Innovation Square At Northern Avenue

Development Review Submission
ARTICLE 80 - Project Notification Form
Minor Revision to Chapter 91 License

Submitted to: The Boston Redevelopment Authority

Submitted by:

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Volume I

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Technical Appendices

For the purposes of this PNF, portions of technical studies have been reproduced and inserted within subject sections, i.e.; Environmental (Section 5.0) and Transportation (Section 7.0). A complete set of study documents are available upon request and include the following:

Volume II - Traffic Impact and Access Study
TEPP LLC (August 14, 2013)

Volume III - Phase I Environmental Site Assessment
McPhail Associates (May 10, 2012)

Volume VI - Preliminary Foundation Engineering Report
McPhail Associates (April 27, 2012)

CHAPTER 1
PROJECT SUMMARY

1.0 Project Summary

1.1.1 Project Description

Kavanagh Advisory Group LLC ("Kavanagh") proposes to construct "Innovation Square at Northern Avenue" on a leased parcel of land located at 316-318 Northern Avenue (Parcel R) in the Boston Marine Industrial Park ("BMIP"). Parcel R is owned by the Economic Development and Industrial Corporation ("EDIC") and will be redeveloped by Kavanagh under a long-term lease. Innovation Square will consist of a four (4) floor, three hundred and fifty five thousand (355,000) square foot, multi-tenanted research and development/manufacturing facility. EDIC has assigned 60 vehicular parking spaces for passenger vehicles on the site with the remainder of the passenger vehicles accommodated in the EDIC parking garage located on Northern Avenue, diagonally across the street from Parcel R. The building has been designed to fully conform to the City of Boston Zoning Code (the "Zoning Code") and no zoning variances are anticipated to accommodate full build-out.

1.1.2 Project Site:

The project site address is 316-318 Northern Avenue and is located at the corner of Tide Street and Northern Avenue. This 179,810 square foot parcel is one of the few remaining vacant parcels in the BMIP. The site is bordered on the north by FID Kennedy Avenue and the proposed Boston Cargo Terminal Project, on the east by Tide Street and one of the largest operating dry-docks on the East Coast (Drydock #3), on the south by Northern Avenue and on the west by Access Road "A" and the New Boston Seafood Center. The site is located within the Innovation District of the South Boston Waterfront.

The proposed site has been vacant for approximately four (4) years, and was formerly the site of an approximately 112,868 square foot building that was occupied by the J.J. Daly Company for over 20 years. The J.J. Daly Company specialized in the storage and

distribution/delivery of stationary and office materials for major firms located within downtown Boston prior to the advent of the Internet and on-line publishing. The company vacated the site in 2008 and the building was demolished by EDIC in 2009-2010. The redevelopment of the Parcel R site is contemplated by the BMIP Master Plan and Chapter 91 License, as further described in Section 3.0.

1.1.3 Project Team

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CHAPTER 2
PROJECT DESCRIPTION

2.0 Project Description

2.1.1 Project Site and Surroundings

Parcel R is a vacant parcel of land approximately 179,810 square feet in size owned by EDIC and located within the BMIP. The BMIP is also located within the South Boston Designated Port Area (DPA). The redevelopment of Parcel R is guided by the BMIP Master Plan (EOEA #8161 & #11816) and Chapter 91 Waterways License (#10233).

Under the BMIP Master Plan, Parcel R is situated in the Waterfront Manufacturing District, a non-water dependent use zone. The Zoning Code identifies the site as being located in an I-2 zone, governed by Volume I (Enabling Act/General Code) and Map # 4 (South Boston District). The proposed uses at Innovation Square include Research & Development (Use Item #48 – Research lab), and General/Light Manufacturing (Use Item #68 – Pharmaceutical Manufacturing), which are allowed as non-water dependent uses under the BMIP Master Plan, Chapter 91, and the Zoning Code.

Presently there are no structures on the site which is presently enclosed with a six (6) foot high chain link fence along its perimeter. A warehouse building previously occupied the site and was in active use by the U.S. Navy and EDIC tenants until recently demolished. Preliminary geotechnical testing indicates foundation remnants remain below the ground surface within the site. Geotechnical information is contained in Section 5.1.8.

2.1.2 Building Program

The full build-out of Innovation Place will accommodate a building program of three hundred fifty nine thousand six hundred and twenty (359,620) square feet which will be accomplished in three phases. On-site parking includes 60 passenger vehicle spaces, as

permitted by the EDIC within the BMIP's allotment under the South Boston Parking Freeze. On-site commercial vehicle parking is permitted under the parking freeze.

The full build-out will result in a building footprint of approximately 85,899 square feet, which is well below the maximum building footprint (103,968 square feet), as permitted under the BMIP Master Plan, and Chapter 91 License.

In accordance with the Boston Zoning Code and BMIP Master Plan, the buildings will be designed within the maximum allowed height of sixty-five (65) feet. The four story buildings will each have a first floor height of eighteen (18) feet and the three upper floors will each be fifteen (15) feet. These floors are designed to support research & development and general/light manufacturing uses.

2.1.3 Parking

Kavanagh has retained Transportation Engineering, Planning and Policy LLC ("TEPP") to conduct a traffic study for the proposed project to quantify any potential impacts associated with the development of the facility (included as Volume II). Section 7.0 provides traffic and access data and information indicating that "The proposed redevelopment does not show significant vehicle-traffic impacts to study-area intersections and does not require traffic mitigation in the form of intersection modifications."

The study also indicates that the parking load for the full build condition is 252 parking spaces. The BMIP is subject to the requirements of the South Boston Parking Freeze. EDIC will permit a maximum of 60 passenger vehicle spaces on-site with the remaining 192 spaces to be accommodated within the BMIP parking garage located diagonally across the street from Innovation Square. The most recent parking garage expansion resulted in 1,765 parking spaces and has the capacity to support the Innovation Square

off-site parking demand. Commercial vehicles will be accommodated on-site, as permitted under the parking freeze.

2.1.4 Vehicular and Pedestrian Access

A sixty (60) space parking lot will be constructed in the northwest corner of the site. Vehicular access to the parking lot will occur from the existing right of way located on the westerly edge of the site. The right of way can be accessed from both FID Kennedy Avenue as well as from Northern Avenue. A separate curb cut for truck access will be provided off the right of way to avoid passenger vehicle and truck interaction. In addition, a pedestrian drop off area will be constructed along Northern Avenue adjacent to the new main entrance at Northern Avenue.

The main pedestrian access to the facility will occur at Northern Avenue with a secondary entrance adjacent to the sixty (60) space parking lot. Because the majority of tenant parking (192 spaces) will utilize the existing EDIC parking garage, a cross walk across Northern Avenue is proposed adjacent to the right of way to accommodate pedestrian traffic from the EDIC garage.

2.1.5 Community Benefits and Public Improvements

Kavanagh will invest approximately $116 million dollars to complete Innovation Square, providing expanded and enhanced facilities within the Boston Marine Industrial Park that complement the growth of research and development and technology companies in the new Boston Innovation District. This investment, and the creation of 359,620 square feet of new R&D/Manufacturing space, will create over 1,000 new full and part-time jobs and approximately 650 construction jobs, stimulating both the local and state economy.

Due to recent and ongoing capital Improvement projects, the BMIP is uniquely equipped to support the redevelopment of Parcel R and the construction of Innovation Square. As

a means of mitigating the potential impacts of redevelopment under the BMIP Master Plan, a proactive approach has been taken by EDIC to carry-out important capital improvement projects, including parking garage expansion(s), roadway and utility improvements along Northern Avenue, Drydock Avenue, Access Roads A & B and FID Kennedy Avenue, as well as water and sewer improvements throughout the BMIP. It is anticipated that because the extensive infrastructure currently in place, the addition of a building of this size will not have a significant impact on roadways, parking, water and sewer or other important infrastructure components, as would a project of this size located in another area of the City.

The Developers also propose to redesign and reconstruct the Silver Line stop currently located on the site and to provide other amenities for the growing number of commuters using the Silver Line as their preferred mode of transportation.

CHAPTER 3
BMIP MASTER PLAN AND CHAPTER 91 LICENSE

3.0 BMIP Master Plan and Chapter 91 License

3.1.1 Boston Marine Industrial Park Master Plan

EDIC purchased the Boston Marine Industrial Park in 1977. The BMIP was formerly the South Boston Naval Annex which played a significant role in World War II but was deemed surplus by the Navy in 1977. In 1978, the EDIC filed an Environmental Impact Report (EIR) with the Commonwealth of Massachusetts Department of Environmental Protection (DEP) for the renovation and conversion of the Naval Annex into the Boston Marine Industrial Park (the "Master Plan"). The Secretary of Environmental Affairs certified it as adequate in 1978 (EOEA #2474). Concurrently, the City of Boston approved an Economic Development Plan (EDP) to guide the development of the BMIP into a diversified industrial area.

In 1983, The Department of Environmental Protection (DEP) approved a Final EIR for the renovation and redevelopment of the 1.6 million square foot Building 114, which was formerly a part of the Army Base adjacent to the BMIP (EOEA #4427). The EDIC incorporated this building into the BMIP and the City of Boston amended the Economic Development Plan to accommodate this change.

In 1989, EDIC filed a Notice of Project Change to the original Master Plan that proposed to construct a parking garage on Parcel E. DEP required the EDIC to prepare a new Environmental Notification Form (EOEA #8161) to initiate the process of updating the Master Plan in light of various regulatory changes that had occurred since the filing of the original master plan. EDIC submitted a Draft Master Plan in 1994 and a Master Plan Update in 1998. EDIC received approval of the Final Master Plan in March of 2000 (EOEA #8161). The Final Master Plan is also referred to as the BMIP Master Plan.

3.1.2 Compliance with Master Plan

The EDIC received approval from the Secretary of Environmental Affairs for the Boston Marine Industrial Park Master Plan (EOEA #8161) on March 16, 2000. In the certificate, the DEP stated "The Final Master Plan establishes a framework for future development within BMIP that is consistent with Chapter 91 regulations, Designated Port Area regulations and local zoning". The building footprints established for Parcel R (6 Tide Street) and delineated on Figure 3-3 of the BMIP Master Plan (Table #7 of the Chapter 91 License) contemplated a building footprint of 103,968 square feet. Innovation Square, as proposed has a building footprint of 85,899 square feet. The Certificate goes on to state "The Final Master Plan establishes that projects proposed outside footprints shown in Figure 3-5 of the Final Master Plan must file a Notice of Project Change under MEPA. As noted by Massport, this procedural requirement would only apply to projects that individually meet one or more MEPA filing thresholds". After review of the MEPA filing thresholds, we do not believe the project as proposed meets any of those thresholds and therefore this filing does not include a Notice of Project Change.

In addition, the BMIP Final Master Plan established a Waterfront Manufacturing District that would accommodate existing and future non-water dependent industrial uses within the BMIP. Parcel R (Innovation Square) is located within this Waterfront Manufacturing District. The BMIP Master Plan and Chapter 91 establish that research & development uses, general manufacturing uses, and light manufacturing uses are non-water dependent industrial uses. The proposed uses at Innovation Square include Research & Development (Use Item #48 – Research lab), and General/Light Manufacturing (Use Item #68 – Pharmaceutical Manufacturing).

3.1.3 Boston Marine Industrial Park Chapter 91 License

One of the major and central commitments made in the approval of the Final Master Plan was the agreement that the BMIP would be a Marine Industrial Park pursuant to Chapter 91 regulations. The designation ensured that 67% of the DPA portion of the BMIP would be devoted to water dependent industrial uses and supporting DPA uses. The balance would be devoted to other non-water dependent industrial uses, and a maximum of 5% of the Leasable Areas would be devoted to commercial uses. The EDIC submitted Waterways Application (W99-9663-N) and received a Waterways License (#10233) on Mar 16, 2005.

3.1.4 Compliance with Chapter 91 License

The approval from the Department of Environmental Protection (DEP) for the Chapter 91 License (Waterways License #10233) was subject to nine (9) Special Conditions and eight (8) Standard Conditions. Of those Special Conditions, Special Condition #5 (b) is applicable to the proposed Innovation Square. Special Condition #5 provides that the Licensee may follow a simplified procedure, as set forth in Special Condition #6, to seek authorization for certain Minor Revisions to the BMIP Master Plan, provided such revision is limited to the following proposed activities:

a) Not Applicable

b) "Construction of new or expanded structures for general industrial or commercial use that are confined to the locations and footprint sizes stipulated at Figure 7 "Future Buildout" and Table 7 "Future Buildout Land Usage Matrix" respectively, in the License Application and attached hereto in Appendix A, provided the Department has determined that such construction is not eligible for authorization as a Minor Project Modification pursuant to 310 CMR 9.22(3)." *See note below regarding Minor Project Modifications.*

As the proposed Innovation Square is within the maximum allowable building footprint (103,969 S.F.), and as the applicable zoning allows for an industrial building/use and Floor Area Ratio of 2 (FAR-2) or up to 359,620 gross square feet of redevelopment, a Minor Revision is warranted. Accordingly, we intend to seek authorization for a Minor Revision to the BMIP Master Plan under the simplified procedures set forth in Condition #6 of the Chapter 91 license.

Note: Innovation Square is not eligible for authorization as a Minor Project Modification, which is limited to previously licensed or exempt projects, including structural alterations confined to existing building footprint; changes of use; and replacement of subsurface utilities.

3.1.5 Compliance with Zoning

The Zoning Code identifies the site as being located in an I-2 Zone, governed by Volume I (Enabling Act/General Code) and Map # 4 (South Boston District). The proposed uses at Innovation Square include Research & Development (Use Item #48 – Research lab), and General/Light Manufacturing (Use Item #68 – Pharmaceutical Manufacturing), which are allowed under the Zoning Code. The Zoning Code allows for an industrial building/use and Floor Area Ratio of 2 (FAR-2) or up to 359,620 and a maximum building height of sixty-five (65') feet. Innovation Square complies with these standards and will also comply with all regulations or requirements related to building construction and operation, including set-backs (street wall and parapet), parking and loading facilities, and screening and buffering requirements as may be prescribed by the Zoning Code or required by BTD, EDIC, or DEP under the BMIP Master Plan or Chapter 91 License.

Please see the following table titled 'Zoning Dimensional Regulations'.

Zoning Dimensional Regulations
Harborpark District, South Boston Marine Park
Project Site: Innovation Square at Northern Avenue

	District	Type of Use	Lot Size	Lot Area	Lot Width	Floor Area Ratio	Usable Open Space	Front Yard	Side Yard	Rear Yard	Setback of Parapet	Building Height
Zoning Regulation	I-2	Any Dwelling Other Use	None	None	None	2	None	None	None	12	(H + L)/6	65' **
Innovation Square	I-2	R & D/ Manufacturing	179,810 SF	179,810 SF	308.5' +/-	2	98,246 SF +/-	34.5' +/-	38.5' +/-	74.8' +/-	24.5'	63'

** Waterfront Manufacturing

CHAPTER 4
URBAN DESIGN

4.0 Urban Design

4.1.1 Introduction

The design intent for Innovation Square at Northern Avenue was developed in conformance with the Zoning Code, BMIP Master Plan, and Chapter 91 License. Conformance with these standards is reflected in the building use, footprint size, general massing and exterior building materials all which make the project compatible with the surrounding structures and neighborhood. In addition, the building is seeking LEED certification under (LEED NC). As part of the construction fit-out, tenants will be encouraged to seek LEED certification for Commercial Interiors (LEED CI).

4.1.2 Massing

The overall design intent creates a building massing, diverse in style, scale and proportion, suggesting that it was designed and built over a period of time. In addition, the overall massing respects the traditional maritime typology where a "head-house" expression is connected to an elongated warehouse which is more repetitive in nature. Along Northern Avenue, the footprint of the building has been slightly recessed to accentuate the main building entrance, distinguishing the two flanking building masses. A projecting canopy with integral lighting and signage will further highlight the entrance sequence. The building face at grade has been slightly recessed creating an architectural arcade at the perimeter. This will give better scale/proportions to the overall building elevation and in function, will allow a transition zone for pedestrians and/or potential seating areas for patrons of retail/restaurant tenants. Along Tide Street, a similar massing strategy has been implemented. The façade is slightly recessed to articulate two building masses, further distinguished by head-house/warehouse components. The rooftop mechanical penthouse is visually screened in elevation and shaped to respect the nautical theme of the area. Except for the expressed arcade, the above strategies have been implemented in regards to the North (FID Kennedy Avenue) and West (Access Road 'A'). Finally, the proposed 4-story structure has a uniform height of 63 feet (measured from ground level to top of roof), which is respectful of the maximum allowable height for this site.

4.1.3 Character and Materials

The architectural character and material selection for this building has been done to reinforce a contemporary maritime typology, again, respecting the headhouse/warehouse components. The headhouses are comprised of a glazed aluminum curtain wall with a combination of vision and opaque glazing for shadow box conditions. The arcade has a glazed aluminum curtain wall system resting on a raised stone base. The expressed columns have a brushed stain pattern metal enclosure that reinforces the architectural lines of the building. The warehouse expression is comprised of a raised grid or frame that expresses the structural grid of the building. This grid is "skinned" in a metal composite panel, giving a clean contemporary look. Each grid has a recessed portion that is a combination of glazing and metal composite panel. Again, the elegance is the repetition from the outside and from the inside, allowing maximum flexibility for interior layout. The rooftop mechanical penthouse is visually screened in elevation and shaped to respect the nautical theme of the area. The metal louvered screen with allow for functional airflow needs while providing visual interest.

4.1.4 Streetscape and Landscape

A building setback along Northern Ave will provide an opportunity for an outdoor green space (urban plaza) which serve as an amenity for the building and local area. It is anticipated that many who arrive to this building will park in the EDIC garage which is located southwest of the site, and as a result, they will transition through this new green space to the front entrance. With a combination of hardscape; stone pavers with a blend of color/texture and softscape; a variety of deciduous trees, low shrubs and accent planting will accentuate the arrival sequence. Exterior lighting, bollards, benches and bicycle racks will further compliment the architecture and the overall journey to the main entrance. In addition, a new bus canopy will be located along Northern Ave which will allow shelter for patrons of the Silver Line bus system.

The hardscape and softscape vernacular will continue along Tide Street with a line of deciduous trees reinforcing the two main masses of the building. Again, the accents of

hardscape will not highlight the tree locations but accentuate the rhythm of the building façade. The sidewalk and low plantings along FID Kennedy Ave will allow a transition to the parking area and rear entrance of the facility. Strategically placed deciduous trees and low plantings will serve as a visual screen for the service and parking areas while unifying the entire site.

4.1.5 Sustainability

4.1.5.1 LEED Checklist

The proponent has completed a LEED Checklist for the proposed project and is included as Exhibit E in the Appendix.

4.1.5.2 Compliance with Article 37

The LEED Checklist has estimated that the proposed project will garner a minimum of 41 points which will allow it to be qualified as a certifiable project as required by Article 37 of the Boston Zoning Code. It is the goal of the proponent to attempt to exceed this number, with the potential to meet or exceed LEED Silver rating, as they proceed through the design process. Every effort will be expended to attain a higher number of points approaching the Silver rating.

CHAPTER 5
ENVIRONMENTAL

5.0 Environmental

5.1.1 Wind

There are currently no buildings occupying the site. The proposed four (4) story flat roofed industrial building will reach a height of sixty-three (63) feet. This height is under the sixty-five (65) feet maximum that is allowed under the City of Boston's zoning code and the BMIP Master Plan for the project site. The new structure will have a footprint of 85,899 SF. At completion, this structure will occupy approximately 48% of the project site. The major public entrance will be off of Northern Avenue, and a secondary access will be from the parking plaza.

As a result of the present and existing conditions, it is expected that none of the locations along the sidewalk will have pedestrian wind levels that exceed the BRA guideline of 31 mph.

5.1.2 Shadow

A shadow impact study has been conducted to illustrate shadows cast by the structure on the site with the existing condition in compliance with the Boston Redevelopment Authority's Development Review Guidelines. The dates and times for which the shadow studies have been simulated are:

Autumnal Equinox – September 21	(9:00 AM, 12:00 PM, 3:00 PM)
Winter Solstice – December 21	(9:00 AM, 12:00 PM, 3:00 PM)
Vernal Equinox – March 21	(9:00 AM, 12:00 PM, 3:00 PM)
Summer Solstice – June 21	(9:00 AM, 12:00 PM, 3:00 PM)

5.1.2.1 Results of the Shadow Study

A detailed set of images is shown in Exhibit B. All net new shadows are shown in light orange and existing shadows are shown in grey. The project site is bound by Northern Avenue to the south, Tide Street to the east, FID Kennedy Avenue to the north, and

Access Road 'A' the west. The buildings directly west of the proposed Innovation Square at Northern Avenue building is the New Boston Seafood Center. A commercial building (22 Drydock Avenue) and the Boston Marine Industrial Park Parking Garage are located to the south of the project site, on the south side of Northern Avenue.

Autumnal Equinox – September 21 (Exhibit B in Appendix)

At 9:00 AM, a new shadow is cast in a westerly direction across the public right of way, and slightly shadows the eastern portion of the New Boston Seafood parking area.

At 12:00 PM, a shadow is cast in a northwesterly direction across the back of the project site and into public right of way.

At 3:00 PM, a shadow is cast in a northeasterly direction across a small portion of FID Kennedy Avenue.

Winter Solstice – December 21 (Exhibit B in Appendix)

At 9:00 AM, a new shadow is cast in a northwesterly direction across the right-of-way onto the eastern edge of New Boston Seafood Company, and across the parking plaza of One Northern Avenue onto FID Kennedy Avenue.

At 12:00 PM, a new shadow is cast in a northwesterly direction across the full width of the right-of-way and impacting the small portion of FID Kennedy Avenue.

At 3:00 PM, a new shadow is cast in a northerly direction across a portion of the parking plaza, and onto a portion of FID Kennedy Avenue.

Vernal Equinox – March 21 (Exhibit B in Appendix)

At 9:00 AM, a new shadow is cast in westerly direction across the full width of the right-of-way, across New Boston Seafood parking area and onto the eastern edge of New Boston Seafood Center's southern building. A new shadow is also cast on the project sites parking plaza

At 12:00 PM, a new shadow is cast in a northwesterly direction to the midpoint of the right-of-way, and also covering approximately 1/3 of the project sites' parking plaza.

At 3:00 PM, new shadow is cast in a northerly direction across a small portion of the project sites' loading zone, as well as across a very small portion of FID Kennedy Avenue and pedestrian sidewalk.

Summer Solstice – June 21 (Exhibit B in Appendix)

At 9:00 AM, a new shadow is cast in a southwesterly direction across approximately half of the right-of-way. A small, new shadow is also cast onto the project site parking plaza, covering approximately 1/3rd of the parking area.

At 12:00 PM, a very small new shadow is cast in a northerly direction and staying within the confines of the project site.

At 3:00 PM, a very small new shadow is cast in a northeasterly direction and staying within the confines of the project site.

5.1.2.2 Conclusions

A shadow study has been conducted on the proposed Innovation Square development and the results indicate the following:

- There are no new shadow impacts on Northern Avenue or Tide Street from the proposed project.

- During the Autum and Vernal Equinox, at 9:00 AM there are minimal impacts on the eastern edge of the New Boston Seafood Center, which is the only time any buildings are impacted by new shadows cast from the proposed project.
- The new shadows created appear to be minimal in comparison to the shadows already generated by existing buildings in the area, and impact primarily the right-of-way separating the project site and New Boston Seafood Center, the project sites' parking plaza, and small portions of FID Kennedy Avenue and sidewalk.

5.1.3 Daylight

The proposed 4 story flat roofed structure will be approximately 150 feet away from the adjacent New Boston Seafood Center and will have very minimal impact on daylight during early winter mornings on the eastern edge of the building. Given the separation between the two buildings in addition to the industrial design of the New Boston Seafood Center with very few window openings, it is believed the impact will be minimal.

5.1.4 Solar Glare

A solar glare analysis is intended to measure potential reflective glare from the buildings onto the potentially affected streets, public open spaces and sidewalks to ascertain the likelihood of visual impairment or discomfort due to reflective spot glare. Innovation Square at One Northern Avenue will make use of non-reflective materials such as brushed aluminum and steel, dark non-reflective glazing, laminate composite materials, pre-cast concrete and stone. Due to this above mentioned palette of materials, it is not anticipated that the project will have adverse solar glare impacts or create solar heat buildup in nearby buildings.

5.1.5 Air Quality

The site is currently used as a storage and parking lot by the City of Boston and when fully built out will have 60 vehicle parking spaces on site. It is our understanding that this parking will exert a relatively minor impact on existing air quality in the Boston Marine Industrial Park. For additional parking requirements, Innovation Square at One Northern Avenue will make use of the Boston Marine Industrial Park parking facility located directly across Northern Avenue, and therefore these minor impacts to air quality should be removed in their entirety. All ventilation will evacuate within the well in the center of the roof and it is anticipated that there will be no impact on pedestrian level air quality.

5.1.6 Flood Zone (Exhibit D in Appendix)

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for the City of Boston (Community Panels 25025C0081G & 25025C0082G) were reviewed to determine if the project site lies within the 100 year flood plain. According to the FIRM, the project lies outside of the 100 Year Flood Zone. The site is, however, directly adjacent to Zone AE which is within the flood zone.

5.1.7 Water Quality

The Project proposes a stormwater management program that will improve the quality of stormwater runoff and promote recharge. Practices to control pollution during construction will be implemented. A stormwater management system will be installed to treat and infiltrate stormwater supplemented with a long-term operation and maintenance plan.

Stormwater pollution prevention measures will include Best Management Practices such as properly storing materials, spill prevention and response plans, and proper storage and disposal of solid wastes. Erosion and sediment controls such as hay bales, silt fence and catch basin filters will be utilized during construction in order to stabilize

the site. The Contractor will also be responsible for controlling dust through the use of a stabilized construction entrance, street sweeping and watering if necessary.

Rooftop runoff will be directed to a subsurface infiltration system with overflows being directed to the municipal storm drain system. This storm water management system will reduce the pollutant load to the municipal storm drain system. Catch basins will be equipped with oil separators.

5.1.8 Geotechnical

Numerous projects have been constructed in the BMIP, and One Northern Avenue was the former site of an approximately 112,868 square foot warehouse, most recently known as J.J. Daly's. Kavanagh Advisory Group retained McPhail Group, LLC to perform a Phase I Environmental Site Assessment as well as a testing program for a preliminary foundation report on the project site (included as Exhibits F & G in the Appendix). A review of the testing results indicated that there is anticipated to be a 20 - 25 foot thickness of miscellaneous fill (including sand, gravel, clay and organic silt) overlying a 3 - 10 foot thickness of organic silt. Below the organic silt layer is a 20 – 30 foot thick deposit of stiff/hard yellow and blue clay. With the northern portion of the site along FID Kennedy Avenue, a 2 – 3.5 foot think deposit of peat was present between the fill and marine clay deposits. At a depth of between 50 – 63 feet dense inorganic silt, sand and gravel was found across the project site. A drilling and testing program is to commence within 30 days of construction to verify this information and to help finalize a foundation design for the structure.

5.1.9 Groundwater

McPhail Group, LLC preformed geotechnical and environmental investigative testing on the project site, which indicated that the depth to groundwater is expected to vary between 8'6" to 11'6" below the existing ground surface. The project is presently

envisioned to not have a basement level, so the impacts to the building should be minimized.

5.1.10 Solid and Hazardous Waste

Historical review has indicated that the site has been occupied by building structures since the 1940's until the demolition of all structures occurred in 2009-2010. The Department of the Navy used the building as a storehouse and it then transitioned to a paper distribution center up until its closing in 2006.

Kavanagh Advisory Group retained the services of McPhail Associates LLC to prepare a Phase I Environmental Site Assessment Report and the report stated "This assessment has identified **no Recognized Environmental Conditions in connection with the Subject Site** with the exception of (i) the presence of PAHs, metals and PCBs identified in soil as a result of historic filling activities in the general area of the site (RTNs 3-3124, 3-16782, 3-26768) and (ii) the reported soil and groundwater impacts to the Building 20 portion of the former South Boston Naval Annex and Army Base property as a result of the historic presence of USTs as documented on RTN 3-0763". If in fact any of these off-site conditions are found to directly impact the site, the removal and disposal of contaminated material will fully comply in all respects with the Massachusetts Contingency Plan (MCP).

5.1.11 Noise

As the proposed Innovation Square is located in an approved Industrial Park and as there are no nearby sensitive receptors, the proponent does not anticipate a significant increase in noise impacts associated with the proposed uses at the project site. The roof-top mechanical equipment will be located together towards the center of the roof to minimize sound transmission. It is anticipated that rooftop equipment will not exceed maximum sound levels. However, the mechanical engineer will be required to provide sound generation data for all specified equipment. During the final design

phase, appropriate low-noise mechanical equipment and noise control measures will be selected, as necessary, to ensure compliance with the City of Boston and DEP noise regulations at all nearby sensitive receptors.

5.1.12 Construction Impacts

The proponent will employ a construction manager who will be responsible for developing a Construction Management Plan ("CMP") that outlines the construction phasing and staging plan, as well as the management of the delivery of materials to the site and will coordinate construction activities with the Boston Transportation Department ("BTD") and other regulatory agencies. The CMP is subject to review, comment and approval by BTD prior to the commencement of any construction activity at the site. The project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications and review the construction contractor's proposed procedures to ensure that vibration and other construction impacts are minimized.

The construction period for the proposed project is expected to last approximately 12 months, beginning in September 2014 and reaching completion by October 2015. The project will comply with the City of Boston Noise and Work Ordinance. Normal work hours will be from 7:00 AM to 6:00PM, Monday through Friday, along with any approved exceptions.

5.1.13 Rodent Control

A rodent control program including inspections, monitoring, and treatment will be implemented prior to, during, and after construction. The construction contractor will file a rodent extermination certificate, along with the building permit application, to comply with City regulations. A preliminary extermination treatment may be performed thoughout the project site prior to site demolition and building construction. During the

construction process, regular site visits will be made in order to maintain effective rodent control levels.

5.1.14 Historic Resources in the Vicinity of the Project Site

The project site is located within the Boston Army Supply Base, an area included in the Inventory of Historic and Archaeological Assets of the Commonwealth. No other historic resources are located within a quarter mile of the Project site.

The proposed Project is located in the immediate vicinity of several buildings associated with the World War II development phase of the Boston Army Supply Base Area. However, it is anticipated that the only impact to these resources will be limited to visual impacts from the proposed new construction.

5.1.15 Historic Resources on the Project Site

Innovation Square at Northern Avenue does not presently contain any historic properties within the boundaries of the site. Previously, a warehouse building constructed in 1940-1942 and known as Building 18 (MHC #BOS. 12971) occupied the site. It was demolished in 2009-2010.

CHAPTER 6
INFRASTRUCTURE

6.0 Infrastructure

6.1.1 Wastewater

6.1.1.1 Existing Sewer System

The Boston Water and Sewer Commission (BWSC) own and maintain the sewer system to the site. A 12" sewer main is located along the West side of the site with (2) 6" lateral connections to the site.

6.1.1.2 Project Generated Sanitary Sewer Flow

It is estimated that the Sanitary Sewer flows will be approximately 250 gallons/minute peak with a total estimated flow of 18,900 gallons/day.

6.1.1.3 Sanitary Sewer Connection

It is proposed that a 6" sewer pipe will connect the building to the existing 12" sewer main along the West side of the building.

6.1.2 Water System

6.1.2.1 Existing Water System

The Boston Water and Sewer Commission (BWSC) own and maintain a 16" water main on the East side of the building.

6.1.2.2 Anticipated Water Consumption

It is estimated that the domestic water consumption associated with the project to be 270 gallons per minute peak with a total estimated flow of 20,700gallons per day. In addition, the fire protection system (standpipes) has been estimated to require a peak of 1000 gallons per minute; the sprinkler system demand has been estimated to require a peak flow of 500 gallons per minute.

6.1.2.3 Water Service Connections

A 4” domestic water service shall serve the building from the 16” main on the East side of the building. An 8” fire protection service shall serve the building from the 16” main on the East side of the building.

6.1.2.4 Water Supply Conservation and Mitigation Measures

Through the use of low flow, high efficiency water closets, urinals, and lavatory faucets for all residential units and utilization of these measures can contribute to a 30% reduction in estimated water consumption.

6.1.3 Storm Drainage System

6.1.3.1 Existing Storm Drainage System

The EDIC own and maintains (2) 10” storm drains; one on the East side of the site and one on the West side.

6.1.3.2 Proposed Storm Drainage System

Due to the location of the site and the proximity to sea level it may not be possible to infiltrate the storm water runoff into the surrounding ground. The roof runoff will be piped into the storm water system via (3) 12” storm drains; 1 on the East side and 2 on the West, to handle the 90,000 square feet of roof area (peak flow rate of 8.35ft^3/s). The storm drains on site will need to be upgraded by the developer to handle the anticipated flows.

6.1.4 Electrical Service

It is estimated that the electrical requirements will be (1)4000 amp and (1) 4000A, 277/480, 3 phase, 4 wire services with a transformer vault located within the building of the proposed project. From the transformer vault, the electric power would be provided to the main electrical distribution switchboards located in the main electrical room. The main electrical service switchboards will distribute power to other

distribution panels for the building electrical loads. The main electrical service conduits will be routed from the main vault to the property line. The building will be provided with an emergency generator 600kW/750kVA, 277/480V, 4-wire. The generator shall support all life safety functions and some miscellaneous building loads.

6.1.5 Telecommunication Systems

Comcast and Verizon both maintain cable TV primary service and telecommunications conduits in. It is anticipated that connections will be made to provide service to the proposed project at these locations.

6.1.6 Gas Systems

The current design assumes gas fired domestic water heaters and hot water boilers. It is estimated that the gas peak load would be 22,000 cubic feet per hour. A gas main runs on the East side of the building and it is assumed that the connection into the main would be made at that location.

6.1.7 Utility Protection During Construction

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

CHAPTER 7
TRANSPORTATION

7.0 Transportation

7.1.1 INTRODUCTION AND SUMMARY

PROJECT DESCRIPTION

Kavanagh Advisory Group, LLC has retained TEPP LLC to prepare this TIAS of the proposed One Northern Avenue Place redevelopment in the City of Boston, Massachusetts. The site is Boston Marine Industrial Park (BMIP) Parcel R. The TIAS is subject to review, comment and approval by the Boston Transportation Department (BTD) and the execution of a Transportation Access Plan Agreement (TAPA) between the developer and BTD.

The site is in the northwest quadrant of the Northern Avenue/Tide Street intersection.

The previous site use was a warehouse with a floor area of about 112,868 square feet (sf). The plan in Appendix A provides for site uses of research and development or general/light industrial with a proposed floor area of about 360,000 sf.

The plan in Appendix A shows that driveways along the right of way (ROW) to the west of the site will provide access to a 60-space parking lot and loading areas. The ROW intersects the north side of Northern Avenue about 350 feet (ft) west of Tide Street.

STUDY SCOPE

This TIAS study area consists of the following intersections:

- Northern Avenue/Massport Haul Road (rotary)
- Northern Avenue/Tide Street (unsignalized)
- Drydock Avenue/Tide Street (unsignalized)
- Summer Street/Drydock Avenue/Pappas Way (signalized)

This TIAS analyzes traffic operations for the weekday AM street-peak hour under the following conditions:

- 2013 existing
- 2018 no-build (*with* background traffic growth and *without* the proposed redevelopment)
- 2018 build (*with* background traffic growth and *with* the proposed redevelopment)

TRIP GENERATION

For the entire weekday, the proposed redevelopment (proposed use compared to previous use) is calculated to generate the following trips (total of in plus out):

- 2,621 for all modes
- -51 truck trips
- 735 automobile trips
- 494 walk trips
- 1,183 transit trips

For the weekday AM peak hour, the proposed redevelopment is calculated to generate the following trips:

- 308 for all modes (259 in plus 49 out)
- -9 truck trips (-7 in plus -2 out)
- 100 automobile trips (87 in plus 13 out)
- 57 walk trips (32 in plus 25 out)
- 160 transit trips (147 in plus 13 out)

For the weekday PM peak hour, the proposed redevelopment is calculated to generate the following trips:

- 318 for all modes (42 in plus 276 out)
- -6 truck trips (-2 in plus -4 out)
- 105 automobile trips (13 in plus 92 out)
- 47 walk trips (15 in plus 32 out)
- 172 transit trips (16 in plus 156 out)

Key points are:

- the reduction in truck trips
- an increase of 100 or fewer peak-hour vehicle-trips (trucks plus automobiles)

CAPACITY ANALYSIS

TEPP LLC conducted capacity analysis as relevant:

- for the weekday AM and PM street-peak hour under existing and future conditions
- for study-area intersections
- to calculate levels of service, delays and queues

Capacity analysis findings are:

- the Northern Avenue/Massport Haul Road intersection (roundabout) shows overall low-to-moderate delays
- the Northern Avenue/Tide Street intersection (multi-way STOP-sign unsignalized) shows low delays
- the Drydock Avenue/Tide Street intersection (two-way STOP-sign unsignalized) shows low-to-moderate delays except for the 2018 no-build and 2018 build AM peak hour, with delayed operations for the Tide Street southbound approach
- the Drydock Avenue/Tide Street intersection (modified to all-way STOP-sign unsignalized) shows low delays for the 2018 build modified AM and PM peak hours
- the Summer Street/Drydock Avenue/Pappas Way intersection (signalized) shows overall moderate delays

TRANSIT

The Massachusetts Bay Transportation Authority (MBTA) provides transit service adjacent to the redevelopment site, as Appendix D shows. MBTA stops are on either side of Northern Avenue along and across from the site frontage. The Silver Line SL2 branch (South Station—Design Center) and Bus Route 4 (North Station—Tide Street) use both stops.

PEDESTRIANS AND BICYCLES

The redevelopment site is in the BMIP. As the BMIP has redeveloped, pedestrian and bicycle facilities have improved. Area streets include bicycle lanes or lanes marked for share bicycle and motor vehicle use. Most area streets include sidewalks, and intersections near the site include marked crosswalks.

CONSTRUCTION-PERIOD TRAFFIC MANAGEMENT

The general contractor will:

- be the point of contact and coordination with the City, other public agencies and the community
- designate, maintain and modify construction areas as appropriate

- provide, maintain and modify signs, markings and barriers for traffic and pedestrian safety and efficiency as appropriate

Adequate on-site parking will be provided for construction workers during construction. Workers will be encouraged to use transit, with on-site posting on transit information and on-site tool storage if practicable.

Construction trucks will use designated routes to avoid local streets. Construction trucks will primarily use South Boston Bypass Road and Massport Haul Road. The general contractor will seek to minimize deliveries as practicable during peak commuter times.

PARKING MANAGEMENT

TEPP LLC understands that the proposed 60 on-site parking spaces are allowed within the South Boston Parking Freeze set forth in 1993 to promote air quality.

The specified parking ratio is down to 0.7 spaces per 1,000-sf floor area for office/non-residential uses in the South Boston waterfront. A ratio of 0.7 per 1,000-sf yields 252 spaces for 360,000-sf floor area.

The 252 spaces exceeds than the 60 on-site spaces by 192 spaces. The Marine Industrial Parking Garage supplies spaces for about 1,700 vehicles and is along the south side of Northern Avenue just west of the redevelopment site.

TRANSPORTATION MEASURES

The proposed redevelopment does not show significant vehicle-traffic impacts to study-area intersection and does not require traffic mitigation in the form of intersection modifications. However, this TIAS sets forth transportation-demand-management (TDM) measures intended to:

- promote alternatives to low-occupancy-automobile commutes
- address area traffic effects of the proposed redevelopment
- generally benefit transportation in the area

These TDM measure relate to:

- encouraging transit use by providing transit information
- encouraging carpools, potentially by assisting in carpool matching or providing preferential convenient parking for carpools
- facilitating bicycle and pedestrian trips by providing an on-site bicycle rack and on-site pedestrian facilities that connect with the public sidewalks that border the site

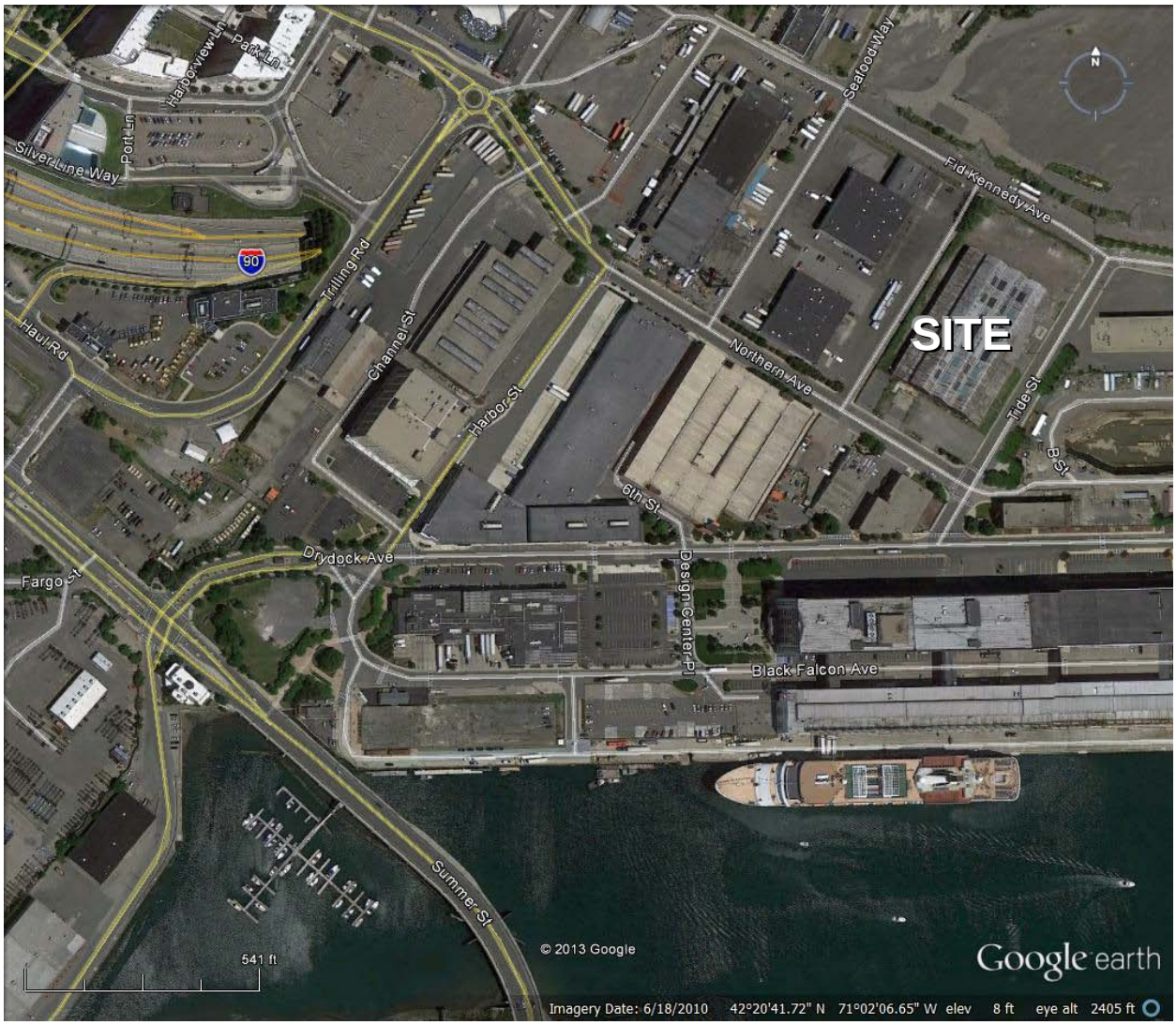

Figure 1. Site location.

7.1.2 EXISTING CONDITIONS

INTRODUCTION

Existing conditions include:

- physical conditions of the transportation network, roads and intersections
- traffic volumes
- other relevant information

PHYSICAL CONDITIONS

TRANSPORTATION NETWORK

Figure 1 shows the transportation network, which includes the following existing streets:

- Northern Avenue
- Drydock Avenue
- Tide Street

The TIAS study area includes the following existing intersections.

- Northern Avenue/Massport Haul Road (roundabout)
- Northern Avenue/Tide Street (unsignalized)
- Drydock Avenue/Tide Street (unsignalized)
- Summer Street/Drydock Avenue/Pappas Way (signalized)

NORTHERN AVENUE

Northern Avenue:

- is oriented approximately east-west
- functions as an urban arterial street
- to the west, provides connections with the City central business district, Seaport Boulevard and Interstate 93 (I-93) and I-90, both freeways of regional importance

- to the east, extends to Tide Street
- has a horizontal alignment that includes tangents and a curve near Harbor Street
- has a near-level vertical alignment
- includes one lane per direction, with essentially no direct on-street parking, and with bicycle provisions and sidewalks on both sides
- is under the jurisdiction of the City

TIDE STREET

Tide Street:

- is oriented approximately north-south
- functions as an urban collector street
- to the north, extends to Fid Kennedy Avenue
- to the south, extends to Drydock Avenue
- has a tangent horizontal alignment
- has a near-level vertical alignment
- includes one lane per direction, with essentially no direct on-street parking, and with bicycle provisions and sidewalks on both sides
- is under the jurisdiction of the City

DRYDOCK AVENUE

Drydock Avenue:

- is oriented approximately east-west
- functions as an urban arterial street
- to the west, extends to Summer Street and provides connections with the City central business district, South Boston, I-93 and I-90
- to the east, extends to the Black Falcon Massport International Cargo area
- has a horizontal alignment that includes tangents and a curve near Summer Street and the Black Falcon Massport International Cargo area
- has a near-level vertical alignment
- includes one lane per direction, with essentially no direct on-street parking, and with bicycle provisions and sidewalks on both sides

- is under the jurisdiction of the City

NORTHERN AVENUE/MASSPORT HAUL ROAD INTERSECTION

The intersection has:

- a four-legged, one-lane roundabout configuration
- Northern Avenue as the east-west street, Massport Haul Road as the south leg and a driveway as the north leg
- near-level grades
- a raised circular central island, and a raised splitter island on all legs except for the driveway north leg
- on the roundabout, all departures, the Northern Avenue westbound approach and the driveway westbound approach, a single lane
- on the Northern Avenue eastbound approach and Massport Haul Road northbound approach, one lane and one right-turn lane
- a marked crosswalk across all legs
- YIELD signs on all approaches
- surrounding mixed urban development including the Bank of America Pavilion performance venue, other commercial buildings and parking areas

NORTHERN AVENUE/TIDE STREET INTERSECTION

The intersection has:

- a four-legged configuration
- Tide Street as the north-south street, Northern Avenue as the west leg and a driveway as the east leg
- near-level grades on all legs
- one-lane approaches
- a marked crosswalk across all legs
- STOP signs on the Tide Street southbound leg and the Northern Avenue eastbound leg, with movements from the driveway also required to stop
- surrounding mixed urban development including office/industrial buildings, a drydock and the redevelopment site
- a location about 150-ft north of the Drydock Avenue/Tide Street intersection

DRYDOCK AVENUE/TIDE STREET INTERSECTION

The intersection has:

- a T configuration
- Drydock Avenue as the major east-west street and Tide Street as the minor north leg
- near-level grades on all legs
- one-lane approaches
- a marked crosswalk across the Tide Street leg
- STOP signs on the Tide Street southbound
- surrounding mixed urban development including the office/industrial buildings and parking areas
- a location about 150-ft south of the Northern Avenue/Tide Street intersection

SUMMER STREET/DRYDOCK AVENUE/PAPPAS WAY INTERSECTION

The intersection has:

- a four-legged configuration
- Summer Street as the major north-south street, Drydock Avenue as the minor east leg and Pappas Way as the minor west leg (closed for construction)
- near-level grades on all legs
- on all legs except for Pappas Way, a raised median separating approaches from departures
- on both Summer Street approaches, one left-turn lane, one through-movement lane and one shared through-movement-and-right-turn lane
- on the Drydock Avenue approach, one shared left-turn-and-through-movement lane and one right-turn lane
- on the Pappas Lane eastbound approach, one lane
- a marked crosswalk across all legs
- traffic-signal control, including full actuation and coordination, protected/permitted left-turn phasing for the Summer Street southbound approach, a right-turn overlap for the Drydock Avenue westbound approach and an exclusive pedestrian signal phase
- surrounding mixed urban development including the office/industrial buildings and parking areas

TRAFFIC VOLUMES

TRAFFIC COUNTS

TEPP LLC obtained turning movement counts:

- at the existing study-area intersections
- on Thursday, July 18, 2013
- from 6:00 to 9:00 AM and from 4:00 to 6:00 PM

The traffic count data are in Appendix B.[1]

EXISTING TRAFFIC VOLUMES

Table 1 and Figures 2 and 3 show 2013 existing weekday AM and PM peak-hour traffic volumes.

Table 1. Existing weekday traffic volumes.

Peak Hour and Location	Vehicles[a]	Percent Direction[b]
AM Peak Hour		
Northern Avenue West of Site	360	72 EB
Drydock Avenue West of Tide Street	291	54 EB
PM Peak Hour		
Northern Avenue West of Site	319	62 WB
Drydock Avenue West of Tide Street	335	63 WB

[a] Two-way volumes in vehicles per hour (vph).

[b] NB = northbound, SB = southbound, .EB = eastbound and WB = westbound.

[1] The TMCs for this TIAS were conducted during July 2013. The Massachusetts Department of Transportation (MassDOT) reported the *2011 Weekday Seasonal Factors* traffic-volume variations in Appendix C. The variations for Factor Group 6, which includes urban arterials and collectors, showed July monthly volumes as about nine percent greater than average monthly volumes.

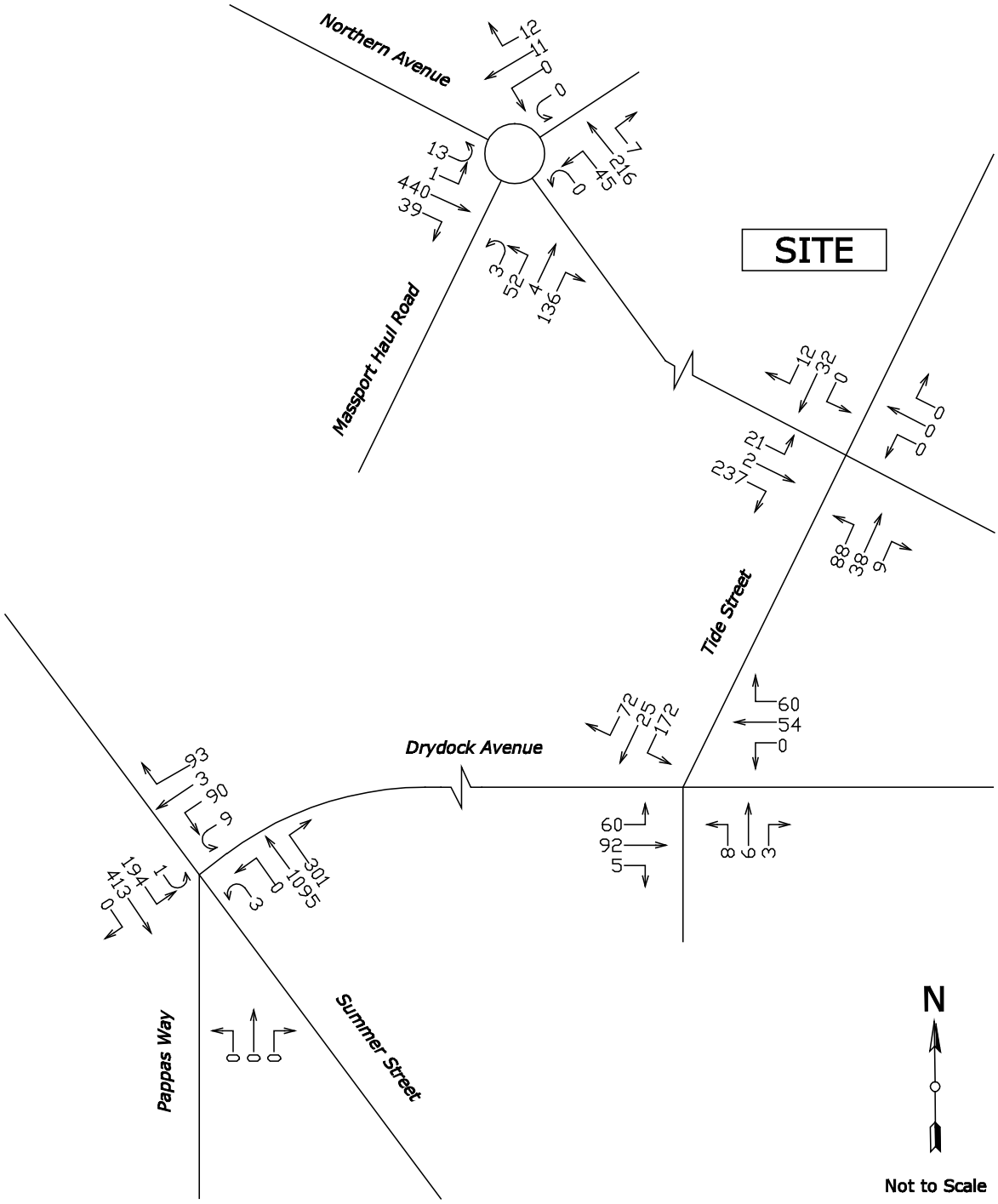

Figure 2. 2013 existing weekday AM-peak-hour traffic volumes.

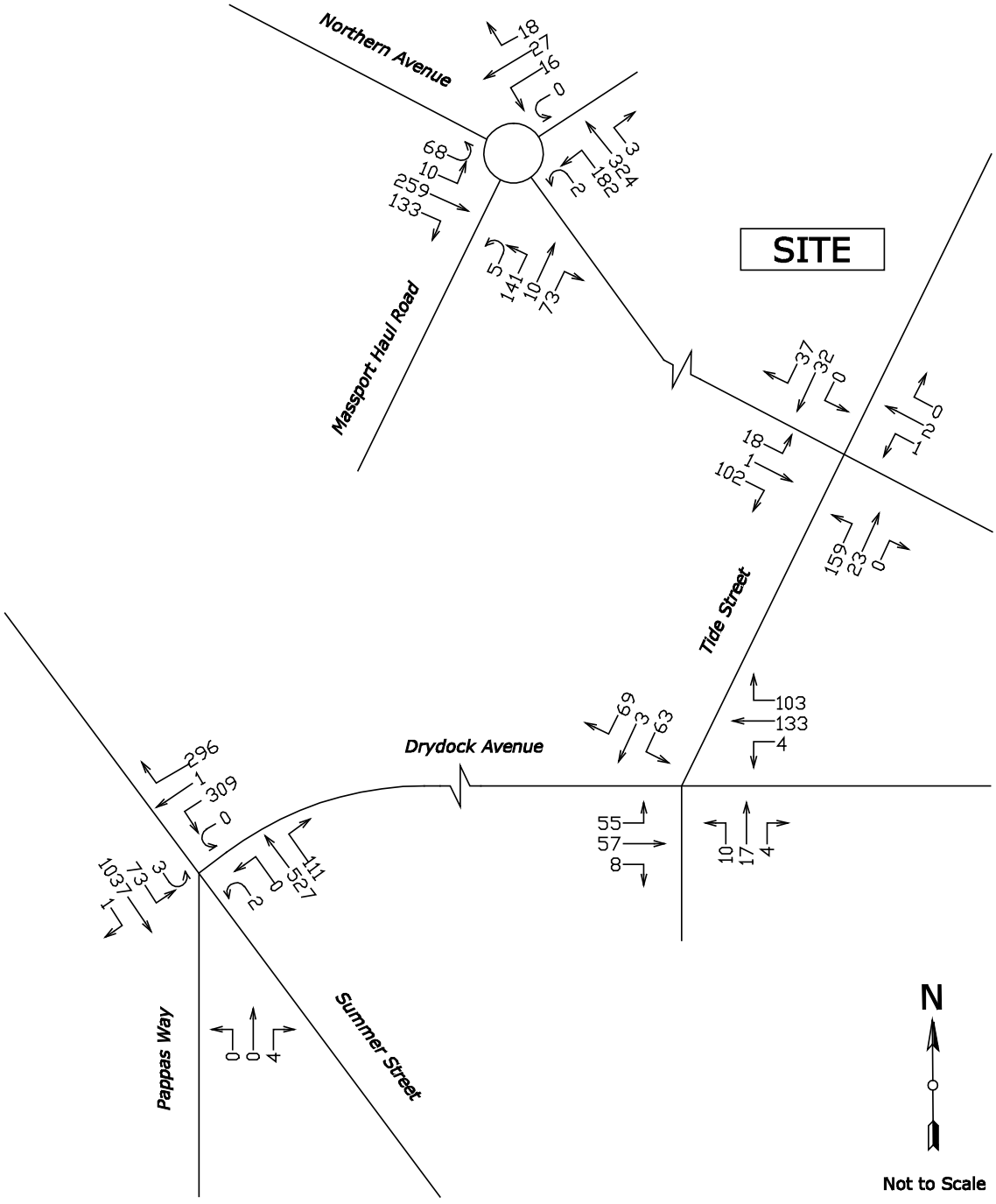

Figure 3. 2013 existing weekday PM-peak-hour traffic volumes.

TRANSIT

The MBTA provides transit service adjacent to the redevelopment site, as Appendix D shows. MBTA stops are on either side of Northern Avenue along and across from the site frontage. The Silver Line SL2 branch (South Station—Design Center) and Bus Route 4 (North Station—Tide Street) use both stops.

The Silver Line SL 2 branch provides service between the Design Center and South Station. The Silver Line SL2 branch operates as surface bus near the site and as bus rapid transit in a tunnel closer to South Station. Bus Route 4, provides service between South Station, North Station and the World Trade Center.

The Silver Line SL2 Branch and Bus Route 4 both provide connections with a wide range of transportation options for trips within the City, across the metropolitan area and beyond. In particular, South Station and North Station are regional transportation hubs, and the Silver Line connects with Logan International airport.

PEDESTRIANS AND BICYCLES

The redevelopment site is in the BMIP. As the BMIP has redeveloped, pedestrian and bicycle facilities have improved. Area streets include bicycle lanes or lanes marked for share bicycle and motor vehicle use. Most area streets include sidewalks, and intersections near the site include marked crosswalks.

7.1.3 FUTURE CONDITIONS

INTRODUCTION

Future conditions include:

- planned road improvements independent of the proposed redevelopment
- future no-build traffic volumes, with background traffic growth and without the proposed redevelopment
- future build traffic volumes, with background traffic growth and with the proposed redevelopment

PLANNED ROAD IMPROVEMENTS

Consultation with the City did not identify significant planned road improvements independent of the proposed redevelopment. Other than potential minor improvements on streets adjacent to the site, no changes to the existing off-site roadway system are planned or otherwise deemed necessary as a result of the Project's implementation.

BACKGROUND TRAFFIC GROWTH

Background traffic growth is:

- independent of the proposed redevelopment
- related to land development in the immediate area, population and economic development in the region and changes in travel patterns in the region
- generally considers two factors: a general traffic-growth rate and specific planned land developments in the immediate area

This TIAS considered the increases from existing to build traffic volumes from the transportation section of the Seaport Square Draft Environmental Impact Report/Draft Project Impact Report (DEIR/DPIR)[2], as Table 2 summarizes.

[2] Boston, Massachusetts, Howard/Stein Hudson Associates, Inc., November 30, 2009.

Table 2. Weekday traffic increases from Seaport Square DEIR/DPIR.

Peak Hour and Location	Increase from Existing to No Build[a]		
	Total[a]	Eastbound[b]	Westbound
AM Peak Hour			
Northern Avenue East of D Street	343 (45%)	133 (43%)	210 (46%)
Drydock Avenue East of Summer Street	83 (12%)	54 (10%)	29 (16%)
PM Peak Hour			
Northern Avenue East of D Street	313 (39%)	135(38%)	178 (41%)
Drydock Avenue East of Summer Street	90 (13%)	24 (18%)	66 (12%)

[a] Volumes in vph and percent. Build volumes compared to existing volumes from Howard/Stein Hudson Associates, Inc.

These increases reflect numerous potential projects over a significant period of time. This TIAS uses a portion of the increases:

- a 21-percent increase on Northern Avenue and Tide Street
- a 13-percent increase on Drydock Avenue at Summer Street

NO-BUILD TRAFFIC VOLUMES

The background traffic growth described above, along with estimated traffic related to the previous redevelopment site use, was applied to the 2013 existing traffic volumes. Figures 4 and 5 show the resulting 2018 no-build weekday AM and PM peak-hour volumes.

SITE TRAFFIC

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative *Trip Generation Manual*.[3] This information is based on empirical data for a variety of land uses including:

[3] ITE, *Trip Generation Manual,* 9th edition (Washington DC, 2012).

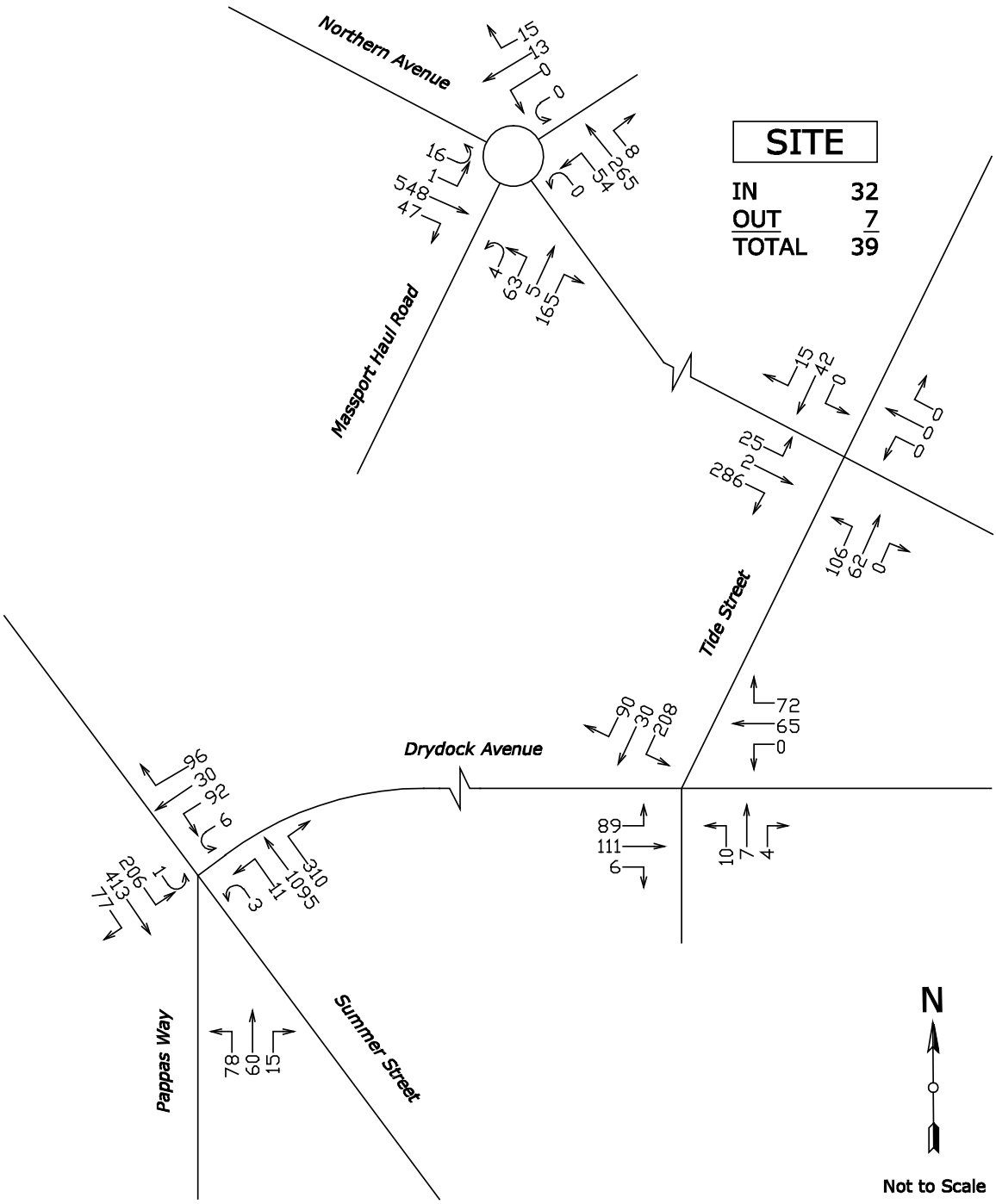

Figure 4. 2018 no-build weekday AM-peak-hour traffic volumes.

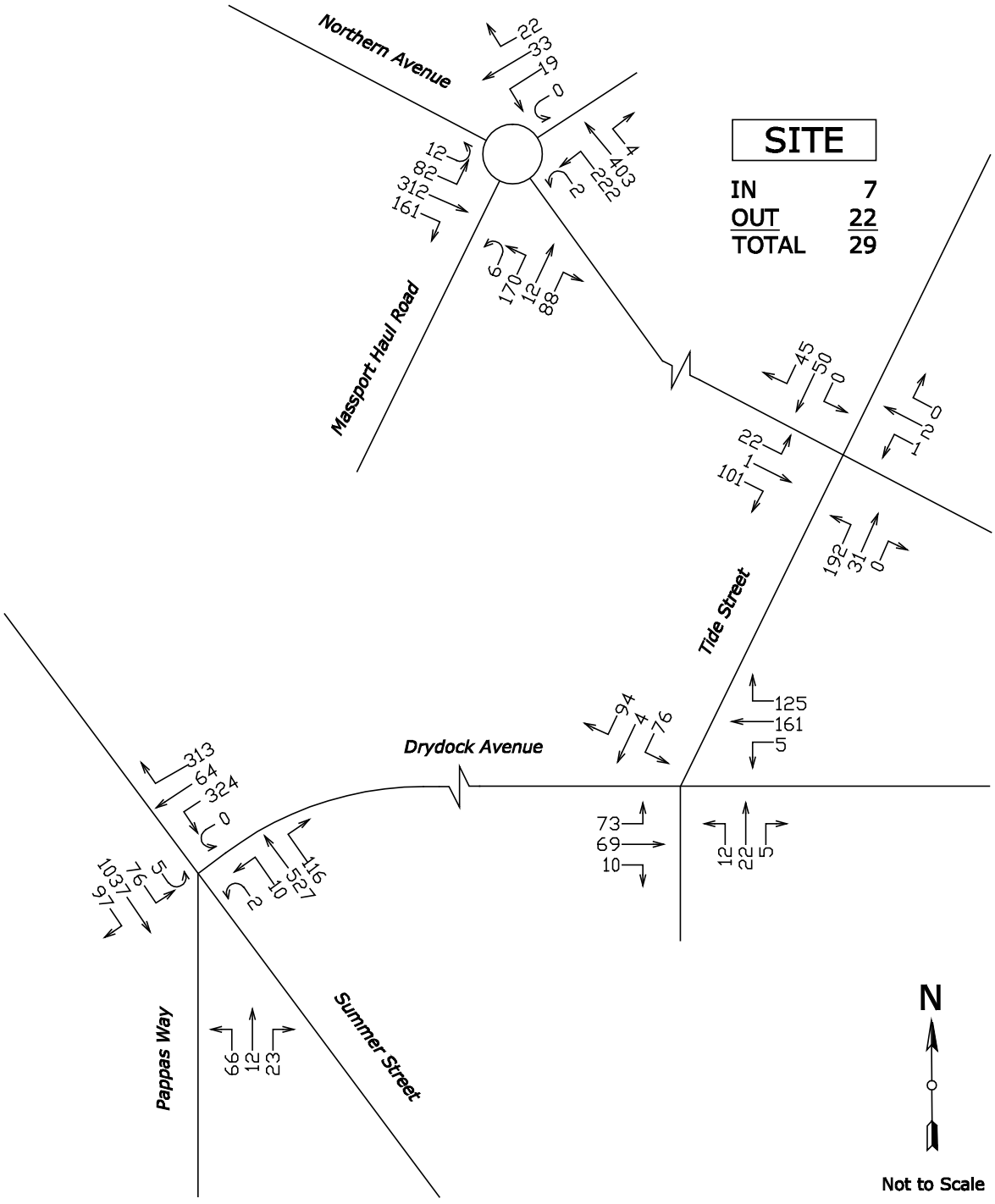

Figure 5. 2018 no-build weekday PM-peak-hour traffic volumes.

- warehousing, land use 150, based on floor area[4]
- research and development center, land use 760, based on floor area[5]
- general light industrial, land use 110, based on floor area[6]

Table 3 presents calculated weekday trip generation. Trips for the previous site use are based on warehousing, land use 150, for a floor area of 112,868 sf. Trip for the proposed site use are based on research and development center, land use 760, which yielded more trips than general light industrial, land use 110, for a floor area of 360,000 sf. Table 3 also presents mode shares, based on the BTD information in Appendix E.[7]

For the entire weekday, the proposed redevelopment (proposed use compared to previous use) is calculated to generate the following trips (total of in plus out):

- 2,621 for all modes
- -51 truck trips
- 735 automobile trips
- 494 walk trips
- 1,183 transit trips

For the weekday AM peak hour, the proposed redevelopment is calculated to generate the following trips:

- 308 for all modes (259 in plus 49 out)
- -9 truck trips (-7 in plus -2 out)
- 100 automobile trips (87 in plus 13 out)
- 57 walk trips (32 in plus 25 out)
- 160 transit trips (147 in plus 13 out)

For the weekday PM peak hour, the proposed redevelopment is calculated to generate the following trips:

[4] ITE, *Trip Generation Manual*, pages 191 to 218.

[5] ITE, *Trip Generation Manual*, pages 1374 to 1395.

[6] ITE, *Trip Generation Manual*, pages 92 to 119.

[7] BTD, South Boston waterfront mode-share calculations, October 30, 2008.

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Table 3. Calculated weekday trip generation.

		AM Street-Peak Hour			PM Street-Peak Hour		
Land Use and Share	Daily	Total	In	Out	Total	In	Out
Past Warehouse Total[a]	547	88	70	18	64	16	48
Truck Share	109 (20%)	17	14 (20%)	3 (20%)	13	3 (20%)	10 (20%)
Automobile Share	137 (25%)	22	18 (26%)	4 (22%)	16	4 (23%)	12 (26%)
Walk Share	88 (16%)	14	7 (10%)	7 (38%)	8	4 (27%)	4 (9%)
Transit Share	213 (39%)	35	31 (44%)	4 (20%)	27	5 (30%)	22 (45%)
Proposed R and D Total[b]	2,908	396	329	67	382	58	324
Truck Share	58 (2%)	8	7 (2%)	1 (2%)	7	1 (2%)	6 (2%)
Automobile Share	872 (30%)	122	105 (32%)	17 (26%)	121	17 (29%)	104 (32%)
Walk Share	582 (20%)	71	39 (12%)	32 (47%)	55	19 (33%)	36 (11%)
Transit Share	1,396 (48%)	195	178 (54%)	17 (25%)	199	21 (36%)	178 (55%)
Difference Total	2,361	308	259	49	318	42	276
Truck Share	-51	-9	-7	-2	-6	-2	-4
Automobile Share	735	100	87	13	105	13	92
Walk Share	494	57	32	25	47	15	32
Transit Share	1,183	160	147	13	172	16	156

[a] Floor area is 112,868 sf. Trip generation and truck share are based on warehousing, land use 150, from ITE, *Trip Generation*, pages 191 to 219. Daily truck share is applied to peak hours. Automobile and walk share are based on revised mode shares for office land uses provided by BTD. Mode-share percentages are in parentheses.

[b] Floor area is 360,000 sf. Trip generation and truck share are based on research and development center, land use 760, from ITE, *Trip Generation*, pages 1374 to 1395. Automobile and walk share are based on revised mode shares for office land uses provided by BTD. Mode-share percentages are in parentheses.

- 318 for all modes (42 in plus 276 out)
- -6 truck trips (-2 in plus -4 out)
- 105 automobile trips (13 in plus 92 out)
- 47 walk trips (15 in plus 32 out)
- 172 transit trips (16 in plus 156 out)

Key points are:

- the reduction in truck trips
- an increase of 100 or fewer peak-hour vehicle-trips (trucks plus automobiles)

TRIP DISTRIBUTION AND NETWORK ASSIGNMENT

Trip distribution and network assignment of vehicle trips to and from the site considered such factors as existing travel patterns, population and regional land development and the BTD trip-distribution information in Appendix F. Table 4 shows estimated trip distribution and network assignment.

Table 4. Trip distribution/assignment.

Road and Direction (To/From)	Percent
Tide Street North	minor
Summer Street North/West	30
Summer Street South	20
Haul Road South	minor
Northern Avenue West	50
Drydock Avenue East	minor

Figures 6 and 7 shows site-traffic volumes for the weekday AM street-peak hour.

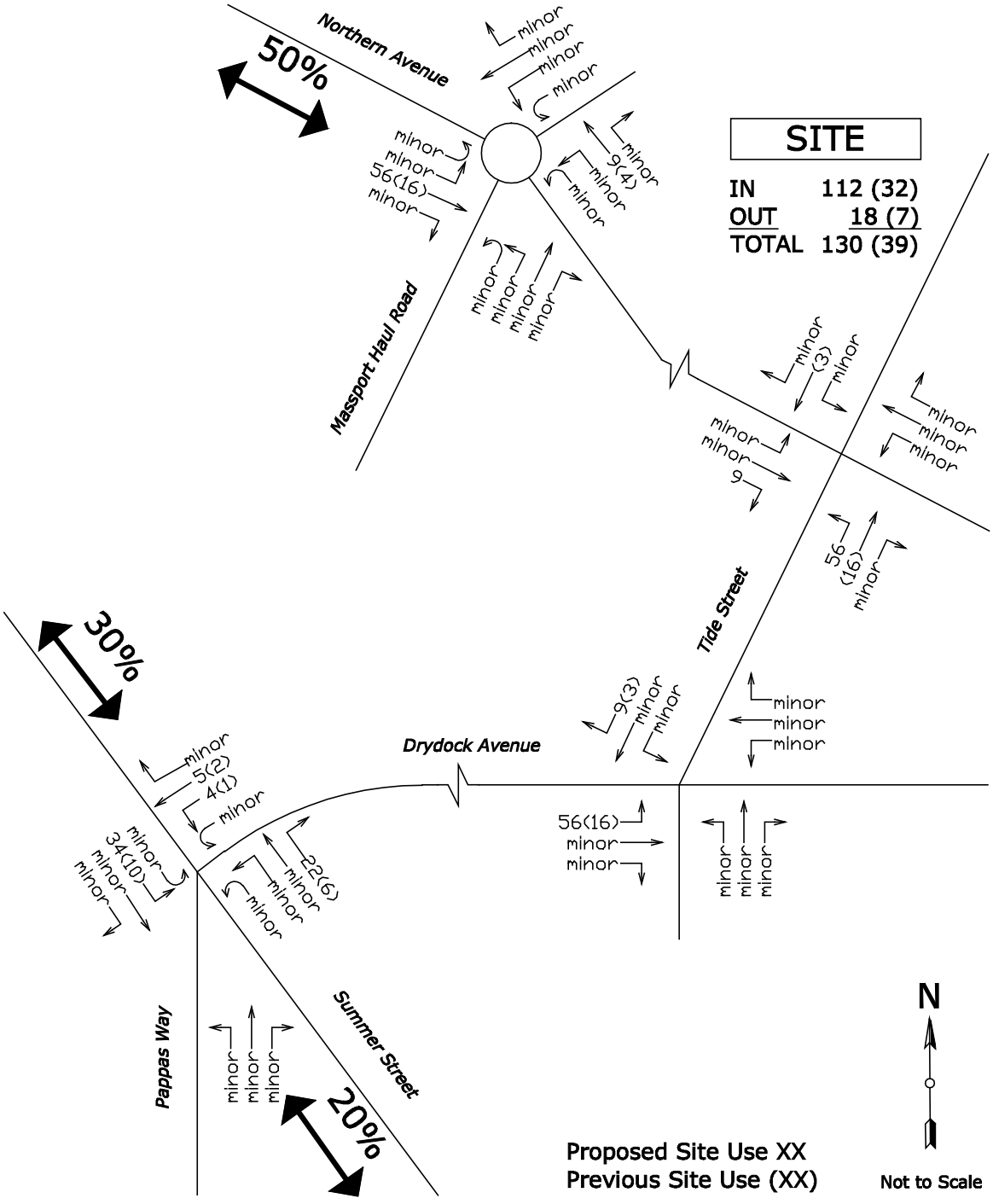


Figure 6. Weekday AM peak-hour site-traffic volumes.

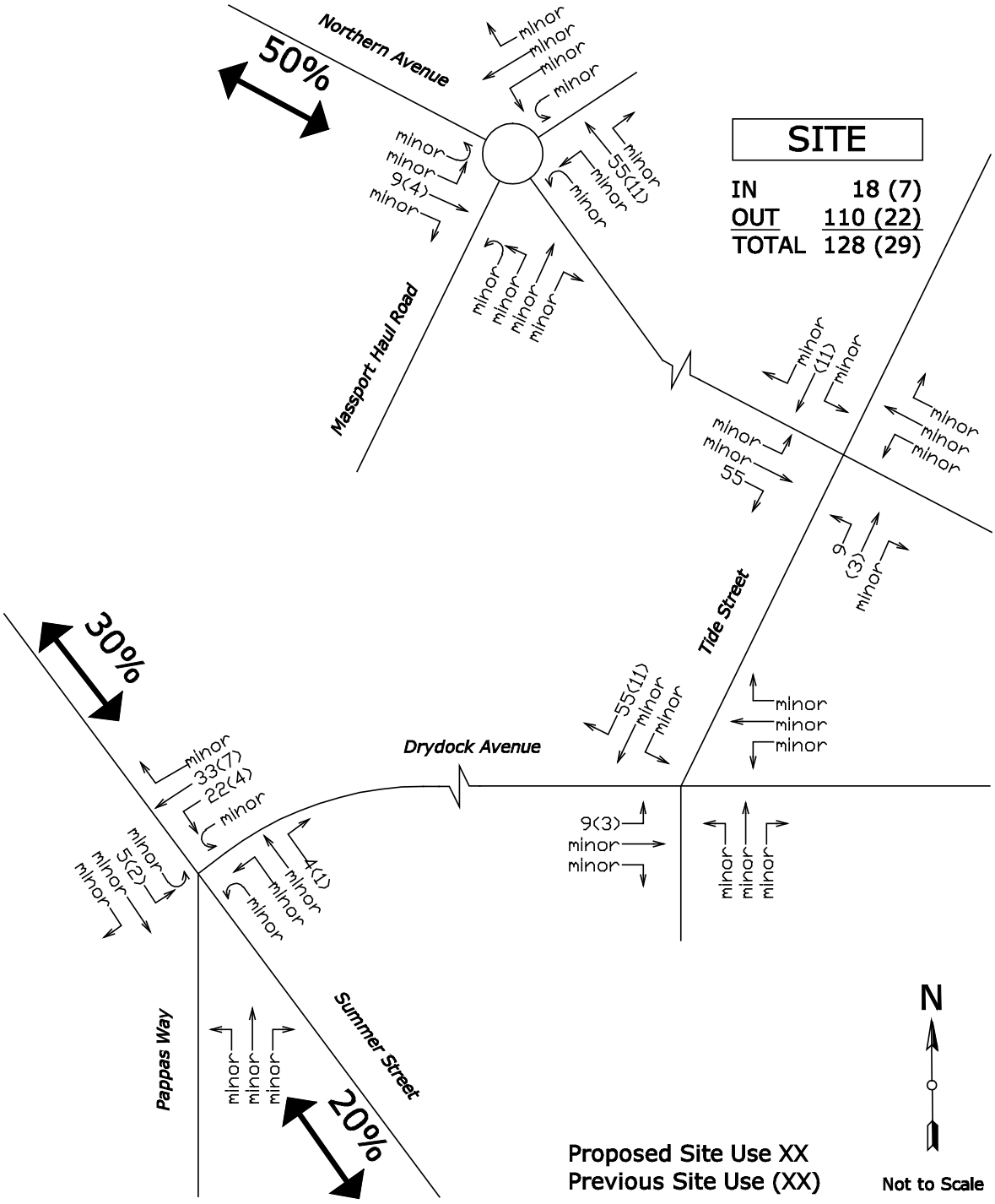


Figure 7. Weekday PM peak-hour site-traffic volumes.

BUILD TRAFFIC VOLUMES

Site traffic volumes were superimposed on the no-build traffic volumes to estimate build traffic volumes. Figures 7 and 8 show the resulting 2018 build weekday AM and PM peak-hour traffic volumes.

TRAFFIC-VOLUME CHANGES

Table 5 presents estimated weekday AM and PM peak-hour traffic-volume changes due to the redevelopment. The greatest tabulated change is 50 vph, an average of less than one vehicle per minute, split by direction.

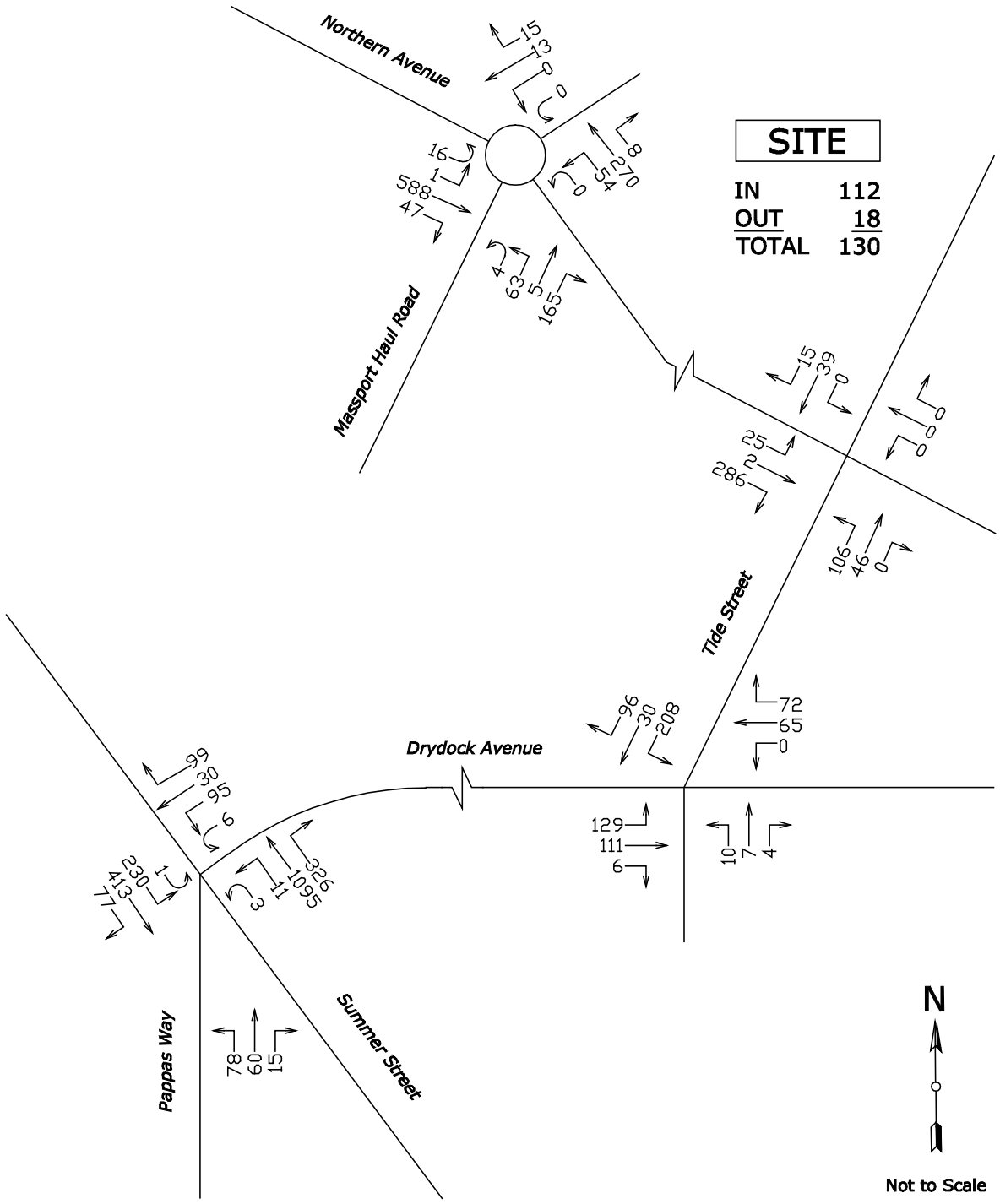


Figure 7. 2018 build weekday AM-peak-hour traffic volumes.

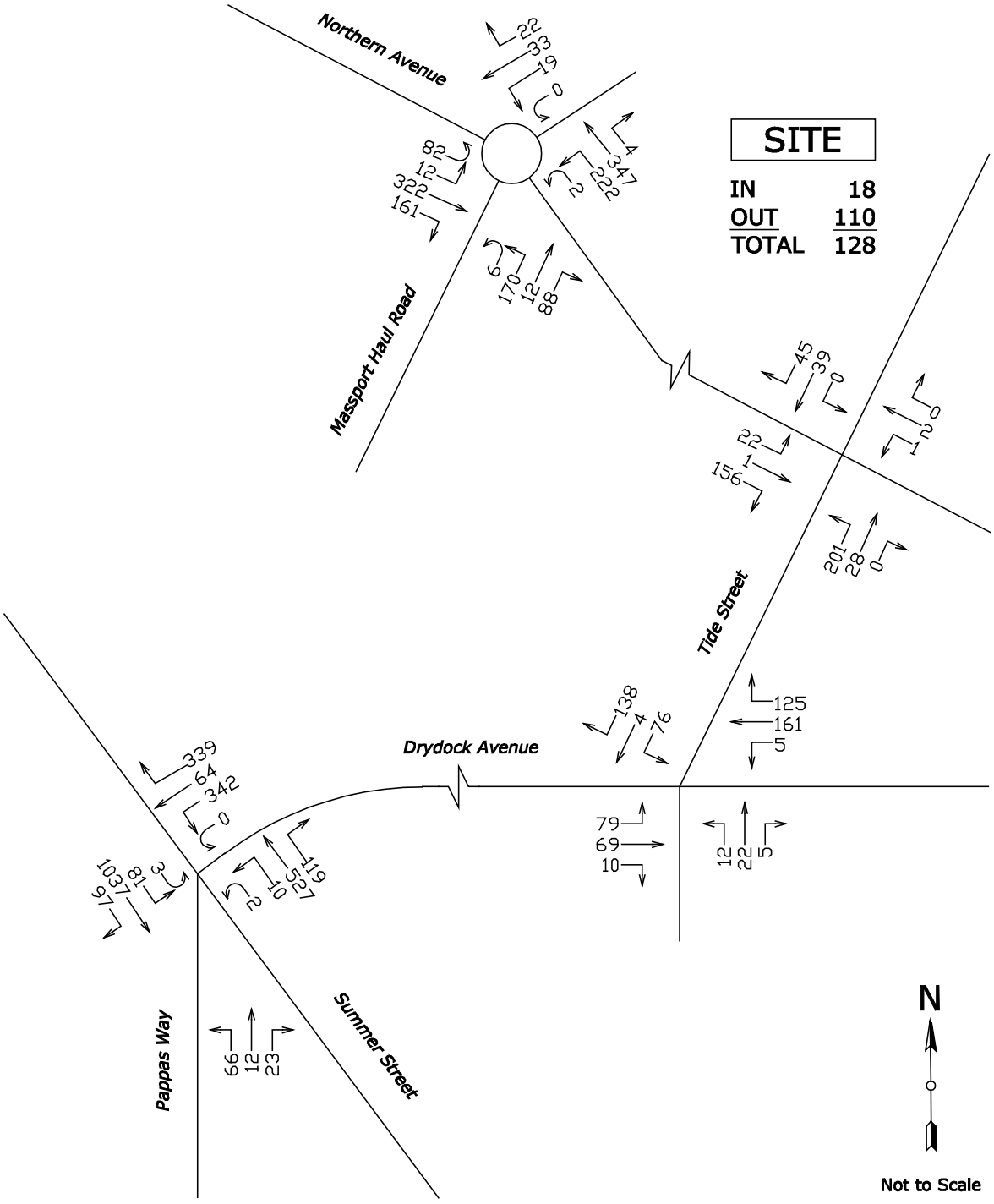


Figure 8. 2018 build weekday PM-peak-hour traffic volumes.

Table 5. Traffic-volume changes for weekday AM and PM peak hours.

Peak Hour and Location	2018 No-Build[a]	2018 Build	Change
AM Peak Hour			
Northern Avenue West of Site	454	499	45
Drydock Avenue West of Tide Street	371	417	46
PM Peak Hour			
Northern Avenue West of Site	378	427	49
Drydock Avenue West of Tide Street	419	469	50

[a] Two-way volumes in vph.

7.1.4 OPERATIONS ANALYSIS

INTRODUCTION

This TIAS has *quantified* existing, future-no-build and future-build traffic volumes. Capacity analysis models the *quality* of traffic operations. Comparing build conditions to the no-build conditions indicates impacts of the redevelopment on quality of traffic operations.

METHODS

Capacity analysis estimates levels of service (LOS) for transportation facilities. LOS indicates the quality of traffic operations based on delay and other measures. The six LOS are designated A to F. LOS A represents the best or highest operating conditions. LOS F is the lowest, but does not necessarily connote failure.

LOS is a function of traffic volumes and traffic control. Because these volumes can vary, LOS of a transportation facility can differ by time of day, day of the week, or month. For example, a transportation facility with a low LOS during peak hours may have a high LOS during other hours. The operational analysis methods of the Transportation Research Board (TRB)[8] models LOS for intersections based on calculated delay per vehicle, as shown in Table 6. Synchro 8 analysis software was utilized.

Method inputs include:

- intersection geometry
- traffic control, such as YIELD sign, two-way STOP sign, all-way STOP sign, roundabout or signal (including phasing, timing and progression)
- traffic volumes
- vehicle composition, such as passenger cars and trucks

The methods are all approximate. In particular, the method for two-way and all-way STOP-sign control can be conservative, with observed delays and queuing shorter than those modeled.

[8] TRB, *Highway Capacity Manual* 2000 (Washington DC 2000) and *Highway Capacity Manual 2010* (Washington DC, 2010).

Table 6. Level-of-service criteria for intersections.

	Control Delay (seconds/vehicle)	
Level of Service	Unsignalized Intersections[a]	Signalized Intersections
A	≤10.0	≤10.0
B	>10.0 and ≤15.0	>10.0 and ≤20.0
C	>15.0 and ≤25.0	>20.0 and ≤35.0
D	>25.0 and ≤35.0	>35.0 and ≤55.0
E	>35.0 and ≤50.0	>55.0 and ≤80.0
F	>50	>80

From Transportation Research Board, *Highway Capacity Manual 2010* (Washington D.C., 2010).

[a] For YIELD sign, two-way STOP sign or all-way STOP sign, control delay defines LOS. For roundabout approaches and overall intersection, control delay defines LOS. For roundabout lanes with volume/capacity ratio ≤1.0, control delay defines LOS. For roundabout lanes with volume/capacity ratio > 1.0, LOS is F regardless of control delay.

RESULTS

Tables 7 and 8 present results for the study-area intersections under the 2013 existing, 2018 no-build and 2018 build conditions for the weekday AM and PM peak hours. The tables show computed LOS, volume/capacity ratios, delays and queues. Capacity-analysis worksheets that give background and explanation are in Appendix G.

Capacity analysis findings are:

- the Northern Avenue/Massport Haul Road intersection (roundabout) shows overall low-to-moderate delays
- the Northern Avenue/Tide Street intersection (multi-way STOP-sign unsignalized) shows low delays
- the Drydock Avenue/Tide Street intersection (two-way STOP-sign unsignalized) shows low-to-moderate delays, except for the 2018 no-build and 2018 build AM peak hour, with delayed operations for the Tide Street southbound approach
- the Drydock Avenue/Tide Street intersection (modified to all-way STOP-sign unsignalized) shows low delays for the 2018 build modified AM and PM peak hours
- the Summer Street/Drydock Avenue/Pappas Way intersection (signalized) shows overall moderate delays

Table 7. Weekday AM-peak-hour capacity analysis.

	2013 Existing				2018 No Build				2018 Build				2018 Build with Modifications			
Intersection and Movement	LOS[a]	Delay[b]	V/C[c]	Queue[d]	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue
Northern Avenue/Massport Haul Road (Roudabout)																
Northern Avenue EB LT	B	11.8	0.57	100	C	17.5	0.73	175	C	20.5	0.78	200	--[e]	--	--	--
Northern Avenue EB R	A	4.3	0.05	0	A	4.4	0.06	0	A	4.4	0.06	0	--	--	--	--
Northern Avenue WB	A	8.7	0.39	50	B	10.5	0.48	75	B	10.7	0.49	75	--	--	--	--
Massport Haul Road NB LT	A	7.9	0.12	0	A	9.8	0.16	25	B	10.3	0.17	25	--	--	--	--
Massport Haul Road NB R	B	10.5	0.27	25	B	14.1	0.38	50	C	15.2	0.40	50	--	--	--	--
Driveway SB	A	6.6	0.07	0	A	7.5	0.09	0	A	7.6	0.09	0	--	--	--	--
Overall	B	10.1	--	--	B	13.9	--	--	C	15.6	--	--	--	--	--	--
Northern Avenue/Tide Street (Multi-Way STOP Sign)																
Tide Street NB LTR	A	9.9	0.22	20	B	11	0.31	35	B	10.6	0.28	30	--	--	--	--
Northern Avenue EB LTR	A	8.9	0.32	35	A	10	0.40	50	A	9.8	0.40	50	--	--	--	--
Northern Avenue WB LTR	A	7.8	0.00	0	A	8.1	0.00	0	A	8.0	0.00	0	--	--	--	--
Tide Street SB LTR	A	8.3	0.07	5	A	8.7	0.09	10	A	8.6	0.09	10	--	--	--	--
Drydock Avenue/Tide Street (Two-Way STOP Sign Except for All-Way STOP under 2018 Build with Modifications)																
Tide Street NB LTR	C	15.2	0.06	5	C	18.0	0.10	10	C	21.0	0.12	10	A	9.1	0.2	0.05
Drydock Avenue EB LTR	A	8.2	0.06	5	A	8.4	0.09	10	A	8.6	0.13	15	B	13.9	2.4	0.46
Drydock Avenue WB LTR	A	0.0	0.00	0	A	0.0	0.00	0	A	0.0	0.00	0	B	10.1	0.9	0.24
Tide Street SB LTR	D	27.0	0.65	112	F	67.3	0.94	255	F	121.4	1.11	350	B	14.6	3.2	0.53
Summer Street/Drydock Avenue/Pappas Way (Signalized)																
Pappas Way EB LTR	E	70.8	0.86	220	E	68.1	0.85	218	E	70.8	0.86	220	--	--	--	--
Drydock Avenue WB LT	E	72.9	0.88	167	E	68.9	0.86	162	E	72.9	0.88	167	--	--	--	--
Drydock Avenue WB R	C	34.7	0.10	30	C	34.8	0.09	27	E	34.7	0.10	30	--	--	--	--
Summer Street NB L	C	22.0	0.20	23	C	21.7	0.20	23	E	22.0	0.20	23	--	--	--	--
Summer Street NB TR	D	42.8	0.97	647	D	38.6	0.95	635	D	42.8	0.97	647	--	--	--	--
Summer Street SB L	E	79.9	0.98	284	E	58.1	0.90	242	E	79.9	0.98	284	--	--	--	--
Summer Street SB TR	A	8.8	0.27	99	A	8.7	0.27	99	A	8.8	0.27	99	--	--	--	--
Overall	D	42.7	0.89	--	D	37.8	0.85	--	D	42.7	0.89	--	--	--	--	--

[a] LOS = level of service.

[b] Delay = average delay in seconds per vehicle.

[c] V/C = volume/capacity ratio.

[d] Q = 95th percentile queue in ft. (assume 25 feet per vehicle)

[e] -- = not calculated, not available or not applicable.

EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

Table 8. Weekday PM-peak-hour capacity analysis.

	2013 Existing				2018 No Build				2018 Build				2018 Build with Modifications			
Intersection and Movement	LOS[a]	Delay[b]	V/C[c]	Queue[d]	LOS	Delay	V/C	Queue	LOS	Delay	V/C	Queue	LOS[a]	Delay[b]	V/C[c]	Queue[d]
Northern Avenue/Massport Haul Road (Roudabout)																
Northern Avenue EB	B	12.2	0.50	75	C	17.1	0.64	125	C	17.7	0.65	125	--[e]	--	--	--
Northern Avenue WB	A	6.9	0.19	25	A	7.9	0.25	25	A	7.9	0.25	25	--	--	--	--
Massport Haul Road NB	C	17.6	0.70	150	E	37.2	0.91	300	E	48.9	0.97	375	--	--	--	--
Driveway SB	A	8.3	0.25	25	B	10.0	0.33	25	B	10.2	0.33	25	--	--	--	--
Overall	A	8.0	0.14	0	A	9.1	0.18	25	A	9.2	0.18	25	--	--	--	--
Northern Avenue/Tide Street (Multi-Way STOP Sign)																
Tide Street NB L	A	9.6	0.29	30	B	10.4	0.36	45	B	10.9	0.38	45	--	--	--	--
Northern Avenue EB L	A	8.1	0.17	15	A	8.5	0.18	15	A	9.0	0.26	25	--	--	--	--
Northern Avenue EB R	A	7.9	0.01	0	A	8.2	0.01	0	A	8.3	0.01	0	--	--	--	--
Drydock Avenue/Tide Street (Two-Way STOP Sign Except for All-Way STOP under 2018 Build with Modifications)																
Drydock Avenue EB	C	15.8	0.11	10	C	19.3	0.17	15	C	20.8	0.18	20	A	9.3	0.3	0.08
Tide Street SB L	A	8.5	0.06	5	A	8.8	0.08	10	A	8.9	0.09	10	B	11.3	1.2	0.29
Tide Street SB R	A	7.5	0.00	0	A	7.5	0.00	5	A	7.5	0.00	5	B	12.4	2.7	0.49
Tide Street SB LTR	C	16.8	0.35	40	C	23.2	0.52	75	D	26.0	0.62	100	B	12.1	1.9	0.40
Summer Street/Drydock Avenue/Pappas Way (Signalized)																
Summer Street EB L	C	23.2	0.01	0	C	22.3	0.31	84	C	21.4	0.30	84	--	--	--	--
Summer Street EB TR	D	43.5	0.82	272	D	45.5	0.88	405	D	46.3	0.90	436	--	--	--	--
Summer Street WB L	C	26.1	0.31	81	C	22.2	0.32	95	C	21.8	0.36	116	--	--	--	--
Summer Street WB TR	C	25.3	0.03	7	C	31.5	0.17	24	C	31.5	0.17	24	--	--	--	--
Drydock Avenue SB LT	C	33.7	0.66	261	D	35.4	0.69	263	D	35.5	0.69	264	--	--	--	--
Drydock Avenue SB R	B	16.7	0.21	62	C	20.8	0.30	66	C	21.9	0.34	68	--	--	--	--
Pappas Way LTR	B	18.8	0.64	406	C	27.1	0.80	464	C	29.0	0.83	464	--	--	--	--
Douglas Street WB LTR	C	26.9	0.70	--	C	30.8	0.83	--	C	31.7	0.85	--	--	--	--	--

[a] LOS = level of service.

[b] Delay = average delay in seconds per vehicle.

[c] V/C = volume/capacity ratio.

[d] Q = 95th percentile queue in ft.

[e] -- = not calculated, not available or not applicable.

EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

7.1.5 PARKING MANAGEMENT

The plan in Appendix A shows that driveways along the ROW to the west of the site will provide access to a 60-space surface parking lot and loading areas. The ROW intersects the north side of Northern Avenue about 350 ft west of Tide Street. TEPP LLC understands that the 60 parking spaces are allowed within the South Boston Parking Freeze set forth in 1993 to promote air quality.

Access Boston parking ratios are in Appendix H. The specified parking ratio is down to 0.7 spaces per 1,000-sf floor area for office/non-residential uses in the South Boston waterfront. A ratio of 0.7 per 1,000-sf yields 252 spaces for 360,000-sf floor area. The 252 spaces exceeds the 60 on-site spaces by 192 spaces. The Marine Industrial Parking Garage supplies spaces for about 1,700 vehicles and is along the south side of Northern Avenue just west of the redevelopment site.

7.1.6 CONSTRUCTION-PERIOD TRAFFIC MANAGEMENT

ROLES OF THE GENERAL CONTRACTOR

The general contractor will:

- be the point of contact and coordination with the City, other public agencies and the community
- designate, maintain and modify construction areas as appropriate
- provide, maintain and modify signs, markings and barriers for traffic and pedestrian safety and efficiency as appropriate

CONTRUCTION WORKERS

Adequate on-site parking will be provided for construction workers during construction. Workers will be encouraged to use transit, with on-site posting on transit information and on-site tool storage if practicable.

CONSTRUCTION TRUCKS

Construction trucks will use designated routes to avoid local streets. Construction trucks will primarily use South Boston Bypass Road and Massport Haul Road. The general contractor will seek to minimize deliveries as practicable during peak commuter times.

7.1.7 TRANSPORTATION MEASURES

INTRODUCTION

The proposed redevelopment does not show significant vehicle-traffic impacts to study-area intersection and does not require traffic mitigation in the form of intersection modifications. However, this TIAS sets forth TDM measures intended to:

- promote alternatives to low-occupancy-automobile commutes
- address area traffic effects of the proposed redevelopment
- generally benefit transportation in the area

These TDM measure relate to:

- encouraging transit use
- encouraging carpools
- facilitating bicycle and pedestrian trips

ENCOURAGING TRANSIT USE

The area is well-served by transit. Both Silver Line SL2 branch and MBTA bus route 4 stop on Northern Avenue at the site. The proposed redevelopment will include posted transit information and materials in public areas.

ENCOURAGING CARPOOLS

The proposed redevelopment may assist in carpool matching or provide preferential convenient parking for carpools as practicable.

FACILITATING BICYCLE AND PEDESTRIAN TRIPS

The area includes bicycle provisions. The proposed redevelopment will include a bicycle rack.

Public sidewalks on Northern Avenue and Tide Street provide direct pedestrian access to the site. The site plan in Appendix A provides for pedestrian facilities that connect with these public sidewalks.

7.1.8 CONCLUSION

PROJECT DESCRIPTION

TIAS analyzes the proposed One Northern Avenue Place redevelopment in the City of Boston, Massachusetts. The site is BMIP Parcel R.

The site is in the northwest quadrant of the Northern Avenue/Tide Street intersection.

The previous site use was a warehouse of with a floor area of about 112,868 sf. The plan in Appendix A provides for site uses of research and development or light industrial with a proposed floor area of about 360,000 sf.

The plan in Appendix A shows that driveways along the ROW to the west of the site will provide access to a 60-space parking lot and loading areas. The ROW intersects the north side of Northern Avenue about 350 ft west of Tide Street.

CAPACITY ANALYSIS

TEPP LLC conducted capacity analysis:

- for the weekday AM and PM peak hours under relevant existing and future conditions, as described above
- for relevant study-area intersections
- to calculate levels of service, delays and queues

Capacity analysis findings are:

- the Northern Avenue/Massport Haul Road intersection (roundabout) shows overall low-to-moderate delays
- the Northern Avenue/Tide Street intersection (multi-way STOP-sign unsignalized) shows low delays
- the Drydock Avenue/Tide Street intersection (two-way STOP-sign unsignalized) shows low-to-moderate delays except for the 2018 no-build and 2018 build AM peak hour, with delayed operations for the Tide Street southbound approach
- the Drydock Avenue/Tide Street intersection (modified to all-way STOP-sign unsignalized) shows low delays for the 2018 build modified AM and PM peak hours

- the Summer Street/Drydock Avenue/Pappas Way intersection (signalized) shows overall moderate delays

TRANSIT

The MBTA provides transit service adjacent to the redevelopment site, as Appendix D shows. MBTA stops are on either side of Northern Avenue along and across from the site frontage. The Silver Line SL2 branch (South Station—Design Center) and Bus Route 4 (North Station—Tide Street) use both stops.

PEDESTRIANS AND BICYCLES

The redevelopment site is in the BMIP. As the BMIP has redeveloped, pedestrian and bicycle facilities have improved. Area streets include bicycle lanes or lanes marked for share bicycle and motor vehicle use. Most area streets include sidewalks, and intersections near the site include marked crosswalks.

CONSTRUCTION-PERIOD TRAFFIC MANAGEMENT

The general contractor will:

- be the point of contact and coordination with the City, other public agencies and the community
- designate, maintain and modify construction areas as appropriate
- provide, maintain and modify signs, markings and barriers for traffic and pedestrian safety and efficiency as appropriate

Adequate on-site parking will be provided for construction workers during construction. Workers will be encouraged to use transit, with on-site posting on transit information and on-site tool storage if practicable.

Construction trucks will use designated routes to avoid local streets. Construction trucks will primarily use South Boston Bypass Road and Massport Haul Road. The general contractor will seek to minimize deliveries as practicable during peak commuter times

PARKING MANAGEMENT

TEPP LLC understands that the proposed 60 on-site parking spaces are allowed within the South Boston Parking Freeze set forth in 1993 to promote air quality.

The specified parking ratio is down to 0.7 spaces per 1,000-sf floor area for office/non-residential uses in the South Boston waterfront. A ratio of 0.7 per 1,000-sf yields 252 spaces for 360,000-sf floor area.

The 252 spaces exceeds than the 60 on-site spaces by 192 spaces. The Marine Industrial Parking Garage supplies spaces for about 1,700 vehicles and is along the south side of Northern Avenue just west of the redevelopment site.

TRANSPORTATION MEASURES

The proposed redevelopment does not show significant vehicle-traffic impacts to study-area intersection and does not require traffic mitigation in the form of intersection modifications. However, this TIAS sets forth TDM measures intended to:

- promote alternatives to low-occupancy-automobile commutes
- address area traffic effects of the proposed redevelopment
- generally benefit transportation in the area

These TDM measure relate to:

- encouraging transit use by providing transit information
- encouraging carpools, potentially by assisting in carpool matching or providing preferential convenient parking for carpools
- facilitating bicycle and pedestrian trips by providing an on-site bicycle rack and on-site pedestrian facilities that connect with the public sidewalks that border the site

CHAPTER 8
SITE PLAN

8.0 Site Plan

The proposed project is not located in a Conservation Protection Subdistrict (CPS) or a Greenbelt Protection Overlay District (GPOD) and therefore it is not required to provide the Site Plan Component outlined in Section 80B-3.6.

CHAPTER 9
DEVELOPMENTAL IMPACT PROJECT

9.0 Development Impact Project

There is no zoning variance required; therefore no Development Impact Project is required.

EXHIBIT A
DESIGN CONCEPT

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - LEVEL 1

HDR

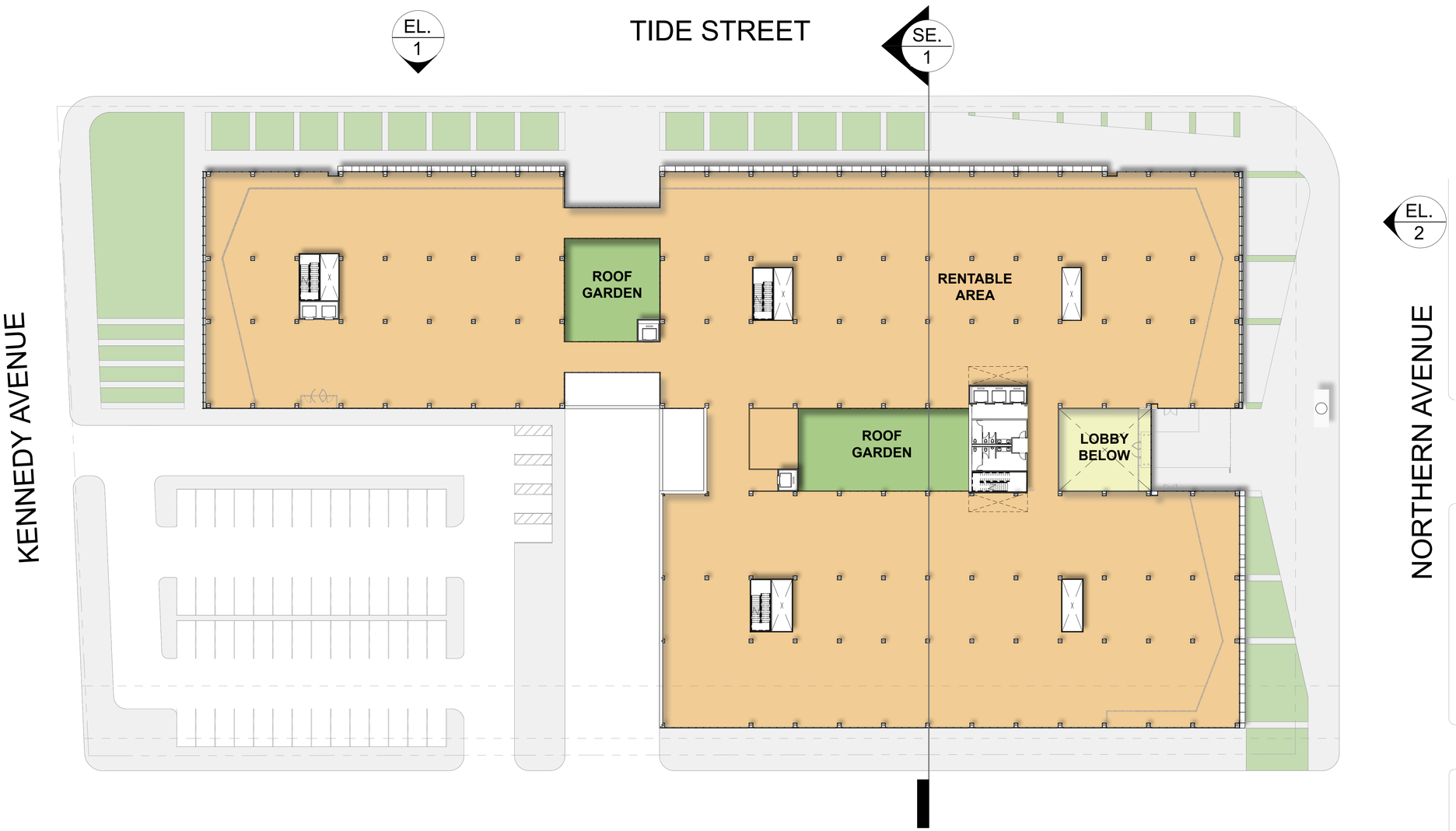
0' 20' 40' 80'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - TYPICAL PLAN



HDR

0' 20' 40' 80'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - TIDE ST ELEVATION

1 TIDE STREET ELEVATION

HDR

0' 5' 10' 20'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - ELEVATIONS

1 TIDE STREET ELEVATION

0' 5' 10' 20'

2 NORTHERN AVE ELEVATION

0' 5' 10' 20'

A PARTIAL ELEVATION

HDR

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - TIDE ST PARTIAL ELEVATION

1 TIDE ST PARTIAL ELEVATION

HDR

0' 5' 10' 20'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - NORTHERN AVE ELEVATION

2 NORTHERN AVE ELEVATION

HDR

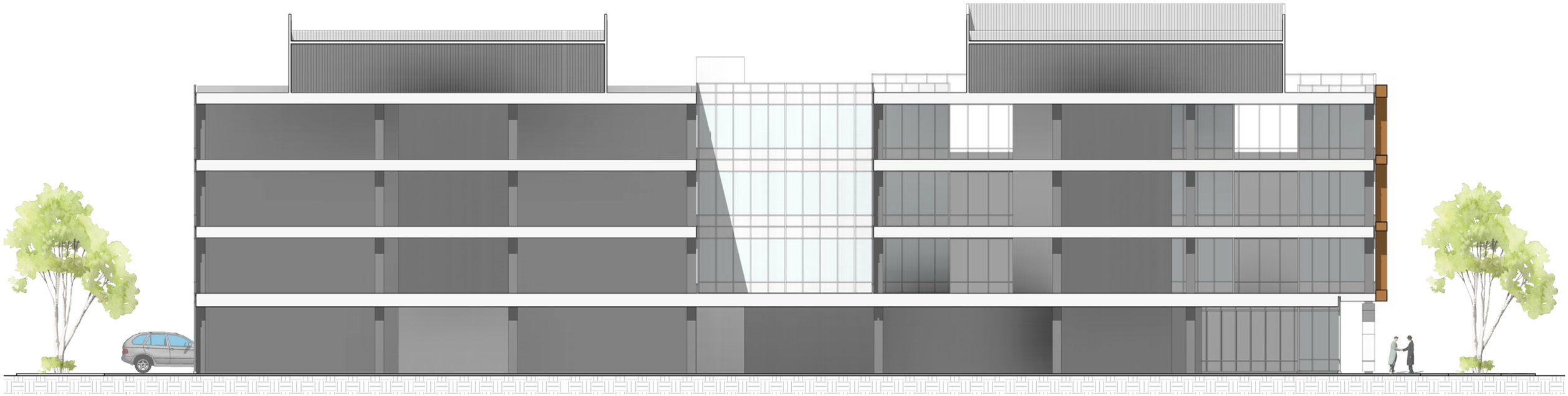
0' 5' 10' 20'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

DESIGN CONCEPT - BUILDING SECTION



1 BUILDING SECTION

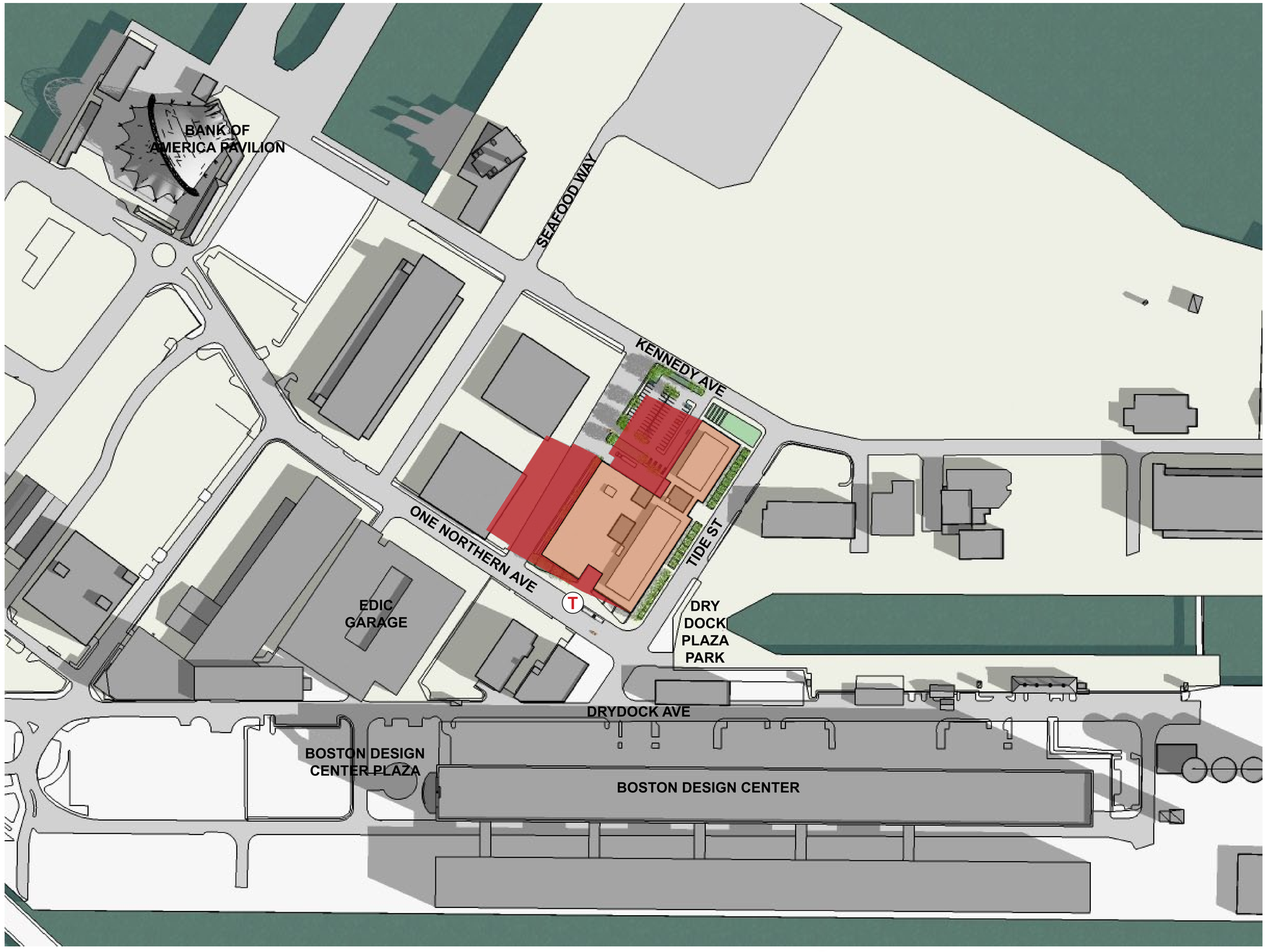
HDR

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

EXHIBIT B
SHADOW STUDY

INNOVATION SQUARE AT NORTHERN AVENUE



SHADOW STUDY: MARCH 21, 9:00 AM

LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

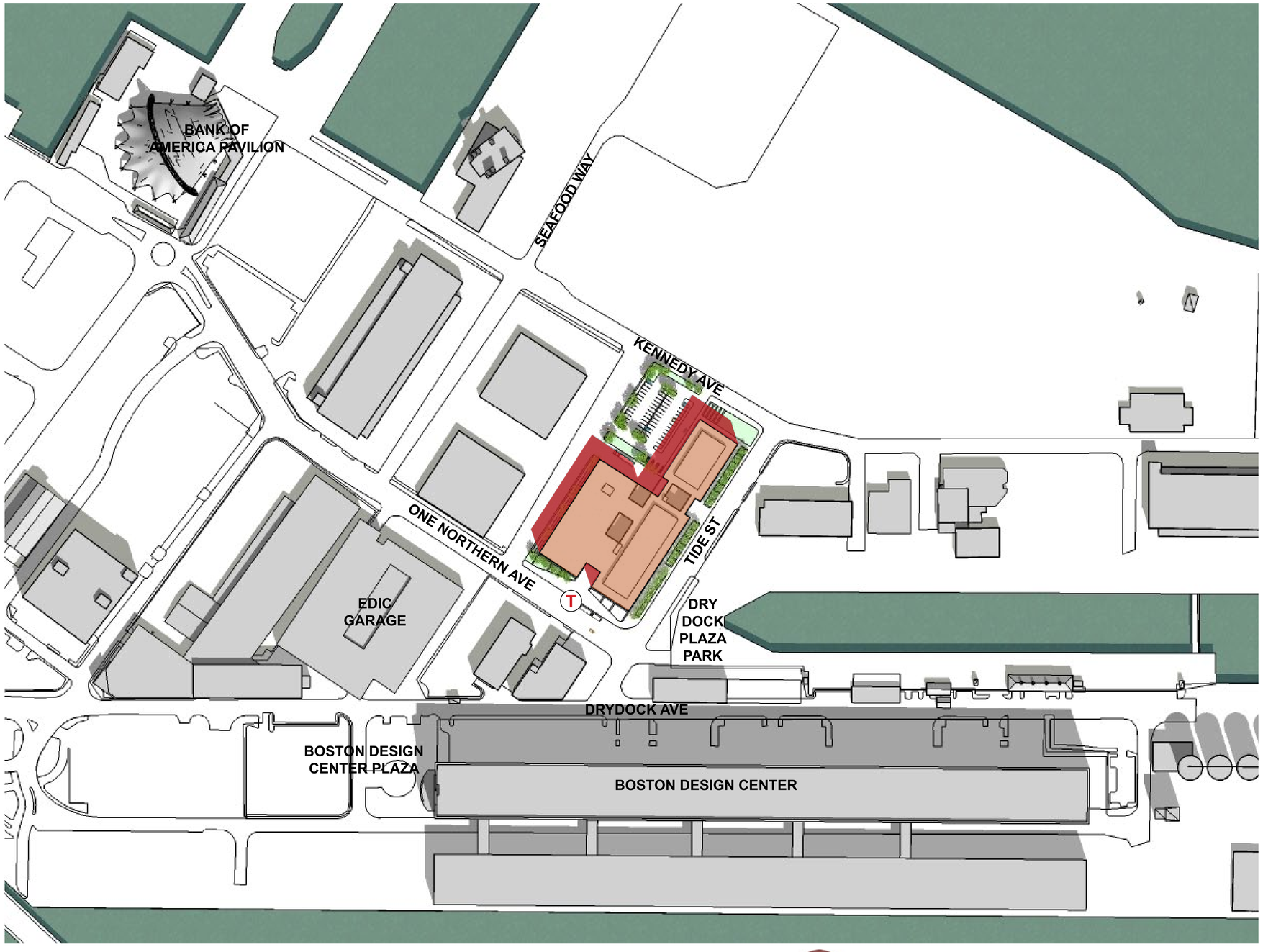
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: MARCH 21, 12 NOON



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

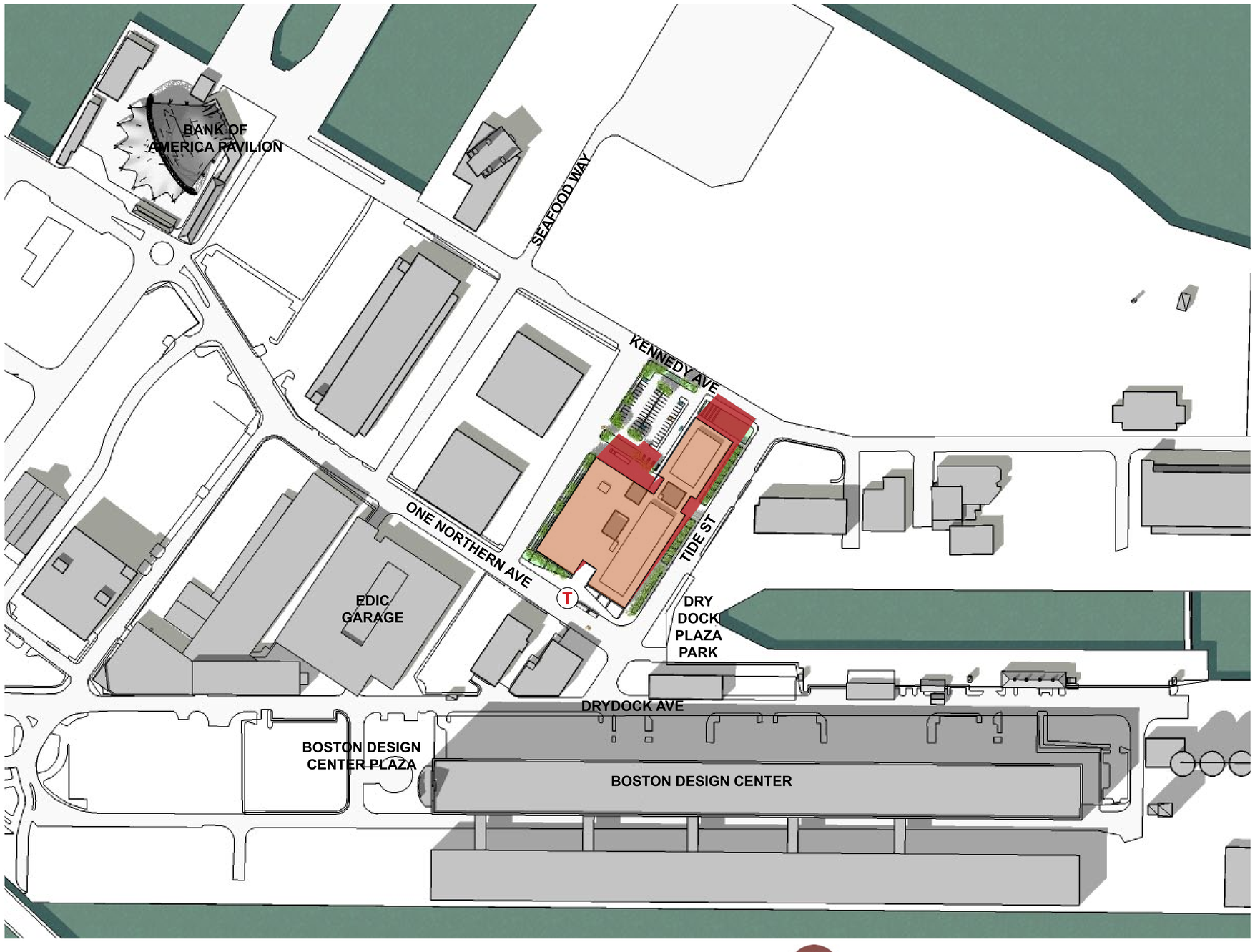
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: MARCH 21, 3:00 PM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

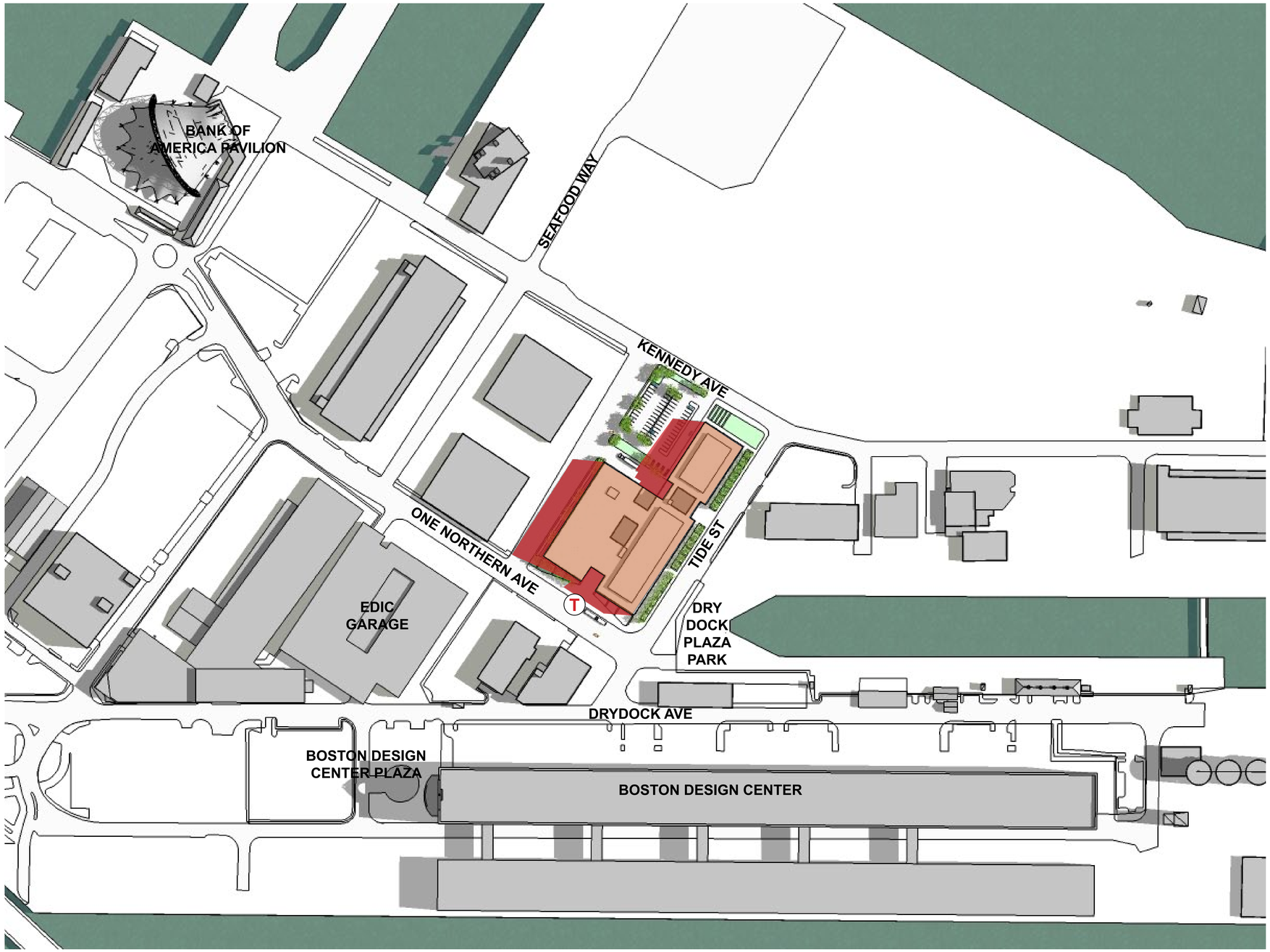
0' 50' 100' 200'

Kavanagh Advisory Group, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: JUNE 21, 9:00 AM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

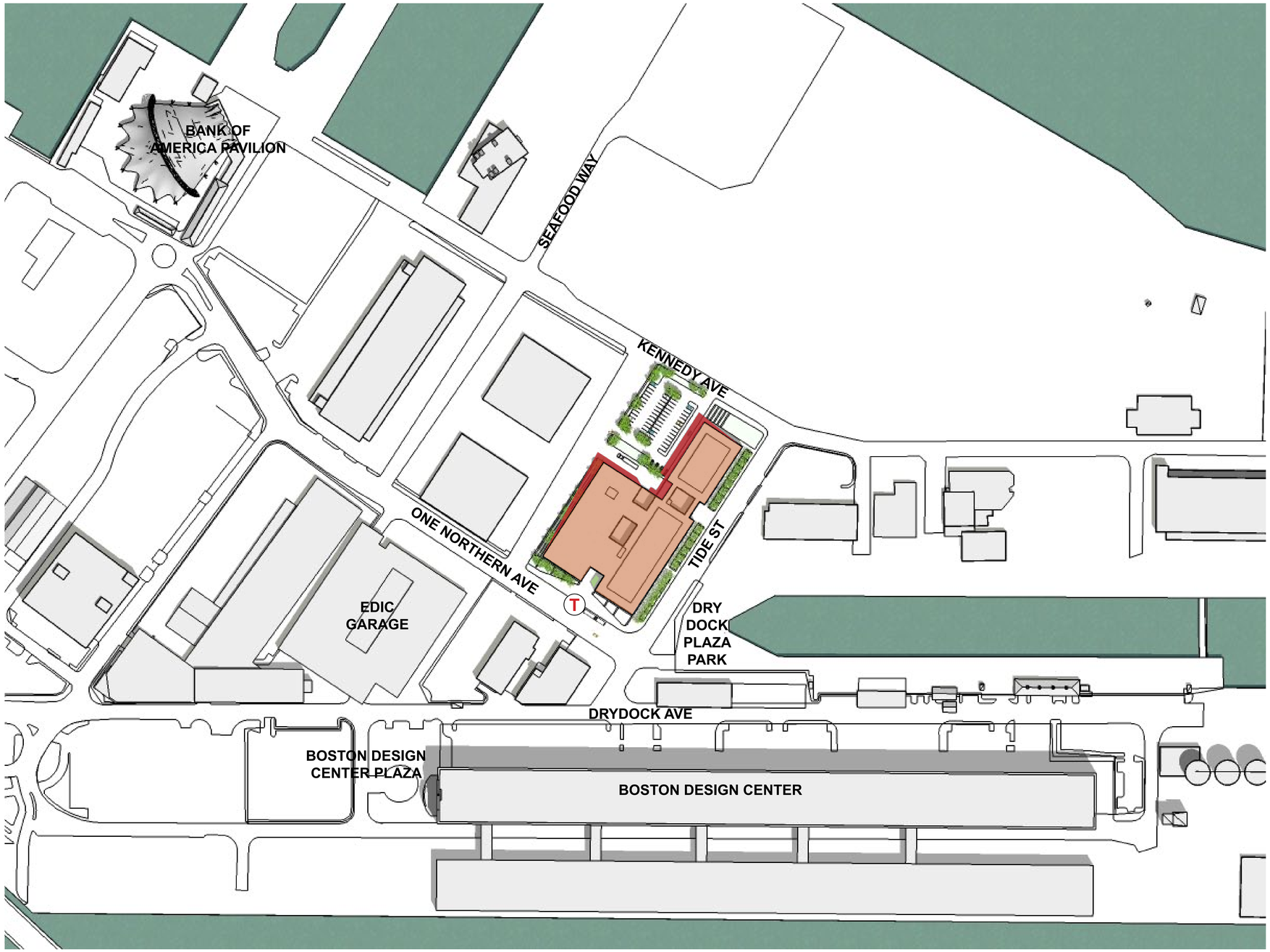
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: JUNE 21, 12 NOON



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

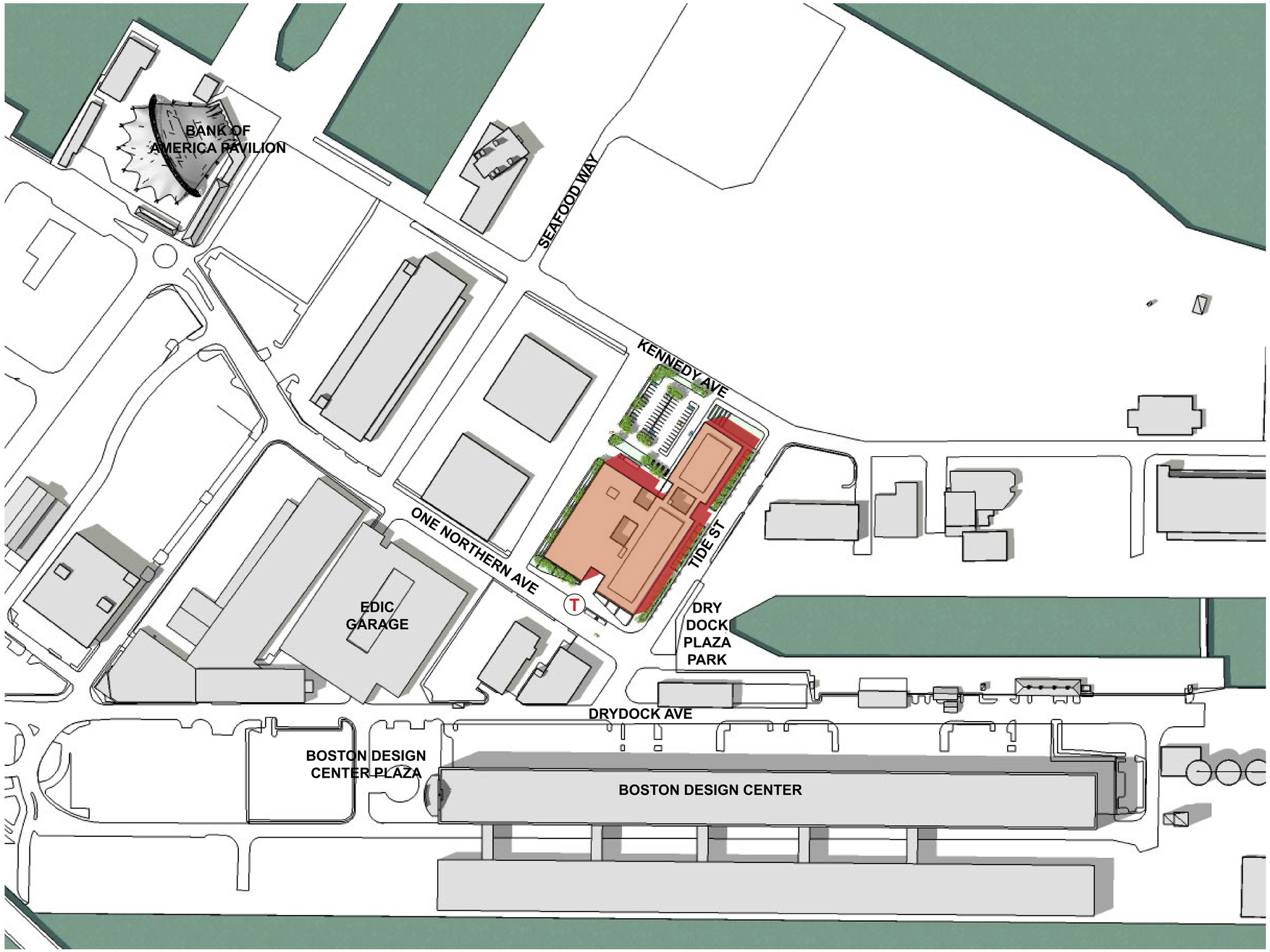
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: JUNE 21, 3:00 PM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

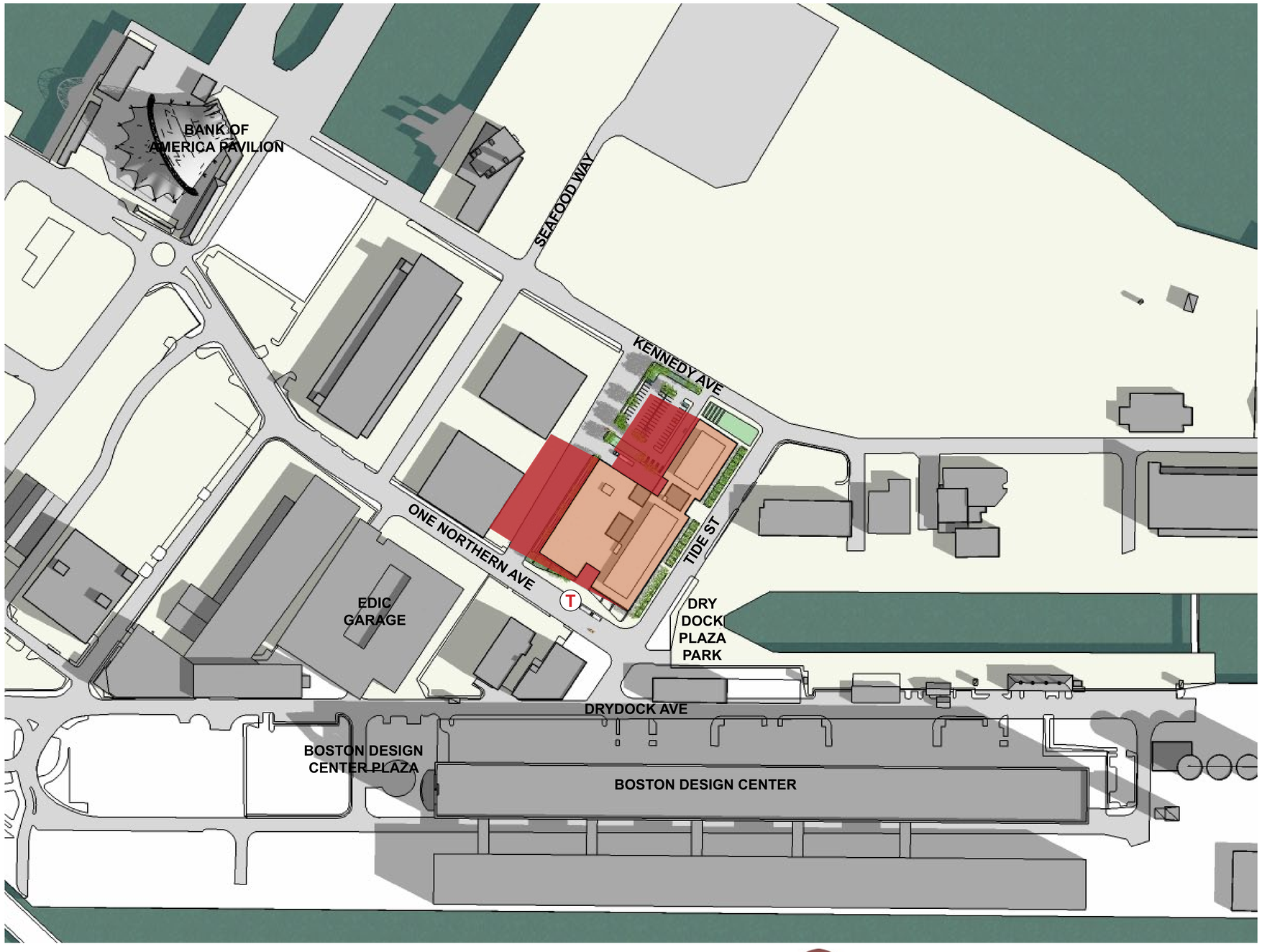
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: SEPT. 21, 9:00 AM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

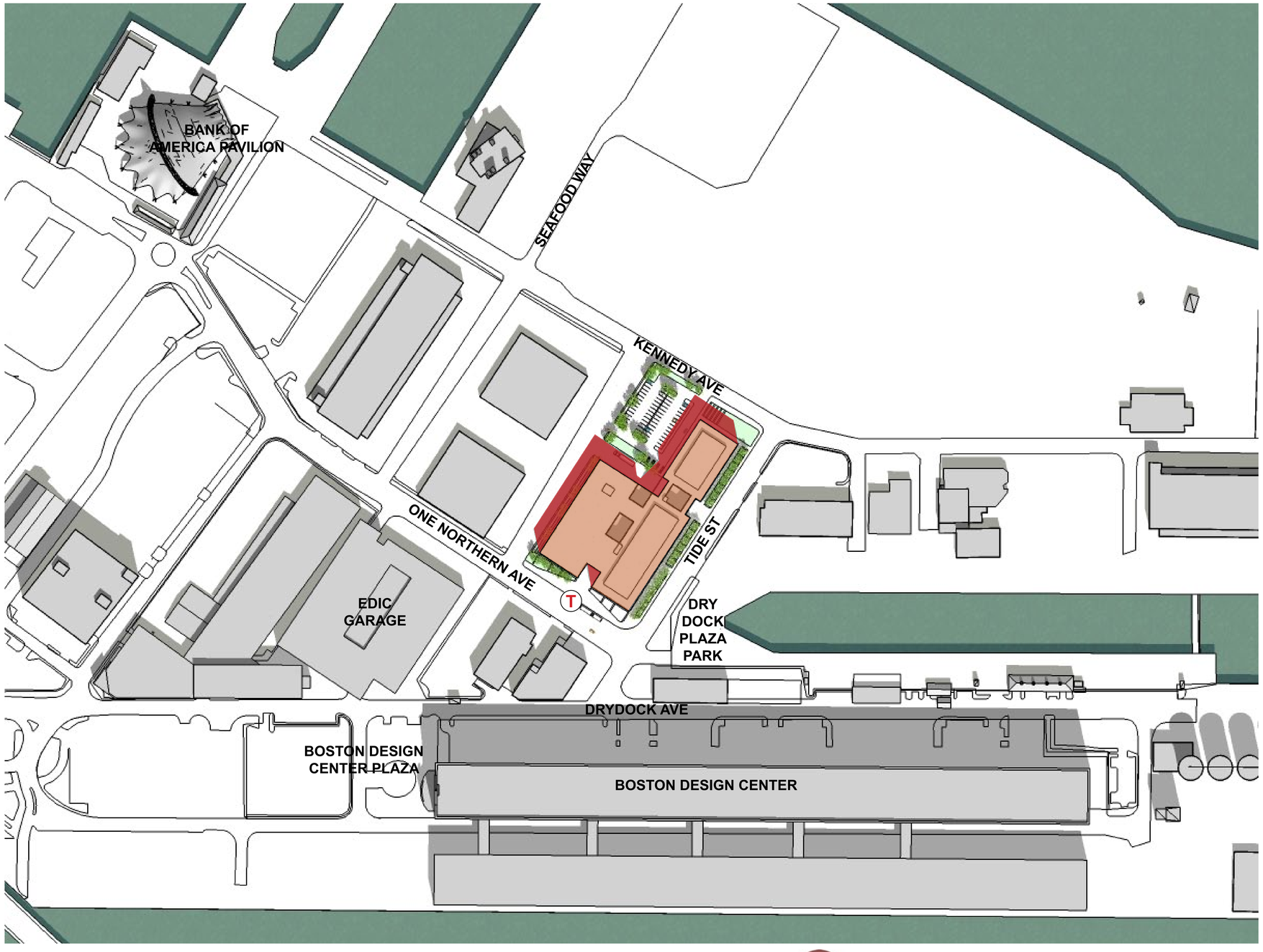
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: SEPT. 21, 12 NOON



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

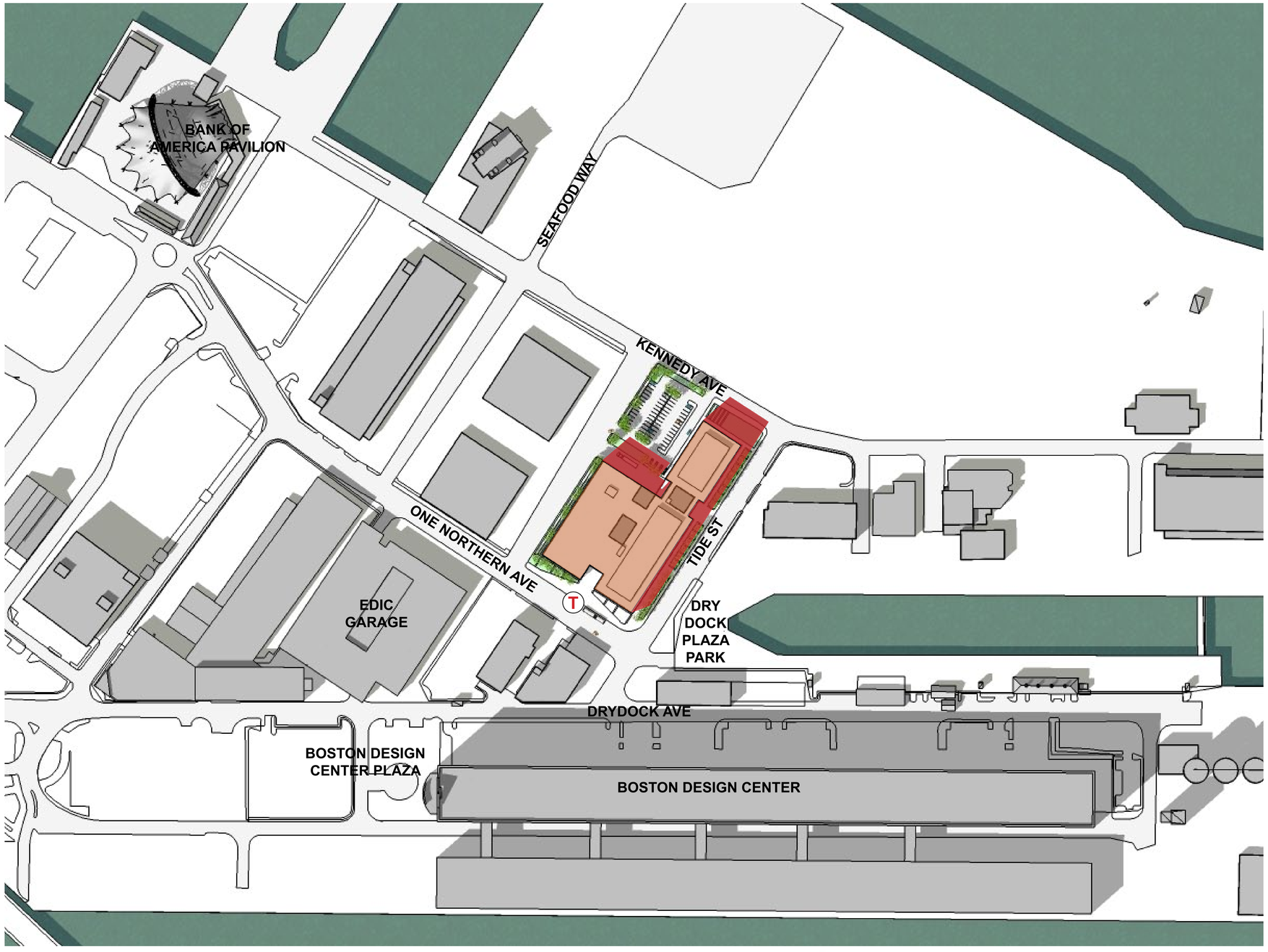
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: SEPT. 21, 3:00 PM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

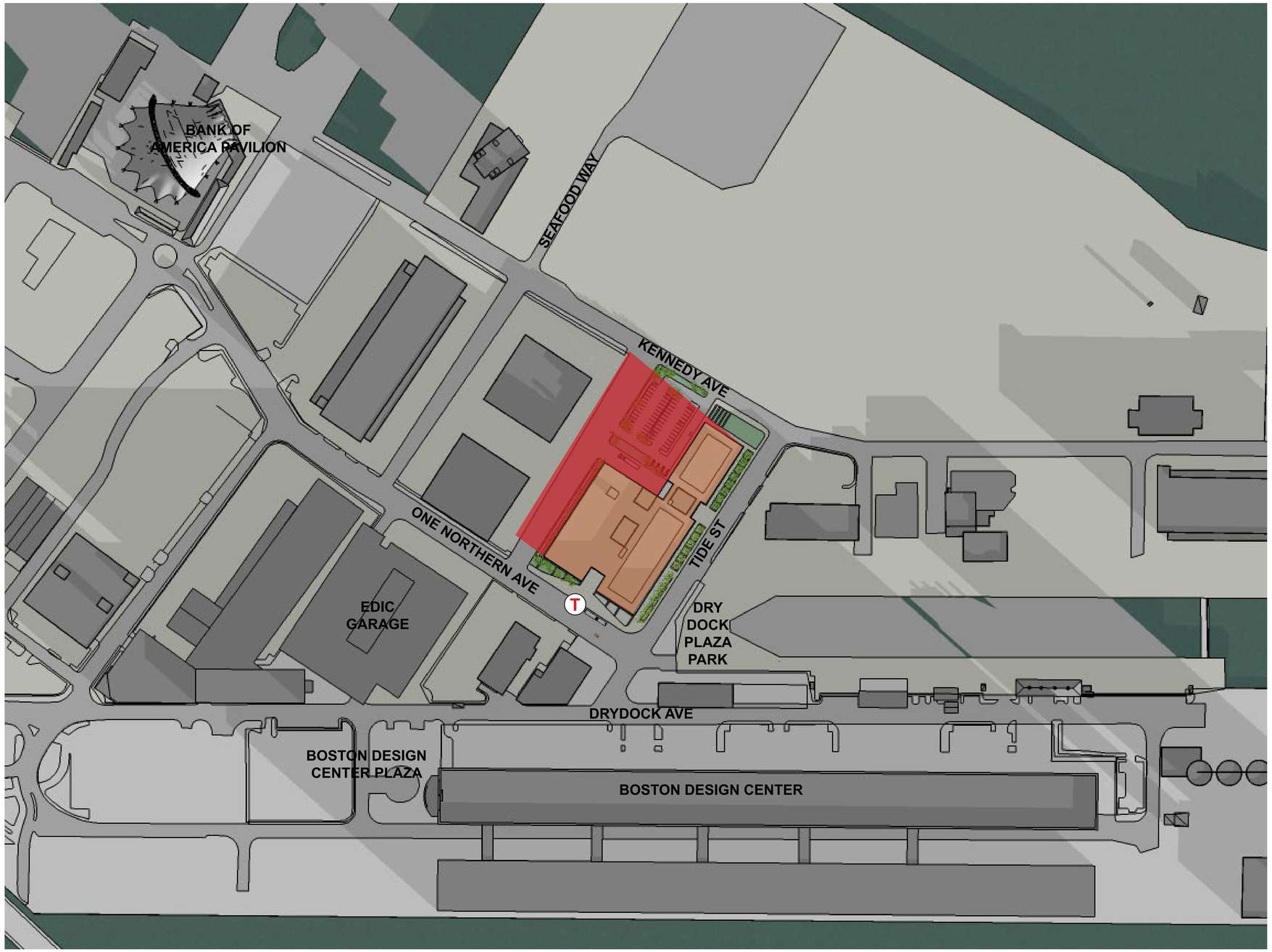
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: DEC. 21, 9:00 AM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

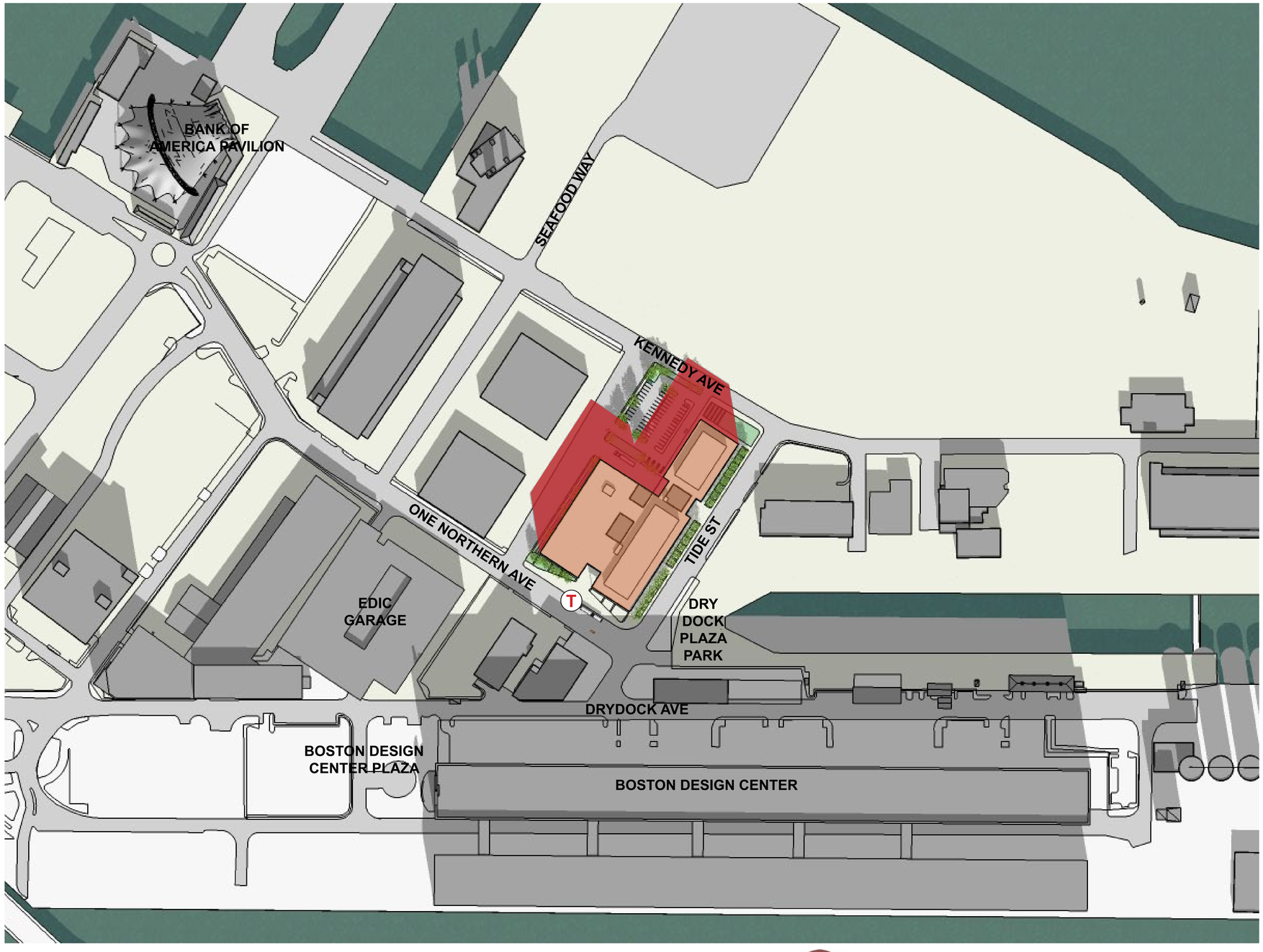
HDR

0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE



SHADOW STUDY: DEC. 21, 12 NOON

LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

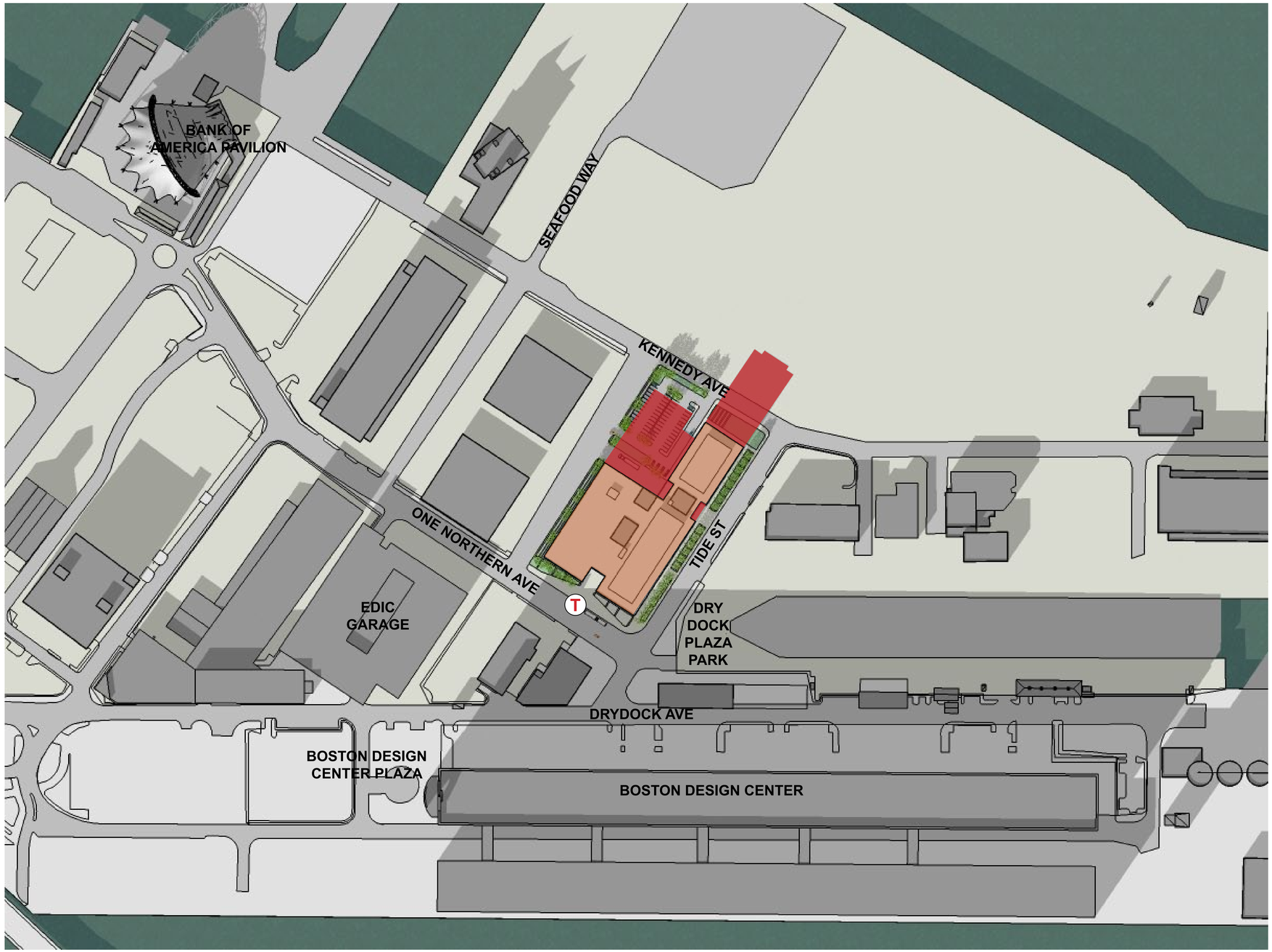
0' 50' 100' 200'

KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

INNOVATION SQUARE AT NORTHERN AVENUE

SHADOW STUDY: DEC. 21, 3:00 PM



LEGEND

- ONE NORTHERN AVE
- EXISTING SHADOW
- NEW SHADOW
- WATER

HDR

0' 50' 100' 200'

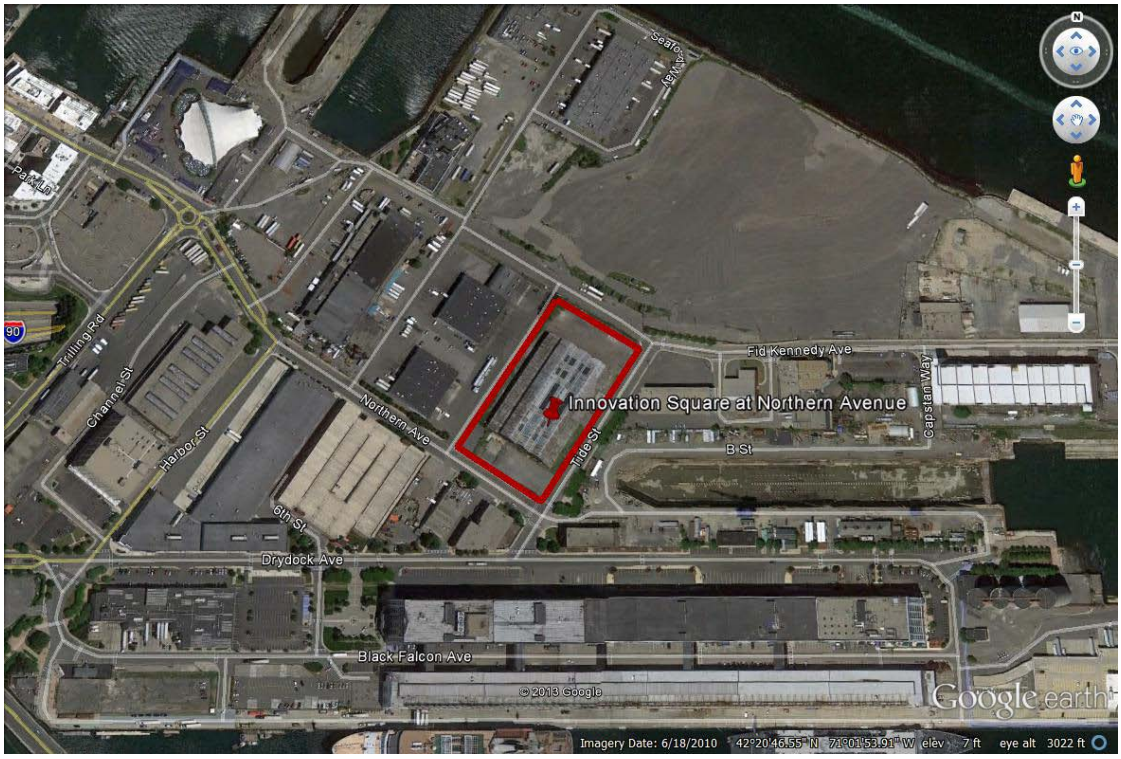
KAVANAGH ADVISORY GROUP, LLC

11 SEPTEMBER 2013

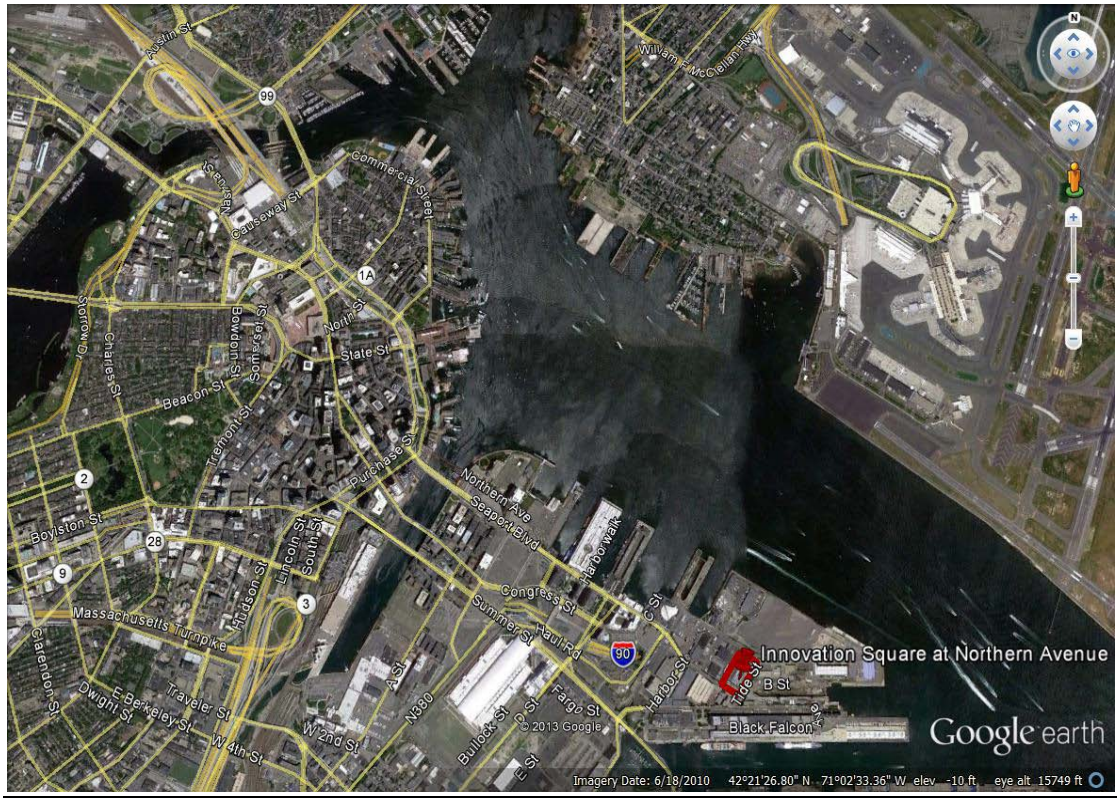
EXHIBIT C
IMAGES

Aerial Images of Innovation Square at Northern Avenue Site

Aerial Image Showing Boston Marine Industrial Park



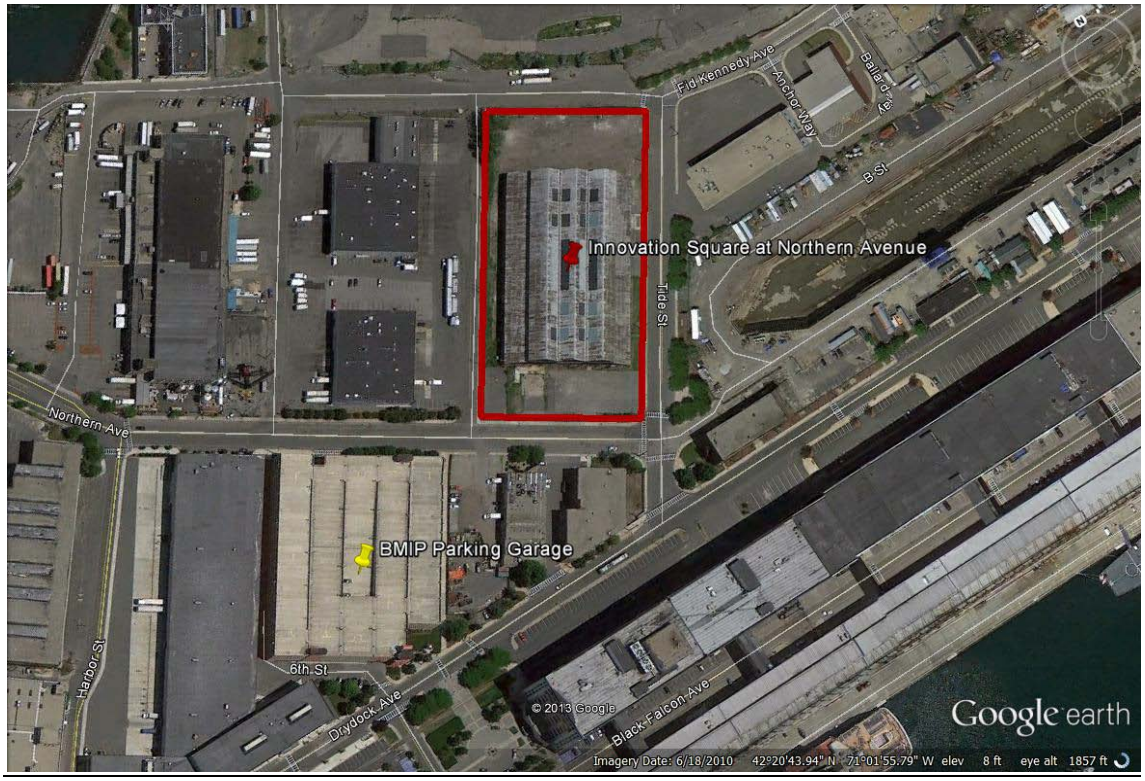
Aerial Image Showing Site Location Relative to City of Boston Downtown Core



Aerial Images of Innovation Square at Northern Avenue Site

Aerial Image Showing Close-up View of Project Site

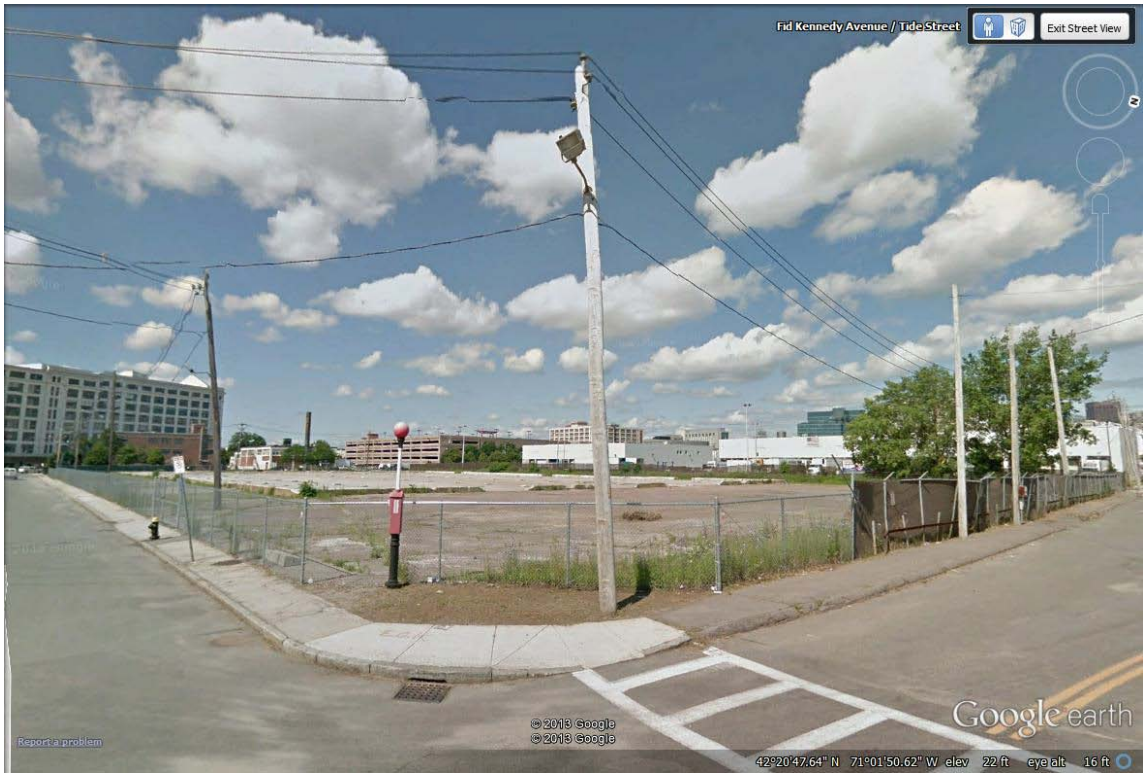
Aerial Image Showing Project Site and BMIP Parking Garage



Existing Condition & Project Site Photos

Corner of Fid Kennedy Avenue and Right-of-Way

Corner of Fid Kennedy Avenue and Tide Street



Existing Condition & Project Site Photos

Corner of Northern Avenue and Right-of-Way

Corner of Northern Avenue and Tide Street

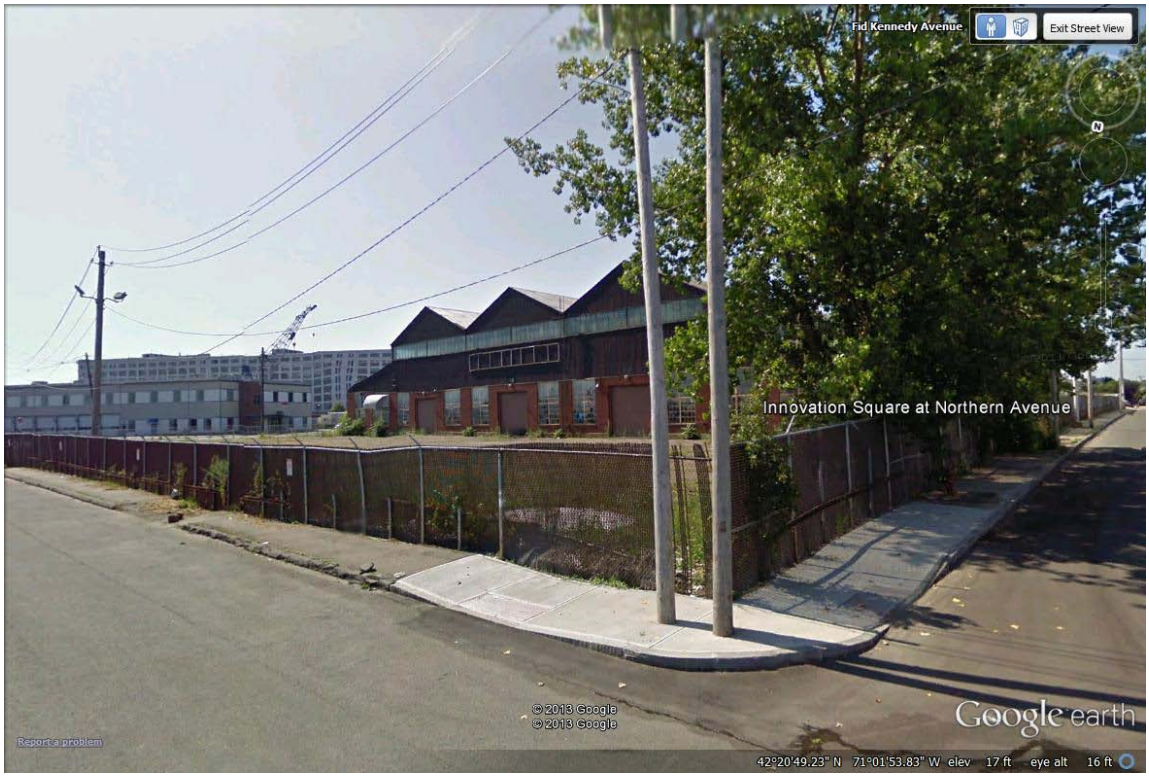
Existing Condition & Project Site Photos

Mid-point of Project Site looking North-West from Tide Street

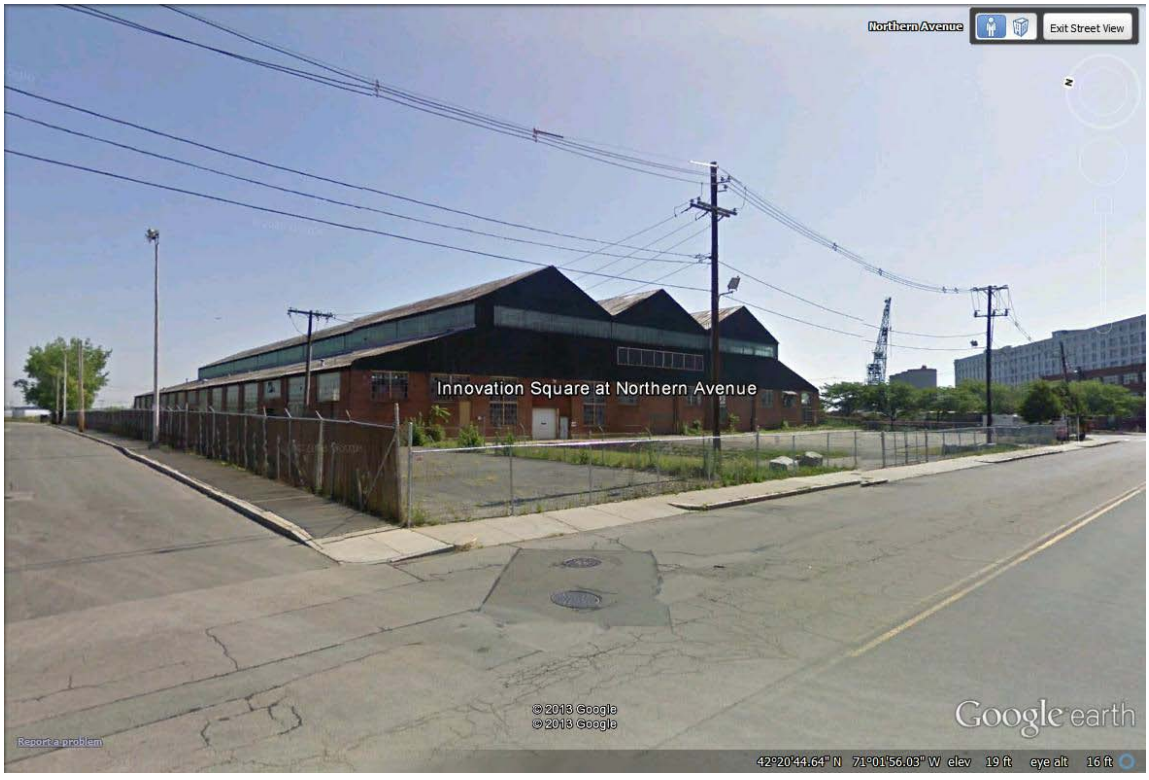
Mid-point of Project Site looking North from Northern Avenue

J.J. Daly Building Project Site Photos

Corner of Fid Kennedy Avenue and Right-of-Way



Corner of Northern Avenue and Right-of-Way



J.J. Daly Building Project Site Photos

Corner of Tide Street and Northern Avenue

Corner of Tide Street and Fid Kennedy Avenue

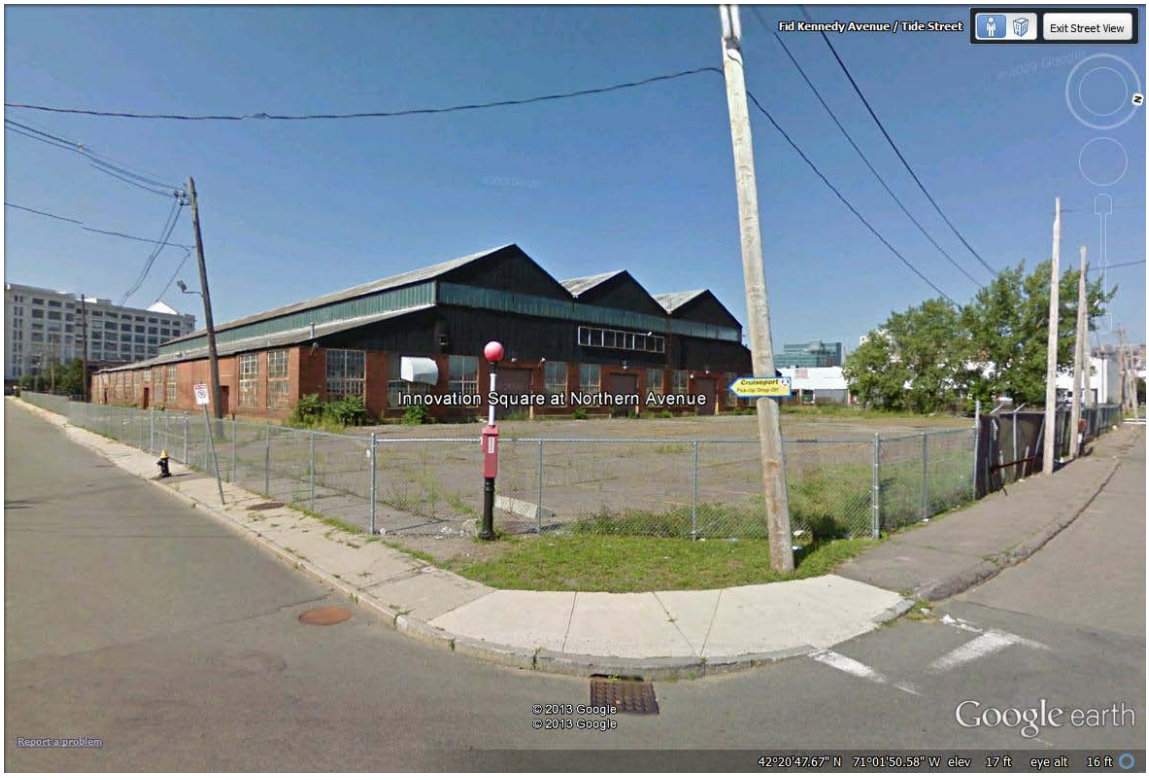


EXHIBIT D
MAPS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane mainland zone (FIPSZONE 2001). The horizontal **datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from digital orthophotography. Base map files were provided in digital form by Massachusetts Geographic Information System (MassGIS). Ortho imagery was produced at a scale of 1:5,000. Aerial photography is dated April 2005.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 — 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000 mN	1000-meter Universal Transverse Mercator grid, zone 19
6000000 M	5000-foot grid: Massachusetts State Plane coordinate system, mainland zone (FIPSZONE 2001), Lambert Conformal Conic
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 25, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0082G

FIRM
FLOOD INSURANCE RATE MAP
SUFFOLK COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 82 OF 151
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOSTON, CITY OF	250286	0082	G
WINTHROP, TOWN OF	250289	0082	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
25025C0082G
EFFECTIVE DATE
SEPTEMBER 25, 2009

Federal Emergency Management Agency

NOTES TO USERS

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SSMC-3, #9202
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LEGEND

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
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ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
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FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

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ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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OTHERWISE PROTECTED AREAS (OPAs)

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	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 — 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000 mN	1000-meter Universal Transverse Mercator grid, zone 19
6000000 M	5000-foot grid: Massachusetts State Plane coordinate system, mainland zone (FIPSZONE 2001), Lambert Conformal Conic
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 25, 2009
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0081G

FIRM
FLOOD INSURANCE RATE MAP
SUFFOLK COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 81 OF 151
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

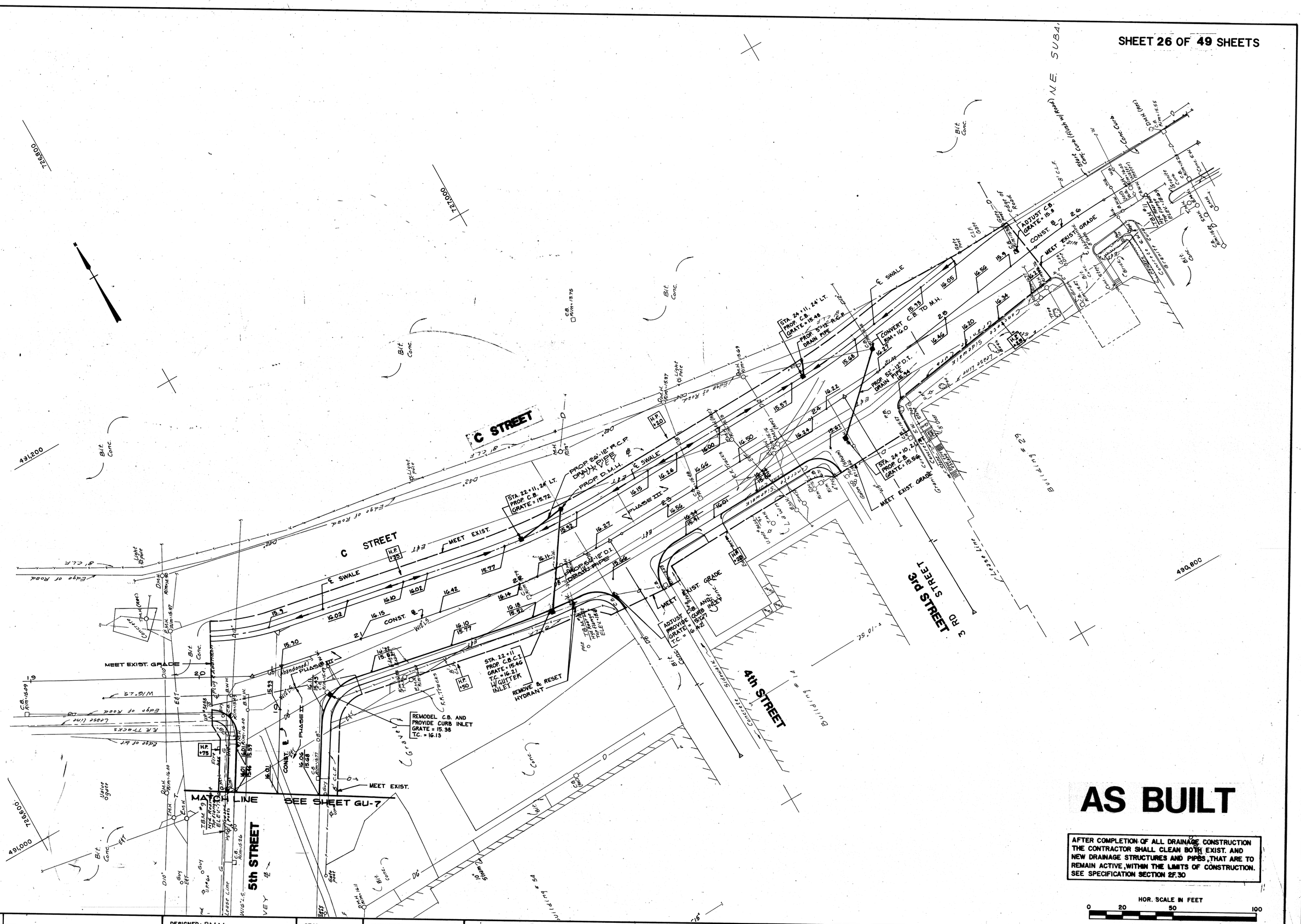
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOSTON, CITY OF	250286	0081	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
25025C0081G
EFFECTIVE DATE
SEPTEMBER 25, 2009

Federal Emergency Management Agency



AS BUILT

AFTER COMPLETION OF ALL DRAINAGE CONSTRUCTION THE CONTRACTOR SHALL CLEAN BOTH EXIST. AND NEW DRAINAGE STRUCTURES AND PIPES, THAT ARE TO REMAIN ACTIVE, WITHIN THE LIMITS OF CONSTRUCTION. SEE SPECIFICATION SECTION 2F.30

HOR. SCALE IN FEET
0 20 50 100

NO.	DATE	BY	REVISION
	4/1/86		REVISED FOR READVERTISEMENT

DESIGNED: P.M.M.
DRAWN: W.J.G.
CHECKED: W.J.C.
DATE: JAN. 1, 1986

SEAL: COMMONWEALTH OF MASSACHUSETTS ROBERT JOSEPH CATON #23654 REGISTERED PROFESSIONAL ENGINEER
LG-109-56

SUBMITTED:
REVIEWED:

ECONOMIC DEVELOPMENT AND INDUSTRIAL CORPORATION OF BOSTON

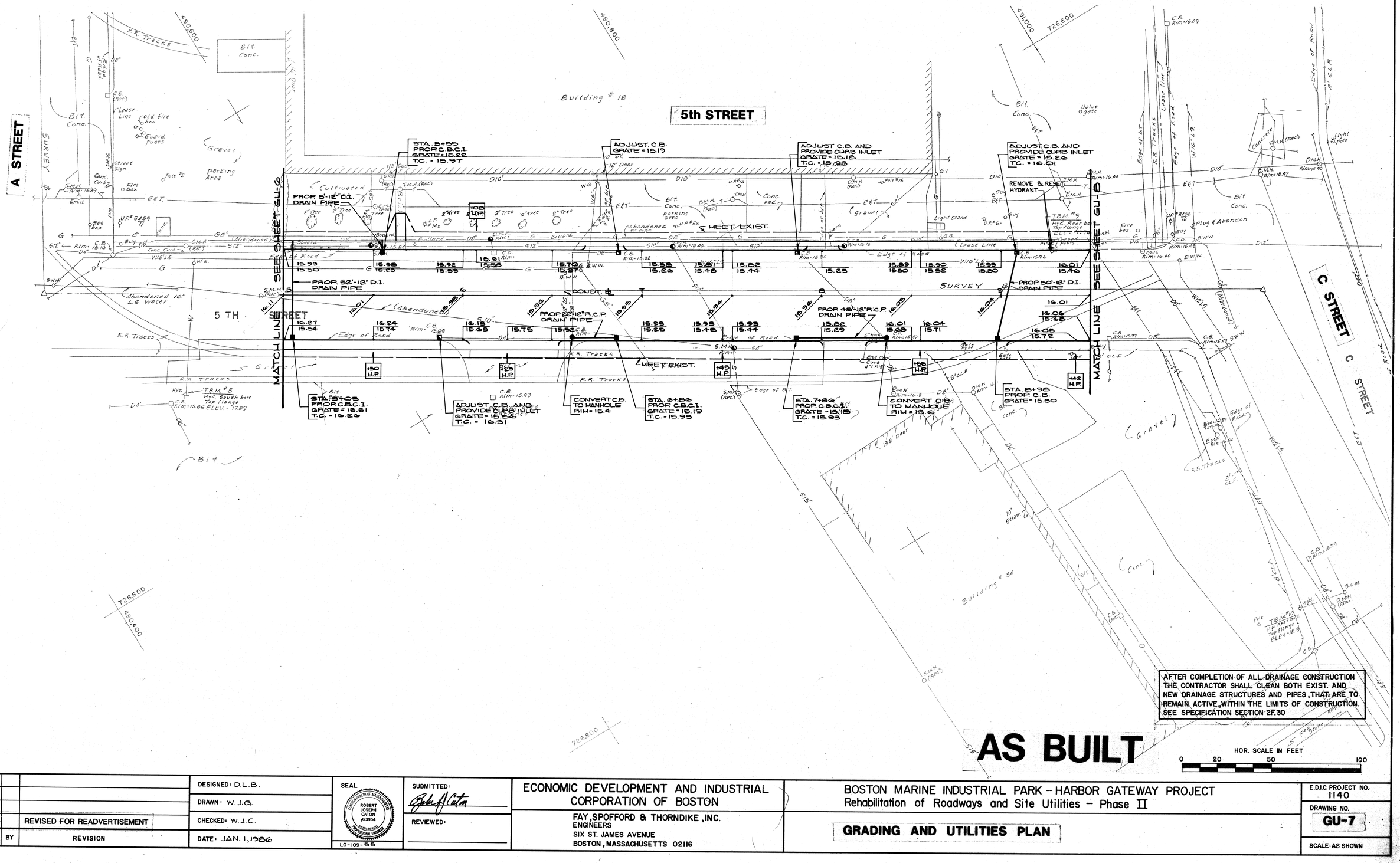
FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
SIX ST. JAMES AVENUE
BOSTON, MASSACHUSETTS 02116

BOSTON MARINE INDUSTRIAL PARK – HARBOR GATEWAY PROJECT
Rehabilitation of Roadways and Site Utilities – Phase II & III

GRADING AND UTILITIES PLAN

E.D.I.C. PROJECT NO. 1140
DRAWING NO. GU-8
SCALE: AS SHOWN

SHEET 25 OF 49 SHEETS



AFTER COMPLETION OF ALL DRAINAGE CONSTRUCTION THE CONTRACTOR SHALL CLEAN BOTH EXIST. AND NEW DRAINAGE STRUCTURES AND PIPES, THAT ARE TO REMAIN ACTIVE, WITHIN THE LIMITS OF CONSTRUCTION. SEE SPECIFICATION SECTION 2F.30

AS BUILT

HOR. SCALE IN FEET
0 20 50 100

NO.	DATE	BY	REVISION
	4/1/86		REVISED FOR READVERTISEMENT

DESIGNED: D.L.B.
DRAWN: W.J.G.
CHECKED: W.J.C.
DATE: JAN. 1, 1986

SEAL
ROBERT JOSEPH CATON #23954
LG-109-55

SUBMITTED: Robert J Caton
REVIEWED:

ECONOMIC DEVELOPMENT AND INDUSTRIAL
CORPORATION OF BOSTON

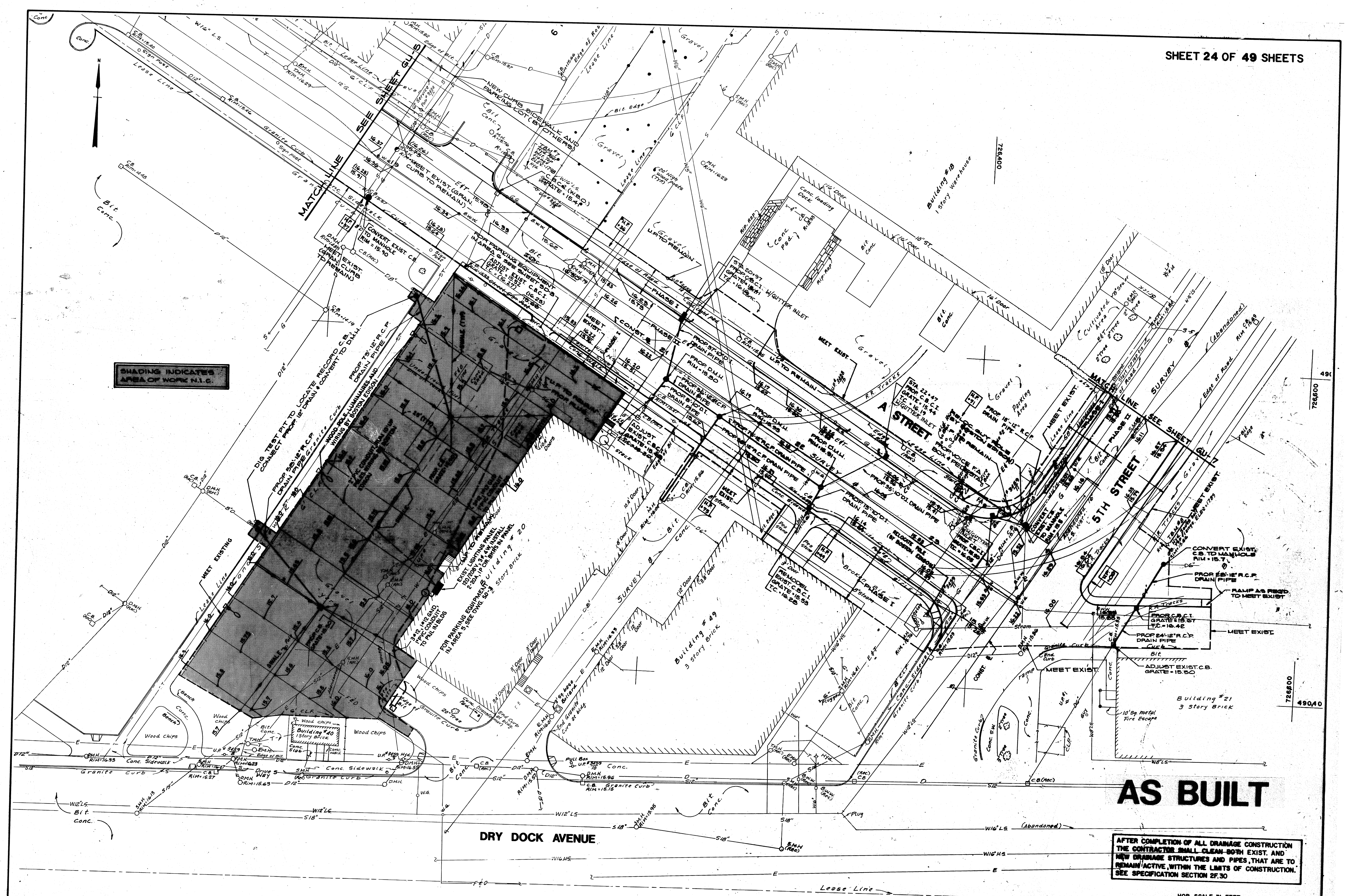
FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
SIX ST. JAMES AVENUE
BOSTON, MASSACHUSETTS 02116

BOSTON MARINE INDUSTRIAL PARK - HARBOR GATEWAY PROJECT
Rehabilitation of Roadways and Site Utilities - Phase II

GRADING AND UTILITIES PLAN

E.D.I.C. PROJECT NO. 1140
DRAWING NO. GU-7
SCALE: AS SHOWN

SHEET 24 OF 49 SHEETS



AFTER COMPLETION OF ALL DRAINAGE CONSTRUCTION THE CONTRACTOR SHALL CLEAN BOTH EXIST. AND NEW DRAINAGE STRUCTURES AND PIPES, THAT ARE TO REMAIN ACTIVE, WITHIN THE LIMITS OF CONSTRUCTION. SEE SPECIFICATION SECTION 2F.30

HOR. SCALE IN FEET 0 20 50 100

NO.	DATE	BY	REVISION
	4/1/86		REVISED FOR READVERTISEMENT

DESIGNED: P.M.M.
DRAWN: R.A.M.
CHECKED: R.J.C.
DATE: NOV. 11, 1985

SEAL: ROBERT JOSEPH CATON — LG-109-21

SUBMITTED:
REVIEWED:

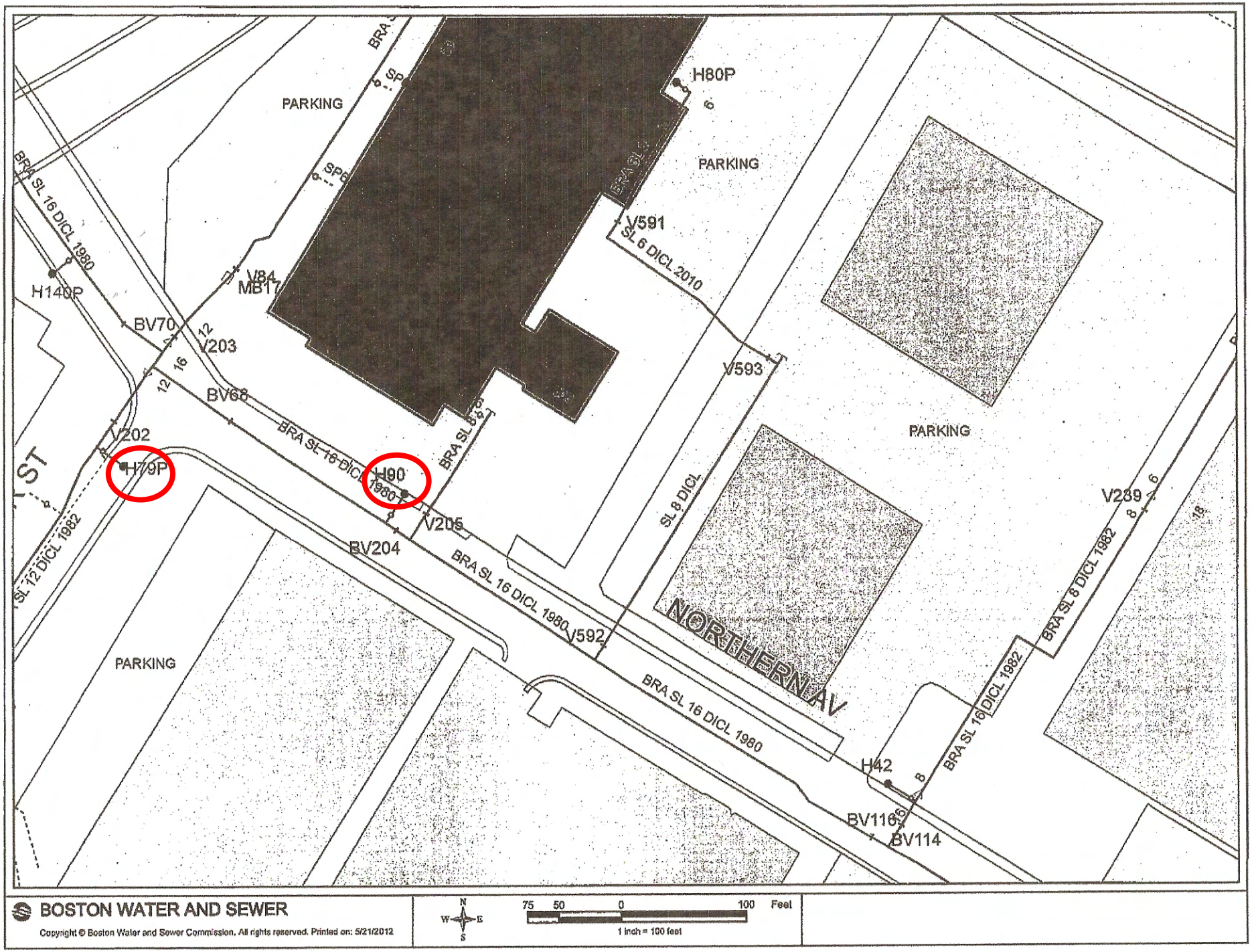
ECONOMIC DEVELOPMENT AND INDUSTRIAL CORPORATION OF BOSTON

FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS
SIX ST. JAMES AVENUE
BOSTON, MASSACHUSETTS 02116

BOSTON MARINE INDUSTRIAL PARK - HARBOR GATEWAY PROJECT
Rehabilitation of Roadways and Site Utilities - Phase I & II

GRADING AND UTILITIES PLAN

E.D.I.C. PROJECT NO. 1140
DRAWING NO. GU-6
SCALE: AS SHOWN



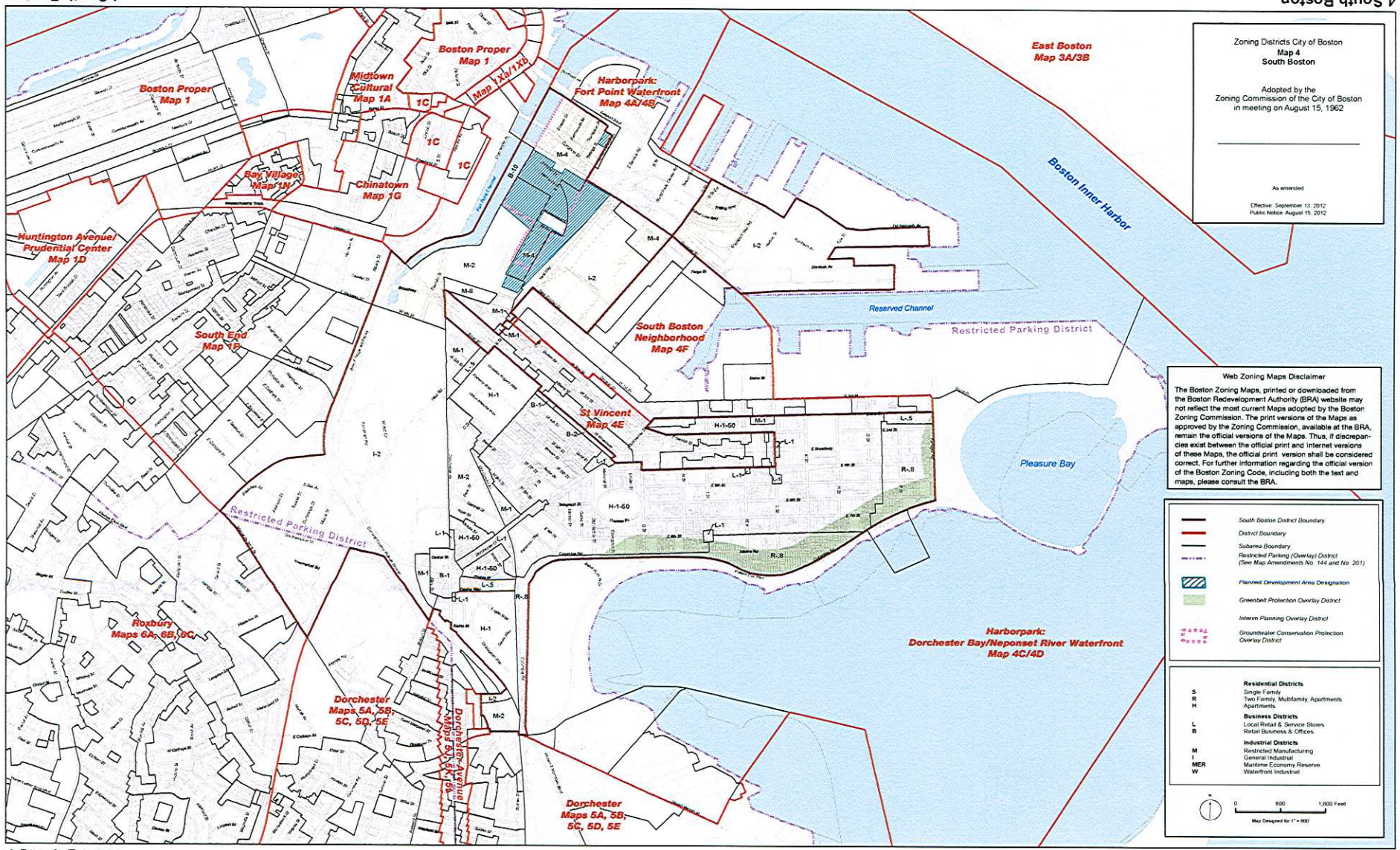

Zoning Districts City of Boston
Map 4
South Boston
Adopted by the
Zoning Commission of the City of Boston
in meeting on August 15, 1962
As amended
Effective September 13, 2012
Public Notice August 15, 2012
Web Zoning Maps Disclaimer
The Boston Zoning Maps, printed or downloaded from the Boston Redevelopment Authority (BRA) website may not reflect the most current Maps adopted by the Boston Zoning Commission. The print versions of the Maps as approved by the Zoning Commission, available at the BRA, remain the official versions of the Maps. Thus, if discrepancies exist between the official print and Internet versions of these Maps, the official print version shall be considered correct. For further information regarding the official version of the Boston Zoning Code, including both the text and maps, please consult the BRA.
South Boston District Boundary
District Boundary
Subarea Boundary
Restricted Parking (Overlay) District
(See Map Amendments No. 144 and No. 201)
Planned Development Area Designation
Greenbelt Protection Overlay District
Interim Planning Overlay District
Groundwater Conservation Protection Overlay District
Residential Districts
S Single Family
R Two Family, Multifamily, Apartments
H Apartments
Business Districts
L Local Retail & Service Stores
B Retail Business & Offices
Industrial Districts
M Restricted Manufacturing
I General Industrial
MER Maritime Economy Reserve
W Waterfront Industrial
0 800 1,600 Feet
Map Designed for 1" = 800'
East Boston Map 3A/3B
Boston Proper Map 1
Midtown Cultural Map 1A
Map 1Xa/1Xb
1C
Harborpark: Fort Point Waterfront Map 4A/4B
Boston Inner Harbor
Bay Village Map 1N
Chinatown Map 1G
Huntington Avenue/ Prudential Center Map 1D
South End Map 1P
Reserved Channel
Restricted Parking District
South Boston Neighborhood Map 4F
St Vincent Map 4E
Pleasure Bay
Roxbury Maps 6A, 6B, 6C
Dorchester Maps 5A, 5B, 5C, 5D, 5E
Dorchester Avenue
Harborpark: Dorchester Bay/Neponset River Waterfront Map 4C/4D

EXHIBIT E
LEED CHECKLIST

LEED 2009 for New Construction and Major Renovations

Project Checklist

DRAFT - One Northern Avenue Place

Aug-13

Sustainable Sites — Possible Points: 26

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

Water Efficiency — Possible Points: 10

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

Energy and Atmosphere — Possible Points: 35

Y	?	N			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
7		12	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
		2	Credit 4	Enhanced Refrigerant Management	2
		3	Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

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

Materials and Resources, Continued

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

Indoor Environmental Quality — Possible Points: 15

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

Innovation and Design Process — Possible Points: 6

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

Regional Priority Credits — Possible Points: 4

Y	?	N			
		1	Credit 1.1	Regional Priority: Specific Credit	1
		1	Credit 1.2	Regional Priority: Specific Credit	1
		1	Credit 1.3	Regional Priority: Specific Credit	1
		1	Credit 1.4	Regional Priority: Specific Credit	1

41	9	60	**Total**	Possible Points:	**110**

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

EXHIBIT F
PHASE I ENVIRONMENTAL SITE ASSESSMENT

McPHAIL ASSOCIATES, LLC

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

6 TIDE STREET

BOSTON MASSACHUSETTS

for

Kavanagh Advisory Group, LLC

May 10, 2012

Project No. 5392

McPHAIL ASSOCIATES, LLC

May 10, 2012

Kavanagh Advisory Group, LLC
100 Conifer Hill Drive, Suite 412
Danvers, MA 01923

Attention: Mr. Sean M. Donnelly, P.E., Associate / Project Manager

Reference: 6 Tide Street Development; South Boston, Massachusetts
Phase I Environmental Site Assessment

Ladies and Gentlemen:

Enclosed herewith is our Phase I Environmental Site Assessment Report prepared for the property identified as the 6 Tide Street Development to be located within the Marine Industrial Park in South Boston, Massachusetts. The general site locus is shown on the enclosed **Figure 1,** and the boundaries of the subject site are shown on the enclosed **Figure 2**.

This report was prepared by McPhail Associates, LLC in accordance with our proposal dated March 9, 2012 and the subsequent authorization of Kavanagh Advisory Group, LLC, and is subject to the limitations contained in **Appendix A**.

This environmental site assessment was conducted pursuant to the provisions contained in ASTM E 1527-05, "Standard Guide for Environmental Site Assessment: Phase I Environmental Site Assessment Process", as referred to in 40 CFR Part 312 (the All Appropriate Inquiries Rule). The objective of the environmental investigation was to identify the potential presence of Recognized Environmental Conditions (RECs), as defined by ASTM, at the subject site or on nearby property that may pose a threat to the subject site. The Massachusetts Oil and Hazardous Materials (OHM) Release Prevention and Response Act (MGL Chapter 21E) and Massachusetts Contingency Plan (MCP) 310 CMR 40.0000 were utilized in our evaluation of the potential presence of RECs as defined herein.

Our scope of services consisted of the following: (i) a visual reconnaissance of the subject site and surrounding properties; (ii) an assessment of the subject site history relative to the possible presence of oil and hazardous materials; (iii) a search of the City of Boston municipal records for permits issued for the storage and/or use of oil or hazardous materials at the site; (iv) a database search of Federal and State records including the National Priorities List, the CERCLA List and the RCRIS Handlers List by EDR Inc.; (v) a search of the Massachusetts Department of Environmental Protection (DEP) online database for records of incidents involving releases of oil and/or hazardous materials at and in the vicinity of the subject site; (vi) screen soil samples obtained from the borings completed as part of our geotechnical investigation for the presence of total volatile organic compounds (TVOC) utilizing a photoionization detector (PID) and (vii) assessing the above and documenting the results in a Phase I Environmental Site Assessment Report.

Excluded from the scope of work were a title search, a lien search, an assessment for the presence of radon, lead-based paint, urea formaldehyde foam insulation (UFFI), mold, mildew and asbestos containing materials.

The subject site consists of one rectangular parcel of land bounded by Northern Avenue to the south, Kennedy Avenue to the north, Tide Street to the east, and a fire lane/utility easement and paved right-of-way to the west. The subject site occupies an approximate area of 4 acres. Currently, the subject site is a flat, vacant parcel of land with a 83,000-square foot (1.9 acre) concrete slab-on-grade occupying the central portion of the site. The subject site was formerly a portion of the 191-acre Boston Naval Annex.

A walk over and visual reconnaissance of the subject site was performed by a representative of McPhail Associates, LLC on April 9, 2012. We observed no evidence of stains or odors at the subject site. Surficial observations of readily observable portions of the subject site did not identify Recognized Environmental Conditions (RECs). Visual observations of surrounding properties were made from outside of the property limits. We did not observed evidence of stains or odors at surrounding properties. No RECs were identified on properties surrounding the subject site.

A review of historical records indicated that the subject site has been utilized for industrial purposes since at least 1977 and as part of the South Boston Naval Annex since 1920. Prior to 1920 the site was tidal flats that were filled in by the Commonwealth of Massachusetts sometime prior to 1900. The historical records reviewed further indicated that the surrounding properties have been occupied by industrial structures and vacant land since at least 1920. RECs were not identified during our review of historical records of the subject site and surrounding properties.

A review of records and files at the City of Boston municipal offices did not indicate any evidence pertaining to the subject site which would be considered an REC.

Research of federal and state records was conducted by EDR Inc. of Milford, Connecticut, and is summarized in a database report dated March 15, 2012. The report includes a records search of federal and state database information indicating potential environmental matters within ASTM-established minimum search distances. Based on our review of the EDR report, the subject site is not a DEP-listed MCP site. Further, a review of the information provided in the available databases searched by EDR indicated that the properties located in the vicinity of the subject site did not pose a threat of impact to the subject site and therefore are not considered RECs.

Files for six (6) listed MCP release sites located at a distance of less than 0.25-miles from the subject site were evaluated to determine whether they could potentially pose a threat of impact to the subject site. Based on our review of readily available information on the DEP's on-line database and in the EDR report, the three (3) of the release sites are not considered likely to pose a threat of impact to the subject site based on the distance and location of these sites with respect to the subject site, the current DEP status of the sites and the response actions conducted. Accordingly, these three (3) release sites are not considered RECs with respect to the subject site. However, the remaining three (3) release sites are considered RECs with respect to the subject site; (i) the presence of PAHs, metals and PCBs identified in soil as a result of historic filling activities in the general area of the subject site (RTNs 3-3124, 3-16782, 3-26768), and (ii) the reported soil and groundwater impacts to the Building 20 portion of the former South Boston Naval Annex and Army Base property as a result of the historic presence of USTs as documented under RTN 3-0763.

In conclusion, we have performed an Environmental Site Assessment in conformance with the scope and limitations of ASTM E-1527-05 for the property identified as 6 Tide Street Development located within the Marine Industrial Park in South Boston, Massachusetts. Any exceptions to, or deletions from this practice are described in the Data Gap section of this report. This assessment has identified no Recognized Environmental Conditions in connection with the subject site with the exception of (i) the presence of PAHs, metals and PCBs identified in soil as a result of historic filling activities in the general area of the subject site (RTNs 3-3124, 3-16782, 3-26768), and (ii) the reported soil and groundwater impacts to the Building 20 portion of the former South Boston Naval Annex and Army Base property as a result of the historic presence of USTs as documented under RTN 3-0763.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning this report, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

Andrew D. Stone

Alison L. Dadona

Joseph G. Lombardo, Jr., L.S.P.

Enclosures
COVERS\5124\ Phase I ESA Ltr
ADS/ald/jgl

McPHAIL ASSOCIATES, LLC

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McPHAIL ASSOCIATES, LLC

APPENDICES

Appendix A:	Limitations
Appendix B:	GIS Map Photographs User Questionnaire
Appendix C:	Sanborn Maps USGS Topographic Maps Aerial Photographs City Directory Listings
Appendix D:	City of Boston Files and Records
Appendix E:	EDR Database Report Executive Summary and Relevant Sections Complete EDR Database Report (on CD)
Appendix F:	Carr Dee Corp. Boring Logs

PURPOSE AND SCOPE

The purpose of this report by McPhail Associates, LLC is to present the results of a Phase I Environmental Site Assessment to assess the potential presence of Recognized Environmental Conditions at the proposed 6 Tide Street Development located within the Marine Industrial Park in South Boston, Massachusetts. Refer to the Project Location Plan (**Figure 1**) for the general site locus. The approximate limits of the subject site, which define the limits of our investigation, are shown on the enclosed **Figure 2**.

These services were performed and this report was prepared in accordance with our proposal dated March 9, 2012, and are subject to the limitations in **Appendix A**.

The environmental site assessment was conducted for the above referenced property in general accordance with the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process (ASTM E 1527-05) as referenced in 40 CFR Part 312 (the All Appropriate Inquiries Rule). Standards utilized in our evaluation included the Massachusetts Oil and Hazardous Materials (OHM) Release Prevention and Response Act (MGL Chapter 21E) and the Massachusetts Contingency Plan (310 CMR 40.0000)

Our scope of services consisted of the following, (i) a visual reconnaissance of the subject site and surrounding area; (ii) an assessment of the site history relative to the possible presence of oil and hazardous materials; (iii) an on-line search of information from the offices of the City of Boston and a written request sent to the City of Boston Fire Prevention Bureau and the City of Boston Office of Environmental Health for records of permits issued for the storage and/or use of oil or hazardous materials at the Site; (iv) a database search of federal and state records including the National Priorities List, the CERCLA List and the RCRIS Handlers List by EDR Inc.; (v) a search of the Massachusetts Department of Environmental Protection (DEP) on-line database and files for records of incidents involving releases of oil and/or hazardous materials at and in the vicinity of the subject site; (vi) screen soil samples obtained from the borings completed as part of our geotechnical investigation for the presence of total volatile organic compounds (TVOC) utilizing a photo-ionization detector (PID); and (vii) assessing the above

and documenting the results in a Phase I Environmental Site Assessment (ESA) Report.

Excluded from our Phase I ESA scope of work were a title search, an environmental lien search, an assessment for the presence of lead-based paint, mildew, mold, urea formaldehyde foam insulation (UFFI), asbestos containing materials and other naturally occurring pollutants such as radon. No attempt was made to check on the compliance of present or past owners of the site with federal, state or local laws and regulations except as documented herein.

The objectives of this Phase I ESA, as defined in the ASTM E1527-05 Standard, are to identify the presence of Recognized Environmental Conditions at the subject site or on surrounding properties that may potentially pose a threat to the subject site.

The term Recognized Environmental Condition (REC) is defined by ASTM E1527-05 as the presence or likely presence of any hazardous substance or petroleum product at a property under conditions that indicate an existing release, a past release, or a material threat of a release into structures at the property, or into the ground, groundwater or surface water of the property. In addition, ASTM E1527-05 indicates that the term REC does not include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies.

Our professional opinion is based solely on the scope of work conducted and pertains to the subject site limits as shown on **Figure 2** and defined below.

SITE AND LOCUS DESCRIPTION

Location and Description

The approximate 4-acre site is bounded by Northern Avenue to the south, Kennedy Avenue to the north and Tide Street to the east. Along the western side of the site, a 25-foot wide fire lane/utility easement and a 40-foot wide paved right-of-way are parallel the property. Until recently, a one-story, industrial-type, high-bay concrete and brick building occupied

an approximate 83,000-square foot (approximate 1.9-acre) plan area within the central portion of the site.

The approximate limits of the subject site are shown on **Figure 2**, which was prepared from a plan provided to McPhail Associates by Kavanagh Advisory Group entitled "Environmental Remediation and Building Demolition" on March 14, 2012.

The subject site is located at longitude and latitude 42° 20' 45.96" north and 71° 01' 54.48" west, respectively, and at UTM coordinates 332,638.1 meters east and 4,689,990.0 meters north in Zone 19.

Site and Vicinity General Characteristics

The subject site is a 4-acre portion of the former 191-acre Boston Naval Annex. The former Boston Naval Annex is identified as the Marine Industrial Park in South Boston, Massachusetts. The area surrounding the subject site is populated by industrial buildings to the west, south, and northeast, a vacant parcel of land to the north, and a drydock to the southeast.

According to the City of Boston on-line Assessor's database, the site is a part of an Economic Development Zone listed as 600 Summer Street in South Boston.

The topography of the subject site area is relatively flat with existing ground surface elevations ranging from about Elevation +16 to Elevation +17. Elevations as noted herein are referenced to the Boston City Base Datum (BCB Datum), which is 5.65 feet below the National Geodetic Vertical Datum of 1929 (NGVD).

Public utilities including municipal water, sewer, electric, and gas service the buildings in surrounding area. Catch basins on Northern Avenue and Tide Street control surface drainage.

Based on an on-line edition of the Massachusetts Geographic Information Systems (GIS) DEP Priority Resources Map viewed on April 10, 2012, the subject site is not located within the boundaries of a Potentially Productive Aquifer or within a Zone II, Interim Wellhead Protection Area

as defined by the Massachusetts Department of Environmental Protection (DEP). Further, the Priority Resources Map indicates that there are no public or private drinking water supply wells, no Areas of Critical Environmental Concern, no fish habitats, no habitats of Species of Special Concern or Threatened or Endangered Species within specified distances of the subject site. There are no water bodies or wetland areas at the subject site. There are no solid waste sites (landfills) noted as being located within 1,000 feet of the subject site. Based on EDR's search of FEMA Flood Plain Maps, the subject site is not within a 100 year flood plain. A copy of the GIS map as viewed on April 10, 2012 is included in **Appendix B**.

Current Uses of Surrounding Properties

There are two industrial buildings that house several seafood processing companies across the paved fire/utility easement to the west, across Northern Avenue to the south, and across Tide Street to the northeast. A drydock for berthing ships is located across Tide Street to the southeast, and a paved open parcel of land that borders Boston Harbor is located to the north of the subject site on the opposite side of Kennedy Avenue.

VISUAL SITE OBSERVATIONS

A walk through and visual reconnaissance of the subject site was performed by a representative of McPhail Associates, LLC on April 9, 2012. Observations of readily visible portions of adjacent and nearby properties were also made. However, in general, these observations were made from outside the boundaries of these properties. The extent of the subject site is shown on Figure 2. Photographs taken during our site visit on April 9, 2012 are included in **Appendix B**.

At the time of the site visit, we observed the presence of a concrete slab at ground surface surrounded by gravel covered open space containing sparse vegetation. The concrete slab had a raised concrete footing around the perimeter and four rows of evenly spaced raised column footings throughout the interior. We observed no evidence of stains, odors, spills or stressed vegetation at the subject site. Our observations of the subject site did not identify evidence of the storage, spills or leaks of OHM which would be considered an REC.

Surrounding Property

Two industrial properties that receive tractor-trailers were observed to the west of the subject site across the paved fire/utility easement. Industrial structures were observed to the south across Northern Avenue and northeast across Tide Street. A drydock exists to the southeast across Tide Street. Across Kennedy Avenue to the north of the site is a large open paved parcel of land that borders Boston Harbor. We observed no evidence of stains, odors, spills or stressed vegetation on readily observable portions of the properties surrounding the subject site.

In summary, no surficial indications of RECs were observed at adjacent or nearby properties to the subject site. Visual observations of surrounding properties were made from outside of the property limits.

SITE HISTORY

Our research into the history of the subject site included a review of Sanborn Fire Insurance Maps dated 2002, 1998, 1995, 1994, 1993, 1992, 1990, 1988, 1964, 1950, and 1923, historic USGS Topographic Maps supplied by EDR, a City Directory Search completed by EDR, aerial photographs dated 2008, 1995, 1986, 1980, 1978, 1969, 1960, 1955, 1946, and 1938. Copies of the historical maps, aerial photographs and the City Directory search are included in **Appendix C**.

The most recent Sanborn Maps dated 2002 and 1998 show the configuration of the subject site prior to the demolition of the former warehouse structure and the current configuration of the surrounding buildings. The Sanborn Maps indicate that the two industrial structures located to the west are occupied by New Boston Seafood Center.

The 1995 Sanborn Map indicates the presence of the former warehouse structure on the subject site. The Sanborn Maps from 1995 dating back to 1988 indicate that the site remained generally unchanged from the 1995 Sanborn Map.

The 1964 and 1950 Sanborn maps both have the note, "not corrected since 1942," and show the subject site as a rail yard with no buildings other than a small shed to the east. The railroad tracks are indicated to be to the west of the subject site. The 1923 Sanborn Map shows the

same configuration of railroad tracks and depicts the small shed as shown on the 1964 and 1950 maps. An additional shed structure is shown at the end of the drydock to the east of the subject site.

A City Directory search was completed by EDR. The City Directories provide information relative to the subject site for properties along Tide Street, Kennedy Avenue, and Northern Avenue generally every five years from 2005 dating back to 1930, except 1980, 1955 and 1940. The search indicated that the subject site properties with addresses of 6 Tide Street, 310 Northern Avenue, and 5 Kennedy Avenue were listed in the City Directory provided by EDR as being industrial from 2005 dating back to 1970. The City Directory indicates that the subject site properties with addresses of 375 Northern Avenue was the South Boston Naval Annex prior to 1977.

Aerial photographs from 2008 back to 1946 provided by EDR show the subject site and the warehouse building in the most recent configuration/layout prior to the recent demolition. The 1938 photograph shows the subject site as open space with the railroad tracks visible to the northwest, two small sheds to the east, and the drydock to the southeast.

In summary, a review of historical records indicated that the subject site had been utilized for industrial purposes since 1977 and as part of the South Boston Naval Annex since at least 1920. The historical records reviewed further indicated that the surrounding properties have also been utilized for industrial purposes since being purchased from the US Navy in 1977. No RECs were identified during our review of historical records of the subject site and surrounding properties.

EVALUATION OF DATA FAILURE

In accordance with ASTM 1527-05, Article 8.3.2 and Article 8.3.2.1 the uses of the property shall be identified back to the property's first developed use, or back to 1940, whichever is earlier, and the maximum interval between historical sources is 5 years. During the time period between earliest reasonable ascertainable evidence regarding the subject site to the present time, some intervals between historical sources exceeded 5 years; therefore, data failure was encountered. However, the indicated use of the subject site between sources was consistent and,

therefore, the data failure is not considered to constitute a significant data gap.

INTERVIEW WITH USER

As part of our research into the historical use of the subject site, an interview was conducted with Mr. Thomas Miller, the Vice President of Kavanagh Advisory Group, LLC, in accordance with the User Questionnaire contained in Appendix X.3 of ASTM E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. A copy of the User Questionnaire was provided to Mr. Miller by email and returned to McPhail. According to Mr. Miller's knowledge of the property, there are no environmental cleanup liens filed or recorded against the subject site, nor any activity and use limitations, engineering controls, land use restrictions or institutional controls in place or recorded in a registry under federal, state or local law. Further, Mr. Miller indicated, that to his knowledge, he is not aware of any spills and/or releases of OHM associated with the subject site. A copy of the User Questionnaire is included in **Appendix B**.

MUNICIPAL AND STATE RECORD REVIEW

Our municipal record review focused on information related to the potential use, storage, generation, and disposal of OHM at the subject site and surrounding properties, and included on-line research and/or written inquiries of the City of Boston Assessors' database, City of Boston Inspectional Services Division, City of Boston Environmental Health Office and the City of Boston Fire Department Fire Prevention Bureau. The Massachusetts DEP's UST Registry On-Line Database was also reviewed.

1. City of Boston Assessors Office

According to the City of Boston Assessors' on-line property database, the subject site at 6 Tide Street is identified as a portion of a larger contiguous parcel known as the Boston Marine Industrial Park (Parcel No. 0602674000) listed with an address at 600 Summer Street that is owned by Economic Development and Industrial Corporation of Boston Mass Co. A copy of the on-line Assessors' information is included in **Appendix D**.

2. City of Boston Inspectional Services Division (ISD)

Records of current and historical permits pertaining to the subject site were reviewed on the City of Boston Inspectional Services Department on-line database on March 30, 2012. Permits and documents on file documented the repairs and renovations to the subject site building including gas fittings and electrical work during the late 1980's through 2004. Based on files reviewed, the northern portion of the subject site was utilized as a storage area for the Horse and Carriage Company in 1999. The historical permits and documentation that were reviewed did not indicate evidence of the storage of OHM or a spill or release of OHM at the site.

3. City of Boston Fire Department - Fire Prevention Division

Our written request for available records related to the historic storage or use of OHM at the subject site and adjacent properties with the listed addresses of 6 Tide Street, 5 Kennedy Avenue, 310 Northern Avenue, and 600 Summer Street was submitted to the City of Boston Fire Department Fire Prevention Division (FPD) on March 16, 2012.

According to FPD's response dated March 30, 2012, their search identified no records or files pertaining to the above listed addresses. A copy of FPD's response is included in **Appendix D**.

4. City of Boston Office of Environmental Health

Our written request for records related to past inspections, possible violations and DEP correspondence for properties that included the addresses of 6 Tide Street, 5 Kennedy Avenue, 310 Northern Avenue and 600 Summer Street was submitted to the City of Boston Office of Environmental Health (OEH) on March 16, 2012.

According to a response letter from OEH dated March 26, 2012, their record search identified no environmental hazard inspections, violations, enforcement activity case files or DEP correspondence for the subject site or surrounding properties. The response letter included an asbestos abatement project permit for 6 Tide Street, the subject site. Based on our review of OEH files, an asbestos abatement project permit was submitted

to the City of Boston for abatement activities performed by CL Vinagro Corp. between October 12, 2010 and December 12, 2010. Asbestos abatement activities were conducted as part of site demolition work. A copy of the OEH letter is included in **Appendix D**.

5. DEP's UST Registry On-Line Database

Our review of the Massachusetts DEP Underground Storage Tank (UST) Registry Online Database on March 23, 2012, identified no records of USTs at the subject site. The nearest property listed in the database is identified as Boston Redevelopment Authority located at 24 Drydock Avenue. According to the database, one 2,649-gallon gasoline reinforced UST was installed on June 1, 1992. The tank is indicated to have interstitial monitoring and product line leak detection. Based on the location of the tank and the leak detection monitors in use, the presence of a UST on a nearby property is not considered an REC with respect to the subject site.

ENVIRONMENTAL DATABASE REPORT

Research of Federal and State records was conducted by EDR Inc. of Milford, Connecticut, and is summarized in a database report dated March 15, 2012. The report includes a records search of federal and state database information indicating potential environmental matters within ASTM-established minimum search distances. A paper copy of the executive summary of the EDR database report and the entire EDR report in an electronic format, are included in **Appendix E**.

The information provided by EDR indicates that the subject site, with the listed address of 6 Tide Street is not listed in the databases reviewed by EDR.

Based upon information provided by EDR, there are no U.S. Environmental Protection Agency (EPA) National Priority List (NPL) sites or Proposed National Priority List sites located within one-mile of the subject site according to the database updated as of September 7, 2011.

The EDR report indicates that there is a Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) site located within 0.5-miles of the subject site listed in the database

updated as of December 27, 2011. This site is identified as South Boston Naval Annex located within the Marine Industrial Park Drydock Avenue. The subject site is a 4-acre portion of the larger 191-acre South Boston Naval Annex. According to the EDR report, this site has been reactivated in CERCLIS and recorded as a State Lead site. Additionally, the report indicates that no further Superfund program actions are anticipated pending completion of state program actions, or unless the state requests additional Superfund program action. Based on the status of this CERCLIS property, it is not considered likely to pose a threat of impact to the subject site. Accordingly, this site is not considered an REC with respect to the subject site.

The EDR report further indicates that there are three (3) CERCLIS-No Further Remedial Action Planned (CERC-NFRAP) sites located within 0.5-miles of the subject site listed in the database updated as of December 28, 2011. Based on the status of these CERC-NFRAP sites, including that no further remedial action is planned, these sites are not considered RECs with respect to the subject site.

Based on the EDR report, one RCRA Corrective Action Activity (CORRACTS) site is located within one-half mile of the subject site based upon the EPA database updated as of August 19, 2011. This site is identified as Boston Edison Company located at 776 Summer Street, which is approximately 2,500 feet to the south of the subject site. Based on the distance and location from the subject site, this CORRACTS site is not considered likely to pose a threat of impact to the subject site. Accordingly, this site is not considered an REC with respect to the subject site.

The EDR report further indicated that there are no Large Quantity Generators (LQG) listed in the Resource Conservation and Recovery Information System (RCRIS) database updated as of November 10, 2011 that are located within 0.25-miles of the subject site.

The EDR report indicated that there are three (3) Small Quantity Generator (SQG) sites listed in the Resource Conservation and Recovery Information System (RCRIS) database last updated on November 10, 2011, that are located within 0.25-miles of the subject site. The SQG sites are identified as Oasys Water Inc, with an address of 7 Tide Street

which is located to the east of the subject site on the opposite side of Tide Street, Boston Ship Repair LLC with an address of 32 A Drydock Road which is located greater than 500 feet to the east-southeast of the subject site, and Dana Farber Cancer Institute with an address of 27 Drydock Avenue which is approximately 1,000 feet to the southeast of the subject site. No violations were reported for these SQG sites, with the exception of Boston Ship Repair. However, violations on file for Boston Ship Repair are reported to have achieved compliance. Based on the location of the SQG sites and that no violations have been reported or reported violations have achieved compliance, the SQG sites are not considered to pose a threat of impact to the subject site, and therefore are not considered RECs with respect to the subject site.

The EDR report further indicated that there are two (2) RCRA Conditionally Exempt Small Quantity Generator (CESQG) sites located within 0.25-miles of the subject site based on the database updated as of November 10, 2011. The CESQG sites are identified as Field Blanche P Inc. with an address of 1 Design Center Place which is approximately 800 feet to the southwest of the subject site and Immunetics Inc with an address of 27 Drydock Avenue which is approximately 1,000 feet to the southeast of the subject site. According to the EDR report, there are no violations on record for these CESQG sites. Based on the location of these CESQG sites and that no violations have been reported, the above RCRA-CESQG sites are not considered to pose a threat of impact to the subject site and are therefore not considered RECs with respect to the subject site.

The EDR report further indicated that there are three (3) RCRA Non-Generator (Non-Gen) sites located within 0.25-miles of the subject site, based on the database updated on November 10, 2011. According to the EDR report, there are no violations on record for the three (3) RCRA Non-Gen sites. The listed RCRA NonGen sites are located approximately 500 feet to the south of the subject site. Based on the distance and location of these three (3) RCRA Non-Gen sites from the subject site and that no violations have been reported, the above RCRA Non-Gen sites are not considered to pose a threat of impact to the subject site, and therefore are not considered RECs with respect to the subject site.

The EDR report indicated that one Formerly Used Defense Site (FUDS) is located within 1-mile of the subject site based on the database updated as of December 31, 2009. The property is identified as the Boston Naval Annex which reportedly occupied 191-acres, including the 4-acre subject site. According to the database, the Navy constructed bulkheads, piers and buildings at this site.

EDR reported no state Solid Waste Facility/Landfill Sites within 0.5-miles of the subject site based upon a state file updated as of January 1, 2012.

EDR further indicates that there are no state-listed dry cleaners within the ASTM standard distance of 0.25-miles based on the Massachusetts DEP dry cleaners database of January 23, 2012.

EDR reported that a Manufactured Gas Plant (MGP) site is located within 1-mile of the subject site. The site is identified as Former Gas Company located at 409 East 1st Street, and was formerly known as the South Boston Gas Light Company. This MGP site is reportedly located greater than 4,000 feet to the southwest of the subject site. Based on the location and distance from the subject site, this MGP site is not considered to pose a threat of impact to the subject site. Accordingly, this MGP site is not considered an REC with respect to the subject site.

EDR reported that there are 159 release sites located within one-mile of the subject site. Based on the EDR Release database dated January 17, 2012, most of these sites are located at a distance equal to or greater than 0.25-miles from the subject site, and based upon the USGS quadrangle map, the majority of these sites are indicated to be located topographically cross to down-gradient with respect to the subject site. In general, most of the sites are not considered to pose a threat of impact based upon their location and distance from the subject site, the type of release, and the remedial activities undertaken. However, six (6) disposal sites, based on their proximity to the subject site and nature of release were assessed for their potential to be considered RECs with respect to the subject site. Files for these release sites were therefore reviewed for information relative to their potential to impact the subject site, and the information is summarized below in the Massachusetts DEP Records Review section.

SITE STATE REGULATORY STATUS

The current Massachusetts DEP database, as reviewed on March 30, 2012 indicates that the subject site located at 6 Tide Street in Boston, Massachusetts is not a DEP-listed release site.

MASSACHUSETTS DEP RECORDS REVIEW

As noted above, according to the EDR review of state databases a total of 159 DEP-listed release sites are located within the ASTM search radius of one-mile from the subject site based on the database update as of January 17, 2012. This number of sites is not unusual for an urban location such as the subject site. Most of the DEP-listed sites are located at distances greater than 500 feet from the subject site and are topographically cross gradient or downgradient with respect to the subject site. Based on the response actions performed, their distances from the subject site and local topography, most of the sites listed are not considered RECs with respect to the subject site. However, the following sites, based on their proximity to the subject site and release conditions, were evaluated for their potential to affect the subject property. Available information on the Massachusetts DEP on-line waste site database was reviewed to assess the potential of these sites to be RECs with respect to the subject site.

1. 310-312 Northern Avenue and 5-7 Kennedy Avenue, Release Tracking Numbers (RTNs) 3-3124 and 3-16782

This property is located to the west of the subject site, on the opposite side of the right-of-way. According to the EDR report, this site is located topographically crossgradient with respect to the subject site. The DEP on-line database indicates that a Release Notification Form (RNF), a Release Abatement Measure Plan (RAM), a Phase I and Tier Classification Report and Class A-3 Response Action Outcome Statement including an Activity and Use Limitation (AUL) were submitted to the DEP.

The DEP was notified of a release condition on May 4, 1998 by ENSR Consulting and Engineering (ENSR). According to a report entitled, "Class A-3 RAO Statement, 310-312 Northern Avenue, Boston, Massachusetts, RTNs 3-3124 and 3-16782," prepared by GZA GeoEnvironmental Inc. (GZA) and dated August 2011, the property was listed as a Location To Be Investigated under RTN 3-3124 in 1990 based

on the detection of TPH, SVOCs, VOCs and metals in soil by ENSR. The report indicates that a Waiver Completion Statement was not filed with the DEP and RTN 3-3124 was issued a Tier 1D (default) status by the DEP. Subsequently, during a Phase II Environmental Site Assessment conducted by GZA in 1996, GZA reported TPH concentrations in soil below applicable Reportable Concentrations, and no VOCs in groundwater.

During reported soil characterization activities associated with construction of two seafood warehouse buildings, concentrations of metals and PCBs were identified in fill material. An RNF was filed with the DEP for the presence of PCBs in soil (RTN 3-16782). Approximately 3,000 tons of impacted soil were disposed off-site under a RAM Plan during construction activities. The presence of metals and PCBs in soil is reported to be the result of historic filling activities.

GZA reported that a Class A-1 RAO was filed for RTN 3-16782 by Action Environmental, Inc. in April 1999, however, the RAO was later retracted in 2000. Action indicated that PCBs were not detected in groundwater. The site was then classified as a Tier II disposal site.

GZA conducted a Method 1, 2 and 3 Risk Characterization in 2011 which found that contaminants of concern were not identified in soil above Method 1 Standards, and contaminants of concern were not detected above laboratory method detection limits in groundwater. Therefore, GZA concluded that fill soils have not impacted groundwater. Based on the results of the Risk Characterization, GZA concluded that a Permanent Solution and a Condition of No Significant Risk (NSR) was achieved at this disposal site, contingent upon the implementation of an AUL. According to the AUL, activities including the use of the property as a residence, school, daycare facility, park or nursery and growing of fruits and/or vegetables for consumption is prohibited.

Based on the proximity of this release site to the subject site, and the reported source of contamination (historic site filling), the release conditions documented under RTNs 3-3124 and 3-16782 are considered an REC with respect to the subject site.

2. Massport Marine Terminal, Kennedy Avenue; RTN 3-26768

This approximately 32.41-acre release site is located to the northeast of the subject site, on the opposite side of Kennedy Avenue. The DEP on-line database indicates that an RNF, a RAM Plan, a Phase 1, Phase 2, Tier Classification Report and Class B-2 Response Action Outcome Statement including an AUL were submitted to the DEP.

The DEP was notified of a release condition on April 17, 2007. According to a report entitled, "Class B-2 RAO Statement, Massport Marine Terminal, RID Kennedy Avenue, South Boston, Massachusetts, RTN 3-26768," prepared by ATC Associates, Inc. (ATC) and dated November 25, 2008, the property has been impacted by a release of metals and PAHs to soil and groundwater. Specifically, beryllium, lead and zinc were detected in site soils above RCS-2 reporting standards, and nickel, naphthalene and phenanthrene were detected in groundwater above RCGW-2 reporting standards. Elevated concentrations of metals and PAHs were reported by ATC to be the result of historic filling activities.

ATC concluded that based on a Method 3 Risk Characterization, a Permanent Solution and a Condition of No Significant Risk was achieved at this disposal site, based in part on the implementation of an AUL. ATC submitted a Class B-2 RAO Statement to the DEP on December 8, 2008. The AUL restricts residential and other specific uses of the property where a child's presence is likely, and requires implementation of a Soil Management Plan and Health and Safety Plan, along with oversight of a Licensed Site Professional (LSP) during any subsurface utility or construction work.

Based on the proximity of this release site to the subject site, and the reported source of contamination, the release condition documented under RTN 3-26768 is considered an REC with respect to the subject site.

3. ERIC Meter Pit 4, Drydock Avenue; RTN 3-25471

This release site is located approximately 1,000 feet to the east of the subject site in an apparent downgradient direction. The DEP on-line

database indicates that an RNF, a RAM Plan and Class A-3 Response Action Outcome Statement including an AUL were submitted to the DEP.

The DEP was notified of a release condition on December 8, 2005. According to a report entitled, "Economic Redevelopment and Industrial Corporation (ERIC), RAM Completion and RAO Statement, Meter Pit No. 4, Drydock Avenue, South Boston, MA, RTN 3-25471," prepared by Weston and Sampson Engineers, Inc. and dated October 2006, mercury was identified in soil during installation of a water meter vault at Meter Pit No.4 in July 2005. Reportedly, groundwater was not encountered during installation activities. Elevated concentrations of mercury in soil were reported to likely be the result of the historic use of marine paint at the property.

Weston and Sampson concluded that based on a Method 3 Risk Characterization, a Permanent Solution and a Condition of No Significant Risk was achieved at this disposal site, based in part on the implementation of an AUL. The AUL restricts residential use of the property and requires protective measures during future construction and utility work to minimize exposure to workers or other receptors.

Based on the distance of this release site to the subject site, and the reported source of contamination, the release condition documented under RTN 3-25471 is not considered an REC with respect to the subject site.

4. 32A Drydock Avenue; RTN 3-29817

This release site is located approximately 200 feet to the east of the subject site, on the opposite side of Tide Street.

The DEP was notified of a two-hour release condition on February 20, 2011. According to a report entitled, "RAO Statement, Diesel Fuel Release, 32A Drydock Avenue, Boston, MA, RTN 3-29817," prepared by Clean Harbors Environmental Services, Inc. (Clean Harbors) and dated April 12, 2011, approximately 125 gallons of diesel fuel was released from an aboveground storage tank (AST) that fell onto its side. The release was reported to have impacted soil/stone dust surfaces, a nearby

drainage structure and associated outlet pipe, and the granite wall and floor of the drydock area.

Immediate Response Action (IRA) activities included removal of impacted soil/stone dust, cleaning of the drainage structure, and disposal of waste material. The report indicates that the soil/stone dust surface was sampled at the completion of response actions. Clean Harbors concluded that a condition of No Significant Risk exists and the release site met the requirements of a Class A-2 RAO.

Based on the location of this release site to the subject site, the nature of the release, and response actions conducted, the release condition documented under RTN 3-29817 is not considered an REC with respect to the subject site.

5. 20 Drydock Avenue; RTN 3-0763

The address of 20 Drydock Avenue is located approximately 500 feet to the south of the subject site on the opposite side of Northern Avenue. This release site is a one-acre portion of the 20 Drydock Avenue property, identified as Building 20. The 20 Drydock Avenue property was formerly part of the South Boston Naval Annex and Army Base. Based on our review of the DEP's on-line database, the DEP was notified of a release on January 15, 1989, and currently the release condition is identified as a Tier 2 release site. The database further indicates that a Phase I Limited Site Investigation Report dated February 12, 1991, a Phase I Limited Site Investigation Report dated October 1, 1991, a Phase II Comprehensive Site Assessment Report dated December 1, 1991 and a Draft Phase III Remedial Response Alternative and Final Remedial Response Report were submitted to the DEP.

Based on a report entitled, "Final Report, Phase II- Comprehensive Site Assessment, South Boston Naval Annex/Army Base located at Marine Industrial Park, Drydock Avenue, Boston, Massachusetts," prepared by EA Engineering Science and Technology (EA) and dated December 1991, Building 20 was formerly a heating plant with six 25,000-gallon heating oil USTs. USTs associated with this property were reportedly removed in 1987. The Phase II report indicates that in March 1988 EDIC requested to dispose of 1,000 to 1,500 cubic yards of PCB contaminated

soil, by placing it into the excavation created by the removal of the USTs. The DEP reportedly approved the request maintaining that PCB concentrations could not exceed 50 parts per million (ppm) and a notification documenting the presence of the PCB contaminated soil be included with the property deed.

EA observed the presence of oil staining and floating product (No. 6 oil) during the period from April to June 1990, and subsequently reported their observations to the then Massachusetts Department of Environmental Quality Engineering (DEQE) now known as the DEP. A Waiver of Approvals for Non-Priority Disposal Sites was approved in 1991.

EA reported that based on the observed nature of soils at the Building 20 site, free migration of free-phase viscous No. 6 fuel oil is unlikely. However, EA concluded that migration of No. 6 fuel oil has the potential to occur along underground utility lines.

Based on the "Draft Phase III-Remedial Response Alternative and Final Remedial Response Plan, South Boston Naval Annex/Army Base, Located at Marine Industrial Park, Drydock Avenue, Boston, Massachusetts," prepared by EA and dated December 1991, recommended the implementation of on-site asphalt batching of approximately 400 cubic yards of petroleum impacted soils. EA further recommended that the extent of non-aqueous phase liquid (NAPL) be determined. The DEP files contain no additional information pertaining to response actions completed at this site since the submittal of the December 1991 EA report.

Based on the proximity of this release site to the subject site, the historic use of the release site, the nature of the release and that a Permanent Solution has not been achieved, the release condition documented under RTN 3-0763 is considered an REC with respect to the subject site.

6. 20 Drydock Avenue; RTN 3-2809

The address of 20 Drydock Avenue is located approximately 1,000 feet to the southwest of the subject site on the opposite side of Northern Avenue. This release site is a 7.3 acre portion of the 20 Drydock Avenue property

identified as Building 126-Harbor Gateway. The release site has also been referenced in DEP files as 1-9 Drydock Avenue. The site was formerly part of the South Boston Naval Annex and Army Base.

Based on a report entitled, "Final Report, Phase II- Comprehensive Site Assessment, South Boston Naval Annex/Army Base located at Marine Industrial Park, Drydock Avenue, Boston, Massachusetts," prepared by EA Engineering Science and Technology (EA) and dated December 1991, the Building 126 site was formerly utilized as a filling station with underground storage tanks containing gasoline, diesel fuel, and waste oil. Specifically, the report indicates the former presence of three 5,000-gallon gasoline tanks, one 5,000-gallon diesel tank, and one 500-gallon waste oil tank.

Based on a report entitled "Supplemental Phase II- Comprehensive Site Assessment, Former Harbor Gateway- Building 126 Site, RTN 3-2809, South Boston, Massachusetts," prepared by ENSR Corporation (ENSR) and dated December 2003, contaminants of concern in soil were identified as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals including lead, chromium and thallium. Concentrations of metals detected were reported to be the result of historic filling activities and were not reported to the DEP as Reportable Concentrations.

Phase I, II and III Comprehensive Response action reports were prepared by EA and submitted to the DEP between 1991 and 1992. A Tier II Extension was submitted to the DEP in August 1996, however the extension expired in 1997 and the site defaulted to a Tier 1B Site. In May 2000, a tenant of the property filed an Extension and Transfer Submittal with the DEP to conduct work activities associated with construction at the site and remove the default status.

ENSR reported that approximately 1,000 cubic yards of soil were removed from the property under a RAM Plan for recycling at an asphalt batch plant. Based on additional chemical analysis of soil and groundwater and a Method 1 Risk Characterization, ENSR concluded that a Permanent Solution and Condition of No Significant Risk exist at this release site. A Class A-3 RAO Statement was submitted to the DEP as part of the Supplemental Phase II report completed by ENSR in

December 2003. A Class A-3 RAO indicates that an AUL has been implemented at the site.

Based on the distance of this release site to the subject site, the nature of the release and that a Permanent Solution has been achieved, the release condition documented under RTN 3-2809 is not considered an REC with respect to the subject site.

DATA GAPS

In accordance with ASTM E 1527-05, the Phase I report shall identify and comment on any significant data gaps that affect the ability of the environmental professional to identify RECs. There were no significant data gaps identified during the completion of this assessment.

RESULTS OF HEADSPACE SCREENING

Soil samples obtained from borings completed as part of our geotechnical investigation were screened for the presence Total Volatile Organic Compounds (TVOC). The TVOC screening results are summarized in **Table 1.** A copy of the geotechnical boring logs are included in **Appendix F**.

The headspace screening was performed in accordance with DEP's "Jar Headspace Analytical Screening Procedure," Attachment II to the Interim Remediation Waste Management Policy for Petroleum Contaminated Soils, #WSC-94-400. The screening was performed with an MiniRae-3000 Photo-ionization Detector equipped with a 10.2 eV lamp.

A total of 33 soil samples were screened for the presence of TVOC. The soil samples screened indicated TVOC concentrations ranging from 0 parts per million (ppm) to 0.7 ppm. No indications of staining or petroleum odors were noted in the samples obtained. Fill samples were reported to have varying amounts of brick, ash and cinders.

SUMMARY AND CONCLUSIONS

A Phase I Environmental Site Assessment has been completed for the the property located at 6 Tide Street in Boston, Massachusetts. The purpose of this report is to assess the potential presence of RECs with respect to the subject site. This report has been prepared in a manner that generally conforms with the ASTM 1527-05 standard for Phase I Environmental Site Assessment (ESA) reporting, as referenced in 40 CMR Part 312 (the All Appropriate Inquiries Rule).

Our assessment included a visual reconnaissance of the subject site and the surrounding areas, a review of the site history relative to the possible presence of oil and hazardous materials, a review of readily available municipal, state and federal records and a database search completed by EDR, Inc. of Milford, Connecticut in accordance with the applicable ASTM 1527-05 criteria.

The approximate 4-acre site was formerly a portion of the larger, 191-acre Boston Naval Annex. The subject site is bounded by Northern Avenue to the south, Kennedy Avenue to the north and Tide Street to the east. Along the western side of the site, a 25-foot wide fire lane/utility easement and a 40-foot wide paved right-of-way are parallel to the property. Until recently, a one-story, industrial-type, high bay concrete and brick building occupied an approximate 83,000 square foot plan area within the middle portion of the site.

A site reconnaissance of the subject site was performed by McPhail Associates, LLC on April 9, 2012. Surficial observations of readily observable portions of the subject site did not identify RECs. Visual observations of surrounding properties were made from outside of the property limits. No stains or odors were observed in the vicinity of the surrounding properties. No RECs were observed on the properties surrounding the subject site.

A review of historical records indicated that the subject site has been utilized for industrial purposes since at least 1977 and was part of the South Boston Naval Annex since at least 1920. The historical records reviewed further indicated that the surrounding properties have been occupied by industrial and commercial structures and vacant land. RECs were not identified during our review of historical records of the subject site and surrounding properties.

A review of records and files at the City of Boston municipal offices did not indicate any evidence pertaining to the subject site which would be considered an REC.

Research of Federal and State records was conducted by EDR Inc. of Milford, Connecticut, and is summarized in a database report dated March 15, 2012. The report includes a records search of federal and state database information indicating potential environmental matters within ASTM-established minimum search distances. Based on our review of the EDR report, the subject site is not a DEP-listed MCP site. Further, a review of the information provided in the available databases searched by EDR indicated that the properties located in the vicinity of the subject site did not pose a threat of impact to the subject site and therefore are not considered RECs.

Files for six (6) listed MCP release sites located at a distance of less than 0.25-miles from the subject site were evaluated to determine whether they could potentially pose a threat of impact to the subject site. Based on our review of readily available information on the DEP's on-line database, three (3) of the release sites are not considered likely to pose a threat of impact to the subject site based on the current DEP status of these sites, the location of these sites with respect to the subject site and the response actions completed at these sites. Accordingly, these three (3) release sites are not considered RECs with respect to the subject site. However, the remaining three (3) release sites are considered RECs with respect to the subject site; (i) the presence of PAHs, metals and PCBs identified in soil as a result of historic filling activities in the general area of the subject site (RTNs 3-3124, 3-16782, 3-26768), and (ii) the reported soil and groundwater impacts to the Building 20 portion of the former South Boston Naval Annex and Army Base property as a result of the historic presence of USTs as documented under RTN 3-0763.

We have performed a *Phase I Environmental Site Assessment* in general conformance with the scope and limitations of ASTM Practice E 1527-05 for property identified as 6 Tide Street Development located within the Marine Industrial Park in South Boston, Massachusetts. This assessment has identified no *Recognized Environmental Conditions* in connection with the *Subject Site* with the exception of (i) the presence of PAHs, metals and PCBs identified in soil as a result of historic filling activities in

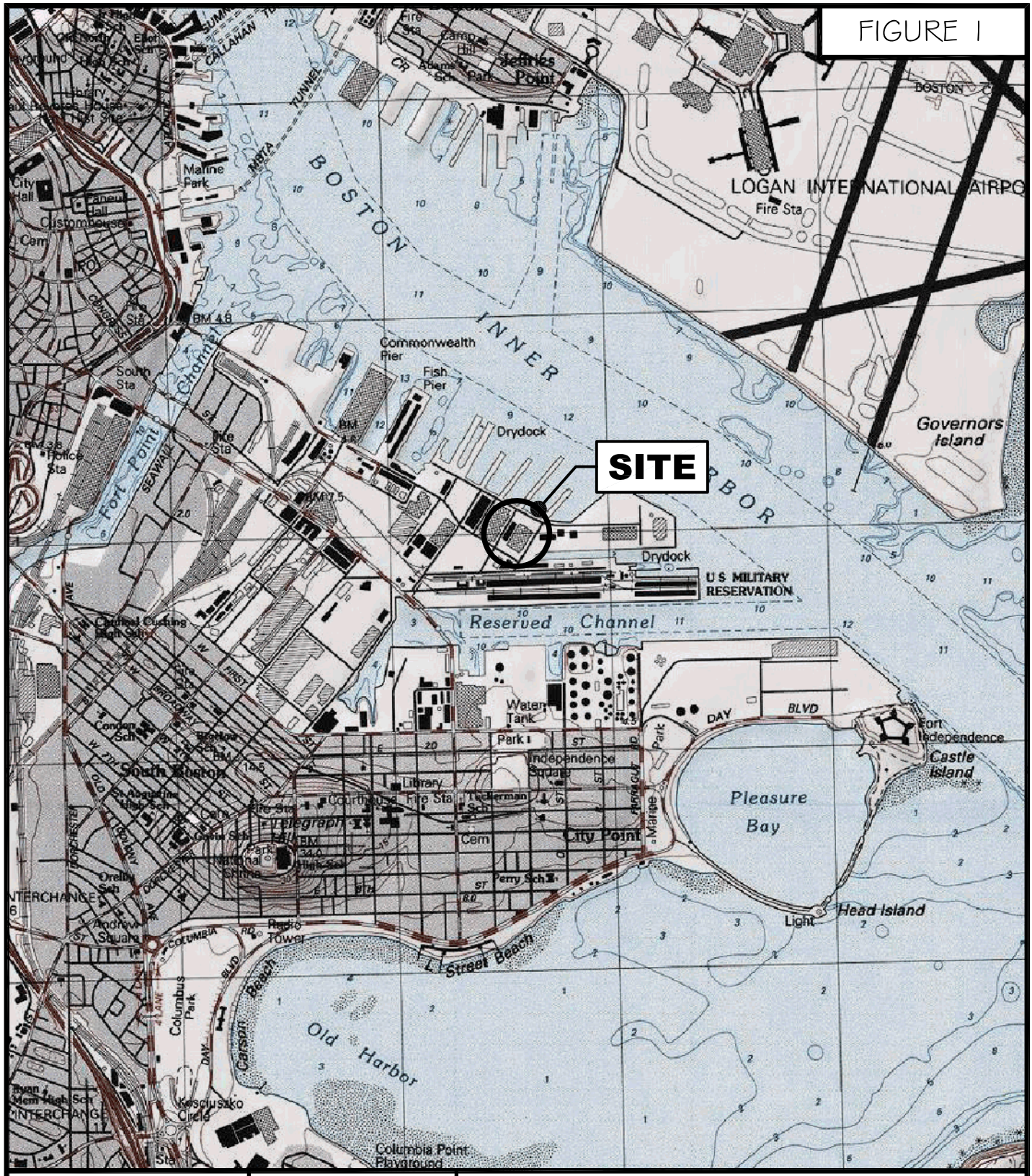
the general area of the subject site (RTNs 3-3124, 3-16782, 3-26768), and (ii) the reported soil and groundwater impacts to the Building 20 portion of the former South Boston Naval Annex and Army Base property as a result of the historic presence of USTs as documented under RTN 3-0763.

ENVIRONMENTAL PROFESSIONAL STATEMENT

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312. Further, I have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Joseph G. Lombardo, Jr., L.S.P.
Environmental Professional

FIGURE 1



McPHAIL ASSOCIATES, LLC
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617/868-1420
617/868-1423 (Fax)

N

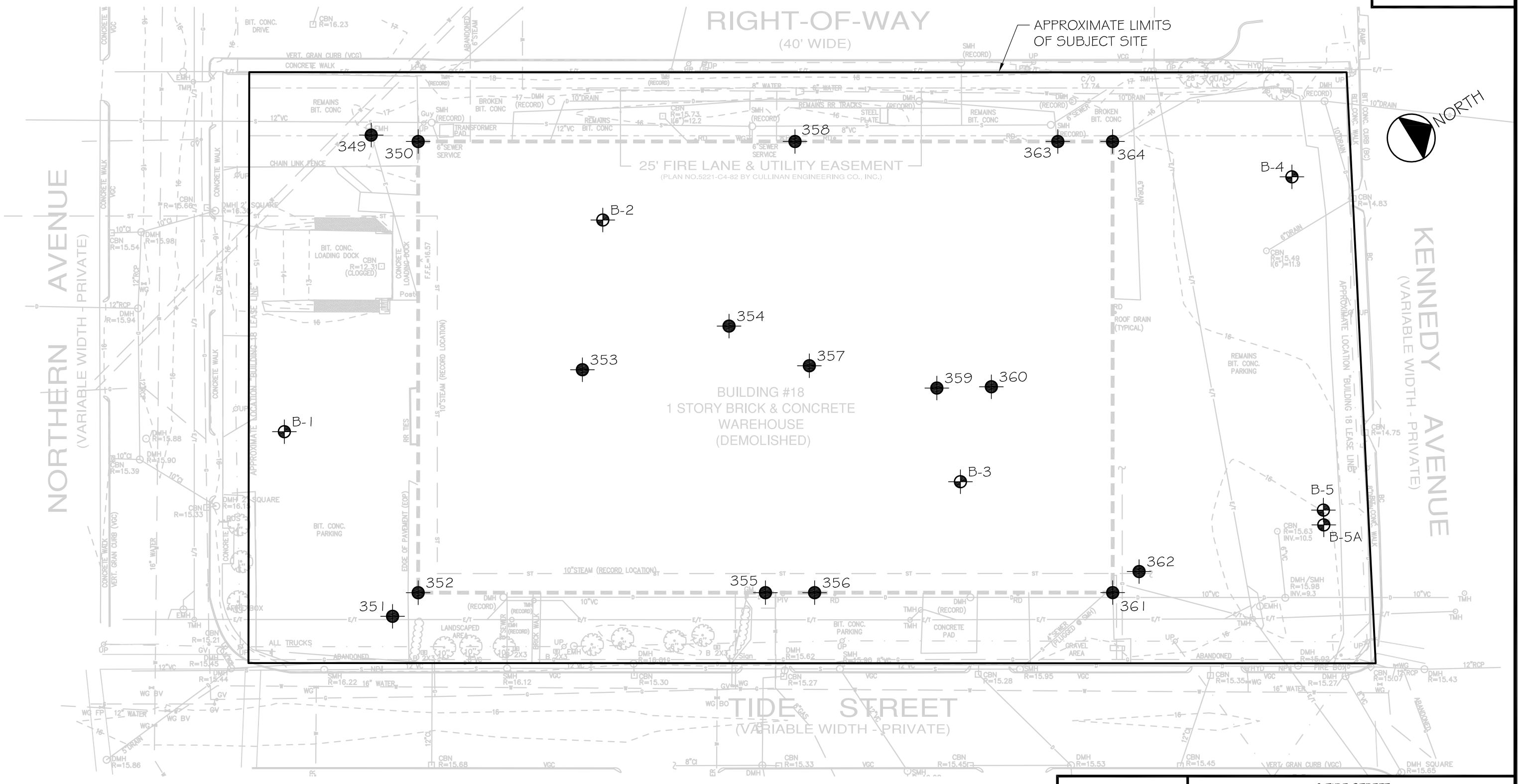
SCALE 1:25,000

PROJECT LOCATION PLAN

6 TIDE STREET

SOUTH BOSTON MASSACHUSETTS

FIGURE 2



LEGEND

— APPROXIMATE LOCATION OF BOREHOLE OBTAINED FROM A 100-SCALE DRAWING ENTITLED "BOSTON NAVAL SHIPYARD, SOUTH BOSTON, ANNEX, PLAN SHOWING BORING LOCATIONS" DATED JANUARY 24, 1951

— APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY CARR-DEE CORP. DURING THE PERIOD OF APRIL 9 THOUGH APRIL 13, 2012 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 30-SCALE DRAWING ENTITLED "ENVIRONMENTAL REMEDIATION AND BUILDING DEMOLITION, 6 TIDE STREET, BOSTON, MA, DWG. NO. P-001" DATED JULY 2010 AND PREPARED BY GALE ASSOCIATES, INC.

GRAPHIC SCALE

50 0 50 100

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)

6 TIDE STREET
SOUTH BOSTON MASSACHUSETTS

SITE PLAN

FOR
KAVANAGH ADVISORY GROUP, LLC
BY
McPHAIL ASSOCIATES, LLC
CONSULTING GEOTECHNICAL ENGINEERS

Date: APRIL 2012	Dwn: I.J.M.	Chkd: A.D.S.	Scale: 1" = 50'
Project No: 5392			

FILE NAME: H:\Acad\JOBS\5392\5392-F02.dwg

TABLE 1
PID HEADSPACE READINGS IN SAMPLE JARS

6 Tide Street
Boston, MA
Project No. 5392

EXPLORATION NO.	SAMPLE NO.	DEPTH FT.	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY PETROLEUM EVIDENCE
B-1	S-1	0.5-2.5	FILL	0.0	
	S-2	5-7	FILL	0.0	
	S-3	10-12	FILL	0.0	
	S-4	15-17	FILL	0.0	
	S-5	20-22	FILL	0.0	
	S-6	25-27	ORGANICS	0.0	
	S-7	30-32	CLAY		
	S-8	35-37	CLAY		
	S-9	40-42	CLAY		
	S-10	45-47	CLAY		
	S-11	50-52	CLAY		
	S-12	55-55.5	CLAY		
	S-12A	55.5-57	GLACIAL TILL		
		59			ROLLER BIT REFUSAL AT 59.0
B-2	S-1	1-3	FILL	0.0	cinders
	S-2	5-5.5	FILL	0.0	cinders
	S-2A	5.5-7	FILL	0.0	
	S-3	10-12	FILL	0.0	
	S-4	15-17	FILL	0.0	
	S-5	20-21	FILL	0.0	
	S-5A	21-22	ORGANICS	0.0	
	S-6	25-27	ORGANICS		
	S-7	30-30.5	ORGANICS		
	S-7A	30.5-32	CLAY		
	S-8	35-37	CLAY		
	S-9	40-40.5	CLAY		
	S-9A	40.5-42	CLAY		
	S-10	45-47	CLAY		
	S-11	50-52	GLACIAL TILL		
	S-12	55-57	GLACIAL TILL		
B-3	S-1	1-3	FILL	0.0	cinders
	S-2	5-7	FILL	0.0	cinders
	S-3	10-12	FILL	0.7	
	S-4	15-17	FILL	0.0	
	S-5	20-22	FILL	0.0	
	S-6	25-27	ORGANICS	0.0	
	S-7	30-30.5	ORGANICS	0.0	
	S-7A	30.5-32	CLAY		
	S-8	35-37	CLAY		
	S-9	40-42	CLAY		
	S-10	45-47	CLAY		
	S-11	50-52	CLAY		
	S-12	55-57	GLACIAL TILL		
	S-13	60-62	GLACIAL TILL		
	S-14	65-67	GLACIAL TILL		

Equipment: Mini-Rae 3000 Photoionization Detectior (PID) with 10.6 eV Probe

PPM = Parts Per Million

TABLE 1
PID HEADSPACE READINGS IN SAMPLE JARS

6 Tide Street
Boston, MA
Project No. 5392

EXPLORATION NO.	SAMPLE NO.	DEPTH FT.	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY PETROLEUM EVIDENCE
B-4	S-1	0.5-2.5	FILL	0.0	ash & cinders
	S-2	5-7	FILL	0.0	
	S-3	10-12	FILL	0.0	
	S-4	15-17	FILL	0.0	
	S-5	20-22	FILL	0.0	
	S-6	25-27	ORGANICS	0.0	
	S-7	30-31.5	ORGANICS	0.0	
	S-7A	31.5-32	PEAT		
	S-8	35-37	CLAY		
	S-9	40-42	CLAY		
	S-10	45-47	CLAY		
	S-11	50-52	CLAY		
	S-12	55-57	CLAY		
	S-13	60-61.5	CLAY		
	S-13A	61.5-62	ALLUVIAL		
	S-14	65-66.5	ALLUVIAL		
	S-14A	66.5-67	GLACIAL TILL		
	S-15	70-70.8	GLACIAL TILL		
		71			ROLLER BIT REFUSAL AT 71
B-5	S-1	0.5-2.5	FILL	0.0	ash & cinders
	S-2	5-6	FILL	0.0	OBSTRUCTION AT 6.0
B-5A	S-1	5-7	FILL	0.0	
	S-2	10-12	FILL	0.0	
	S-3	15-17	FILL	0.0	
	S-4	20-22	FILL	0.0	
	S-5	25-27	ORGANICS	0.0	
	S-6	30-31.5	PEAT		
	S-6A	31.5-32	CLAY		
	S-7	35-37	CLAY		
	S-8	40-42	CLAY		
	S-9	45-47	CLAY		
	S-10	50-52	CLAY		
	S-11	55-57	CLAY		
	S-12	60-62	ALLUVIAL		
	S-13	65-67	GLACIAL TILL		
	S-14	70-72	GLACIAL TILL		

Equipment: Mini-Rae 3000 Photoionization Detectior (PID) with 10.6 eV Probe

PPM = Parts Per Million

EXHIBIT G
PRELIMINARY FOUNDATION ENGINEERING REPORT

McPHAIL ASSOCIATES, LLC

PRELIMINARY FOUNDATION ENGINEERING REPORT

6 TIDE STREET DEVELOPMENT

SOUTH BOSTON MASSACHUSETTS

for

Kavanagh Advisory Group, LLC

April 27, 2012

Project No. 5392

McPHAIL ASSOCIATES, LLC

April 27, 2012

Kavanagh Advisory Group, LLC
100 Conifer Hill Drive, Suite 412
Danvers, MA 01923

Attention: Mr. Sean M. Donnelly, P.E., Associate / Project Manager

Reference: 6 Tide Street Development; South Boston, Massachusetts
Preliminary Foundation Engineering Report

Ladies and Gentlemen:

This letter report documents the results of our subsurface exploration program and preliminary foundation design study for the proposed development to be located at 6 Tide Street within the Marine Industrial Park in South Boston, Massachusetts. Refer to the Project Location Plan, Figure 1, for the general site location.

These services were performed in accordance with our proposal dated March 9, 2012 and the subsequent authorization of Mr. Sean Donnelly of Kavanagh Advisory Group, LLC on March 9, 2012. Our services are subject to the limitations contained in Appendix A.

Purpose and Scope

The purposes of the subsurface exploration program and preliminary foundation design study were to define the subsurface soil and groundwater conditions at the site as they relate to foundation design and, based on these conditions, provide preliminary recommendations for economical foundation design for the proposed development.

Foundation design includes foundation support of the proposed building structure and its lowest level slab, treatment of the lowest level slab in consideration of groundwater, and earthquake design considerations in accordance with the Eighth Edition of the Massachusetts State Building Code (the Code). Foundation construction considerations are also addressed herein.

Available Information

Information provided to McPhail Associates, LLC included a 30-scale site plan prepared by Gale Associates, Inc. entitled "Environmental Remediation and Building Demolition, 6 Tide Street, Boston, MA, Dwg. No. P-001" dated July 2010. Additional subsurface information utilized in the preparation of this report was obtained from drawings entitled "Boston Naval Shipyard, South Boston Annex, Plan Showing Boring Locations and Boring Schedules" dated January 24, 1951 and April 3, 1951, respectively.

Existing Conditions

The approximate 4-acre site is bounded by Northern Avenue to the south, Kennedy Avenue to the north and Tide Street to the east. Along the western side of the site, a 25-foot wide fire lane/utility easement and a 40-foot wide paved right-of-way parallel the property. Until recently, a one-story, industrial-type, high-bay concrete and brick building occupied an approximate 83,000 square-foot plan area within the middle portion of the site.

The general project area was formerly known as "Commonwealth Flats" through the mid- to late-1800s as it was comprised of tidal flats of Boston Harbor. Site filling was conducted approximately between 1914 and 1916 as part of the construction of the 1,170-foot long dry dock located immediately southeast of the development parcel. In 1920, the dry dock and portions of the surrounding filled land became part of the Boston Naval Shipyard.

Ground surface across the site is relatively level, with existing grades varying from about Elevation +16 to Elevation +17. Elevations as noted herein are in feet and are referenced to the Boston City Base Datum (BCB Datum), which is 5.65 feet below the National Geodetic Vertical Datum of 1929 (NGVD).

Proposed Development

The scope of the proposed development is planned to be phased and may include up to three (3) buildings and a surface parking area. The Phase I construction is proposed to consist of a two-story, office and laboratory building with a footprint of about 50,000 square feet. The specific location of the buildings on the property and other specific details of construction have not been determined. However, it understood that the proposed buildings will contains no below-grade space and that excavated site soils will be reused on-site to the greatest extent possible.

Subsurface Explorations

Our recent subsurface exploration program consisting of five (5) borings was conducted at the site during the period of April 9 through 13, 2012. The borings were performed by Carr-Dee Corp. of Medford, Massachusetts under contract to McPhail Associates, LLC. Logs of the recent borings are contained in Appendix B. The approximate locations of the boring explorations are indicated on the enclosed Subsurface Exploration Plan, Figure 2.

The borings were advanced by a truck-mounted drill rig through the fill deposit with NW casing using the wet rotary drilling technique. Standard 2-inch O.D. split-spoon samples and standard penetration tests were typically obtained at 5-foot increments in general accordance with the procedures described in ASTM D1586. The borings were terminated upon refusal within the glacial till deposit underlying the site at depths varying from 57 to 72 feet below the existing ground surface. It should be noted that Boring B-5/5A was relocated approximately 7 feet to the west after encountering an obstruction at a depth of 6 feet below the existing ground surface.

The borings were monitored by a representative of McPhail Associates, LLC who performed field layout, prepared field logs, obtained and visually classified soil samples, monitored groundwater conditions in the completed boreholes, made minor adjustments to the exploration locations and determined the required exploration depth based upon the actual subsurface conditions encountered.

Field locations of the borings were determined by taping from existing site features identified on the referenced site plan. The existing ground surface elevation at each boring location was determined by a level survey performed by McPhail Associates, LLC utilizing vertical control identified on the referenced site plan.

Existing Subsurface Information

As previously indicated, existing subsurface information for the project site was obtained from two drawings entitled "Boston Naval Shipyard, South Boston Annex, Plan Showing Boring Locations and Boring Schedules" dated January 24, 1951 and April 3, 1951, respectively. Based on the information presented on these drawings, logs of fifteen (15) borings (349 through 364, inclusive) were determined to have been conducted at the project site. The borings extended from 34 to 62.5 feet below ground surface. The logs of these borings are included as Appendix C.

Elevations as indicated on the existing boring logs contained in Appendix C are assumed to be referenced to the Boston Navy Yard Datum which is 99.43 feet below the Boston City Base Datum.

Subsurface Conditions

A detailed description of the subsurface conditions encountered at each of the explorations is presented in the boring logs contained in Appendices B and C. A generalized subsurface profile across the project site is presented as Figure 3. The following is a discussion of the generalized subsurface conditions across the site which are inferred primarily from the recent and previous explorations and from our knowledge of the South Boston geology.

In general, the borings indicate the site to be underlain by an approximate 18 to 25-foot thick fill deposit which generally consists of a loose to compact, brown to black, silty sand with some to trace gravel containing variable amounts of ash, cinders, and brick, varying to a very soft to firm gray silty clay. The upper portion of the fill deposit was generally observed to be granular, with the lower portion of the deposit consisting of a fine-grained hydraulic fill.

Underlying the fill deposit, the borings encountered a natural organic deposit representative of the original bottom of Boston Harbor. The organic deposit was typically observed to be about 6 to 10 feet in thickness and consist of very soft to stiff, gray to black organic silt, containing a trace of fine sand with shells. The lower 1 to 3-foot thickness of the organic deposit was commonly observed to consist of firm dark brown fibrous peat.

Underlying the organic deposit, the borings encountered a marine clay deposit consisting of a firm to hard, yellow to gray-blue silty clay typically extending to depths of about 27 to 31 feet below the existing ground surface, corresponding to about Elevation -12 to Elevation -16, respectively. The marine clay deposit has a hard to very stiff overconsolidated upper crust which is generally considered to be the result of desiccation during a period of significantly lower ocean levels in the geologic past. The consistency of the clay deposit decreases with increasing depth to firm within the lower portion of the deposit. The total thickness of the marine clay deposit typically ranged from approximately 20 to 28 feet.

Beneath the marine clay deposit, the borings encountered a glacial till deposit comprised of compact to very dense, gray well-graded mixture of silt, sand, and gravel. It is anticipated that cobbles and boulders are also present within the glacial till deposit. Grain size distributions of typical samples of the glacial till deposit are presented in the enclosed Figure 4. The surface of the glacial till deposit was generally encountered at depths ranging from approximately 45 to 60 feet below the existing ground surface, corresponding to Elevation -30 and Elevation -45, respectively.

Groundwater was observed in completed boreholes B-1 through B-5/B-5A at levels varying from about 8.5 to 11.5 feet below the existing ground surface which corresponds to about Elevation +5.1 and Elevation

+7.5, respectively. It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as tidal fluctuations, normal seasonal changes, runoff, particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns.

Preliminary Foundation Design Recommendations

Based upon our current understanding of the proposed development and the anticipated subsurface conditions, it is recommended that proposed structures at the site be supported on a foundation system which transfers the building loads through the unsuitable existing fill and organic deposits. Several types of deep foundation systems were considered for support of the proposed structure, including drilled caissons bearing in the top of the marine clay deposit, timber piles developing frictional support in the marine clay and end bearing piles driven to glacial till and/or bedrock.

Details and structural loads associated with the proposed building have not been determined at this time, however, a system of end-bearing piles installed through the marine clay deposit and into the glacial till deposit present across the site is considered to be the most economical foundation type for foundation support. Although the end-bearing piles are anticipated to be 10 to 20 feet longer than the frictional piles, the design capacity of the end-bearing pile is likely to be 90 to 100 tons greater.

Specifically, the most economical pile type for support of the proposed structures is considered to be a 14-inch square precast-prestressed concrete pile with a design capacity of 125 tons per pile in compression. The piles should be detailed in accordance with Section 1810.3.8.3 of the Code. Although the requirements of Section 1810.3.3.1 of the Code specify that a pile load test is required for piles having a proposed design capacity greater than 50 tons, the pile load test requirement may be waived by the Code official upon submittal of substantiating data which includes load test data or performance records for piles under similar soil and loading conditions. Thus, pending the availability of pile load test results in the vicinity of the project site, the pile load test requirement for the 125-ton design capacity pile may be waived for this project.

The 14-inch square precast-prestressed piles should be spaced no closer than 3 feet on center and should be embedded a minimum of 4 inches into the pile caps. It is recommended that all perimeter pile caps and grade beams extend to a depth of 4 feet below exterior finished grade for frost protection.

It is understood that the recently demolished structure formerly present on the site was supported on a system of timber piles. Therefore, it is recommended that the proposed pile layout for the proposed building be coordinated to the greatest extent possible to avoid existing timber pile locations to minimize obstructions to pile driving. Coordination of the proposed pile layout with the existing pile locations may require the redesign of pile caps around the existing foundations.

In consideration of the presence of the unsuitable fill and compressible organic deposits that directly underlie the existing ground surface, it is recommended that the proposed lowest level floor slab be designed as a structurally supported or framed slab. Since the majority of the lowest level floor slab will be approximately coincident with the finished grade, underslab or perimeter drainage systems are not anticipated to be required.

Lateral forces can be considered to be transmitted from the structure to the soil by passive pressure against the below-grade perimeter walls, pile caps, tie beams and grade beams utilizing an equivalent fluid density of 120 pounds per cubic-foot providing that these elements are designed to resist these pressures.

In addition, fill placement across the project site is anticipated to result in the settlement of the compressible fill and organic deposits. Therefore, it is recommended that site filling be limited to 1-foot above the existing ground surface in order to minimize impacts to the proposed pile foundations, new utilities and surface finishes.

Seismic Design

For purposes of determining parameters for structural seismic design, this site is considered to be classified as a Site Class D as defined in Section 1613.0 of the Code. Further, the bearing stratum on the proposed site is not considered to be subject to liquefaction during an earthquake based on the criterion of Section 1806.4 of the Code.

Foundation Construction Considerations

The major foundation construction considerations include removal of below-grade obstructions to pile installation, installation of foundation piles, dewatering, and off-site disposal of excavated soil.

As discussed under the Foundation Design Recommendations section of this report, the proposed pile layout should be coordinated with the grid of the existing timber piles that supported the former structure. In the event the pile layout of the former building is not coordinated with the proposed pile grid prior to commencing pile installation, all pile locations should be pre-excavated to a depth of at least 15 feet to locate and remove obstructions prior to commencing pile driving operations. The pre-excavations should be backfilled with the excavated granular fill that is tamped in 2-foot thick lifts with the backhoe bucket. Obstructions encountered during pile driving that prevent the installation of piles at that location, should be evaluated on a case-by-case basis to determine the necessity to remove the obstruction or to redesign the pile cap around the obstruction. Elsewhere across the proposed building footprint, pre-excavation should be performed on an as required basis.

Based on our experience with precast concrete piles in the South Boston area, the 125-ton design capacity of the 14-inch square precast-prestressed pile is anticipated to be obtained utilizing a pile driving hammer with a rated energy of approximately 40,000 foot-pounds to drive the piles to a resistance of 10 to 12 blows per inch for the final 6 inches in the glacial till and/or bedrock.

From the results of the subsurface explorations, the end-bearing piles are estimated to be driven to depths ranging from 50 to 70 feet below ground surface into the glacial till or bedrock deposits. The proposed precast-prestressed piles are anticipated to be installed in one section and should not require a splice. During construction, a limited number of indicator piles should be installed across the site to assist the pile contractor in determining the lengths to be ordered for the production piles. One of the indicator piles would be selected for static load testing, in the event that a load test is required.

Based on the observed groundwater conditions, it is anticipated that groundwater will not significantly impact the proposed construction. If groundwater becomes present during construction, dewatering may be performed utilizing conventional sumping methods within the open excavations on-site recharge.

It is anticipated that soil generated from pile pre-excavation and excavation for pile caps and grade beams can be reused as backfill below the elevated lowest level slab. If excess excavated soil remains after all site filling operations are completed, and off-site disposal of the material is required, disposal should be conducted in accordance with the current policies of the Massachusetts Department of Environmental

Protection. Conformance with the existing environmental regulations and policies will necessitate undertaking some chemical testing of representative samples of the excess soil for off-site disposal purposes.

Final Comments

It is recommended that McPhail Associates, LLC be retained to provide final foundation design services once the details of the proposed development have been determined. Depending on the scope of the proposed development, these services may include a final subsurface exploration program and the preparation of a final foundation design report. In addition, it is recommended that McPhail Associates, LLC provide design assistance services during the final design of this project. The purpose of this involvement is to generate the earthwork and pile specification sections, and to review the structural drawings as a check on proper implementation of our foundation design recommendations into the Contract Documents for construction of the proposed building.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the recommendations presented herein, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

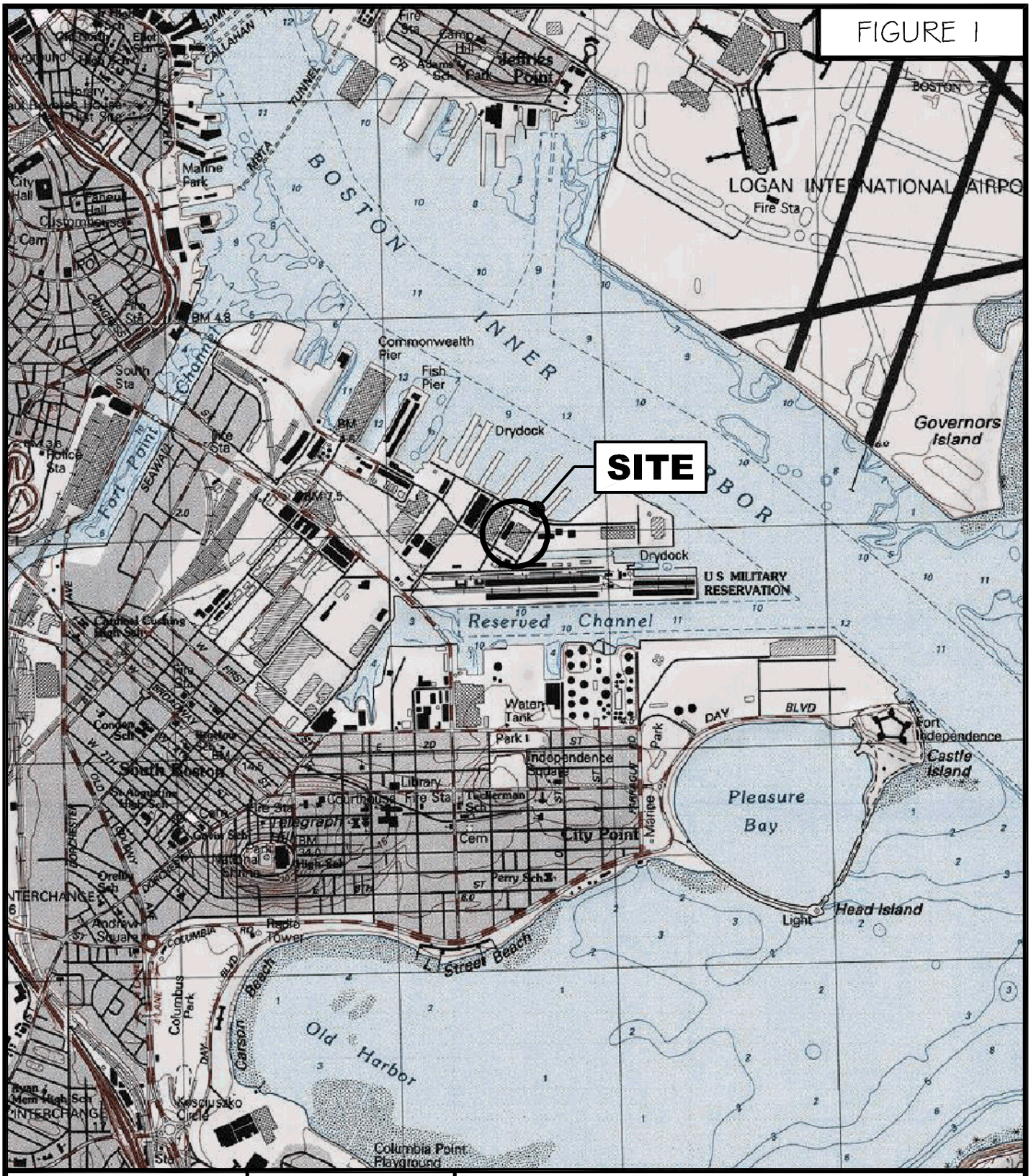
Chris M. Erikson, P.E.

Enclosures

F:\WP5\5392-L.wpd

CME/jwp

FIGURE 1



McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)

N

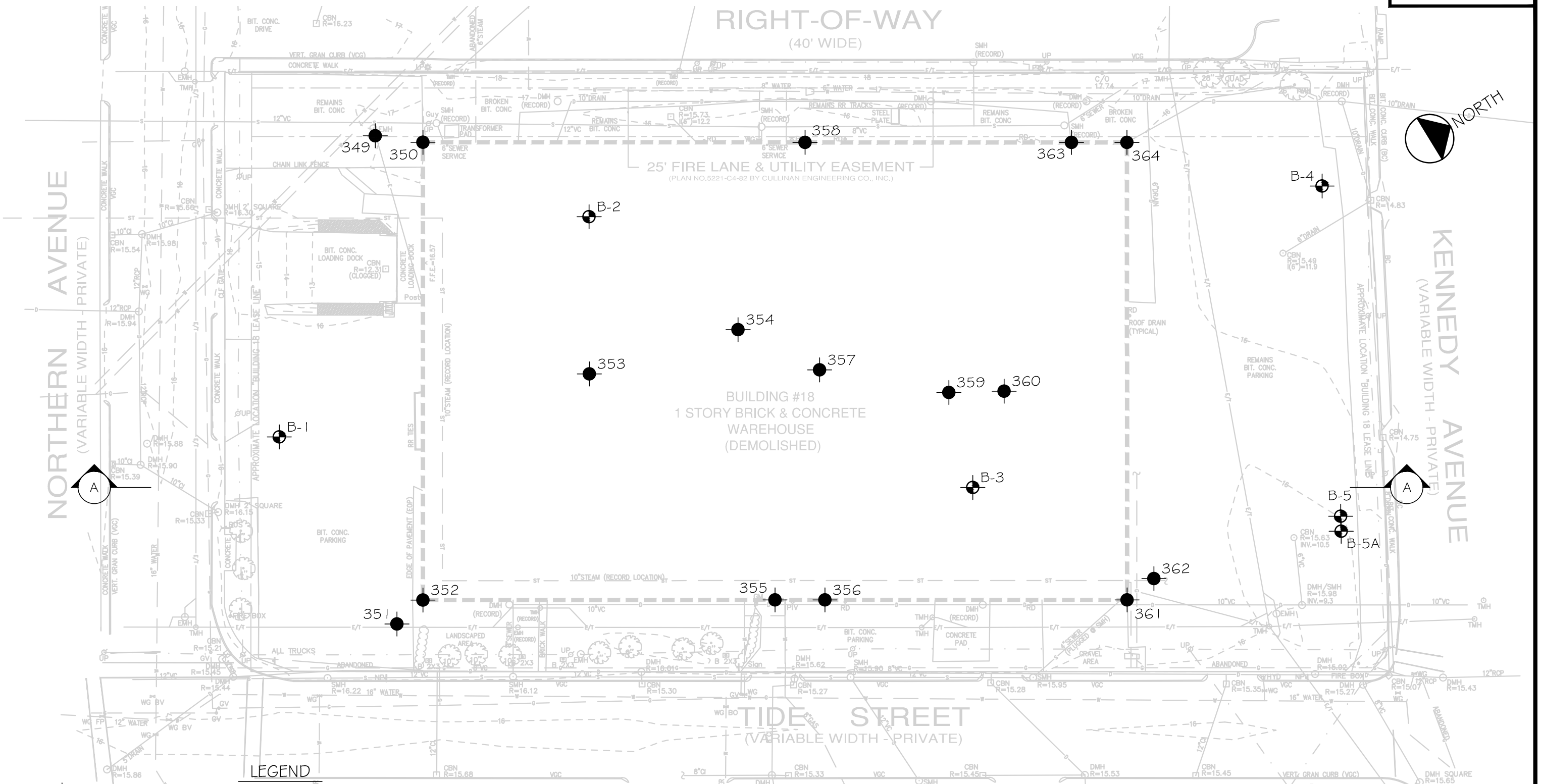
SCALE 1:25,000

PROJECT LOCATION PLAN

6 TIDE STREET

SOUTH BOSTON MASSACHUSETTS

FIGURE 2



LEGEND

— APPROXIMATE LOCATION OF BOREHOLE OBTAINED FROM A 100-SCALE DRAWING ENTITLED "BOSTON NAVAL SHIPYARD, SOUTH BOSTON, ANNEX, PLAN SHOWING BORING LOCATIONS" DATED JANUARY 24, 1951

— APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY CARR-DEE CORP. DURING THE PERIOD OF APRIL 9 THOUGH APRIL 13, 2012 FOR McPHAIL ASSOCIATES, LLC

A — INDICATES LOCATION OF GENERALIZED SUBSURFACE PROFILE A-A; REFER TO FIGURE 3

REFERENCE: THIS PLAN WAS PREPARED FROM A 30-SCALE DRAWING ENTITLED "ENVIRONMENTAL REMEDIATION AND BUILDING DEMOLITION, 6 TIDE STREET, BOSTON, MA, DWG. NO. P-001" DATED JULY 2010 AND PREPARED BY GALE ASSOCIATES, INC.

GRAPHIC SCALE

50 0 50 100

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)

6 TIDE STREET
SOUTH BOSTON MASSACHUSETTS

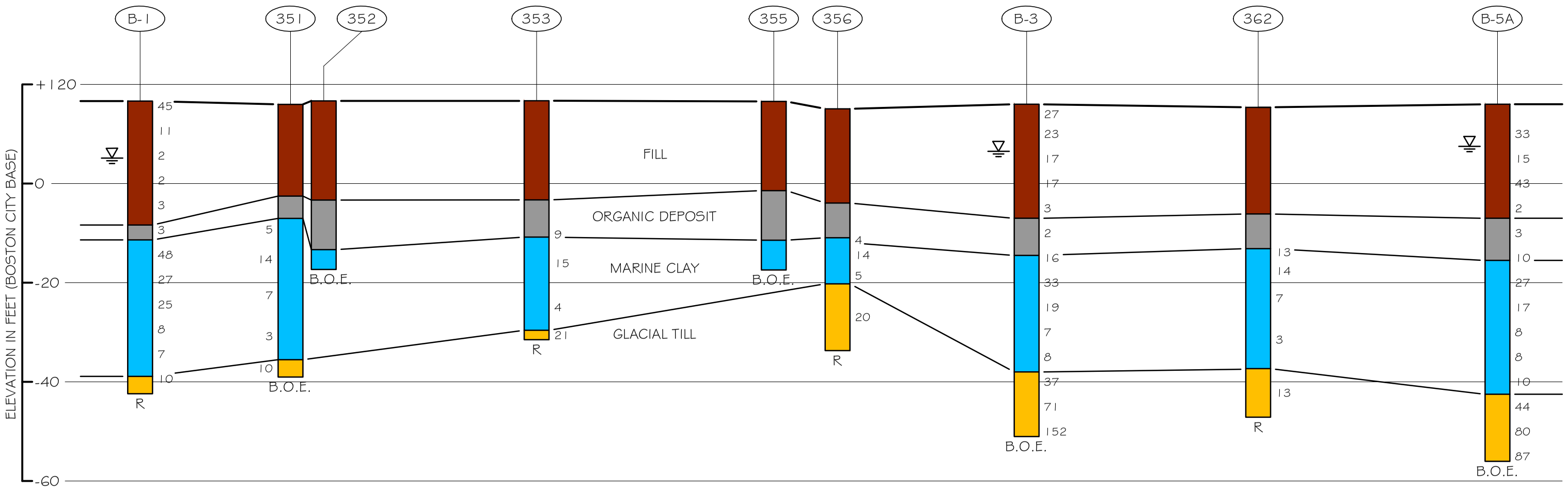
SUBSURFACE EXPLORATION PLAN

FOR
KAVANAGH ADVISORY GROUP, LLC
BY
McPHAIL ASSOCIATES, LLC
CONSULTING GEOTECHNICAL ENGINEERS

Date: APRIL 2012	Dwn: F.G.P.	Chkd: C.M.E.	Scale: 1" = 50'
Project No: 5392			

FILE NAME: H:\Acad\JOBS\5392\5392-FO2rev1.dwg

FIGURE 3



SECTION A-A

HORIZONTAL 1" = 40'
VERTICAL 1" = 20'

LEGEND

- B-1 — BOREHOLE NUMBER
- ▽ — GROUNDWATER LEVEL OBSERVED IN COMPLETED BOREHOLE.
- 9 — STANDARD PENETRATION RESISTANCE OR N-VALUE, BLOWS PER FOOT.
- B.O.E. — BOTTOM OF EXPLORATION.
- R — BOREHOLE TERMINATED UPON REFUSAL.

SUBSURFACE UNIT	GRAPHIC SYMBOL	GENERAL DESCRIPTION
FILL		LOOSE TO COMPACT, BROWN TO BLACK, SILTY SAND WITH SOME TO TRACE GRAVEL CONTAINING VARIABLE AMOUNTS OF ASH, CINDERS, AND BRICK, TO A VERY SOFT TO FIRM GRAY SILTY CLAY.
ORGANIC DEPOSIT		VERY SOFT TO STIFF, GRAY TO BLACK ORGANIC SILT, CONTAINING A TRACE OF FINE SAND WITH SHELLS VARYING TO A DARK BROWN FIBROUS PEAT.
MARINE CLAY		FIRM TO HARD, YELLOW TO BLUE-GRAY, SILTY CLAY.
GLACIAL TILL		COMPACT TO VERY DENSE, GRAY WELL-GRADED MIXTURE OF SILT, SAND, AND GRAVEL WITH OCCASIONAL COBBLES AND BOULDERS.

NOTES:
1. REFER TO FIGURE 2 FOR LOCATION AND ORIENTATION OF SUBSURFACE SECTION.
2. STRATIFICATION LINES BETWEEN EXPLORATIONS ARE BASED ON LINEAR INTERPOLATION OF DATA FROM THE EXPLORATIONS AND MAY NOT NECESSARILY REPRESENT ACTUAL SUBSURFACE CONDITIONS.

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)

6 TIDE STREET
BOSTON MASSACHUSETTS

GENERALIZED SUBSURFACE PROFILE A-A

FOR
KAVANAGH ADVISORY GROUP, LLC
BY
McPHAIL ASSOCIATES, LLC

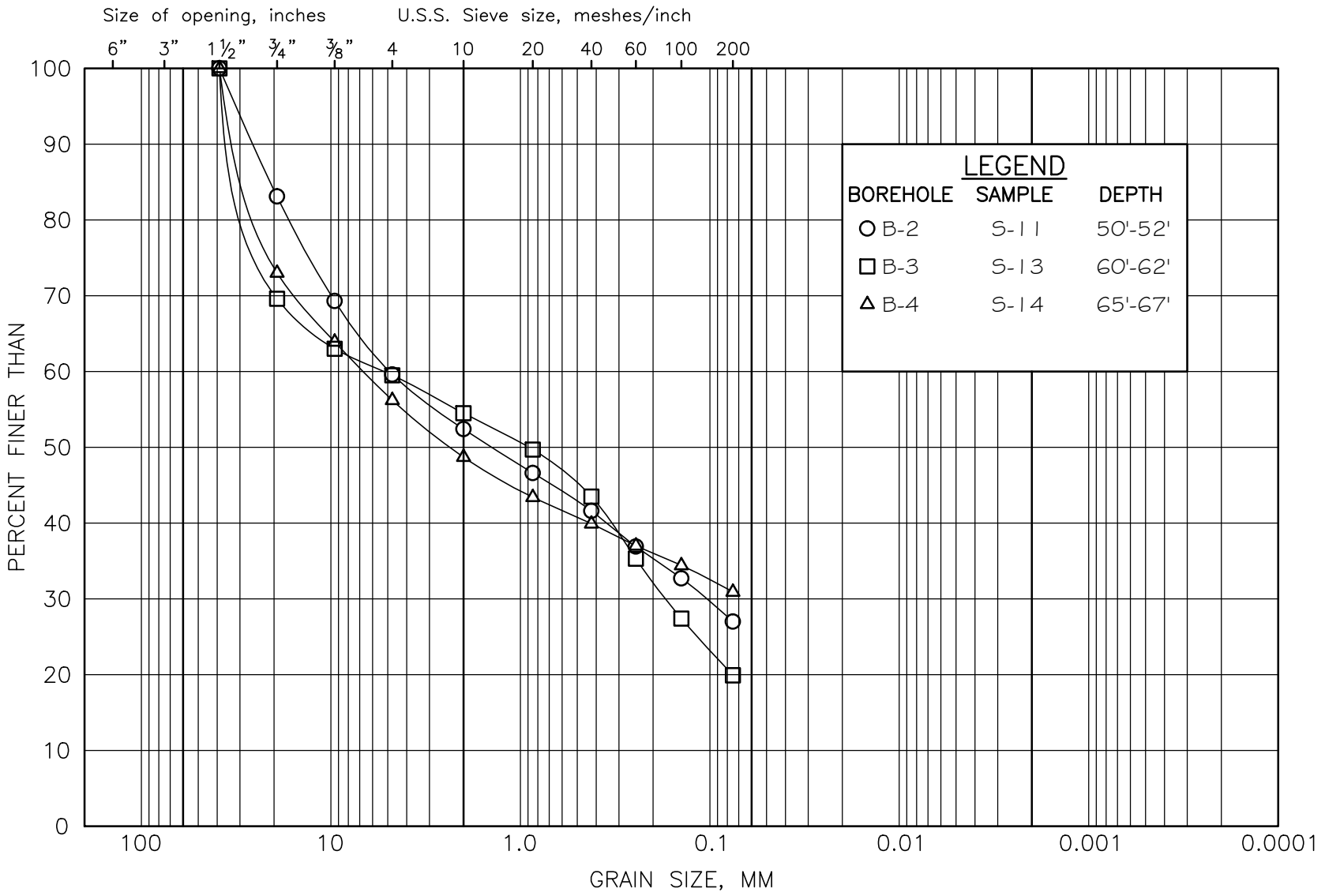
Date: APRIL 2012	Dwn: F.G.P.	Chkd: C.M.E.	Scale: AS NOTED
Project No: 5392			

FILE NAME: H:\Acad\JOBS\5392\5392-F03_Section.dwg

FILE NAME: H:\Acad\JOBS\5392\5392-F04_Sieve.dwg

PROJECT No. 5392

M.I.T. GRAIN SIZE SCALE



COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES, INC.

GRAIN SIZE DISTRIBUTION
GLACIAL TILL

FIGURE 4

McPHAIL ASSOCIATES, LLC

APPENDIX A

Limitations

McPHAIL ASSOCIATES, LLC

Limitations

This report has been prepared on behalf of and for the exclusive use of Kavanagh Advisory Group, LLC for specific application to the proposed development to be located at 6 Tide Street in South Boston, Massachusetts in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature, design or location of the proposed development are planned, the information contained in this report should not be considered valid unless the changes are reviewed and the information presented in this report is modified or verified in writing.

The analyses and recommendations presented in this report are based upon the data obtained from the subsurface explorations performed at the approximate locations indicated on the enclosed Figure 2. If variations in the nature and extent of subsurface conditions between the widely spaced explorations become evident during the course of construction, it will be necessary for a re-evaluation of the recommendations of this report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.

It is recommended that McPhail Associates, LLC be retained to provide final design and design assistance services to the Architect and Structural Engineer during the final design phase of this project. The purpose of this involvement is to review the structural foundation drawings and foundation notes for conformance with the recommendations herein, and to prepare the applicable specialty foundation specification sections for inclusion into the Contract Documents for construction.

McPHAIL ASSOCIATES, LLC

APPENDIX B

Carr-Dee Corp.
Boring Logs
B-1 through B-5/B-5A

CARR-DEE CORP.

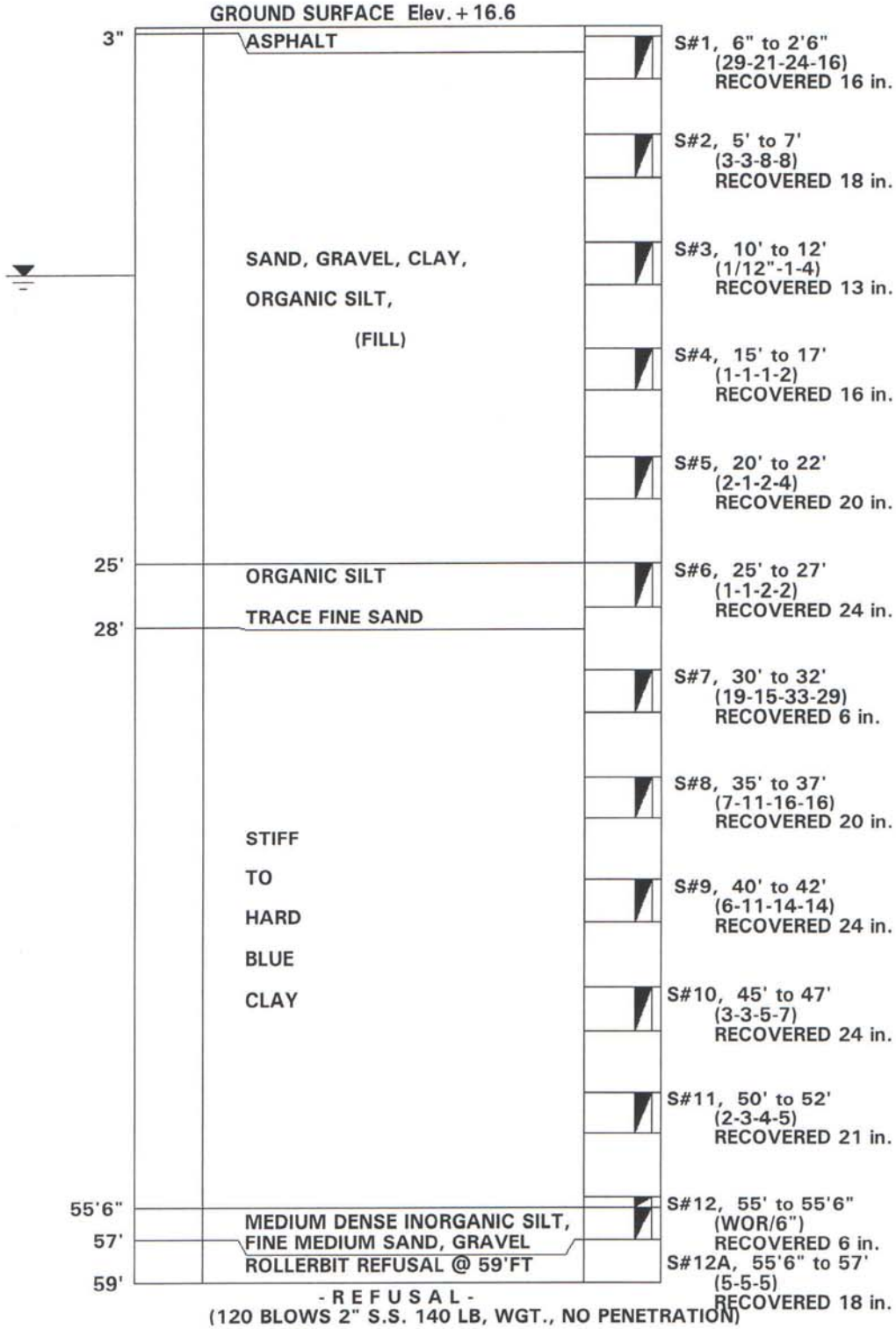
37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 8 ft.

BORING 1

GROUND SURFACE Elev. + 16.6



- REFUSAL -
(120 BLOWS 2" S.S. 140 LB, WGT., NO PENETRATION)

WATER LEVEL 11'6"
SIZE OF CASING NW LENGTH 25'0"
DRILLER: G.SMITH, INSPECTOR: F.B.KONJIC

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

CARR-DEE CORP.

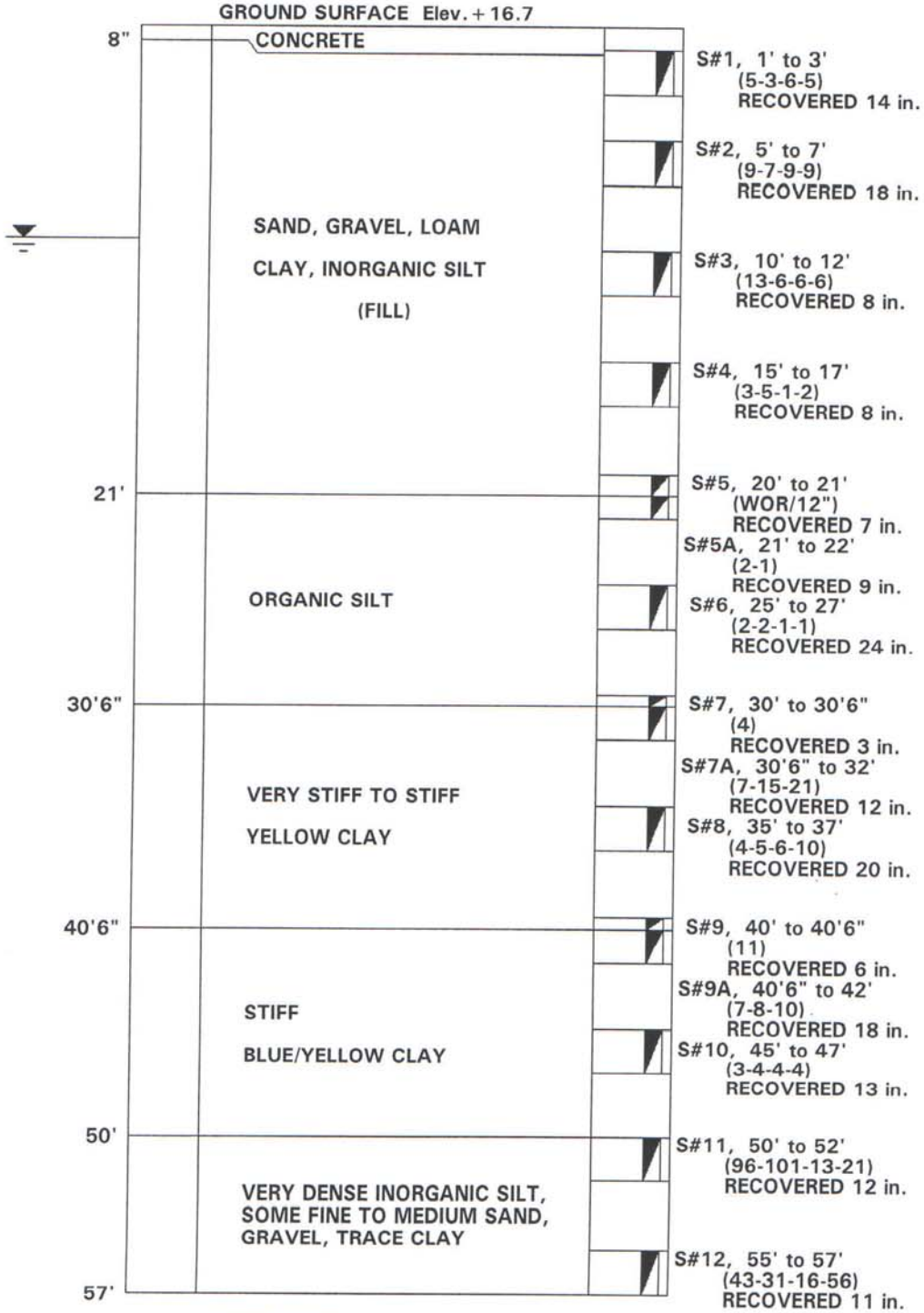
37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 8 ft.

BORING 2

GROUND SURFACE Elev. + 16.7



WATER LEVEL 9'6"
SIZE OF CASING NW LENGTH 40'6"
DRILLER: G.SMITH, INSPECTOR: F.B.KONJIC
DATE STARTED & COMPLETED 4-9-10-2012

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

CARR-DEE CORP.

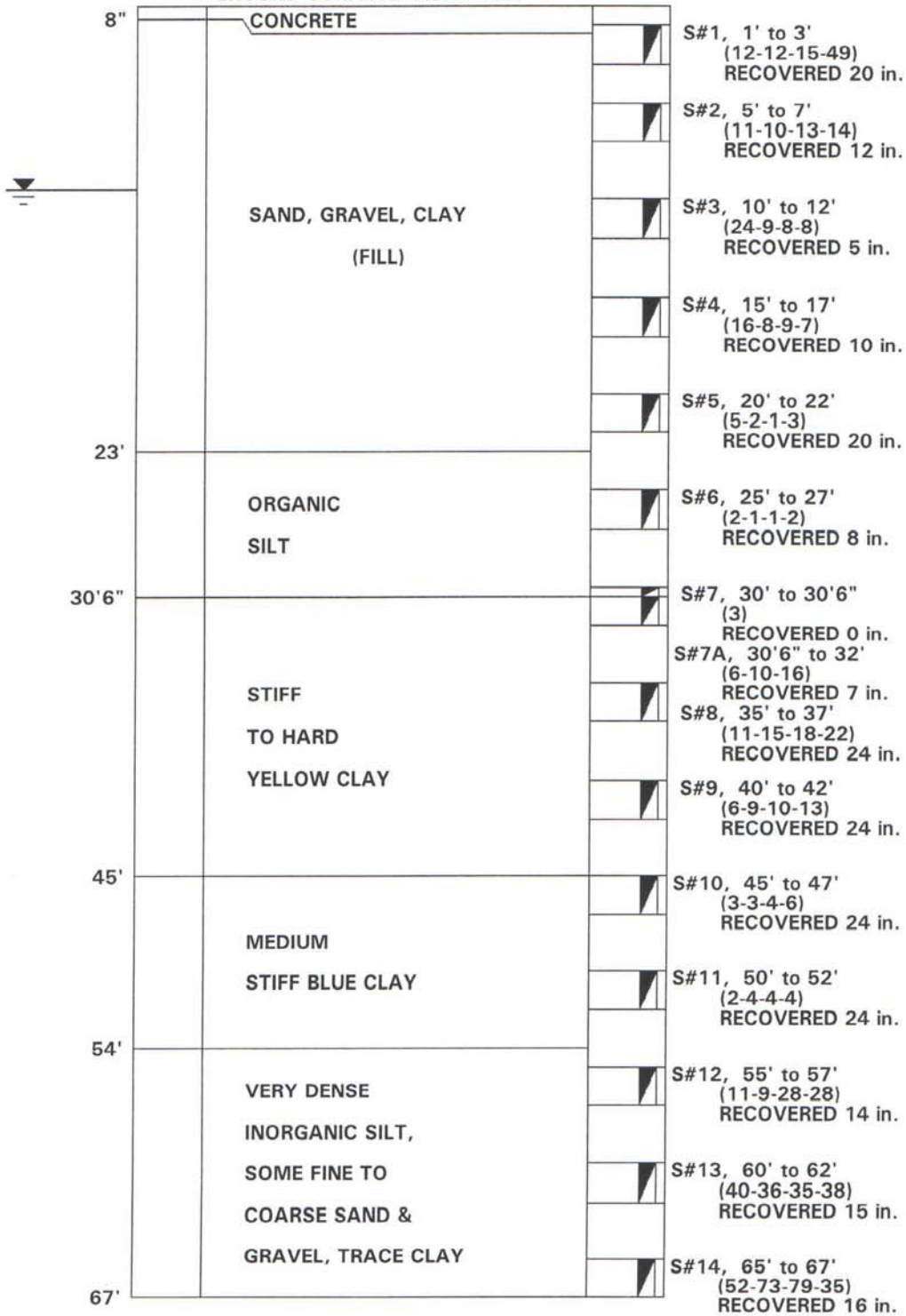
37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 9 ft.

BORING 3

GROUND SURFACE Elev. + 16.7



WATER LEVEL 9'6"
SIZE OF CASING NW LENGTH 32'6"
DRILLER: G.SMITH, INSPECTOR: F.B.KONJIC
DATE STARTED & COMPLETED 4-13-2012

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

CARR-DEE CORP.

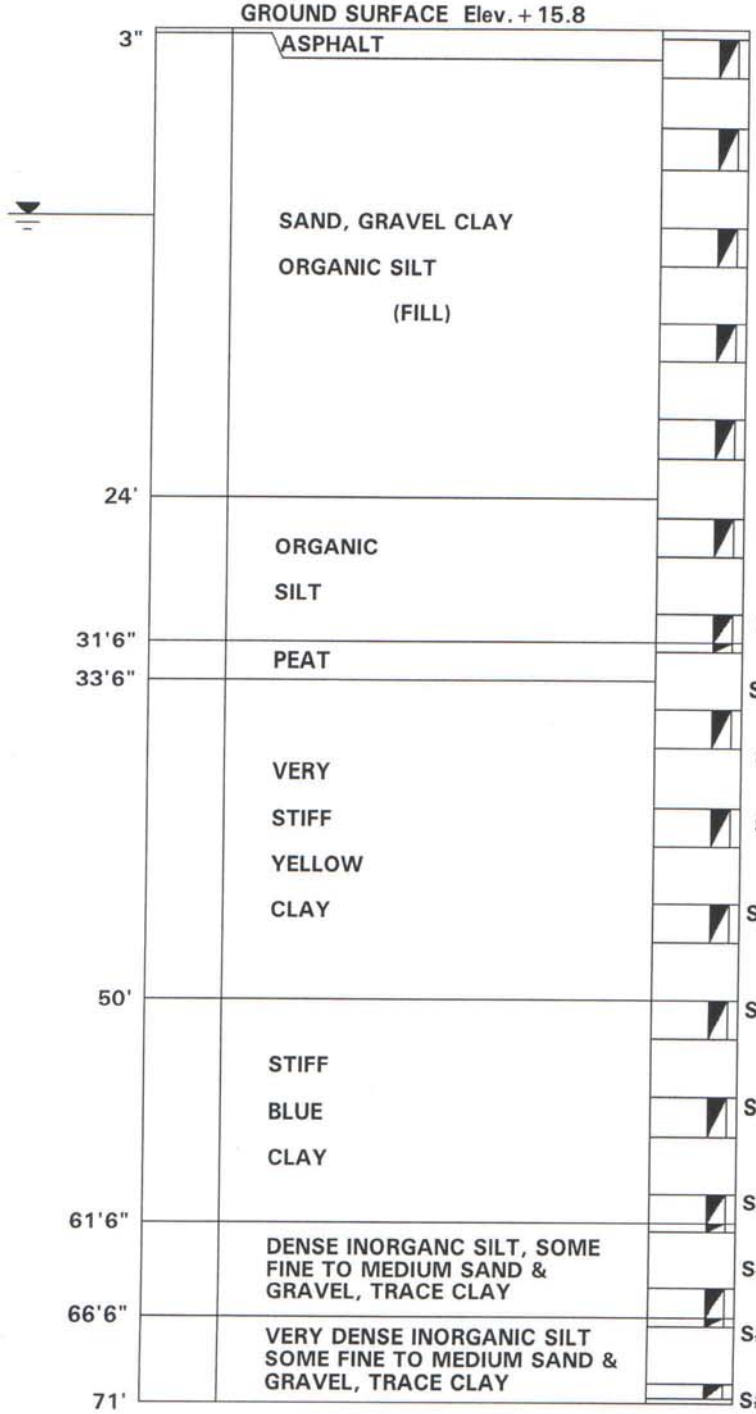
37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 10 ft.

BORING 4

GROUND SURFACE Elev. + 15.8



S#1, 6" to 2'6" (6-10-16-22) RECOVERED 21 in.

S#2, 5' to 7' (7-7-6-16) RECOVERED 7 in.

S#3, 10' to 12' (33-19-9-8) RECOVERED 5 in.

S#4, 15' to 17' (14-7-3-3) RECOVERED 7 in.

S#5, 20' to 22' (12-16-20-16) RECOVERED 5 in.

S#6, 25' to 27' (3-4-7-4) RECOVERED 10 in.

S#7, 30' to 31'6" (2-2-4) RECOVERED 8 in.

S#7A, 31'6" to 32' (7) RECOVERED 6 in.

S#8, 35' to 37' (10-15-27-24) RECOVERED 24 in.

S#9, 40' to 42' (11-12-16-20) RECOVERED 24 in.

S#10, 45' to 47' (7-9-12-14) RECOVERED 24 in.

S#11, 50' to 52' (2-3-5-4) RECOVERED 24 in.

S#12, 55' to 57' (2-2-5-4) RECOVERED 24 in.

S#13, 60' to 61'6" (2-3-13) RECOVERED 18 in.

S#13A, 61'6" to 62' (19) RECOVERED 6 in.

S#14, 65' to 66'6" (15-9-14) RECOVERED 6 in.

S#14A, 66'6" to 67' (75) RECOVERED 5 in.

S#15, 70' to 70'9" (65-120/3") RECOVERED 6 in.

WATER LEVEL 9'6"
SIZE OF CASING NW LENGTH 25'0"
DRILLER: G.SMITH, INSPECTOR: F.B.KONJIC
DATE STARTED & COMPLETED 4-10-11-2012

NOTE: ROLLERBIT REFUSAL @ 71'FT

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

CARR-DEE CORP.

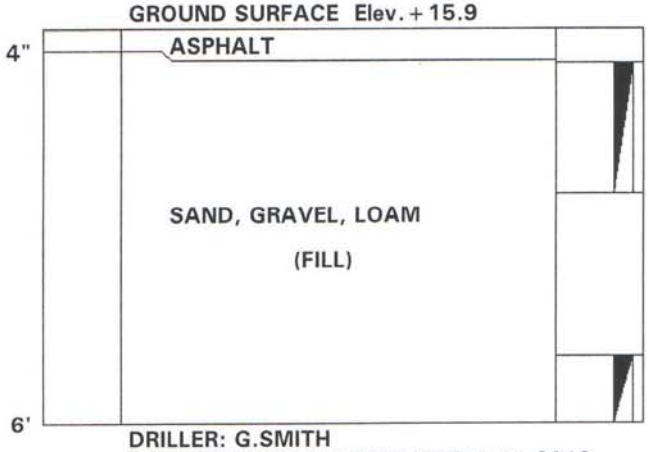
37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 3 ft.

BORING 5

GROUND SURFACE Elev. + 15.9



S#1, 6" to 2'6"
(19-17-19-9)
RECOVERED 14 in.

S#2, 5' to 6'
(1-2)
RECOVERED 5 in.

DRILLER: G.SMITH
DATE STARTED & COMPLETED 4-11-2012

NOTE: ENCOUNTERED OBSTRUCTION @ 6'FT
MOVED BORING 7'FT TOWARDS TIDE ST

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

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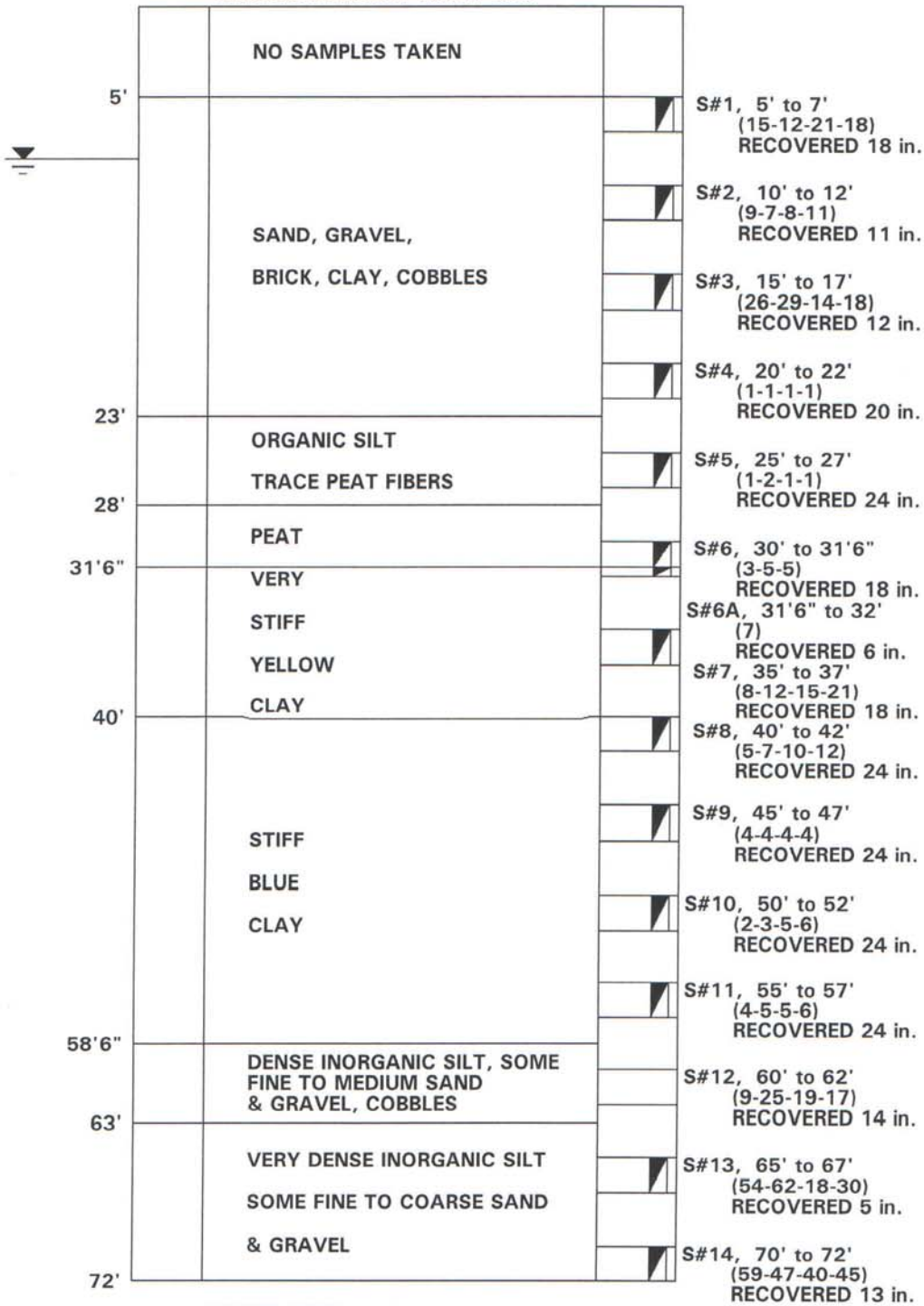
To: McPHAIL ASSOCIATES, LLC 2269 MASS, AVE. CAMBRIDGE, MA Date: 4-17-2012 Job No.: 2012-53

Location: 6 TIDE STREET SOUTH BOSTON, MA Scale: 1 in. = 10 ft.

BORING 5-A

GROUND SURFACE Elev. + 16.0



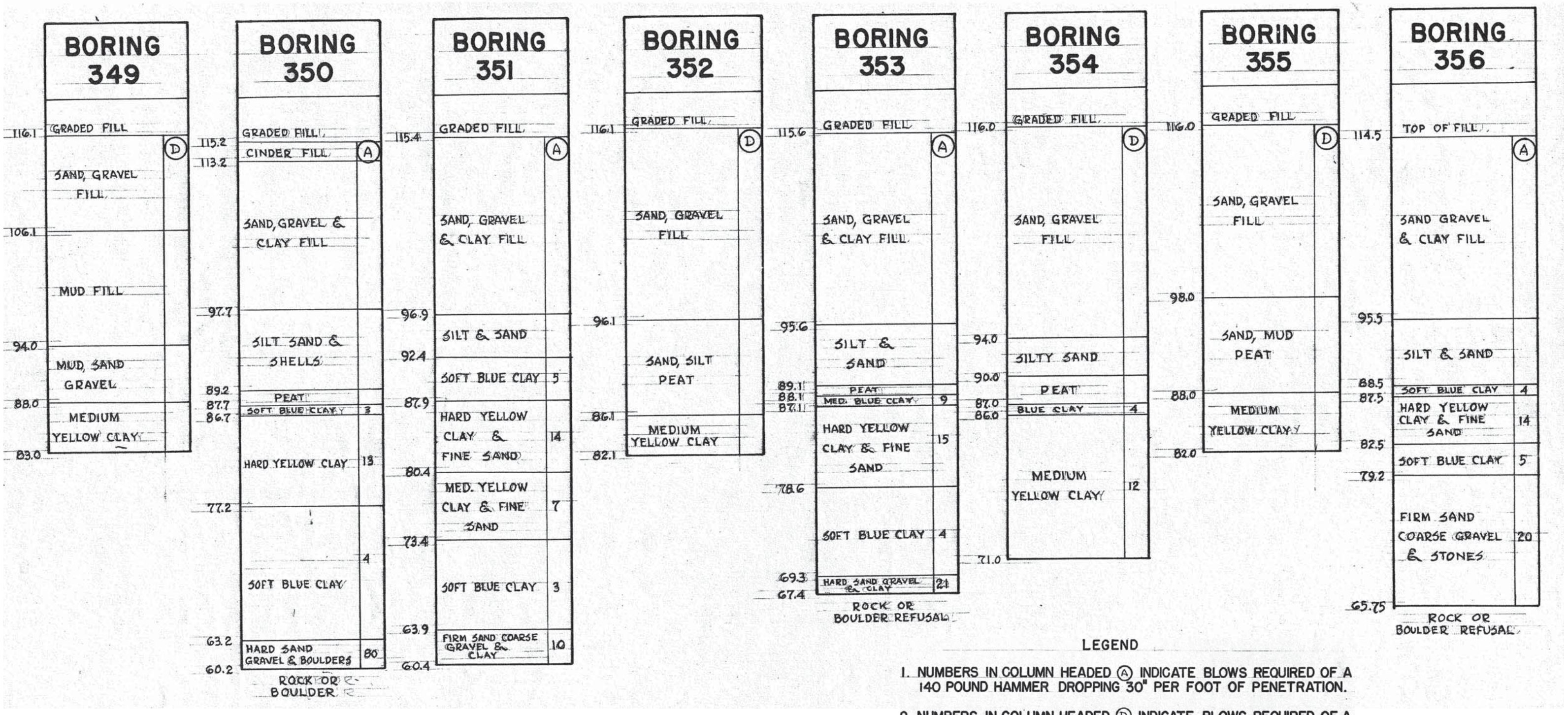
WATER LEVEL 8'6"
SIZE OF CASING NW LENGTH 32'0"
RILLER: G.SMITH, INSPECTOR: F,B.KONJIC
DATE STARTED & COMPLETED 4-12-2012
NOTE: ENCOUNTERED OBSTRUCTION @ 6'FT
MOVED BORING 7'FT TOWARDS TIDE ST

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

McPHAIL ASSOCIATES, LLC

APPENDIX C

Boston Naval Shipyard
Boring Logs
349 through 364



LEGEND

1. NUMBERS IN COLUMN HEADED (A) INDICATE BLOWS REQUIRED OF A 140 POUND HAMMER DROPPING 30" PER FOOT OF PENETRATION.
2. NUMBERS IN COLUMN HEADED (D) INDICATE BLOWS REQUIRED OF A 175 POUND HAMMER DROPPING 16" PER FOOT OF PENETRATION.
3. WHERE THE BLOWS COLUMN IS HEADED (P) A JET PROBING IS INDICATED.
4. WHERE THE BLOWS COLUMN IS HEADED (19) (BORINGS TAKEN IN 1919) PENETRATION RESISTANCE NOT NOTED.

BORING 357

115.4 GRADED FILL — A

HARD SAND GRAVEL, STONES & CLAY FILL

94.4 SILT, SAND & SHELLS

88.4 PEAT

87.4 MED. BLUE CLAY — 9

85.9 HARD YELLOW CLAY & FINE SAND — 15

77.4 SOFT BLUE CLAY — 3

72.4 FIRM SAND, GRAVEL, CLAY — 12

71.6 ROCK OR BOULDER REFUSAL

BORING 358

114.0 TOP OF FILL — A

SAND, GRAVEL & CLAY FILL

95.0 CONCRETE OR STONE

94.0 SILT & SAND

88.0 PEAT

86.8 MED. BLUE CLAY — 9

86.0 HARD YELLOW CLAY & FINE SAND — 16

79.0 SOFT BLUE CLAY — 4

65.8 FIRM SAND COARSE GRAVEL, STONES & CLAY — 20

63.25 ROCK OR BOULDER REFUSAL

BORING 359

112.4 TOP OF FILL — A

SAND, GRAVEL & CLAY FILL

93.9 SILT & SAND

85.9 PEAT

84.9 HARD BLUE CLAY — 12

83.7 HARD YELLOW CLAY & FINE SAND — 16

77.4 SOFT BLUE CLAY — 4

56.2 HARD SAND GRAVEL CLAY & STONES — 20

54.4 ROCK OR BOULDER REFUSAL

BORING 360

116.0 GRADED FILL — D

SAND GRAVEL FILL

93.0 SAND, MUD, PEAT

86.0 MEDIUM YELLOW CLAY

82.0

BORING 361

116.1 GRADED FILL — D

SAND GRAVEL FILL

94.0 MUD

89.0 PEAT WITH CLAY

88.0 BLUE CLAY — 6

83.0 MEDIUM YELLOW CLAY — 14

12

61.0 COARSE SAND — 4

59.0 HARDPAN — 24

BORING 362

114.8 TOP OF FILL — A

SAND, GRAVEL & CLAY FILL

93.3 SILT, SAND & SHELLS

87.3 PEAT & SAND

86.3 HARD BLUE CLAY & FINE SAND — 13

84.8 HARD YELLOW CLAY & FINE SAND — 14

78.8 MEDIUM YELLOW CLAY & FINE SAND — 7

73.8 SOFT BLUE CLAY — 3

62.1 SAND GRAVEL & CLAY — 12

52.3 ROCK OR BOULDER REFUSAL

BORING 363

116.1 GRADED FILL — D

SAND, GRAVEL FILL

91.1 MUD

87.1 PEAT

85.0 BLUE CLAY — 6

81.0 MEDIUM YELLOW CLAY — 13

74.1

BORING 364

113.1 TOP OF FILL — A

SAND, GRAVEL FILL

94.6 SILT, SAND & SHELLS

85.6 PEAT

84.1 MED. BLUE CLAY — 9

81.6 HARD YELLOW CLAY & FINE SAND — 15

75.1 SOFT BLUE CLAY — 3

58.9 HARD SAND GRAVEL, CLAY & BOULDERS — 30

52.6 ROCK OR BOULDER REFUSAL

LEGEND

1. NUMBERS IN COLUMN HEADED (A) INDICATE BLOWS REQUIRED OF A 140 POUND HAMMER DROPPING 30" PER FOOT OF PENETRATION.
2. NUMBERS IN COLUMN HEADED (D) INDICATE BLOWS REQUIRED OF A 175 POUND HAMMER DROPPING 16" PER FOOT OF PENETRATION.
3. WHERE THE BLOWS COLUMN IS HEADED (JP) A JET PROBING IS INDICATED.
4. WHERE THE BLOWS COLUMN IS HEADED (19) (BORINGS TAKEN IN 1919) PENETRATION RESISTANCE NOT NOTED.