KIPP Academy Boston Charter School

MATTAPAN, MASSACHUSETTS

Submitted by
KIPP Boston Fund, Inc.
90 High Rock Street
Lynn, MA 01902

Prepared by
VHB *Vanasse Hangen Brustlin, Inc.*
99 High Street, 10th Floor
Boston, MA 02110

In association with
Qroe Preservation Development
Arrowstreet
Jacobs
Nitsch Engineering
Copley-Wolff Design Group
Ransom Consulting
Krokidas & Bluestein
Garcia, Galuska, DeSousa

Project Notification Form

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May 2014

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Project Description and Impact Summary

In 2009, leadership of the highly successful KIPP Academy Charter School in Lynn, Massachusetts met with City of Boston civic and government leaders, including the Mayor, to investigate whether a new KIPP charter school would be a welcome and valuable addition in Boston. Following a positive reception, KIPP initiated discussions with community leaders and civic groups in the neighborhood of Mattapan to discuss that community's educational landscape and the potential value of a KIPP school located in and serving Mattapan. The result of these conversations was KIPP's 2010 application to the State Department of Elementary and Secondary Education to open a Boston charter school in Mattapan for 588 students in grades K-8. The Charter was granted in 2011 and the School opened in a temporary space outside of Mattapan in 2012.

The Proposed Project described in this document represents the completion of KIPP's plan to locate its School within the neighborhood of Mattapan and the fulfillment of its 2010 commitment to the Mattapan community.

Proponent

KIPP Academy Boston Charter School ("KAB", "Proponent") is a free open enrollment public charter school open to only Boston residents that opened in August of 2012 in a temporary space in Jamaica Plain. It is currently located in a new temporary space at 384 Warren Avenue in Roxbury. The School is chartered for a full enrollment of 588 students in grades K-8, but will take until 2018 to ramp up to full enrollment. Current enrollment is 144 students in grades 5-6. Enrollment upon occupancy of the proposed facility in 2016 will be approximately 475 students in grades K-2 and 5-8.

At its temporary location on Warren Street in Roxbury, approximately 78% of KIPP Academy Boston's current students are from Mattapan, Roxbury, and Dorchester. KAB committed to serving the families of Mattapan, and is continuing to focus its

student recruitment efforts in the community. Based on this recruitment effort, when at full scale in its proposed location in Mattapan, KIPP expects that at least 50% of its students will be from Mattapan and the balance of its students will come from the surrounding neighborhoods of Dorchester and Roxbury. Current State law requires that all City of Boston residents receive equal enrollment opportunities in the school lottery process.

In its first year, KIPP Academy Boston students' proficiency/advanced scores more than doubled. Math scores grew from 15% proficient or advanced entering KIPP to 38% proficient or advanced. In ELA, 19% of the students were proficient or advanced entering KIPP and after just one year, 48% scored proficient or higher. Additionally, 62% of the KAB 5th graders scored proficient or advanced on the Science MCAS.

The School program is based on a longer school day, academic and character development, a relentless focus on student outcomes and college completion, intensive professional development for teachers and staff, and a comprehensive continuum of service for students, alumni and families. KIPP's success is measured by both academic achievement and college graduation outcomes of its students. KIPP is dedicated to providing students support to and through college. KIPP believes that the Mattapan community is a place where achievement and opportunity gaps can be closed, not in some distant future, but for the children they serve right now.

KIPP: Massachusetts

KIPP Massachusetts (KIPP:MA) is responsible for management and governance of both the Lynn and Boston Schools. KIPP:MA is a member of a national non-profit network of 141 Knowledge Is Power Program (KIPP) schools in 20 states plus the District of Columbia. The total network serves 55,000 students, with a track record of success in underserved communities.

Approximately 81 percent of KIPP:MA's students are eligible for the federal free or reduced-price meal programs, and 87 percent are African American or Latino. Since its start in 2004, KIPP: MA has grown with quality and earned charter expansions for further growth. In 2005 the first KIPP school in Massachusetts was opened in Lynn with 77 fifth graders and a founding staff of five. Today, KIPP Academy Lynn middle and high schools are co-located on one newly constructed campus, serving 724 students in grades 5-11 and will, at full scale, serve 850 students in grades 5-12.

KIPP Academy Boston and KIPP Academy Lynn are governed by a single 12-member Board of Trustees providing governance and guidance to the schools. The Board has a committee structure to determine and enact policy, oversee academic success, raise funds, monitor the organization's financial stability, and lead long term

strategic planning. Both the Boston and Lynn Schools are led by a single Executive Director, who oversees all the School Principals as well as the central office functions of finance, facility management, human resources, fundraising, and other administrative functions. Across the entire KIPP:MA organization, there are approximately 140 full-time employees, including faculty and staff.

In 2013, MCAS scores for the Lynn School reflected tremendous academic development and character growth. In addition to knowledge and skill, the children demonstrated grit to struggle through challenging math problems, curiosity to master the intricacies of cell division, and zest to craft a masterful essay. These scores represent one step on the students' journeys towards college graduation and meaningful and independent lives.

- KIPP Academy Lynn (KAL) had the second highest growth of any school in the state in 7th grade Mathematics (91st percentile) and 8th grade English Language Arts (ELA - 79th percentile).
- KAL's fifth grade ELA, fifth grade Science, and eighth grade Science scores were the best in the school's history.
- On the biology MCAS, typically taken in the 10th grade, KAL ninth graders improved to 93% proficient or advanced on the biology MCAS. Seventy-three percent (73%) of 10th graders scored advanced on Mathematics, and 94% scored proficient or advanced in ELA.
- When the current ninth graders came to KAL in the 4th grade, only 35% of them were proficient or advanced on the MCAS in ELA and 27% were proficient or higher on the Math test. These students made consistent gains in their time at KAL, and by the time they reached 8th grade, 82% were proficient on the ELA MCAS, and 69% were proficient or higher in Math. This means their projected college graduation rate has improved by 5 times.

Project Description

The Proponent proposes to construct an approximately 53,000 gross square foot (GSF) school building located at 1464 Blue Hill Avenue[1] in the Boston neighborhood of Mattapan ("Proposed Project"). The Proposed Project includes a four-story classroom building which also contains a two-story cafeteria and administrative space, and a one-story gymnasium. To allow for the possibility of some additional enrollment in the same K-8 grades, the School facility is designed to house up to 650 students and 84 full-time equivalent faculty and staff. As shown in **Figure 1-1**, the School building is proposed to be situated along Babson Street and the adjacent MBTA Fairmount Commuter Rail Line. The School will have approximately 48 off-street parking spaces and a drive lane connecting Babson Street to Blue Hill Avenue

[1] Property also has the address of 37 Babson Street, Boston, MA.

that will accommodate internal access/circulation and drop-off/pick-up for both parents and school buses. The site will also have an outdoor play area on the northern side of the site. For student safety, the fencing system along the boundary with the MBTA tracks will be designed to prevent access to the tracks from the site.

The School is designed to accommodate middle school students on the top two floors and the elementary students on the lower two floors of the building. A cafeteria/common space will be provided on the first floor adjacent to the gymnasium at the south end of the building. Administrative offices are located in the second floor above the cafeteria. The single story gymnasium will provide the students with opportunity for physical activity throughout the school year, as well as space for large assemblies. The gymnasium can be accessed separately so that is can be available for community uses during non-school hours.

The Project will significantly benefit the School's students, providing an opportunity to create a campus environment with improved classroom, common space and recreational amenities for those children who attend. The current Roxbury facility, which is too small for full enrollment and subject to a short-term lease arrangement, lacks sufficient parking, outdoor recreation spaces, and adequate common space. The proposed facility is organized in a more traditional school layout.

The Project is subject to Large Project Review under Article 80 of the City of Boston Zoning Code. Accordingly, the Proponent submits this expanded Project Notification Form (PNF), including the substantive components that are required for Large Project Review, such as urban design, transportation, environmental, as well as other components generally prepared in fulfillment of Draft Project Impact Report (Draft PIR) requirements.

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Existing Site Conditions

The Project site consists of approximately 1.7 acres of land located north of the existing MBTA Fairmont Commuter Rail Line and between Blue Hill Avenue and Babson Street, and approximately one-half mile north of Mattapan Square. The site currently has gated access on both Babson Street and Blue Hill Avenue. In the future, the site will be accessed via Babson Street and egressed via Blue Hill Avenue (one-way traffic flow).

The locus map and existing site conditions plan are shown in **Figures 1-2** and **Figure 1-3**, respectively.

KIPP:MA MASSACHUSETTS

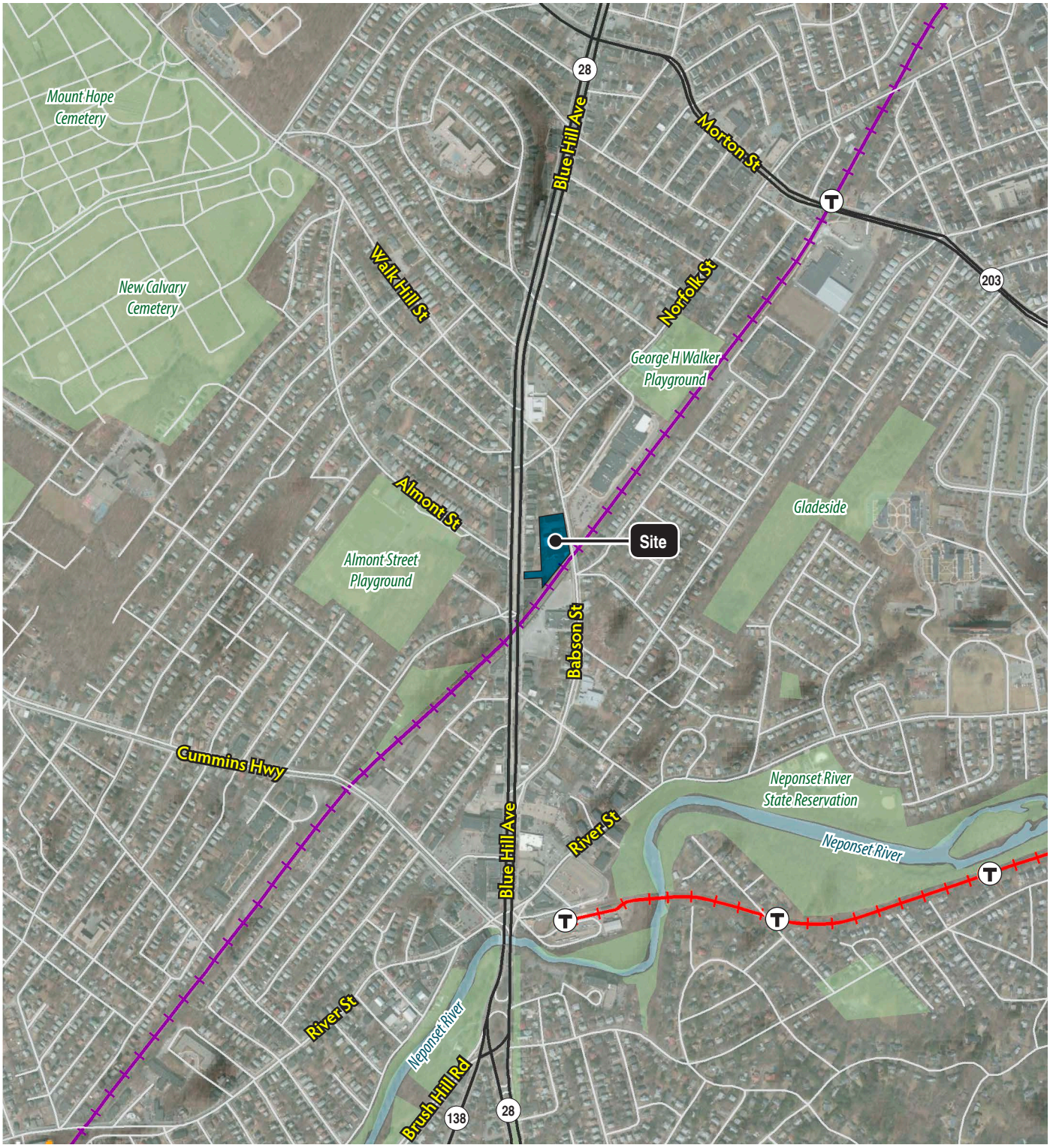
KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

PROPOSED SITE PLAN

FIGURE 1-1



0 500 1000 Feet

KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

LOCUS MAP

FIGURE 1-2

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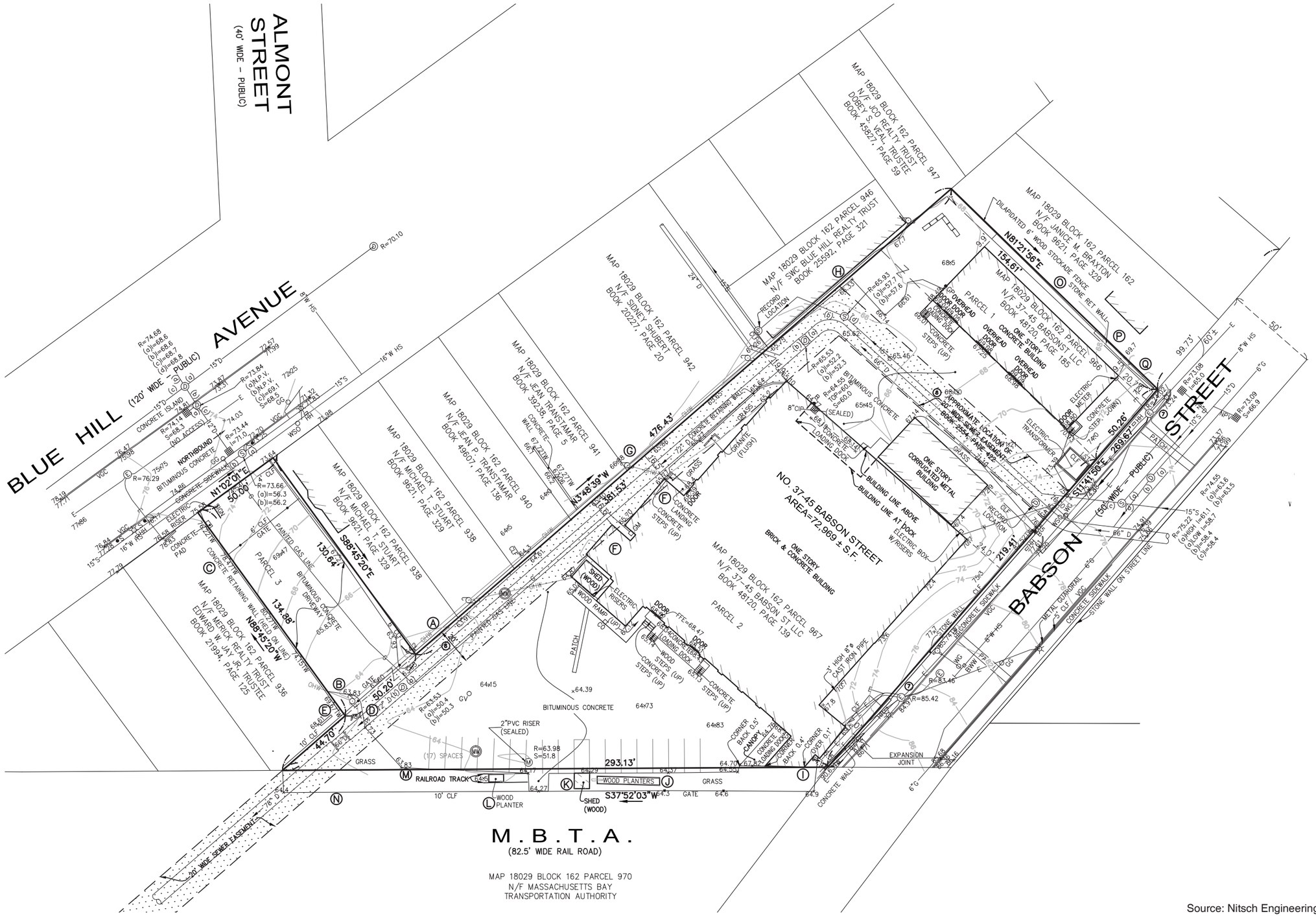
BLUE HILL AVENUE (120' WIDE – PUBLIC)
ALMONT STREET (40' WIDE – PUBLIC)
BABSON STREET (50' WIDE – PUBLIC)
M . B . T . A .
(82.5' WIDE RAIL ROAD)
MAP 18029 BLOCK 162 PARCEL 970
N/F MASSACHUSETTS BAY
TRANSPORTATION AUTHORITY
MAP 18029 BLOCK 162 PARCEL 947
N/F VCO REALTY TRUST
DOBEY S. VEAL, TRUSTEE
BOOK 45627, PAGE 59
MAP 18029 BLOCK 162 PARCEL 946
N/F SWC BLUE HILL REALTY TRUST
BOOK 25592, PAGE 321
MAP 18029 BLOCK 162 PARCEL 942
N/F SIDNEY SHUBERT
BOOK 20227, PAGE 20
MAP 18029 BLOCK 162 PARCEL 941
N/F JEAN TRANSTAMAR
BOOK 39235, PAGE 5
MAP 18029 BLOCK 162 PARCEL 940
N/F JEAN P. TRANSTAMAR
BOOK 49607, PAGE 136
MAP 18029 BLOCK 162 PARCEL 938
N/F MICHAEL T. STUART
BOOK 9621, PAGE 329
MAP 18029 BLOCK 162 PARCEL 936
N/F MERROK REALTY TRUST
EDWARD W. JAY JR., TRUSTEE
BOOK 21994, PAGE 125
MAP 18029 BLOCK 162 PARCEL 162
N/F JANICE M. BRAXTON
BOOK 9621, PAGE 329
MAP 18029 BLOCK 162 PARCEL 985
N/F 37-45 BABSONST LLC
BOOK 48120, PAGE 185
MAP 18029 BLOCK 162 PARCEL 967
N/F 37-45 BABSON ST LLC
BOOK 48120, PAGE 139
NO. 37-45 BABSON STREET
AREA=72,969 ± S.F.
PARCEL 1
PARCEL 2
PARCEL 3
N81°21'56"E 154.61'
N1°02'01"E 50.00'
S88°45'20"E 130.64'
N88°45'20"W 134.86'
S3°48'39"W 476.43'
S37°52'03"W 293.13'
S1°41'56"E 269.67'
S88°45'20"E 44.70'
N88°45'20"W 50.20'
50.26'
218.41'
99.73'
DILAPIDATED 6' WOOD STOCKADE FENCE
STONE RET WALL
STONE WALL ON STREET LINE
CONCRETE RETAINING WALL
CONCRETE SIDEWALK
BITUMINOUS CONCRETE
BITUMINOUS CONCRETE DRIVEWAY
CONCRETE ISLAND
CONCRETE PAD
CONCRETE LOADING DOCK
CONCRETE STEPS (UP)
WOOD STEPS (UP)
WOOD RAMP (UP)
WOOD PLANTERS
WOOD PLANTER
SHED (WOOD)
ONE STORY CONCRETE BUILDING
ONE STORY CORRUGATED METAL BUILDING
BRICK & CONCRETE BUILDING
BUILDING LINE ABOVE
BUILDING LINE AT DOCK
APPROXIMATE LOCATION OF 50' WIDE SEWER EASEMENT BOOK 2554, PAGE 422
20' WIDE SEWER EASEMENT
RECORD LOCATION
ELECTRIC BOX W/RISERS
ELECTRIC RISERS
ELECTRIC METER
ELECTRIC TRANSFORMER
2"PVC RISER (SEALED)
8"CIP (SEALED)
3" HIGH 6" CAST IRON PIPE
RAILROAD TRACK
EXPANSION JOINT
GRANITE (FLUSH)
GRASS
PATCH
(17) SPACES
R=74.68
R=76.29
R=73.84
R=74.14
R=73.44
R=70.10
R=73.66
R=65.93
R=65.53
R=64.55
R=63.98
R=63.53
R=75.22
R=73.08
R=74.55
R=73.09
R=83.46
R=85.42
0 30 60 Feet
Source: Nitsch Engineering
KIPP MA MASSACHUSETTS
KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
VHB Vanasse Hangen Brustlin, Inc.
EXISTING CONDITIONS SURVEY
FIGURE 1-3

Building Program

It is intended that the new construction and improvements will be put in place immediately after the required project approvals are obtained. **Table 1-1** summaries the proposed development program for the Project. In total, the Proposed Project will include the construction of approximately 53,000 square feet of educational, community, and administrative space.

Table 1-1
Proposed Building Program

Building	Square Feet (SF)
Classroom	49,000
Gymnasium	4,000
Grand Total	53,000

Site Access Improvements

The Project site will be accessed via curb cuts along Babson Street and Blue Hill Avenue. Since Blue Hill Avenue is divided by a median, all traffic exiting the site will be required to take a right-turn onto Blue Hill Avenue northbound. The driveways will provide access to the campus with dedicated visitor and faculty/staff parking and school bus and parent drop-off/pick-up areas. School buses will load/unload in the outside lane and parents will drop-off/pick-up their children in the two inside lanes adjacent to the School. KAB faculty/staff will proactively manage the drop-off / pick-up area to streamline operations and increase safety for all users.

The Project will construct approximately 48 off-street parking spaces located on site. The School's main egress on Blue Hill Avenue will be stop-controlled with right-only onto Blue Hill Avenue northbound. Both driveways will be constructed with ABA/AAB accessible pedestrian amenities in order to safely manage pedestrian traffic in conjunction with vehicular movements. Both driveways will have gates installed that can be closed during non-school hours in order to prohibit cut-through traffic from Babson Street to Blue Hill Avenue. These gates may also be closed at certain times during school hours if warranted by student safety concerns. On-site pedestrian amenities include sidewalks surrounding the School building and crosswalks to safely guide students between the drop-off/pick-up area and the School sidewalk.

Public Review Process

On January 29, 2014, the Proponent submitted a Letter of Intent to the BRA Director in accordance with the "Executive Order of Mayor Thomas M. Menino Relative to the Provision of Mitigation by Development Projects in Boston[2]" (Executive Order). The purpose of the Executive Order is to provide for the review of project impacts and proposed mitigation by an Impact Advisory Group (IAG). The IAG consist of Mayor-appointed individuals including residents, business owners, and designees of relevant community organizations. It is anticipated that the IAG will evaluate expected project-related impacts and proposed mitigation efforts.

In addition to a series of meetings with community leaders and groups during and after its charter school application and start process in 2009 – 2011, the Proponent has met with numerous elected officials and community leaders over the past four months about this specific Project. Meetings have been held with and early project presentations have been made to the following elected officials:

- State Senator Linda Dorcena Forry
- State Representative Daniel Cullinane
- State Representative Russell Holmes
- City Councilor Timothy McCarthy
- City Councilor Charles Yancey

In addition, the Proponent has also met and consulted with representatives of the Boston Redevelopment Authority, the Mayor's Office of Neighborhood Services, Boston Water and Sewer Commission, and the Boston Transportation Department.

A community meeting was held on April 15, 2014 at the Mattapan Community Library at which 20-25 community members attended. The meeting was publicized by delivery of approximately 300 fliers to homes in the surrounding neighborhood, informing of elected representatives, and posting on the Mattapan United website. The Proponent's Executive Director, architect, and transportation engineer each presented information regarding the School, the Proposed Project design, and the traffic management program. Community members asked questions and provided constructive comments. The Proponent promised to hold additional community meetings regarding both the Proposed Project and how the School can best serve the needs of the community.

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

Project Benefits

The Proposed Project will provide the following significant community benefits to the City and the Mattapan Community:

- The new facilities will remediate, repurpose, and very significantly upgrade a former industrial property in a largely residential neighborhood;
- It will provide a new high quality free, public education alternative for the children and families it serves in Boston and Mattapan in particular;
- The School will work with the community to establish a program by which the gymnasium, classrooms, and meeting spaces inside the School facility will be available for use by community residents and community sponsored programs during non-school hours; and
- The Proponent is committed to long-term engagement in community wide initiatives targeted toward the betterment of youth opportunity, safety, and advancement.

■

Employment

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

Construction Employment

The construction of the Project will contribute directly to the local economy by providing approximately 115 FTE prevailing wage construction jobs. An Employment Plan/Quarterly Work Force Projection Table (the "Plan") will be submitted in accordance with the Boston Residents Jobs Policy. The Plan will provide that the company will make best efforts to have at least 50 percent of the total on-site employee work hours for the Project be performed by Boston residents, at least 25 percent of such hours be performed by minorities and at least 10 percent of such hours be performed by women. As a public construction project, all on-site construction work will conform to prevailing wage law.

In addition to compliance with the Boston Residents Jobs Policy, the Proponent will commit to a community based recruitment effort to ensure that qualified Mattapan community residents are made aware of the construction labor opportunities on site and are afforded preferred opportunities to secure employment with project contractors and sub-contractors. The Proponent and its selected contractor will work with the city and community groups to better design and define this effort prior to construction bidding.

Permanent Employment

KIPP Academy Boston will employ approximately 84 full time staff on site at full enrollment. The School will commit to a community based recruitment effort to identify qualified Mattapan community residents and make them aware of employment and training opportunities at KIPP.

Project Impacts

This section summarizes Project impacts, including transportation and environmental protection. Impacts to infrastructure and a discussion regarding historic resources are also presented. Overall, as described below, the Proposed Project will not have significant environmental impacts.

Transportation

The transportation improvement plan proposed by KAB will improve access to the Project site from Babson Street and Blue Hill Avenue to safely and efficiently manage traffic and pedestrian movements to and from the School. A series of actions have been developed to generally improve both the vehicular and pedestrian access on site. The proposed on-site and off-site parking for the Project will satisfy the expected parking demands generated by the Project (which is driven almost entirely by the faculty/staff population). Finally, the Proponent will explore proactive Transportation Demand Management (TDM) measures and supporting amenities to encourage and support the use of carpooling, transit, walking, and cycling.

A summary of key findings of the transportation analysis for the Project is as follows:

- The Project will generate approximately 153 entering and 121 exiting vehicle trips during the weekday morning peak hour and approximately 67 entering and 99 exiting vehicle trips during the weekday evening peak hour.
- A single drop-off/pick-up area will be used by both parents and school buses. The area will be in front of the School building and will consist of three drive aisles with supporting pedestrian pathways for vehicle loading and unloading. This drop-off area has been sized to accommodate all anticipated KAB generated pick-up/drop-off demand.
- During morning arrival and afternoon dismissal, school buses will use the outside lane and parents will use the two inside lanes adjacent to the School.
- KAB will maintain an active faculty/staff presence in the drop-off area during both the drop-off and pick-up periods to ensure student safety and streamline loading/unloading.
- The study area intersections will continue to operate at the same levels of service when the School opens as under future No-Build conditions, with the

exception of the intersection of Blue Hill Avenue/Walk Hill Street/Babson Street (decrease from LOS C to LOS D) during the morning peak hour and the intersection of Babson Street/Norfolk Street during the evening peak hour (decrease from LOS C to LOS D).

- The School will provide accessible sidewalks along both driveways and accessible ramps, crosswalks, and sidewalks throughout the Project site.
- On-site parking will be comprised of approximately 48 spaces, which will support parking for visitors and most faculty/staff. Additional faculty/staff parking will be provided in an off-site, off-street parking lot. Discussions about leased parking spaces have been initiated with the Jubilee Church located to the south of the site.
- The Proponent is also committed to providing and enhancing a wide array of Transportation Demand Management measures offered to faculty and staff as a means to encourage the use of alternative transportation modes.

Each of these transportation impacts are described in greater detail in **Chapter 4,** *Transportation*.

■

Environmental Protection

The Proposed Project will have no significant environmental impacts. As compared to the existing site, the Proposed Project will upgrade site access conditions, improve stormwater runoff quantity and quality, and the aesthetic character of the Project site and the surrounding area.

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

Wind

The Proposed Project is not expected to generate changes in wind impacts on adjacent buildings or on open space since the new construction will not exceed 55 feet from ground level.

Shadow

The Proposed Project will not produce significant new shadow impacts outside of the Project site.

Daylight

The Proposed Project will result in a nominal increase in daylight obstruction on Babson Street in comparison to the existing conditions. Although the proposed building will not be closer to Babson Street, it will be taller than the existing two-story industrial building.

Solar Glare

The Project will not include large areas of reflective glass or other materials that would contribute to solar glare.

Air Quality

It is expected that the Proposed Project will comply with the requirements of the City of Boston, the Massachusetts State Implementation Plan (SIP), and Housing and Urban Development (HUD) criteria for residential receptors. Carbon monoxide concentrations are expected to fall below the National Ambient Air Quality Standards (NAAQS).

Water Quality

The Proposed Project will improve water quality at the site in terms of both stormwater quality and quantity. At least 80 percent of Total Suspended Solids will be removed from runoff originating from roof areas, parking lots, and other impervious surfaces, in compliance with DEP Stormwater Regulations. The design intent is to collect stormwater runoff from the impervious area and roof of the Proposed Project and direct it to a subsurface recharge system on site which will overflow to an adjacent BWSC storm drain main.

Flood Hazard Zones/Wetlands

The FEMA Flood Zone designation for the Proposed Project is located outside the 0.2 percent annual chance floodplain, identifying it as an area of minimal flooding.

Groundwater

Groundwater is anticipated to be present within a typical depth of five to ten feet below ground surface.

Geotechnical Conditions

The geotechnical assessment was limited to the area of an existing retaining wall located along Babson Street to evaluate potential geotechnical effects that the proposed School building would have on the retaining wall. Due to the setback distance from the wall to the building, the character of the site soils, and the depth of the groundwater, construction of the eastern wall of the School building will be designed as to not affect the stability of the existing retaining wall.

Hazardous Materials

Thorough environmental site assessments have been completed at the Project site. The results of the site assessments have indicated the presence of petroleum-impacted soils and light non-aqueous phase liquid (LNAPL) at an isolated area. The presence of petroleum-impacted soil and LNAPL will be addressed in conjunction with site redevelopment and in accordance with the provisions of the Massachusetts Contingency Plan (MCP). The project will resolve a currently existing situation and ensure that no exposure hazard exists for students, staff, visitors, construction workers, and community members.

Excess excavated soil to be taken off-site will be subjected to laboratory analysis to evaluate its disposition for off-site reuse, disposal, treatment, or recycling in accordance with MA DEP policy and the MCP.

Noise

It is expected that the noise impacts generated at the Project site will be improved with the Proposed Project in place. The site formerly accommodated several industrial tenants. These uses were relocated in advance of the Project and will be permanently replaced with educational uses, resulting in improved noise conditions.

Primary noise sources from the Proposed Project will be the mechanical equipment to support the heating, ventilation, and air conditioning (HVAC), which will control the climate within the buildings. The actual capacity, manufacturer, screening methodology, and exact locations of HVAC equipment are not yet known as the design is still in progress. The Project will comply with the City of Boston Zoning District Noise Standards.

The Proponent is committed to instituting noise attenuation measures and to comply with the Regulations for the Control of Noise in the City of Boston.

The construction activities related to the development of the site will generate noise for a limited period of time. Although construction sound levels will be higher than

the existing sound levels, they will be temporary, and construction-related noise will be minimized.

Construction Impacts

Construction of the Proposed Project is expected to last approximately 12 months, with the School anticipated to open for the 2016-2017 academic year. Typical construction hours will be from 7:00 AM to 3:30 PM, Monday through Friday. The Proponent will require its contractors to construct the Project in compliance with all applicable City, State and Federal regulations governing noise, dust, and traffic maintenance. In addition, the Proponent will develop a Construction Management Plan with the Boston Transportation Department to address pedestrian and vehicular access concerns. An entrance will be built to reduce mud and dirt on City streets. When necessary, the contractor will be required to sweep the street to remove any construction-generated debris.

Rodent Control

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

Historic Resources

No above-ground properties that are either inventoried or listed in the State Register of Historic Places are in or adjacent to the Project area. There are no inventoried or listed archaeological sites in the Project area. There are two buildings on site that are more than 50 years old in age, the 1925 industrial/warehouse and the 1940s shed, and are subject to review per Article 85 of the Boston Zoning Code.

Sustainability

The Project will be designed and built to meet LEED-Silver certification levels. Article 80B-6 provides that new development projects that are over 50,000 SF must comply with green building standards and sustainable design features as described in Article 37 of the City's Zoning Code. The Proponent is committed to incorporating numerous design elements into this renovation and construction Project to respond to environmental concerns, reduce energy consumption, and reduce water use.

A LEED for Schools checklist is included in the PNF in **Chapter 5,** *Environmental Protection*, which quantifies the green building points defined by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building rating system.

■

Infrastructure Systems

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

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

2

General Information

Applicant Information

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Development Team

The Proponent has assembled a development team of experts familiar with the City's substantive requirements and approval process.

Proponent

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■

Legal Information

Legal Judgments or Actions Pending Concerning the Proposed Project

The Proponent is not aware of any legal judgment or pending legal actions relating to the Project.

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

The Proponent owns no real estate in Boston for which real estate tax payments are in arrears.

Evidence of Site Control Over Entire Project Area

The Proponent has control over the entire Project site pursuant to a Purchase and Sale Agreement dated June 5, 2013, as most recently amended by a second Amendment to Purchase and Sale Agreement dated October 9, 2013.

Regulatory Controls and Permits

■

Zoning

According to Boston Zoning Map 8C (Mattapan), the Project site is located within the Greater Mattapan Neighborhood District (the "District") of the City of Boston which is governed by Article 60 of the Boston Zoning Code (the "Zoning Code"). Within the District, the majority of the Project site (and the entirety of the building) is located within the Community Commercial Subdistrict, and two small portions of the Project site are located within a 3 Family Residential Subdistrict as shown in the *Urban Design* chapter's Figure 3-1. The Project will be used as a K-8 public charter school. Pursuant to Article 60 Sections 60-8 & 60-16 and Tables A & B of the Zoning Code, kindergarten and elementary or secondary school uses are permitted as of right in the Residential Subdistrict and are conditional in the Community Commercial Subdistrict. Since the building and a majority of the Project site are located in the Community Commercial Subdistrict, a conditional use permit will be required for the Project.

The following table sets forth the dimensional requirements applicable to the Project and the Project's dimensional compliance. Because the Project site is located in two Subdistricts, the requirements for both are included. However, because the building is located entirely within the Community Commercial Subdistrict, the analysis assumes that the requirements of that Subdistrict apply, as modified by Article 12 of the Zoning Code (Transition Zoning).

Table 2-1
Project Dimensional Requirements

Category	Required in 3F-6000 and CC Subdistricts[1]	Provided by Project	Relief Required?
Maximum Floor Area Ratio	.8 (3F) 4.0 (CC)	.81 (53,000/65,045)[2]	No
Maximum Building Height	3 stories/35 ft. (3F) no story limit/55 ft. (CC)	4 stories/55 ft.[3]	No
Minimum Lot Area per Dwelling Unit[4]	6,000 SF (3F) None (CC)	6,000 SF for first 1,500 SF	No
Minimum Lot Area for Each Additional Dwelling Unit[4]	3,000 SF (3F) None (CC)	66,939 SF for the rest of the building	No
Minimum Lot Width	45 ft. (3F) None (CC)	50 ft.	No
Minimum Lot Frontage	45 ft. (3F) None (CC)	50 ft.	No
Minimum Usable Open Space per Dwelling[5]	Not Applicable	Not Applicable	No
Minimum Front Yard	10 ft. (3F) None/10 ft. (CC)[6]	21 ft.	No
Minimum Side Yard	7 ft. (3F) None/7 ft. (CC)[7]	60 ft.	No
Minimum Rear Yard	30 ft. (3F) None/30 ft. (CC)[7]	27 ft. 4 in.[8]	Yes
Rear Yard Maximum Occupancy by Accessory Buildings[5]	25% (3F) 25% (CC)	No accessory buildings	No

1 See Section 60-9 and Table D, and Section 60-17 and Table F.
2 Combined Lot Area is 72,969 SF; with 7,924 SF within the 3F-6000 Residential Subdistrict and 65,045 SF within the Community Commercial Subdistrict. If the full 72.969 SF Lot Area is used, the FAR is .73.
3 Although the building exceeds the height limit of the 3F-6000 Subdistrict, since it is located entirely in the CC Subdistrict, no relief is required.
4 Under the definition of "Lot Area Per Dwelling Unit" 1,500 square feet of gross floor area devoted to non-residential use equal 1 dwelling unit. With an aggregate gross floor area of 53,000, the Project would be deemed to include 35 dwelling units.
5 A footnote to Table D states that the minimum usable open space requirement applies only to residential uses and dormitory and fraternity uses.
6 Although no front yard is required in the CC Subdistrict, Section 12-3 of the Zoning Code provides that where land on one side of a street between two intersecting streets is zoned partly as residential and partly as business, the front yard depth in so much of the business district as lies within 100 feet of the boundary line between the two districts must satisfy the residential requirement.
7 Although no side or rear yard is required in the CC Subdistrict, Section 12-3 of the Zoning Code provides that where a lot in a business district abuts a lot in a residential district, the lot in the business district must have along each line abutting the residential district a yard that complies with the residential district requirement.
8 Zoning Relief Required

Sections 60-36, 60-37 and 60-38 of the Zoning Code set forth design requirements for certain projects within the Greater Mattapan Neighborhood District including requirements for street wall continuity and screening and buffering. Projects subject to Large Project Review are not subject to the specific provisions of these Sections. Instead these design criteria are addressed through the Article 80 process.

Section 60-40 of the Zoning Code provides that for projects subject to Large Project Review, required off-street parking and loading shall be determined through such review. For purposes of such review, the following information is provided:

Table 2-2
Required Off-Street Parking and Loading

Category	Requirement[1]	Provided by Project
Off-Street Parking	0.7 Spaces per 1,000 Square Feet of Gross Floor Area[2] (37 spaces)	48 spaces
Loading	1.0 loading bay required for projects 15,001 to 49,999 square feet	Ample off-street parking provided

1 These are requirements that would have applied had the Project not been subject to Large Project Review.
2 Per Section60-40 and Table H of Article 60 of the Zoning Code.
3 Per Section60-40 and Table I of Article 60 of the Zoning Code.

Section 60-40 includes other requirements regarding the location and design of parking and loading areas which the Project may not satisfy, but which will be addressed in the Article 80 process.

■

Article 80

The Project exceeds the threshold of 50,000 square feet of gross square footage of development, which requires Large Project Review under Article 80B of the Zoning Code. The Proponent has commenced Large Project Review under Article 80 of the Boston Zoning Code with the filing of a Letter of Intent with the Boston Redevelopment Authority (BRA) on January 30, 2014, which indicates the Proponent's intention to file a Project Notification Form in connection with the Project. The Proponent has reached out to and met with City agencies, neighborhood representatives and groups, elected officials, and other interested parties over the last several months.

This expanded Project Notification Form (PNF) presents details about the Project and provides an analysis of transportation, environmental protection, infrastructure, and other components of the Proposed Project in order to inform the City agencies and neighborhood residents about the Project, its potential impacts, and mitigation proposed to address those potential impacts. Based on a comprehensive approach to addressing potential impacts and mitigation similar to the level of information

normally presented in a Draft Project Impact Report (DPIR), it is the desire of the Proponent that the BRA, after reviewing public and agency comments on this expanded PNF, will issue a Scoping Determination Waiving Further Review pursuant to the Article 80 process.

As currently contemplated, the Project will not be a Development Impact Project. Under Article 80 of the Zoning Code, such a project is one that (i) requires zoning relief; (ii) will devote more than 100,000 sf to a Development Impact Use; and (iii) involves the creation or substantial rehabilitation of more than 100,000 sf of gross floor area. Because the total gross floor area of the Project will be less than 100,000 sf, the Project is not a Development Impact Project.

■

Project Schedule

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

- Project Review, Approval, & Permitting — Spring 2014-Fall 2014
- Site Enabling and Remediation — Winter 2015
- Site Excavation and Construction — Spring 2015 - Summer 2015
- School Construction — Summer 2015 – Summer 2016
- School Opening — August 2016

It is anticipated that the Project construction will commence by Spring 2015. The Project includes demolition of an existing structure on the site, site enabling, and excavation activities. The entire construction schedule is anticipated to be approximately 16 months with completion scheduled by Spring 2016 and the new School opening in August 2016.

■

State and Local Permits & Other Approvals Anticipated

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

Table 2-3
Anticipated Permits and Approvals

Agency Name	Permit or Action
Federal Government	
Environmental Protection Agency	(i) Region 1 Toxic Substances Control Act (TSCA) coordination and (ii) National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP)
Commonwealth of Massachusetts	
Massachusetts Dept. of Environmental Protection, Division of Water Pollution Control	Sewer Connection Permit
Massachusetts Dept. of Environmental Protection, Bureau of Waste Site Cleanup	(i) Release Notification and Retraction Form BWSC-103; (ii) MCP Phase I Initial Site Investigation, Tier Classification, Tier Transfer of RTN3-25435 ; (iii) Release Abatement Measure Plan (iv) Class A-3 Response Action Outcome Statement; and (v) Notice of Activity and Use Limitation
Massachusetts Dept. of Environmental Protection, Bureau of Waste Prevention	Beneficial Use Determination Permit for ABC Rubble Re-use
Massachusetts Dept. of Environmental Protection, Division of Air Quality Control	Notice of Commencement of Demolition and Construction; Notice of Asbestos Removal; Fossil Fuel Utilization; Comprehensive Air Quality Permit
Massachusetts Water Resources Authority	Sewer Use
Massachusetts Historical Commission	Determination of "No Adverse Effect" on Historical Buildings or Districts
City of Boston	
Boston Redevelopment Authority	Article 80 Large Project Review- Scoping Determination Waiving Further Review
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan (each as part of Article 80 Large Project Review)
Boston Department of Public Works	Curb-Cut Permit (also requires approval of BTD and PIC); Street Opening Permit; Street/ Sidewalk Occupancy Permit
Public Improvements Commission	Street Sidewalk Specific Repair Plan; Maintenance Agreement
Boston Water and Sewer Commission	Local Sewer and Water Tie-in and Site Plan Approval
Boston Department of Inspectional Services	Health Department Permit, Building Permits; Other Construction-Related Permits; Site Cleanliness Permit; Assembly Permit, Certificates of Occupancy

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

3

Urban Design

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

Project Description

The KIPP Academy Boston Charter School proposes to establish a permanent location for their K-8 program in Mattapan, relocating from a temporary location that they are currently operating at 384 Warren Street in Roxbury. The new location will enable this high-performing charter school to provide a dedicated setting with greater space and enhanced amenities, including outdoor play areas. This Project proposes to transform an existing underutilized former industrial property into a vibrant, child-friendly campus that will become an asset for the neighborhood and the greater Mattapan community. The School will be designed to serve up to 650 students in grades kindergarten through eight. In round numbers, the School will encompass 53,000 square feet of new construction. **Figure 3-1** is the Proposed Site Plan for the Project.

Existing Site Conditions

The site at 1464 Blue Hill Avenue is approximately 1.7 acres and bounded on the east by Babson Street, to the south by a MBTA Commuter Rail right-of-way and a commercial business, and to the west by Blue Hill Avenue and a residential neighborhood. The north side of the property is bound by a continuation of the same residential neighborhood. **Figure 3-2** provides context photos of the surrounding neighborhood for reference.

The existing site incorporates two industrial structures. The first structure is a partially utilized warehouse, and incorporates a small mezzanine level and non-accessible basement. The original building was built around the year 1925, however it was added to and modified at various points thereafter. It has a footprint of approximately 22,000 SF and a brick masonry exterior with steel and wood framed

super-structure. As the original structure was added onto at various points in history, it now includes several attached storage sheds in various states of disrepair, resulting in a structure with little of its original historic fabric left intact. The building is currently being used as a combination warehouse and a leased office space, and the condition of the building is generally poor with both environmental and moisture related degradation.

The second existing industrial structure on site is a more recent construction, having been built in 1986. This building is approximately 4,000 SF, and is a load-bearing concrete block warehouse structure with metal framed roof. This building is being used exclusively as a warehouse storage facility. **Figure 3-3** includes photographs of the two existing structures on site.

The site is a generally degraded property that is indifferent to the surrounding community due to its industrial use. Truck yards, loading docks and parking areas occupy most of the site. Poorly-conditioned chain link fencing with barbed wire surrounds the majority of the site along the residential properties to the north and west.

In addition to the existing industrial structures on site, a large Boston Water & Sewer Commission easement for a drainage culvert transverses the site from Babson Street to the MBTA Commuter Rail property on the southern edge of the site. This easement precludes the construction of any permanent structure on top of it, and restricts the potential site area that is available for new construction.

Both of the existing industrial structures on the site will be demolished to provide space for the new school. Neither structure possesses a configuration or condition that is amenable to reuse for the purposes of the new school.

Design Goals and Context

The Project will create a school environment that generates a vibrant physical and cultural link between the neighborhoods along the Blue Hill Avenue and Babson Street corridors. At the apex of the public connection between these two thoroughfares, the new school will act as the focal point of the Project, providing a tremendous asset to the greater Mattapan community once completed. In concept, this new facility is designed as a four story classroom wing and a gymnasium wing that flank a central cafeteria/administration area. The cafeteria functions as a welcoming entry point for students, staff and visitors, and provides a sense of community, place and orientation upon arrival to the school.

The design of the Project considers the perception of the building from the surrounding community to be of prime importance. The perspectives of the school vary greatly from points in the immediate context, and each perspective is

considered in an effort to best integrate the new development within the existing urban fabric. By removing both of the existing industrial structures on site, the adjacent residential neighborhoods will benefit from increased open space abutting their properties. By aligning the building mass along the Babson Street retaining wall and the MBTA Commuter Rail tracks, two non-descript utilitarian edges will be obscured by the building form, improving and activating the aesthetic of the urban environment. See **Figure 3-4** and **Figure 3-5** for proposed renderings of the Project showing views from both Babson Street looking south and Blue Hill Avenue looking north.

The classroom wing was developed as a four story volume in order to maximize the capacity of the building footprint for the required program. In addition to the efficiency of this approach, the four floors provide for a clear delineation between the elementary and middle school grades within the building, where the elementary school occupies the lower two floors, and the middle school resides on the upper two floors. While separated by floors, both schools will have convenient access to the common resources of the cafeteria/forum space and the gymnasium by way of stairwells and an elevator. Travel to and from these common resource spaces will provide ample opportunity for students of different ages to interact and develop a larger sense of school community as a whole. **Figure 3-6** and **Figure 3-7** are proposed elevations for the new school building. **Figure 3-8** through **Figure 3-11** inclusive depict the floor plan layouts for the proposed project.

Height and Massing

The proposed building is located along the south-eastern edge of the site to provide continuity to the urban street-wall for Babson Street while containing circulation to the rear of the building. The four story classroom wing is oriented parallel to Babson Street; the grade change that occurs along the street serves to mitigate the height of the building. Because of that grade change, the classroom wing will present only three stories of height along Babson Street. The gymnasium wing and cafeteria /administration area both represent two story massing that is perceived primarily from Blue Hill Avenue. The position of these lower volumes will help to break down the scale of the classroom wing when approaching from the west. Additionally, the gymnasium wing, with its programmatic need for fewer window openings and a large volume, will serve as a buffering element for the remainder of the building/site from the impact of the adjacent MBTA Commuter Rail tracks.

Character and Materials

The character of the School will be both welcoming and inclusive, achieved primarily through the use of fenestration and a building organization which allows for a clear understanding of its function. The exterior walls of the School will include a durable

masonry veneer base with light weight fiber cement or metal siding panels above that give the building a contemporary appearance. Large classroom windows will characterize the majority of the building elevations, allowing for a high degree of transparency in the envelope. Given the sustainable mandate for the Project, materials that are selected for the Project will be considered from both a first-cost and life-cycle cost perspective, using an optimal balance between those two considerations.

Open Space, Pedestrian Ways and Amenities

Vehicles will circulate the site on a one-way through drive that provides access to drop-off areas, parking, building entrances, service areas and bus queuing areas. This road enters the site from Babson Street and exits onto Blue Hill Avenue. The entry drive and parking areas are located behind the building to minimize the impact of these elements on the neighborhood.

Accessible pedestrian paths will follow the vehicular circulation and will provide a public connection between Babson Street and Blue Hill Avenue. The existing site topography includes steep slopes that drop into the site from both public ways, so the Project will re-grade these areas to enable pedestrian access with compliant slopes. The site will also incorporate an enclosed outdoor play area that will provide outdoor recreation opportunities on a variety of play surfaces and structures. In addition to the enclosed play area, a portion of the parking area on site will be also be available for use as basketball courts. These areas will be used for play only during the course of the school day when no traffic circulation will be occurring on site. In this manner the hard surfaces on site can be used safely and efficiently for both play and vehicular circulation at varying times during the day.

In addition to the on-site vehicular access to the main student entrance, a pedestrian entrance for the School will be provided directly from Babson Street. This pedestrian entrance will enhance the School's street presence along Babson Street and gives the School added flexibility for student and staff access at busy times of the day.

Landscaping

The Project will improve the existing landscaping along Babson Street. Planted areas will be created adjacent to the building and along the drive to Blue Hill Avenue. These planted buffers will benefit the local environment.

In addition to the planted areas, the building will incorporate two paved plaza areas that will serve as entry forecourts to the building. Both plazas will incorporate permanent pedestrian walking surfaces that are accentuated by planted areas and seating elements. The first plaza is located directly outside the cafeteria and will be a

public, welcoming space that invites people into the School. This area will accommodate the majority of student drop-off and pick-up, providing a safe and supportive environment for these daily rituals of arrival and departure.

The second entry plaza will be located along Babson Street, providing a direct access for pedestrians moving along that public way. This plaza will afford the School a functional urban presence along Babson Street to ensure that the street-front is activated along this major thoroughfare. To access the second plaza, a new opening will be created in an existing stone wall that edges Babson Street. The new opening will provide a portal that defines the entry to the building, and a low, open gate across this new wall opening will allow the school to manage access to the plaza after hours, ensuring a safe and well maintained environment.

Adjacent to the northern end of the building is a new fenced in play area designed for the age range of students who will attend the School. Within this play area there will be a combination of play surfaces and small play structures. Being shielded from direct mid-day southern sunlight by the mass of the proposed building, the play area will have great access to sunlight in the morning and afternoon. Covered bike storage will be provided on site to provide a dry and secure location for bike parking, encouraging both staff and students to utilize an alternative form of transportation to the site.

Site Signage

The one-way access drive through the site will provide safe vehicle and pedestrian circulation and the ability to provide a significant amount of queuing space for drop-off and pick-up by both school buses and parents. This approach will help to minimize off-site vehicle waiting. In addition, school administration will actively manage the drop-off and pick-up periods to provide a heightened level of organization to that process. At each point where traffic enters and exits the site, ample signage will be provided to make vehicles aware of pedestrians, reinforcing the need to yield to pedestrian traffic.

The school identification sign along Babson Street will be freestanding in the landscape, and will be of sufficient stature to act as a welcoming beacon while also obscuring the existing electrical transformer that must remain in its current location. Additional building identification signage will be mounted on the building at both building entrances, providing a sense of place and orientation for the visiting public and regular occupants alike.

Vehicle Access, Circulation, and Parking

The Project site will be accessed via curb cuts along Babson Street and Blue Hill Avenue. All site egress will be to Blue Hill Avenue. Since Blue Hill Avenue is divided by a median, all traffic exiting the site will be required to take a right-turn onto Blue Hill Avenue northbound. The driveways will provide access to the campus with dedicated visitor and faculty/staff parking and school bus and parent drop-off/pick-up area. This area will consist of three drive aisles separated by dedicated pedestrian pathways for loading and unloading. School buses will load/unload in the outside lane and parents will drop-off/pick-up their children in the two inside lanes adjacent to the building. The Project will construct approximately 48 off-street parking spaces located on site. This plan and site access/circulation is described in greater detail in **Chapter 4**, *Transportation*.

Zoning Subdistrict
Three-Family Residential (3F)

Zoning Subdistrict
Community Commercial (CC)

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

PROPOSED SITE PLAN

FIGURE
3-1

BLUE HILL AVENUE - NEIGHBORING BUILDINGS

BABSON STREET - NEIGHBORING BUILDINGS

BABSON STREET BRIDGE - NEIGHBORING COMMUTER RAIL

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SITE ENTRANCE FROM BABSON STREET

SITE ENTRANCE FROM BLUE HILL AVENUE

VIEW FROM BABSON STREET BRIDGE OVERLOOKING SITE

EXISTING BUILDING ON SITE

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

EXISTING SITE PHOTOS

FIGURE 3-3

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KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

RENDERING:
VIEW FROM
BABSON STREET

FIGURE
3-4

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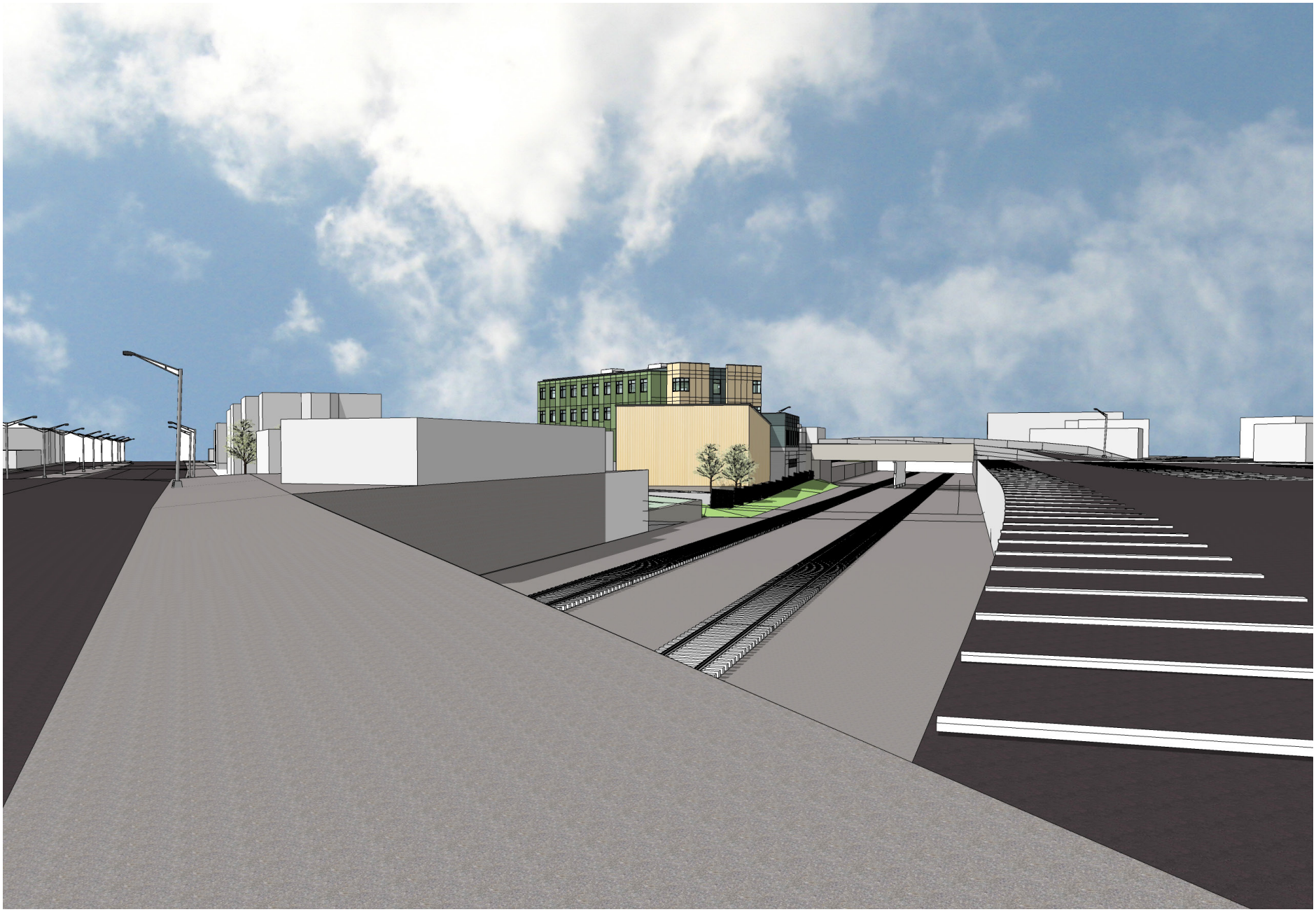

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

RENDERING:
VIEW FROM
BLUE HILL AVENUE

FIGURE
3-5

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WEST ELEVATION // SCALE 3/64" = 1'-0"

EAST ELEVATION // SCALE 3/64" = 1'-0"

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

SCALE: 1" = 125' - 0"

ELEVATIONS: WEST, EAST

FIGURE
3-6

NORTH ELEVATION // SCALE 3/64" = 1'-0"

SOUTH ELEVATION // SCALE 3/64" = 1'-0"

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

SCALE: 1" = 125' - 0"

ELEVATIONS: NORTH, SOUTH

FIGURE
3-7

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 30'

LEVEL 1 FLOOR PLAN

FIGURE 3-8

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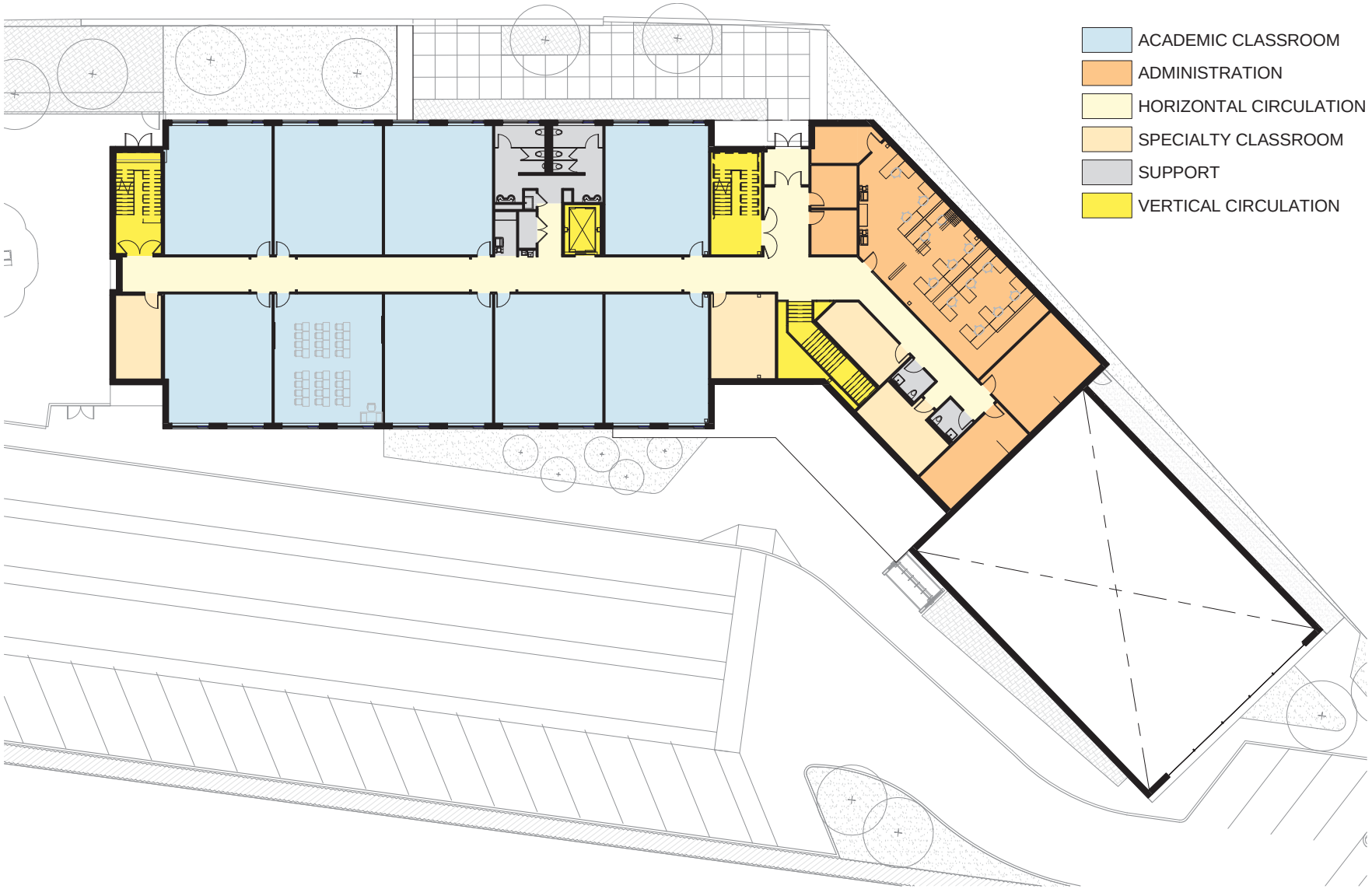

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 30'

LEVEL 2 FLOOR PLAN

FIGURE 3-9

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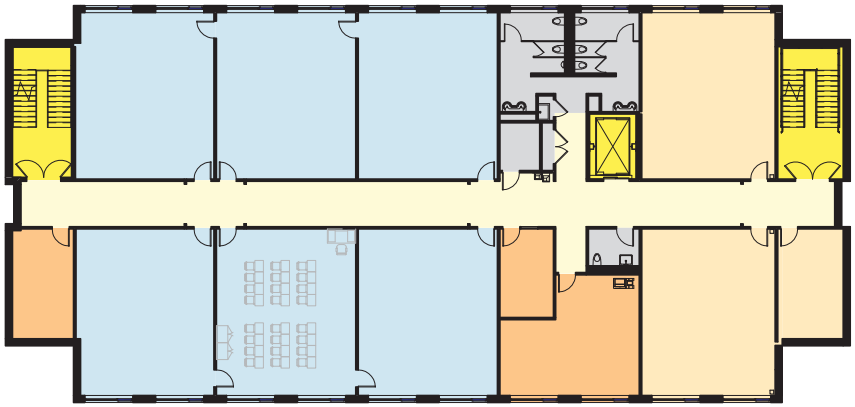

ACADEMIC CLASSROOM
ADMINISTRATION
HORIZONTAL CIRCULATION
SPECIALTY CLASSROOM
SUPPORT
VERTICAL CIRCULATION

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 30'

LEVEL 3 FLOOR PLAN

FIGURE 3-10

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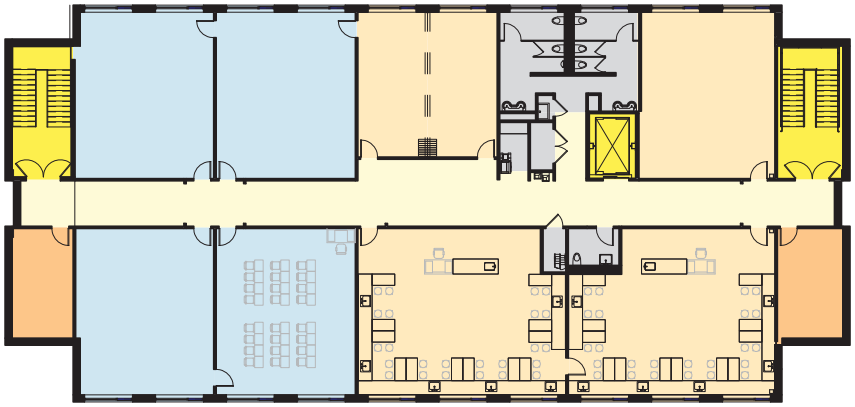

ACADEMIC CLASSROOM
ADMINISTRATION
HORIZONTAL CIRCULATION
SPECIALTY CLASSROOM
SUPPORT
VERTICAL CIRCULATION

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

SCALE: 1" = 30'

LEVEL 4 FLOOR PLAN

FIGURE
3-11

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4

Transportation

Introduction

This chapter presents an evaluation and summary of existing and future transportation infrastructure and operations that are expected relative to the development of the KIPP Academy Boston Charter School between Blue Hill Avenue and Babson Street in Boston's Mattapan neighborhood. KAB proposes to relocate their existing public school and programs supporting the School from their current location at 384 Warren Street in Roxbury to this more spacious, 1.7 acre site. This transportation study has been developed in order to understand the transportation impacts of the Project and to develop appropriate transportation infrastructure improvements to the study area that mitigate the impacts of the Proposed Project as required by Article 80B of the City of Boston Zoning Code. This study specifically addresses the scope developed in collaboration with the Boston Transportation Department (BTD) via ongoing consultation with the Proponent.

The transportation study includes an analysis of the following:

- Vehicle traffic on study area roadways and intersections;
- Parking conditions;
- Loading and service activities;
- Pedestrian activities;
- Public transportation services; and
- Accident history.

In addition, this chapter quantifies and assesses the transportation impacts that are expected under future conditions. The purposes of these analyses are to:

- Define and quantify existing transportation conditions in the Project study area;
- Estimate the transportation impacts that will be generated under future conditions based on anticipated traffic activities generated by the Proposed Project; and

- Develop a set of improvement strategies and measures, which will help to lessen the transportation effects of future growth and to provide improvements to the transportation infrastructure in the area.

The following sections provide an overview of the Project and a summary of findings of the transportation analysis, including anticipated impacts, proposed improvements, a discussion of the study methodology, and a description of the study area. Subsequent sections provide detailed discussions of existing and future transportation conditions expected both with and without the Proposed Project. The final section of the chapter presents a detailed summary of transportation improvement actions that the Proponent is committed to implementing in connection with the Project.

Project Description

KAB proposes to construct an approximately 53,000 gross square foot (GSF) school on Blue Hill Avenue in the Boston's Mattapan neighborhood. The Proposed Project includes a new four-story classroom building with an attached one-story gymnasium. The new facility will enable this diverse School to provide a more appropriate campus setting for its students and expand its educational offerings to kindergarten through the eighth grade. At capacity, the School will house approximately 650 students and 84 full-time equivalent faculty/staff.

The School is designed to accommodate middle school students on the top two floors and the elementary students on the lower two floors of the facility. A cafeteria/ common space will be provided on the first floor adjacent to the gymnasium at the south end of the building. The gymnasium will provide students with opportunity for physical activity throughout the school year.

Site improvements include the addition of pervious areas to the site (in the form of green space and landscaping), increasing the available outdoor sports/play space for students, and increasing environmental benefits through effective stormwater management. Parking will be provided on site for visitors and some faculty/staff in the form of approximately 48 on-site spaces while the remaining faculty/staff will be accommodated in defined off-site, off-street parking.

The site circulation infrastructure has been designed to carry school buses and passenger vehicles into the School campus in a one-way direction from Babson Street to Blue Hill Avenue during peak drop-off/pick-up time periods. This drive lane will serve both for internal access/circulation and parent/school bus drop-off/pick-up. **Figure 4-1** depicts the proposed site plan for the Project and the improvements that will be made.

1. Relocation Babson Street driveway (entrance only)
2. ADA compliant sidewalks along both driveways
3. On-site staff parking (42 Spaces)
4. One-way flow from Babson Street to Blue Hill Avenue
5. Dedicated Bus and Parent drop-off/pick-up area
6. Visitor and drop-off/pick-up parking (4 spaces)
7. Secondary access plaza along Babson Street
8. Student arrival/dismissal proactively managed by KIPP staff
9. Maintain Blue Hill Avenue driveway (exit only)
10. Right turn only onto Blue Hill Avenue northbound
11. Overflow pick-up along Babson Street frontage
12. Both driveways will have gates installed that can be closed during non-school hours in order to prohibit cut-through traffic

0 35 70 Feet

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SITE & TRAFFIC MANAGEMENT/IMPROVEMENT PLAN

FIGURE 4-1

Site and Access Improvements

The Project site will be accessed via a new curb cut along Babson Street and an existing curb cut along Blue Hill Avenue. Since Blue Hill Avenue is divided by a median, all traffic exiting the site will be required to take a right-turn onto Blue Hill Avenue northbound. The driveways will provide access to the campus with dedicated visitor and faculty/staff parking and school bus and parent drop-off/pick-up area as illustrated previously in the Site & Traffic Management/Improvement Plan, Figure 4-1. School buses will load/ unload in the outside lane and parents will drop-off/pick-up their children in the two inside lanes adjacent to the building. KAB faculty/staff will proactively monitor and manage the drop-off/pick-up area to streamline operations and increase safety for all users.

The Project will construct approximately 48 off-street parking spaces located on site. The School's main egress on Blue Hill Avenue will be stop-controlled and right-only onto Blue Hill Avenue northbound. Both driveways will be constructed with ABA/AAB accessible pedestrian amenities in order to safely manage pedestrian traffic in conjunction with vehicular movements. On-site pedestrian amenities include sidewalks surrounding the School building and crosswalks to safely guide students between the drop-off/pick-up area and the School sidewalk.

Summary of Findings

The primary finding of this transportation analysis is that the transportation improvement plan proposed by the Proponent will provide improved access to the Project site from Babson Street and Blue Hill Avenue, which will be upgraded to safely and efficiently manage traffic and pedestrian movements to and from the School. A summary of those improvements is illustrated previously in Figure 4-1. A series of actions have been developed generally improve both the vehicular and pedestrian access. The proposed on-site and off-site parking for the Project will satisfy the expected parking demands generated by the Project (which is driven almost entirely by the faculty/staff population). Finally, the Proponent will explore proactive Transportation Demand Management (TDM) measures and supporting amenities to encourage and support the use of carpooling, transit, walking, and cycling.

A summary of key findings of the transportation analysis for the Project is as follows:

- The Project will generate approximately 153 entering and 121 exiting additional vehicle trips during the weekday morning peak hour and approximately 67 entering and 99 exiting vehicle trips during the weekday evening peak hour.

- A single drop-off/pick-up area will be used by both parents and school buses. The area will be in-front of the School building and will consist of three drive aisles with dedicated pedestrian pathways for vehicle loading and unloading. This drop-off area has been sized to accommodate all anticipated KAB generated pick-up/drop-off demand.
- During morning arrival and afternoon dismissal, school buses will use the outside lane and parents will use the two inside lanes adjacent to the building.
- KAB will maintain an active faculty/staff presence in the drop-off area during both the drop-off and pick-up periods to ensure student safety and streamline loading/unloading.
- The study area intersections will continue to operate at the same levels of service when the School opens as under future No-Build conditions, with the exception of Blue Hill Ave/Walk Hill St/Babson St (decrease from LOS C to LOS D) during the morning peak hour and Babson St/Norfolk St during the evening peak hour (decrease from LOS C to LOS D).
- KAB will provide accessible sidewalks along both driveways and accessible ramps, crosswalks, and sidewalks throughout the Project site.
- On-site parking will comprise of approximately 48 spaces, which will support parking for visitors and some faculty/staff. Additional faculty/staff parking will be provided in an off-site, off-street parking lot. Discussions about leased parking spaces have been initiated with the Jubilee Church located to the south of the site.
- The Proponent is also committed to providing and enhancing a wide array of Transportation Demand Management measures offered to faculty and staff as a means to encourage the use of alternative transportation modes.

Study Methodology

The transportation analysis provides an evaluation of anticipated impacts of the Project on the surrounding transportation environment. This analysis was conducted in three phases. The first phase involved defining and quantifying the existing transportation conditions in the Project study area including roadway and intersection geometrics and traffic characteristics for the surrounding transportation infrastructure.

The second phase of the study estimates the future transportation conditions in the Project study area by adding the traffic impacts from projected background traffic growth and other planned developments in the area, and an estimate of traffic demands to be generated by the Project to the existing conditions defined in phase one. The first and second phases utilize Synchro version 6.0 to analyze the 2014 Condition as well as the 2019 No-Build and Build Conditions.

The third phase of the study identified measures to improve future transportation conditions including developing improvement strategies, such as Transportation Demand Management actions and Project site access/circulation improvements, to lessen the transportation impacts of the Project.

Study Area

The study area runs along Blue Hill Avenue and Babson Street in the Mattapan neighborhood of Boston. The study area includes six key intersections as illustrated in **Figure 4-2**.

Signalized Intersections

1. Blue Hill Avenue at Walk Hill Street/Babson Street
2. Blue Hill Avenue at Norfolk Street
3. Blue Hill Avenue at Woodhaven Street
4. Blue Hill Avenue at Babson Street/MCHC Driveway
5. Babson Street at Norfolk Street
6. Babson Street at Fremont Street

Roadway Jurisdiction

All of the study area roadways and intersections are regulated and maintained under the jurisdiction of the City of Boston, with the exception of short sections of Babson Street and Blue Hill Avenue. These roadways travel over MBTA Commuter Rail tracks on two bridges. Both of these bridges are owned and maintained by the Massachusetts Department of Transportation (MassDOT). The City of Boston controls and maintains all traffic signal controls in the study area.

Existing Conditions

Evaluation of transportation impacts associated with the Proposed Project is based upon an understanding of the existing transportation system in the Project study area. The evaluation of existing transportation conditions in the study area includes roadway geometry, traffic controls, daily and peak hour traffic volumes, traffic safety data, pedestrian, and public transportation information. Each of these elements is described in the following sections.

■

Roadway Conditions

The principal roadways and intersections in the Project study area are described briefly below. The descriptions of the roadways include physical characteristics, adjacent land uses and traffic control devices.

Roadways

The following are the key roadways evaluated in this transportation analysis.

Blue Hill Avenue

Blue Hill Avenue is a median-divided roadway with two lanes traveling in the north/south direction between the Boston neighborhood of Dorchester to the north and the Town of Milton to the south. The Project site has access to Blue Hill Avenue, just north of the bridge over the MBTA Fairmount Commuter Rail Line. The roadway provides sidewalks along both sides of the corridor and allows for parking within most of the study area. South of the site in the northbound direction, parking is also permitted along the median. MBTA Bus Routes 28, 29, and 31 run along Blue Hill Avenue within the study area. Land uses adjacent to Blue Hill Avenue near the Project site consist of residential uses with some commercial space.

Babson Street

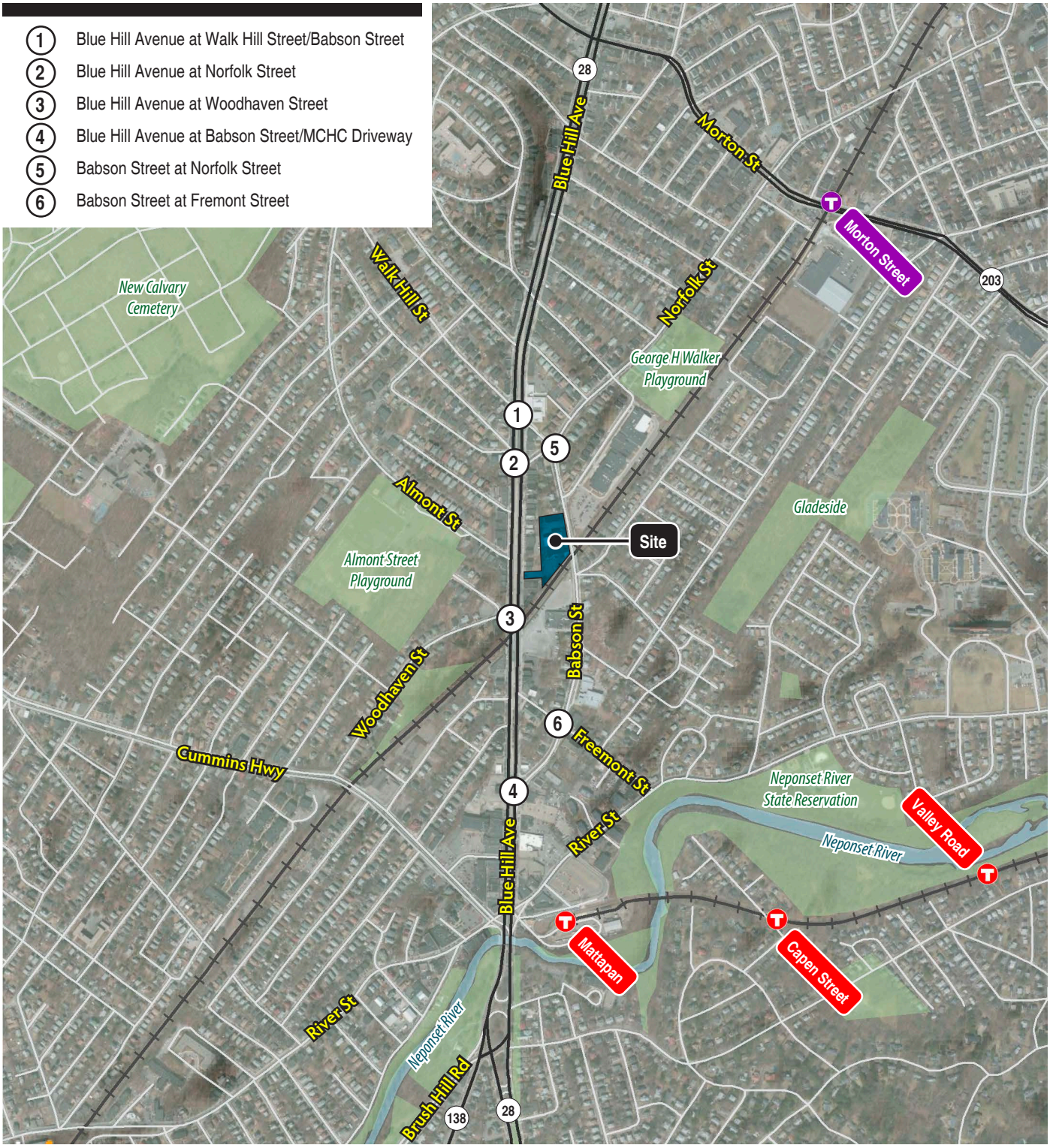
Babson Street is a two-lane roadway traveling in the north-south direction. The Project site is located on Babson Street, just north of the MBTA Fairmount Commuter Rail Line. Babson Street connects to Blue Hill Avenue at both ends of the street. In the study area, Babson Street provides sidewalks on both sides of the roadway. A school zone spans the majority of roadway in the study area while the remainder is most residential uses with some commercial space. On-street parking is a mix between unrestricted parking and no-parking areas.

Intersections

The following study area intersections are evaluated in the transportation analysis:

Blue Hill Avenue/Walk Hill Street/Babson Street

Babson Street/Walk Hill Street/Babson Street is a four-legged signalized intersection, which operates with three phases including an actuated, exclusive pedestrian phase. The eastbound Walk Hill Street approach is a single general-purpose lane with adjacent parking. The westbound Babson Street approach is one-way away from the intersections. Each of the Blue Hill Avenue approaches consists



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KIPP ACADEMY OF BOSTON STUDY AREA INTERSECTIONS

1464 BLUE HILL AVENUE, BOSTON MA

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FIGURE 4-2

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of a left-turn bay, a through lane and a shared through/right lane with adjacent bike lane and parking lane. There are MBTA bus stops on the far side of each of the Blue Hill Avenue approaches. Crosswalks and sidewalks are provided at all approaches.

Blue Hill Avenue/Norfolk Street

Blue Hill Avenue/Norfolk Street is a three-legged, actuated three-phase signalized intersection, including an actuated, exclusive pedestrian phase. The Norfolk Street westbound approach parking lanes ends upstream of the intersection, thus providing enough width for both a left- and right-turn lane. The Blue Hill Avenue approaches both provide two through lanes (northbound approach provides through lane and shared through/right lane) with adjacent bike lane and parking lane. Sidewalks are provided along all approaches of the intersection and crosswalks are available across Norfolk Street and the south leg of Blue Hill Avenue.

Blue Hill Avenue/Woodhaven Street

The Blue Hill Avenue/Woodhaven Street intersection is a three-legged, three phase signalized intersection including an actuated, exclusive pedestrian phase. The eastbound Woodhaven Street approach provides a left- and right-turn lane with no on-street parking near the intersection. Blue Hill Avenue northbound approaches the intersection with an exclusive left-turn lane and two through lanes with sharrow markings for bicycles. There is an MBTA bus stop adjacent to the approaches. The southbound Blue Hill Avenue approach consists of a through lane and a shared through/right lane with adjacent bike lane and parking lane. Sidewalks are available along all approaches and there are crosswalks across Woodhaven Street and Blue Hill Avenue on the north side of the intersection.

Blue Hill Avenue/Babson Street/MCHC Driveway

The Blue Hill Avenue/Babson Street/MCHC Driveway is a four-legged signalized intersection that includes the Mattapan Community Health Center's (MCHC) driveway. This intersection was recently reconstructed as part of the MCHC construction. The Babson Street westbound approach to the intersection is striped with both a left-turn lane and a right-turn lane. The MCHC driveway eastbound approaches the intersection with a single general-purpose lane. Blue Hill Avenue southbound approaches the intersection with two through lanes and an exclusive left-turn lane with an adjacent bike lane. There is also a MBTA bus stop just upstream of the intersection. The northbound Blue Hill Avenue approach has a free channelized right, a through lane and a shared left/through lane. Sharrows are provided for bicycle on the approach. Crosswalks are provided across the Babson Street approach, MCHC driveway approach and Blue Hill Avenue on the south side of the intersection. The pedestrian phase is an actuated, exclusive phase.

Babson Street/Norfolk Street

Babson Street/Norfolk Street is a signalized, three-phase intersection with an actuated, exclusive pedestrian phase. Babson Street southbound is one-way towards the intersection. All approaches are a single, general purpose lane. On-street parking is provide along both sides of Norfolk Street westbound, on the south side of Norfolk Street eastbound, on the west side of Babson street northbound and on the east side of Babson Street southbound. Crosswalks and sidewalks are provided at all approaches.

Babson Street/Fremont Street

Babson Street/Fremont Street is a four-legged signalized intersection, which operates with three phases including an actuated, exclusive pedestrian phase. The eastbound approach is one-way into the intersection with a wide general-purpose lane. The remaining approaches are single general-purpose lanes also. Crosswalks and sidewalks are provided at all approaches.

■

Traffic Volume Data Collection

To better assess the study area's existing conditions, traffic volumes were collected. Manual Turning Movement Counts (TMCs) were conducted on Wednesday, January 8, 2014. TMCs took place during the morning peak period of 7:00 AM – 9:00 AM and the evening peak period of 4:00 PM – 6:00 PM.

In addition to the TMCs, an Automatic Traffic Recorder (ATR) Count was conducted over a 24-hour period from on Wednesday, January 8, 2014. The ATR was placed on Blue Hill Avenue, just north of Babson Street and south of the Project site.

TMC and ATR raw data are compiled in the Appendix of this expanded PNF.

■

Existing Traffic Volumes

TMCs and ATRs were used to determine the traffic volumes for the 2014 Existing Condition.

Table 4-1 presents a summary of the daily traffic volumes calculated from the ATR counts. As shown in the table, Blue Hill Avenue north of Babson Street and south of Rexford Street carries approximately 25,000 vehicles per day (vpd).

Table 4-1
Existing Traffic Volumes Summary

Location	Daily	Peak Hour					
		Weekday Morning			Weekday Evening		
	Weekday (vpd)[1]	Volume (vph)[2]	"K" Factor[3]	Directional Distribution	Volume (vph)[2]	"K" Factor[3]	Directional Distribution
Blue Hill Avenue (North of Babson Street)							
Northbound	13,986	1,442	0.10	67%	835	0.06	50%
Southbound	11,013	716	0.06	33%	839	0.08	50%
Total	24,999	2,158	0.09	100%	1,674	0.07	100%

Source: Automatic Traffic Recorder (ATR) counts conducted by PDI in January 2014
1. Daily traffic expressed in vehicles per day.
2. Peak hour volumes expressed in vehicles per hour.
3. Percent of daily traffic that occurs during the peak hour.

The intersection TMCs were used to establish traffic networks for the 2014 Existing Condition for the weekday morning and evening peak hours. The study area's overall weekday morning peak hour was determined to occur between 7:15 AM and 8:15 AM, which coincides with the morning peak hour for the School-generated traffic. The area's overall evening peak hour was determined to occur between 5:00 PM and 6:00 PM. The 2014 Existing Condition weekday morning and evening peak hour traffic volumes are shown in **Figure 4-3** and **Figure 4-4**, respectively.

■

Parking

This section identifies the parking supply within the study area, including both on-site and on-street parking.

On-Site Parking

In its existing conditions, the Project site provides 17 marked, off-street parking spaces. However, observations on site saw many of these spaces covered with various debris and materials and were therefore unable to be used for parking. The site is currently gated at both the Blue Hill Avenue and Babson Street entrances and has only a nominal amount of activity occurring on site in the existing conditions.

On-Street Parking

This study provides an inventory of curb use and parking restrictions within a quarter mile radius of the site. Within the quarter mile area, the on-street parking is predominately unregulated or no parking zones. **Figure 4-5** illustrates an inventory of existing curb use and parking restrictions in the study area.

■

Existing Site-Generated Traffic Volumes

The Project site, in its existing state, is partially occupied and has driveway from both Blue Hill Avenue and Babson Street. However, there is only a nominal amount of existing activity on site and the driveway to Babson Street is typically locked and gated. Therefore, no credit was taken for any existing site-generated traffic volume in this study.

■

Pedestrians

Weekday morning and evening peak hour pedestrian counts for each study area intersection are presented in **Figure 4-6** and **Figure 4-7**, respectively. Key observations of pedestrian activities in the study area include:

- Sidewalks are provided along and at all study area streets and intersections.
- Crosswalks are provided across all streets at all study area intersections.
- The study area intersections with the highest pedestrian volumes were Blue Hill Avenue/Walk Hill Street/Babson Street and Babson Street/Fremont Street. The intersection of Blue Hill Avenue/Walk Hill Street/Babson Street experienced a total of 65 and 84 pedestrian crossings per hour during the weekday morning and evening peak hours, respectively. The intersection of Babson Street/Fremont Street experienced a total of 55 and 45 pedestrian crossings per hour during the weekday morning and evening peak hours respectively.

■

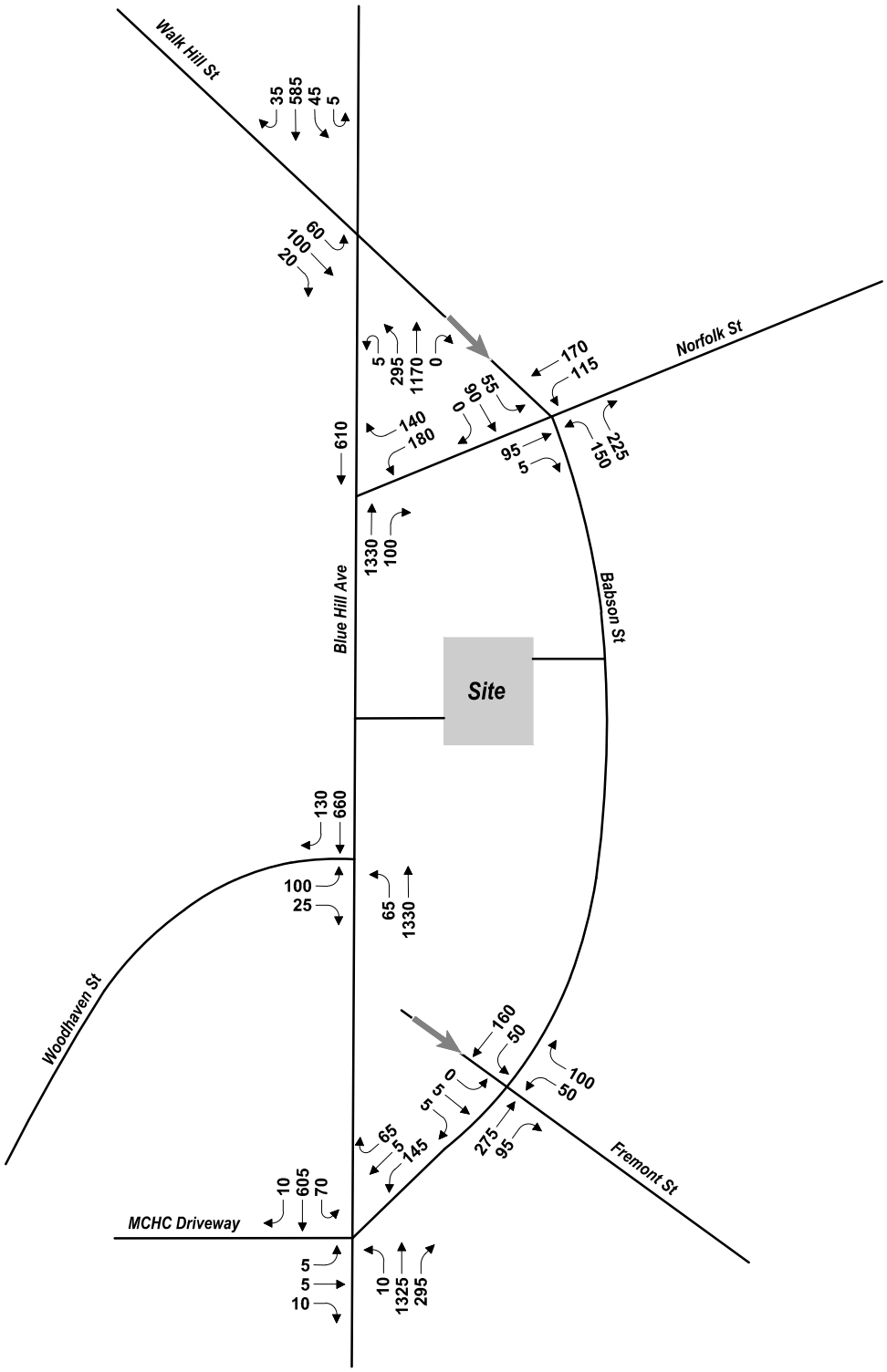
Public Transportation

Massachusetts Bay Transportation Authority (MBTA) services near the Project site include three bus lines and the Red Line. These services, illustrated in **Figure 4-8**, are described in further detail below.

Bus Service

Three bus routes are available near the Project site and are described below.

- **Route 28** (Mattapan Station – Ruggles Station via Dudley Street) provides service along Blue Hill Avenue with a stop adjacent to the site on the inbound route and across from the site on the outbound route. Bus service is provided between the hours of 3:20 AM and 1:40 AM on weekdays and weekends. Ruggles Station provides connections to the Orange Line, Commuter Rail Needham, Franklin, and Providence Lines and Bus Routes 8, 15, 19, 22, 23, 25, 28, 42, 43, 44, 45, 47, CT2, and CT3.



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2014 EXISTING CONDITION TRAFFIC VOLUMES, WEEKDAY MORNING PEAK HOUR (7:15-8:15 AM)

FIGURE 4-3

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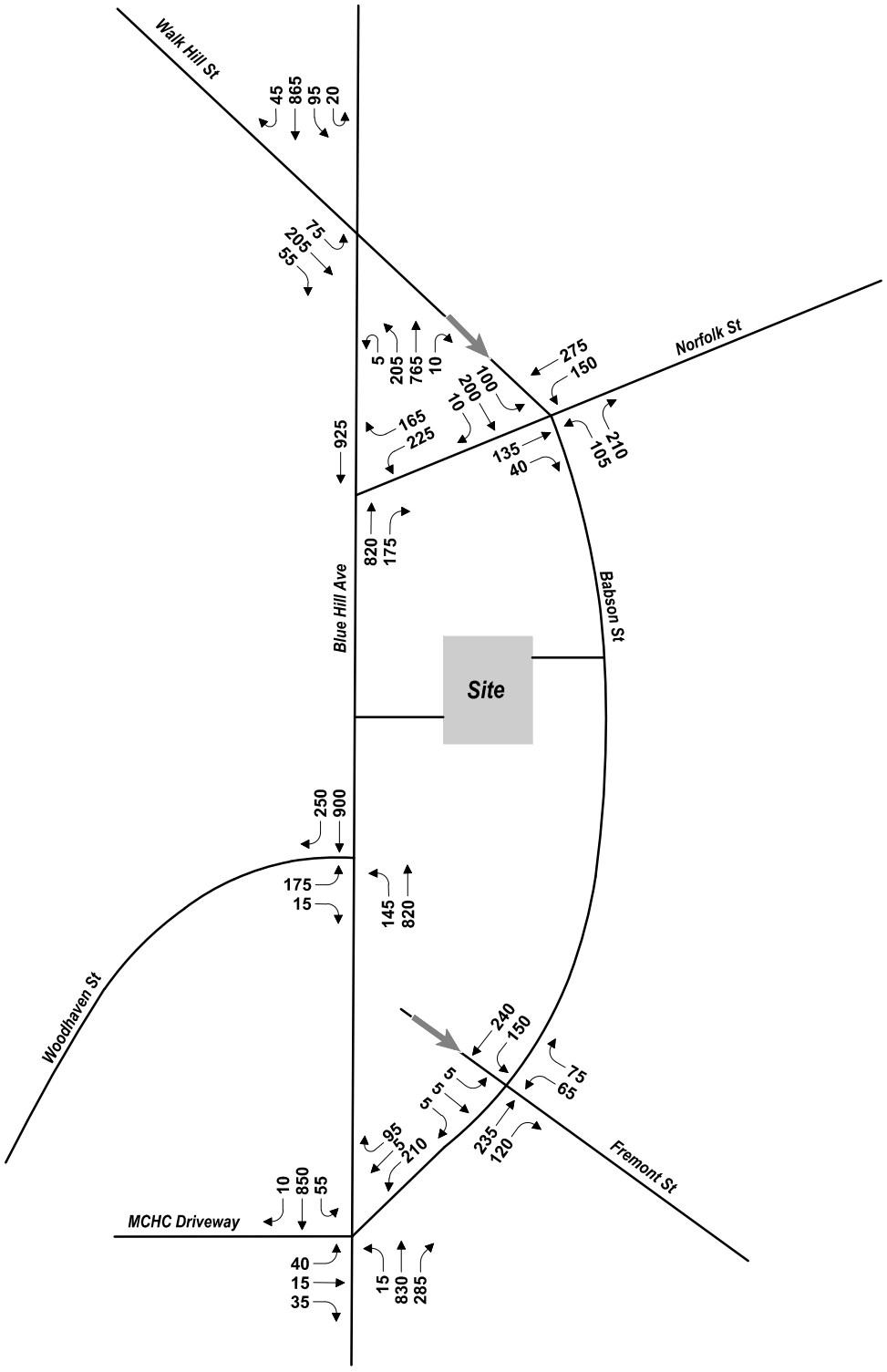

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2014 EXISTING CONDITION TRAFFIC VOLUMES, WEEKDAY EVENING PEAK HOUR (5:00-6:00 PM)

FIGURE 4-4

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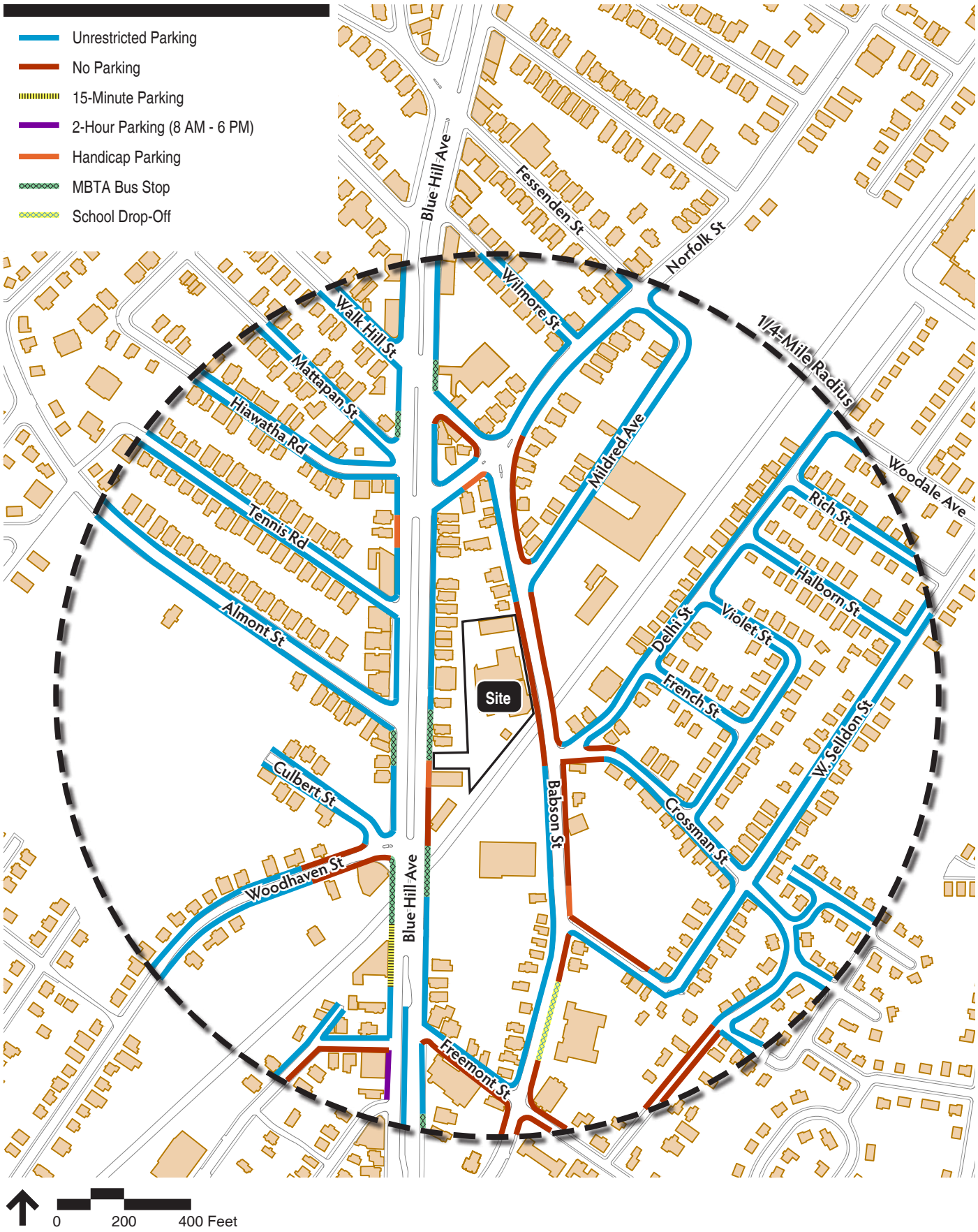

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EXISTING ON-STREET PARKING REGULATIONS

FIGURE 4-5

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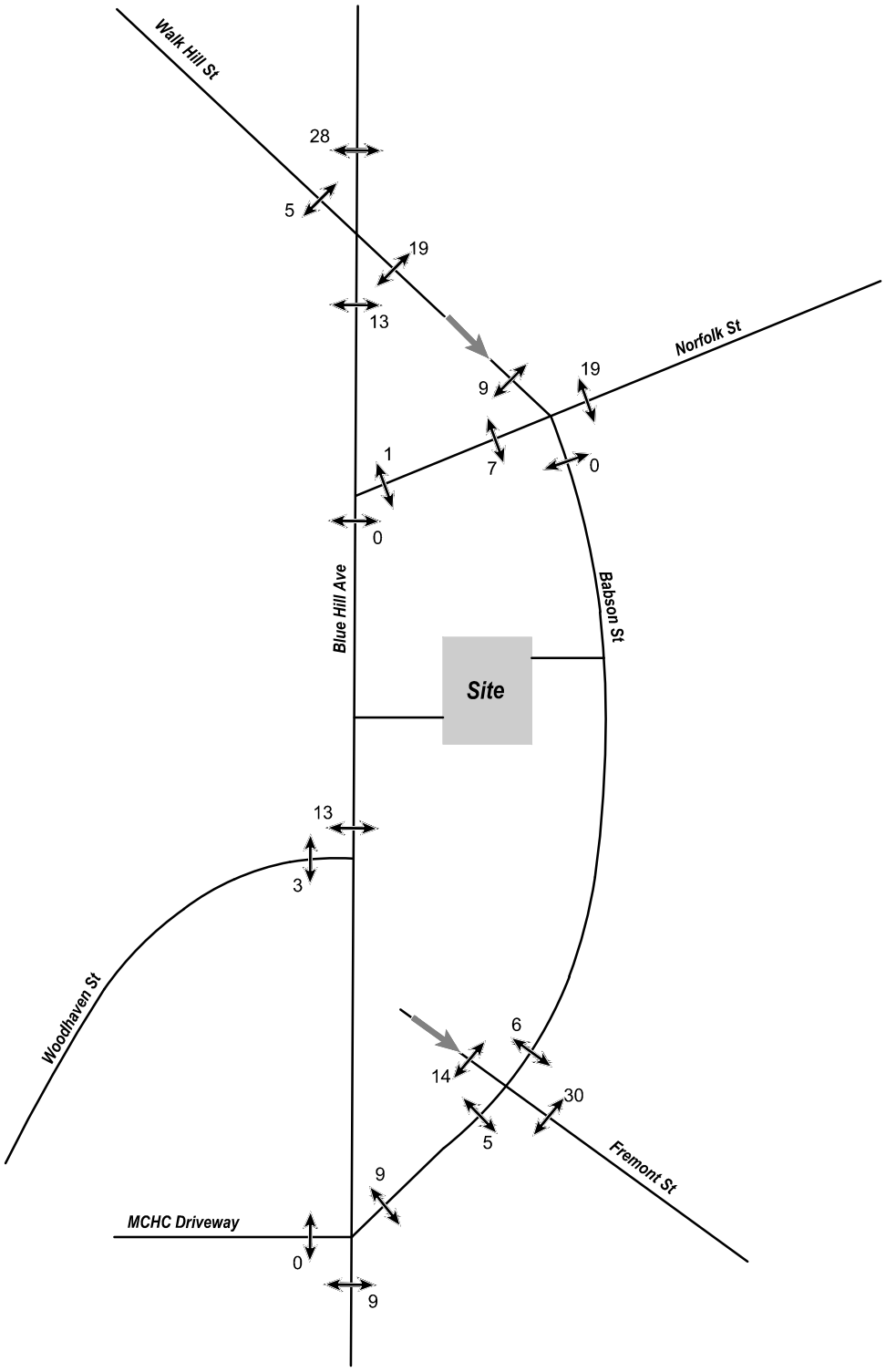

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1464 BLUE HILL AVENUE, BOSTON MA

2014 EXISTING CONDITION PEDESTRIAN VOLUMES, WEEKDAY MORNING PEAK HOUR (7:15-8:15 AM)

FIGURE 4-6

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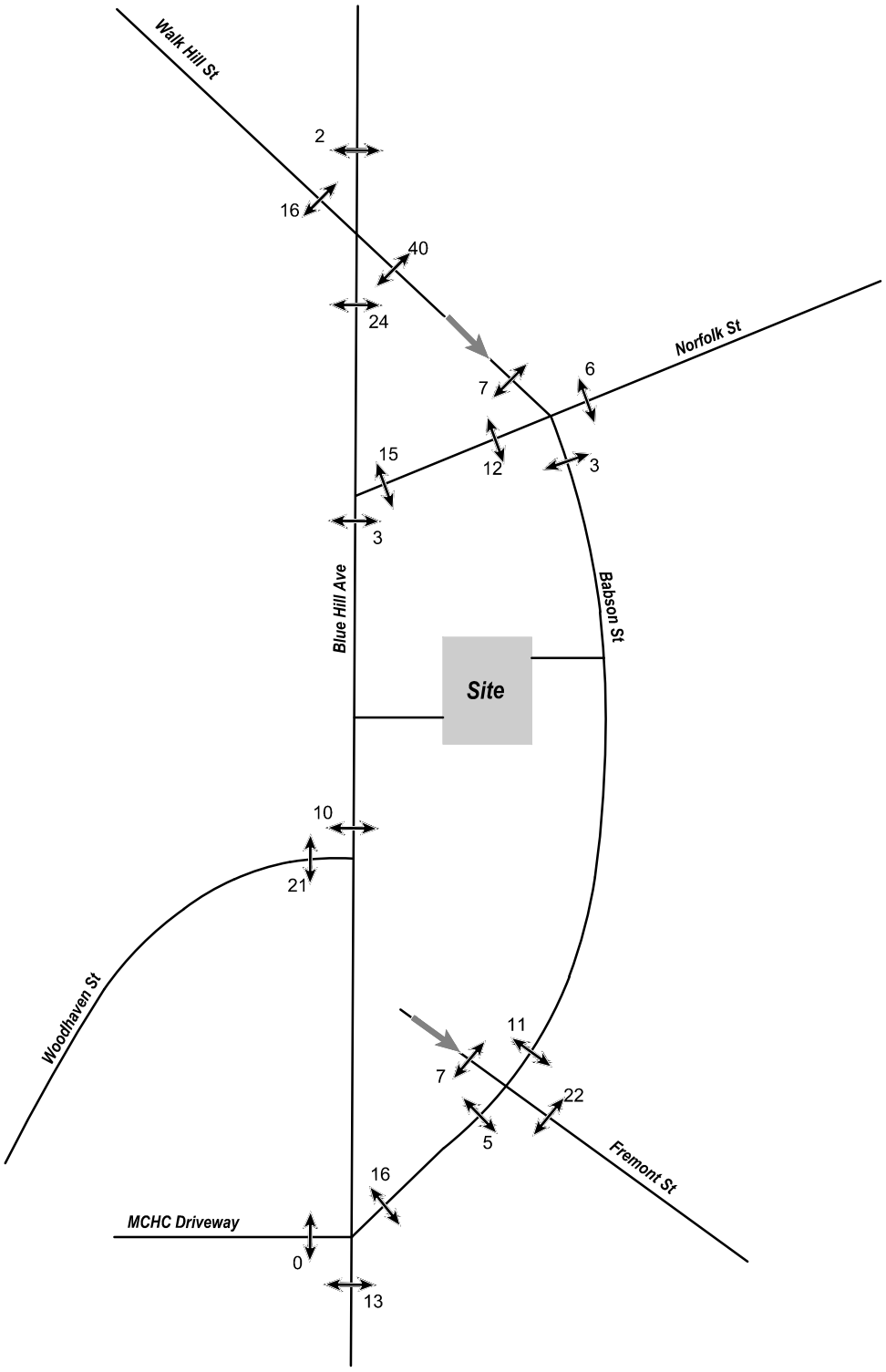

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2014 EXISTING CONDITION PEDESTRIAN VOLUMES, WEEKDAY EVENING PEAK HOUR (5:00-6:00 PM)

FIGURE 4-7

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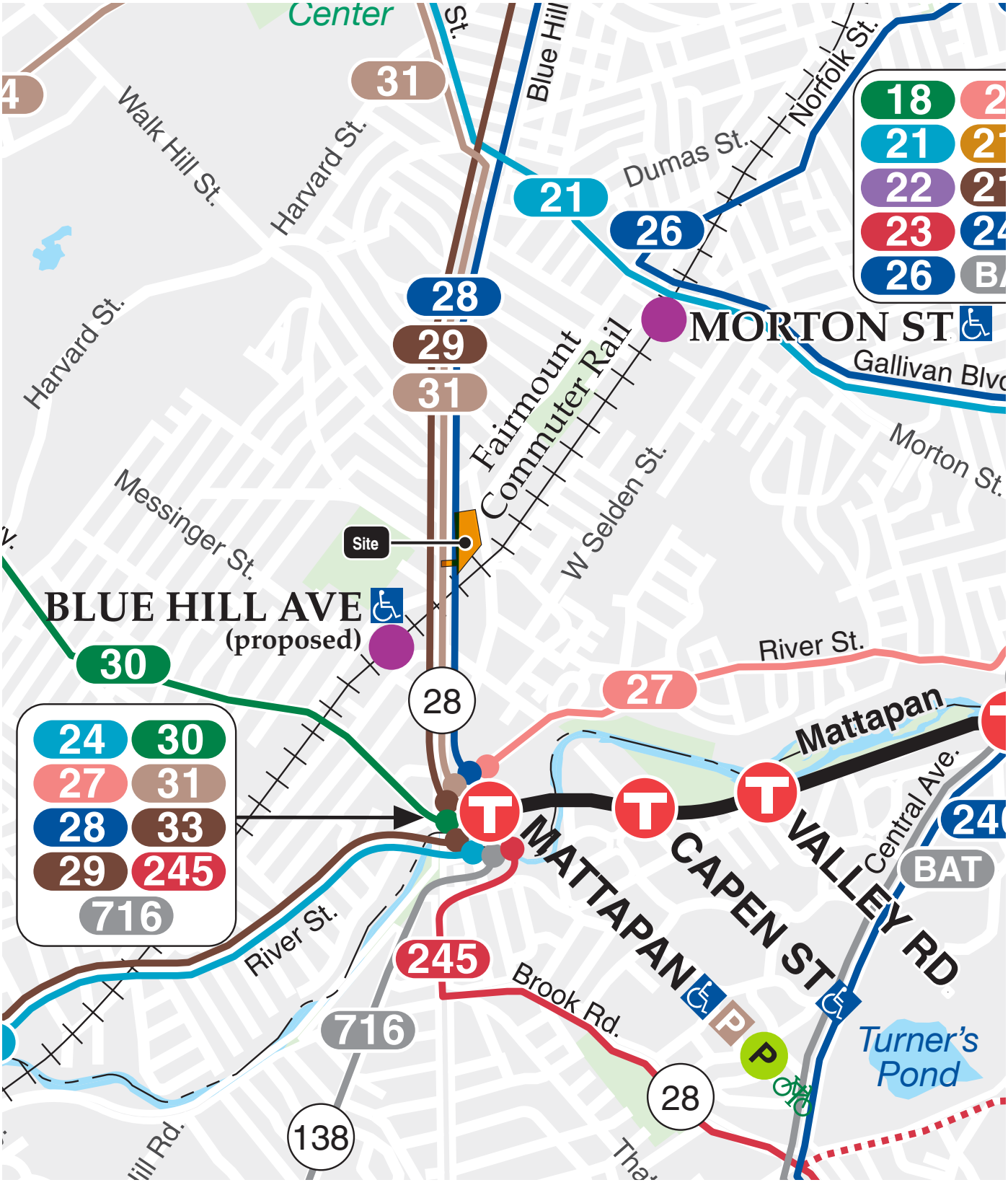

0 550 1100 Feet

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PUBLIC TRANSPORTATION

FIGURE 4-8

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- **Route 29** (Mattapan Station – Jackson Square Station via Seaver Street) provides service along Blue Hill Avenue. On the weekdays, between 5:55 AM and 7:09 PM, the bus route runs between Mattapan Station and Jackson Square Station. After that time, the bus route continues past Jackson Square Station to Ruggles Station until 1:20 AM. On Saturday, the bus route is from Mattapan Station to Ruggles Station between the hours of 8:20 PM and 1:12 AM. There is no Sunday service. Jackson Square Station provides connections to the Orange Line, as well as Bus Routes 14, 22, 29, 41, and 44.
- **Route 31** (Mattapan Station – Forest Hills Station via Morton Street) provides bus service between Mattapan Station and Forest Hills. Bus service is provided from Mattapan Station to Forest Hills between 4:53 AM and 1:18 AM on weekdays and between 5:00 AM and 1:16 AM during Saturdays. Service is also provided on Sundays between the hours of 6:00 AM and 1:16 AM. Forrest Hills Station provides a connection to the Orange Line, Commuter Rail Needham Line, and Bus Routes 16, 21, 30, 31, 32, 34, 34E, 35, 36, 37, 38, 39, 40, 42, 50, and 51.

Subway

The MBTA Red Line terminates in Mattapan Square, approximately half a mile south of the site in Mattapan Square. The Red Line provides access to downtown Boston, extending north to Alewife, and in addition, transfers can be made at JFK/UMass Station to travel south to Braintree. The Red Line connects to the Commuter Rail, Silver Line, Orange Line, and Green Line at various downtown stations. Mattapan Station also provides connections to Bus Routes 24, 27, 28, 29, 30, 31, 33 and 245.

Commuter Rail

Though the commuter rail runs adjacent to the Project site, the closest station currently is approximately half a mile northeast of the site. Morton Street Station is served by the Fairmont Line. The Fairmont Line terminate/originate at South Station in Boston which provides connections to numerous MBTA Commuter Rail lines and the MBTA's Red Line, Silver Line, and Bus Routes 7, 11, 448, 449, and 459.
The MBTA is presently in the community process phase of the design of a new Fairmont Commuter Rail Line station just west of the site between the Blue Hill Avenue and Cummins Highway overpasses. This future Blue Hill Avenue Station will provide a fast single seat access to downtown Boston from the Mattapan neighborhood. Station access will be provided by ramps from both overpasses. This station will serve the local neighborhood, as only minimal parking will be constructed with the station and riders will be encouraged to utilize a new drop-off/pic-up area.

■

Accident History

To identify accident trends and/or roadway safety deficiencies in the study area, crash data were obtained from the MassDOT records for the City of Boston for the most recent three-year time period available (2009 through 2011). A summary of the crash data is presented in **Table 4-2**. The average crash rate (crashes per million entering vehicles) for District 6, the MassDOT district the site is in, is 0.76 for signalized intersections.

There were 17-recorded crashes at the study area intersections over the three-year period that was studied. Blue Hill Avenue at Walk Hill Street/Babson Street had the most crashes with three over the three year period with seven. All the intersections in the study area fell well below the District 6 average crash rate.

Table 4-2
Vehicular Crash Summary (2009 to 2011)

	Blue Hill Ave at				Babson St at	
	Walk Hill St/ Babson St	Norfolk St	Woodhaven St	Babson St	Norfolk St	Fremont St
Currently Signalized?	Yes	Yes	Yes	Yes	Yes	Yes
MassHighway ACR	0.76	0.76	0.76	0.76	0.76	0.76
MassHighway CCR	0.28	0.04	0.08	0.15	0.13	0.15
Exceeds?	No	No	No	No	No	No
Year						
2009	2	0	2	1	1	0
2010	4	1	0	2	1	0
2011	1	0	0	1	0	1
Total	7	1	2	4	2	1
Collision Type						
Angle	0	1	0	1	0	0
Rear-end	3	0	1	0	1	0
Sideswipe, same direction	1	0	0	1	0	0
Single vehicle crash	1	0	0	1	0	0
Not reported	2	0	1	1	1	1
Total	7	1	2	4	2	1
Crash Severity						
Fatal injury	0	0	0	0	0	0
Non-fatal injury	3	0	1	1	0	0
Property damage only (none injured)	3	0	0	2	1	0
Not Reported	1	0	1	1	1	1
Unknown	0	1	0	0	0	0
Total	7	1	2	4	2	1
Time of Day						
Weekday, 7:00 AM - 9:00 AM	0	0	1	1	1	0
Weekday, 4:00 PM - 6:00 PM	2	0	1	0	0	0
Saturday, 11:00 AM - 2:00 PM	0	0	0	0	0	0
Weekday, other time	3	1	0	2	1	1
Weekend, other time	2	0	0	1	0	0
Total	7	1	2	4	2	1
Pavement Conditions						
Dry	4	0	1	2	1	0
Wet	0	1	0	1	0	0
Not reported	3	0	1	1	1	1
Total	7	1	2	4	2	1
Non Motroist (Bike, Pedestrian)						
Total	0	0	0	0	1	0

Source: MassDOT Highway Division

2019 No-Build Condition

Traffic growth within a defined area is a function of expected land development, economic activity, and changes in demographics. A two-step process has been employed to estimate future traffic activity in the Project study area under the 2019 No-Build Condition.

First, general area-wide traffic growth was estimated based on regional traffic growth trends along major study area roadways. The focus of this part of the analysis was to develop and apply an annualized growth rate that could be applied to existing condition peak hour traffic volumes to reasonably account for future traffic growth in the area.

Second, peak hour traffic generation estimates for specific developments that are either currently under construction, are approved, or are planned projects that have formally initiated the City of Boston Article 80 Development Review process were added to the resultant volumes produced under the first step. This process generates peak hour traffic volumes for the 2019 No-Build Condition. A more detailed discussion of the process employed to develop peak hour traffic estimates for the 2019 No-Build Condition is presented below.

General Background Traffic Growth

As mentioned previously, in order to account for general background traffic growth, an annualized growth rate was developed and applied to the existing condition peak hour traffic volumes to reasonably account for future through traffic growth in the study area.

An annual growth rate of 0.5 percent per year between 2014 and 2019 was applied to the 2014 Existing Condition. This is a conservative rate of growth given the historical trend of traffic growth in the area has been flat over the past ten years.

Area Development Projects

Project trips for the following applicable Article 80-submitted projects were added to the 2014 Existing Condition, in addition to a general background growth rate, to develop the 2019 No-Build Condition:

- The Shops at Riverwood,
- Match Community Day Public Charter School,
- Neponset Fields Residential Project,
- 875 River Street,

- 872 Morton Street, and
- 422 River Street.

Specific Planned Projects

The Shops at Riverwood is a retail shopping center located on the site of the former Bay State Paper manufacturing facility on River Street in Hyde Park. The project consists of multiple retail buildings totaling 105,000 square feet of development with 315 off-street parking spaces. The project is being built in phases. Approximately 40,000 SF is currently built and another 20,500 SF is currently under construction.

Match Community Day Public Charter School is a 700 student (kindergarten through 12th grade) school permitted on Poydras Street. The school intends to construct two new school buildings, a gymnasium, adjacent playing fields, and other areas to be devoted to outdoor classroom space. The site will also have 79 off-street parking spaces, bus and parent drop-off/pick-up areas, sidewalks and other walking paths.

Neponset Fields Residential Project, located on Poydras Street, is a residential development. This development originally consisted of 48 housing units, 51 senior housing units, and 111 parking spaces; however, the project has been reduced to 18 units to allow for the construction of the adjacent Match School. The project is being built in phases. At the time of this report, only the senior housing has been constructed. Due to the reduced size of the development, trips generated by this project are included in the 0.5% annual background growth rate.

875 River Street, is a mixed use development located on a currently vacant lot in Hyde Park. The project will consist of 42 residential units, 3 commercial units, and 102 parking spaces on the 94,500SF parcel. There is currently no timetable for the project's construction.

872 Morton Street is a small mixed used development consisting of 28 condominium units and 2,000SF of ground floor retail. Due to the small size of the development, trips generated by this project are included in the 0.5% annual background growth rate.

422 River Street is a four-story, residential development consisting of 27 apartment units, four of which will be affordable, with 22 parking spaces under the building on the ground floor. Due to the small size of the development, trips generated by this project are included in the 0.5% annual background growth rate.

2019 No-Build Traffic Volumes

The 2014 Existing Condition volumes were adjusted to 2019 with a growth rate of 0.5 percent per year. The applicable projects that are either planned, approved and/or under construction were then added to these adjusted volumes to create the 2019 No-Build Condition Weekday Morning and Evening peak hour traffic volumes. **Figure 4-9** and **Figure 4-10** present the 2019 No-Build Condition traffic volume networks for the weekday morning and evening peak hours, respectively.

2019 Build Condition

The 2019 Build Condition traffic volumes for study area roadways were developed by estimating Project-generated traffic volumes, distributing these volumes, and assigning them to the study area roadways. The traffic volumes expected to be generated by the Proposed Project were added to an adjusted 2019 No-Build Condition traffic volumes to create the year 2019 Build Condition traffic volume networks. The following sections describe the procedures used to develop the adjusted No-Build Conditions and Build Condition traffic volume networks.

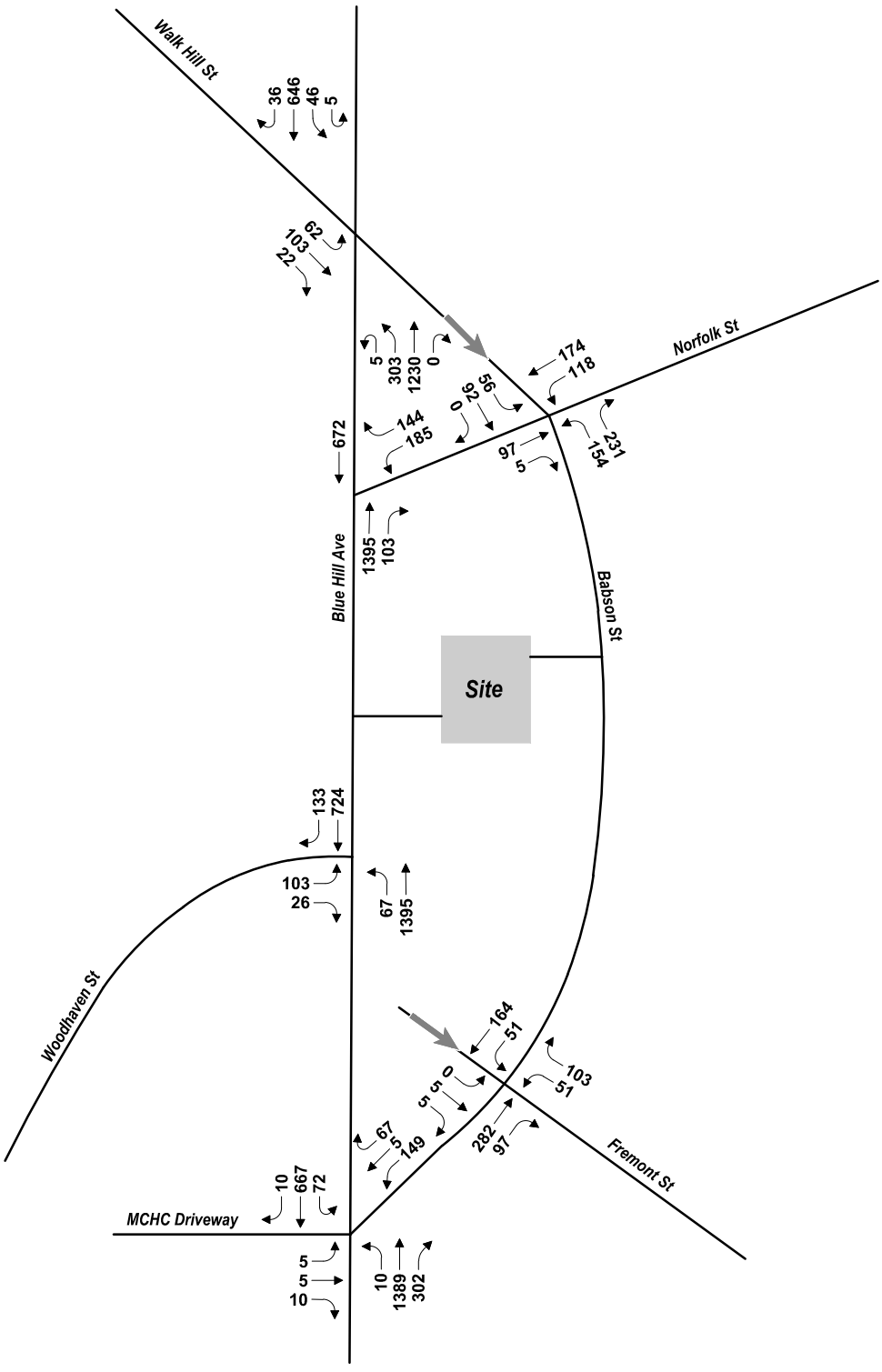
Trip Generation

To determine the future 2019 Build Condition Project trip generation, existing vehicle trip generation was first quantified based on the existing travel characteristics of the KAB students and faculty/staff in conjunction with the understanding of similar school operations. Operations at the nearby Match Community Day Charter Public School and Boston Renaissance Public Charter School were studied to support this effort. Existing trends were then applied to the projected student and faculty/staff populations with completion of the Proposed Project. For the purposes of this study, it is assumed that the School will be fully occupied and at capacity by 2019.

The use of Institute of Transportation Engineer's (ITE) trip generation was investigated for the Proposed Project. However, the resulting trip estimates based on ITE rates were not consistent with the existing trends at the School and therefore not used for this analysis.

Future peak hour vehicle trips, broken down by parent drop-off/pick-up, school bus, and faculty/staff, were calculated using the total volume of students and faculty/staff and applying the mode share found at the existing KIPP Academy Boston and other area charter schools.

Based on the student population of 650 students at full capacity, future peak hour vehicle trips were estimated using the School's existing mode shares and a vehicle



KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

2019 NO-BUILD CONDITION
TRAFFIC VOLUMES,
WEEKDAY MORNING PEAK
HOUR (7:15-8:15 AM)

FIGURE
4-9

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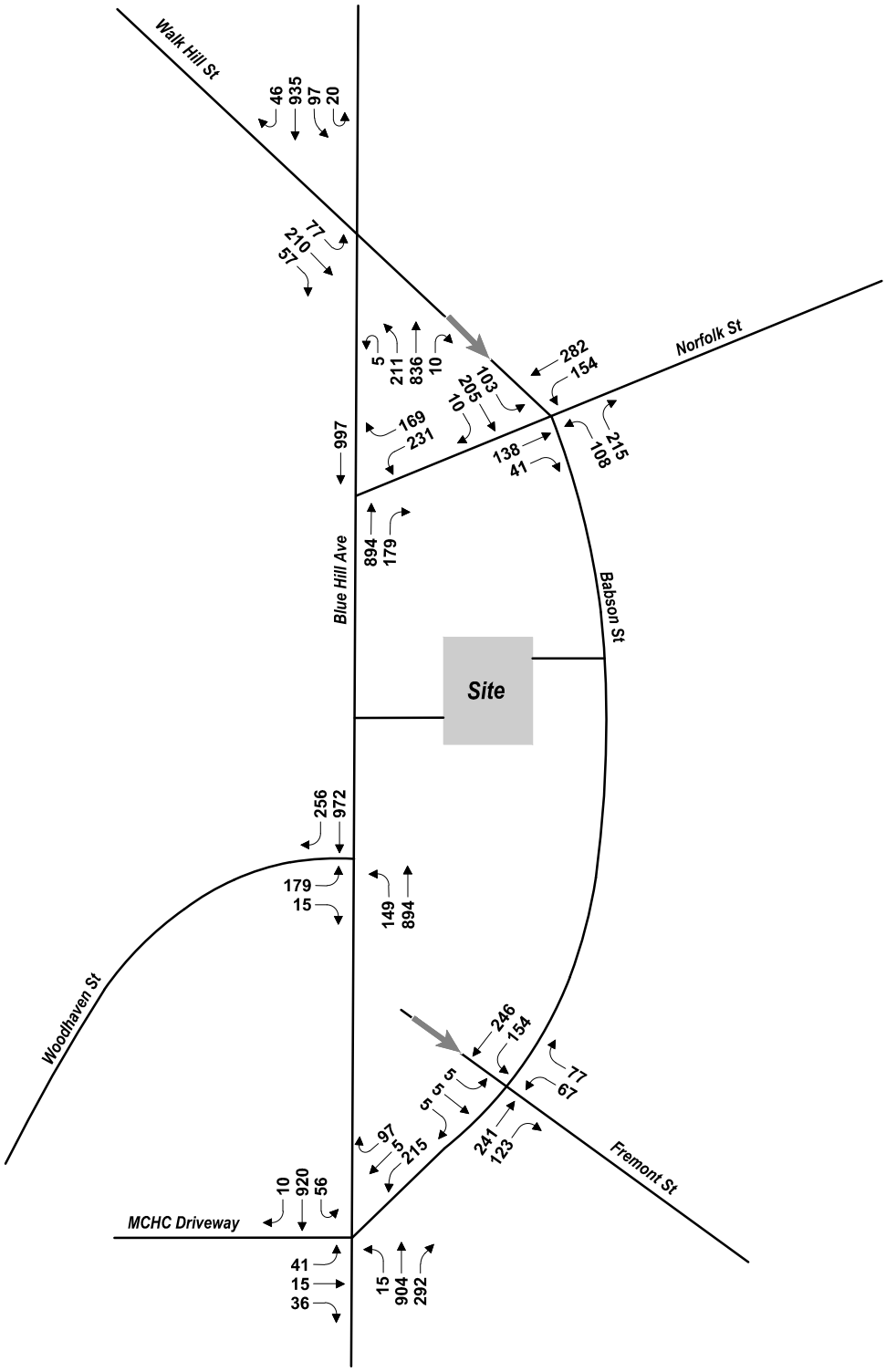

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA

2019 NO-BUILD CONDITION
TRAFFIC VOLUMES,
WEEKDAY EVENING PEAK
HOUR (5:00-6:00 PM)

FIGURE
4-10

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occupancy rate (VOR) of 1.2 students/parent vehicle. KAB anticipates that at least 10% of the student population, or 65 students, will participate in after school activities. After school activities typically last at least 90 minutes after dismissal and are therefore not included in the evening peak hour volumes. All of these students are required to be picked-up by their parents.

Though faculty/staff typically arrive and depart off-peak, to be conservative, it was assumed that half would arrive during the morning peak hour and depart during the evening peak hour. These employees arriving/departing during the peak were divided proportionally between on-site and off-site parking. To be conservative, it was assumed that staff vehicle have a VOR of 1.0 persons/vehicle

Estimated Project-generated vehicle trips for the 2019 Build Condition are shown below in **Table 4-3**.

Table 4-3
Estimated Project Generated Vehicle Trips

	Morning Peak Hour			Evening Peak Hour		
	Student	Faculty	Total	Student	Faculty	Total
Arriving						
School Bus	12	0	12	12	0	12
Vehicle Trip	109	32	141	55	0	55
Total Entering	121	32	153	67	0	67
Departing						
School Bus	12	0	12	12	0	12
Vehicle Trip	109	0	109	55	32	87
Total Exiting	121	0	121	67	32	99

Source: VHB

The Proposed Project will generate 153 new vehicle trips during the morning peak hour and 99 new vehicle trips during the evening peak hour. The majority of the trips are parents that will be traveling to KAB to drop-off and pick-up their children.

■

Trip Distribution

Project trips for the 2019 Build Condition were distributed through the Study Area intersections. Trip assignments for the vehicles traveling to the site were determined using the 2013-2014 KIPP Academy Boston's student and facility/staff population residences.

During the peak drop-off and pick-up time periods, the School driveway will operate in a one-way direction from Babson Street to Blue Hill Avenue. Since Blue Hill Avenue is divided by a median, all traffic exiting the site is required to take a right onto Blue Hill Avenue northbound. Any vehicles destined to the south will use Babson Street to access roadways south of the site.

The Project trip distribution is depicted in **Figure 4-11**. The Project generated vehicle trips, presented previously in Table 4-3**,** have been assigned to the roadway network using the trip distribution and the resulting 2019 Project generated trips. Morning peak hour trips are presented in **Figure 4-12** and evening peak hour trips are presented in **Figure 4-13**.

■

2019 Build Traffic Volumes

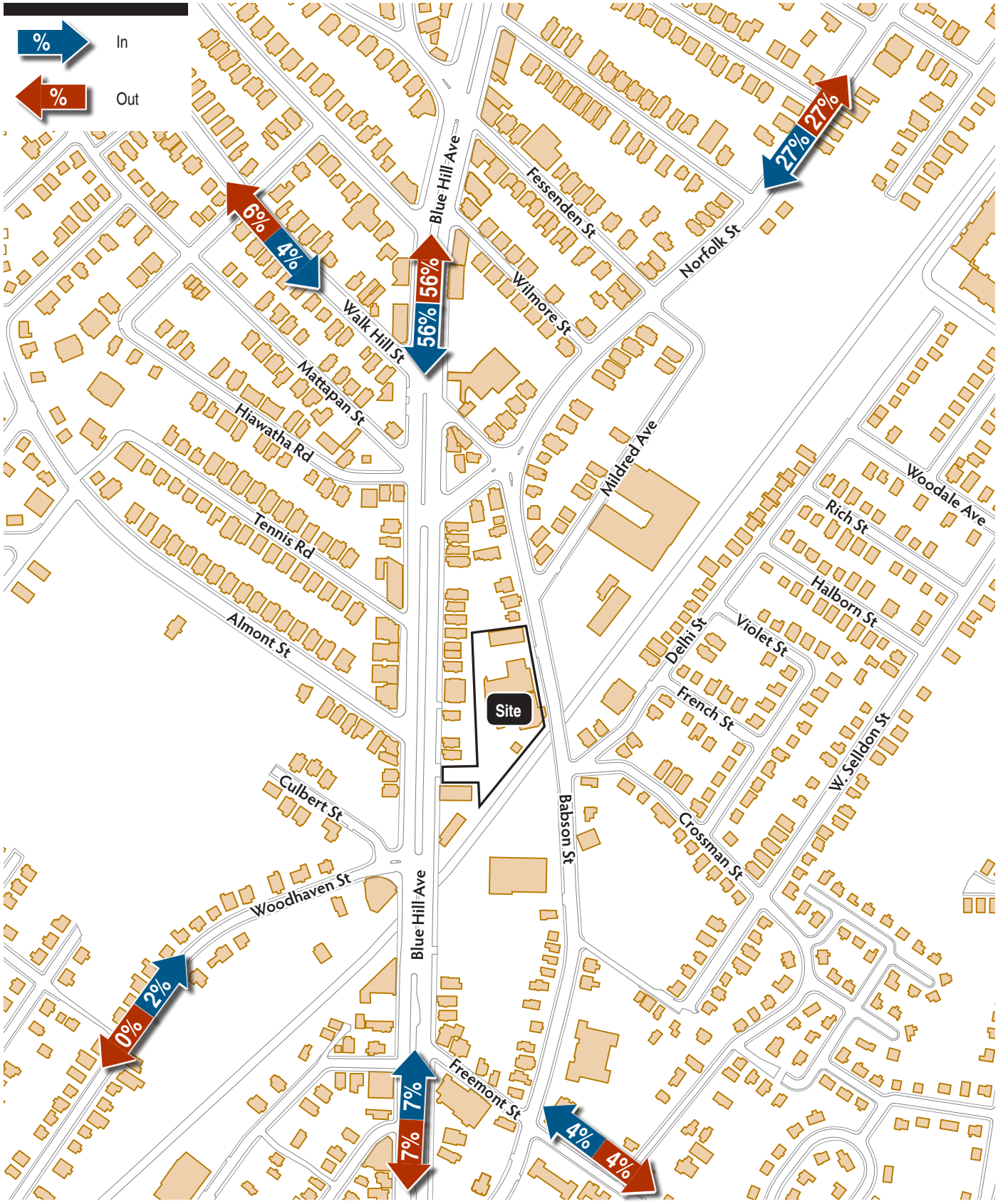
The Project generated trips were added to the 2019 No-Build volumes to develop the 2019 Build Condition peak hour traffic volumes. These volumes are shown in **Figure 4-14** and **Figure 4-15** for the morning and evening peak hours, respectably.

■

Student Pick-Up/Drop-Off

The proposed site provides a single drop-off/pick-up area that will be used by both parents and school buses. Access is provided via a one-way driveway from Babson Street to Blue Hill Avenue. The area will be in front of the School building and consists of three drive aisles separated by dedicated pedestrian pathways. A crosswalk, monitored by a faculty/staff member, will provide a safe crossing area for students to access the School's main entrance from the drop-off/pick-up area. Additional faculty/staff members will help students find/load and unload from school buses and parent vehicles and ensure an efficient drop-off/pick-up operation.

The Proponent expects students to begin arriving at the School half an hour before the start of the school day and parent and school buses to arrive 15 minutes prior to dismissal. As previously shown in Figure 4-1, school buses will load/unload in the outside lane and parents will drop-off/pick-up their children in the two inside lane adjacent to the building. Four visitor parking spaces next to the gymnasium will also be used during pick-up by parents in the event that their student is not ready for



KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

PROJECT TRIP DISTRIBUTION

FIGURE 4-11

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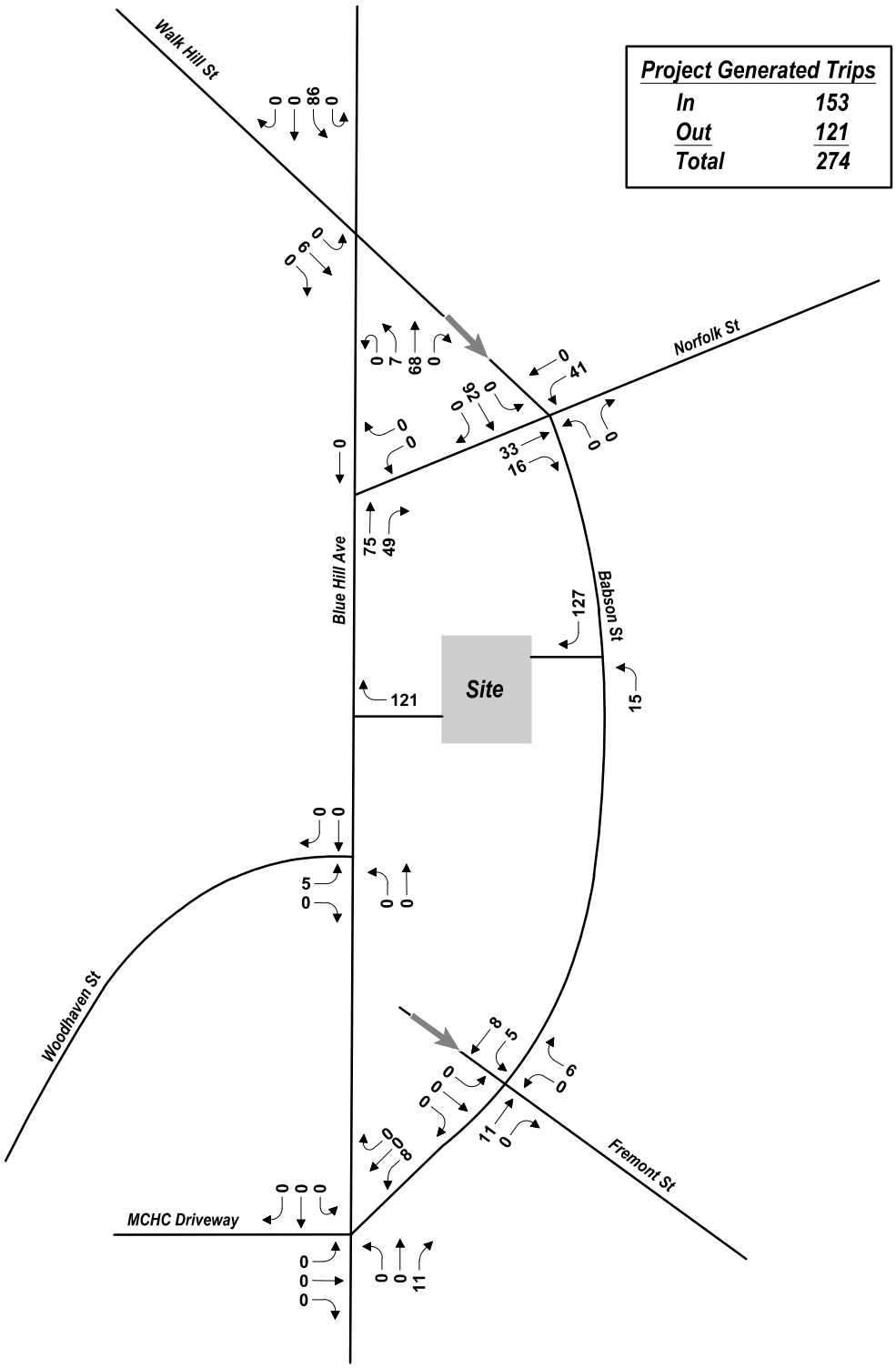

KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

PROJECT GENERATED TRAFFIC VOLUMES, WEEKDAY MORNING PEAK HOUR (7:15-8:15 AM)

FIGURE 4-12

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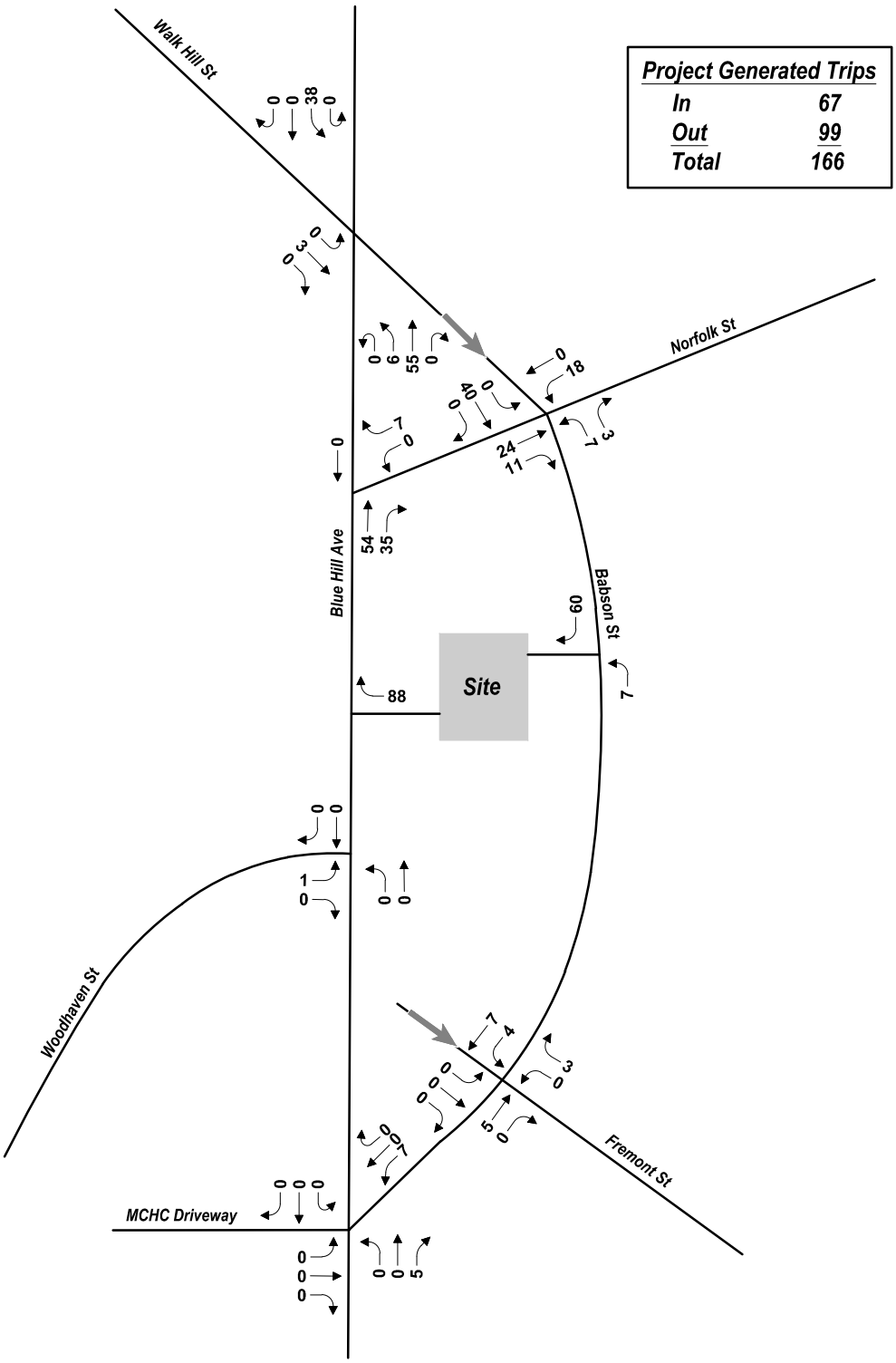

KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

PROJECT GENERATED TRAFFIC VOLUMES, WEEKDAY EVENING PEAK HOUR (5:00-6:00 PM)

FIGURE 4-13

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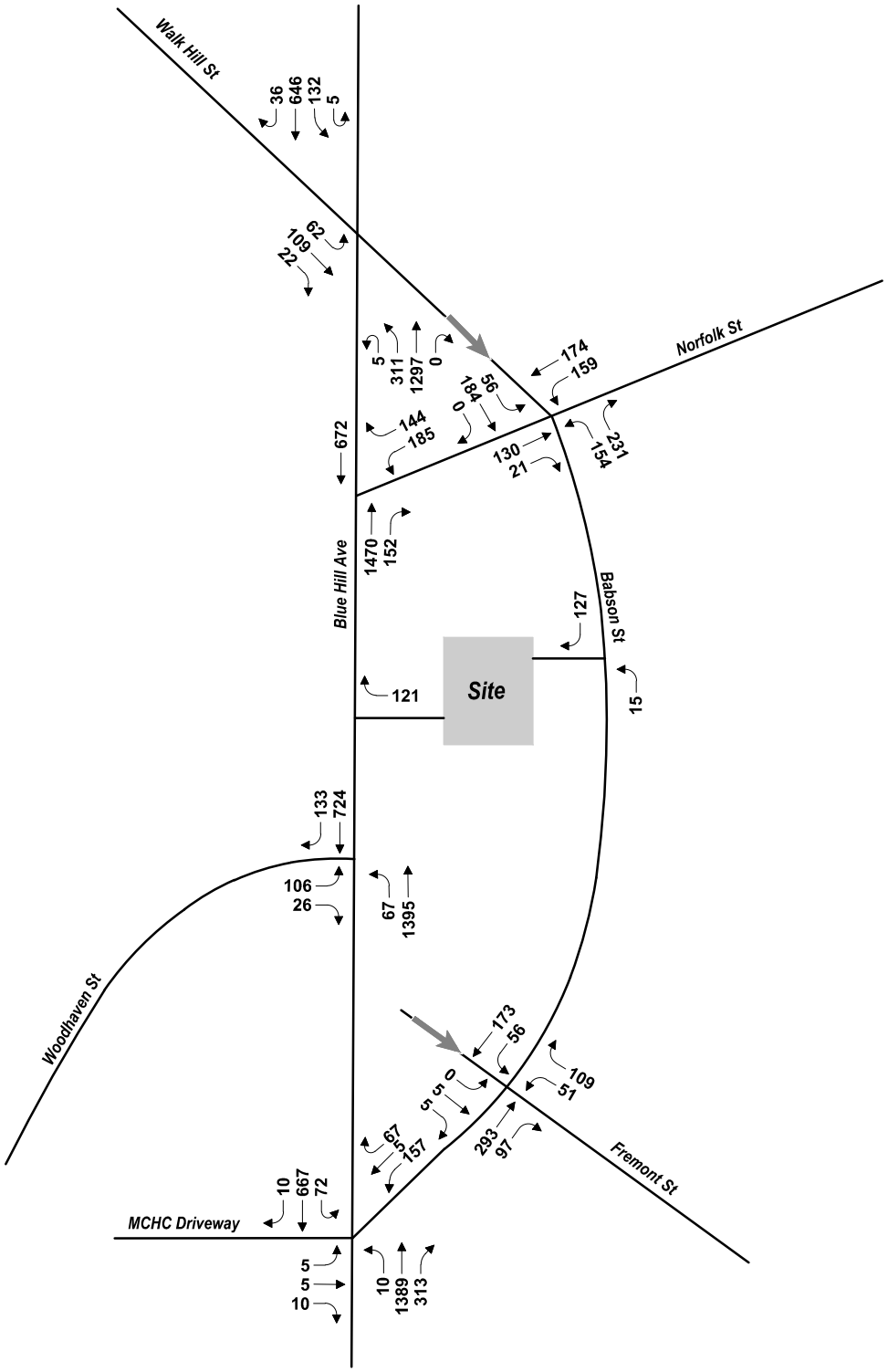

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA

2019 BUILD CONDITION TRAFFIC VOLUMES, WEEKDAY MORNING PEAK HOUR (7:15-8:15 AM)

FIGURE 4-14

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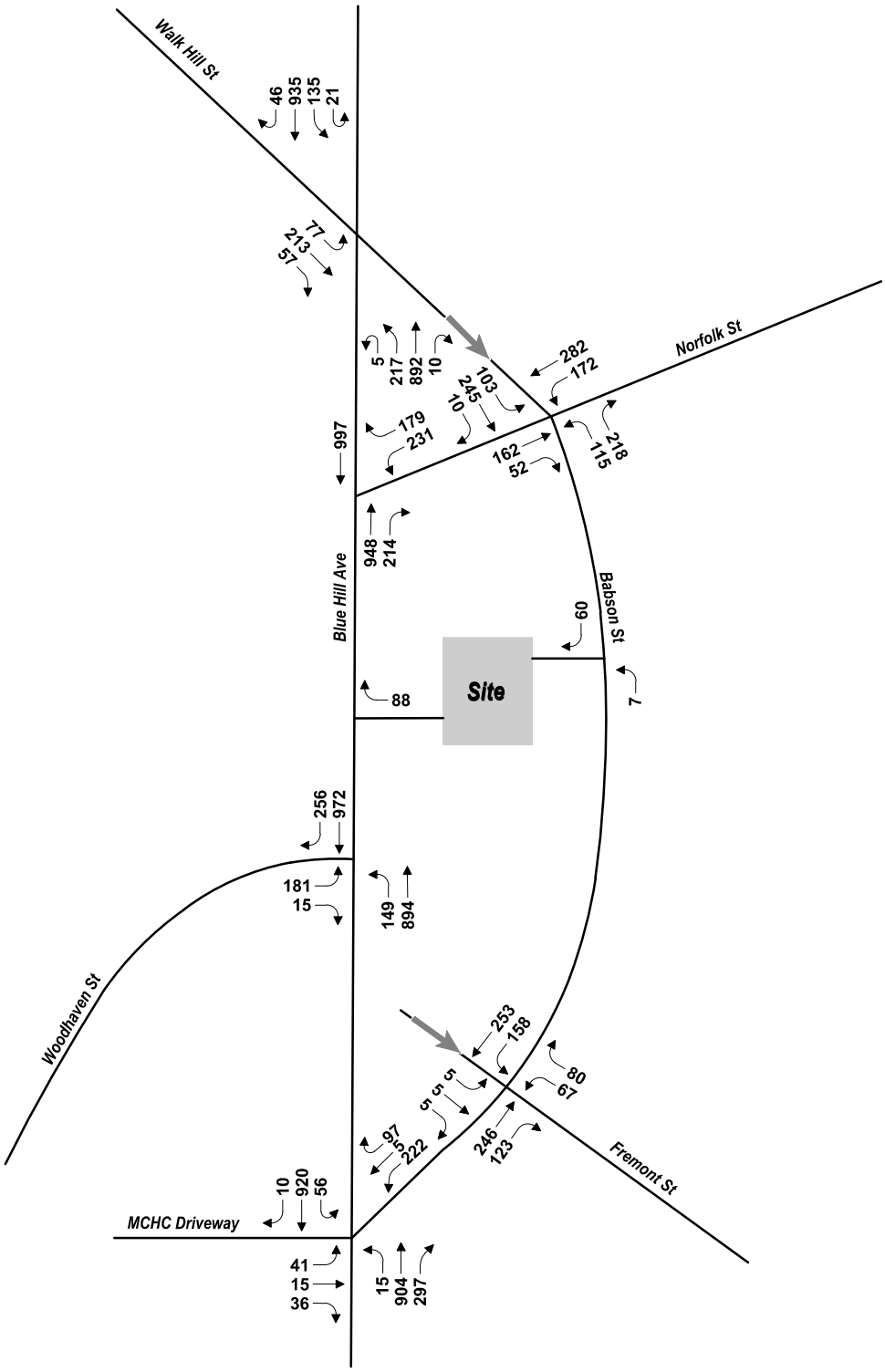

KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

2019 BUILD CONDITION TRAFFIC VOLUMES, WEEKDAY EVENING PEAK HOUR (5:00 - 6:00 PM)

FIGURE 4-15

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pick-up at dismissal. This will help minimize blocking in the pick-up area and manage the pick-up operations.

■

Parking

The Proposed Project will contain approximately 48 parking spaces on-campus. The parking along the west side of the site (21 spaces) along the Blue Hill Avenue driveway (10 spaces) and along the Babson Street driveway (11 spaces) will be designated for faculty/staff parking throughout the school day. Parking next to the gymnasium (4 spaces) will be designated as visitor spaces. These visitor spaces will also be used by parents during afternoon pick-up. There will also be two accessible spaces located directly across from the main entrance into the School. In addition to these on-site parking spaces, additional faculty/staff parking will be provided in a defined off-site, off-street parking lot.

■

Loading and Emergency Vehicle Access

Loading and service functions for the School will be accommodated in the drop-off/pick-up area. KAB will work will vendors to ensure deliveries occur off-peak, to minimize any impacts to the neighborhood roadway network and School drop-off/pick-up operations. Minimal deliveries are expected and will be made mostly by delivery vans and not larger, tractor-trailer trucks. A single dumpster/compactor will be provided at the bottom of the Blue Hill Avenue driveway adjacent to the gymnasium. This dumpster will be emptied or removed/replaced weekly.

The site driveways and drive aisles have been designed to accommodate emergency vehicle access to the site. An existing gate that provides access to the adjacent MBTA tracks will be maintained.

■

Pedestrians

With students walking and riding the MBTA to School daily, the Proponent intends to create a solid pedestrian connection between Babson Street and Blue Hill Avenue to the Proposed School. Accessible sidewalks along both driveways will be provided. On the Proposed site, the Proponent intends to provide ample sidewalk space, accessible ramps and crosswalks to ensure the safety of the students, faculty/staff, and visitors.

Traffic Operations Analysis

Capacity analyses were conducted for the 2014 Existing, 2019 No-Build, and 2019 Build Conditions to determine how well the roadway facilities serve the existing and future traffic demands. These roadway operating conditions are classified by quantified levels of service.

Level-of-Service Criteria

Level-of-service (LOS) is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection. Level-of-service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. For signalized intersections, the analysis considers the operation of each lane or lane group entering the intersection. The LOS designation is for overall conditions at the intersection.

The evaluation criteria used for the LOS analysis are based on the *2000 Highway Capacity Manual* (HCM)[1]. **Table 4-4** below presents the level of service delay threshold criteria as defined in the HCM.

Table 4-4
Level of Service Criteria

Level-of-Service	Signalized Intersection Control Delay (sec/veh)
LOS A	≤ 10
LOS B	> 10-20
LOS C	> 20-35
LOS D	> 35-55
LOS E	> 55-80
LOS F	> 80

Source: 2000 HCM

Consistent with BTD's guidelines, Synchro 6 software was used to model LOS operations at the study area intersections. Intersection operations summary reports are presented in the Appendix of this expanded PNF.

Signalized Intersection Capacity Analysis

The study area contains six signalized intersections in the 2014 Existing, 2019 No-Build Conditions, and 2019 Build Condition. Capacity analyses were conducted for

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

these signalized intersections. A summary of the signalized intersection capacity analysis is presented in **Table 4-5**.

Table 4-5
Signalized Intersection Capacity Analysis Summary

		2014 Existing Condition			2019 No-Build Condition			2019 Build Condition		
Location	Period	V/C[1]	Delay[2]	LOS[3]	V/C	Delay	LOS	V/C	Delay	LOS
Blue Hill Ave/Walk Hill St/Babson St	Weekday Morning	.77	27.5	C	.81	29.6	C	>1.0	47.7	D
	Weekday Evening	>1.0	>80	F	>1.0	>80	F	>1.0	>80	F
Blue Hill Ave/ Norfolk Street	Weekday Morning	.79	21.9	C	.83	22.8	C	.88	23.8	C
	Weekday Evening	.65	25.1	C	.69	26.5	C	.74	26.7	C
Blue Hill Ave/ Woodhaven St	Weekday Morning	.73	9.8	A	.76	10.7	B	.76	10.9	B
	Weekday Evening	.80	18.1	B	.85	19.3	B	.85	19.4	B
Blue Hill Ave/Babson St/ MCHC Driveway	Weekday Morning	>1.0	>80	F	>1.0	>80	F	>1.0	>80	F
	Weekday Evening	.99	53.4	D	>1.0	69.3	E	>1.0	71.1	E
Babson St/ Norfolk St	Weekday Morning	.74	35.8	D	.77	35.6	D	.92	42.7	D
	Weekday Evening	.78	34.0	C	.81	34.3	C	.89	39.2	D
Babson St/ Fremont St	Weekday Morning	.44	10.7	B	.46	10.8	B	.49	10.9	B
	Weekday Evening	.68	12.6	B	.72	14.6	B	.74	15.7	B

Source: VHB
1. V/C = volume to capacity ratio
2. Delay = Average delay in seconds per vehicle
3. LOS = Level of Service

Under 2014 Existing Condition, all study area intersections operate at LOS D or better during both the morning and evening peak hour with the exception of two intersections. Blue Hill Ave/Walk Hill Street/Babson Street during the evening peak and Blue Hill Ave/Babson St and MCHC Driveway during the morning peak both operate at LOS F.

Under 2019 No-Build Condition, all but two stud area intersections will continue to operate under the same LOS as in the existing conditions. The intersection of Blue Hill Ave/Woodhaven Street experiences a change in LOS from LOS A to LOS B in the morning, but average intersection delay increases less than one second. The intersection of Blue Hill Ave/Babson Street/MCHC Driveway decreases from LOS D to LOS E in the evening mainly due to an increase in vehicles traveling northbound on Blue Hill Avenue.

Under 2019 Build Condition (i.e., with the Proposed Project in place), two study area intersections' LOS will change from the No-Build Condition. Blue Hill Ave/Walk Hill St/Babson St will decrease from LOS C to LOS D during the morning peak hour due to an increase in traffic traveling southbound to the site. The intersection of Babson St/Norfolk St also changes from LOS C to LOS D in the evening peak hour due to a slight increase in westbound left turning vehicles traveling to the site. All

other intersections and analysis periods operate at the same LOS as in the No-Build Condition.

Transportation Improvements

This section delineates the transportation improvements plan developed by the Proponent in connection with the Proposed Project. In addition to physical improvements, the Proponent proposes to minimize reliance on travel by automobile through implementation of a Traffic Demand Management (TDM) plan. Generally, TDM strategies are most effective with commuter travel where most trips are made by employees (e.g. in an office development). However, there are a number of measures that will be implemented in an effort to reduce faculty/staff auto trips.

Area Improvements

The Proponent is proposing minimal improvements to the surrounding area due to the limited Project impact and overall good condition of area roadways and sidewalks. Improvements the Proponent is committed to include reconstructing the sidewalk along Babson Street that is impacted by the relocation of the site driveway, providing accessible connections from the Project site to Babson Street and Blue Hill Avenue, and installing signage to reinforce the right-only movement onto Blue Hill Avenue northbound from the Project site.

These improvements are shown previously in Figure 4-1.

Transportation Demand Management

The goal of the Transportation Demand Management plan is to reduce the Project's overall traffic impact through the implementation of TDM measures that are geared toward affecting the demand side of the transportation equation, rather than the supply side. By their very nature, TDM programs attempt to change people's behavior, and, to be successful, they must rely on incentives or disincentives to make these shifts in behavior attractive to the commuter[2].

TDM programs are designed to maximize the people-moving capability of the existing transportation infrastructure by increasing the number of persons in a vehicle, providing alternate modes of travel, or influencing the time of, or need to, travel.

[2] *Implementing Effective Traffic Demand Management Measures: Inventory of Measures and Synthesis of Experience*, prepared by Comsis Corporation and the Institute of Transportation Engineers, for the U.S. Department of Transportation, DOT-T-94-02, September 1993, p. I-1.

TDM measures are most often directed at commuter travel, characterized by the day-to-day regularity of this type of trip. Conditions at the workplace, in terms of employer practices such as on-site services, bicycle storage, shower facilities and shuttle services, impact faculty and staff commuter choices, and makes this market the most suitable for identifying alternatives.

The term TDM encompasses both alternatives to driving alone and the techniques or supporting strategies that encourage the use of these alternatives. TDM alternatives to driving alone include carpools and vanpools, public and private transit, and non-motorized travel including bicycling and walking.

TDM strategies are the supporting measures that encourage the use of alternatives to driving alone. TDM strategies include financial incentives, time incentives, provision of new or enhanced commuter services, dissemination of information, and marketing alternative services. TDM strategies include all the incentives and disincentives that increase the likelihood for people to change their existing travel behavior.

Transportation Demand Management Plan

To implement a TDM program for the Proposed Project, the Proponent will consider a number of measures that will contribute toward the reduction of vehicular traffic to and from the Project site.

The following measures could comprise the proposed TDM package.

Ridesharing

The Proponent will promote ridesharing for its faculty and staff by carpooling. The Proponent will provide information regarding carpooling and its benefits to faculty and staff. KAB will consider providing ridesharing vehicles with preferential parking spaces in the parking lots as a rideshare incentive.

Transportation Coordinator

A transportation coordinator will be identified to ensure that the complete rideshare program, including ride matching, promotion, incentives and a guaranteed ride home, is consistently promoted and provided.

Guaranteed Ride Home

In the event of an emergency or a request to stay late at work, the guaranteed ride home would allow faculty and staff to receive transportation service home, usually in the form of a taxi. This program helps to alleviate commuter's worries about being

stuck on-campus when using alternative modes in case of various family emergencies.

Transit Incentives

To encourage the use of transit by faculty and staff to commute to work, KAB will provide local bus schedule and route information in the faculty/staff areas. In addition, the Proponent will offer monthly pre-tax MBTA pass sales for faculty/staff to promote the use of public transportation.

Transit Transportation

The Proponent is considering operating a shuttle bus to and from major transit hubs, such as Mattapan Station or Ashmont Station, to further encourage use of transit by faculty, staff, and students.

Bicycle and Pedestrian Measures

Bicycling to the site will likely be attractive to some faculty/staff due to the proximity of many residential communities. To encourage and facilitate use of bicycles by faculty/staff, both secure/covered and outdoor bicycle storage racks will be provided at the new School.

Again, due to the close proximity of residential areas to the site, walking will be attractive to some students and faculty/staff. The Proponent is committed to maintain sidewalks on and around the site. Safe on-site pedestrian circulation will be promoted through clearly delineated crosswalks/walkways on site. All constructed pedestrian facilities will be ADA compliant.

Construction Management

Following the Article 80 review process, a detailed Construction Management Plan (CMP) will be developed and submitted to the BTD for its approval in connection with the Proposed Project. The CMP will provide a detailed evaluation of potential short-term construction related transportation impacts during the course of the Proposed Project's construction. The CMP will include truck routing, construction staging on-campus, and pedestrian circulation around the campus.

Construction vehicles will be necessary to move construction materials to and from the Proposed Project site. The Proponent recognizes that construction traffic is a concern to area residents. No roadway closures are anticipated with the construction project. The need for street occupancy (i.e. temporary removal of parking or single lane closures) along roadways adjacent to the Proposed Project site is possible during certain periods of construction.

Contractors will be required to devise access plans for their personnel that de-emphasizes auto use (such as seeking off-site parking, provide transit subsidies, etc.). All parking for construction workers will be provided on site. The following are some of the elements that are anticipated to be included in a forthcoming CMP to support the Project:

- The vehicular access to the Project site during the construction period will be from Blue Hill Avenue.
- The construction site will be maintained on private property and will likely not require long-term roadway and/or sidewalk occupancies (other than for utilities connections, the reconstruction of sidewalks, etc.).
- Construction worker parking will be provided on site, thereby eliminating the need for construction worker parking elsewhere in the area.
- Staging areas for construction are anticipated to be located directly on the Project site.

5

Environmental Protection

This chapter presents the findings of technical studies that were conducted to determine the direct or indirect impact to the environment reasonably attributable to the Proposed Project as described in Chapter 1, *Project Description and Impact Summary.* Existing conditions and proposed conditions are shown in **Figure 5-1** and **Figure 5-2**, respectively. The categories of environmental impacts for which studies and mitigation are addressed herein include wind, shadow, daylight, solar glare, air quality, solid and hazardous waste, noise, stormwater management, flood hazards/wetlands, geotechnical and groundwater analysis, construction impacts, rodent control, historical resources, and sustainable design.

Overall, as described below, the Proposed Project will not have significant environmental impacts, and in several instances, will enhance existing conditions both on the Project site as well as the adjacent site environs.

Wind

Given the limited height (not to exceed 55 feet at the highest point) of the proposed development, and the grade difference from the street to the proposed development, the Project is not expected to cause significant wind impacts on the neighborhood or open space areas and therefore does not warrant a wind study.

Shadow

The Proposed Project is located in a transitional, urban-scale neighborhood at the threshold between multi-family residential and commercial uses. Recognizing the importance of natural daylight in maintaining and enhancing the quality of the streetscape and the surrounding residential properties, the Project Proponent has conducted a detailed shadow analysis to assess the Proposed Project's shadow impacts within its urban context.

The primary purpose of the shadow analysis is twofold: first, the analysis examines the extent to which the Proposed Project creates new shadow on the surrounding area, and second, the analysis examines the difference between the net-new shadow cast by the Proposed Project and the existing industrial structures on site, which represent a significantly larger footprint on the site and are located in much greater proximity to the residential neighborhood.

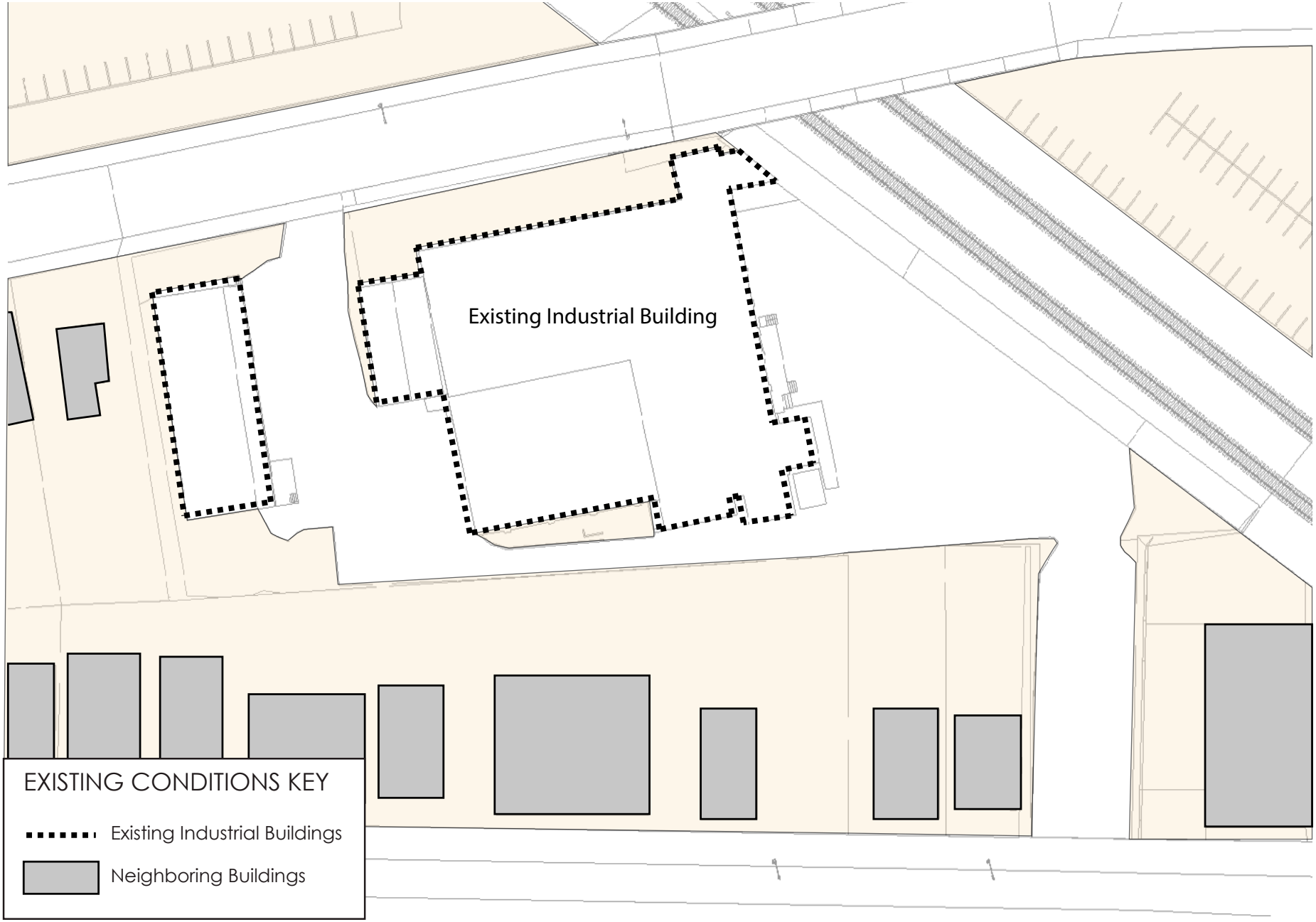
Shadow studies were conducted for the following dates and times, consistent with BRA Development Review guidelines and customary practice:

- March 21 (spring equinox): 9:00AM, 12:00PM, 3:00PM
- June 21 (summer solstice): 9:00AM, 12:00PM, 3:00PM, 6:00PM
- September 21 (fall equinox): 9:00AM, 12:00PM, 3:00PM
- December 21 (winter solstice): 9:00AM, 12:00PM, 3:00PM

The graphical results of the shadow studies are included and shown in **Figure 5-3** through **Figure 5-15** inclusive. In summary, the shadow studies yielded the following conclusions about the Proposed Project's shadow impacts:

- The Proposed Project will cast minimal new shadows on public streets and sidewalks. The main scope of any impact was found to be during the late afternoon hours; and the affected area is primarily a section of Babson Street that crosses over the MBTA rail lines, resulting in a minimal impact to the quality of the urban environment.
- Due to the position of the proposed structure along Babson Street and the MBTA rail lines, the surrounding residential properties will only be affected by shadow impact in the early morning hours during the timeframe of the winter solstice (See Figure 5-15).
- Given that the Proposed Project consolidates the built site footprint in the corner of the site that is furthest from the adjacent residential properties, the Proposed Project will reduce the dispersion of shadow impact across the overall net site area, reducing the shadow impact on the surrounding residential properties during many times of the day/year.
- Most of the Proposed Project's shadow impacts fall within the Project Site area and over surrounding roadways, parking lots and rail lines.

Overall, the Proposed Project will have no significant net-new shadow impact on the surrounding community, and in particular will have limited net-new shadow impact on the residential structures immediately adjacent to the site.



KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

ASSUMED EXISTING CONDITIONS

FIGURE 5-1

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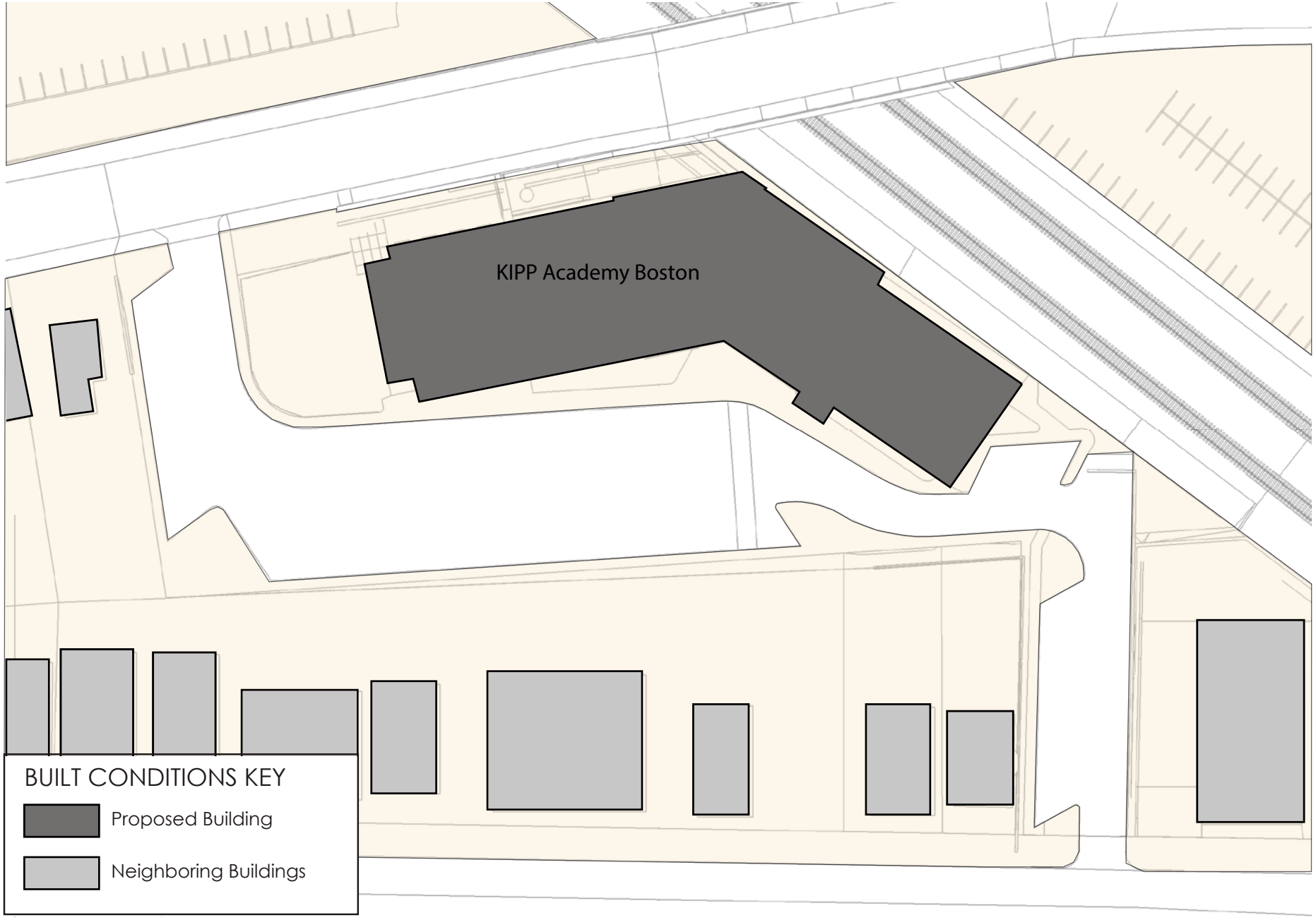

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

ASSUMED BUILT CONDITIONS

FIGURE 5-2

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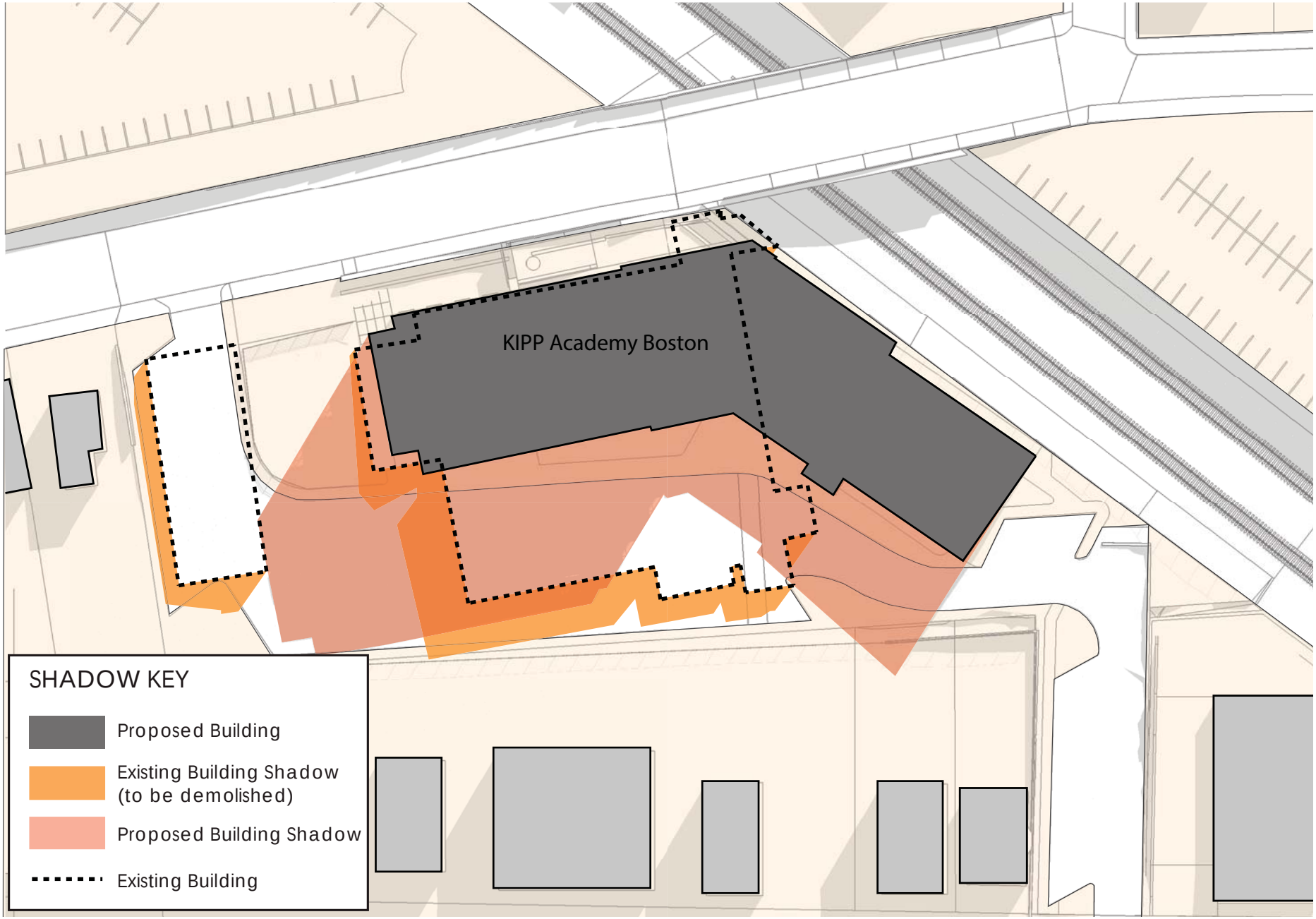

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
MARCH 21ST 9AM

FIGURE
5-3

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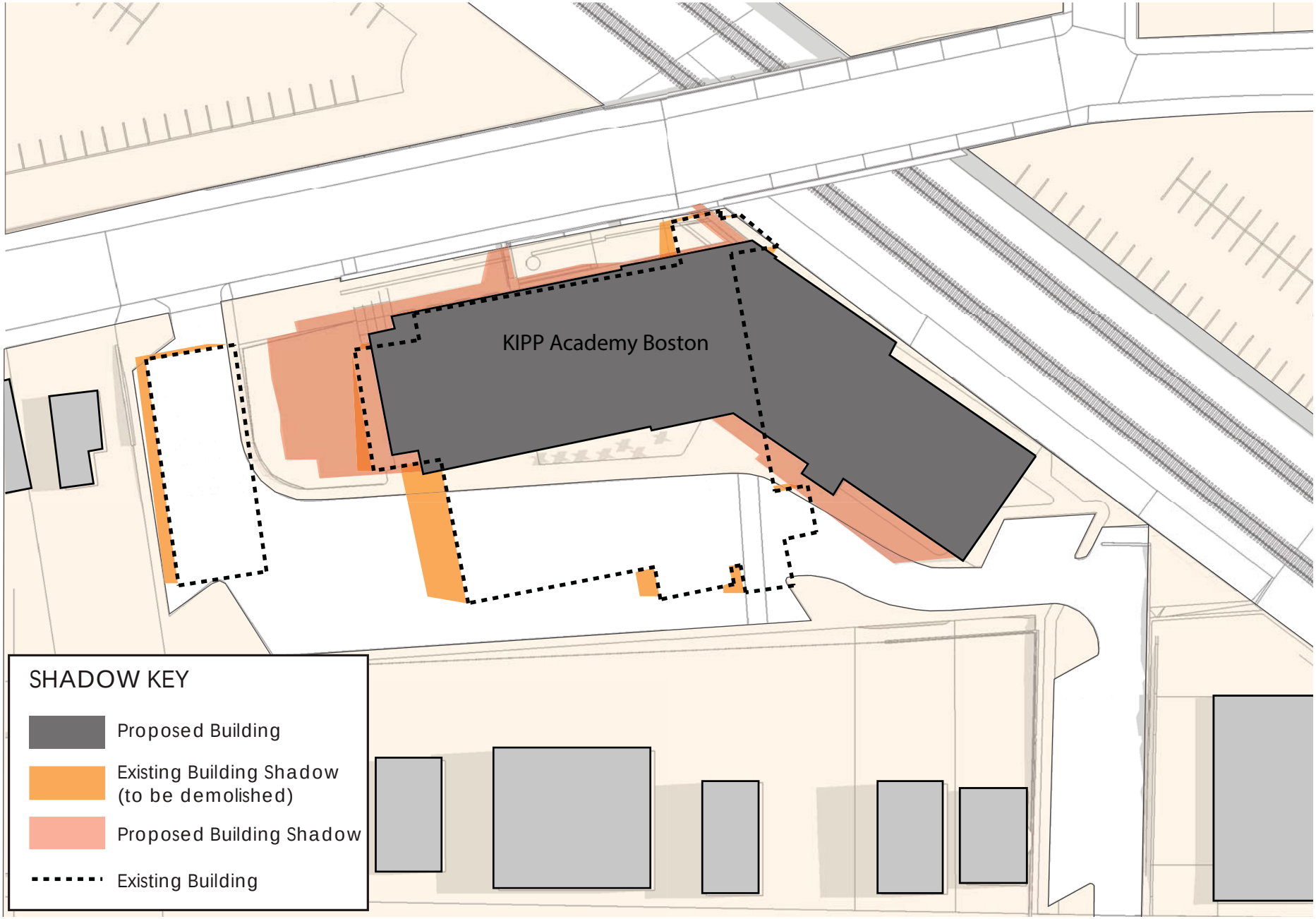

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
MARCH 21ST 12PM

FIGURE
5-4

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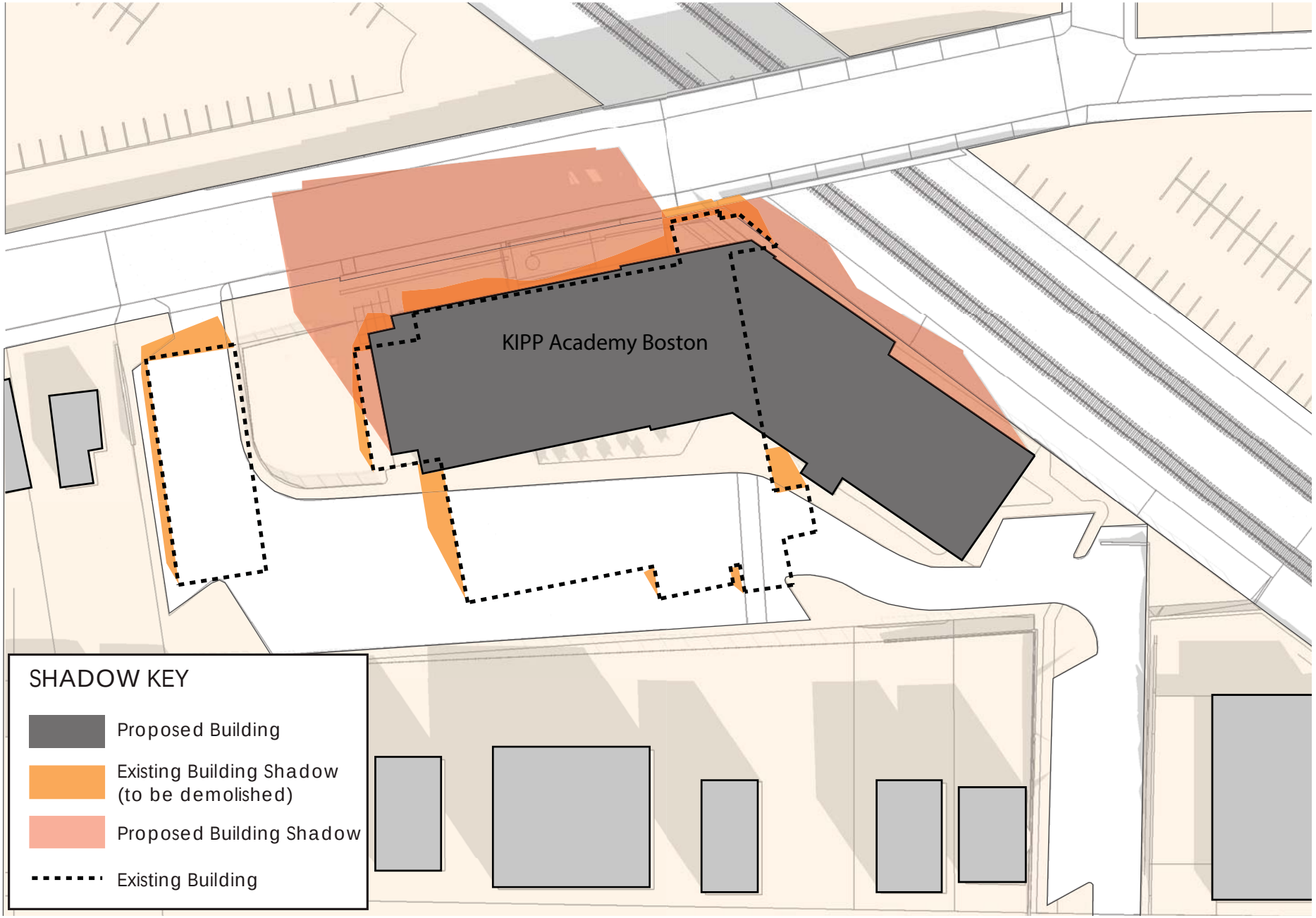

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
MARCH 21ST 3PM

FIGURE
5-5

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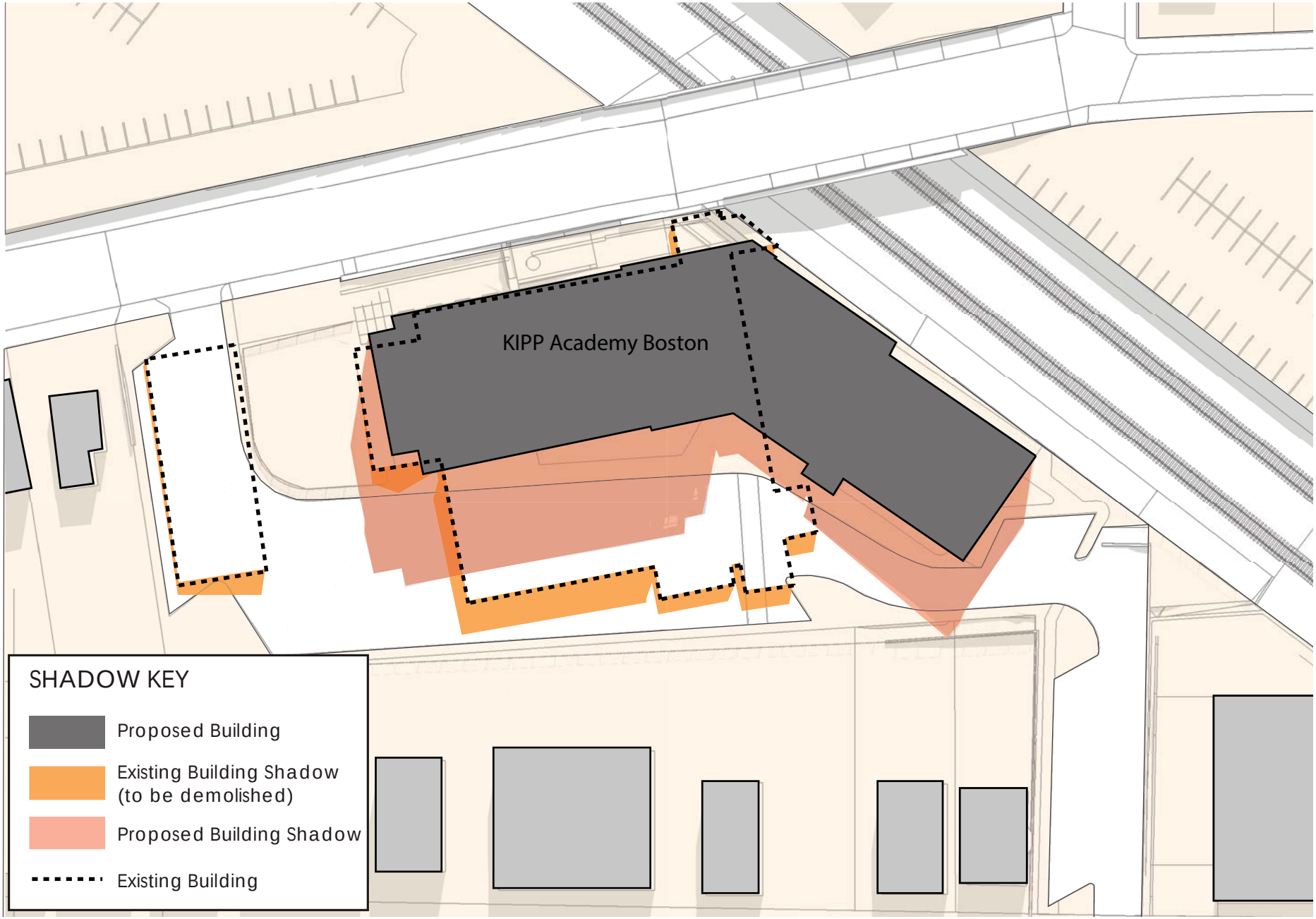

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KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

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SHADOW STUDY
JUNE 21ST 9AM

FIGURE
5-6

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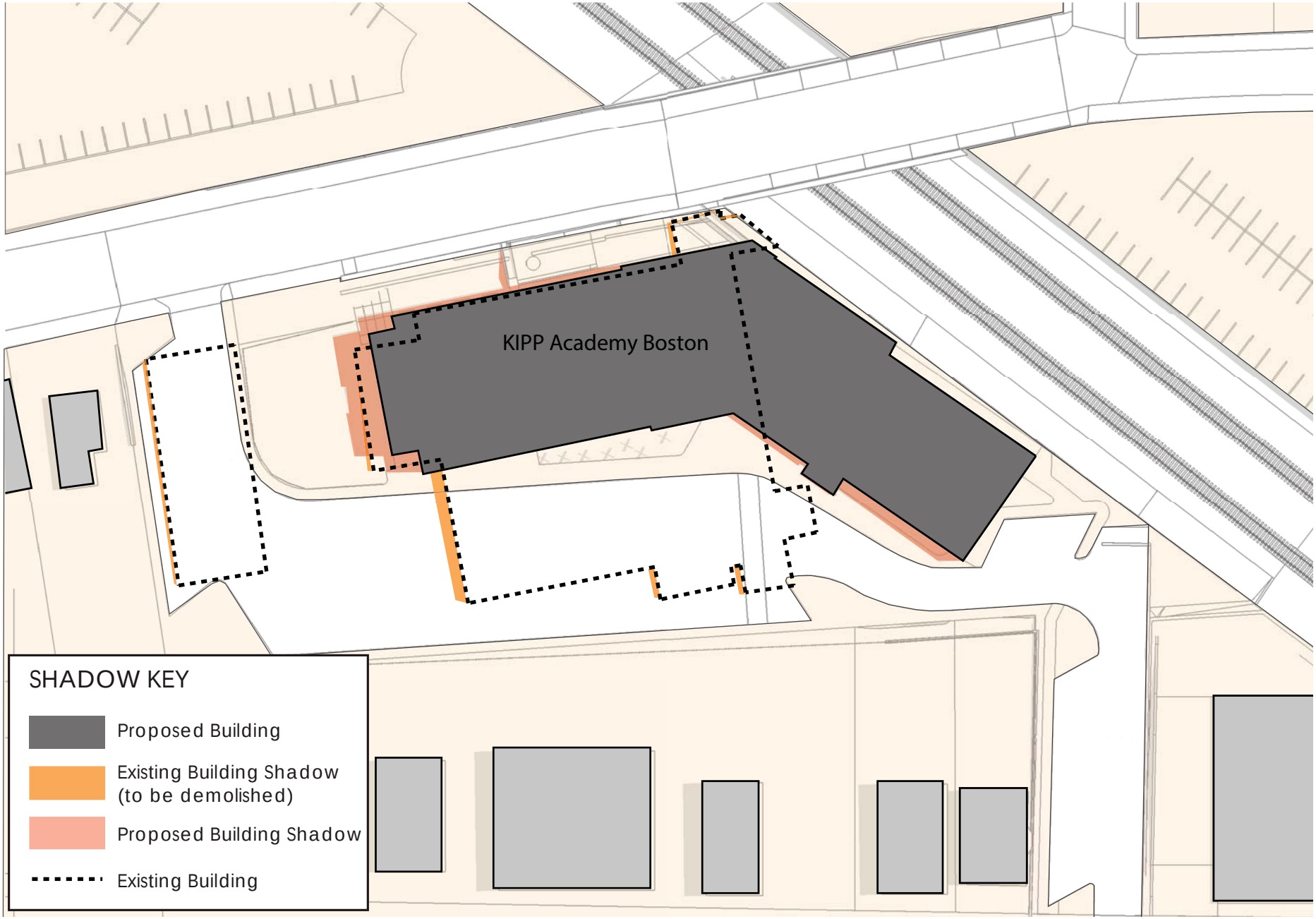

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
JUNE 21ST 12PM

FIGURE
5-7

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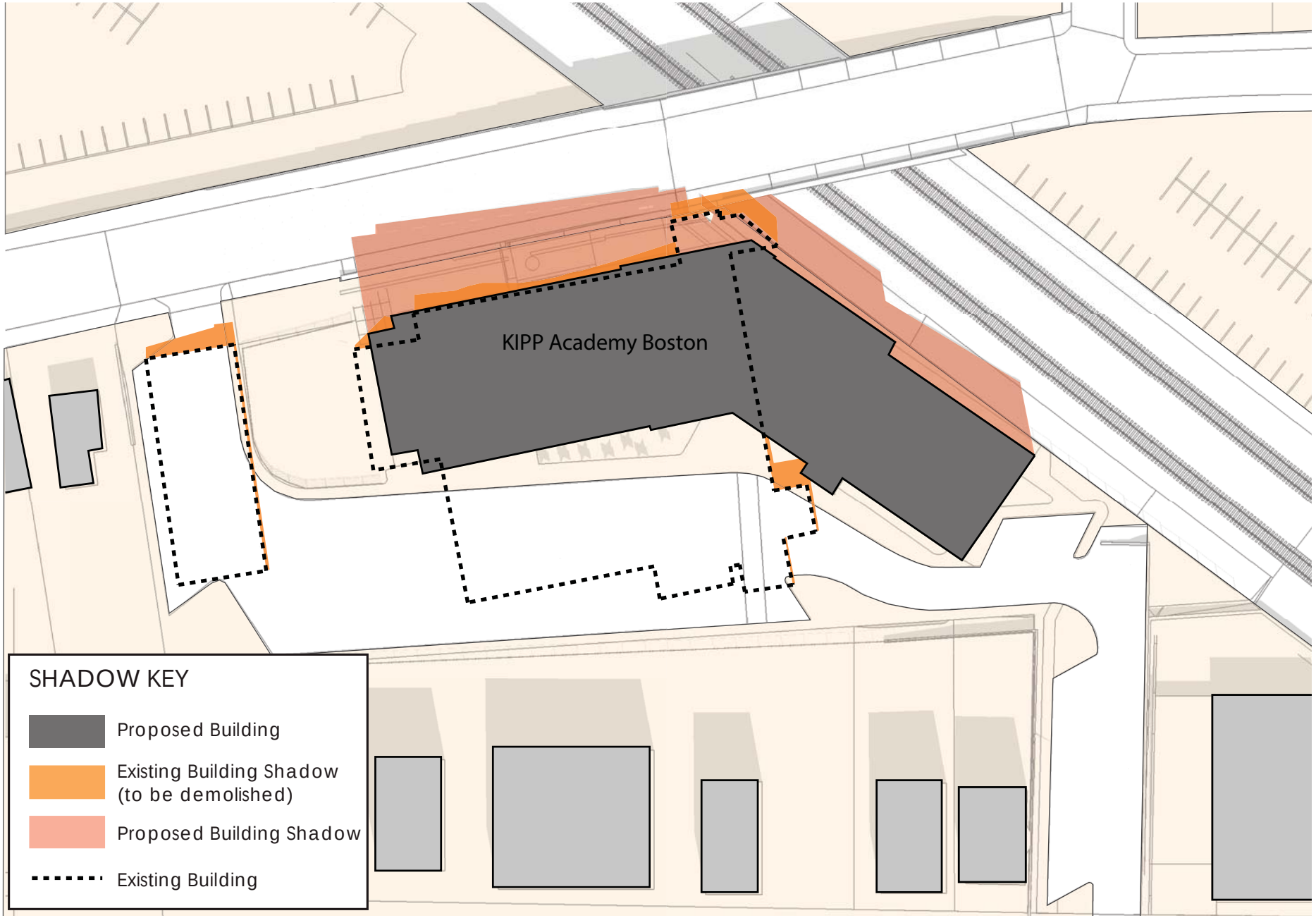

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
JUNE 21ST 3PM

FIGURE
5-8

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KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
JUNE 21ST 6PM

FIGURE
5-9

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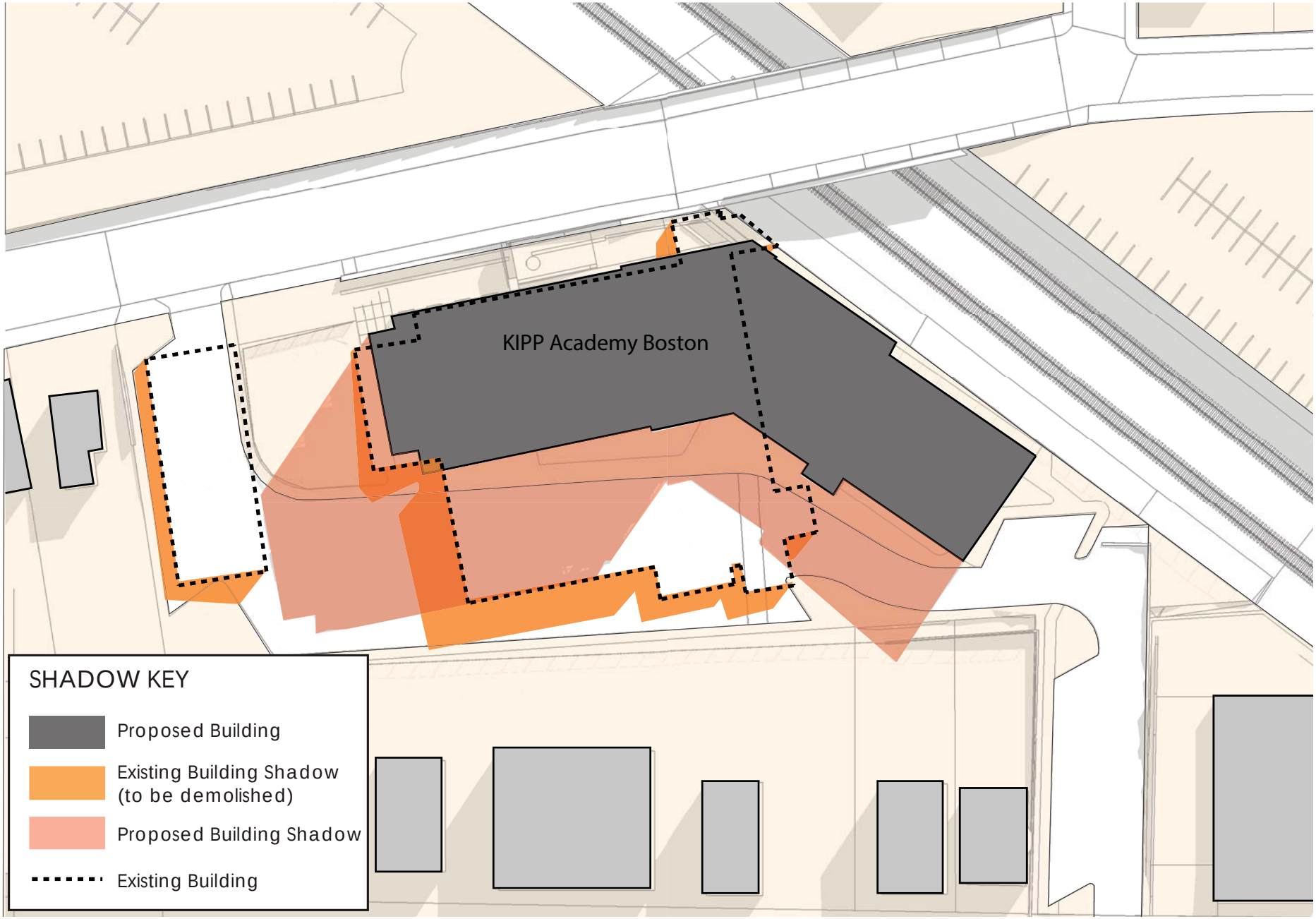

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

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SHADOW STUDY
SEPTEMBER 21ST 9AM

FIGURE
5-10

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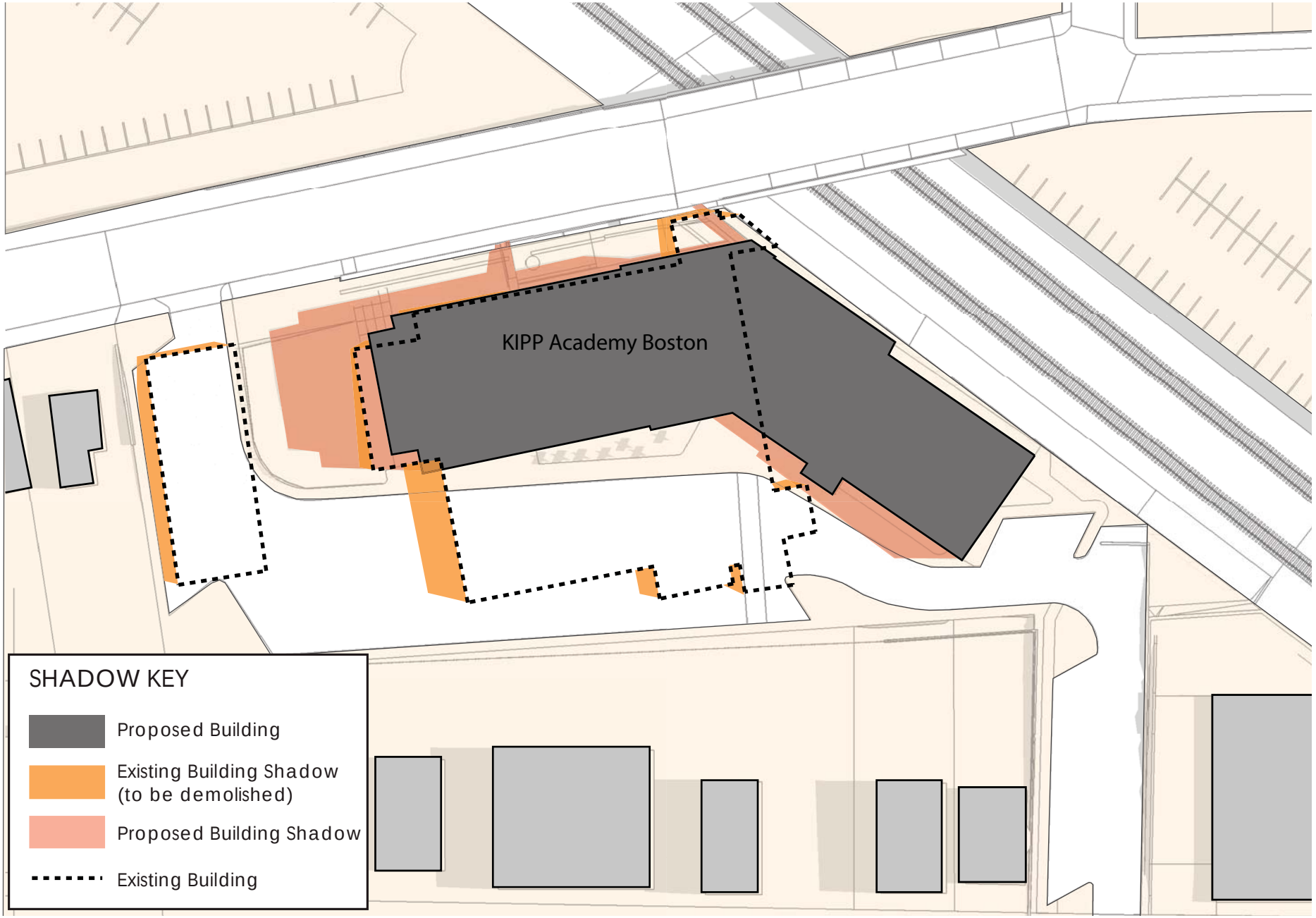

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

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SHADOW STUDY
SEPTEMBER 21ST 12PM

FIGURE
5-11

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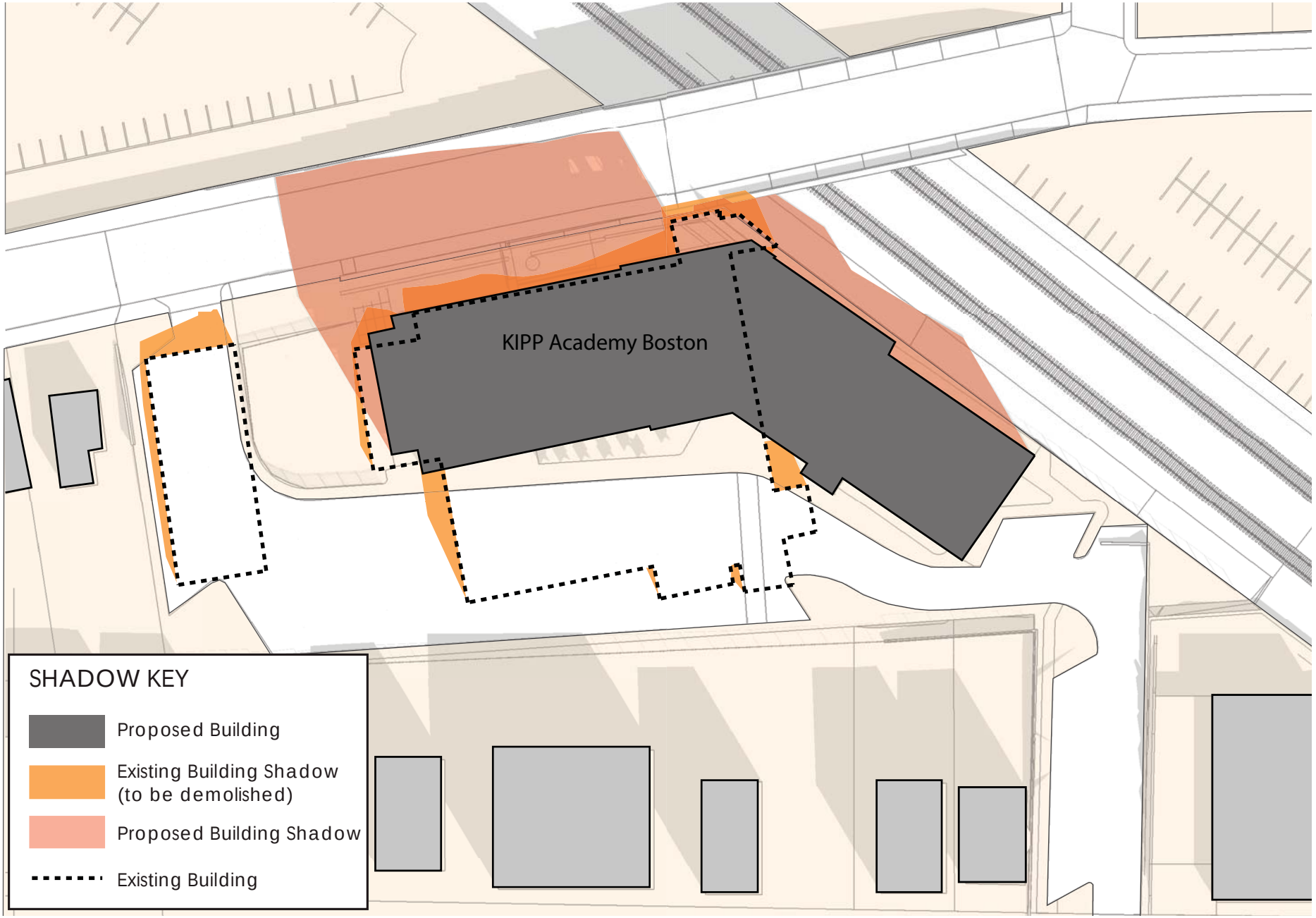

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

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SHADOW STUDY
SEPTEMBER 21ST 3PM

FIGURE
5-12

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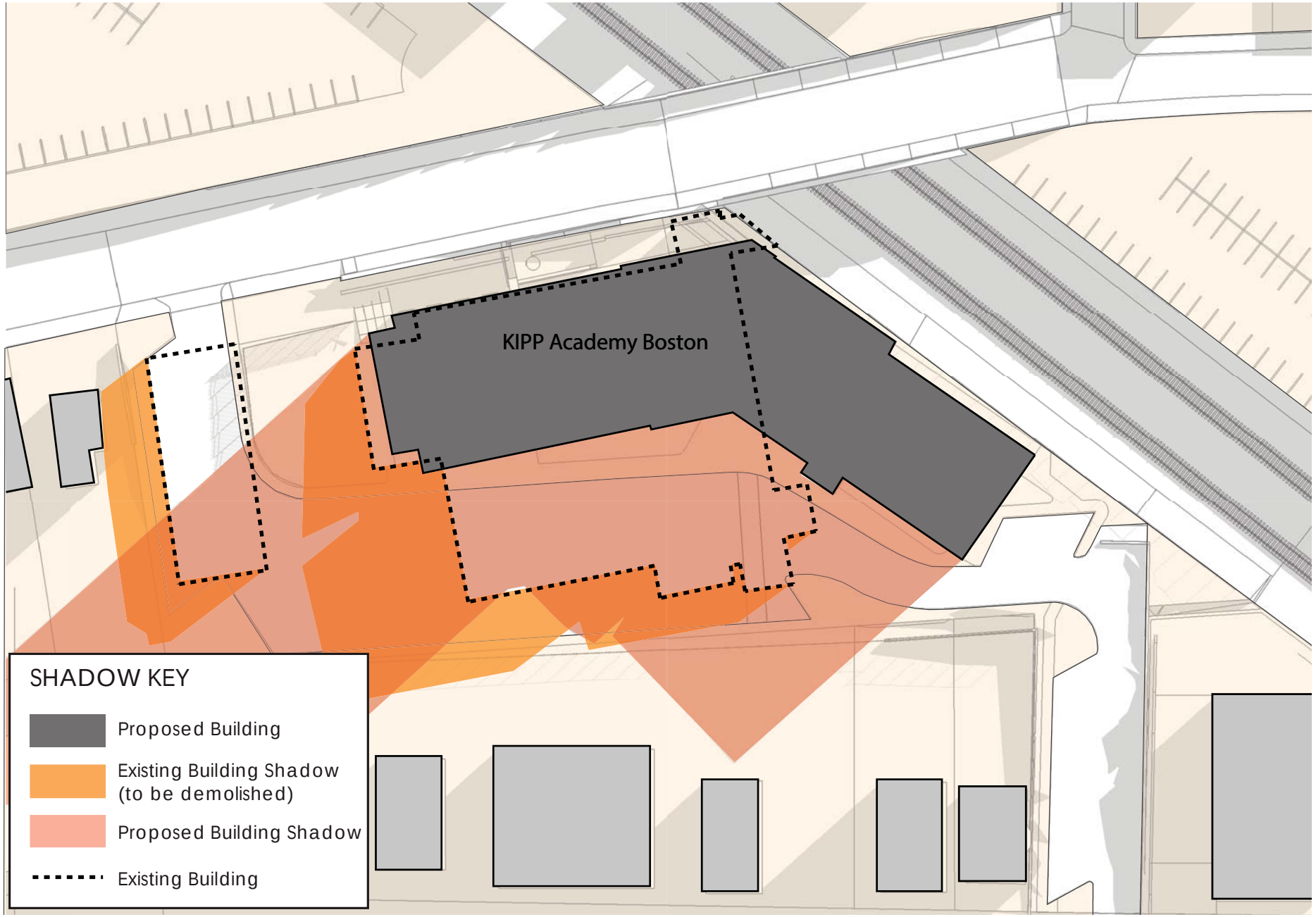

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
DECEMBER 21ST 9AM

FIGURE
5-13

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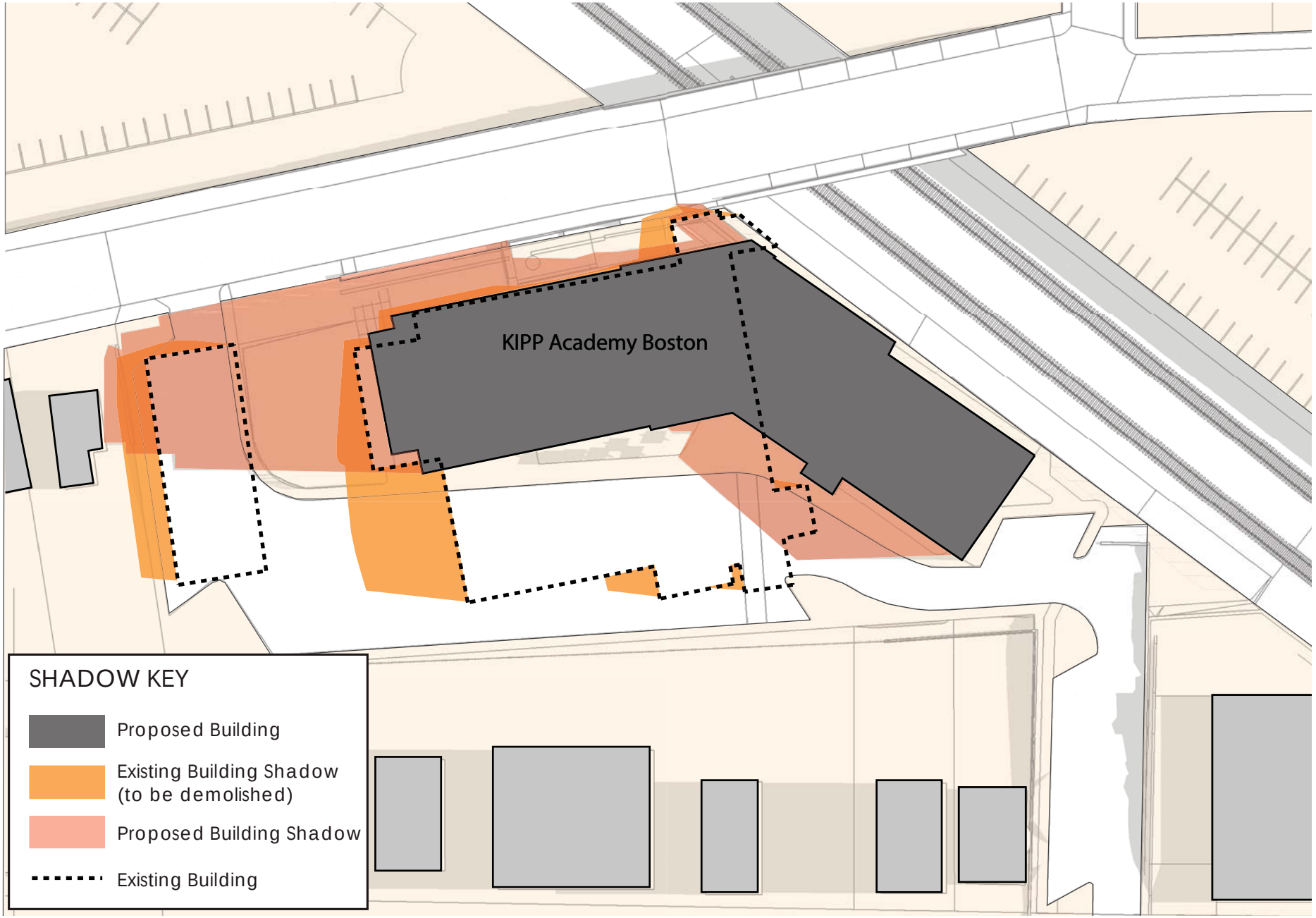

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

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SHADOW STUDY
DECEMBER 21ST 12PM

FIGURE
5-14

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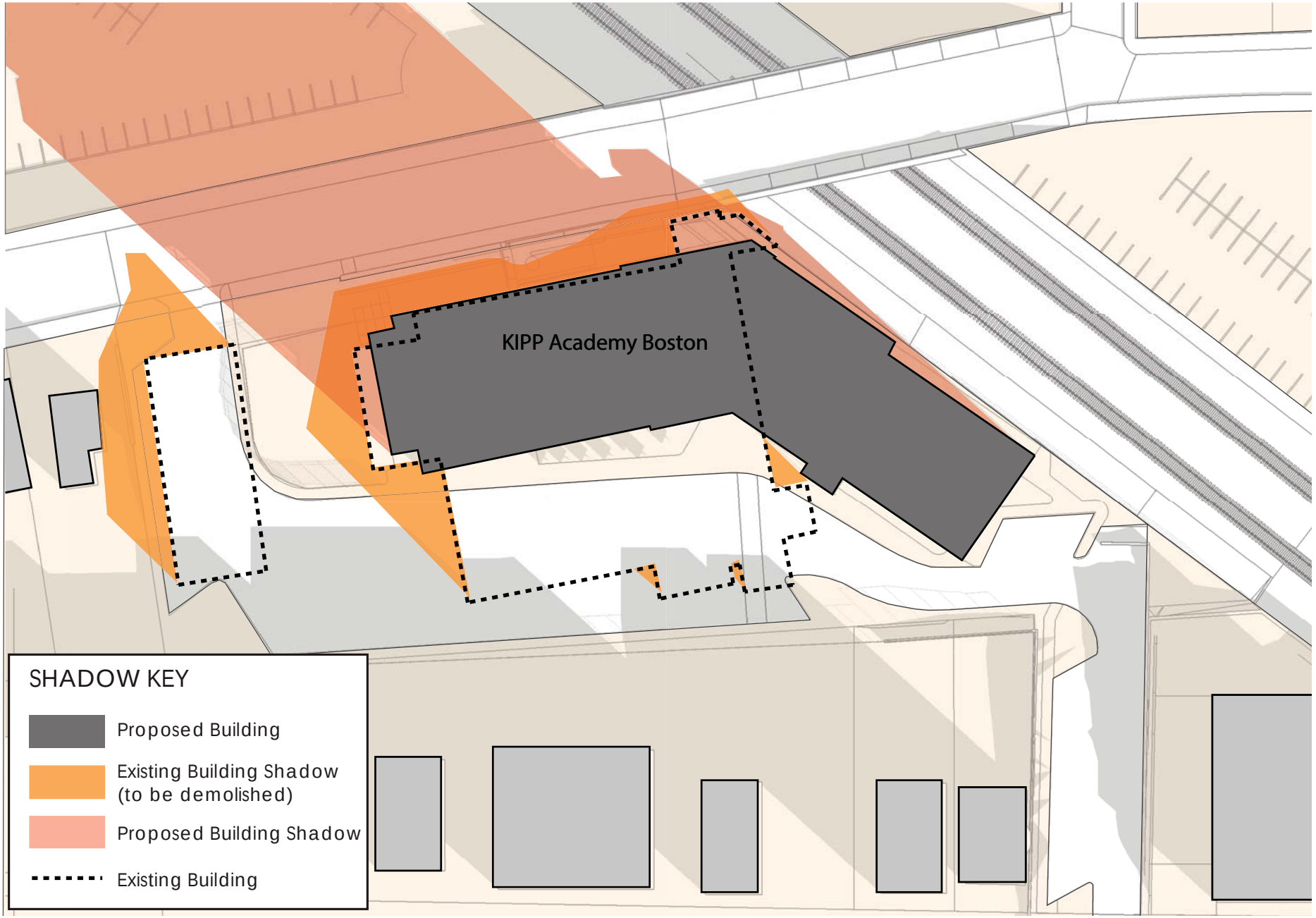

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

ARROWSTREET

SCALE: 1" = 60' (1:720)

N

SHADOW STUDY
DECEMBER 21ST 3PM

FIGURE
5-15

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Daylight

The following section describes the Project's anticipated effect on daylight obstruction at the site. The analysis was prepared using the BRA's Daylight Analysis Program and has been completed in accordance with the requirements of Article 80 of the City of Boston Zoning Code. The results of the analysis are presented in **Figure 5-16.**

Regulatory Context

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

Methodology

The Proposed Project was analyzed utilizing the Boston Redevelopment Authority Daylighting Analysis (BRADA) computer program.[1] Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent City streets or pedestrian ways centered on each of the proposed buildings that abut a public way. The façade of the building facing the viewpoint, including heights, setbacks, corners, and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from each respective viewpoint that is studied.

The BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0 percent to 100 percent. BRADA calculates this obstruction value based on the width of view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building. The lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

Potential daylight impacts were analyzed from the Babson Street side of the site at the elevation of Babson Street which is fourteen feet above the site grade level.

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

■

Analysis Summary

The results of the daylight analysis are presented in Figure 5-16. Development of the Proposed Project will result in twenty-four and a half percent obstruction of daylight on Babson Street. This is an increase in skyplane obstruction, however well below a fifty percent obstruction.

Solar Glare

Solar glare impacts on neighbors and adjacent roadways are not anticipated due to the proposed building designs not including large areas of reflective glass or other materials that would contribute to solar glare. A more in depth discussion of the façade is presented previously in **Chapter 3**, *Urban Design.*

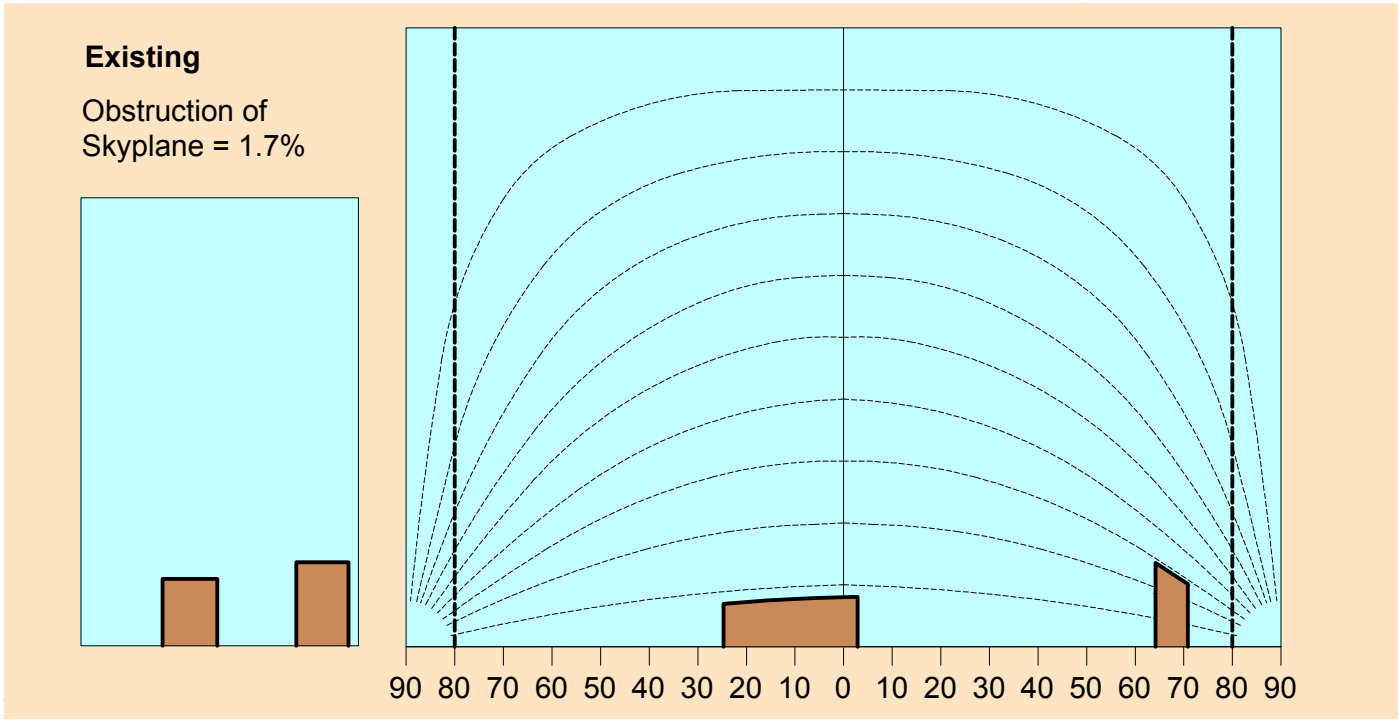
Water Quality and Conservation

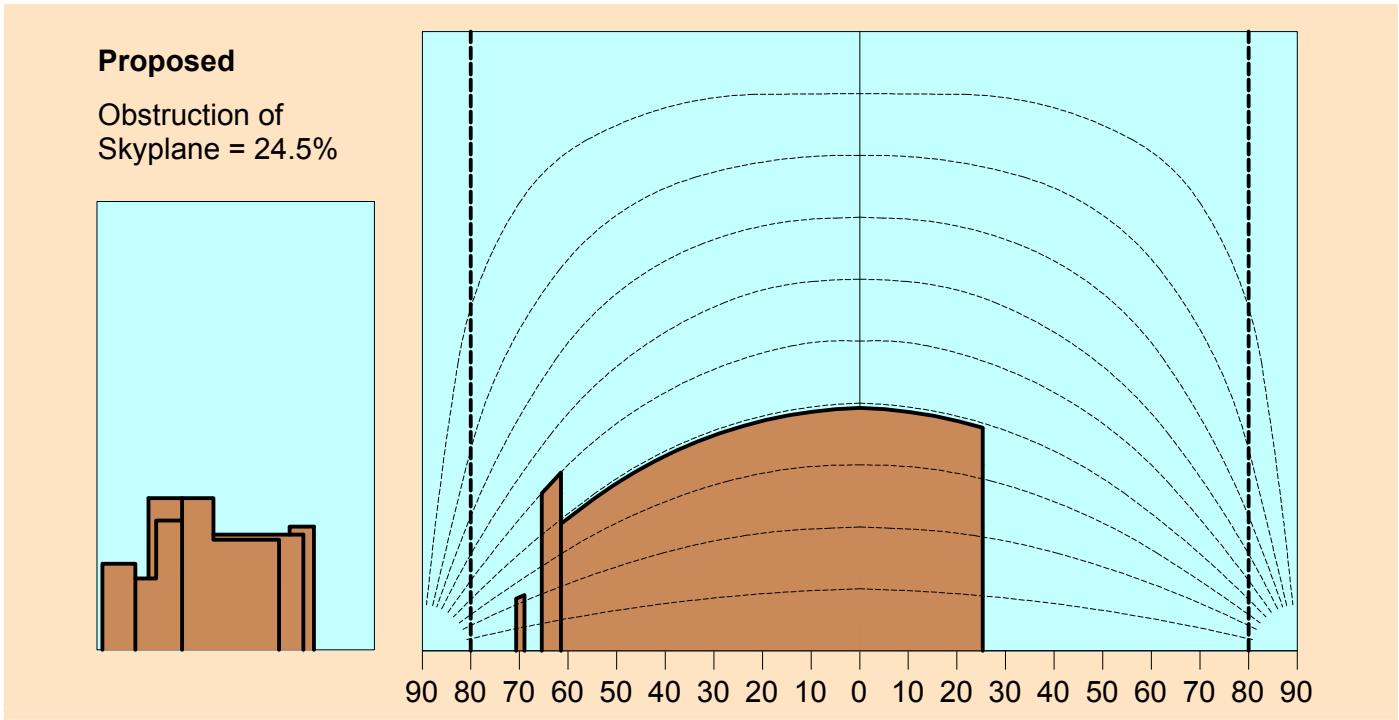
The proposed stormwater management system will provide at least 80% Total Suspended Solids (TSS) removal for stormwater runoff from all roof areas, parking lots, and other impervious areas to comply with the Massachusetts Stormwater Management Standards. The water quality volume will be equal to 0.5-inch over the entire impervious area of the post-development site. In addition, BMPs will be implemented into the long term pollution prevention plan to provide for 80% TSS removal. The Stormwater Management section of Chapter 6, Infrastructure Systems, describes in detail the stormwater management system to be put in place in connection with the proposed project.

The project will require a United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from construction activities because the construction area of the project exceeds one (1) acre in land disturbance. Regulated projects are required to develop and implement stormwater pollution prevention plans in order to obtain permit coverage.

A plan to control construction related impacts, including erosion , sedimentation, and other pollutant sources during construction and land disturbance activities will be developed and implemented. A pollution prevention plan will be developed and will be incorporated as part of the design of this project and will be implemented during site construction.

In order to reduce pollution from the site, the parking lot will include a closed drain system. The proposed stormwater management system will include at least one





Note: Babson Street is approximately 14-feet above site grade level. Analysis is taken from elevation of Babson Street

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

DAYLIGHT ANALYSIS
CENTER OF BABSON
STREET

FIGURE
5-16

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infiltration system which will be sized to provide the required recharge volume and TSS removal for the proposed project.

Wetlands and Flood Hazard

The Federal Emergency Management (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the Project Site (Suffolk County, Community-Panel Number 25025C0089G). This designation is illustrated in **Figure 5-17**. The map shows that the Proposed Project Site is located outside the 0.2 percent annual chance floodplain (commonly referred to as the 500 year flood limit), identifying it as an area of minimal flooding.

Geotechnical and Groundwater Analysis

■

Site Conditions

The site consists of two contiguous parcels covering a total land area of approximately 1.64 acres:

1. Parcel ID 1800966000 (37 Babson Street), an approximately 0.17-acre parcel occupied by a warehouse building having a footprint of 4,000 square feet (the Warehouse); and

1. Parcel ID 1800967000 (45 Babson Street), an approximately 1.47-acre parcel occupied by a commercial/light industrial building having a footprint of 21,215 square feet (the Site building) and a shed having a footprint 1,595 square feet (the Shed).

The site is accessed via Blue Hill Avenue (driveway at the southwest portion of the site) and Babson Street (driveway at the northeast portion of the site).

The Warehouse is a one-story structure constructed of concrete blocks and steel, with a concrete-slab foundation. The site building is one story with a two-story wood shop structure constructed of wood, steel, and concrete, and has undergone several renovations and additions. The Shed is constructed of sheet metal and wood. The buildings are surrounded by asphalt pavement and vegetated areas. Two small wooden sheds (for general storage and the location of former *in-situ* groundwater remediation equipment) and two storage containers are also located at the site.

The proposed scope of development includes the construction of an approximately 53,000 square foot school building and associated parking and outdoor play area. The School will serve children from kindergarten through the 8th grade with an enrollment of 650 children.

Soil and Bedrock Conditions

Based on a review of prior subsurface information and the results of a recent subsurface exploration program, the following subsurface conditions are anticipated:

Fill Materials

Fill materials were encountered in soil borings advanced at the site from the existing grades to depths of up to 15 feet below the ground surface. Samples of the fill materials from the borings consisted of silty fine-to-medium sand with trace amounts of gravel. Some samples contained coal ash and fragments of bricks and concrete within the granular fill soils. Boulders were exposed at grade and in the vicinity of both borings. Standard penetration testing indicated that the fill materials are characterized as medium dense to dense.

Glacial Till

Naturally occurring glacial till soils were encountered directly below the fill materials. Samples of the glacial till from the borings consisted of sandy silt and clay with trace amounts of gravel. Standard penetration testing indicated that the glacial till soils are characterized as dense to very dense. The borings were advanced 8 to 12 feet into the glacial till and did not encounter the full thickness of the deposit.

Bedrock

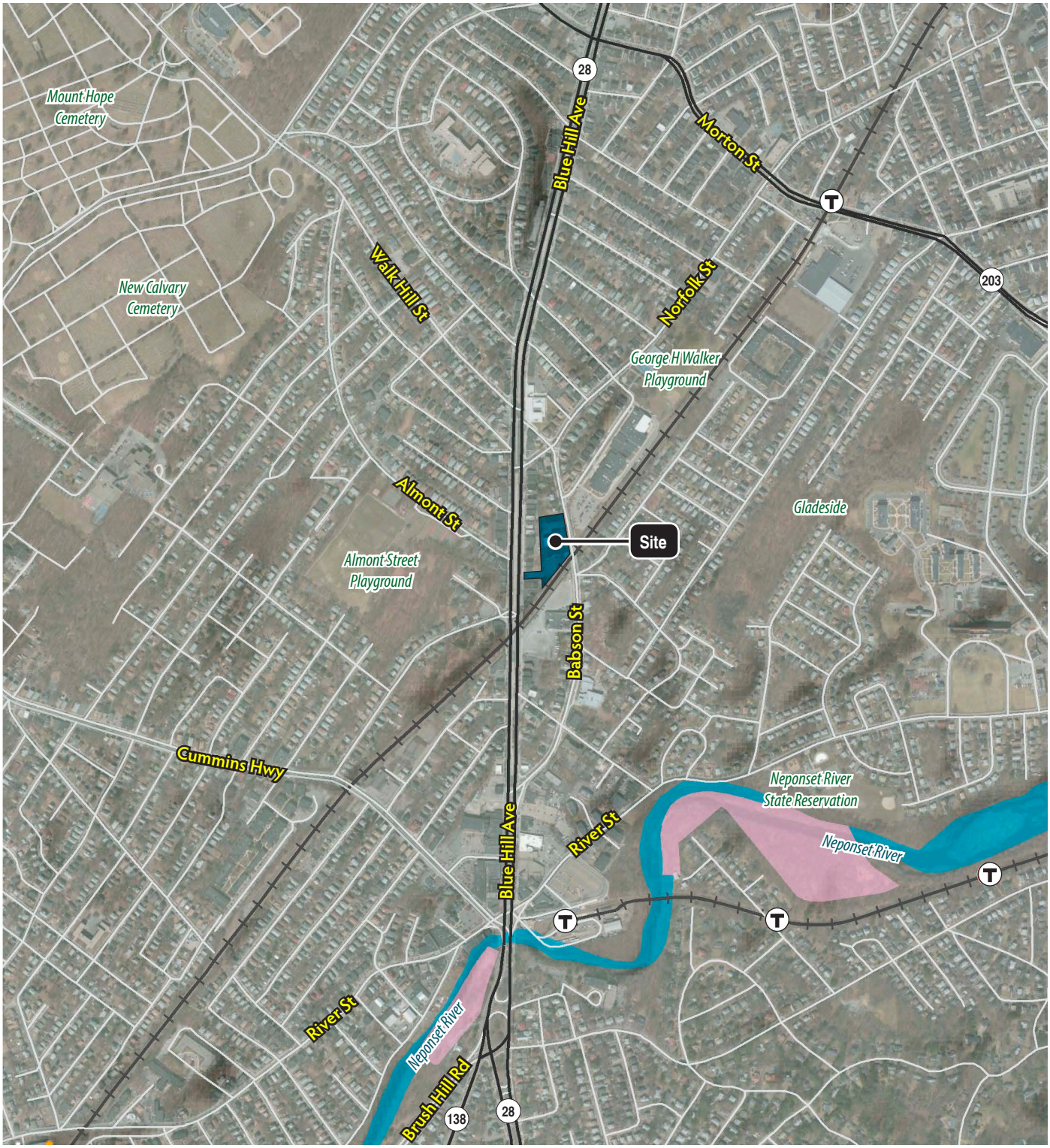
Based on information provided on the USGS Bedrock Geologic Map of Massachusetts, bedrock at the site and vicinity is identified as Roxbury Conglomerate (Proterozoic Z to earliest Paleozoic) which consists of conglomerate, sandstone, siltstone, argillite, and melaphyre, as well as Brookline, Dorchester and Squantum members. Ransom did not observe bedrock outcrops at the site or vicinity during our reconnaissance. In addition, Ransom did not encounter bedrock during the course of prior investigations at depths of up to 16 feet below the ground surface

Groundwater Conditions

Groundwater was observed in monitoring wells at the site at depths at least five feet below the ground surface. Groundwater was not observed at some boring hole locations.

Impacts of Geotechnical Conditions

The geotechnical assessment completed at the site was limited to the area of an existing retaining wall located along Babson Street and was performed to evaluate potential geotechnical effects that the proposed construction of the School building



Legend

- Zone AE
- Zone ANI

0 500 1000 Feet

KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

LOCUS MAP

FIGURE 5-17

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would have on the retaining wall. The subsurface exploration included the advancement of 2 soil borings in the vicinity of the retaining wall.

The existing soils that form the slope consist of medium dense to very dense granular fill materials and glacial till. Standard penetration testing of these soils indicates that temporary and finished slopes in this area of the site should be no steeper than 1.5H:1V.

The easterly wall of the School building will be constructed approximately 24 feet from the retaining wall. Due to the setback distance from the wall to the building, the character of the site soils, and the depth of the groundwater, construction of the eastern wall of the School building will be designed as to not affect the stability of the existing retaining wall.

Hazardous Materials

■

Site History

According to building department records, the site building was originally built for ice manufacturing. Additions were added to the building throughout the 1920s and 1930s. Building records indicate that an engine room (associated with ice manufacturing) and a transformer house (associated with freezer room equipment) were present at the existing building. Records indicated that a coal shed was present at the Site, and burned down in 1943. The first gas fitting permit available was dated 1971. Building records indicate that ice manufacturing ended in the mid 1950s, and renovations occurred in order to accommodate the new occupant, Mattapan Plumbing Supply. Ransom reviewed documents indicating that a residence was located at 37 Babson Street; as of 1975, the building had been vacant for some time, and burned down.

■

Site Assessment

Environmental site assessments have been completed at the Project site. The results of the site assessments have indicated the presence of petroleum-impacted soils and light non-aqueous phase liquid (LNAPL). Despite the presence of petroleum-impacted soils and LNAPL, groundwater has not been significantly impacted. The presence of petroleum-impacted soil and LNAPL will be addressed in conjunction with site redevelopment and in accordance with the provisions of the Massachusetts Contingency Plan (MCP).

Historic Petroleum Release(s)

Two 10,000-gallon kerosene underground storage tanks (USTs), one 3,000-gallon fuel oil UST, and one 2,000-gallon gasoline UST were removed from the site. The two 10,000-gallon kerosene USTs and the 3,000-gallon fuel oil UST were removed in 2000. The removal date for the 2,000-gallon gasoline UST is not known.

Ransom reviewed the MA DEP online database for information pertaining to the site and/or properties in the vicinity with known and/or suspected environmental contamination that have the potential to adversely impact environmental conditions at the site. The site is identified on the MA DEP database as a release site associated with petroleum releases identified in 2000. The releases were assigned Release Tracking Number (RTNs) 3-19709 and 3-19970 by the MA DEP. According to the MA DEP database, a Class A-2 Response Action Outcome (RAO) Statement was submitted to the MA DEP on December 2, 2004. Response actions completed at the site to address the petroleum releases were performed by IES, Inc. (IES).

A 120-day MA DEP reportable condition was reported to the MA DEP on June 30, 2000 due to the presence of petroleum contaminants in soil samples at concentrations above their corresponding RCS-1 Reportable Concentrations (RCs) and in groundwater samples at concentrations above their corresponding RCGW-2 RCs. This release was assigned RTN 3-19707 by the MA DEP. The petroleum-impacted soils were discovered south of the site building, in the area of former fuel oil and gasoline USTs. The source of the fuel oil contamination was identified as a 3,000-gallon UST which was removed from the site in July 2000. Prior to removal, approximately 1,500 gallons of fuel oil were removed from the tank and an approximately ½-inch-diameter hole was observed in the tank. The source of the gasoline contamination was determined to be a 2,000-gallon gasoline UST located in the same area as the fuel oil UST, which was installed in 1935 and removed at an unknown date.

On September 25, 2000, the MA DEP was notified of a 72-hour reportable condition when organic vapors were detected in a soil sample collected during the removal of a UST at a concentration above 100 parts per million by volume (ppmv). This condition was discovered during the removal of the first of two 10,000-gallon fuel oil/kerosene UST at the site. Approximately 20,000 gallons of product (oil/water mixture) was removed from the two tanks. This release was assigned RTN 3-19770 by the MA DEP.

As a result of these releases a Release Abatement Measure (RAM) was initiated in December 2000. The RAM included *in-situ* bioremediation and excavation of a limited quantity of petroleum-impacted soil (approximately 80 cubic yards), which was shipped off site for asphalt batching. Subsurface investigations were performed at the site in 1999, 2000, and 2004 and included numerous rounds of groundwater sampling.

Based on the results of the RAM, IES concluded that "laboratory testing of soil and groundwater samples obtained from the site did not reveal the presence of any elevated levels of EPH, target PAH's, VPH or target VOC's above the applicable MCP Method 1 S-1 Standards in soil or GW-2 and GW-3 Standards in groundwater." To support their conclusion, IES completed a Method 1 and a Method 2 risk characterization. By their estimates of exposure point concentrations (EPCs) for soil and groundwater, with the exception of the EPC for C_9–C_{18} aliphatic hydrocarbons in groundwater samples collected from well B-6, the EPCs of contaminants detected in soil and groundwater at the Site did not exceed their corresponding Method 1 numerical standards. The EPC for C_9–C_{18} aliphatic hydrocarbons in groundwater samples collected from well B-6 reportedly exceeded its Method 1 GW-3 standard of 20,000 micrograms per liter (µg/l). Through the Method 2 risk characterization, IES developed a site-specific GW-3 standard for C_9–C_{18} aliphatics of 100,000 µg/l. As a result, IES concluded that the requirements of a Class A-2 RAO had been met and that a Permanent Solution had been achieved at the site with respect to the petroleum releases.

Based on the observation of petroleum-impacted soils and LNAPL during the 2013 investigation, the prior response actions taken at the site to address the petroleum releases reported in 2000 were not entirely effective.

■

Mitigation Measures and Monitoring

Based on the limited data generated, excess excavated soil to be taken off-site will be subjected to laboratory analysis to evaluate its disposition for off-site reuse, disposal, treatment, or recycling in accordance with MA DEP policy and the MCP. The construction contractor will be responsible for on-site re-use and/or proper off-site removal of contaminated soil, and disposal of solid waste and debris. Additional groundwater testing may be performed in support of obtaining temporary construction dewatering permits and to assess the need for on-site treatment to remove contaminants prior to off-site discharge.

Air Quality

Article 80 may require an evaluation of impacts on air quality from any significant stationary or mobile sources associated with the Proposed Project. The Proponent is prepared to address this requirement if necessary with a microscale analysis in accordance with the protocol/modeling procedures typically required by the BRA to determine conformance with the National Ambient Air Quality Standards (NAAQS).

The U.S. Department of Housing and Urban Development (HUD) has established the NAAQS as the criteria for evaluating air quality impacts on residential and other

sensitive receptors. The air quality analysis evaluates carbon monoxide concentrations at sensitive receptor locations and demonstrates that the Proposed Project will not interfere with the attainment or maintenance of the Massachusetts State Implementation Plan (SIP) and NAAQS for carbon monoxide.

■

Air Quality Standards

The 1990 Clean Air Act Amendments (CAAA) resulted in states being categorized as attainment and non-attainment areas, based upon the severity of their air quality problems. The Proposed Project is located in an area that has been designated as a Carbon Monoxide Maintenance area. The U.S. Environmental Protection Agency (EPA) has established the NAAQS for carbon monoxide to protect the public health. The Commonwealth of Massachusetts has adopted the same standards as those set by the EPA, and HUD applies these NAAQS when evaluating impacts. The NAAQS for carbon monoxide is 35 parts per million (ppm) for a 1 hour period and 9 ppm for an 8-hour period, each not to be exceeded more than once per year.

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

Noise

It is expected that the noise impacts generated at the Project site will be improved with the Proposed Project in place. The site formerly accommodated several industrial tenants. These uses were relocated in advance of the Project and will be permanently replaced with educational uses, resulting in improved noise conditions.

Primary noise sources from the Proposed Project will be the mechanical equipment to support the heating, ventilation, and air conditioning (HVAC), which will control the climate within the buildings. The actual capacity, manufacturer, screening methodology, and exact locations of HVAC equipment are not yet known as the design is still in progress. One of the foremost HVAC manufactures provided sound level data for the proposed mechanical equipment. The Project will comply with the City of Boston Zoning District Noise Standards.

The City of Boston and the DEP have developed noise impact criteria that establish noise thresholds deemed to result in adverse impacts. The Proponent is committed to instituting noise attenuation measures and to comply with the Regulations for the Control of Noise in the City of Boston.

City of Boston Criteria

The City of Boston has established regulations evaluating sound levels from proposed developments. These regulations establish maximum allowable sound levels based upon the land use of the proposed development. If the proposed development is located in an industrial zoning district, the maximum noise level affecting residential uses shall not exceed the Residential-Industrial Noise Standard. The industrial land use noise standard is 65 dBA for daytime conditions (7:00 AM to 6:00 PM) and 55 dBA for nighttime conditions (6:00 PM to 7:00 AM). The Business land use noise standard is 65 dBA for both daytime and nighttime conditions. These criteria are applicable to building facility noise sources, such as mechanical equipment, and do not apply to operation of any motor vehicle on any public roadway.

DEP Criteria

The Department of Environmental Protection (DEP) has established a policy (DEP Policy 90-001) for implementing its noise regulations (310 CMR 7.10). This policy states that a source of sound will be considered in violation of the Department's noise regulation under the following conditions:

- If the source increases the broad band sound level by more than 10dBA above ambient (normally defined as L90 or the noise level exceeded 90 percent of the time during the hours of noise source operation), or
- If the source produces a "pure tone" condition.

The DEP Noise Policy applies to mechanical equipment and not motor vehicles

Noise Mitigation

Primary noise sources from the Proposed Project will be the mechanical equipment to support the heating, ventilation, and air conditioning (HVAC), which control the climate within the buildings. The actual capacity, manufacturer, screening methodology, and exact locations of HVAC equipment are not yet known as the design is still in progress. Therefore, estimated cooling loads were used for this preliminary qualitative analysis. With careful attention to the equipment selection

and adequate screening, the Project will comply with the City of Boston Zoning District Noise Standards.

The anticipated noise levels are anticipated to fall below the City of Boston regulation limit. However, the Proponent is committed to the following noise attenuation measures and to complying with the Regulations for the Control of Noise in the City of Boston:

- Using HVAC equipment with low speed, low noise fans.
- Locating equipment to achieve sound level reductions.
- Controlling noise from back-up beepers, opening and closing of vehicle and loading dock doors, emptying of dumpsters, and movement of goods.
- Scheduling deliveries, trash/recycling removal, and use of facilities to be compatible with noise attenuation objectives.
- Installing permanent "No Idling" signs at loading/receiving areas.

The construction activities related to the development of the site will generate noise for a short period of time. Although construction sound levels will be higher than the existing sound levels, they will be temporary, and construction-related noise will be minimized. See below for additional discussion on construction-related noise.

Construction Impacts

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

Construction Schedule

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

- Project Review, Approval, & Permitting — Spring 2014-Fall 2014
- Site Enabling and Remediation — Winter 2015
- Site Excavation and Construction — Spring 2015 - Summer 2015
- School Construction — Summer 2015 – Summer 2016
- School Opening — August 2016

It is anticipated that the Project construction will commence by Spring 2015. The Project includes demolition of an existing structure on the site, site enabling, and excavation activities. The entire construction schedule is anticipated to be approximately 16 months with completion scheduled by Spring 2016 and the new School opening in August 2016.

■

Construction Noise Impacts and Mitigation

The construction activities related to site development will generate noise related to site demolition, excavation, earth movement, and construction vehicles. Although construction sound levels will be temporarily higher than the existing sound levels, no violations of the City of Boston construction noise criteria are expected and the Proponent is committed to mitigate construction-related noise impacts.

Noise Impacts

Moderate increases in noise levels associated with the construction of the Project may occur in the short-term during construction since heavy machinery is expected to be used intermittently throughout the Proposed Project's construction. Some equipment may be heard from off-site locations; however, construction work will comply with the requirements of the City of Boston noise ordinance and every reasonable effort will be made to minimize the noise impact of construction activities.

The construction phases that will generate the highest sound levels are building demolition, site excavation and grading. Construction sound levels, based upon construction equipment noise studies prepared by the Environmental Protection Agency, are expected to range from an L_{10} of 65 to 75 dBA with an Lmax of 85 dBA. The City of Boston noise control regulation considers construction sound levels to be an impact to residential land uses if the L_{10} is in excess of 75 dBA or the Lmax is in excess of 86 dBA. The predicted construction sound levels are below the City of Boston noise criteria. A construction management program will be developed with the City of Boston to ensure that the noise regulation is met.

City of Boston Requirements

Project construction noise is not expected to exceed the limits described in **Table 5-1** below. Regulation 3 of the Regulations for the Control of Noise in the City of Boston,

"Restrictions of Noise Emitted from Construction Sites," establishes limits for construction noise. The limits are applied at the lot line of the receiving property. In the case where equipment is operated at closer than 50 feet to the applicable lot line, the limits are applied at 50 feet from the equipment. The City of Boston regulations are not applicable to impact devices such as jackhammers, pile drivers, riveters, pavement breakers, etc. In addition, the L_{10} must exceed the ambient L_{10} by at least 5 dBA to be considered a violation of the limits. It is the goal of this Project to operate within the criteria set by the Boston ordinance.

Table 5-1
Summary of Construction Site Noise Limits for Boston

Land Use of Affected Property	Noise Level Limit* dBA L_{10} Level	Noise Level Limit* dBA Maximum Level***
Residential or Institutional	75	86
Business or Recreational	80	-
Industrial**	85	-

Source: Regulation 3, City of Boston Air Pollution Control Commission, Regulation for the Control of Noise in the City of Boston, adopted December 17, 1976
* Measured at the lot line of the affected property.
** The industrial noise limit shall apply to public ways.
*** Maximum noise level shall be measured with the sound level meter on 'SLOW' response.

Construction Noise Mitigation

Construction period activities may temporarily increase nearby sound levels due to the intermittent use of heavy machinery during the construction. These activities include demolition, foundation construction, truck movements, heavy equipment operations, and general construction activities. Regulation 3 of the City of Boston Code, Ordinances, Title 7, Section 50, includes specific construction noise limits by land use. The relevant criterion for the Project is based on residential or institutional land use. The construction noise at the property line for residential or institutional land use is limited to a maximum level of 86 dBA; with a limit of 75 dBA for the construction noise level exceeded 10 percent of the time (L_{10}). In addition, the City of Boston Code, Ordinances, Title 14, Chapter 11, Section 354 (titled "Unreasonable Noise") also applies to construction activities. This ordinance establishes a noise limit of 50 dBA for construction noise measured at residential lot lines between 6:00 PM and 7:00 AM. This ordinance effectively prohibits nighttime construction near residential areas.

The Project will utilize the following construction noise mitigation measures to assist in operating the Project within the criteria set by the Boston ordinance:

- Scheduling of work during daytime hours. Project construction hours will be restricted to be 7:00 AM to 6:00 PM. Contractors will not be allowed to operate diesel equipment or prepare and move materials before 7:00 AM.
- Selecting the quietest practical items of equipment, e.g. whenever possible, electric instead of diesel powered equipment.
- Scheduling equipment operations to keep average levels low, to synchronize noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels.
- Turning off idle equipment.
- Protecting sensitive locations by shielding or distancing noisy equipment.
- Maintaining muffler enclosure on continuously operating equipment, such as air compressors and welding generators.

■

Construction Air Quality

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

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

- Use of standard dust control such as watering-down the exposed ground surfaces or spreading hygroscopic salts will be employed to control and suppress dust that originates from construction related activities.
- Covering of soil subgrades with crushed stone where heavy equipment will be traveling.
- All trucks leaving the site shall be securely covered.
- The contractor shall clean debris from the construction area and surrounding streets on a routine basis.
- Mechanical sweeping will occur as needed.
- Wheel wash locations will be provided as necessary.
- Contaminated soils that are stockpiled onsite will be securely covered with polyethylene sheeting.

- All contractor and sub-contractor-operated diesel-powered non-road construction equipment with engine horsepower (HP) ratings of 60 HP and above, which is used on the Project for a period in excess of 30 days, shall be retrofitted with Emission Control Devices in order to reduce diesel emissions.
- In addition, all motor vehicles and construction equipment shall comply with all pertinent City, State, and Federal regulations covering exhaust emission control and safety.
- The reduction of emissions of volatile organic compounds (VOCs), carbon monoxide (CO), and particulate matter (PM) from diesel-powered equipment shall be accomplished by installing Retrofit Emission Control Devices.

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

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

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

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

■

Construction Water Quality

Local dewatering may be required to construct utilities and facilitate other deeper excavations. On-site recharge in accordance with the MCP at 310 CMR 40.0045 is planned as the primary approach for construction dewatering discharge. Discharge to municipal storm drains under a NPDES Remediation General Permit (RGP) will

be implemented in the event that subsurface geology cannot accept dewatering flows. Effluent from dewatering efforts may include groundwater, precipitation, and surface water runoff. If needed, a dewatering effluent treatment system will be designed and operated by the contractor. Discharge water quality sampling and analyses will be conducted to monitor compliance with the NPDES RGP.

■

Construction Traffic

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

Construction Trip Generation and Worker Parking

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

Truck Routes and Volumes

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

■

Rodent Control

The Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550 and the State Building Code, Section 108.6, Policy Number 87-4 (City of Boston) states that extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation and basement rehabilitation. In compliance with the City's requirements, a rodent extermination certificate will be filed with the Proponent's building permit application to the City of Boston and a rodent control program will be developed prior to construction.

The rodent control program will include inspection and extermination in all areas of the Project site, including the interior of the existing buildings, prior to commencement of work. During construction, regular inspections will be made in

order to maintain effective rodent control levels. The Proponent will establish a post-construction pest management program that requires the use of preventive methods outlined in the program to ensure that the buildings are not infested with rodents

Historic Resources

No above-ground properties that are either inventoried or listed in the State Register of Historic Places are in or adjacent to the project area. There are no inventoried or listed archaeological sites in the project area.

The three parcels in the project area currently contain four buildings: a 1980s warehouse building; 1980s wood shed, 1925 industrial building/warehouse, and a 1940s metal shed. All of these properties will be demolished for the project.

Article 85 and Other Reviews

The two buildings that are more than 50 years old in age – the 1925 industrial/warehouse and the 1940s shed – are subject to review per Article 85 of the Boston Zoning Code, which requires a review of the demolition of all buildings over 50 years old that are not in local districts or individual landmarks. The Article 85 application for these two buildings will be submitted to the Boston Landmarks Commission staff for review. Review by the Massachusetts Historical Commission will be required if there is state or federal involvement in the Project.

Sustainable Practices

City of Boston Green Building Requirements

Newly amended Article 80B-6 provides that new development projects that are over 50,000 SF must comply with green building standards and sustainable design features as described in Article 37 of the City's zoning code. The Proponent is committed to incorporating numerous design elements into the building construction to respond to environmental concerns, reduce energy consumption, reduce water use, and increase recycling.

A LEED for Schools checklist is included in this PNF as **Figure 5-18** computing the green building points defined by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building rating system.

Project LEED Team

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

Matthew Rice, AIA, LEED AP BD+C
Laurence Spang, AIA, LEED AP
Chelsea Christenson, PE, CPSWQ, LEED AP BD+C
Keith Lane, LEED AP

Description of LEED Checklist

The Project will utilize the LEED for School Standard as it is a K-8 School Project. The following section is a synopsis of LEED prerequisites and potential credits under review for the project.

Sustainable Sites

Construction Activity Pollution Prevention

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

Environmental Site Assessment

Remediation will be part of project as the project site is known to be contaminated. Remediation work will meet the standard set by the EPA and other agencies which have jurisdiction over the project.

Development Density & Community Connectivity

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

Brownfield Redevelopment

The Project site meets the definition of a brownfield due to the presence of hazardous materials within the existing buildings on site that will be demolished as part of the site development. All contaminates identified on site will be removed or reduced to a safe level as scheduled in the remediation program for the site. The proposed project meets the intent of the brownfield redevelopment credit due to complications of additional cost and required regulatory compliance work.

Alternative Transportation: Public Transportation Access

The Project site is located within 0.5 miles of a bus stop on Blue Hill Avenue that is served by three MBTA bus lines. The project will also be served by Boston Public Schools school bus system.

Alternative Transportation: Bicycle Use

The Project will provide bicycle storage and changing facilities.

Alternative Transportation: Low-Emitting & Fuel-Efficient Vehicles

Five percent of the parking spaces will be preferred parking for Low-Emitting & Fuel-Efficient Vehicles. A vanpool space will be provided as part of the project.

Site Development: Maximize Open Space

The project site incorporates open landscaped areas on the site, meeting the credit standard.

Stormwater Design: Quantity Control

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

Stormwater Design: Quality Control

The stormwater management plan will utilize Best Management Practices to treat runoff and remove 80% of the average annual post development total suspended solids.

Heat Island Effect: Roof

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

Sustainable Sites — Possible Points: 24

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	Required
Y			Prereq 2	Environmental Site Assessment	Required
1			Credit 1	Site Selection	1
4			Credit 2	Development Density and Community Connectivity	4
1			Credit 3	Brownfield Redevelopment	1
4			Credit 4.1	Alternative Transportation—Public Transportation Access	4
	1		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
2			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	2
	2		Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
1			Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
	1		Credit 7.1	Heat Island Effect—Non-roof	1
	1		Credit 7.2	Heat Island Effect—Roof	1
1			Credit 8	Light Pollution Reduction	1
		1	Credit 9	Site Master Plan	1
		1	Credit 10	Joint Use of Facilities	1

Water Efficiency — Possible Points: 11

Y			Prereq 1	Water Use Reduction—20% Reduction	Required
2			Credit 1	Water Efficient Landscaping - Reduce by 50%	2 to 4
2			Credit 1.2	Water Efficient Landscaping - No Potable Use or No Irrigation	2
		2	Credit 2	Innovative Wastewater Technologies	2
	2	2	Credit 3	Water Use Reduction (30% Reduction)	2 to 4
		1	Credit 4	Process Water Use Reduction	1

Energy and Atmosphere — Possible Points: 33

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Fundamental Refrigerant Management	Required
11		8	Credit 1	Optimize Energy Performance (32% New Buildings or 28% Existing Building Renovations)	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
	1		Credit 4	Enhanced Refrigerant Management	1
1		1	Credit 5	Measurement and Verification	2
		2	Credit 6	Green Power	2

Materials and Resources — Possible Points: 13

Y			Prereq 1	Storage and Collection of Recyclables	Required
		2	Credit 1.1	Building Reuse— (Maintain 95% of Existing Walls, Floors, and Roof)	1 to 2
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
1			Credit 2.1	Construction Waste Management — Divert 50% from Disposal	1
1			Credit 2.2	Construction Waste Management — Divert 50% from Disposal	1
		1	Credit 3.1	Materials Reuse — 5%	1
		1	Credit 3.2	Materials Reuse — 10%	1
1			Credit 4.1	Recycled Content — 10% (post-consumer + ½ pre-consumer)	1
	1		Credit 4.2	Recycled Content — 20% (post-consumer + ½ pre-consumer)	1
1			Credit 5.1	Regional Materials — 10% Extracted, Processed & Manufactured Regionally	1
		1	Credit 5.2	Regional Materials — 20% Extracted, Processed & Manufactured Regio	1
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 19

Y			Prereq 1	Minimum Indoor Air Quality Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
Y			Prereq 3	Minimum Acoustical Performance	Required
		1	Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives & Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints & Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood & Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
		1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
		1	Credit 7.1	Thermal Comfort—Design	1
		1	Credit 7.2	Thermal Comfort—Verification	1
2	1		Credit 8.1	Daylight and Views—Daylight	1 to 3
	1		Credit 8.2	Daylight and Views—Views	1
		1	Credit 9	Enhanced Acoustical Performance	1
		1	Credit 10	Mold Prevention	1

Innovation and Design Process — Possible Points: 6

	1		Credit 1.1	Innovation in Design: Green Cleaning	1
1			Credit 1.2	Innovation in Design: Integrated Pest Management	1
	1		Credit 1.3	Innovation in Design: Provide Specific Title	1
	1		Credit 1.4	Innovation in Design: Provide Specific Title	1
1			Credit 2	LEED Accredited Professional	1
	1		Credit 3	The School as a Teaching Tool	1

Regional Priority Credits — Possible Points: 4

			Credit 1.1	Regional Priority: MRc1.1 Building Reuse: 75%	1
			Credit 1.2	Regional Priority: EAc2 Renewable Energy - 1%	1
1			Credit 1.3	Regional Priority: SSc3 - Brownfield Redevelopment	1
1			Credit 1.4	Regional Priority: SSc6.1 - Stormwater Design, Quantity Control	1
	1		Credit 1.5	Regional Priority: SSc7.1 - Heat Island Effect, Non-Roof	1
	1		Credit 1.6	Regional Priority: SSc7.2 - Heat Island Effect, Roof	1

LEED Project Total (pre-certification estimates) — Possible Points: 110

51	19	40	LEED Project Total (pre-certification estimates) — Possible Points: 110

APPENDIX A to ARTICLE 37 - Boston Green Building Credits

1		1	APPENDIX A to ARTICLE 37 - Boston Green Building Credits

		1	Historic Preservation

This point will be awarded if a Proposed Project involves the historic renovation of an existing structure and recognizes the importance of preserving Boston's historic assets. Project is registered under the State Register of Historic Places and is currently seeking listing on National Register of Historic Places.

1			Groundwater Recharge

For Proposed Projects in areas not governed by Article 32 and located in areas of filled land, one point will be awarded for Proposed Projects that capture a volume of rainwater on the lot equivalent to no less than one inch across that portion of the surface area of the lot to be occupied by the Proposed Project, or provide measures that otherwise result in on-site infiltration of rainwater including landscape irrigation. Applicants must demonstrate how combined building systems will meet this standard including area absorption/retention calculations.

Project Totals (pre-certification estimates)

52	19	40	Project Totals (pre-certification estimates)

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

KIPP:MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON
1464 BLUE HILL AVENUE, BOSTON MA
ARROWSTREET

LEED-NC
LEED-SCH 2009 Registered Project Checklist
KIPP Academy Boston, Mattapan, MA
Date: 2/21/2014

FIGURE 5-18

Intentionally Blank

Light Pollution Reduction

Light pollution will be minimized with the use of high-efficiency lighting fixtures that are dark sky compliant. Fixtures for area lighting will be pole-mounted cut-off luminaires in the parking and roadway areas. Building perimeter fixtures will be wall mounted cut-off luminaires over exterior doors. Exterior lighting will be controlled by photocell on and timed off operation.

Water Efficiency

Water Efficient Landscaping

Landscape plant materials will be native and drought resistant to achieve the 50% reduction in irrigation water use. Furthermore, the project will not incorporate any type of irrigation system.

Water Use Reduction; 30%

Low flow toilet, urinals, and low flow faucets will be employed to reduce water usage. System will target a reduction in water consumption by 30% from a code required system.

Energy & Atmosphere

Fundamental Commissioning of Building Energy Systems

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

Minimum Energy Performance

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

Fundamental Refrigerant Management

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

Enhanced Commissioning

A commissioning agent will be hired to develop commissioning plan meeting the requirement stated in the EA Credit 3.

Measurement & Verification

The School is committed to documenting whole-building energy and water data through ENERGY STAR Portfolio Manager for a five-year period.

Materials & Resources

Storage and Collection of Recyclables

Recycling bins will be provided in each classroom and office. In addition, a dedicated recycling collection/storage area will be located within the dumpster enclosure to facilitate the recycling program.

Construction Waste Management

The construction contractor will be required to implement a waste management plan to divert at least 75% of construction and demolition material to recycling and salvage facilities. It is expected that as much as 95% of the construction waste could be diverted.

Recycled Content: 10%

The Project team will use material with as much recycled content as possible for the project. Some of the materials include fly ash in concrete, recycled gypsum boards, structural steel, ceiling tiles, and flooring.

Regional Materials: 10%

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

Certified Wood

The Project is expected to achieve at least 50% of FSC certified wood for all wood-based product used.

Prerequisites

The Project will meet the minimum requirements of the Massachusetts Building Code and ASHRAE 62.1-2010 for ventilation and indoor air quality. Smoking will be prohibited on school grounds per Massachusetts General Law. The HVAC system will be designed to meet the ASHRAE Handbook, Chapter 47, requirement under Option 2.

Construction IAQ Management Plan

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

Low-Emitting Materials

Adhesives, sealants, paints, coatings, and carpet systems with low VOC content limits will be specified for use in the project.

Indoor Chemical & Pollutant Source Control

Entry mat systems will be installed in all entries. Direct ventilation to outside will be provided in all chemical storage areas, including housekeeping spaces. A MERV 13 filter will be specified to meet the standard for this credit.

Controllability of Systems - Lighting

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

Daylight & Views - Daylight

At least 75% of the classroom spaces within the School will be provided with sufficient daylight to provide the teachers and students with a connection to the outdoors. This will be primarily accomplished through the use of large classroom windows which allow ample opportunity for daylight to permeate the classroom spaces.

Innovation & Design Process

Innovation in Design: Green Cleaning

The Project may develop and implement a Green Housekeeping program. The program would include detailed information regarding staff training, cleaning process and chemicals, and occupant feedback.

Innovation in Design: Integrated Pest Management

The Project will develop and implement an indoor integrated pest management plan. The plan will call for the use of least-toxic chemical pesticides, minimum use of chemicals, use only in targeted locations and use only for targeted species.

LEED Accredited Professional

The Project design team has at least one LEED AP in each of the major disciplines.

■

Recycling

The Proponent is committed to developing a recycling program to sort bottles, plastics, and papers on the site. During the construction period, a construction waste management plan will be put in place to recycle up to 75% of materials.

■

Energy Conservation

The Proposed Project will be highly energy efficient due to an improved building envelope, increased insulation at walls and roof, improved windows at all locations, high efficiency lighting for all spaces, daylight harvesting to reduce lighting energy need, and a high efficiency HVAC system including condensing boilers, heat recovery wheels, and dehumidification ventilation system.

■

Water Conservation and Quality

Various elements of the project will meet goals of water conservation and improved water quality. Landscape plant materials will be native and drought resistant to achieve the 50% reduction in irrigation water use. This additional greenspace on the site will also have the benefit of improving groundwater recharge and the quality of runoff.

Low flow toilets, urinals and faucets will be employed to reduce water usage.

■

Air Quality

The Project is not anticipated to affect local or regional air quality. Indoor air quality will be improved over the current condition by the use of low-emitting materials and increased ventilation.

■

Building Materials

The Project will include materials with high percentages of recycled content and those that have been locally sourced. Elements to enhance sustainability will be integrated into the building design, like a highly insulated roofing assembly to maximize the insulative value and reduce cooling loads, as well as exterior wall assemblies that provide a high level of air-tightness.

6

Infrastructure Systems

Introduction

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

- Wastewater
- Water
- Stormwater
- Natural Gas
- Electricity
- Telecommunications

Wastewater

■

Existing Wastewater

There are existing Boston Water and Sewer Commission (BWSC) sewer mains located in Babson Street, Blue Hill Avenue, and within the 20-foot wide BWSC sewer easement which passes through the site parcel. There is a 10-inch sewer main flowing south in Babson Street. The 15- sewer main connects to a 15-inch sewer main, which runs through the site parcel within the 20-foot wide sewer easement. The 15-inch sewer main within the sewer easement connects to the 15-inch sewer main in Blue Hill Avenue flowing south.

Wastewater Generation

The Proposed Project's sewage generation rates were estimated using the Massachusetts Division of Water Pollution Control Sewer System Extension and Connection Permit Program at 314 CMR 07.00 and the proposed building program. 314 CMR 7.00 lists typical sewage generation values for the proposed sources, as shown in **Table 6-1**. Typical generation values are conservative values for estimating the sewage flows from new construction. 314 CMR 7.00 sewage generation values are used to evaluate new sewage flows or an increase in flows to existing connections. Table 6-1 describes the increased sewage generation in gallons per day (gpd) due to the Proposed Project.

Table 6-1
Proposed Project Wastewater Generation

Use	Size	314 CMR Value	Total Flow
Proposed Use			
School with cafeteria, gymnasium and showers	733 Students & Staff	20 GPD/Person	14,660 GPD
Existing Use			
Factory or Industrial Plant	52 People	20 GPD/Person	1,040 GPD
Community Center	335 People	10 GPD/Person	3,350 GPD
Total Existing			4,390 GPD
Net Change			10,270 GPD

Proposed Connection

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Proposed Project is expected to generate an increase in wastewater flows of approximately 10,270 gallons per day. The sewer services for the Proposed Project will connect to the sewer main in Babson Street, within the BWSC sewer easement, or in Blue Hill Avenue.
All improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's site plan review process for the Proposed Project. This process includes a comprehensive design review of the proposed service connections, an assessment of project demands and system capacity, and the establishment of service accounts.

Sewage Capacity & Impacts

The capacities of the 10-inch sanitary sewer line in Babson, the 15-inch sanitary sewer line in the 20-foot wide sewer easement and the 15-inch sanitary sewer line in Blue

Hill Avenue are summarized below in **Table 6-2** and **Table 6-3**. Pipe diameter and inverts used to calculate the capacities are a combination of information obtained from the BWSC wastewater infrastructure system map (**Figure 6-1**) and survey information provided by Nitsch Engineering. Flow capacities of the existing sanitary sewers were calculated in cubic feet per second (cfs) and million gallons per day (MGD) using Manning's equation.

Table 6-2
Sewer Hydraulic Capacity Analysis – Babson Street to 20' Wide Easement

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
203 to 186	197	63.00	61.40	0.8%	10	0.010	2.57	1.66
186 to 187	180	58.40	57.70	0.4%	15	0.010	5.24	3.38
187 to 188	50	57.60	57.26	0.7%	15	0.010	6.92	4.48
Lowest Flow Observed:							2.57	1.66

Table 6-3
Sewer Hydraulic Capacity Analysis – Blue Hill Avenue

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
281 to 282	210	62.67	59.32	1.6%	12	0.010	5.85	3.78
282 to 284	435	59.32	55.66	0.9%	15	0.010	7.79	5.04
Lowest Flow Observed							5.85	3.78

The Proposed Project is not expected to exceed existing sewer capacities.

■

Water Supply

Existing Water Infrastructure

Water for the Proposed Project site will be provided by the BWSC. There are five water systems within the City, and these provide service to portions of the City based on ground surface elevation. The five systems are southern low (SL, commonly known as low service), southern high (SH, commonly known as high service), southern extra high, northern low, and northern high.

BWSC owns and operates an 8-inch SH ductile iron cement lined water main within Babson Street (1999) and a 16-inch SH cast iron pipe water main in Blue Hill Avenue

(constructed 1901, cleaned 1993). The existing water system information was obtained from the BWSC water infrastructure system map (See **Figure 6-2**). The existing site is serviced by four fire hydrants; H4 serviced by the 8-inch main in Babson Street, and H44, H60 and H72 serviced by the 16-inch main Blue Hill Avenue. Hydrant flow tests for hydrants H4 and H60 were requested on January 16, 2014. Flow test results have not yet been received.

Water Consumption

The Proposed Project's water demand estimate for domestic services is based on the Proposed Project's estimated sewage generation, described above. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Proposed Project's estimated increase in domestic water demand is 11,297 gpd (10,270*1.1). The water for the Proposed Project will be supplied by the BWSC systems within Babson Street and/or Blue Hill Avenue.

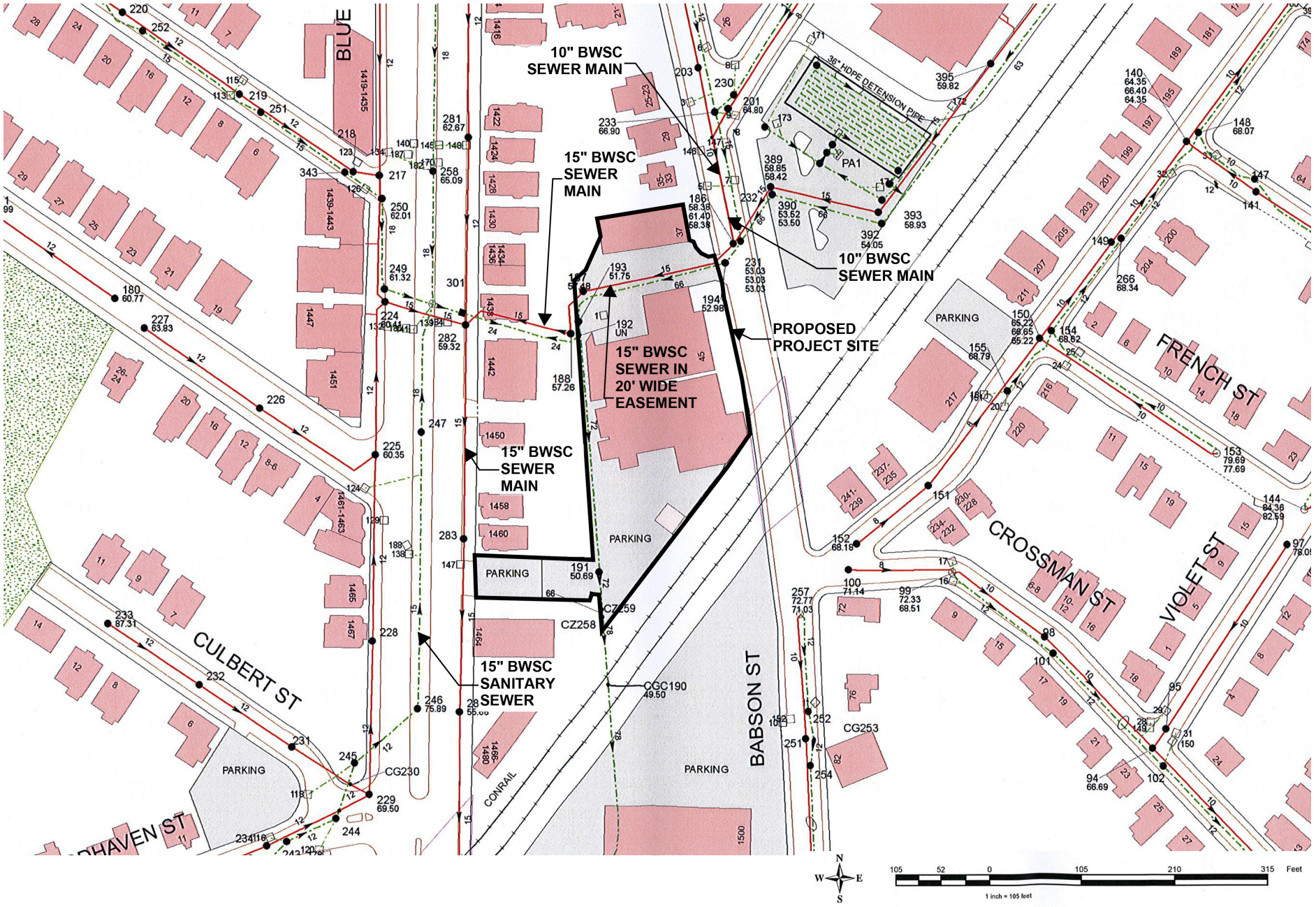
All reasonable efforts to reduce water consumption will be made. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, metering faucets and high-efficiency low flow urinals and toilets will be installed. The project goal is to reduce water consumption by at least 30% from code requirements.

All new water services will be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the Boston Water and Sewer Commission's Automatic Meter Reading (AMR) system.

Proposed Project

The proposed domestic water and fire services will be required to connect to either the existing 8-inch water main in Babson Street or the existing 16-inch water main in Blue Hill Avenue. The domestic and fire protection water service connections required by the Proposed Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of BWSC's Site Plan Review Process.

This review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.



KIPP MA MASSACHUSETTS

KIPP ACADEMY OF BOSTON

1464 BLUE HILL AVENUE, BOSTON MA

VHB Vanasse Hangen Brustlin, Inc.

SEWER INFRASTRUCTURE

FIGURE 6-1

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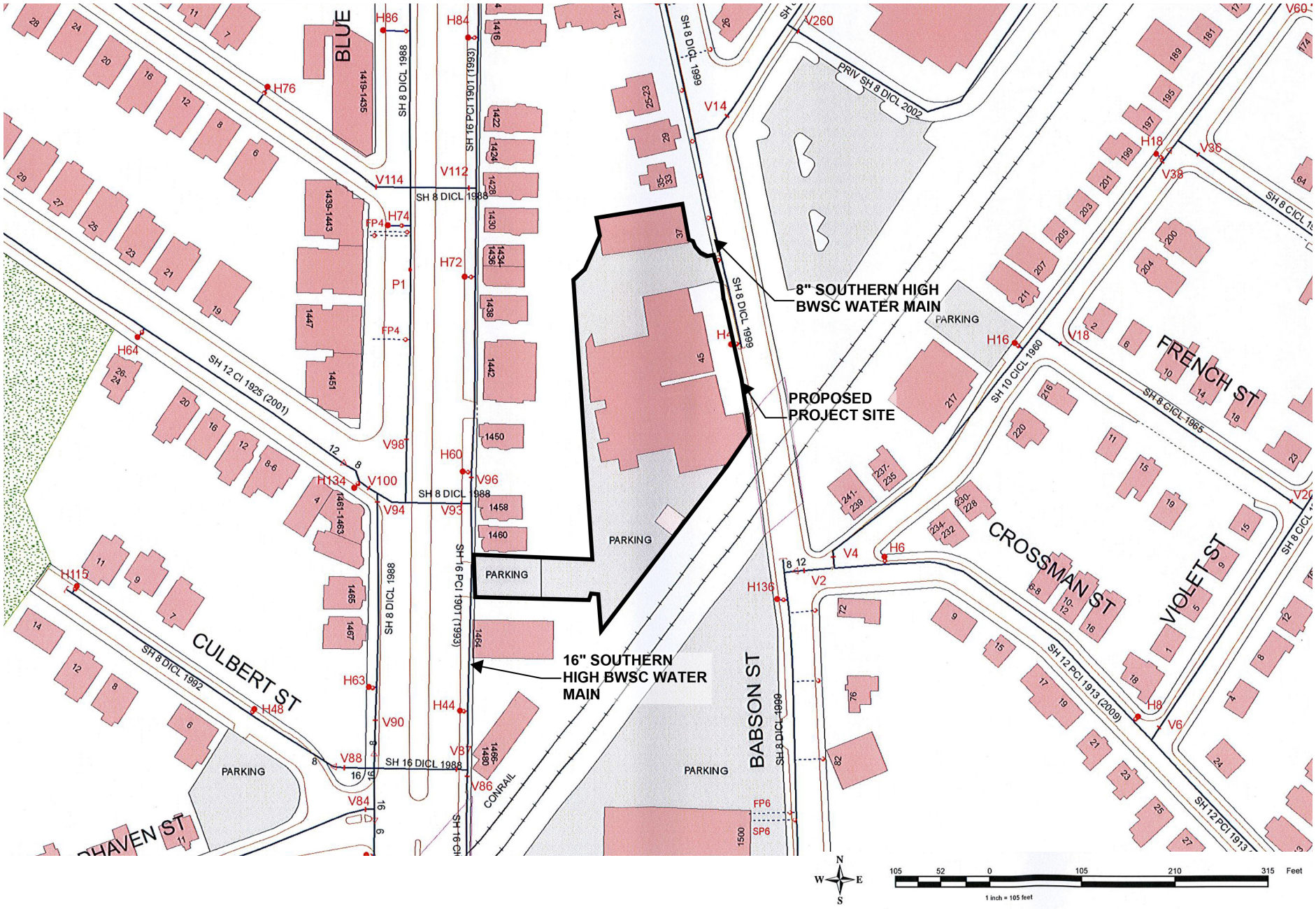

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1464 BLUE HILL AVENUE, BOSTON MA

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WATER INFRASTRUCTURE

FIGURE 6-2

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■

Stormwater Management

Existing Conditions

There are existing BWSC storm drains located in Babson Street, the 20-foot wide sewer easement and Blue Hill Avenue. There is an existing 15-inch storm drain main in Babson Street, which combines into the 66-inch storm drain which flows through the parcel within the 20-foot wide sewer easement. There is an 18-inch storm drain main in Blue Hill Avenue which also combines into the 66-inch drain line within the sewer easement. The capacities of the 15-inch drain line in Babson Street and the 66-inch storm drain in the sewer easement are summarized below in Table 6-6. Pipe diameter and inverts used to calculate the capacities are a combination of information obtained from the BWSC wastewater infrastructure system map (**Figure 6-3**) and survey information provided by Nitsch Engineering.

Flow capacity of existing storm drains were calculated in cubic feet per second (cfs) using Manning's Equation.

Table 6-4
Storm Drain Hydraulic Capacity Analysis Table

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
233 to 232	122	66.90	63.60	2.7%	15	0.012	11.51	7.44
232 to 231	31	63.50	57.28	20.1%	15	0.012	31.35	20.26
231 to 194	45	53.03	52.98	0.1%	66	0.012	121.26	78.38
194 to 193	154	52.98	52.30	0.4%	66	0.012	241.74	156.24
193 to 191	290	52.30	50.40	0.7%	72	0.012	371.37	240.02
Lowest Flow Observed:							11.51	7.44

The Proposed Project is not expected to exceed existing storm drain capacities.

Proposed Conditions

The design intent is to collect stormwater runoff from the impervious area and roof of the Proposed Project and direct it to a subsurface recharge system on site which will overflow to an adjacent BWSC storm drain main. Soil testing will be performed to confirm that this is feasible. The project is committed to treating phosphorus and other TSS prior to discharge into the BWSC storm drain system. Site runoff will be

collected by a closed drainage system, treated and recharged into the ground before overflowing to the BWSC storm drainage system. The stormwater management system will decrease or maintain the flow and volume of stormwater runoff from the site. Stormwater runoff will not be directed towards any abutters.

The site is tributary to the Neponset River. BWSC will require that the new stormwater management system include phosphorus mitigation. The Project is not located within the City of Boston Groundwater Conservation Overland District (GCOD) so the design will not be required to comply with article 32 of the Boston Zoning Guide. The proposed stormwater management system will collect all site runoff and recharge 1-inch over the project's impervious area in accordance with the BWSC's current stormwater requirements.

All improvements and connections to BWSC infrastructure will be reviewed as part of the Commission's site plan review process. The process includes a comprehensive design review of the proposed service connections, assessment of project demands and system capacity, and compliance with the City of Boston Zoning Code

Water Quality Impact

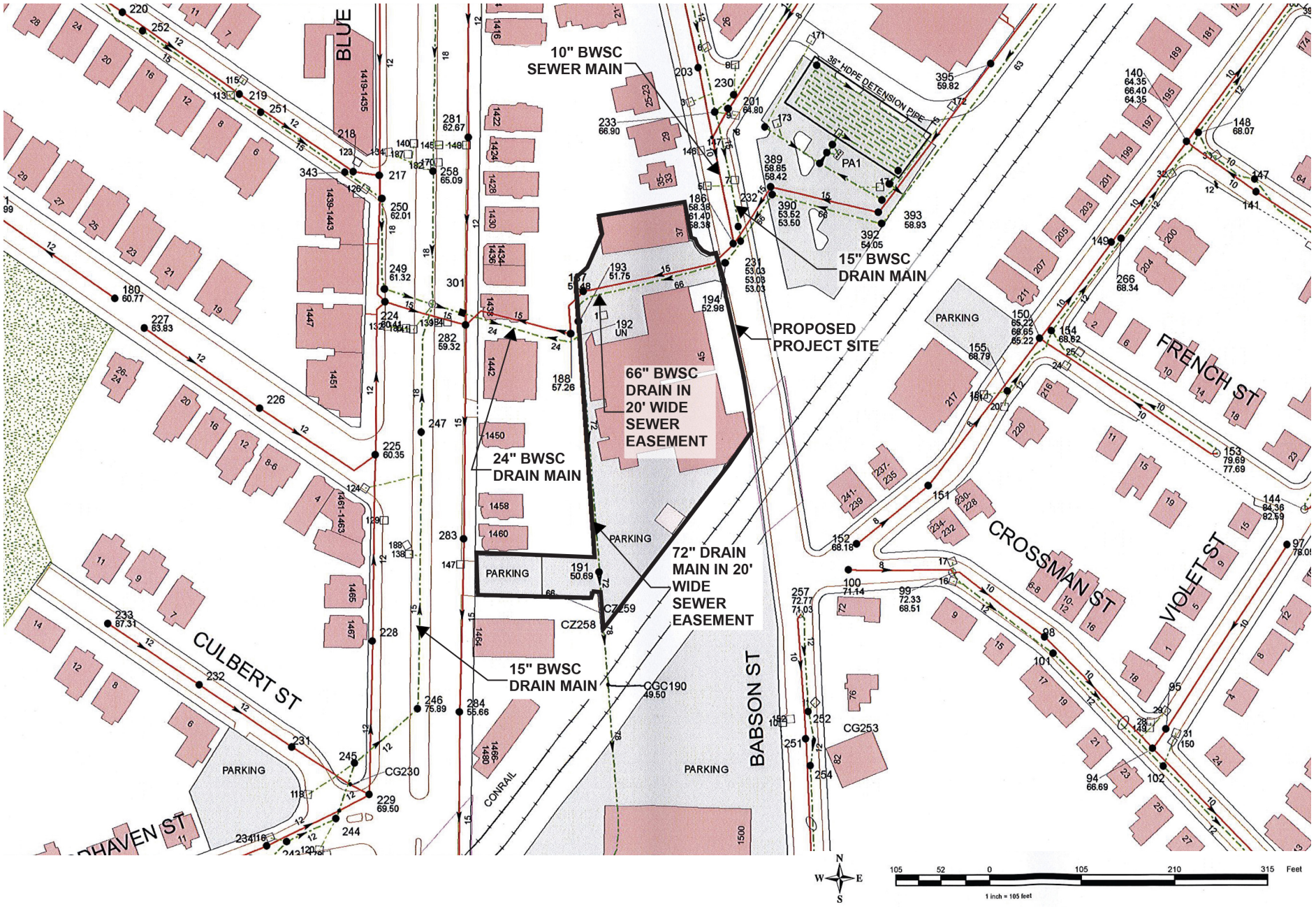
The Proposed Project will not adversely affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales and/or crushed stone, to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Proposed Project will be in compliance with all local and state stormwater management policies. See below for additional information.

■

DEP Stormwater Management Policy Standards

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



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STORM DRAIN INFRASTRUCTURE

FIGURE 6-3

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management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40. A brief explanation of each Policy Standard and the system is provided below.

Standard 1

No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance

The proposed design will comply with this Standard. The Project site is not located near any wetlands or water bodies. Therefore, no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or water of the Commonwealth as a result of stormwater discharges related to the Proposed Project.

Standard 2

Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

Compliance

The proposed design will comply with this Standard. The existing discharge rate will be met or decreased as a result of the improvements associated with the Proposed Project.

Standard 3

For New Construction, loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. The standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance

The Proposed Project is a Redevelopment, and will comply with this standard to the maximum extent practicable.

Standard 4

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when: (a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; (b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and (c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Compliance

The proposed design will comply with this standard. Within the Proposed Project's limit of work, there will be mostly roof, landscape, parking and pedestrian areas. Any paved areas that would contribute unwanted sediments or pollutants to the existing storm drain systems will be collected by deep sump, hooded catch basins and treated before discharging into the BWSC system.

Standard 5

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot me completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the Proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c.21 §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance

The proposed design will comply with this standard. The Proposed Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6). The Project complies with this standard.

Standard 6

Stormwater discharges within Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for

managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Compliance

The Proposed design will comply with this Standard. The Proposed Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard 7

A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent possible. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance

The Proposed Project will comply with this standard. The Proposed Project complies with the Stormwater Management Standards as applicable to the redevelopment.

Standard 8

Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

Compliance

The Proposed Project will comply with this standard. Sedimentation and erosion controls will be incorporated as part of the design of these projects and employed during construction.

Standard 9

A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance

The Proposed Project will comply with this standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Proposed Project and will assume proper maintenance and functioning of the stormwater management system.

Standard 10

All illicit discharges to the stormwater management system are prohibited.

Compliance

The Proposed Project will comply with this standard. There will be no illicit connections associated with the Proposed Project.

Anticipated Energy Needs

■

Natural Gas Service

Presently there exist a 6-inch gas main in Babson Street. A new natural gas service will be provided to the building from this main. Once final gas-fired equipment has been selected the Proponent will coordinate with the gas provider to obtain the service.

■

Electrical Service

Underground electrical service will be provided via proposed connections to the local utility company electrical distribution system on Babson Street. The Proponent will coordinate with the local utility company to determine specific requirements, a connection point, and obtain appropriate approvals as the project design advances.

■

Telecommunications

The Proponent will select the telecommunications companies to provide telephone, cable, and data services to meet the needs of the KIPP Academy Boston Charter

School. An underground telecommunications service will be provided via proposed connections to the selected service providers system on Babson Street. Once the service providers are selected, the Proponent will coordinate with the service providers the location connection points and infrastructure requirements to service the building.

Protection of Utilities

Construction shall not interfere with or interrupt utilities which are to remain. Specifically, the existing pad-mounted electrical transformer located along Babson St. will be protected and maintained. It is the Contractor's responsibility to maintain all existing site utilities, except those noted to be abandoned and/or removed and disposed. The Contractor shall comply with Massachusetts General Laws Chapter 82, Section 40, as amended, which states that no one may excavate in the Commonwealth of Massachusetts except in an emergency without 72 hours notice, exclusive of Saturdays, Sundays, and legal holidays, to natural gas pipeline companies, and municipal utility departments that supply gas, electricity, telephone, or cable television service in or to the City of Boston where the excavation is to be made. The Contractor shall call "Dig Safe" at 1-888-DIG-SAFE. The location of all existing site utilities to remain will be marked and protected during construction.

Sustainable Design/Energy Conservation

The building will be designed to comply with all applicable Massachusetts General Law and Massachusetts State Building Code requirements with respect to energy consumption, which includes the preparation of a Life Cycle Cost Analysis per Chapter 149 Section 44M, and compliance with energy efficiency criteria identified in 780 CMR Chapter 13 and Chapter 115 Appendix AA: Stretch Energy Code.

The proposed HVAC energy conservation systems include a high efficiency gas fired condensing hot water boiler heating plant, gas-fired high efficiency direct expansion electric cooling/dehumidification, packaged, variable and constant volume rooftop units, and a building energy management system.

The building will be primarily heated through the use of a high efficiency gas fired condensing water plant that shall distribute hot water to heating equipment located throughout the building via an insulated 2-pipe steel and copper piping distribution system. The hot water flow shall be controlled by the use of 2 way control valves, differential pressures sensors and hot water pumps equipped with variable speed drives.

The Classrooms will be provided with ventilation and partial air conditioning (dehumidification) by two (2) 8,500 CFM rooftop units with 100% outdoor air

capability, energy recovery ventilation, gas fired heating, direct expansion cooling/dehumidification, MERV 13 air filters, outdoor air economizer controls and supply and return fans with VFD drives. During occupied periods the units shall operate in constant volume mode.

The Administration areas will be provided with ventilation and partial air conditioning (dehumidification) by a 3,000 CFM rooftop unit with 100% outdoor air capability, energy recovery ventilation, gas fired heating, direct expansion cooling/dehumidification, MERV 13 air filters, outdoor air economizer controls and supply and return fans with VFD drives.

The Cafeteria will be provided with ventilation and partial air conditioning (dehumidification) by a 4,500 CFM variable volume recirculation design rooftop unit with 100% outdoor air capability, energy recovery ventilation, gas fired heating, direct expansion cooling/dehumidification, MERV 13 air filters, outdoor air economizer controls, CO2 demand ventilation controls, and supply and return fans with VFD drives.

The Gymnasium will be provided with ventilation and partial air conditioning (dehumidification) by a 9,500 CFM rooftop units with 100% outdoor air capability, gas fired heating, direct expansion cooling/dehumidification MERV 13 air filters, outdoor air economizer controls, CO2 demand ventilation controls, and supply and return fans with VFD drives.

Janitor rooms and copy rooms will have dedicated exhaust systems.

The building HVAC systems will be monitored, controlled and scheduled for occupied/unoccupied operation by a building energy management and automatic temperature control system.

Lighting design will be performance based and shall meet or exceed 20% better than code required light power densities overall. This will be achieved by using high efficiency fluorescent fixtures throughout the building. All exterior rooms with daylight will utilize daylight harvesting. Light fixtures in these rooms will include dimming photocells that will measure the light levels and dim the fixtures accordingly to the amount of daylight present in the room.

7

Project Certification

This Expanded PNF has been submitted to the BRA, as required by Article 80 of the Zoning Code, on the 19th day of May, 2014.

Proponent
KIPP Boston Fund, Inc.
90 High Rock Street
Lynn, MA 01902

John Kalafatas
Chief Operating Officer

Preparer
Vanasse Hangen Brustlin, Inc.

Sean M. Manning, PE, PTOE
Principal

KIPP Academy Boston Charter School
PNF Appendix Material

Appendix A
Climate Change Preparedness & Resiliency Checklist

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	KIPP Academy of Boston
Project Address Primary:	1464 Blue Hill Avenue, Boston, MA 02126
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Christopher Simmler / Business Leader / Jacobs / Christopher.simmler@jacobs.com / 617-250-4825

A.2 - Team Description

Owner / Developer:	KIPP Massachusetts
Architect:	Arrowstreet, Inc.
Engineer (building systems):	Garcia, Galuska, Desousa
Sustainability / LEED:	Arrowstreet
Permitting:	VHB, Inc.
Construction Management:	Jacobs
Climate Change Expert:	

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Elementary/Middle School
List the First Floor Uses:	*Elementary/Middle School*

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

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*72,939 SF*	Building Area:	*53,000 SF*
Building Height:	*53 Ft.*	Number of Stories:	*4 Flrs.*
First Floor Elevation (reference Boston City Base):	*65 Ft.*	Are there below grade spaces/levels, if yes how many:	*Yes / 0.5 (7 support spaces)*

A.5 - Green Building

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

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

Will the project be USGBC Registered and / or USGBC Certified

Registered:	*No*	Certified:	*No*

A.6 - Building Energy

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

Electric:	*265.0 (kW)*	Heating:	*1,024.7 (MMBtu/hr)*
What is the planned building Energy Use Intensity:	*46.06 (kbut/SF)*	Cooling:	*98.2 (Tons/hr)*

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

Electric:	*0.0 (kW)*	Heating:	*(MMBtu/hr)*
		Cooling:	*(Tons/hr)*

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

Electrical Generation:	*0.0 (kW)*		Fuel Source:	
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

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

B.1 – Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

7/ 91 Deg.

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

91 Deg.	*7 Days*	*2 Events / yr.*

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

45 Days	*1 Events / yr.*

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

48 Inches / yr.	*6.6 Inches*	*2 Events / yr.*

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

105 Peak Wind	*3 second*	*1 Events / yr.*

B.2 - Mitigation Strategies

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

Building energy use below code:	*26%*
How is performance determined:	Computerized energy modeling.

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

Select all appropriate:	High performance building envelop	High performance lighting & controls	Building day lighting	EnergyStar equip. / appliances
	High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:				

What are the insulation (R) values for building envelop elements?

Roof:	*R = 29.35*	Walls / Curtain Wall Assembly:	*R = 19.92*
Foundation:	*R = 11.08*	Basement / Slab:	*R =10.86*
Windows:	*U =0.70*	Doors:	*U =0.66 & 0.37*

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

	On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
	On-site Solar PV	On-site Solar Thermal	Wind power	None
Describe any added measures:				

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

Select all appropriate:	Connected to local distributed	Building will be Smart Grid ready	Connected to distributed steam,	Distributed thermal energy

electrical		hot, chilled water	ready

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

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

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

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	High Performance Building Envelop
Describe any added measures:				

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

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	High reflective roof materials	Vegetated roofs
Describe other strategies:				

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

Select all appropriate:	On-site retention systems & ponds	Infiltration galleries & areas	vegetated water capture systems	Vegetated roofs
Describe other strategies:				

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

Select all appropriate:	Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

No

Describe site conditions?

Site Elevation – Low/High Points:	*65 Ft./ 83 Ft.*

Building Proximity to Water:	*Approx. 1,500 Ft*

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

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

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

2013 FEMA Prelim. FIRMs:	*Prelim Firm not available*	Future floodplain delineation updates:	*N/A*

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

Approx. 1,400 Ft. To Flood Zone

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. ***Otherwise you have completed the questionnaire; thank you!***

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*Ft.*	Frequency of storms:	*per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No	If yes, to what height above 100	*Boston City Base*

		Year Floodplain:	*Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	Yes / No
If Yes, describe:	

Will the building remain occupiable without utility power during an extended period of inundation:

	Yes / No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

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

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:				

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

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