The Chain Forge Hotel

105 First Avenue, Charlestown, Navy Yard

December 19, 2014

Development Review Submission:

Article 80 - Project Notification Form

Submitted to: The Boston Redevelopment Authority

Submitted by: Chain Forge Hotel LLC
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Appendix Information

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CHAPTER 1
PROJECT SUMMARY

1.0 Project Summary

1.1.1 Project Description

Chain Forge Hotel LLC proposes to develop the Chain Forge Hotel, to be located within the Boston Redevelopment Authority owned Chain Forge - Building 105 situated at 105 First Avenue in the Historic Monument Area of the Charlestown Navy Yard. The Chain Forge Hotel will be a 5 level hotel development, approximately 180,000 GSF in size, encompassing the entire current structure on site and adding an additional level on the rear of the building. There will be approximately 230 hotel rooms within the hotel, with an associated hotel lobby area, conference rooms, pool, fitness center, restaurant, and historical exhibit showcasing the projects prior industrial uses. A critical component of the hotel redevelopment is the historical exhibit area located within the lobby atrium. The exhibit will allow visitors and guests at the hotel to view 38 pieces of historical machinery owned by the United States National Park Service, and retained onsite as an interpretive exhibition.

As the building is located within the Historic Monument Area of the Charlestown Navy Yard, pursuant to Boston Zoning Code Section 42F-10, guest and visitor parking will be fully accommodated off-site in the existing Boston AutoPort area of Charlestown by way of valet attendants. A parking space rental agreement has been discussed with the owners and operators of the AutoPort, and the Proponent has been assured there is ample available supply to meet the needs of the hotel and restaurant use.

The hotel building has been designed to historical design guidelines, as agreed to by five parties who hold an approving vote on the projects final design; Boston Redevelopment Authority (City of Boston), National Park Service – Philadelphia (regional office), National Parks Service - Boston, Massachusetts Historical Commission, and Boston Landmarks Commission. The project's design will require modifications to the guidelines, and a collaborative meeting with all five parties is currently being scheduled in the coming weeks to agree on the changes necessary for redevelopment to occur. Please refer to

Exhibit A of the Appendix for Site Plans, Building Sections, Building Elevations, Images, and Floor Plans.

1.1.2 Project Site

The Chain Forge Hotel is located within the Historical Monument Area of the Charlestown Navy Yard, Charlestown MA. The site is bounded by Ninth Street to the south, Thirteenth Street to the north, Second Avenue pedestrian walkway to the west and First Avenue to the east. The Charlestown Navy Yard is located in the Charlestown area of Boston MA, and is separated from the main area of Charlestown by a large iron fence and rock wall. The Charlestown Navy Yard, previously known as the Boston Naval Shipyard (BNS), was listed in 1966 on the National Register of Historic Places and the BNS is designated a National Historic Landmark. Primary entry to the Navy Yard can be through two entry/exit gates, located at Fifth Street to the south, and Thirteenth Street to the north.

The project's building site is broken into three sections, which include the Chain Forge Shed (Smithery), Connector, and Head House structures. The building was designed by the Bureau of Yards and Docks constructed by P.J. McCaffery/L.L. Leach & Sons for the United States Navy from 1900-1904. 'Building 105', as it was known by Navy personnel, was constructed of a steel framework and roof trusses with brick exterior walls. Additions have changed the appearance of the building significantly over the history of the building, with a second level added to the First Avenue elevation in the early 1940's at the same time as a large high-bay area was added to the Second Avenue elevation to accommodate the use of larger forging machinery within the building.

The Chain Forge Hotel site area is approximately 63,000 Gross Square Feet, and when redevelopment of the building occurs, a full build out of approximately 180,000 GSF will be attained. The site is located within the vibrant mixed-use neighborhood of the

Charlestown Navy Yard. Please refer to Exhibit A & C of the Appendix for aerial photographs, maps, existing conditions site photographs and surveys.

The Chain Forge has been vacant since the 1974 closure of the Boston Naval Shipyard, and was conveyed to the Boston Redevelopment Authority ('BRA') in 1978. The Boston National Park Service retained ownership of the machinery left inside of the building as part of the conveyance. As the Chain Forge property is located within the Historic Monument Area of the Charlestown Navy Yard, specific historical design guidelines need to be met in order for redevelopment of the building to occur. Many of the structures in the area have been renovated or built since the closing of the Boston Naval Shipyard, including a 54 unit condominium development Kavanagh Advisory Group, LLC currently has under construction on Parcel 39A, adjacent to the Chain Forge Hotel project site on First Avenue.

1.1.3 Project Team

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CHAPTER 2
PROJECT DESCRIPTION

2.0 Project Description

2.1.1 Building Program

The Chain Forge Hotel is proposed to be an approximately 180,000 gross square feet, 230 key limited service, extended stay hotel serving the lodging needs of the Navy Yard, the community of Charlestown, the North End, and the surrounding areas of Boston. The hotel will be an amenity unlike any other currently located within the Charlestown Navy Yard, providing the surrounding community with lodging and dining options that do not exist at this time.

As the building is essentially three structures all connected together as one building, we are proposing to restore the entire building's current area of approximately 63,000 GSF, and will stay within the existing footprint. We are proposing to add one additional level of hotel rooms which would extend beyond the current buildings envelope on the Second Avenue elevation, which is necessary to provide additional revenue to cover the extensive restoration and environmental remediation costs that currently exist at the building. This one-level addition will not be seen from the main thoroughfare of First Avenue, and only partially visible from portions of Ninth and Thirteenth Streets.

Head House/Connector Building

Included within the Head House section of the building of the Chain Forge Hotel is an approximately 5,100 square foot, 20 foot ceiling height restaurant and 900 square foot bar/lounge, which will be open to the general public as well as hotel guests. There will also be restaurant and hotel kitchen and loading space included in this portion of the Head House. Completing the ground floor of the Head House are two 20 foot ceiling height Meeting Rooms of approximately 1,650 square feet each, as well as a Pre-Function space.

On the second level of the Head House/Connector Building, there will be approximately 13 hotel rooms located along the exterior walls of the building, as well as a

housekeeping storage room. The hotel rooms will utilize the existing window openings to bring natural light into the space. This second level of the Head House will connect to the Shed building through the connector building, linking up seamlessly on the second level of the Shed building and utilizing the elevator bank at the east end of the complex for access.

On the third level of the Head House, there will be approximately 13 hotel guest rooms located along the exterior walls of the building, similar to the second level of the building. These units will also utilize the existing exterior window openings for lighting requirements. On the interior portion of the third level, there will be an approximately 2,000 square foot pool, fitness and restroom area, with skylights allowing natural light into the space. There will also be housekeeping facilities. This level of the Head House will connect to the main Shed building through the Connector.

Shed/Smithery Building

The main Shed building will be the largest part of the hotel and will house the majority of the hotel rooms. In addition, the main entrance, lobby/reception, back of house space, breakfast area, conference/meeting space, administration and historical exhibit space will be located in this portion of the building.

On the ground floor of the Shed building, Chain Forge Hotel LLC is proposing to include 26 hotel rooms located along the exterior walls of the building, ranging in size from 300 to 500 square feet in size. The main entrance to the building will be located on the First Avenue side of the building, approximately 100 feet from the Thirteenth Street intersection. Luggage storage, front desk registration area, two separate elevator areas at each of the building (3 elevators in the south end of the building and 2 in the north end of the lobby), hotel administration, back of house space, breakfast eating areas and meeting space will also be located in this ground floor space. A critical component of the ground floor program will be the Chain Forge Historical Exhibit area, which is going to

showcase a significant number of forging machines used throughout the buildings history. In 2014, the Proponent commissioned a study in consultation with the Boston National Park Service (owners the remaining pieces of machinery) to determine the historically significant pieces which should remain on-site and be included in the exhibit. The study determined that 38 machines were of significance, with some pieces being the only remaining in the world. These pieces will be on display in the atrium/lobby space in areas where the public can visit and view the history of the building. The ground floor space will open up to the atrium and allow visitors to experience what was termed 'the cathedral of industry', and gain an understanding of the monumental space as it was when fully operational from 1904-1973.

The second level of the Shed building will include approximately 58 hotel rooms. Thirty-one (31) rooms will be located on the exterior walls of the building and will primarily utilize existing window openings to allow natural light into the units. There will also be twenty-seven (27) interior atrium facing hotel rooms. These units will look into the hotel atrium space and are acceptable by hotel standards. The second level of the Shed will join with the Head House through the Connector building. This level of hotel rooms will fit entirely within the current building envelope.

The third level of the Shed building will include approximately 55 hotel rooms. Approximately thirty-nine (39) rooms will be located along the exterior walls of the building, while sixteen (16) rooms will be interior atrium facing. This level of the Shed building also connects with the third level of the Head House building through the Connector building, allowing direct access into the fitness and pool area. This level of hotel rooms will fit entirely within the current building envelope.

The fourth level of the Shed building will include approximately 40 hotel rooms primarily situated on a double loaded corridor on the Second Avenue side of the building. There are approximately twenty-one (21) hotel rooms located along the exterior walls of the

building, with nineteen (19) hotel rooms facing the interior atrium of the building. This level will not have direct access to the Connector nor the Head House buildings, and elevator or stairs will need to be used to access other areas of the hotel. This level of hotel rooms will also fit entirely within the existing building envelope.

The fifth level of the Shed building will include approximately twenty-three (23) hotel rooms, ranging in size from 300 – 500 square feet. All hotel rooms will be exterior facing. This level of the hotel is the only addition to the original building structure.

2.1.2 Parking

The projects long and short term parking requirements will be accommodated entirely off-site via a valet parking service operated and managed by the hotel. The Boston AutoPort Manager has assured the Proponent that it is capable of reserving approximately 200 spaces for the project on an as-needed basis, with the ability to add more spaces to the reservation if necessary. The hotel operator will be responsible for the implementation of the valet parking service and rates will be determined based on market conditions at the time of opening.

Chain Forge Hotel LLC 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 hotel. Section 6.0, entitled 'Transportation', provides traffic and access data and information.

2.1.3 Vehicular and Pedestrian Access

Vehicular access onto the project site's property will only occur in one location, which will be the approximately 20 foot wide hotel loading and receiving area proposed for the project. The loading zone is proposed to run parallel to the Head House building between the building and the Second Avenue pedestrian walkway. Please see the attached site plan for aerial map. This curb cut, located on Ninth Street will allow

deliveries and refuse collection to occur for the Chain Forge Hotel, restaurant and lounge. Please refer to the Project Site Plan.

Primary pedestrian access into the hotel will occur from First Avenue into a centrally located building lobby. This lobby will include a guest reception desk, associated hotel lobby amenities, conference space, as well as ground floor hotel rooms. The atrium space will include a historical equipment exhibit space, showcasing a number of pieces of equipment deemed historically significant by the National Park Service. National Park Service Rangers on guided tours, as well as members of the general public will be encouraged to enter into the lobby atrium space to view the exhibit and gain an understanding of the Chain Forge Building's prior existence.

There is proposed to be an eight (8) car valet loading and taxi area to be located directly in front of the main hotel entrance on First Avenue. This area is currently a 2 hour parking zone. In response to the loss of the those spaces, the Propoent is proposing to widen the road on the north side of Ninth Street, directly in front of the Head House building, and create a curb cut into the boulevard to create approximately four (4) new parking spaces. This modification would lessen the impact of the loss of the eight (8) parking spaces on First Avenue and help alleviate some of the Navy Yard communities parking concerns. After an initial consultation with the Boston Transportation Department, this approach appeared to be a viable option, however permitting and approval from various agencies will still be required.

Primary access into the restaurant and lounge will be through the main entrance to the Head House building. There will be a secondary entrance to this area through the Connector building from the hotel lobby space, primarily used for hotel guests visiting the lounge or restaurant.

Access to Second Avenue from inside the building will occur via an internal hallway leading from the lobby/atrium space to the Second Avenue pedestrian walkway.

2.1.4 Community Benefits and Public Improvements

The Project will provide a number of community and public benefits, including:

- Adaptive re-use of a rapidly deteriorating vacant building
- Cleaning and restoration of a blighted property
- Creation of over 300 jobs, many of which are permanent
- Increase in City of Boston tax base
- Historical Interpretation Exhibit showcasing former Chain Forge operations and machinery, which will be open to the public
- Restaurant and bar open for public use
- Support of local community non-profits such as the Charlestown YMCA

2.1.5 Community Outreach

The development team has conducted extensive community outreach to date, and will continue its engagement throughout the permitting process. In addition to our community group outreach, we have met with various historical societies, city officials, city politicians, and State and Federal approving agencies.

To date, we have met and presented our proposed project to:

- Boston Preservation Alliance
- Charlestown Neighborhood Council
- Friends of the Navy Yard
- Charlestown Preservation Society
- Charlestown Waterfront Coalition

2.1.6 Compliance with Boston Zoning Code

A review of Article 42F of the Boston Zoning Code does not indicate the need for zoning relief at the proposed project site. However, an on-going in-depth code review is being undertaken by the proponent and its consultants. If in the course of the review, it is determined that zoning relief will be required, the proponent will promptly notify the BRA of that requirement and formally apply to the Boston Zoning Board of Appeals for the zoning relief.

CHAPTER 3
URBAN DESIGN

3.0 Design Narrative

3.1.1 Urban Design Programming Narrative

Urban design issues for the Chain Forge Hotel are primarily related to the disposition of program elements within the existing building and the location of doors and service entries.

The Power House end of the building is a significant visual presence in the Navy Yard and the intent is to activate this end of the project with a two story restaurant fronting on 9th Street. The entry to the restaurant will be on the corner of 9th Street and 1st Avenue.

The main portion of the hotel will be in the original Chain Forge section of the building. The main entry will use the gable end elevation with the transept that crosses the main axis of the space.

A drop off for hotel patrons and a cab waiting zone will be located at the main entry starting at 13th Street and extending just past the hotel entry transept.

Service and loading will be accommodated at the only section of the building that is not built out to the property line. This is at the north edge of the Power House at the corner of 2nd Avenue and 9th Street. There is an existing curb cut in place. Service entry will be provided here for the hotel and restaurant functions. Transformers will also be located in this service zone.

The 5th floor addition will be set back from the existing face of the building on 2nd Avenue in order to preserve the existing cornice height of the building and maintain the urban dimensions that currently exist. As shown in the shadow studies, the addition has minimal impact on the urban fabric.

From an urban design context the building is largely being restored. Because of changes over the years, the restoration is not all being brought back to a single date. Rather, significant changes will be retained. As it is new construction, the 5th floor addition will be distinct from the existing conditions.

The 5th floor addition will be a glass and metal addition with simple vertical mullions and large panes of glass without divided lites. The intent is to make the addition a "backdrop" to the more highly detailed base building wherein the windows contain finely divided lites.

3.1.2 Historic Preservation Narrative

The Chain Forge (Building 105) is a contributing resource to the Boston Naval Shipyard (BNS), within the boundaries of the Boston National Historical Park, and is included in the BRA's Historic Monument Area. The building has the most intact assemblage of BNS equipment from the era of shipyard operations which ended in 1973, and has national significance for its long role in providing anchor chain to the United States Navy. It is also notable for architecture that is representative of the evolution of styles from 1900 up through World War II. The building, unused since the 1970's, possesses significant character, including some original elements and some later modifications such as the additions built in the 1940's. Preserving this building is part of this adaptive reuse project

Design Guidelines written in the 1990's, in anticipation of the preservation of the building as a museum, outlined criteria for how the building would be treated. The focus was on retaining existing materials to the greatest extent possible and avoiding alterations.

As part of the work of this project, the Chain Forge Design Guidelines will be updated. These updates will address the fact that the building has deteriorated since the Guidelines were written in the 1990s. More importantly, the update will address the fact that to make this project financially viable, the preservation of the building must be combined with a more extensive adaptation of use. The building will not serve as a museum for the chain fabrication equipment, but will be a functioning hotel. This more extensive transformation will bring with it items such as added floor levels, a variety of building entries, and the need to make the building more energy efficient.

The major preservation goals of the project include the following:

- Preserve the stylistic interest and historic character of the existing components that remain.
- Retain original material where possible from a financial and maintenance perspective. Where that is infeasible, consider the financial implications, as preservation of the entire building is more important than salvaging any particular detail.
- Where change is required for functional or other reasons, design new elements in a way that minimizes disruption to the character-defining features of the building.
- With the exception of the proposed added 5th floor above the existing roof at the Second Avenue side of the building, all other program elements will stay within the existing building envelope.

The following is a summary of the anticipated scope of work related to preservation:

Building Exterior

Masonry

- Retain and conserve the existing façade, including arched openings, at the power house wing. Retain 1930's modifications such as altered window openings and lowered doors, from when this portion of the building was transformed into a train repair operation.
- Remove masonry at bricked-up openings to allow for either re-creation of original windows/door designs, or to allow for new openings or systems.

Windows

- As original windows are deteriorated beyond repair, replicate original (or later) lite configurations, matching profiles as best as possible, with more cost-effective, durable materials.

- Industrial ‘strip’ windows at 1940’s era facades will be matched as closely as possible. Some adjustment to window dimensions will be made to accommodate new interior use.
- At first floor areas, original (or later) solid panels may be replaced with glass, where needed for functional reasons at the interior.

Doors

- The remaining original material is deteriorated and requires replacement. Most doors were sized for equipment and/or vehicles, rather than humans. New, pedestrian-scaled code-compliant openings will be located at original entry areas. Designs will be consistent with the detailing of the original or 1940’s era,
- Roll-top doors at grade level of the main building at Second Avenue are no longer feasible. Openings will remain, but infill will allow for hotel guest and service uses.

Roofing

- Replace in kind slate roofing, related copper gutters and leaders at the power house and connector. Limit new roof penetrations to locations where they will be least visible from the street.
- Main wing has had a series of roofing materials including slate, standing seam copper, corrugated metal, and asphalt shingles at gable areas. All are in poor condition and require replacement. New roofing will match existing in appearance, though matching earlier materials may also be considered.
- Rooftop items such as exhaust ventilators have evolved over the life of the building, with some original and some replacement remaining. Some were removed. The existing will be retained where possible, or replaced to match the appearance of the existing.

Exterior Siding

- 1940's corrugated asbestos transite panels at the north and south additions will be replaced with a corrugated metal panel that retains the industrial character as well as its scale and texture.

Building Interior

Structure

- Retain the existing steel trusses and supporting columns at the central space of the main building. Maximize visibility of the original volume of the space and views to the industrial-scale windows at the east end of the space. Repair materials and reinforce as required by building codes.

Equipment and Machinery

- Retain equipment identified in the Raber report. (This study assessed the rarity, significance, and interpretive potential of the equipment, and provided recommendations for equipment retention, relocation, or other disposition.) The items to be retained include 18 items recommended for retention in place (or as close as possible) and 20 items recommended for retention in new locations as may be needed.
- Incorporate the chain-making equipment and machinery into the hotel design, locating items where they can be seen by the public. Include interpretive materials.

Finishes

- Where possible, the design will retain finishes from the period of significance, as long as compliance with environmental regulations is met.
- New materials at the interior will be designed in a way that allows the industrial character of the space to remain the focus, maintaining a distinction between new and existing.

3.1.3 Sustainability

Introduction

The Project architectural/engineering/construction team includes several LEED Accredited Professionals.

A preliminary LEED checklist is provided at the end of this section to identify sustainability design objectives for this Project, highlights of which are included below. At this early stage of the design process, specific building systems have not yet been determined. System design solutions will be developed in an effort to achieve the targeted LEED credits. The final design and construction of the Project will create a sustainable building to promote the internal building environmental quality for the users, enhance the surrounding neighborhood locally, and reduce environmental impacts globally.

Article 37 of the Boston Zoning Code

The Project will implement an outdoor construction management plan that may include provisions for wheel washing, site vacuuming, truck covers, and anti-idling signage. The Project will also implement a comprehensive integrated pest management plan. Further, at this early stage of the design process, the Project will evaluate achieving three of the four available Boston Green Building credits:

1. Groundwater Recharge

   The Project will evaluate capturing storm water and, through irrigation and other means, achieving greater recharge than required by Article 32-6 as it applies to areas located within the Groundwater Conservation Overlay District.

2. Modern Mobility

   Since the Project Site is an urban location in close proximity to both the MBTA Harbor Shuttle station and the #93 bus lines that serves the Navy Yard, there are obvious strategies to take advantage of available

transportation access. To satisfy the prerequisites for this credit, the building management will be responsible for coordinating and posting transportation information (i.e. public transportation, shuttle services). Secured bicycle storage facilities are expected to be provided onsite. Transportation Demand Management ("TDM") options include shuttle services for building guests, and providing transit and pedestrian information to guests before check-in.

3. Historic Preservation

   The project is a contributing building to the Boston Naval Shipyard, which was listed on the National Register of Historic Places in 1966.

The following DRAFT LEED Prerequisites and Credits are also targeted for investigation:

Sustainable Sites

1. Construction Activity (Prerequisite)

   A management plan will enforce measures to protect adjacent areas from pollution.

2. Site Selection (Credit 1)

   The Project Site has previously been completely developed and is located in an urban area. This development does not violate any of the established criteria. This credit is expected to be achievable.

3. Development Density (Credit 2)

   The project is an existing building, and the density is compatible with surrounding sites. This credit is expected to be achievable.

4. Brownfield Redevelopment (Credit 3)

   Asbestos, PCB, and lead paint (possible) abatement is expected to be needed prior to demolition activity. This credit is expected to be achievable.

5. Alternative Transportation (Credits 4.1, 4.2, 4.3, 4.4)

Public transportation access and bicycle storage are included in the Boston Green Building credits. Parking will be provided in an existing parking facility, and the number of total parking spaces will not exceed local zoning requirements.

These credits are expected to be achievable.

6. Stormwater Design (Credits 6.1, 6.2)

   The site is currently completely impervious. The Project proposes to pursue a stormwater treatment program for removal of total suspended solids per the credit requirements.

   These credits continue to be investigated and developed.

7. Heat Island Effects (Credits 7.1, 7.2)

   More than 50% of the parking for the site is located inside an existing parking facility. A "green/high-emissivity" roof system will be evaluated for covering all areas of the roof.

   These credits continue to investigated and developed.

Water Efficiency

1. Water Efficient Landscaping (Credit 1)

   Utilization of captured rainwater and high-efficiency irrigation technology will be investigated to reduce potable water consumption by at least 50% over conventional means. This credit is expected to be achievable.

2. Water Use Reduction (Prerequisite 1, Credit 3)

   Appropriate low-flow and low consumption plumbing fixtures are anticipated to achieve a reduction in water usage of 30 – 40% over the baseline.

Energy and Atmosphere

1. Fundamental Commissioning (Prerequisite 1)

   Commissioning of the Mechanical and Electric building systems will be performed.

2. Minimum Energy Performance (Prerequisite 2)

   The energy code utilized for the New Addition will be the Massachusetts Building Code, IECC 2012, at a minimum, and ASHRAE Standard 90.1-2010.

3. Refrigerant Management (Prerequisite 3)

   Non-CFC-based refrigerants will be utilized for the Project.

4. Optimize Energy Performance (Credit 1)

   Preliminary calculations show it is possible that the building will perform approximately 16% better than Energy Code minimum requirements. This goal will be investigated further as building systems are evaluated and selected. A water source heat pump system is expected to be used which will incorporate high-efficiency equipment and control strategies.

5. Enhanced Commissioning (Credit 3)

   An independent commissioning authority will be investigated to perform on-board design reviews and re-commission the building systems after occupancy.

6. Enhanced Refrigerant Management (Credit 4)

   Air conditioning equipment refrigerant options will be evaluated to optimize the balance between ozone-depletion and global warming/greenhouse gas production effects. This credit is expected to be achievable.

7. Measurement and Verification (Credit 5)

   The appropriate use of measurement and verification equipment will be evaluated as building systems are selected. Property management is expected to perform on-going reviews of system operation, environmental conditions and indoor air quality, energy and water use, and the potential for improvements and innovations.

Materials and Resources

1. Storage and Collection of Recyclables (Prerequisite)

   Facilities are expected to be provided at each residential floor level and in the parking garage for collection of recyclable materials.

2. Existing Building Reuse (Credit 1.1)

   The exact quantity of existing building to be reused remains to be determined and calculated, but the reused amount of existing structure is expected to exceed 75%. This credit will be rechecked later in the design process.

3. Construction Waste Management (Credit 2)

   The Construction Manager will implement a waste management plan that will seek to divert at least 75% of construction and demolition waste material removed from the site from landfills through recycling and salvaging. This credit is expected to be achievable, and may be pursued aggressively in an opportunity to gain an exemplary performance credit of 95% construction waste recycling.

4. Recycled Content (Credit 4)

   Project Specifications will encourage provision and tracking of materials with recycled content where practical.

5. Regional Materials (Credit 5)

   Project Specifications will encourage provision and tracking of materials that have been manufactured and extracted/harvested within 500 of the project site.

6. Certified Wood (Credit 7)

   Project Specifications will encourage provision and tracking of these materials where practical.

Indoor Environmental Quality

1. Minimum IAQ Performance (Prerequisite 1)

   The ventilation code utilized for the Project will be ASHRAE Standard 62.1-2007, as required by the present Massachusetts Building Code.

2. Environmental Tobacco Smoke Control (Prerequisite 2)

   The Proponent intends to designate the entire building as a non-smoking facility. In addition, positively pressurized corridors are being investigated to minimize environmental smoke from migrating between private and common areas in the event that smoking is allowed in the building.

3. Construction IAQ Management Plan (Credit 3.1)

   Indoor Air Quality Management plans are expected to be implemented during the construction phase per the requirements of this credit.

4. Low-Emitting Materials (Credits 4.1, 4.2, 4.3, 4.4)

   Adhesives, sealants, paint, and flooring are expected to be specified with low VOC content limits as prescribed by the respective applicable standards. Composite wood products with no added urea-formaldehyde will be investigated further during design. These credits are expected to be achievable.

5. Indoor Chemical and Pollutant Source Control (Credit 5)

   A permanent entryway system is expected to be installed at high-volume building entrances to prevent air contaminants from entering the building. Housekeeping and laundry areas are expected to be separated with full height walls and exhausted to outside to comply with the requirements of this credit. Air handling units are expected to be provided with appropriate filtration to meet the credit. This credit is expected to be achievable.

6. Controllability of Systems, Lighting and Thermal Comfort (Credits 6.1, 6.2)

   Individual lighting and temperature controls are expected to meet the minimum requirements of these credits. These credits are expected to be achievable.

7. Thermal Comfort (Credit 7.1)

   The building envelope and HVAC systems are expected to be designed to meet the requirements of ASHRAE 55-2004.

8. Daylight and Views (Credits 8.1, 8.2)

   Daylight exposure will be investigated in detail during the design to determine compliance with the requirements of the credit. Exterior views are expected to be maximized to the extent practical.

Innovation and Design Process

1. Construction Waste Management (Credit 1.1)

   As stated above, the Construction Manager will implement a waste management plan that will seek to divert at least 75% of construction and demolition waste material removed from the site from landfills through recycling and salvaging. This credit may be pursued

aggressively in an opportunity to gain an exemplary performance credit of 95% construction waste recycling.

2. Tenant Education and Guidelines (Credit 1.2)

   The Proponent intends to develop Green guest guidelines, educational programs, and resources for guests within the building.

3. Green Housekeeping (Credit 1.3)

   The Proponent intends to engage in a green housekeeping policy wherein all cleaners and paper products used in the building will comply with the Green Seal standard GS-37.

4. Exemplary Performance MRc4 (Credit 1.4)

   The project will implement a materials tracking plan in an effort to utilize more than 30% recycled content materials.

5. Exemplary Performance MRc5 (Credit 1.5)

   The project will implement a materials tracking plan in an effort to utilize more than 30% regional materials.

5. LEED Accredited Professional (Credit 2)

   In addition to the Sustainability consultant, there are several other members of the design and construction team that are LEED Accredited professionals. This credit is expected to be achievable.

Regional Priority Credits

Regional Priority Credits available for the project location (02129) are SSc3, SSc6.1, SSc7.1, SSc7.2, EAc1 (1%), and MRc1.1 (75%). Of these SSc3, SSc7.1, SSc7.2, and MRc1.1 are all expected to be achievable.

LEED 2009 for New Construction and Major Renovations

Project Checklist

Chain Forge Hotel, 105 First Ave, Charlestown, MA 02129

PNF December 2014

Sustainable Sites — Possible Points: 26

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

Water Efficiency — Possible Points: 10

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

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	4	10	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			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			
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

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

Innovation and Design Process — Possible Points: 6

	1		Credit 1.1	Innovation in Design: Exceed MRc2 to >95%	1
1			Credit 1.2	Innovation in Design: Education Display	1
1			Credit 1.3	Innovation in Design: Green Housekeeping	1
	1		Credit 1.4	Innovation in Design: Exceed MRc4 to >30%?	1
	1		Credit 1.5	Innovation in Design: Exceed MRc5 to >30%?	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: SSc3	1
1			Credit 1.2	Regional Priority: SSc7.2	1
1			Credit 1.3	Regional Priority: MRc1.1, 75%	1
1			Credit 1.4	Regional Priority: SSC7.1; [EAc2 (1%); SSc6.1]	1

Total — Possible Points: 110

52	22	36	

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

CHAPTER 4
ENVIRONMENTAL

4.0 Environmental

4.1.1 Wind

As the project will be retaining the existing building's massing, with only one level of vertical addition to the Second Avenue façade, pedestrian level wind conditions are not anticipated to change as a result of the hotel redevelopment. As a result, no wind study should be required.

4.1.2 Shadow

An analysis of existing and future shadow conditions was conducted in order to determine the additional shadows created by the proposed roof-top addition at the north (Second Avenue) side of the building. The results of the analysis indicate that the project will not cause substantial changes in the shadows from what currently exists. The minor impacts that will occur will be at Second Avenue and 13th Street. No shadow from the Project is anticipated to fall on exiting or proposed open spaces or public parks in the area.

The dates for which the shadow studies have been simulated are noted below. Studies were modeled at morning, noon and afternoon.

Spring Equinox, March 21

Summer Solstice, June 21

Autumnal Equinox, September 21

Winter Solstice, December 21

4.1.2.1 Results of the Shadow Study

A detailed set of images is included in Exhibit B of the Appendix. The existing Chain Forge building is shown in yellow, and the proposed addition is shown in pink. Existing shadows cast are in gray, with new shadows cast in red.

Spring Equinox March 21

At 9:00 AM a very small shadow is cast in a northwesterly direction at Second Avenue, to the south of Building 149.

At 12:00 noon a very small shadow is cast in a northerly direction at the north side of Second Avenue, to the south of Building 149.

At 3:00 PM a very small shadow is cast in an easterly direction at Second Avenue, to the north of the Basilica building.

Summer Solstice June 21

At 9:00 AM a very small shadow is cast in a northwesterly direction at Second Avenue, to the south of Building 149.

At 12:00 noon there is no additional shadow.

At 3:00 PM there is no additional shadow.

At 6:00 PM there is no additional shadow.

Autumnal Equinox September 21

At 9:00 AM a very small shadow is cast in a northwesterly direction across Second Avenue, to the south of Building 149.

At 12:00 noon a very small shadow is cast in a northerly direction at Second Avenue, to the south of Building 149.

At 3:00 PM a very small shadow is cast in an easterly direction at Second Avenue, to the north of the Basilica building.

At 6:00 PM there is no additional shadow.

Winter Solstice December 21

At 9:00 AM there is no additional shadow.

At 12:00 noon a very small shadow is cast in a northeasterly direction across 13th street, to the west of Building 106.

At 3:00 PM a very small shadow is cast in a northeasterly direction across 13th Street and on Second Avenue to the north of the Basilica Building.

4.1.3 Daylight

The proposed project is not expected to have any adverse daylight effects on the surround public spaces due to the retention of the existing building's massing, with only a minor one floor addition to the 2nd avenue elevation.

4.1.4 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. The Chain Forge Hotel will use non-reflective materials such as brick, clear glass, granite, slate and copper and because of this palette of materials, it is not anticipated that the project will have adverse solar glare impacts or create solar heat buildup in nearby buildings.

4.1.5 Air Quality

The design of the proposed project anticipates using individual, in-room water source heating and cooling systems which will utilize a central cooling tower to be located on the roof of the addition at the rear of the building. All ventilation will evacuate through a central area of each building's roof and it is anticipated that there will be no impact on pedestrian level air quality.

4.1.6 Flood Zone (Exhibit D in Appendix)

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for the City of Boston (Community Panel 25025C0018G) was 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 MY0586 which is within the flood zone. Please refer to Exhibit C of the Appendix for the FEMA FIRM Map.

4.1.7 Water Quality

The proposed project is not expected to impact water quality in any way. The project proposes a storm water 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 if needed. 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.

4.1.8 Geotechnical

Numerous projects have been constructed in the Charlestown Navy Yard, most recently The Starboard, located directly across Ninth Street. A historical review of these testing results indicated that there is anticipated to be a 5-15 foot thickness of miscellaneous fill overlying a marine clay deposit with a similar range in thickness. Below the clay is a deposit of glacial till that is expected to vary from a depth of about 15 feet below ground surface along Second Avenue to about 35 feet below ground surface along First Avenue. With the southern portion of the site along First Avenue, a deposit of organic silt may be present between the fill and marine clay deposits. A drilling and testing program is to commence within 90 days to verify this information and to help finalize a foundation design for the structure.

4.1.9 Groundwater

Ground water testing conducted within the building has indicated that the depth to groundwater is expected to vary between 5 to 15 feet below the existing ground surface. The project does not have a basement level, so the impacts from groundwater to the building should be minimized.

4.1.10 Solid and Hazardous Waste

As part of the Department of Defense Environmental Restoration Program for Formerly Used Defense Sites, U.S. Army Corps of Engineers performed environmental sampling activities at Building 105 in 1992 and 1993. From December 1994 to January 1995, Metcalf and Eddy collected samples from bulk, wipe and aqueous media throughout Building 105, including the Blacksmith Shop and the Roundhouse in support of a Massachusetts Contingency Plan (MCP) Phase I investigation. In 1996 Metcalf and Eddy prepared a MCP Final Phase II Method III Risk Assessment and Phase III Remedial Action Plan for the Site as required by the MCP.

During the seventy years that Building 105 remained in service, forging operations produced byproduct and wastes that contaminated the structure and equipment surfaces within the building. Compounds detected in the building include polychlorinated biphenyls (PCB's), polynuclear aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH) and heavy metals.

In November 1997 until June 1998, Stone & Webster and its subcontractors performed "general cleaning" of the building interior, removal of the top ten inches of soil from exposed earthen areas surrounding equipment inside the building and an Interim Evaluation pilot test of various decontamination methods on building and equipment surfaces in the Main Forge Shop.

Between October 1998 and March 1999, Stone & Webster and its subcontractors performed two stages of additional sampling at the site. Data collected was used to prepare a Risk Assessment in accordance with CERCLA to develop risk-based cleanup levels for potential contaminants of concern.

A Subsurface Investigation was performed at the Site in July 1999 and included advancement of soil borings and the development of monitoring wells to characterize groundwater conditions beneath the building.

The Army Corps of Engineers conducted remedial activities in 2000 and 2001 which consisted of cleaning of the NPS owned forging equipment as well as surface cleaning of walls up to a height of 8 feet. This was the last remedial activity performed on the site.

In June 2014, the Proponent retained Weston and Sampson to conduct additional testing to verify earlier test results and to close gaps in the data. During the months of August and September testing was conducted and a report prepared for review. The Proponent and Weston and Sampson then met with representatives of the U.S. Environmental Protection Agency (EPA) to discuss a cleanup approach. In December 2014 Weston and Sampson were authorized to prepare a risk based cleanup plan

including a risk assessment in accordance with the requirements of the Toxic Substance Control Act (TSCA) and EPA's Risk Based Cleanup and Disposal regulations.

Completion of the Risk Assessment and the Remedial Action Plan is scheduled for March 2015 with submittal to EPA and DEP immediately thereafter.

4.1.11 Noise

The Proponent does not anticipate a significant increase in noise impacts associated with the hotel uses at the project site, compared to the buildings past industrial use. The primary sources of external mechanical noise will include HVAC and Life Safety equipment necessary for occupancy. As rooftop equipment will not exceed maximum sound levels, no mitigation is proposed. 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.

4.1.12 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 24 months, beginning in Summer 2015 and reaching completion by October 2017. 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.

4.1.13 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.

4.1.14 Historic Resources in the Vicinity of the Project Site

The Proposed Project is located within the historic Monument Area of the Charlestown Navy Yard which lies within the Charlestown Neighborhood of Boston. Properties proximate (1/2 mile) to the site that are listed on the National Register of Historic Places and/or designated Boston Landmarks are listed as follows:

National Register of Historic Places

- Francis B. Austin House – 58 High Street
- Boston Naval Shipyard – South of Chelsea Street
- Bunker Hill Monument
- Hoosic Stores 1&2/Hoosic Stores 3 – 25 & 115 Water Street
- Roughan Hall – 15-18 City Square
- Terminal Warehouse District – 40 & 50 Terminal Street
- Town Hill District – Rutherford Avenue, Main Street and Warren Street
- USS Cassin Young – Boston Naval Shipyard
- USS Constitution – Boston Naval Shipyard

Boston Landmarks/Massachusetts historic Districts and Structures

- Charlestown Savings Bank – 1-4 Thompson Square

- Great House Archeological Site – City Square
- Edward Everett House – 16 Harvard Street
- Charlestown Mystic River Industrial Area
- George B. Neil House – One Monument Square
- Historic Monument Area – Charlestown Navy Yard

4.1.15 Historic Resources on the Project Site

The Boston Naval Shipyard (BNS) was designated a National Historic Landmark on November 13, 1966. When the BNS closed in 1974, the Navy Yard was subdivided into various sections. The first section of approximately 30 acres was designated to be owned and managed by the National Park Service and is presently the home of the USS Constitution and the USS Cassin Young. Another section was identified as the Historic Monument Area and was to be designated for preservation and development under the management and ownership of the Boston Redevelopment Authority. The remainder of the Navy Yard was designated as the New Development Area and as such allowed new development and private ownership.

The Chain Forge Building, Building 105, is a contributing structure to the Historic Monument Area and as such is subject to design guidelines governing its redevelopment. The Building 105 Design Guidelines will be modified to accommodate the change in use of the building from a museum to a 230 key limited service hotel. That process has commenced and requires the approval of the BRA, Boston NPS, NPS Regional office in Philadelphia, Boston Landmarks Commission and the Massachusetts Historical Commission.

In addition, the forging equipment within the building is owned by the Boston National Park Service and the Boston NPS has required any reuse of the building to identify and retain significant historic equipment. The Proponent has conducted a study of the equipment and identified the equipment of historic significance that will remain and submitted that information to the Boston NPS.

CHAPTER 5
INFRASTRUCTURE

5.0 Infrastructure

5.1.1 Introduction and Agency Coordination

The following analysis describes the existing utility systems servicing the Project area, discusses the Project's potential impacts on these utilities, and identifies mitigation measures to address potential impacts.

Proposed connections to the Boston Water and Sewer Commission's (BWSC) water, sewer, and storm drain systems will be designed in conformance with the Commission's design standards, Sewer Use and Water Distribution System Regulations, and Requirements for Site Plans. The Proponent will submit a General Service Application and a Site Plan to the Commission's Engineering Services Division for review and approval. The Site Plan will show the location of water mains, sanitary sewers and storm drains that serve the site, as well as the location of existing and proposed water, sewer, and storm drain connections. In addition, a Stormwater Pollution Prevention Plan will be submitted specifying best management measures for protecting the BWSC systems during construction.

The Proponent will work with utility companies as building design and permitting progress continues. Updated design information on the proposed utility connections will be made available to the BRA as this information becomes available. Sewer, water, storm drainage, electric, and other utilities are discussed below.

5.1.2 Sanitary Sewer

5.1.2.1 Existing Sewer Service

The local existing sewer system is owned and maintained by the Boston Water and Sewer Commission (BWSC), which is part of the Massachusetts Water Resources Authority (MWRA) collection and treatment system. Flows from BWSC sewers are

ultimately discharged to MWRA interceptors for conveyance, treatment and disposal through the MWRA Deer Island Wastewater Treatment Plant.

Existing municipal sewers can be found in adjacent streets which abut the parcel. The sewer system includes a 10-inch sanitary sewer in Second Avenue, and a 12-inch sanitary sewer in First Avenue. Existing sewers located in the vicinity of the Project site are shown in Exhibit C on the Boston Water and Sewer Commission maps.

5.1.2.2 Projected Wastewater Flows

Under existing conditions the building discharges sewage to the 10-inch gravity sewer located in Second Avenue. The proposed Project will also likely discharge sewage to this 10-inch sewer via existing or new sewer services subject to final design of the proposed connections and approval of the design by the BWSC. The Project will generate an estimated 45,300 gallons per day (gpd) of sewage flow based on sewage estimates as calculated in Table 5-1 below in accordance with Massachusetts Department of Environmental Protection (MassDEP) regulations 314 CMR 7.00**.**

Table 5-1 Project Wastewater Flows

Hotel:	230 keys	110 gpd/bedroom	25,300 gpd
Restaurant:	400 seats	50 gpd/seat*	20,000 gpd
TOTAL			**45,300 gpd**

* Includes 35 gpd/seat for food service, and 15 gpd/seat for kitchen flow.

Of the 400 restaurant seats, 150 will be located in a separate breakfast only area of the first floor of the hotel. The existing sewer system has ample capacity to convey the Project's estimated wastewater flows.

5.1.2.3 Sewer System Mitigation

New sewer connections to the existing collection system, if required, will be constructed in accordance with BWSC Standards and Regulations, and will be made watertight. Any

existing sewer connections on site that are not to be used will be cut, made watertight (capped), and abandoned in accordance with applicable BWSC and City standards. Upon completion of the Project design phase, a Site Plan will be submitted to the BWSC for approval. A General Service Application will be submitted for construction of the planned services.

5.1.3 Water Service

5.1.3.1 Existing Water Service

The water system consists of a well-developed network of piping throughout the Project area. Existing water services to the site are provided by the BWSC, which is a member of the MWRA transmission system.

Within the Project site vicinity; there are existing 12-inch water mains in Second Avenue, Ninth Street, First Avenue, and Thirteenth Street. The existing building derives its water services from the First Avenue and Ninth Street water mains.

Existing water mains located in the vicinity of the Project site are shown as Exhibit C in the Appendix.

5.1.3.2 Proposed Water Service

Provided that the existing water services are in good operating condition and appropriately sized, they may be re-used for the proposed Project subject to BWSC approval. Any new water service for the Project will connect to the existing BWSC water system in the adjacent streets subject to final design of the proposed connections. The Project will require an estimated 49,830 gpd of water based upon the estimated average daily sewage flow and using a water consumption factor of 1.10.

5.1.3.3 Water Supply Conservation and Mitigation Measures

The State Building Code requires the use of water-conserving plumbing fixtures. Water conservation measures such as low-flow toilets and restricted flow faucets will help reduce the domestic water demand on the existing distribution system. Landscaping is minimal for the site and will not present an irrigation demand.

The Proponent will arrange for a water meter consistent with the BWSC's automatic meter reading system. The BWSC will provide a meter transmission unit (MTU) at the Proponent's expense. The Proponent will provide a telephone line and jack near the meter and outside meter reading device. The BWSC will connect the telephone line and MTU to the meter and program the MTU.

To prevent cross connections from the building sprinkler system or other regulated plumbing equipment, a backflow preventer will be installed on the appropriate plumbing fixture. The design for the device used to prevent backflow into the potable water supply will be submitted to the BWSC Cross Connection Control Department for review and approval in accordance with BWSC Regulations.

The proposed water supply system and the fire protection system for the building will be carefully designed to meet the needs of the proposed Project. The proposed Project will comply with the Standards of the State Plumbing Code and the National Fire Protection Association. All required fittings for the mix of uses will be installed in accordance with the above codes.

Based on the makeup of the existing buildings in the general area of the Project site, it is anticipated that the existing BWSC water system will not be adversely affected by the proposed development.

5.1.4 Storm Drainage System

5.1.4.1 Existing Storm Drainage System

Stormwater from the site currently discharges to the existing systems in the adjacent streets. There is an existing 12-inch drain in Ninth Street, a 36-inch drain in Second Avenue, and a 48-inch drain in First Avenue all adjacent to the project site. These drains flow easterly toward Thirteenth Street and ultimately to Boston Harbor.

The Project site currently drains to these adjacent receiving drain systems.

5.1.4.2 Proposed Storm Drainage System Volume

Since the existing site consists entirely of impervious cover, the proposed Project cannot create additional impervious surface areas. The BWSC requires that all new construction and major renovation projects infiltrate a volume of runoff equal to 1-inch over the area of the site, accordingly the Project will reduce the amount of runoff draining into the BWSC storm drain system by 5,390 cubic feet ((64,684 s.f.)(1”/12”) = 5,390 c.f.)) during storm events.

5.1.4.3 DEP Stormwater Management Policy Standards

MassDEP adopted a Stormwater Management Policy to address non-point source pollution. The Policy prescribes specific Stormwater Management Standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40. This Project is a redevelopment project under the Policy and will comply with all of the applicable standards to the maximum extent practicable.

5.1.4.4 Mitigation Measures

The site is presently completely covered by impervious surfaces. These surfaces will essentially remain impervious with completion of the proposed redevelopment Project. As a consequence, there will not be an increase in runoff rate or volume from the Project, rather, as noted above, the Project will infiltrate a minimum volume of 5,390 cubic feet in accordance with BWSC requirements and therefore post redevelopment conditions will result in a reduction of site runoff entering the storm drainage system.

Erosion and sedimentation control measures will be utilized during construction to prevent the discharge of sediments to the BWSC's stormwater drainage system.

In conjunction with the Site Plan and General Service Application submitted to the BWSC's Engineering Services Division, the Project Proponent will submit a Pollution Prevention Plan identifying existing drainage patterns and areas to be used for storage or treatment of any contaminated soils, groundwater or stormwater.

5.1.5 Energy Requirements and Service

5.1.5.1 Existing and Proposed Electric Power

NStar (Boston Edison Company) provides electric service in the City of Boston. There are existing electric manholes and duct banks with service drops in First Avenue and Ninth Street. The existing building currently has an underground electric service from Ninth Street.

The electrical, space heating and energy systems for the proposed Project have not yet been fully designed; however preliminary analysis has concluded that:

- It is anticipated to have an NStar pad mount transformer outside the building to support buildings secondary service. The final service approach and transformer location will be determined during the final design and discussions with NStar.

- The current estimated electrical load for the building is in the range 2,000 KW, we are currently planning on a 3,000 AMP at 480Y/277 volt service from NStar.

- There will be a diesel fired emergency generator current estimated size is 300 KW which will be located on grade to serve the building life safety and legally required loads. The unit will be in an acoustical enclosure.

5.1.5.2 Gas Service

KeySpan (Boston Gas Company) provides gas service in the City of Boston. There are existing gas mains in First Avenue and in Ninth Street. Gas service is anticipated to be available from either of these sources; the existing building has a gas service from the Ninth Street gas main.

The Project's heating system has not yet been determined, however a preliminary analysis has concluded with the following load requirements:

- The estimated gas demand for the building breaks down as follows:
    - HVAC System: 7650 CFH
    - Domestic Hot Water: 1400 CFH
    - Kitchen: 4000 CFH
    - Laundry 1000 CFH

- The estimated water/sewer demand for the building breaks down as follows:
    - Hotel 25,300 GPD
    - Kitchen/Resturant 20,000 GPD

This information will be determined in the final design stages of the Project.

5.1.5.3 Energy Conservation Measures

The Proponent will incorporate energy efficient lighting, heating and cooling systems in the design for the building. Applicable standards and regulations will be complied with in regard to the use of energy conservation measures.

5.1.6 Telephone and Cable Television

The Proponent will coordinate with telephone and cable representatives regarding these services. There are existing underground telephone and cable services in First Avenue adjacent to the Project site.

5.1.7 Mechanical Systems Description

The draft MEP specification provides for the building to be heated and air conditioned by means of a Water Source Heat Pump system. The system will require a 500 ton cooling tower which will be located on the roof.

Energy recovery units shall provide ventilation air to the heat pumps by exhausting the unit's toilets to reclaim the energy. At this time we are planning on seven (7) working units. (ERU-1 through ERU-7). Five (5) of the ERUs would be roof mounted. The indoor pool space shall be served by a roof mounted top unit RTU-1.

Heating for the building shall be via gas fired hot water condensing boilers. These boilers shall be located in a first floor mechanical room and shall provide hot water to heat pump system.

The preliminary size of major equipment is as follows:

1. Cooling Tower: 500 tons
2. Energy Recovery Unit (ERU-1): 8000 CFM
3. Energy Recovery Unit (ERU-2): 8000 CFM
4. Energy Recovery Unit (ERU-3): 8000 CFM
5. Energy Recovery Unit (ERU-4): 5000 CFM
6. Energy Recovery Unit (ERU-5): 3000 CFM
7. Energy Recovery Unit (ERU-6): 1500 CFM (Located Indoors)
8. Energy Recovery Unit (ERU-7): 2000 CFM (Located Indoors)
9. Pool Rooftop Unit (RTU-1): 2000 CFM
10. Restaurant Grease Exhaust (KEF-1):10000 CFM
11. Hotel Grease Exhaust (KEF-2): 5000 CFM
12. Restaurant Make Up Air (MUA-1):8000 CFM

13. Hot Water Boilers	2500 MBH Each (2 Modules)

5.1.8 Fire Safety System Description

The atrium shall have roof mounted smoke exhaust fans and intakes located on the lowest level of the atrium. The atrium smoke exhaust system shall be designed based on a computational fluid dynamic (CFD) model. The smoke exhaust system would only operate in an emergency and is normally not operational.

5.1.9 Utility Protection During Construction

During construction, infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The Contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of utilities with the appropriate utility owners and agencies. The Contractor will also be required to provide adequate notification to the utility owner prior to work commencing on their utility. Also, in the event that a utility cannot be maintained in service during switchover to a temporary or permanent system, the Contractor will be required to coordinate the shutdown with the utility owner and Project abutters to minimize impacts and inconveniences.

CHAPTER 6
TRANSPORTATION

TRANSPORTATION

INTRODUCTION

Chain Forge Hotel, LLC has retained TEPP LLC to prepare this transportation assessment for the proposed Chain Forge hotel in the Charlestown Navy Yard at 105 First Avenue.

This transportation assessment includes:

- project description
- description of the area street system
- description of area transportation services
- description of bicycle facilities and conditions
- calculated trip generation for the hotel project
- vehicle routes between the hotel site and parking facility
- area traffic operations
- parking generation for the hotel project
- services and deliveries for the hotel project
- transportation and parking demand management
- construction management plan

PROJECT DESCRIPTION

The Chain Forge hotel site is in the Charlestown Navy Yard at 105 First Street, as Figure 1 shows. The site is bounded by:

- First Avenue, to the east
- Ninth Street, to the south
- Thirteenth Street, to the north
- Second Avenue walkway, to the west

The site includes a vacant building that the United States Navy previously used for the production of chain. The project site:

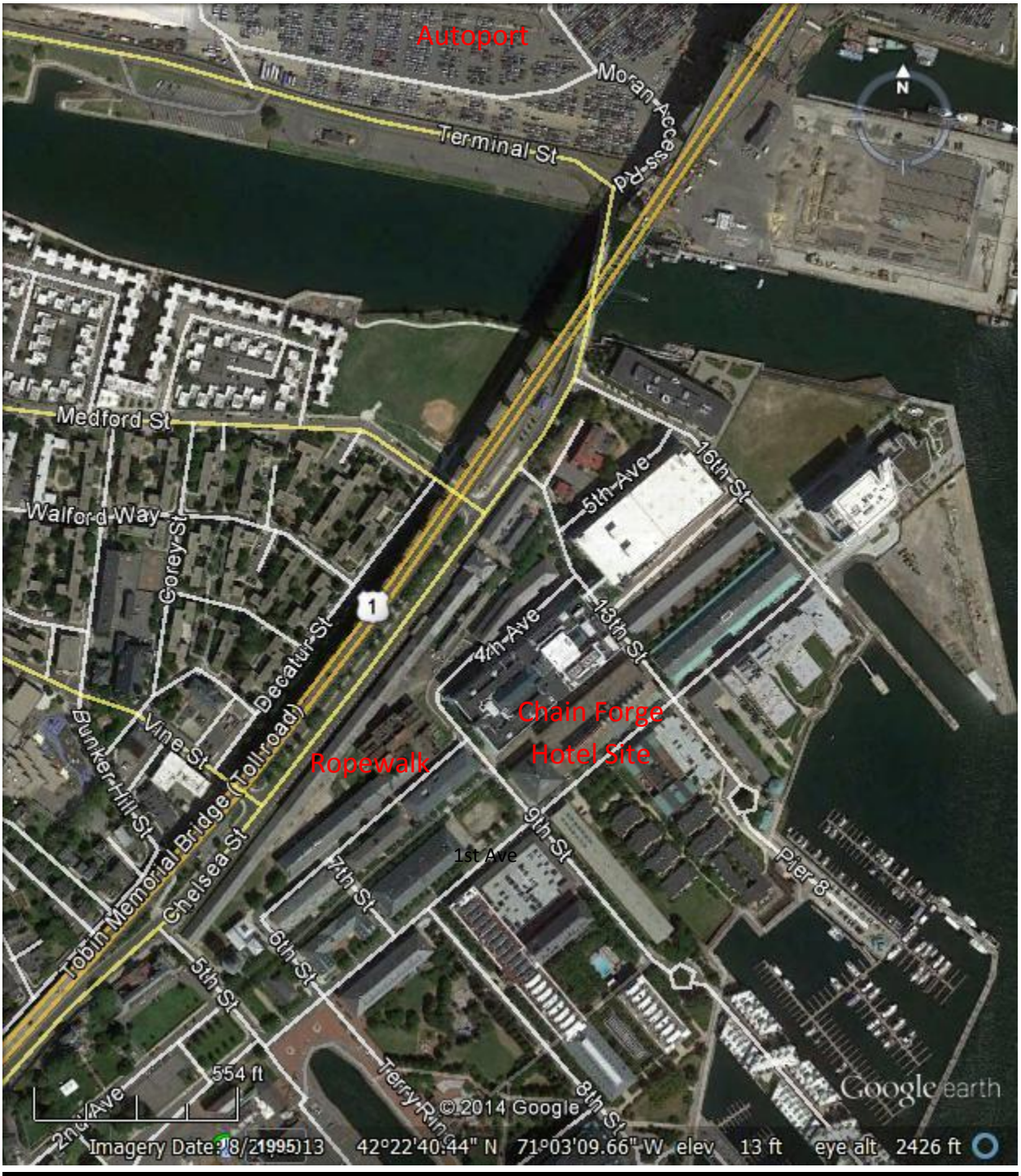


Figure 1. Site location.

- adapts the building for use as a 230-room hotel
- replaces about 8 parking spaces along the First Avenue site frontage with a valet and drop-off area
- creates about 4 parking spaces along the Ninth Street site frontage
- will have about 200 hotel parking spaces designated at the Moran Terminal Autoport, with valet/shuttle service
- has multiple forms of transit in the area
- is surrounded by sidewalks and a pedestrian walkway
- has its primary pedestrian access along the First Avenue site frontage
- will provide pedestrian facilities and bicycle facilities

THE ROPEWALK PROJECT NOTIFICATION FORM

Per consultation with the Boston Transportation Department (BTD) and Boston Redevelopment Authority (BRA), this transportation assessment references the April 30, 2014 Ropewalk Project Notification Form (PNF). That Ropewalk PNF was submitted by Frontier Enterprises, Inc., and was prepared by Northeast Strategy and Communications Group, in association with Neshamkin French Architects, Inc. and McClurg Traffic. The Ropewalk site is in the Charlestown Navy Yard and is bounded by Fifth Street to the north and Chelsea Street to the west, as Figure 1 shows.

STREET SYSTEM

Overview

Figure 1 shows the area street system. Area streets include:

- Chelsea Street
- First Avenue
- Thirteenth Street
- Ninth Street

Streets

Chelsea Street:

- is an arterial street
- connects City Square, to the south, and Terminal Street, to the north

- is undivided, with two lanes per direction south of Thirteenth Street and one lane per direction north of Thirteen Street
- generally has sidewalks
- generally does not have on-street parking

First Avenue:

- is a collector street
- connects Third Street, to the south, and Sixteenth Street, to the north
- is roughly parallel to and east of Chelsea Street
- has connections with Chelsea Street via Fifth Street, to the south, and Thirteenth Street, to the north
- is undivided, with one lane per direction.
- has sidewalks
- has some on-street parking

Thirteenth Street:

- is a collector street
- connects Chelsea Street, to the west, and Pier 8, to the east
- is undivided, with one lane per direction.
- has sidewalks
- has some on-street parking

Ninth Street:

- is a collector street
- connects Fourth Street, to the west, and Pier 7, to the east
- is undivided, with one lane per direction.
- has sidewalks
- has some on-street parking

Intersections

Area intersections include:

- Chelsea Street/Fifth Street (analyzed in the Ropewalk PNF)
- Chelsea Street/Vine Street (analyzed in the Ropewalk PNF)
- Chelsea Street/Medford Street (analyzed in the Ropewalk PNF)
- Chelsea Street/Thirteenth Street (analyzed in the Ropewalk PNF)
- Chelsea Street/Sixteenth Street (analyzed in the Ropewalk PNF)
- First Avenue/Thirteenth Street
- First Avenue/Ninth Street

The Chelsea Street/Fifth Street intersection:

- has three legs
- has two lanes on each of the Chelsea Street approaches
- has one lane on the Fifth Street westbound approach
- is signalized
- was analyzed in the Ropewalk PNF

The Chelsea Street/Vine Street intersection:

- has three legs
- has two lanes on the Chelsea Street approaches
- has one lane on the Vine Street eastbound approach
- is unsignalized
- was analyzed in the Ropewalk PNF

The Chelsea Street/Medford Street intersection:

- has three legs
- has two lanes on the Chelsea Street approaches
- has one lane on the Medford Street eastbound approach
- is unsignalized
- was analyzed in the Ropewalk PNF

The Chelsea Street/Thirteenth Street intersection:

- has three legs
- has two lanes on each of the Chelsea Street approaches
- has one lane on the Thirteenth Street westbound approach
- is signalized
- was analyzed in the Ropewalk PNF

The Chelsea Street/Sixteenth Street intersection:

- has three legs
- has one lane on each of the Chelsea Street approaches
- has one lane on the Sixteenth Street westbound approach
- is signalized
- was analyzed in the Ropewalk PNF

The First Avenue/Thirteenth Street intersection:

- has four legs
- has First Avenue as the major north-south street and Thirteenth Street as the minor east-west street
- has one lane on each approach
- is unsignalized, with STOP signs facing the Thirteenth Street approaches

The First Avenue/Ninth Street intersection:

- has four legs
- has First Avenue as the major north-south street and Ninth Street as the minor east-west street
- has one lane on each approach
- is unsignalized, with STOP signs facing the Ninth Street approaches

TRANSPORTATION SERVICES

Introduction

Area transportation services include:

- public bus transit
- water transportation
- Partners Healthcare shuttle bus

Figure 2 is a Massachusetts Bay Transportation Authority (MBTA) system map that includes Charlestown.

Public Bus Transit

MBTA bus route 93 serves the area. Figure 3 is the route map and Figure 4 is the schedule.

The route is between Devonshire Street and Milk Street, in downtown Boston, and Sullivan Square, and the route includes Haymarket Square. The outbound (northbound) route travels Chelsea Street while the inbound (southbound) route travels Bunker Hill Street, Lowney Way, Park Street, Adams Street and Warren Street.

On weekdays and Saturdays, service begins before 5:00 AM and extends after 12:00 midnight. On Sundays, service begins between 5:00 and 6:00 AM and extends after 12:00 midnight. Headways vary depending on time of day and are relatively short during peak times.[1]

Water Transportation

The MBTA Charlestown Ferry connects the Charlestown Navy Yard Pier 3 and Boston Long Wharf. Figure 5 is the MBTA boat map and Figure 6 is the Charlestown Ferry schedule. The schedule includes:

- weekdays between 6:30 AM and 5:55 PM
- weekday boats every 15 minutes between 6:30 and 9:15 AM and 3:30 and 5:45 PM
- weekday boats every 30 minutes other times
- weekends between 10:00 AM and 6:15 PM, with boats every 30 minutes[2]

[1] Source www.mbta.com, accessed December 17, 2014.

[2] Source www.mbta.com, accessed December 17, 2014.

Figure 2. MBTA system map including Charlestown (source MBTA).

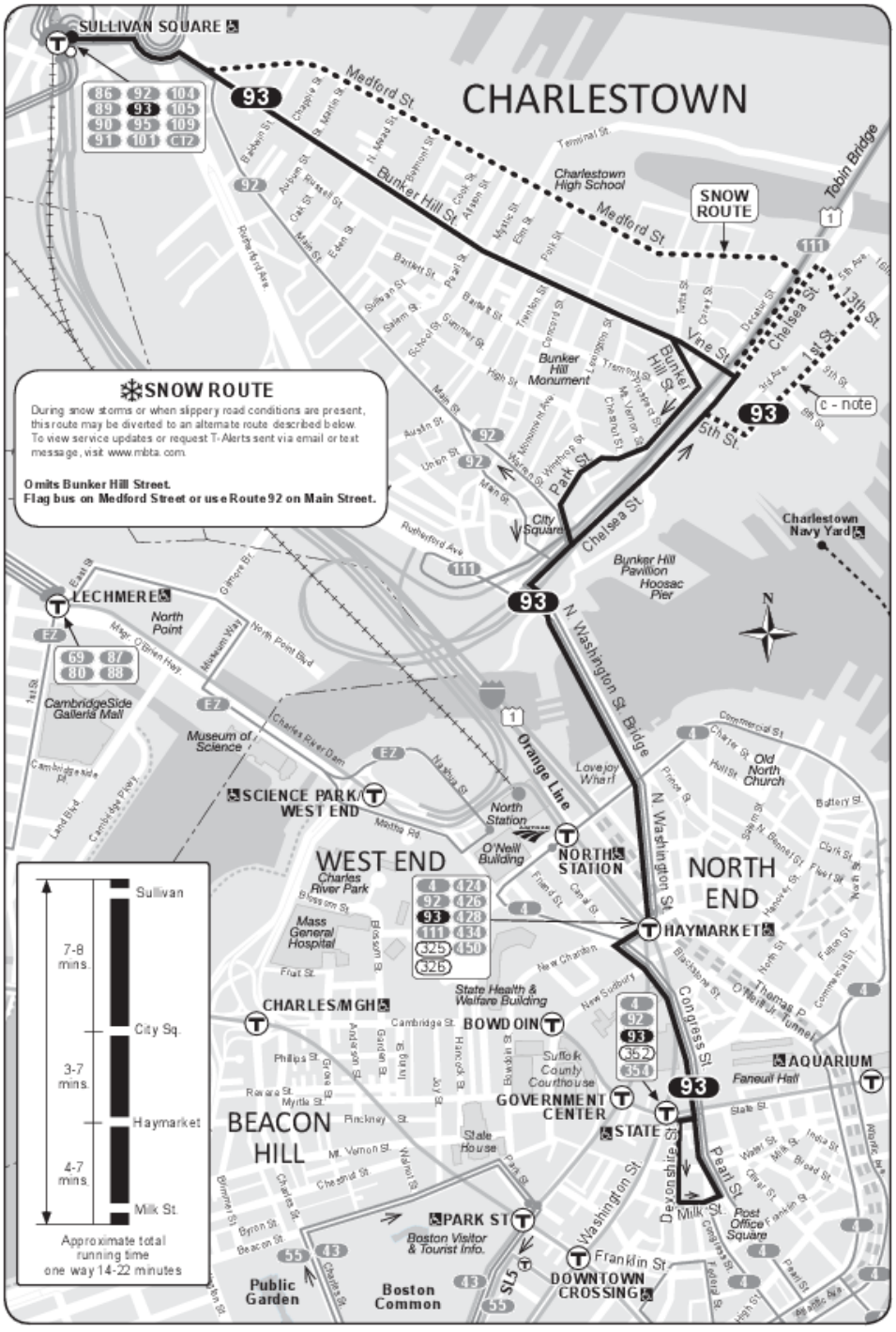


Figure 3. MBTA bus route 93 map (source MBTA).

Figure 4. MBTA bus route 93 schedule (source MBTA).

93 Weekday AM

Inbound			Outbound		
Leave Sullivan Square	Arrive Haymarket Square	Arrive Devonshire & Milk Sts.	Leave Devonshire & Milk Sts.	Lv/Arrive Haymarket Square	Arrive Sullivan Square
a 4:49A	4:59A	.....	.....	5:03	5:11
5:30	5:42	5:46	5:51	5:54	6:04
6:00	6:12	6:16	d 6:25	6:28	6:42
6:15	6:27	6:31	6:36	6:39	6:53
6:25	6:37	6:41	6:46	6:49	7:03
6:35	6:47	6:51	6:56	6:59	7:13
6:45	6:57	7:02	7:10	7:13	7:27
6:55	7:08	7:13	7:15	7:18	7:34
7:05	7:18	7:23	d 7:28	7:32	7:47
7:12	7:25	7:30	7:37	7:41	7:56
7:19	7:32	7:37	d 7:45	7:49	8:04
7:26	7:41	7:46	7:53	7:57	8:12
7:33	7:49	7:54	d 8:02	8:06	8:21
7:40	7:56	8:01	8:08	8:12	8:27
7:47	8:03	8:08	8:15	8:19	8:34
7:54	8:10	8:15	8:22	8:26	8:41
8:01	8:17	8:22	8:29	8:33	8:48
8:08	8:24	8:29	d 8:38	8:42	8:57
8:15	8:32	8:39	d 8:48	8:52	9:07
8:22	8:40	8:47	8:56	9:00	9:15
8:29	8:46	8:53	9:06	9:10	9:25
8:36	8:53	9:00	9:07	9:11	9:26
8:43	9:00	9:07	9:13	9:17	9:32
8:51	9:05	9:12	9:18	9:22	9:37
d 9:00	9:15	9:22	9:28	9:32	9:47
9:10	9:25	9:32	9:35	9:39	9:54
9:20	9:35	9:42	9:45	9:49	10:02
9:40	9:55	10:02	10:05	10:10	10:23
d 10:00	10:15	10:22	d 10:25	10:30	10:43
10:20	10:34	10:39	10:45	10:50	11:03
10:40	10:53	10:58	11:05	11:10	11:23
d 11:00	11:13	11:18	d 11:25	11:30	11:43
11:20	11:33	11:38	11:45	11:50	**12:03P**
11:40	11:53	11:58			

a - Leaves from Clarendon Hill at 4:33 am
b - Leaves from Clarendon Hill at 5:15 am
c - Via Vine Street to Navy Yard
d - Continues to Clarendon Hill
e - Leaves from Bunker Hill Street at Concord Street
s - Does NOT run during school vacation
u - Trip departs from Sullivan Square Station upper busway
w - Waits for last train to arrive at Sullivan Station Monday through Thursday only. Friday & Saturday leaves at scheduled time.

93 Weekday PM

Inbound			Outbound		
Leave Sullivan Square	Arrive Haymarket Square	Arrive Devonshire & Milk Sts.	Leave Devonshire & Milk Sts.	Lv/Arrive Haymarket Square	Arrive Sullivan Square
c 12:00N	**12:13P**	**12:18P**	**12:05P**	**12:10P**	**12:23P**
12:20P	**12:33**	**12:38**	**c 12:25**	**12:30**	**12:43**
12:40	**12:53**	**12:58**	**12:45**	**12:50**	**1:03**
c 1:00	**1:13**	**1:18**	**1:05**	**1:10**	**1:23**
1:20	**1:33**	**1:38**	**c 1:25**	**1:30**	**1:45**
1:40	**1:53**	**1:58**	**1:45**	**1:50**	**2:05**
c 2:00	**2:13**	**2:18**	**2:05**	**2:10**	**2:25**
es 1:50	**2:17**	.....	.....	**s 2:20**	**2:34**
2:15	**2:28**	**2:33**	**c 2:25**	**2:30**	**2:45**
2:30	**2:43**	**2:48**	**2:39**	**2:44**	**2:59**
2:45	**2:58**	**3:03**	**2:55**	**3:00**	**3:15**
c 3:00	**3:13**	**3:18**	**3:10**	**3:15**	**3:30**
3:15	**3:28**	**3:33**	**c 3:25**	**3:30**	**3:45**
3:30	**3:42**	**3:47**	**3:40**	**3:45**	**4:00**
3:40	**3:52**	**3:57**	**3:55**	**4:00**	**4:15**
3:45	**3:57**	**4:02**	**4:04**	**4:09**	**4:24**
3:52	**4:04**	**4:09**	**4:13**	**4:18**	**4:33**
c 3:58	**4:10**	**4:15**	**4:21**	**4:26**	**4:40**
4:06	**4:18**	**4:23**	**4:31**	**4:37**	**4:52**
4:14	**4:26**	**4:31**	**4:37**	**4:43**	**4:58**
4:22	**4:35**	**4:41**	**4:45**	**4:51**	**5:07**
c 4:30	**4:44**	**4:50**	**4:53**	**4:59**	**5:16**
4:38	**4:52**	**4:58**	**5:01**	**5:09**	**5:26**
4:46	**5:00**	**5:06**	**5:10**	**5:18**	**5:35**
4:54	**5:07**	**5:13**	**5:17**	**5:25**	**5:41**
c 5:02	**5:15**	**5:21**	**5:26**	**5:33**	**5:49**
5:10	**5:23**	**5:29**	**5:33**	**5:40**	**5:56**
5:18	**5:31**	**5:37**	**5:41**	**5:48**	**6:04**
5:26	**5:39**	**5:45**	**5:49**	**5:56**	**6:13**
c 5:34	**5:47**	**5:53**	**5:57**	**6:03**	**6:19**
5:42	**5:55**	**6:01**	**c 6:05**	**6:11**	**6:27**
c 5:57	**6:10**	**6:16**	**6:13**	**6:19**	**6:34**
6:12	**6:25**	**6:30**	**6:21**	**6:27**	**6:41**
6:27	**6:38**	**6:42**	**6:35**	**6:40**	**6:54**
6:45	**6:56**	**7:00**	**6:50**	**6:55**	**7:09**
7:15	**7:26**	**7:30**	**7:05**	**7:10**	**7:24**
u 7:45	**7:58**	.....	**7:35**	**7:40**	**7:54**
u 8:20	**8:33**	.....	.....	**8:00**	**8:11**
u 8:55	**9:08**	.....	.....	**8:35**	**8:46**
u 9:30	**9:43**	.....	.....	**9:10**	**9:21**
u 10:10	**10:23**	.....	.....	**9:45**	**9:56**
u 11:10	**11:23**	.....	.....	**10:25**	**10:36**
u 12:10A	12:23A	.....	.....	**11:25**	**11:36**
uw 1:10	1:22	.....	.....	12:25A	12:36A
			.....	1:23	1:34

93 Saturday

Inbound			Outbound		
Leave Sullivan Square	Arrive Haymarket Square	Arrive Devonshire & Milk Sts.	Leave Devonshire & Milk Sts.	Lv/Arrive Haymarket Square	Arrive Sullivan Square
a 4:48A	4:54A	.....	.....	5:04A	5:12A
5:17	5:27	.....	.....	5:28	5:36
5:45	5:55	.....	.....	5:58	6:06
6:15	6:25	.....	.....	6:28	6:36
6:45	6:55	.....	.....	6:58	7:06
7:20	7:30	.....	.....	7:35	7:43
7:40	7:50	.....	.....	7:55	8:03
8:00	8:10	.....	.....	8:15	8:23
8:20	8:32	8:36A	8:45A	8:51	9:02
8:40	8:52	8:56	9:05	9:11	9:22
9:00	9:12	9:16	9:25	9:31	9:42
9:20	9:32	9:36	9:45	9:51	10:02
9:40	9:52	9:56	10:05	10:11	10:22
10:00	10:12	10:16	10:25	10:31	10:42
10:20	10:32	10:36	10:45	10:51	11:02
10:40	10:52	10:56	11:05	11:11	11:22
11:00	11:12	11:16	11:25	11:31	11:42
11:20	11:32	11:36	11:45	11:51	**12:03P**
11:40	11:52	11:56			
			12:05P	**12:12P**	**12:24P**
12:00N	**12:12P**	**12:16P**	***Every***	***20 Mins.***	***Until***
Every	***20 Mins.***	***Until***	**3:05**	**3:12**	**3:25**
3:00	**3:12**	**3:18**	**3:25**	**3:32**	**3:45**
3:20	**3:32**	**3:38**	**3:45**	**3:53**	**4:06**
3:40	**3:52**	**3:58**	**4:05**	**4:13**	**4:26**
4:00	**4:12**	**4:18**	**4:25**	**4:33**	**4:46**
4:20	**4:33**	**4:37**	**4:45**	**4:53**	**5:06**
4:40	**4:52**	**4:56**	**5:05**	**5:13**	**5:26**
5:00	**5:12**	**5:16**	**5:25**	**5:33**	**5:46**
5:20	**5:32**	**5:36**	**5:45**	**5:53**	**6:05**
5:40	**5:52**	**5:56**	**6:05**	**6:12**	**6:25**
6:00	**6:12**	**6:16**	**6:25**	**6:32**	**6:45**
6:20	**6:32**	**6:36**	**6:45**	**6:52**	**7:05**
6:45	**6:57**	**7:01**	**7:10**	**7:17**	**7:30**
7:15	**7:27**	**7:31**	**7:35**	**7:42**	**7:55**
u 7:45	**8:00**	.....	.....	**8:05**	**8:17**
u 8:30	**8:45**	.....	.....	**8:50**	**9:02**
u 9:20	**9:33**	.....	.....	**9:40**	**9:50**
u 10:20	**10:33**	.....	.....	**10:40**	**10:50**
u 11:20	**11:33**	.....	.....	**11:40**	**11:50**
u 12:20A	12:33A	.....	.....	12:40A	12:50A
u 1:10	1:23	.....	.....	1:30	1:40

All buses are accessible to persons with disabilities

93 Sunday

Inbound			Outbound		
Leave Sullivan Square	Arrive Haymarket Square	Arrive Devonshire & Milk Sts.	Leave Devonshire & Milk Sts.	Lv/Arrive Haymarket Square	Arrive Sullivan Square
b 5:28A	5:39A	.....	.....	d 5:44A	5:54A
6:00	6:11	.....	.....	6:13	6:23
7:00	7:13	.....	.....	7:13	7:23
8:00	8:13	.....	.....	8:13	8:23
9:00	9:13	.....	.....	9:13	9:23
9:30	9:43	.....	.....	9:43	9:53
10:00	10:13	.....	.....	10:13	10:23
11:00	11:12	11:17A	11:20	11:25	11:39
11:40	11:52	11:57			
			12:00N	**12:05P**	**12:19P**
12:20P	**12:32P**	**12:37P**	**12:40P**	**12:45**	**12:59**
1:00	**1:12**	**1:17**	**1:20**	**1:25**	**1:39**
1:40	**1:52**	**1:57**	**2:00**	**2:05**	**2:19**
2:20	**2:32**	**2:37**	**2:40**	**2:45**	**2:59**
3:00	**3:12**	**3:17**	**3:20**	**3:25**	**3:39**
3:40	**3:52**	**3:57**	**4:00**	**4:05**	**4:19**
4:20	**4:32**	**4:37**	**4:40**	**4:45**	**4:59**
5:00	**5:12**	**5:17**	**5:20**	**5:25**	**5:39**
5:40	**5:52**	**5:57**	**6:00**	**6:05**	**6:19**
6:20	**6:32**	**6:37**	**6:40**	**6:45**	**6:59**
7:01	**7:14**	.....	.....	**7:14**	**7:25**
u 8:01	**8:14**	.....	.....	**8:14**	**8:24**
u 9:01	**9:14**	.....	.....	**9:14**	**9:24**
u 10:00	**10:11**	.....	.....	**10:13**	**10:23**
u 11:00	**11:11**	.....	.....	**11:13**	**11:23**
u 12:00M	12:11A	.....	.....	12:13A	12:23A

Route 93
Sullivan Square-Downtown Boston

Fare	Local Bus	Bus + Bus	Rapid Transit	Bus + Rapid Transit
CharlieCard	$1.60	$1.60	$2.10	$2.10
CharlieTicket	$2.10	$2.10	$2.65	$4.75
Cash-on-Board	$2.10	$4.20	$2.65	$4.75
Student CharlieCard*	$0.80	$0.80	$1.05	$1.05
Senior/TAP CharlieCard**	$0.80	$0.80	$1.05	$1.05

VALID PASSES: LinkPass ($75/mo.); Monthly Local Bus ($50/mo.); *StudentPass ($24.00/Month for 5-Day validity Mon-Fri or 7-Day validity on all days); **Senior/TAP Pass ($29/mo.); and express bus, commuter rail, and boat passes.
FREE FARES: Children 11 and under ride free when accompanied by an adult; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.
* Requires Student CharlieCard, available to students through participating middle schools and high schools.
** Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

Fall 2014 Holidays
October 13 & November 11: see Weekday
September 1, November 27, & December 25: see Sunday

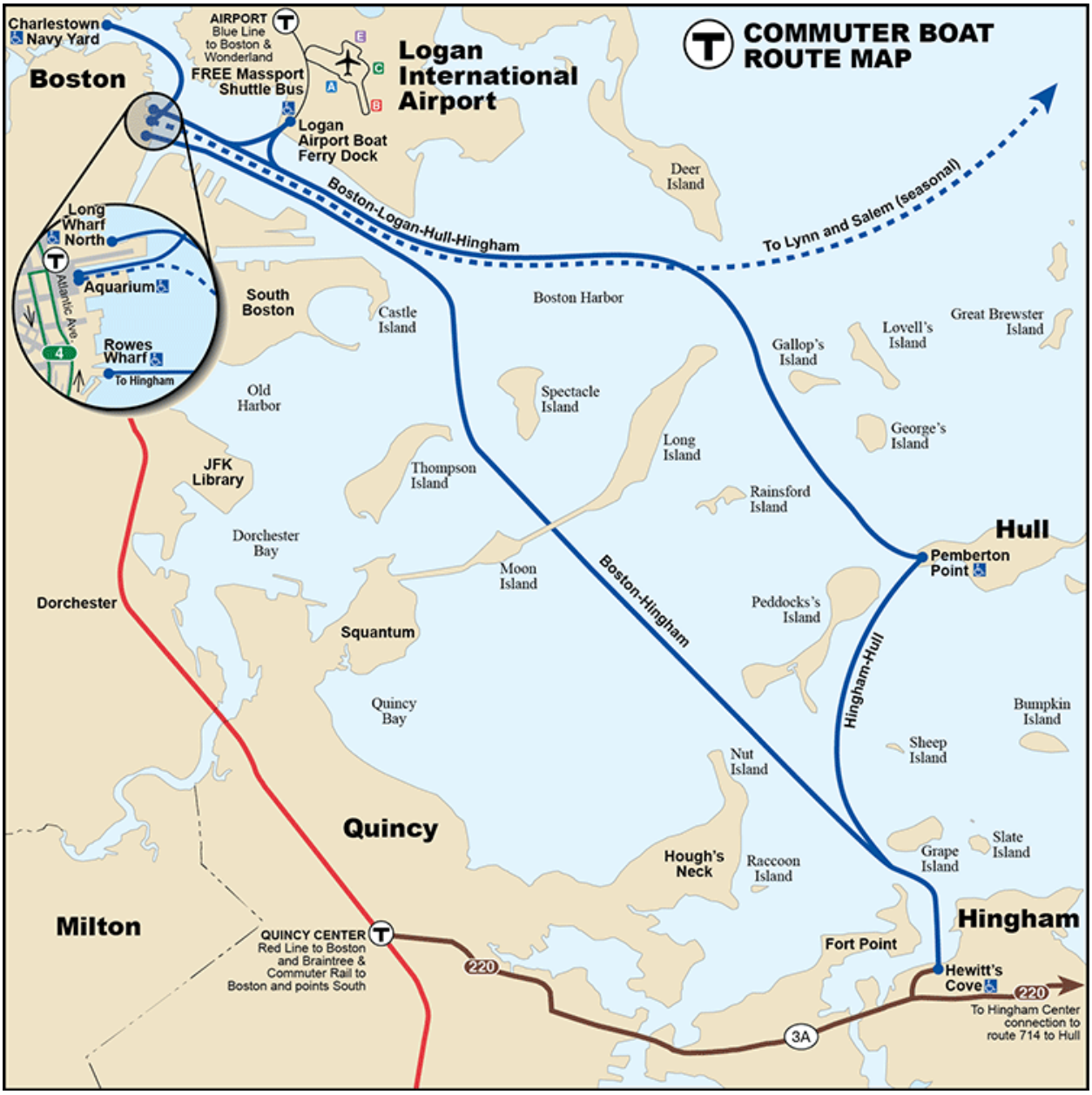
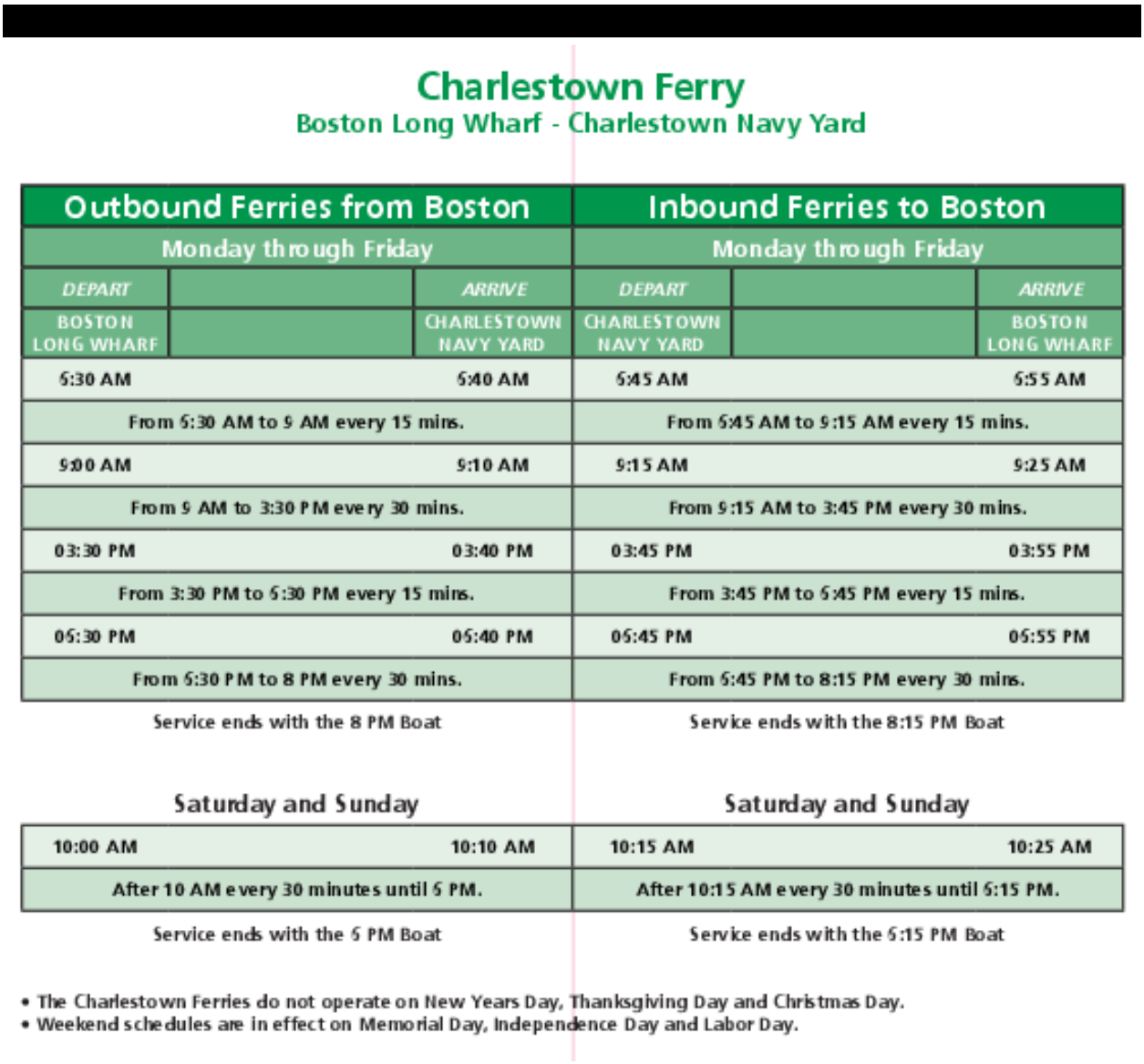


Figure 5. MBTA boat map (source MBTA).



Charlestown Ferry

Boston Long Wharf - Charlestown Navy Yard

Outbound Ferries from Boston			Inbound Ferries to Boston		
Monday through Friday			Monday through Friday		
DEPART		ARRIVE	DEPART		ARRIVE
BOSTON LONG WHARF		CHARLESTOWN NAVY YARD	CHARLESTOWN NAVY YARD		BOSTON LONG WHARF
6:30 AM		6:40 AM	6:45 AM		6:55 AM
From 6:30 AM to 9 AM every 15 mins.			From 6:45 AM to 9:15 AM every 15 mins.		
9:00 AM		9:10 AM	9:15 AM		9:25 AM
From 9 AM to 3:30 PM every 30 mins.			From 9:15 AM to 3:45 PM every 30 mins.		
03:30 PM		03:40 PM	03:45 PM		03:55 PM
From 3:30 PM to 6:30 PM every 15 mins.			From 3:45 PM to 6:45 PM every 15 mins.		
06:30 PM		06:40 PM	06:45 PM		06:55 PM
From 6:30 PM to 8 PM every 30 mins.			From 6:45 PM to 8:15 PM every 30 mins.		
Service ends with the 8 PM Boat			Service ends with the 8:15 PM Boat		

Saturday and Sunday			Saturday and Sunday		
10:00 AM		10:10 AM	10:15 AM		10:25 AM
After 10 AM every 30 minutes until 6 PM.			After 10:15 AM every 30 minutes until 6:15 PM.		
Service ends with the 6 PM Boat			Service ends with the 6:15 PM Boat		

- The Charlestown Ferries do not operate on New Years Day, Thanksgiving Day and Christmas Day.
- Weekend schedules are in effect on Memorial Day, Independence Day and Labor Day.

Figure 6. MBTA Charlestown Ferry Schedule (source MBTA).

Partners Healthcare Shuttle Bus

The Partners Healthcare shuttle bus is for Partners Healthcare employees, patients and visitors. The Spaulding Express shuttle bus stops at North Station on Causeway Street and in the Charlestown Navy Yard on Third Avenue.

On weekdays, the shuttle bus operates between 6:00 and 9:00 AM and between 3:00 and 6:00 PM, approximately every 10 minutes. On weekends, the shuttle bus operates between 5:30 and 9:00 AMM, approximately every 10 minutes.

The Partners Healthcare shuttle bus system includes:

- Boston Crosstown 801 Massachusetts Avenue
- Boston East Boston Health Center
- Boston Longwood Medical Area
- Boston Massachusetts General Hospital
- Boston North End Health Center
- Boston North Station
- Boston Back Bay Prudential Center
- Boston Sullivan Square MBTA/Somerville
- Brookline 10 Brookline Place
- Cambridge Massachusetts Institute of Technology
- Charlestown Bunker Hill Health Center
- Charlestown Navy Yard
- Chelsea Health Center
- Everett Health Center
- Revere Health Center
- Roslindale Faulkner Hospital[3]

BICYCLE CONDITIONS AND FACILITIES

Thirteenth Street and Chelsea Street north of Thirteenth Street includes a bicycle route.[4]

A Hubway bike-share station is located at Spaulding Rehabilitation Hospital in the Charlestown Navy Yard.[5]

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[3] Source www.partners.org, accessed December 17, 2014.

[4] Source www.ridethecity.com, accessed December 17, 2014.

[5] Source www.thehubway.com, accessed December 17, 2014.

CAR SHARING

A Zipcar care sharing location is at 1 First Avenue.[6]

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative *Trip Generation Manual*.[7] This information is based on empirical data for a variety of land uses including hotel, land use 310, based on rooms.[8] ITE defines hotel as "places of lodging that provide sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops."[9]

BTD Development Review Guidelines provide mode-split information.[10] Table 1 presents calculated trip generation and mode split.

ITE suggests that land developments generating at least 100 peak-hour vehicle-trips, in the busier direction, are candidates for consideration of traffic impact analysis.[11] The Table 1 shows significantly less than 100 peak-hour vehicle-trips, in the busier direction, due to the proposed hotel. Peak-hour transit trips are due to proposed hotel are also minor.

VEHICLE ROUTES

The anticipated vehicle route from the hotel to the Autoport is:

- First Avenue southbound
- right turn to Ninth Street westbound
- right turn to Fourth Avenue northbound
- left turn to Thirteenth Street westbound
- right turn to Chelsea Street northbound to the Autoport

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[6] Source www.zipcar.com, accessed December 17, 2014.

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

[8] ITE, *Trip Generation Manual*, pages 603 to 630.

[9] ITE, *Trip Generation Manual*, page 603.

[10] Ropewalk PNF, page 2-8.

[11] ITE, *Manual of Transportation Engineering Studies* (Prentice Hall: Englewood Cliffs, New Jersey, 2000), page 144.

Table 1. Calculated trip generation.

Time Period and Direction	Vehicle-Trips			
		Mode Split[b]		
	Total[a]	Automobile (53%)	Transit (12%)	Walk (35%)
Weekday Daily	1,685	893	202	590
Weekday AM Street-Peak Hour				
In	72	38	9	25
Out	50	27	6	17
Total	122	65	15	42
Weekday PM Street-Peak Hour				
In	70	37	8	25
Out	68	36	8	24
Total	138	73	16	49
Saturday Daily[a]	1,918	1,017	230	671
Saturday Peak Hour				
In	93	49	11	33
Out	73	39	9	25
Total	166	88	20	58

[a] Trip generation totals are based on hotel, land use 310, from ITE, *Trip Generation Manual*, 9th edition, pages 603 to 630.

[b] Mode split is from BTD Development Review Guidelines, as cited in the Ropewalk PNF, page 2-8.

The anticipated vehicle route from the Autoport to the hotel is:

- Chelsea Street southbound
- left turn to Thirteenth Street eastbound
- right turn to right turn to First Avenue southbound

AREA TRAFFIC OPERATIONS

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)[12] models LOS for intersections based on calculated delay per vehicle, as shown in Table 2.

Table 2. 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.

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.

The Ropewalk PNF included capacity analysis for the following intersections:

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

- Chelsea Street/Fifth Street (signalized)
- Chelsea Street/Vine Street (unsignalized)
- Chelsea Street/Medford Street (unsignalized)
- Chelsea Street/Thirteenth Street (signalized)
- Chelsea Street/Sixteenth Street (signalized)

Table 3 summarizes capacity analysis for the 2019 build condition from the Ropewalk PNF[13] Table shows low to moderate delays throughout and vehicle-trip generation due to the proposed hotel would not be significant to overall area traffic operations.

PARKING

ITE compiles parking generation information for a variety of land uses and independent variables and publishes same in *Parking Generation*, an authoritative guide for calculating site parking demand.[14] This publication includes hotel (land use 310), based on occupied rooms.[15]

For a weekday:

- average peak parking demand is 0.89 vehicles per occupied room
- BTD automobile mode split is 53 percent
- calculated peak parking demand is 230 rooms times 0.89 vehicles per occupied room times 53 percent, or 108 vehicles

For a Saturday:

- average peak parking demand is 1.20 vehicles per occupied room
- BTD automobile mode split is 53 percent
- calculated peak parking demand is 230 rooms times 1.20 vehicles per occupied room times 53 percent, or 146 vehicles

[13] Ropewalk PNF, page 2-11.

[14] ITE, *Parking Generation,* 4th edition, (Washington DC, 2010).

[15] ITE, *Parking Generation*, pages 73 to 77.

Table 3. Capacity analysis for Ropewalk PNF 2019 build condition.

	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
Intersection	LOS[b]	Delay[b]	LOS	Delay	LOS	Delay
Chelsea Street/Fifth Street (Signalized)						
Northbound	A	8.3	A	5.9	A	6.1
Southbound	C	20.3	C	20.0	B	17.4
Westbound	A	8.7	B	10.8	A	7.6
Overall	B	13.1	B	12.9	B	10.8
Chelsea Street/Vine Street (Unsignalized)						
Eastbound	C	18.1	D	27.2	B	11.4
Northbound Left	A	1.4	A	2.9	A	1.9
Chelsea Street/Medford Street (Unsignalized)						
Eastbound	C	16.2	C	18.2	B	10.5
Northbound Left	A	0.1	A	1.6	A	1.2
Chelsea Street/Sixteenth Street (Signalized)						
Northbound	A	2.6	A	7.6	A	8.9
Southbound	B	14.3	B	12.4	B	14.5
Westbound	A	4.8	A	5.5	A	3.6
Overall	A	5.2	A	7.7	A	9.2
Chelsea Street/Sixteenth Street (Signalized)						
Northbound	B	10.0	A	9.1	B	12.7
Souhbound	B	10.0	A	9.1	B	12.7
Westbound	B	16.4	B	15.4	B	15.2
Overall	B	10.0	A	7.6	B	10.4

Source: Ropewalk PNF, page 2-11.

[a] LOS = level of service.

[b] Delay in average seconds per vehicle.

About 200 hotel parking spaces will designated at the Boston Autoport, with valet/shuttle service.

SERVICE AND DELIVERIES

The hotel is expected to have about 2 to 3 deliveries per day. Most of these deliveries are anticipated between 7:00 AM and 5:00 PM. The hotel will also require typical trash removal.

Based on the foregoing, service and deliveries are anticipated to have no significant impact on the area.

TRANSPORTATION AND PARKING DEMAND MANAGEMENT

Access Plan Agreement

The proponent will prepare a Transportation Access Plan Agreement (TAPA). The TAPA is anticipated to:

- be a legal agreement between the BTD and the proponent
- set forth transportation findings
- set forth mitigation commitments
- include access elements
- include design elements
- set forth travel demand management (TDM) measures

Transportation Demand Management

The proposed hotel is anticipated to have no significant impact on area street-traffic operations. However, the proponent will incorporate a TDM program.

A TDM program may include:

- taking advantage of transit access in marketing to hotel guests
- providing a web site that includes transportation information for hotel guests, visitors and staff
- making transportation information available on site to hotel guests, visitors and staff
- designating a transportation coordinator for matters such as parking, service, loading, deliveries, public transportation, bicycling and walking

Bicycle Accommodation

The TAPA is anticipated to provide for secure covered bicycle parking for hotel guests, visitors and staff. Accordingly, the project will include on-site bicycle storage.

CONSTRUCTION MANAGEMENT PLAN

A construction management plan (CMP) will:

- provide for the construction period
- be filed with the BTD by the general contractor in conjunction with the application for building permit
- incorporate truck routes, public-way occupancy, noise attenuation, dust attenuation, construction staging, parking and deliveries as appropriate
- consider vehicle detours, lane closures, parking restrictions and pedestrian detours as appropriate
- encourage construction workers to use public transportation or carpool as practicable and appropriate
- consider providing secure on-site supply and tool storage so that workers do not need to transport them to and from the site on a daily basis

CHAPTER 7
SITE PLAN

7.0 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 8
DEVELOPMENTAL IMPACT PROJECT

8.0 Development Impact Project

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

APPENDIX

EXHIBIT A
DESIGN CONCEPT

0 25’ 50’

FIRST FLOOR PLAN

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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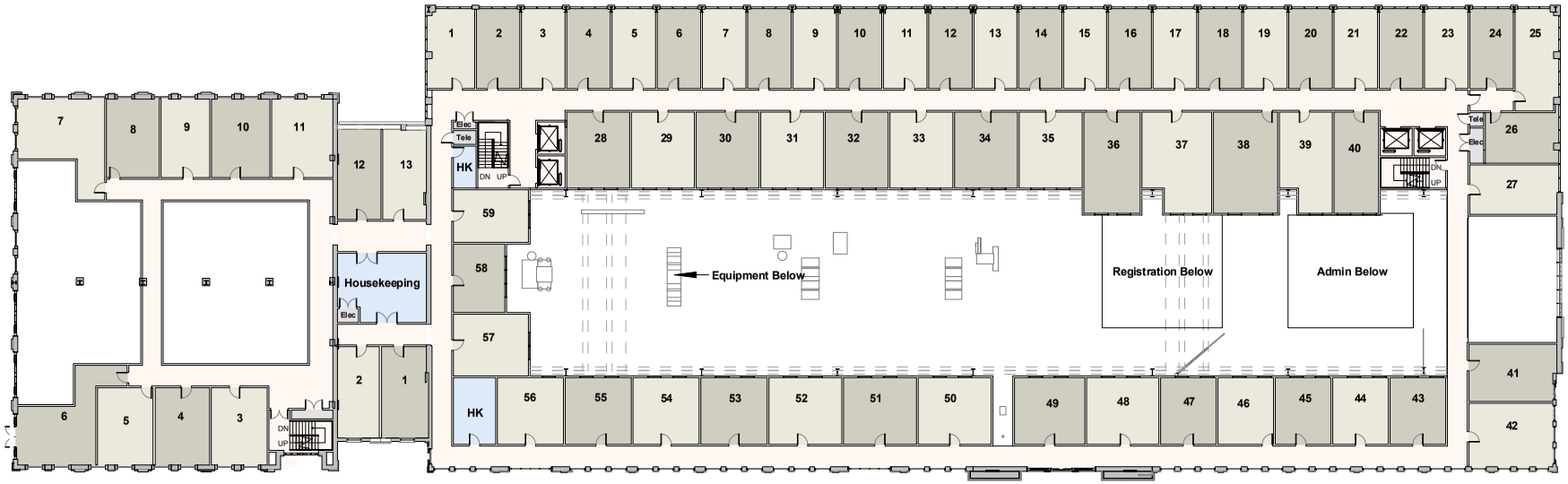

0 25’ 50’

SECOND FLOOR PLAN

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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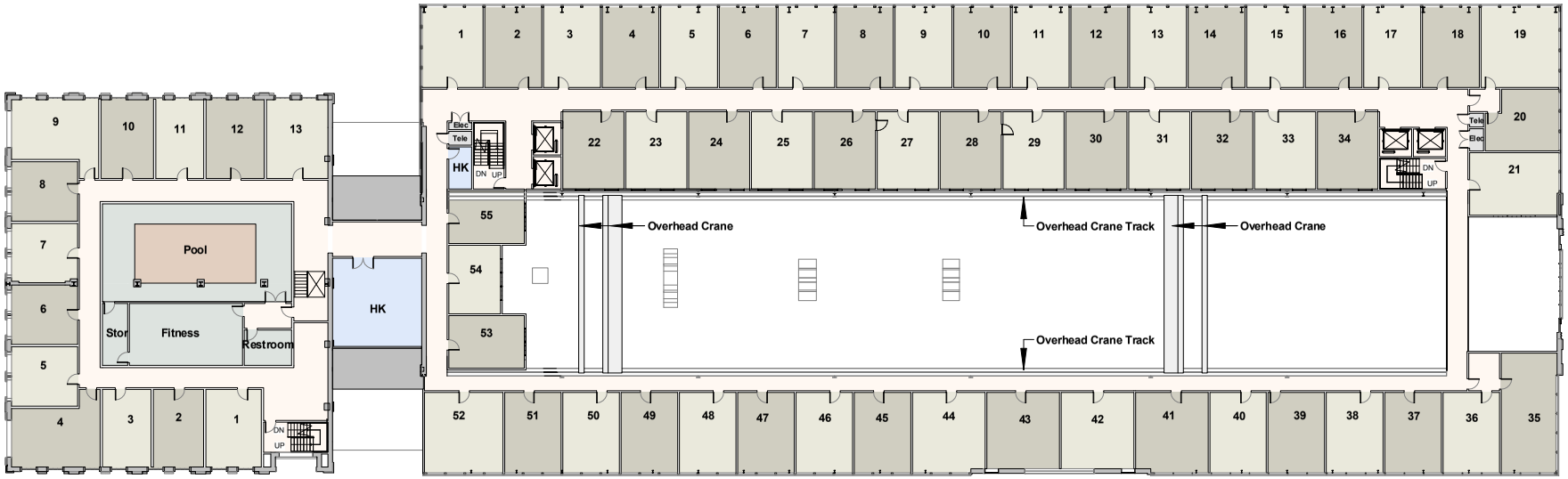

0 25’ 50’

THIRD FLOOR PLAN

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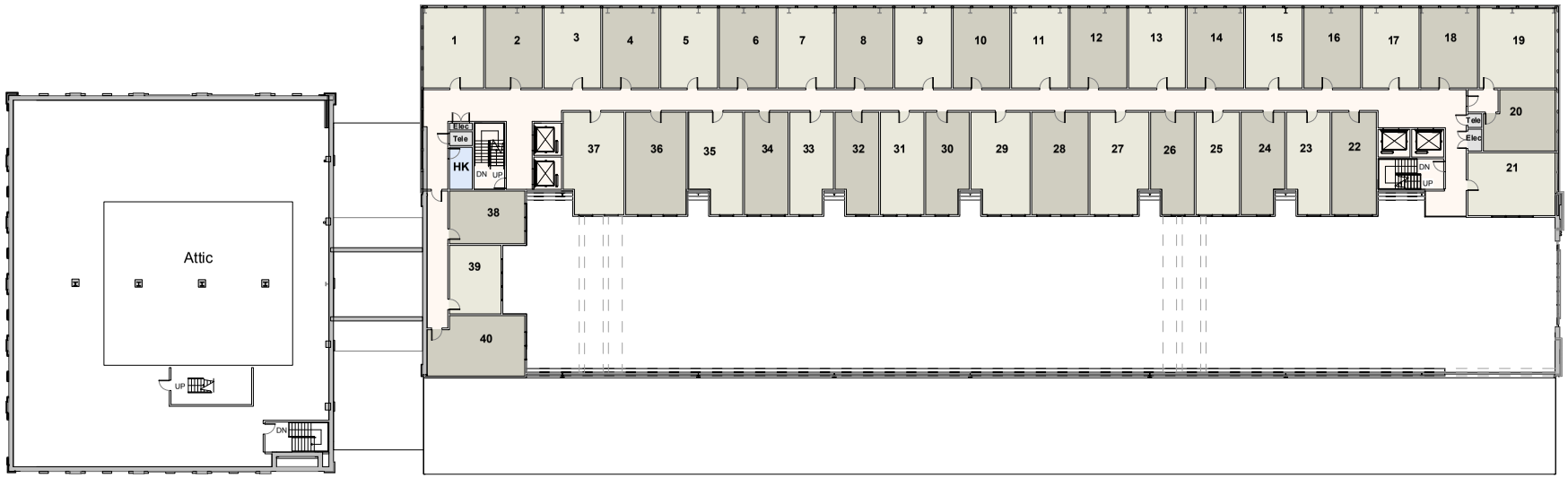

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FOURTH FLOOR PLAN

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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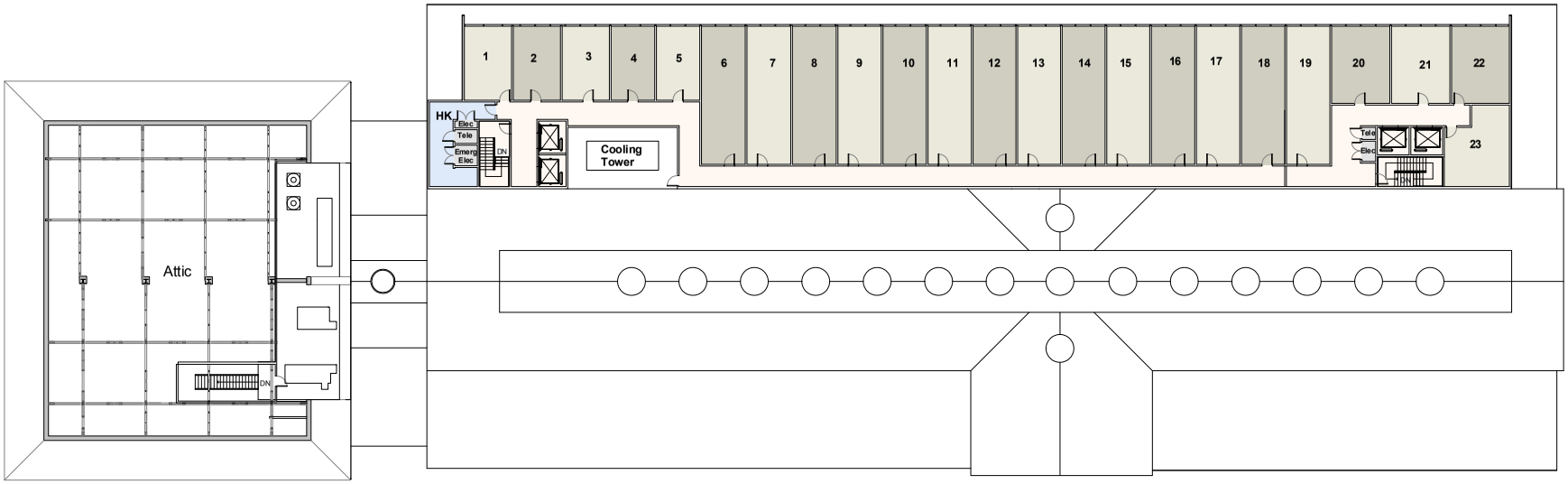

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FIFTH FLOOR PLAN

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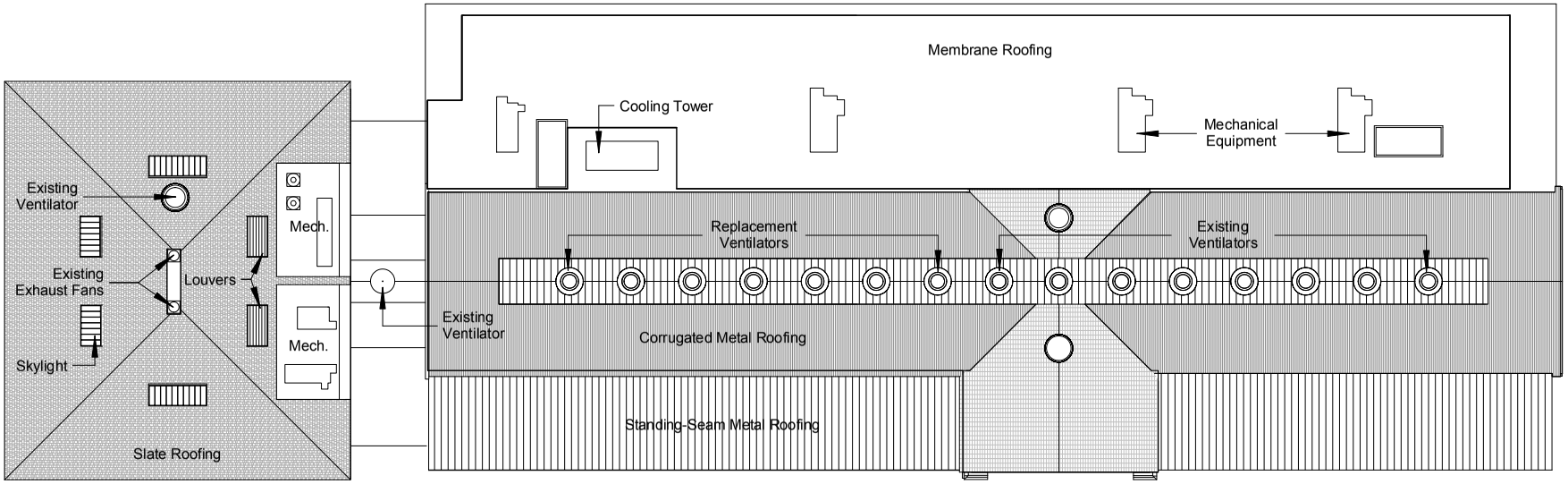

0 8’ 16’

ROOF PLAN

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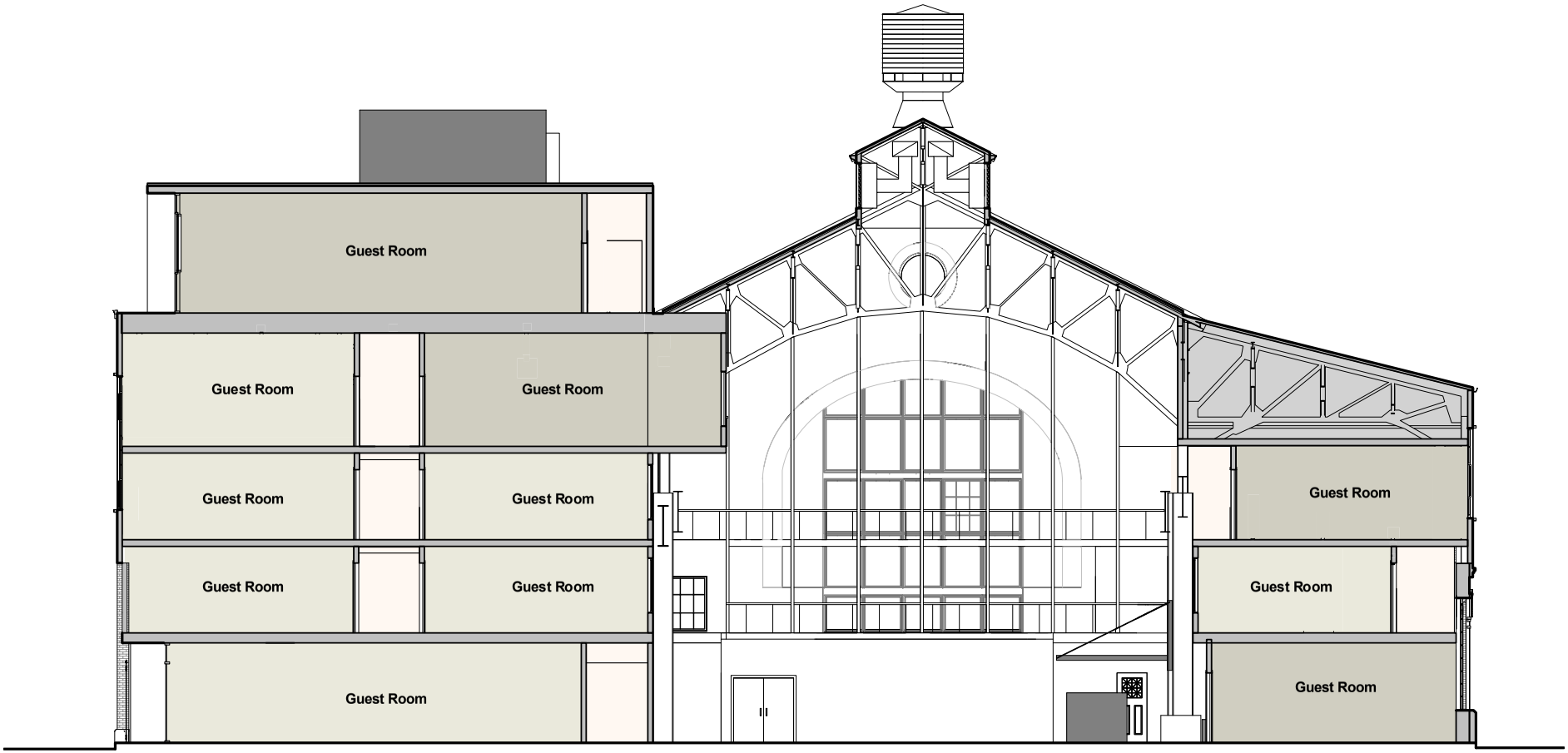

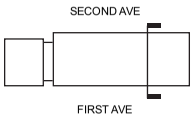

0 8’ 16’

SECTION @ MAIN BUILDING

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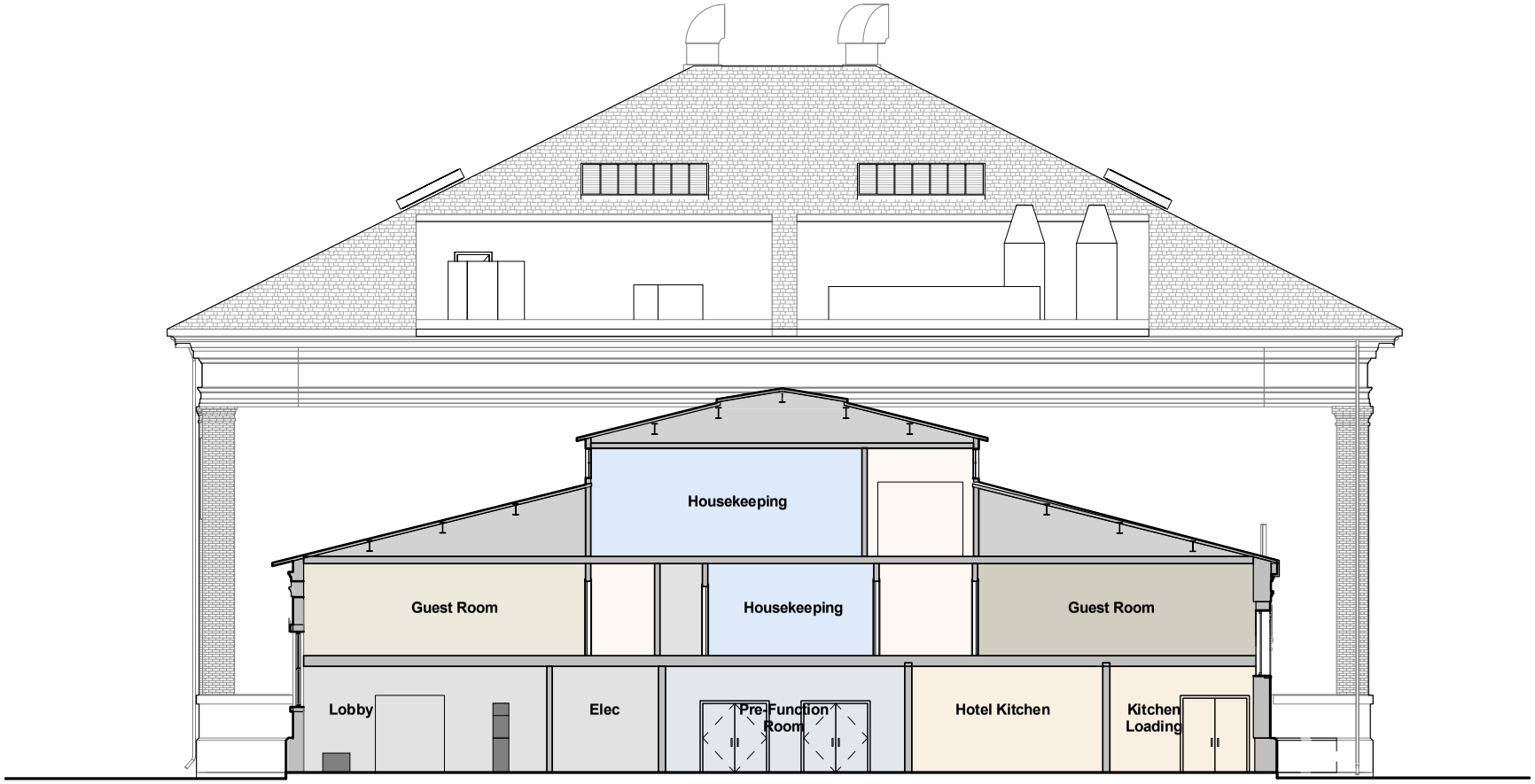

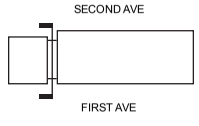

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SECTION @ CONNECTOR BUILDING

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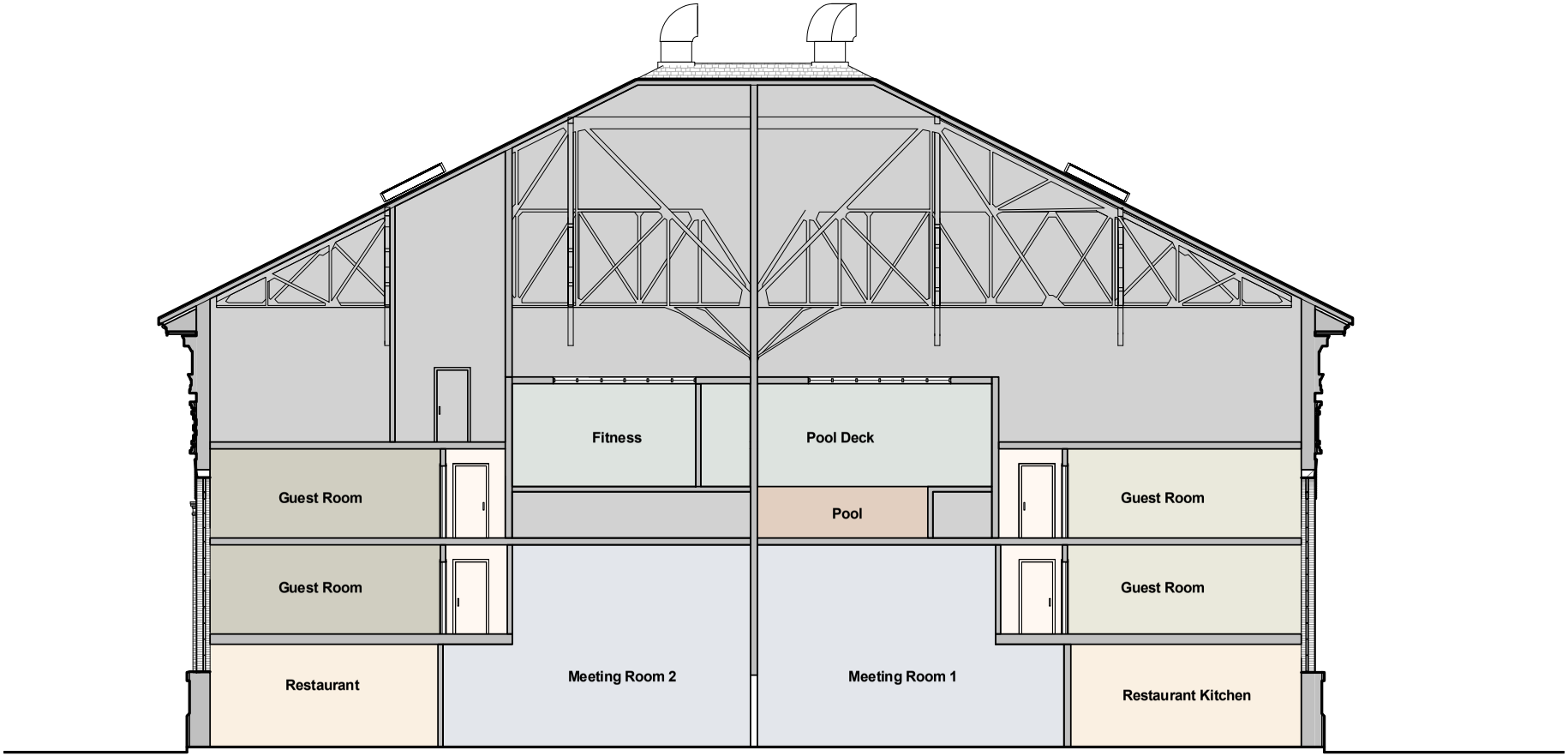

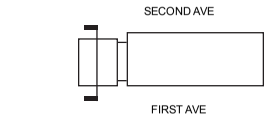

0 8’ 16’

SECTION @ POWERHOUSE

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SECOND AVENUE
PROPOSED ELEVATION

SECOND AVENUE
EXISTING ELEVATION

0 16’ 32’

SECOND AVENUE ELEVATION

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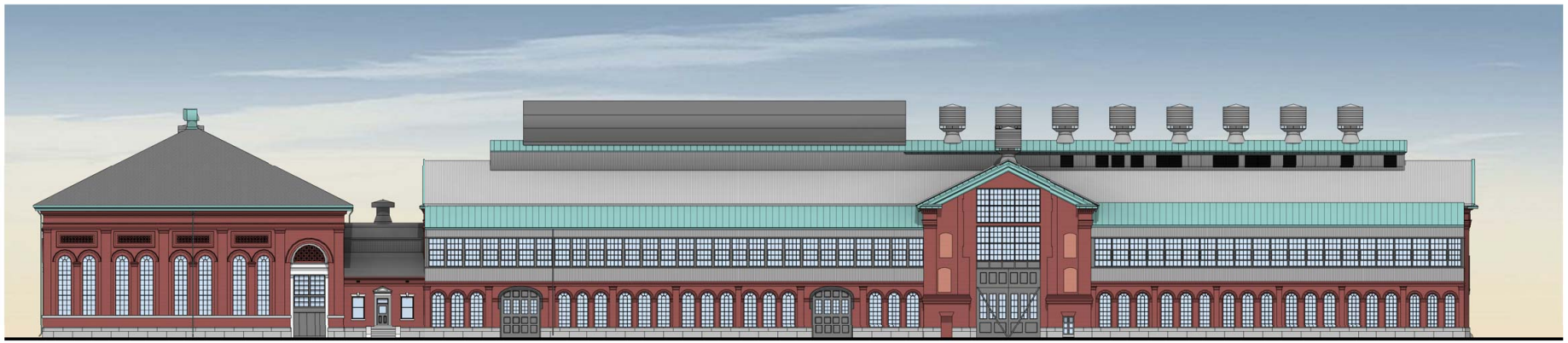
PROPOSED ELEVATION



FIRST AVENUE
EXISTING ELEVATION

0 16’ 32’

FIRST AVENUE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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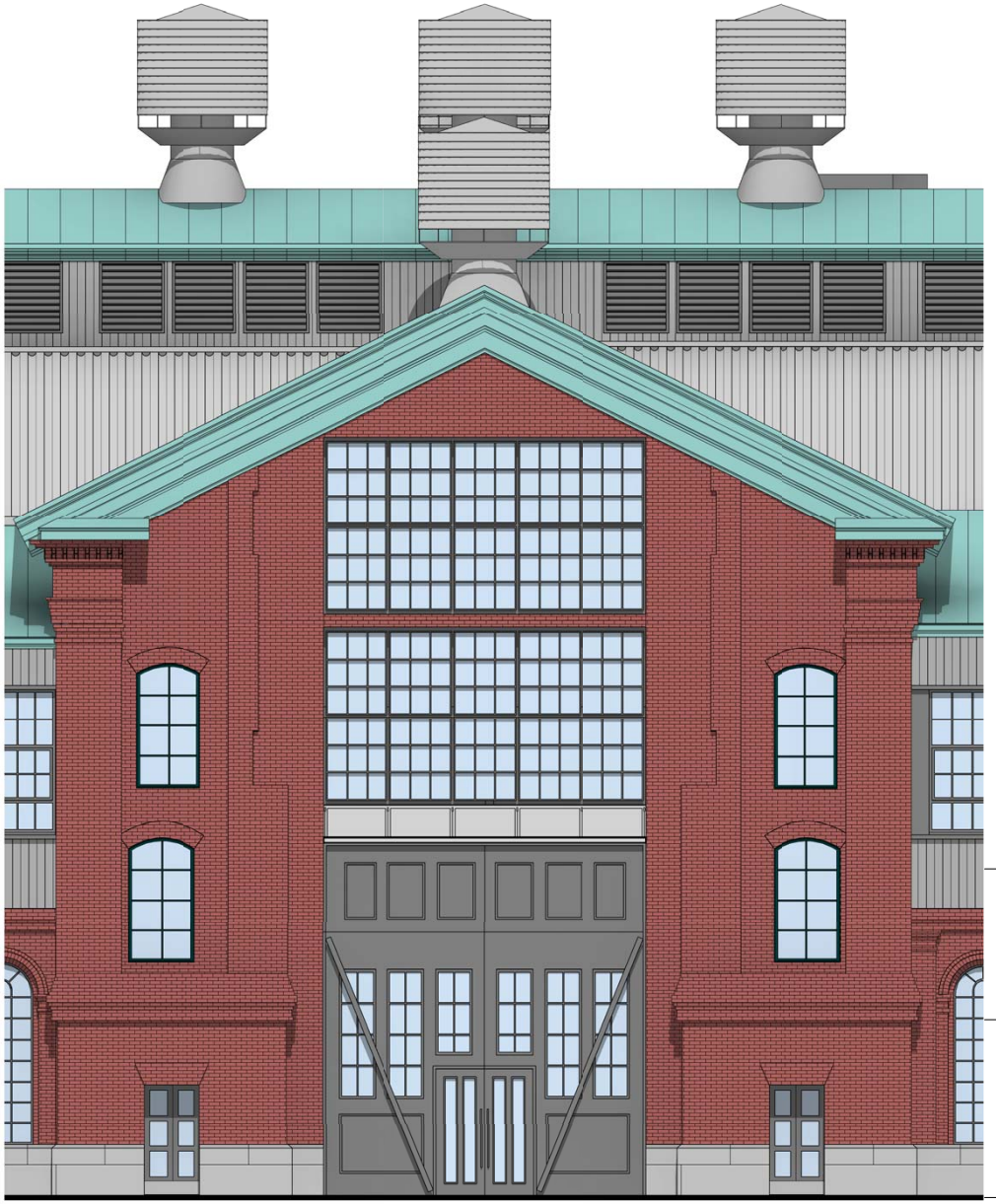

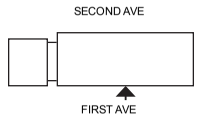

0 4’ 8’ 16’

PROPOSED HOTEL ENTRY @ FIRST AVENUE

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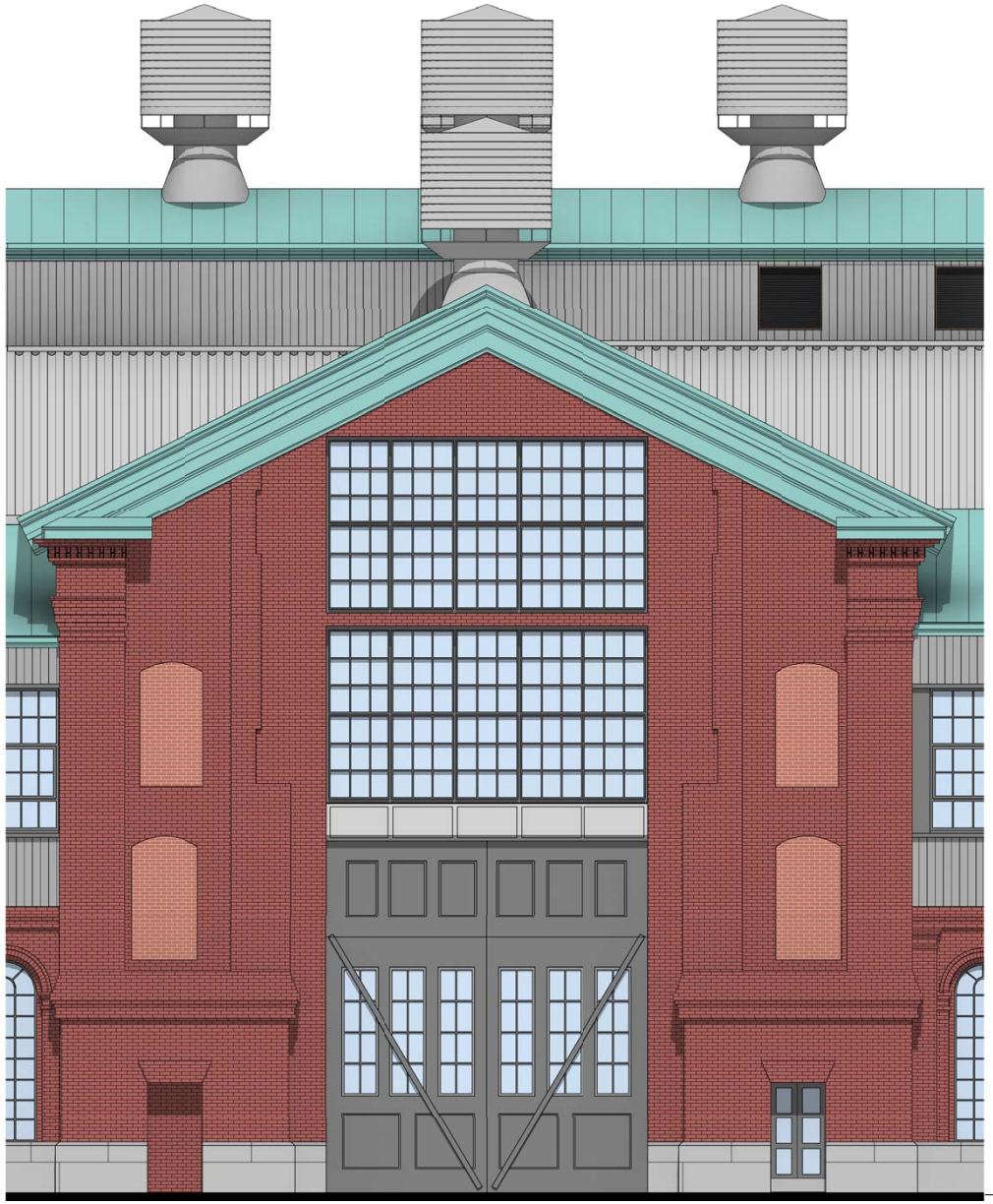

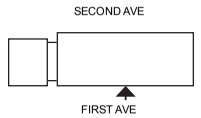

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EXISTING CONDITION : HOTEL ENTRY

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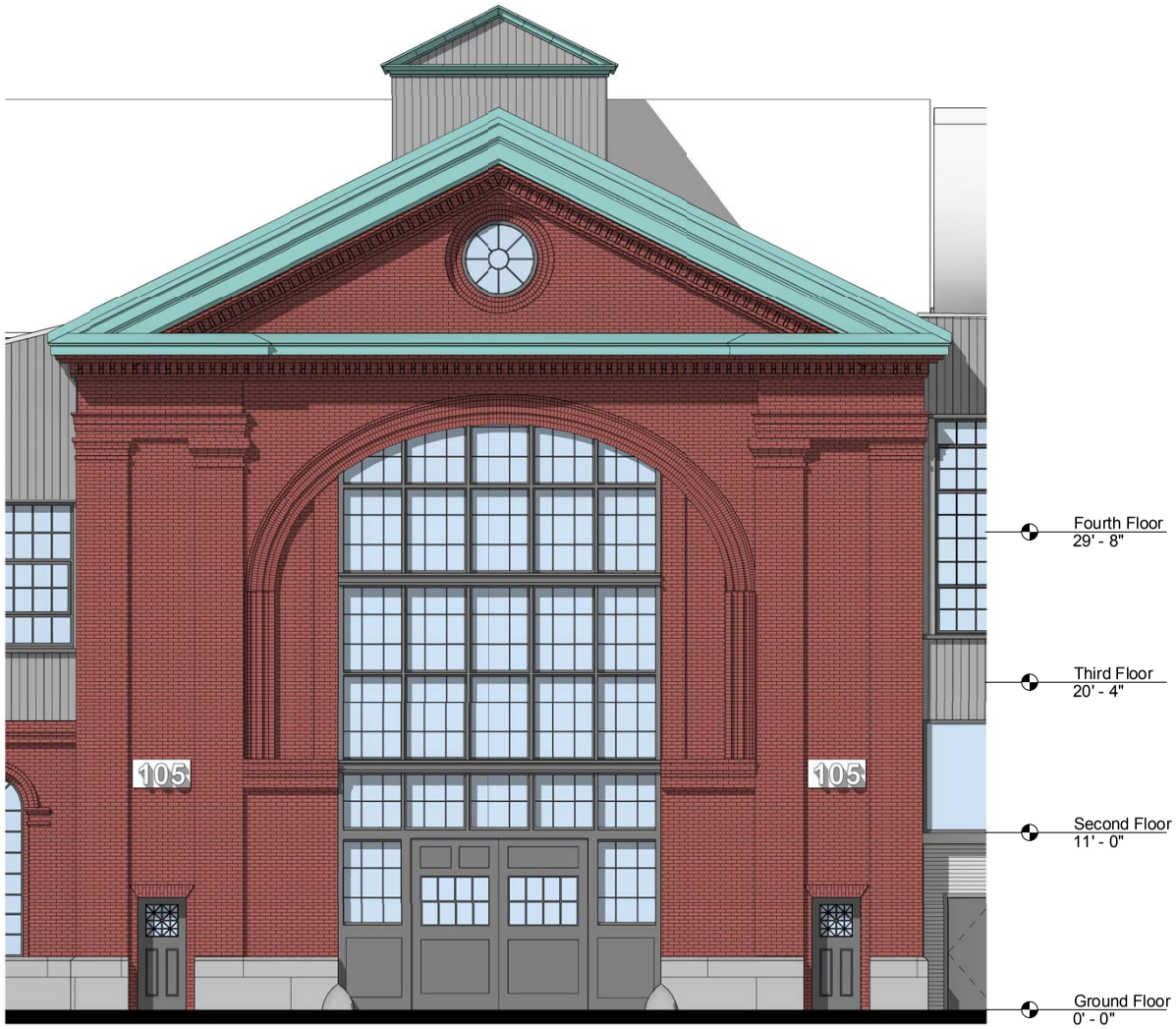
EXISTING CONDITION : HOTEL ENTRY



PROPOSED 13TH STREET END ELEVATION

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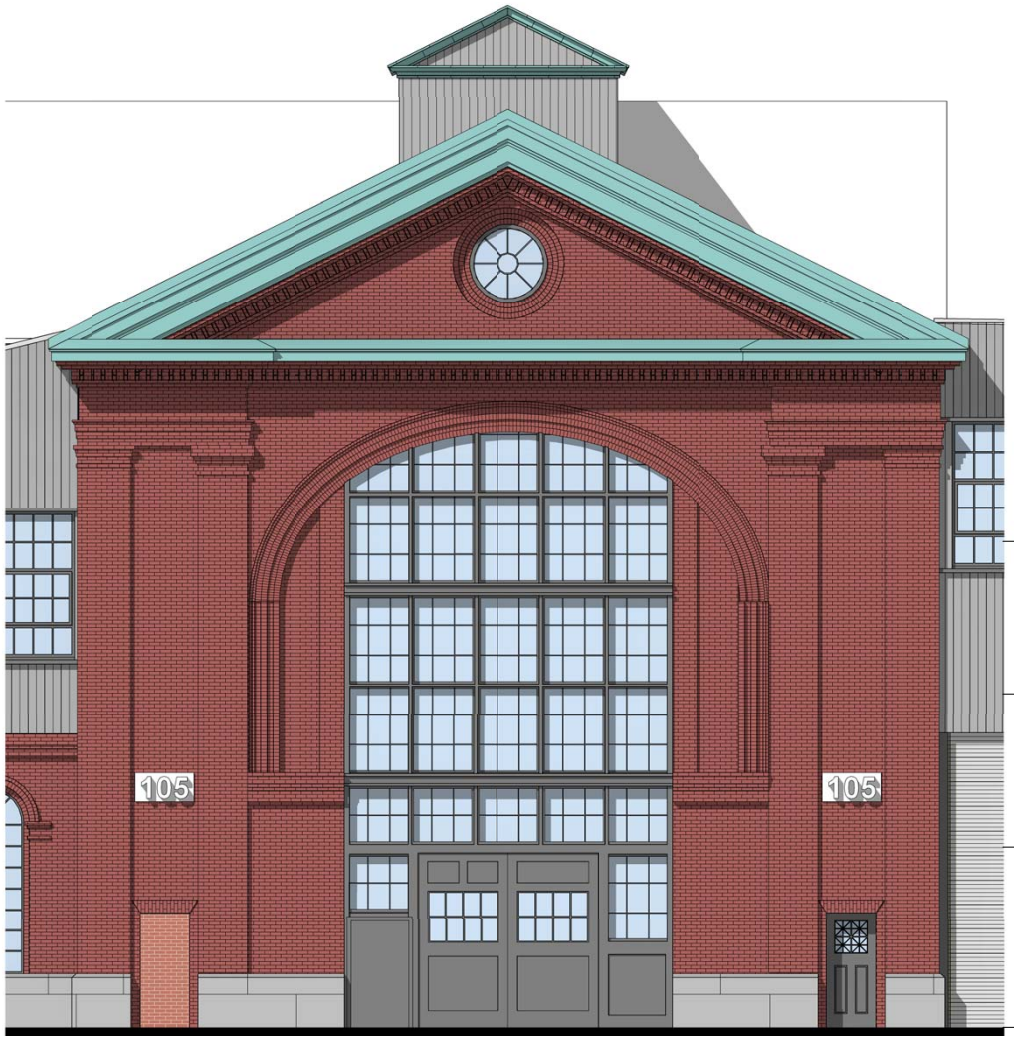

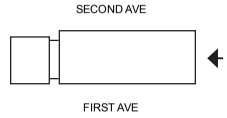

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EXISTING 13TH STREET END ELEVATION

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13TH STREET END ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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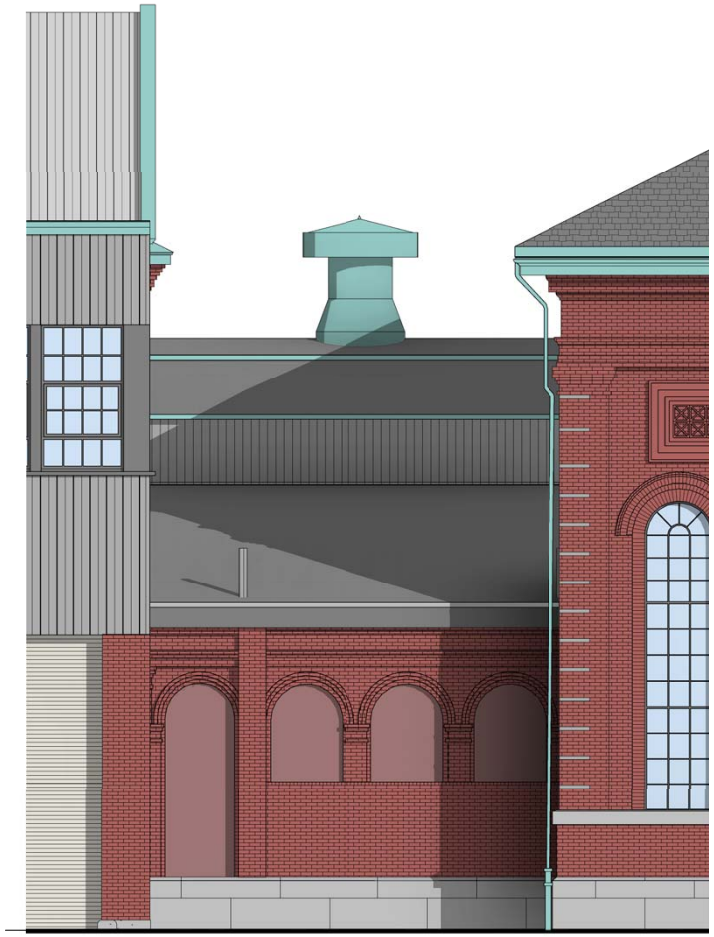

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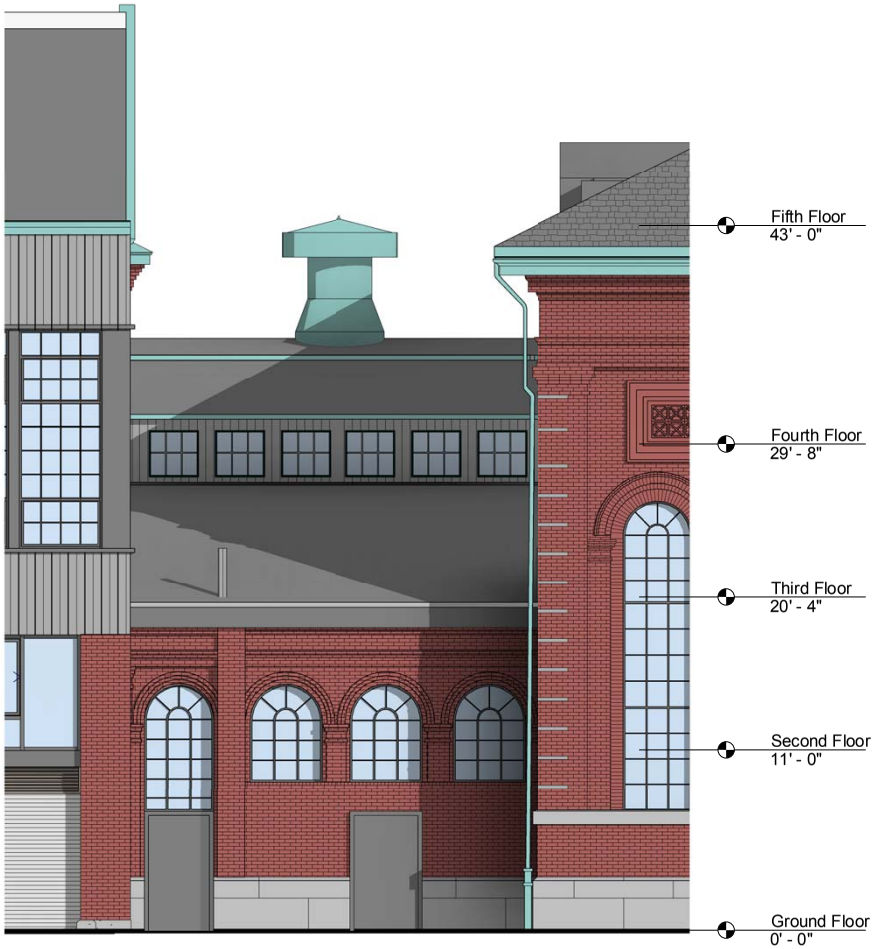

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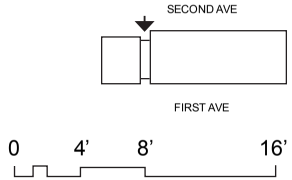

CONNECTOR NORTH SIDE

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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EXISTING CONDITION, CONNECTOR NORTH SIDE

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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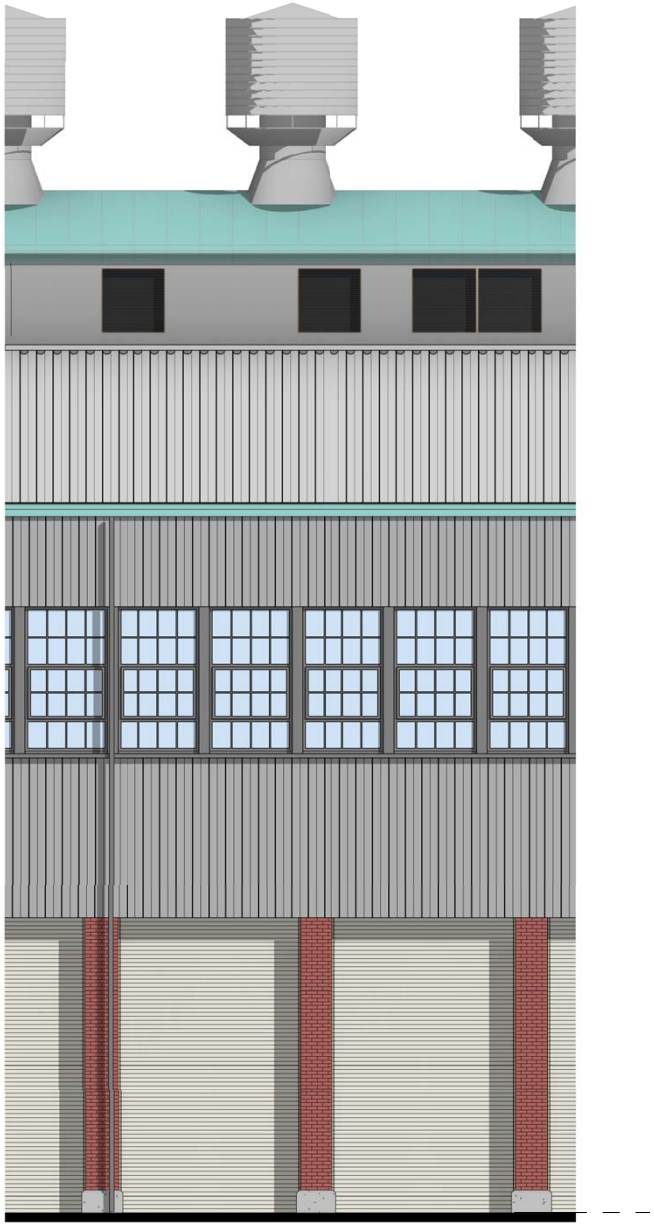
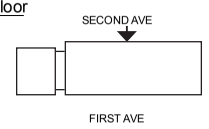


EXISTING

PROPOSED



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PARTIAL SECOND AVENUE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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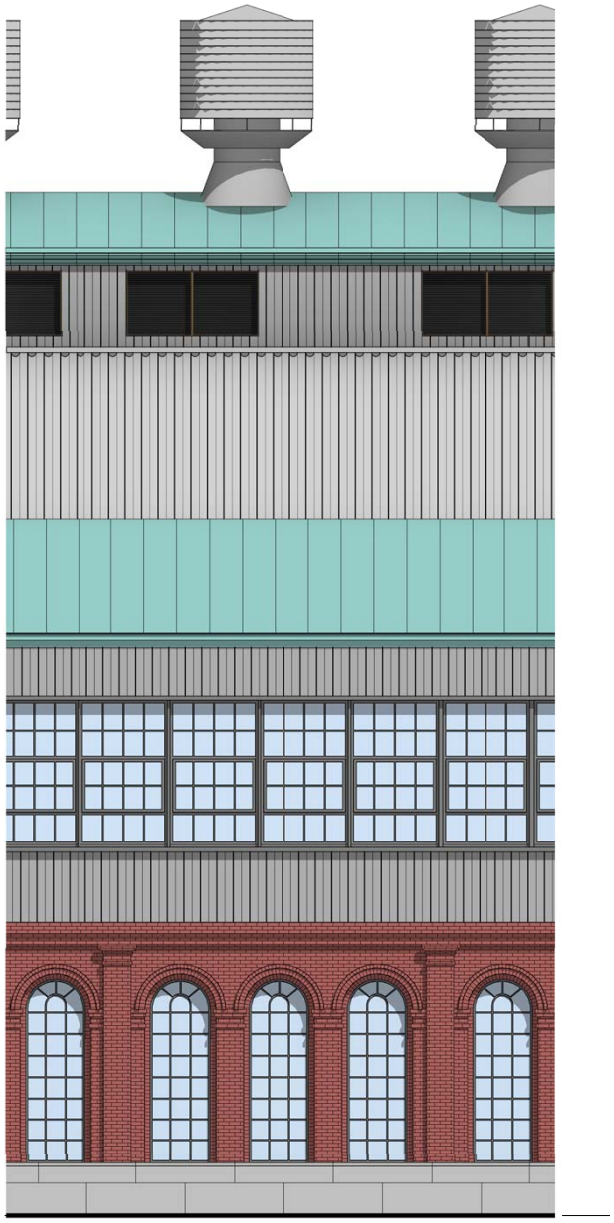
EXISTING CONDITION, SECOND AVENUE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014



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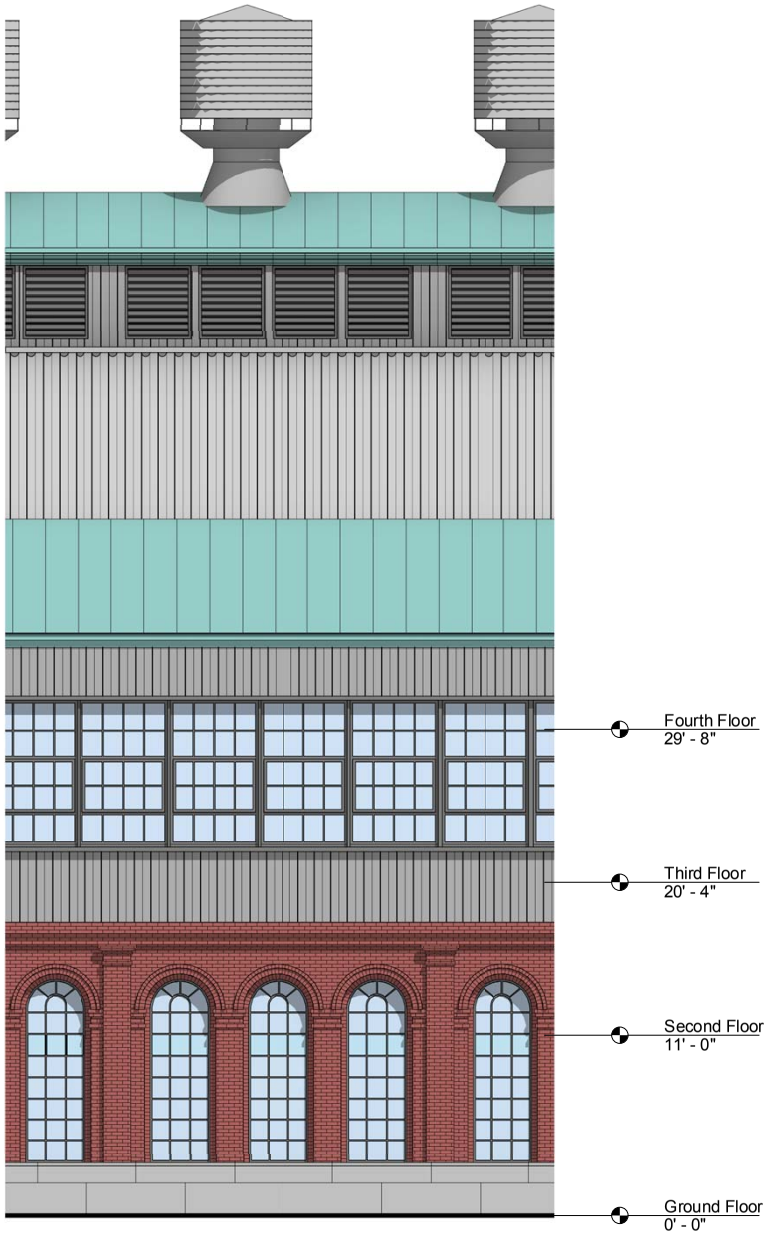
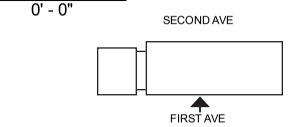
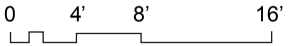


PROPOSED





PARTIAL FIRST AVENUE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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EXISTING CONDITION, FIRST AVENUE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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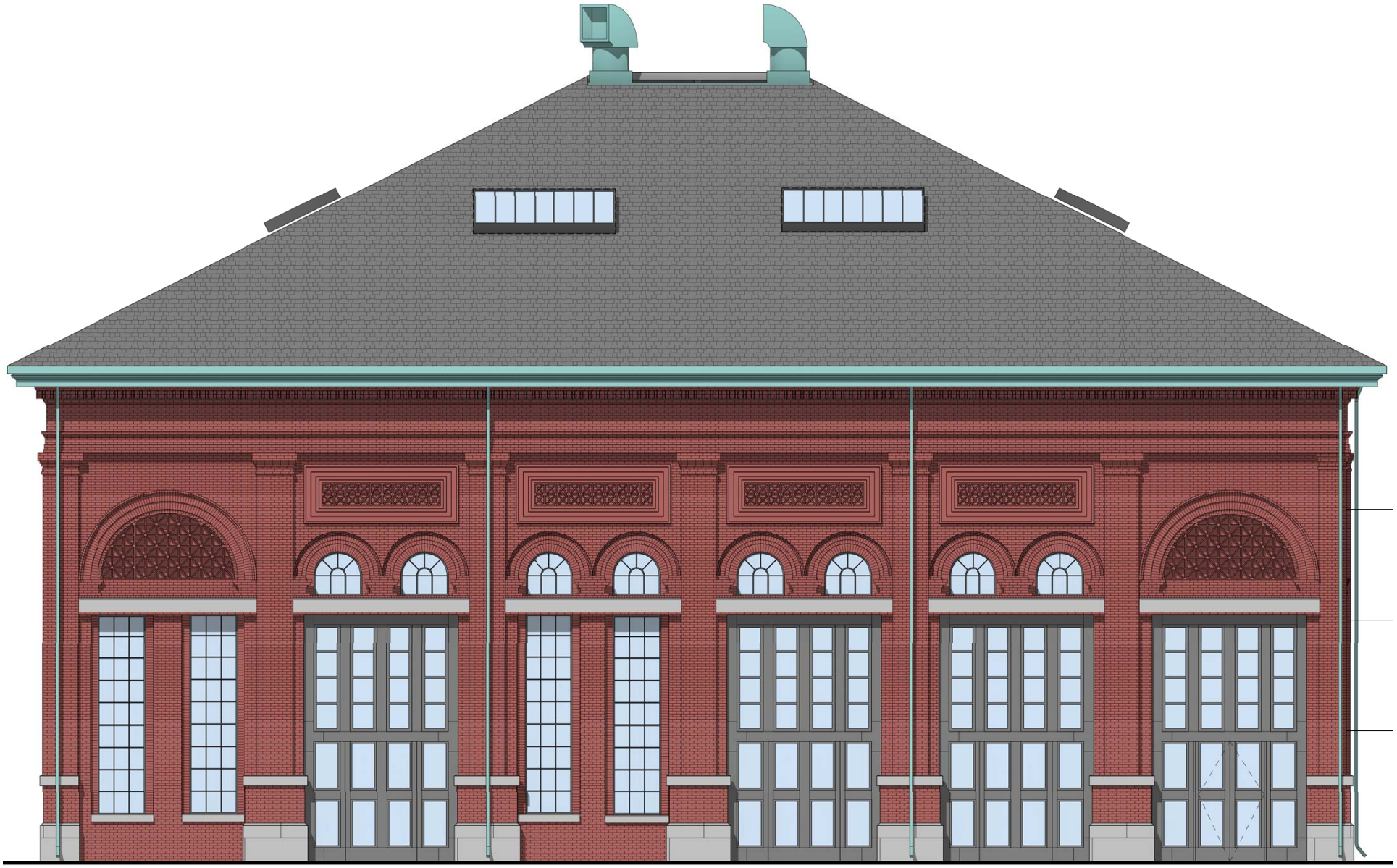

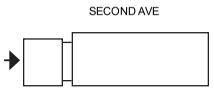

0 4’ 8’ 16’

PROPOSED 9TH STREET POWERHOUSE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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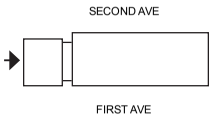

EXISTING 9TH STREET POWERHOUSE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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9TH STREET ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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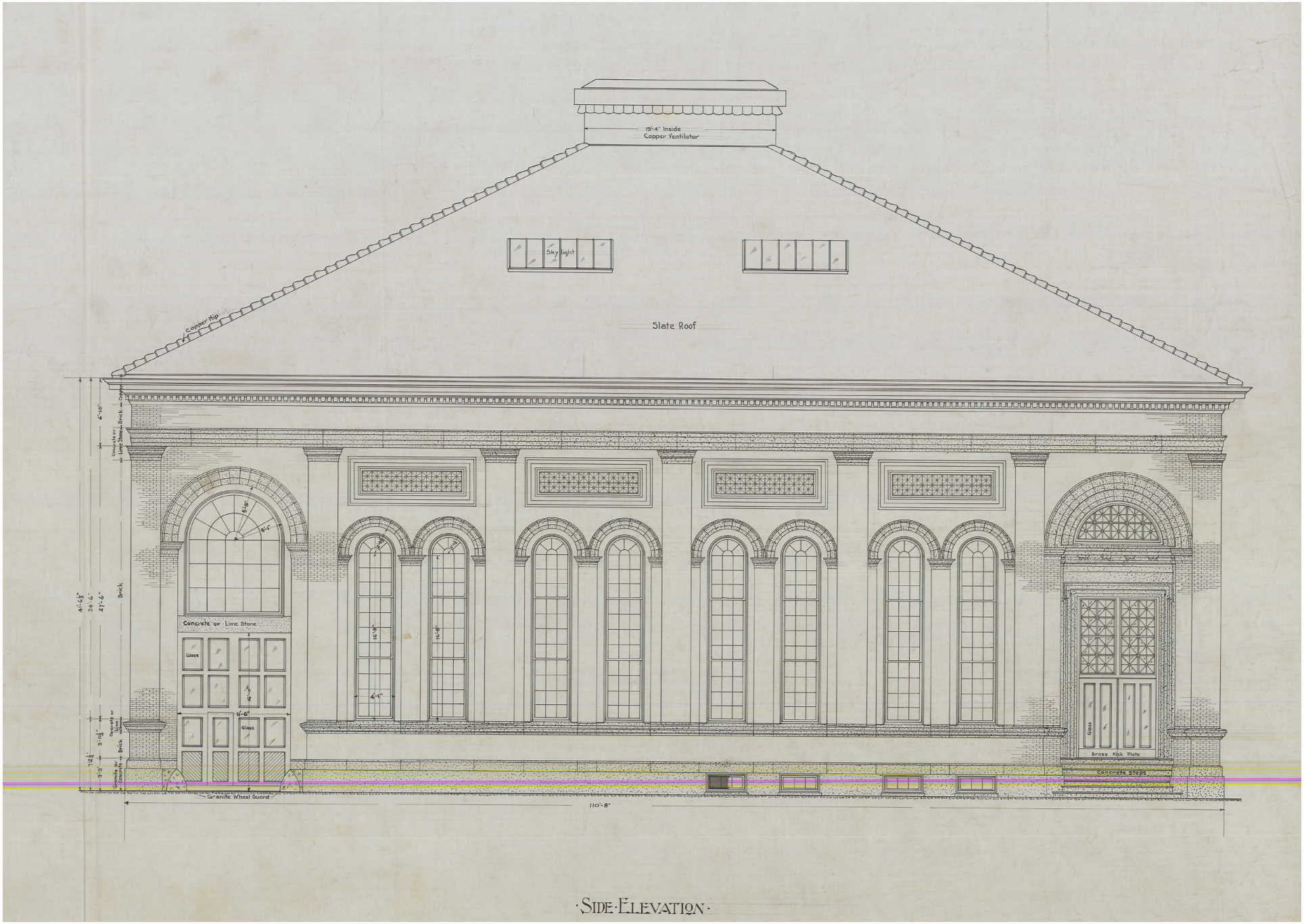

ORIGINAL 9TH STREET ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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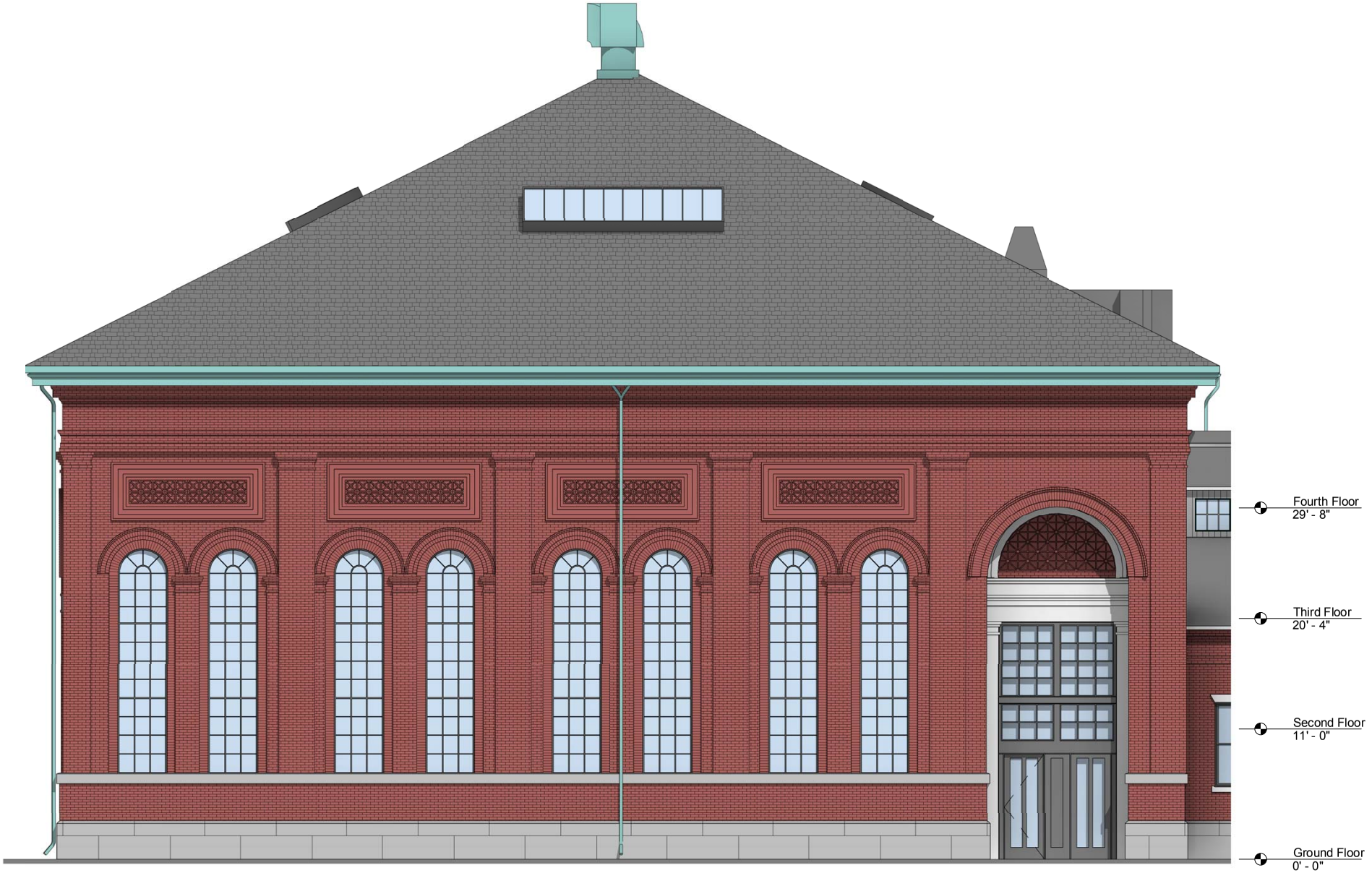

PROPOSED FIRST AVENUE POWERHOUSE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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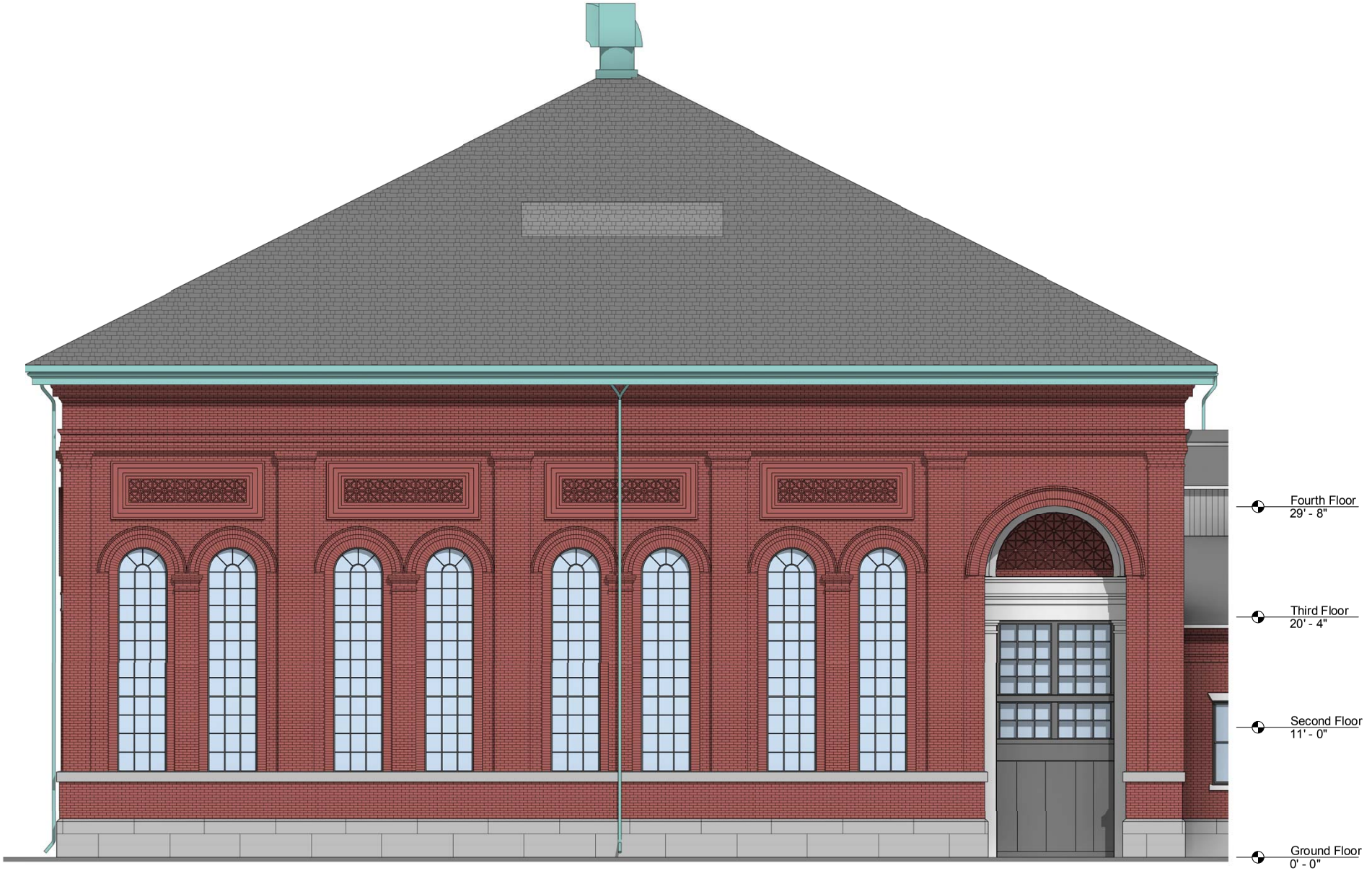

EXISTING FIRST AVENUE POWERHOUSE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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EXISTING FIRST AVENUE POWERHOUSE ELEVATION

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/16/2014

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ELEVATION ENLARGEMENT

SITE PLAN

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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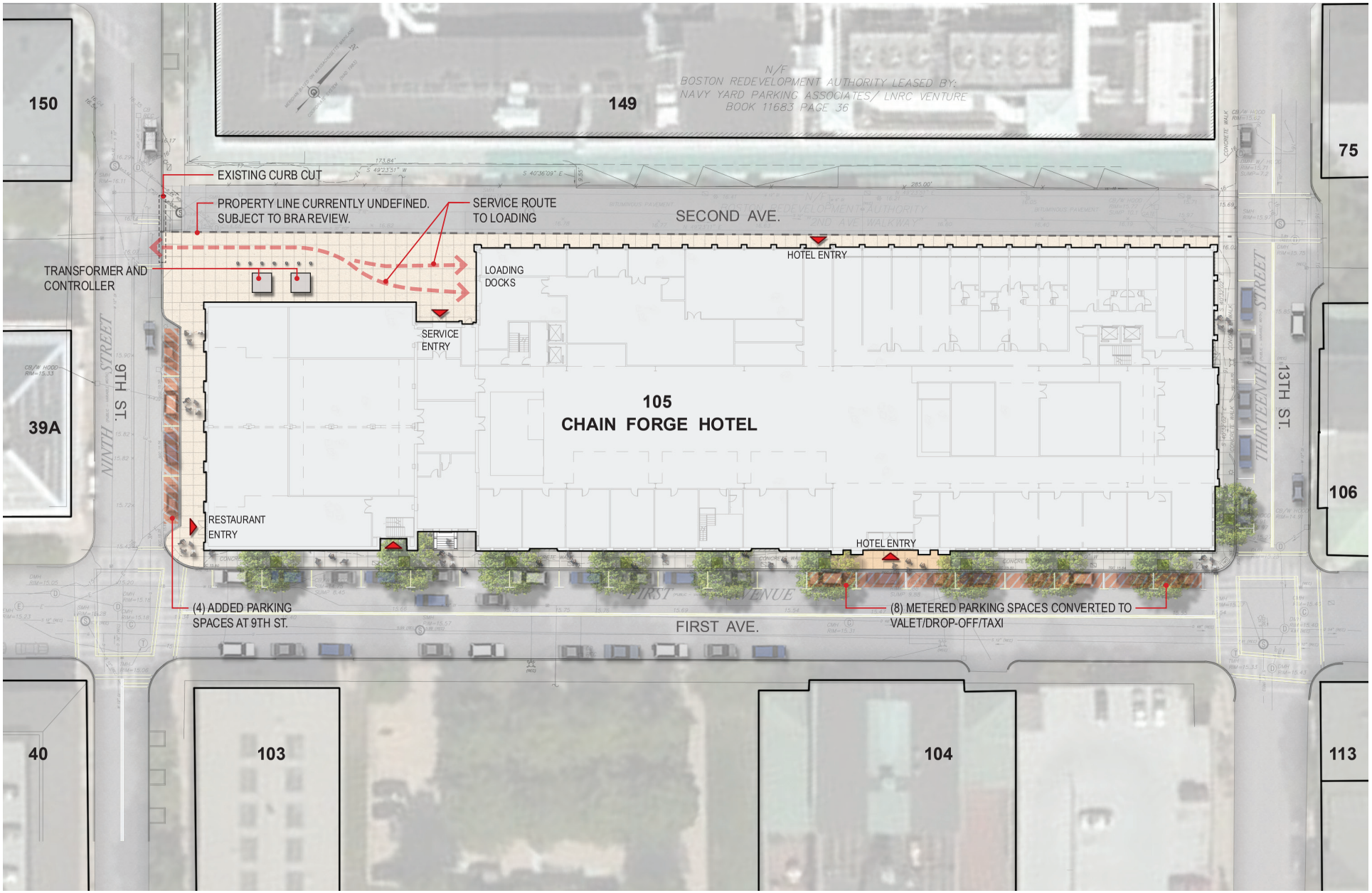

0 30' 60'

SITE PLAN - DETAIL

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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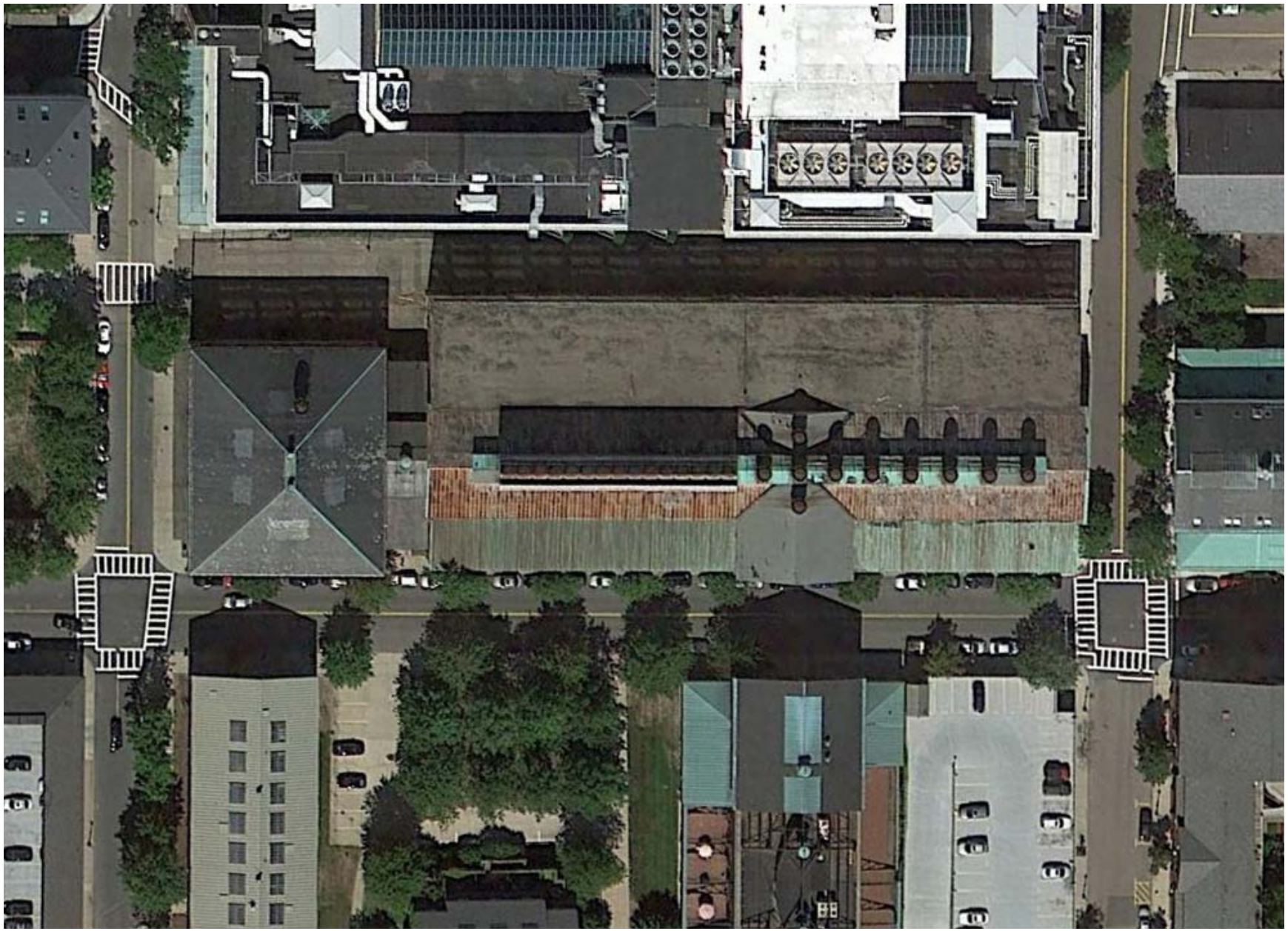
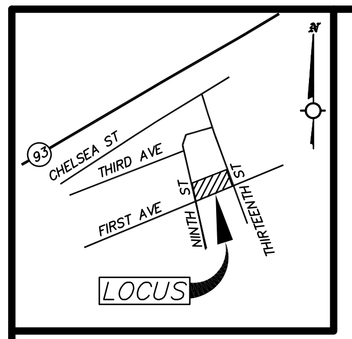


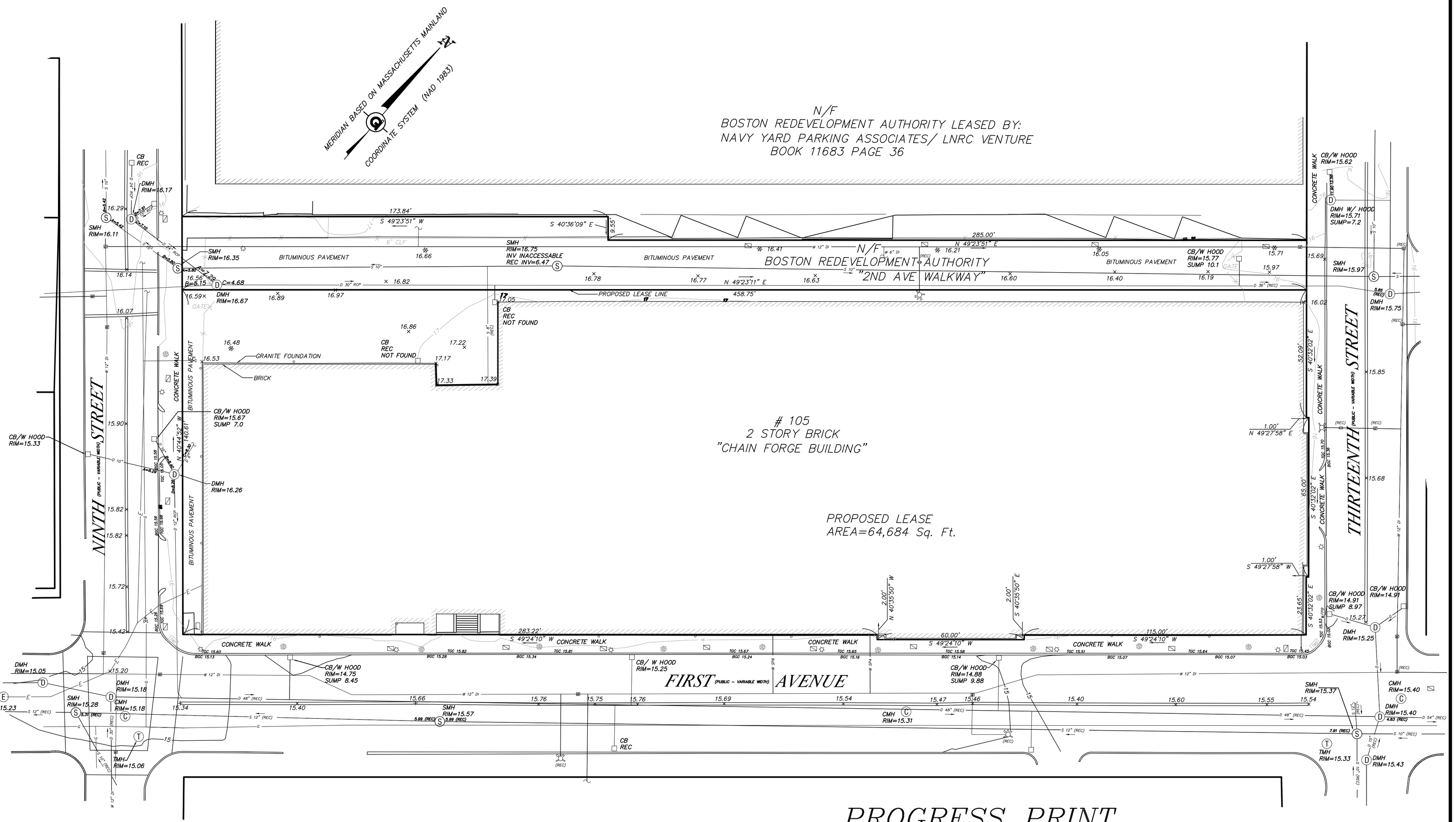
SITE AERIAL



LOCUS MAP:
NOT TO SCALE

LEGEND

- FLOW DIRECTION
- STONE BOUND
- DRAIN MANHOLE
- SEWER MANHOLE
- CATCH BASIN
- FIRE HYDRANT
- WATER GATE
- WATER SERVICE
- SEWER SERVICE
- GAS SERVICE
- GAS GATE
- SPOT GRADE + 120.6
- BOLLARD
- ELECTRIC MANHOLE
- FIREBOX
- EXISTING LIGHT
- TELEPHONE MANHOLE
- SIGN
- ELECTRIC BOX
- DOWNSPOUT
- FIRE ALARM BOX
- HANDICAP RAMP
- HANDHOLE
- STORM DRAIN — D —
- SANITARY SEWER — S —
- WATER MAIN — W —
- GAS MAIN — G —
- UNDERGROUND ELECTRIC — E —
- OVERHEAD WIRES — OHW —
- 1' CONTOUR
- 5' CONTOUR
- DECIDUOUS TREE
- EXISTING MONUMENT
- DOUBLE YELLOW LINE
- VERTICAL GRANITE CURB WITH ELEVATIONS TGC 15.26 BGC 14.76



PROGRESS PRINT

REFERENCES

BOOK	PAGE	DESCRIPTION
9182	119	BRA DEED FOR PARCEL 1
11683	36	LEASE FOR ABUTTOR
PLANS		
8955	262	PARCEL 1
L 11334		FIRST AVENUE LAYOUT
L 11337		THIRTEENTH STREET LAYOUT
L 10776		NINTH STREET LAYOUT

NOTES:

1. THE TOPOGRAPHICAL AND BOUNDARY SURVEY SHOWN HEREON WAS OBTAINED FROM AN ACTUAL FIELD SURVEY CONDUCTED ON MAY 20, 2014 BY GEOD CONSULTING, INC.
2. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED UPON A FIELD SURVEY AND COMPILATION OF PLANS OF RECORD. GEOD CONSULTING, INC. DOES NOT WARRANTY THE LOCATION OF ALL UTILITIES AS SHOWN. THE RECORD INFORMATION FROM THE GAS AND ELECTRIC COMPANYS WERE NOT RECIVED AT THIS TIME. THE CONTRACTOR, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT DIG SAFE AT 1-888-344-7233.
3. THE ELEVATIONS SHOWN HEREON WERE BASED ON BOSTON CITY BASE DATUM.
4. THE PURPOSE OF THIS PLAN IS TO PROVIDE A RECORD CONDITIONS PLAN CONSISTING OF OBSERVABLE SURFACE FEATURES AT THE TIME AND DATE OF THE FIELD SURVEY.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED IN ACCORDANCE WITH THE PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS.

LAND SURVEYOR PLS# 49930

LOCUS & RECORD OWNER:
BOSTON REDEVELOPMENT AUTHORITY

PROPOSED LEASE BY KAVANAGH ADVISORY GROUP LLC.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

DWG. No. 14668M

EXISTING CONDITIONS PLAN
LOCATED AT
105 FIRST AVENUE
CHARLESTOWN, MASSACHUSETTS

PREPARED FOR
KAVANAGH ADVISORY GROUP, LLC

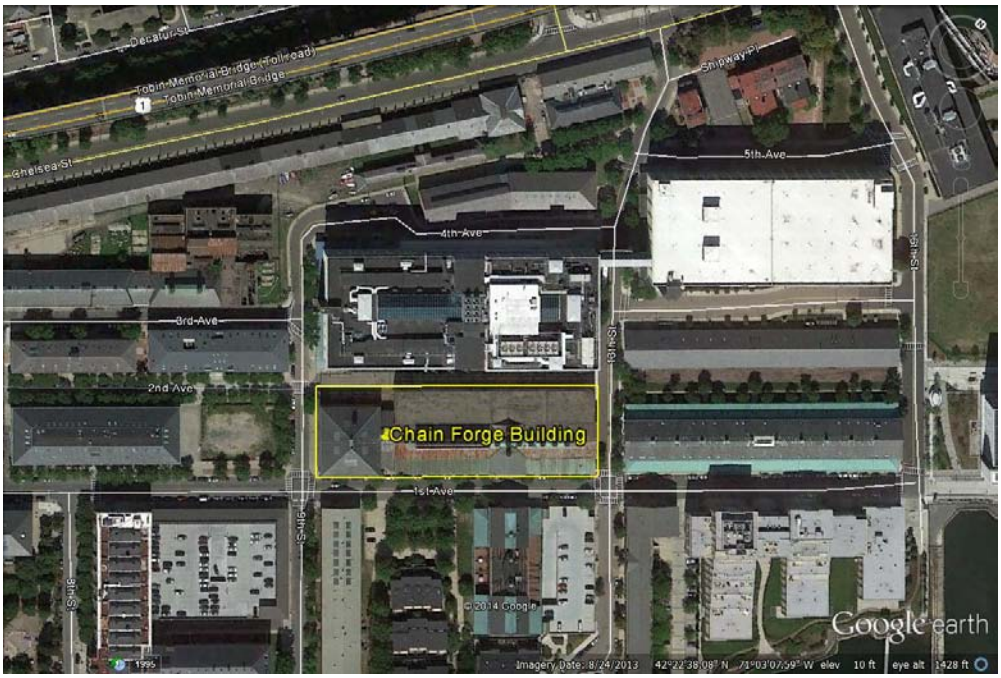
SCALE: 1"= 20' DATE: OCTOBER 2, 2014

GEOD CONSULTING
ENGINEERING · TRANSPORTATION · SURVEYING
24 Ray Avenue, Burlington, MA 01803
Phone (781) 273-3434 Fax (781) 273-3430

SHEET No. 1 OF 1 PROJECT No. 14668M

Chain Forge Building within the Charlestown Navy Yard

Chain Forge Building Site



Chain Forge Existing Conditions Photos

View towards Head House from corner of 1st Ave & 9th Street

View of Chain Forge Shed from corner of 1st Avenue & 13th Street

Chain Forge Existing Conditions Photos

View looking Northeast on 2nd Avenue from 9th Street

View of Chain Forge Shed from 13th Street

Chain Forge Existing Conditions Photos

Interior View of Chain Forge Shed Atrium

Interior View of Shed with Equipment

Chain Forge Existing Conditions Photos

Interior View of Head House and Equipment

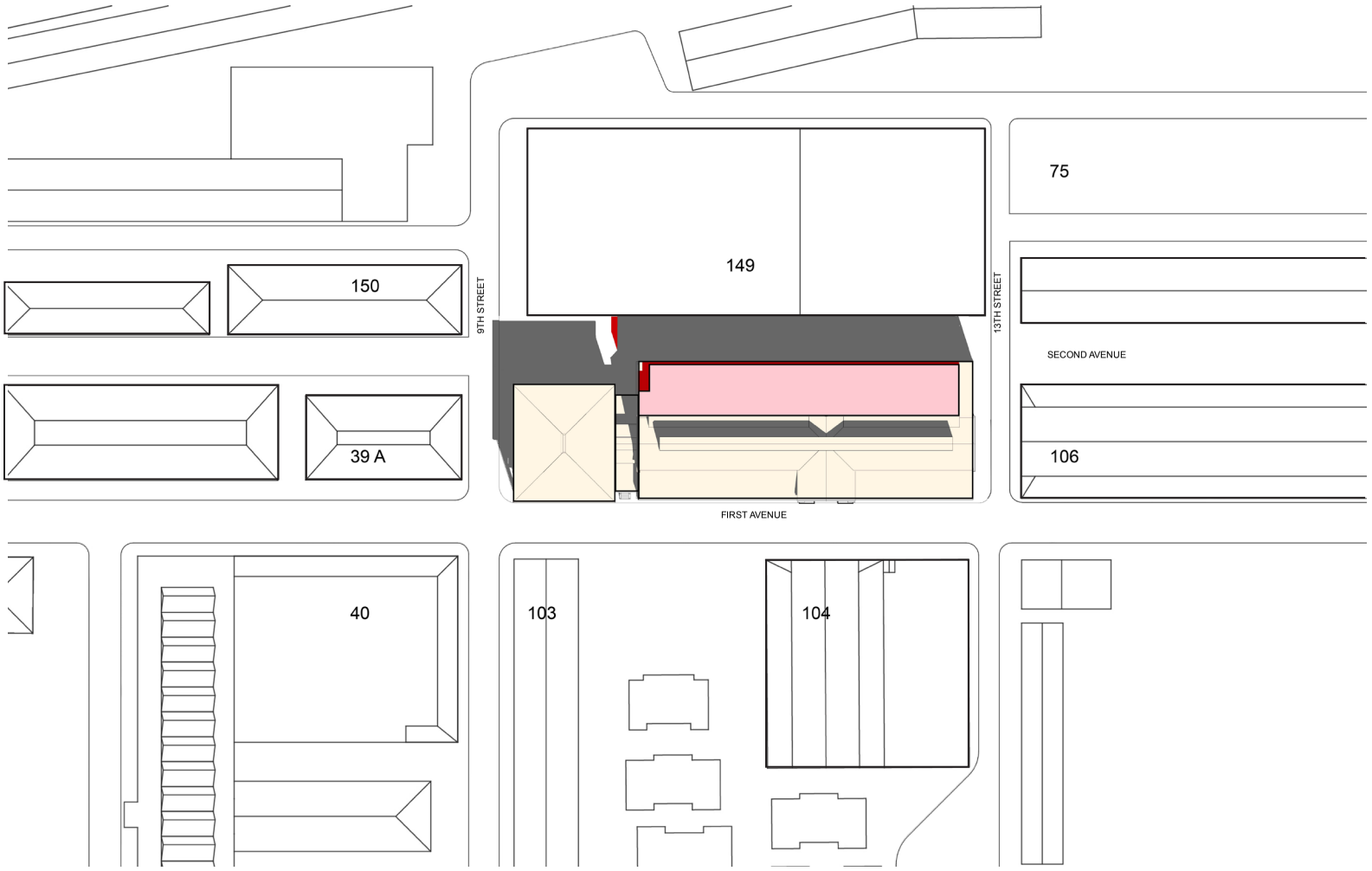
Interior View of Shed Building Machinery

EXHIBIT B
SHADOW STUDY

SPRING EQUINOX - MARCH 21

9:00 AM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20’ 40’

1 SHADOW STUDY : SPRING EQUINOX

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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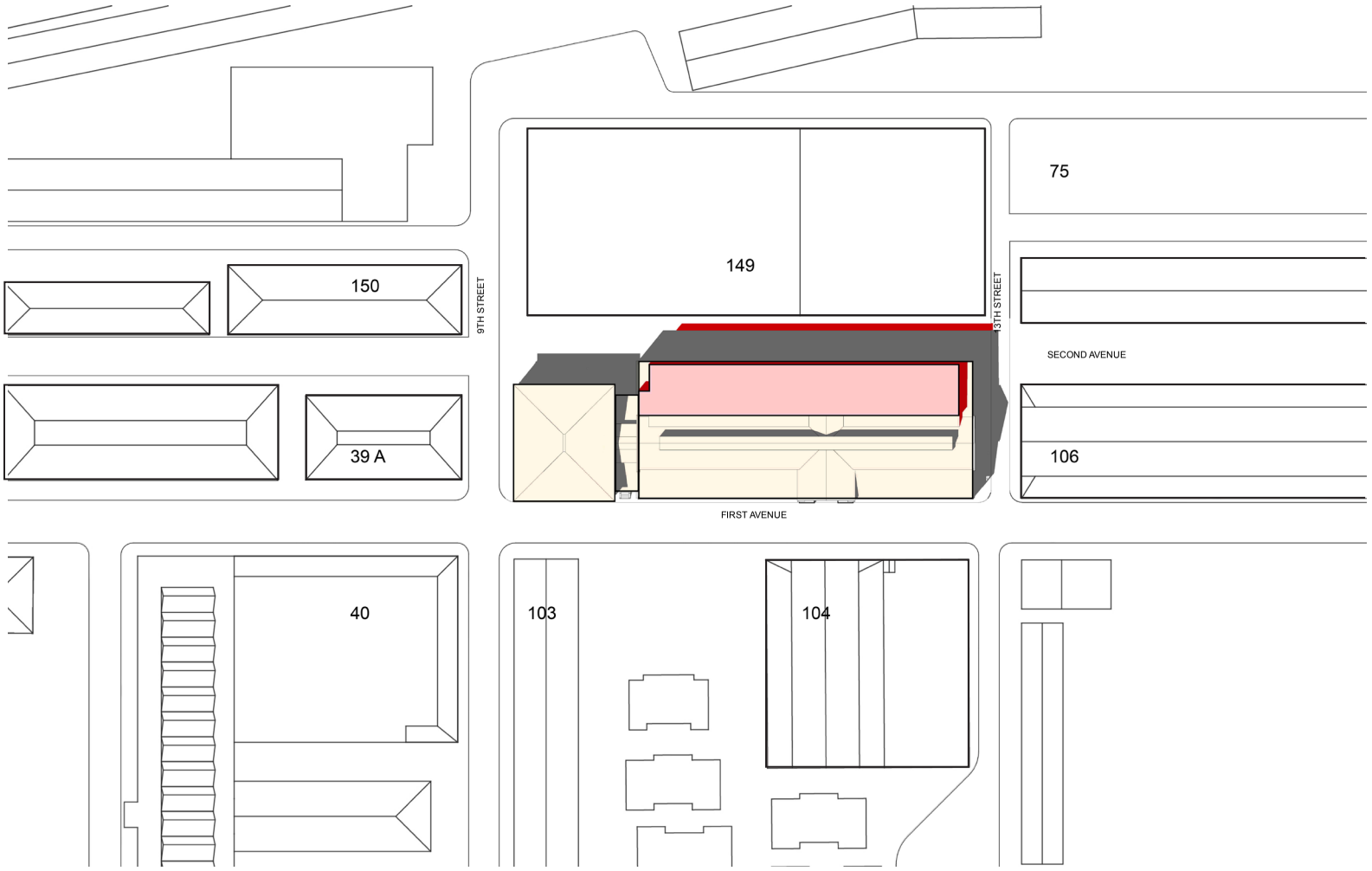
SPRING EQUINOX - MARCH 21

12:00 PM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20' 40'

2 SHADOW STUDY : SPRING EQUINOX

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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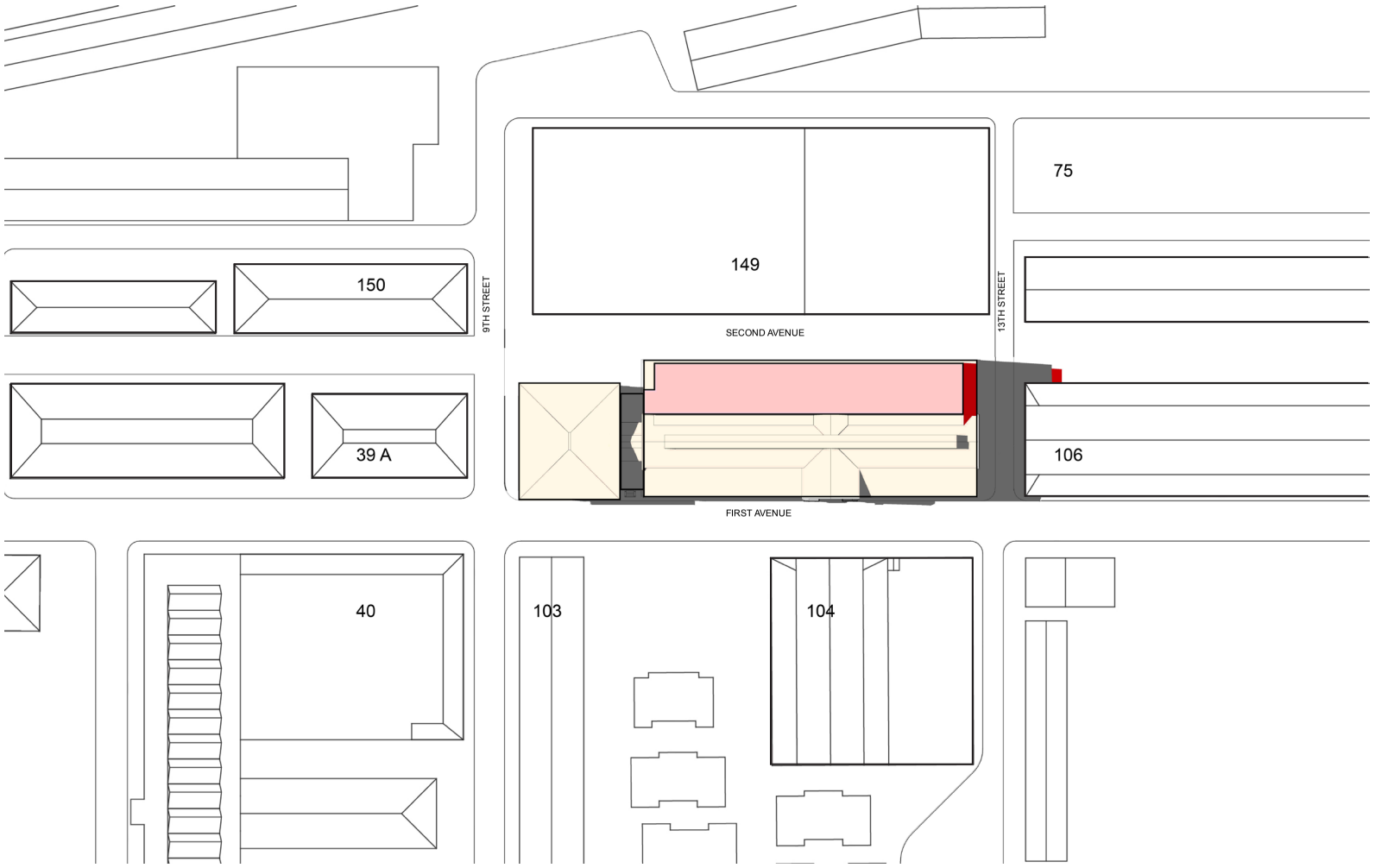
SPRING EQUINOX - MARCH 21

3:00 PM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20’ 40’

3 SHADOW STUDY : SPRING EQUINOX

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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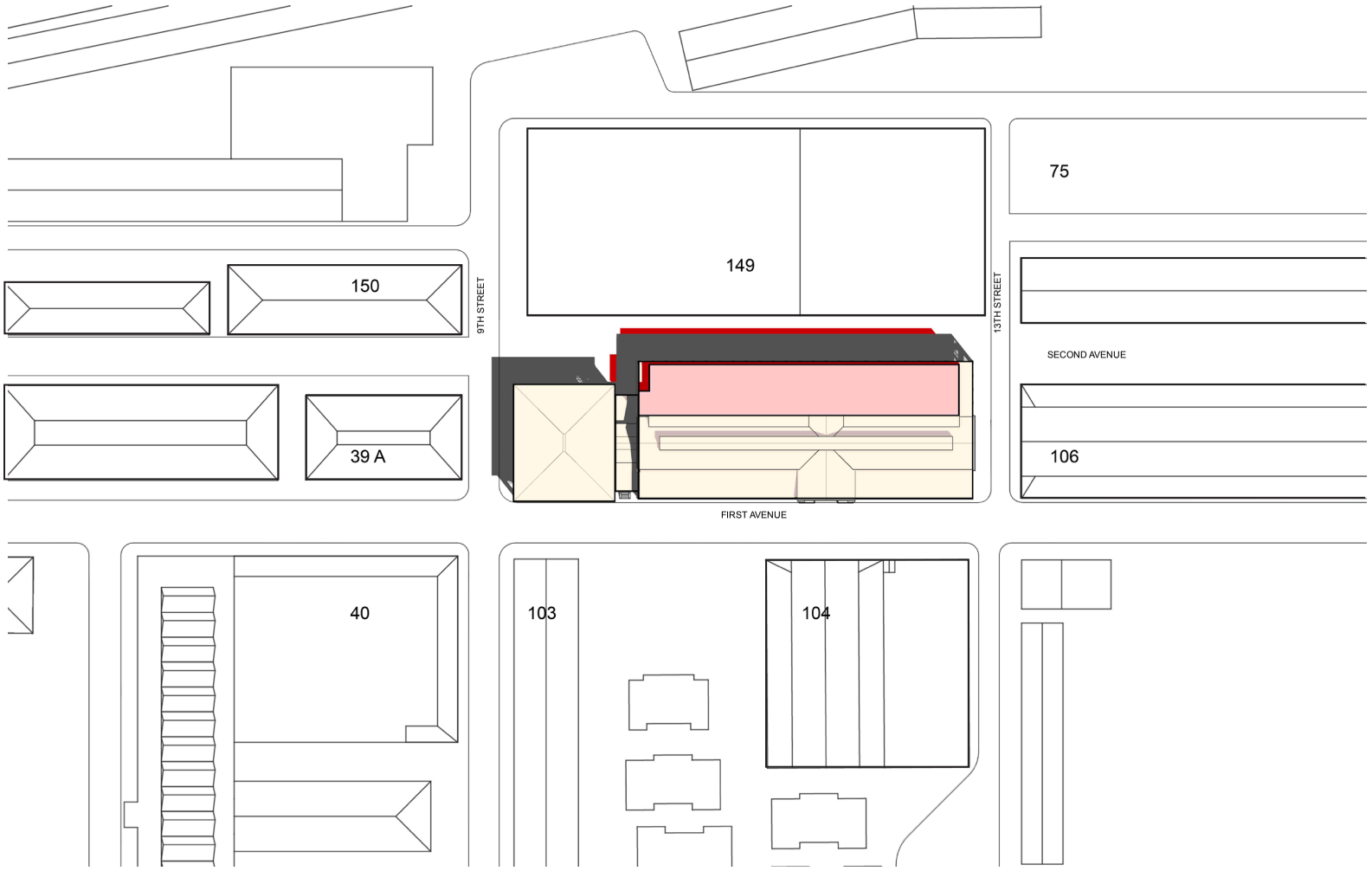
SUMMER SOLSTICE - JUNE 21

9:00 AM
12:00 PM No Impact
3:00 PM No Impact
6:00 PM No Impact

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20' 40'

4 SHADOW STUDY : SUMMER SOLSTICE

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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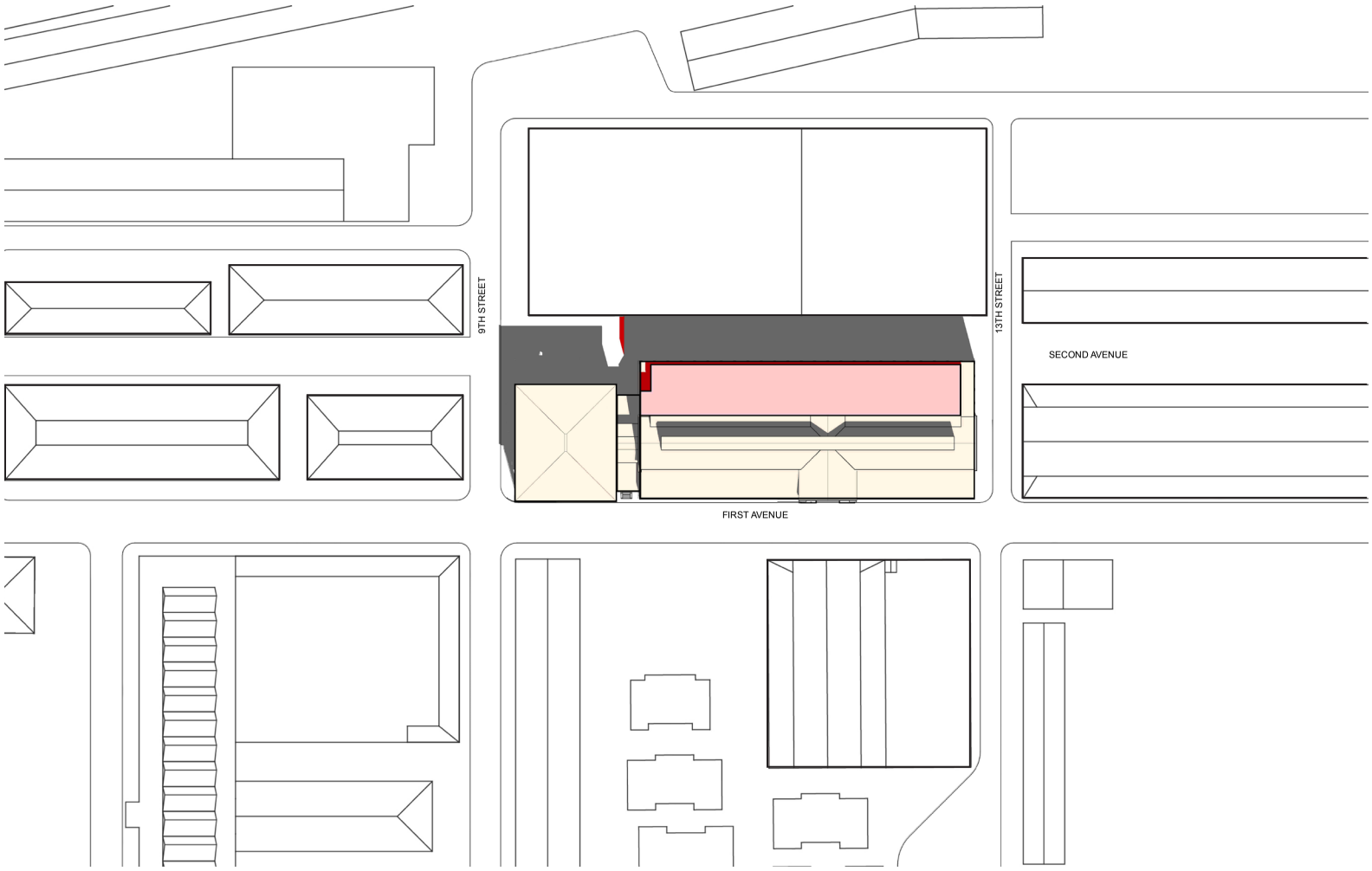
FALL EQUINOX - SEPTEMBER 21

9:00 AM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20’ 40’

5 SHADOW STUDY : FALL EQUINOX

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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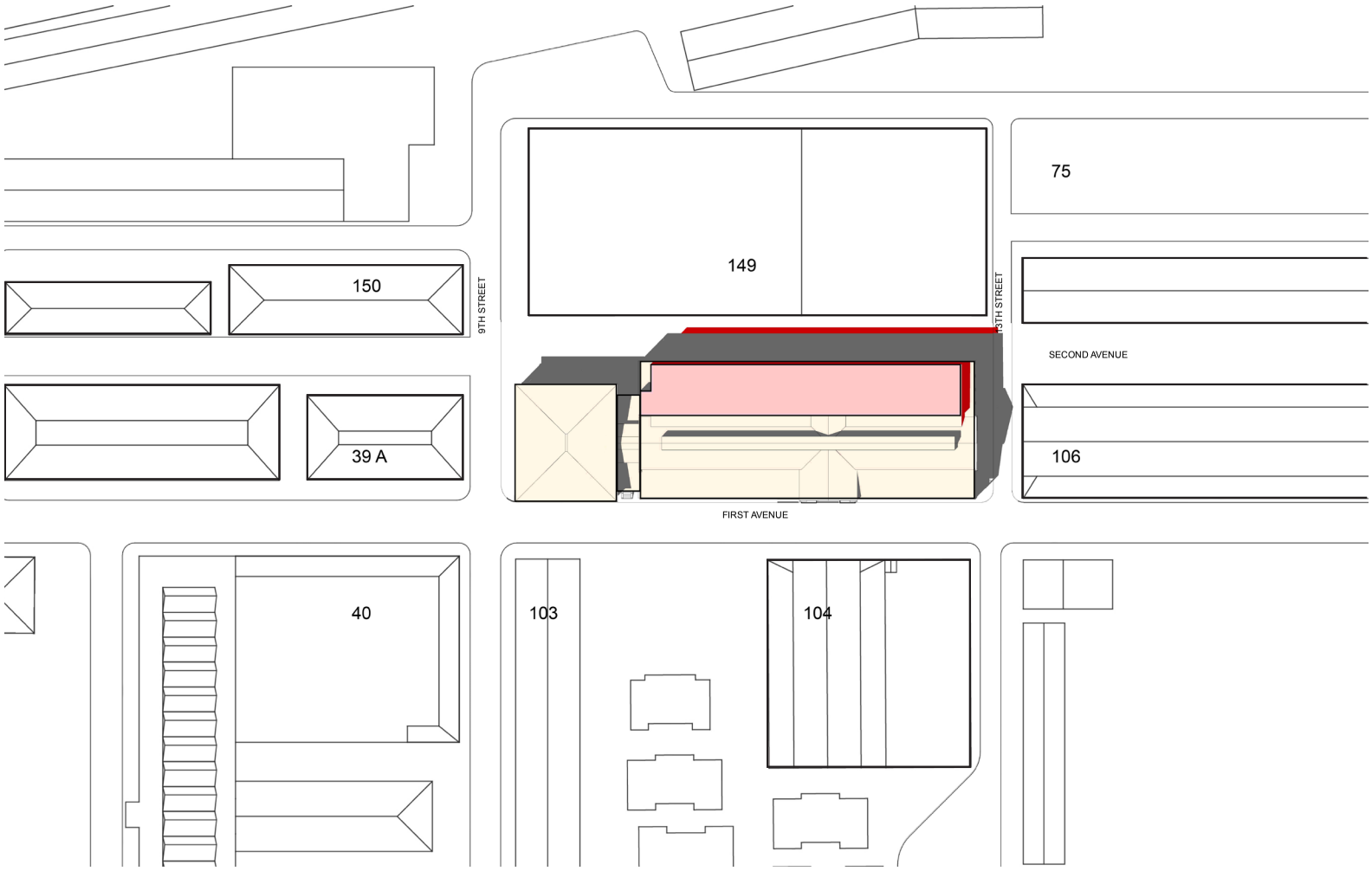
FALL EQUINOX - SEPTEMBER 21

12:00 PM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20' 40'

6 SHADOW STUDY : FALL EQUINOX

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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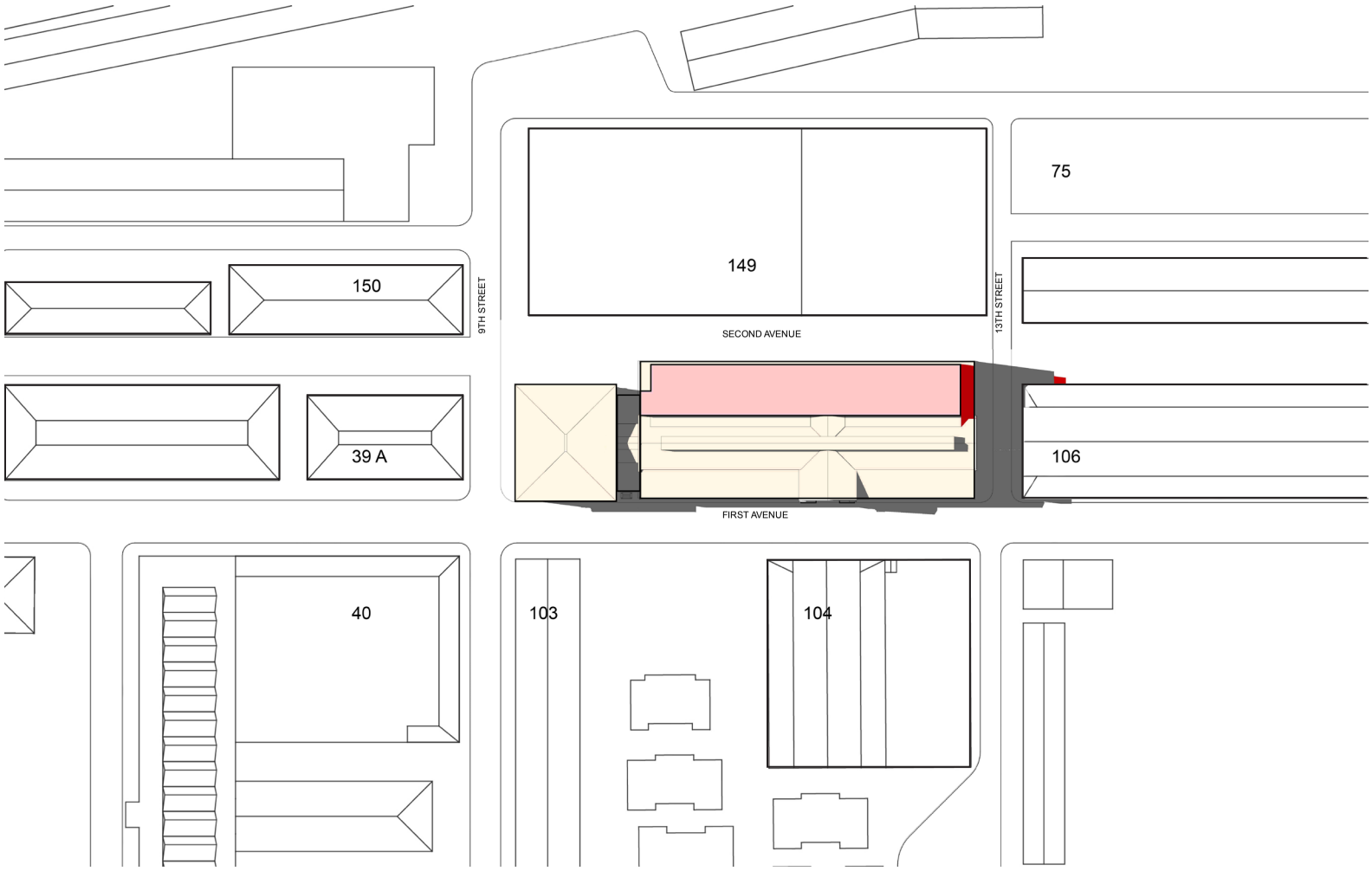
FALL EQUINOX - SEPTEMBER 21

3:00 PM
6:00 PM No Impact

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20’ 40’

7 SHADOW STUDY : FALL EQUINOX

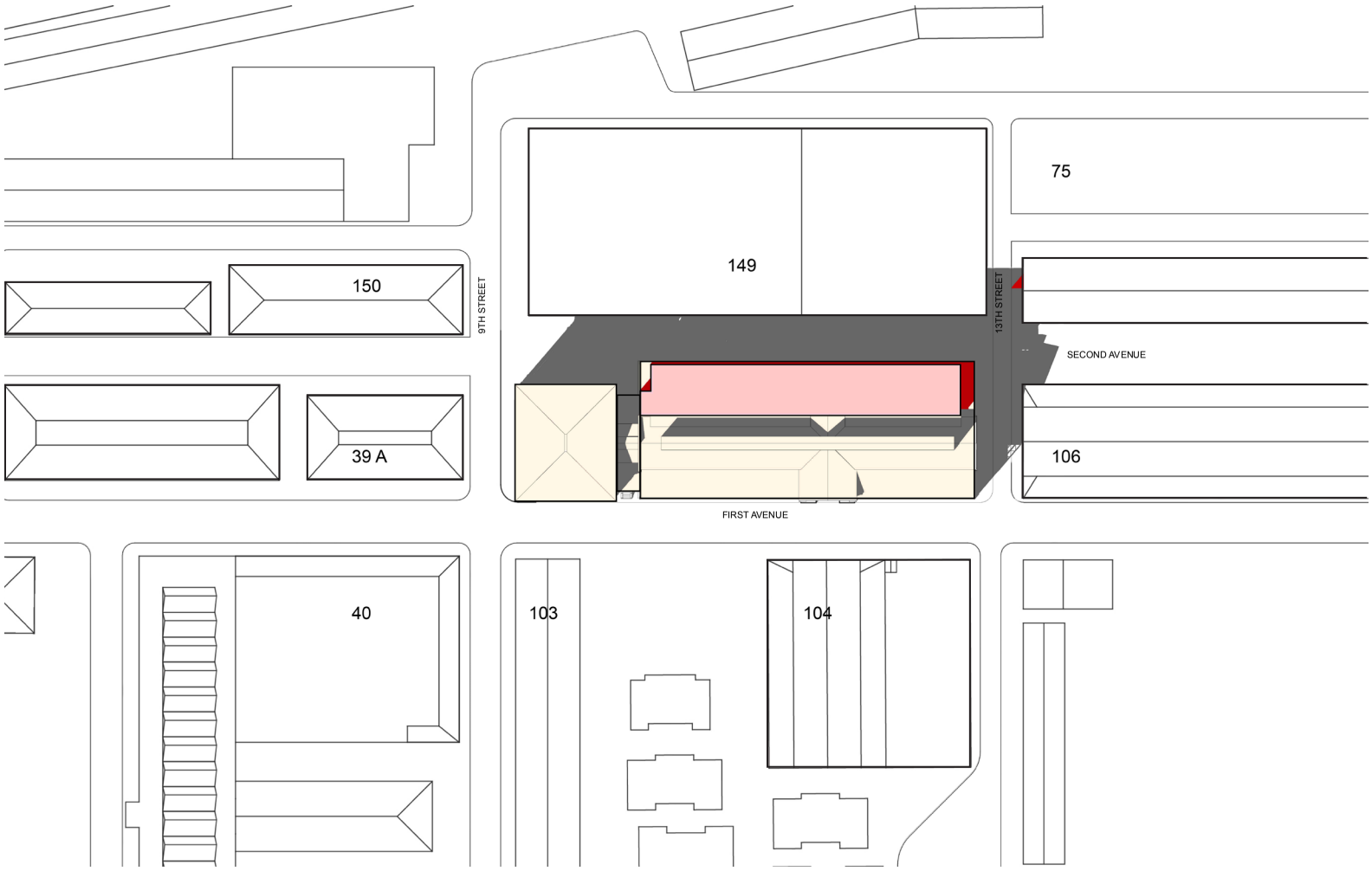
Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

P:\3183 Chain Forge\dwg\01-sd\2014-1215\Chain Forge.indd

WINTER SOLSTICE - DECEMBER 21

9:00 AM No Impact
12:00 PM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20' 40'

8 SHADOW STUDY : WINTER SOLSTICE

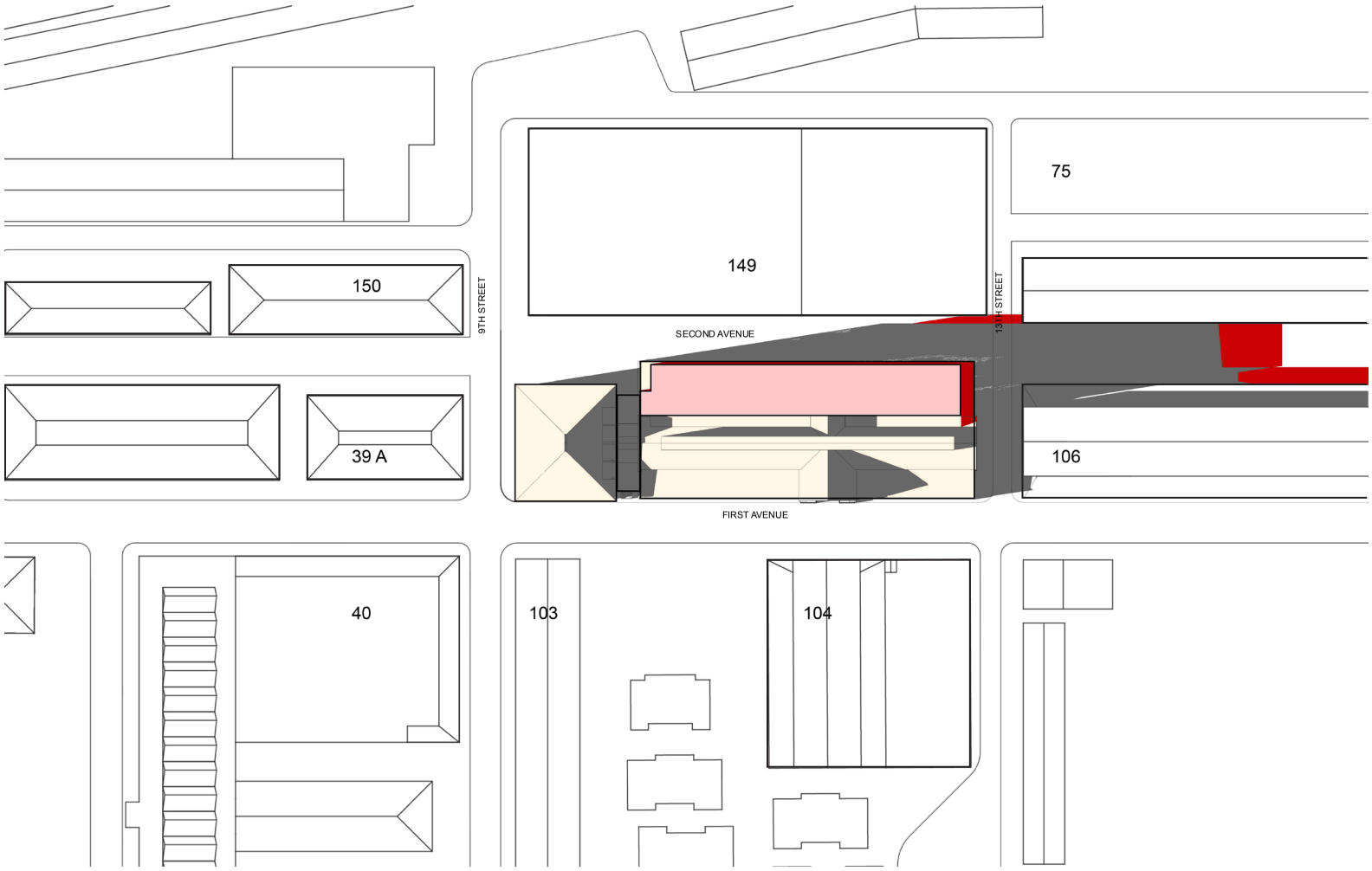
Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

P:\3183 Chain Forge\dwg\01-sd\2014-1215\Chain Forge.indd

WINTER SOLSTICE - DECEMBER 21

3:00 PM

EXISTING BUILDING
NEW ADDITION
EXISTING CAST SHADOW
ADDITIONAL SHADOW 2014



0 20’ 40’

9 SHADOW STUDY : WINTER SOLSTICE

Bargmann Hendrie + Archetype, Inc. 300 A Street Boston, MA 02210 Tel: (617) 350-0450 12/15/2014

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EXHIBIT C
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.

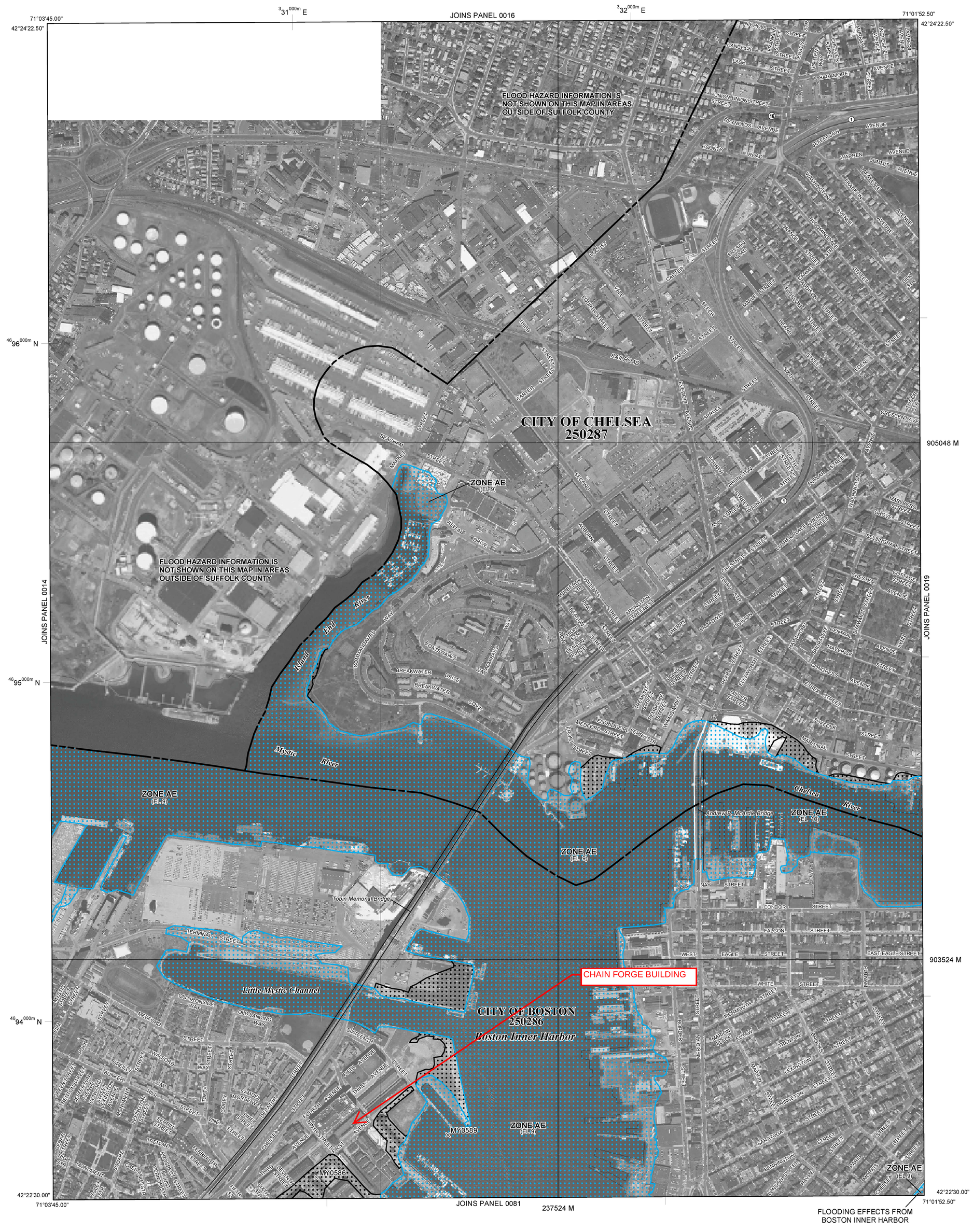
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a 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)
- $^{4275^{000m}}$N — 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 0018G

FIRM
FLOOD INSURANCE RATE MAP

SUFFOLK COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 18 OF 151
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOSTON, CITY OF	250286	0018	G
CHELSEA, CITY OF	250287	0018	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
25025C0018G

EFFECTIVE DATE
SEPTEMBER 25, 2009

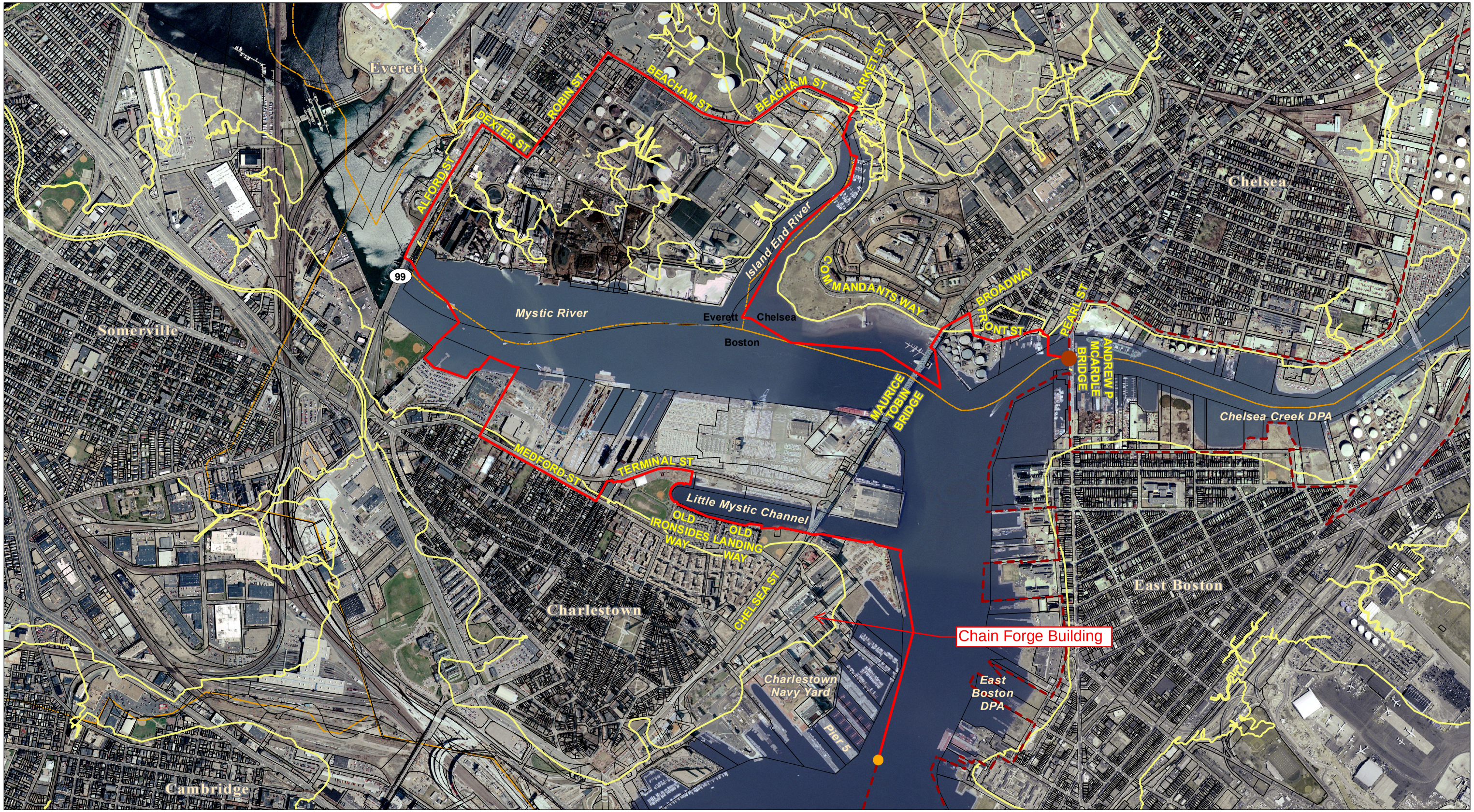
Federal Emergency Management Agency

Massachusetts Office of Coastal Zone Management
251 Causeway Street, Suite 800
Boston, MA 02114
www.mass.gov/czm

Mystic River

Designated Port Area (DPA)

For planning purposes only. In the event of conflict between this map and the accompanying written description, CZM shall issue a written clarification pursuant to the Designated Port Area (DPA) regulations at 301 CMR 25.00.



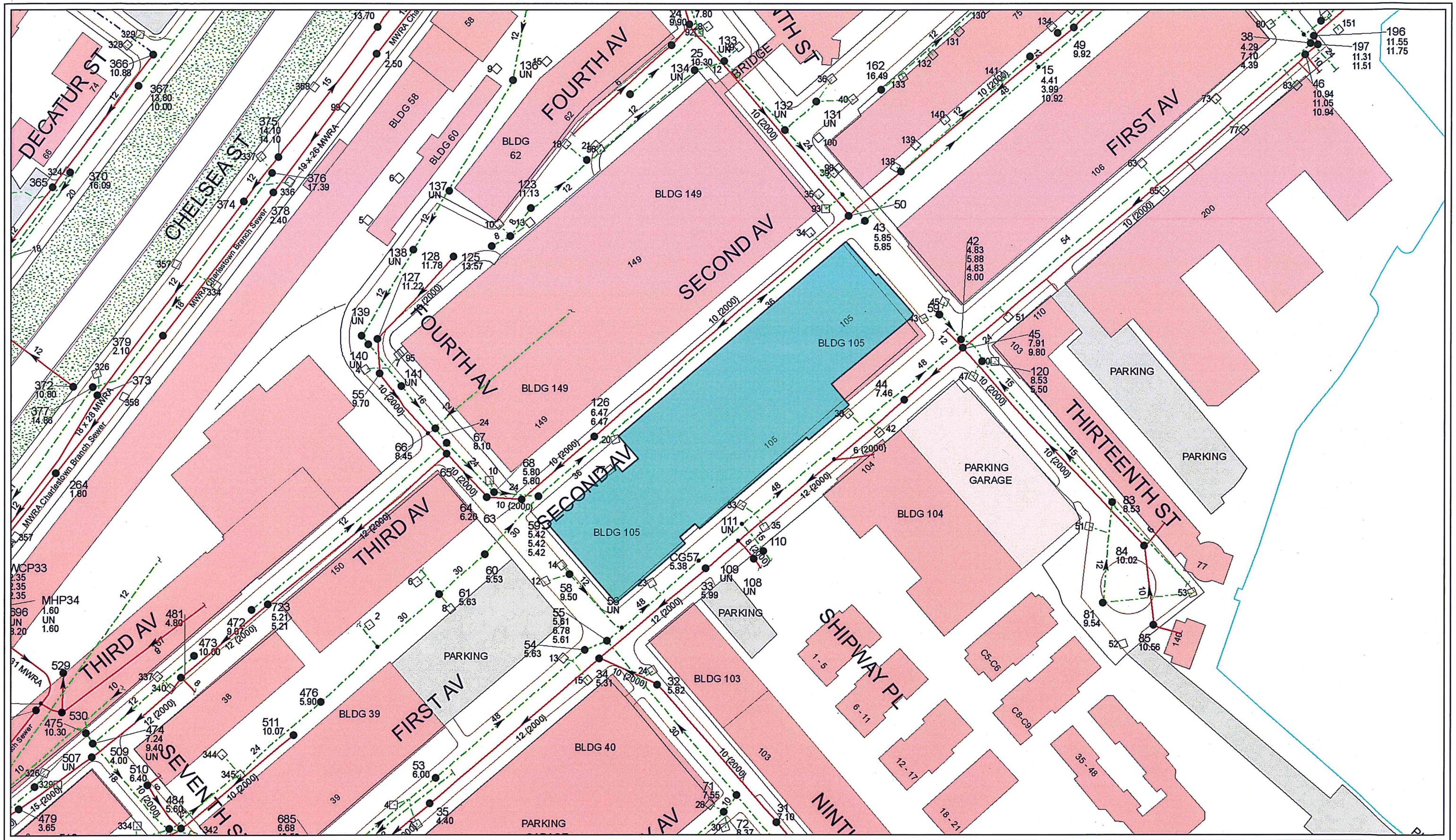
Point of Beginning
Point of Ending
Mystic River DPA Boundary
Adjacent DPA Boundaries
Chapter 91 Presumptive Line
Municipal Boundary
Assessor's Parcel

N

Base map: MassGIS 1:5,000 Color Ortho Imagery, 2001.
Map coordinate system: North American Datum of 1983, Massachusetts State Plane Coordinate System, Mainland Zone (FIPS zone 2001), meters.

0 1,000 2,000 3,000 4,000 Feet

March 2011

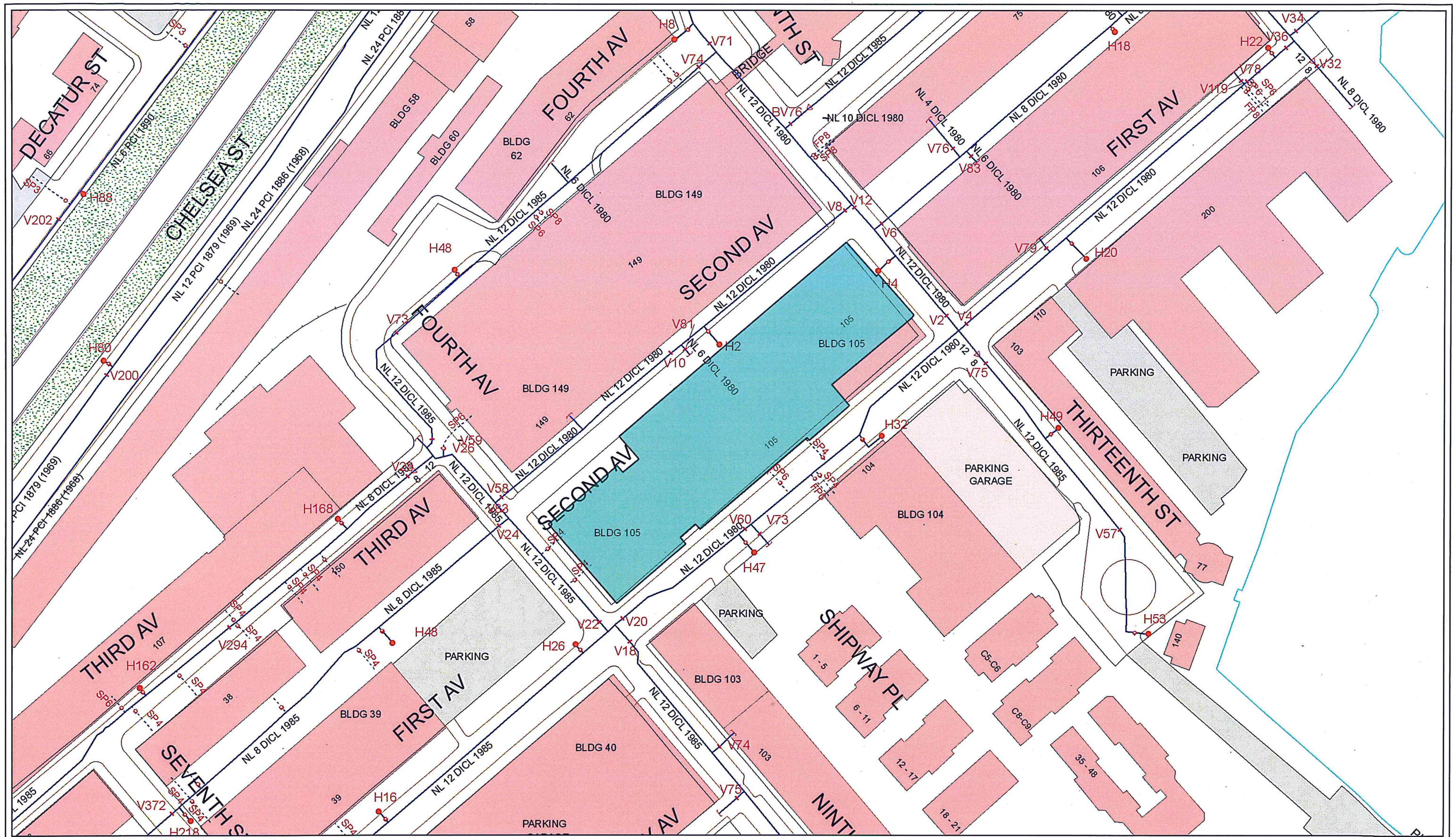


BOSTON WATER AND SEWER

N W E S

100 50 0 100 200 300 Feet

1 inch = 100 feet



BOSTON WATER AND SEWER