



3371-3375 Washington Street & 197-201 Green Street, Jamaica Plain

Submitted Pursuant to Article 80B of the Boston Zoning Code

Submitted By:

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Submitted To:

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Table of Contents

- 1.0 Project Summary / Overview 1-1
 - 1.1 Introduction 1-1
 - 1.2 Detailed Project Description 1-3
- 2.0 General Information 2-1
 - 2.1 Project Schedule 2-1
 - 2.2 Project Proponent 2-1
 - 2.3 Public Benefits 2-1
 - 2.4 Compliance with Boston Zoning Code – Use and Dimensional Requirements 2-2
 - 2.5 Public Review Process and Agency Coordination..... 2-4
- 3.0 Urban Design and Sustainability 3-1
 - 3.1 Site and Surroundings 3-1
 - 3.2 Shadow Study 3-1
 - 3.3 Urban Design Concept 3-1
 - 3.4 Materials and Finishes 3-2
 - 3.5 Sustainable Design/Green Building 3-3
 - 3.5.1 Location and Linkages 3-4
 - 3.5.2 Sustainable Sites..... 3-5
 - 3.5.3 Water Efficiency..... 3-6
 - 3.5.4 Energy and Atmosphere 3-6
 - 3.5.5 Materials and Resources..... 3-6
 - 3.5.6 Indoor Environmental Quality 3-7
 - 3.5.7 Innovation and Design Process 3-8
 - 3.6 Urban Design Drawings 3-8
- 4.0 Transportation Analysis 4-9
- 5.0 Geotechnical Information 5-1
- 6.0 Additional Project Information..... 6-1
 - 6.1 Preliminary List of Permits or Other Approvals Which May Be Sought 6-1
 - 6.2 Project Team 6-2

Appendices

- Appendix A - Urban Design Drawings
- Appendix B - Existing Site Conditions
- Appendix C – Renderings
- Appendix D – Conceptual Site Plan
- Appendix E – Shadow Study
- Appendix F – LEED Information Report
- Appendix G – Geotechnical Report
- Appendix H – Accessibility Checklist
- Appendix I – Traffic Impact and Access Study

1.0 PROJECT SUMMARY / OVERVIEW

1.1 Introduction

This package is being submitted on behalf of CRM Property Management Corp. (the "Proponent") for a new two-building, mixed-use development that is approximately 63,785 gross square feet in size. The first building, located at 3371-3375 Washington Street, is approximately 31,660 gross square feet, and includes thirty-three residential units and 850 square feet of commercial space. The second building, which will be located at 197-201 Green Street, is approximately 32,125 gross square feet, and includes twenty-five residential units and 880 square feet of commercial space. The Proposed Project will include thirty-three associated parking spaces: twenty interior spaces within the Washington Street building, and thirteen interior spaces within the Green Street building. Both buildings will also contain bike rooms at the ground level. (Please see **Figure 1.1. Project Locus.**)

The Project Site comprises approximately 22,663 square feet of underutilized commercial and residential land. The Project will include combining four existing parcels into two lots. Parcel ID 1102584000 and Parcel ID 1102583002 will be combined to form one lot at 3371-3375 Washington Street, and Parcel ID 1102580000 and Parcel ID 1102579000 will be combined to form one lot at 197-201 Green Street. The Proposed Project includes a revitalization of the Project Site by replacing the existing auto shop, ironworks shop, restaurant, and single family dwelling with two new mixed-use buildings. The Project also includes vehicular and pedestrian access measures and improvements. The current estimated cost of this Project, based upon the most recent plans, is approximately \$14,655,000.

CRM Property Management Corp.'s goal when conceptualizing this Project was to revitalize the neighborhood by replacing the existing outdated commercial uses and free standing single family dwelling with two mixed use buildings that will add new housing units to the increasingly popular Jamaica Plain community. As part of the community benefits related to the Proposed Project, the existing and unsightly commercial buildings will be demolished, and will be replaced with new aesthetically- pleasing, energy-efficient, residential buildings.

The Proposed Project will exceed the 50,000-square foot total build-out requirement for a project in a Boston neighborhood, and therefore required the preparation of filing(s) under the Large Project Review regulations, pursuant to Article 80 of the Boston Zoning Code. The Proponent will also seek zoning dimensional relief from the Code from the Boston Zoning Board of Appeal related to the size and change of use for the Proposed Project.

A Letter of Intent (LOI) to file a Project Notification Form was filed with the Boston Planning & Development Agency for the Proposed Project on January 10, 2017, in accordance with Article 80B of the Boston Zoning Code.

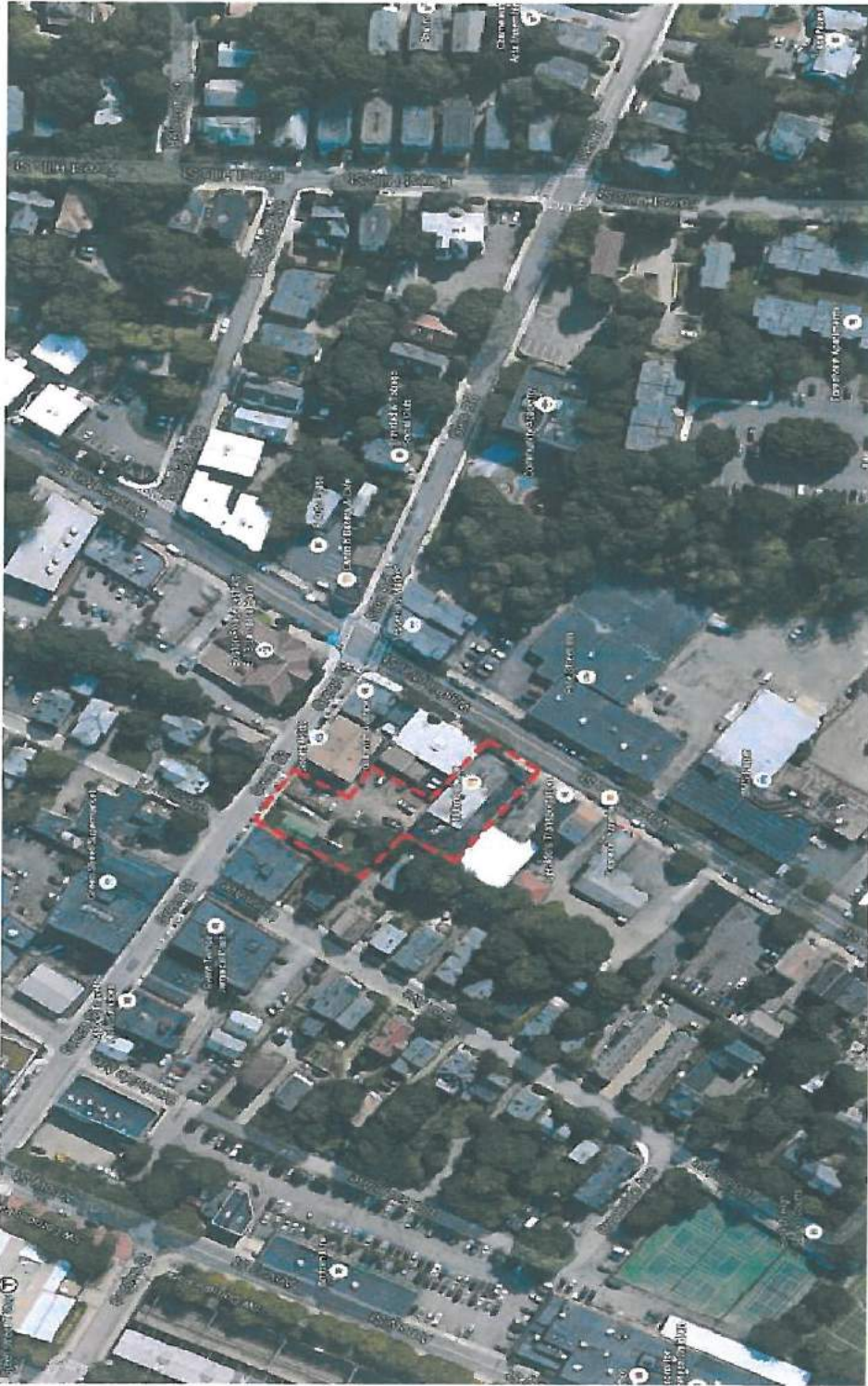


Figure 1.1
Project Locus

1.2 Detailed Project Description

The Proposed Project sits on approximately 22,663 square feet of underutilized land along Washington Street and Green Street, which is located within a Local Industrial Subdistrict. In addition to the frontage on both Washington and Green Street, the site borders Union Ave in the rear. The site currently contains an auto shop, ironworks shop, restaurant and single family dwelling. As part of the community benefits related to this Project, the old commercial and residential buildings will be demolished and new market rate housing with neighborhood commercial space will be developed. The Proposed Project will serve to invigorate this section of Jamaica Plain and bring residential foot traffic to the neighborhood.

The Proposed Project will be constructed as two five-story residential market-rate buildings with ground-floor commercial space. The Proposed Project is ideally situated within close proximity to the Green Street, Forest Hills, and Stony Brook MBTA stations, making it convenient for future resident commuters. The Proposed Project will be in close proximity to the Scagnoli-Nihill Athletic Complex, which will give residents plenty of open space and green space to utilize. The Project's location along Washington Street, offers many neighborhood shops and restaurants within walking distance to service the new residents of the development. The Developers are proposing a project that would include both residential units and neighborhood commercial spaces that will take advantage of its ideal location.

The Developers are proposing a two-building, mixed-use development that is approximately 63,785 gross square feet in size, and will include fifty-eight residential units and two commercial spaces. The first building, located at 3371-3375 Washington Street, is approximately 31,660 gross square feet, and includes thirty-three residential units and 850 square feet of commercial space. The second building, which will be located at 197-201 Green Street, is approximately 32,125 gross square feet, and includes twenty-five residential units and 880 square feet of commercial space. The Proposed Project, will include thirty-three associated parking spaces: twenty interior spaces within the Washington Street building, and thirteen interior spaces within the Green Street building. Both buildings will also contain bike rooms at the ground level. Each building will also contain a gym and a lounge for the residents.

The building along Washington Street will be comprised of two studio units, nineteen one-bedroom units, and twelve two-bedroom units. The Green Street building will include six one-bedroom units, four two-bedroom units, and fifteen three-bedroom units. Many of the units will have exterior decks, which will provide residents with usable outdoor space. The Developers understand that parking is always a concern to the neighborhood residents, and are proposing a ground level interior parking facility that will house a total of thirty-three parking spaces. Furthermore, two separate bike rooms, as well as bike racks have been proposed. The Proposed Project's proximity to three MBTA stations will minimize community impact from resident/patron parking from the Proposed Project.

The second component of the Proposed Project will include 850 square feet of commercial space along Washington Street and 880 square feet of commercial space along Green Street. The commercial space will accommodate the needs of Jamaica Plain's growing population. The Developers hope this use will encourage local neighborhood shopping. This type of amenity will allow for residents of the neighborhood to walk to the commercial space from their homes or from one of the busy MBTA stations. The Jamaica Plain community has been looking to add more commercial space to new projects, to ensure that residents can both live and have access to such opportunities within the community.

The Proposed Project is subject to Large Project Review under Article 80B of the Boston Zoning Code. In parallel with this application, the Proposed Project will seek zoning relief from the Boston Zoning Code at the Boston Zoning Board of Appeal related to the size and change of use of the land and structures that currently sit on them.

The Proposed Project will completely revitalize this section of Washington Street and Green Street and will bring necessary residential housing to an underutilized corridor. The site is attractive due to its access to MBTA stations, and the location's close proximity to a variety of shops and restaurants.

Table 1-1. Approximate Project Dimensions of 3371-3375 Washington & 197-201 Green Street

Lot Area:	22,663
Gross Square Feet:	63,785
FAR:	2.81
Floors:	5
Height:	56'0"

2.0 GENERAL INFORMATION

2.1 Project Schedule

Project Schedule: 3371-3375 Washington Street & 197-201 Green Street Project	
Construction Commencement:	Summer/Fall 2017
Construction Completion:	Fall/Winter 2018
Status of Project Design:	Schematic

2.2 Project Proponent

CRM Property Management Corp., founded in 2004, has grown to become a leading full-service real estate firm dedicated to buying, selling, renting, developing and managing property in the Boston area. Since its conception, CRM and its managing partners have overseen over \$500 million in real estate transactions. CRM's current portfolio consists of over 600 stabilized units as well as over 50 properties currently in various stages of development.

CRM Property Management Corp. is run by Managing Partners Fred Starikov and Steve Whalen. Fred Starikov has more than eighteen years of experience in real estate and has overseen \$500 million in real estate transactions. Mr. Starikov has a proven ability to quickly analyze market data and execute plans precisely in order to achieve optimal returns.

Stephen Whalen has over twenty-two years of experience in real estate with broad expertise in commercial and residential property acquisition, disposition and leasing. Mr. Whalen excels in relationship management and conflict resolution and honed his command of real estate practices while employed with Equis Corp. and NAI Hunneman Commercial.

CRM Property Management Corp. has extensive experience in managing and developing real estate and in managing businesses, which will guide this Proposed Project to completion.

2.3 Public Benefits

The Proposed Project will provide substantial benefits to the City of Boston and the Jamaica Plain community. The Proposed Project will generate both direct and indirect economic and social benefits to the Jamaica Plain neighborhood. The Proposed Project provides for:

- Creating much needed market rate residential housing in the Jamaica Plain Neighborhood.
- Creating on-site affordable rental units, which will meet the Boston Planning & Development Agency's affordable housing standards.
- Revitalizing four underutilized parcels and replacing the current vacant lot, office use, and single-family dwelling with housing and retail space.

- Creating commercial retail space along Washington Street and Green Street to accommodate Jamaica Plain's growing population of residents, which will allow residents to not only live, but also shop and have access to amenities in the neighborhood.
- Constructing a building that will incorporate open space in the form of decking and terraces, and energy-efficient appliances, which will result in a high LEED standard for the Project.
- Constructing a ground-level parking facility that will accommodate parking spaces for the unit residents.
- Dedicated car sharing parking spaces to accommodate the residents of the building, and members of the surrounding community.
- Encouraging alternative modes of transportation through the use of bicycling and walking, due to the close proximity of the bus lines and the MBTA at Green Street Station, Forest Hills Station and Stony Brook Station.
- Creating bike racks and dedicated bike rooms for storage of bikes within each building to encourage bicycling as a mode of transportation, allowing for less vehicular traffic.
- Adding revenue in the form of property taxes to the City of Boston.
- Creating full-time jobs (commercial retail).
- Creating temporary construction and labor jobs.
- Temporary utilization of the existing single family home on Green Street for artists.
- The house has come to be known as "The Little House on Green Street," and allows artists to conduct public tours of the building, which contains artwork from local artists.

2.4 Compliance with Boston Zoning Code – Use and Dimensional Requirements

The Site is located in a Local Industrial Subdistrict (LI) in the Jamaica Plain Neighborhood District, Article 55 of the Boston Zoning Code (the "Code"). (See **Table 2.1** 3371-3375 and 197-201 Green Street – Zoning Compliance).

Multi-family dwellings are a Forbidden Use under Article 55, Table C. Therefore, a Use Variance would need to be obtained from the City of Boston Zoning Board of Appeal. Retail Uses and Restaurants are either an Allowed Use or a Conditional Use in a Local Industrial Subdistrict. Therefore, a Variance may be required depending on which specific retail or restaurant use is proposed. The Proposed Project also seeks relief from several requirements of the existing zoning outlined in Article 55. The proposed structure exceeds the maximum allowable floor-area-ratio ("FAR"). It also exceeds the height limitations for the district, and will require relief from the Zoning Board of Appeal.

For a project that is subject to Article 80 Large Project Review, required off-street parking spaces and off-street loading facilities will be determined as a part of the Large Project Review process in accordance with the provisions of Article 80 of the Boston Zoning Code. Design elements of the project will also be reviewed, in accordance with the Article 80 Review process.

The Site is located in an area that contains both residential and commercial uses. The design team feels that given this location, and the structures influencing the design, as well as comparable developments in the neighborhood, that the proposed building's height, mass and scale are appropriate for this location and conducive to the Jamaica Plain neighborhood.

Table 2.1. 3371-3375 Washington Street and 197-201 Green Street - Zoning Compliance

Categories	Local Industrial Subdistrict	Proposed Project
Minimum Lot Area (Square Feet)	None	22,663
Floor Area Ratio	1.0	2.81
Minimum Lot Width	None	Varies, 60'0" - 85'7"
Minimum Lot Frontage	None	Washington Street – 60' Green Street – 85'7"
Minimum Front Yard	None	Washington Street – 3'0" – 5'0" Green Street – 2'3" – 6'2"
Minimum Side Yard	None	Washington Street – 0'0" Green Street – 4'8" – 12'0"
Minimum Rear Yard	20 Feet	Washington Street – 20'0" Green Street – 21'11"
Maximum Building Height	35 Feet	Washington Street – 56'0" Green Street – 56'0"
Minimum Useable Open Space Per Dwelling Unit (Square Feet)	50 S.F. Per Unit	84 S.F. Per Unit
Off-Street Parking Spaces	2.0 Spaces Per Unit (116)	33 Spaces

2.5 Public Review Process and Agency Coordination

The Washington Street and Green Street development team has provided extensive community outreach efforts for the Proposed Project, including community meetings in the Jamaica Plain neighborhood, and presentations before the elected officials. As part of the process, the development team has held an abutter's meeting to explain the Project to surrounding neighbors that will be directly impacted during and after construction. The development team also appeared twice before the Union Ave Neighborhood Association. The Proponent received positive feedback from both the neighbors and group members, and made several design changes based upon their feedback.

The development team has met individually with Jamaica Plain's elected officials and their staff members, including: State Senator Sonia Chang-Díaz, State Representative Elizabeth Malia, City Councilor Matt O'Malley, and Mayor's Office of Neighborhood Services Liaison for Jamaica Plain, Jullianne Doherty. Jamaica Plain's elected officials have had input during the community outreach process, and have had staff presence at all community meetings.

The Proponent has also discussed the Proposed Project with representatives of the Boston Planning & Development Agency ("BPDA") prior to filing this Briefing Package in order to identify issues/concerns as well as design requirements related to the Proposed Project. Meetings have been held with the BPDA's planners and urban design staff, and the Project design has changed based upon the feedback received.

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.

3.0 URBAN DESIGN AND SUSTAINABILITY

3.1 Site and Surroundings

The Project Site is located in Jamaica Plain. The site has frontage on both Washington Street and Green Street and is bounded by Union Ave. The Proposed Site sits on approximately 22,663 square feet of underutilized commercial space along Washington and Green Street. The current site has contained an auto shop, ironworks shop, and restaurant along Washington Street, and a single-family dwelling along Green Street. As part of the proposal these commercial and residential buildings will be demolished. The Washington Street portion of the Project Site is abutted by commercial buildings on either side, and is located across the street from the Pine Street Inn, which is located at 3368 Washington Street. The Green Street portion of the Project Site is abutted by commercial buildings to the left and a four-story, mixed-use building to the right. It sits across the street from several residential homes. The Project Site is primarily abutted in the rear by residential buildings along Union Ave. For existing site pictures see **Appendix B**.

3.2 Shadow Study

A comparative shadow study was done for the proposed project and for the existing site conditions to measure the impact that the project will have on the surrounding community. The studies represent four different times of the year, the winter and summer solstices as well as the fall and spring equinoxes. Three times of the day, morning, mid-day, and evening, are studied for each time period representing the shadows cast by the sun as it moves through the sky.

The shadows cast by the proposed buildings will most greatly impact Washington and Green streets to the east and north of the project, respectively. Shadows will be cast on these streets in the late afternoon year-round with the time of the greatest impact in the winter months. The buildings will have little to no impact on the residential buildings along Union Avenue to the west of the project, with the greatest impact occurring in the early morning during the winter. This is due to the 20'-0" setback at the rear of both buildings creating a buffer between the building and the smaller residential buildings and a product of multiple meetings with community members. See **Appendix E** for the complete Shadow Study.

3.3 Urban Design Concept

Public Connection:

The proposed buildings work to connect the sites with the surrounding neighborhood by providing a more pedestrian friendly use and associated site improvements. Currently, at the Green Street site sits a vacant house and dirt parking. During the planning process, the developer in connection with local artists has worked to beautify the existing building and create an artistic installation on otherwise vacant land. The proposed project will remove this structure and introduce consistent street frontage along Green Street. In addition to the residential entry for the building, a commercial space of 880 square feet will be constructed. If possible, artwork from the current installation will be incorporated and displayed in the lobby of the new building, which will be visible from the street connecting the community to the building. The current storefront along Washington Street will be replaced with a new

commercial space of 850 square feet, in addition to a residential lobby maintaining the current street frontage. Auto access for both buildings will be from Green Street, sharing a common driveway with the proposed project at the corner of Washington and Green Street. In addition to private parking spaces for the tenants of the building, three spaces along Green Street have been set aside for ride-sharing services. These vehicles will be accessible to both tenants and the community. As a result of multiple meetings with the residents along Union Avenue, both buildings maintain a 20'-0" rear setback facilitating the creation of green space at grade at the rear of the Green Street building.

Building Design:

The height of the proposed buildings will be five stories, one story shorter than the project proposed at the corner of Washington and Green Streets stepping down towards the residential neighborhood along Union Avenue. The fifth floor is also set back on all sides further diminishing the perceived height of the project. The buildings will look to combine traditional and modern materials to incorporate into the neighborhood while being contemporary in design. Parking will be located at grade and accommodate 33 spaces total on both sites. The parking is located at the rear of both buildings and will be open air but screened from the neighbors on Union Avenue by a horizontal slat fence. Parking is accessed by a common driveway off Green Street shared with the proposed project at the corner of Washington and Green Street. Ride-sharing spaces will also be accessed from Green Street, and will be located just off the main street. The spaces will be screened using the same horizontal slat system as in the rear of the building, allowing for a visual connection between the spaces and the public that will have access to them. Each building will also have secure bike storage for a total of 795 square feet for bike parking. The ground floor along Washington and Green Streets will be mostly glass creating a connection from the interior to the exterior for not only the commercial spaces but also for viewing areas of local artwork to be displayed in the residential lobbies of the buildings.

The public faces of the buildings will be large format fiber cement panels framing the entries to the buildings. The side and rear elevations will be mostly fiber cement siding connecting to the residential typography of the neighborhood. Railings will be glass, and decks will break up the massing on the sides and rear of the buildings. The upper penthouse floors will be large format fiber cement panels, further separating it from the overall mass of the building below. For renderings of the proposed Project, please see **Appendix C**.

3.4 Materials and Finishes

Both of the proposed buildings utilize the same complimentary mixture of materials and finishes, and will look to combine traditional and modern materials that incorporate the project into the neighborhood while being contemporary in design.

The portions of the buildings facing Washington and Green Streets are made up of large format fiber cement panels transitioning to a fiber cement clapboard siding at the side and rear of the buildings facing the residential context along Union Ave. The fifth floor of the building will be large format fiber cement panels breaking the massing the building below. The ground-floor parking screen will be made up resilient fiber cement rather than wood. The ground floor along Washington and Green Streets will be mostly glass to connect the interior with the exterior. All railings will be glass. All building materials will be sustainably sourced and environmentally friendly when possible.

3.5 Sustainable Design/Green Building

All developments proposed in the City of Boston must follow the Boston Green Building Regulations, including standards established under Article 37 of the Boston Zoning Code. The Project as currently conceived will meet or exceed the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) system to achieve a Certified level. A summary of how the project addresses each checklist category is included below with an expanded version to be prepared in accordance with the Article 37 regulations. A Climate Change Preparedness Questionnaire and Accessibility Checklist will also be prepared and submitted to the Interagency Green Building Committee as required.

This project will provide new dwelling units in an emergent neighborhood within walking distance to the Green Street subway station, many local businesses, and open space including Franklin Park. Our team is committed to incorporating environmentally-sensitive, sustainable design elements into the proposed development. These elements will improve the quality of life for the residents of this project as well as the neighborhood, while helping to protect the global environment. Ultimately, they will also reduce operating costs while increasing value for the project, improving its business viability. We are committed to identifying opportunities presented by the redevelopment by setting proactive goals, and ensuring an undertaking that is LEED Certified at a minimum and satisfies the requirements of the City of Boston Environment Department.

The proponent has assembled an architectural and engineering team familiar with implementing these goals. Embarc Studio's own LEED-accredited personnel is working in concert with experienced LEED-accredited engineers (mechanical, electrical and plumbing engineers.) When the time comes, the team will actively involve the selected contractor in turning this commitment into reality. Please see **Appendix F** for a LEED scorecard.

The following sections outline the team's approach to individual LEED Credits:

City of Boston Article 37

The Project will include the following Prerequisite Boston Green Building Credits:

Boston Public Health Development Prerequisite Credits:

Prerequisite Diesel Retrofit of Construction Vehicles

Retrofit of all diesel construction vehicles from the United States Environmental Protection Agency approved retrofit technologies or a contribution of a comparable amount to the Air Pollution Control Commission Abatement Fund.

Prerequisite Outdoor Construction Management Plan

An outdoor construction management plan including provisions for wheel washing, site vacuuming, truck covers, and anti-idling signage.

Prerequisite Integrated Pest Management Plan

The Project will include Item No. 3 and 4 listed below, of the Boston Credits.

Boston Credits:

- | | | |
|----|--|----------------------------------|
| A. | Modern Grid Credit; | Not applicable for this Project. |
| B. | Historic Preservation Credit; | Not applicable for this Project. |
| C. | Groundwater Recharge Credit; | Yes |
| | 1. The Project will capture rainwater. | |
| D. | Modern Mobility Credit | Yes |

Prerequisites (meet all):

1. Designate an on-site transportation coordinator in the management office.
2. Post information about public transportation and car-sharing options.
3. Provide transit, bike, and pedestrian access information on building website.
4. Provide on-site, external bicycle racks for visitors, and covered secure bicycle storage for the building occupants. 15% residential and 5% other uses.
5. Comply with Boston Transportation Department district parking ratios.

For Residential Projects (meet at least three):

1. Provide a fifty percent (50%) subsidy for monthly T pass purchases, one for each dwelling unit for the tenants first full year of occupancy.
2. Provide preferred parking spaces for a car-sharing service capable of serving 1% of building occupants.
3. On-site electric charging plug-in stations for plug-ins capable of serving 1% of the building occupants.

LEED Narrative

The Project as currently conceived will meet or exceed the U.S. Green Council's Leadership in Energy and Environmental Design (LEED) system to achieve a Certified standard. The USGBC rating system that this project will be using is LEED for Homes Mid-rise. A summary of how the project addresses each checklist category is included below with an expanded version to be prepared in accordance with the Article 37 regulations.

3.5.1 Location and Linkages

LL 2 Site Selection (2 credit): Site meets all of the following attributes: Above FEMA 100-year floodplain, not built on habitat for threatened or endangered species, not within 100 feet of water and wetlands, not built on land that was public parkland, and not built on land with prime soils, unique soils, or soils of state significance.

LL 3 infill (2 credit): 75% of the perimeter immediately borders previously developed land.

LL4 Existing Infrastructure (1 credit): There are existing utilities, including water and sewer service lines, directly in front of the project lot on Washington and Green Street.

LL 5.3 Community Resources (3 credits): The project site is centrally located and have access within ¼ miles of at least 11 basic community resources.

LL 6 Access to Open Space (1 credit): The project site is 0.1 miles (3-minute walk) from Scagnoli-Nihil Athletic Complex, which is a 5.54-acre park and athletic field maintained by the City of Boston Parks and Recreation.

3.5.2 Sustainable Sites

SS 1.1 Erosion Controls during Construction (Prerequisite): The Project team will design and plan appropriate erosion control features. Contractor will be required to maintain these erosion control features through the construction phase, and will include such things as protection and reuse of existing on-site topsoil, controlling run-off, protection of on-site sewer inlets and most importantly streams and diverting of surface water run-off.

SS 1.2 Minimize Disturbed Area of Site for Mid-Rise (1 credit): The density of the Project is currently +/- 58 unites on a 0.52-acre lot, and will therefore exceed the 40 units/ace threshold.

SS 3.2 Reduce Roof Heat Island Effects (1 credit): The buildings will be installed with high albedo roofing system material on more than 75% of the rood surface.

SS 4.3 Storm Quality Control for Mid-Rise (2 credits): The Project will implement a Stormwater Management Plan in accordance with the Commonwealth of Massachusetts and City of Boston ordinances and standards.

SS 5 Pest Control Alternative (1 credit): The construction documents will require sealing of external racks, joints, gaps with caulking, and install pest-proof screens. Details will show dividers at wood-to-concrete connections.

SS 6.1 – 6.3 Compact Development, Very High Density (3 credits): The Project will have approximately 58 units per 0.52 acre, meeting the standard for the Very High Density threshold of 80 units/acre.

SS 7.1 Public Transit (1 credit): Project is within ½ mile walking distance from the Green Street Station of the Orange Line. The corner of Washington and Green Street is a stop for Bus Route 42.

SS 7.2 Bicycle Storage (1 credit): A secured bicycle room is provided that will accommodate 15% of building occupants (approximately 25 bicycle spaces). Separate outdoor bicycle parking is provided for visitors.

SS 7.3 Parking Capacity/Low-Emitting Vehicles (1 credit): Number of parking spaces does not exceed minimum zoning requirements and 3 spaces will be dedicated for Zipcar parking.

3.5.3 Water Efficiency

WE 3.2 Indoor Water Use – High-Efficiency Fixtures and Fittings (3 credits): The Project will use high-efficiency lavatory faucets, shower heads, and toilets meeting EPA Water Sense standards.

WE 3.3 Water Efficient Appliances for Mid-Rise (2 credits): The Project will use water-efficient clothes washers and ENERGY STAR dishwashers.

3.5.4 Energy and Atmosphere

EA 1.1 Minimum Energy Performance for Mid-Rise (Prerequisite): The Project will meet the mandatory provision, and exceed the 15% minimum reduction in energy use according to the ASHRAE 90.1-2007, Appendix G simulation.

EA 1.2 Testing and Verification for Mid-Rise (Prerequisite): The Project will meet EPA Multi-Family High Rise Program Testing & Verification Protocols requirements.

EA 7.2 Pipe Insulation (1 credit): All domestic hot water piping shall have R-4 insulation, including appropriate insulation on all pipe elbows and transitions.

3.5.5 Materials and Resources

MR 1.1 Framing Order Waste Factor (Prerequisite): Limit the overall estimated waste factor to 10% or less.

MR 1.4 Framing Efficiencies (1 credit): Framing Efficiencies will be achieved, and will include such things as pre-cut framing packages, open-web floor trusses, ceiling/floor/roof joist spacing in excess of 16" OC.

MR 2.1 FSC Certified Tropical Woods (Prerequisite): Project shall require that any tropical woods used shall be FSC Certified.

MR 2.2 Environmentally Preferable Products (min. 3 credits): The Project will specify and approve during the submittal process products the environmentally preferable, low-emitting or locally-sourced in accordance with EPP Table. Anticipated credits will be 3.

MR 3.1 Construction Waste Management Planning (Prerequisite): The Project will investigate and document local options for diversion of all anticipated major constituents of the project waste stream.

MR 3.2 Construction Waste Reduction (1.5 credits): The Project aims to divert 50% of its construction generated waste from landfill.

3.5.6 Indoor Environmental Quality

EQ 2.1 Basic Combustion Venting Measures (Prerequisite): These requirements, no unvented combustion appliances, CO monitoring on each floor, space heating equipment that is closed combustion, are basic requirements of the State Building Code and will be incorporated into the work. There are no fireplaces in the dwelling units.

EQ 4.1 Basic Outdoor Air Ventilation (Prerequisite): Continuous ventilation shall be provided to each dwelling unit to meet the ASHRAE 62.2.

EQ 5.1 Basic Local Exhaust (Prerequisite): Bathroom exhaust fans and kitchen exhaust fans will be ASHRAE compliant for air flow, and installed per ASHRAE 62.2. Bathroom exhaust fans shall be ENERGY STAR listed.

EQ 5.2 Enhanced Local Exhaust (1 Credit): Bathroom exhaust fans will be operated with automatic timer tied to switch to operate fan for additional 20 minutes after occupant left the room.

EQ 6.1 Room by Room Load Calculations (Prerequisite): Perform room-by-room load calculations and install system accordingly. Calculations will be performed by the mechanical engineer of record for the project.

EQ 7.2 Air Filtering (Prerequisite): Better than MERV 10 filters will be installed, and adequate pressures and air flow will be maintained.

EQ 8.1 Indoor Contaminant Control During Construction (1 credit): Upon installation, all ductwork will be sealed to minimize contamination during construction.

EQ 10.1 No HVAC in Garage (Prerequisite): The garage will not have HVAC equipment other than that required for mechanical (CO) ventilation in which the make-up air will not be conditioned.

EQ 11 Environmental Tobacco Smoke Control, a) Reduce smoke exposure and transfer (0.5 credit): Smoking will be prohibited inside the building (inside dwelling units and all common areas) and outside within 25 feet from entries, air intake and windows. Provisions for enforcement shall be in the lease or condominium regulations. No smoking signs shall be posted.

EQ 12.1 Compartmentalization of Units (Prerequisites): Air-sealing protocol will be implemented to ensure leakage below .30 CFM50 per square foot of interior space, and verified through blower door test.

3.5.7 Innovation and Design Process

ID 1.1 Preliminary Rating (Prerequisite): A Green Rater has not yet been chosen as a team member; however, once this consultant is chosen, the Project team will review the Checklist prepared to date with the Green Rater. It is intention of the Team that the Project at a minimum achieve a Certified Level.

ID 1.2 Energy Expertise for Mid-Rise (Prerequisite): The Project Team includes a team member familiar with Mid-Rise Energy systems and components as well as energy modeling per ASHRAE 90.1,

ID 1.3 Professional Credentialed with Respect to LEED for Homes: At least one member of the design team (other than the Green Rater) will be accredited by USGBC for LEED for Homes projects.

3.6 Urban Design Drawings

The Proposed Project's urban design drawings and perspectives are contained in **Appendix A** and include:

- A-1 Street Level Plan
- A-2 Proposed Floor Plans – Second Floor
- A-3 Proposed Floor Plans – Third and Fourth Floor
- A-4 Proposed Floor Plans – Fifth Floor
- A-5 Proposed Elevations – Washington Street Elevations
- A-6 Proposed Elevations – Green Street Elevations
- C-1 Conceptual Utility and Drain Plan

4.0 TRANSPORTATION ANALYSIS

Design Consultants, Inc. (DCI) has conducted an evaluation of the transportation impacts for the proposed residential development ("Project") to be located at 3371-3375 Washington Street in the Jamaica Plain neighborhood of Boston. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the Boston Planning & Development Agency's (BPDA) Article 80 development review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, pedestrian activity, and public transportation services.

The Project site is located in the Jamaica Plain neighborhood of Boston, and is bounded by Green Street to the north, Washington Street to the east, and a mix of commercial and residential buildings to the south and west. Land use surrounding the site is a mixture of commercial and residential uses.

The proposed Project will demolish the existing buildings to construct a new residential building, which will house 58 residential uses and two ground floor commercial spaces. Site access will be provided via one new curb cut on Green Street. The curb cut from Green Street will provide access to an at-grade parking area for providing 30 residential parking spaces and 3 Zip Car parking spaces, for a total of 33 parking spaces. This results in a parking ratio of 0.52 residential parking spaces per dwelling unit. Primary pedestrian access will be provided by one entrance on Washington Street and one entrance on Green Street. For full results of the Traffic Impact and Access Study, please see **Appendix I**.

5.0 GEOTECHNICAL INFORMATION

On October 28, 2016, Design Consultants Inc. issued a Geotechnical Investigations Letter Report for the Project Site. This Report was based on seven (7) historical borings conducted in 2010 and 2015, and test borings advanced by DCI in September of 2015. The results of the test borings indicate that there are six soil layers at the site. Asphalt was encountered in three of the borings to a depth of 3 or 4 inches. Under the asphalt and at the ground surface in the other locations was a layer of Urban Fill consisting of sand with trace and little of amounts of silt. Several test borings encountered loam, cinders, ash, and brick in the Urban Fill. This layer was typically 5.5 feet to 8 feet deep. A one thick foot layer of Peat was encountered under the Urban Fill in one boring. A four-foot-thick layer of soft clay was encountered under the Urban Fill in one boring.

Below the Urban Fill, Peat is a natural layer of Sand and Silty Sand with varying amounts of silt and gravel. This layer typically extends to a depth of 14 to 15 feet below ground surface. The layer is loose to dense, becoming less dense with depth.

A natural Sandy Silt and Clay was encountered below the Sand to the bottom of the borings. This layer was typically medium to very stiff.

The foundations could be supported on strip and spread footings bearing on the natural sands or structural fill, given the removal and replacement of the Urban Fill, Peat and Soft Clay, and replacement of structural fill throughout the building footprint with a net bearing capacity of 1 ton per square foot. Alternatively, deep foundations consisting of helical piles or rammed aggregate piers bearing in the medium stiff to stiff silty sand or silt clay could support the building. A high design groundwater depth of 4.5 feet below the ground surface was recommended. See **Appendix G** for the complete Geotechnical Report.

6.0 ADDITIONAL PROJECT INFORMATION

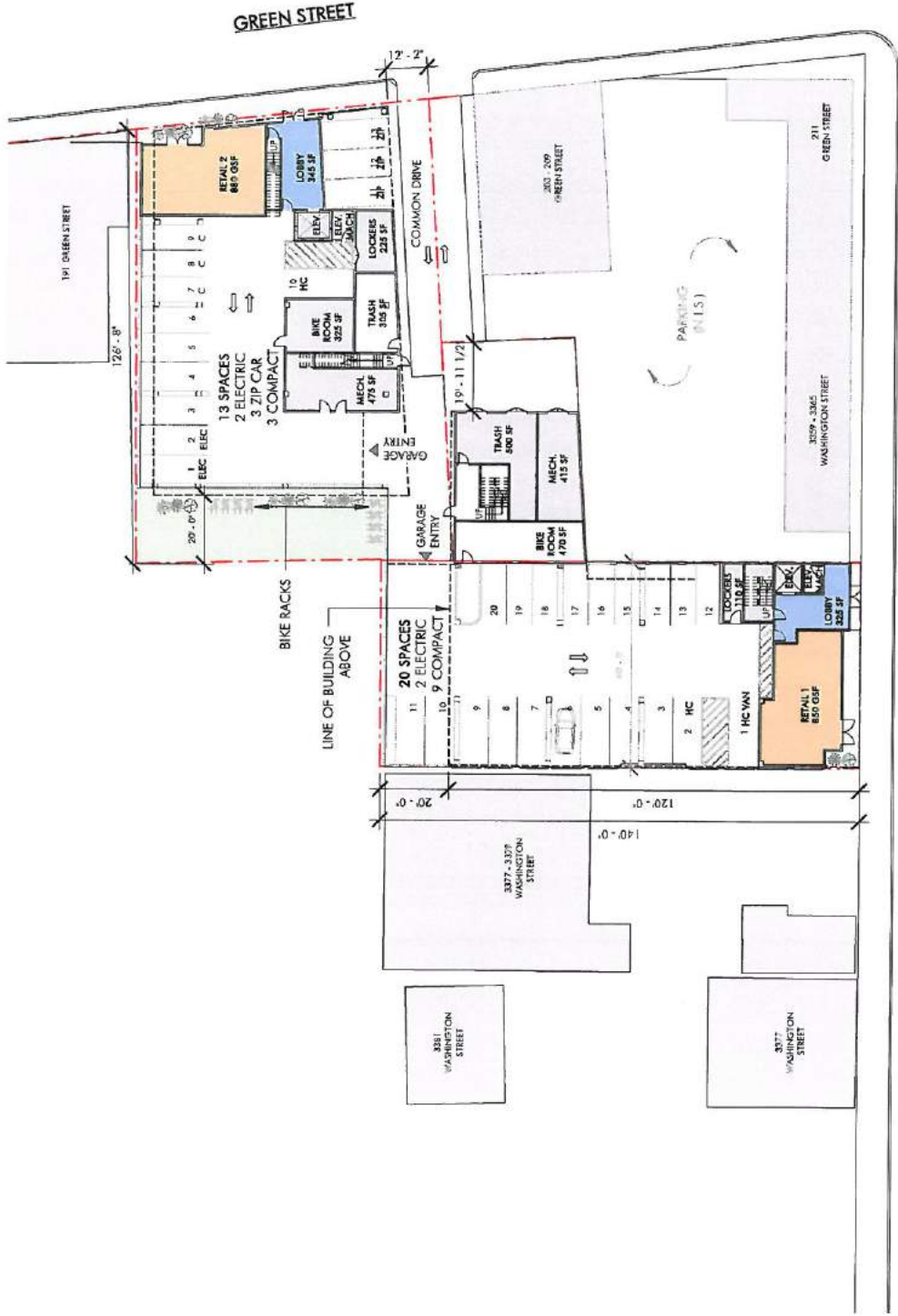
6.1 Preliminary List of Permits or Other Approvals Which May Be Sought

Agency Name	Permit or Action*
Local Agencies	
Boston Planning & Development Agency	Article 80 Review and Execution of Related Agreements; Section 80B-6 Certificate of Compliance
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Department of Public Works, Public Improvement Commission	Possible Sidewalk Repair Plan; Curb-Cut Permit; Street/Sidewalk Occupancy Permit; Other
Boston Zoning Board of Appeals	Possible Variances and Dimensional Relief from Existing Zoning Code Requirements
Boston Fire Department	Approval of Fire Safety Equipment
Boston Water and Sewer	Approval for Sewer and Water Connections; Construction Site Dewatering; and Storm Drainage
Boston Parks Department	Approval for Site Location in Relation to Nearby Parks
Boston Department of Inspection Services	Building Permits; Certificates of Occupancy; Other Construction-Related Permits

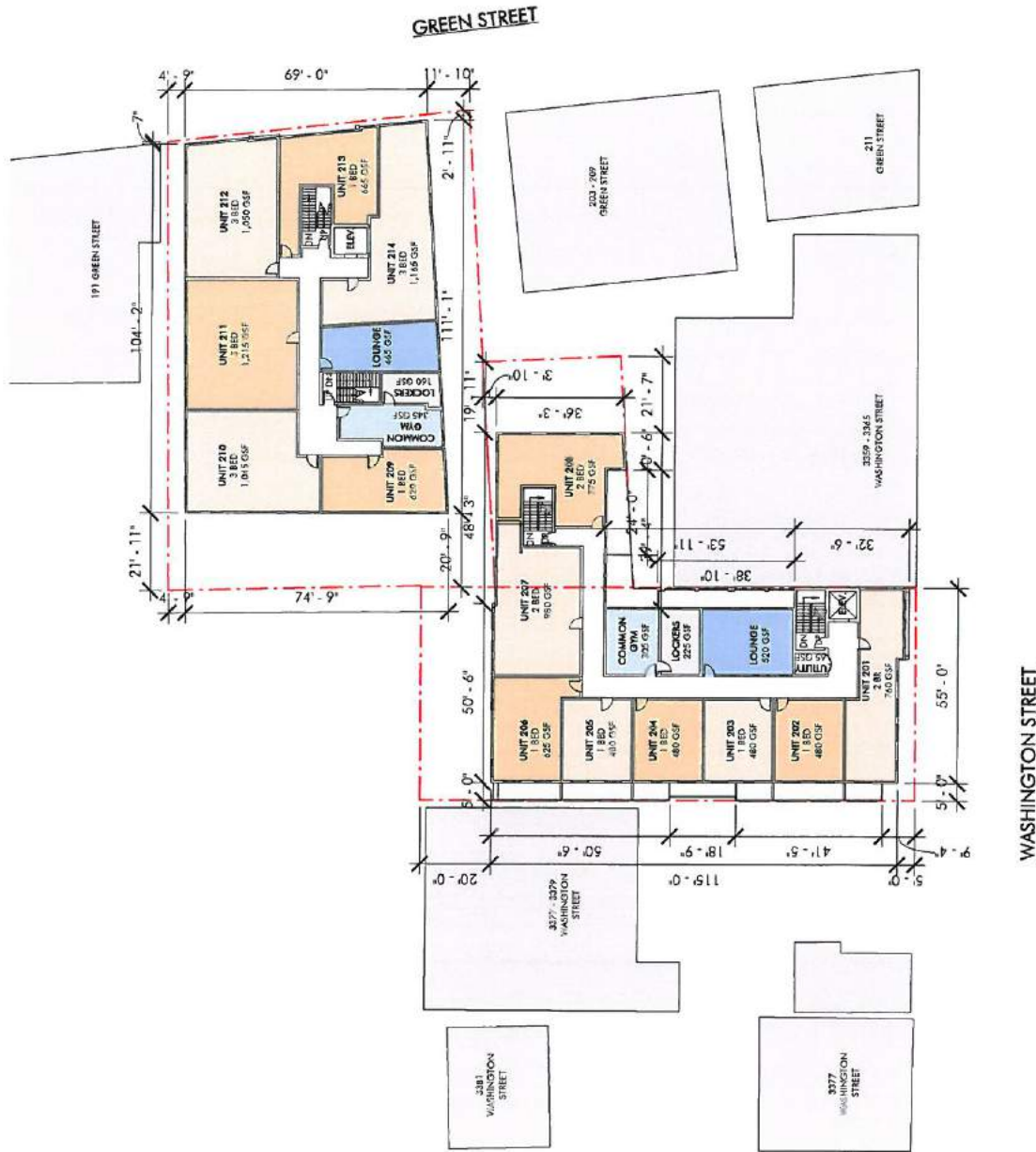
* This is a preliminary list based on project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits may be needed.

6.2 Project Team

Project Name: 3371-3375 Washington Street & 197-201 Green Street		Project Team Information
Property Owner / Developer	CRM Property Management Corp. 320 Washington Street Brookline, MA 02445 Fred Starikov, Fred.Starikov@cityrealtystudio.com Steve Whalen, Steve.Whalen@cityrealtystudio.com	
Article 80 Permitting Consultant / Legal Counsel / Outreach	Drago & Toscano, LLP 15 Broad Street, Suite 610 Boston, MA 02109 Jeffrey Drago, Esq., jdtago@dtlawllp.com Matthew Eckel, Esq., matt@dtlawllp.com	
Architect	Embarc Studio 60 K Street, 3 rd Floor Boston, MA 02127 Dartagnan Brown, dbrown@embarcstudio.com Dan Artiges, dartiges@embarcstudio.com	
Civil Engineer/Geotechnical Engineer/ Transportation Planner	Design Consultant, Inc. 120 Middlesex Ave., Suite 20 Somerville, MA 02145 Michael Clark, mclark@dcma.com Stephen Sawyer, ssawyer@dcma.com Stephen Siragusa, ssiragusa@dcma.com Tom Bertulis, TBertulis@dcma.com	
Community Outreach	CK Strategies, LLC 15 Broad Street, Suite 610 Boston, MA 02109	
Environmental / 21E Engineer	FSL Associates, INC. 358 Chestnut Hill Avenue Boston, MA 02135	



WASHINGTON STREET



1/32" = 1'-0"

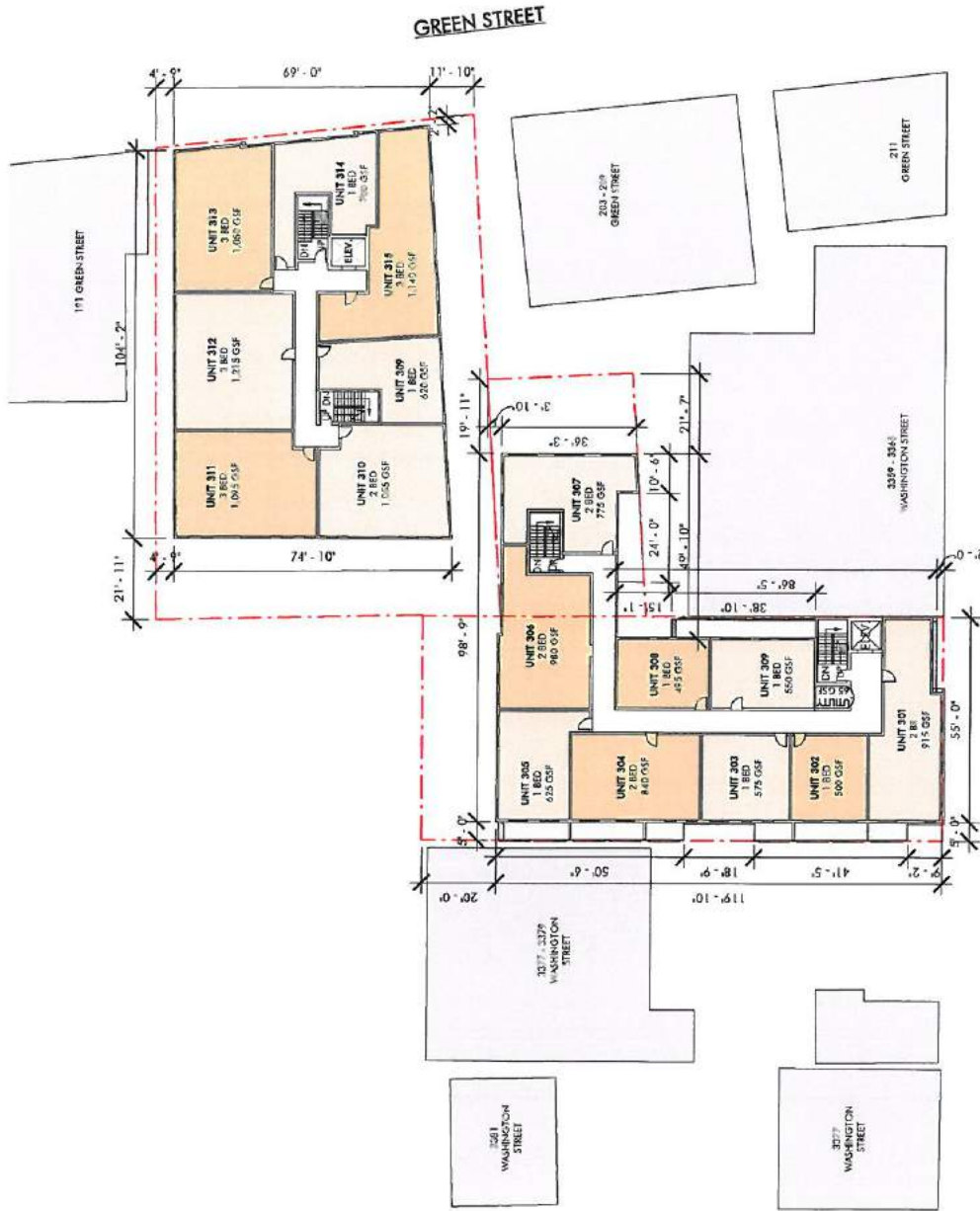
A2

SECOND LEVEL PLAN
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 JAMAICA PLAIN, MA 02130

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1/32" = 1'-0"

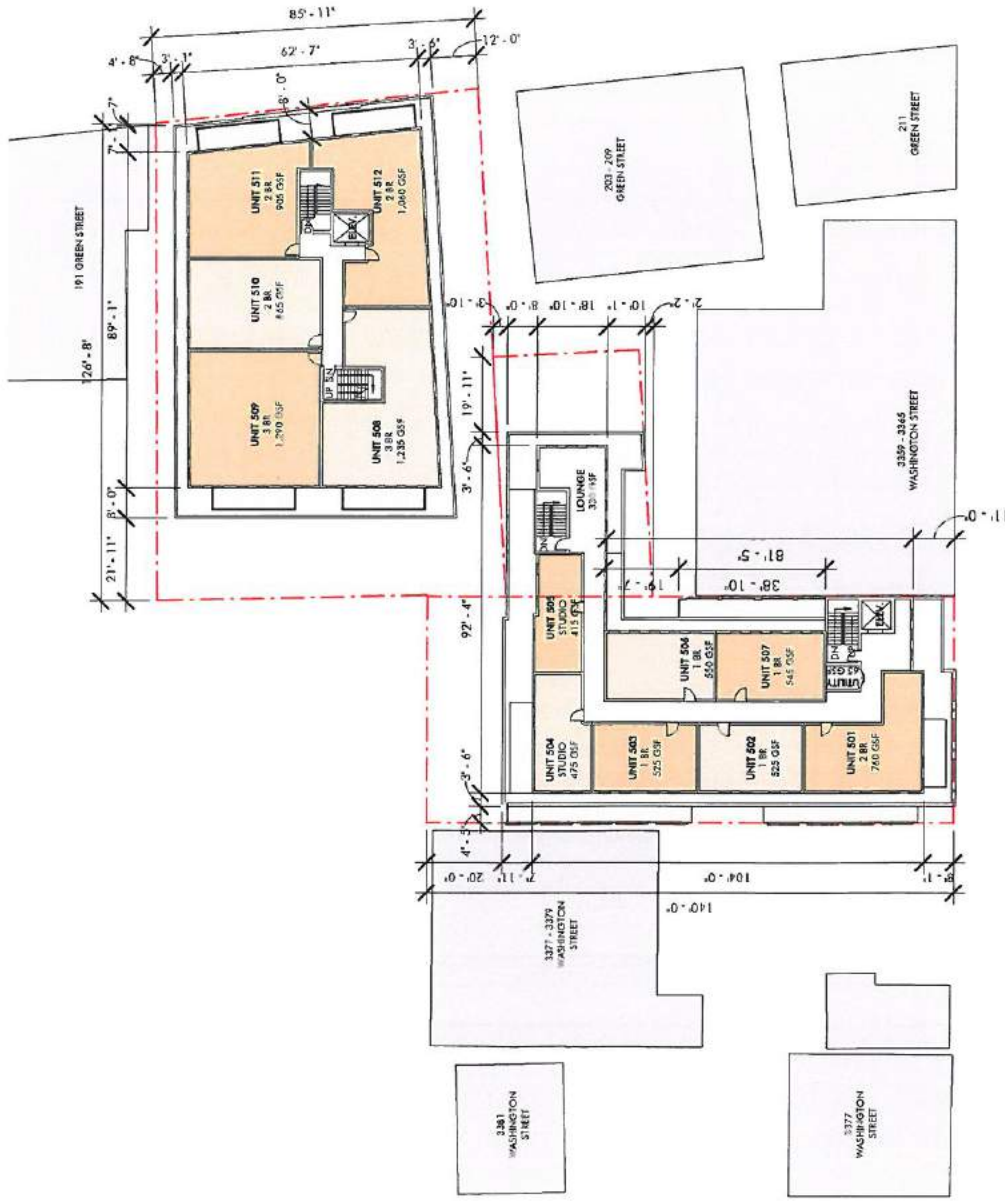
A3

THIRD AND FOURTH FLOOR PLAN
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 1000 WASHINGTON STREET, SUITE 100, BOSTON, MA 02111
 TEL: 617.552.1000 | WWW.EMBARCSTUDIO.COM

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1/32" = 1'-0"

A4

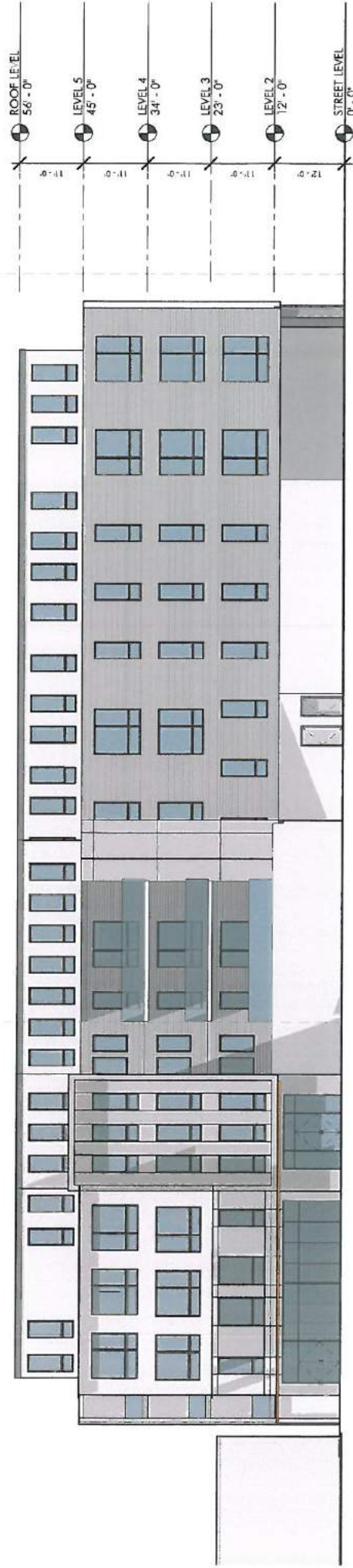
FIFTH FLOOR PLAN
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3353 WASHINGTON STREET



1/16" = 1'-0"

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WASHINGTON STREET ELEVATION
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A5

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3353 WASHINGTON STREET



1/16" = 1'-0"

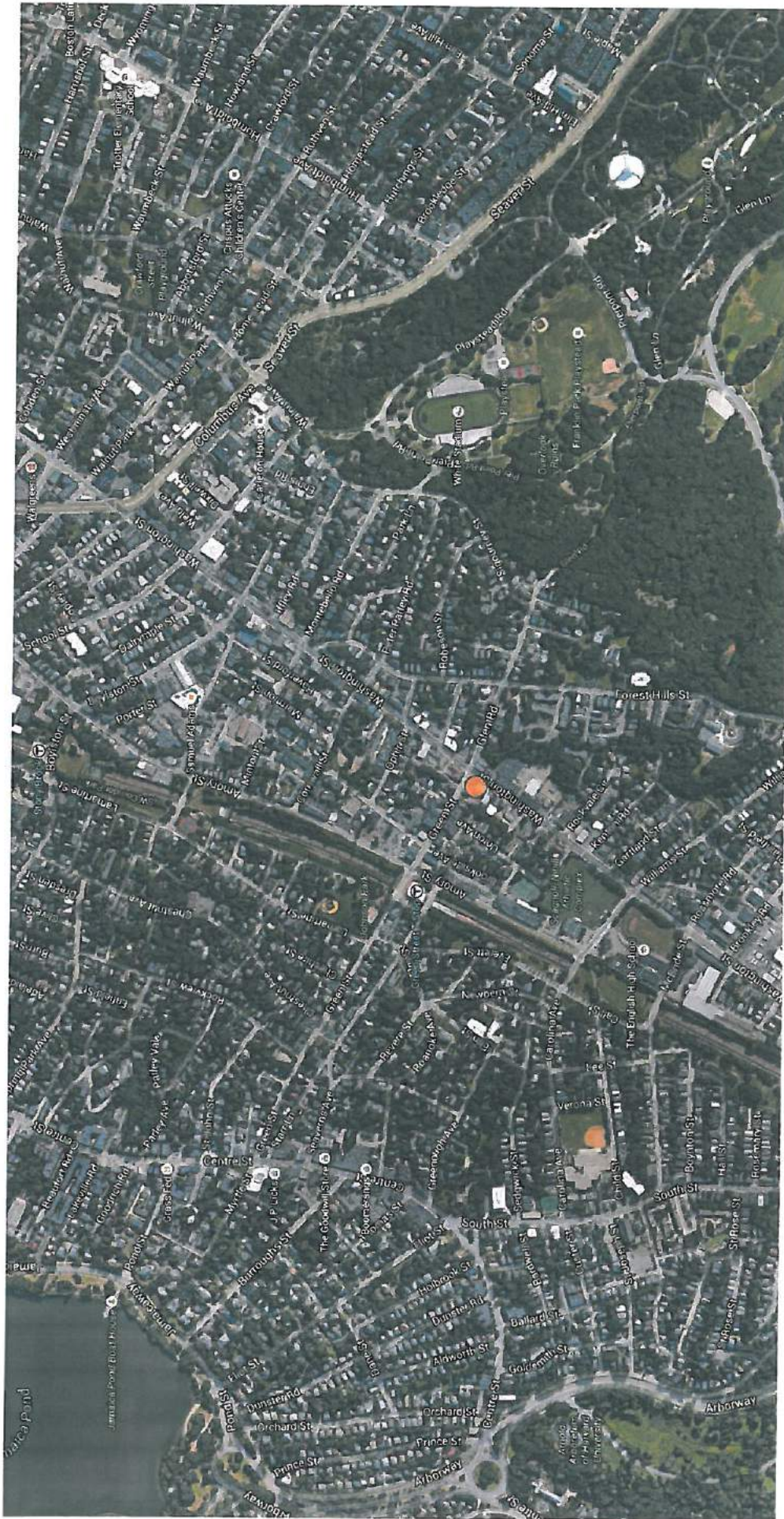
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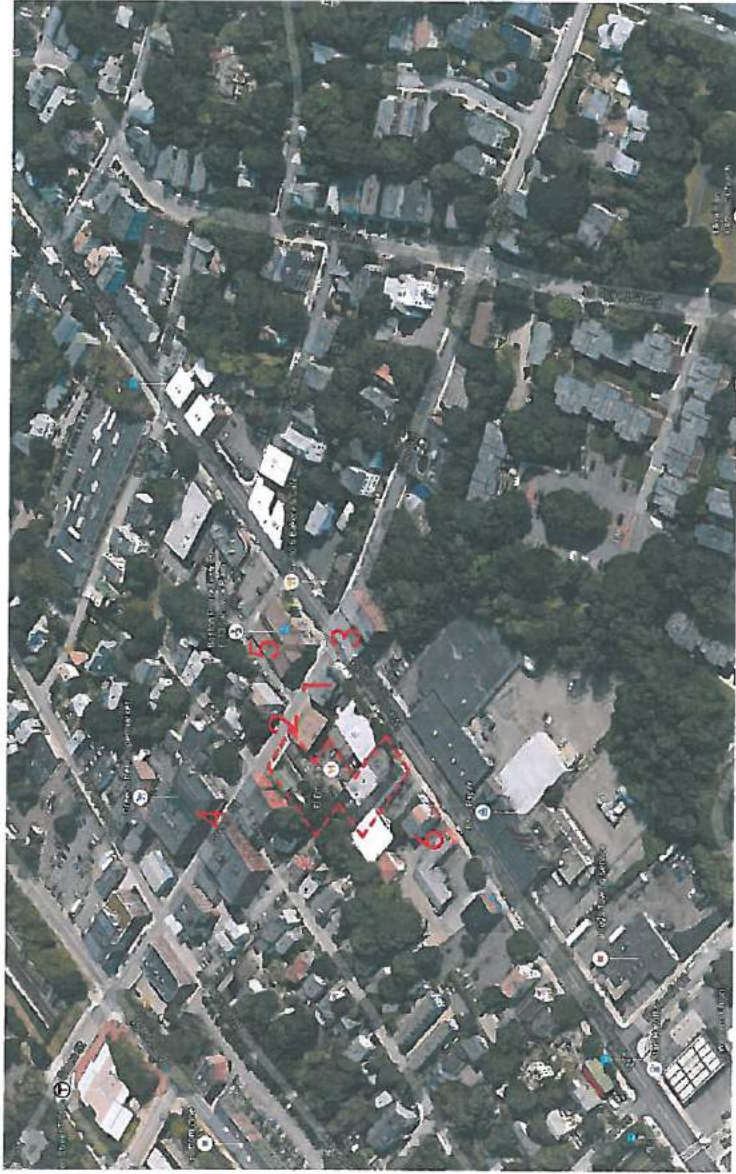
GREEN STREET ELEVATION
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1



2



3



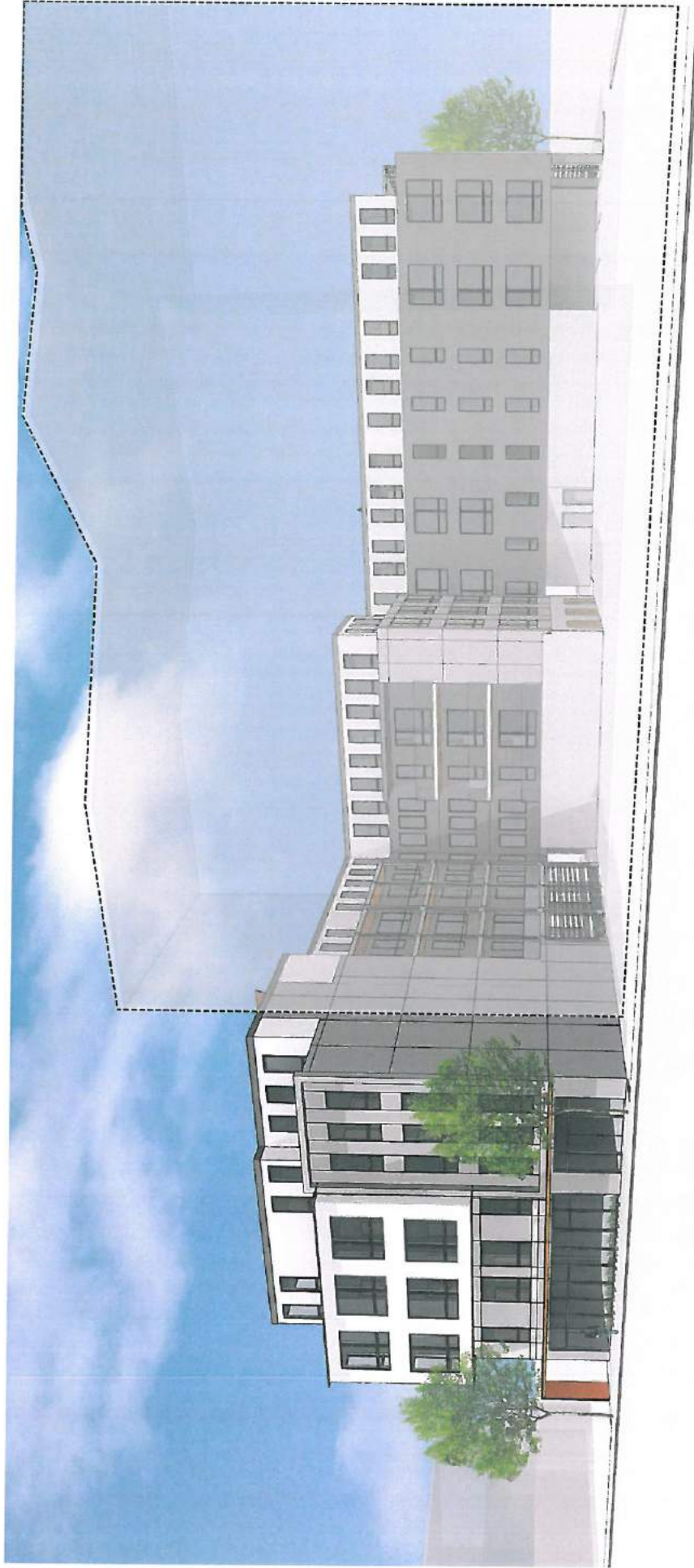
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5



6





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R2
GREEN STREET VIEW
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Design Consultants Inc.
 150 Water Street, Suite 202
 Boston, MA 02109
 Tel: 617.338.1234
 Fax: 617.338.1235
 www.dci-engineers.com

PROPOSED
 MIXED USE
 DEVELOPMENT
 3371-3375
 WASHINGTON
 STREET
 JAMAICA PLAIN
 MASS

REV.	DESCRIPTION	DATE



CONCEPTUAL
 UTILITY &
 DRAIN PLAN

SHEET NAME

C1.0

DRAWN BY

CHECKED BY

DATE

SCALE

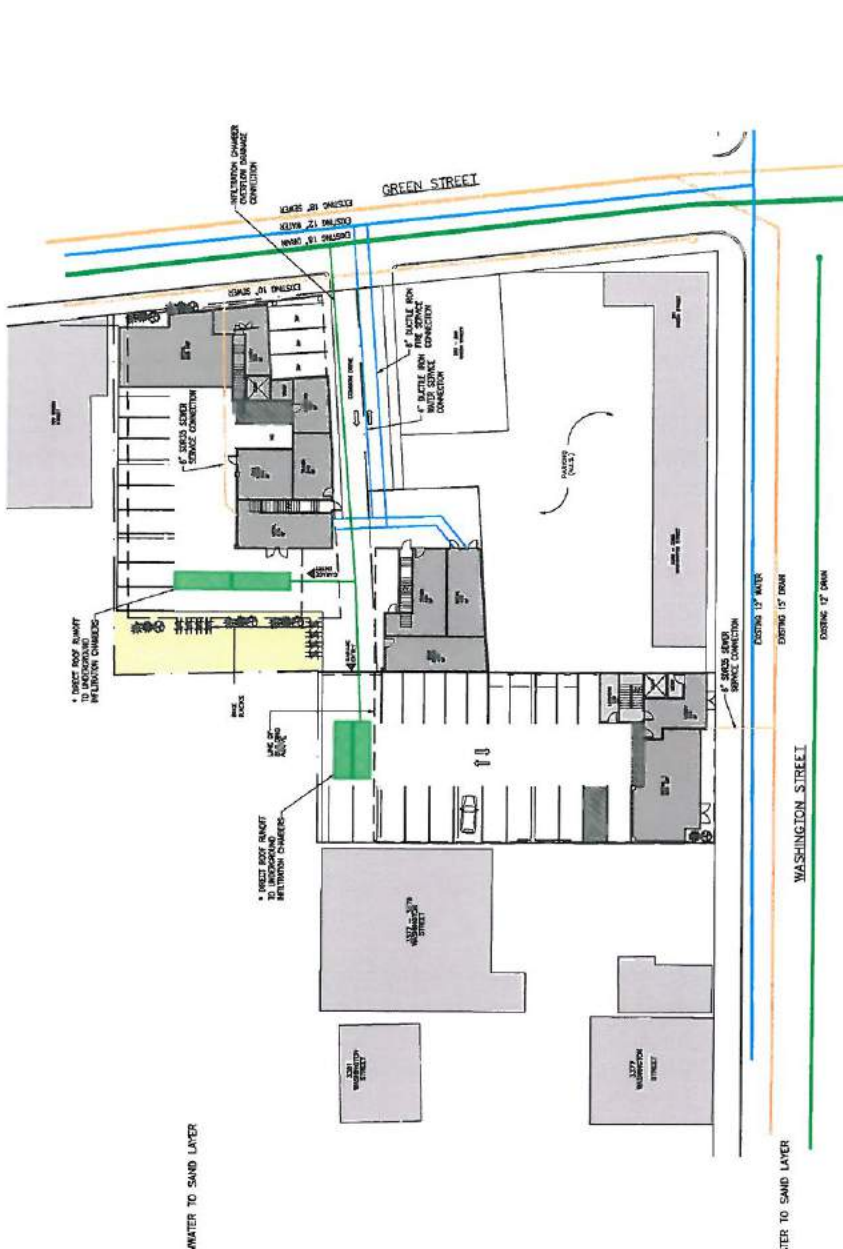
SEWER FLOW CALCULATIONS:
 EXISTING USE:
 RESIDENTIAL @ 40 BEDROOMS - 6,360 GPD
 COMMERCIAL @ 1,750 SF - 150 GPD
 EXISTING USE:
 RETAIL @ 100,000 SF - 450 GPD
 RESTAURANT @ 1,000 SF - 1,750 GPD
 TOTAL ADDED SEWER FLOW = 3,812 GPD
 (ALL FLOWS PER 210 CMR 15.00 TITLE 5 SPECIFICATIONS)

★ STORMWATER INFILTRATION NOTE:
 THE PROJECT REQUIRES 1,700 CUBIC FEET OF STORMWATER STORAGE TO HOLD
 AND INFILTRATE 1" OF RAINFALL OVER THE PAVED AND BUILDING AREAS
 TIME AVAILABLE. THE PROPOSED PROJECT
 UNDERGROUND INFILTRATION CHAMBERS, BASED ON BORING INFORMATION THE SOIL
 AT LOCATIONS INDICATED IS SUITABLE FOR INFILTRATION WITH SAND 7 TO 15
 INCHES BELOW THE GRADE. THE INFILTRATION
 CHAMBERS WILL BE DESIGNED TO INTERFACE WITH THE PERMEABLE SAND LAYER TO
 INSURE INFILTRATION CHAMBERS DRAIN WITHIN A 72 HOUR TIME PERIOD.

FIGURE 4
 INFILTRATE STORMWATER TO SAND LAYER
 CARLISLE CORP.
 100 WATER STREET, SUITE 202
 BOSTON, MA 02109
 DRAWN BY: J. DAY
 DATE: 12/20/2023



FIGURE 5
 INFILTRATE STORMWATER TO SAND LAYER
 CARLISLE CORP.
 100 WATER STREET, SUITE 202
 BOSTON, MA 02109
 DRAWN BY: J. DAY
 DATE: 12/20/2023



- PIPE MATERIALS:**
- ROOF DRAINS: 6" SCHEDULE 80 PVC, SLOPE - 2% MIN.
 - STORMWATER OVERFLOW: 6" SDR 35 PVC
 - SANITARY SEWER: 8" SDR 35, SLOPE - 2% MIN.
 - DOMESTIC WATER: 6" CLASS 40 DCL PIPE
 - FIRE PROTECTION SERVICE: 6" CLASS 66 DCL PIPE
 - ALL WATER LINES SHALL HAVE A MINIMUM 3 FEET OF COVER. ALL WATER FITTINGS SHALL BE CLASS 56





9 A.M.



12 P.M.



6 P.M.

SUMMER SOLSTICE

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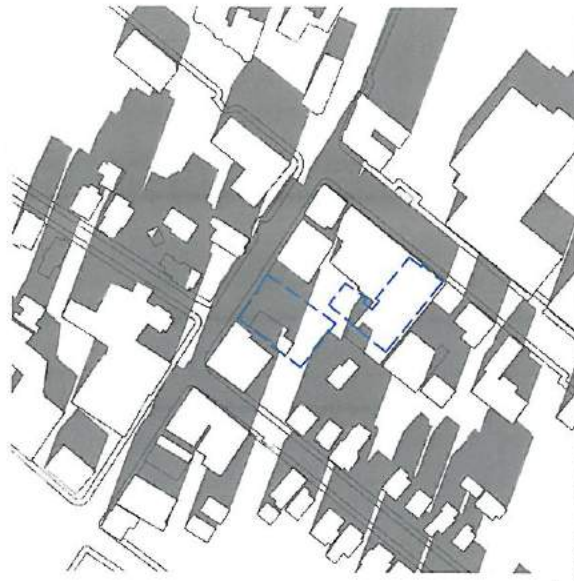
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SPRING/FALL EQUINOX

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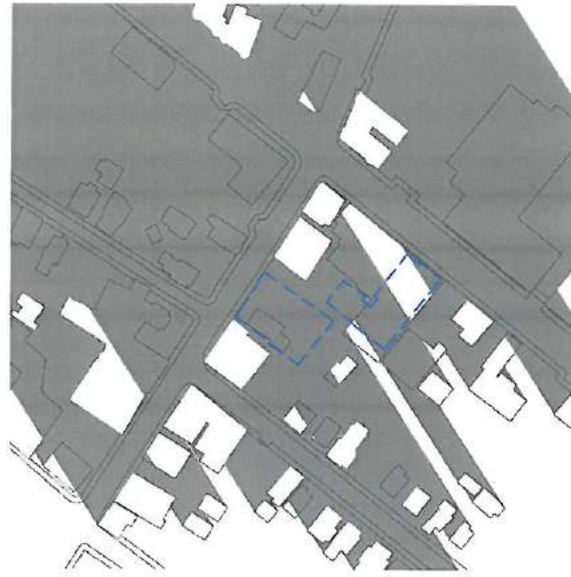
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6 P.M.

WINTER SOLSTICE

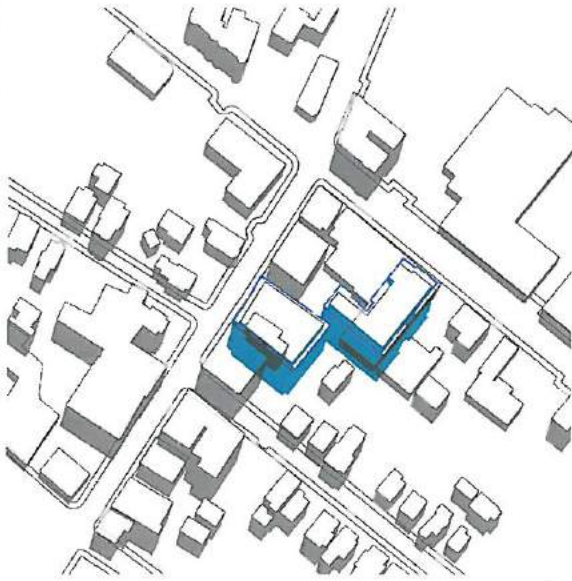
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SS3

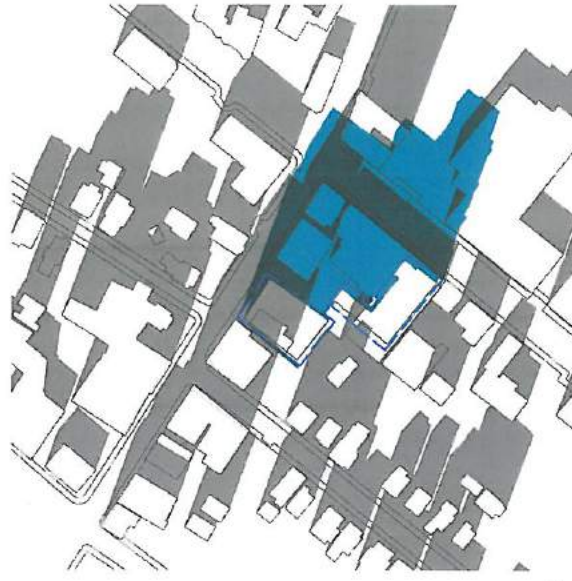
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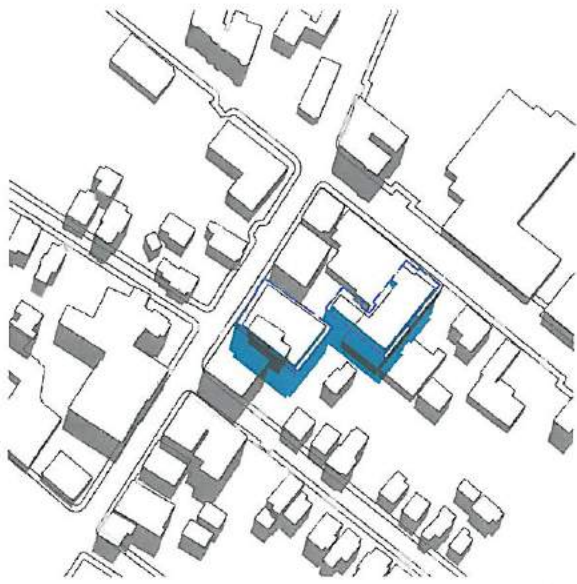
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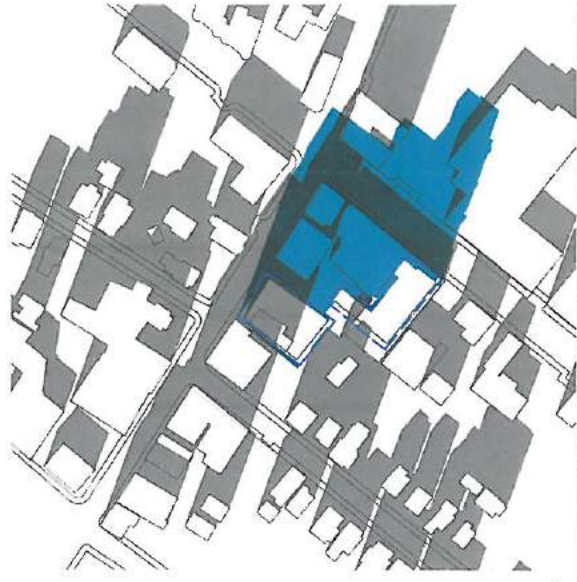
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SPRING/FALL EQUINOX

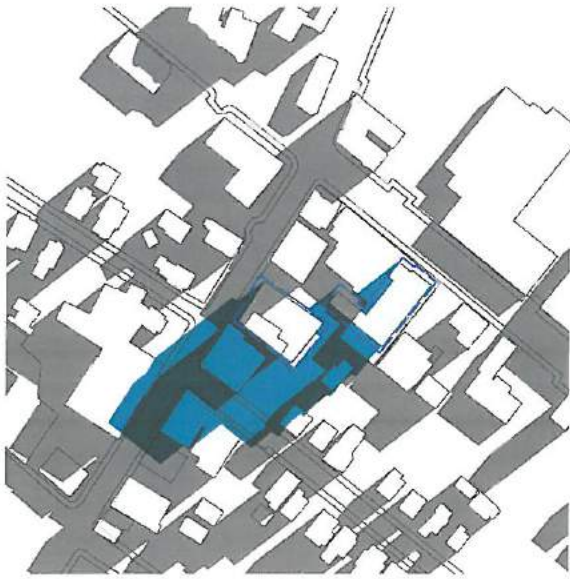
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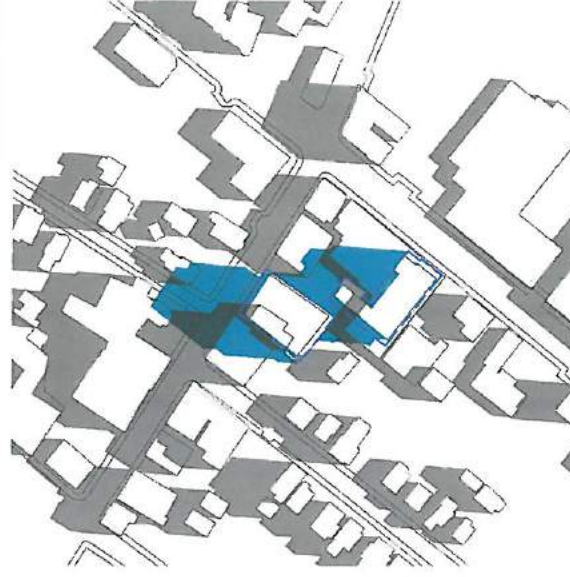
PROPOSED SHADOW STUDIES
3371 - 3375 WASHINGTON ST
JAMAICA PLAIN, MA 02130

SS5

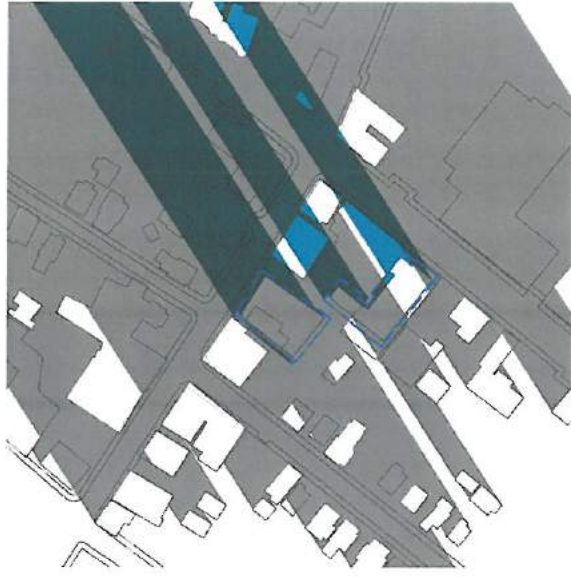
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PROPOSED SHADOW STUDIES
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SS6

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for Homes

LEED for Homes Mid-rise Simplified Project Checklist

Builder Name:	
Project Team Leader (if different):	
Home Address (Street/City/State):	3371-3375 Washington Street, Jamaica Plain, MA

Project Description:

Building type: *Mid-rise multi-family* # of stories: 5
 # of units: 58 Avg. Home Size Adjustment: -10

Adjusted Certification Thresholds

Certified: 35.0 Gold: 65.0
 Silver: 50.0 Platinum: 80.0

Project Point Total	Final Credit Category Total Points				
Prelim: 39.5 + 17.5 maybe pts	Final: 5.5	ID: 0	SS: 4	EA: 0	EQ: 0
Certification Level		LL: 0	WE: 0	MR: 1.5	AE: 0
Prelim: Not Certified	Final: Not Certified	<i>Min. Point Thresholds Not Met for Prelim. OR Final Rating</i>			

date last updated :
 last updated by :

		Max Pts	Project Points				
			Preliminary	Final			
			Y/Pts	Maybe	No	Y/Pts	
Innovation and Design Process (ID) (No Minimum Points Required)							
		Max	Y/Pts	Maybe	No	Y/Pts	
1. Integrated Project Planning	1.1 Preliminary Rating	Prereq					
	1.2 Energy Expertise for MID-RISE	Prereq					
	1.3 Professional Credentialed with Respect to LEED for Homes	1	1	0		0	
	1.4 Design Charrette	1	1	0		0	
	1.5 Building Orientation for Solar Design	1	0	0		0	
	1.6 Trades Training for MID-RISE	1	0	0		0	
2. Durability Management Process	2.1 Durability Planning	Prereq					
	2.2 Durability Management	Prereq					
	2.3 Third-Party Durability Management Verification	3	0	0		0	
3. Innovative or Regional Design	3.1 Innovation #1	1	0	0		0	
	3.2 Innovation #2	1	0	0		0	
	3.3 Innovation #3	1	0	0		0	
	3.4 Innovation #4	1	0	0		0	
<i>Sub-Total for ID Category:</i>		11	2	0		0	
Location and Linkages (LL) (No Minimum Points Required)							
		OR	Max	Y/Pts	Maybe	No	Y/Pts
1. LEED ND	1 LEED for Neighborhood Development	LL2-6	10	0	0		0
2. Site Selection	2 Site Selection		2	2	0		0
3. Preferred Locations	3.1 Edge Development		1	0	0		0
	3.2 Infill	LL 3.1	2	2	0		0
	3.3 Brownfield Redevelopment for MID-RISE		1	0	0		0
4. Infrastructure	4 Existing Infrastructure		1	1	0		0
5. Community Resources/ Transit	5.1 Basic Community Resources for MID-RISE		1	0	0		0
	5.2 Extensive Community Resources for MID-RISE	LL 5.1, 5.3	2	0	0		0
	5.3 Outstanding Community Resources for MID-RISE	LL 5.1, 5.2	3	3	0		0
6. Access to Open Space	6 Access to Open Space		1	1	0		0
<i>Sub-Total for LL Category:</i>			10	9	0		0
Sustainable Sites (SS) (Minimum of 5 SS Points Required)							
		OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Site Stewardship	1.1 Erosion Controls During Construction	Prerequisite					
	1.2 Minimize Disturbed Area of Site for MID-RISE	1	1	0		0	
2. Landscaping	2.1 No Invasive Plants	Prerequisite					
	2.2 Basic Landscape Design	SS 2.5	1	0	0		0
	2.3 Limit Conventional Turf for MID-RISE	SS 2.5	2	0	0		0
	2.4 Drought Tolerant Plants for MID-RISE	SS 2.5	1	0	0		0
	2.5 Reduce Overall Irrigation Demand by at Least 20% for MID-RISE	3	3	0	0		0
3. Local Heat Island Effects	3.1 Reduce Site Heat Island Effects for MID-RISE		1	0	0		0
	3.2 Reduce Roof Heat Island Effects for MID-RISE		1	1	0		0
4. Surface Water Management	4.1 Permeable Lot for MID-RISE		2	0	0		0
	4.2 Permanent Erosion Controls		1	0	0		0
	4.3 Stormwater Quality Control for MID-RISE		2	2	0		0
5. Nontoxic Pest Control	5 Pest Control Alternatives		2	1	0		0
6. Compact Development	6.1 Moderate Density for MID-RISE		2	0	0		0
	6.2 High Density for MID-RISE	SS 6.1, 6.3	3	0	0		0
	6.3 Very High Density for MID-RISE	SS 6.1, 6.2	4	4	0		4
7. Alternative Transportation	7.1 Public Transit for MID-RISE		2	2	0		0
	7.2 Bicycle Storage for MID-RISE		1	1	0		0
	7.3 Parking Capacity/Low-Emitting Vehicles for MID-RISE		1	1	1		0
<i>Sub-Total for SS Category:</i>			22	13	1		4

LEED for Homes Mid-rise Pilot Simplified Project Checklist (continued)

						Max Pts	Project Points			
							Preliminary			Final
							Y/Pts	Maybe	No	Y/Pts
Water Efficiency (WE) (Minimum of 3 WE Points Required) OR						Max				
1. Water Reuse	☒	1	Water Reuse for MID-RISE			5	0	0	0	
2. Irrigation System	☒	2.1	High Efficiency Irrigation System for MID-RISE	WE 2.2		2	0	0	0	
		2.2	Reduce Overall Irrigation Demand by at Least 45% for MID-RISE			2	0	0	0	
3. Indoor Water Use	☒	3.1	High-Efficiency Fixtures and Fittings			3	3	0	0	
		3.2	Very High Efficiency Fixtures and Fittings			6	0	0	0	
		3.3	Water Efficient Appliances for MID-RISE			2	2	0	0	
<i>Sub-Total for WE Category:</i>						15	5	0	0	
Energy and Atmosphere (EA) (Minimum of 0 EA Points Required) OR						Max				
1. Optimize Energy Performance	☒	1.1	Minimum Energy Performance for MID-RISE			Prereq				
		1.2	Testing and Verification for MID-RISE			Prereq				
		1.3	Optimize Energy Performance for MID-RISE			34	0	0	0	
7. Water Heating	☒	7.1	Efficient Hot Water Distribution			2	0	2	0	
		7.2	Pipe Insulation			1	1	0	0	
11. Residential Refrigerant Management	☒	11.1	Refrigerant Charge Test			Prereq				
		11.2	Appropriate HVAC Refrigerants			1	0	0	0	
<i>Sub-Total for EA Category:</i>						38	1	2	0	
Materials and Resources (MR) (Minimum of 2 MR Points Required) OR						Max				
1. Material-Efficient Framing	☒	1.1	Framing Order Waste Factor Limit			Prereq				
		1.2	Detailed Framing Documents	MR 1.5		1	0	0	0	
		1.3	Detailed Cut List and Lumber Order	MR 1.5		1	0	0	0	
		1.4	Framing Efficiencies	MR 1.5		3	1	0.5	0	
		1.5	Off-site Fabrication			4	0	4	0	
2. Environmentally Preferable Products	☒	2.1	FSC Certified Tropical Wood			Prereq				
		2.2	Environmentally Preferable Products			8	3	0	0	
3. Waste Management	☒	3.1	Construction Waste Management Planning			Prereq				
		3.2	Construction Waste Reduction			3	1.5	1.5	1.5	
<i>Sub-Total for MR Category:</i>						16	5.5	5.5	1.5	
Indoor Environmental Quality (EQ) (Minimum of 6 EQ Points Required) OR						Max				
2. Combustion Venting	☒	2	Basic Combustion Venting Measures			Prereq				
3. Moisture Control	☒	3	Moisture Load Control			1	0	0	0	
4. Outdoor Air Ventilation	☒	4.1	Basic Outdoor Air Ventilation for MID-RISE			Prereq				
		4.2	Enhanced Outdoor Air Ventilation for MID-RISE			2	0	2	0	
		4.3	Third-Party Performance Testing for MID-RISE			1	0	1	0	
5. Local Exhaust	☒	5.1	Basic Local Exhaust			Prerequisite				
		5.2	Enhanced Local Exhaust			1	1	0	0	
		5.3	Third-Party Performance Testing			1	0	0	0	
6. Distribution of Space Heating and Cooling	☒	6.1	Room-by-Room Load Calculations			Prereq				
		6.2	Return Air Flow / Room by Room Controls			1	0	0	0	
		6.3	Third-Party Performance Test / Multiple Zones			2	0	2	0	
7. Air Filtering	☒	7.1	Good Filters			Prereq				
		7.2	Better Filters	EQ 7.3		1	1	0	0	
		7.3	Best Filters			2	0	0	0	
8. Contaminant Control	☒	8.1	Indoor Contaminant Control during Construction			1	1	0	0	
		8.2	Indoor Contaminant Control for MID-RISE			2	0	1	0	
		8.3	Preoccupancy Flush			1	0	0	0	
9. Radon Protection	☒	9.1	Radon-Resistant Construction in High-Risk Areas			Prereq				
		9.2	Radon-Resistant Construction in Moderate-Risk Areas			1	0	0	0	
10. Garage Pollutant Protection	☒	10.1	No HVAC in Garage for MID-RISE			Prereq				
		10.2	Minimize Pollutants from Garage for MID-RISE	EQ 10.3		2	0	2	0	
		10.3	Detached Garage or No Garage for MID-RISE			3	0	0	0	
11. ETS Control	☒	11	Environmental Tobacco Smoke Reduction for MID-RISE			1	1	0	0	
12. Compartmentalization of Units	☒	12.1	Compartmentalization of Units			Prereq				
		12.2	Enhanced Compartmentalization of Units			1	0	0	0	
<i>Sub-Total for EQ Category:</i>						21	4	8	0	
Awareness and Education (AE) (Minimum of 0 AE Points Required) OR						Max				
1. Education of the Homeowner or Tenant	☒	1.1	Basic Operations Training			Prereq				
		1.2	Enhanced Training			1	0	0	0	
		1.3	Public Awareness			1	0	1	0	
2. Education of Building Manager	☒	2	Education of Building Manager			1	0	0	0	
<i>Sub-Total for AE Category:</i>						3	0	1	0	

October 28, 2016

Josh Fetterman
CRM Property Management Corporation
320 Washington St, Suite 3FF
Brookline, MA 02445

RE: Geotechnical Investigations Letter Report
3371 Washington Street
Jamaica Plain, MA
DCI Project No. 2016-102

Dear Mr. Fetterman:

Design Consultants Inc. (DCI) is pleased to provide CRM Property Management Corporation (CRM) with this summary letter report for the geotechnical investigations associated with the proposed development at 3371 Washington Street in the Jamaica Plain section of Boston, Massachusetts.

Project Background

CRM is in the process of redeveloping the subject property into a mixed used commercial residential project with 67 residential units. To this end, CRM has retained DCI's services to conduct a geotechnical investigation.

The Site is located on **Figure 1** and is about 3,900 feet southeast of Jamaica Pond. The existing conditions are shown on **Figure 2**. The Site is located on a relatively flat section of Washington Street to the southeast and Green Street to the northeast. The Site is located at approximately El. 33 (NAVD 88) and totals about 22,663 square feet (0.52 acres). The Site includes the following contiguous parcels:

- Parcel 1102584000 - One story commercial building entirely on 3371 Washington Street (8,400 square feet). The commercial building is comprised of a cinderblock exterior, structural steel framing, and a concrete slab-on-grade floor.
- Parcel 1102583002 – Predominantly paved parking area and a common way at 203 Green Street (2,527 square feet).
- Parcel 1102580000 – Paved parking with a small landscape area to the southwest at 199 Green Street (5,281 square feet).
- Parcel 1102579000 – Two story residential building with a paved drive and landscaping at 197 Green Street (6,455 square feet). The residential structure is comprised of a stone/mortar foundation with a basement, wooden framing, and wooden clapboard siding.

In support of the impending development, CRM requested that the geotechnical investigations described herein be undertaken to better understand subsurface conditions. To this end, DCI reviewed available subsurface information and contracted with Soil Exploration Corporation (SEC) of Leominster, Massachusetts to drill three (3) borings at the Site (B-1 through B-3) where shown on **Figure 2**. The drilling activities were conducted with full-time oversight by a professional geotechnical engineer from DCI. DCI was responsible for locating the explorations and SEC was responsible for coordinating the clearing of utilities by DigSafe.

Existing Subsurface Information

As part of our investigation, DCI reviewed the following available information:

1. Soil Survey Mapping from the U.S. Soil Conservation Service;
2. *Response Action Outcome Statement* for 3373R Washington Street, by McPhail Associates, dated July 22, 2010;
3. *Phase I Environmental Site Assessment and Subsurface Investigation* for 3371-3375 Washington Street, by FSL Associates. (FSL), dated September 7, 2015; and
4. *Limited Removal Action Report* for 3373 Washington Street, by FSL, dated June 20, 2016

U.S. Soil Conservation Service Soil Survey

The U.S. Department of Agriculture Soil Conservation Service Soil Survey of Suffolk County (2009 Update) indicates that conditions in the vicinity of the Site are Urban Land. Urban land consists of areas where 85 percent or more of the land is covered with impervious surfaces such as buildings and pavement. This map unit is mostly in residential, commercial, and industrial developments.

Response Action Outcome Statement (McPhail)

The purpose of this report was to provide the supporting data associated with submittal of a Response Action Outcome (RAO) Statement for the disposal site impacted by a release of petroleum hydrocarbons to which RTN 3-27083 applies. The disposal site is located on the southeastern portion of the property at the address of 3371R Washington Street.

McPhail Associates, Inc. conducted the subsurface investigation in May 2010. The investigation included the drilling of five borings completed as wells (B/MW-1 through B/MW-5). The borings were completed by Carr-Dee Corp. of Medford, MA. The subsurface explorations are shown on **Figure 2** and the boring/well logs are provided in **Attachment One**.

Underlying the ground surface at the project site, the explorations encountered a miscellaneous fill deposit which ranged from 6 to 8 feet in thickness. The fill deposit generally consists of a loose to dense, brown to black, silt and sand with trace to some gravel, and varying amounts of brick, ash and cinders. A 1-foot thick organic deposit consisting of a firm, dark-brown organic silt was encountered at a depth of 6 feet below ground surface within boring B-5.

Beneath the fill and/or organic deposit, the explorations generally encountered a natural, inorganic soil deposit consisting of glacial outwash. The glacial outwash was encountered at depths ranging from 6- to 8-feet below ground surface (bgs). The outwash deposit was observed to vary from a compact to dense, gray sand and gravel with a trace to some silt, to silty fine sand. The outwash deposit was observed to range from 4- to 8-feet thick.

The glacial outwash deposit is underlain by marine deposit consisting of a stiff to very stiff, gray clayey silt. The five borings were terminated in the marine deposit at depths ranging from 16- to 20-feet bgs.

The groundwater levels at the time of the McPhail investigation were observed to range from 7.5- to 9.5-feet bgs.

FSL Phase I Environmental Site Assessment and Subsurface Investigation (FSL)

FSL conducted a preliminary environmental assessment at 3371 Washington Street for the purpose of assessing the Site for potential contamination by a release of oil or hazardous material from on-Site or off-Site source(s), which, if present, could present an environmental liability under 310 CMR 40.0000. The explorations are located on **Figure 2**; however the boring logs are not available.

On August 18, 2015, FSL oversaw drilling operations conducted by Lake Shore Environmental, LLC, of Malden, Massachusetts. Drilling operations were conducted using a truck-mounted Geoprobe™. Soil boring FSL-1 was advanced inside the commercial building inside the loading dock area through the uneven and cracked concrete floor. Soil boring FSL-2 was advanced inside the commercial building in the auto repair tenant space adjacent to an underground hydraulic lift.

Subsurface conditions at FSL-1 consisted of very little recovery to approximately 7.5 feet bgs, with approximately 0.5 feet of dark brown sandy silt. Urban fill with coal ash and crushed rock to grey sand with gravel was observed in the 8- to 12-foot bgs layer. Grey sand with gravel to brown and grey silty clay was observed to depth at 16-feet bgs. A groundwater monitoring well was constructed at FSL-1 (FSL-MW-1) and consisted of 10-feet of 0.010-foot slotted polyvinyl chloride (PVC) piping and 5-feet of solid PVC riser. The well was finished with a flush-mounted road box sealed with concrete.

Subsurface conditions at FSL-2 consisted of urban fill with coal ash, clay pipe fragments, brick fragments, wood fragments, and crushed rock. Brown silty sand with some gravel was observed below this in the 4- to 8-feet bgs layer. Dark brown (almost black) silt/loam to brown to grey silty sand with gravel was observed at 8- to 12-feet bgs layer. Brown sand with gravel to brown to grey clay was observed to depth at 16-feet bgs. A groundwater monitoring well FSL-MW-2 consisted of similar construction to FSL-MW-1.

FSL personnel field screened the boring FSL-1 soil sample from 7.5- to 8-feet bgs using a MiniRae 2000 photoionization detector (PID). The PID reading for total volatile organic compounds (TVOCs) was above the instrument detection limit (9,999 parts per million (ppm)). FSL proceeded to collect an undisturbed portion of the FSL-1, 7.5- to 8-feet soil sample to be analyzed for volatile organic compounds (VOCs) based on this reading. FSL then collect the following soil samples: FSL-

1, 8- to 12-feet for extractable petroleum hydrocarbons / polycyclic aromatic hydrocarbons (EPH/PAH) and RCRA 8 metals; FSL-1, 12- to 15-feet for volatile petroleum hydrocarbons (VPH) and EPH/PAH; FSL-2, 0- to 4-feet for VOCs, RCRA 8 metals, and toxicity characteristic leaching procedure (TCLP) metals; FSL-2, 8- to 12-feet for VOCs, EPH/PAH, RCRA 8 metals, PCBs, and TCLP metals.

On August 26, 2015, FSL obtained water levels from groundwater monitoring wells FSL-MW-1, FSL-MW-2, and B-3 (the groundwater monitoring well which had been installed by McPhail). At the time of the FSL assessment, groundwater was encountered at approximately 9.06- to 10.34-feet bgs. FSL personnel then purged each well utilizing low-flow peristaltic pumping techniques and collected groundwater samples from each well. Groundwater samples were relinquished to RI Analytical, Inc. to be analyzed for VOCs via method 8260 (FSL-MW-1, FSL-MW-2, and B-3), EPH/PAH (FSL-MW-2 only), dissolved RCRA 8 metals (FSL-MW-2 only), and PCBs (FSL-MW-2 only).

The soil and groundwater testing revealed reportable concentrations of petroleum constituents and heavy metals lead and chromium in Site soil above the applicable reportable concentrations as codified in 310 CMR 40.1600. As a result, the results were reported to the DEP, with the recognition that up to 20 cubic yards of soil impacted with oil and hazardous materials may be removed under a Limited Removal Action (LRA) without notification to DEP. All such removed soils were subject to the provisions of 310 CMR 40.0030.

The assessment also revealed evidence of historic recognized environmental conditions in the form the DEP disposal site on the 3371R Washington Street portion. The release was closed with a Class B-1 RAO which indicated that a Permanent Solution had been achieved, a level of No Significant Risk has been established, and no further action is required in regard to the release. However, the RAO also indicated that "...the vertical extent of petroleum impacted soil at the subject disposal site is present at a depth of approximately 6 to 12 feet below ground surface." All soil removed from the subject Site must adhere to state and federal regulations.

Limited Removal Action

As part of subsurface investigations conducted in August 2015, FSL personnel collected a sample of soil from a hole in the concrete floor of the auto repair tenant space at 3373 Washington Street. The hole had been used as a "floor drain" to dump materials into the soil below the concrete floor. The sample was analyzed and contained reportable concentrations of EPH fractions, PAH constituents, and heavy metals chromium and lead.

FSL proceeded to conduct a LRA by removing the concrete surrounding the "floor drain" hole and excavating the soil below. A total of approximately 3.43 tons of impacted soil was removed from the excavation and disposed of at Turnkey Landfill in Rochester, NH. Soil remaining in the excavation was screened in the field using a photoionization detector (PID) with a detection limit of 0.1 parts per million (ppm). No readings were obtained above the PID instrument detection limit.

Post-excavation soil samples were also collected from each of the three (3) sidewalls and the bottom of the excavation (the west sidewall consisted of the concrete foundation of the Site building). The

excavation was then backfilled with clean fill and concrete was poured to seal the floor of the auto repair tenant space. The post-excavation soil analytical results confirm that the reportable condition had been eliminated. FSL then recommended no further action for the Site.

DCI Subsurface Investigations

On behalf of DCI, SEC drilled three geotechnical boreholes (B-201 through B-203) on September 27, 2016. Borings were not be drilled in the vicinity of 3371 Washington Street due to access constraints. The three additional borings were drilled for estimating the broader Site soil density through Standard Penetration Tests (SPTs). The borings were advanced using hollow stem augers and placing a head of water in the casing below the water table. Soil samples were obtained using a 2-inch split spoon sampler and samples were collected at 5-foot intervals. The boring locations are shown on **Figure 2** and the boring logs prepared by DCI's geotechnical engineer are provided in **Attachment Two**.

The borings are also located on Figure 1 and are summarized in Table 1.

Table 1
Summary of Boring Data

Boring	Approx. Ground Elevation (NAVD88)	Est. Bottom of Fill in Feet (and Elev.)	Est. Bottom of Loose/Soft Soil in Feet (and Elev.)	Boring Depth (and Elev.)
McPhail May 2010 Investigations				
B/MW-1	33.0	8.0 (El. 25.0)		20.0
B/MW-2	33.0	6.0 (El. 27.0)		16.0
B/MW-3	33.0	8.0 (El. 25.0)		16.0
B/MW-4	33.0	8.0 (El. 25.0)		16.0
B/MW-5	33.0	6.0 (El. 27.0)	7.0 (El. 26.0) – "Peat"	17.0
FSL August 2015 Investigations				
FSL-MW1	33.0	8.0 (El. 25.0)		
FSL-MW2	33.0	8.0 (El. 25.0)	12.0 (El. 21.0) – "Loam"	
DCI September 2016 Investigations				
B-201	33.0	6.0 (El. 27.0)	18.5 (El. 14.5)	27.0 (El. 6.0)
B-202	33.0	8.0 (El. 25.0)	28.5 (El. 4.5)	42.0 (El. -9.0)
B-203	33.5	5.5 (El. 28.0)	13.0 (El. 20.0)	27.0 (El. 6.5)

Groundwater Monitoring

Groundwater observations were made at the time of drilling and on September 27, 2016, DCI and SEC gauged the groundwater depths from the newly drilled borehole casing. The recent observations and historic levels are provided in **Table 2**.

Table 2
Summary of Groundwater Observations

Boring	Approx. Ground Elevation (NAVD88)	Est. Depth to Groundwater (Feet)	Groundwater Elevation (NAVD88)
McPhail June 2, 2010 (Well Stabilized)			
B/MW-1	33.0	8.3	24.7
B/MW-2	33.0	7.4	25.6
B/MW-3	33.0	7.2	25.8
B/MW-4	33.0	7.6	25.4
B/MW-5	33.0	7.2	25.8
FSL August 25, 2015 (Well Stabilized)			
FSL-MW1	33.0	9.1	23.9
FSL-MW2	33.0	10.3	22.7
DCI September 27, 2016 (Borehole Observation)			
B-201	33.0	8.0	25.0
B-202	33.0	9.0	24.0
B-203	33.5	7.0	26.5

On September 27, 2016, we observed groundwater across the Site ranged from about 7-feet-deep (EL. 26.5 in boring B-203) to 9-feet-deep (EL. 24.0 in B-202). The groundwater results are consistent with the stabilized groundwater results made in June 2010 and are about 1.5 feet above the groundwater levels observed in August 2015. Groundwater levels across the site are expected to vary from those reported herein due to factors such as normal seasonal fluctuations, periods of heavy precipitation, and alterations of existing drainage patterns.

Findings

The subsurface investigations for the 3371 Washington Street Site borings generally encountered the following subsurface conditions from the ground surface to depth:

- Asphalt – Three borings (B-1, B-201 and B-203) encountered an approximate 3- to 4-inch layer of asphalt.
- Urban Fill – All borings encountered a layer of fill consisting of sand, with trace to little silt, and little gravel. The 2010 borings encountered loam, cinders, ash and brick in the fill. The fill is generally 5.5- to 8-feet deep. The fill density varies widely and is loose to very dense.
- Peat – Boring B-5 encountered a layer of “peat” at a depth of 6- to 7-feet. Black mottling was also observed in boring B-202 at a depth of 6- to 7-feet.
- Clay – Boring B-203 encountered a layer of soft clay from a depth of about 5.5- to 9.5-feet.
- Sand and Silty Sand – Below the fill, peat and soft clay, all borings encountered a natural layer of sand and silty sand, with varying amounts of silt and gravel at a depth of about 6- to 20-feet. The layer typically extends to a depth of about 14- to 15-feet, with the exception of the deeper layer encountered in the vicinity of boring B-2. The more shallow sand and gravel is medium dense to dense. The deeper silty sand is loose to medium dense.
- Sandy Silt and Clay – Below the silty sand, six borings (B-2, B-4, B-5, B-201, B-202 and B-203) encountered a fine sandy silt and clay at 12- to 15-feet deep. The layer is typically medium stiff to very stiff with the exception of the upper soft zone encountered at boring B-201 to 18-feet-deep and B-2 to 23-feet-deep.

As noted above, the groundwater across the Site on September 26, 2016 ranged from about 7-feet-deep (EL. 26.5) in boring B-203 to 9-feet-deep (EL. 24.0) in B-202. The groundwater results are consistent with the stabilized groundwater results made in June 2010 and are about 1.5 feet above the groundwater levels observed in August 2015. Groundwater levels across the site are expected to vary from those reported herein due to factors such as normal seasonal fluctuations, periods of heavy precipitation, and alterations of existing drainage patterns. We recommend a design high groundwater level of El. 28.5.

Conclusions and Recommendations

The geotechnical investigations presented herein provide a general idea of the existing conditions and foundation needs for the Site development. The attached information can be used to develop the final geotechnical design requirements.

A review of the borings indicates that 5.5- to 8-feet of unsuitable fill has been placed over some “peat” in the vicinity of boring B-5 and stratified natural layers of sand and gravel, silty sand and silt/clay. Sections of the natural silty sand from 15- to 25-feet deep are loose. Two foundation options are available: (1) low pressure continuous and/or spread footings, as long as near surface, unsuitable fill

materials and organic soil (“peat”) are over-excavated and replaced with compacted structural fill, or (2) use of a deep foundation system such as helical piles, or rammed aggregate piers. For Option 1, it is anticipated that the footings will bear on compacted structural fill and the natural stratified soils. For Option 2, it is anticipated that the deep foundation will extend into the medium stiff to stiff silty sand or silt/clay

Foundations and retaining walls must be designed and constructed in accordance with the Massachusetts State Building Code (780 CMR 18). We recommend the following:

- All excavation activities and soil management planning should be coordinated with any environmental findings and conclusions. The combined geotechnical and environmental findings, conclusions and recommendations will dictate the final bottom of footing elevations.
- *Following demolition of the existing structure at 3371 Washington Street, two additional borings should be drilled on the south part of the Site in order to confirm the soil conditions and recommendations described herein.*
- Work shall be conducted in-the-dry and existing subgrades should be proof rolled.
- For Option 1 – Continuous Spread Footings
 - Dimensions shall be designed in accordance with the Massachusetts State Building Code (780 CMR 18). The minimum footing vertical depth shall be 1 foot and the minimum horizontal width of continuous footings shall be 2 feet. The bottom of footings shall be placed a minimum of 4-feet below the final grade for frost protection.
 - The existence of a 5.5- to 8-foot deep layer of fill and “peat” at 6’ to 7-feet requires the over-excavation of unsuitable materials from below proposed footings, or installing footing below these materials. This must be accomplished while working in-the-dry.
 - All unsuitable soil (fill or remnants of former topsoil) shall be removed and replaced with clean structural fill that is compacted to 95% of the maximum dry density as determined by modified proctor (ASTM D1557-C). Clean structural fill shall also be placed against foundations and walls. Structural fill shall meet the following grain size requirements:

Sieve Size	Percent Finer by Weight
8-inch	100 (1)
3-inch	70-100
1-inch	45-90
No. 4	20-70
No. 10	15-60
No. 40	10-40

Sieve Size	Percent Finer by Weight
No. 200	0-10
<i>Notes:</i> <i>(1) Three-inch maximum particle size within 12 inches of slab, footing or pavement grade.</i>	

- In general, the foundations are anticipated to be founded on 2- to 4.5-feet of compacted structural fill and the natural stratified soils. In accordance with Massachusetts Building Code (780 CMR 18), Table 1804.3, we recommend an allowable net bearing pressure of 1 tons per square foot (TSF) for the deeper loose silty sand and soft clay.
- For design purposes, the structural fill shall be assumed to have a dry unit weight of 120 pounds per cubic foot (pcf); a friction angle of 32° ; a coefficient of passive earth pressure (K_p) of 3.25; and a coefficient of active earth pressure (K_A) of 0.30.
- For Option 2, the deep foundation system will extend at least five feet into the underlying medium stiff to still silty sand or silt/clay. Since the lateral extent and depth of unsuitable materials vary across the Site, it is anticipated that the pile or pier depths will vary from about 13- to 25-feet-deep.
- Groundwater across the Site ranged from about 7-feet-deep (EL. 26.5) in boring B-203 to 9-feet-deep (EL. 24.0) in B-202. The groundwater results are consistent with the stabilized groundwater results made in June 2010 and are about 1.5 feet above the groundwater levels observed in August 2015. Groundwater levels across the site are expected to vary from those reported herein due to factors such as normal seasonal fluctuations, periods of heavy precipitation, and alterations of existing drainage patterns. We recommend a design high groundwater level of El. 28.5, about 4.5 feet below the existing ground surface.
- In order to promote positive drainage away from foundations, we recommend that structural details incorporate best management groundwater practices in accordance with the Massachusetts Building Code (780 CMR 1806.5 and 1807.4.2). Section 1807.4.2 allows for the use of a properly filtered gravel or crushed stone as a foundation drain. The drain shall extend a minimum of 12-inches outside the edge of the footing and shall not extend to 6-inches from the top of the footing. If a drain tile or perforated pipe is used the pipe invert shall not be higher than the floor elevation.
- Given the nature of the Site, there is high potential for liquefaction. In accordance with 780 CMR 9.4.1.2.1 the Site is a Class E, and under 780 CMR 16 Table 1604.11, the seismic loads for Boston are $S_s=0.29$ and $S_1=0.068$.

- All excavations shall be carefully designed and managed so as not to undermine adjacent structures or violate local, state and federal safety requirements, such as Jackies Law and OSHA standards. The minimum ratio to prevent undermining of adjacent footings and structures is 1 horizontal to 1 vertical (1H:1V).
- A professional structural engineer shall be engaged to design all structures in accordance with the Massachusetts State Building Code. The structural engineer shall determine the appropriate factors of safety and the varying surcharge loads against each structure. We also recommend that a licensed geotechnical engineer be engaged during the design and construction process to ensure that our recommendations have been met.

Closing

The analyses and recommendations submitted in this letter report are based in part upon the data obtained from the subsurface explorations. The nature and extent of variations across the Site may not become evident until further explorations are conducted or until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this letter.

The estimated groundwater levels in the borings are based on observations made during the borehole advancement and under the conditions stated on the logs. It is noted that fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time the borings were advanced.

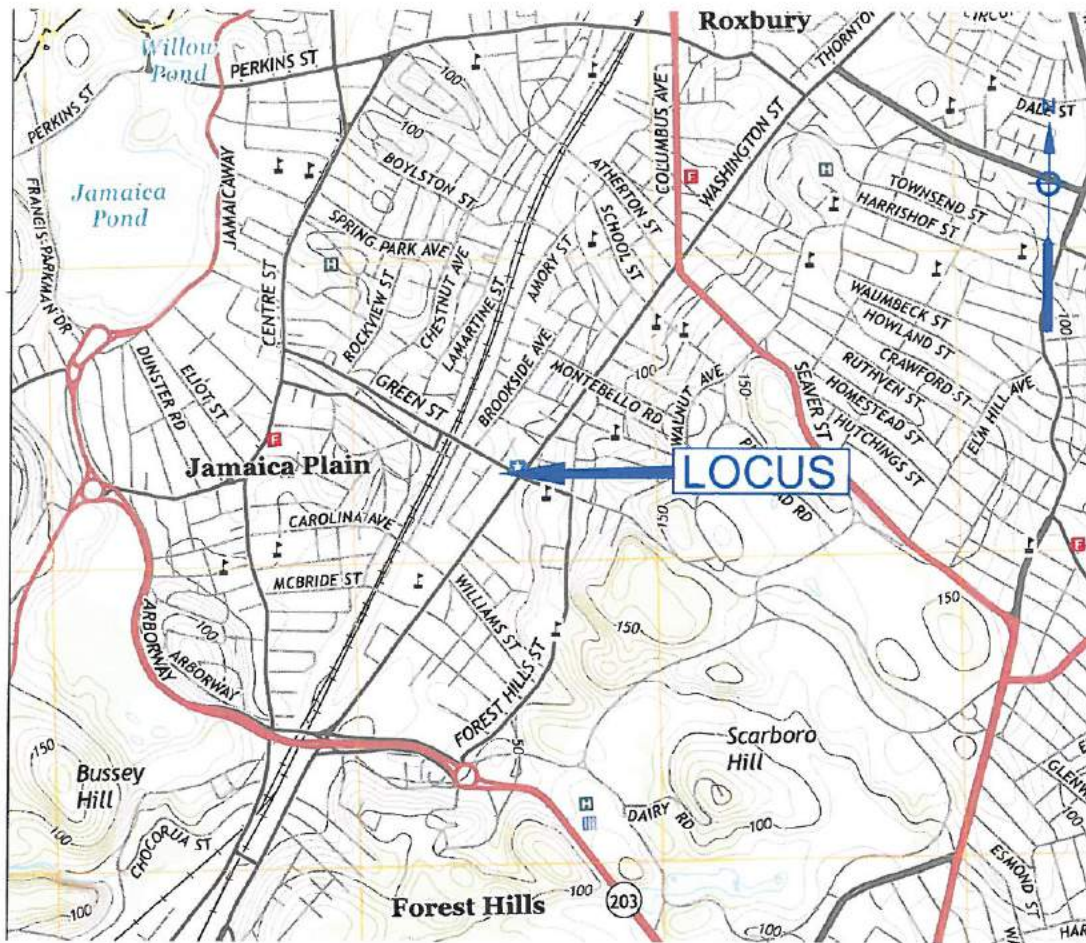
In the event that any changes in the nature, design or location of the proposed 3371 Washington Street development are planned, the conclusions and recommendations contained in this letter report shall not be considered valid unless the changes are reviewed and conclusions of this report is modified or verified in writing by DCI. This preliminary geotechnical investigation report has been prepared for CRM and the 3371 Washington Street project. Our report is sufficient for final design and should be supplemented with detailed earthwork specifications for construction purposes. The specifications should be prepared by a licensed geotechnical engineer.

Should you have any questions or require additional information, please do not hesitate to call us. We can be reached at 617-689-1010.

Sincerely
Design Consultants Inc.

Michael F. Clark, P.E.
Principal-In-Charge

Attachments



SCALE: 1" = 2,000'

LATITUDE: 42.309° N
 LONGITUDE: 71.105° W

REF: USGS TOPO QUAD
 BOSTON SOUTH, MA
 2015

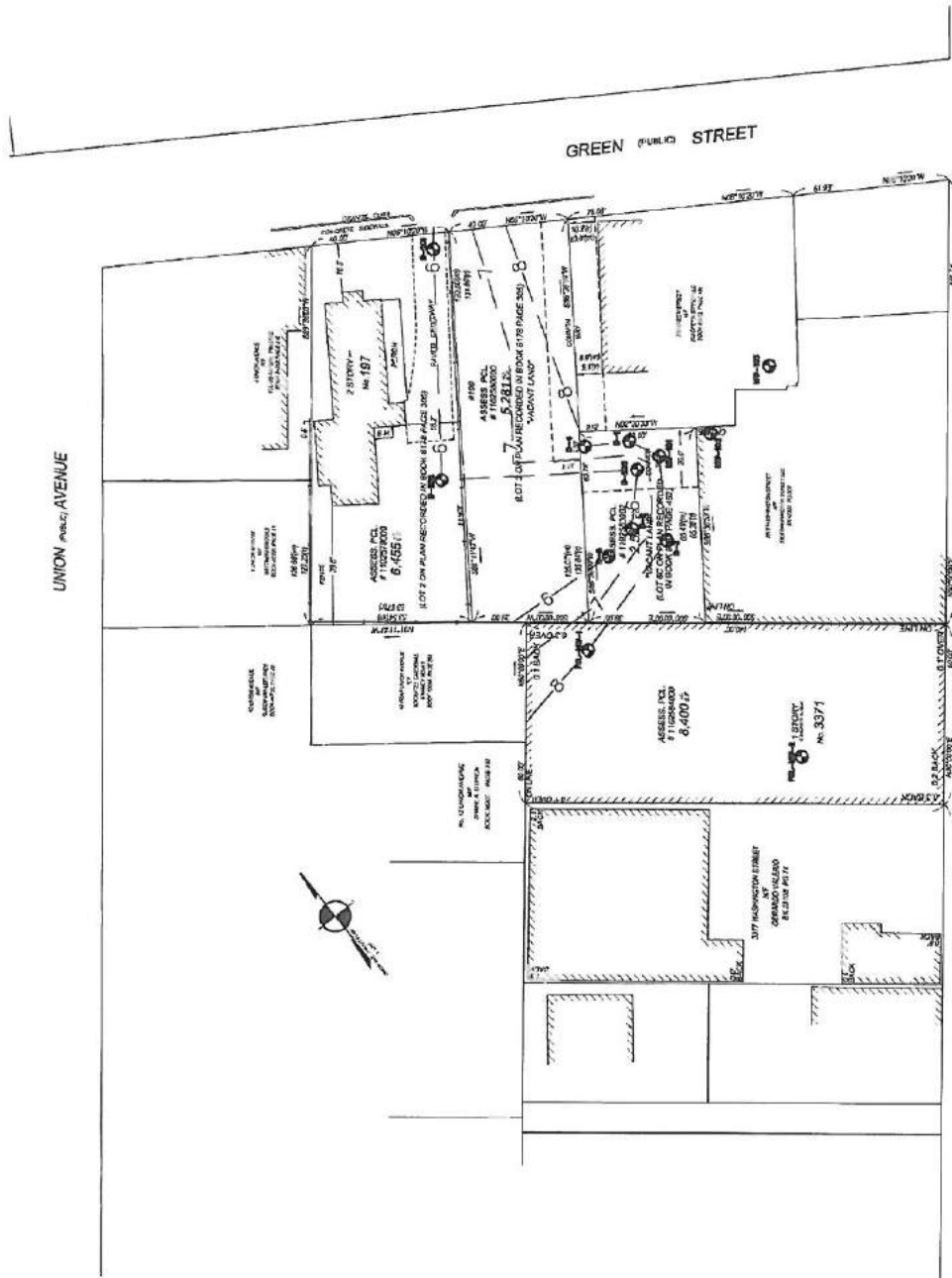
FIGURE 1

SITE LOCATION MAP
 3371 WASHINGTON STREET
 JAMAICA PLAIN, MA
Design Consultants, Inc.
 CIVIL ENGINEERS and LAND SURVEYORS

SOMERVILLE • NEWBURYPORT • QUINCY

NOTES:

- 1) BASE PLAN AND SURVEY INFORMATION BASED ON "SITE PLAN OF LAND LOCATED AT 197-201 GREEN STREET, 3371 WASHINGTON STREET -JAMAICA PLAIN, MA" DATED OCTOBER 30, 2015 AND COMPLETED BY BOSTON SURVEY, INC.



LEGEND:

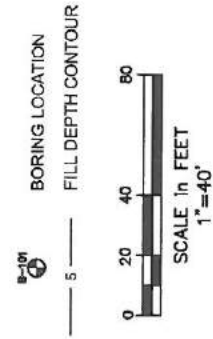


Figure 2

BORING LOCATIONS
 3371 WASHINGTON STREET
 JAMAICA PLAIN, MA
Design Consultants, Inc.
 CIVIL ENGINEERS AND LAND SURVEYORS
 100 WASHINGTON STREET, SUITE 200
 BOSTON, MA 02111
 TEL: 617-552-1100
 WWW.DCI-MA.COM



Geotechnical Engineers

APPENDIX B

Carr-Dee Corp.
Boring Logs

Boring Logs
by Others

McPhail Associates, Inc.
Groundwater Monitoring Report

CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: **McPHAIL ASSOCIATES, INC.** 2269 MASS, AVE. CAMBRIDGE, MA

Date: 5-28-2010

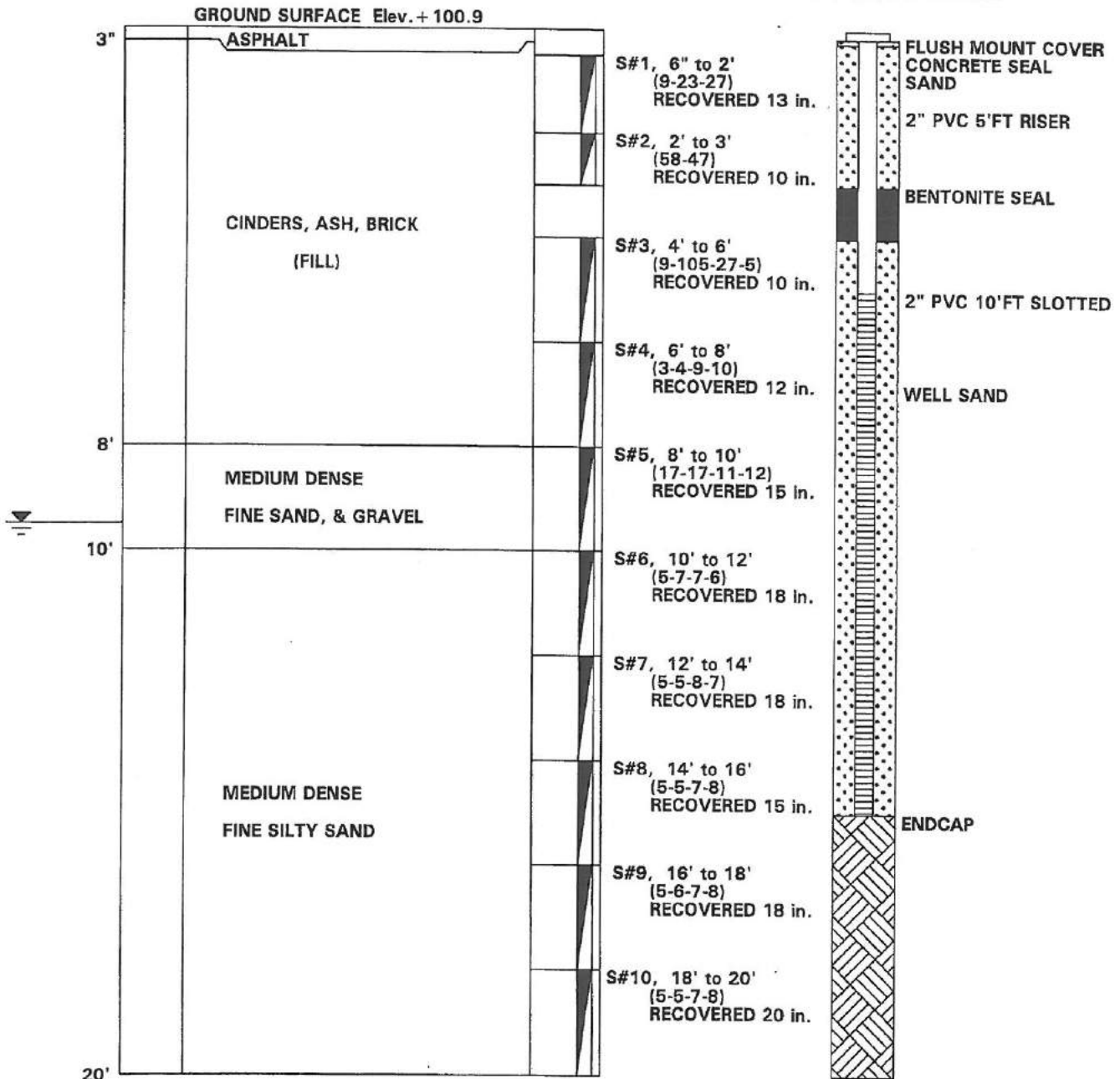
Job No.: 2010-80

Location: 197 GREEN STREET, JAMAICA PLAIN, MA

Scale: 1 in. = 3 ft.

BORING 1

MONITORING WELL



All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, INC. 2269 MASS. AVE. CAMBRIDGE, MA

Date: _____

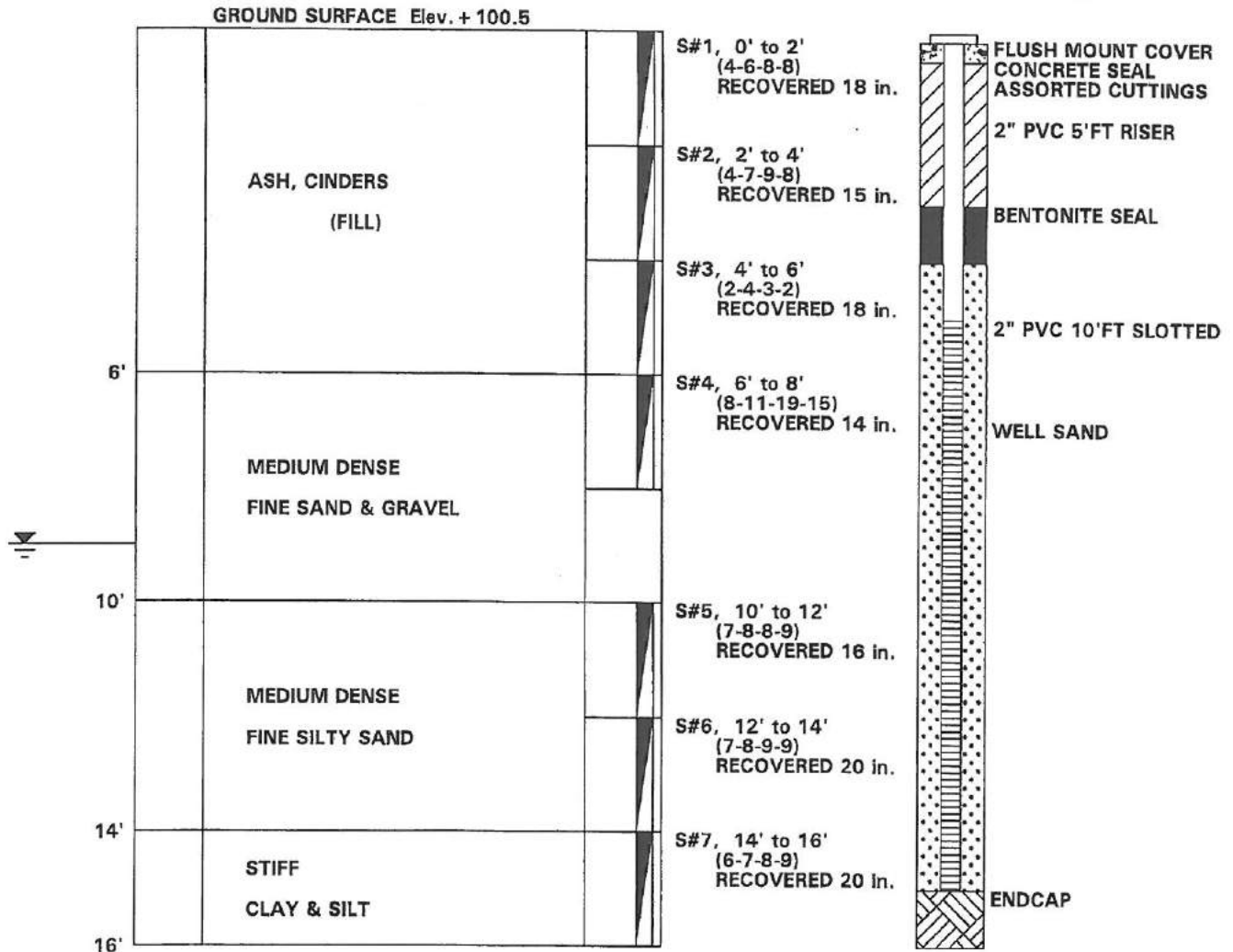
Job No.: 2010-80

Location: 197 GREEN STREET, JAMAICA PLAIN, MA

Scale: 1 in. = 3 ft.

BORING 2

MONITORING WELL



WATER LEVEL 9'
 SIZE OF AUGERS 3-3/4" I.D. LENGTH 14'0"
 DRILLER: J.CENTRELLA, INSPECTOR: T.CORMICAN
 DATE STARTED & COMPLETED 5-24-2010

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, INC. 2269 MASS. AVE. CAMBRIDGE, MA

Date:

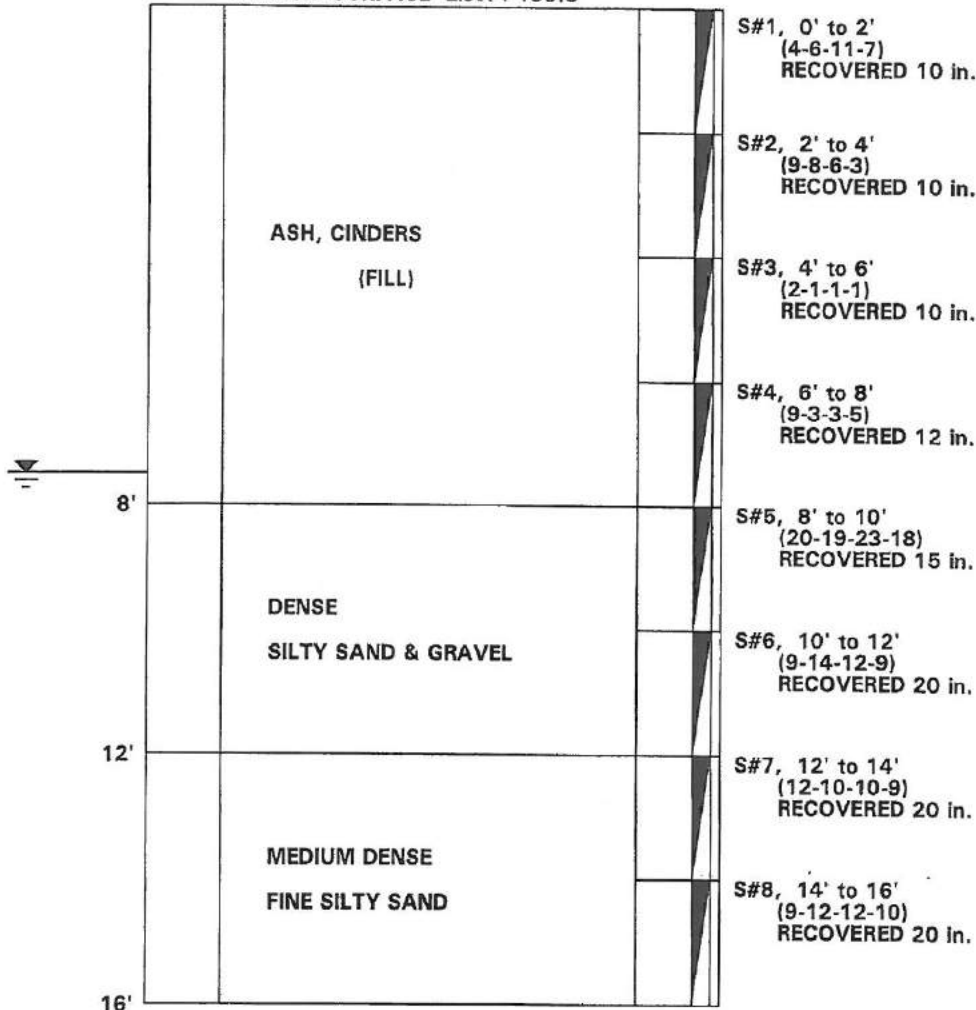
Job No.: 2010-80

Location: 197 GREEN STREET, JAMAICA PLAIN, MA

Scale: 1 in. = 3 ft.

BORING 3

GROUND SURFACE Elev. + 100.6



WATER LEVEL 7'6"
 SIZE OF AUGERS 3-3/4" I.D. LENGTH 14'0"
 DRILLER: J.CENTRELLA, INSPECTOR: T.CORMICAN
 DATE STARTED & COMPLETED 5-25-2010

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, INC. 2269 MASS. AVE. CAMBRIDGE, MA

Date:

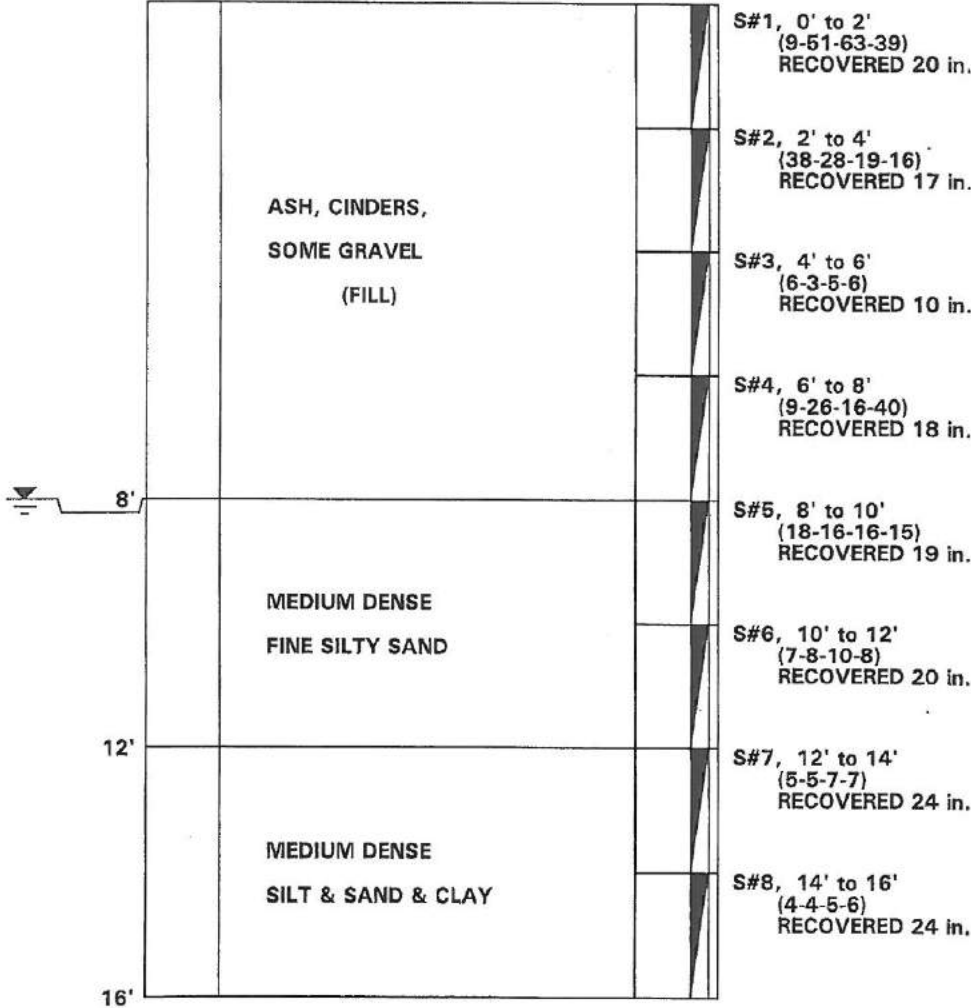
Job No.: 2010-80

Location: 197 GREEN STREET, JAMAICA PLAIN, MA

Scale: 1 in. = 3 ft.

BORING 4

GROUND SURFACE Elev. +100.3



WATER LEVEL 8'
 SIZE OF AUGERS 3-3/4" I.D. LENGTH 14'0"
 DRILLER: J.CENTRELLA, INSPECTOR: T.CORMICAN
 DATE STARTED & COMPLETED 5-25-2010

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, INC. 2269 MASS. AVE. CAMBRIDGE, MA

Date:

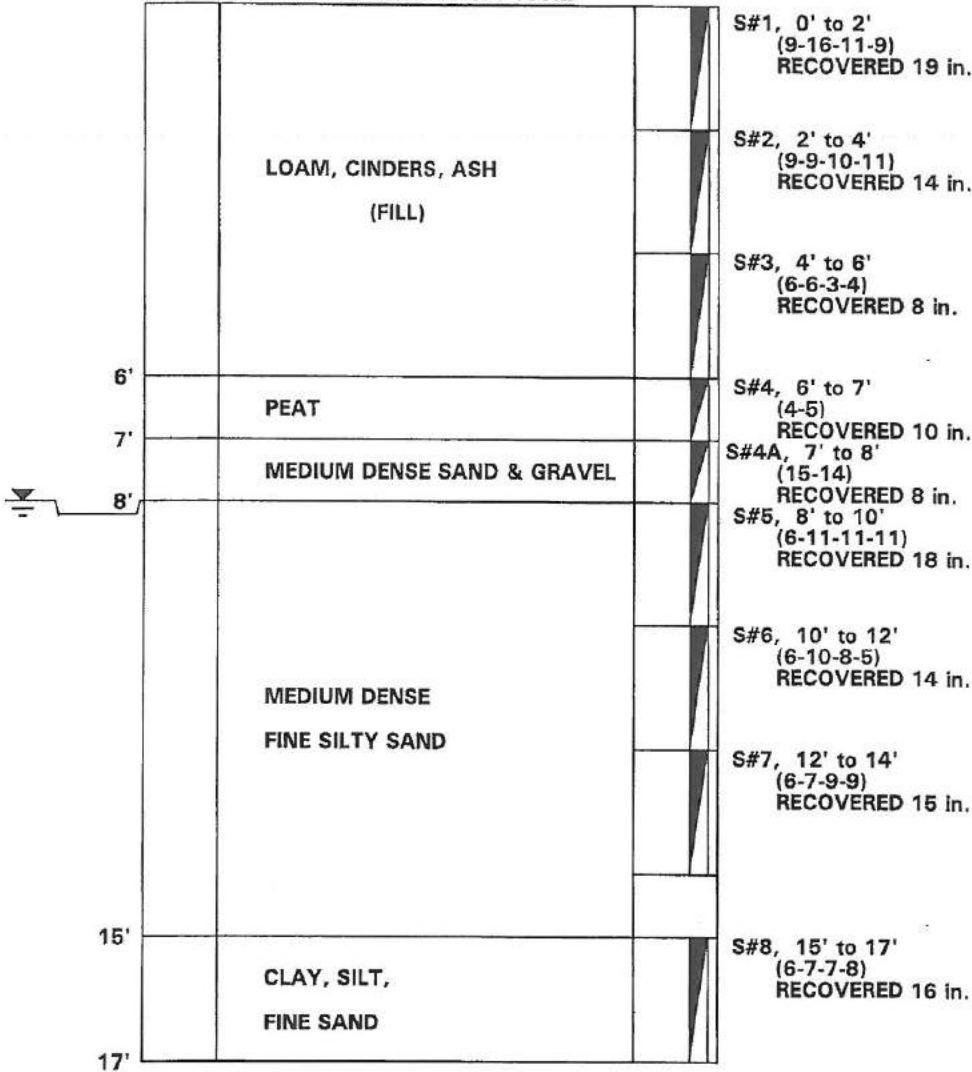
Job No.: 2010-80

Location: 197 GREEN STREET, JAMAICA PLAIN, MA

Scale: 1 in. = 3 ft.

BORING 5

GROUND SURFACE Elev. + 100.2



WATER LEVEL 8'
 SIZE OF AUGERS 3-3/4" I.D. LENGTH 15'0"
 DRILLER: J.CENTRELLA, INSPECTOR: T.CORMICAN
 DATE STARTED & COMPLETED 5-25-2010

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

NOVLR ARMSTRONG ASSOCIATES, INC.



TEST BORING LOG

BORING NUMBER: MW-101

PROJECT: Commercial Property

NAA PROJECT NUMBER: P1859
FIELD REP: M. Alger & Jessica Johnstone

LOCATION: 3357-3363 Washington Street
Jamaica Plain, Massachusetts

CLIENT: Mr. Mordechai Levin

CONTRACTOR: Bronson Drilling, Cambridge, MA

DRILLER: Dan Bronson

TYPE	SAMPLER	CASING	CORE BARREL	DEPTH TO GROUNDWATER	
Geoprobe	Steel	Steel	Steel	DATE	03/27/07
SIZE (ID)	1"	1"	2"	TIME	9:00 AM
HAMMER WEIGHT	NA	NA	--	DEPTH	6.69'
HAMMER FALL	NA	NA	--	SURFACE ELEV:	Top of Riser

SAMPLING INTERVALS					Strata Change	DESCRIPTION OF MATERIALS (Bermisler Soil Classification System)	Monitoring Well Construction Details / Materials
DEPTH (feet)	Sample ID #	REC/PEN Inches	Blows / 6" <small>1=standard</small>	PID (ppmv)			
0-4	S1	30/48	NA	NA		Paved at surface	1" PVC
4-8	S2	36/48	NA	NA		0'-4' Medium Brown to Black Medium Sand and Loose Black Ash. No Odor or Staining.	0'-8' Riser
8-12	S3	48/48	NA	50.4		4'-8' Medium Brown to Black Medium Sand and Blue Clay with Little Fine Gravel. No Staining. Petroleum Odor at 8'.	8'-16' Screen
12-16	S4	45/48	NA	NA		8'-12' Medium Brown Silt and Blue Clay. Black Stain and Petroleum Odor at 8'-10'.	
						12'-16' Blue Clay and Silt.	
						16' - End of Boring	

DRILLING RIG TYPE: Mobile Direct-Push Geoprobe
SURFACE ELEVATION: -40 feet
START DATE: 3/22/2007
END DATE: 3/22/2007

MONITORING WELL INSTALLED.
RISER FROM: 0 TO: 6' **SCREEN FROM:** 6' TO: 16'
Filter Sand: #2 Sand Pack Interval 5'-16"
Bentonite Seal Intervals 4'-5'

PROPORTIONS USED	RELATIVE DENSITY	CONSISTENCY	SOIL CLASSIFICATION (inches)		SUMMARY
Trace 0-10%	0-4 Very Loose	0-2 Very Soft	Boulders >11.8	Fine Sand .02-.003	Overburden (feet): >16'
Little 10-20%	4-10 Loose	2-4 Soft	Cobbles 11.8-2.9	Fine Silt <.003	Rock Cored (feet): 0
Some 20-35%	10-30 Medium Dense	4-8 Medium Stiff	Coarse Gravel 2.9-.75	Clay <.003	# of samples: 4
and 35-50%	30-50 Dense	8-15 Stiff	Fine Gravel .75-.19		Well set (feet): 16.0
	50+ Very Dense	15-30 Very Stiff	Coarse Sand .19-.08		
		30+ Hard	Medium Sand .08-.02		

NOVER-ARMSTRONG ASSOCIATES INC.



TEST BORING LOG

BORING NUMBER: MW-102

PROJECT: Commercial Property	NAA PROJECT NUMBER: P1859
LOCATION: 3357-3363 Washington Street Jamaica Plain, Massachusetts	FIELD REP: M. Alger & Jessica Johnstone
CONTRACTOR: Bronson Drilling, Cambridge, MA	CLIENT: Mr Mordechai Levin
	DRILLER: Dan Bronson

TYPE	SAMPLER	CASING	CORE BARREL	DEPTH TO GROUNDWATER	
Geoprobe	Steel	Steel	Steel	DATE	03/27/07
SIZE (ID)	1"	1"	2"	TIME	9:00 AM
HAMMER WEIGHT	NA	NA	---	DEPTH	7.29'
HAMMER FALL	NA	NA	---	SURFACE ELEV:	Top of Riser

SAMPLING INTERVALS					Strata Change	DESCRIPTION OF MATERIALS (Barmister Soil Classification System)	Monitoring Well Construction Details / Materials
DEPTH (feet)	Sample ID #	REC/PEN Inches	Blows / 6"	PID (ppmv)			
						<u>Paved at surface</u>	1" PVC
0-4	S1	30/48	NA	NA		<u>0'-4'</u> Light to Dark Brown Coarse Sand with some Medium Gravel. No Odor or Staining.	0'-8' Riser
4-8	S2	30/48	NA	NA		<u>4'-8'</u> Light to Medium Brown Coarse Sand to Silty Clay with Some Medium Gravel. No Odor or Staining.	6'-16' Screen
8-12	S3	48/48	NA	0.0		<u>8'-12'</u> Medium Brown Coarse Sand and Silt to Silty Blue Clay. Petroleum Odor and Black Staining at 12 feet. Not Enough to Sample (~1 inch lens).	
12-16	S4	48/48	NA	NA		<u>12'-16'</u> Blue Clay with Some Brown Silt.	
						16' - End of Boring	

DRILLING RIG TYPE: Mobile Direct-Push Geoprobe	MONITORING WELL INSTALLED:
SURFACE ELEVATION: ~40 feet	RISER FROM: 0 TO: 6' SCREEN FROM: 6' TO: 16'
START DATE: 3/22/2007	Filter Sand: #2 Sand Pnek Interval
END DATE: 3/22/2007	Bentonite Seal Intervals: 5'-16" / 4'-5'

PROPORTIONS USED	RELATIVE DENSITY	CONSISTENCY	SOIL CLASSIFICATION (inches)		SUMMARY
trace 0-10%	0-4 Very Loose	0-2 Very Soft	Boulders >11.8	Fine Sand .02-.003	Overburden (feet): >16'
little 10-20%	4-10 Loose	2-4 Soft	Cobbles 11.8-2.9	Fine Silt <.003	Rock Cored (feet): 0
some 20-35%	10-30 Medium Dense	4-8 Medium Stiff	Coarse Gravel 2.9-.75	Clay <.003	# of samples: 4
and 35-50%	30-50 Dense	8-15 Stiff	Fine Gravel .75-.19		Well set (feet): 16.0
	50+ Very Dense	15-30 Very Stiff	Coarse Sand .19-.08		
		30+ Hard	Medium Sand .08-.02		

NOVER-ARMSTRONG ASSOCIATES, INC.



TEST BORING LOG

BORING NUMBER: MW-103

PROJECT: Commercial Property	NAA PROJECT NUMBER: P1859
LOCATION: 3357-3363 Washington Street Jamaica Plain, Massachusetts	FIELD REP: M. Alger & Jessica Johnstone
CONTRACTOR: Bronson Drilling, Cambridge, MA	CLIENT: Mr. Mordechai Levin
	DRILLER: Dan Bronson

SAMPLER	CASING	CORE BARREL	DEPTH TO GROUNDWATER	
TYPE: Geoprobe	Steel	Steel	DATE: 03/27/07	
SIZE (ID): 1"	1"	2"	TIME: 9:00 AM	
HAMMER WEIGHT: NA	NA	---	DEPTH: 9.74'	
HAMMER FALL: NA	NA	---	SURFACE ELEV.: Top of Floor	

SAMPLING INTERVALS					Strata Change	DESCRIPTION OF MATERIALS (Burmester Soil Classification System)	Monitoring Well Construction Details / Materials
DEPTH (feet)	Sample ID #	REC/PEN Inches	Blows / 6" <small>sub/total</small>	PID (ppmv)			
0-4	S1	30/48	NA	NA		Paved at surface 0'-4' Light to Dark Brown Medium to Coarse Sand with Some Wood Ash and Coarse Gravel. No Odor or Staining.	1" PVC 0'-8' Riser
4-8	S2	30/48	NA	NA		4'-8' Medium Brown Coarse Sand to Tan Silt and Clay. No Odor or Staining.	6'-15' Screen
8-12	S3	20/48	NA	0.0		8'-12' Tan and Blue Silt and Clay. No Odor or Staining.	
12-16	S4	20/48	NA	NA		12'-16' Tan and Blue Silt and Clay. No Odor or Staining.	
						16' - End of Boring	

DRILLING RIG TYPE: Mobile Direct-Push Geoprobe	MONITORING WELL INSTALLED:
SURFACE ELEVATION: ~40 feet	RISER FROM: 0 TO: 6' SCREEN FROM: 6' TO: 16'
START DATE: 3/22/2007	Filter Sand: #2 Sand Pack Interval 5'-16'
END DATE: 3/22/2007	Bentonite Seal Intervals 4'-5'

PROPORTIONS USED	RELATIVE DENSITY	CONSISTENCY	SOIL CLASSIFICATION (inches)			SUMMARY
trace 0-10%	0-4 Very Loose	0-2 Very Soft	Boulders >11.8	Fine Sand .02-.003	Overburden (feet): >16'	
little 10-20%	4-10 Loose	2-4 Soft	Cobbles 11.8-2.9	Fine Silt <.003	Rock Cored (feet): 0	
some 20-35%	10-30 Medium Dense	4-8 Medium Stiff	Coarse Gravel 2.9-.75	Clay <.003	# of samples: 4	
and 35-50%	30-50 Dense	8-15 Stiff	Fine Gravel .75-.19		Well set (feet): 16.0	
	50+ Very Dense	15-30 Very Stiff	Coarse Sand .19-.08			
		30+ Hard	Medium Sand .08-.02			

GROUNDWATER MONITORING REPORT

Well I.D.		Elevation Subtrahend		Job. No.		
B-1 (OW)		+100.94		5114.9.00		
		(feet)		Job Name		
				197 Green Street		
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
5/24/2010	11:30	Initial	8.5	+92.44	Installed at 16.0 ft. and developed today	TMC
5/25/2010		1	8.05	+92.89	Before developing again	TMC
5/26/2010		2	8.05	+92.89		TMC
6/2/2010		9	8.3	+92.6		TMC

GROUNDWATER MONITORING REPORT

Well I.D.	B-2 (OW)	Elevation Subtrahend (feet)	+101	Job. No.	5114.9.00	Job Name	197 Green Street
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By	
5/24/2010	14:30	Initial	9.8	+90.74	Installed at 15.7 ft. and developed today	TMC	
5/25/2010		1	7.25	+93.29	Before developing again	TMC	
5/26/2010		2	7.25	+93.29		TMC	
6/2/2010		9	7.35	+93.2	Before sampling	TMC	

GROUNDWATER MONITORING REPORT

Well I.D. B-3 (OW)	Elevation Subtrahend (feet) +100.62	Job. No. 5114.9.00	Job Name 197 Green Street
---------------------------	--	---------------------------	----------------------------------

Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
5/25/2010		Initial	7.3	+93.32	Installed at 16.0 ft. and developed today	TMC
5/26/2010		1	7.05	+93.57	Before developing again	TMC
6/2/2010		8	7.2	+93.4	Before sampling	TMC

GROUNDWATER MONITORING REPORT

Well I.D.	B-4 (OW)	Elevation Subtrahend <small>(feet)</small>	+100.31	Job No.	5114.9.00	
				Job Name	197 Green Street	
Date	Time	Elapsed Time <small>(days)</small>	Depth of Water from R-Box Top <small>(feet)</small>	Elevation of Water <small>(feet)</small>	Remarks	Read By
5/25/2010	12:30	Initial	8.0	+92.31	Installed at 15.8 ft. and developed today	TMC
5/26/2010		1	7.4	+92.91	Before developing again	TMC
6/2/2010		8	7.55	+92.8	Before sampling	TMC

GROUNDWATER MONITORING REPORT

Well I.D.		Elevation Subtrahend		Job No. 5114.9.00		
B-5 (OW)		+100.24		Job Name 197 Green Street		
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
5/25/2010	15:30	Initial	9.6	+90.64	Installed at 15.7ft. and developed today	TMC
5/26/2010		1	7.15	+93.09	Before developing again	TMC
6/2/2010		8	7.15	+93.1		TMC

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 70'S, CLOUDY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-201
Location: See Plan
Approx. Ground Elevation: 33'
Approx. Groundwater Elevation: 25'
Date/Time of Groundwater Elevation: 12:40 PM
Datum: NAVD 88
Project No.: 2016-102

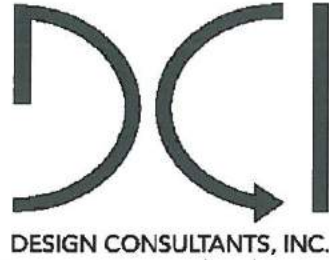
Depth (feet)	Sample No.	Blows per 6-Inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
				3" of ASPHALT	.25'	ASPHALT	
1		8		S-1, SAND, Little Gravel, Trace Silt, Brown, Dry, Dense		FILL	(1)
2	S-1	14	24"/16"				
3		16					
4		20					
5		12		S-2, SAND, Little Silt, Tan, Dry, Medium Dense	6'		
6	S-2	8	24"/14"				
7		8					
8		7					
9				S-3, SAND, Some Silt, Yellow-Tan, Wet, Loose		SILTY SAND	
10		3					
11	S-3	2	24"/22"				
12		3					
13		2					
14					14.5'		
15		1		S-4, SILT, Little Sand, Grey, Wet, Soft		SANDY SILT	
16	S-4	1	24"/24"				
17		1					
18		2					
19							
20							

NOTES:
(1) Water observed at 8' below grade

LEGEND	
S - Split Spoon Sample	O/A - Sample Collected Off the Augers
UT - Undisturbed Tube Sample	
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%
Little - Approximately 10 to 20%	And - Approximately 35 to 50%
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff
4-8 Fine Soil N Value - Medium Stiff	>30 Fine Soil N Value - Hard
	15-30 Fine Soil N Value - Very Stiff

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 70'S, CLOUDY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-201
Location: See Plan
Approx. Ground Elevation: 33'
Approx. Groundwater Elevation: 25'
Date/Time of Groundwater Elevation: 12:40 PM
Datum: NAVD 88
Project No.: 2016-102

Depth (feet)	Sample No.	Blows per 6-inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
21	S-5	2	24"/19"	S-5, SILT, Some Sand, Grey, Wet, Medium Stiff		SANDY SILT	
22		2					
23		3					
24		3					
25	S-6	1	24"/24"	S-6, Similar to S-4			
26		2					
27		2					
28		3					
29				BOTTOM OF BORING AT 27'			
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							

NOTES:

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers	
UT - Undisturbed Tube Sample		
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%	
Little - Approximately 10 to 20%	And - Approximately 35 to 50%	
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense	
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense	
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff	>30 Fine Soil N Value - Hard
4-8 Fine Soil N Value - Medium Stiff	15-30 Fine Soil N Value - Very Stiff	

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 70'S, CLOUDY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-202
Location: See Plan
Approx. Ground Elevation: 33'
Approx. Groundwater Elevation: 24'
Date/Time of Groundwater Elevation: 10:20 AM
Datum: NAVD 88
Project No.: 2016-102

Depth (feet)	Sample No.	Blows per 6-inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
1	S-1	4	24"/16"	S-1, Top 5" TOPSOIL Bottom 11", SAND, Little Silt Little Gravel, Brown, Dry, Medium Dense	.5'	TOPSOIL	(1)
2		6					
3		8					
4		11				FILL	
5	S-2	13	24"/11"	S-2, Top 6", Similar to S-1, Bottom 5", SAND, Some Silt, Little Gravel, Brown, Red & Black Mottling, Moist, Medium Dense	6'		
6		8					
7		5					
8		11					
9							
10	S-3	5	24"/22"	S-3, SAND, Some Silt, Yellow-Tan, Wet, Loose	14'	SILTY SAND	
11		5					
12		3					
13		3					
14							
15	S-4	1/12"	24"/20"	S-4, SILT, Some Sand, Grey, Wet, Soft		SANDY SILT	
16		1					
17		3					
18							
19							
20							

NOTES:

(1) Water observed at 9' below grade.

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers
UT - Undisturbed Tube Sample	
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%
Little - Approximately 10 to 20%	And - Approximately 35 to 50%
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff
4-8 Fine Soil N Value - Medium Stiff	>30 Fine Soil N Value - Hard
	15-30 Fine Soil N Value - Very Stiff

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 70'S, CLOUDY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-202
Location: See Plan
Approx. Ground Elevation: 33'
Approx. Groundwater Elevation: 24'
Date/Time of Groundwater Elevation: 10:20 AM
Datum: NAVD 88
Project No. 2016-102

Depth (feet)	Sample No.	Blows per 6-Inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
21	S-5	1	24"/24"	S-5, Similar to S-4			
22		1					
23		2					
24		4					
25		1	24"/24"	S-6, Similar to S-5			
26	S-6	2					
27		2					
28		2					
29			24"/24"	S-7, Similar to S-6, Medium Stiff		SANDY SILT	
30		2					
31	S-7	3					
32		3					
33		4	24"/21"	S-8, Similar to S-7			
34		4					
35		3					
36	S-8	4					
37		6					
38							
39							
40							

NOTES:

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers
UT - Undisturbed Tube Sample	
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%
Little - Approximately 10 to 20%	And - Approximately 35 to 50%
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff
4-8 Fine Soil N Value - Medium Stiff	>30 Fine Soil N Value - Hard
	15-30 Fine Soil N Value - Very Stiff

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 70'S, CLOUDY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-202
Location: See Plan
Approx. Ground Elevation: 33'
Approx. Groundwater Elevation: 24'
Date/Time of Groundwater Elevation: 10:20 AM
Datum: NAVD 88
Project No.: 2016-102

Depth (feet)	Sample No.	Blows per 6-inch	Pen./Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
41	S-9	4 7 9 13	24"/18"	S-9, Similar to S-8, Olive, Very Stiff		SANDY SILT	
42				BOTTOM OF BORING AT 42'			
43							
44							
45							
46							
47							
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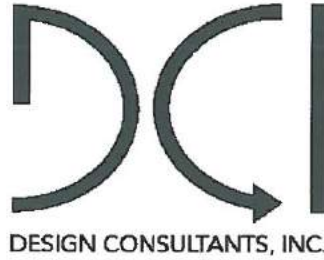
NOTES:

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers
UT - Undisturbed Tube Sample	
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%
Little - Approximately 10 to 20%	And - Approximately 35 to 50%
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff
4-8 Fine Soil N Value - Medium Stiff	>30 Fine Soil N Value - Hard
	15-30 Fine Soil N Value - Very Stiff

BORING LOG

Project: 3371 WASHINGTON STREET
Location: JAMAICA PLAIN, MA
Client: CRM DEVELOPMENT CORP.
Driller: SOIL EXPLORATIONS
Drilling Methods: HOLLOW STEM AUGER
Weather: 60'S, RAINY
Performed By: PJS **Date:** 9/27/16
Checked By: PGC **Date:** 10/16/16



Boring No: B-203
Location: See Plan
Approx. Ground Elevation: 33.5'
Approx. Groundwater Elevation: 26.5'
Date/Time of Groundwater Elevation: 8:00 AM
Datum: NAVD 88
Project No.: 2016-102

Depth (feet)	Sample No.	Blows per 6-inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
1		14		4" of ASPHALT	.33'	ASPHALT	
2	S-1	10	24"/20"	S-1, Top 14", SAND, Little Silt, Little, Gravel, Black, Dry, Dense, Bottom 6", SAND, Little Silt, Little Gravel, Olive, Dry, Dense		FILL	
3		21					
4		20					
5		3			5.5'		
6	S-2	1	24"/18"	S-2, Top 6", Similar to bottom of S-1, Bottom 12", CLAY, Some Sand, Little Gravel, Grey, Moist, Soft		CLAY	(1)
7		1					(2)
8		2					
9					9.5'		
10		4					
11	S-3	4	24"/16"	S-3, SAND, Some Silt, Grey, Wet, Loose		SILTY SAND	
12		4					
13		3			13		
14		4					
15		5					
16	S-4	5	24"/15"	S-4, SILT, Some Sand, Grey, Wet, Stiff		SANDY SILT	
17		6					
18		4					
19							
20							

NOTES:

- (1) Bottom 6" of S-2 smelled of petroleum
- (2) Water observed at 7' below grade

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers
UT - Undisturbed Tube Sample	
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%
Little - Approximately 10 to 20%	And - Approximately 35 to 50%
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff
4-8 Fine Soil N Value - Medium Stiff	>30 Fine Soil N Value - Hard
	15-30 Fine Soil N Value - Very Stiff

BORING LOG

Project: 3371 WASHINGTON STREET
 Location: JAMAICA PLAIN, MA
 Client: CRM DEVELOPMENT CORP.
 Driller: SOIL EXPLORATIONS
 Drilling Methods: HOLLOW STEM AUGER
 Weather: 60'S, RAINY
 Performed By: PJS Date: 9/27/16
 Checked By: PGC Date: 10/16/16



Boring No: **B-203**
 Location: **See Plan**
 Approx. Ground Elevation: **33.5'**
 Approx. Groundwater Elevation: **26.5'**
 Date/Time of Groundwater Elevation: **8:00 AM**
 Datum: **NAVD 88**
 Project No. **2016-102**

Depth (feet)	Sample No.	Blows per 6-inch	Pen./ Rec.	Soil Description	Stratum Change Depth (feet)	Stratum	Note No.
21	S-5	4	24"/17"	S-5, Similar to S-4, Medium Stiff		SANDY SILT	
22		3					
23		3					
24		4					
25	S-6	3	24"/21"	S-6, Similar to S-5			
26		3					
27		4					
28		5					
29				BOTTOM OF BORING AT 27'			
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							

NOTES:

LEGEND

S - Split Spoon Sample	O/A - Sample Collected Off the Augers	
UT - Undisturbed Tube Sample		
Trace - Approximately 0 to 10%	Some - Approximately 20 to 35%	
Little - Approximately 10 to 20%	And - Approximately 35 to 50%	
0-10 Coarse Soil N Value - Loose	30-50 Coarse Soil N Value - Dense	
10-30 Coarse Soil N Value - Medium Dense	>50 Coarse Soil N Value - Very Dense	
0-4 Fine Soil N Value - Soft	8-15 Fine Soil N Value - Stiff	>30 Fine Soil N Value - Hard
4-8 Fine Soil N Value - Medium Stiff	15-30 Fine Soil N Value - Very Stiff	

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
 - a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
 - a. <http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html>
3. Boston Complete Street Guidelines
 - a. <http://bostoncompletestreets.org/>
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
 - a. <http://www.cityofboston.gov/Disability>
5. City of Boston – Public Works Sidewalk Reconstruction Policy
 - a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
 - a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations

Article 80 | ACCESSIBILITY CHECKLIST

- a. [http://www.mbta.com/about the mbta/accessibility/](http://www.mbta.com/about_the_mbta/accessibility/)

Project Information

Project Name:	3371-3375 Washington Street
Project Address Primary:	3371-3375 Washington Street Jamaica Plain, MA 02130
Project Address Additional:	N/A
Project Contact (name / Title / Company / email / phone):	Jeffrey Drago / Drago & Toscano, LLP / jdrago@dtlawllp.com / 617.391.9450

Team Description

Owner / Developer:	CRM Property Development Corp.
Architect:	Embarc Studio LLC.
Engineer (building systems):	TBD
Sustainability / LEED:	TBD
Permitting:	Drago & Toscano, LLP
Construction Management:	TBD

Project Permitting and Phase

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

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

Article 80 | ACCESSIBILITY CHECKLIST

Building Classification and Description

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

Residential – One to Three Unit	Residential - Multi-unit, Four +	Institutional	Education
Commercial	Office	Retail	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List) <i>Commercial and Residential Lobby</i>			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete
------------	---------	-------------	----------

Describe the building?

Site Area:

22,663 SF
56 Ft.
0' Elev.

Building Area:

63,785 SF
5 Flrs.
No

Building Height:

Number of Stories:

First Floor Elevation:

Are there below grade spaces:

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.

The proposed site is in the Jamaica Plain neighborhood of Boston, situated between the Green Street Orange line Station to the west Franklin Park to the east. The current neighborhood is primarily single family residential developments with a

Article 80 | ACCESSIBILITY CHECKLIST

List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.

List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.

Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.

cluster of retail and commercial buildings at the intersection of Washington Street and Green Street

Green Street stop, Orange line, ¼ mile west of the proposed site / Washington St @ Green St, 42 Bus, adjacent to the proposed site

Surrounding institutions include the Pine Street Inn across Washington Street from the proposed site, the Boston Islamic Center adjacent to the site, and The English High School ½ mile south west from the proposed site. As well there are a number of non-profit organizations within walking distance including: the Center for Labor Education, Friends of the Children, and Strong Women Strong Girls.

The nearest facility in the neighborhood is the Boston Police District E-13 Station across Green St from the site, followed by Franklin Park’s Playground and Stadium ¾ of a mile to the west of the site.

Surrounding Site Conditions – Existing:

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

Are there sidewalks and pedestrian ramps existing at the development site?

If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.

Are the sidewalks and pedestrian ramps existing-to-remain? **If yes**, have the sidewalks and pedestrian ramps been verified as compliant? **If yes**, please provide surveyors report.

Yes.

Existing sidewalks are concrete with granite curbs, to be replaced with new construction.

No.

Article 80 | ACCESSIBILITY CHECKLIST

Is the development site within a historic district? **If yes**, please identify.

No.

Surrounding Site Conditions – Proposed

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

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org

No, The project only includes 60' of frontage on Washington Street. The available sidewalk width is 10'. The building is setback approximately 5' from the back of sidewalk. This area will be landscaped. The project could provide for street trees in the furnishing zone. The sidewalk is only 6' wide on Green Street only allowing for a pedestrian zone.

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.

The street types are Neighborhood Main on Washington Street and Neighborhood Connector on Green Street. There is not sufficient sidewalk widths to fully implement the complete streets design guidelines.

What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.

10' total width Washington Street, 3' Furnishing for Street Trees and 7' Pedestrian Zone. 6' total width on Green Street all allocated to pedestrian zone.

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?

Cement concrete proposed for pedestrian and furnishing zone between tree grates on Washington Street. Cement concrete proposed for Green Street.

If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?

N/A

Article 80 | ACCESSIBILITY CHECKLIST

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?

N/A

If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?

No Café proposed, Retail space proposed on Washington Street. Landscaping proposed in front of this area and Lobby for residential access.

Proposed Accessible Parking:

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

What is the total number of parking spaces provided at the development site parking lot or garage?

33

What is the total number of accessible spaces provided at the development site?

3, 1 Van accessible.

Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?

TBD

Where is accessible visitor parking located?

TBD

Has a drop-off area been identified? **If yes,** will it be accessible?

No, TBD.

Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry

Attached.

Article 80 | ACCESSIBILITY CHECKLIST

locations. Please include route distances.

--

Circulation and Accessible Routes:

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

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

Provide a diagram of the accessible route connections through the site.

Attached.

Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.

Residential Lobbies to be a flush condition with the sidewalk at building exterior, are is the Commercial Space entries. The rear entry to the lobbies is to be a flush doorway condition from the garage through the egress stairway, from the Lobby elevator access will provide access to upper floors.

Are the accessible entrance and the standard entrance integrated?

Yes.

If no above, what is the reason?

N/A

Will there be a roof deck or outdoor courtyard space? **If yes**, include diagram of the accessible route.

No.

Has an accessible routes way-finding and signage package been developed? **If yes**, please describe.

No, TBD.

Accessible Units: (If applicable)

Article 80 | ACCESSIBILITY CHECKLIST

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

What is the total number of proposed units for the development?

58

How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?

58 units for rent, 10 affordable and 48 market rate

How many accessible units are being proposed?

55 units will meet Group 1 requirements, 3 will meet Group 2 accessibility requirements.

Please provide plan and diagram of the accessible units.

Specific unit plans have not been developed.

How many accessible units will also be affordable? If none, please describe reason.

TBD

Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes**, please provide reason.

No

Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?

No.

Did the Advisory Board vote to support this project? **If no**, what recommendations did the Advisory Board give to make this project more accessible?

N/A

Article 80 | ACCESSIBILITY CHECKLIST

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities

Design Consultants, Inc.

120 Middlesex Ave. Suite 20
Somerville, MA 02145
(617) 776-3350

MEMORANDUM

DCI Project No. 2016-102

TO: Josh Fetterman
CRM Development Corporation
320 Washington Street, Suite 3FF
Brookline, MA 02445

CC:

FROM: Tom Bertulis, M.S., P.E, P.T.O.E.

SUBJECT: **Reduction in Number of Residential Units at 3371-3375 Washington Street in Jamaica Plain, MA**

DATE: December 29, 2016

This memorandum has been prepared by Design Consultants, Inc. (DCI) to supplement the *Traffic Impact and Access Study (TIAS)* dated December 2016, prepared by DCI.

The TIAS, dated December 2016, included the study of two proposed buildings that were to consist of 58 total residential dwelling units, 1,775 total square feet of retail space, and 33 total parking spaces. After additional planning and design, the new plan, created by EMBARC Studio, LLC, includes a reduction in the size of the retail space, from 1,775 square feet to 1,730 square feet.

As shown in Table 1, the original design was expected to generate 26 vehicle-trips during the morning peak hour and 20 vehicle-trips during the evening peak hour. With the reduction in retail space square footage, the total number of vehicle trips is expected to decrease. As shown in Table 2, the updated design is expected to generate 25 vehicle-trips during the morning peak hour and 20 vehicle-trips during the evening peak hour. This corresponds to a reduction in vehicle-trips of **one (1)** during the morning peak hour and **zero (0)** during the evening peak hour, as shown in Table 3. Preliminary trip generation calculations and mode splits can be found in the Appendix.

Table 1: Trip Generation Calculations – December 2016 TIAS (58 Units and 1,775 sq. feet of Retail)

	AM Peak Hour	PM Peak Hour
Base Trips	63	49
Total Person-Trips	74	58
Total Vehicle Trips	26	20
Entering Vehicle-Trips	5	13
Exiting Vehicle-Trips	21	7
Total Public Transportation Trips	31	24
Total Bicycle Trips	4	3
Total Walking Trips	4	3
Other Trips	9	8

Table 2: Trip Generation Calculations – Updated Design (58 Units and 1,730 sq. feet of Retail)

	AM Peak Hour	PM Peak Hour
Base Trips	61	48
Total Person-Trips	72	57
Total Vehicle Trips	25	20
Entering Vehicle-Trips	5	13
Exiting Vehicle-Trips	20	7
Total Public Transportation Trips	30	23
Total Bicycle Trips	4	3
Total Walking Trips	4	3
Other Trips	9	8

Table 3: Net Reduction in Vehicle-Trips

<i>Reduction in Vehicle-Trips</i>	AM Peak Hour	PM Peak Hour
December 2016 TIAS (58 Units, 1,775 sq. feet of Retail)	26	20
Updated Design (58 Units, 1,730 sq. feet of Retail)	25	20
Net Reduction	1	0

Given that the current proposal consists of 45 fewer square feet of retail space than the total square footage of retail space included in the December 2016 TIAS, it is expected that there will be a decrease in projected trips for this project. Accordingly, it is expected that there will also be a reduction in project related impacts due to traffic in the surrounding neighborhood as compared to the December 2016 TIAS. Therefore, DCI recommends that further traffic impact study not be undertaken for this site.

TABLE OF CONTENTS

2.0 Transportation	4
2.1 Introduction	4
2.1.1 Project Description	4
2.1.2 Methodology	4
2.1.3 Study Area.....	5
2.2 Transportation System Existing Conditions.....	6
2.2.1 <i>Intersection Conditions</i>	6
2.2.2 Study Roadways.....	11
2.2.3 <i>Traffic Conditions</i>	17
2.2.3.1 Traffic Operations	18
2.2.4 <i>On-Street Parking</i>	22
2.2.5 <i>Public Transportation in the Study Area</i>	22
2.2.6 <i>Car Sharing</i>	22
2.2.7 <i>Pedestrian Access and Circulation</i>	23
2.2.8 <i>Bicycle Access and Circulation</i>	23
2.2.9 <i>Loading and Service</i>	28
2.3 Evaluation of Long-term Impacts	28
2.3.1 <i>No-Build Conditions</i>	28
2.3.1.1 Background Traffic Growth.....	28
2.3.1.2 <i>No-Build Conditions Traffic Operations</i>	29
2.3.2 <i>Build Conditions</i>	33
2.3.2.1 Site Access and Circulation	33
2.3.2.2 Trip Generation and Mode Split	33
2.3.2.3 Site Generated Trips.....	38
2.3.2.4 Build Conditions Traffic Operations.....	38
2.3.2.5 Build Conditions Parking Supply	43
2.3.2.6 Build Bicycle and Pedestrian Conditions.....	44
2.3.2.7 Build Bicycle Accommodations	45
2.3.2.8 Build Conditions Loading and Service.....	45
2.4 Evaluation of Traffic Impacts.....	45

2.5	Evaluation of Short-term/Construction Impacts.....	46
2.6	Transportation & Parking Demand Management	47
2.6.1	Access Plan Agreement	47

APPENDICES

TRAFFIC COUNTS.....	50
MULTI-MODAL TRANSPORTATION.....	51
TRIP GENERATION.....	52
CAPACITY ANALYSIS	53

LIST OF FIGURES

Figure 2-1: Intersection of Washington Street at Green Street and Glen Road	6
Figure 2-2: Intersection of Washington Street at Montebello Road and Forest Hills Street	7
Figure 2-3: Intersection of Washington Street and Williams Street.....	8
Figure 2-4: Intersection of Green Street and Amory Street.....	9
Figure 2-5: Study Intersections.....	10
Figure 2-6: Street View of Washington Street facing North.....	11
Figure 2-7: Street View of Green Street facing West	12
Figure 2-8: Street View of Glen Road facing West.....	13
Figure 2-9: Street View of Montebello Road facing East	14
Figure 2-10: Street View of Forest Hills Street facing Southeast	15
Figure 2-11: Street View of Williams Street facing West.....	16
Figure 2-12: Street View of Amory Street	17
Figure 2-13: Year 2016 Existing Traffic Volumes.....	20
Figure 2-14: Car-Sharing Locations.....	23
Figure 2-15: On-Street Parking in Project Area	25
Figure 2-16: Public Transportation.....	26
Figure 2-17: Year 2016 Existing Pedestrian Volumes.....	27
Figure 2-18: Background Traffic Volumes.....	31
Figure 2-19: Year 2023 No-Build Traffic Volumes.....	32
Figure 2-20: Site Plan.....	34
Figure 2-21: Trip Distribution	40
Figure 2-22: Project Trips.....	41
Figure 2-23: Year 2023 Build Traffic Volumes	42

LIST OF TABLES

Table 2-1: ATR Data Summary.....	18
Table 2-2: Intersection LOS Thresholds	19
Table 2-3: 2016 Existing Conditions LOS	21

Table 2-4: Bicycles at the Study Intersections	24
Table 2-5: 2023 No-Build Conditions LOS	30
Table 2-6: ITE Trip Generation Rates - Existing Single-Family House	35
Table 2-7: ITE Trip Generation Rates - Existing Automobile Service Center	35
Table 2-8: ITE Trip Generation Rates - Existing Restaurant	35
Table 2-9: ITE Trip Generation Rates - Proposed Residential Units.....	35
Table 2-10: ITE Trip Generation Rates - Proposed Green St. Retail.....	36
Table 2-11: ITE Trip Generation Rates - Proposed Washington St. Retail.....	36
Table 2-12: Net Number of Trips.....	36
Table 2-13: Mode Split Data for Residents of Census Tract 1202.01	37
Table 2-14: Adjusted Trip Generation	38
Table 2-15: 2023 Build Conditions LOS	43
Table 2-16: Parking Need Calculation.....	44
Table 2-17: Level-of-Service Comparison: Existing, No-Build, Build Scenarios	46

2.0 Transportation

2.1 Introduction

Design Consultants, Inc. (DCI) has conducted an evaluation of the transportation impacts for the proposed residential development ("Project") to be located at 3371-3375 Washington Street in the Jamaica Plain neighborhood of Boston, Massachusetts. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the Boston Redevelopment Authority's (BRA) Article 80 development review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, pedestrian activity, and public transportation services.

2.1.1 Project Description

The Project site is located in the Jamaica Plain neighborhood of Boston and is bounded by Green Street to the north, Washington Street to the east, and a mix of commercial and residential buildings to the south and west. Land use surrounding the site is a mix of commercial and residential uses.

The proposed Project will demolish the existing buildings to construct a new residential building which will house 58 residential units and 1,775 square feet of retail space. Site access will be provided via one new curb cut on Green Street. The curb cut from Green Street will provide access to an at-grade parking area providing 30 residential parking spaces and 3 Zip Car parking spaces, for a total of 33 parking spaces. This results in a parking ratio of 0.52 residential parking spaces per dwelling unit. Primary pedestrian access will be provided by one entrance on Washington Street and one entrance on Green Street.

2.1.2 Methodology

In accordance with *BTD Transportation Access Plan Guidelines (2001)* the study team at DCI has conducted a transportation analysis for the proposed Project. The analysis is summarized in the following sections:

- Existing conditions: roadway capacities, parking, public transportation, pedestrian and bicycle circulation, loading, and site conditions.
- Future transportation conditions and assessment of potential traffic impacts associated with the proposed Project and other neighboring projects. Long-term impacts are evaluated for the year 2023, based on a seven-year horizon from the 2016 base year. Expected roadway, parking, transit, pedestrian, and loading conditions are identified. This section includes:
 - No-Build scenario (2023) including: general background growth and additional vehicular traffic associated with specific proposed or planned developments within the vicinity of the site; and
 - Build scenario (2023) including: specific travel demand forecast for the proposed Project.
- An evaluation of short-term traffic impacts associated with construction activities.

2.1.3 Study Area

The following intersections in the Jamaica Plain neighborhood of Boston, as agreed upon by the BTB, were examined in this traffic study:

- Washington Street at Green Street and Glen Road
- Washington Street at Montebello Road and Forest Hills Street
- Washington Street at Williams Street
- Green Street at Amory Street
- Driveway(s) to the proposed development

All the intersections listed above are signalized with the exception of the driveway(s) to and from the proposed development. Figures 2-1, 2-2, 2-3, and 2-4 depict the four study intersections and Figure 2-5 illustrates a map showing study locations relative to the Project site.

2.2 Transportation System Existing Conditions

2.2.1 Intersection Conditions

The intersection of **Washington Street at Green Street and Glen Road** is a four-way, signalized intersection. Washington Street runs southwest to northeast, while Green Street approaches from the Northwest and Glen Road from the Southeast. There are crosswalks at all approaches to the intersection. Near the intersection, parking is allowed on both sides of Washington Street, the westbound side of Glen Road and the eastbound side of Green Street. Sidewalks are located on both sides of each street included in the intersection.



Figure 2-1: Intersection of Washington Street at Green Street and Glen Road

The intersection of **Washington Street at Montebello Road and Forest Hill Street** is a five-way, signalized intersection. Washington Street is a two directional roadway that runs southwest to northeast, while Montebello

Road is a one directional that runs from the Southeast to Northwest. Forest Hills Street is a two directional roadway that approaches the intersection from the southeast. There are crosswalks at all approaches to the intersection. Near the intersection, parking is allowed on both sides of Washington Street and Montebello Road, and neither side of Forest Hill Street. Sidewalks are located on both sides of each street included in the intersection.



Figure 2-2: Intersection of Washington Street at Montebello Road and Forest Hills Street

The intersection of **Washington Street and Williams Street** is a four-way, signalized intersection. Washington Street is a two directional roadway that runs southwest to northeast, while Williams Street is a two directional roadway on the northwest approach but one directional on the southeast departure. There are crosswalks at all approaches and departures to the intersection. Near the intersection, parking is allowed on both sides of Washington Street. Parking on Williams Street is not allowed on the either side of the northwest approach but is allowed on the north side of the

southeast departure. Sidewalks are located on both sides of each street included in the intersection.



Figure 2-3: Intersection of Washington Street and Williams Street

The intersection of **Green Street and Amory Street** is a four-way, signalized intersection. Green Street is a two directional roadway that runs southwest to northeast, while Amory Street is a two directional roadway that runs southeast to northwest. There are crosswalks at all approaches and departures to the intersection. Near the intersection, parking on Green is allowed on the north side of both approaches while it is not allowed on the south side of either approach. Parking on Amory Street is allowed on neither side of the northeast approach but is allowed on the west side of the southwest approach. Sidewalks are located on both sides of each street included in the intersection.



Figure 2-4: Intersection of Green Street and Amory Street



Legend

- Study Intersection
- Y Counting Tube (ATR)

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 Consulting Engineers and Surveyors
 120 MIDDLESEX AVENUE, SUITE 20
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 (617) 776-3350
 Copyright 2015 Design Consultants, Inc.

3371-3375 Washington Street
 BOSTON, MA

Study Intersections

PROJECT NO.: 2016-102
 DATE: DECEMBER 2016
 SCALE: N.T.S. Figure 2-6

2.2.2 Study Roadways

Washington Street is classified as an urban principal arterial by MassDOT and the Boston Transportation Department (BTD) under the jurisdiction of the City. It runs southwest-northeast through the study area, and carries one lane in each direction. Washington Street is approximately 8.8 miles in length, and runs from its southwestern limit at the Dedham Town line to its northeastern limit at its intersection with Court and State Street. Washington Street has approximately a 39 foot wide traveled way in the vicinity of the study area. The posted speed limit is 35 mph. There are sidewalks and parking on both sides of the street in the vicinity of the Project. Land use on Washington Street is mixed residential and commercial. Figure 2-6 illustrates a typical street view of Washington Street.



Figure 2-6: Street View of Washington Street facing North

Green Street is classified as an urban collector according to MassDOT and by the BTD under the jurisdiction of the City. The roadway has one lane in each direction in the vicinity of the Project. Green Street runs primarily

southeast-northwest and is approximately 0.6 miles in length. It intersects with Glen Road and Washington Street at its southeast limit and Myrtle Street and Centre Street at its northwestern limit. Green Street has approximately a 26 foot wide traveled-way in the study area. Sidewalks are provided on both sides of Green Street while parking is only permitted on the southerly side within the study area. The land use on Green Street is mixed residential and commercial. Figure 2-7 illustrates a typical street view of Green Street.



Figure 2-7: Street View of Green Street facing West

Glen Road is classified as an urban collector according to MassDOT and by the BTD under the jurisdiction of the City. The roadway has one lane in each direction in the vicinity of the Project. Glen Road runs primarily southeast-northwest and is approximately 0.3 miles in length. The southeastern limit of the roadway is a dead end at Franklin Park while the northwestern limit is the intersection at Washington Street and Green Street. Glen Road has an approximate 26-foot wide traveled way in the study area. Sidewalks are provided on both sides of Glen Road while parking is only permitted on the northerly side of the road in the study

area. The land use on Glen Road is residential in the study area. Figure 2-8 illustrates a typical street view of Glen Road.



Figure 2-8: Street View of Glen Road facing West

Montebello Road is classified as a local road according to MassDOT and by the BTD under the jurisdiction of the City. The roadway is a one lane, one-way road that runs southeast to northwest. Montebello Road is approximately 0.3 miles in length with a 25 foot wide traveled way. The roadway intersects with Walnut Avenue at its southeastern and Brookside Avenue at its northwestern limit. Sidewalks and parking are provided on both sides of Montebello Road in the study area. The land use of the roadway is residential in the vicinity of the project. Figure 2-9 illustrates a typical street view of Montebello Road.



Figure 2-9: Street View of Montebello Road facing East

Forest Hills Street is classified as an urban collector according to MassDOT and by the BTD under the jurisdiction of the City. The roadway has one lane in each direction in the vicinity of the Project. Forest Hills Street runs primarily south-north and is approximately 0.9 miles in length. The roadway intersects with the Arborway at its southern limit and with Washington Street at its northern limit. Forest Hill Street has an approximate 26-foot wide traveled way in the study area. Sidewalks are provided on both sides while parking is not permitted on either side in the study area. The land use on Forest Hill Street is residential in the vicinity of the project. Figure 2-10 illustrates a typical street view of Forest Hills Street.



Figure 2-10: Street View of Forest Hills Street facing Southeast

Williams Street is classified as a local road according to MassDOT and by the BTD and is under City jurisdiction. The roadway has one lane in each direction at its northwest approach to the intersection of Washington Street, and is one lane in one direction heading southeast towards its intersection with Forest Hills Street. Williams Street runs primarily northwest to southeast and is approximately 0.4 miles in length. The roadway intersects with the Everett Street, Call Street and Carolina Avenue at its northwestern limit and Forest Hills Street at its southeastern limit. Williams Street has an approximate 26-foot wide traveled way in the study area. Sidewalks are provided on both sides of the roadway. Parking is permitted only on the southeast departure of Williams Street from the Washington Street intersection, on both sides. The northwest approach to the Washington Street intersection does not allow parking. The land use on Amory Street is mixed commercial and residential in the vicinity of the project. Figure 2-11 illustrates a typical street view of Williams Street.



Figure 2-11: Street View of Williams Street facing West

Amory Street is classified as an urban collector according to MassDOT and by the BTD and is under City jurisdiction. The roadway has one lane in each direction in the vicinity of the Project. Amory Street runs primarily southwest to northeast and is approximately 1.2 miles in length. The roadway intersects with the Williams Street at its southeastern limit and Columbus Avenue at its northwestern limit. Forest Hill Street has an approximate 30-foot wide traveled way in the study area. Sidewalks are provided on both sides of the roadway. Parking is permitted on one side of the roadway at all times but the side varies over its length. The land use on Amory Street is mixed commercial and residential in the vicinity of the project. Figure 2-12 illustrates a typical street view of Amory Street.



Figure 2-12: Street View of Amory Street

2.2.3 Traffic Conditions

DCI contracted with Precision Data Industries, LLC (PDI) to collect traffic count data. Turning movement counts were collected in October 2016. In order to provide accurate analysis for separate peak periods during the day, PDI collected data for two peak hours during both morning (7am to 9am) and evening (4pm to 6pm) peak hours on a typical Thursday. The traffic counts collected turning movements at all four of the study intersections. The unadjusted existing traffic volumes for the morning and evening peak hours are shown in Figure 2-12.

PDI also collected Automatic Traffic Recorder (ATR) counts over three consecutive days beginning on a Tuesday and continuing through Thursday in October 2016. The ATRs collected traffic volumes, vehicular speeds, vehicle classifications, and the length of gaps in between vehicles. The counts are summarized in 15-minute, hourly, and daily intervals. ATR data was collected at the following location:

- Washington Street south of Green Street/Glen Road

The ATR data collected on Washington Street are summarized in Table 2-1.

Table 2-1: ATR Data Summary

<i>Location</i>	<i>ADT</i>	<i>Weekday AM Peak Hour</i>			<i>Weekday PM Peak Hour</i>		
		<i>Volume</i>	<i>K</i>	<i>Peak Direction</i>	<i>Volume</i>	<i>K</i>	<i>Peak Direction</i>
Washington Street south of Green Street/Glen Road	14496	823	6%	58.8% NB	892	6%	51.9% SB

As indicated in Table 2-1, the average weekday daily traffic on Washington Street is approximately 14,500 vehicles. Complete traffic count data is provided in the Appendix.

2.2.3.1 Traffic Operations

Both signalized intersection capacity analyses and stop- and yield-controlled intersection capacity analyses are used for traffic impact studies. The Highway Capacity Manual (HCM) published by Transportation Research Board provides methodologies on how to calculate motor vehicle Level of Service (LOS), average delay, and volume-to-capacity ratios. Those terms are commonly used to measure performance levels for freeway sections, ramp junctions, weave sections, and intersections, both signalized and unsignalized.

Level of Service (LOS) is a term used to denote different operating conditions that occur under various traffic volume loads. It is a qualitative measure of the effect of a number of factors including geometrics, speed, travel delay, freedom to maneuver, and safety. The LOS is divided into a range of six letter grades, ranging from A to F, with A being the best and F the worst. LOS E and F are generally considered inadequate traffic operations in suburban and urban areas. The delay ranges differ slightly between unsignalized and signalized intersections due to driver expectations and behavior for each LOS.

Table 2-2: Intersection LOS Thresholds

LOS	Signalized	Unsignalized
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	0-10	0-10
B	>10-20	> 10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: 2000 Highway Capacity Manual

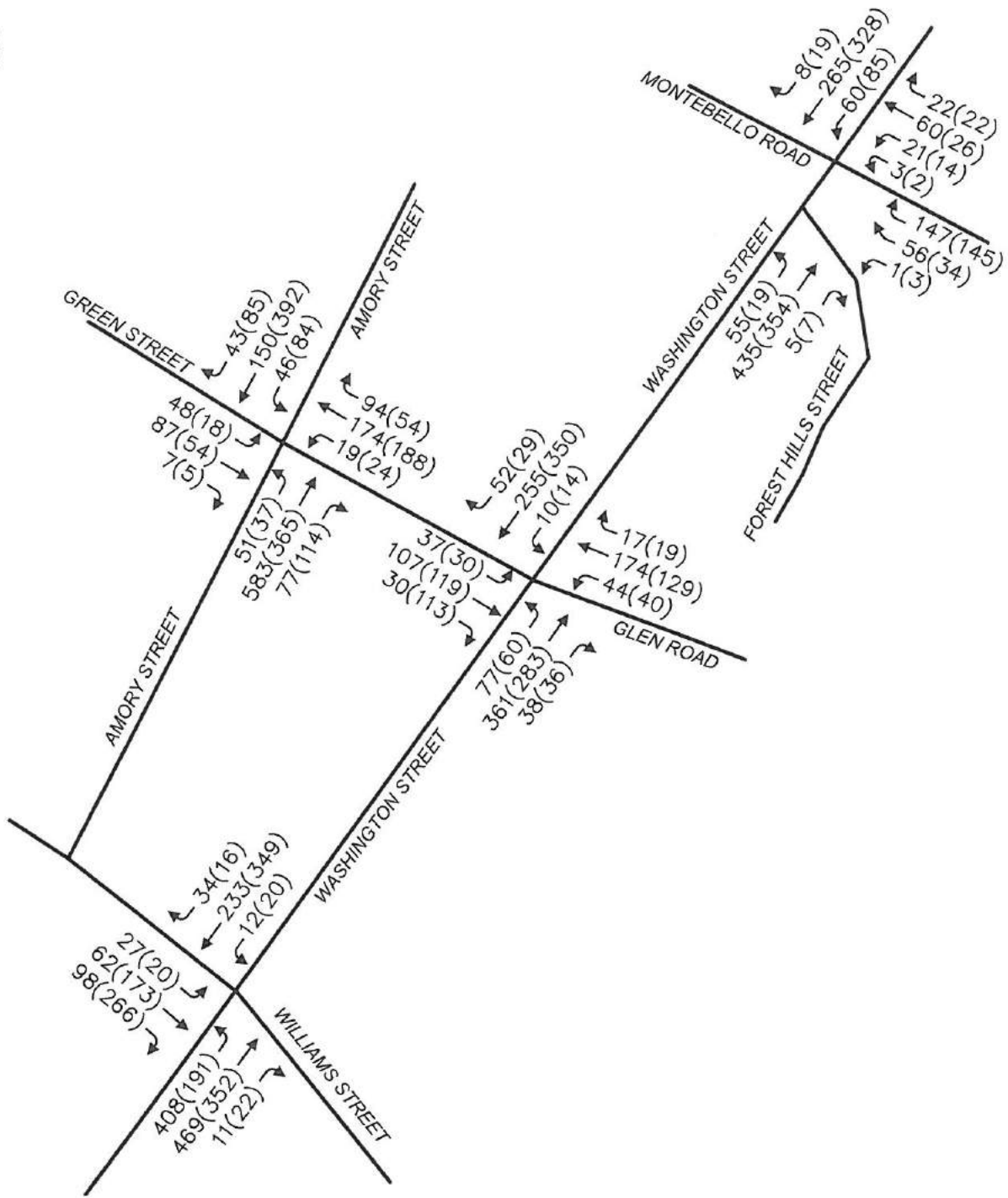
In this study, intersection performance measures were calculated in the form of volume to capacity (v/c) ratio, average intersection delay, 95th percentile queue lengths, level-of-service (LOS) of overall intersection LOS and the LOS of each approach. *Synchro 8.0 was the software used to execute the intersection analysis.* *Synchro 8.0*, a software program from Trafficware, uses the methodologies and thresholds outlined within the HCM. This is the preferred and recommended software of MassDOT. Traffic volume represents the travel demand observed and capacity represents the amount of traffic the intersection can accommodate under prevailing conditions. A volume to capacity ratio that approaches or exceeds 1.0 indicates traffic congestion or poor operating conditions.

Three types of Synchro reports were created to analyze and compare intersection performance in this study:

- Main report – “Int: Lanes, Volumes, Timings”
- Int: Queues
- HCM Signalized/Unsignalized Report

For signalized intersections, LOS is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. For unsignalized intersections, the analysis assumes that the traffic on the mainline is not affected by traffic on the side street. The LOS for each movement is calculated by determining the length of gaps that are available in the conflicting traffic stream. In the HCM Unsignalized Report 95th percentile queue length is estimated.

In *Synchro 8*, HCM 2000 reports and HCM 2010 reports are both available. Both of them use HCM methodology to measure the performance of the intersection.



Legend

xx(yy) → AM(PM) Peak Hour Existing Volumes

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3371-3375 Washington Street
 BOSTON, MA

Figure 2-13
 2016 Existing
 Traffic Volumes

Existing Conditions. The study intersections were analyzed for existing traffic conditions during the weekday morning and weekday evening peak hours. Existing intersection lane configurations and traffic control were modelled the same as the current traffic operations. The results of the existing conditions analysis are shown in Table 2-3 and volumes are shown in Figure 2-13. Detailed capacity analysis worksheets are included in the Appendix.

Table 2-3: 2016 Existing Conditions LOS

ID	East-West Road	North-South Road	Lane	Existing							
				AM Peak Hour				PM Peak Hour			
				v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)	v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)
1	Green Street	Washington Street	EB LTR	0.87	64.4	E	173	0.86	60.6	E	252
			WB LTR	0.90	68.4	E	#280	0.87	71.4	E	216
			NEB LTR	0.75	12.3	B	m97	0.57	24.1	C	m198
			SWB LTR	0.75	41.4	D	#324	0.65	34.2	C	#444
			Overall		39.5	D			42.3	D	
2	Montebello Road/Forest Hills Street	Washington Street	WB LTR	0.80	82.9	F	#188	0.66	62.4	E	71
			NB LTR	0.87	77.2	E	#278	0.90	85.2	F	#267
			SB LTR	0.86	58.8	E	#488	1.31	>120	F	#684
			NEB LTR	1.03	83.6	F	#673	0.67	37.7	D	403
			Overall		75.7	E			110.0	F	
3	Williams Street	Washington Street	SEB LTR	0.78	49.1	D	149	1.06	94.3	F	#514
			NEB LTR	1.17	112.6	F	#1038	1.55	>120	F	#860
			SWB LTR	0.73	41.6	D	m273	0.79	41.5	D	#442
			Overall		87.0	F			>120	F	
4	Green Street	Amory Street	EB LTR	0.65	28.3	C	82	0.21	8.8	A	28
			WB LTR	0.79	30.5	C	#167	0.63	14.1	B	81
			SB LTR	0.81	18.6	B	#380	0.81	24.5	C	#265
			NB LTR	0.41	7.8	A	84	0.96	44.5	D	#306
			Overall		20.2	C			29.2	C	

Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained from HCM 2000 outputs in Synchro 8
 - Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 # = volume for 95th percentile cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th percentile queue will rarely be exceeded. Queue shown is maximum after two cycles.
 'm' Volume for 95th percentile queue is metered by upstream signal

As shown in Table 2-3, three of the four study intersections operate under capacity and have adequate levels of service. The intersection of Washington Street at Williams Street operates over capacity. Additionally, there are a few movements in both the morning and evening peak hours that operate at inadequate levels of service. However, these conditions are existing and do not reflect any impact of the proposed Project. The operational issues that exist were noted, and will be addressed as needed moving forward through the 2023 Build scenario.

2.2.4 On-Street Parking

On-Street parking is vast near the Project site. Parking is permitted on both sides of Washington Street throughout the study area. At the intersection of Washington Street, Green Street and Glen Road parking is only permitted on the southeast bound portion of Green and northwest bound portion of Glen. The intersection of Washington Street, Montebello Road and Forest Hills Street permits parking on both sides of Montebello Road while it is prohibited on both sides of Forest Hills Street. At the intersection of Washington Street and Williams Street, parking is prohibited on both sides of the northwest approach to the intersection from Williams Street but permitted on both sides of the southeast departure. In the vicinity of the project, Amory Street permits parking on one side at all times but varies which side along the length of the roadway. Where parking is allowed, there are no restrictions for duration or who is allowed to park there. Figure 2-15 shows on-street parking near the Project site.

2.2.5 Public Transportation in the Study Area

Massachusetts Bay Transportation Authority (MBTA) Bus and Subway Service

In the vicinity of the Project site, MBTA bus route 42 services the area. The route runs from Dudley Station to Forest Hills Station along Washington Street. Bus route 42 has a stop at the intersection of Washington at Green Street and Glen Road. Buses run at approximately 15-20 minute intervals.

In the vicinity of the Project site, the MBTA Orange Line Subway services the area. The Orange Line runs from the Oak Grove Station in Malden to the Forest Hills Station in Jamaica Plain. This subway route has a stop at the Green Street "T" Stop located proximate to the project area.

Figure 2-16 shows a street map of Bus route 42 and the MBTA Orange Line in relation to the Project site. Detailed schedules and maps can be found in the Appendix.

2.2.6 Car Sharing

Car sharing refers to vehicles that are rented on an hourly or daily basis. The closest car sharing location to the Project site is located at the

intersection of Woodside Avenue and Washington Street, less than a quarter of a mile from the project site. Figure 2-14 shows the car-sharing locations relative to the Project Area. Additionally, three parking spaces are proposed on-site for car-sharing vehicles.

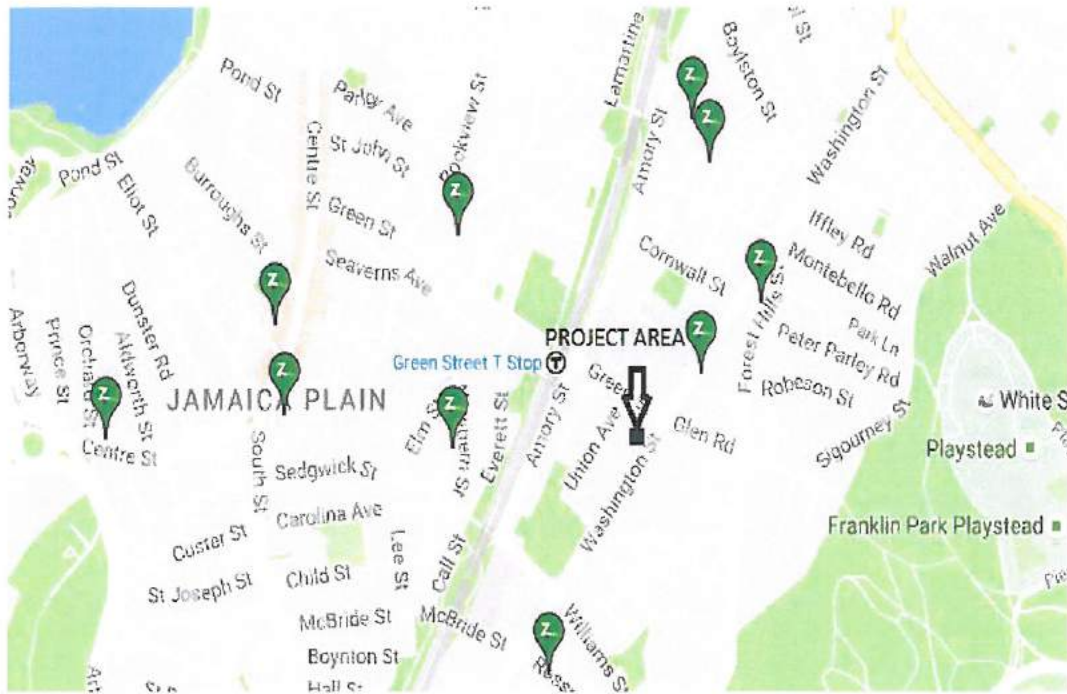


Figure 2-14: Car-Sharing Locations

2.2.7 Pedestrian Access and Circulation

Pedestrian traffic was tallied at each of the study intersections from 7:00 to 9:00 a.m. and from 4:00 to 6:00 p.m. Existing peak-hour pedestrian volumes are shown in Figure 2-17. Detailed pedestrian count data can be found in the Appendix.

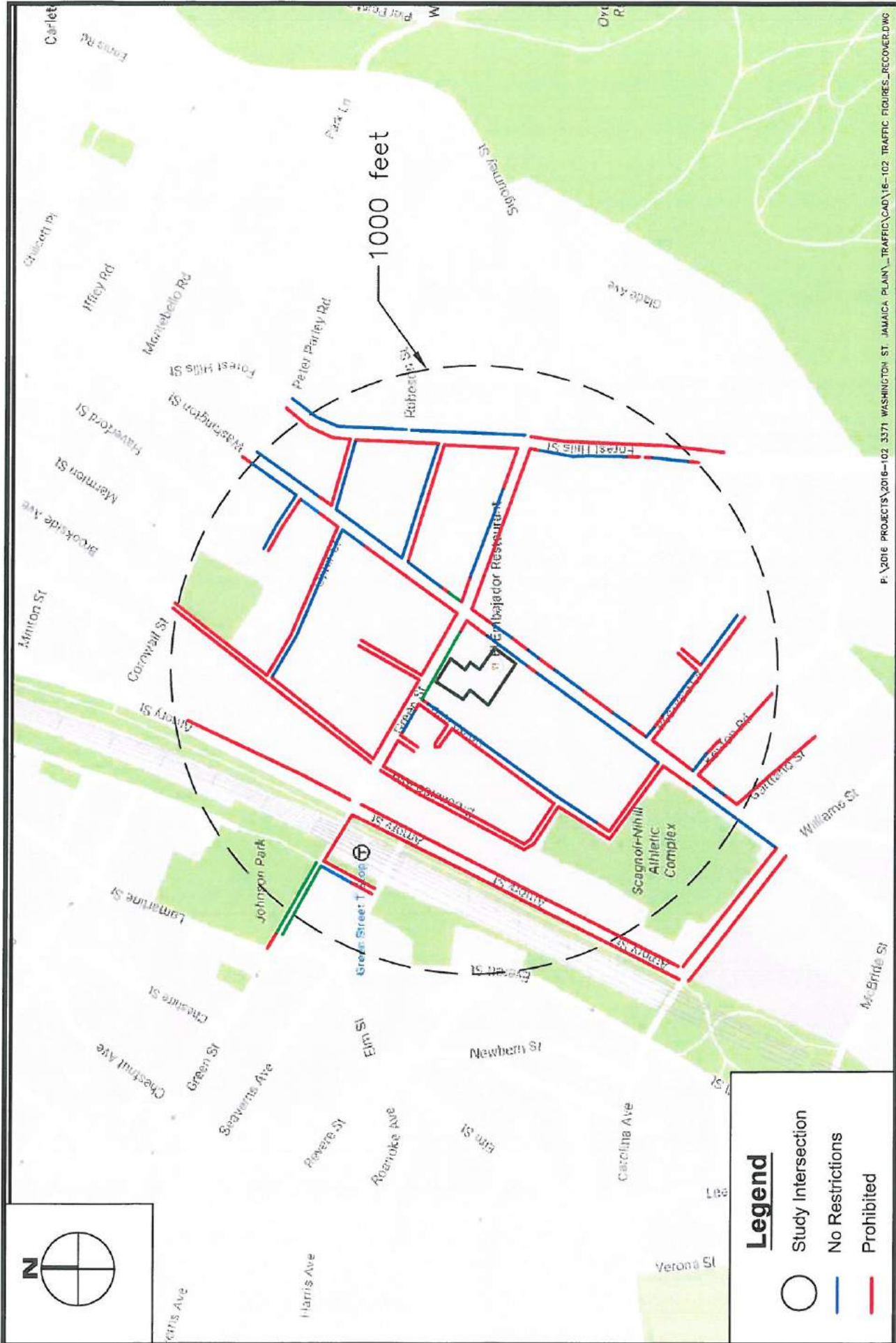
2.2.8 Bicycle Access and Circulation

There are no designated bicycle facilities along Washington Street or any of the intersecting streets within the study area. However, the Project is located approximately 0.3 miles from Franklin Park, and approximately 800 feet from the Southwest Corridor Park. The Southwest Corridor Park is a 4.7 mile, 52-acre, linear park stretching from the Back Bay to Forest Hills. It links the neighborhoods of South End, Back Bay, Roxbury and Jamaica Plain and has approximately six miles of biking, jogging and walking paths.

Table 2-4 shows the total numbers of bicycles passing through the study intersections during each of the peak hours. Detailed bicycle counts are provided in the Appendix.

Table 2-4: Bicycles at the Study Intersections

Intersection	Number of Bicycles	
	AM Peak Hour	PM Peak Hour
<i>Washington Street at Green Street/Glen Road</i>	20	21
<i>Washington Street at Montebello Road/Forest Hills Street</i>	18	10
<i>Washington Street at Williams Street</i>	16	21
<i>Amory Street at Green Street</i>	12	26

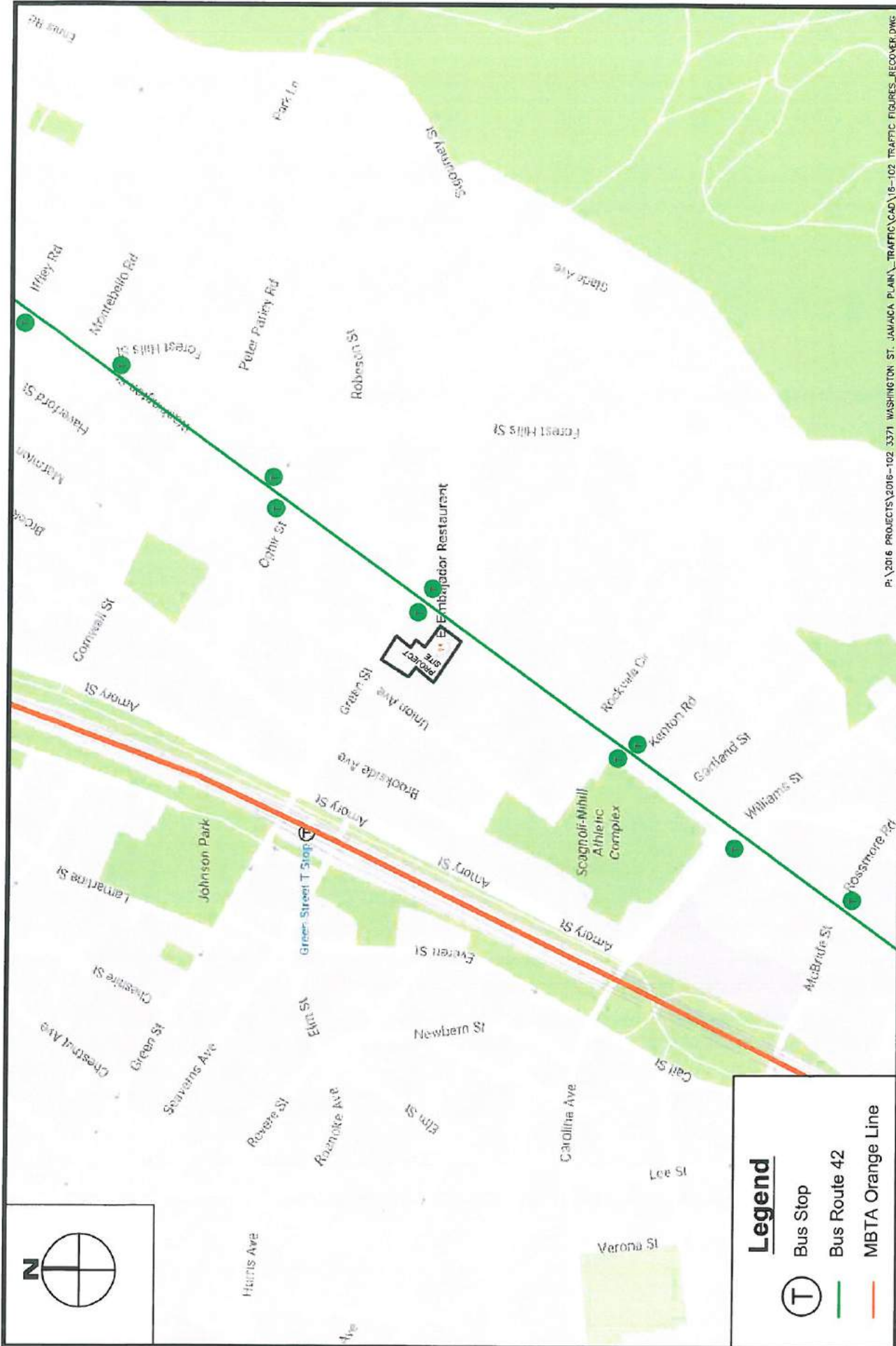


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On-Street Parking

P:\2016 PROJECTS\2016-102_3371 WASHINGTON ST. JAMAICA PLAIN\TRAFFIC\CAD\16-102 TRAFFIC FIGURES_RECOVER.DWG



P:\2016 PROJECTS\2016-102_3371 WASHINGTON ST. JAMAICA PLAIN\TRAFFIC\CAD\16-102 TRAFFIC FIGURES_RECOVER.DWG

PROJECT NO.:	2016-102
DATE:	DECEMBER 2016
SCALE:	N.T.S. Figure 2-16

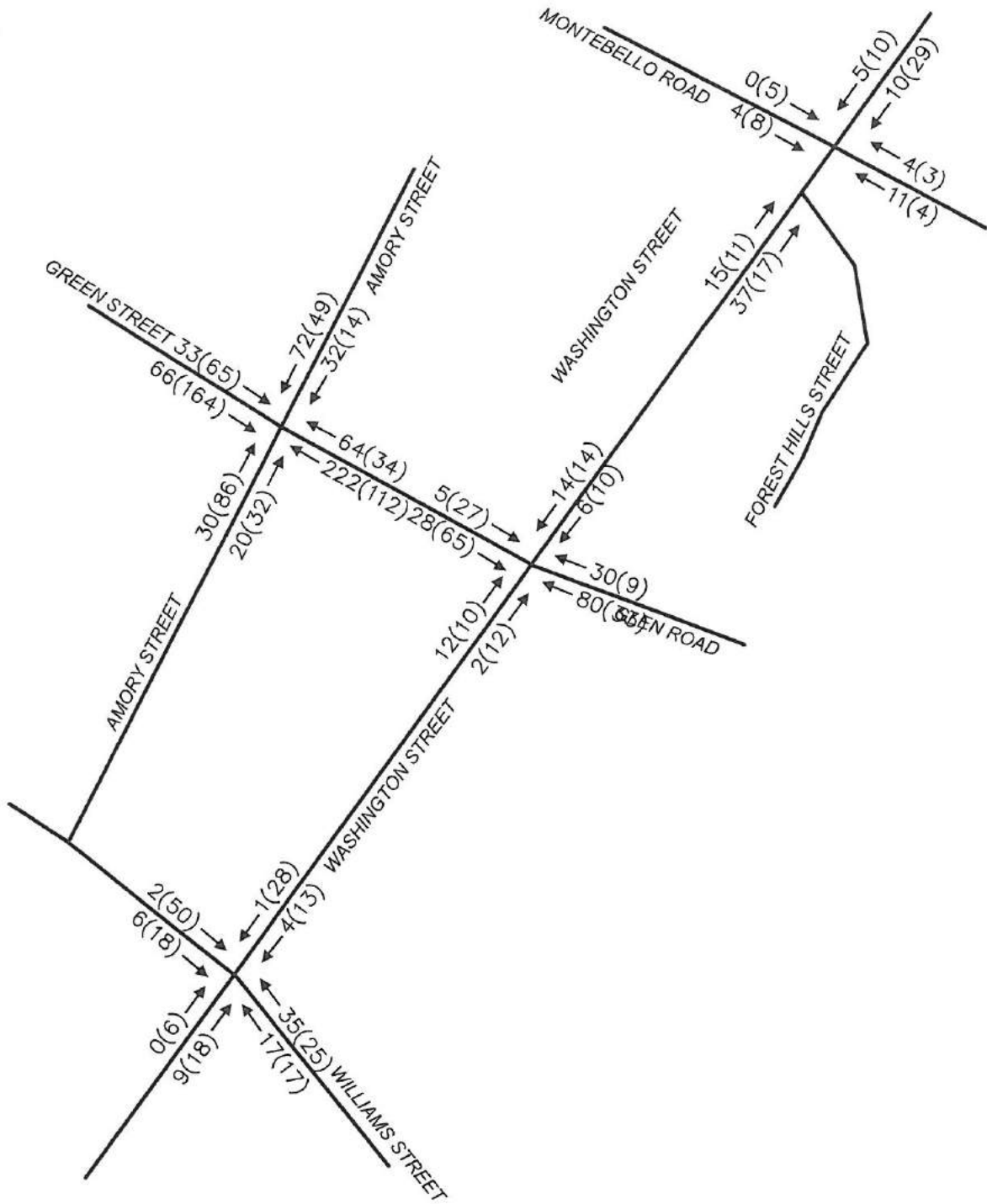
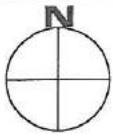
Public Transportation

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- Legend**
- Bus Stop
 - Bus Route 42
 - MBTA Orange Line



Legend

XX(YY) → AM(PM) Peak Hour Existing Pedestrian Volumes

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Figure 2-17
2016 Existing
Pedestrian
Traffic Volumes

DATE: DEC. 2016

DCI PROJECT: 2016-102

2.2.9 Loading and Service

The existing site currently consists of a restaurant and an automobile service center, both of which generated vehicular trips and loading services. Deliveries stop on Washington Street or utilize the vacant area to the south of the site. However, loading and service activity on-site is generally minimal.

2.3 Evaluation of Long-term Impacts

This section describes and evaluates the projected 2023 No-Build and Build conditions.

2.3.1 No-Build Conditions

2.3.1.1 Background Traffic Growth

The study intersections were analyzed for estimated traffic conditions for year 2023 No-Build Conditions during the weekday morning and weekday evening peak hours. Existing lane configurations and traffic control were assumed to remain unchanged for this analysis. There are two procedures used to determine background traffic growth.

The first procedure is to estimate and distribute specific traffic volumes generated by planned new major developments and anticipated roadway changes. Within the vicinity of the Project site there are four new developments that will impact traffic within the study area, and the associated traffic volumes are shown in Figure 2-18:

- **3320 Washington Street:** The project, located on the east side of Washington Street between Montebello Road and Iffley Road, will consist of 73 residential apartments, three residential townhouse units, and approximately 5,516 square feet of retail/restaurant space.
- **3321-3529 Washington Street:** The project, located on the west side of Washington Street between Burnett Street and McBride Street, will consist of a 130,000 square-foot self-

storage facility, 28,000 square feet of retail space, and 42 residential units.

- **The Residences at Forest Hills:** The project, located across the street from the Forest Hills MBTA Station, will consist of 5,500 square feet of street front retail, restaurant space, and 252 residential units.
- **The Commons at Forest Hills Station:** The project, located on the west side of Washington Street just north of the Arborway, will consist of 280 rental apartment homes and 7,960 square feet of retail space.

The second procedure of determining background growth is to apply a general background rate to account for changes in demographics, auto usage, and ownership. Based on discussions with the Boston Transportation Department (BTD), and based on traffic volume data compiled by MassDOT from count stations, an annual traffic growth rate for Jamaica Plain was chosen for analysis purposes. In order to provide an accurate and conservative analysis, a 1.0 percent compounded annual growth rate was used to account for general background traffic growth and development by others not yet identified.

2.3.1.2 No-Build Conditions Traffic Operations

The 2023 No-Build analysis uses the methodology described in the Existing Conditions. These traffic conditions utilize the 2023 No-Build volumes shown in Figure 2-19. These volumes include a conservative regional growth rate of 1.0 percent per year combined with the existing traffic volumes. The results of the 2023 No-Build analysis are shown in Table 2-5. Detailed capacity analysis worksheets are included in the Appendix.

As shown in Table 2-5 on the subsequent page, there are movements that continue to operate at an LOS of F, and some movements that experience an increase in delay and a drop in level of service. The expected impact due specifically to the proposed development at 3371-3375 Washington Street is reflected in any changes going from the 2023 No-Build to the 2023 Build scenarios.

Table 2-5: 2023 No-Build Conditions LOS

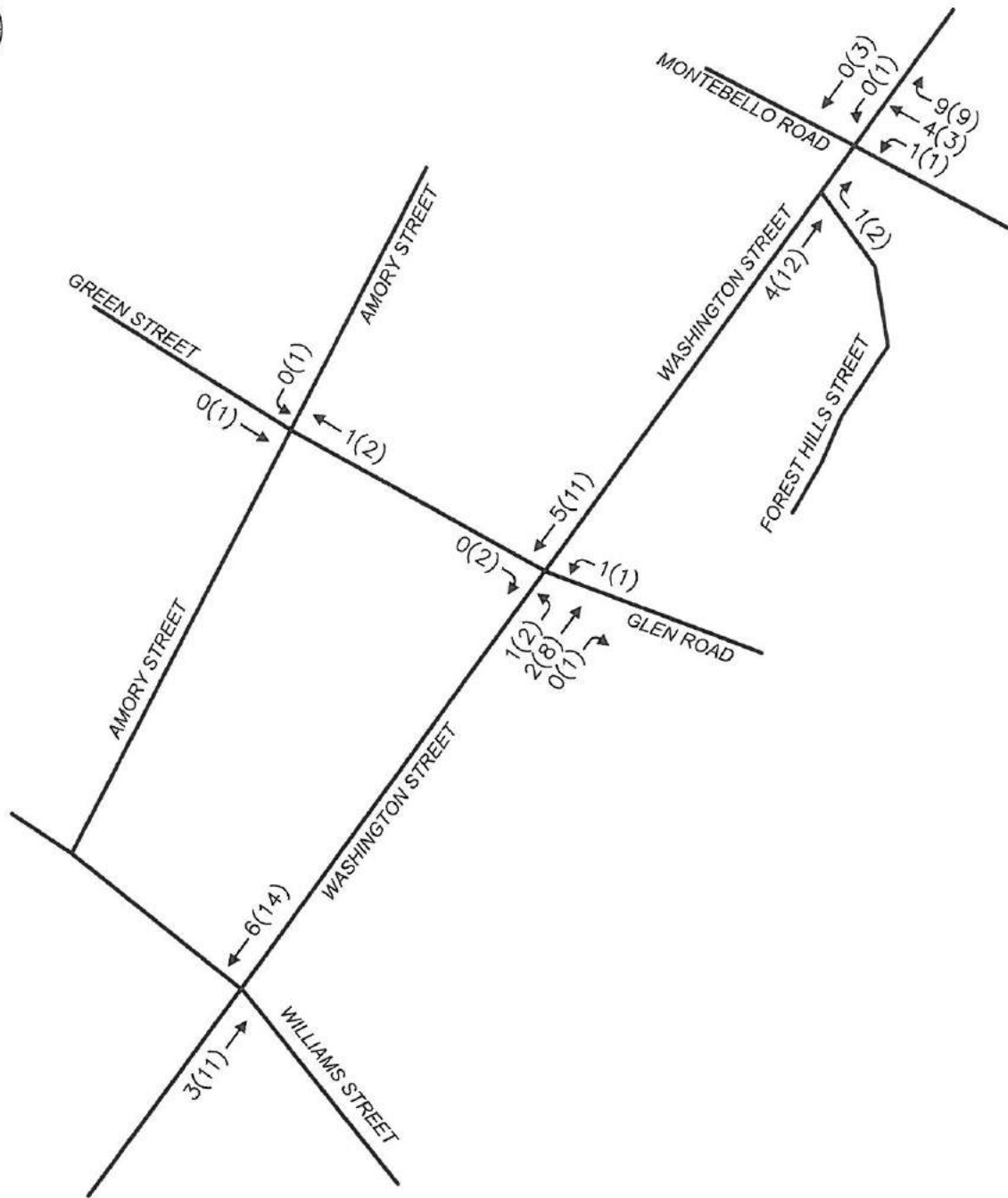
ID	East-West Road	North-South Road	Lane	No-Build							
				AM Peak Hour				PM Peak Hour			
				v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)	v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)
1	Green Street	Washington Street	EB LTR	0.71	48.8	D	186	0.87	59.9	E	269
			WB LTR	0.88	65.3	E	#270	0.87	70.5	E	221
			NEB LTR	0.75	12.3	B	m99	0.60	27.6	C	m188
			SWB LTR	0.75	41.3	D	#329	0.68	35.7	D	#483
			Overall		35.6	D			43.6	D	
2	Montebello Road/Forest Hills Street	Washington Street	WB LTR	0.81	81.9	F	#206	0.60	56.2	E	104
			NB LTR	0.88	76.9	E	#294	0.87	80.1	F	#292
			SB LTR	0.90	63.6	E	#524	1.29	>120	F	#746
			NEB LTR	0.98	71.5	E	#741	0.67	36.9	D	433
			Overall		71.2	E			102.7	F	
3	Williams Street	Washington Street	SEB LTR	0.76	48.1	D	173	1.07	96.2	F	#599
			NEB LTR	1.23	>120	F	#1133	1.67	>120	F	#929
			SWB LTR	0.72	41.4	D	m280	0.82	42.1	D	#483
			Overall		104.0	F			>120	F	
4	Green Street	Amory Street	EB LTR	0.56	23.8	C	87	0.19	8.9	A	28
			WB LTR	0.79	30.6	C	#180	0.60	13.9	B	81
			SB LTR	0.83	19.7	B	#404	0.81	23.4	C	#265
			NB LTR	0.35	7.0	A	73	0.97	45.8	D	#312
			Overall		20.2	C			29.7	C	

*Any improvements to No-Build Conditions are due to the standard practice of using a 0.92 Peak Hour Factor for future conditions in accordance with MassDOT Guidelines.

Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained from HCM 2000 outputs in Synchro 8 – Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

= volume for 95th percentile cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th percentile queue will rarely be exceeded. Queue shown is maximum after two cycles.

'm' Volume for 95th percentile queue is metered by upstream signal



Legend

XX(YY) → AM(PM) Peak Hour Background Traffic Volumes

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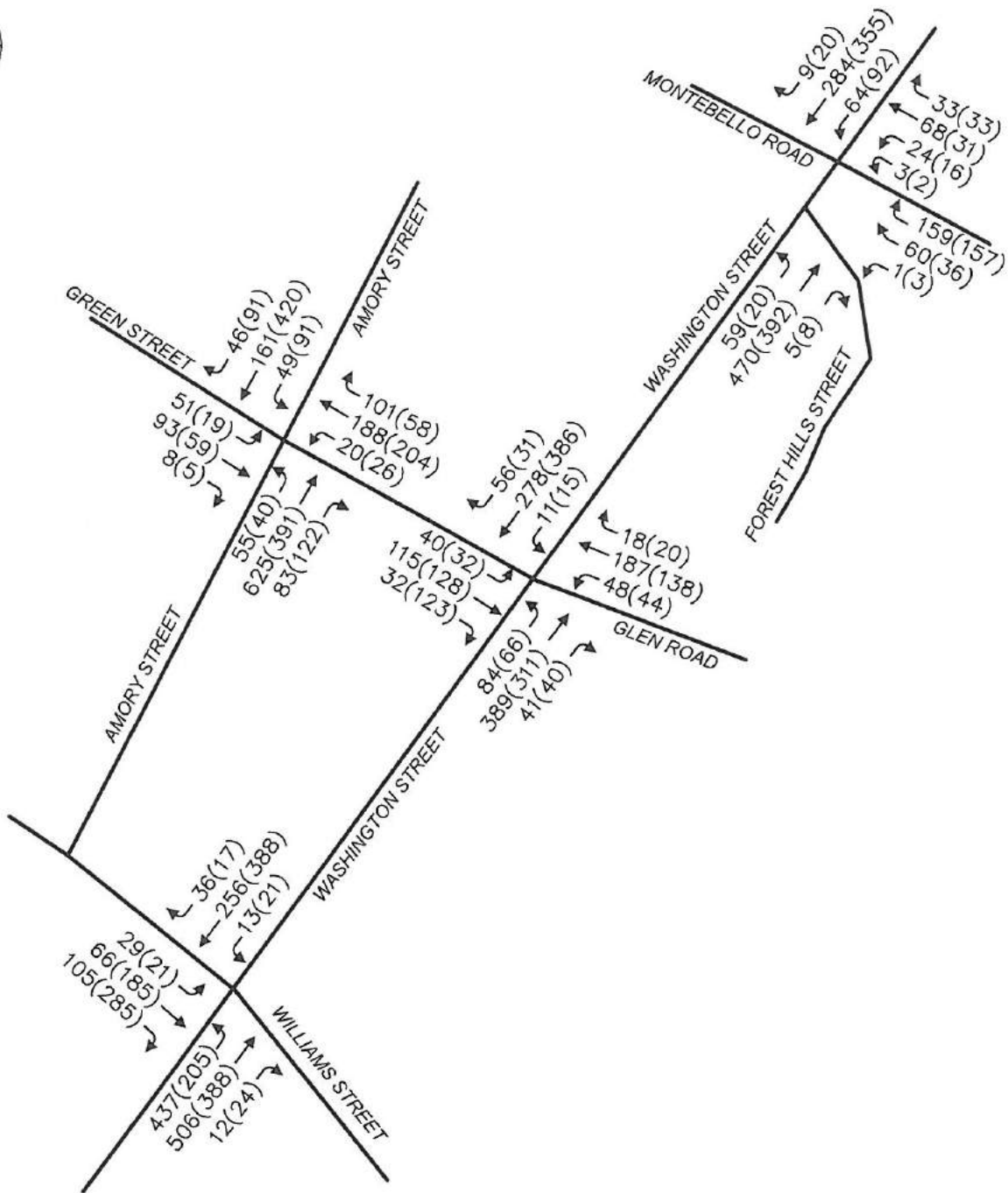
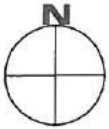
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Figure 2-18
Background Projects
Traffic Volumes

DATE: DEC. 2016

DCI PROJECT: 2016-102



Legend

xx(yy) → AM(PM) Peak Hour No-Build Volumes

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3371-3375 Washington Street
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Figure 2-19
2023 No-Build
Traffic Volumes

DATE: DEC. 2016

DCI PROJECT: 2016-102

2.3.2 Build Conditions

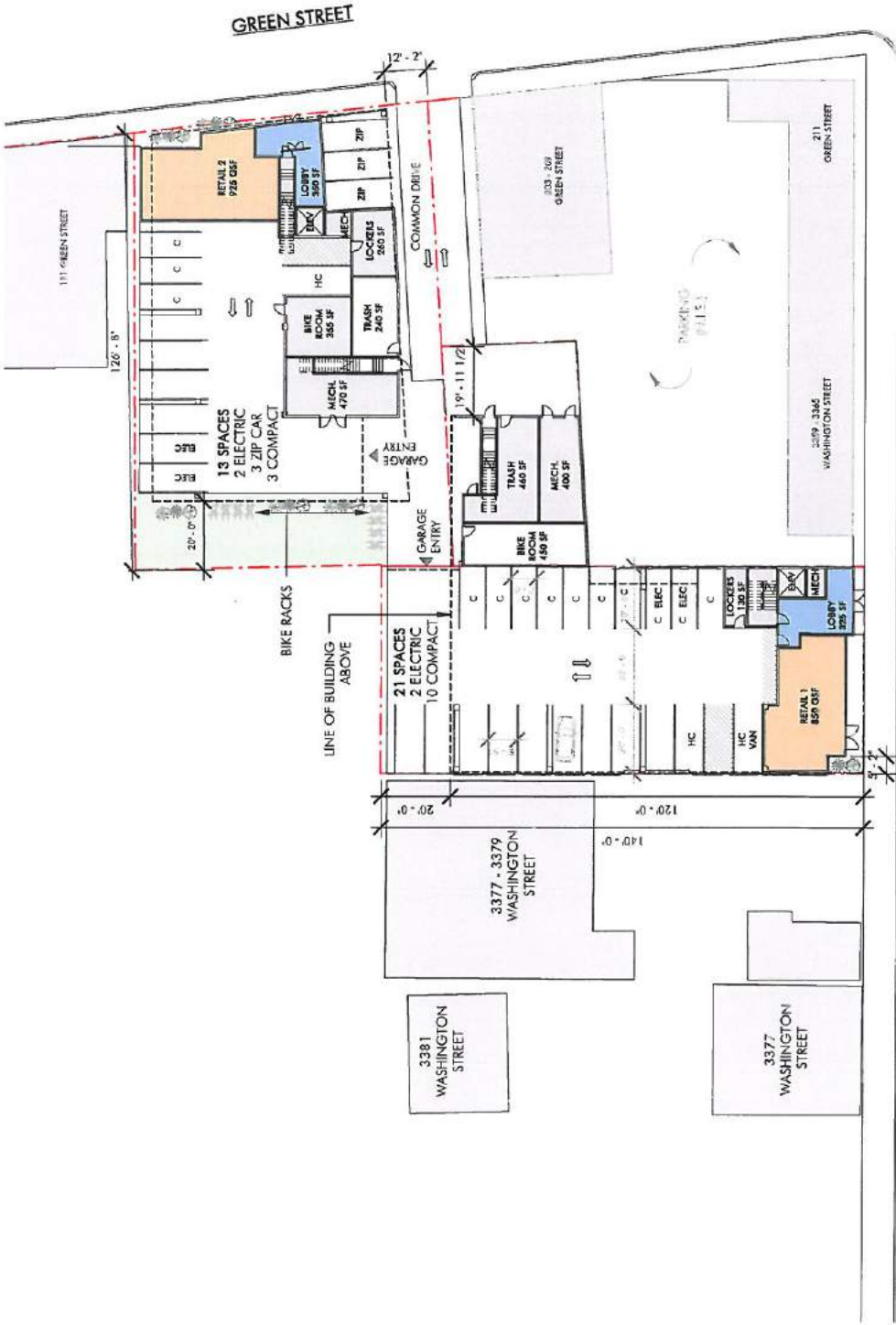
As summarized in Section 2.1.1, the proposed Project will demolish the existing buildings to construct a new mixed-use building which will house 58 residential units and 1,775 square feet of retail space. Site access will be provided via one new curb cut on Green Street. The curb cut from Green Street will provide access to an at-grade parking area providing 30 residential parking spaces and three Zip Car parking spaces, for a total of 33 parking spaces. The proposed site plan is shown in Figure 2-20.

2.3.2.1 Site Access and Circulation

Vehicular access and egress to and from the site will be at a proposed driveway via Green Street, located approximately 150 feet west of the signalized intersection with Washington Street. This driveway will make use of the existing curb cut along Green Street.

2.3.2.2 Trip Generation and Mode Split

The volume of vehicular trips that a land use will generate is projected on the basis of rates provided in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 9th Edition*. The trip generation rates for the proposed Project were calculated using the ITE manual. As is standard for traffic studies, credit was taken for trips generated by existing uses that will be discontinued once current buildings are demolished. Consequently, the existing trips were subtracted from the expected trips for the proposed Project and the **net new number of trips** was calculated. Tables 2-6 through 2-8 show the trip generation calculations for the existing land uses, Tables 2-9 through 2-11 show the trip generation calculations for the proposed land uses, and Table 2-12 shows the net number of trips that will be used in further trip generation calculations. The square footages used for the calculations of the Automobile Service Center were gathered from a Site Plan of Land by Boston Survey, Inc.



WASHINGTON STREET

1/32" = 1'-0"

Figure 2-20

Table 2-6: ITE Trip Generation Rates - Existing Single-Family House

Land Use Code: 210		Single-Family Detached House		
	AM Peak Hour	PM Peak Hour	Daily	
Size (per # of Houses)	1	1	1	
Average Rate	0.75	1.00	9.52	
Total Trips	1	1	10	
Entering%	25%	63%	50%	
Exiting%	75%	37%	50%	
Entering Trips	0	1	5	
Exiting Trips	1	0	5	

Table 2-7: ITE Trip Generation Rates - Existing Automobile Service Center

Land Use Code: 942		Automobile Care Center		
	AM Peak Hour	PM Peak Hour	Daily	
Size (per 1000 square feet)	4.9	4.9	4.9	
Average Rate	2.25	3.11	--	
Total Trips	11	15	--	
Entering%	66%	48%	--	
Exiting%	34%	52%	--	
Entering Trips	7	7	--	
Exiting Trips	4	8	--	

Table 2-8: ITE Trip Generation Rates - Existing Restaurant

Land Use Code: 932		High-Turnover (Sit-Down) Restaurant		
	AM Peak Hour	PM Peak Hour	Daily	
Size (# of Seats)	35	35	35	
Average Rate	0.00	0.41	4.83	
Total Trips	0	14	169	
Entering%	--	57%	50%	
Exiting%	--	43%	50%	
Entering Trips	--	8	85	
Exiting Trips	--	6	85	

Table 2-9: ITE Trip Generation Rates - Proposed Residential Units

Land Use Code: 220		Apartment		
	AM Peak Hour	PM Peak Hour	Daily	
Dwelling Units (X)	58	58	58	
Fitted Curve Equation	$T = 0.49(X) + 3.73$	$T = 0.55(X) + 17.65$	$T = 6.06(X) + 123.56$	
Total Trips (T)	32	49	476	
Entering%	20%	65%	50%	
Exiting%	80%	35%	50%	
Entering Trips	6	32	238	
Exiting Trips	26	17	238	

Table 2-10: ITE Trip Generation Rates - Proposed Green St. Retail

Land Use Code: 933		Fast-Food Restaurant w/out Drive Thru		
	AM Peak Hour	PM Peak Hour	Daily	
Size (per 1000 square feet)	0.925	0.925	0.925	
Average Rate	43.87	26.15	716	
Total Trips	41	24	662	
Entering%	60%	51%	50%	
Exiting%	40%	49%	50%	
Entering Trips	25	12	331	
Exiting Trips	16	12	331	

Table 2-11: ITE Trip Generation Rates - Proposed Washington St. Retail

Land Use Code: 920		Copy, Print and Express Ship Store		
	AM Peak Hour	PM Peak Hour	Daily	
Size (per 1000 square feet)	0.85	0.85	0.85	
Average Rate	2.78	7.41	--	
Total Trips	2	6	--	
Entering%	100%	17%	--	
Exiting%	0%	83%	--	
Entering Trips	2	1	--	
Exiting Trips	0	5	--	

Table 2-12: Net Number of Trips

	AM Peak Hour	PM Peak Hour	Daily
Existing Trips	12	30	--
Proposed Trips	75	79	1138
Total Net New Trips	63	49	--

These trip rates are unadjusted, as they only account for motorized traffic trips. Non-vehicle trips were deducted from the base trips in the Mode Split section below. It should be noted that pass-by trips were not accounted for when calculating the trip generation for the fast-food restaurant. Not accounting for pass-by trips yields a more conservative number of trips, thus providing more conservative analyses.

Trip Distribution. DCI estimated the trip distribution of Project-generated traffic from the site into the study area for the year 2023. The directional distribution of this Project-generated traffic is based on existing travel patterns, which were observed during the initial data collection in October 2016.

Standard practice is to employ the same trip distribution and assignment percentages for both inbound and outbound movements, acknowledging that the trip counts are estimates at this time. This

technique accounts for nuances in estimating the future numbers. These nuances can include proximity to the transportation and roadway network intricacies. The trip distribution for this Project is shown graphically in Figure 2-21.

Mode Split. ITE's Trip Generation methods are typically based on data from suburban developments with no nearby public transportation service and no appreciable share of people walking or bicycling to or from the site. Commuting characteristics were analyzed from the 2010-2014 American Community Survey 5-Year Estimates. Census Data from the Census Tract 1202.01 in Jamaica Plain was analyzed and used to estimate mode splits for journeys to work in the Project area. Table 2-13 displays estimated mode splits.

Table 2-13: Mode Split Data for Residents of Census Tract 1202.01

MEANS OF TRANSPORTATION TO WORK	
Car, truck, or van	45.8%
Drove alone	32.5%
Carpooled:	13.2%
In 2-person carpool	12.0%
In 3-person carpool	1.3%
In 4-person carpool	0.0%
Public transportation (excluding taxicab)	41.2%
Walked	5.1%
Bicycle	5.2%
Other means	1.1%
Worked at home	1.7%

Based on the modal split data above an Average Vehicle Occupancy (AVO) rate of 1.3 persons per vehicle was calculated. Since Land Use Code 220 takes into account an AVO of 1.1, the number of trips was adjusted by 1.1, and then the new AVO of 1.3 persons per vehicle for the Project area was applied to the preliminary trip generation calculations to determine the total number of Person-Trips that are expected to be generated by the Project. The number of non-vehicle trips was determined by multiplying the person-trips by the percentage expected to utilize public transportation, bicycling, and walking to access the Project site. The US Census Journey to Work data for Jamaica Plain is attached in the Appendix.

2.3.2.3 Site Generated Trips

The public transportation, walking, and biking mode share from the US Census Data for Jamaica Plain were applied to the total person trips. By applying this non-vehicular mode split to the Trip Generation calculations, the amount of expected vehicle traffic associated with the Project is reduced. The resulting adjusted vehicular traffic on the surrounding roadways was estimated and is summarized in Table 2-14.

Table 2-14: Adjusted Trip Generation

	AM Peak Hour	PM Peak Hour
Base Trips	63	49
Total Person-Trips	74	58
Total Vehicle Trips	26	20
Entering Vehicle-Trips	5	13
Exiting Vehicle-Trips	21	7
Total Public Transportation Trips	31	24
Total Bicycle Trips	4	3
Total Walking Trips	4	3
Other Trips	9	8

As indicated in Table 2-14, the Project is expected to generate 26 net new vehicle-trips during weekday morning peak hour and 20 net new vehicle-trips during weekday evening peak hour. Generated new public transportation trips are expected to be 31 during the morning peak hour and 24 during the evening peak hour. New pedestrian trips are expected to be 4 person-trips during the morning peak hour and 3 person trips during the evening peak hour. It is estimated that there will be 4 new bicycle trips generated during the morning peak hour and 3 new bicycle trips generated during the evening peak hour. The resulting vehicular trips were distributed based on the existing travel patterns, and the corresponding volumes are shown in Figure 2-22.

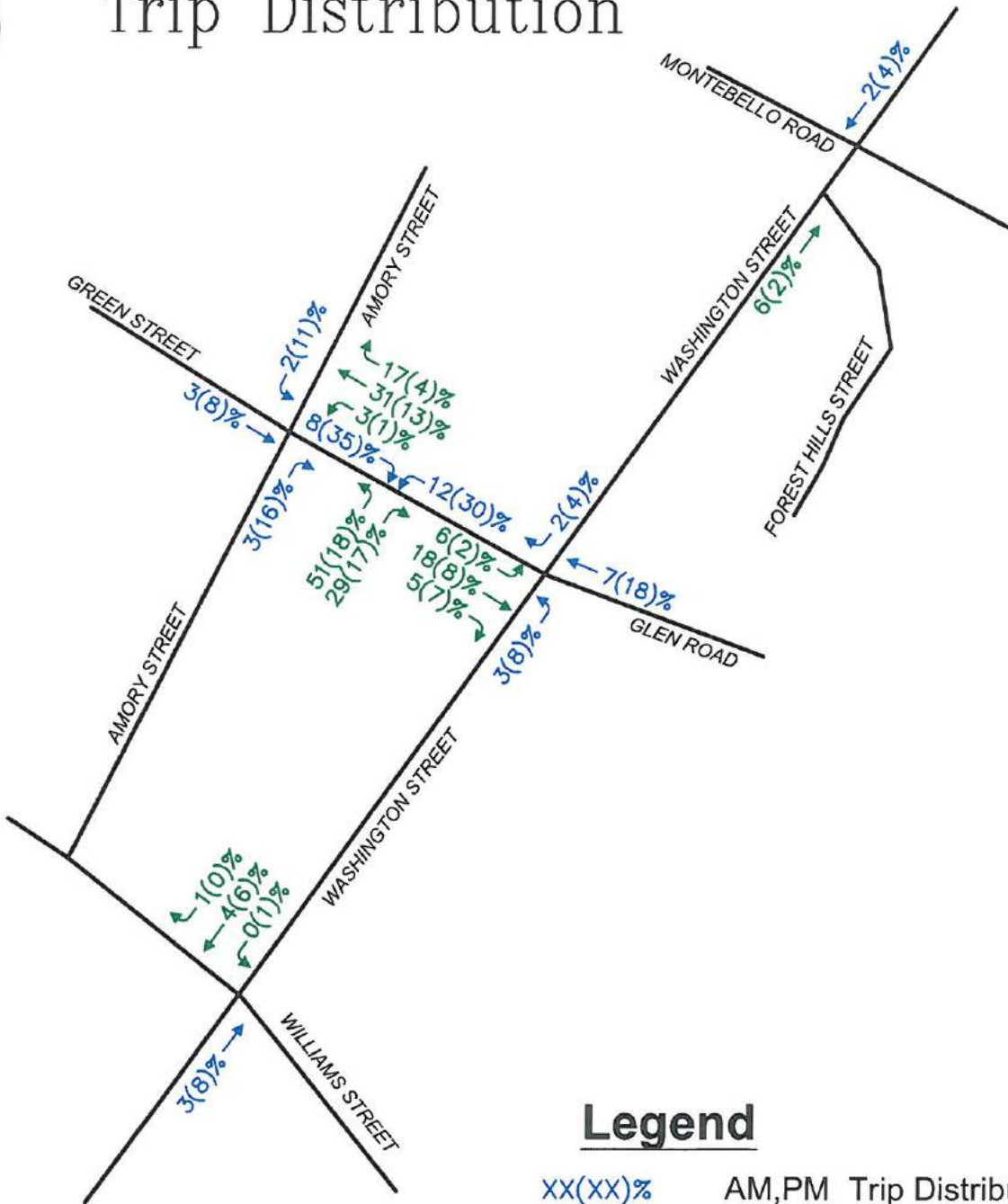
2.3.2.4 Build Conditions Traffic Operations

The study intersections were analyzed for estimated traffic conditions for year 2023 Build Conditions, during the weekday morning and weekday evening peak hours. Existing lane configurations and traffic control were

assumed for this analysis. The results of the 2023 Build analysis are shown in Table 2-15. Detailed capacity analysis worksheets are included in the Appendix.



Trip Distribution



Legend

- XX(X)% AM,PM Trip Distribution (INTO THE SITE)
- XX(X)% AM,PM Trip Distribution (OUT OF THE SITE)

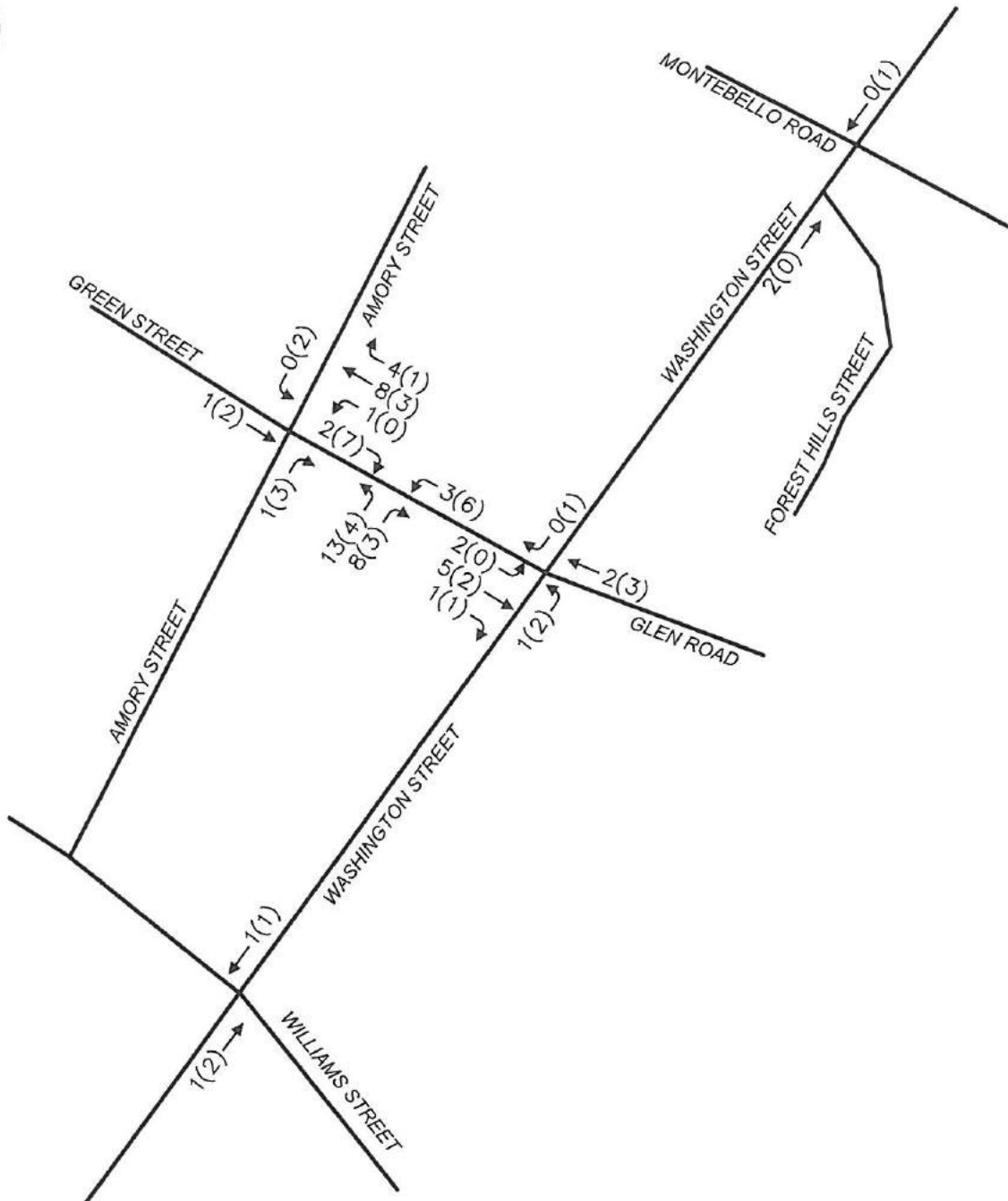
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 Consulting Engineers and Surveyors

120 MIDDLESEX AVENUE
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86 PLEASANT STREET
 NEWBURYPORT, MA 01950
 978-358-7173

3371-3375 Washington Street
 BOSTON, MA

Figure 2-21
 Trip Distribution



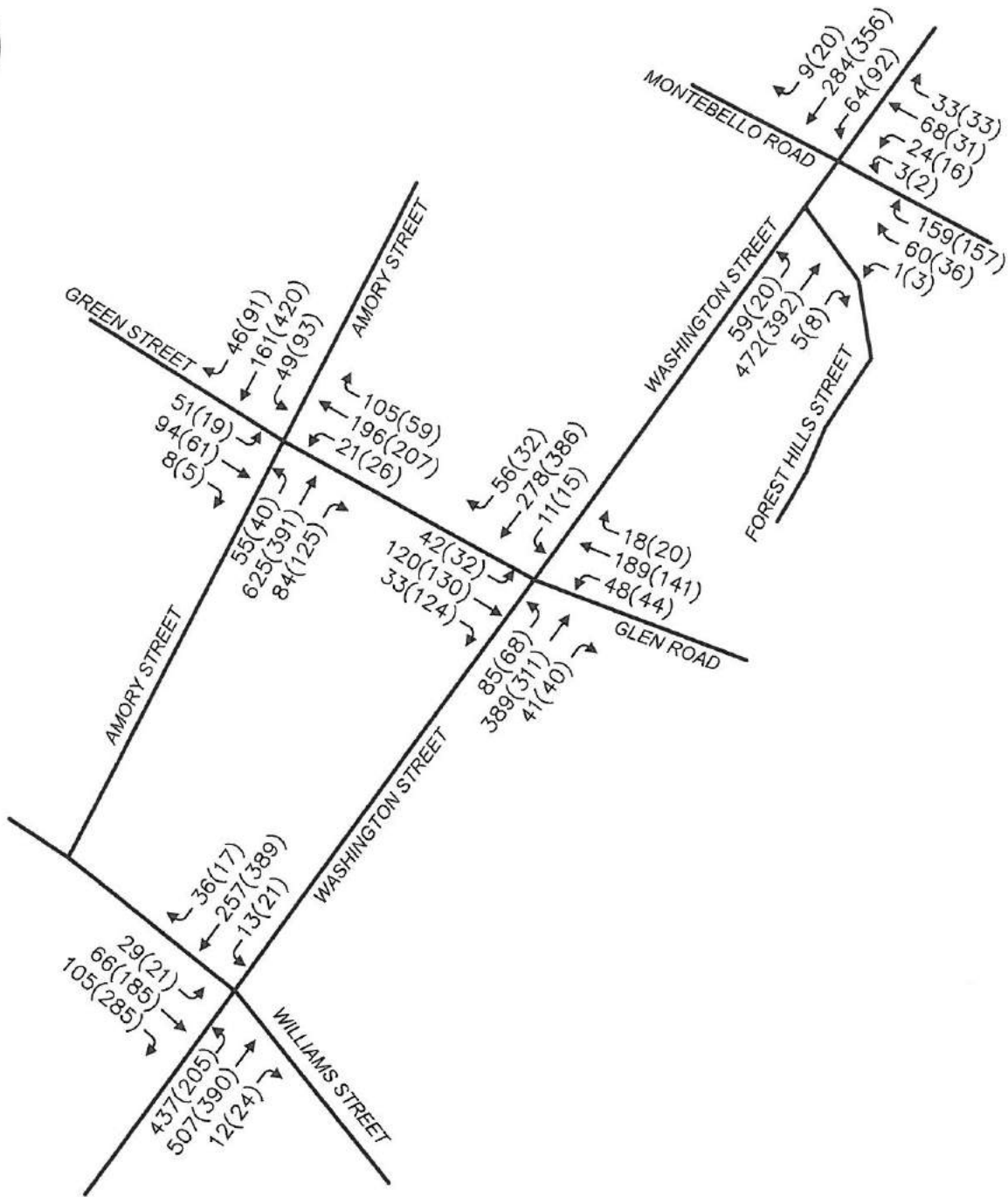
Legend

XX(YY) → AM(PM) Peak Hour Project Trips

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NEWBURYPORT, MA 01850
978-358-7173

3371-3375 Washington Street
BOSTON, MA

Figure 2-22
Project Trips



Legend

xx(yy) → AM(PM) Peak Hour Build Volumes

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 Consulting Engineers and Surveyors

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 617-776-3350

68 PLEASANT STREET
 NEWBURYPORT, MA 01950
 978-356-7173

3371-3375 Washington Street
 BOSTON, MA

Figure 2-23
 2023 Build
 Traffic Volumes

Table 2-15: 2023 Build Conditions LOS

ID	East-West Road	North-South Road	Lane	Build							
				AM Peak Hour				PM Peak Hour			
				v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)	v/c	Avg. delay / veh (s)	LOS	95th % Q (ft)
1	Green Street	Washington Street	EB LTR	0.75	51.5	D	195	0.87	60.0	E	272
			WB LTR	0.88	65.5	E	#274	0.87	70.6	E	224
			NEB LTR	0.76	12.5	B	m99	0.61	28.0	C	m188
			SWB LTR	0.75	41.3	D	#329	0.69	35.9	D	#484
			Overall		36.2	D			43.9	D	
2	Montebello Road/Forest Hills Street	Washington Street	WB LTR	0.82	83.5	F	#206	0.60	56.2	E	104
			NB LTR	0.88	76.9	E	#294	0.87	80.1	F	#292
			SB LTR	0.90	62.7	E	#523	1.29	>120	F	#747
			NEB LTR	0.98	71.3	E	#744	0.67	36.9	D	433
			Overall		71.1	E			102.8	F	
3	Williams Street	Washington Street	SEB LTR	0.76	48.1	D	173	1.07	96.2	F	#599
			NEB LTR	1.23	>120	F	#1135	1.67	>120	F	#930
			SWB LTR	0.72	41.6	D	m281	0.82	42.1	D	#484
			Overall		104.3	F			>120	F	
4	Green Street	Amory Street	EB LTR	0.56	23.7	C	88	0.19	8.9	A	29
			WB LTR	0.81	32.3	C	#192	0.61	13.9	B	82
			SB LTR	0.84	20.2	C	#404	0.82	24.0	C	#267
			NB LTR	0.35	7.1	A	73	0.98	49.2	D	#315
			Overall		20.9	C			31.2	C	

Volume-to-capacity (v/c), delay (seconds/veh), and Level of Service (LOS) obtained from HCM 2000 outputs in Synchro 8
 ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 # = volume for 95th percentile cycle exceeds capacity. If the v/c for this movement is less than 1.0, the 95th percentile queue will rarely be exceeded. Queue shown is maximum after two cycles.
 'm' Volume for 95th percentile queue is metered by upstream signal

As shown in Table 2-15, there are only minor increases in delay moving from the 2023 No-Build to 2023 Build conditions. During both the morning and evening peak hours, increases in delay are minimal. Although some movements experience an increase in delay, zero movements decrease to an LOS of F going into the Build conditions.

2.3.2.5 Build Conditions Parking Supply

The Project at 3371-3375 Washington Street will consist of 58 residential dwelling units, 1,775 square feet of retail space, and 33 total parking spaces (30 parking spaces for the retail and residential space and three Zip Car parking spaces). This results in a parking ratio of 0.52 parking spaces per dwelling unit. The anticipated parking requirements are shown in the subsequent table.



Table 2-16: Parking Need Calculation

Type	Size (per # of units)	Size (per 1000 Square Feet)	Range of Parking Spaces / Unit	Range of Parking Spaces / 1000 square feet	Range of Parking Spaces Required
Market	48		0.75-1.25		36 to 60
Affordable	10		0.75-1.25		8 to 13
Commercial		1.175		0.75-1.25	1 to 2
Total	58	1.175			45 to 75

Parking requirements set forth by the BTB are based on proximity to public transportation and housing type (Market vs. Affordable). For the purpose of this study, a range of required parking spaces was determined for the Project at 3371-3375 Washington Street. As shown in Table 2-16, the proposed Project will require between 45 and 75 parking spaces. Although the 33 parking spaces that will be provided after redevelopment does not fall within this range, the proximity to the Green Street T Stop on the MBTA Orange Line reduces the need for vehicle parking spaces on-site. Further determinations will be made following discussions with BTB to determine the exact parking requirements for the proposed Project.

2.3.2.6 Build Bicycle and Pedestrian Conditions

Future Bicycle and Pedestrian Volumes

With the construction of the Project, there will be an expected increase in bicycle and pedestrian volumes in the area. The Project is set to add a secure bicycle parking area, which will promote bicycle usage by residents. The census data from the Census Tract for Jamaica Plain shows that approximately 5.2% of residents bike to work and 5.1% walk to work. Given the number of expected trips generated by the Project, this would result in approximately seven bicycle trips and seven walking trips for commuting during both the morning and evening peak hours combined. Given the proximity of Franklin Park and the Southwest Corridor Path, recreational biking and walking trips will likely be higher. Moreover, the Pew Research Center reports a 53% bicycle ownership rate in the United States, showing a latent demand for biking if there are safe bicycle facilities.

Additionally, the Proponent will abide by the Boston Complete Streets Guidelines for all modifications, such as potentially adding street trees and improving the streetscape. These improvements will facilitate access to

MBTA transit stops and shopping and recreation areas along Washington Street.

2.3.2.7 Build Bicycle Accommodations

BTD has established guidelines requiring all projects that are subject to Transportation Access Plan Agreements (TAPA) to provide secure, covered bicycle parking for residents and employees, and short-term bicycle racks for visitors. Sufficient on-site, secure storage will be provided to meet those guidelines.

2.3.2.8 Build Conditions Loading and Service

All recycling, trash collection, and loading activities for the Project will occur on-site where possible. Trash and loading activities for both the retail and residential spaces will occur within the surface parking lot. Trash will be stored within one of two dumpster enclosures located under the buildings, as shown in Figure 2-20 on Page 2-34, and then wheeled/carried out to Green Street for curbside pick-up.

Most residential deliveries will be made via the curbside on Green Street. Building management will coordinate all residential move-in and move-out activity and schedule this activity during off-peak hours, where possible. Move-in and move-out activity is generally infrequent once the building is occupied.

2.4 Evaluation of Traffic Impacts

Table 2-17 shows level of service at each study intersection, in each peak hour and each scenario. The comparison shows that the residential Project will have minimal effect on traffic operations at both of the study intersections.

Table 2-17: Level-of-Service Comparison: Existing, No-Build, Build Scenarios

ID	East-West Road	North-South Road	Lane	Existing		No-Build*		Build	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	Green Street	Washington Street	EB LTR	E	E	D	E	D	E
			WB LTR	E	E	E	E	E	E
			NEB LTR	B	C	B	C	B	C
			SWB LTR	D	C	D	D	D	D
			Overall	D	D	D	D	D	D
2	Montebello Road/Forest Hills Street	Washington Street	WB LTR	F	E	F	E	F	E
			NB LTR	E	F	E	F	E	F
			SB LTR	E	F	E	F	E	F
			NEB LTR	F	D	E	D	E	D
			Overall	E	F	E	F	E	F
3	Williams Street	Washington Street	SEB LTR	D	F	D	F	D	F
			NEB LTR	F	F	F	F	F	F
			SWB LTR	D	D	D	D	D	D
			Overall	F	F	F	F	F	F
4	Green Street	Amory Street	EB LTR	C	A	C	A	C	A
			WB LTR	C	B	C	B	C	B
			SB LTR	B	C	B	C	C	C
			NB LTR	A	D	A	D	A	D
			Overall	C	C	C	C	C	C

LEGEND

	LOS of F in Existing Conditions
	LOS Declined from previous condition

*Any improvements to No-Build Conditions are due to the standard practice of using a 0.92 Peak Hour Factor for future conditions in accordance with MassDOT Guidelines.

As can be seen from Table 2-17, the development at 3371-3375 Washington Street will have no significant impact on surrounding traffic networks. Although one movement drops in Level of Service between the No-Build and Build scenarios, that movement does not drop to an LOS of F and the overall intersection LOS remain the same.

2.5 Evaluation of Short-term/Construction Impacts

Most of the 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 (CMP) to be filed with the BTM in accordance with the City's transportation maintenance plan requirements.

In order to minimize transportation impacts during the construction period, the following measures will be incorporated into the CMP:

- Limited construction worker parking will be permitted on-site; carpooling will be encouraged;
- A subsidy for MBTA passes will be considered for full-time employees; and
- Secure spaces will be provided on-site for workers' supplies and tools so they do not have to be brought to the Project site each day.

2.6 Transportation & Parking Demand Management

In keeping with the City's efforts to reduce the dependency on automobile usage by encouraging travelers to use other alternatives to driving alone, the Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce dependency on autos and reduce parking demand. The nature and location of the proposed Project will facilitate TDM implementation. The site's proximity to an MBTA bus route and the MBTA Orange Line will contribute to reduced auto use by both residents and visitors. Since the Project is mostly residential, its trip generation is already lower than that of a large retail or office-use project.

2.6.1 Access Plan Agreement

The Proponent is prepared to take advantage of the site's pedestrian and transit access in marketing to future residents. TDM measures may include, but will not be limited to, the following:

- Post MBTA bus and commuter rail schedules and maps in common areas of the proposed building to inform tenants about nearby public transportation.
- Provide tenants with information and maps for nearby bicycle and pedestrian facilities in the area to promote pedestrian and bicycle travel.

- Pedestrian facility improvements on Washington Street and Green Street to encourage pedestrian activity.
- Priority parking spaces for carpools / ride-sharing vehicles.
- Providing Zip Cars to reduce trips, demand for parking, and automobile dependence.
- Safe, secure bicycle storage conveniently located to encourage bicycle usage.

2.7 Conclusions

This Traffic Impact Study was created to analyze the expected impact on surrounding traffic networks of the proposed redevelopment of the site at 3371-3375 Washington Street in the Jamaica Plain neighborhood of Boston, Massachusetts. There are existing buildings on site, which will be demolished to construct a 58 unit residential building that will include 1,775 square feet of retail space. The site will be accessed via a curb cut on Green Street, which will provide access to both an at-grade parking area with a total of 30 parking spaces and three (3) Zip Car spaces. This results in a parking ratio of 0.52 parking spaces per dwelling unit.

Capacity analyses were carried out for the four study intersections for 2016 Existing, 2023 No-Build, and 2023 Build conditions. The Project is expected to generate 26 net new vehicle-trips during the morning peak hour and 20 net new vehicle-trips during the evening peak hour. During both the morning and evening peak hours, increases in delay are minimal and only one movement decreases in level of service going from the No-Build to the Build conditions. Based on the trip generation and capacity analyses carried out, the proposed redevelopment of the site at 3371-3375 Washington Street will have minimal impact on surrounding traffic networks in the Jamaica Plain neighborhood of Boston, Massachusetts.