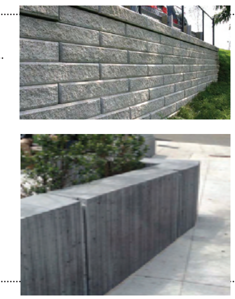
Trash Enclosure

UPRIGHT GROWING TREES
Soften building edges and contrast with horizontal building elements

LILAC - SHRUB MASSING

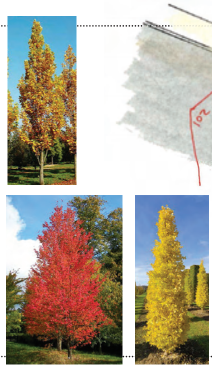
PAVING
Use infiltration pavers within parking area to manage stormwater



RETAINING WALL
Large precast concrete block retaining wall to enclose depressed parking area

Street tree planting along Gardner Street

FLOWERING TREES



UPRIGHT GROWING TREES
Accent/contrast with horizontal building elements

GARDEN ENTRY COURT
Use seatwalls to protect plantings and form accessible sloped walkway and ramp to entrance

Evergreen hedging reinforces geometry and defines spaces.

VERDANT
LANDSCAPE ARCHITECTURE

APARTMENTS (189-197 GARDNER STREET) LANDSCAPE PLAN
RIVERS EDGE
MAY 22, 2019

3-16

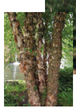
PLANT LIST					
KEY	QTY	LATIN NAME	COMMON NAME	MIN. SIZE	NOTES
DECIDUOUS TREES					
AL	8	Amelanchier laevis	Allegheny Serviceberry	2-2.5" cal.	b&b single stem
AR	11	Acer rubrum ' Ar,strpmg'	Upright Red Maple	2.5-3" cal.	b&b
LT	14	Liriodendron tulipifera fastigiata	Upright growing Tuliptree	3-3.5" cal.	b&b
LSS	12	Liquidambar styraciflua 'Sleder Siilhouette'	Culumnar Sweet Gum		
QP	3	Quercus palustris	Pin Oak	3-3.5" cal.	b&b
EVERGREEN TREES					
PS	6	Pinus strobus	White Pine	7-8' ht.	b&b
TP	2	Thuja plicata 'Green Giant'	Green Giant Arborvitae	7-8' ht.	b&b
SHRUBS/VINES 135					
BS		Buxus sempervirens	Common Boxwood	5 gal.	
CD		Callicarpa dichotoma	Purple Beautyberry	3 gal.	
CA		Clethra alnifolia	Summersweet	5 gal.	
FG		Fothergilla gardenii	Dwarf Fothergilla	5 gal.	
HA		Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea	5 gal.	
IM		Ilex meservaea 'China Girl'	China Girl Holly	30-36"	2 shall be male
IV		Itea virginica 'Henry's Garnet'	Virginia Sweetspire	#3 gal	
RC		Rhododendron catawbiense	Rosebay Rhodo	36" ht.	
SJ		Spiraea japonica 'Little Princess'	Little Princess Spirea	#3 pot	
SP		Syringa patula 'Miss Kim'	Miss Kim Lilac	35 pots	
TM		Taxus media 'Hicksii'	Hicks Yew	#5 pot/30" ht.	
VD		Viburnum dentatum	Arrowwood Viburnum	3-4' ht.	
SHRUBS/VINES 10					
CR		Campsis radicans	Trumpet Creeper	#3 pot	
CV		Clematis virginiana	Virgin Bowers Vine	#2 pot	
PQ		Parthenocissus quinqufolia	Virginia Creeper	#2 pot	
PERENNIALS/GRASSES					
ac		Anemone canadensis	Canada Anemone	#1 pot	18" o.c.
ah		Amsonia hubrecktii	Texas Bluestar	#2 pot	
an		Anemone hupehensis	Jap. Windflower	#1 pot	18" o.c.
cf		Calamagrostis acutiflora 'Karl Foerster'	Feather Reed Grass	#2 pot	18" o.c.
cm		Carex morrowii 'Ice Dance'	Variegated Carex	#1 pot	
cp		Carex pennsylvanica	Pennsylvania Sedge	#1 pot	12" o.c.
ep		Echinachea purpurea 'White Swan'	White flowering Coneflower	#1 pot	18" o.c.
gm		Geranium macrorrhizum 'Bevan's Variety'	Bevan's Variety Geranium	#2 pot	24" o.c.
hm		Hakonachloa macra 'Aureola'	Golden Hakone Grass	#2 pot	
hp		Heuchera x Palace Purple	Coral bells	#1 pot	
hs		Hemerocallis 'Catherine Woodbury"	Fragrant Daylily	#2 pot	2' o.c.
ho		Hosta 'Sum and Substance'	Sum and Substance Hosta	#3 pot	
ms		Miscanthus sinensis 'Morning Light'	Morning Light Miscanthus	#3 pot	3' o.c.
nb		Nepeta recemosa 'Blue Wonder'	Blue Wonder Catmint	#1 pot	18" o.c.
nw		Nepeta faasenii 'Walkers Low'	Walkers Low Catmint	#2 pot	2' o.c.
pr		Perovskia atriplicifolia	Russian Sage	#2 pot	2' o.c.
pv		Panicum 'Rotstrahlbusch'	Red Switchgrass	#2 pot	2' o.c.
sa		Sedum 'Autumn Joy'	Autumn Joy Sedum	#2 pot	18" o.c.
vm		Vinca minor 'Ralph Shugert'	Variegated Myrtle	1 qt. pot	12" o.c.

SCALE: 1" = 10'-0"
0 5' 10' 25'

VERDANT
LANDSCAPE ARCHITECTURE

APARTMENTS (189-197 GARDNER STREET) PLANTING PLAN
RIVERS EDGE
MAY 22, 2019

SUSTAINABLE STORMWATER MANAGEMENT PRINCIPLES:
Utilize permeable pavements and stormwater planters to reduce subsurface storage structures.
Plant water-tolerant River Birch and ornamental grasses to accent courtyard



CREATE DOOR YARD GARDENS
Separate individual entrances with picket fencing, accented with climbing plants and perennials

EVERGREEN TREES
Use evergreen tree planting along east boundary to screen development from abutting residences

RETAINING WALL & PLANTINGS
Unify townhouse architecture with a wall amd shrub plantings
Combine entrances to minimize number of front walks

PARKWAY TREES
Establish & reinforce parkway character of Charles Park Road
Shift sidewalk to create 6' tree planting lawn along edge of road
Establish double row of Oaks to create robust park edge

VERDANT
LANDSCAPE ARCHITECTURE

TOWNHOUSES (178 GARDNER STREET) LANDSCAPE PLAN
RIVERS EDGE
MAY 22, 2019

PLANT LIST

KEY	QTY	LATIN NAME	COMMON NAME	MIN. SIZE	NOTES
DECIDUOUS TREES					
AL	7	Amelanchier laevis	Allegheny Serviceberry	2-2.5" cal.	b&b single stem
AR	6	Acer rubrum ' Ar,strpmg'	Upright Red Maple	2.5-3" cal.	b&b
BN	10	Betula nigra "Heritage"	Heritage River Birch	2.5-3" cal.	b&b
CA	6	Cornus alternafolia	Pagoda Dogwood	8-10'	b&b
QP	2	Quercus palustris	Pin Oak		
QR	13	Quercus rubra	Red Oak	3-3.5" cal.	b&b
EVERGREEN TREES					
PS	4	Pinus strobus	White Pine	7-8' ht.	b&b
TO	5	Thuja occidentalis 'Smaragd'	Emerald Green Arborvitea	7-8'	b&b
TP	8	Thuja plicata 'Green Giant'	Green Giant Arborvitae	7-8' ht.	b&b
SHRUBS/VINES 125					
CD		Callicarpa dichotoma	Purple Beautyberry	3 gal.	
CA		Clethra alnifolia	Summersweet	5 gal.	
FG		Fothergilla gardenii	Dwarf Fothergilla	5 gal.	
HA		Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea	5 gal.	
IM		Ilex meservaea 'China Girl'	China Girl Holly	30-36" 2 shall be male	
IV		Itea virginica 'Henry's Garnet'	Virginia Sweetspire	#3 gal	
RC		Rhododendron catawbiense	Rosebay Rhodo	36" ht.	
SJ		Spiraea japonica 'Little Princess'	Little Princess Spirea	#3 pot	
SP		Syringa patula 'Miss Kim'	Miss Kim Lilac	35 pots	
TM		Taxus media 'Hicksii'	Hicks Yew	#5 pot/30" ht.	
VD		Viburnum dentatum	Arrowwood Viburnum	3-4' ht.	
SHRUBS/VINES 23					
CV		Clematis virginiana	Virgin Bowers Vine	#2 pot	
PQ		Parthenocissus quinqufolia	Virginia Creeper	#2 pot	
R		Rosa - David Austin Hybrids	Pink, Red and White climbing roses #3 pots		
PERENNIALS/GRASSES					
ac		Anemone canadensis	Canada Anemone	#1 pot	18" o.c.
ah		Amsonia hubrecktii	Texas Bluestar	#2 pot	
an		Anemone hupehensis	Jap. Windflower	#1 pot	18" o.c.
cf		Calamagrostis acutiflora 'Karl Foerster'	Feather Reed Grass	#2 pot	18" o.c.
cm		Carex morrowii 'Ice Dance'	Variegated Carex	#1 pot	
cp		Carex pennsylvanica	Pennsylvania Sedge	#1 pot	12" o.c.
ep		Echinachea purpurea 'White Swan'	White flowering Coneflower	#1 pot	18" o.c.
gm		Geranium macrorrhizum 'Bevan's Variety'	Bevan's Variety Geranium	#2 pot	24" o.c.
hm		Hakonachloa macra 'Aureola'	Golden Hakone Grass	#2 pot	
hp		Heuchera x Palace Purple	Coral bells	#1 pot	
hs		Hemerocallis 'Catherine Woodbury"	Fragrant Daylily	#2 pot	2' o.c.
ho		Hosta 'Sum and Substance'	Sum and Substance Hosta	#3 pot	
ms		Miscanthus sinensis 'Morning Light'	Morning Light Miscanthus	#3 pot	3' o.c.
nb		Nepeta recemosa 'Blue Wonder'	Blue Wonder Catmint	#1 pot	18" o.c.
nw		Nepeta faasenii 'Walkers Low'	Walkers Low Catmint	#2 pot	2' o.c.
pr		Perovskia atriplicifolia	Russian Sage	#2 pot	2' o.c.
pv		Panicum 'Rotstrahlbusch'	Red Switchgrass	#2 pot	2' o.c.
sa		Sedum 'Autumn Joy'	Autumn Joy Sedum	#2 pot	18" o.c.
vm		Vinca minor 'Ralph Shugert'	Variegated Myrtle	1 qt. pot	12" o.c.

SCALE: 1" = 10'-0"

VERDANT
LANDSCAPE ARCHITECTURE

TOWNHOUSES (178 GARDNER STREET) PLANTING PLAN
RIVERS EDGE
MAY 22, 2019

VERDANT
LANDSCAPE ARCHITECTURE

OVERALL PROJECT LANDSCAPE PLAN
RIVERS EDGE
MAY 22, 2019

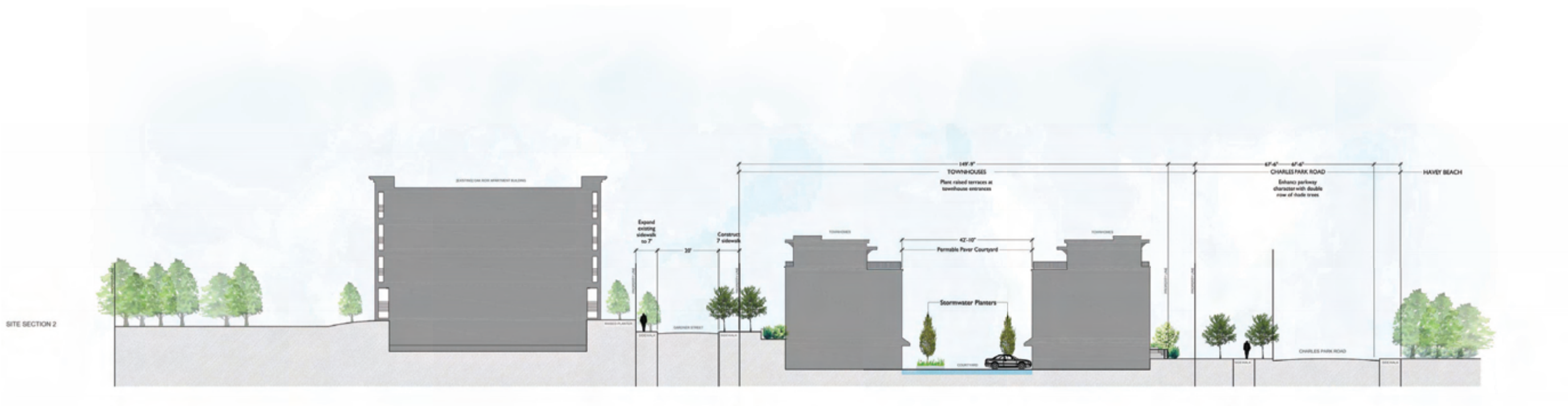
3-20

SCALE: 1/16"=1'-0"
0 4' 8' 16' 40'

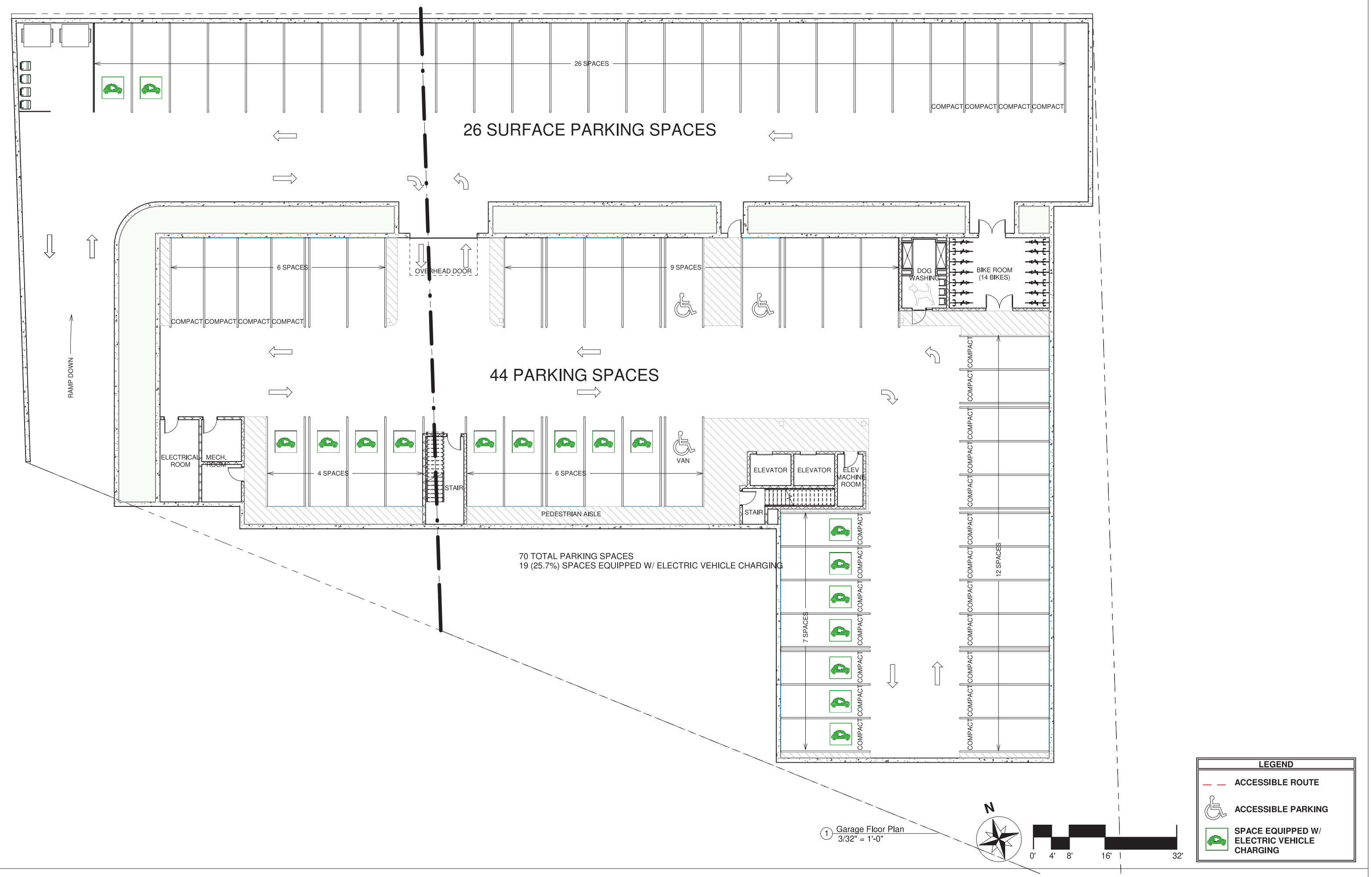
VERDANT
LANDSCAPE ARCHITECTURE

LANDSCAPE CROSS SECTIONS
RIVERS EDGE
MAY 22, 2019

3-21



SCALE: 1/16"=1'-0"
0 4' 8' 16' 40'



1 Garage Floor Plan
3/32" = 1'-0"

KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Garage Level

Project number	18111	3-23
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale: As indicated

5/28/2019 5:57:01 PM

1 Ground Floor Plan
3/32" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Ground Level Plan

Project number	18111
Date	05/30/2019
Drawn by	WC
Checked by	JSK

3-24

Scale: As indicated

5/28/2019 5:57:03 PM

1 2nd Floor Plan
3/32" = 1'-0"

KHALSA DESIGN INC.	**WEST BRIGHTON ACQUISITIONS LLC**
17 IVALOO STREET SUITE 400 SOMERVILLE, MA 02143 TEL: 617-591-8682 FAX: 617-591-2086	West Roxbury Residences 178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132

189-197 Gardner Street-Second Floor Plan

Project number	18111	3-25
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale: As indicated

5/28/2019 5:57:04 PM

1 3rd Floor Plan
3/32" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Third Floor Plan

Project number	18111
Date	05/30/2019
Drawn by	WC
Checked by	JSK

3-26

Scale: As indicated

5/28/2019 5:57:06 PM

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Fourth Floor Plan

Project number	18111	3-27	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	As indicated

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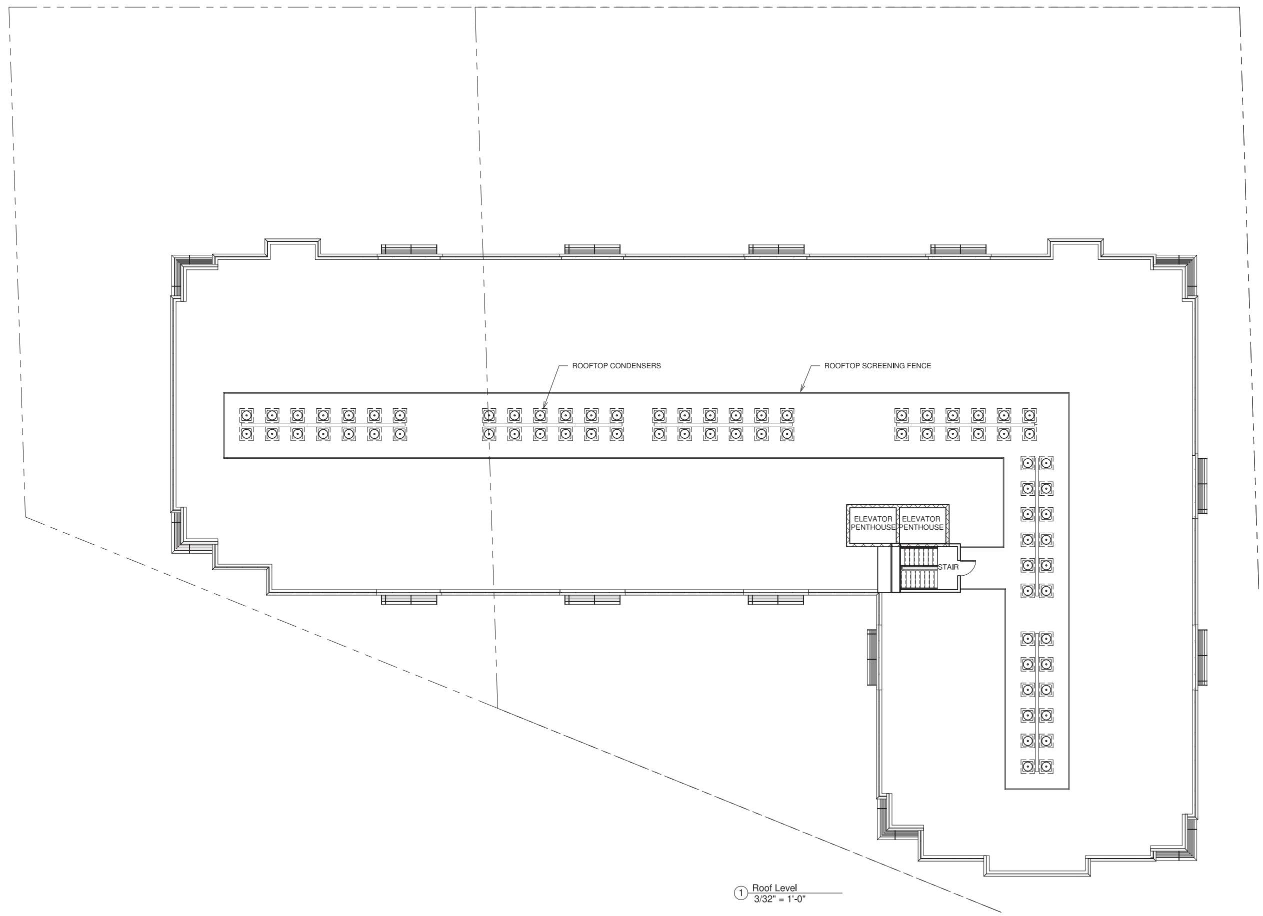

KHALSA DESIGN INC.

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Roof Floor Plan

Project number	18111
Date	05/30/2019
Drawn by	WC
Checked by	JSK

3-28

Scale: As indicated

5/28/2019 5:57:08 PM

1 South
1/8" = 1'-0"

3 West
1/8" = 1'-0"

EXTERIOR MATERIALS

- CEMENTITIOUS CLAPBOARDS (JAMES HARDI - DEEP OCEAN)
- CEMENTITIOUS CLAPBOARDS (JAMES HARDI - GRAY SLATE)
- CEMENTITIOUS PANELS (JAMES HARDI - GRAY SLATE)
- CEMENTITIOUS PANELS (JAMES HARDI - MONTEREY TAUPE)
- PERFORATED METAL PANEL

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WEST BRIGHTON ACQUISITIONS LLC
West Roxbury Residences
178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Exterior Elevations

Project number	18111	3-29	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	1/8" = 1'-0"

5/28/2019 5:57:13 PM

1 North
1/8" = 1'-0"

2 East
1/8" = 1'-0"

EXTERIOR MATERIALS

- CEMENTITIOUS CLAPBOARDS (JAMES HARDI - DEEP OCEAN)
- CEMENTITIOUS CLAPBOARDS (JAMES HARDI - GRAY SLATE)
- CEMENTITIOUS PANELS (JAMES HARDI - GRAY SLATE)
- CEMENTITIOUS PANELS (JAMES HARDI - MONTEREY TAUPE)
- PERFORATED METAL PANEL

DESIGN
KHALSA

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Exterior Elevations

Project number	18111	3-30	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	1/8" = 1'-0"

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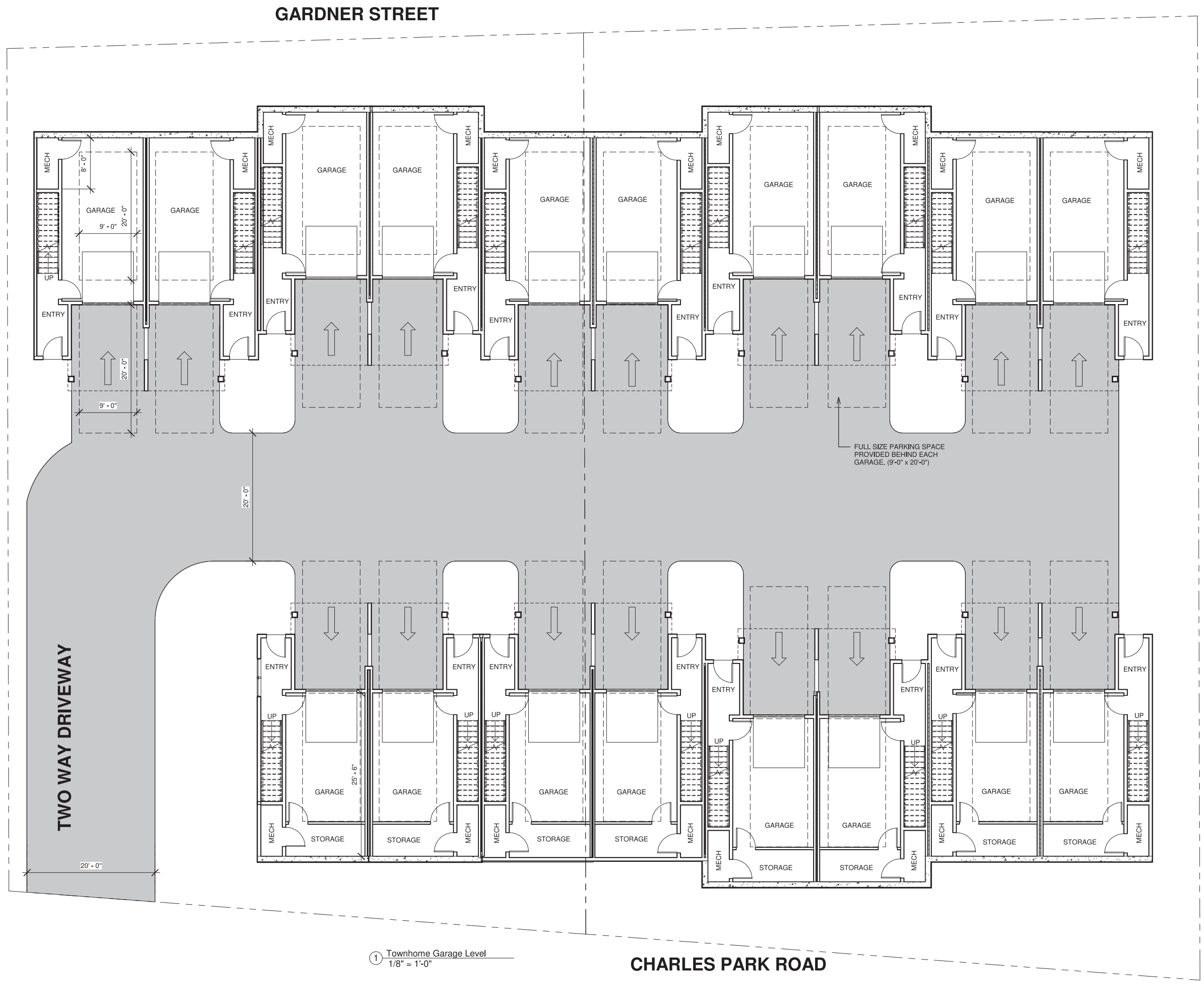
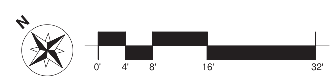


18 GARAGE SPACES
+18 TANDEM SPACES
36 TOTAL SPACES
MINIMUM OF 25% (9 SPACES) WILL BE EQUIPPED W/ ELECTRICAL VEHICLE CHARGING (FINAL LOCATIONS TBD)



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WEST BRIGHTON ACQUISITIONS LLC

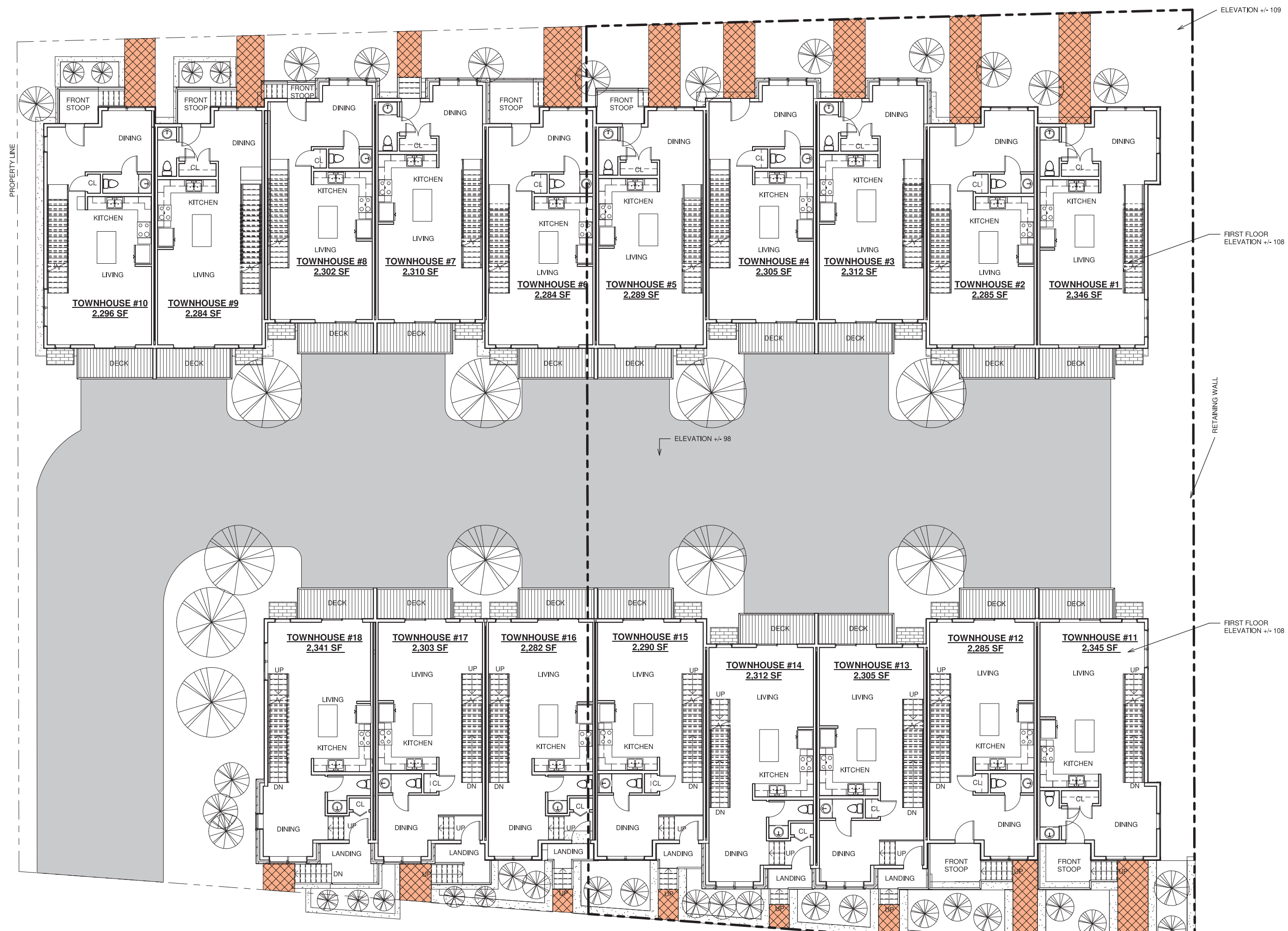
West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Garage Level Plan

Project number	18111	3-31
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale: As indicated

5/28/2019 5:53:04 PM



3 Townhome 1st Floor Level
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

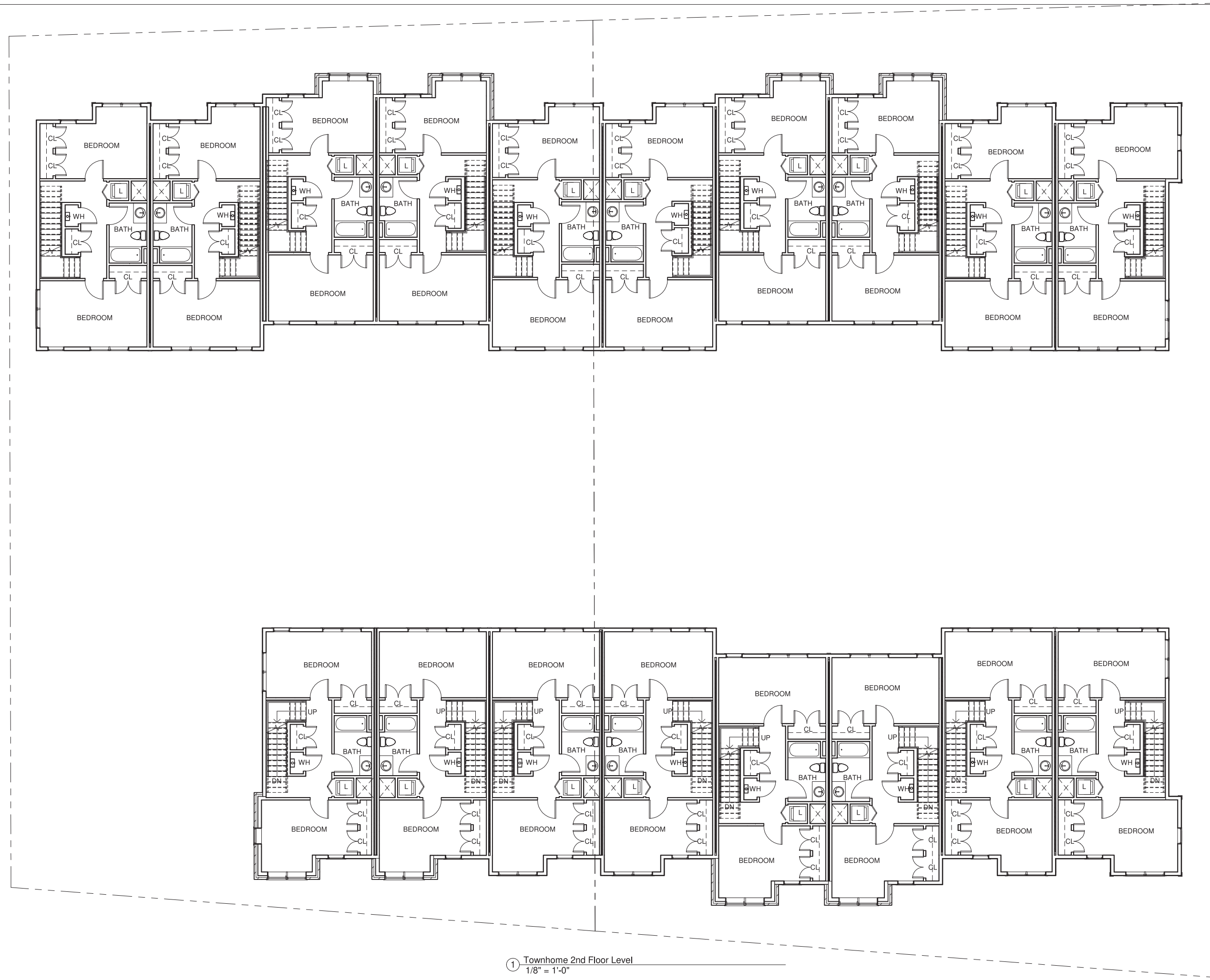
178 Gardner Street-First Floor Plan

Project number	18111
Date	05/30/2019
Drawn by	WC
Checked by	JSK

3-32

Scale 1/8" = 1'-0"

5/28/2019 5:53:08 PM



1 Townhome 2nd Floor Level
1/8" = 1'-0"

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SOMERVILLE, MA 02143
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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Second Floor Plan

Project number	18111	3-33
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale 1/8" = 1'-0"

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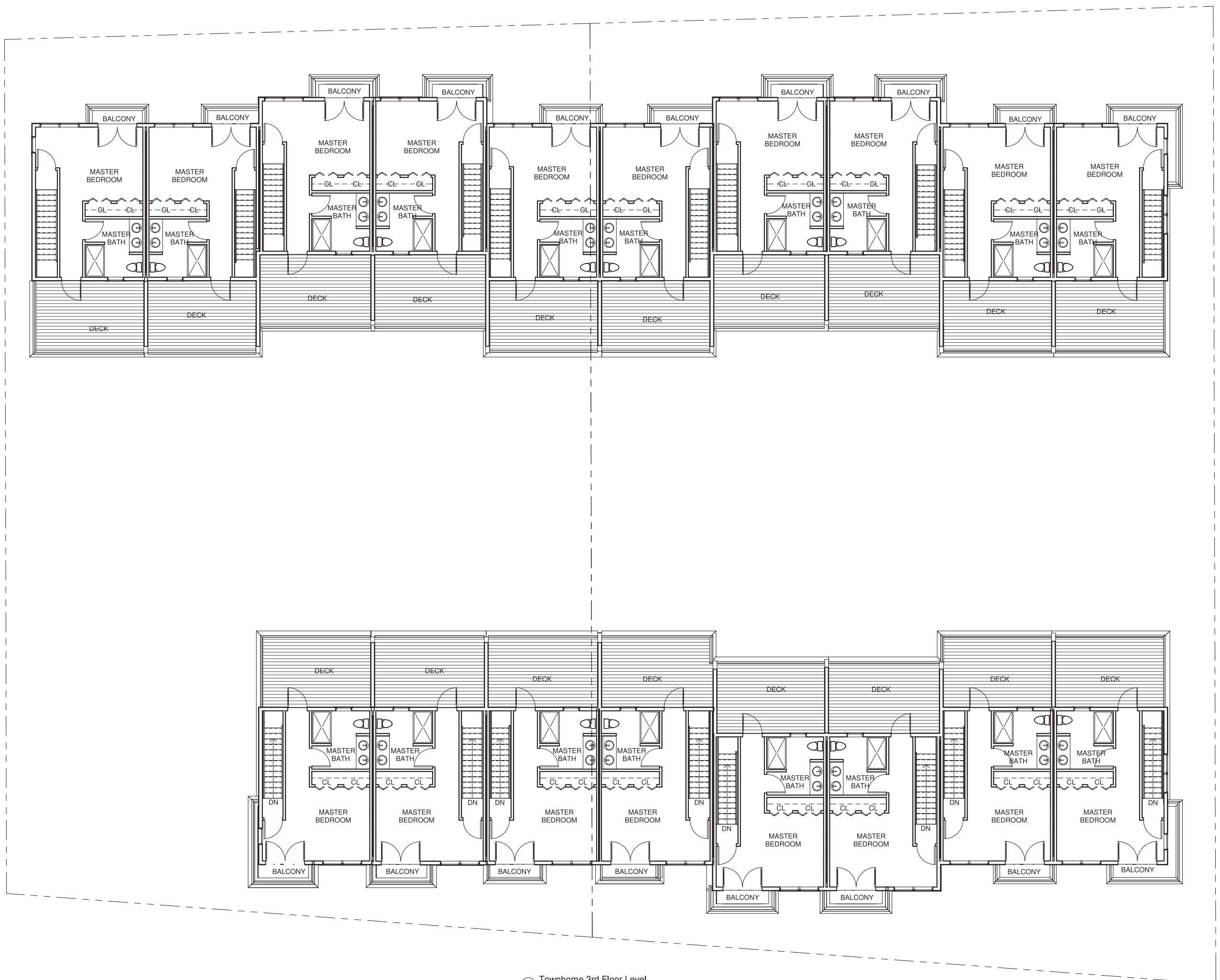

1 Townhome 3rd Floor Level
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC
West Roxbury Residences
178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Third Floor Plan

Project number	18111	3-34
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale 1/8" = 1'-0"

5/28/2019 5:53:12 PM

1 Townhome Roof Level
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Roof Plan

Project number	18111	3-35	
Date	05/30/2019		
Drawn by	Author		
Checked by	Checker	Scale	1/8" = 1'-0"

5/28/2019 5:53:12 PM

1 Gardner Street Elevation
1/8" = 1'-0"

3 Charles Park Road Elevation
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Exterior Elevations

Project number	18111	3-36	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	1/8" = 1'-0"

5/28/2019 5:53:22 PM

1 Courtyard Elevation 1
1/8" = 1'-0"

2 Courtyard Elevation 2
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Exterior Elevations

Project number	18111	3-37	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	1/8" = 1'-0"

5/28/2019 5:53:30 PM

1 East Elevation
1/8" = 1'-0"

2 West Elevation
1/8" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Exterior Elevations

Project number	18111	3-38
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale 1/8" = 1'-0"

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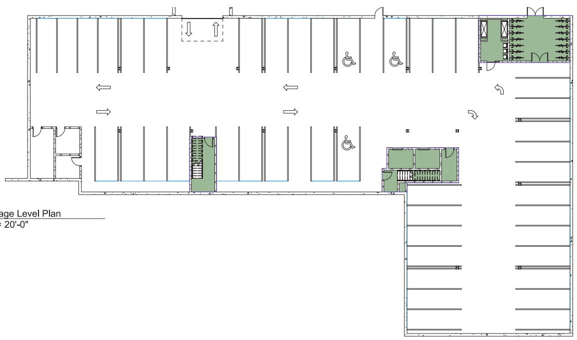
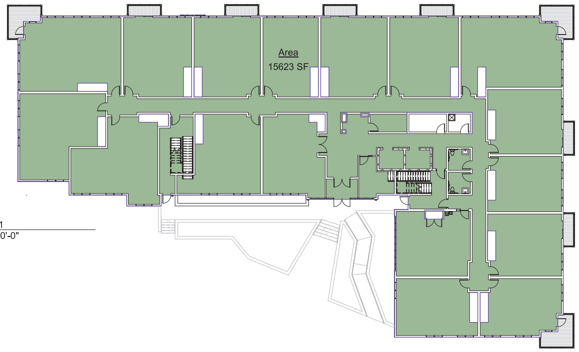
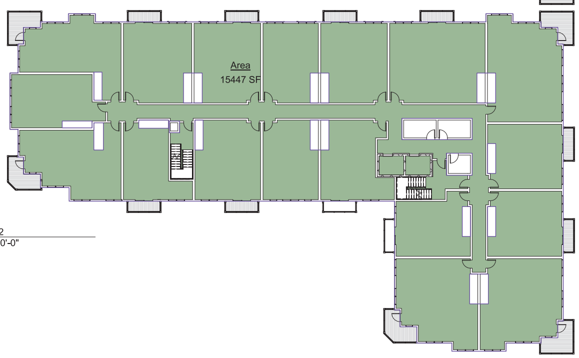


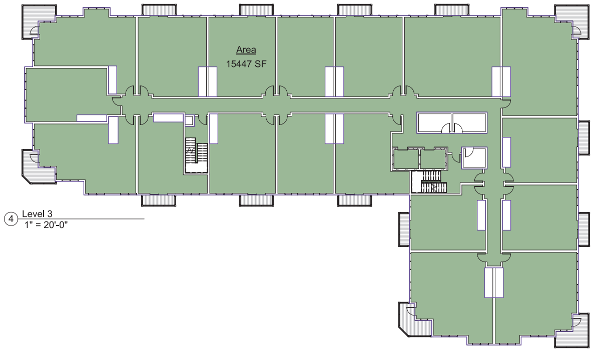
1 Garage Level Plan
1" = 20'-0"



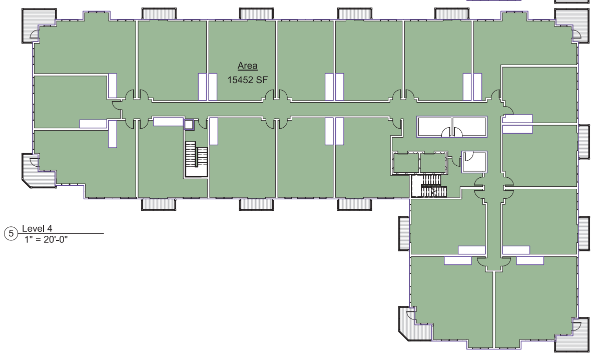
2 Level 1
1" = 20'-0"



3 Level 2
1" = 20'-0"



4 Level 3
1" = 20'-0"



5 Level 4
1" = 20'-0"

Area Schedule (Gross Building)

Area	Name
15623 SF	Area
382 SF	Area
15447 SF	Area
15447 SF	Area
15452 SF	Area
582 SF	Area
199 SF	Area
63132 SF	

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Gross Area Plan

Project number	18111	3-39
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale 1" = 20'-0"

5/31/2019 7:01:20 AM

1 Level 1
1" = 20'-0"

2 Level 2
1" = 20'-0"

3 Level 3
1" = 20'-0"

4 Level 4
1" = 20'-0"

Area Schedule (Rentable)

Area	Name
Level 1	
666 SF	BALCONY
150 SF	BATH
693 SF	COMMUNITY ROOM
2057 SF	CORRIDOR
148 SF	ELEVATOR
694 SF	GYM
63 SF	JANITOR
176 SF	LEASING OFFICE
208 SF	PACKAGE
572 SF	STAIR
666 SF	UNIT 1
636 SF	UNIT 2
663 SF	UNIT 3
594 SF	UNIT 4
687 SF	UNIT 5
1017 SF	UNIT 6
787 SF	UNIT 7
761 SF	UNIT 8
636 SF	UNIT 9
761 SF	UNIT 10
799 SF	UNIT 11
780 SF	UNIT 12
1058 SF	UNIT 13
899 SF	UNIT 14
875 SF	UNIT 15
17046 SF	

Area Schedule (Rentable)

Area	Name
Level 2	
1092 SF	BALCONY
1453 SF	CORRIDOR
168 SF	ELEVATOR
247 SF	MECHANICAL
444 SF	STAIR
932 SF	UNIT 16
623 SF	UNIT 17
963 SF	UNIT 18
694 SF	UNIT 19
689 SF	UNIT 20
1056 SF	UNIT 21
1081 SF	UNIT 22
718 SF	UNIT 23
761 SF	UNIT 24
636 SF	UNIT 25
636 SF	UNIT 26
748 SF	UNIT 27
761 SF	UNIT 28
588 SF	UNIT 29
779 SF	UNIT 30
838 SF	UNIT 31
666 SF	UNIT 32
899 SF	UNIT 33
17472 SF	

Area Schedule (Rentable)

Area	Name
Level 3	
1092 SF	BALCONY
1460 SF	CORRIDOR
161 SF	ELEVATOR
247 SF	MECHANICAL
444 SF	STAIR
931 SF	UNIT 34
964 SF	UNIT 35
623 SF	UNIT 36
694 SF	UNIT 37
689 SF	UNIT 38
1056 SF	UNIT 39
1081 SF	UNIT 40
1468 SF	UNIT 41
761 SF	UNIT 42
636 SF	UNIT 43
636 SF	UNIT 44
761 SF	UNIT 46
585 SF	UNIT 47
779 SF	UNIT 48
838 SF	UNIT 49
666 SF	UNIT 50
899 SF	UNIT 51
17472 SF	

Area Schedule (Rentable)

Area	Name
Level 4	
1092 SF	BALCONY
1465 SF	CORRIDOR
172 SF	ELEVATOR
247 SF	MECHANICAL
440 SF	STAIR
931 SF	UNIT 52
964 SF	UNIT 53
623 SF	UNIT 54
694 SF	UNIT 55
655 SF	UNIT 56
596 SF	UNIT 57
803 SF	UNIT 58
761 SF	UNIT 59
718 SF	UNIT 60
761 SF	UNIT 61
636 SF	UNIT 62
636 SF	UNIT 63
748 SF	UNIT 64
761 SF	UNIT 65
588 SF	UNIT 66
779 SF	UNIT 67
877 SF	UNIT 68
590 SF	UNIT 69
874 SF	UNIT 70
17411 SF	
69400 SF	

70 UNITS TOTAL
70 PARKING SPACES + 3 VISITOR SPACES

(30) 1 BEDROOM UNITS
(20) 1 BEDROOM + UNITS
(19) 2 BEDROOM UNITS

TOTAL NON RENTABLE SPACE = 11,699 SF
(NOT INCLUDING GARAGE)

TOTAL RENTABLE SPACE = 53,758 SF
AVERAGE UNIT = 768 SF

TOTAL UNIT OUTDOOR SPACE = 3,931 SF

BUILDING AMENITIES

-DOG WASHING STATION
-BIKE ROOM W/ BIKE REPAIR STATION
-FITNESS CENTER
-COMMUNITY ROOM

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner Street-Rentable Area Plan

Project number	18111	3-40	
Date	05/30/2019		
Drawn by	WC		
Checked by	JSK	Scale	1" = 20'-0"

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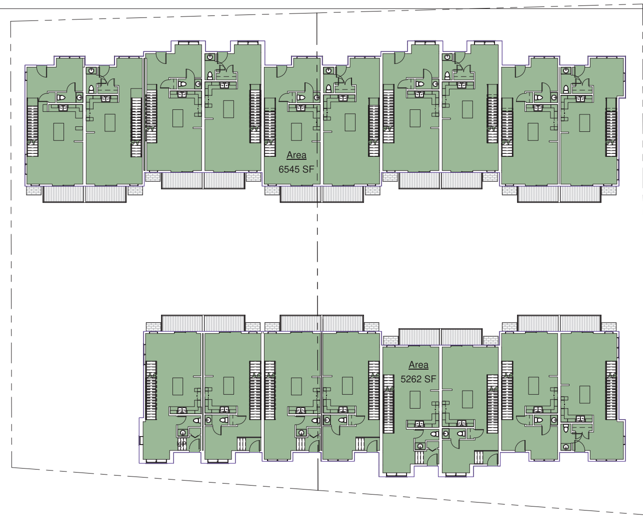
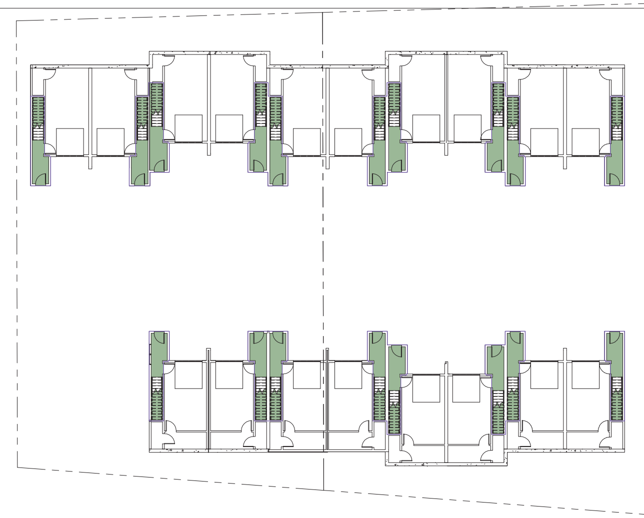


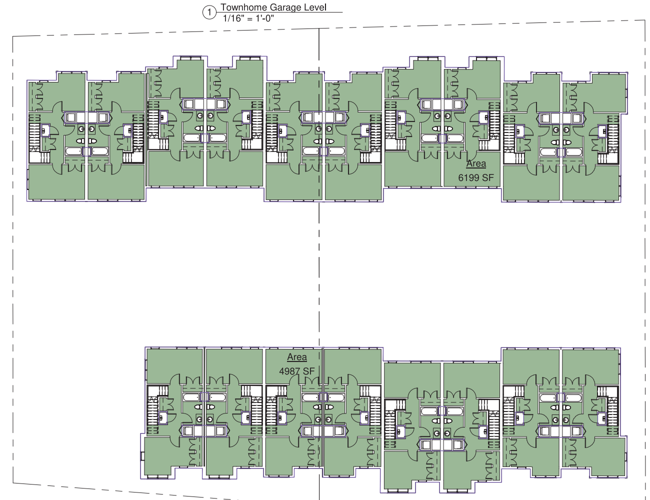
(2) Townhome 1st Floor Level
1/16" = 1'-0"



(1) Townhome Garage Level
1/16" = 1'-0"

Area Schedule (Gross Building)	
Area	Name
6199 SF	Area
3403 SF	Area
6545 SF	Area
249 SF	Area
249 SF	Area
4987 SF	Area
5262 SF	Area
4251 SF	Area
125 SF	Area
249 SF	Area
249 SF	Area
249 SF	Area
126 SF	Area
126 SF	Area
248 SF	Area
249 SF	Area
126 SF	Area
32893 SF	

(4) Townhome 3rd Floor Level
1/16" = 1'-0"



(3) Townhome 2nd Floor Level
1/16" = 1'-0"

DESIGN
KHALSA

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SOMERVILLE, MA 02143
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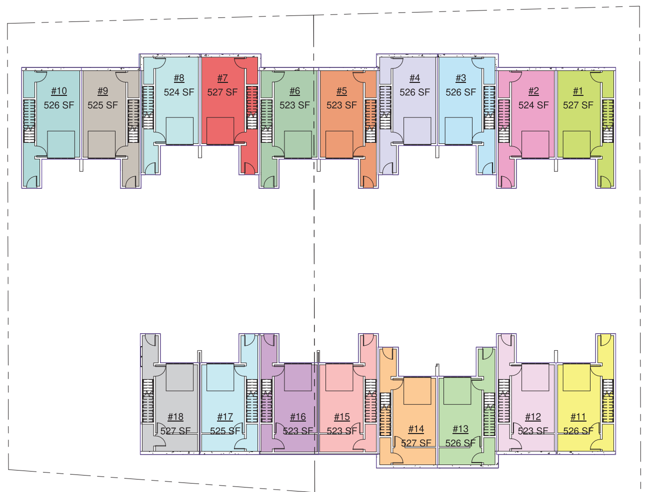
WEST BRIGHTON ACQUISITIONS LLC
West Roxbury Residences
178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Gross Area Plan

Project number	18111	3-41
Date	05/30/2019	
Drawn by	WC	
Checked by	JSK	Scale 1/16" = 1'-0"

5/28/2019 5:53:44 PM



1 Townhome Garage Level
1/16" = 1'-0"

3 Townhome 2nd Floor Level
1/16" = 1'-0"

2 Townhome 1st Floor Level
1/16" = 1'-0"

4 Townhome 3rd Floor Level
1/16" = 1'-0"

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WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street-Rentable Area Plan

Project number	18111	3-42
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale 1/16" = 1'-0"

5/28/2019 5:53:54 PM

Figure 3-43

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

Project Name: 178 Gardner
Date: 24-May-19

Y	?	N			
1			Credit	Integrative Process	1

Y	?	N			
10	**0**	**6**		**Location and Transportation**	**16**
			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
2			Credit	High Priority Site	2
4		1	Credit	Surrounding Density and Diverse Uses	5
		5	Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

Y	?	N			
2	**3**	**4**		**Sustainable Sites**	**10**
Y			Prereq	Construction Activity Pollution Prevention	Required
	1		Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
		1	Credit	Open Space	1
	1	1	Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

Y	?	N			
9	**0**	**2**		**Water Efficiency**	**11**
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
6			Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

Y	?	N			
14	**4**	**15**		**Energy and Atmosphere**	**33**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
4		2	Credit	Enhanced Commissioning	6
8	1	9	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
	1	2	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

Y	?	N			
2	**2**	**9**		**Materials and Resources**	**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

Y	?	N			
6	**1**	**9**		**Indoor Environmental Quality**	**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
		3	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1		1	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1		1	Credit	Interior Lighting	2
		3	Credit	Daylight	3
1			Credit	Quality Views	1
		1	Credit	Acoustic Performance	1

Y	?	N			
6	**0**	**0**		**Innovation**	**6**
5			Credit	Innovation - EP Heat Island, Integrated Pest Mgmt, Green Cleaning, Thermal Comfc	5
1			Credit	LEED Accredited Professional	1

Y	?	N			
3	**1**	**0**		**Regional Priority**	**4**
1			Credit	Regional Priority: Indoor Water Use	1
1			Credit	Regional Priority: High Priority Site	1
1			Credit	Regional Priority: Optimize Energy	1
	1		Credit	Regional Priority: Renewable	1

Y	?	N			
53	**11**	**45**	**TOTALS**	Possible Points:	**110**

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

Home Energy Rating Certificate

Figure 3-44

CLEAResult®

Property

178 Gardner Street
Boston, MA

HERS

Rating Type:	Projected Rating	Certified Energy Rater:	Nicholas Abreu
Rating Date:	2019-05-21	Rating Number:	
Registry ID:			

Projected Rating: Based on Plans - Field Confirmation Required.

HERS Index: 53

General Information

Conditioned Area	1851 sq. ft.	House Type	Townhouse, end unit
Conditioned Volume	19808 cubic ft.	Foundation	More than one type
Bedrooms	3		

Mechanical Systems Features

Heating:	Fuel-fired air distribution, Natural gas, 95.0 AFUE.
Cooling:	Air conditioner, Electric, 16.0 SEER.
Water Heating:	Instant water heater, Natural gas, 0.95 EF, 0.0 Gal.
Duct Leakage to Outside	60.00 CFM25.
Ventilation System	Exhaust Only: 90 cfm, 11.0 watts.
Programmable Thermostat	Heat=Yes; Cool=Yes

Building Shell Features

Ceiling Flat	R-50.0	Slab	R-10.0 Edge, R-0.0 Under
Sealed Attic	NA	Exposed Floor	R-26.4
Vaulted Ceiling	NA	Window Type	U-Value: 0.260, SHGC: 0.320
Above Grade Walls	R-26.0	Infiltration Rate	Htg: 3.00 Clg: 3.00 ACH50
Foundation Walls	R-0.0	Method	Blower door

Lights and Appliance Features

Interior Fluor Lighting (%)	0.0	Range/Oven Fuel	Natural gas
Interior LED Lighting (%)	100.0	Clothes Dryer Fuel	Electric
Refrigerator (kWh/yr)	600	Clothes Dryer CEF	2.62
Dishwasher (kWh/yr)	270	Ceiling Fan (cfm/Watt)	0.00

Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	45.6	$367	26%
Cooling	2.1	$103	7%
Hot Water	9.6	$75	5%
Lights/Appliances	17.1	$708	50%
Photovoltaics	-0.0	$-0	-0%
Service Charges		$157	11%
Total	**74.5**	**$1409**	**100%**

Criteria

This home meets or exceeds the minimum criteria for the following:

Massachusetts Stretch Energy Code*

* Compliance is determined by the rater.

Nicholas Abreu
Project Manager
50 Washington Street
Westborough, MA 01581

Certified Energy Rater:

REM/Rate - Residential Energy Analysis and Rating Software v15.7.3

Home Energy Rating Certificate

Figure 3-45

CLEAResult®

Property

178 Gardner Street
Boston, MA

HERS

Rating Type:	Projected Rating	Certified Energy Rater:	Nicholas Abreu
Rating Date:	2019-05-21	Rating Number:	
Registry ID:			

Projected Rating: Based on Plans - Field Confirmation Required.

HERS Index: 53

General Information

Conditioned Area	1851 sq. ft.	House Type	Townhouse, inside unit
Conditioned Volume	19808 cubic ft.	Foundation	More than one type
Bedrooms	3		

Mechanical Systems Features

Heating:	Fuel-fired air distribution, Natural gas, 95.0 AFUE.
Cooling:	Air conditioner, Electric, 16.0 SEER.
Water Heating:	Instant water heater, Natural gas, 0.95 EF, 0.0 Gal.
Duct Leakage to Outside	60.00 CFM25.
Ventilation System	Exhaust Only: 88 cfm, 11.0 watts.
Programmable Thermostat	Heat=Yes; Cool=Yes

Building Shell Features

Ceiling Flat	R-50.0	Slab	R-10.0 Edge, R-0.0 Under
Sealed Attic	NA	Exposed Floor	R-26.4
Vaulted Ceiling	NA	Window Type	U-Value: 0.290, SHGC: 0.270
Above Grade Walls	R-26.0	Infiltration Rate	Htg: 3.00 Clg: 3.00 ACH50
Foundation Walls	R-0.0	Method	Blower door

Lights and Appliance Features

Interior Fluor Lighting (%)	0.0	Range/Oven Fuel	Natural gas
Interior LED Lighting (%)	100.0	Clothes Dryer Fuel	Electric
Refrigerator (kWh/yr)	600	Clothes Dryer CEF	2.62
Dishwasher (kWh/yr)	270	Ceiling Fan (cfm/Watt)	0.00

Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	36.4	$299	23%
Cooling	2.0	$94	7%
Hot Water	8.8	$70	5%
Lights/Appliances	17.1	$708	53%
Photovoltaics	-0.0	$-0	-0%
Service Charges		$157	12%
Total	**64.3**	**$1329**	**100%**

Criteria

This home meets or exceeds the minimum criteria for the following:

Massachusetts Stretch Energy Code*

* Compliance is determined by the rater.

Nicholas Abreu
Project Manager
50 Washington Street
Westborough, MA 01581

Certified Energy Rater: Nicholas Ab

REM/Rate - Residential Energy Analysis and Rating Software v15.7.3

This information does not constitute any warranty of energy costs or savings.
The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

4.0 Environmental Protection Component

4.1 Shadow Impacts Analysis

4.1.1 Introduction

The following shadow study describes and graphically depicts anticipated new shadow impacts from the Project compared to shadows from existing buildings. The study presents the existing and built conditions for the proposed Project for the hours 9:00 AM, 12:00 Noon, and 3:00 PM for the vernal equinox, summer solstice, autumnal equinox, and winter solstice. In addition, shadows are depicted for 6:00 PM during the summer solstice and autumnal equinox.

4.1.2 Vernal Equinox (March 21)

Figures 4-1 thru **4-3** depict shadows on March 21.

<u>Apartments (189-197 Gardner Street)</u>

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of the adjacent sites along Gardner Street, with remaining shadow contained within the site and onto the surface parking lot.

At 12:00 Noon, new shadow is cast in a northerly direction and is totally contained within the site.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction, contained mostly within the site and onto minor portion of the adjoining apartment building

<u>Townhouses (178 Gardner Street)</u>

At 9:00 AM, shadows are cast in a northwesterly direction onto a portion of the adjacent parking along Gardner Street, with remaining shadow contained within the site.

At 12:00 Noon, new shadow is cast in a northerly direction contained within the site and overlapping a portion of Gardner Street

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction, contained mostly within the site and onto a portion of Gardner Street.

4.1.3 Summer Solstice (June 21)

Figures 4-4 thru **4-7** depict shadow impacts on June 21.

Apartments (189-197 Gardner Street)

At 9:00 AM, shadows are cast in a westerly direction onto the adjacent house on Gardner Street, and into the front yard of the proposed building along Gardner.

At 12:00 Noon, new shadow is cast in a northerly direction totally contained in the surface parking lot of the project site.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction generally contained in the project site's surface parking area except for a small portion in the parking lot of the adjacent Oak Row apartments.

At 6:00 PM, new shadow from the Project is cast in an easterly direction onto the parking lot of the adjacent Oak Row apartments.

Townhouses (178 Gardner Street)

At 9:00 AM, shadows are cast in a westerly direction onto the adjacent parking lot of the Pizzeria Uno headquarters on Gardner Street, while generally limited to areas within the townhouse site.

At 12:00 Noon, new shadow is cast in a northerly direction and is totally contained within the project site.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction generally contained within the project site or on a portion of Gardner except for a small portion in the residential lot on Gardner Street opposite the Oak Row apartments.

At 6:00 PM, new shadow from the Project is cast in an easterly direction onto the residences opposite the Oak Row apartments.

4.1.4 Autumnal Equinox (September 21)

Figures 4-8 thru **4-11** depict shadow impacts on September 21.

Apartments (189-197 Gardner Street)

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of the adjacent sites along Gardner Street, with remaining shadow contained within the site and onto the surface parking lot.

At 12:00 Noon, new shadow is cast in a northerly direction and is totally contained within the site.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction, contained mostly within the site and onto minor portion of the adjoining apartment building

<u>Townhouses (178 Gardner Street)</u>

At 9:00 AM, shadows are cast in a northwesterly direction onto a portion of the adjacent parking along Gardner Street, with remaining shadow contained within the site.

At 12:00 Noon, new shadow is cast in a northerly direction; it is generally contained within the site and overlapping a portion of Gardner Street

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction and is contained mostly within the site and onto a portion of Gardner Street and an edge of the Oak Row apartment building façade along Gardner Street.

4.1.5 Winter Solstice (December 21)

Figures 4-12 thru **4-14** depict shadow impacts on December 21. Winter sun casts the longest shadows of the year.

<u>Apartments (189-197 Gardner Street)</u>

At 9:00 AM, new shadow is cast in a northwesterly direction onto portions of the adjacent residential buildings on the opposite side of Gardner Street, onto the Home Depot access roadway and onto the Home Depot's parking area.

At 12:00 Noon, new shadow is cast in a northerly direction onto the project site parking lot and the Home Depot access driveway.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction across the Home Depot access driveway, with a small area of the adjoining Oak Row parking lot in new shadow.

<u>Townhouses (178 Gardner Street)</u>

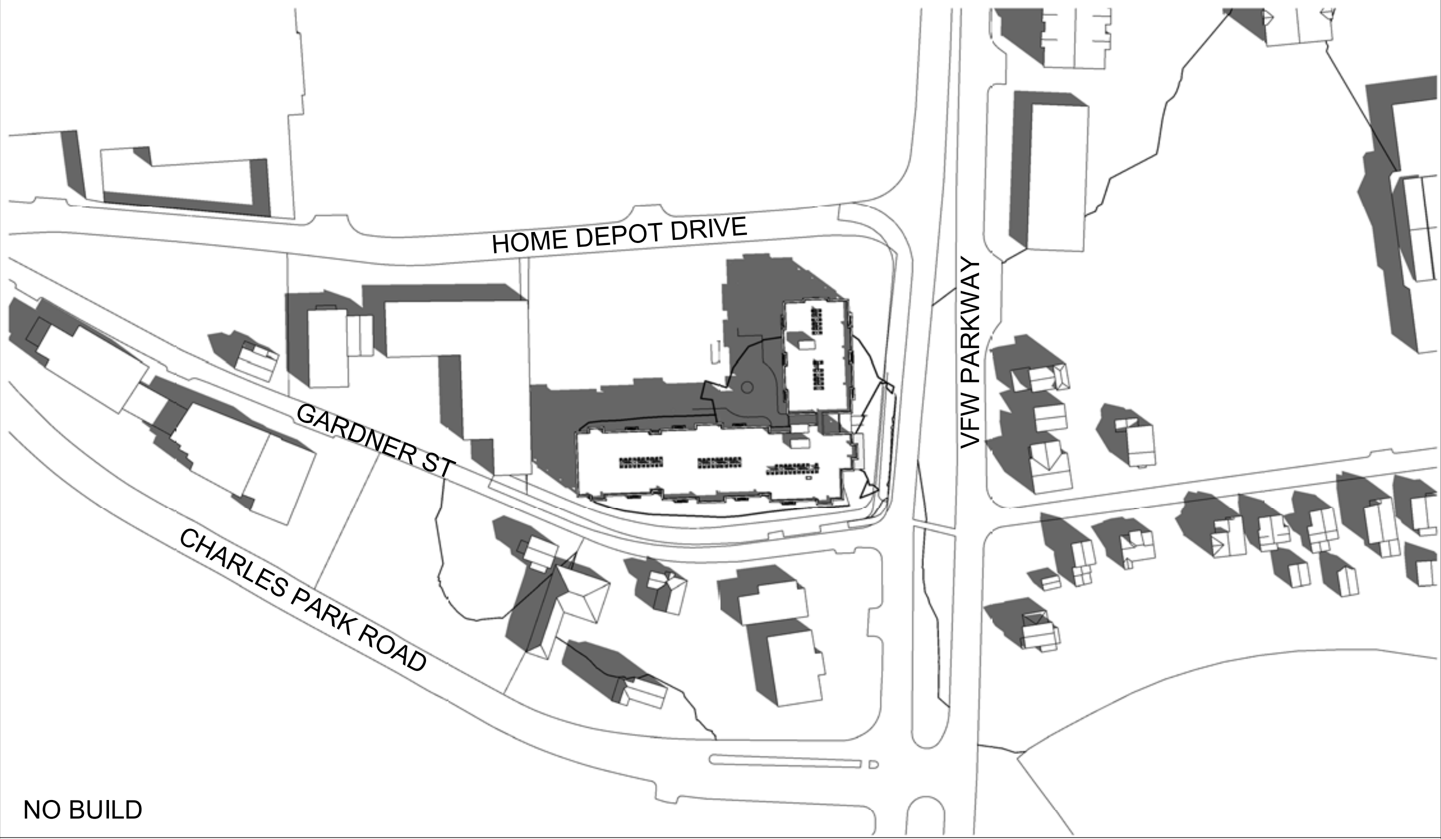
At 9:00 AM, new shadow is cast in a northwesterly direction onto portions of the adjacent Pizzeria UNO HQ area, onto the Home Depot access roadway and onto the Home Depot's parking area.

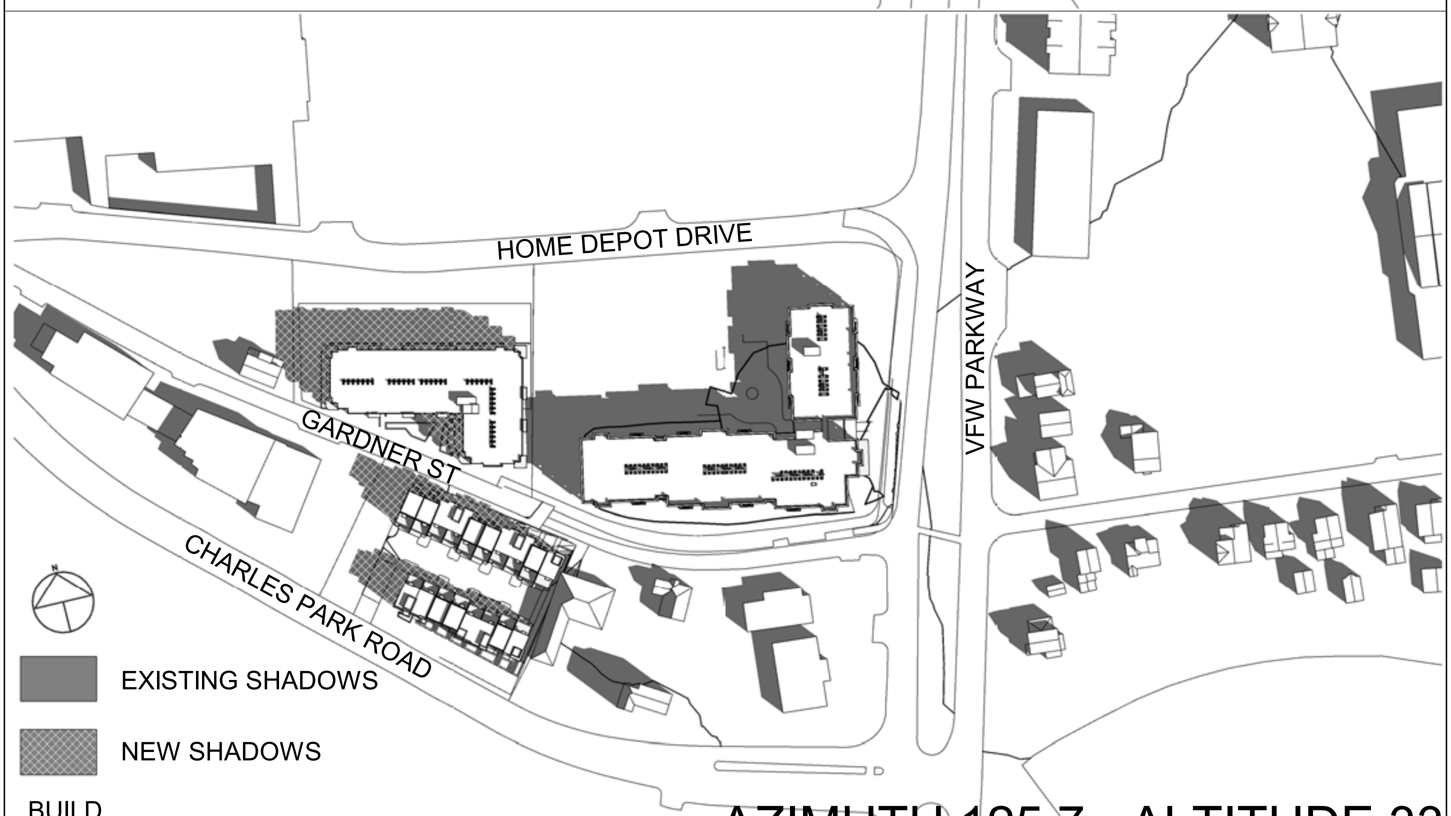
At 12:00 Noon, new shadow is cast in a northerly direction onto Gardner Street and a portion of the front yard along the Home Depot access driveway.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction across the Home Depot access driveway, with some new shadow on the adjoining Oak Row's parking lot and on the façade along Gardner Street.

4.1.6 Summary

The 4-story rental apartments' shadow impacts are generally contained within the development site except during the early mornings at 9:00 AM when shadow extends along Gardner Street to the adjacent residence opposite the Pizzeria Uno HQ, and at later times during the day where the shadow will extend to the Home Depot access driveway area. New shadow for the townhouses will fall on the adjacent Pizzeria Uno parking lot during the same 9:00 AM time period and will be contained within the development footprint or fall on Gardner Street during later times during the day. is generally limited to the streets surrounding the Site. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings. The proposed project height is within the allowable height maximum of 45-feet in the applicable West Roxbury zoning district.





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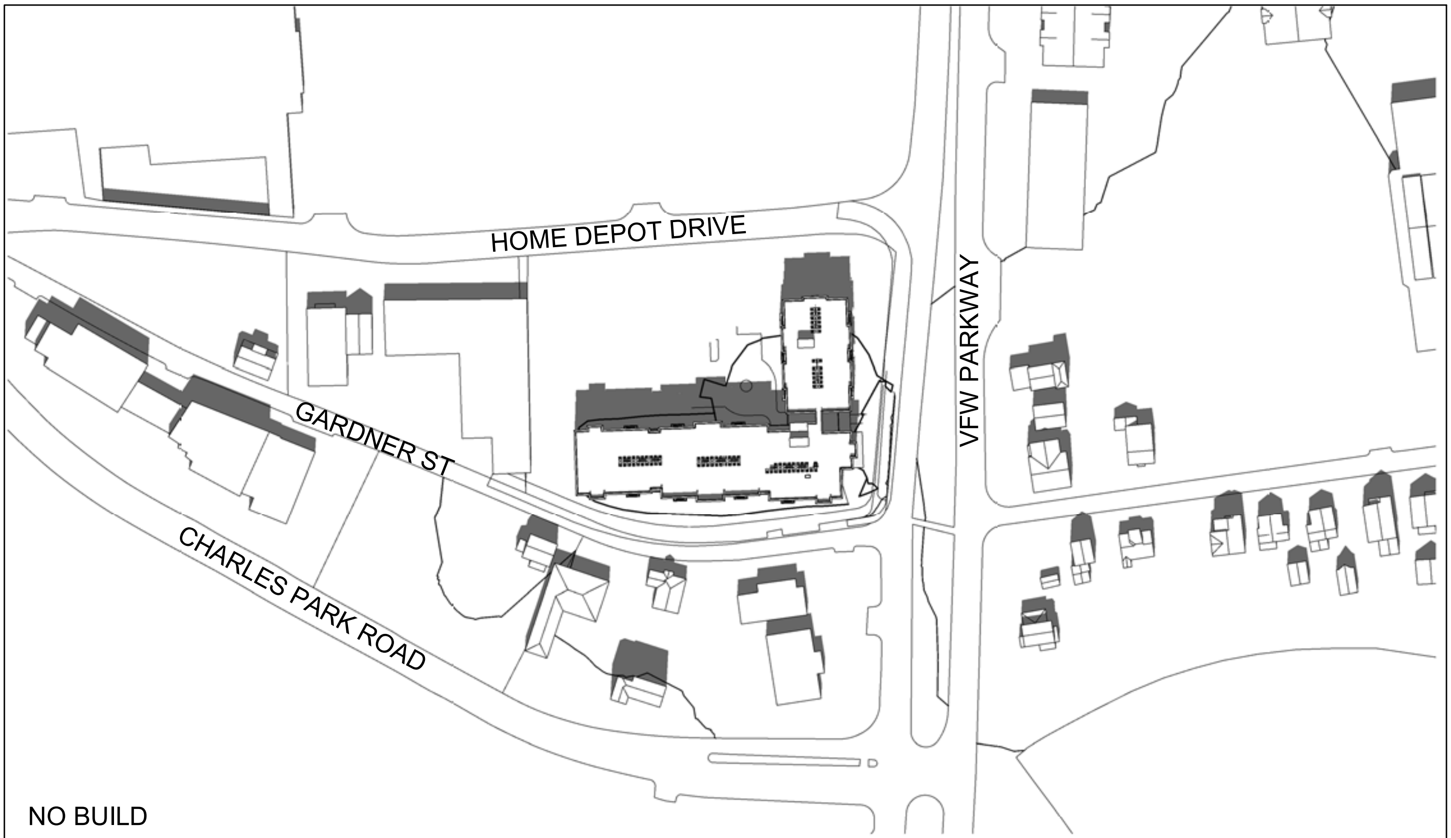
KHALSA DESIGN	**Architect** **KHALSA DESIGN INC** 17 Ivaloo Street, Suite 400, Somerville, MA 02143 Tel: 617-591-8682 www.TKGEAST.com COPYRIGHT KDI © 2019	**WEST BRIGHTON ACQUISITIONS LLC** **West Roxbury Residences** 178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132	Spring Equinox 9 AM Shadow Study		
			Project number	**18111**	4-1
			Date	**05/30/2019**	
			Drawn by	**ERS**	
			Checked by	**JSK**	Scale **1" = 200'-0"**



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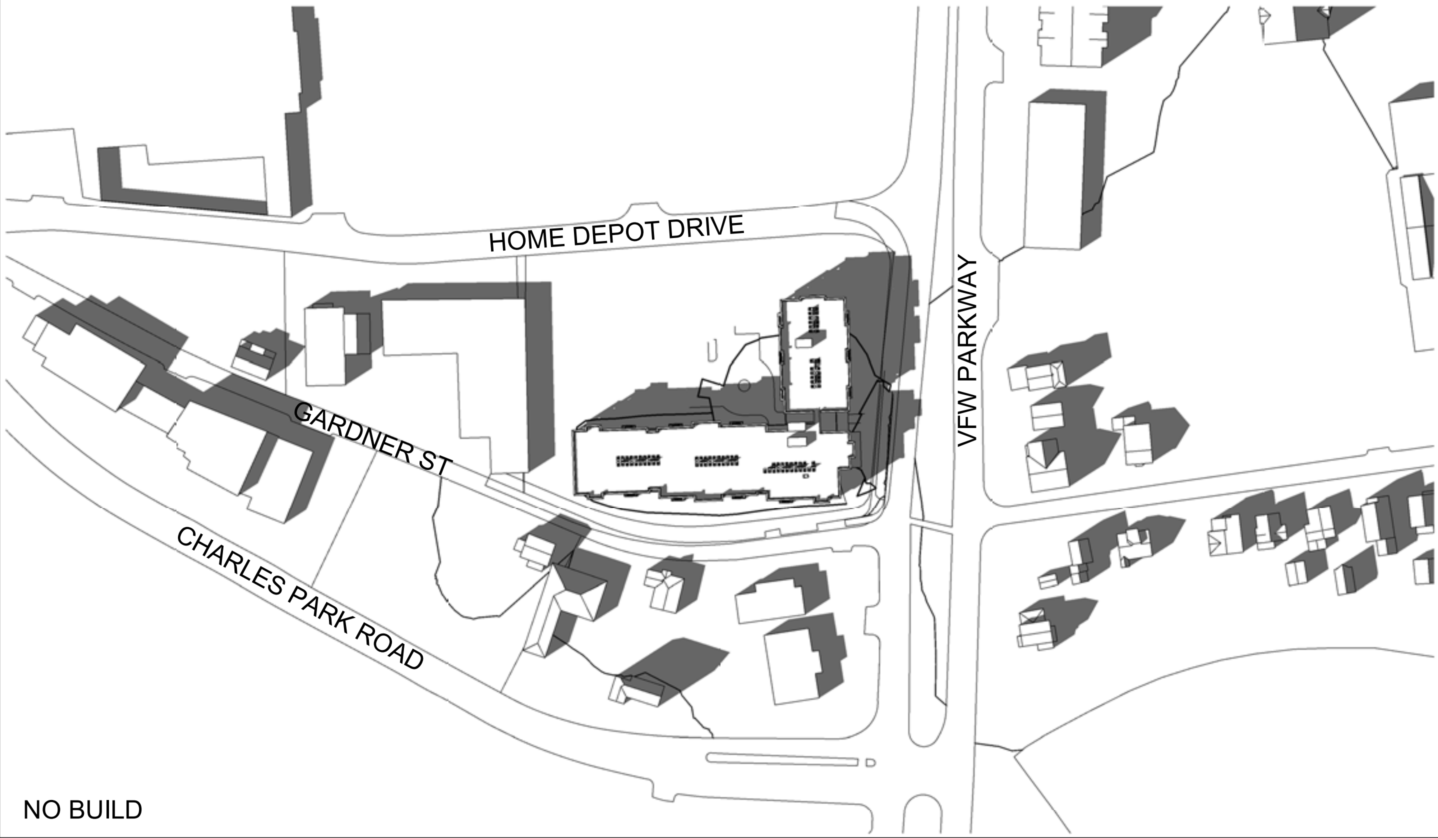
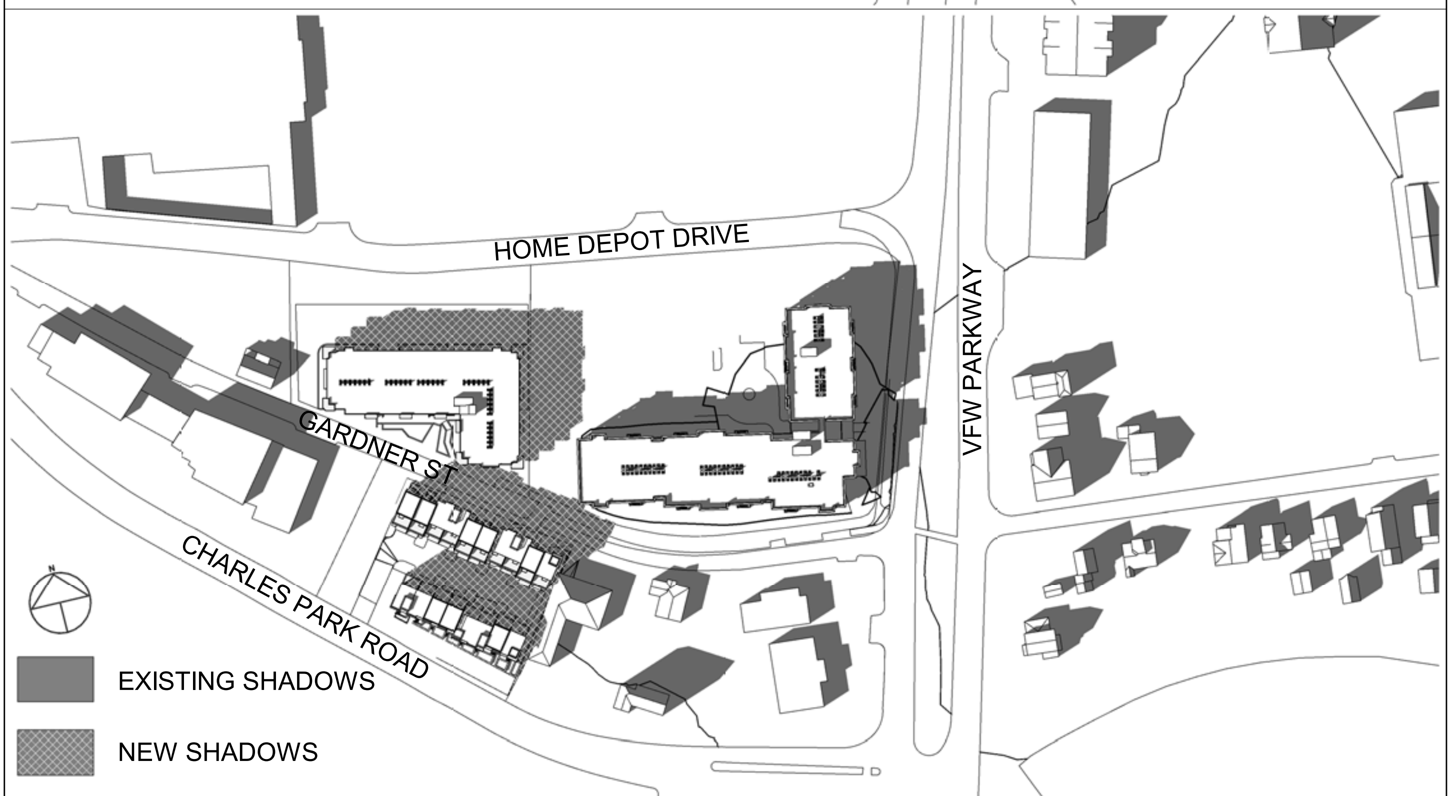
West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132

Spring Equinox Noon Shadow Study

Project number	**18111**	4-2
Date	**05/30/2019**	
Drawn by	**ERS**	
Checked by	**JSK**	Scale **1" = 200'-0"**





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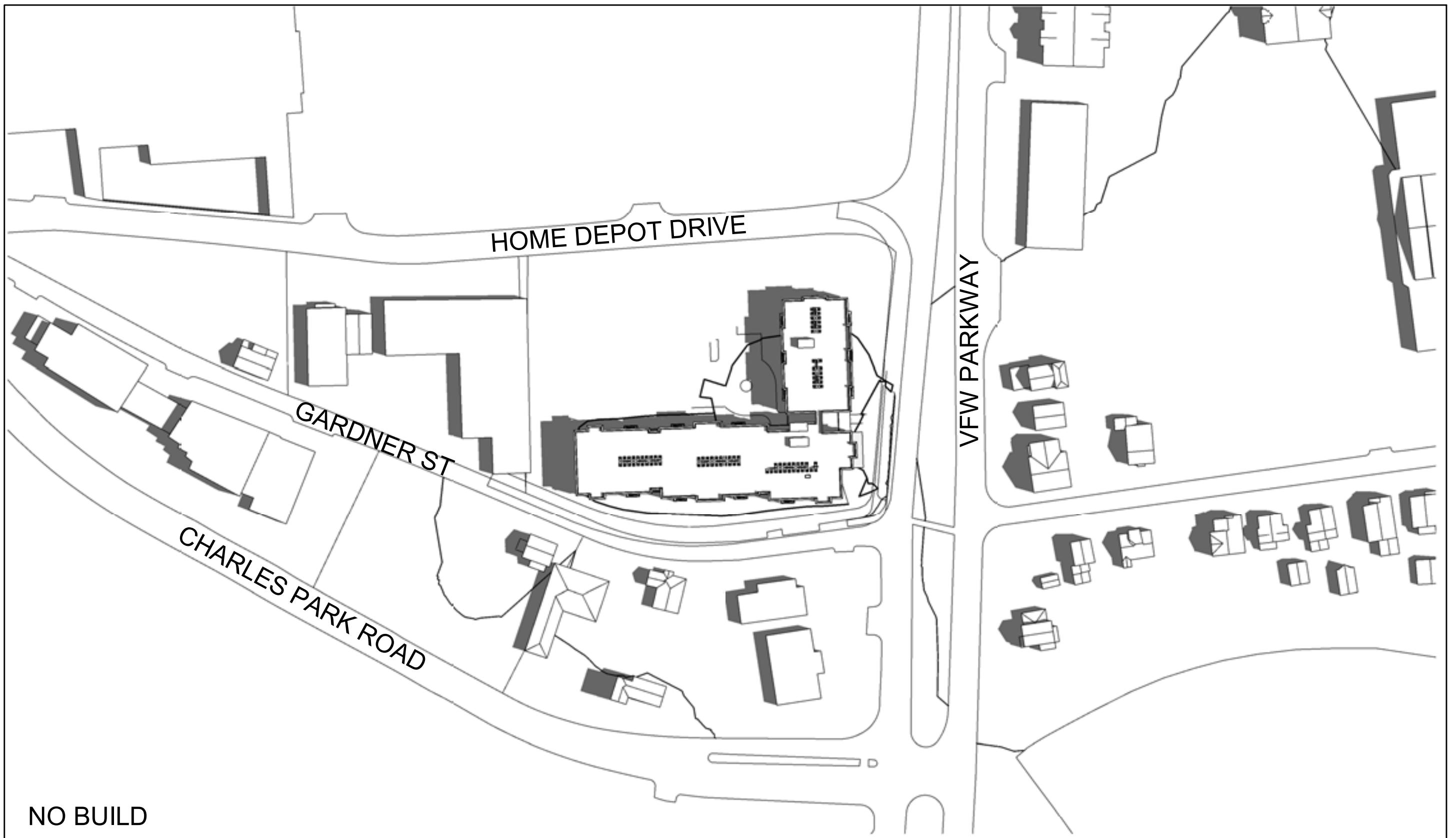
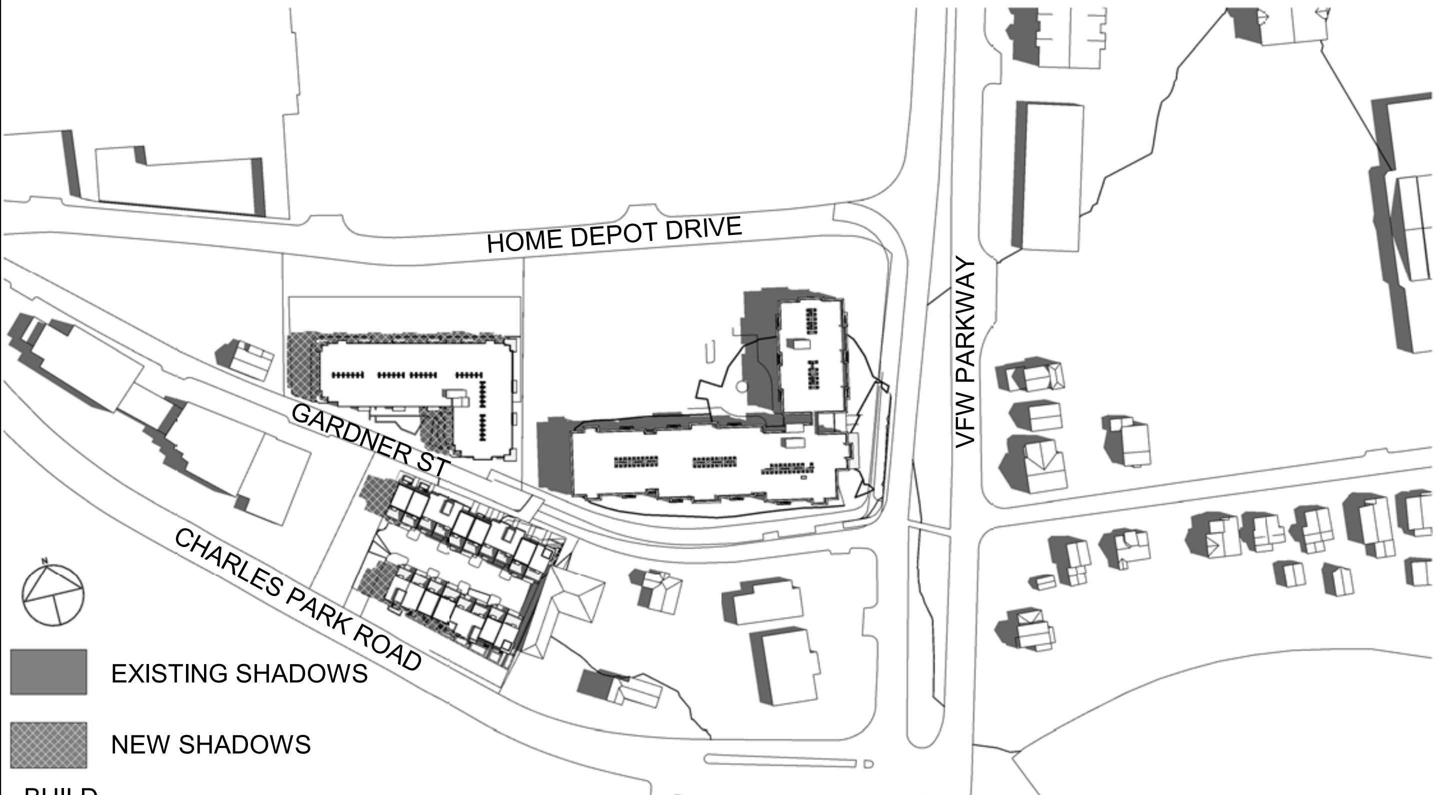
			Project number **18111** Date **05/30/2019** Drawn by **ERS** Checked by **JSK**	4-3 Scale **1" = 200'-0"**





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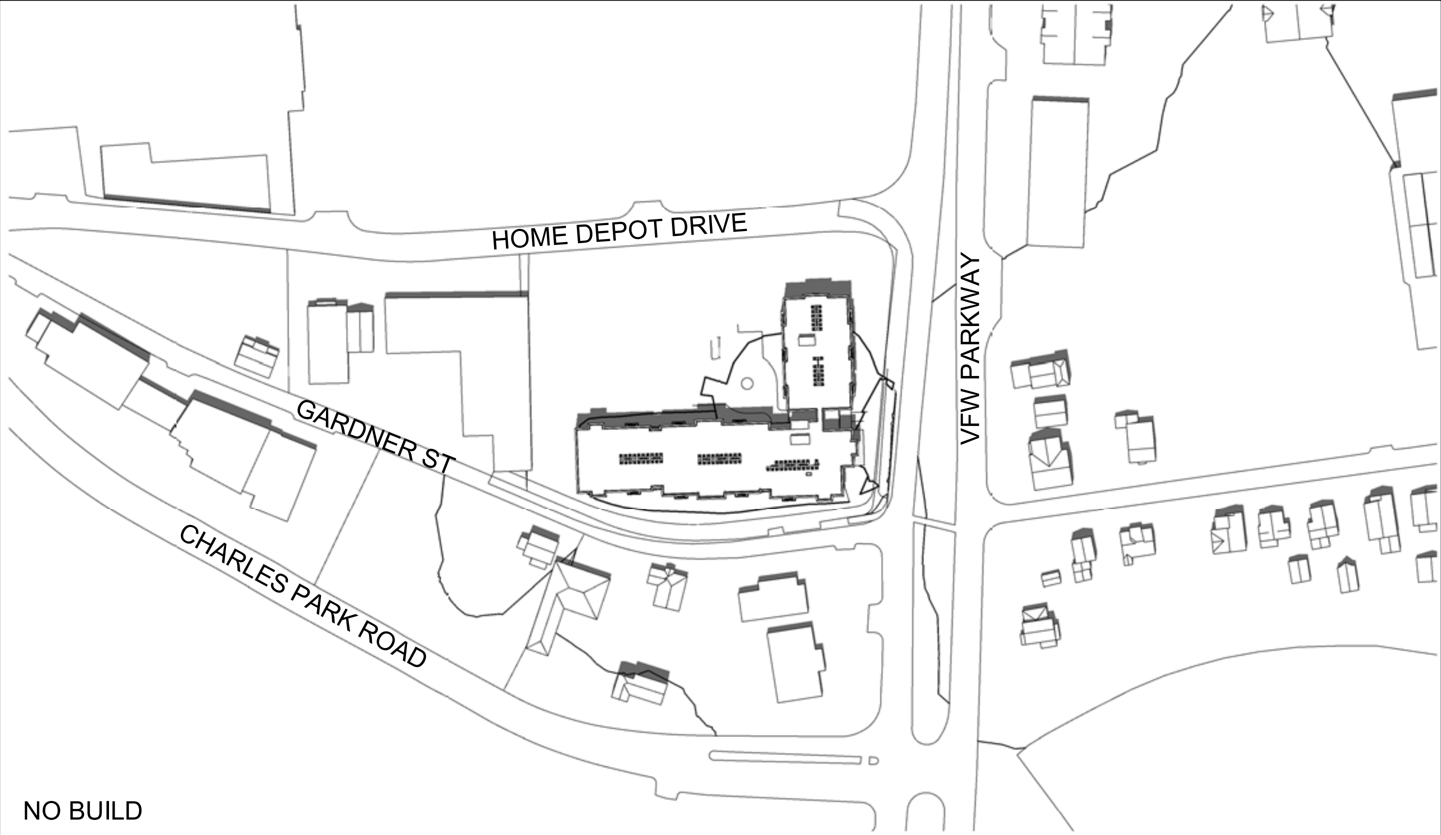
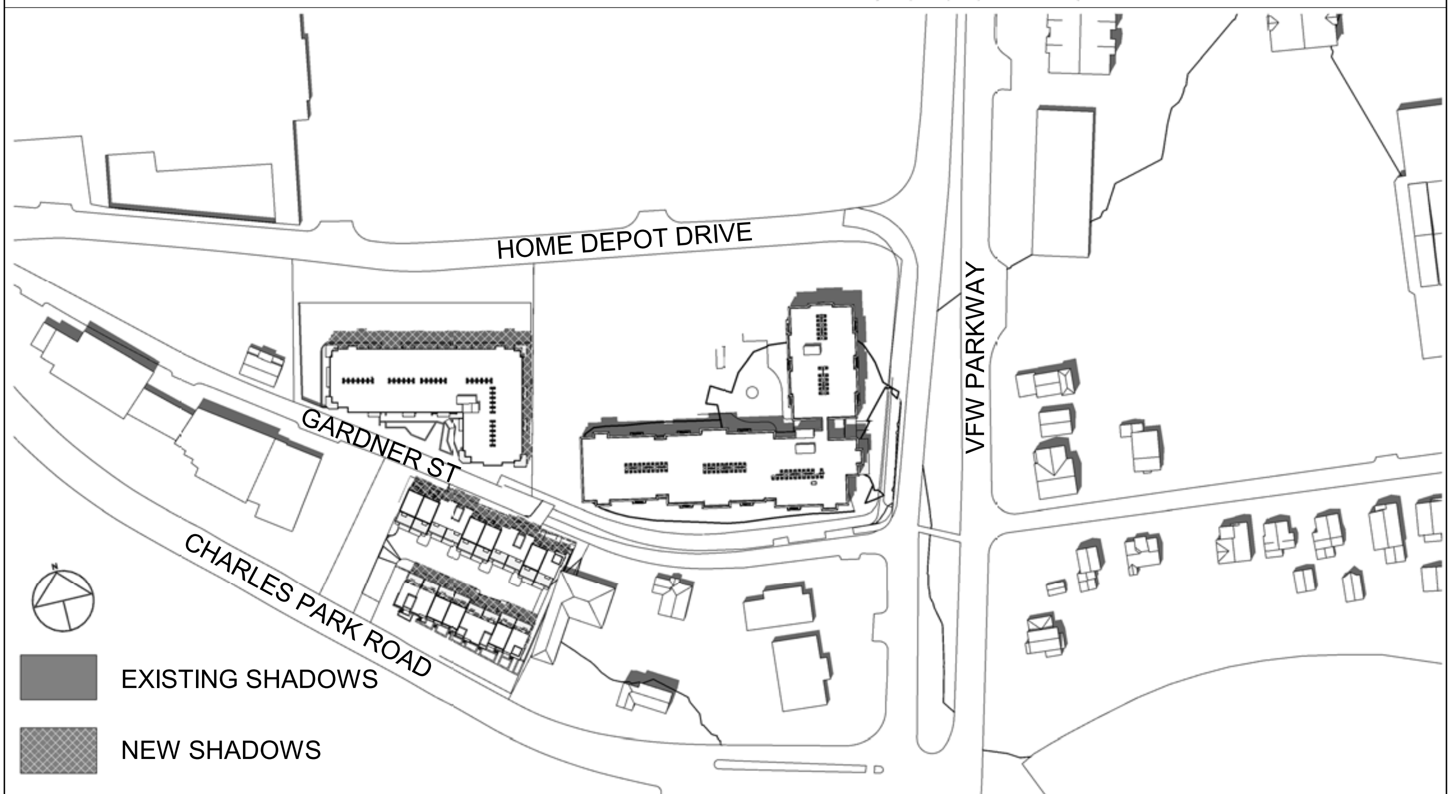
Summer Solstice 9 AM Shadow Study

Project number	**18111**	4-4
Date	**05/30/2019**	
Drawn by	**ERS**	
Checked by	**JSK**	Scale **1" = 200'-0"**





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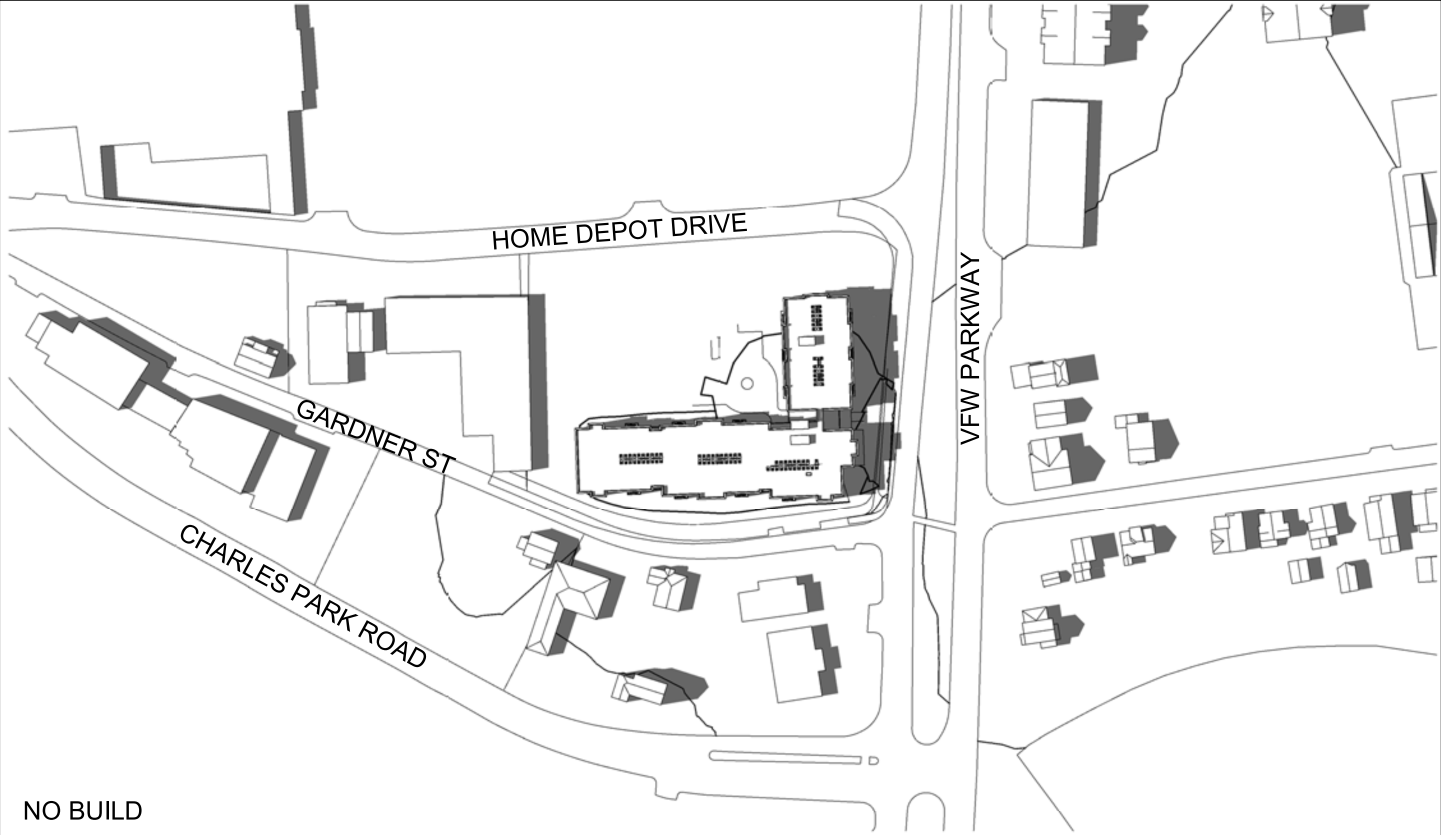
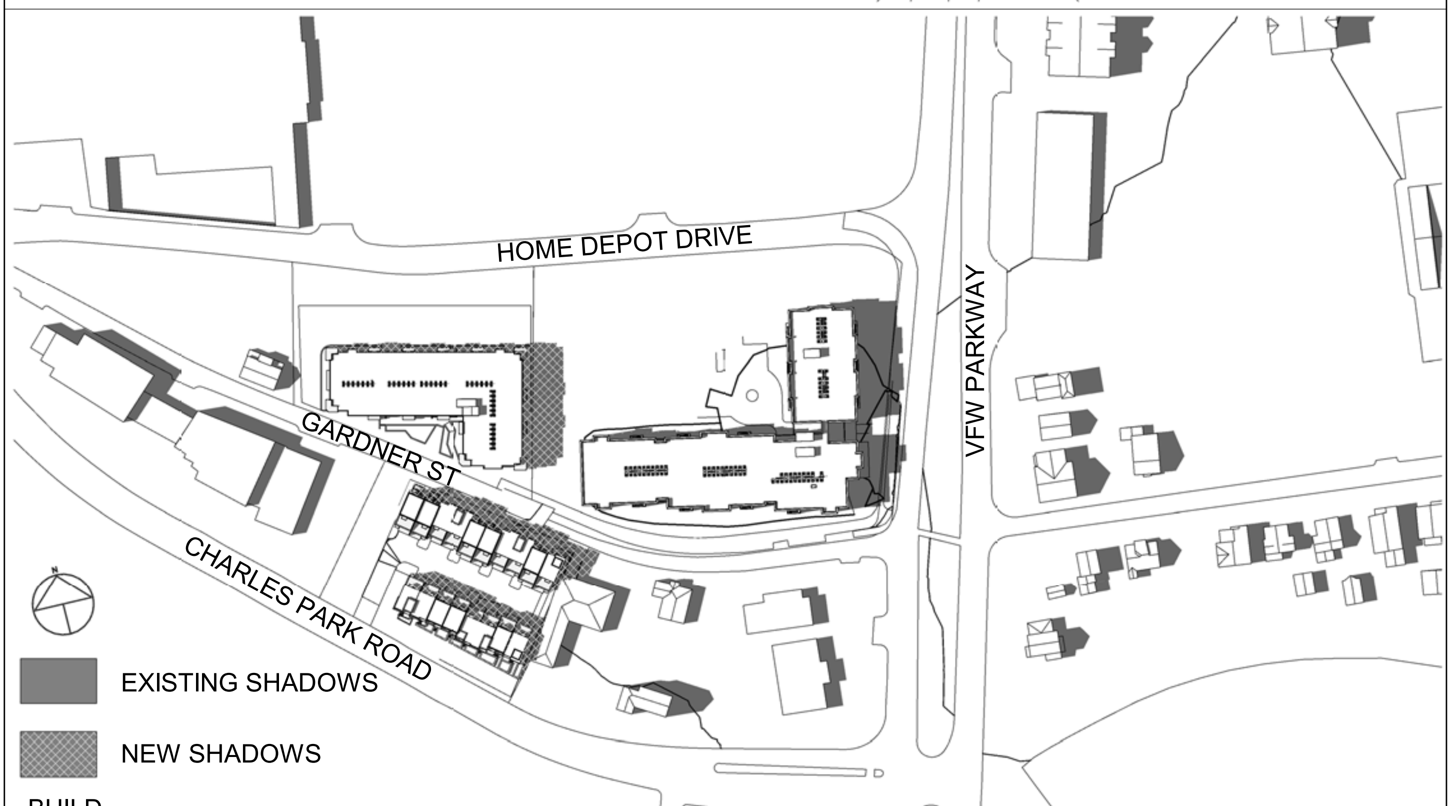
Summer Solstice Noon Shadow Study

Project number	**18111**	4-5
Date	**05/30/2019**	
Drawn by	**ERS**	
Checked by	**JSK**	Scale **1" = 200'-0"**





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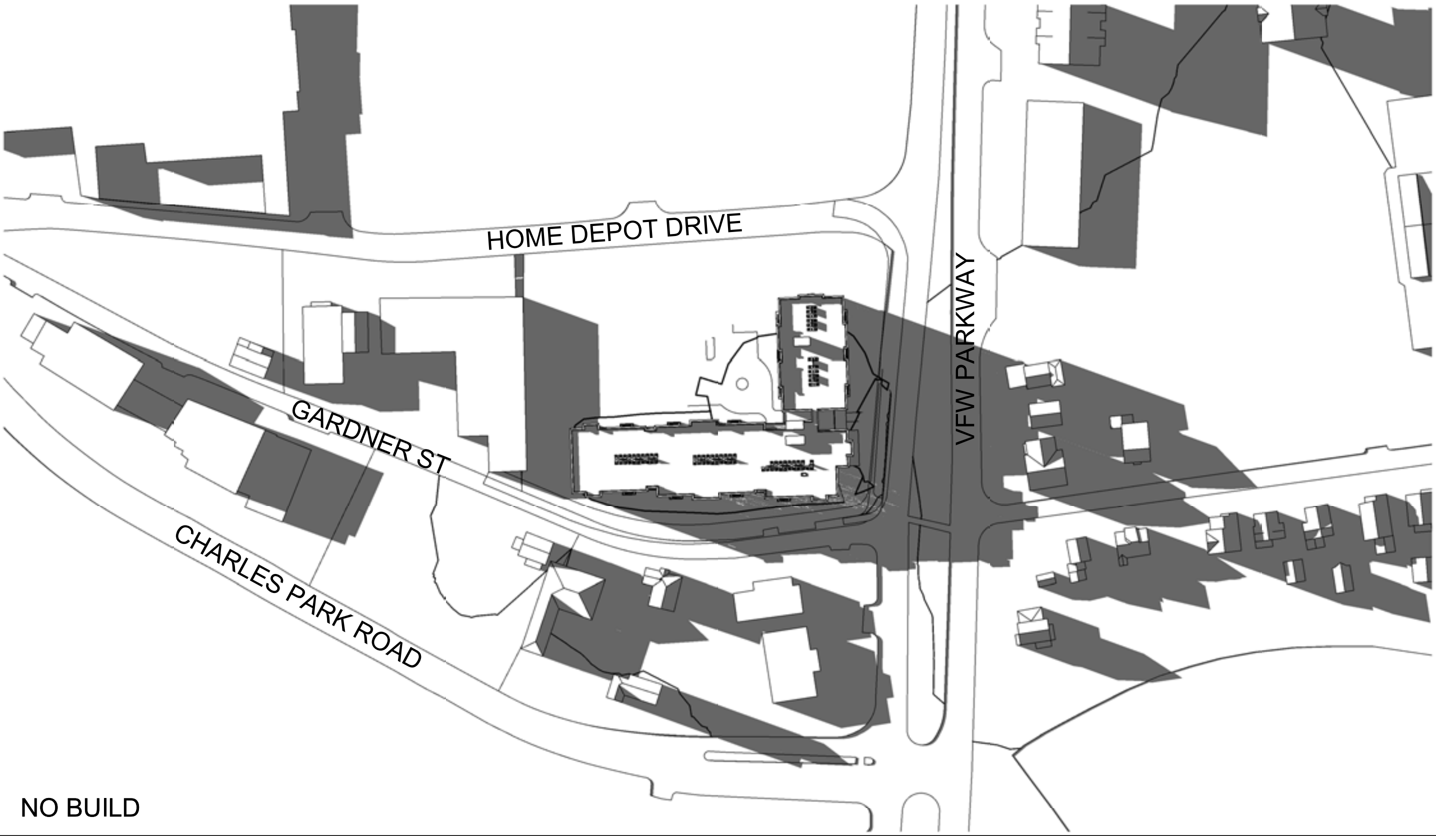
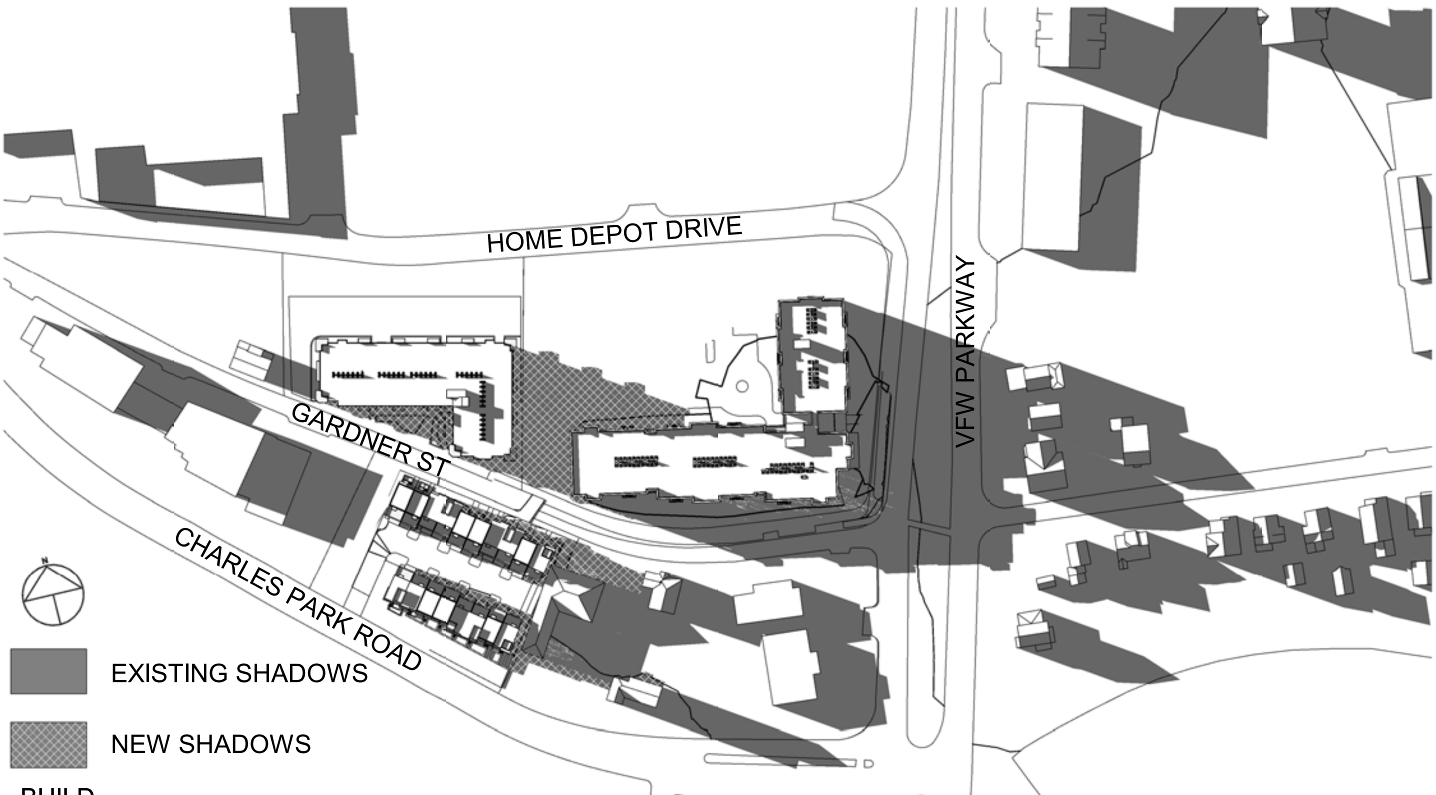
			Project number **18111** Date **05/30/2019** Drawn by **ERS** Checked by **JSK**	4-6 Scale **1" = 200'-0"**





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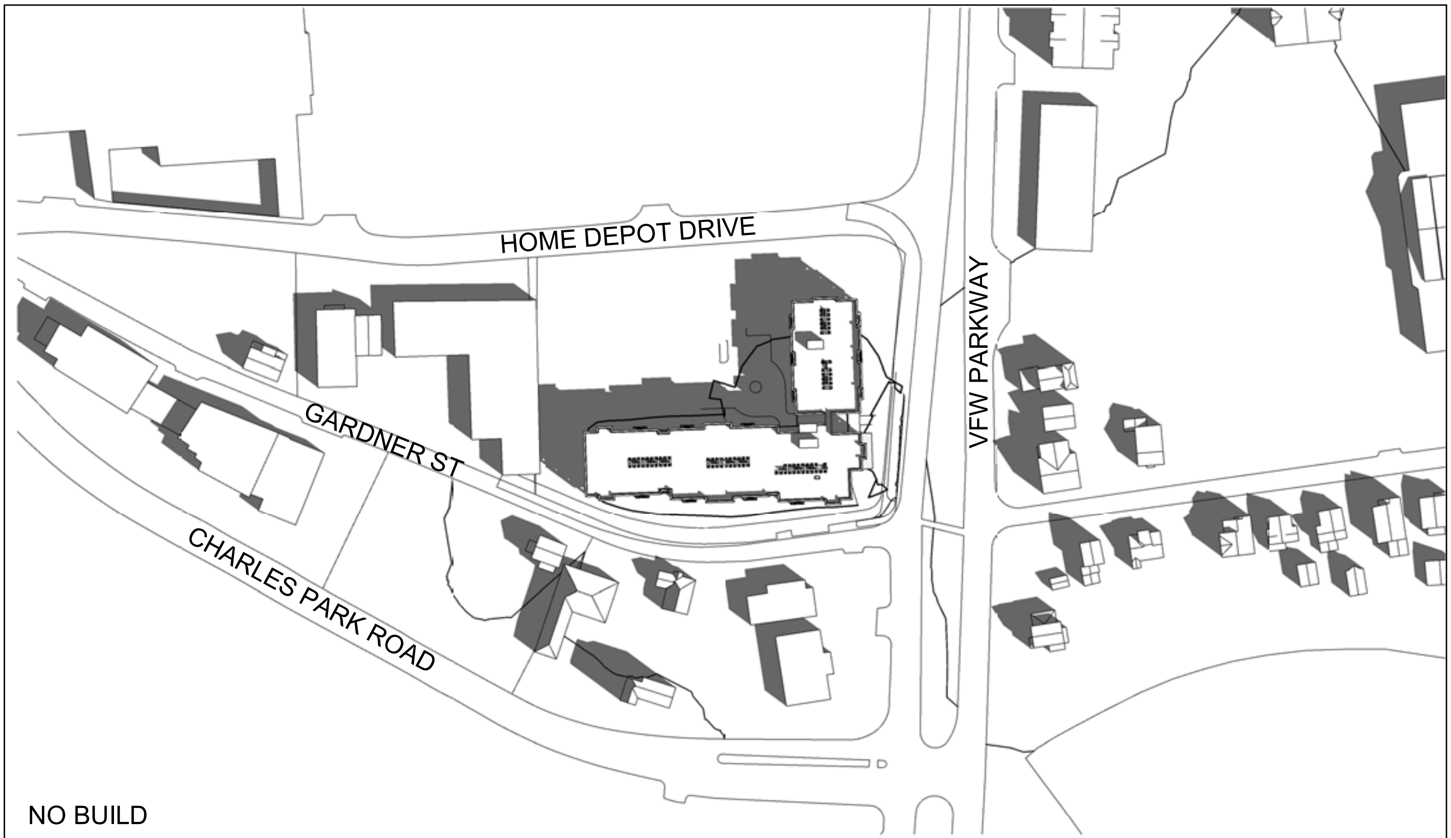

AZIMUTH 125.7 - ALTITUDE 33

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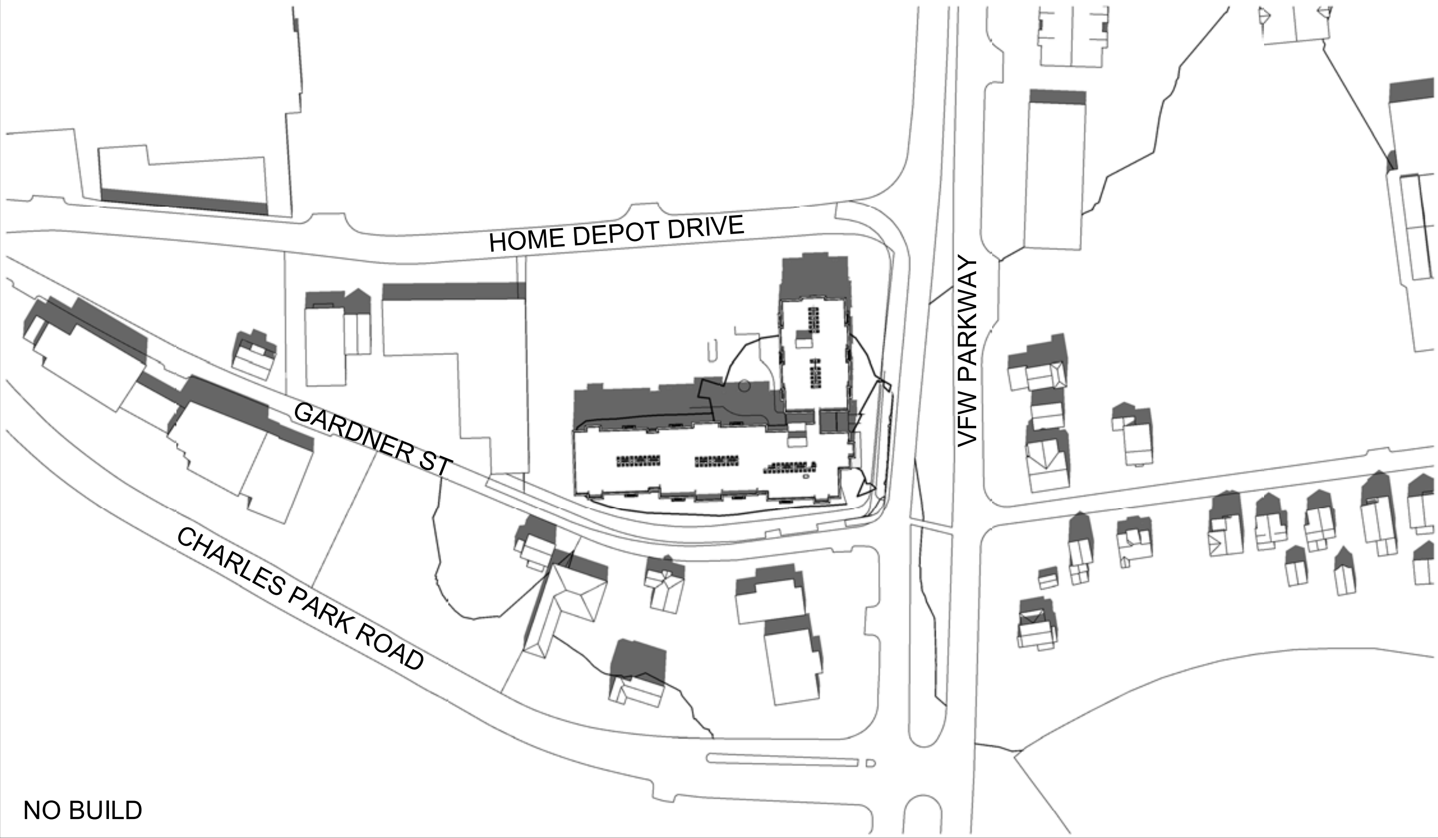
WEST BRIGHTON ACQUISITIONS LLC
West Roxbury Residences
178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132

Fall Equinox 9 AM Shadow Study

Project number	**18111**	4-8
Date	**05/30/2019**	
Drawn by	**ERS**	
Checked by	**JSK**	Scale **1" = 200'-0"**



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West Roxbury Residences
178, 189-197 Gardner Street and Charles Park Rd. West Roxbury, MA 02132

Fall Equinox Noon Shadow Study

Project number	**18111**	4-9
Date	**05/30/2019**	
Drawn by	**ERS**	
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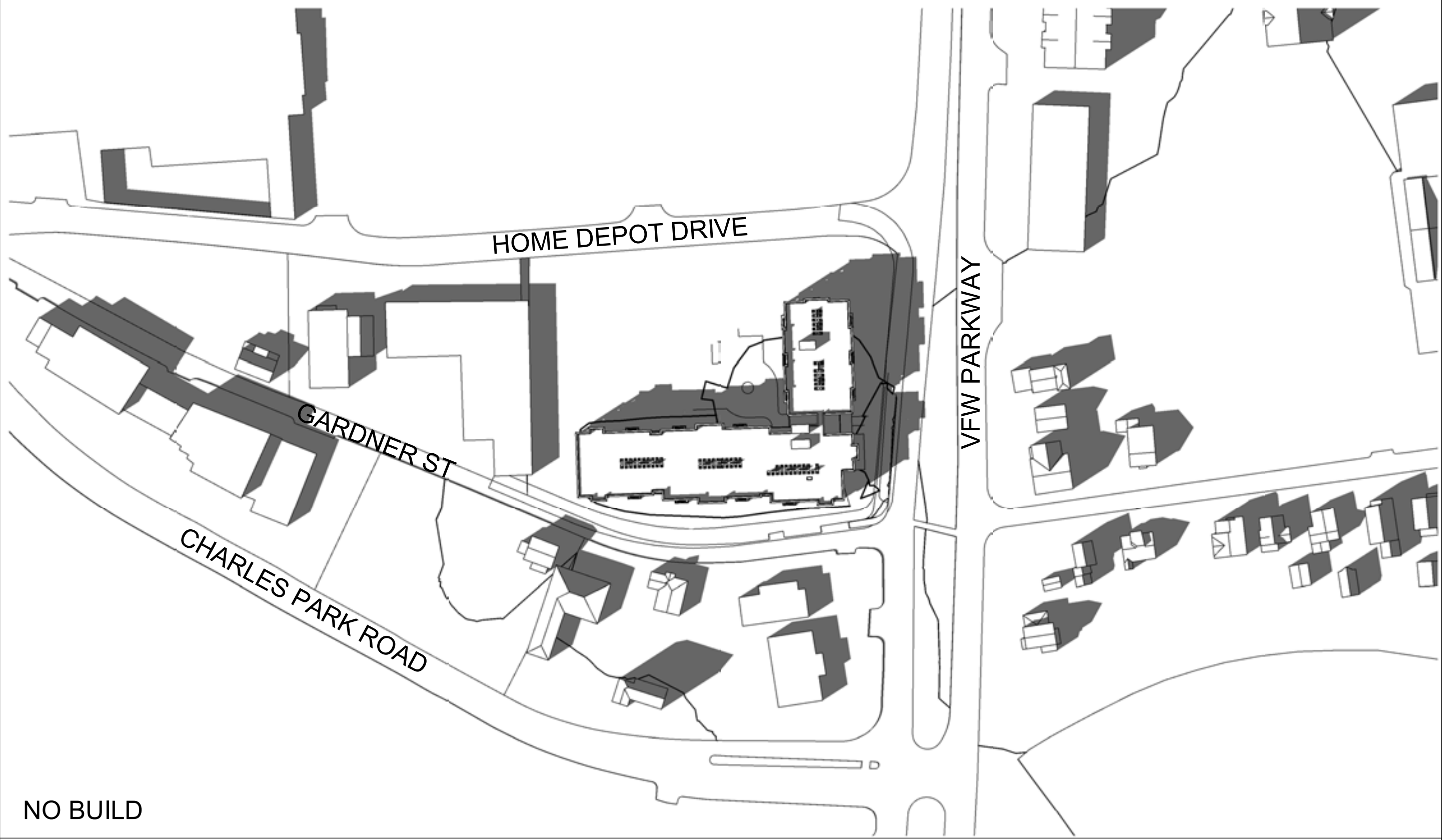

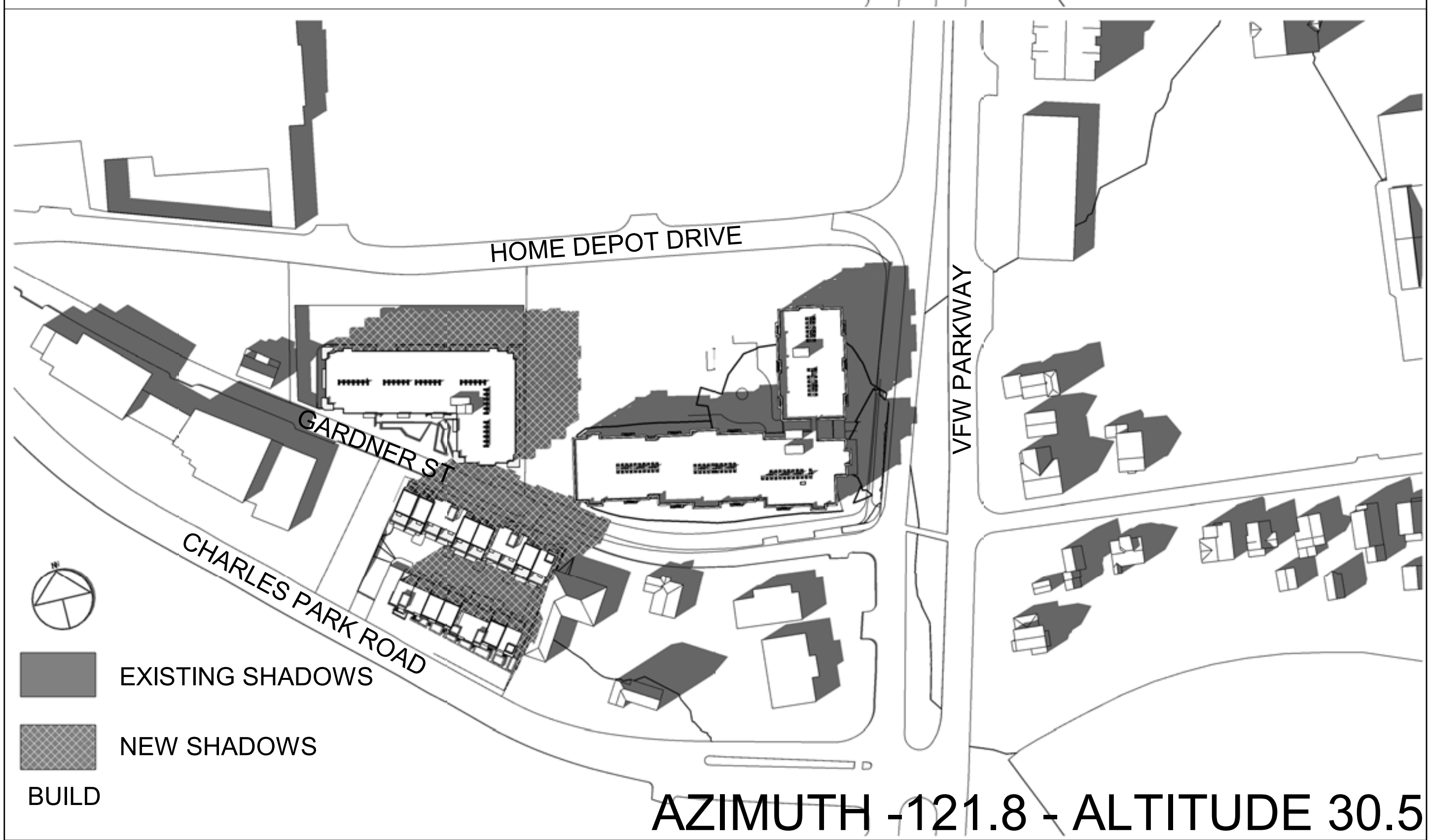

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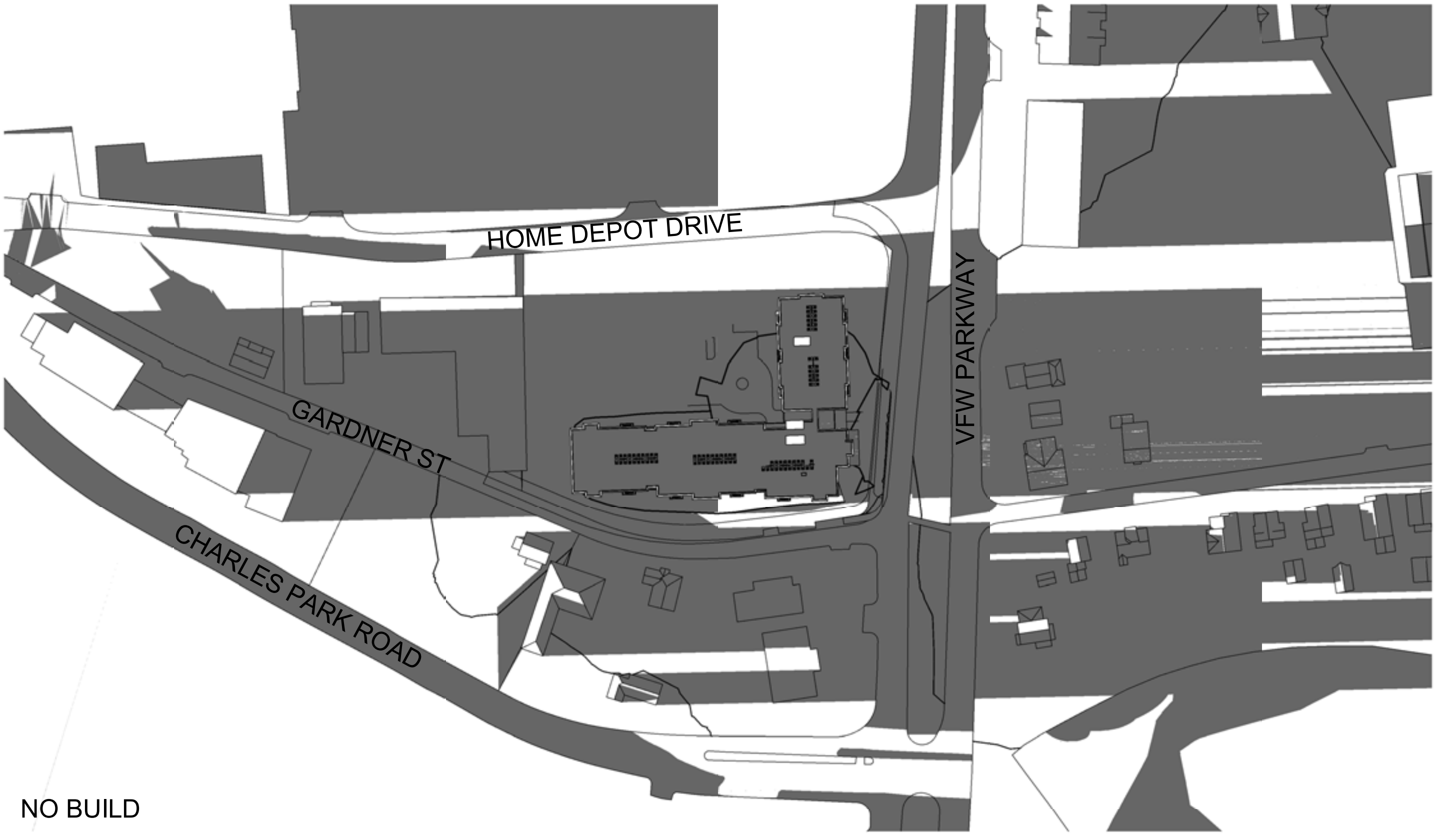
Fall Equinox 3 PM Shadow Study

Project number	**18111**
Date	**05/30/2019**
Drawn by	**ERS**
Checked by	**JSK**

4-10

Scale **1" = 200'-0"**



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AZIMUTH 141.9 - ALTITUDE 14.2

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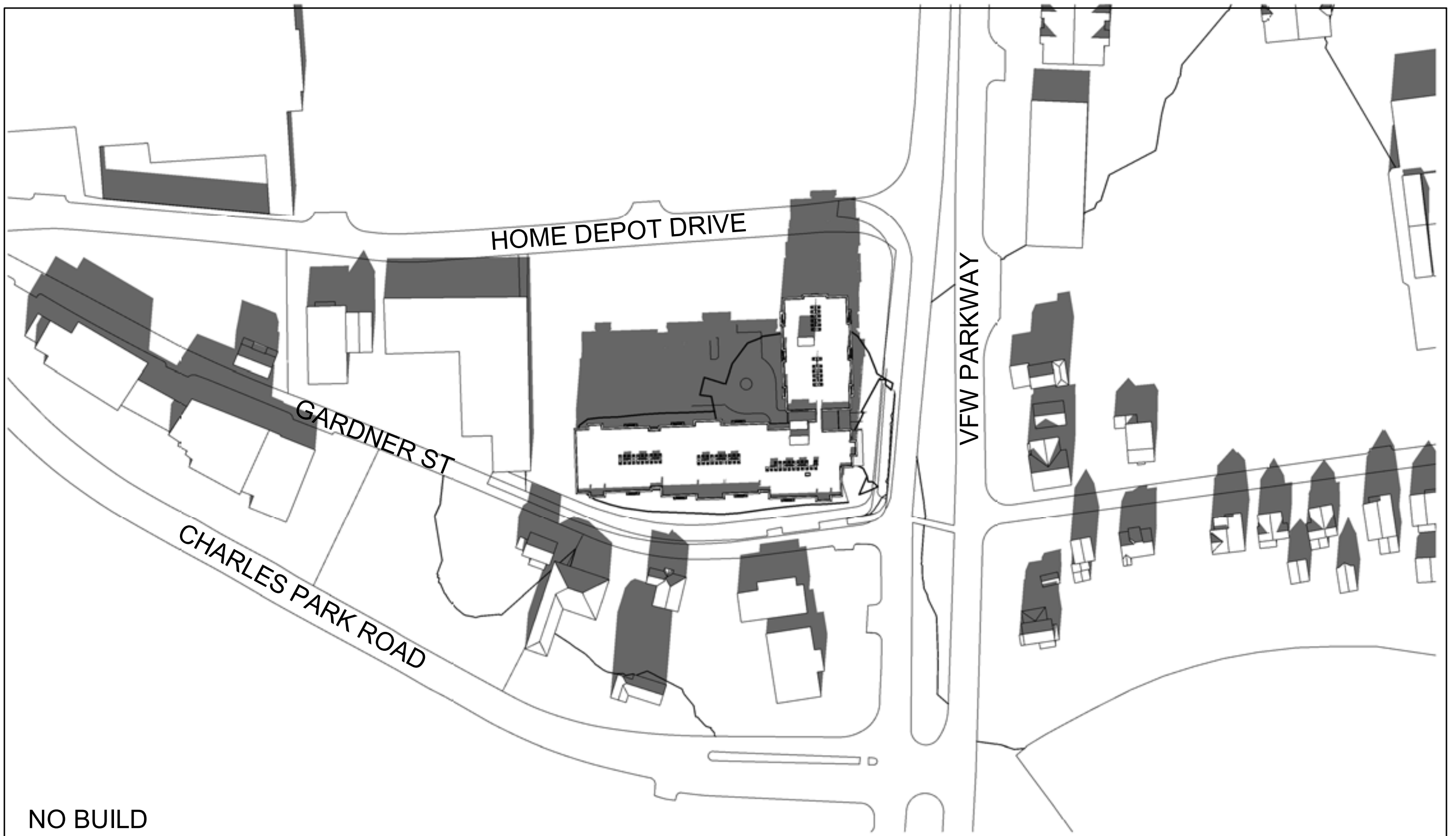
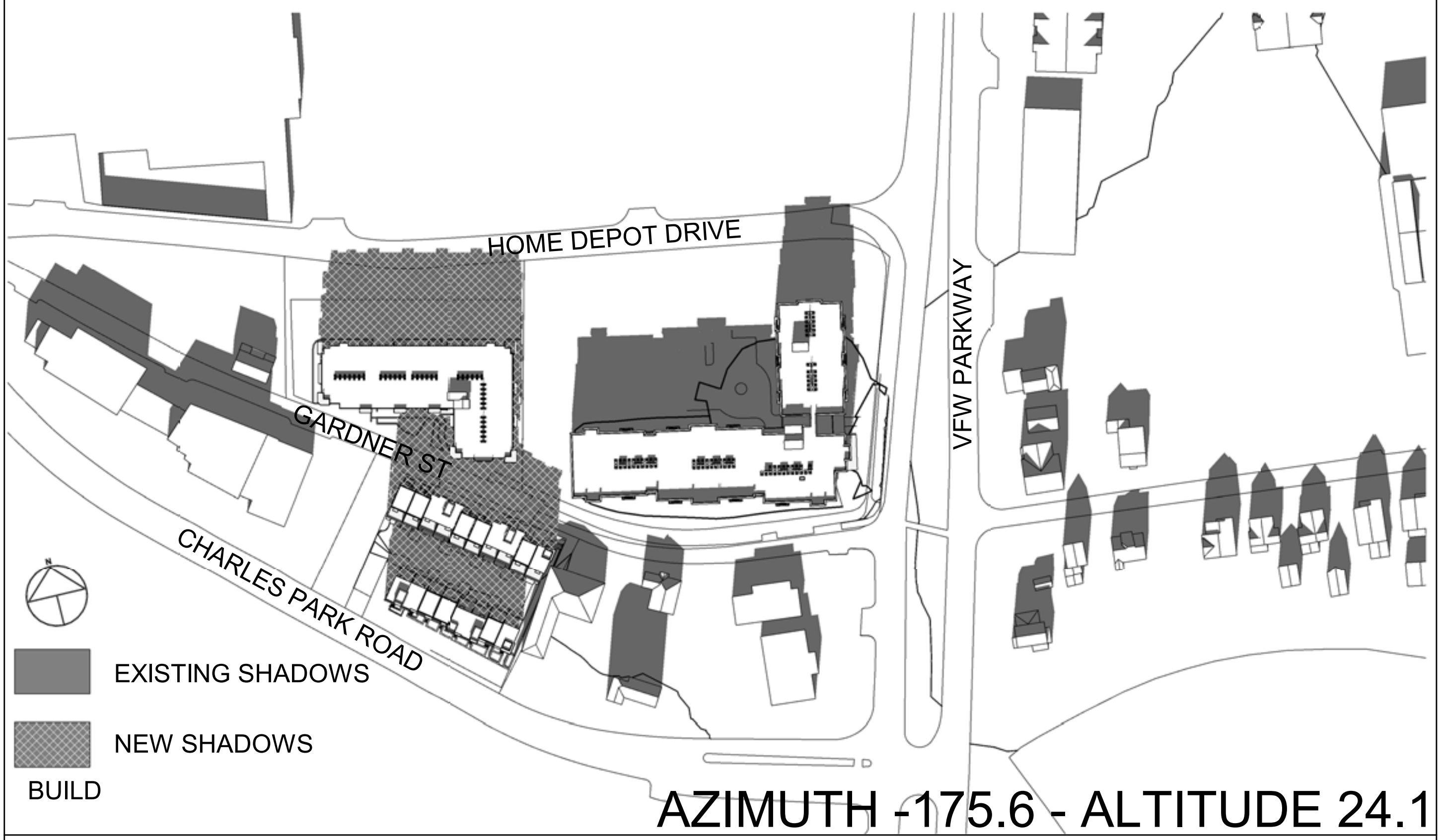
			Project number **18111** Date **05/30/2019** Drawn by **ERS** Checked by **JSK**	4-12 Scale **1" = 200'-0"**





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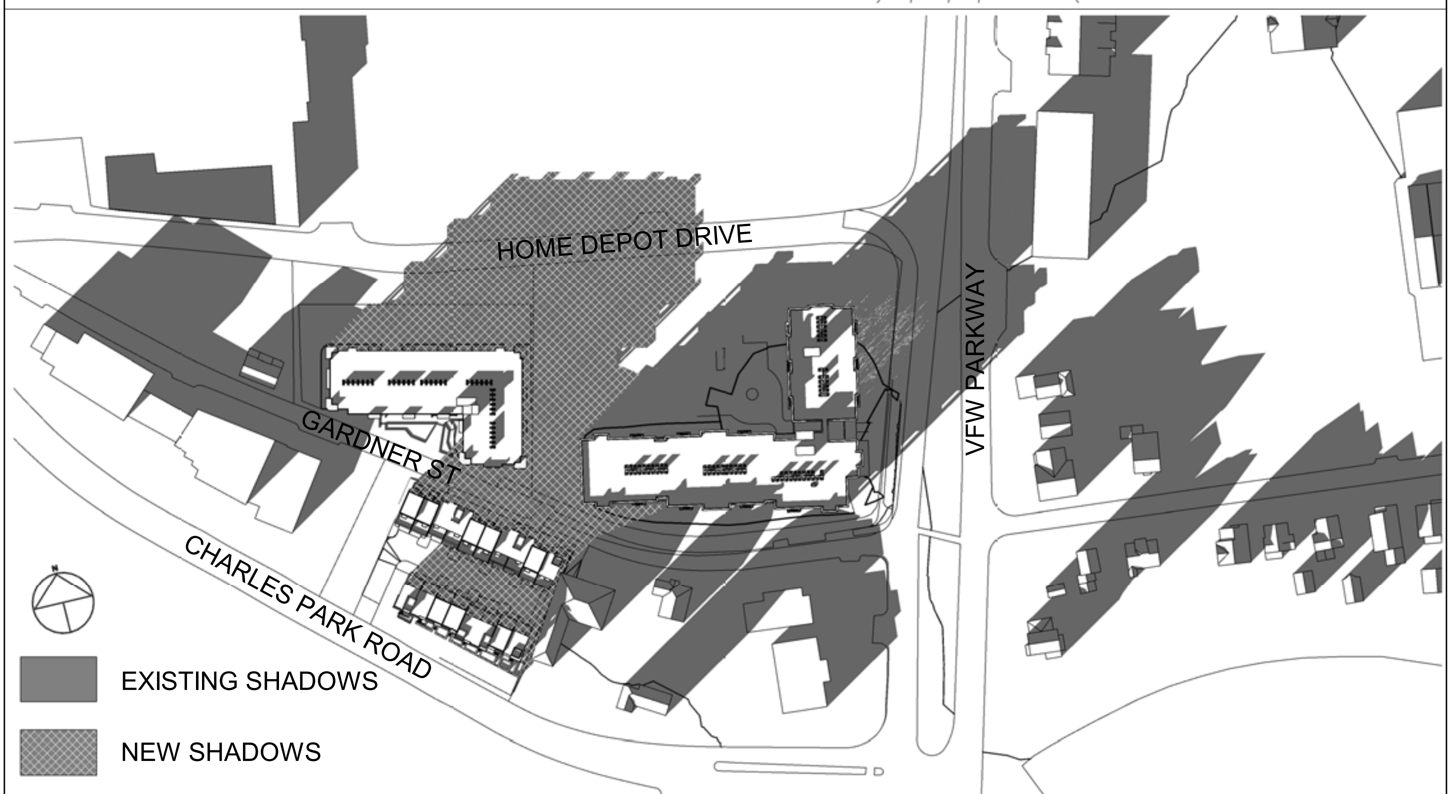
Winter Solstice Noon Shadow Study

Project number	**18111**	4-13
Date	**05/30/2019**	
Drawn by	**ERS**	
Checked by	**JSK**	Scale **1" = 200'-0"**



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			Project number **18111**	4-14
			Date **05/30/2019**	
			Drawn by **ERS**	
			Checked by **JSK**	Scale **1" = 200'-0"**

4.2 Air Quality

Tech Environmental, Inc. performed air quality analyses for the Proposed Project (the "Project"). These analyses consisted of: 1) an evaluation of existing air quality; 2) an evaluation of potential carbon monoxide (CO) impacts from the operation of the Project's enclosed parking garage, and 3) a microscale CO analysis for intersections in the Project area that meet the BPDA criteria for requiring such an analysis.

4.2.1 Existing Air Quality

The City of Boston is currently classified as being in attainment of the Massachusetts and National Ambient Air Quality Standards ("NAAQS") for all of the criteria air pollutants except ozone (see **Table 4.2-1**). These air quality standards have been established to protect the public health and welfare in ambient air, with a margin for safety.

The Massachusetts Department of Environmental Protection ("DEP") currently operates air monitors in various locations throughout the city. The closest, most representative, DEP monitors for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), coarse particulate matter (PM_{10}), lead, and ozone (O_3) are located at Harrison Avenue (Dudley Square). The closest, most representative, DEP monitor for fine particulate matter ($PM_{2.5}$) is located at North Street (North End).

Table 4.2-2 summarizes the DEP air monitoring data, for the most recent available, complete, three-year period (2015-2017), that are considered to be representative of the project area. **Table 4.2-2** shows that the existing air quality in the Project area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone and $PM_{2.5}$. Ozone is a regional air pollutant on which the small amount of additional traffic generated by this Project will have an insignificant impact. The Project's operations will not have a significant impact on local $PM_{2.5}$ concentrations.

Table 4.2-1. Massachusetts and National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	NAAQS (μg/m^3)
SO_2	1-hour[P] 24-hour[P] Annual[P] (Arithmetic Mean)	196[a] 365[b] 80
CO	1-hour[P] 8-hour[P]	40,000[b] 10,000[b]
NO_2	1-hour[P] Annual[P/S] (Arithmetic Mean)	188[c] 100
PM_{10}	24-hour[P/S]	150
$PM_{2.5}$	24-hour[P/S] Annual[P/S] (Arithmetic Mean)	35[d] 12[e,f]
O_3	8-hour[P/S]	147[g]
Pb	Rolling 3-Month Avg.[P/S] Calendar Quarter[P/S] (Arithmetic Mean)	0.15 1.5

P = primary standard; S = secondary standard.
[a] 99th percentile 1-hour concentrations in a year (average over three years).
[b] One exceedance per year is allowed.
[c] 98th percentile 1-hour concentrations in a year (average over three years).
[d] 98th percentile 24-hour concentrations in a year (average over three years).
[e] Three-year average of annual arithmetic means.
[f] As of March 18, 2013, the U.S. EPA lowered the $PM_{2.5}$ annual standard from 15 ug/m^3 to 12 ug/m^3.
[g] Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.075 ppm (147 ug/m^3) (effective May 27, 2008) and the annual PM_{10} standard was revoked in 2006.

Table 4.2-2. Representative Existing Air Quality in the Project Area

Pollutant, Averaging Period	Monitor Location	Value ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
CO, 1-hour	Von Hillern Street, Boston	1,925 (1.68 ppm)	40,000	5%
CO, 8-hour	Von Hillern Street, Boston	1,416 (1.24 ppm)	10,000	14%
NO_2, 1-hour	Von Hillern Street, Boston	89.0	188	47%
NO_2, Annual	Von Hillern Street, Boston	47.8	100	48%
Ozone, 8-hour	Harrison Avenue, Boston	120	137	87%
PM_{10}, 24-hour	Harrison Avenue, Boston	28	150	19%
$PM_{2.5}$, 24-hour	Von Hillern Street, Boston	14.2	35	41%
$PM_{2.5}$, Annual	Von Hillern Street, Boston	6.5	12	54%
Lead, Quarterly	Harrison Avenue, Boston	0.017	0.15	12%
SO_2, 1-hour	Harrison Avenue, Boston	15.8	196	8%

Source: MassDEP, http://www.mass.gov/eea/agencies/massdep/air/quality/air-monitoring-reports-and-studies.html.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2015 - 2017). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

(2) The eight-hour ozone value is the 3-year average of the annual fourth-highest values, the 24-hour $PM_{2.5}$ value is the 3-year average of the 98th percentile values, the annual $PM_{2.5}$ value is the 3-year average of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.

(3) The one-hour NO_2 value is the -year average of the 98th percentile values and the one-hour SO_2 value is the -year average of the 99th percentile values.

(4) Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m^3) (effective December 28, 2015); the annual PM_{10} standard was revoked in 2006 and the 3-hour SO_2 standard was revoked by the US EPA in 2010.

4.2.2 Impacts from Parking Garage

The Project includes an enclosed parking garage for the apartments designed to provide parking spaces for 44 vehicles. An analysis of the worst-case air quality impacts from the proposed parking garage was performed (see **Appendix B**). The procedures used for this analysis are consistent with U.S. EPA's Volume 9 guidance.[1] CO emissions from motor vehicles operating inside the garage were calculated and the CO concentrations surrounding the Project were determined based on morning and afternoon peak traffic periods.

[1] US EPA, "Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources," EPA-450/4-78-001, September 1978.

The objective of this analysis was to determine the maximum CO concentrations at the closest sensitive receptors surrounding the Project during peak traffic periods. These closest sensitive receptors include: air intakes located on the proposed building and nearby existing buildings, and pedestrians at ground level anywhere near the Project. The parking garage CO emissions were modeled using an U.S. EPA-approved air model.

Garage Ventilation System

The proposed parking garage will require mechanical ventilation. The garage ventilation system will be designed to provide adequate dilution of the motor vehicle emissions before they are vented outside. The design of the garage ventilation system will meet all building code requirements. Full ventilation of the garage will require a maximum flow of approximately 14,250 cubic feet per minute (cfm) of fresh air. This quantity of air is designed to meet the building code and will be more than adequate to dilute the emission inside the parking garage to safe levels before they are vented outside.

Peak Garage Traffic Volumes

The peak morning and afternoon one-hour entering and exiting traffic volumes for the garage are shown in **Table 4.2-3**. The values are for vehicles entering and exiting the garage.

Table 4.2-3. Peak-Hour Garage Traffic Volumes

Period	Entering (vehicles / hour)	Exiting (vehicles / hour)	Total (vehicles/hour)
Morning Peak Hour	8	23	31
Afternoon Peak Hour	24	15	39

Source: Howard Stein Hudson

Motor Vehicle Emission Rates

The U.S. Environmental Protection Agency (EPA) MOVES2014b emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph. The inputs to the MOVES2014b model followed the latest guidance from the Massachusetts Department of Environmental Protection (DEP) and were performed for the future traffic year of 2026. The CO emission rate calculated by MOVES2014b, for vehicles moving at 5 miles per hour (mph), was 3.045 grams per vehicle-mile for each entering and exiting vehicle. These emission rates apply to wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOVES2014b model output is provided in the **Appendix B.**

To determine the maximum one-hour CO emissions generated by the vehicle traffic it was necessary to estimate the amount of time each motor vehicle will be in the parking garage with its engine running. To be conservative, it was assumed that every car entering the garage will travel to the furthest parking spot, and that the vehicles leaving the garage will have to travel the same distance from inside the garage to the exit. The calculations in **Appendix B** show the distance each vehicle was calculated to travel in the garage for the weekday afternoon peak period.

Peak Garage CO Emission Rate and CO Concentration Inside the Garage

The peak one-hour CO emission rate for the parking garage was calculated to be 0.073 grams per minute for the morning peak hour and 0.092 grams per minute for the afternoon peak hour. Applying the maximum volumetric garage ventilation flow rate for the parking garage, the peak one-hour CO concentration inside the garage was calculated to be 0.16 parts of CO per million parts of air (ppm) for the morning peak hour and 0.20 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 0.20 ppm with a peak one-hour emissions rate of 0.092 grams/minute (0.0015 grams/second), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

Peak Ambient CO Concentration

Worst-case concentrations of CO from the parking garage were predicted for locations around the buildings using AERMOD model (Version 18081) in screening-mode. The results of the air quality analysis for locations outside and around the buildings are summarized in **Table 4.2-4**. The results in **Table 4.2-4** represent all outside locations on and near the Project Site, including nearby building air intakes and nearby residences. **Appendix B** contains the AERMOD model output.

The AERMOD model in screening-mode was used to predict the maximum concentration of CO by modeling the enclosed parking garage emissions as a volume source using worst-case meteorological conditions for an urban area. The screening-mode option simulates modeling results predicted by AERMOD. The predicted concentrations presented here represent the worst-case air quality impacts from the parking garage at all locations on and around the Project.

AERMOD predicted that the maximum one-hour CO concentration from the parking garage will be 0.064 ppm (72.90 $\mu g/m^3$). This concentration represents the maximum CO concentration at any location surrounding the Project. AERSCREEN guidance allows the maximum eight-hour CO impact to be conservatively estimated by multiplying the maximum one-hour impact by a factor of 0.9 (i.e. the eight-hour impact is 90% of the one-hour impact). The maximum predicted eight-hour CO concentration was determined to be approximately 0.057 ppm (0.064 ppm x 0.9).

The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare in ambient air, with a margin for safety. The NAAQS for CO are 35 ppm for a one-hour average and 9 ppm for an eight-hour average. The Commonwealth of Massachusetts has established the same standards for CO. The CO background values of 1.68 ppm for a one-hour period and 1.24 ppm for an eight-hour period were added to the maximum predicted garage ambient impacts to represent the CO contribution from other, more distant, sources. With the background concentration added, the peak, total, one-hour and eight-hour CO impacts from the parking garage, at any location around the building, will be no larger than 1.75 ppm and 1.29 ppm, respectively. These maximum predicted total CO concentrations (garage exhaust impacts plus background) are safely in compliance with the NAAQS. This analysis demonstrates that the operation of the parking garage will not have an adverse impact on air quality.

Table 4.2-4. Peak Predicted Parking Garage Air Quality Impacts

Location	Peak Predicted One-Hour Impact (ppm)	One-Hour NAAQS (ppm)	Peak Predicted Eight-Hour Impact (ppm)	Eight-Hour NAAQS (ppm)
Outside – Surrounding the Building* (Parking Garage)	1.75**	35 (NAAQS)	1.29**	9 (NAAQS)

NAAQS = Massachusetts and National Ambient Air Quality Standards for CO (ppm = parts per million)
* Representative of maximum CO impact at all nearby residences, buildings, and sidewalks.
** Includes background concentrations of 1.68 ppm for the one-hour period and 1.24 ppm for the eight-hour period.

4.2.3 Microscale CO Analysis for Selected Intersections

The Boston Planning & Development Agency (BPDA) and the DEP typically require a microscale air quality analysis for any intersection in the Project study area where the level of service (LOS) is expected to deteriorate to D and the proposed project causes a 10% increase in traffic (unless the increase in traffic volume is less than 100 vehicles per hour (vph)), or where the level of service is E or F and the project contributes to a reduction in LOS. For such intersections, a microscale air quality analysis is required to examine the carbon monoxide (CO) concentrations at sensitive receptors near the intersection.

A microscale air quality analysis was not performed for this Project due to two of the three intersections will not have a LOS D or lower in the Build (2026) Condition, except for the VFW Parkway and Charles Park Road intersection. The No-Build 2026 Condition for this intersection was already at LOS D and the proposed project will not cause a 10% increase in traffic. Furthermore, the increase in vehicle delays is less than one second due to the proposed project. **Table 4.2-5** shows a comparison of the Existing (2019) and Build (2026) LOS at the three intersections.

Table 4.2-5. Summary of Build Case Level of Service

Intersection	Existing LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
VFW Parkway/Charles Park Road- signalized	C/D	C/D	NO*
VFW Parkway/Gardner Street - signalized	A/A	A/A	NO
Charles Park Road/Rivermoor Street- unsignalized	A/B	A/B	NO

The LOS shown represents the overall delay at each intersection.
*Less than a 10% increase in traffic from the proposed project.

Source: Howard Stein Hudson

Conclusions

The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, the motor vehicle traffic generated by the Project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

4.3 Noise Impacts

Tech Environmental, Inc., performed a noise study to determine whether the operation of the proposed Project will comply with the City of Boston Noise Regulations and the Massachusetts Department of Environmental Protection ("DEP") Noise Policy.

4.3.1 Common Measures of Community Noise

The unit of sound pressure is the decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB), not a doubling to 140 dB. Thus, every 3-dB increase represents a doubling of sound energy. For broadband sounds, a 3-dB change is the minimum change perceptible to the human ear. **Table 4.3-1** gives the perceived change in loudness of different changes in sound pressure levels.[2]

[2] American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989 ASHRAE Handbook--Fundamentals (I-P) Edition, Atlanta, GA, 1989.

Table 4.3-1. Subjective Effects of Changes in Sound Pressure Levels

Change in Sound Level	Apparent Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

Non-steady noise exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Levels of many sounds change from moment to moment. Some are sharp impulses lasting 1 second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is typically used. The L_{90} can also be thought of as the level representing the quietest 10 percent of any time period. Similarly, the L_{10} can also be thought of as the level representing the quietest 90 percent of any time period. The L_{10} and L_{90} are broadband sound pressure measures, i.e., they include sounds at all frequencies.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz. A source is said to create a pure tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle traffic on local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, nature noises such as insects, tree frogs, small animals, and general city noises such as street sweepers and police/fire sirens. Typical sound levels associated with various activities and environments are presented in **Table 4.3-2**.

4.3.2 Noise Regulations

<u>Commonwealth Noise Policy</u>

The DEP regulates noise through 310 CMR 7.00, “Air Pollution Control.” In these regulations “air contaminant” is defined to include sound and a condition of “air pollution” includes the presence of an air contaminant in such concentration and duration as to “cause a nuisance” or “unreasonably interfere with the comfortable enjoyment of life and property.”

Regulation 7.10 prohibits "unnecessary emissions" of noise. The DEP DAQC Policy Statement 90-001 (February 1, 1990) interprets a violation of this noise regulation to have occurred if the noise source causes either:

1. An increase in the broadband sound pressure level of more than 10 dBA above the ambient level; or
2. A "pure tone" condition.

The ambient background level is defined as the L_{90} level as measured during equipment operating hours. A "pure tone" condition occurs when any octave band sound pressure level exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more.

The DEP does not regulate noise from motor vehicles accessing a site or the equipment backup notification alarms. Therefore, the provisions described above only apply to a portion of the sources that may generate sound following construction of the Project.

Local Regulations

The City of Boston Environment Department regulates noise through the Regulations for the Control of Noise as administered by the Air Pollution Control Commission. The Project is located in an area consisting of commercial and residential uses. The Project will have low-rise residential uses to the north, east, and south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations**. Table 4.3-3** lists the maximum allowable octave band and broadband sound pressure levels for residential and business districts. Daytime is defined by the City of Boston Noise Regulations as occurring between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

Table 4.3-2. Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure (μPa)	Sound Level (dBA)	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 1m
	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	Average Whisper
		15	Broadcast and Recording Studios
	63	10	
		5	Human Breathing
Reference Pressure Level	20	0	Threshold of Hearing

Notes: μPa, or micro-Pascals, describes sound pressure levels (force/area). DBA, or A-weighted decibels, describes sound pressure on a logarithmic scale with respect to 20 μPa (reference pressure level).

Table 4.3-3. Maximum Allowable Sound Pressure Levels (dB) City of Boston

Octave Band (Hz)	Zoning District		
	Residential (Daytime)	Residential (All Other Times)	Business (anytime)
32 Hz	76	68	79
63 Hz	75	67	78
125 Hz	69	61	73
250 Hz	62	52	68
500 Hz	56	46	62
1000 Hz	50	40	56
2000 Hz	45	33	51
4000 Hz	40	28	47
8000 Hz	38	26	44
Broadband (dBA)	**60**	**50**	**65**

4.3.3 Pre-Construction Sound Level Measurements

Existing baseline sound levels in the Project area were measured during the quietest overnight period when human activity and street traffic were at a minimum, and when the Project's mechanical equipment (the principal sound sources) could be operating. Since the Project's mechanical equipment may operate at any time during a 24-hour day, a weekday between 11:00 p.m. and 4:00 a.m. was selected as the worst-case time period, i.e., the time period when Project-related sounds may be most noticeable due to the quieter background sound levels. Establishing an existing background (L_{90}) during the quietest hours of the facility operation is a conservative approach for noise impact assessment and is required by the DEP Noise Policy.

The nighttime noise measurement locations are as follows (see the **Figure 1** in the **Appendix C**):

Monitoring Location #1: 187 Gardner Street

Monitoring Location #2: 1325-1243 Veterans of Foreign Wars Parkway

Monitoring Location #3: 129-143 Gardner Street

Broadband (dBA) and octave band sound level measurements were made with a Bruel and Kjaer (B&K) Model 2250 environmental sound level analyzer, at each monitoring location, for a duration of approximately thirty minutes. The full octave band frequency analysis was performed on the frequencies spanning 16 to 16,000 Hertz. A time-integrated statistical analysis of the data used to quantify the sound variation was also performed, including the calculation of the L_{90}, which is used to set the ambient background sound level.

The B&K model 2250 is equipped with a ½" precision condenser microphone and has an operating range of 5 dB to 140 dB and an overall frequency range of 3.5 Hz to 20,000 Hz. This meter meets or exceeds all requirements set forth in the ANSI S1.4-1983 Standards for Type 1 quality and accuracy and the State and City requirements for sound level instrumentation. Prior to any measurements, this sound analyzer was calibrated with an ANSI Type 1 calibrator that has an accuracy traceable to the National Institute of Standards and Technology (NIST). During all measurements, the B&K 2250 was tripod mounted at approximately five feet above the ground in open areas away from vertical reflecting surfaces.

The sound level monitoring was conducted early Tuesday night, May 7, 2019. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was in the 60s, and the skies were partly cloudy, and the winds were 0 to 10 mph, from the northwest. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The nighttime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. A significant source of existing sound at all locations is motor vehicle traffic on nearby highways and local streets, residential and commercial air handling equipment, and aircraft over-flights.

The results of the nighttime baseline sound level measurements are presented in **Table 4.3-4**. The nighttime background L_{90} level was 42.4 dBA at Location #1, 47.1 dBA at Location #2, and 38.0 dBA at Location #3. The octave band data in **Table 4.3-4** show that no pure tones were detected in the nighttime noise measurements.

Noise monitoring at the Project Site during the evening peak traffic period was used to evaluate the existing ambient sound levels and to evaluate conformance with the Site Acceptability Standards established by HUD for residential development. The purpose of the HUD guidelines is to provide standards for determining the acceptability of residential project locations with regards to existing sound levels. The HUD criteria regarding the day-night average sound level (L_{dn}) are listed below. These standards apply to L_{dn} measurements taken several feet from the building in the direction of the predominant source of noise.

- Normally Acceptable – L_{dn} not exceeding 65 dBA
- Normally Unacceptable – L_{dn} above 65 dBA but not exceeding 75 dBA
- Unacceptable – L_{dn} above 75 dBA.

These HUD standards do not apply to this Project, but are used as guidance regarding the suitability of the Project area with regard to background sound levels.

Daytime sound level measurements were taken to help estimate the L_{dn} for the Project Site. A 30-minute sound level measurement was taken during the morning, on Wednesday May 8, 2019 between 8:34 a.m. and 9:04 a.m. at 187 Gardner Street (the closest location to the project). The weather conditions during the sound survey were conducive to accurate sound level monitoring: the skies were partially cloudy, and the winds were approximately 0-10 mph. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The daytime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. The main sources of noise during the evening period sound level measurements were motor vehicle traffic on nearby local streets, public buses and pedestrians.

The L_{eq} measured during the morning period was 60.3 dBA at Bremen Street. The L_{eq} sound level measured during the nighttime at the same location was 48.7 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 59.7dBA, which is below the HUD guideline noise limit of 65 dBA primarily.

It is assumed that standard building construction practices will result in at least a 30-dBA reduction of sound from outdoor sound levels. The Proponent will incorporate sound mitigation, as necessary, to assure that the typical urban sound sources do not result in noise impacts greater than 45 dBA inside the residential units closest to the neighboring streets.

Table 4.3-4. Nighttime Baseline Sound Level Measurements, May 7-8, 2019

Sound Level Measurement	(Location #1) 187 Gardner Street 11:24 p.m. – 11:54 p.m.	(Location #2) 1235 Veterans of Foreign Wars Parkway 11:58 p.m. – 12:28 a.m.	(Location #3) 129 Gardner Street 12:35 a.m. – 1:05 a.m.
Broadband (dBA)	48.7	55.0	41.7
Background (L_{90})	42.4	47.1	38.0
Octave Band L_{90} (dB)			
16 Hz	49.5	51.1	48.5
32 Hz	51.7	54.5	50.2
63 Hz	50.6	54.3	49.6
125 Hz	46.2	51.8	46.1
250 Hz	42.2	49.1	39.1
500 Hz	39.1	46.1	35.0
1000 Hz	38.9	40.0	32.3
2000 Hz	30.4	33.6	26.2
4000 Hz	19.8	24.7	16.4
8000 Hz	15.0	15.3	11.3
16000 Hz	11.2	11.3	10.4
Pure Tone?	No	No	No

4.3.4 Reference Data and Candidate Mitigation Measures

The mechanical systems for the Proposed Project are in the early design stage. Typical sound power data for the equipment of the expected size and type for the Project have been used in the acoustic model to represent the Project's mechanical equipment. The sound levels from all potential significant Project noise sources are discussed in this section.

The design for the Proposed Project is expected to include the following significant mechanical equipment:

- Ninety-two (92) rooftop air conditioning units

The equipment listed above, which will be located on the building rooftop, was included in the noise impact analysis. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and Massachusetts DEP noise regulations.

The sound generation profiles for the mechanical equipment noise sources operating concurrently under full-load conditions were used to determine the maximum possible resultant sound levels from the Project Site as a whole, to define a worst-case scenario. To be in compliance with City and DEP regulations, the resultant sound level must not exceed the allowable octave band limits in the City of Boston noise regulation and must be below the allowable incremental noise increase, relative to existing noise levels, as required in the DEP Noise Policy.

This sound level impact analysis was performed using sound generation data for representative equipment to demonstrate compliance with noise regulations. As the building design evolves, the sound generation for the actual equipment selected may differ from the values that were utilized for the analysis.

To minimize the sound level at nearby residences, the following noise mitigation specifications will be incorporated into the final engineering design of the Proposed Project, as necessary, to comply with the applicable sound level criteria:

- Specification of low-noise rooftop air conditioning units.

4.3.5 Calculated Future Sound Levels

Methodology

Future maximum sound levels at the upper floors of all existing residences bordering the Project, and at the nearest residential property lines, were calculated with acoustic modeling software assuming simultaneous operation of all mechanical equipment at their maximum loads.

The Cadna-A computer program, a comprehensive 3-dimensional acoustical modeling software package was used to calculate Project generated sound propagation and attenuation.[3] The model is based on ISO 9613, an internationally recognized standard specifically developed to ensure the highly accurate calculation of environmental noise in an outdoor environment. ISO 9613 standard incorporates the propagation and attenuation of sound energy due to divergence with distance, surface and building reflections, air and ground absorption, and sound wave diffraction and shielding effects caused by barriers, buildings, and ground topography.

Receptors

The closest/worst-case sensitive (residential) location is to the east of the project area at 1235 VFW Parkway. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts) and the amount of shielding by the project (residences further from the project will experience less shielding from the Project's rooftop mechanical equipment, which may result in larger potential noise impacts from the Project). This location is expected to receive the largest sound level impacts from the Project's rooftop mechanical equipment. It can be classified as a residential zone.

[3] Cadna-A Computer Aided Noise Abatement Program, Version 4.3

The sound level impacts from the building's mechanical equipment were predicted at the closest residential location, as well as additional residential uses to the west (211 Gardner Street), and east (5 Charles Park Road and 164 Gardner Street). Figure 2 in Appendix C shows the locations of the modeled noise receptors. Noise impacts at other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

4.3.6 Compliance with State and Local Noise Standards

The City of Boston and DEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in **Tables 4.3-5** through **4.3-8**. The sound impact analysis includes the simultaneous operation of the Project's rooftop HVAC equipment. The predicted sound levels are worst-case predictions that represent all hours of the day, as the analysis assumes full operation of the mechanical equipment 24-hours a day. The typical sound level impacts from the mechanical equipment will likely be lower than what is presented here, since most of the mechanical equipment will operate at full-load only during certain times of the day and during the warmer months of the year, it is not likely that all of the mechanical equipment will operate at the same time. Sound level impacts at locations farther from the Project (e.g. other residences, etc.) will be lower than those presented in this report.

<u>City of Boston Noise Standards</u>

The noise impact analysis results, presented in **Tables 4.3-5** through **4.3-8**, reveal that the sound level impact at the upper floors of the closest residences will be between 31.4 and 41.2 dBA. The smallest sound level impact of 37.4 dBA is predicted to occur at 211 Gardner Street. The largest sound level impact of 41.2 dBA is predicted to occur at 1235 VFW Parkway. Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at the closest locations.

The City of Boston noise limits for business areas are significantly higher than the nighttime noise limits for residential areas (see **Table 4.3-3**). The Project will also easily comply with the City of Boston business area noise limits at all surrounding commercial properties.

<u>Massachusetts DEP Noise Regulations</u>

The predicted sound level impacts at the worst-case residential locations were added to the measured L_{90} value of the quietest daily hour to test compliance with DEP's noise criteria. Assuming the Project's mechanical noise is constant throughout the day, the Project will cause the largest increase in sound levels during the period when the lowest background noise occurs. Minimum background sound levels (diurnal) typically occur between 12:00 a.m. and 5:00 a.m.

The predicted sound level impacts at the upper floors of the closest residences were added to the L_{90} values measured during the period with the least amount of background noise to test compliance with DEP's noise criteria. The predicted noise impacts at the property line and the closest residences were added to the most-representative measured L_{90} values to determine the largest possible increase in the sound level at each location during the quietest hour at the Project Site.

As shown in **Tables 4.3-5** through **4.3-8**, the Project is predicted to produce no more than 1 dBA change in the background sound levels at all modeled locations. Therefore, the Project's worst-case sound level impacts during the quietest nighttime periods will be in compliance with the Massachusetts DEP allowed noise increase of 10 dBA. The noise predictions for each octave band indicate that the mechanical equipment will not create a pure tone condition at any location.

Table 4.3-5. Estimated Future Sound Level Impacts – Anytime, 211 Gardner Street – Location R1

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	38
63 Hz	67	37
125 Hz	61	36
250 Hz	52	35
500 Hz	46	30
1000 Hz	40	24
2000 Hz	33	18
4000 Hz	28	11
8000 Hz	26	0
Broadband (dBA)	**50**	**31**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	42.4
178-197 Gardner Street Project*	31.4
Calculated Combined Future Sound Level	42.7
Calculated Incremental Increase	+0.3
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

Table 4.3-6. Estimated Future Sound Level Impacts – Anytime, 1235 VFW Parkway (Closest/Worst Case Residence) – Location R2

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	38
63 Hz	67	41
125 Hz	61	42
250 Hz	52	43
500 Hz	46	40
1000 Hz	40	35
2000 Hz	33	31
4000 Hz	28	25
8000 Hz	26	14
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	47.1
178-197 Gardner Street Project*	41.2
Calculated Combined Future Sound Level	48.1
Calculated Incremental Increase	+1.0
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

Table 4.4-7. Estimated Future Sound Level Impacts – Anytime, 164 Gardner Street – Location R3

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	33
63 Hz	67	33
125 Hz	61	33
250 Hz	52	34
500 Hz	46	30
1000 Hz	40	27
2000 Hz	33	23
4000 Hz	28	16
8000 Hz	26	4
Broadband (dBA)	**50**	**32**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	47.1
178-197 Gardner Street Project*	32.2
Calculated Combined Future Sound Level	47.2
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

Table 4.4-8. Estimated Future Sound Level Impacts – Anytime, 5 Charles Park Road – Location R4

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	38
63 Hz	67	38
125 Hz	61	37
250 Hz	52	37
500 Hz	46	33
1000 Hz	40	27
2000 Hz	33	22
4000 Hz	28	15
8000 Hz	26	4
Broadband (dBA)	**50**	**34**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	47.1
178-197 Gardner Street Project*	33.8
Calculated Combined Future Sound Level	47.3
Calculated Incremental Increase	+0.2
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

4.3.7 Conclusions

Sound levels at all nearby sensitive locations and at all property lines will fully comply with the most stringent City of Boston and DEP daytime and nighttime sound level limits.

This acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

4.4 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 6.5**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The existing storm drain utility infrastructure surrounding the Site appears to be of adequate capacity to service the needs of the Project. The Project will result in an increase in impervious area, but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

Erosion and sediment controls will be used during construction to protect adjacent properties, the municipal storm drain system and the on-site storm drain system. A pollution prevention plan, if required, will be prepared for use during construction including during demolition activity.

4.5 Solid and Geo-Environmental Considerations

4.5.1 Solid Waste

During the preparation of the Site, debris from the existing sites buildings and parking lots will be removed from the Project Site. The Proponent will ensure that waste removal and disposal during construction and operation will be in conformance with the City and DEP's Regulations for Solid Waste.

Upon completion of construction, the Project is estimated to generate approximately 123 tons of solid waste per year, based on the assumption that each of the 88 units will generate approximately 1.4 tons per year. A significant portion of the waste will be recycled. The project will also include ambitious goals for construction waste management in order to meet the requirements for the LEED™ rating system. This strategy will divert demolition and construction waste by reusing and recycling materials.

In order to meet the requirements for the Boston Environmental Department and the LEED^{TM} rating system, the Project will include space dedicated to the storage and collection of recyclables. The recycling program will meet or exceed the City's guidelines, and provide-areas for waste paper and newspaper, metal, glass, and plastics (21 through 27, co-mingled).

4.5.2 Geo-Environmental Considerations

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 12-feet below existing grade. It is estimated that construction for the below-grade level will generate about 4,000 cubic yards (cy) of excess fill and 10,000 cy of excess natural soil to be disposed or reused off-site.

Based on the results of the preliminary chemical testing performed on selected samples of the fill material at the site by McPhail Associates, LLC, the Project's geotechnical engineer, the fill and natural soil are anticipated to be Unregulated in accordance with the provisions of the Massachusetts Contingency Plan (310 CMR 40.0000).

The project proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals. Upon finalizing the proposed building footprints and limits of the below grade areas, a site specific Soil Management Plan will be prepared for the project by the LSP retained by the project proponent.

Based on the results of the Phase I Environmental Site Assessment Report, entitled "178, 189, 197 and Gardner Street (Parcel #2009236000)", dated January 8, 2019 prepared by McPhail Associates, LLC for this project, evidence of a release of oil or hazardous materials has not been detected at the site. Should evidence of a release be encountered during redevelopment, response actions will be performed in accordance with the applicable provisions of the MCP.

4.6 Geotechnical and Foundation Considerations

The project site contains four (4) separate parcels identified as the 178 Gardner Street, 189 Gardner Street, 197 Gardner Street, and Gardner Street (Parcel #2009236000). The properties identified as 189 and 197 Gardner Street consist of adjoining parcels located on the north side of Gardner Street, with 197 Gardner Street located along the west side of 189 Gardner Street. The parcels identified as 178 Gardner Street and Gardner Street (Parcel #2009236000) consist of adjoining parcels located on the south side of Gardner Street, with Gardner Street (Parcel #2009236000) located along the west side of the 178 Gardner Street.

The proposed redevelopment of the project site will consist of a multi-building residential development consisting of approximately eighteen (18) three-bedroom townhouse style buildings and a seventy (70) unit mid-rise apartment building. The lowest levels of the townhouse style building are currently proposed to be located at or slightly above the proposed finish grades. The lowest level of the mid-rise apartment building will be located one level below grade corresponding to about 9.5 feet below the proposed finish ground surface and will consist of a parking garage and mechanical space.

Based on the results of a preliminary subsurface exploration program performed at the project site, the ground surface across is generally underlain by a fill layer that ranges from about 2 to 8 feet below the existing ground surface. The fill layer is underlain by a natural sand deposit. During our subsurface exploration program, groundwater was observed to be located at depths ranging from about 9 to 11 feet below the existing ground surface.

Based on the anticipated soil conditions described above, foundation support for the proposed buildings will consist of conventional spread footings. The lowest level floor slab will consist of a soil supported slab-on-grade. The footings will bear directly on the underlying natural sand deposit or structural fill placed directly over the natural sand deposit. Perimeter foundation and underslab drainage will be installed to protect the below grade areas against groundwater intrusion. Temporary earth support along the perimeter of the site is not anticipated to be required for foundation construction.

Groundwater and Temporary Construction Dewatering Considerations

The project site is not located within the Groundwater Conservation Overlay District (GCOD) as outlined in Article 32 of the City of Boston Zoning Code.

Excavation for construction of the building foundations and below-grade level is anticipated to extend to depths ranging from up to about 5 feet for the townhouse style buildings and up to about 12 feet below the ground surface for the midrise building. Therefore, based on the results of the geotechnical engineer's subsurface exploration program which indicates groundwater to be present at depths ranging from about 9 to 11 feet below the existing ground surface, temporary dewatering during excavation is anticipated during the construction of the below grade level of the midrise building. Groundwater encountered during excavation of the midrise building below grade level will be managed with localized sumps in conjunction with on-site recharge of the groundwater. Construction of the proposed below grade level is not expected to have adverse short or long-term impact on the existing groundwater conditions.

It is expected that an on-site groundwater recharge system will be installed as part the redevelopment of the site.

4.7 Construction Impact

The following section describes impacts likely to result from the 178-197 Gardner Street Project construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager that will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

4.7.1 Construction Management Plan

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan, ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Proper pre-construction planning with the neighborhood will be essential to the successful construction of this Project. Construction methodologies that will ensure safety will be employed; signage will include construction manager contact information with emergency contact numbers.

The Proponent will also coordinate construction with other ongoing projects in the neighborhood.

4.7.2 Proposed Construction Program

Construction Activity Schedule

The construction period for the Proposed Project is expected to last approximately 18 months, beginning in the 2nd Quarter 2020 and reaching completion in the 4th Quarter 2021. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday.

Perimeter Protection/Public Safety

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. If possible, the sidewalk will remain open to pedestrian traffic during the construction period. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to ensure pedestrian safety.

Proper signage will be placed at every corner of the Project as well as those areas that may be confusing to pedestrians and automobile traffic.

The Proponent will continue to coordinate with all pertinent regulatory agencies and representatives of the surrounding neighborhoods to ensure they are informed of any changes in construction activities.

4.7.3 Construction Traffic Impacts

Construction Vehicle Routes

Estimated truck deliveries and routes are identified in at the end of this section. Specific truck routes will be established with BTD through the CMP. These established truck routes will prohibit travel on any residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via the VFW Parkway direct to the site via Charles Park Road.

Construction Worker Parking

The number of workers required for construction of the Project will vary during the construction period. However, it is anticipated that all construction workers will arrive and depart prior to peak traffic periods.

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, public transit use will be encouraged with the Proponent and construction manager working to ensure the construction workers are informed of the public transportation options serving the area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The contractor will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

Pedestrian Traffic

The Site abuts sidewalks on two streets (Gardner Street and Charles Park Road). Pedestrian traffic may be temporarily impacted in these areas. Once the Construction Manager is overseeing the construction, he will minimize the impact that the construction of the proposed building will have and the adjacent sidewalks. The contractor will implement a plan that will clearly denote all traffic patterns. Safety measures such as jersey barriers, fencing, and signage will be used to direct pedestrian traffic around the construction site and to secure the work area.

4.7.4 Construction Environmental Impacts and Mitigation

Construction Air Quality

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

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

- Using wetting agents to control and suppress dust from construction debris;
- Ensuring that all trucks traveling to and from the Project Site will be fully covered;
- Removing construction debris regularly;
- Monitoring construction practices closely to ensure any emissions of dust are negligible;
- Cleaning streets and sidewalks to minimize dust and dirt accumulation;
- Monitoring construction activities by the job site superintendent and safety officer; and
- Wheel-washing trucks before they leave the Project Site during the excavation phase.

Construction Noise Impacts

To reduce the noise impacts of construction on the surrounding neighborhood, a number of noise mitigation measures will be included in the CMP. Some of the measures that may be taken to ensure a low level of noise emissions include:

- Initiating a proactive program for compliance to the City of Boston's noise limitation impact;
- Scheduling of work during regular working hours as much as possible;
- Using mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously operating equipment, such as air compressors and welding generators;
- Scheduling construction activities so as to avoid the simultaneous operation of the noisiest construction activities;
- Turning off all idling equipment;
- Reminding truck drivers that trucks cannot idle more than five (5) minutes unless the engine is required to operate lifts of refrigeration units;
- Locating noisy equipment at locations that protect sensitive locations and neighborhoods through shielding or distance;
- Installing a site barricade at certain locations;
- Identifying and maintaining truck routes to minimize traffic and noise throughout the project;
- Replacing specific construction techniques by less noisy ones where feasible-e.g., using vibration pile driving instead of impact driving if practical and mixing concrete off-site instead of on-site; and
- Maintaining all equipment to have proper sound attenuation devices.

4.7.5 Rodent Control

The City of Boston enforces the requirements established under Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550. This policy establishes that the elimination of rodents is required for issuance of any building permits. During construction, rodent control service visits will be made by a certified rodent control firm to monitor the situation.

5.0 HISTORIC RESOURCES COMPONENT

This section provides a discussion of the history of the Project Site and the historic resources/ districts in the Project vicinity.

5.1 Historic Resources on the Project Site and Property History

Based on the historical records completed by McPhail Associates for the 2019 Phase I Environmental Assessment Report:

- 178 Gardner Street was occupied by a dwelling in the northeast corner of the parcel in the Sanborn Map, and by 1964 the western portion of 178 Gardner Street is used by parking. 178 Gardner Street is depicted on the Sanborn map as remaining in this configuration until at least 2002.

- 189 Gardner Street according to Sanborn Maps, was not developed until at least 1929 with a laundry facility at the southeast portion of the parcel. By 1950, a Pattern Makers Shop (metal) was indicated to be located where the laundry facility was formerly located. In the 1964 Sanborn Map, the remaining portion of the 189 Gardner Street parcel is depicted as being developed. The 1989 to 2012 Sanborn Maps depicted the parcel in the same configuration as the 1964 map, with the occupancy of the site identified as a warehouse.

- 197 Gardner Street according to the Sanborn Maps, was not developed until at least 1950, and is indicated to be occupied by an underwear factory. On later maps, the site is indicated as being occupied by a store until at least 2002.

According to files at the Massachusetts Historical Commission, no on-site structures are listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth. It is not expected that the Project will cause adverse impacts on any historic or architectural elements of nearby historic resources outside the Project Site (see **Figure 5-1** for identifications of historic resources in the Project vicinity).

5.2 Historic Districts and Resources

The Project Site is not within, nor does it directly abut, any listed historic districts or resources. However, the Veterans of Foreign Wars (VFW) Parkway, a National Historic Register District, is within one-quarter-mile radius of the Proposed Project. This parkway, designed by Charles Eliot and the Olmsted Brothers, stretches from Washington Street in Dedham to Centre Street in West Roxbury.

The area directly surrounding the Project Site is characterized by mostly residential with commercial and industrial uses. On the other side of the VFW Parkway, Gardner Street between Spring Street and the VFW Parkway retains the greatest concentration of residential buildings in this area of West Roxbury, which catered primarily to industrial uses from the late 19th to the early 20th centuries. Gardner Street was laid out from Spring Street west to Baker Street in 1871, and from Baker Street west to Cow Island Pond in 1876. Construction of the VFW Parkway in the early 1930s severed the eastern end of the street from the western end near Cow Island Pond and the Charles River. Increasing industrial use of the land between Baker Street and the Charles River in the late 19th century, as well as the construction of the Needham Branch railroad (ca. 1906) to the north, according to historical records, contributed fragmentation and decline of the mid-19th century community in the Gardner Street vicinity. Later development on Gardner Street primarily consisted of 20th century infill construction.

The historic resources within one-quarter-mile radius of the Proposed Project are summarized in **Table 5-1** that follows.

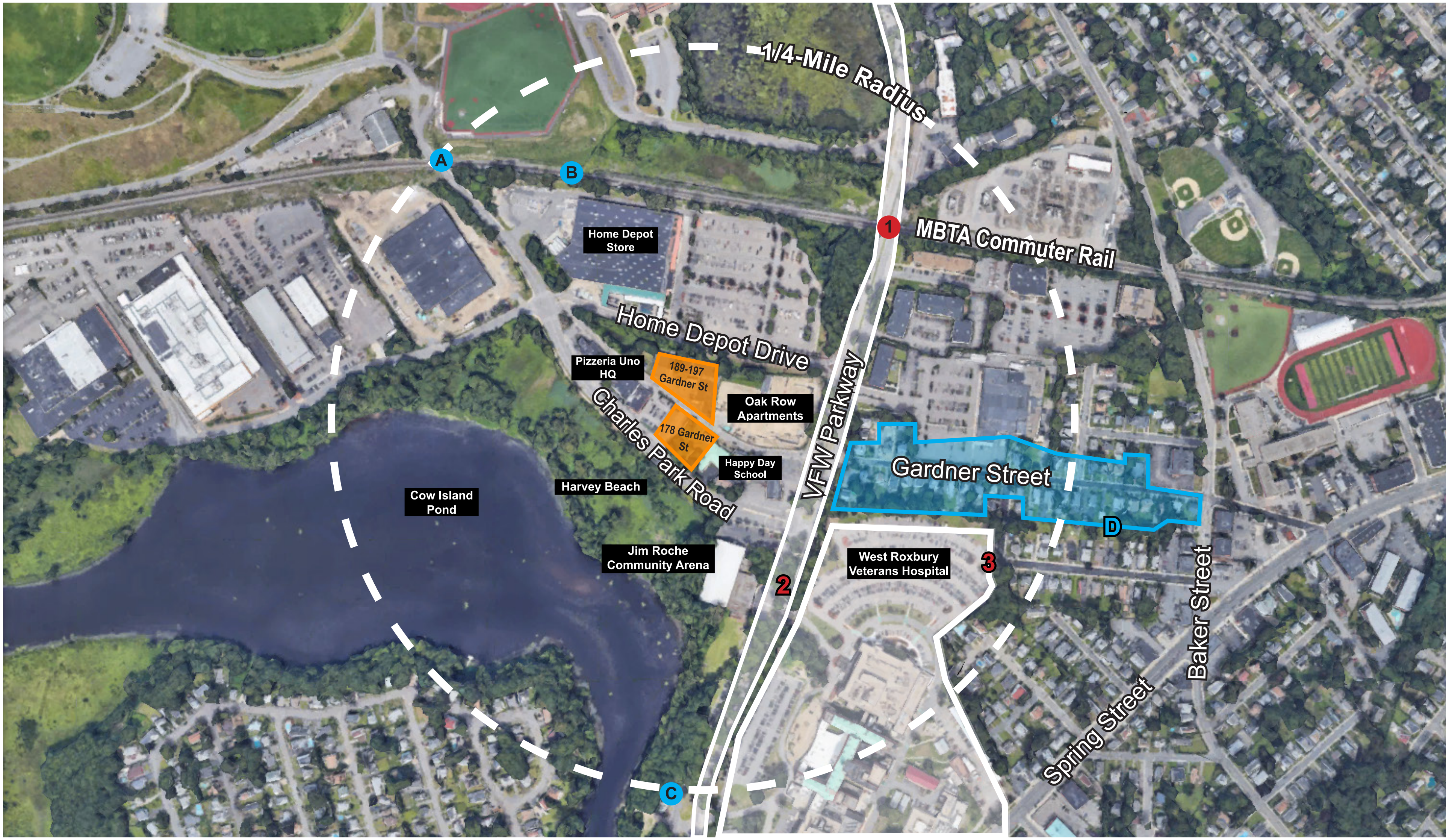
Table 5.1. Historic Resources in the Vicinity of the Project Site

Key to Historic Resources Figure (Figure 5-1)	Historic Resource	Address/Description
National Register Historic District		
1	NY, NH& H Railroad Bridge	Over VFW Parkway
2	VFW Parkway	Parkway stretching from Washington Street in Dedham to Centre Street, near the Arnold Arboretum in Jamaica Plain
3	Veterans Administration Medical Center	VFW Parkway
Inventoried Properties		
A	Gardner St Bridge	Over Conrail/MBTA Commuter Tracks
B	NY, NH&H Railroad Bridge	Over Metropolitan Sewer
C	Havey Beach	Parental School for Boys Stable
D	40-137 Gardner Street	Inventoried area on opposite site of the VFW Parkway

The Proposed Project is not expected to have effects on any of the listed historically significant resources in **Table 5-1.**

5.3 Archaeological Resources

No known archaeological resources were located within the Project site during the review of Massachusetts Historic Commission files and MACRIS, therefore no impacts to archaeological resources are anticipated.



179 & 189-197 Gardner Street

Inventoried Area

National Register of Historic Places Area

Inventoried Property

National Register of Historic Places

National Register of Historic Places Points and Areas
1. NY, NH & H Railroad Bridge
2. VFW Parkway
3. Veterans Administration Medical Center

Inventoried Property Points and Areas
A- Gardner Street Bridge over Conrail
B- NY, NH & H Railroad Bridge over Metropolitan Sewer
C- Havey Beach Parental School for Boys Stable
D- 40-137 Gardner Street

MLF CONSULTING LLC

Figure 5-1. 179 & 189-197 Gardner Street Historic Resources

Historic Resources Component

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project. The following sections describe the existing sewer, water, and drainage systems surrounding the site and explain how these systems will service the development.

A detailed infrastructure analysis will be performed when the Project proceeds into the Design Development Phase. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the new water, sanitary sewer, and storm drain connections. In addition, a Storm Water Pollution Prevention Plan will be submitted specifying best management measures for protecting the BWSC drainage systems during construction.

A Drainage Discharge Permit Application is required from BWSC for any construction dewatering. The appropriate approvals from the U.S. Environmental Protection Agency (EPA) will also be needed.

6.1 Sanitary Sewer System

6.1.1 Existing Sewer System

The Boston Water and Sewer Commission owns and maintains the sanitary sewer system adjacent to the Project Site in Gardner Street and Charles Park Road (See **Figure 6-1**). BWSC record drawings indicate an existing 15-inch sanitary sewer line in Gardner Street adjacent to the Project Site. This sewer main flows northwesterly before changing directions at the intersection of Rivermoor Street/Gardner Street/Charles Park Road. It than flows southeasterly in Charles Park Road. The sewer main in Charles Park Road ties into a 36-inch sewer in VFW Parkway that is part of the MWRA's Upper Neponset Valley Sewer system.

Table 6-1. Existing Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Residential (178 Gardner Street)	3 bedrooms	110 gpd/bedroom	330 gpd
Industrial/Manufacturing (189 Gardner Street)	32 people[1]	20 gpd/person	640 gpd
Commercial/Warehouse (197 Gardner Street)	22 people[1]	20 gpd/person	440 gpd
Total			**1,410 gpd**

1. Assumes 500 sf/person for buildings located at 189 and 197 Gardner Street. 189 Gardner Street=16,100 sf (16,100/500=32). 197 Gardner Street=10,900 sf (10,900/500=22).

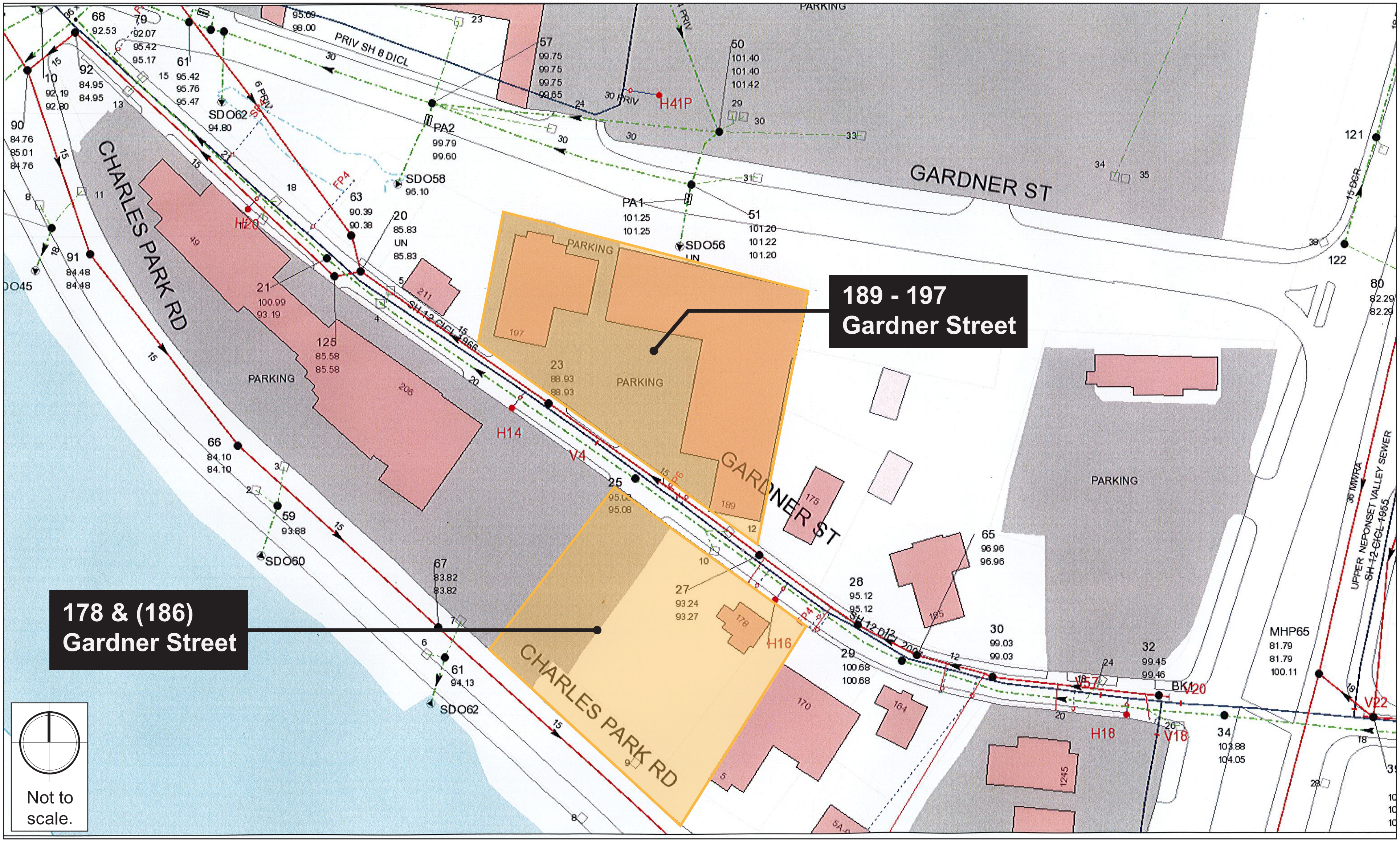


Figure 6-1.
BWSC Water and Sewer Map

6.1.2 Project-Generated Sewage Flow

The Project proposes two townhome-style buildings at 178-186 Gardner Street that together will accommodate 18 units. A 4-story apartment building is proposed at 189-197 Gardner Street that will accommodate 70 units. The proposed development is anticipated to generate 15,7300 gallons per day (gpd) of wastewater based on design sewer flows provided in 310 CMR 15.000-The State Environmental Code, Title 5 and the proposed building program as summarized in **Table 6-2**. The net new wastewater generation for the Proposed Project is estimated at **14,320 gpd** (15,730 (proposed) – 1,410 (existing).

Table 6-2. Projected Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow
Residential (178 -186 Gardner St.)	54 beds	110 gpd/bedroom	5,940 gpd
Residential (189-197 Gardner St.)	89 bedrooms	110 gpd/bedroom	9,790 gpd
Total			**15,730 gpd**

6.1.3 Sanitary Sewage Connection

It is anticipated that the wastewater services from the proposed townhouses will be collected by an 8-inch trunk line on-site. The 8-inch trunk line would connect to the 15-inch sanitary sewer in Charles Park Road. It is anticipated that the proposed apartment building at 189-197 Gardner Street will have an 8-inch sanitary sewer service that would tie into the 15-inch sanitary sewer in Gardner Street

Parking garage floor drains will be routed through an oil and sand trap prior to discharging to the BWSC sanitary sewer system.

6.1.4 Sewer System Mitigation

To help conserve water and reduce the amount of wastewater generated by the Proposed Project, the Proponent will investigate the use of water-efficient toilets, aerated shower-heads, and low-flow lavatory faucets in compliance with all pertinent Code requirements to reduce water usage and sewer generation.

6.2 Water System

6.2.1 Existing Water Service

The water mains in the vicinity of the Project Site are owned and maintained by BWSC (see **Figure 6-1**). BWSC record drawings indicate there is an existing 12-inch cement-lined, cast iron pipe (CICL) installed in 1966 in Gardner Street. It is part of BWSC's Southern High-Water distribution system. It appears the existing buildings on the Project Site are serviced by this main.

The site is within the service radius of several hydrants. There are two public hydrants (H14 and H16) that are directly adjacent to the Project Site. The Proponent will confirm that the hydrants are sufficient for the development with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

The BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the site will be requested by the Proponent. If recent hydrant flow data is not available for any hydrants located near the project site, the Proponent will request a hydrant flow test be conducted by the BWSC.

6.2.2 Anticipated Water Consumption

The Project's water demand estimate for domestic services is based on the project's estimated sewage generation, plus a factor to account for consumption, system losses, and other usages to estimate an average water demand. The maximum average daily water demand is estimated at approximately 17,300 gpd.

6.2.3 Proposed Water Service

It is anticipated that a 4-inch domestic water service and a 6-inch fire protection service will have separate taps into the 12-inch water main in Gardner Street to service the townhouses. The use of a single water service with meter pit may be explored if a water room cannot be located near Gardner Street.

It is anticipated that a 4-inch domestic water service and a 6-inch fire protection service will have separate taps into the 12-inch water main in Gardner Street to service the proposed apartment building at 189-197 Gardner Street. The domestic water meter and the backflow preventer for the fire protection line are expected to be installed within a sprinkler room on the garage level.

The water supply systems servicing the building will be gated so as to minimize public hazard or inconvenience in the event of a water main break. Final locations and sizes of the services will be provided on a Site Plan during the detailed design phase and submitted to BWSC for review and approval.

Water service to the building will be metered in accordance with BWSC's requirements. The property owner will provide a suitable location for a Meter Transmission Unit (MTU) as part of BWSC's Automatic Meter Reading System. A backflow preventer will be installed on the fire protection service and will be coordinated with BWSC's Cross Connection Control Department.

6.2.4 Water Supply System Mitigation

As discussed in the Sewer System Mitigation Section, water conservation measures such as the use of water-efficient toilets, low-flow lavatory faucets, and aerated showerheads in compliance with all pertinent Code requirements are being considered to reduce potable water usage. Water usage for landscape irrigation will be significantly reduced by the selection of native and adaptive plantings, and using soil moisture sensors as part of the irrigation system.

6.3 Storm Drainage System

6.3.1 Existing Drainage Conditions

178 Gardner Street contains an existing single-family home. Stormwater runoff from most of the site, including more than half the roof area, drains overland where it is eventually picked up by the storm drain system in Charles Park Road. The runoff from the adjacent parking lot at 186 Gardner Street drains overland to the same storm drain system. The storm drain system has a nearby outfall that discharges into the Charles River at the downstream end Cow Island Pond.

Runoff from the front yard and part of the roof at 178 Gardner Street flows overland to Gardner Street where it is picked up by the municipal storm drain system. The storm drain flows northwesterly in a 21-inch pipe. This pipe connects with a 36"x60" storm drain near the intersection of Gardner Street and Rivermoor Street ultimately discharging through an outfall in the wetlands associated with the Charles River/Cow Island Pond.

189 Gardner Street is entirely impervious and contains a building and paved loading area with surface parking. There is a catch basin on-site that appears to capture very little stormwater runoff. The pavement area drains toward Gardner Street where it is picked up by the municipal storm drain system. The building rooftop runoff is captured by a gutter and downspout system that empties onto the surface with most of the runoff being directed to the pavement area where it flows overland to Gardner Street.

The one-story brick and masonry building at 197 Gardner Street appears to have a roof drainage system that is tied into the storm drain in Gardner Street. The pavement area at 197 Gardner Street has no drain inlets and runoff drains overland to Gardner Street.

6.3.2 Proposed Drainage Systems

Although most of the site would qualify as redevelopment, the proposed stormwater management system is expected to fully meet MassDEP's Stormwater Management Standards (the "Standards").

It is also the intent to meet BPDA's Smart Utilities Policy for stormwater infiltration which greatly exceeds the Standards. These measures will decrease the peak flow and substantially improve the water quality of the site's runoff reaching the BWSC's storm drain system and ultimately the Charles River.

The Project will explore the use of low impact development practices including the use of permeable pavers in the surface parking areas, and small bioretention areas.

In general, rooftop runoff is expected to be directed to a stormwater infiltration system. The impervious areas of the surface parking and drive aisles will be collected in deep sump catch basins then directed to a water quality unit to receive pretreatment before flowing to one of the stormwater infiltration systems proposed on site.

6.4 Water Quality

The Proposed Project will improve the quality of stormwater leaving the site through the installation of an on-site infiltration system and therefore is not expected to have negative impacts on the water quality of the Charles River. Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable EPA and BWSC discharge permits. Once construction is complete, the Proposed Project will be in compliance with BWSC Site Plan requirements.

6.5 Electric Systems

Eversource owns and maintains the electrical transmission system in the vicinity of the Proposed Project. There is existing overhead service in the Project Area. It is expected that electrical service can be provided by Eversource. Electric power supply design, and any upgrades that may be required, will be further coordinated with Eversource as the design for each phase progresses. The Proponent will investigate energy conservation measures, including high efficiency lighting.

6.6 Telephone and Cable Systems

Verizon, Comcast, and RCN provide telephone service in the Project area. It is anticipated that telephone service can be provide by any of the providers. Any upgrades will be coordinated with the provider. Telephone systems will be reviewed with the provider as the design progresses.

Comcast and RCN provide cable and internet service in the Project area. It is expected that Comcast and/or RCN can provide services to the Project site. Any upgrade required to the services will be coordinated with the services providers.

6.7 Steam and Gas Systems

The Proposed Project is not expected to require steam service and there is no steam infrastructure in the Project area.

National Grid provides natural gas in the Project area. National Grid owns and maintains a 12-inch, carbon steel gas main in Gardner Street and VFW Parkway. The project is expected to use natural gas for heating and domestic hot water. It is expected that there is adequate supply of natural gas in the area. The actual size and location of the building services will be coordinated with National Grid.

6.8 Utility Protection During Construction

The Contractor will notify utility companies and call "Dig Safe" prior to excavation. During construction, infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The Construction Contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners and/or agencies. The Construction Contractor will also be required to provide adequate notification to the utility owner prior to any work commencing on their utility. Also, in the event a utility cannot be maintained in service during switch over to a temporary or permanent system, the Construction Contractor will be required to coordinate the shutdown with the utility owners and project abutters to minimize impacts and inconveniences.

7.0 TRANSPORTATION COMPONENT

7.1 Introduction

The Project team has conducted an evaluation of the transportation impacts of a proposed residential development to be located at 178, 189-197 Gardner Street and Charles Park Road (the "Project" and/or "Site"), in Boston's West Roxbury neighborhood. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the Boston Redevelopment Authority's Article 80 development review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, transit services, and pedestrian and bicycle activity.

7.2 Project Description

The Project site is located on both sides Gardner Street between the intersections of Gardner Street at Rivermoor Street to the west and Gardner Street at VFW Parkway to the east. The site currently contains industrial and non-descript residential properties with a total of seven curb-cuts.

The Project will include the construction of multiple structures, including approximately 18 residential townhouses for homeownership and 70 rental units within a mid-rise apartment structure. The Project will also provide each townhouse with personal garage and driveway parking as well as approximately 70 parking spaces on-site for rental tenants. Vehicular access will be provided along Charles Park Road for the townhouses, and along Gardner Street for the mid-rise apartment structure. Additionally, a designated area for apartment related pick-up/drop off activity will be provided along Gardner Street.

7.2.1 Study Area

The transportation study area is generally bounded by the VFW Parkway to the east, Charles Park Road to the south, Rivermoor Street to the west, and the Home Depot Driveway to the north. The study area includes the following four intersections:

- VFW Parkway/Charles Park Road (signalized);
- VFW Parkway/Gardner Street (signalized);
- VFW Parkway/Home Depot Driveway (unsignalized); and
- Gardner Street/Charles Park Road/Rivermoor Street/Home Depot Driveway (unsignalized).

The study area is shown in **Figure 7-1**.

Figure 7-1.
Study Area Intersection

7.2.2 Study Methodology

The Existing Condition analysis includes an inventory of the existing transportation conditions such as traffic characteristics, parking, curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. Existing counts for vehicles, bicycles, and pedestrians were collected at the study area intersections. A traffic data collection effort forms the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2020, based on a seven-year horizon from the year of the filing of this traffic study.

The No-Build (2026) Condition includes both general background traffic growth, traffic growth associated with specific developments (not including this Project) and transportation improvements that are planned in the vicinity of the Project site.

The Build (2026) Condition includes a net increase in traffic volume due to the addition of Project-generated trip estimates to the traffic volumes developed as part of the No-Build (2026) Condition. Expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies are identified.

The final part of the transportation study identifies measures to mitigate Project-related impacts and to address any traffic, pedestrian, bicycle, transit, safety, or construction related issues that are necessary to accommodate the Project. An evaluation of short-term traffic impacts associated with construction activities is also provided.

7.3 Existing Condition

This section includes descriptions of existing study area roadway geometries, intersection traffic control, peak-hour vehicular and pedestrian volumes, average daily traffic volumes, transit availability, parking, curb usage, and loading conditions.

7.3.1 Existing Roadway Conditions

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

VFW Parkway is a two-way, predominantly four lane roadway located to the east of the Project site. The VFW Parkway is classified as a principal arterial roadway under DCR jurisdiction and runs in a predominately north-south direction between Centre Street in Jamaica Plain to the north and High Street in Dedham to the south. There is a median that divides the northbound and southbound travelway and breaks in the median that allow for left turns and u-turns. In the vicinity of the site on-street parking is not provided on either side of the roadway, and sidewalks are provided on both sides of the roadway.

Charles Park Road is a two-way, two lane roadway located to the south of the Project site. Charles Park Road is classified as a local road under the jurisdiction of the City of Boston and runs in a predominately east-west direction between Rivermoor Street in the west and the VFW Parkway in the east. In the vicinity of the site on-street parking is provided along the south side of the roadway to and is restricted to DCR patrons only. Sidewalks are provided on the southern side of the roadway.

Gardner Street is a one-way eastbound, one-lane roadway located adjacent to the south of the Project site. To the west of VFW Parkway, Gardner Street runs one-way eastbound and to the east of VFW Parkway, Gardner Street runs one-way westbound. It is classified as a local roadway under the jurisdiction of the City of Boston and runs in a predominately east-west direction between Millennium Park to the west and the Baker Street to the east. In the vicinity of the site on-street parking is restricted along the north side of the roadway and is not restricted along the south side of the roadway. However, there is approximately 40 feet of curb designated as Residential Permit Parking only. Sidewalks are provided on both sides of the roadway.

7.3.2 Existing Intersection Conditions

The existing study area intersections are described below. Intersection characteristics such as traffic control, lane usage, pedestrian facilities, pavement markings, and adjacent land use are described.

VFW Parkway/Charles Park Road is a three-legged, signalized intersection located to the south of the project site. The Charles Park Road eastbound approach consists of three lanes, two left-turn only lanes and one right-turn only lane. VFW Parkway northbound approach consists of three lanes, a shared U-turn/left-turn lane and two through lanes. The VFW Parkway southbound approach consists of three lanes, a shared right-turn/through lane, a through lane and a U-turn only lane. On-street parking is restricted along all approaches to the intersection. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across the west side of the intersection and are generally in good condition.

VFW Parkway/Gardner Street is a four-legged, signalized intersection with four approaches; however, VFW is separated by a median that does not allow crossing traffic. The intersection is located to the southeast of the Project site. The Gardner Street eastbound approach consists of one right-turn only lane and operates under stop control. The Garner Street westbound approach consists of one right-turn only lane and operates under stop control. The VFW Parkway northbound approach consists of two through lanes and operates under signalized control. The VFW Parkway southbound approach consists of two lanes, a shared right-turn/through lane and a through lane and operates under signalized control. On-street parking is permitted on the Gardner Street westbound approach. Crosswalks and wheelchair ramps are provided across all approaches to the intersection. Pedestrian movements are allowed across the median and accommodations are provided via pedestrian signal equipment. Sidewalks and other pedestrian accommodations are generally in good condition in the vicinity of the Project site.

Gardner Street/Charles Park Road/Rivermoor Street/Home Depot Driveway is a four legged, unsignalized intersection with four approaches, located to the west of the Project site. All four approaches consist of a shared left-turn/through/right-turn lane and are stop controlled. The west end of Gardner Street intersects the Home Depot driveway approximately 25 feet east of the intersection. Parking is restricted along each approach. Crosswalks and wheelchair ramps are provided along the north, south, and west legs of the intersection and are generally in good condition.

7.3.3 Existing Parking and Curb Use

An inventory of the on-street parking in the vicinity of the Project was collected. On-street parking is generally not provided in the area, except for the south side of both Gardner Street and Charles Park Road. All parcels provide sufficient parking on-site. One, approximately 40 foot long, section of Gardner Street supplies two residential on street spaces. The on-street parking regulations within the study area are shown in **Figure 7-2**.

7.3.4 Car Sharing Services

Car sharing enables easy access to short term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location.

Car sharing, predominantly served by Zipcar in the Boston area, provides easy access to vehicular transportation for those who do not own cars. Currently there are no car sharing locations within a half-mile of the Project site.

7.3.5 Existing Public Transportation

The Project site is located in Boston's West Roxbury neighborhood with several public transit opportunities including the MBTA Commuter Rail Needham Line and several bus routes. The following describes each public transportation route located in the vicinity of the Project site. The nearby public transit services are shown in **Figure 7-3** and summarized in **Table 7-1**.

Figure 7-2.
On-Street Parking Regulations

Figure 7-3.
Existing Public Transportation Services

Commuter Rail Needham Line

The Needham Line of the MBTA commuter rail system stops at West Roxbury Station, which is approximately one mile from the Project site. The Needham Line runs between South Station in Boston to the east and Needham Heights in Needham to the west. The Needham Line operates with weekday service from 6:05 a.m. to 11:10 p.m. with approximately 30 minute peak hour headways. Weekend service runs from 7:10 a.m. to 12:00 a.m. with 120 minute headways.

Bus Routes

There are four MBTA bus lines as well as a local bus service that stop within one mile of the Project site. The MBTA's 36 Route travels adjacent to the site, the MBTA's 52 Route travels less than a half a mile from the site, and the MBTA's 35 Route and 37 Route are within a mile of the site. The Town of Dedham offers a local bus service called "Dedham on the Move." The nearest stop to the Project site is located approximately one-half mile south, however riders that wish to be picked up at this location must contact the bus service. The route travels south into Dedham and a majority of the stops along the route are designated as "Flag Stops" where a rider must wave the bus driver over in order to board. The service operates from 7:30 a.m. to 3:30 p.m. with approximately one and a half hours of headway.

Table 7-1. Existing Public Transportation

Route	Description	Peak-hour Headway (mins)*	Weekday Service Duration*
Commuter Rail			
Needham Line		30	6:05 a.m. – 11:10 p.m.
Local Bus Routes			
35	Dedham Mall/Stimson Street - Forest Hills Station via Belgrade Avenue & Centre Street	15-20	5:25 a.m. – 9:42 p.m.
36	Charles River Loop or VA Hospital - Forrest Hills Station	20	4:37 a.m. – 1:44 a.m.
37	Baker & Vermont Streets - Forest Hills Station via Belgrade Avenue & Centre Street	10	5:35 a.m. – 8:01 p.m.
52	Dedham Mall or Charles River Loop – Watertown Yard via Oak Hill & Newton Centre	20	6:15 a.m. – 7:57 p.m.
DED	VA Hospital/Spring Street – Endicott Station	90	7:30 a.m. – 3:30 p.m.

* Source: MBTA.com, April 2019. Headway varies.

7.3.7 Existing Traffic Data

Traffic volume data was collected at the three study area intersections on Tuesday, April 30, 2019. Turning Movement Counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) at the study area intersections. The traffic classification counts included car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts for the study area intersections are provided in Appendix D.

7.3.8 Existing Vehicular Traffic Volumes

To account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT was reviewed. The most recent (2017) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the April 2019 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group U3) during the month of April is 0.95. This indicates that average month traffic volumes are approximately five percent less than the traffic volumes that were collected. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a conservatively high analysis consistent with the peak season traffic volumes. The MassDOT 2017 Weekday Seasonal Factors table is provided in **Appendix D.**

The existing traffic volumes collected in April 2019 were used to develop the Existing Condition traffic volumes. The volumes were balanced where necessary across the roadway network within the study area. The resulting Existing Condition weekday a.m. peak hour and weekday p.m. peak hour traffic volumes are shown in **Figure 7-4** and **Figure 7-5**, respectively.

7.3.9 Existing Bicycle Volumes and Accommodations

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to bicycle-friendly facilities. The City of Boston's "Bike Routes of Boston" map indicates that the VFW Parkway is designated as an advanced route suitable for more traffic-confident cyclists. Designated bike lanes are provided on the VFW Parkway in the vicinity of the Project site.

Bicycle volumes were conducted concurrent with the April 2019 vehicular TMCs. The weekday a.m. Peak Hour and weekday p.m. Peak Hour bicycle volumes are presented in **Figure 7-6**.

BlueBikes (Hubway) is the Boston area's largest bicycle sharing service, which was launched in 2011 and currently consists of more than 3,400 shared bicycles at more than 190 stations throughout Boston, Brookline, Cambridge and Somerville. However, BlueBikes is not located within walking distance of the site at this time.

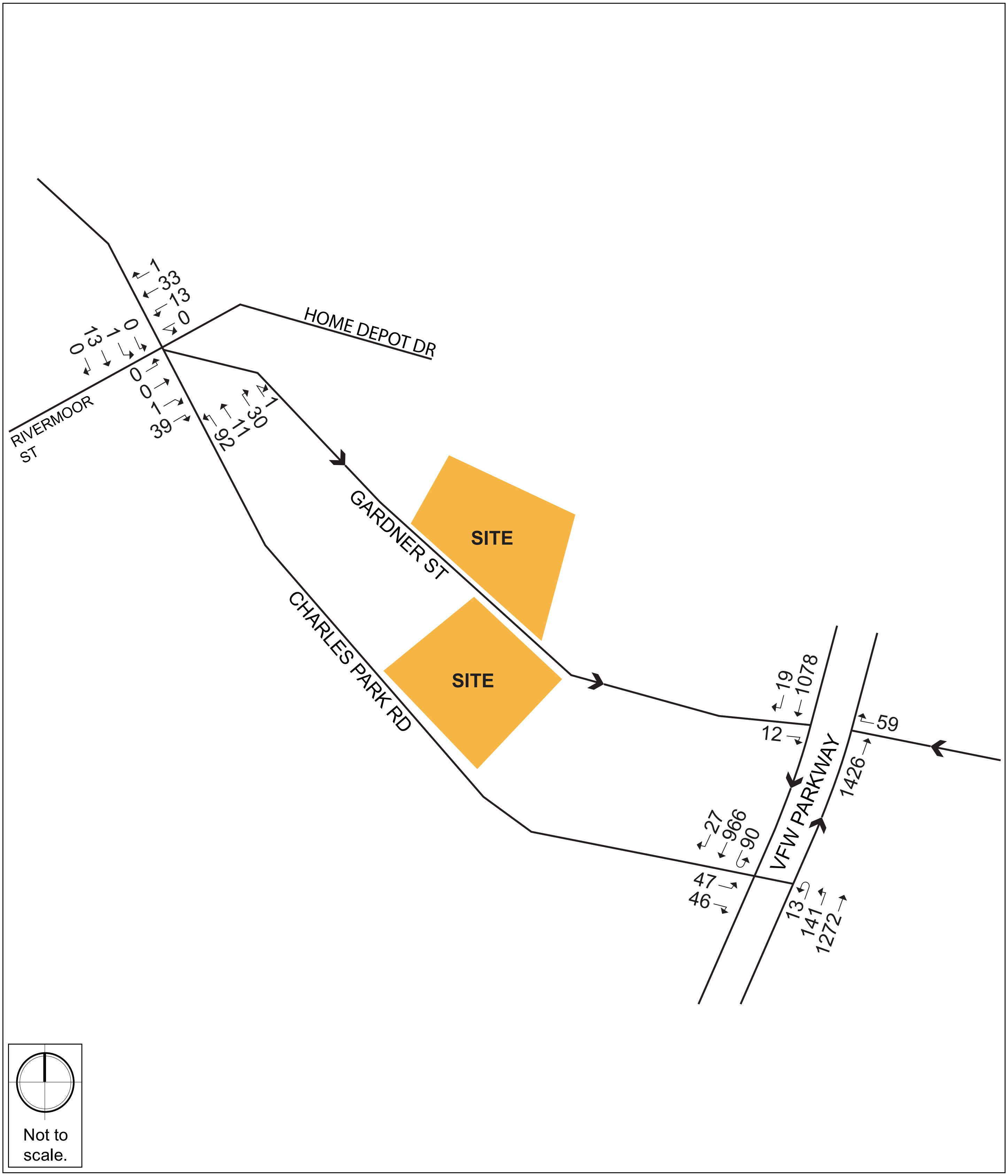


Figure 7-4.
Existing Condition Traffic Volumes, Weekday a.m. Peak Hour

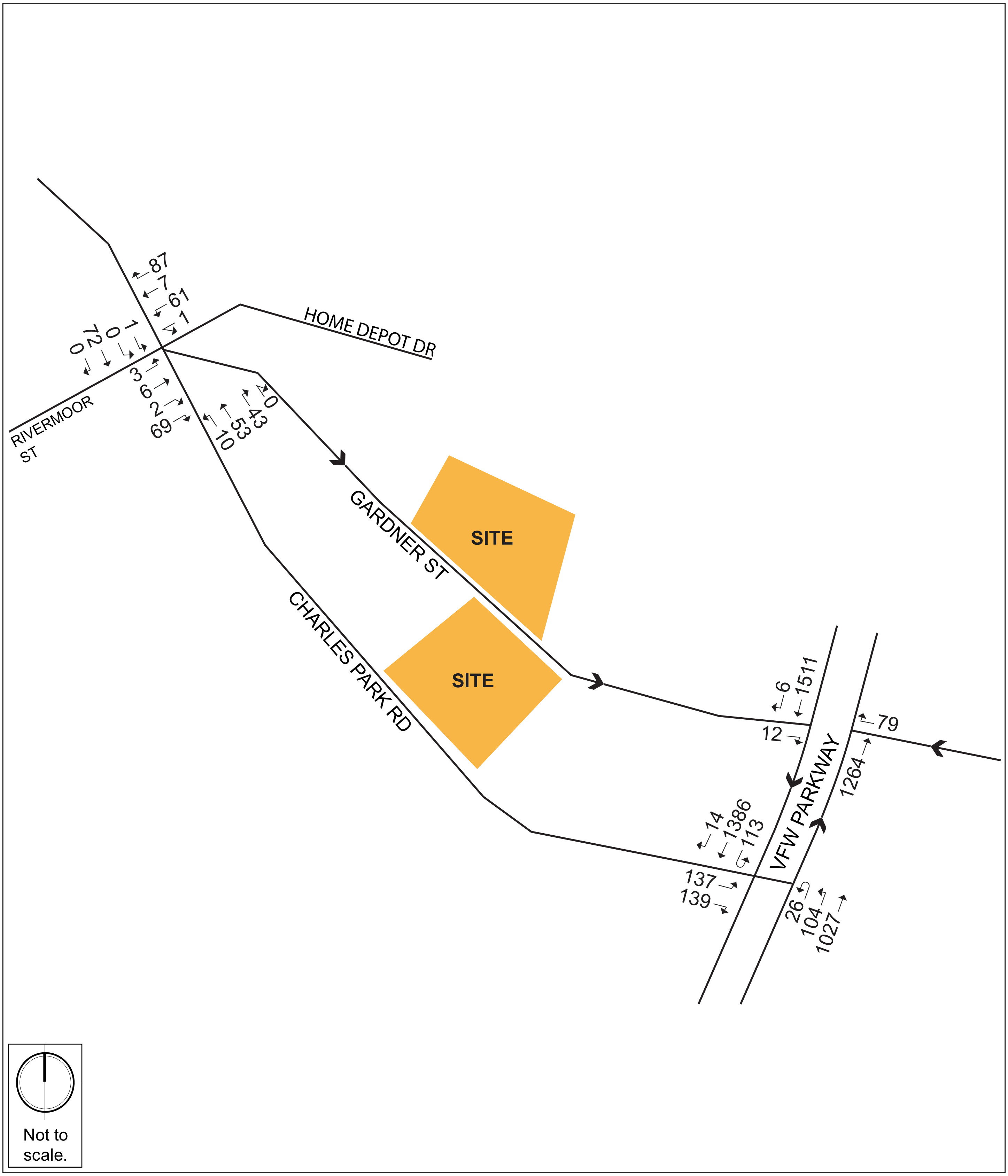


Figure 7-5.
Existing Condition Traffic Volumes, Weekday p.m. Peak Hour

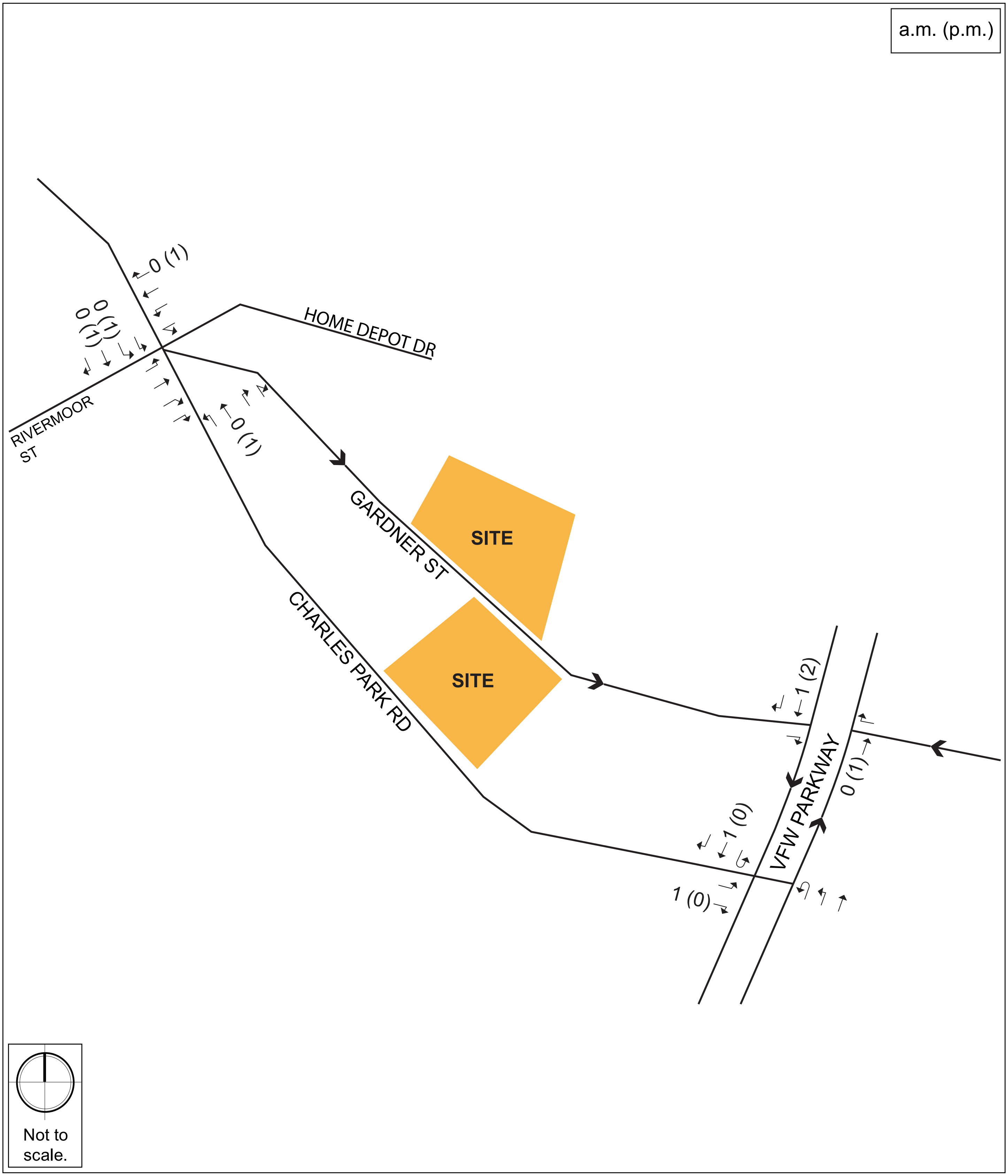


Figure 7-6.
Existing Condition Bicycle Volumes, a.m. and p.m. Peak Hours

7.3.10 Existing Pedestrian Volumes and Accommodations

In general, the sidewalks that are provided along the roadways in the study area are in good condition. There are several areas without sidewalks, specifically the north side of Charles Park Road and both sides of the Home Depot Driveway. Crosswalks are provided at most study area intersections with the exception that there are not any crosswalks provided to cross the VFW Parkway at the intersection of the VFW Parkway/Charles Park Road, and at the intersection of Charles Park Road /Gardner Street /Rivermoor Street /Home Depot Driveway there is not a crosswalk provided to cross the westbound Home Depot Driveway. Pedestrian signal equipment is provided at both of the signalized study area intersections.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersection. The weekday a.m. Peak Hour and weekday p.m. Peak Hour pedestrian volumes are presented in **Figure 7-7**.

7.4 No-Build (2026) Condition

The No-Build (2026) Condition reflects a future scenario that incorporates anticipated traffic volume changes associated with background traffic growth independent of any specific project, traffic associated with other planned specific developments, and planned infrastructure improvements that will affect travel patterns throughout the study area. The No-Build (2026) Condition does not include the impact of the Project. These infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements.

7.4.1 Background Traffic Growth

The methodology to account for generic future background traffic growth, independent of large development projects, may be affected by changes in demographics, smaller scale development projects, or projects unforeseen at this time. Based on a review of recent and historic traffic data collected recently and to account for any additional unforeseen traffic growth, a one-half percent per year annual traffic growth rate was used.

7.4.2 Specific Development Traffic Growth

The second part of the methodology identifies any specific planned developments that are expected to affect traffic patterns throughout the study area within the future analysis time horizon. **Figure 7-8** shows the location of the **270 Baker Street** development. The Project will retain the existing commercial office building and will include the development of 56 residential units.

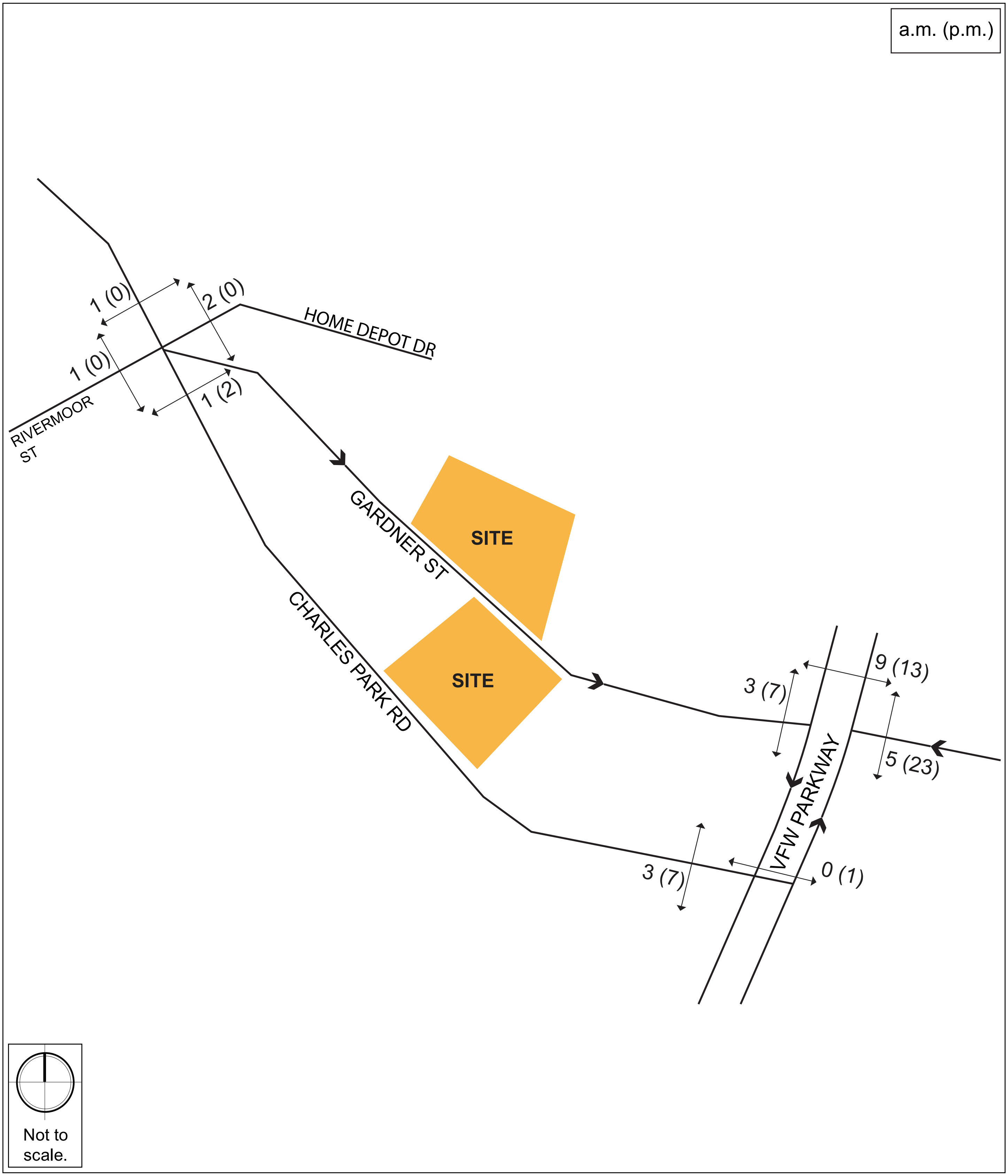


Figure 7-7.
Existing Condition Pedestrian Volumes, a.m. and p.m. Peak Hours

Figure 7-8.
Background Development Projects

7.4.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. Based on this review, it was determined that the VFW Parkway will have updated signal equipment installed at intersections from Independence Drive to Charles Park Road. The updated equipment will allow for the signal timings to be optimized and coordinated with each other, improving travel progression along the VFW Parkway corridor.

7.4.4 No-Build (2026) Condition Traffic Volumes

The one-half percent per year annual growth rate was applied to the Existing Condition traffic volumes, then the traffic volumes associated with the background development project listed above was added to develop the No-Build (2026) Condition traffic volumes. The No-Build (2026) weekday a.m. and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-9** and **Figure 7-10**, respectively.

7.5 Build (2026) Condition

As previously summarized, the Project will include the construction of approximately 88 residential units, with approximately 106 parking spaces, consisting of personal garage space and 1 tandem space for each townhouse as well as 1 space per apartment rental unit, 44 of which will be located at-grade below the raised apartment structure, the remaining 26 spaces will be provided in a surface lot at the rear of the apartment structure. Vehicular access will be provided for the apartment rental units via a curb-cut on the north side of Gardner Street and for the townhouses via a curb-cut on the north side of Charles Park Road.

7.5.1 Vehicle Site Access and Circulation

As shown in the Project site plans in **Figures 3-6** and **3-7** in **Section 3.0**, vehicular access to the apartment building and the townhouses will be provided by two curb-cuts, one per residential unit style. The driveway associated the apartment rental units will be located along Gardner Street, and the driveway associated with the townhouses will be located along Charles Park Road. A majority of the seven existing curb-cuts along Gardner Street will be closed. A drop-off and pick-up area for the residential apartment rental units will be provided to the east of the driveway entrance.

7.5.2 Loading and Service Accommodations

Residential units primarily generate delivery trips related to small packages and prepared food on a daily basis. Residential units also generate move-in/move-out activity, although less frequently. Loading, deliveries, and trash pick-up will take place on the Project site in however a designated loading area will not be provided. All loading and service activity will take place within the site on the surface lots.

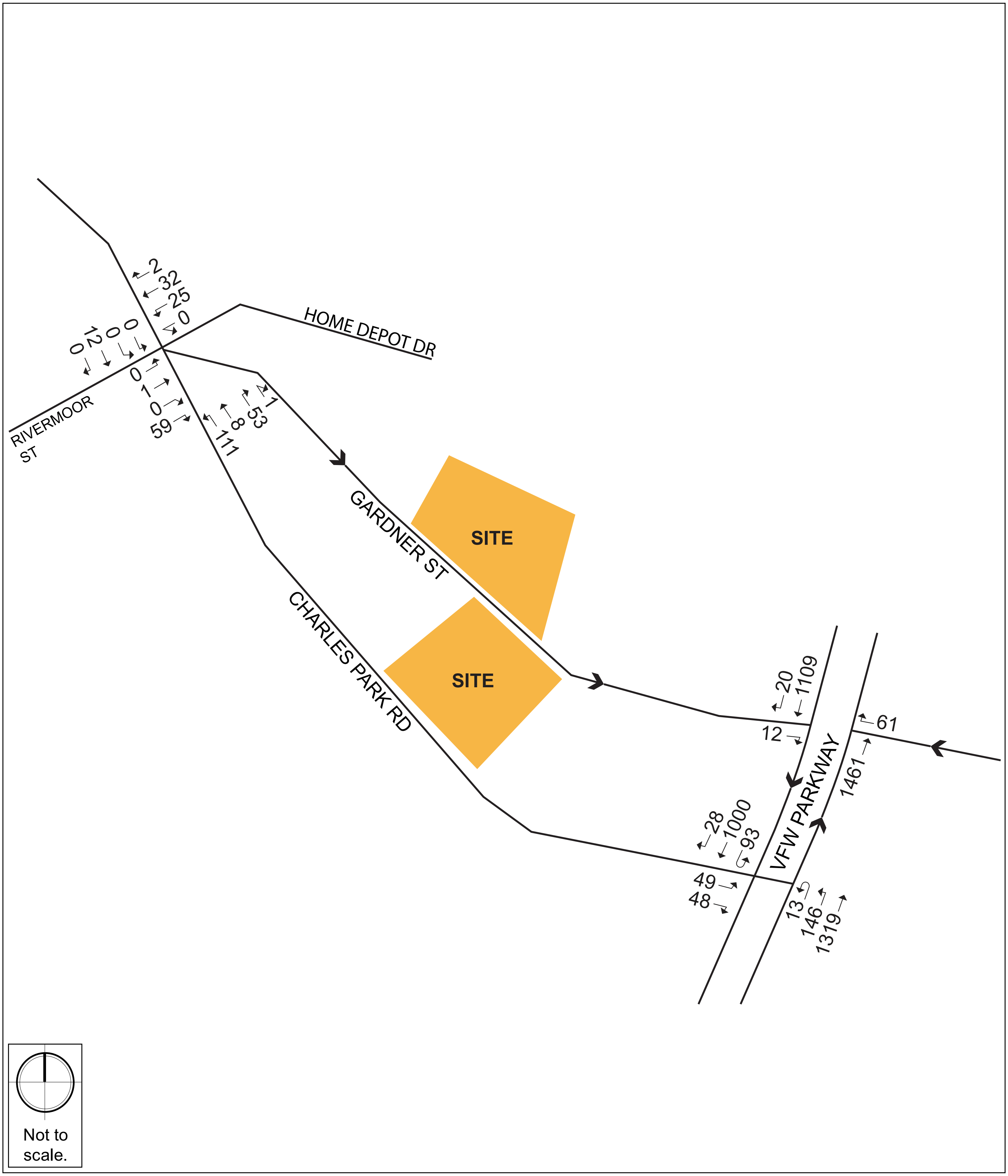


Figure 7-9.
No-Build (2026) Condition Traffic Volumes, a.m. Peak Hour

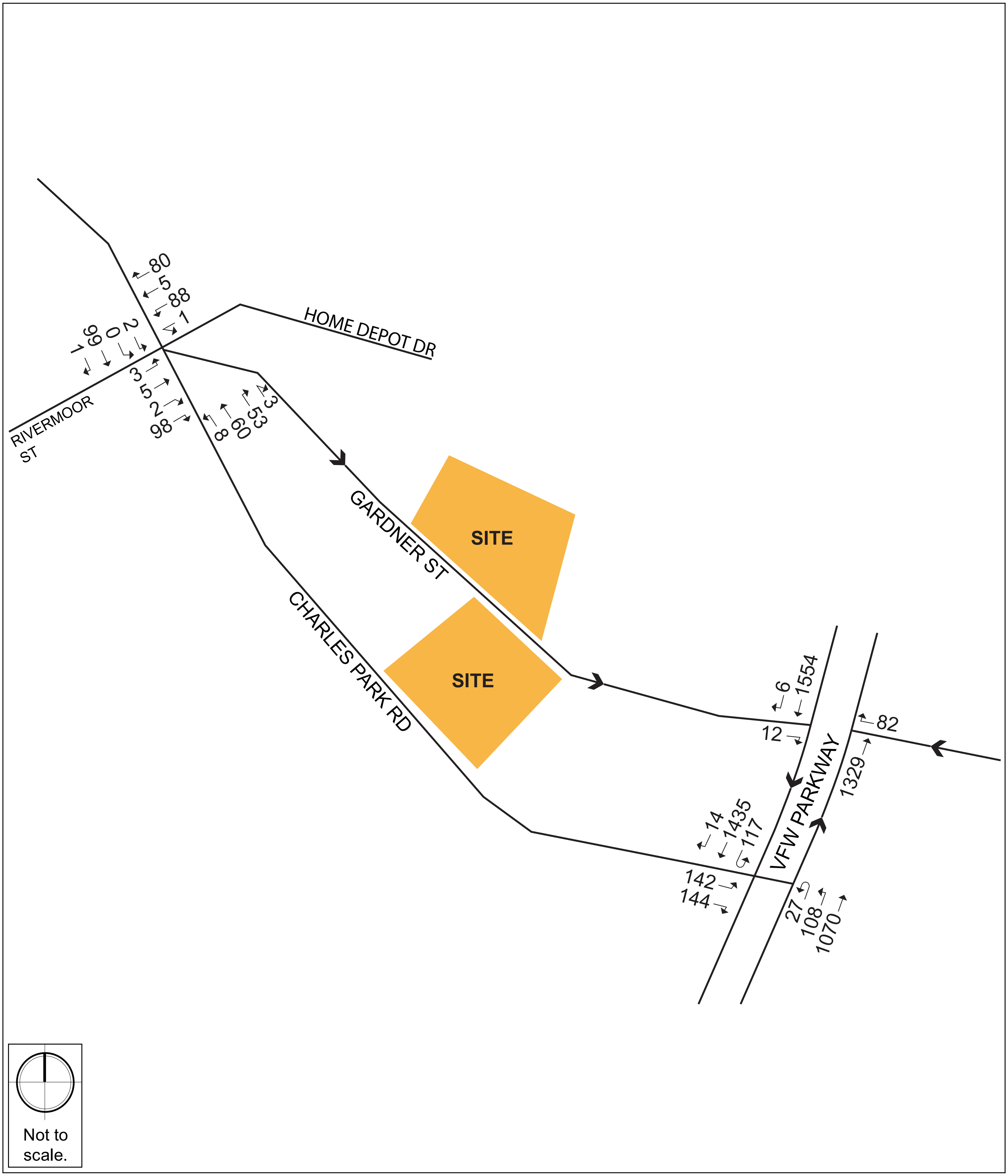


Figure 7-10.
No-Build (2026) Condition Vehicular Traffic Volumes, p.m. Peak Hour

MLF CONSULTING LLC
HOWARD STEIN HUDSON Engineers + Planners
178-197 Gardner Street

7.5.3 Project Parking

The Project is proposing to construct approximately 106 parking spaces. The apartment rental unit structure will remain at-grade with Gardner Street while its driveway ramps down to a surface parking lot behind the structure. There will be 26 spaces provided in the apartment rental surface lot, 4 of these spaces will be designated compact vehicle spaces. There will be 44 secure parking spaces located beneath the elevated structure, 19 of which will be designated compact vehicle spaces. Each townhouse will provide one garage space as well as a tandem space outside the garage.

The parking goals developed by the BTD for this section of West Roxbury are a maximum of 1.0 to 1.5 parking spaces per residential unit. The Project is providing a parking ratio of approximately 1.2 parking spaces per dwelling unit, consistent with the BTD maximum parking goals.

7.5.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of one secure bicycle parking/storage space per unit.

7.5.5 Trip Generation Methodology

Determining the future trip generation of the Project is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a proposed development and a specific land use program. A project's location and proximity to different travel modes determines how people will travel to and from a project site.

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[4] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the unadjusted number of vehicular trips for the Project, the following ITE land use code (LUCs) was used:

Land Use Code 221 – Multifamily Housing (Mid-Rise). The Multifamily Housing Mid-Rise LUC includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and ten floors. Calculations of the number of trips use ITE's average rate per dwelling units.

[4] Trip Generation Manual, 9th Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

7.5.6 Travel Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. Project is located within designated Area 19 – West Roxbury. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[5]. The person trips were then distributed to different modes according to the mode shares shown in **Table 7-2**.

Table 7-2. Travel Mode Shares

Time Period		Vehicle Occupancy Rate[a]	Walk/Bike Share[b]	Transit Share[b]	Vehicle Share[b]
Daily	In	1.18	8%	8%	84%
	Out	1.18	8%	8%	84%
a.m. Peak Hour	In	1.18	11%	9%	80%
	Out	1.18	8%	19%	73%
p.m. Peak Hour	In	1.18	8%	19%	73%
	Out	1.18	11%	9%	80%

a 2009 National Household Travel Survey.
b Based on rates published by the Boston Transportation Department for Area 19 – West Roxbury.

7.5.7 Project Trip Generation

The mode share percentages shown in **Table 7-2** were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The trip generation for the Project by mode is shown in **Table 7-3**. The detailed trip generation information is provided in **Appendix D.**

[5] *Summary of Travel Trends: 2009 National Household Travel Survey*; FHWA; Washington, D.C.; June 2011.

Table 7-3. Trip Generation Summary

Time Period		Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
	In	23	23	236
Residential [a]	Out	23	23	236
	Total	**46**	**46**	**472**
a.m. Peak Hour				
	In	1	1	7
Residential	Out	2	5	20
	Total	**3**	**6**	**27**
p.m. Peak Hour				
	In	2	5	21
Residential	Out	2	2	14
	Total	**4**	**7**	**35**

a Based on ITE LUC 221 – 88 Multifamily Housing (Mid-Rise) units, average rate.

7.5.8 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 19 – West Roxbury and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 7-11**.

7.5.9 Build (2026) Condition Traffic Volumes

The vehicle trips were distributed through the study area. The project-generated trips for the weekday a.m. Peak Hour and weekday p.m. Peak Hour are shown in **Figure 7-12** and **Figure 7-13**, respectively. The trip assignments were added to the No-Build (2026) Condition vehicular traffic volumes to develop the Build (2026) Condition vehicular traffic volumes. The Build (2026) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-14** and **Figure 7-15**, respectively.

7.6 Traffic Capacity Analysis

Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 7-4** displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition, with significant traffic

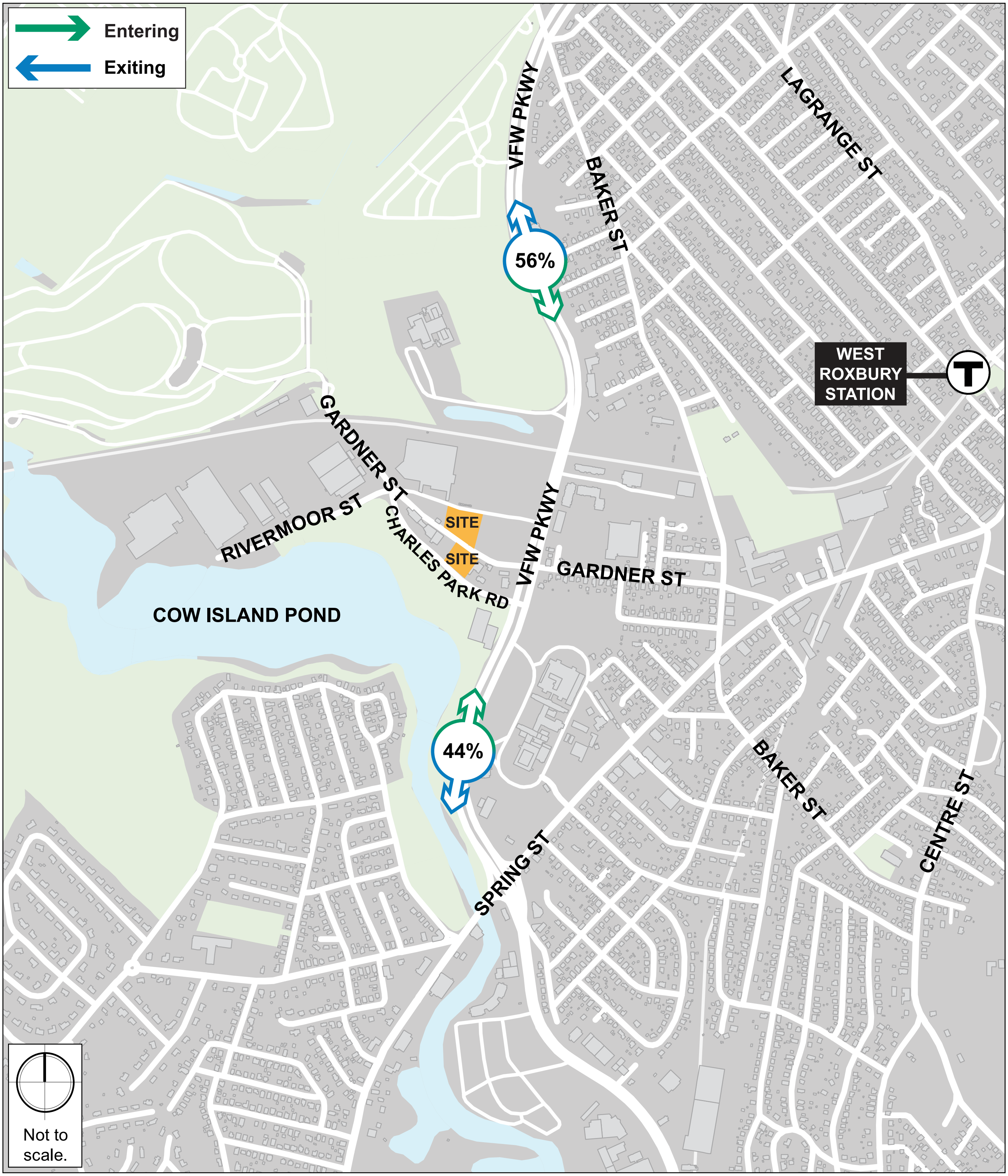


Figure 7-11.
Trip Distribution

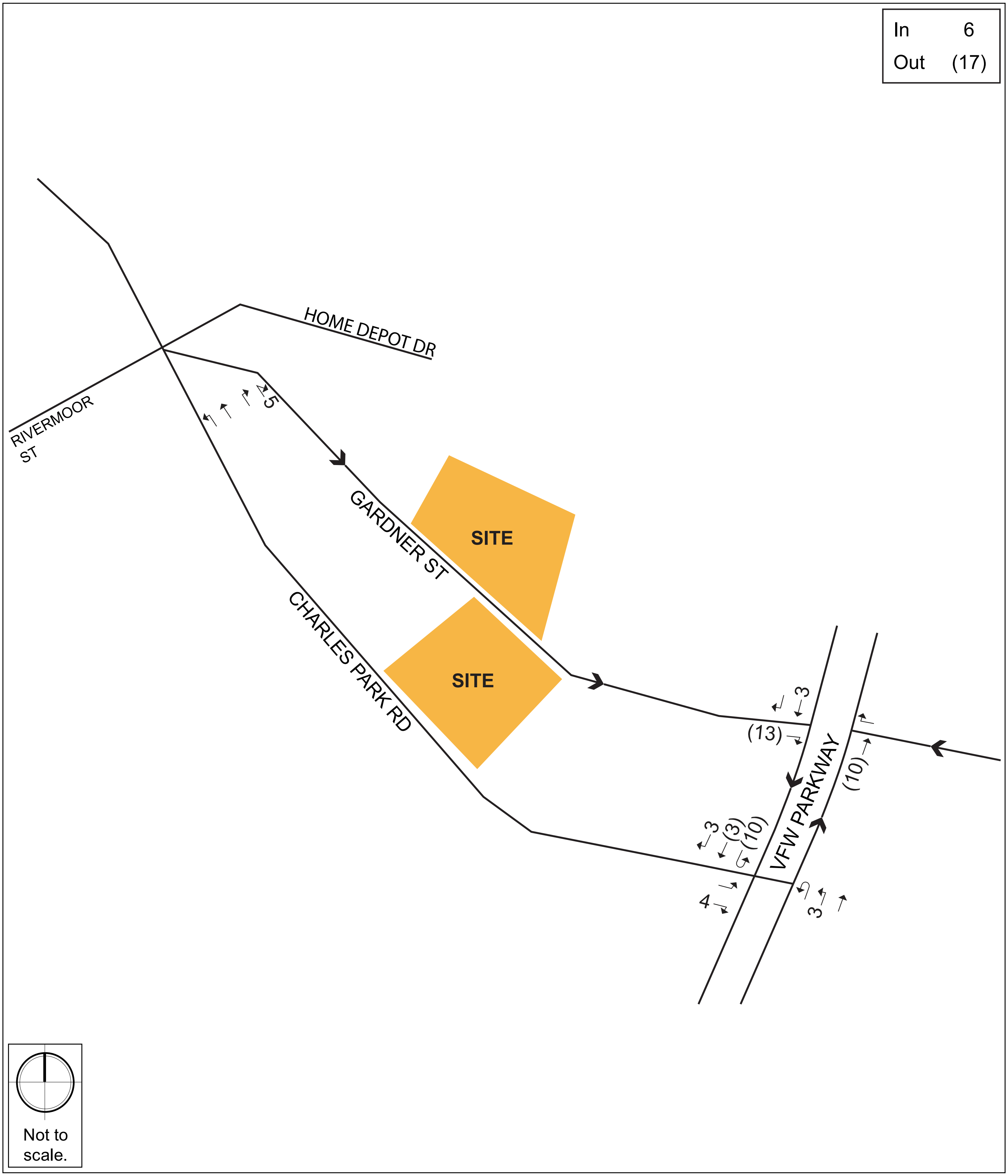


Figure 7-12.
Project-Generated Vehicle Trip Assignment, a.m. Peak Hour

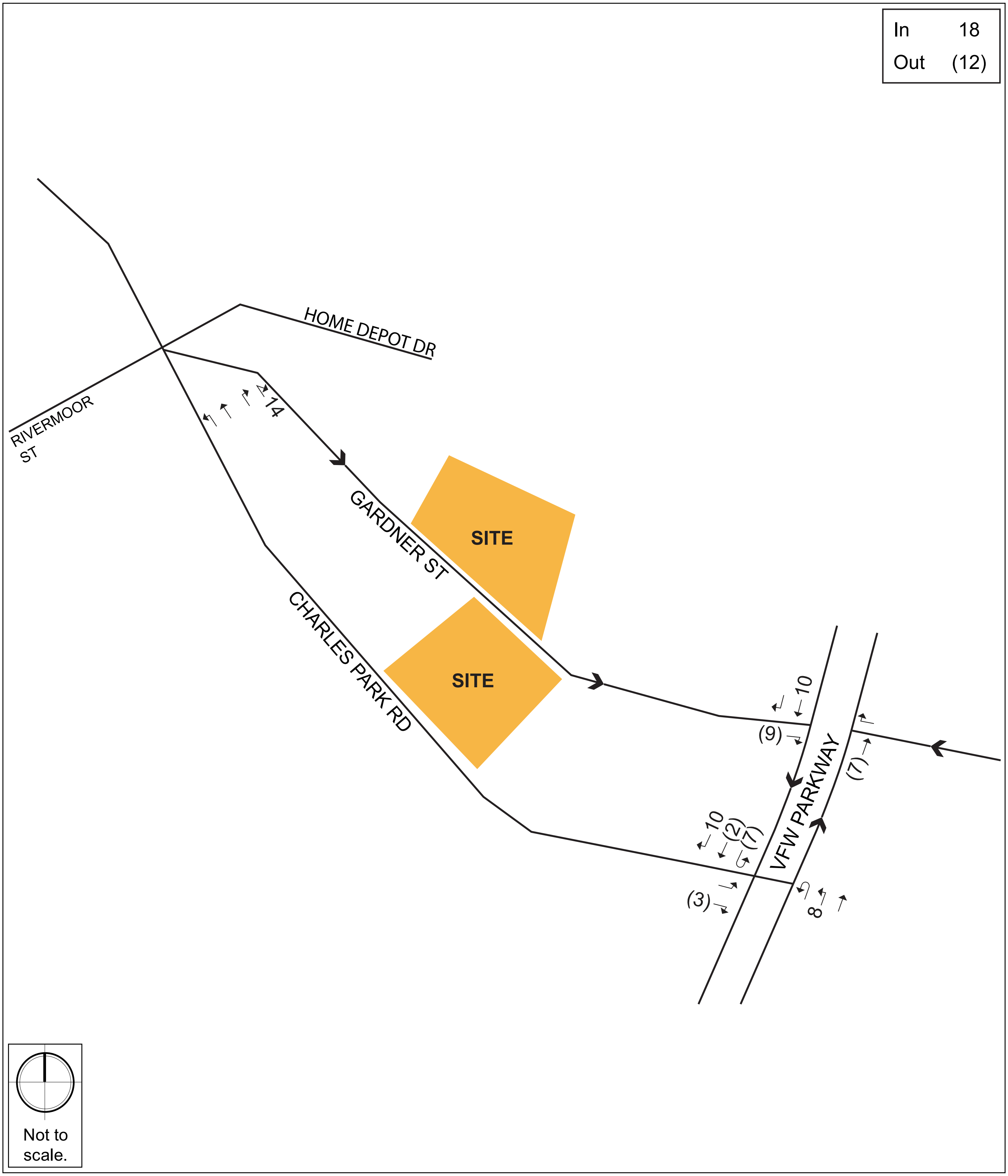


Figure 7-13.
Project-Generated Vehicle Trip Assignment, p.m. Peak Hour

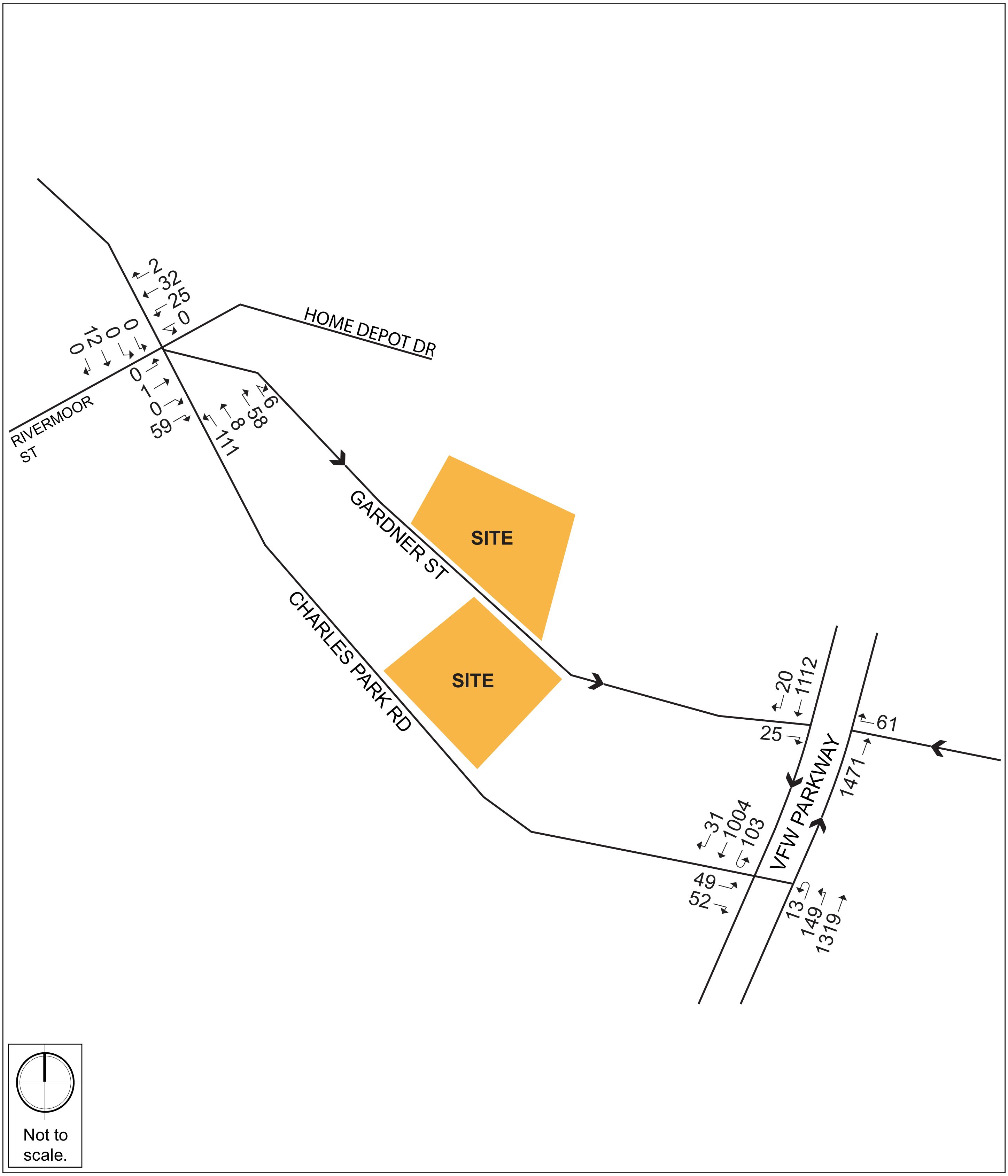


Figure 7-14.
Build (2026) Condition Vehicular Traffic Volumes, a.m. Peak Hour

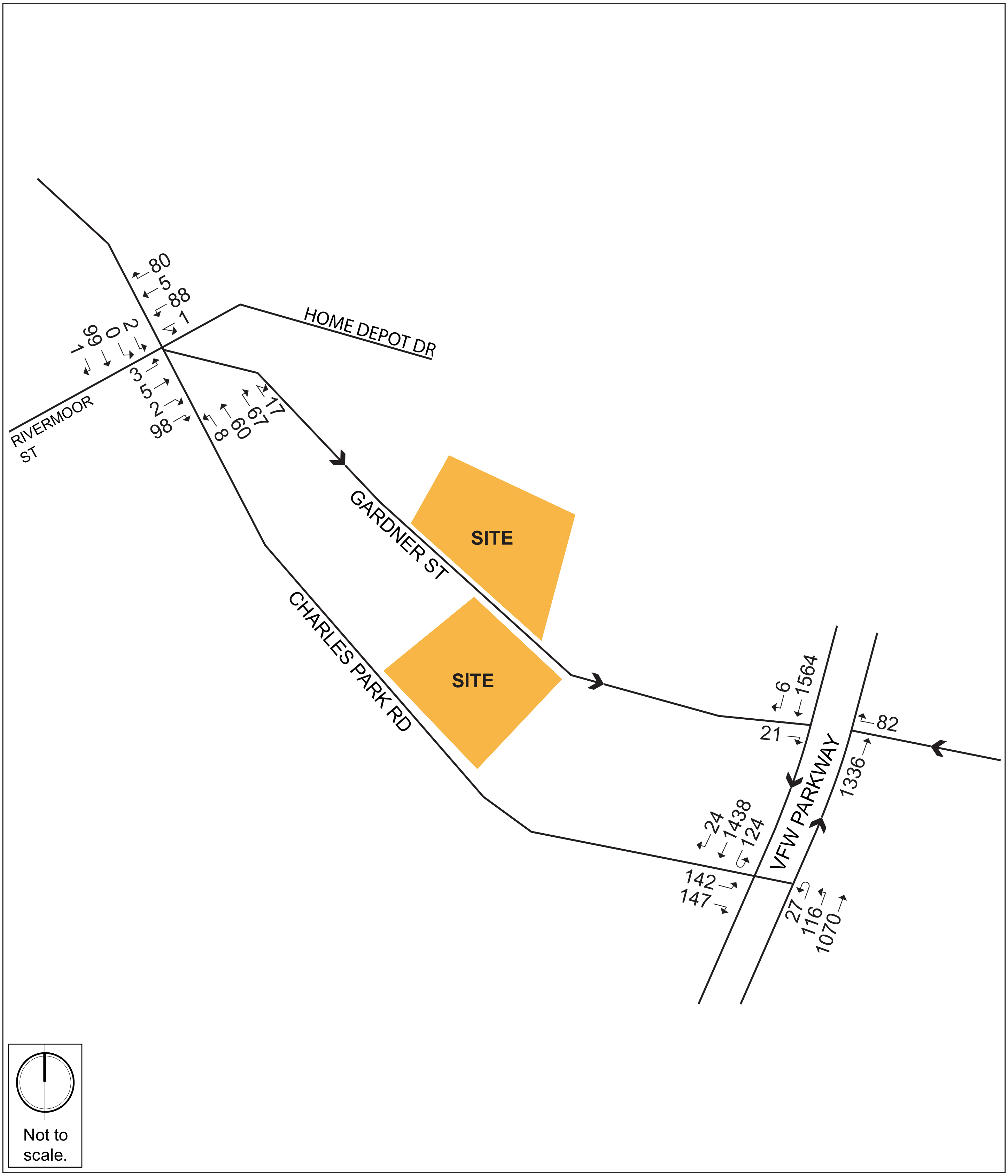


Figure 7-15.
Build (2026) Condition Vehicular Traffic Volumes, p.m. Peak Hour

delay. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

Table 7-4. Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

In addition to delay and LOS, the operational capacity and vehicular queues are calculated and used to further quantify traffic operations at intersections. The following describes these other calculated measures.

The volume-to-capacity (v/c) ratio is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has adequate capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity.

The 50th percentile queue length, measured in feet, represents the maximum queue length during a cycle of the traffic signal with typical (or median) entering traffic volumes.

The 95th percentile queue length, measured in feet, represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during five percent of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only five percent of the time and would typically not occur during off-peak hours. Since volumes fluctuate throughout the hour, the 95th percentile queue represents what can be considered a "worst case" scenario. Queues at the intersection are generally below the 95th percentile queue throughout the course of the peak hour. It is also unlikely that the 95th percentile queues for each approach to the intersection will occur simultaneously.

7.6.1 Existing Condition Traffic Operations Analysis

As shown in **Table 7-5** and **Table 7-6**, in the Existing Condition, all of the study area intersections and a majority of the approaches operate at acceptable levels of service (LOS D or better) during the weekday a.m. and p.m. peak hours, with the exception of the following movements:

- The signalized intersection of the VFW Parkway/Charles Park Road currently operates at LOS C during the weekday a.m. peak hour and LOS D during the weekday p.m. peak hour. During the a.m. peak hour, the Charles Park Road eastbound left | left approach, the VFW Parkway northbound U-turn/left-turn approach and the VFW southbound U-turn approach all operate at LOS E. During the p.m. peak hour, the Charles Park Road eastbound left-turn approach, the VFW Parkway northbound /U-turn/left-turn approach, and the VFW Parkway southbound U-turn approach and thru | thru/right-turn approach operate at LOS E. The longest queues at the intersection occur in the VFW Parkway northbound thru | thru lane during the a.m. peak hour and in the VFW Parkway southbound thru | thru/right-turn lane during the p.m. peak hour.

7.6.2 No-Build (2026) Condition Traffic Operations Analysis

As shown in the No-Build (2026) Condition, all of the study area intersections and approaches continue to operate at the same levels of service during the weekday a.m. and p.m. peak hours.

7.6.3 Build (2026) Condition Traffic Operations Analysis

As shown in the Build (2026) Condition, all of the study area intersections and approaches continue to operate at the same levels of service during the weekday a.m. and p.m. peak hours.

Table 7-5. Existing Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Movement	Existing (2019) Condition					No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues 50th	Queues 95th	LOS	Delay (s)	V/C Ratio	Queues 50th	Queues 95th
Signalized Intersections															
VFW Parkway/Charles Park Road	**C**	**23.3**	**-**	**-**	**-**	**C**	**24.5**	**-**	**-**	**-**	**C**	**27.8**	**-**	**-**	**-**
Charles Park Rd EB left|left	E	69.2	0.40	26	43	E	69.3	0.41	27	45	E	69.3	0.41	27	45
Charles Park Rd EB right	C	25.9	0.45	0	34	C	25.5	0.46	0	34	C	25.6	0.48	0	35
VFW Parkway NB u-turn/left	E	74.1	0.73	139	207	E	74.1	0.74	144	213	E	74.2	0.74	147	216
VFW Parkway NB thru|thru	B	12.4	0.58	288	443	B	13.2	0.61	312	478	B	14.0	0.62	314	483
VFW Parkway SB u-turn	E	57.8	0.42	77	126	E	57.8	0.42	79	130	E	58.8	0.46	88	141
VFW Parkway SB thru|thru/right	C	23.6	0.52	302	433	C	25.9	0.54	322	461	C	32.9	0.56	327	468
VFW Parkway/Gardner Street	**A**	**3.0**	**-**	**-**	**-**	**A**	**3.1**	**-**	**-**	**-**	**A**	**3.1**	**-**	**-**	**-**
Gardner St EB right	A	0.0	0.02	0	0	A	0.0	0.02	0	0	A	0.1	0.05	0	0
Gardner St WB right	A	0.1	0.05	0	0	A	0.1	0.05	0	0	A	0.1	0.05	0	0
VFW Parkway NB thru|thru	A	2.8	0.52	0	268	A	2.9	0.54	0	288	A	2.9	0.54	0	293
VFW Parkway SB thru|thru/right	A	3.5	0.39	0	244	A	3.6	0.40	0	258	A	3.6	0.41	259	156
Unsignalized Intersections															
Gardner Street/Charles Park Road/Rivermoor Street/Home Depot Driveway	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rivermoor St EB left/thru/right	A	7.3	0.08	-	8	A	7.3	0.09	-	8	A	7.4	0.09	-	8
Home Depot Driveway WB left/thru/right	A	8.4	0.14	-	11	A	8.5	0.15	-	13	A	8.5	0.15	-	13
Charles Park Road NB left/thru/right	A	8.6	0.23	-	23	A	8.7	0.24	-	23	A	8.8	0.25	-	25
Gardner Street SB left/thru/right	A	7.8	0.02	-	3	A	7.8	0.02	-	3	A	7.8	0.02	-	3

Grey shading indicates LOS E or F.

Table 7-6. Existing (2015) Condition Capacity Analysis Summary, Weekday p.m. Peak Hr

Intersection/Movement	Existing (2019) Condition					No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	95th	LOS	Delay (s)	V/C Ratio	Queues 50th	95th	LOS	Delay (s)	V/C Ratio	Queues 50th	95th
Signalized Intersections															
VFW Parkway/Charles Park Road	**D**	**46.4**	**-**	**-**	**-**	**D**	**47.0**	**-**	**-**	**-**	**D**	**49.3**	**-**	**-**	**-**
Charles Park Rd EB left|left	E	69.5	0.62	75	98	E	69.5	0.62	77	101	E	69.6	0.66	86	99
Charles Park Rd EB right	B	17.9	0.62	0	47	B	17.6	0.62	0	48	B	16.5	0.63	0	26
VFW Parkway NB u-turn/left	E	72.1	0.68	121	186	E	72.6	0.69	125	191	E	74.8	0.73	135	202
VFW Parkway NB thru|thru	B	12.8	0.51	230	355	B	13.6	0.54	250	385	B	15.2	0.56	272	420
VFW Parkway SB u-turn	E	64.4	0.55	98	155	E	64.7	0.56	102	161	E	64.1	0.58	110	170
VFW Parkway SB thru|thru/right	E	69.1	0.69	352	#812	E	70.0	0.72	381	#871	E	72.9	0.78	447	#983
VFW Parkway/Gardner Street	**A**	**5.8**	**-**	**-**	**-**	**A**	**6.1**	**-**	**-**	**-**	**A**	**6.5**	**-**	**-**	**-**
Gardner St EB right	A	0.0	0.02	0	0	A	0.0	0.02	0	0	A	0.0	0.02	0	0
Gardner St WB right	A	0.1	0.07	0	0	A	0.1	0.07	0	0	A	0.1	0.07	0	0
VFW Parkway NB thru|thru	A	3.8	0.48	0	207	A	4.0	0.50	0	223	A	4.2	0.52	0	236
VFW Parkway SB thru|thru/right	A	8.1	0.57	0	404	A	8.6	0.59	0	435	A	9.2	0.62	0	466
Unsignalized Intersections															
Gardner Street/Charles Park Road/Rivermoor Street/Home Depot Driveway	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Rivermoor St EB left/thru/right	B	10.1	0.26	-	25	B	10.2	0.27	-	28	A	8.7	0.19	-	18
Home Depot Driveway WB left/thru/right	A	9.8	0.30	-	30	A	9.9	0.31	-	33	A	9.7	0.27	-	28
Charles Park Road NB left/thru/right	A	9.4	0.20	-	18	A	9.5	0.21	-	20	B	12.4	0.34	-	38
Gardner Street SB left/thru/right	A	9.5	0.21	-	20	A	9.6	0.22	-	20	A	9.4	0.19	-	18

\# 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Grey shading indicates LOS E or F.

7.7 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to minimize automobile usage and Project related traffic impacts. TDM will be facilitated by the nature of the Project (which does not generate significant peak hour trips) and its proximity to numerous public transit alternatives.

On-site management will keep a supply of transit information (schedules, maps, and fare information) to be made available to the residents and patrons of the site. The Proponent will work with the City to develop a TDM program appropriate to the Project and consistent with its level of impact.

The Proponent is prepared to take advantage of good transit access in marketing the site to future residents by working with them to implement the following TDM measures to encourage the use of non-vehicular modes of travel.

The TDM measures for the Project may include but are not limited to the following:

- Orientation Packets: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options.
- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.
- Provide information on travel alternatives for employees and visitors via the Internet and in the building lobby.
- Electric Vehicle Charging: The Proponent will explore the feasibility of providing electric vehicle charging station(s) within the garage.
- Vehicle Sharing Program: The Proponent will explore the feasibility of providing spaces in the garage for a car sharing service.

7.8 Transportation Mitigation Measures

The Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The proposed measures listed above and any additional transportation improvements to be undertaken as part of this Project will be defined and documented in the TAPA.

The Proponent will also produce a Construction Management Plan (CMP) for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project.

7.9 Evaluation of Short-term Construction Impacts

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

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

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

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

8.0 Coordination with Governmental Agencies

8.1 Architectural Access Board Compliance

This Project will comply with the requirements of the Architectural Access Board. The Project will also be designed to comply with the Standards of the Americans with Disabilities Act.

8.2 Massachusetts Environmental Policy Act Review

Based on information currently available, development of the Proposed Project will not result in a state permit/state agency action and meet a review threshold that would require review by the MEPA Office of the Massachusetts Executive Office of Energy and Environmental Affairs.

8.3 Boston Civic Design Commission Review

The Project does not exceed the 100,000 gross square feet of FAR floor area and therefore is not expected to be reviewed by the Boston Civic Design Commission.

8.4 Boston Parks Commission Review

The Project is within 100 feet of Park Subject to City Ordinance 7.4-11 and review by the Boston Parks Commission.

9.0 PROJECT CERTIFICATION

This form has been circulated to the Boston Planning and Development Agency as required by Article 80 of the Boston Zoning Code.

WEST BRIGHTON ACQUISITIONS, LLC

Signature of Proponent

6/7/19
Date

MITCHELL L. FISCHMAN ("MLF") CONSULTING LLC

Signature of Preparer
Mitchell L. Fischman, Principal

06/07/19
Date

APPENDIX A – LETTER OF INTENT TO FILE PNF, APRIL 16, 2019

McDERMOTT
QUILTY &
MILLER LLP

28 STATE STREET, SUITE 802
BOSTON, MA 02109

30 ROWES WHARF, SUITE 600
BOSTON, MA 02110

April 16, 2019

Mr. Brian Golden, Director
Boston Redevelopment Authority
One City Hall Plaza, 9th Floor
Boston, MA 02201

Attn: Aisling Kerr, Project Manager

Re: Letter of Intent to File Expanded Project Notification Form ("EPNF")
Article 80B - Large Project Review
178, 189 - 197 Gardner Street and Charles Park Rd., West Roxbury, MA

Dear Director Golden:

As zoning and permitting counsel to West Brighton Acquisitions, LLC (the "Proponent"), which has secured development rights to the real property assemblage at 178, 189 and 197 Gardner Street, West Roxbury, I am writing to notify the Boston Planning and Development Agency (the "BPDA") of the Proponent's intent to file an Expanded Project Notification Form ("EPNF") with the BRA pursuant to Article 80B, Large Project Review requirements of the City of Boston Zoning Code (the "Code").

The proposed project seeks to revitalize and convert approximately 1.4 acres of non-descript industrial and residential property at this transitional location off the VFW Parkway in West Roxbury, into a multi-building residential development of approximately 96,000 gross square feet, with a variety of townhouse home-ownership units and rental apartments, on-site parking and related improvements in landscaping, pedestrian and vehicular access and design (the "Proposed Project"). The overall residential program will include 18 three-bedroom townhomes for homeownership, each with their own deck area/open space, garage and driveway parking; along with a new mid-rise apartment building consisting of 70 rental units, 70 on-site parking spaces, on-site amenities, patios, decks and landscaped open space. Investments in new sidewalk connectivity and public realm updates will also be further explored with the City, as part of the Proposed Project.

Consistent with the policy goals of Mayor Walsh's 2030 Housing Plan, the Proposed Project will also assist in addressing the shortage of both market-rate and affordable housing, while accommodating families with a portion of new home ownership opportunities. In addition to its market rate units, the Proposed Project will comply with the City's Inclusionary Development Policy for on-site affordable units.

Identified as 178, 189 and 197 Gardner Street, the overall project site includes four (4) parcels of land along both sides of Gardner Street with a combined land area of 62,451 square feet, including two adjacent parcels totaling 36,194 square feet on the north side and 26,257 square feet on the opposite/south side of Garner Street, with frontage along Charles Park Road (the "Project Site"). The larger land area at 189 and 197 Gardner Street includes industrial properties recently utilized by a plastics manufacturer and construction contractor; while the smaller parcels to the south at 178 Gardner Street include paved parking areas and non-descript residential structures. Situated in a transitional section of the West Roxbury neighborhood, the Project Site also abuts the new Oak Row Apartments at 1235 VFW Parkway. Vacant and distressed for decades, this former IHOP restaurant location was successfully redeveloped into the new Oak Row Apartments by the Proponent's principal, Mr. Peter Davos of West Roxbury, with extensive public input and support. Consistent with this recent and future residential expansion in the immediate area, the Project Site is also ideally situated within a short walk to the City's Millennium Park and adjacent to the Children's Happy Day School on Gardner Street. For your reference, please see attached hereto **Figure 1 - Project Locus.**

The Proposed Project will exceed the 50,000 square foot total build-out size requirement for a project located in a Boston neighborhood and therefore requires preparation of filing(s) under the Large Project Review regulations, pursuant to Article 80 of the Code. In this regard, the proposed EPNF filing is expected to address many issues normally presented in a Draft Project Impact Report ("DPIR") including a transportation analysis, urban design and sustainability component, handicap and disability access, and shadow, infrastructure, historic resources, and other environmental evaluations that will help explain potential project impacts from the proposed uses, and any needed mitigation measures to reduce these impacts.

The Project Site is located within the Community Commercial (CC) sub-district of the West Roxbury Neighborhood District (Article 56 of the Code), which requires a Conditional Use Permit for the proposed multi-family residential use by the Boston Zoning Board of Appeal. Determination of off-street parking and loading will be reviewed by the BPDA as stipulated by Article 80, and the Proposed Project is presently designed in substantially conformity with the dimensional requirements of the Code.

In support of the required Article 80 Large Project Review process, the Proponent and its development team have conducted, and will continue to undertake, productive community outreach with neighbors and abutters of the Project Site, including meetings and discussions with local elected and appointed officials from the area, and with property owners along Gardner Street and Charles Park Road. Initial outreach to-date has included an informal neighborhood meeting hosted by the Proponent at a local restaurant near to the Project Site, to present its preliminary plans and discuss public reviews required by the BPDA for the Proposed Project, followed by an initial project presentation to the Zoning Committee of the West Roxbury Neighborhood Council.

Thank you for your time and attention to this Proposed Project, and our team looks forward to working with you, the BPDA staff, prospective members of the Impact Advisory Group, local elected officials and the community towards a positive outcome. Please also do not hesitate to contact me should you have any questions or for more information regarding the Proposed Project.

Very truly yours,

Joseph P. Hanley, Esq.
Partner - McDermott, Quilty & Miller, LLP

Attachment: **Figure 1. Project Locus**

cc: City Councilor O'Malley
State Senator Rush
State Representative Coppinger
Jack Duggan, Mayor's Office of Neighborhood Services
Jonathan Greeley, BPDA Development Director
Aisling Kerr, Project Manager
Peter Davos, West Brighton Acquisitions, LLC
Mitchell L. Fischman, MLF Consulting LLC
West Roxbury Neighborhood Council, Zoning Committee

Figure 1. Project Locus
178 & 189-197 Gardner Street Multifamily Development

MLF CONSULTING LLC

Letter of Intent to File PNF

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

178-197 GARDNER STREET
PROJECT NOTIFICATION FORM

Pages **Contents**

```
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for     1 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =     71532.0 ;  Urban Roughness Length =  1.000 m

 **Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Assumes Receptors on FLAT Terrain.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Full Conversion Assumed for NO2.
        6. Urban Roughness Length of 1.0 Meter Used.

 **Other Options Specified:
        NOCHKD   - Suppresses checking of date sequence in meteorology files
        SCREEN   - Use screening option
 which forces calculation of centerline values

 **Model Accepts FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  CO

 **Model Calculates  1 Short Term Average(s) of:   1-HR

 **This Run Includes:      1 Source(s);       1 Source Group(s); and    1026 Receptor(s)

               with:      0 POINT(s), including
                          0 POINTCAP(s) and      0 POINTHOR(s)
                and:      1 VOLUME source(s)
                and:      0 AREA type source(s)
                and:      0 LINE source(s)
                and:      0 OPENPIT source(s)
                and:      0 BUOYANT LINE source(s) with      0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  18081

 **Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours
```

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 6.10 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.6 MB of RAM.

**Input Runstream File: CO_5yrs_CO.DTA
**Output Print File: CO_5yrs_CO.LST

**File for Summary of Results: W:\Apps\aermod\4465\CO_5yrs_CO.SUM

*** AERMOD - VERSION 18081 *** *** 178 & 189 Gardner Street BPDA *** 05/17/19
*** AERMET - VERSION 18081 *** *** *** 11:53:07
PAGE 2

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 18081 *** *** 178 & 189 Gardner Street BPDA *** 05/17/19
*** AERMET - VERSION 18081 *** *** *** 11:53:07
PAGE 3

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: Urban.sfc Met Version: 18081
Profile file: Urban.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 11111 Upper air station no.: 22222
Name: UNKNOWN Name: UNKNOWN
Year: 2010 Year: 2010

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	10.	10.0	255.2	2.0
10	01	02	2	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	20.	10.0	255.2	2.0
10	01	03	3	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	30.	10.0	255.2	2.0
10	01	04	4	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	40.	10.0	255.2	2.0
10	01	05	5	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	50.	10.0	255.2	2.0
10	01	06	6	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	60.	10.0	255.2	2.0
10	01	07	7	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	70.	10.0	255.2	2.0
10	01	08	8	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	80.	10.0	255.2	2.0
10	01	09	9	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	90.	10.0	255.2	2.0
10	01	10	10	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	100.	10.0	255.2	2.0
10	01	11	11	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	110.	10.0	255.2	2.0

```
 10 01 12  12 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  120.   10.0  255.2    2.0
 10 01 13  13 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  130.   10.0  255.2    2.0
 10 01 14  14 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  140.   10.0  255.2    2.0
 10 01 15  15 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  150.   10.0  255.2    2.0
 10 01 16  16 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  160.   10.0  255.2    2.0
 10 01 17  17 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  170.   10.0  255.2    2.0
 10 01 18  18 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  180.   10.0  255.2    2.0
 10 01 19  19 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  190.   10.0  255.2    2.0
 10 01 20  20 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  200.   10.0  255.2    2.0
 10 01 21  21 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  210.   10.0  255.2    2.0
 10 01 22  22 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  220.   10.0  255.2    2.0
 10 01 23  23 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  230.   10.0  255.2    2.0
 10 01 24  24 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  240.   10.0  255.2    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 10 01 01 01   10.0 1   10.    0.50   255.3   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
 *** AERMOD - VERSION  18081 ***   *** 178 & 189 Gardner Street BPDA                                         ***        05/17/19
 *** AERMET - VERSION  18081 ***   ***                                                                       ***        11:53:07
                                                                                                                        PAGE   4
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

                                              *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***


                                  ** CONC OF CO       IN MICROGRAMS/M**3                         **

                                                      DATE                                                                NETWORK
GROUP ID                           AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


ALL      HIGH   1ST HIGH VALUE IS      72.90184  ON 10031412: AT (  320786.37,  4682952.16,     6.10,     6.10,    1.52)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION  18081 ***   *** 178 & 189 Gardner Street BPDA                                         ***        05/17/19
 *** AERMET - VERSION  18081 ***   ***                                                                       ***        11:53:07
                                                                                                                        PAGE   5
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           1 Warning Message(s)
 A Total of           0 Informational Message(s)

 A Total of       18504 Hours Were Processed

 A Total of           0 Calm Hours Identified

 A Total of           0 Missing Hours Identified (  0.00 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***
```

INDOOR GARAGE ANALYSIS PROGRAM

PROJECT: 178-197 GARDNER STREET PARKING GARAGE PEAK PM HOUR - YEAR: 2026

DISTANCE IN:	75 METERS
DISTANCE OUT:	75 METERS
NUMBER OF EXIT LANES:	1 LANE(S)
PEAK VOLUME:	39 VEH/HOUR
CO RATE:	3.045 GRAMS CO/MILE
SPEED IN GARAGE:	5.0 M.P.H.
VENT CFM:	14,250 CFM
TOTAL CO EMISSIONS =	0.092 GRAMS/MIN = 0.0015 GRAMS/SEC
TOTAL VENTILATION =	404 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES = 0.20 PPM

MOVES2014B OUTPUT – 178-197 GARDNER STREET

Zone ID	Road Type ID	Link Length (miles)	Link Volume (Vehicles/Hr)	Link Avg Speed (Miles/Hr)	Pollutant	Emission Factor (Grams/veh-mi)
250250	5	0.046	31	5	CO	3.04536
250250	5	0.046	39	5	CO	3.04536

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

178-197 GARDNER STREET
PROJECT NOTIFICATION FORM

Page **Contents**

Figure 1
Sound Monitoring Location
178-197 Gardner Street

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

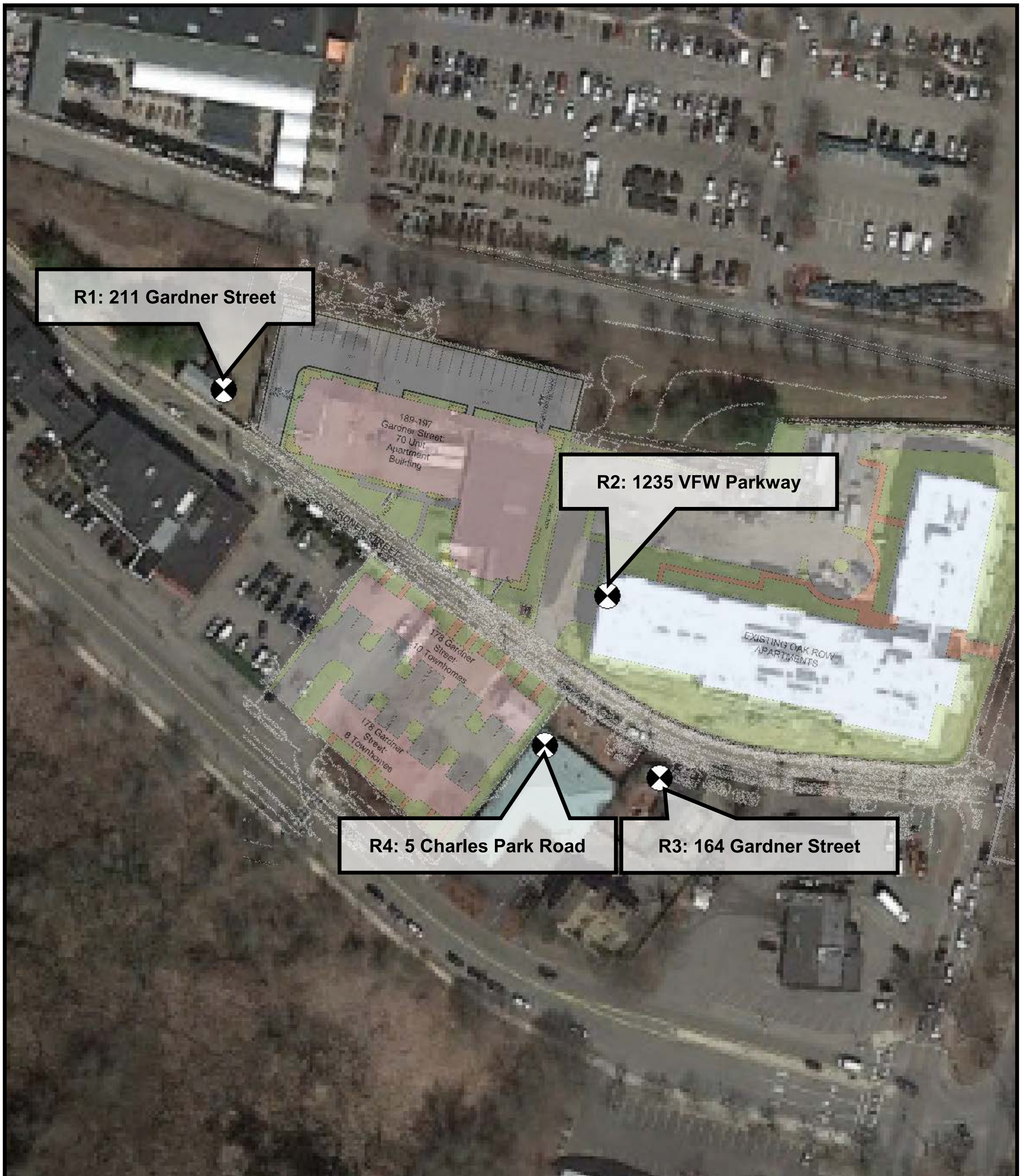


Figure 2
Sound Modeling Receptor Locations
West Roxbury Residences, West Roxbury, MA

Cadna Noise Modeling Results

	31.5	63	125	250	500	1000	2000	4000	8000	A-Wtd	
Local Nighttime Limit	68	67	61	52	46	40	33	28	26	**50**	
NIGHTTIME RESULTS & CITY OF BOSTON ANALYSIS	**31.5**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-Wtd**	**Complies Night?**
211 Gardner Street	38	37	36	35	30	24	18	11	-2	31	**YES**
1235 VFW Parkway	38	41	42	43	40	35	31	25	14	41	**YES**
164 Gardner Street	33	33	33	34	30	27	23	16	4	32	**YES**
5 Charles Park Road	38	38	37	37	33	27	22	15	4	34	**YES**

NIGHTTIME RESULTS & MASSDEP ANALYSIS (< +10 dBA)	**Impact Level (dBA)**	**Backgrou nd Level (dBA)**	***Total Level (dBA)***	***Increase (dBA)***	**Complies Night?**
211 Gardner Street	31.4	42.4	42.7	**+0.3**	**YES**
1235 VFW Parkway	41.2	47.1	48.1	**+1.0**	**YES**
164 Gardner Street	32.2	47.1	47.2	**+0.1**	**YES**
5 Charles Park Road	33.8	47.1	47.3	**+0.2**	**YES**

APPENDIX D – TRANSPORTATION APPENDIX

D1 – Detailed Traffic Counts

D2 – MassDOT Weekday Seasonal Adjustment Factor

D3 – Detailed Trip Generation Calculations

D4 – Synchro Analysis

APPENDIX D1 – Detailed Traffic Counts

Client: Michael White
Project #: 381_C32_HSH
BTD #: Location 1
Location: West Roxbury, Boston, MA
Street 1: Gardner St/Charles Park Rd
Street 2: Rivermoor St
Count Date: 4/30/2019
Day of Week: Tuesday
Weather: Partly Sunny, 50°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
Start Time	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
7:00 AM	21	4	7	0	0	0	4	0	0	0	1	9	0	2	10	0
7:15 AM	22	3	6	0	0	1	6	0	0	0	0	10	0	0	7	1
7:30 AM	21	2	6	0	0	0	0	0	0	0	0	11	0	7	5	0
7:45 AM	28	2	11	1	0	0	3	0	0	0	0	9	0	4	11	0
8:00 AM	18	1	14	0	0	0	5	0	0	1	0	8	0	2	6	0
8:15 AM	12	1	6	0	0	0	1	0	0	0	0	13	0	4	9	2
8:30 AM	7	3	12	0	0	0	1	1	1	0	0	10	0	8	4	2
8:45 AM	11	5	21	0	1	0	2	0	0	0	0	15	0	5	6	3

	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
Start Time	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	3	8	13	1	0	0	12	0	0	0	0	26	0	14	4	5
4:15 PM	3	7	13	0	0	0	9	1	0	0	0	20	0	20	0	5
4:30 PM	1	5	12	0	1	0	7	0	0	0	0	12	0	18	2	6
4:45 PM	4	10	11	0	0	0	13	0	0	3	0	13	0	14	2	16
5:00 PM	2	14	7	0	0	0	25	0	1	1	0	26	1	16	3	21
5:15 PM	1	11	9	0	0	0	13	0	1	1	1	13	0	18	0	24
5:30 PM	3	18	16	0	1	0	21	0	1	1	1	17	0	13	2	26
5:45 PM	2	6	10	0	1	0	13	1	0	0	0	15	0	17	0	6

AM PEAK HOUR 7:00 AM to 8:00 AM	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
	92	**11**	**30**	**1**	**0**	**1**	**13**	**0**	**0**	**0**	**1**	**39**	**0**	**13**	**33**	**1**
PHF	**0.80**				**0.50**				**0.91**				**0.78**			
HV %	**3.3%**	**45.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**61.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**15.4%**	**0.0%**	**15.4%**	**3.0%**	**100.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
	10	**53**	**43**	**0**	**1**	**0**	**72**	**0**	**3**	**6**	**2**	**69**	**1**	**61**	**7**	**87**
PHF	**0.72**				**0.73**				**0.71**				**0.93**			
HV %	**50.0%**	**1.9%**	**4.7%**	**0.0%**	**0.0%**	**0.0%**	**4.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**1.6%**	**85.7%**	**0.0%**

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 1
Location:	West Roxbury, Boston, MA
Street 1:	Gardner St/Charles Park Rd
Street 2:	Rivermoor St
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

BOSTON TRAFFIC DATA
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HEAVY VEHICLES

	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
Start Time	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	0	0	0	0	3	0	0	0	0	2	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	2	0	0	0	0	3	0	0	0	0	1	0	1	1	1
7:45 AM	1	2	0	0	0	0	2	0	0	1	0	3	0	0	0	0
8:00 AM	0	1	0	0	0	0	2	0	0	0	0	5	0	0	0	0
8:15 AM	1	2	0	0	0	0	0	0	0	0	0	3	0	0	1	0
8:30 AM	2	1	0	0	0	0	2	0	0	0	0	7	0	0	0	0
8:45 AM	0	1	2	0	0	0	0	0	0	0	0	5	0	0	0	0

	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
Start Time	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	4	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0
4:30 PM	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	2	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0
5:30 PM	3	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0
5:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
	4	**6**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**1**	**0**	**18**	**0**	**0**	**1**	**0**
PHF	**0.83**				**0.75**				**0.68**				**0.25**			

PM PEAK HOUR 4:15 PM to 5:15 PM	Charles Park Rd Northbound				Gardner St Southbound				Rivermoor St Eastbound				Rivermoor St Westbound			
	Left	Thru	Right	Hard Right	Left	Soft Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
	8	**3**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**2**	**0**
PHF	**0.60**				**0.38**				**0.38**				**0.25**			

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 1
Location:	West Roxbury, Boston, MA
Street 1:	Gardner St/Charles Park Rd
Street 2:	Rivermoor St
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

BOSTON
TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	Charles Park Rd Northbound					Gardner St Southbound					Rivermoor St Eastbound					Rivermoor St Westbound				
Start Time	Thru	Right	Hard Right	PED		Soft Left	Thru	Right	PED		Thru	Soft Right	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:30 AM	0	0	0	1		0	0	0	0		0	0	0	1		0	0	0	2	
7:45 AM	0	0	0	0		0	0	0	1		0	0	0	0		0	0	0	0	
8:00 AM	0	0	0	1		0	0	0	0		0	0	0	6		0	0	0	0	
8:15 AM	0	0	0	1		0	0	0	0		0	0	0	1		0	0	0	0	
8:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
8:45 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	5	

	Charles Park Rd Northbound					Gardner St Southbound					Rivermoor St Eastbound					Rivermoor St Westbound				
Start Time	Thru	Right	Hard Right	PED		Soft Left	Thru	Right	PED		Thru	Soft Right	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
4:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
4:30 PM	0	0	0	1		0	0	0	0		0	0	0	0		0	0	0	0	
4:45 PM	0	0	0	1		0	0	0	0		0	0	0	0		0	0	0	0	
5:00 PM	0	0	0	1		0	0	0	0		0	0	0	0		0	0	0	1	
5:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
5:30 PM	1	0	0	0		1	1	0	0		0	0	0	0		0	0	1	0	
5:45 PM	0	0	0	0		0	0	0	0		0	0	0	1		0	0	0	3	

AM PEAK HOUR[1] 7:00 AM to 8:00 AM	Charles Park Rd Northbound					Gardner St Southbound					Rivermoor St Eastbound					Rivermoor St Westbound				
	Thru	Right	Hard Right	PED		Soft Left	Thru	Right	PED		Thru	Soft Right	Right	PED		Left	Thru	Right	PED	
	0	0	0	1		0	0	0	1		0	0	0	1		0	0	0	2	

PM PEAK HOUR[1] 4:45 PM to 5:45 PM	Charles Park Rd Northbound					Gardner St Southbound					Rivermoor St Eastbound					Rivermoor St Westbound				
	Thru	Right	Hard Right	PED		Soft Left	Thru	Right	PED		Thru	Soft Right	Right	PED		Left	Thru	Right	PED	
	1	0	0	2		1	1	0	0		0	0	0	0		0	0	1	1	

[1] *Peak hours corresponds to vehicular peak hours.*

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 2
Location:	West Roxbury, Boston, MA
Street 1:	VFW Pkwy
Street 2:	Gardner St
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	326	0	0	0	172	2	0	0	0	4	0	0	0	21
7:15 AM	0	0	384	0	0	0	225	2	0	0	0	2	0	0	0	17
7:30 AM	0	0	372	0	0	0	244	1	0	0	0	1	0	0	0	20
7:45 AM	0	0	338	0	0	0	290	5	0	0	0	4	0	0	0	14
8:00 AM	0	0	367	0	0	0	279	7	0	0	0	5	0	0	0	14
8:15 AM	0	0	349	0	0	0	265	6	0	0	0	2	0	0	0	11
8:30 AM	0	0	316	0	0	0	267	1	0	0	0	4	0	0	0	12
8:45 AM	0	0	341	0	0	0	264	2	0	0	0	3	0	0	0	13

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	25*	0	0	0	379	6	0	0	0	2	0	0	0	10
4:15 PM	0	0	261	0	0	0	371	2	0	0	0	1	0	0	0	7
4:30 PM	0	0	280	0	0	0	396	2	0	0	0	2	0	0	0	22
4:45 PM	0	0	299	0	0	0	405	0	0	0	0	2	0	0	0	10
5:00 PM	0	0	288	0	0	0	397	0	0	0	0	2	0	0	0	15
5:15 PM	0	0	299	0	0	0	340	1	0	0	0	2	0	0	0	26
5:30 PM	0	0	346	0	0	0	394	4	0	0	0	3	0	0	0	18
5:45 PM	0	0	331	0	0	0	380	1	0	0	0	5	0	0	0	20

AM PEAK HOUR 7:30 AM to 8:30 AM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1426**	**0**	**0**	**0**	**1078**	**19**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**59**
PHF	**0.96**				**0.93**				**0.60**				**0.74**			
HV %	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**

PM PEAK HOUR 5:00 PM to 6:00 PM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1264**	**0**	**0**	**0**	**1511**	**6**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**79**
PHF	**0.91**				**0.95**				**0.60**				**0.76**			
HV %	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Michael White
Project #: 381_C32_HSH
BTD #: Location 2
Location: West Roxbury, Boston, MA
Street 1: VFW Pkwy
Street 2: Gardner St
Count Date: 4/30/2019
Day of Week: Tuesday
Weather: Partly Sunny, 50°F

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HEAVY VEHICLES

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	4	0	0	0	2	3	0	0	0	0	0	0	0	0
8:45 AM	0	0	7	0	0	0	4	1	0	0	0	0	0	0	0	0

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
7:00 AM to 8:00 AM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**17**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.53**				**0.63**				**0.00**				**0.00**			

PM PEAK HOUR	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
5:00 PM to 6:00 PM	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**8**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.67**				**0.60**				**0.00**				**0.00**			

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 2
Location:	West Roxbury, Boston, MA
Street 1:	VFW Pkwy
Street 2:	Gardner St
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

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PEDESTRIANS & BICYCLES

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	3	0	0	0	5	0	0	0	3

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	4	0	0	0	3	0	0	0	3
5:15 PM	0	0	0	0	0	1	0	4	0	0	0	2	0	0	0	4
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	13
5:45 PM	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0	3

AM PEAK HOUR[1]	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
7:30 AM to 8:30 AM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	1	0	9	0	0	0	3	0	0	0	5

PM PEAK HOUR[1]	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Gardner St Eastbound				Gardner St Westbound			
5:00 PM to 6:00 PM	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	1	0	0	0	2	0	13	0	0	0	7	0	0	0	23

[1] *Peak hours corresponds to vehicular peak hours.*

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 3
Location:	West Roxbury, Boston, MA
Street 1:	VFW Pkwy
Street 2:	Charles Park Rd
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	2	41	293	0	19	0	147	3	0	8	0	10	0	0	0	0
7:15 AM	1	25	322	0	29	0	191	6	0	17	0	13	0	0	0	0
7:30 AM	2	27	326	0	25	0	214	3	0	14	0	10	0	0	0	0
7:45 AM	2	46	309	0	24	0	262	5	0	7	0	8	0	0	0	0
8:00 AM	4	42	330	0	16	0	245	12	0	12	0	11	0	0	0	0
8:15 AM	5	26	307	0	25	0	245	7	0	14	0	17	0	0	0	0
8:30 AM	0	30	267	0	29	0	226	11	0	12	0	19	0	0	0	0
8:45 AM	0	39	304	0	33	0	228	5	0	13	0	17	0	0	0	0

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	19	26	202	0	18	0	354	1	0	34	0	32	0	0	0	0
4:15 PM	17	24	202	0	33	0	344	1	0	25	0	33	0	0	0	0
4:30 PM	12	20	232	0	23	0	377	3	0	20	0	17	0	0	0	0
4:45 PM	14	21	234	0	32	0	360	6	0	28	0	24	0	0	0	0
5:00 PM	10	23	232	0	18	0	365	5	0	49	0	46	0	0	0	0
5:15 PM	5	27	247	0	19	0	322	2	0	26	0	40	0	0	0	0
5:30 PM	5	37	275	0	32	0	367	4	0	39	0	29	0	0	0	0
5:45 PM	6	17	273	0	44	0	332	3	0	23	0	24	0	0	0	0

AM PEAK HOUR 7:30 AM to 8:30 AM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	13	**141**	**1272**	**0**	**90**	**0**	**966**	**27**	**0**	**47**	**0**	**46**	**0**	**0**	**0**	**0**
PHF	**0.95**				**0.93**				**0.75**				**0.00**			
HV %	**7.7%**	**7.1%**	**1.0%**	**0.0%**	**2.2%**	**0.0%**	**1.7%**	**3.7%**	**0.0%**	**4.3%**	**0.0%**	**41.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 5:00 PM to 6:00 PM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	26	**104**	**1027**	**0**	**113**	**0**	**1386**	**14**	**0**	**137**	**0**	**139**	**0**	**0**	**0**	**0**
PHF	**0.91**				**0.94**				**0.73**				**0.00**			
HV %	**7.7%**	**7.7%**	**0.5%**	**0.0%**	**0.9%**	**0.0%**	**0.6%**	**7.1%**	**0.0%**	**1.5%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client: Michael White
Project #: 381_C32_HSH
BTD #: Location 3
Location: West Roxbury, Boston, MA
Street 1: VFW Pkwy
Street 2: Charles Park Rd
Count Date: 4/30/2019
Day of Week: Tuesday
Weather: Partly Sunny, 50°F

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HEAVY VEHICLES

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	4	0	5	0	5	0	0	1	0	5	0	0	0	0
7:15 AM	0	1	1	0	0	0	6	0	0	0	0	2	0	0	0	0
7:30 AM	0	4	5	0	1	0	5	0	0	1	0	3	0	0	0	0
7:45 AM	1	3	2	0	0	0	4	0	0	0	0	6	0	0	0	0
8:00 AM	0	1	1	0	1	0	3	1	0	0	0	7	0	0	0	0
8:15 AM	0	2	5	0	0	0	4	0	0	1	0	3	0	0	0	0
8:30 AM	0	4	3	0	1	0	2	0	0	3	0	6	0	0	0	0
8:45 AM	0	2	5	0	0	0	4	0	0	3	0	3	0	0	0	0

	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	0	0	0	0	3	0	0	1	0	3	0	0	0	0
4:15 PM	0	4	0	0	0	0	4	0	0	0	0	1	0	0	0	0
4:30 PM	0	3	0	0	0	0	5	0	0	0	0	2	0	0	0	0
4:45 PM	0	2	0	0	0	0	0	0	0	1	0	2	0	0	0	0
5:00 PM	0	2	3	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	1	0	0	0	1	0	3	0	0	1	0	0	0	0	0	0
5:30 PM	0	4	1	0	0	0	1	0	0	1	0	0	0	0	0	0
5:45 PM	1	2	1	0	0	0	4	1	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	1	**9**	**12**	**0**	**6**	**0**	**20**	**0**	**0**	**2**	**0**	**16**	**0**	**0**	**0**	**0**
PHF	**0.61**				**0.65**				**0.75**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	VFW Gardner Pkwy Northbound				VFW Gardner Pkwy Southbound				Charles Park Rd Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**10**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**2**	**0**	**8**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.60**				**0.63**				**0.00**			

Client:	Michael White
Project #:	381_C32_HSH
BTD #:	Location 3
Location:	West Roxbury, Boston, MA
Street 1:	VFW Pkwy
Street 2:	Charles Park Rd
Count Date:	4/30/2019
Day of Week:	Tuesday
Weather:	Partly Sunny, 50°F

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PEDESTRIANS & BICYCLES

	VFW Gardner Pkwy					VFW Gardner Pkwy					Charles Park Rd									
	Northbound					Southbound					Eastbound					Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:45 AM	0	0	0	0		0	1	0	0		0	0	0	2		0	0	0	0	
8:00 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
8:15 AM	0	0	0	0		0	0	0	0		0	0	1	1		0	0	0	0	
8:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
8:45 AM	0	0	0	0		0	0	0	0		0	0	0	1		0	0	0	0	

	VFW Gardner Pkwy					VFW Gardner Pkwy					Charles Park Rd									
	Northbound					Southbound					Eastbound					Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	0		0	0	0	0		0	0	0	2		0	0	0	0	
4:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
4:30 PM	0	0	0	0		0	0	0	0		0	0	0	2		0	0	0	0	
4:45 PM	0	0	0	0		0	1	0	0		0	0	0	1		0	0	0	0	
5:00 PM	0	0	0	0		0	0	0	0		0	0	0	3		0	0	0	0	
5:15 PM	0	0	0	0		0	0	0	1		0	0	0	2		0	0	0	0	
5:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
5:45 PM	0	0	0	0		0	0	0	0		0	0	0	2		0	0	0	0	

AM PEAK HOUR[1]	VFW Gardner Pkwy					VFW Gardner Pkwy					Charles Park Rd									
7:30 AM	Northbound					Southbound					Eastbound					Westbound				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:30 AM	0	0	0	0		0	1	0	0		0	0	1	3		0	0	0	0	

PM PEAK HOUR[1]	VFW Gardner Pkwy					VFW Gardner Pkwy					Charles Park Rd									
5:00 PM	Northbound					Southbound					Eastbound					Westbound				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
6:00 PM	0	0	0	0		0	0	0	1		0	0	0	7		0	0	0	0	

[1] *Peak hours corresponds to vehicular peak hours.*

APPENDIX D2 – MassDOT Weekday Seasonal Adjustment Factors

Massachusetts Highway Department
Statewide Traffic Data Collection
2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
R4-R7	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
U1-Boston	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
U1-Essex	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
U1-Southeast	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
U1-West	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
U1-Worcester	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
U2	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
U3	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
U4-U7	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
Rec - East	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

4/10/2019

APPENDIX D3 – Detailed Trip Generation Calculations

Gardner Street - West Roxbury

Trip Generation Assessment

HOWARD STEIN HUDSON

26-Apr-2019

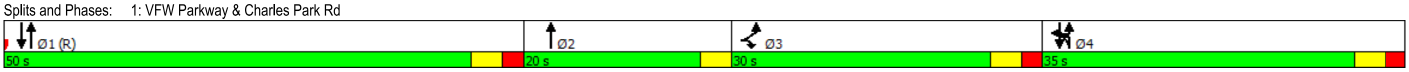
Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Transit Share[2]	Transit Person-Trips	Walk/Bike/ Other Share[2]	Walk/ Bike/ Other Trips	Auto Share[2]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[3]	Total Adjusted Private Auto Trips
Daily Peak Hour															
Multifamily Housing (Mid Rise)[4]	88	Total		5.440	478	1.18	**564**	8%	**46**	8%	**46**	84%	**472**	1.18	**400**
	units	In	50%	2.720	239	1.18	**282**	8%	**23**	8%	**23**	84%	**236**	1.18	**200**
		Out	50%	2.720	239	1.18	**282**	8%	**23**	8%	**23**	84%	**236**	1.18	**200**
Total		Total			**478**		**564**		**46**		**46**		**472**		**400**
		In			**239**		**282**		**23**		**23**		**236**		**200**
		Out			**239**		**282**		**23**		**23**		**236**		**200**
AM Peak Hour															
Multifamily Housing (Mid Rise)[4]	88	Total		0.360	31	1.18	**36**		**6**		**3**		**27**	1.18	**23**
	units	In	26%	0.094	8	1.18	**9**	9%	**1**	11%	**1**	80%	**7**	1.18	**6**
		Out	74%	0.266	23	1.18	**27**	19%	**5**	8%	**2**	73%	**20**	1.18	**17**
Total		Total			**31**		**36**		**6**		**3**		**27**		**23**
		In			**8**		**9**		**1**		**1**		**7**		**6**
		Out			**23**		**27**		**5**		**2**		**20**		**17**
PM Peak Hour															
Multifamily Housing (Mid Rise)[4]	88	Total		0.440	39	1.18	**46**		**7**		**4**		**35**	1.18	**30**
	units	In	61%	0.268	24	1.18	**28**	19%	**5**	8%	**2**	73%	**21**	1.18	**18**
		Out	39%	0.172	15	1.18	**18**	9%	**2**	11%	**2**	80%	**14**	1.18	**12**
Total		Total			**39**		**46**		**7**		**4**		**35**		**30**
		In			**24**		**28**		**5**		**2**		**21**		**18**
		Out			**15**		**18**		**2**		**2**		**14**		**12**

1. 2017 National vehicle occupancy rates - 1.18:home to work; 1.82: family/personal business; 1.82: shopping; 2.1 social/recreational
2. Mode shares based on peak-hour BTD Data for Area 19
3. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
4. ITE Trip Generation Manual, 10th Edition, LUC 221 (Multifamily Housing Mid-Rise (3-10 floors)), average rate

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	47	46	13	141	1272	90	966	27	
Future Volume (vph)	47	46	13	141	1272	90	966	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor							1.00		
Frt		0.850					0.996		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	2648	1333	0	1583	3249	1593	3234	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	2648	1333	0	1583	3249	1593	3234	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		58					2		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Bikes (#/hr)								6	
Peak Hour Factor	0.80	0.80	0.95	0.95	0.95	0.96	0.96	0.96	
Heavy Vehicles (%)	19%	9%	9%	2%	0%	2%	0%	0%	
Adj. Flow (vph)	59	58	14	148	1339	94	1006	28	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	59	58	0	162	1339	94	1034	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									22
Act Effct Green (s)	7.5	7.5		19.0	95.6	19.0	83.6		
Actuated g/C Ratio	0.06	0.06		0.14	0.71	0.14	0.62		
v/c Ratio	0.40	0.45		0.73	0.58	0.42	0.52		
Control Delay	69.2	25.9		74.1	12.4	57.8	19.0		
Queue Delay	0.0	0.0		0.0	0.0	0.0	4.6		
Total Delay	69.2	25.9		74.1	12.4	57.8	23.6		
LOS	E	C		E	B	E	C		
Approach Delay	47.7				19.0		26.4		
Approach LOS	D				B		C		
Queue Length 50th (ft)	26	0		139	288	77	302		
Queue Length 95th (ft)	43	34		207	443	126	433		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	490	294		351	2300	354	2003		
Starvation Cap Reductn	0	0		0	0	0	879		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.12	0.20		0.46	0.58	0.27	0.92		

Intersection Summary		
Area Type:	CBD	
Cycle Length: 135		
Actuated Cycle Length: 135		
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection		
Natural Cycle: 85		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.73		
Intersection Signal Delay: 23.3		Intersection LOS: C
Intersection Capacity Utilization 68.2%		ICU Level of Service C
Analysis Period (min) 15		

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations			↱			↱		↑↑			↑↑				
Traffic Volume (vph)	0	0	12	0	0	59	0	1409	0	0	1071	19			
Future Volume (vph)	0	0	12	0	0	59	0	1409	0	0	1071	19			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99			0.99					1.00				
Frt			0.865			0.865					0.997				
Flt Protected															
Satd. Flow (prot)	0	0	1112	0	0	1479	0	3217	0	0	3238	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1098	0	0	1459	0	3217	0	0	3238	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											4				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		194			554			275			151				
Travel Time (s)		4.4			12.6			6.3			3.4				
Confl. Peds. (#/hr)			3			6						3			
Confl. Bikes (#/hr)												5			
Peak Hour Factor	0.50	0.50	0.50	0.76	0.76	0.76	0.90	0.90	0.90	0.94	0.94	0.94			
Heavy Vehicles (%)	0%	0%	33%	0%	0%	0%	0%	1%	0%	0%	0%	0%			
Adj. Flow (vph)	0	0	24	0	0	78	0	1566	0	0	1139	20			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	24	0	0	78	0	1566	0	0	1159	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														9	9
Act Effct Green (s)			82.5			82.5		77.7			75.7				
Actuated g/C Ratio			1.00			1.00		0.94			0.92				
v/c Ratio			0.02			0.05		0.52			0.39				
Control Delay			0.0			0.1		2.7			3.5				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.0			0.1		2.8			3.5				
LOS			A			A		A			A				
Approach Delay					0.1			2.8			3.5				
Approach LOS					A			A			A				
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		268			244				
Internal Link Dist (ft)		114			474			195			71				
Turn Bay Length (ft)															
Base Capacity (vph)			1098			1459		3030			2971				
Starvation Cap Reductn			0			0		227			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.02			0.05		0.56			0.39				

Intersection Summary

Area Type: CBD
Cycle Length: 82.5
Actuated Cycle Length: 82.5
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 3.0 — Intersection LOS: A
Intersection Capacity Utilization 56.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: VFW Parkway & Gardner Street

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	57	24	31	2	107	8	51	0	12	0
Future Vol, veh/h	0	1	57	24	31	2	107	8	51	0	12	0
Peak Hour Factor	0.75	0.75	0.75	0.51	0.51	0.51	0.86	0.86	0.86	0.73	0.73	0.73
Heavy Vehicles, %	0	0	10	6	0	0	2	12	0	0	6	0
Mvmt Flow	0	1	76	47	61	4	124	9	59	0	16	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.4	8.6	7.8
HCM LOS	A	A	A	A

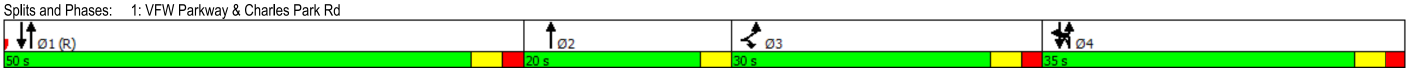
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	64%	0%	42%	0%
Vol Thru, %	5%	2%	54%	100%
Vol Right, %	31%	98%	4%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	58	57	12
LT Vol	107	0	24	0
Through Vol	8	1	31	12
RT Vol	51	57	2	0
Lane Flow Rate	193	77	112	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.232	0.084	0.143	0.021
Departure Headway (Hd)	4.323	3.918	4.621	4.64
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	916	778	773
Service Time	2.335	1.935	2.638	2.658
HCM Lane V/C Ratio	0.231	0.084	0.144	0.021
HCM Control Delay	8.6	7.3	8.4	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.5	0.1

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	137	139	26	104	1027	113	1386	14	
Future Volume (vph)	137	139	26	104	1027	113	1386	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor							1.00		
Frt		0.850					0.999		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	3152	1425	0	1590	3249	1624	3245	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	3152	1425	0	1590	3249	1624	3245	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		172					1		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Bikes (#/hr)								3	
Peak Hour Factor	0.81	0.81	0.92	0.92	0.92	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	2%	3%	2%	0%	0%	0%	0%	
Adj. Flow (vph)	169	172	28	113	1116	116	1429	14	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	169	172	0	141	1116	116	1443	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									4
Act Effct Green (s)	11.6	11.6		17.7	90.7	17.7	86.7		
Actuated g/C Ratio	0.09	0.09		0.13	0.67	0.13	0.64		
v/c Ratio	0.62	0.62		0.68	0.51	0.55	0.69		
Control Delay	69.5	17.9		72.1	12.8	64.2	20.3		
Queue Delay	0.0	0.0		0.0	0.0	0.2	48.8		
Total Delay	69.5	17.9		72.1	12.8	64.4	69.1		
LOS	E	B		E	B	E	E		
Approach Delay	43.5				19.5		68.8		
Approach LOS	D				B		E		
90th %ile Green (s)	15.3	15.3	23.0	23.0		23.0	61.7		17.0
90th %ile Term Code	Gap	Gap	Gap	Gap		Gap	Coord		Ped
70th %ile Green (s)	13.1	13.1	19.1	19.1		19.1	87.8		0.0
70th %ile Term Code	Gap	Gap	Gap	Gap		Gap	Coord		Skip
50th %ile Green (s)	11.6	11.6	16.4	16.4		16.4	92.0		0.0
50th %ile Term Code	Gap	Gap	Gap	Gap		Gap	Coord		Skip
30th %ile Green (s)	10.1	10.1	15.0	15.0		15.0	94.9		0.0
30th %ile Term Code	Gap	Gap	Min	Min		Min	Coord		Skip
10th %ile Green (s)	8.0	8.0	15.0	15.0		15.0	97.0		0.0
10th %ile Term Code	Gap	Gap	Min	Min		Min	Coord		Skip
Queue Length 50th (ft)	75	0		121	230	98	352		
Queue Length 95th (ft)	98	47		186	355	155	#812		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	583	404		353	2182	360	2083		
Starvation Cap Reductn	0	0		0	0	33	857		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.29	0.43		0.40	0.51	0.35	1.18		

Intersection Summary

Area Type: CBD
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 46.4 Intersection LOS: D
Intersection Capacity Utilization 77.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations			↗			↗		↑↑			↑↑				
Traffic Volume (vph)	0	0	12	0	0	79	0	1277	0	0	1501	6			
Future Volume (vph)	0	0	12	0	0	79	0	1277	0	0	1501	6			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99			0.98					1.00				
Frt			0.865			0.865					0.999				
Flt Protected															
Satd. Flow (prot)	0	0	1479	0	0	1479	0	3249	0	0	3245	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1459	0	0	1454	0	3249	0	0	3245	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											1				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		210			554			275			302				
Travel Time (s)		4.8			12.6			6.3			6.9				
Confl. Peds. (#/hr)			6			18						6			
Confl. Bikes (#/hr)												3			
Peak Hour Factor	0.38	0.38	0.38	0.77	0.77	0.77	0.93	0.93	0.93	0.97	0.97	0.97			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
Adj. Flow (vph)	0	0	32	0	0	103	0	1373	0	0	1547	6			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	32	0	0	103	0	1373	0	0	1553	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														22	22
Act Effct Green (s)			82.5			82.5		72.9			68.9				
Actuated g/C Ratio			1.00			1.00		0.88			0.84				
v/c Ratio			0.02			0.07		0.48			0.57				
Control Delay			0.0			0.1		3.8			8.1				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.0			0.1		3.8			8.1				
LOS			A			A		A			A				
Approach Delay					0.1			3.8			8.1				
Approach LOS					A			A			A				
90th %ile Green (s)													29.5	24.0	14.0
90th %ile Term Code													Coord	Ped	Ped
70th %ile Green (s)													29.5	24.0	14.0
70th %ile Term Code													Coord	Ped	Ped
50th %ile Green (s)													77.5	0.0	0.0
50th %ile Term Code													Coord	Skip	Skip
30th %ile Green (s)													77.5	0.0	0.0
30th %ile Term Code													Coord	Skip	Skip
10th %ile Green (s)													77.5	0.0	0.0
10th %ile Term Code													Coord	Skip	Skip
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		207			404				
Internal Link Dist (ft)		130			474			195			222				
Turn Bay Length (ft)															
Base Capacity (vph)			1459			1454		2871			2710				
Starvation Cap Reductn			0			0		271			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.02			0.07		0.53			0.57				

Intersection Summary

Area Type: CBD
Cycle Length: 82.5
Actuated Cycle Length: 82.5
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 5.8 — Intersection LOS: A
Intersection Capacity Utilization 58.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: VFW Parkway & Gardner Street

Ø1 (R)	Ø2	Ø3
30 s	29 s	23.5 s

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	5	95	1	85	5	77	8	58	51	2	96	1
Future Vol, veh/h	3	5	95	1	85	5	77	8	58	51	2	96	1
Peak Hour Factor	0.58	0.58	0.58	0.92	0.75	0.75	0.75	0.82	0.82	0.82	0.68	0.68	0.68
Heavy Vehicles, %	50	25	5	2	0	0	0	11	3	0	0	0	0
Mvmt Flow	5	9	164	1	113	7	103	10	71	62	3	141	1
Number of Lanes	0	1	0	0	0	1	0	0	1	0	0	1	0

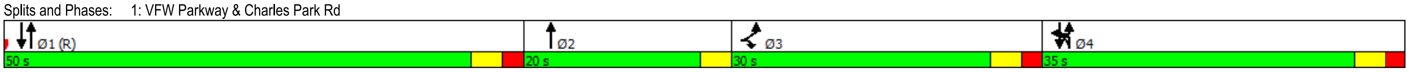
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.1	9.8	9.4	9.5
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	3%	51%	2%
Vol Thru, %	50%	5%	3%	97%
Vol Right, %	44%	92%	46%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	117	103	168	99
LT Vol	8	3	86	2
Through Vol	58	5	5	96
RT Vol	51	95	77	1
Lane Flow Rate	143	178	224	146
Geometry Grp	1	1	1	1
Degree of Util (X)	0.199	0.256	0.293	0.205
Departure Headway (Hd)	5.013	5.195	4.715	5.066
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	709	685	754	702
Service Time	3.097	3.276	2.79	3.15
HCM Lane V/C Ratio	0.202	0.26	0.297	0.208
HCM Control Delay	9.4	10.1	9.8	9.5
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.7	1	1.2	0.8

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	49	48	13	146	1319	93	1000	28	
Future Volume (vph)	49	48	13	146	1319	93	1000	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor							1.00		
Frt		0.850					0.996		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	2648	1333	0	1584	3249	1593	3234	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	2648	1333	0	1584	3249	1593	3234	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		60					2		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Bikes (#/hr)								6	
Peak Hour Factor	0.80	0.80	0.95	0.95	0.95	0.96	0.96	0.96	
Heavy Vehicles (%)	19%	9%	9%	2%	0%	2%	0%	0%	
Adj. Flow (vph)	61	60	14	154	1388	97	1042	29	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	61	60	0	168	1388	97	1071	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									22
Act Effct Green (s)	7.6	7.6		19.4	95.0	19.4	83.0		
Actuated g/C Ratio	0.06	0.06		0.14	0.70	0.14	0.61		
v/c Ratio	0.41	0.46		0.74	0.61	0.42	0.54		
Control Delay	69.3	25.5		74.1	13.2	57.5	19.8		
Queue Delay	0.0	0.0		0.0	0.0	0.3	6.0		
Total Delay	69.3	25.5		74.1	13.2	57.8	25.9		
LOS	E	C		E	B	E	C		
Approach Delay	47.6				19.7		28.5		
Approach LOS	D				B		C		
Queue Length 50th (ft)	27	0		144	312	79	322		
Queue Length 95th (ft)	45	35		213	478	130	461		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	490	295		352	2287	354	1989		
Starvation Cap Reductn	0	0		0	0	57	854		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.12	0.20		0.48	0.61	0.33	0.94		

Intersection Summary	
Area Type: CBD	
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 69.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations			↱			↱		↑↑			↑↑				
Traffic Volume (vph)	0	0	12	0	0	61	0	1461	0	0	1109	20			
Future Volume (vph)	0	0	12	0	0	61	0	1461	0	0	1109	20			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99			0.99					1.00				
Frt			0.865			0.865					0.997				
Flt Protected															
Satd. Flow (prot)	0	0	1112	0	0	1479	0	3217	0	0	3238	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1098	0	0	1459	0	3217	0	0	3238	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											4				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		208			554			275			213				
Travel Time (s)		4.7			12.6			6.3			4.8				
Confl. Peds. (#/hr)			3			6						3			
Confl. Bikes (#/hr)												5			
Peak Hour Factor	0.50	0.50	0.50	0.76	0.76	0.76	0.90	0.90	0.90	0.94	0.94	0.94			
Heavy Vehicles (%)	0%	0%	33%	0%	0%	0%	0%	1%	0%	0%	0%	0%			
Adj. Flow (vph)	0	0	24	0	0	80	0	1623	0	0	1180	21			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	24	0	0	80	0	1623	0	0	1201	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														9	9
Act Effct Green (s)			82.5			82.5		77.7			75.7				
Actuated g/C Ratio			1.00			1.00		0.94			0.92				
v/c Ratio			0.02			0.05		0.54			0.40				
Control Delay			0.0			0.1		2.9			3.6				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.0			0.1		2.9			3.6				
LOS			A			A		A			A				
Approach Delay					0.1			2.9			3.6				
Approach LOS					A			A			A				
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		288			258				
Internal Link Dist (ft)		128			474			195			133				
Turn Bay Length (ft)															
Base Capacity (vph)			1098			1459		3030			2971				
Starvation Cap Reductn			0			0		216			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.02			0.05		0.58			0.40				

Intersection Summary

Area Type: CBD
Cycle Length: 82.5
Actuated Cycle Length: 82.5
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 3.1 Intersection LOS: A
Intersection Capacity Utilization 58.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: VFW Parkway & Gardner Street

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	59	25	32	2	111	8	53	0	12	0
Future Vol, veh/h	0	1	59	25	32	2	111	8	53	0	12	0
Peak Hour Factor	0.75	0.75	0.75	0.51	0.51	0.51	0.86	0.86	0.86	0.73	0.73	0.73
Heavy Vehicles, %	0	0	10	6	0	0	2	12	0	0	6	0
Mvmt Flow	0	1	79	49	63	4	129	9	62	0	16	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	8.5	8.7	7.8
HCM LOS	A	A	A	A

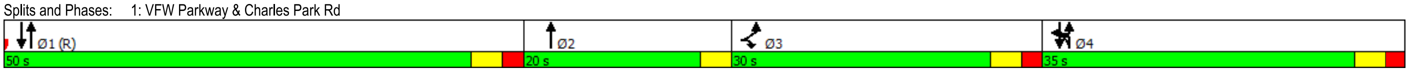
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	65%	0%	42%	0%
Vol Thru, %	5%	2%	54%	100%
Vol Right, %	31%	98%	3%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	60	59	12
LT Vol	111	0	25	0
Through Vol	8	1	32	12
RT Vol	53	59	2	0
Lane Flow Rate	200	80	116	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.241	0.088	0.149	0.021
Departure Headway (Hd)	4.338	3.942	4.645	4.665
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	830	910	774	768
Service Time	2.353	1.958	2.661	2.687
HCM Lane V/C Ratio	0.241	0.088	0.15	0.021
HCM Control Delay	8.7	7.3	8.5	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.5	0.1

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	142	144	27	108	1070	117	1435	14	
Future Volume (vph)	142	144	27	108	1070	117	1435	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor							1.00		
Frt		0.850					0.999		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	3152	1425	0	1590	3249	1624	3245	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	3152	1425	0	1590	3249	1624	3245	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		178					1		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Bikes (#/hr)								3	
Peak Hour Factor	0.81	0.81	0.92	0.92	0.92	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	2%	3%	2%	0%	0%	0%	0%	
Adj. Flow (vph)	175	178	29	117	1163	121	1479	14	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	175	178	0	146	1163	121	1493	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									4
Act Effct Green (s)	11.9	11.9		18.0	90.1	18.0	86.1		
Actuated g/C Ratio	0.09	0.09		0.13	0.67	0.13	0.64		
v/c Ratio	0.63	0.62		0.69	0.54	0.56	0.72		
Control Delay	69.5	17.6		72.6	13.6	64.5	21.4		
Queue Delay	0.0	0.0		0.0	0.0	0.2	48.7		
Total Delay	69.5	17.6		72.6	13.6	64.7	70.0		
LOS	E	B		E	B	E	E		
Approach Delay	43.3				20.1		69.6		
Approach LOS	D				C		E		
Queue Length 50th (ft)	77	0		125	250	102	381		
Queue Length 95th (ft)	101	48		191	385	161	#871		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	583	408		353	2169	360	2070		
Starvation Cap Reductn	0	0		0	0	37	823		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.30	0.44		0.41	0.54	0.37	1.20		

Intersection Summary

Area Type: CBD
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 47.0 Intersection LOS: D
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations															
Traffic Volume (vph)	0	0	12	0	0	82	0	1329	0	0	1554	6			
Future Volume (vph)	0	0	12	0	0	82	0	1329	0	0	1554	6			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99			0.98					1.00				
Frt			0.865			0.865					0.999				
Flt Protected															
Satd. Flow (prot)	0	0	1479	0	0	1479	0	3249	0	0	3245	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1459	0	0	1454	0	3249	0	0	3245	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											1				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		218			554			275			151				
Travel Time (s)		5.0			12.6			6.3			3.4				
Confl. Peds. (#/hr)			6			18						6			
Confl. Bikes (#/hr)												3			
Peak Hour Factor	0.38	0.38	0.38	0.77	0.77	0.77	0.93	0.93	0.93	0.97	0.97	0.97			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
Adj. Flow (vph)	0	0	32	0	0	106	0	1429	0	0	1602	6			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	32	0	0	106	0	1429	0	0	1608	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														22	22
Act Effct Green (s)			82.5			82.5		72.9			68.9				
Actuated g/C Ratio			1.00			1.00		0.88			0.84				
v/c Ratio			0.02			0.07		0.50			0.59				
Control Delay			0.0			0.1		3.9			8.6				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.0			0.1		4.0			8.6				
LOS			A			A		A			A				
Approach Delay					0.1			4.0			8.6				
Approach LOS					A			A			A				
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		223			435				
Internal Link Dist (ft)		138			474			195			71				
Turn Bay Length (ft)															
Base Capacity (vph)			1459			1454		2871			2710				
Starvation Cap Reductn			0			0		260			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.02			0.07		0.55			0.59				

Intersection Summary	
Area Type: CBD	
Cycle Length: 82.5	
Actuated Cycle Length: 82.5	
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: VFW Parkway & Gardner Street

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	5	98	1	88	5	80	8	60	53	2	99	1
Future Vol, veh/h	3	5	98	1	88	5	80	8	60	53	2	99	1
Peak Hour Factor	0.58	0.58	0.58	0.92	0.75	0.75	0.75	0.82	0.82	0.82	0.68	0.68	0.68
Heavy Vehicles, %	50	25	5	2	0	0	0	11	3	0	0	0	0
Mvmt Flow	5	9	169	1	117	7	107	10	73	65	3	146	1
Number of Lanes	0	1	0	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.2	9.9	9.5	9.6
HCM LOS	B	A	A	A

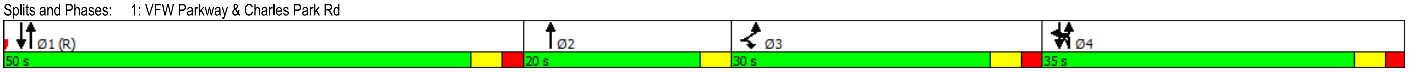
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	3%	51%	2%
Vol Thru, %	50%	5%	3%	97%
Vol Right, %	44%	92%	46%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	106	174	102
LT Vol	8	3	89	2
Through Vol	60	5	5	99
RT Vol	53	98	80	1
Lane Flow Rate	148	183	232	150
Geometry Grp	1	1	1	1
Degree of Util (X)	0.207	0.266	0.306	0.213
Departure Headway (Hd)	5.056	5.235	4.752	5.111
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	701	680	749	695
Service Time	3.149	3.321	2.831	3.203
HCM Lane V/C Ratio	0.211	0.269	0.31	0.216
HCM Control Delay	9.5	10.2	9.9	9.6
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.8	1.1	1.3	0.8

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	49	52	13	149	1319	103	1004	31	
Future Volume (vph)	49	52	13	149	1319	103	1004	31	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor							1.00		
Frt		0.850					0.996		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	2648	1333	0	1584	3249	1593	3233	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	2648	1333	0	1584	3249	1593	3233	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		65					2		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Bikes (#/hr)								6	
Peak Hour Factor	0.80	0.80	0.95	0.95	0.95	0.96	0.96	0.96	
Heavy Vehicles (%)	19%	9%	9%	2%	0%	2%	0%	0%	
Adj. Flow (vph)	61	65	14	157	1388	107	1046	32	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	61	65	0	171	1388	107	1078	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									22
Act Effct Green (s)	7.6	7.6		19.6	92.8	19.6	80.8		
Actuated g/C Ratio	0.06	0.06		0.15	0.69	0.15	0.60		
v/c Ratio	0.41	0.48		0.74	0.62	0.46	0.56		
Control Delay	69.3	25.6		74.2	14.0	58.5	20.7		
Queue Delay	0.0	0.0		0.0	0.0	0.4	12.2		
Total Delay	69.3	25.6		74.2	14.0	58.8	32.9		
LOS	E	C		E	B	E	C		
Approach Delay	46.7				20.6		35.2		
Approach LOS	D				C		D		
Queue Length 50th (ft)	27	0		147	314	88	327		
Queue Length 95th (ft)	45	35		216	483	141	468		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	490	299		352	2233	354	1935		
Starvation Cap Reductn	0	0		0	0	60	845		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.12	0.22		0.49	0.62	0.36	0.99		

Intersection Summary

Area Type: CBD
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 27.8 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations			↱			↱		↑↑			↑↑				
Traffic Volume (vph)	0	0	25	0	0	61	0	1471	0	0	1112	20			
Future Volume (vph)	0	0	25	0	0	61	0	1471	0	0	1112	20			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor			0.99			0.99					1.00				
Frt			0.865			0.865					0.997				
Flt Protected															
Satd. Flow (prot)	0	0	1112	0	0	1479	0	3217	0	0	3238	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1098	0	0	1459	0	3217	0	0	3238	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											4				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		228			554			275			236				
Travel Time (s)		5.2			12.6			6.3			5.4				
Confl. Peds. (#/hr)			3			6						3			
Confl. Bikes (#/hr)												5			
Peak Hour Factor	0.50	0.50	0.50	0.76	0.76	0.76	0.90	0.90	0.90	0.94	0.94	0.94			
Heavy Vehicles (%)	0%	0%	33%	0%	0%	0%	0%	1%	0%	0%	0%	0%			
Adj. Flow (vph)	0	0	50	0	0	80	0	1634	0	0	1183	21			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	50	0	0	80	0	1634	0	0	1204	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														9	9
Act Effct Green (s)			82.5			82.5		77.7			75.7				
Actuated g/C Ratio			1.00			1.00		0.94			0.92				
v/c Ratio			0.05			0.05		0.54			0.41				
Control Delay			0.1			0.1		2.9			3.6				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.1			0.1		2.9			3.6				
LOS			A			A		A			A				
Approach Delay		0.1			0.1			2.9			3.6				
Approach LOS		A			A			A			A				
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		293			259				
Internal Link Dist (ft)		148			474			195			156				
Turn Bay Length (ft)															
Base Capacity (vph)			1098			1459		3030			2971				
Starvation Cap Reductn			0			0		214			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.05			0.05		0.58			0.41				

Intersection Summary

Area Type: CBD
Cycle Length: 82.5
Actuated Cycle Length: 82.5
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 3.1 — Intersection LOS: A
Intersection Capacity Utilization 58.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: VFW Parkway & Gardner Street

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	59	25	32	2	111	8	58	0	12	0
Future Vol, veh/h	0	1	59	25	32	2	111	8	58	0	12	0
Peak Hour Factor	0.75	0.75	0.75	0.51	0.51	0.51	0.86	0.86	0.86	0.73	0.73	0.73
Heavy Vehicles, %	0	0	10	6	0	0	2	12	0	0	6	0
Mvmt Flow	0	1	79	49	63	4	129	9	67	0	16	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	8.5	8.8	7.8
HCM LOS	A	A	A	A

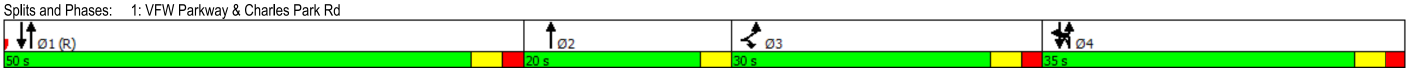
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	63%	0%	42%	0%
Vol Thru, %	5%	2%	54%	100%
Vol Right, %	33%	98%	3%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	60	59	12
LT Vol	111	0	25	0
Through Vol	8	1	32	12
RT Vol	58	59	2	0
Lane Flow Rate	206	80	116	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.247	0.088	0.15	0.021
Departure Headway (Hd)	4.323	3.954	4.657	4.671
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	908	772	767
Service Time	2.34	1.971	2.673	2.694
HCM Lane V/C Ratio	0.247	0.088	0.15	0.021
HCM Control Delay	8.8	7.4	8.5	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.3	0.5	0.1

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	Ø2
Lane Configurations									
Traffic Volume (vph)	142	147	27	116	1070	124	1438	24	
Future Volume (vph)	142	147	27	116	1070	124	1438	24	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	190	190		125		230		0	
Storage Lanes	1	1		1		1		0	
Taper Length (ft)	200			25		25			
Lane Util. Factor	0.97	1.00	0.95	1.00	0.95	1.00	0.95	0.95	
Ped Bike Factor				1.00			1.00		
Frt		0.850					0.997		
Flt Protected	0.950			0.950		0.950			
Satd. Flow (prot)	3090	1439	0	1504	3249	1608	3202	0	
Flt Permitted	0.950			0.950		0.950			
Satd. Flow (perm)	3090	1439	0	1501	3249	1608	3202	0	
Right Turn on Red		Yes						Yes	
Satd. Flow (RTOR)		201					1		
Link Speed (mph)	30				30		30		
Link Distance (ft)	1231				559		275		
Travel Time (s)	28.0				12.7		6.3		
Confl. Peds. (#/hr)				7				7	
Peak Hour Factor	0.73	0.73	0.91	0.91	0.91	0.94	0.94	0.94	
Heavy Vehicles (%)	2%	1%	8%	8%	0%	1%	1%	7%	
Adj. Flow (vph)	195	201	30	127	1176	132	1530	26	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	195	201	0	157	1176	132	1556	0	
Turn Type	Prot	Prot	Prot	Prot	NA	Prot	NA		
Protected Phases	3	3	4	4	1 2	4	1		2
Permitted Phases									
Detector Phase	3	3	4	4		4			
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0		15.0	30.0		5.0
Minimum Split (s)	10.0	10.0	20.0	20.0		20.0	35.0		20.0
Total Split (s)	30.0	30.0	35.0	35.0		35.0	50.0		20.0
Total Split (%)	22.2%	22.2%	25.9%	25.9%		25.9%	37.0%		15%
Maximum Green (s)	25.0	25.0	30.0	30.0		30.0	45.0		17.0
Yellow Time (s)	3.0	3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0	2.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		
Total Lost Time (s)	5.0	5.0		5.0		5.0	5.0		
Lead/Lag	Lead	Lead	Lag	Lag		Lag	Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Recall Mode	None	None	None	None		None	C-Max		None
Walk Time (s)									8.0
Flash Dont Walk (s)									9.0
Pedestrian Calls (#/hr)									4
Act Effct Green (s)	12.9	12.9		19.2	87.9	19.2	83.9		
Actuated g/C Ratio	0.10	0.10		0.14	0.65	0.14	0.62		
v/c Ratio	0.66	0.63		0.73	0.56	0.58	0.78		
Control Delay	69.6	16.5		74.8	15.2	63.6	24.6		
Queue Delay	0.0	0.0		0.0	0.0	0.5	48.4		
Total Delay	69.6	16.5		74.8	15.2	64.1	72.9		
LOS	E	B		E	B	E	E		
Approach Delay	42.6				22.2		72.3		
Approach LOS	D				C		E		
Queue Length 50th (ft)	86	0		135	272	110	447		
Queue Length 95th (ft)	99	26		202	420	170	#983		
Internal Link Dist (ft)	1151				479		195		
Turn Bay Length (ft)	190	190		125		230			
Base Capacity (vph)	572	430		334	2114	357	1989		
Starvation Cap Reductn	0	0		0	0	55	735		
Spillback Cap Reductn	0	0		0	0	0	0		
Storage Cap Reductn	0	0		0	0	0	0		
Reduced v/c Ratio	0.34	0.47		0.47	0.56	0.44	1.24		

Intersection Summary

Area Type: CBD
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 49.3 Intersection LOS: D
Intersection Capacity Utilization 80.1% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: VFW Parkway & Charles Park Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø3
Lane Configurations															
Traffic Volume (vph)	0	0	21	0	0	82	0	1336	0	0	1564	6			
Future Volume (vph)	0	0	21	0	0	82	0	1336	0	0	1564	6			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95			
Ped Bike Factor						0.98					1.00				
Frt			0.865			0.865					0.999				
Flt Protected															
Satd. Flow (prot)	0	0	1479	0	0	1479	0	3217	0	0	3213	0			
Flt Permitted															
Satd. Flow (perm)	0	0	1479	0	0	1456	0	3217	0	0	3213	0			
Right Turn on Red			Yes			Yes			Yes			Yes			
Satd. Flow (RTOR)											1				
Link Speed (mph)		30			30			30			30				
Link Distance (ft)		204			554			275			151				
Travel Time (s)		4.6			12.6			6.3			3.4				
Confl. Peds. (#/hr)	13					13			23			7			
Confl. Bikes (#/hr)									1			2			
Peak Hour Factor	0.60	0.60	0.60	0.76	0.76	0.76	0.91	0.91	0.91	0.95	0.95	0.95			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%			
Adj. Flow (vph)	0	0	35	0	0	108	0	1468	0	0	1646	6			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	35	0	0	108	0	1468	0	0	1652	0			
Turn Type			Perm			Perm		NA			NA				
Protected Phases								1 2			1 3		1	2	3
Permitted Phases			1 2 3			1 2 3									
Detector Phase															
Switch Phase															
Minimum Initial (s)													5.0	5.0	5.0
Minimum Split (s)													10.0	29.0	19.0
Total Split (s)													30.0	29.0	23.5
Total Split (%)													36%	35%	28%
Maximum Green (s)													25.0	24.0	18.5
Yellow Time (s)													3.0	3.0	3.0
All-Red Time (s)													2.0	2.0	2.0
Lost Time Adjust (s)															
Total Lost Time (s)															
Lead/Lag													Lead	Lag	
Lead-Lag Optimize?													Yes	Yes	
Vehicle Extension (s)													2.0	2.0	2.0
Recall Mode													C-Max	None	None
Walk Time (s)														10.0	8.0
Flash Dont Walk (s)														14.0	6.0
Pedestrian Calls (#/hr)														22	22
Act Effct Green (s)			82.5			82.5		72.9			68.9				
Actuated g/C Ratio			1.00			1.00		0.88			0.84				
v/c Ratio			0.02			0.07		0.52			0.62				
Control Delay			0.0			0.1		4.1			9.2				
Queue Delay			0.0			0.0		0.1			0.0				
Total Delay			0.0			0.1		4.2			9.2				
LOS			A			A		A			A				
Approach Delay					0.1			4.2			9.2				
Approach LOS					A			A			A				
Queue Length 50th (ft)			0			0		0			0				
Queue Length 95th (ft)			0			0		236			466				
Internal Link Dist (ft)		124			474			195			71				
Turn Bay Length (ft)															
Base Capacity (vph)			1479			1456		2843			2683				
Starvation Cap Reductn			0			0		246			0				
Spillback Cap Reductn			0			0		0			0				
Storage Cap Reductn			0			0		0			0				
Reduced v/c Ratio			0.02			0.07		0.57			0.62				

Intersection Summary

Area Type: CBD
Cycle Length: 82.5
Actuated Cycle Length: 82.5
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 60.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: VFW Parkway & Gardner Street

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	5	98	1	88	5	80	8	60	67	2	99	1
Future Vol, veh/h	3	5	98	1	88	5	80	8	60	67	2	99	1
Peak Hour Factor	0.71	0.71	0.71	0.88	0.88	0.88	0.88	0.67	0.67	0.67	0.75	0.75	0.75
Heavy Vehicles, %	0	0	1	0	2	80	0	88	2	2	0	1	0
Mvmt Flow	4	7	138	1	100	6	91	12	90	100	3	132	1
Number of Lanes	0	1	0	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	9.7	12.4	9.4
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	3%	51%	2%
Vol Thru, %	44%	5%	3%	97%
Vol Right, %	50%	92%	46%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	106	174	102
LT Vol	8	3	89	2
Through Vol	60	5	5	99
RT Vol	67	98	80	1
Lane Flow Rate	201	149	198	136
Geometry Grp	1	1	1	1
Degree of Util (X)	0.347	0.189	0.267	0.194
Departure Headway (Hd)	6.191	4.661	4.855	5.125
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	584	775	730	703
Service Time	4.191	2.661	2.95	3.132
HCM Lane V/C Ratio	0.344	0.192	0.271	0.193
HCM Control Delay	12.4	8.7	9.7	9.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.5	0.7	1.1	0.7

APPENDIX E – RESPONSES TO CLIMATE CHANGE QUESTIONNAIRE

Appendix E1. Climate Resiliency Checklist 189-197 Gardner Street (Apartments) West Roxbury

A.1 - Project Information

Project Name:	**West Roxbury Residences – 189 - 197 Gardner Street**			
Project Address:	189 - 197 Gardner Street, West Roxbury			
Project Address Additional:				
Filing Type (*select*)	*Initial (**PNF**, EPNF, NPC or other substantial filing)* *Design / Building Permit (prior to final design approval), or* *Construction / Certificate of Occupancy (post construction completion)*			
Filing Contact	Colleen Soden	Soden Sustainability	*colleen@sodensustainability.com*	*617-372-7857*
Is MEPA approval required	*Yes/**no***		*Date*	

A.3 - Project Team

Owner / Developer:	West Brighton Acquisitions, LLC
Architect:	Khalsa Design
Engineer:	Vincent A. Dilorio, Inc
Sustainability / LEED:	Soden Sustainability
Permitting:	Mitchell L. Fischman (MLF) Consulting LLC
Construction Management:	TBD

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Residential Apartments
List the First Floor Uses:	Residential
List any Critical Site Infrastructure and or Building Uses:	N/A

Site and Building:

Site Area:	*36,194 SF*	Building Area:	*81,844 SF*
Building Height:	*44 Ft*	Building Height:	*4-Stories*
Existing Site Elevation – Low:	*101.8 Ft BCB*	Existing Site Elevation – High:	*107.4 Ft BCB*
Proposed Site Elevation – Low:	*101.8 Ft BCB*	Proposed Site Elevation – High:	*107.4 Ft BCB*
Proposed First Floor Elevation:	*107.5 Ft BCB*	Below grade levels:	*1 Story*

Article 37 Green Building:

LEED Version - Rating System :	LEED- BD&C	LEED Certification:	*Yes / No*
Proposed LEED rating:	*Certified/Silver/ Gold/Platinum*	Proposed LEED point score:	*Pts.*

Building Envelope

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

Roof:	*49ci (R)*	Exposed Floor:	*10ci wood frame(R)*
Foundation Wall:	*7.5ci (R)*	Slab Edge (at or below grade):	*R15 for 24” (R)*

Vertical Above-grade Assemblies (%’s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	*0 (%)*	Wall & Spandrel Assembly Value:	*NA (U)*
Area of Framed & Insulated / Standard Wall:	*72 (%)*	Wall Value	*R20+R5ci wood frame*
Area of Vision Window:	*23 %*	Window Glazing Assembly Value:	*0.45 (U)*
		Window Glazing SHGC:	*0.4 (SHGC)*
Area of Doors:	*5 %*	Door Assembly Value:	*0.45 (U)*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	*Energy loads and performance were estimated using an eQuest 3.65 energy model based on the March 20, 2019 schematic drawings*		
Annual Electric:	*610,864 (kWh)*	Peak Electric:	*155.6 (kW)*
Annual Heating:	*1,420 (MMbtu)*	Peak Heating:	*1.1 (MMbtu/hr)*
Annual Cooling:	*14,848 (Tons-hr)*	Peak Cooling:	*14.25 (Tons)*
Energy Use - Below ASHRAE 90.1 - 2013:	*29.3 %*	Have the local utilities reviewed the building energy performance?:	*Yes / no*
Energy Use - Below Mass. Code:	*26.1 %*	Energy Use Intensity:	*60 (no garage) (kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*125 (kW)*	Number of Power Units:	1
System Type:	*Ground*	Fuel Source:	Natural Gas

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

Electric:	*45 (kW)*	Heating:	*0.5 (MMbtu/hr)*
		Cooling:	*10 /(Tons)*

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

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

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: *582 (Tons)*

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

High energy performance of the building has been incorporated in the project via condensing boilers, condensing DHW heaters, improved envelope, low flow hot water fixtures, and energy star appliances.

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

There is passive energy savings in the orientation and shading of the glazing with recessed balconies as well as operable windows and sliders at the balconies.

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

The high efficiency equipment includes: low flow plumbing fixtures, high efficiency condensing boilers, high efficiency condensing domestic hot water heaters, as well as variable speed hot water pumps.

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

The variable speed hot water loop, condensing boilers (reduced hot water temp) and low flow hot water plumbing fixtures will reduce the loads on both the boiler and the domestic hot water heaters. LED light fixtures will reduce the cooling load in the building as well as reduce the lighting energy.

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

There are not any district scale emission reduction strategies incorporated at this time. Project will consider strategies where feasible as they arise.

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

There will not be any energy efficiency assistance offered except that tenants will pay for their own utilities which will encourage individuals to be energy efficient.

B.2 - GHG Reduction - Adaptation Strategies

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

The building has space on the roof that could house both a solar PV array to offset electrical use as well as solar hot water heaters to reduce natural gas use in the building.

C - Extreme Heat Events

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

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	*3 Deg.*	Temperature Range - High:	*103 Deg.*
Annual Heating Degree Days:	5,596	Annual Cooling Degree Days	900

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

Days - Above 90°:	*25 #*	Days – Above 100°:	*10 #*
Number of Heatwaves / Year:	*5 #*	Average Duration of Heatwave (Days):	*4 #*

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

Heat island effect is reduced by incorporating reflective building materials as well as covered parking.

C.2 - Extreme Heat – Adaptation Strategies

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

The building is cooled by many individual heat pumps that can operate independently to maintain indoor conditions at higher outdoor average temperatures.

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

Interruptions of power can be mitigated in the short term by the emergency generator. Longer power outages could require operable windows to provide ventilation and natural cooling.

D - Extreme Precipitation Events

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

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*6.0 In.*

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

Subsurface infiltration is expected to be used to retain stormwater runoff on-site

D.2 - Extreme Precipitation - Adaptation Strategies

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

Subsurface infiltration is anticipated to be sized to infiltrate at least the equivalent of 1.25 inches times the impervious area of the site as prescribed in BPDA's Smart Utilities Policy for projects at or above 100,000 square feet of floor area

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E – Sea Level Rise and Storms

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

Is any portion of the site in a FEMA SFHA?	Yes / No	What Zone:	A, AE, AH, AO, AR, A99, V, VE
		Current FEMA SFHA Zone Base Flood Elevation:	*Ft BCB*

Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online [BPDA SLR-FHA Mapping Tool]() to assess the susceptibility of the project site.	Yes / No

---

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

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

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online [BPDA SLR-FHA Mapping Tool]() to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*Ft BCB*	First Floor Elevation:	*Ft BCB*
Site Elevations at Building:	*Ft BCB*	Accessible Route Elevation:	*Ft BCB*

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

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

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

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

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

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

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

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

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

189 – 197 Gardner St, West Roxbury, MA
PNF Application Preliminary Energy Model Analysis

Summary

For the 189 – 197 Gardner Street Project PNF application, an energy analysis was performed based on the geometry and orientation described in the March 20, 2019 schematic building drawings. Analysis was performed by Allison Gaiko, PE, LEED AP for Soden Sustainability Consulting using eQuest3.65 to compare the proposed design case to two baseline scenarios:

- Energy cost comparison to ASHRAE 90.1-2010 Appendix G in accordance with LEED v4 requirements
- Energy use comparison to ASHRAE 90.1-2013 in accordance with MA Energy Code requirements

Model Input Assumptions

Below is a table summarizing the input of the proposed design and two baseline energy models

		ASHRAE 90.1-2010	ASHRAE 90.1-2013	Proposed
Opaque Assemblies	Roof	R20ci insulation – U-0.048	R30ci insulation – U-0.032	R49ci insulation - U-0.020
	Above Grade Walls	R13 + R7.5ci – U-0.064	R13 + R10ci – U-0.055	R20 + R5ci (wood frame) – U-0.0455
	Exposed Floor	R30 – U-0.038	R30 – U-0.038	R10ci (wood frame) – U-0.074
	Slab on Grade (unheated)	F-0.730	F-0.520	F-0.730
Glazing	Metal Framing U-Factor (other)	Assembly U-0.55	Assembly U-0.50 (operable) U-0.42 (fixed)	Assembly U-0.45
	SHGC	Assembly SHGC - 0.4	Assembly SHGC - 0.4	Assembly SHGC - 0.4
Lighting	Residential Dwelling[3]	0.90 W/SF	0.81 W/SF	0.72 W/SF
	Mechanical[3]	0.95 W/SF	0.38 W/SF	0.75 W/SF
	Corridor/Transition[3]	0.66 W/SF	0.59 W/SF	0.53 W/SF
	Parking Garage[3]	0.19 W/SF	0.17 W/SF	0.15 W/SF
Process Loads	Residential Dwelling[1]	1.42 W/SF	1.42 W/SF	1.31 W/SF
	Corridor/Transition	0.2 W/SF	0.2 W/SF	0.2 W/SF
	Elevator	30 kW/car	30 kW/car	30 kW/car

		ASHRAE 90.1-2010	ASHRAE 90.1-2013		Proposed
DHW	Hot Water Heater Efficiency	80%	80%		95%
	Lavatory Sink Flow[2]	2.2 GPM	2.2 GPM		0.5 GPM
	Kitchen Sink Flow[2]	2.2 GPM	2.2 GPM		1.5 GPM
	Shower Flow[2]	2.5 GPM	2.5 GPM		1.5 GPM
HVAC	Boiler[3]	80%	88%		95%
	HW temperature	180 °F	180 °F		150 °F
	PTAC EER[3]	9.3 EER	10.23 EER		14 SEER
	PVAV SEER DX < 65[3]	13 SEER	15.4 SEER		16 SEER

Please note that the energy model is not created to predict actual energy use for the proposed building but rather to compare energy consumption between the design case and baseline cases. Inputs such as occupancy, weather data and individual occupants' habits affect the proposed model's ability to predict energy use. For this reason, the baseline and design models were created with identical weather data as well as identical schedules for parameters such as occupancy, lighting EFLH (electrical full load hours), and temperature set points. Schedules were based on the EFLH Tab of the v4 Minimum Energy Performance Calculator created for LEED v4 and are summarized in the attached Appendix.

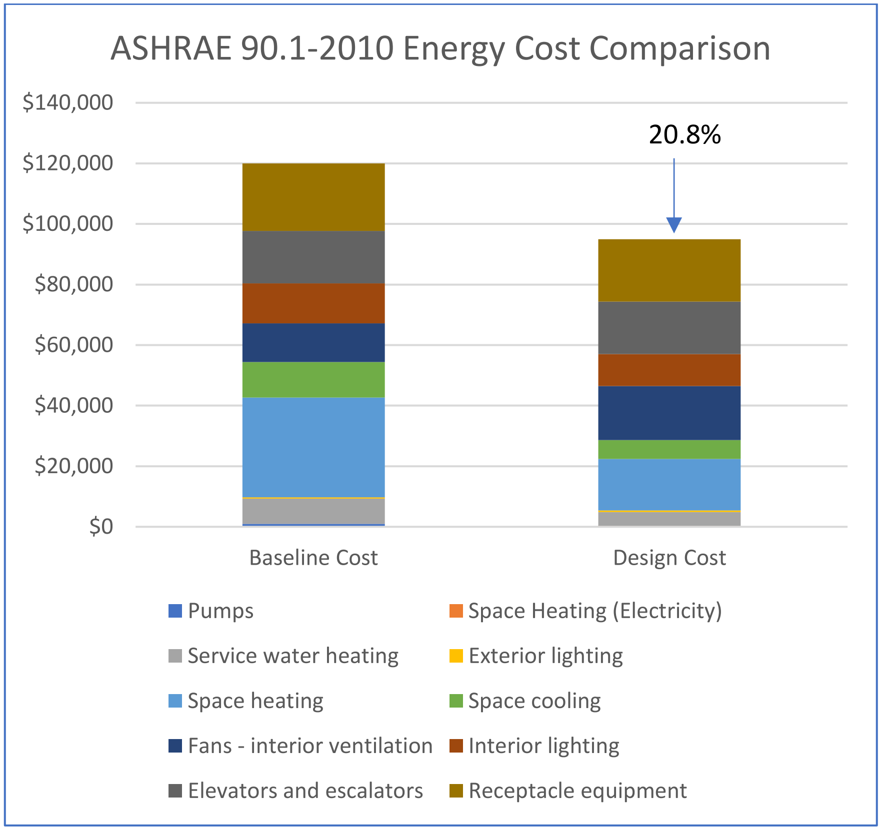
Table notes:

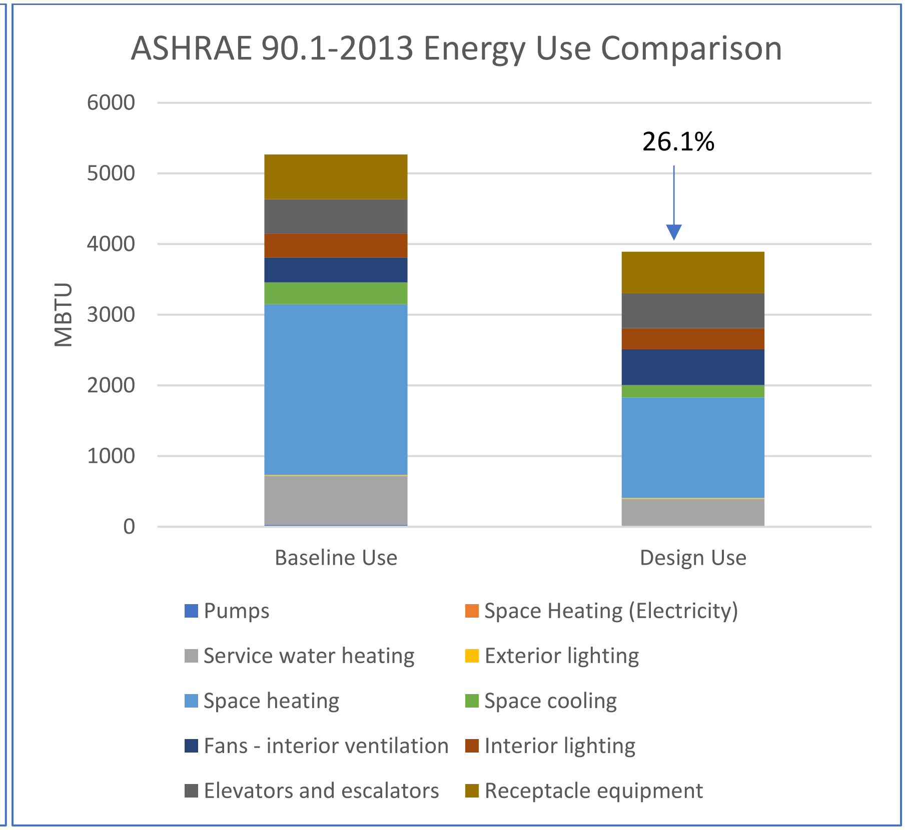
1. Reduction in plug load in the residential units is based on Energy Star appliances that have been incorporated in the project and has been calculated based on the Multi-Family Tab of the v4 Minimum Energy Performance Calculator created for LEED v4 and are summarized in the attached Appendix.
2. Reduction in domestic hot water flow in the residential units is based on the reduced flow fixtures and Energy Star appliances that have been incorporated in the project and has been calculated based on the Multi-Family Tab of the v4 Minimum Energy Performance Calculator created for LEED v4 and are summarized in the attached Appendix.
3. In accordance with Massachusetts Code requirements section C406, two additional efficiency package options were included in the ASHARAE 90.1-2013 baseline case. The two options selected were (1) More efficient HVAC performance – Exceed energy efficiency provisions by 10% and (2) Reduced lighting power density by 10%.

Model Results

The results of the 189 – 197 Gardner Street preliminary energy model analysis show:

- 20.8% annual energy cost reduction vs ASHRAE 90.1-2010 (8 LEEDv4 points)
- 26.1% annual energy use reduction vs ASHRAE 90.1-2013 (MA Energy Code)





Most of the energy savings in the 189 – 197 Gardner Street project are the result of reduced lighting, efficient domestic hot water heaters and efficient boilers, and are represented in the above graphs by reductions in space heating, interior lighting and service water heating energy use and cost.

Appendix

(OPTIONAL) Equivalent Full Load Hours Calculator

Default Schedules

Residential Dwelling Unit Default Schedules

Schedule Name: Dwelling Unit Thermostat setpoint schedule

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PN	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	Hours/day	Hours/year
Daily Heating Setpoint	70.0	70.0	70.0	70.0	70.0	70.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	70.0	24.00	8,760
Daily Cooling Setpoint	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	80.0	80.0	80.0	80.0	80.0	80.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	24.00	8,760

Schedule Name: Dwelling Unit Lighting Schedule

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PM	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	7.7%	14.0%	14.0%	10.8%	10.8%	10.8%	7.7%	7.7%	7.7%	7.7%	7.7%	10.8%	21.7%	21.7%	21.7%	21.7%	18.6%	1.6%	2.34	585
Weekend	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	7.7%	14.0%	14.0%	10.8%	10.8%	10.8%	7.7%	7.7%	7.7%	7.7%	7.7%	10.8%	21.7%	21.7%	21.7%	21.7%	18.6%	1.6%	2.34	243
Holiday	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	7.7%	14.0%	14.0%	10.8%	10.8%	10.8%	7.7%	7.7%	7.7%	7.7%	7.7%	10.8%	21.7%	21.7%	21.7%	21.7%	18.6%	1.6%	2.34	26
Total Equivalent Full Load Hours of Operation per Year																										854

Schedule Name: Dwelling Unit Miscellaneous Equipment Schedule

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PM	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	5%	5%	5%	5%	5%	5%	5%	5%	50%	50%	50%	50%	30%	50%	50%	50%	50%	50%	35%	5%	5%	5%	5%	5%	5.80	1,450
Weekend	5%	5%	5%	5%	5%	5%	5%	5%	50%	50%	50%	50%	30%	50%	50%	50%	50%	50%	35%	5%	5%	5%	5%	5%	5.80	603
Holiday	5%	5%	5%	5%	5%	5%	5%	5%	50%	50%	50%	50%	30%	50%	50%	50%	50%	50%	35%	5%	5%	5%	5%	5%	5.80	64
Total Equivalent Full Load Hours of Operation per Year																										2,117

Schedule Name: Residential Common Area Miscellaneous Equipment Schedule

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PN	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	10%	10%	10%	10%	10%	30%	45%	45%	45%	45%	30%	30%	30%	30%	30%	30%	30%	30%	60%	80%	90%	80%	60%	30%	9.00	2,250
Weekend	10%	10%	10%	10%	10%	30%	45%	45%	45%	45%	30%	30%	30%	30%	30%	30%	30%	30%	60%	80%	90%	80%	60%	30%	9.00	936
Holiday	10%	10%	10%	10%	10%	30%	45%	45%	45%	45%	30%	30%	30%	30%	30%	30%	30%	30%	60%	80%	90%	80%	60%	30%	9.00	99
Total Equivalent Full Load Hours of Operation per Year																										3,285

Schedule Name: Residential DHW Schedule

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PN	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	5%	5%	5%	5%	5%	5%	30%	50%	40%	30%	30%	35%	40%	35%	35%	30%	30%	50%	50%	40%	35%	45%	30%	5%	6.70	1,675
Weekend	5%	5%	5%	5%	5%	5%	30%	50%	40%	30%	30%	35%	40%	35%	35%	30%	30%	50%	50%	40%	35%	45%	30%	5%	6.70	697
Holiday	5%	5%	5%	5%	5%	5%	30%	50%	40%	30%	30%	35%	40%	35%	35%	30%	30%	50%	50%	40%	35%	45%	30%	5%	6.70	74
Total Equivalent Full Load Hours of Operation per Year																										2,446

Schedule Name: Garage Exhaust

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PN	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	7%	7%	7%	7%	7%	7%	17%	20%	50%	50%	15%	15%	35%	15%	15%	15%	25%	50%	50%	25%	7%	7%	7%	7%	4.64	1,159
Weekend	7%	7%	7%	7%	7%	7%	17%	20%	50%	50%	15%	15%	35%	15%	15%	15%	25%	50%	50%	25%	7%	7%	7%	7%	4.64	482
Holiday	7%	7%	7%	7%	7%	7%	17%	20%	50%	50%	15%	15%	35%	15%	15%	15%	25%	50%	50%	25%	7%	7%	7%	7%	4.64	51
Total Equivalent Full Load Hours of Operation per Year																										1,693

Copy & Paste Schedule Above

Schedule Name: Apt Elev

	12-1AM	1-2AM	2-3AM	3-4AM	4-5AM	5-6AM	6-7AM	7-8AM	8-9 AM	9-10AM	10-11AM	1AM-12PN	12-1PM	1-2PM	2-3PM	3-4PM	4-5PM	5-6PM	6-7PM	7-8PM	8-9PM	9-10PM	10-11PM	11-12PM	EFLH/day	EFLH/year
Weekday	5%	5%	5%	5%	5%	5%	20%	40%	50%	40%	40%	35%	35%	30%	30%	30%	40%	45%	50%	40%	35%	30%	10%	5%	6.35	1,588
Weekend	5%	5%	5%	5%	5%	5%	10%	25%	50%	50%	50%	40%	45%	45%	40%	40%	50%	45%	45%	45%	30%	30%	25%	15%	7.10	738
Holiday	5%	5%	5%	5%	5%	5%	10%	25%	50%	50%	50%	40%	45%	45%	40%	40%	50%	45%	45%	45%	30%	30%	25%	15%	7.10	78
Total Equivalent Full Load Hours of Operation per Year																										2,404

Multifamily Home Details

Complete the table for each building in the project. Input the number of units and the average floor area for units with the corresponding bedroom number.

Building Unit summary

Building ID	Studio		1 Bedroom		2 Bedrooms		3 Bedrooms		4 Bedrooms		5 Bedrooms		6 Bedrooms		7 Bedrooms		8 Bedrooms	
	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)	Qty	Average Floor Area (sq ft)
189 Gardner			51	700	19	900												
Total number of units																		70
Total number of bedrooms																		89
Total Area of Dwelling Units (square feet)																		52,800

Building ID	Total Number of Units	Total Number of Bedrroms	Total Area of Dwelling Units (square feet)	Average Number of Bedrooms Per Unit	Average Floor Area per Unit (square feet)	Average Floor Area Per Unit for Reference Building (square feet)
189 Gardner	70	89	52,800	1.27	754	1,162

Homes Dwelling Unit Equipment Calculator

Enter the appliances and equipment that is present in the residential dwelling units for the project. For clothes washers and dryers, enter the quantity of each unit installed within the project scope of work. For fans, enter the total supply volume for all fans installed for the project.

Building ID	Load Source	Quantity (or sum total fan volume [cfm] for fans)	Energy Star Eqp?	Average bedrooms per dwelling unit		Electric Loads					Natural Gas Loads					Annual Service Hot Water Load (gallons/year)			
						Annual Consumption (kWh/year)		Sensible Ratio	Latent Ratio		Annual Consumption (therms/year)		Sensible Ratio	Latent Ratio		Baseline Per Equipment	Proposed Per Equipment	Baseline Total	Proposed Total
						Baseline	Proposed				Baseline	Proposed							
189 Gardner	Bath / Utility Fan, 10 to 89 cfm	7565	Yes	1.271429		4602.042	3944.607	0	0		0	0	0.00	0.00		0.00	0.00	0.00	0
189 Gardner	Refrigerator	70	Yes	1.271429		37030	29610	1	0		0	0	0.00	0.00		0.00	0.00	0.00	0
189 Gardner	Clothes Dryer (In-unit electric)	70	Yes	1.271429		41631	41631	0.15	0.05		0	0	0.00	0.00		0.00	0.00	0.00	0
189 Gardner	Clothes Washer (In-unit)	70	Yes	1.2714286		5,670	3,990	0.8	0		0	0	0.00	0.00		2,435.80	1,127.40	170,506.0	78,918.0
189 Gardner	Dishwasher	70	Yes	1.2714286		14,420	11,480	0.6	0.15		0	0	0.00	0.00		1,290.00	860.00	90,300.0	60,200.0
189 Gardner	Cooking (gas stove/range)	70	Yes	1.2714286		0	0	0	0		3,150	3,150	0.30	0.20		0.00	0.00	0.0	0.0

Homes Dwelling Unit Equipment Modeling Summary

Report the modeled Receptacle Equipment and Appliances Equivalent Full Load Hours of Operation in the Schedules tab before referring to the table below. The Equivalent Full Load Hours of Operation is used to calculate the equipment power density for resdential dwelling units that must be modeled based on the building equipment reported for the building. After confirming the Equivalent Full Load Hours of Operation in the schedules tab, use the values below for the Baseline and Proposed Miscellaneous Equipment Loads in the Dwelling Units. These loads include 0.5 Watts per square foot of electric miscellaneous equipment load with a 0.9 sensible ratio and 0.1 latent ratio in addition to the equipment load sources selected above.

Building ID	Equivalent Full Load Hours of Dwelling Unit Miscellaneous Equipment Operation Per Year	Total Area of Dwelling Units (square feet)		Electric Miscellaneous Loads in Dwelling Unit (including appliances and equipment listed above)							Natural Gas Miscellaneous Loads in Dwelling Unit (including appliances and equipment listed above)							Dwelling Unit Equipment Hot Water Loads (gallons/year)	
				Baseline			Proposed				Baseline			Proposed					
				Equipment Power Density (Watts/ sq ft)	Sensible Ratio	Latent Ratio	Equipment Power Density (Watts/ sq ft)	Sensible Ratio	Latent Ratio		Equipment Power Density (Btu/ sq ft)	Sensible Ratio	Latent Ratio	Equipment Power Density (Btu/ sq ft)	Sensible Ratio	Latent Ratio		Base	Proposed
189 Gardner	2,117	52800		1.42	0.67	0.06	1.31	0.66	0.06		2.82	0.30	0.20	2.82	0.30	0.20		260806.00	139118.00

Homes Service Water Heating Load Summary

Residential Usage Profile Dependent on Project Demographics		Baseline Residential Usage per person Excluding Clothes / Dish Washers	
Low	Demographics such as all occupants working, seniors, middle income, and higher population density.	12	gallons/day
Medium	Demographics such as mixture of working / non-working occupants, mixture of age groups, medium population densities.	25	gallons/day
High	Demographics such high percentages of children, low income, public assistance, or no occupants working.	44	gallons/day

Report the modeled Service Water Heating Full Load Hours of Operation in the Schedules tab before referring to the table below. The Equivalent Full Load Hours of Operation is used to calculate the DHW modeled peak residential flow a the DHW Heater that must be modeled to be consistent with the annual hot water consumption calculated here. After confirming the Equivalent Full Load Hours of Operation in the schedules tab,Identify the residential service water heating usage profile, and the average fixture flows for sink and shower fixtures. Supply temperature at fixture point of use shall be 120 degrees F. If the modeled supply DHW temperature from the DHW heater is higher than this, indicate the supply DHW temperature from the DHW heater and the average cold water input temperature below.

This information along with the appliance information entered above and the schedule data from the schedules tab is used to determine the DHW modeled Peak Flow at DHW heater,which should be input into the energy model.

Building ID	Residential Usage Profile	Average Fixture Flows (gallons/minute)		DHW Temperature Settings (degrees F)			DHW Sink and Shower Fixture Loads at Point of Use (gallons / year)		DHW In-Unit Appliance Loads at Point of Use (gallons / year)		DHW Laundry Room Equipment Loads at Point of Use (gallons / year)		DHW Total Residential Loads at Point of Use (gallons / year)		DHW Total Residential Loads at DHW Heater (gallons / year)		DHW Equivalent Full Load Hours of Operation	DHW Modeled Peak Residential Flow at DHW Heater (gallons / minute)	
		Showers	Sinks	DHW Supply Temp	Average Cold Water Temp	DHW Temp at Fixture Point of Use	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed	Baseline	Proposed		Baseline	Proposed
189 Gardner	Medium	1.50	0.50	120.0	50.0	120.0	812,125	573,951	260,806	139,118	0	0	1,072,931	713,069	1,072,931	713,069	2,446	7.311	4.859

Note: Flow rates are based on Energy Star Multifamily Simulation Guidance. One person is assumed per bedroom.

May 24, 2019

boston planning & development agency

Appendix E2. Climate Resiliency Checklist
178 Gardner Street (Townhouses), West Roxbury

A.1 - Project Information

Project Name:	West Roxbury Residences - 178 Gardner Street			
Project Address:	178 Gardner Street West Roxbury			
Project Address Additional:				
Filing Type (*select*)	*Initial (**PNF**, EPNF, NPC or other substantial filing),* *Design / Building Permit (prior to final design approval), or* *Construction / Certificate of Occupancy (post construction completion)*			
Filing Contact	*Colleen Soden*	Soden Sustainability	*Email: colleen@sodensustainability.com*	*Phone 617.372.7857*
Is MEPA approval required	*Yes/no*		*Date*	

A.3 - Project Team

Owner / Developer:	West Brighton Acquisitions, LLC
Architect:	Khalsa Design
Engineer:	Vincent A. Dilorio, Inc
Sustainability / LEED:	Soden Sustainability
Permitting:	Mitchell L. Fischman (MLF) Consulting LLC
Construction Management:	TBD

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Townhouses
List the First Floor Uses:	Residential
List any Critical Site Infrastructure and or Building Uses:	N/A

Site and Building:

Site Area:	*26,257 SF*	Building Area:	*40,096 SF*
Building Height:	*42Ft*	Building Height:	*4-Stories*
Existing Site Elevation – Low:	*101.7 Ft BCB*	Existing Site Elevation – High:	*115.2 Ft BCB*
Proposed Site Elevation – Low:	*101.7 Ft BCB*	Proposed Site Elevation – High:	*113.2 Ft BCB*
Proposed First Floor Elevation:	*110.5 Ft BCB*	Below grade levels:	*1-Story*

Article 37 Green Building:

LEED Version - Rating System :	V4 MF Lowrise	LEED Certification:	*No*
Proposed LEED rating:	*Silver*	Proposed LEED point score:	*57 Pts.*

Building Envelope

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

Roof:	*(R) 49*	Exposed Floor:	*(R) 27*
Foundation Wall:	*(R) N/A*	Slab Edge (at or below grade):	*(R) 10 Edge + Below*

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	*0 (%)*	Wall & Spandrel Assembly Value:	*N/A (U)*
Area of Framed & Insulated / Standard Wall:	*86.1 (%)*	Wall Value	*R20 + 6 cont. (R)*
Area of Vision Window:	*11.7 %*	Window Glazing Assembly Value:	*0.26 (U)*
		Window Glazing SHGC:	*0.30 (SHGC)*
Area of Doors:	*2.2 %*	Door Assembly Value:	*0.2 (U)*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	*HERS modeling was completed on sample units. The numbers below reflect a per unit energy model*		
Annual Electric:	*5027 (kWh)*	Peak Electric:	*1.9 (kW)*
Annual Heating:	*42 (MMbtu/hr)*	Peak Heating:	*36.4 (MMbtu)*
Annual Cooling:	*9 (MMbtu/hr)*	Peak Cooling:	*01.67 (Tons)*
Energy Use - Below ASHRAE 90.1 - 2013:	*(Not applicable – HERS Modeling Stretch Code*	Have the local utilities reviewed the building energy performance?:	*no*
Energy Use - Below Mass. Code:	*3.6 %*	Energy Use Intensity:	*34.3 (kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*0 (kW)*	Number of Power Units:	N/A
System Type:	*0 (kW)*	Fuel Source:	N/A

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

Electric:	*0 (kW)*	Heating:	*0 (MMbtu/hr)*
		Cooling:	*0 (Tons/hr)*

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

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

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: *0.01455 (Tons)*

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

The project complied with the Massachusetts Stretch Energy Code standard of achieving a HERS 55, and the current modeling is achieving a HERS 53.

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

The primary building design is a robust envelope including continuous insulation on above grade walls. The building will also include very high efficiency mechanicals.

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

The buildings have a robust enclosure with very high efficiency mechanicals including on demand water heating and high efficiency heating and cooling.

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

There are not on-site renewables, clean, or energy storage systems incorporated into this project.

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

There are no on-site renewables, central energy plants, distributed energy systems or smart grid infrastructure incorporated into this project.

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

The townhouses will enroll and are planning to participate in the Massachusetts New Construction (utility rebate) program, MASS SAVE.

B.2 - GHG Reduction - Adaptation Strategies

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

The enclosure and mechanicals will greatly reduce energy needed to heat/cool the apartments thus reducing the emissions for the project. By employing a hydro-air system, there will be future flexibility in heat/cool source selection.

C - Extreme Heat Events MEP

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

C.1 – Extreme Heat - Design Conditions MEP

Temperature Range - Low:	*12 Deg.*	Temperature Range - High:	*88 Deg.*
Annual Heating Degree Days:	5621	Annual Cooling Degree Days	5609

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

Days - Above 90°:	*9 #*	Days – Above 100°:	*0 #*
Number of Heatwaves / Year:	*2 #*	Average Duration of Heatwave (Days):	*3 #*

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

The buildings are installing white balconies and will reduce the building load by having better thermal performance with low SHGC windows.

C.2 - Extreme Heat – Adaptation Strategies

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

The buildings are utilizing a robust enclosure to ensure that increase in load will not require an increase mechanical output.

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

Having a tight and robust enclosure will allow for longer occupancy during times of utility interruptions.

D - Extreme Precipitation Events

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

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*6.0 In.*

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

Subsurface infiltration is expected to be used to retain stormwater runoff on-site.

D.2 - Extreme Precipitation - Adaptation Strategies

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

Subsurface infiltration is anticipated to be sized to infiltrate at least the equivalent of 1.25 inches times the impervious area of the site as prescribed in BPDA’s Smart Utilities Policy for projects at or above 100,000 square feet of floor area.

E – Sea Level Rise and Storms CIVIL

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

Is any portion of the site in a FEMA SFHA?	*Yes / **No***	What Zone:	A, AE, AH, AO, AR, A99, V, VE
		Current FEMA SFHA Zone Base Flood Elevation:	*Ft BCB*
Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site.	*Yes / **No***		

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

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

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*Ft BCB*	First Floor Elevation:	*Ft BCB*
Site Elevations at Building:	*Ft BCB*	Accessible Route Elevation:	*Ft BCB*

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

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

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

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

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

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

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

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

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

APPENDIX F – RESPONSES TO COB ACCESSIBILITY GUIDELINES

Article 80 – Accessibility Checklist

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

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

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

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

Accessibility Analysis Information Sources:

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

Glossary of Terms:

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

1. Project Information: *If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*			
Project Name:	178 Gardner Street Multifamily Residences		
Primary Project Address:	178 Gardner Street, West Roxbury		
Total Number of Phases/Buildings:	2		
Primary Contact (Name / Title / Company / Email / Phone):	Peter Davos – Principal West Brighton Acquisitions LLC davisboston@comcast.net (617) 719-8668		
Owner / Developer:	West Brighton Acquisitions LLC C/O Peter Davos		
Architect:	Jai Singh Khalsa Khalsa Design, Inc. 17 Ivaloo Street Somerville, MA 02143 (617) 591-8682		
Civil Engineer:	Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080		
Landscape Architect:	Verdant Landscape Architecture 318 Harvard Street, Suite 25 Brookline, MA 02446 (617) 735-1180		
Permitting:	Mitchell L. Fischman Consulting LLC 41 Brush Hill Road Newton, MA 02461 (781) 760-1726		
Construction Management:	TBD		
At what stage is the project at time of this questionnaire? Select below:			
	PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	No			
2. Building Classification and Description: *This section identifies preliminary construction information about the project including size and uses.*				
What are the dimensions of the project?				
Site Area:	*26,257 SF*	Building Area:		*32,893 GSF PER ZONING CODE*
Building Height:	*45 FT.*	Number of Stories:		*4-Flrs.*
First Floor Elevation:	+/-107.5'	Is there below grade space:		*Yes- Below Grade Garages*
What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	Residential - Multi-unit, Four +	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	*This project consists of 18 Townhouses. The ground floor contains living space for each unit*			
3. Assessment of Existing Infrastructure for Accessibility: *This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.*				
Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	Gardner Street is a one-way street consisting of the following parcels: On the Right (South) Side of the one-way street: - 3 Commercial parcels with a 2-story office structure. - 1 Vacant Commercial Land parcel. - This Project, which is comprised of 1 Vacant Commercial Land parcel & 1 R-1 parcel. - 1 Apartment parcel. - 1 Single Family parcel - & 1 Commercial parcel. On the Left (North) Side of the one-way Street: - 1 Vacant Commercial Land parcel.			

	- 1 Single Family parcel. - 1 Commercial parcel & 1 industrial parcel which make up the 1st phase of this project to be filed under a separate cover. - 1 Apartment parcel (Oak Row) A crosswalk connects to the other portion of Gardner Street which also terminates at VFW Parkway.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The site is 0.2 miles (3 min. walk) to the MBTA Number 36 bus service along Charles Park Road. This bus travels from the Forest Hills Orange & Commuter Rail Station to Millennium Park. The site is 0.4 miles (8 min. walk) to the MBTA Number 52 bus service along Baker St. This bus travels from Watertown Yard to the Dedham Mall The West Roxbury Commuter Rail station is 0.9 miles away (18 min. walk). This station serves the Needham Line which travels from Needham Heights to South Station
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	Hospitals: Faulkner Hospital, VA Medical Center-West Roxbury BHA Public Housing: Rockland Towers, Spring Street Community, Georgetown Homes Assisted Living Facilities: Deutsches Altenheim, Sophia Snow Place, Edelweiss Village. Educational Facilities: Roxbury Latin High School, Catholic Memorial High School, Beethoven Public Elementary School.
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	West Roxbury Branch Public Library Jim Roche Community Arena West Roxbury Community Center BCYF Roche Community Center Dedham Health and Athletic Complex Parkway Community YMCA Millennium Park
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? *If yes,* identify which district:	No.
Are there sidewalks and pedestrian ramps existing at the development site? *If yes*, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Yes, the existing sidewalks are in generally good condition with granite curbing.

Are the sidewalks and pedestrian ramps existing-to-remain? *If yes,* have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? *If yes,* provide description and photos:	No. The existing sidewalks in front of the site along Gardner Street & Charles Park Road are going to be widened.

5. Surrounding Site Conditions – Proposed

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

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? *If yes*, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes. City of Boston Guidelines- Residential Street
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Sidewalk width = 7’-0” plus an additional buffer for landscaping Slope will be less than 5% and less than 2% horizontally.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	C.O.B R.O.W

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? *If yes,* what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	N/A
Will any portion of the Project be going through the PIC? *If yes,* identify PIC actions and provide details.	This project will go through PIC during the design process. As a result, the Sidewalks will we widened to 7'-0" from 5'-0" by expanding 2' onto the site.
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations.*	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	Each townhome is provided with 1 enclosed garage space & 1 tandem garage space outside of the garage for a total of 36 spaces.
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8-foot access aisle?	This project is not required to be accessible per section 9.6 of 521 CMR which states: TOWNHOUSES - GROUP 1 UNITS ONLY: RESERVED until further notice. In the interim, they are exempt. This project does not require group 2 units per section 9.4 of 521 CMR which states: GROUP 2 DWELLING UNITS In multiple dwellings that are for rent, hire, or lease (but not for sale) and contain 20 or more units, at least 5% of the dwelling units must be Group 2A units. Less than 20 Units are being proposed. Therefore, no accessible spaces are provided for this development.

Will any on-street accessible parking spaces be required? *If yes,* has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No.
Where is the accessible visitor parking located?	N/A
Has a drop-off area been identified? *If yes,* will it be accessible?	No.
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability-with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	This project is not required to be accessible per section 9.6 of 521 CMR which states: TOWNHOUSES - GROUP 1 UNITS ONLY: RESERVED until further notice. In the interim, they are exempt. This project does not require group 2 units per section 9.4 of 521 CMR which states: GROUP 2 DWELLING UNITS In multiple dwellings that are for rent, hire, or lease (but not for sale) <u>and contain 20 or more units</u>, at least 5% of the dwelling units must be Group 2A units. Less than 20 Units are being proposed. Therefore, entryways are not required to be accessible.
Are the accessible entrances and standard entrance integrated? *If yes, describe. If no,* what is the reason?	This project is not required to be accessible per section 9.6 of 521 CMR which states: TOWNHOUSES - GROUP 1 UNITS ONLY: RESERVED until further notice. In the interim, they are exempt. This project does not require group 2 units per section 9.4 of 521 CMR which states: GROUP 2 DWELLING UNITS In multiple dwellings that are for rent, hire, or lease (but not for sale) <u>and contain 20 or more units</u>, at least 5% of the dwelling units must be Group 2A units. Less than 20 Units are being proposed. Therefore, accessible entries are not required.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	All accessible routes & way-finding elements will be designed to comply with the 521 CRM: Architectural Access Board regulations.

8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	18 Units
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	The number of affordable units provided per the City of Boston's Inclusionary Development Policy are as follows: Total # Of Units: 18 Required Affordable (13%): 2.34 Provided Affordable: 2
If a residential development, how many accessible Group 2 units are being proposed?	This project does not require group 2 units per section 9.4 of 521 CMR which states: GROUP 2 DWELLING UNITS In multiple dwellings that are for rent, hire, or lease (but not for sale) <u>and contain 20 or more units</u>, at least 5% of the dwelling units must be Group 2A units. Less than 20 Units are being proposed.
If a residential development, how many accessible Group 2 units will also be IDP units? *If none*, describe reason.	This project does not require group 2 units per section 9.4 of 521 CMR which states: GROUP 2 DWELLING UNITS In multiple dwellings that are for rent, hire, or lease (but not for sale) <u>and contain 20 or more units</u>, at least 5% of the dwelling units must be Group 2A units. Less than 20 Units are being proposed.
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? *If yes,* provide amount and location of equipment.	N/A
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. *If yes*, provide reason.	Yes, Unit entries are located above the average grade of the sidewalk with stairs to grade. These units are not required to be accessible.

Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? *If yes*, describe:	No.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community*.	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	Public Improvements include extension of the existing sidewalk & streetscape renovations.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	N/A
Are any restrooms planned in common public spaces? *If yes,* will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? *If no*, explain why not.	N/A

Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? *If yes,* did they approve? *If no,* what were their comments?	The proposed plans have not yet been reviewed with the City of Boston Disability Commissioner or the Architectural Access Staff.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? *If no,* what recommendations did the Advisory Board give to make this project more accessible?	The proponent has not yet presented the proposed plans to the Disability Advisory Board.

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project. See Attachment Figure F1.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances.
Provide a diagram of the accessible route connections through the site, including distances.
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable)
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. **Figure F1 shows accessible Routes, Distances, Location of Group 2 Units, & Location of Affordable Units.**
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.

This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

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

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

Architectural Access staff can be reached at:

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

1 Accessibility- Site
3/32" = 1'-0"

KHALSA DESIGN INC.

17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

178 Gardner Street Accessibility - Site

Project number	18111
Date	05/30/2019
Drawn by	Author
Checked by	Checker
Scale	3/32" = 1'-0"

F1

5/28/2019 5:55:37 PM

Article 80 – Accessibility Checklist

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

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

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

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   http://www.mass.gov/ocabr/government/oca-agencies/dpl-lp/opsi/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/ocabr/government/oca-agencies/dpl-lp/opsi/ma-state-building-code-780-cmr.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

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2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
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4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
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6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

1. Project Information:

If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.

Project Name:	189 Gardner Street Multifamily Residences
Primary Project Address:	189 Gardner Street, West Roxbury
Total Number of Phases/Buildings:	1
Primary Contact (Name / Title / Company / Email / Phone):	Peter Davos – Principal West Brighton Acquisitions LLC davisboston@comcast.net (617) 719-8668
Owner / Developer:	West Brighton Acquisitions LLC C/O Peter Davos
Architect:	Jai Singh Khalsa Khalsa Design, Inc. 17 Ivaloo Street Somerville, MA 02143 (617) 591-8682
Civil Engineer:	Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080
Landscape Architect:	Verdant Landscape Architecture 318 Harvard Street, Suite 25 Brookline, MA 02446 (617) 735-1180
Permitting:	Mitchell L. Fischman Consulting LLC 41 Brush Hill Road Newton, MA 02461 (781) 760-1726
Construction Management:	TBD

At what stage is the project at time of this questionnaire? Select below:

	PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? *If yes,* identify and explain.	No			
2. Building Classification and Description: *This section identifies preliminary construction information about the project including size and uses.*				
What are the dimensions of the project?				
Site Area:	*36,194 SF*	Building Area:		*65,912 GSF PER ZONING CODE*
Building Height:	*44 FT.*	Number of Stories:		*4-Flrs.*
First Floor Elevation:	+/-107.5'	Is there below grade space:		*Yes- Below Grade Garage*
What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	**Residential - Multi-unit, Four +**	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	*Entry Lobby, leasing, fitness, community room, & up to 15 dwelling units.*			
3. Assessment of Existing Infrastructure for Accessibility: *This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.*				
Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	Gardner Street is a one-way street consisting of the following parcels: On the Right (South) Side of the one-way street: - 3 Commercial parcels with a 2-story office structure. - 1 Vacant Commercial Land parcel. - 1 Vacant Commercial Land parcel & 1 R-1 parcel, which make up the 2nd phase of this project to be filed under a separate cover. - 1 Apartment parcel. - 1 Single Family parcel - & 1 Commercial parcel. On the Left (North) Side of the one-way Street: - 1 Vacant Commercial Land parcel.			

	- 1 Single Family parcel. - This project, which is comprised of 1 Existing Commercial parcel & 1 Existing industrial parcel. - 1 Apartment parcel (Oak Row) A crosswalk connects to the other portion of Gardner Street which also terminates at VFW Parkway.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The site is 0.2 miles (3 min. walk) to the MBTA Number 36 bus service along Charles Park Road. This bus travels from the Forest Hills Orange & Commuter Rail Station to Millennium Park. The site is 0.4 miles (8 min. walk) to the MBTA Number 52 bus service along Baker St. This bus travels from Watertown Yard to the Dedham Mall The West Roxbury Commuter Rail is 0.9 miles away (18 min. walk). This station serves the Needham Line which travels from Needham Heights to South Station
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	<u>Hospitals</u>: Faulkner Hospital, VA Medical Center-West Roxbury <u>BHA Public Housing</u>: Rockland Towers, Spring Street Community, Georgetown Homes <u>Assisted Living Facilities</u>: Deutsches Altenheim, Sophia Snow Place, Edelweiss Village. <u>Educational Facilities</u>: Roxbury Latin High School, Catholic Memorial High School, Beethoven Public Elementary School.
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	West Roxbury Branch Public Library Jim Roche Community Arena West Roxbury Community Center BCYF Roche Community Center Dedham Health and Athletic Complex Parkway Community YMCA Millennium Park
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? *If yes,* identify which district:	No.
Are there sidewalks and pedestrian ramps existing at the development site? *If yes*, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Yes, the existing sidewalks are in generally good condition with granite curbing.

Are the sidewalks and pedestrian ramps existing-to-remain? *If yes,* have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? *If yes,* provide description and photos:	No. The existing use requires a majority of the frontage to be occupied by curb cuts, which will be decreased with this proposal.
5. Surrounding Site Conditions – Proposed *This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.*	
Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? *If yes*, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes. City of Boston Guidelines- Residential Street
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Sidewalk width = 7'-0" plus an additional buffer for landscaping Slope will be less than 5% and less than 2% horizontally.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	C.O.B R.O.W

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	N/A
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	This project will go through PIC during the design process. As a result, the Sidewalks will we widened to 7'-0" from 5'-0" by expanding 2' onto the site.
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations.*	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	44 Enclosed Garage Spaces and 26 Surface Spaces (70 Total)
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8-foot access aisle?	3 Accessible Spaces are being provided within the enclosed garage. All 3 of these spaces will be Van Accessible, providing an 8-foot access aisle.

Will any on-street accessible parking spaces be required? *If yes,* has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No.
Where is the accessible visitor parking located?	Within the garage, across from the elevators.
Has a drop-off area been identified? *If yes,* will it be accessible?	No.
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Entryway will have a slope less than 5% leading to main lobby with stair and elevator access.
Are the accessible entrances and standard entrance integrated? *If yes, describe. If no,* what is the reason?	Yes, all entrances are accessible.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	All accessible routes & way-finding elements will be designed to comply with the 521 CRM: Architectural Access Board regulations.

<table>
<tr><td colspan="2">8. Accessible Units (Group 2) and Guestrooms: (If applicable)
In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.</td></tr>
<tr><td>What is the total number of proposed housing units or hotel rooms for the development?</td><td>70 Units</td></tr>
<tr><td>If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?</td><td>The number of affordable units provided per the City of Boston's Inclusionary Development Policy are as follows:
<table>
<tr><td></td><td>1 Bedroom</td><td>1 Bedroom +</td><td>2 Bedroom</td><td>Total</td></tr>
<tr><td>Total # Of Units</td><td>31</td><td>20</td><td>19</td><td>70</td></tr>
<tr><td>Required Affordable (13%):</td><td>4.03</td><td>2.6</td><td>2.47</td><td>9.1</td></tr>
<tr><td>Provided Affordable:</td><td>4</td><td>3</td><td>2</td><td>9</td></tr>
</table></td></tr>
<tr><td>If a residential development, how many accessible Group 2 units are being proposed?</td><td>Per the regulations set forth in 521 CMR, 4 Group 2 units are being proposed.</td></tr>
<tr><td>If a residential development, how many accessible Group 2 units will also be IDP units? If none, describe reason.</td><td>Two of the 4 required MAAB Group 2 units will be IDP units.</td></tr>
<tr><td>If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? If yes, provide amount and location of equipment.</td><td>N/A.</td></tr>
</table>

Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. *If yes*, provide reason.	Yes; the 1st floor level is above the average grade at the main sidewalk.
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? *If yes*, describe:	A sloped walkway will lead from the sidewalk to the main entry. This development will be equipped with an elevator.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	Public Improvements include extension of the existing sidewalk & streetscape renovations in front of the site.

What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	Development will have fully accessible common areas.
Are any restrooms planned in common public spaces? *If yes,* will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? *If no*, explain why not.	Yes. This development includes common areas and accessible public restrooms on the first floor.
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? *If yes,* did they approve? *If no,* what were their comments?	The proposed plans have not yet been reviewed with the City of Boston Disability Commissioner or the Architectural Access Staff.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? *If no,* what recommendations did the Advisory Board give to make this project more accessible?	The proponent has not yet presented the proposed plans to the Disability Advisory Board.

10. Attachments *Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.* **See Attachment Figures F2, F3, F4, F5 and F6.**
Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. **The Diagrams shown on Figures F2 through F6 show accessible Routes, Distances, Location of Group 2 Units, & Location of Affordable Units.**
Provide a diagram of the accessible route connections through the site, including distances. **The Diagrams shown on Figures F2 through F6 show accessible Routes, Distances, Location of Group 2 Units, & Location of Affordable Units.**
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) N/A
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. **The Diagrams shown on Figures F2 through F6 show accessible Routes, Distances, Location of Group 2 Units, & Location of Affordable Units.**
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.

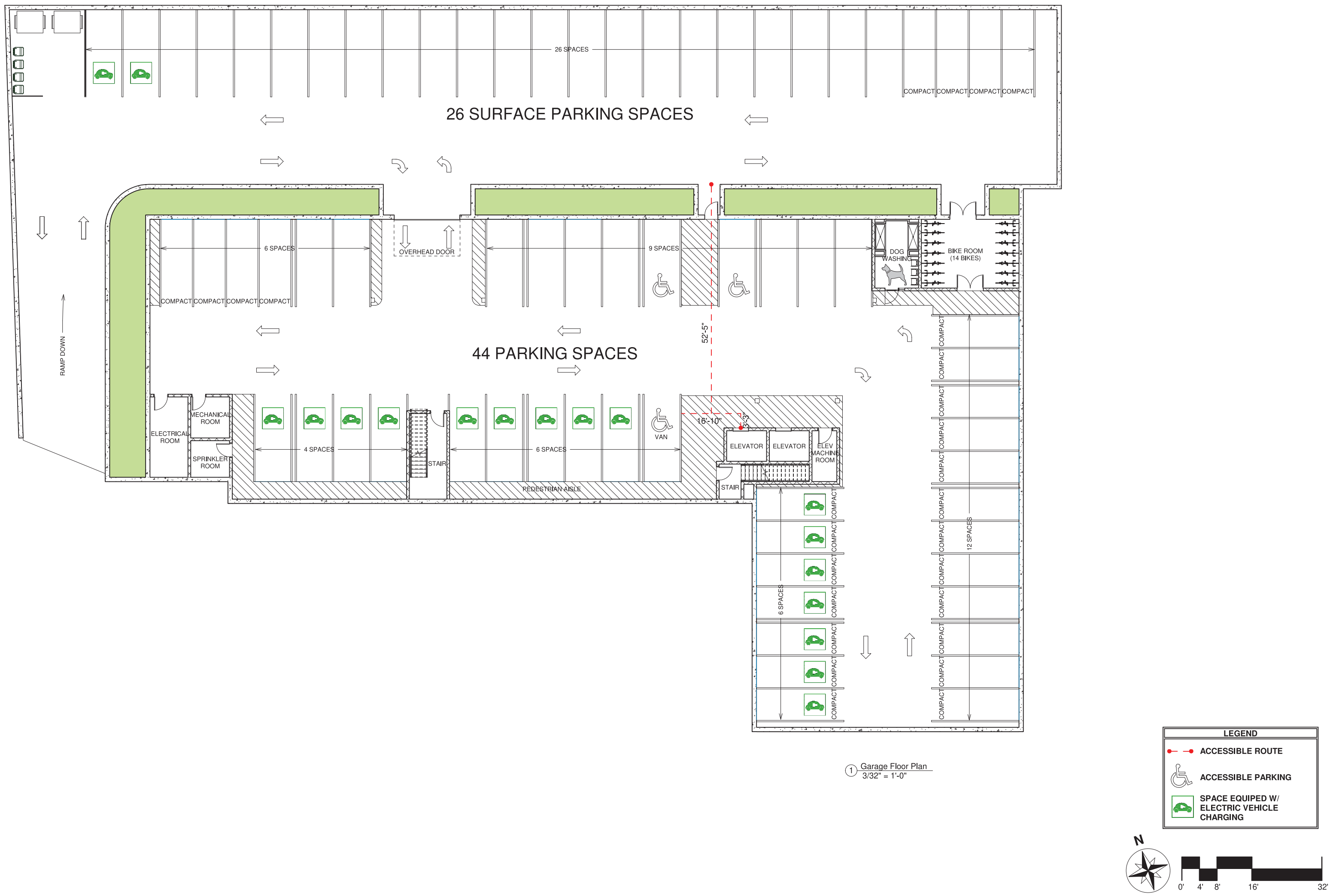
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

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

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

Architectural Access staff can be reached at:

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



1 Garage Floor Plan
3/32" = 1'-0"

DESIGN KHALSA

KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner St Accessibility - Garage

Project number	18111	F2
Date	05/30/2019	
Drawn by	ERS	
Checked by	JSK	Scale: As indicated

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1 Ground Floor Plan
3/32" = 1'-0"

DESIGN
KHALSA

KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner St Accessibility - Site & 1st Floor

Project number	18111	F3
Date	05/30/2019	
Drawn by	ERS	
Checked by	JSK	Scale: As indicated

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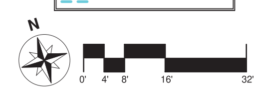
1 2nd Floor Plan
3/32" = 1'-0"

LEGEND

- 1 BED
- 1 BED +
- 2 BED
- AMENITY SPACE
- ACCESSIBLE ROUTES
- GROUP 2 UNIT



KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner St Accessibility - 2nd Floor

Project number	18111	F4	
Date	05/30/2019		
Drawn by	ERS		
Checked by	JSK	Scale	As indicated

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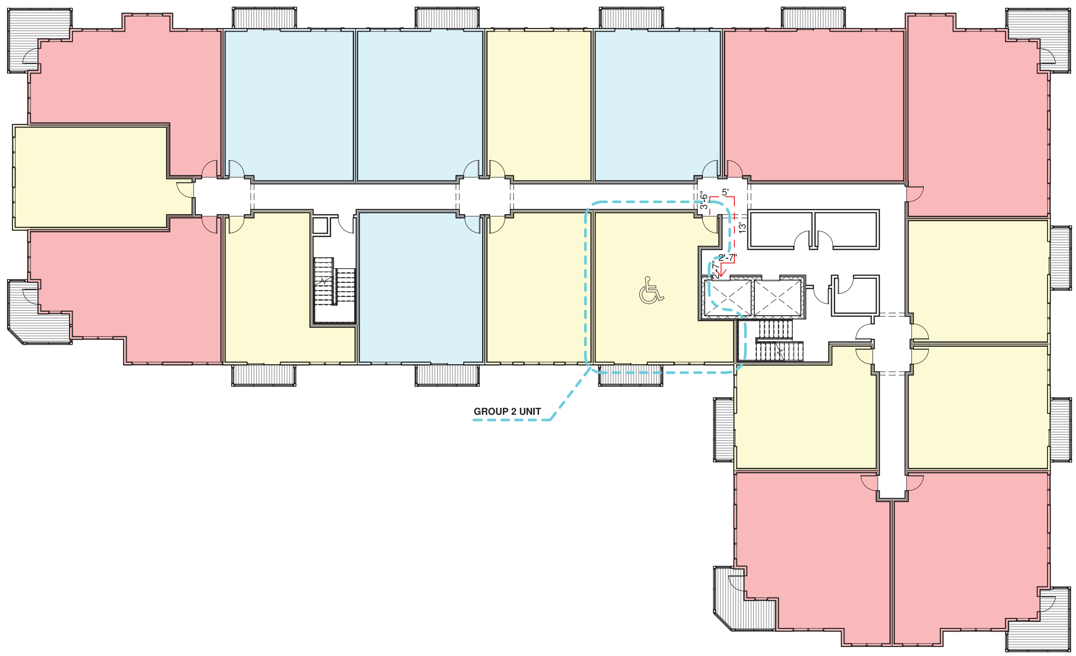

1 3rd Floor Plan
3/32" = 1'-0"

KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner St Accessibility - 3rd Floor

Project number	18111	F5
Date	05/30/2019	
Drawn by	ERS	
Checked by	JSK	Scale: As indicated

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1 4th Floor Plan
3/32" = 1'-0"

DESIGN
KHALSA
KHALSA DESIGN INC.
17 IVALOO STREET SUITE 400
SOMERVILLE, MA 02143
TEL: 617-591-8682
FAX: 617-591-2086

WEST BRIGHTON ACQUISITIONS LLC

West Roxbury Residences

178, 189-197 Gardner Street and Charles Park Rd.
West Roxbury, MA 02132

189-197 Gardner St Accessibility - 4th Floor

Project number	18111	F6
Date	05/30/2019	
Drawn by	Author	
Checked by	Checker	Scale: As indicated

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APPENDIX G – RESPONSE TO COB BROADBAND QUESTIONNAIRE

Appendix G

Broadband Ready Buildings Questionnaire

178-197 Gardner Street, West Roxbury

The City of Boston is working to cultivate a broadband ecosystem that serves the current and future connectivity needs of residents, businesses, and institutions. The real estate development process offers a unique opportunity to create a building stock in Boston that enables this vision. In partnership with the development community, the Boston Planning and Development Authority and the City of Boston will begin to leverage this opportunity by adding a broadband readiness component to the Article 80 Design Review. This component will take the form of a set of questions to be completed as part of the Project Notification Form. Thoughtful integration of future-looking broadband practices into this process will contribute to progress towards the following goals:

1. Enable an environment of competition and choice that results in all residents and businesses having a choice of 2 or more wireline or fixed wireless high-speed Internet providers
2. Create a built environment that is responsive to new and emerging connectivity technologies
3. Minimize disruption to the public right of way during and after construction of the building

The information that is shared through the Project Notification Form will help BPDA and the City understand how developers currently integrate telecommunications planning in their work and how this integration can be most responsive to a changing technological landscape.

Upon submission of this online form, a PDF of the responses provided will be sent to the email address of the individual entered as Project Contact. Please include this PDF in the Project Notification Form packet submitted to BPDA.

Section 1: General Questions

For consistency, general intake questions below are modeled after Boston Planning and Development Agency Climate Change Resiliency and Preparedness Checklist.

Project Information

- Project Name: **178-197 Gardner Street, West Roxbury**
- Project Address Primary: **178-197 Gardner Street, West Roxbury**
- Project Address Additional:
- Project Contact: **Peter Davos, DavosBoston@comcast.net, Tel: 617-719-8668**
- Expected completion date: **2021**

Team Description

- Owner / Developer: **West Brighton Acquisitions, LLC**
- Architect: **Khalsa Design**
- Engineer (building systems): **Howard Stein Hudson**
- Permitting: **Mitchell L. Fischman ("MLF") Consulting LLC**
- Construction Management: **TBD**

Section 2: Right of Way to Building

Point of Entry Planning

Point of entry planning has important implications for the ease with which your building's telecommunications services can be installed, maintained, and expanded over time.

#1: Please provide the following information for your building's point of entry planning (conduits from building to street for telecommunications). Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of Points of Entry: **Unknown**
- Locations of Points of Entry: **Gardner Street or Charles Park Road**
- Quantity and size of conduits: **Unknown**
- Location where conduits connect (e.g. building-owned manhole, carrier-specific manhole or stubbed at property line): **Unknown**
- Other information/comments: **Unknown**

#2: Do you plan to conduct a utility site assessment to identify where cabling is located within the street? This information can be helpful in determining the locations of POEs and telco rooms. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- **Yes**
- No
- Unknown

<u>Section 3: Inside of the Building</u>

Riser Planning

Riser capacity can enable multiple telecom providers to serve tenants in your building.

#3: Please provide the following information about the riser plans throughout the building. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of risers: **Unknown**
- Distance between risers (if more than one): **Unknown**
- Dimensions of riser closets: **Unknown**
- Riser or conduit will reach to top floor: **Unknown**
- Number and size of conduits or sleeves within each riser: **Unknown**
- Proximity to other utilities (e.g. electrical, heating): **Unknown**
- Other information/comments: **Unknown**

Telecom Room

A well designed telecom room with appropriate security and resiliency measures can be an enabler of tenant choice and reduce the risk of service disruption and costly damage to telecom equipment.

#4: Please provide the following information about the telecom room plans. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- What is the size of the telecom room? **Unknown**

- Describe the electrical capacity of the telecom room (i.e. # and size of electrical circuits) **Unknown**

- Will the telecom room be located in an area of the building containing one or more load bearing walls? **Unknown**

- Will the telecom room be climate controlled?

  - **Yes**
  - No
  - Unknown

- If the building is within a flood-prone geographic area, will the telecom equipment will be located above the floodplain?
  - **Yes**
  - No
  - Unknown

- Will the telecom room be located on a floor where water or other liquid storage is present?
  - Yes
  - **No**
  - Unknown
- Will the telecom room contain a flood drain?
  - Yes
  - No
  - **Unknown**

- Will the telecom room be single use (telecom only) or shared with other utilities?
  - Telecom only
  - Shared with other utilities
- U**nknown**

Delivery of Service Within Building (Residential Only)

Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure. Questions 5 through 8 are for residential development only.

#5: Will building/developer supply common inside wiring to all floors of the building?

- Yes
- No
- **Unknown**

#6: If so, what transmission medium (e.g. coax, fiber)? Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure. **Unknown**

#7: Is the building/developer providing wiring within each unit?

- **Yes**
- No
- Unknown

#8: If so, what transmission medium (e.g. coax, fiber)? Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure.

<u>Section 4: Accommodation of New and Emerging Technologies</u>

Cellular Reception

The quality of cellular reception in your building can have major impacts on quality of life and business operations.

Please provide the following information on your plans to facilitate high quality cellular coverage in your building. Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure.

#9: Will the building conduct any RF benchmark testing to assess cellular coverage?

- **Yes**
- No
- Unknown

#10: Will the building allocate any floor space for future in-building wireless solutions (DAS/small **cell/booster equipment)?**

- **Yes**
- No
- Unknown

#11: Will the building be providing an in-building solution (DAS/ Small cell/ booster)?

- **Yes**
- No
- Unknown

#12: If so, are you partnering with a carrier, neutral host provider, or self-installing?

- Carrier
- Neutral host provider
- **Self-installing**

Rooftop Access

Building rooftops are frequently used by telecommunications providers to install equipment critical to the provision of service to tenants.

Please provide the following information regarding your plans for roof access and usage. Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure.

#13: Will you allow cellular providers to place equipment on the roof?

- Yes
- No
- **Unknown**

#14: Will you allow broadband providers (fixed wireless) to install equipment on the roof?

- Yes
- No

- **Unknown**

<u>Section 5: Telecom Provider Outreach</u>

Supporting Competition and Choice

Having a choice of broadband providers is a value add for property owners looking to attract tenants and for tenants in Boston seeking fast, affordable, and reliable broadband service. In addition to enabling tenant choice in your building, early outreach to telecom providers can also reduce cost and disruption to the public right of way. The following questions focus on steps that property owners can take to ensure that multiple wireline or fixed wireless broadband providers can access your building and provide service to your tenants.

#15: (Residential Only) Please provide the date upon which each of the below providers were successfully contacted, whether or not they will serve the building, what transmission medium they will use (e.g. coax, fiber) and the reason they provided if the answer was 'no'. **TO BE COMPLETED DURING DESIGN DEVELOPMENT**

- Comcast - enter contact info
- RCN - enter contact info
- Verizon - enter contact info
- Wicked Broadband - enter contact info
- WebPass
- Starry
- Level 3
- Cogent
- Lightower
- XO Communications
- AT&T
- Zayo
- Other(s) - please specify - enter contact info

#16: Do you plan to abstain from exclusivity agreements with broadband and cable providers?

- **Yes**
- No
- Unknown

#17: Do you plan to make public to tenants and prospective tenants the list of broadband/cable providers who serve the building?

- Yes
- No
- **Unknown**

<u>Section 6: Feedback for Boston Planning and Development Agency</u>

The Boston Planning and Development Agency looks forward to supporting the developer community in enabling broadband choice for resident and businesses. Please provide feedback on your experience completing these questions. **Some of these questions are difficult to respond to at this point in the design process.**

APPENDIX H – RESPONSE TO BOSTON SMART UTILITIES CHECKLIST

Appendix H. Response to Boston Smart Utilities Checklist
178-197 Gardner Street, West Roxbury

Date Submitted:	06/07/19
Submitted by:	Mitchell L. Fischman Consulting LLC

Background

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

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

b) integration of the Smart Utility Standards

More information about the Boston Smart Utilities Vision project, including the Smart Utilities Policy and Smart Utility Standards, is available at: www.http://bostonplans.org/smart-utilities

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

Part 1 - General Project Information

1.1 Project Name	178-197 Gardner Street, West Roxbury
1.2 Project Address	178-197 Gardner Street, West Roxbury
1.3 Building Size (square feet) **For a multi-building development, enter total development size (square feet)*	Approx. 96,000 gsf
1.4 Filing Stage	Project Notification Form

Appendix H. Response to Boston Smart Utilities Checklist
178-197 Gardner Street, West Roxbury

1.5 Filing Contact Information

1.5a Name	**Mitchell L. Fischman**
1.5b Company	**Mitchell L. Fischman ("MLF") Consulting LLC**
1.5c E-mail	mitchfischman@gmail.com
1.5d Phone Number	**781-760-1726**

1.6 Project Team

1.6a Project Owner/Developer	**West Brighton Acquisitions, LLC**
1.6b Architect	**Khalsa Design**
1.6c Permitting	**MLF Consulting LLC**
1.6d Construction Management	**TBD**

Part 2 - District Energy Microgrids

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

Note on submission requirements timeline:

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

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

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

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

Please email submission to manuel.esquivel@boston.gov

Appendix H. Response to Boston Smart Utilities Checklist
178-197 Gardner Street, West Roxbury

2.1 Consultant Assessing/Designing District Energy Microgrid (if applicable)	
2.2 Latest document submitted	
2.3 Date of latest submission	
2.4 Which of the following have you had engagement/review meetings with regarding District Energy Microgrids? (select all that apply)	
2.5 What engagement meetings have you had with utilities and/or other agencies (i.e., MA DOER, MassCEC) regarding District Energy Microgrids? (Optional: include dates)	

Part 3 - Telecommunications Utilidor

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

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

Please email submission to manuel.esquivel@boston.gov

3.1 Consultant Assessing/Designing Telecom Utilidor (if applicable)	

Appendix H. Response to Boston Smart Utilities Checklist 178-197 Gardner Street, West Roxbury

3.2 Date Telecom Utilidor Map/Diagram was submitted	
3.3 Dimensions of Telecom Utilidor (include units)	
3.3a Cross-section (i.e., diameter, width X height)	
3.3b Length	
3.4 Capacity of Telecom Utilidor (i.e., number of interducts, 2 inch (ID) pipes, etc.)	
3.5 Which of the following have you had engagement/review meetings with regarding the Telecom Utilidor? (select all that apply)	
3.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding the Telecom Utilidor? (Optional: include dates)	

Part 4 - Green Infrastructure

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

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

Please email submission to manuel.esquivel@boston.gov

4.1 Consultant Assessing/Designing Green Infrastructure (if applicable)	

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4.2 Date Green Infrastructure Map/Diagram was submitted	
4.3 Types of Green Infrastructure included in the project (select all that apply)	
4.4 Total impervious area of the development (in square inches)	
4.5 Volume of stormwater that will be retained (in cubic inches)* **Note: Should equal to at least "Total impervious area (entered in section 4.3)" times "1.25 inches"*	
4.6 Which of the following have you had engagement/review meetings with regarding Green Infrastructure? (select all that apply)	
4.7 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Green Infrastructure? (Optional: include dates)	

Part 5 - Adaptive Signal Technology (AST)

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

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

Please email submission to manuel.esquivel@boston.gov

5.1 Consultant Assessing/Designing Adaptive Signal Technology (if applicable)	**Howard Stein Hudson**
5.2 Date AST Map/Diagram was submitted	**Will be submitted at the time of the TAPA review.**
5.3 Describe how the AST system will benefit/impact the following transportation modes	
5.3a Pedestrians	**Will be determined at the time of the TAPA review.**
5.3b Bicycles	**Will be determined at the time of the TAPA review.**
5.3c Buses and other Public Transportation	**Will be determined at the time of the TAPA review.**
5.3d Other Motorized Vehicles	**Will be determined at the time of the TAPA review.**
5.4 Describe the components of the AST system (including system design and components)	**Will be determined at the time of the TAPA review.**
5.5 Which of the following have you had engagement/review meetings with regarding AST? (select all that apply)	**No meetings to date. Will be determined at the time of the TAPA review.**
5.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding AST? (Optional: include dates)	**No meetings to date. Will engage in meetings at the time of the TAPA and the PIC reviews.**

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Part 6 - Smart Street Lights

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

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

Please email submission to manuel.esquivel@boston.gov

6.1 Consultant Assessing/Designing Smart Street Lights (if applicable)	**Howard Stein Hudson, Khalsa Design and MEP to be determined.**
6.2 Date Smart Street Lights Map/Diagram was submitted	**Will be determined and provided at the time of the PIC Review.**
6.3 Which of the following have you had engagement/review meetings with regarding Smart Street Lights? (select all that apply)	**Will be determined at the time of the PIC Review.**
6.4 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Smart Street Lights? (Optional: include dates)	**Will include discussions with Boston Street Lighting at the time of the PIC Review.**

Part 7 - Smart Utility Standards

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

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

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

Please email submission to manuel.esquivel@boston.gov

7.1 Date Cross Section Diagram(s) was submitted	TBD
7.2 Date Lateral Diagram(s) was submitted	TBD

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MLF CONSULTING LLC