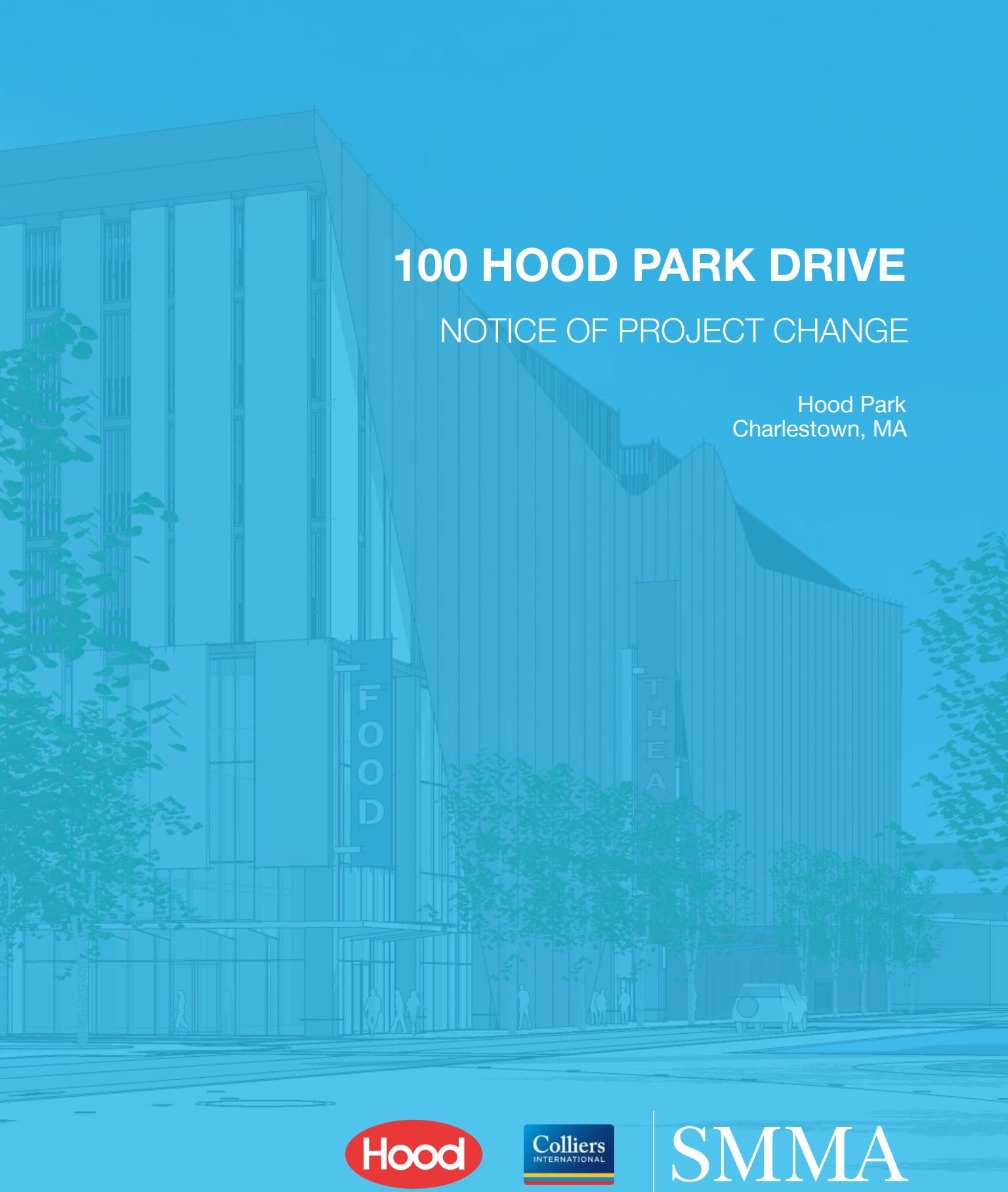


100 HOOD PARK DRIVE

NOTICE OF PROJECT CHANGE

Hood Park
Charlestown, MA

Hood

Colliers INTERNATIONAL

SMMA

Notice of Project Change

Hood Park is an approximately 20-acre site owned by Hood Park LLC **(the "Proponent"),** located on Rutherford Avenue in Charlestown. Hood Park was formerly used as the Hood Dairy plant and is currently the location of approximately 443,000 square feet of commercial space and a 177-unit residential project currently under construction. Commencing shortly after Hood Dairy ceased operations in Charlestown in the late 1990s, the Proponent has worked to replace the lost industrial jobs with a campus-style office park, receiving approvals for a masterplan for development including approximately 1.2 million square feet of leasable square footage in October 2000. Hood Business Park, as it was originally named, has been successful in attracting office and lab tenants to occupy the available space. Hood Park is now fully leased and development of the next phase of Hood Park is required to accommodate future growth.

The 2000 approvals require the construction of one the structured parking garages to allow the development of the next phase of office. Accordingly, the Proponent seeks approvals to develop an approximately 990-space parking garage with approximately 75,000 SF of active ground-floor retail in the place of a previously-approved 812-space parking garage (the **"Proposed Project"**). The Proposed Project has a slightly different footprint and will require modifications to the previously-approved roadway configuration. The ground-floor active retail may contain restaurant, performance space, entertainment, and other uses designed to bring activity and life to Hood Park (the "Commercial Component"). The address for the Proposed Project is 100 Hood Park Drive.

Project Background and History

On October 19, 2000, the Boston Zoning Commission (**"BZC"**) approved the Master Plan for Planned Development Area No. 51, Hood Business Park, dated October 12, 2000 **(the "PDA Master Plan")** covering approximately 20 acres on Rutherford Avenue in Charlestown. The PDA Master Plan describes a series of projects to be undertaken within Hood Park, with approximately 1,168,820 square feet of gross floor area to be developed across six buildings and three structured parking garages. The PDA Master Plan has been amended three times, most recently in December 2016 to add residential as an allowed use and re-allocate previously-approved building area from the future 570 Rutherford Avenue project to the 480 Rutherford Avenue project.

As described in the PDA Master Plan, as amended, an 812-space parking garage (shown as "P1" in the PDA Master Plan) is to be developed in conjunction with the 520 Rutherford Avenue project, currently approved as a 218,130 SF office building. The Proposed Project will be constructed on a 98,150 square foot portion of Hood Park located to the west of the 480 Rutherford Avenue project (the **"Project Site"**). The Project Site is currently being used as a construction staging area for the 480 Rutherford construction project. In order to accommodate construction phasing, construction staging, and parking requirements for the remainder of Hood Park, the Proponent intends to develop the Proposed Project immediately prior to the design, permitting and development of the 520 Rutherford Avenue Project.

The Proponent is submitting this Notice of Project Change ("NPC") to the Boston Planning and Development Agency ("BPDA") and seeks the BPDA's determination that the changes described herein do not constitute material changes and that there are no increases, significant or otherwise, in the impacts of the proposed

changes that would warrant further review of the Proposed Project by the BPDA under Article 80B of the Boston Zoning Code (the **"Code"**). The total approved building area will remain unchanged at 1,168,820 square feet.

This NPC is being submitted with a Planned Development Area Development Plan for Garage P1, within Planned Development Area No. 51 Hood Business Park (the **"PDA Development Plan"**) and a Fourth Amendment to Master Plan for Planned Development Area No. 51 Hood Business Park (the **"Fourth Amendment"**). The Fourth Amendment will add uses such as day care, community centers, concert hall, cinema, auditorium, bowling alley, restaurant with live entertainment, hotel, conference center, and neighborhood retail. The Fourth Amendment will also clarify that allowed and conditional uses in the underlying LI zoning are permitted within the PDA Master Plan and Hood Park. The Proposed Project is a Phase 2 project under the PDA Master Plan and the Proponent is therefore required to submit the following studies with the PDA Development Plan:

1. Qualitative wind study for the Proposed Project. This study details the impact of the Proposed Project upon pedestrians and the landscaped plaza in the interior of Hood Park and identifies any areas where wind velocities exceed acceptable levels.
2. Ambient noise assessment with noise analysis for the Proposed Project which analyzes the acoustical impact of the Proposed Project's mechanical, HVAC, and exhaust systems.
3. Plans showing the locations and sizing of all connections to water, sewer, storm drain, electrical, and other infrastructure.
4. Daylight and shadow analysis showing the impact of the Proposed Project's height above 75'.

The Proponent has provided these studies herein and has also prepared and provided an updated transportation study and materials showing compliance with Article 37 of the Code regarding green buildings.

Existing Conditions

Hood Park is located within an emerging growth and development corridor stretching from Kendall Square and downtown Boston to Assembly Square in Somerville and the Wynn Casino in Everett. This corridor will benefit from over $325 million in roadway improvements over the next several years including reconstruction of the North Washington Street bridge and reconfiguration of Rutherford Avenue and Sullivan Square. Rutherford Avenue will be redesigned to be less of a regional highway and more of a neighborhood-friendly urban boulevard with fewer lanes and better pedestrian, bicycle, and automobile connections to amenities in the residential neighborhood of Charlestown. The Rutherford Avenue project will also provide an improved streetscape including shared use paths, open spaces, and amenities such as pocket parks, street furniture, improved lighting and connections to a new North Washington Street Bridge. Likewise, Sullivan Square will be transformed by replacing the traffic rotary and tunnel with an urban street grid and providing future opportunities for open space, development, community amenities, and improved access to Sullivan Square station, the Mystic River, and Ryan Playground. The construction of the Wynn Casino in Everett (including the Wynn-funded roadway improvements to D Street, Spice Street, and the Sullivan Square busway) and other nearby projects such as 32 Cambridge Street, Bridgeview, Cambridge Crossing (formerly Northpoint) and Assembly Square are bringing new private investment to the area and changing the nature of development in the corridor.

There are currently three buildings in Hood Park:

- 500 Rutherford Avenue: 500 Rutherford Avenue is the most prominent building in Hood Park fronting Rutherford Avenue. Formerly the H.P. Hood & Sons headquarters, this building has been redeveloped into approximately 418,000 square feet of office space. The 500 Rutherford Avenue building is fully-occupied by 13 existing tenants and will remain as part of the Proposed Project.

- 510 Rutherford Avenue, the Power House: The Power House is a 20,000 square foot building located adjacent to 500 Rutherford Avenue. The Power House is currently a fully-occupied office building. This building and the accompanying smoke stack will remain as part of the Proposed Project.

- 570 Rutherford Avenue, the Cooler Building: The Cooler Building is a 55,000 square foot office building located in the northwest corner of the Project Site. The Cooler Building will be demolished as part of the Proposed Project as was also intended in the 2000 PDA Master Plan.

A fourth building, 480 Rutherford Avenue is currently under construction. 480 Rutherford Avenue is a 177-unit residential project with 154 market rate units and 23 affordable units, including approximately 10,000 square feet of retail space.

The parking for the existing buildings is currently located in several surface parking lots within Hood Park. At this time, the surface parking lots are fully utilized by tenants under existing leases and agreements. In order to maintain sufficient parking for the existing tenants, construction of the Proposed Project must occur before any additional surface parking can be replaced with developments approved under the PDA Master Plan. The Proposed Project will replace 241 surface parking spaces resulting in up to 749 net new spaces.

Area Context

The western side of Rutherford Avenue, including Hood Park, continues to evolve. Formerly an industrial and operations district, the corridor is currently transitioning to office and residential uses, though still separated from the balance of the residential neighborhood portions of Charlestown by the existing heavily-travelled Rutherford Avenue. The long-established Charlestown residential community immediately east of Hood Park and Rutherford Avenue has a wide variety of housing stock, neighborhood amenities, and businesses.

To the north of Hood Park, directly across D Street is 32 Cambridge Street (now known as The Graphic), a 171-unit conversion of an existing three-story industrial building currently under construction and projected to open in summer of 2018. Across Sullivan Square to the east is the Shraffts Center and to the north is the Assembly Square project in Somerville. The Sullivan Square MBTA station is a major transfer station to the Orange Line from numerous bus lines servicing the northern suburban market. The nearby development of the Wynn Casino project in Everett is underway and will be completed in 2019. As part of that development, Wynn is making several improvements to the area, including:

- Reconstructing Spice Street and D Street directly adjacent to the Project Site;
- Reconfiguring the streets and busways at Sullivan Square to allow northbound traffic from Hood Park to avoid the Sullivan Square rotary;
- Improving signal timing on Cambridge Street,
- and adding an additional right turn lane off the I-93 northbound ramp onto Cambridge Street.

To the south and southwest of Hood Park are low-intensity industrial uses including a self-storage facility, wholesalers, shipping and receiving services, Boston Sand and Gravel, Cassella Waste transfer station, and other industrial uses. Further south, Bridgeview opened in 2016 as a 61-unit residential project with a five-unit adult supportive service program. Further south is the Bunker Hill Community College with educational and community facilities, ball fields, walking trails, and the Community College MBTA stop on the Orange Line.

The Project site is well served by public transportation, with access to two Orange Line MBTA stations, (Sullivan Square and Community College) and a dozen bus routes within a ten-minute walk. Sullivan Square station is located approximately 0.2 miles north of the Project Site and provides access to the Orange Line and 12 MBTA bus routes. Spice Street is a direct connection between the Project Site and the Sullivan Square station and is currently being improved as part of the Wynn Casino mitigation. The reconstructed Spice Street and D Street, along with the completion of the 32 Cambridge Street project, will allow for more pleasant and safer pedestrian and bicycle access to Sullivan Square station.

Community College station is approximately 0.6 miles from the Project Site and is accessible via pedestrian paths on the Bunker Hill Community College campus or via Rutherford Avenue.

The Orange Line provides connections to Somerville and Malden to the north, and downtown Boston, North Station, Back Bay, Roxbury, and Jamaica Plain to the south. Commuters can transfer to MBTA commuter rail trains at North Station for points north of Boston, and Back Bay for points south of Boston. The 12 MBTA bus routes connect the Project site to locations such as Harvard Square, Cleveland Circle, Davis Square, Clarendon Hill, Malden Center, Linden Square, and Ruggles Station, among others.

To the west of the Project Site are the elevated north and southbound lanes of the I-93 highway and Leverett connector which create a visual and physical barrier to East Cambridge and Somerville and the Cambridge Crossing development.

Proposed Changes

100 Hood Park Drive will be an up to 990-space, four-level parking garage over approximately 75,000 square feet of ground floor retail space potentially including a restaurant, bar, entertainment, or other active uses. The garage is designed as a flat-plate structure with exterior permeability to comply with open-air ventilation type garage requirements. The floor to floor heights in the garage are approximately 13'-0", which in combination with the flat plate system will allow for future conversion to office space or other non-parking uses should demand for parking decline sufficiently in the future. The envelope of the structure is a combination of glazing at the retail entry areas, more solid masonry façade elements at back of house and acoustically sensitive demising wall areas, and a screening system at the upper levels to meet the ventilation requirements for parking areas. The structure height is approximately 95 feet and is therefore a high-rise building according to the building code. The project includes a layer of PV solar panels at the top level of the parking deck providing sustainable solar energy generation and a cover for the parking deck. The garage will include electronic parking controls and management systems to indicate locations and quantities of available parking spaces on each level to facilitate ease of finding spaces and thereby reduce travel and idle times in the garage during peak usage.

Each level of parking will be approximately 60,000 square feet with approximately 181 parking spaces per level in both standard and tandem configurations. The vehicular entrance and exit to the garage will be from Chimney Court at the east end of the building, and pedestrians will access the garage through a lobby located on Hood Park Drive. The entrance and exit lanes will be managed through an electronic control system with remote pay stations, allowing for reversing of the traffic flow as appropriate to accommodate peak exit flows in the evenings and other periods as needed.

To accommodate the potential conversion of the garage to other uses in the future, and to accommodate the potential addition of future residential or commercial levels above the parking, lobby space and provisions for a future elevator core are included in the design.

The Proponent will provide the required number of Electric Vehicle ("EV") charging stations and will install the necessary infrastructure where appropriate to permit additional charging stations as demand warrants. In the event that autonomous vehicle fleets become common, there will need to be significant numbers of charging stations available, central to the urban core, to accommodate remote charging, and the proponent anticipates the garage being a potential hub for this use, based on the central location to Boston, Cambridge and Somerville areas. The solar array on the rooftop is anticipated to generate sufficient electrical power to offset the usage for lighting and parking controls at the garage.

The ground floor of the Proposed Project will include lobby space for the garage, an approximately 12,000 square foot lease space proposed principally for a restaurant tenant usage, and an approximately 63,000 square foot entertainment / retail space utilizing the ground level including an internal mezzanine area. The restaurant and entertainment space are designed to be complementary uses and activate this corner of Hood Park.

Pedestrians will access the entertainment space through a lobby on Hood Park Drive and those arriving by car will be able to access the space directly from the garage lobby. A pair of loading docks serving the entertainment space are located at the western end of Hood Park Drive and will be able to accommodate two full size tractor trailers. The western end of Hood Park Drive between the garage and the future 520 Rutherford Avenue project will be designed to serve as a hardscaped plaza accommodating food trucks, pop-up stores, and markets while providing access to the loading and service docks and emergency egress gathering space for 100 Hood Park Drive and 520 Rutherford Avenue. Additional service areas, including common trash collection and removal for the restaurant use, are located on the south façade of the garage, accessed from Chimney Court.

The total square footages of the approved PDA Master Plan will remain unchanged at 1,168,820 square feet. Under the PDA Master Plan, floor area dedicated for structured parking is not included in the allowed floor area. All of the previously-approved P1 project was dedicated to parking so none of the approved square footage was allocated to P1. Therefore, 75,000 square feet for the ground floor active retail uses will be reallocated from the 550 Rutherford Avenue project to the 100 Hood Park Drive project. The future 550 Rutherford Avenue project will be reduced from 102,160 square feet to 27,160 square feet.

The Proposed Project will be further described in the PDA Development Plan and the reallocation of square footage and an update to the roadway configuration will be included in the Fourth Amendment, both filed with the BPDA on December 1, 2017.

Public Benefits

The Proposed Project will provide many public benefits for Charlestown, the City of Boston, and the surrounding neighborhood.

The Proposed Project will:

- Replace surface parking with an attractive structured parking garage with approximately 75,000 square feet of active ground floor retail including restaurants and entertainment uses. This parking will be available to Charlestown residents during snow emergencies.
- Provide new destination retail and entertainment amenities within Hood Park, immediately adjacent to two MBTA stations, highway access, and walking distance from residential Charlestown.
- Increase the City's real estate tax base by adding new development and increasing property values in the surrounding blocks.
- Provide over $590,000 in Linkage funds to be used for affordable housing and job training in the City of Boston.
- Create an estimated 150 construction jobs over the next 12 months.
- Create an estimate 100 permanent jobs once completed.
- Improve infrastructure systems, thereby reducing the environmental impact of Hood Park and its impact upon water, sewer, stormwater, and electrical systems.
- Raise the elevation of the Project Site above flood levels at Elev. 20.0' BCB, thereby increasing the resiliency of the City and the Proposed Project.

Sustainability, Resiliency, and Smart Growth

The Proponent has demonstrated a commitment to sustainability and green building as evidenced by the anticipated LEED Platinum certification of the 480 Rutherford Avenue project currently under construction. While the U.S. Green Building Council does not offer a certification for structured parking garages, the Commercial Component will be designed with sustainability as a prime consideration.

The Proposed Project will include a solar array on the rooftop to provide a significant portion of the power required for the garage uses. The parking trays will be constructed with flat floor plates to allow the potential future conversion to non-parking uses. The Proponent will provide Electric Vehicle ("EV") charging stations in five percent of the parking spaces and will install infrastructure to allow additional charging stations to be easily installed as demand requires.

The Proponent's commitment to sustainability will extend beyond the Commercial Component and into the garage component of the Proposed Project. The Proponent is evaluating the feasibility of obtaining the Parksmart Gold Certification Level, the highest level awarded. Beyond the requirements of Article 37, the Proponent will also

evaluate the utilization of materials and supplies in the construction and operation of the Proposed Project to limit the impacts of the Proposed Project upon the environment.

The grading of the Project Site supports the design goals of the streetscape and public open spaces, and meets design criteria for resilience and flood protection. The grading creates a street network that is generally 2-3 feet above the existing elevation of the site, enabling first floor elevations of all proposed buildings to be set at approximately elevation 20 (BCB), consistent with the City's goals for climate change preparedness.

General Information

Applicant Information

The Proposed Project will be undertaken by Hood Park LLC, a Massachusetts limited liability company.

Development Team

Hood Park LLC has gathered a team of experts to design, permit, and construct the Proposed Project. This primarily Boston-based team is very qualified to lead the Article 80 process and deliver a successful project.

Proponent	Hood Park LLC Six Kimball Lane Lynnfield, MA 01940 Christopher P. Kaneb, Manager
Owner's Representative	Colliers International New England 160 Federal Street Boston, MA 021210 Telephone: (617) 330-8000 Mark Rosenshein, Senior Vice President Geoffrey Lewis, Vice President
Project Architect	SMMA | Symmes Maini & McKee Associates 1000 Massachusetts Avenue Cambridge, MA 02138 Telephone: (617) 547-5400 Brian Lawlor Mark Spaulding
Legal Counsel	Rubin and Rudman LLP 53 State Street Boston, MA 02109 Telephone: (617) 330-7000 Paula Devereaux, Esq.

Transportation Engineering	Howard Stein Hudson, Inc. 11 Beacon Street, 10th Floor Boston, MA 02108 Telephone: (617) 482-7080 Guy Busa, Principal-in-Charge Brian Beisel, Senior Transportation Engineer
Civil Engineering and Land Surveying	SMMA | Symmes Maini & McKee Associates 1000 Massachusetts Avenue, Cambridge, MA 02138 Telephone: (617) 547-5400
Mechanical/Electrical/Plumbing Consultant	SMMA | Symmes Maini & McKee Associates 1000 Massachusetts Avenue, Cambridge, MA 02138 Telephone: (617) 547-5400
Geotechnical Consultant/Licensed Site Professional	Haley & Aldrich 465 Medford Street, Suite 2200 Boston, MA 02129 Telephone: (617) 886-7400 Kelvin Wong, P.E. Damian Siebert, P.E.
Sustainability Consultant	New Ecology, Inc. 15 Court Square, Suite 420 Boston, MA 02108 Telephone: (617) 557-1700 Lauren Bauman, Vice President
Pre-Construction Advisor	Lee Kennedy Co, Inc. 122 Quincy Shore Drive Quincy, MA 02171 Telephone: (617) 825-6930 Chris Pennie, Senior Vice President Christine Walsh, Government/Community Liaison

Zoning

Zoning District/Planned Development Area

The Project Site is located in the New Rutherford Local Industrial ("LI") Subdistrict within the Charlestown Neighborhood District, governed by Article 62 of the City of Boston's Zoning Code (the "Code"). The Project Site is covered in its entirety by the Master Plan for Planned Development Area No. 51 approved on October 19, 2000 (the "Existing PDA Master Plan"). This PDA Master Plan has been amended three times, most recently on December 16, 2016 to allow residential uses within the Existing PDA Master Plan. Planned Development Areas are allowed in the LI subdistrict.

Under the Existing PDA Master Plan, up to 1,168,820 square feet of development is approved in six buildings, plus three structured parking garages. Parking uses in structured parking garages are not counted in the approved building area. Individual projects under the PDA Master Plan must file individual PDA Development Plans and go through the BPDA's design review process and must also be reviewed by the Boston Civic Design Commission.

The Fourth Amendment will re-allocate 75,000 SF from the previously-approved 550 Rutherford Avenue project to the Proposed Project to allow the Commercial Component and add uses such as Concert hall, Auditorium, Theater, Cinema, Bar, and Bar with Live entertainment. The Fourth Amendment will also reallocate up to 178 spaces from the previously-approved P3 Parking Garage project to the Proposed Project. The Fourth Amendment will also clarify that allowed and conditional uses in the underlying LI zoning such as Daycare, Community Center, Restaurant with live entertainment not operating after 1030, Restaurant with live entertainment operating after 10:30 p.m., Executive Suites, Hotel, Conference Center, Research Lab, Product and Prototype development, Restaurant, Large Take-out Restaurant, and General Retail Business are permitted within the PDA Master Plan and Hood Park.

Regulatory Processes

Article 80 Review

The Proposed Project is subject review under Article 80A-6 and Article 80C of the Code. Per the Mayor's Executive Order regarding mitigation of development projects, dated October 10, 2000, A Letter of Intent was filed with the BPDA on November 13, 2017 requesting the establishment of an Impact Advisory Group ("IAG") to advise the City, BPDA, and Proponent about the impacts of the Proposed Project and any mitigation actions to be taken.

Other Requirements

Boston Civic Design Commission

The Proposed Project will be subject to conceptual design review with Boston Civic Design Commission ("BCDC") review under Article 28 of the Code.

Article 37

The Proposed Project is also subject Article 37 of the Code governing green buildings. As part of Article 37, the Proposed Project must provide a LEED Checklist showing compliance with standards for LEED certification to the Interagency Green Building Committee. Because there is no LEED rating system for structured parking garages, the Proponent is providing documentation showing compliance with Article 37 of the Code for the Commercial Component being constructed as part of the larger parking garage.

The Commercial Component will be designed and constructed under the guidelines of U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Building Design and Construction (BD+C) Version 4 (v4) rating system, and will meet or exceed the Article 37 requirement of "LEED certifiability". The preliminary LEED compliance strategy for this project is included in this filing.

Legal Information

Legal Judgments or Actions Pending Regarding the Proposed Project

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

History of Tax Arrears on Property Owned in Boston by Proponent

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

Evidence of Site Control over Entire Project Area

The Proponent has control over the entire Project Site.

Based on the completed survey of Hood Park there are no public easements on the Project Site.

All interest in any rights held by Pan Am as successor in interest to Boston and Maine Railroad have been extinguished by agreement of Pan Am and the Proponent in 2017.

Anticipated Permits

The Proposed Project anticipates the following permits, approvals, and actions from various public agencies as listed in Table 1.2.

Table 1.2: Anticipated Permits

Agency	Permit/Approval/Action
Boston Planning and Development Agency	Article 80A-6 Determination Certification of Compliance Certification of Consistency Development Impact Project Agreement Cooperation Agreement
Interagency Green Building Committee	Article 37 Green Building Compliance Review
Boston Zoning Commission	PDA Master Plan Approval PDA Development Plan Approval
Boston Civic Design Commission	Design Review
Boston Employment Commission	Boston Residents Construction Employment Plan
Boston Water and Sewer Commission	Site Plan Review Water and Sewer Connection permits Construction Dewatering Permits Cross Connection Backflow Prevention
Public Improvement Commission	Specific Repair Plan approvals (if required)
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Boston Public Works	Curb Cut permit(s) (if required)
Public Safety Commission Licensing Committee	Permit to Erect and Maintain Garage Inflammable Storage License
Boston Inspectional Services Department	Building permit

Agency	Permit/Approval/Action
	Occupancy permit
STATE	
Executive Office of Energy and Environmental Affairs	MEPA Review (if required) Public Benefits Determination (if required)
Massachusetts Department of Environmental Protection	Notification of Construction and Demolition
Massachusetts Department of Transportation	Chapter 40 Section 54A approval
Massachusetts Historic Commission	State Register Review (if required)
FEDERAL	
US Environmental Protection Agency	National Pollution Discharge Elimination System (NPDES) permit
Federal Aviation Administration	Determination of No Hazard

Community outreach

The filing of this Notice of Project Change begins the public process under Article 80A and Article 80C of the Code, including public process. The Proponent will work with the BPDA and City of Boston to ensure that the community process is robust, open to comment, and responsive to questions.

Existing Parking Analysis
Hood Park PDA Master Plan
December 1, 2017

Building No. / Building Name	2017 Master Plan (as proposed) GFA (ex. Parking)	Existing & Proposed office/retail/R&D	Required parking @1.5/1000
(1) 570 Rutherford Avenue Cooler Building Renovat	55,000	55,000	83
(2) 480 Rutherford Avenue	168,000	10,500	16
(3) 510 Rutherford Avenue Power Building Renovat	20,000	20,000	30
(4) 520 Rutherford Avenue	218,130	-	-
(4a) Garage P1-100 Hood Park Drive	75,000	75,000	113
(5) 500 Rutherford Avenue Renovation	368,750	368,750	553
(6) 550 Rutherford Avenue	27,160	-	-
(7) 570 Rutherford Avenue	291,780	-	-
Demolition of Cooler Building 570 Rutherford Aven	(55,000)	-	-
Total GFA (excluding parking)	1,168,820	529,250	794

Required Spaces @ 1.5/1000 upon 100 Hood Park Dr. completion	794
Existing parking spaces (ex 78 spaces within 480 Rutherford)	1,681
Surplus office/retail/R&D spaces	887
Residential spaces within 480 Rutherford	78

Existing	1020
100 HPD Building footprint	-241
Other construction areas	-88
Added in garage	990
	1681

Full Build Parking Analysis
Hood Park PDA Master Plan
December 1, 2017

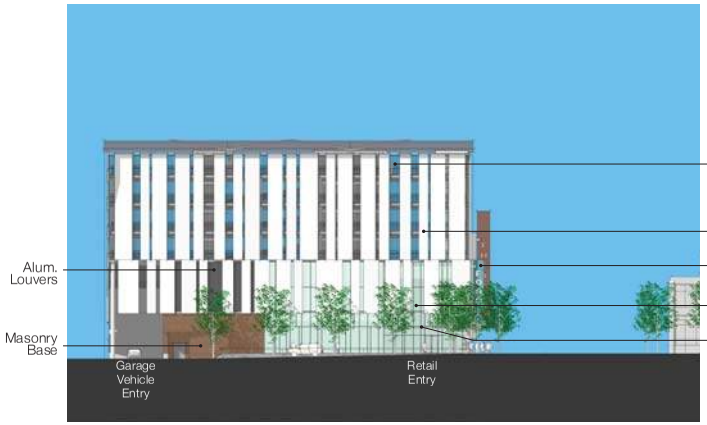
Building No. / Building Name	2017 Master Plan (as proposed) GFA (ex. Parking)	Office/Retail/R&D GFA
(1) 570 Rutherford Avenue Cooler Building Renovat	55,000	55,000
(2) 480 Rutherford Avenue	168,000	10,500
(3) 510 Rutherford Avenue Power Building Renovat	20,000	20,000
(4) 520 Rutherford Avenue	218,130	218,130
(4a) Garage P1-100 Hood Park Drive	75,000	75,000
(5) 500 Rutherford Avenue Renovation	368,750	368,750
(6) 550 Rutherford Avenue	27,160	27,160
(7) 570 Rutherford Avenue	291,780	291,780
Demolition of Cooler Building 570 Rutherford Aven	(55,000)	(55,000)
Total GFA (excluding parking)	1,168,820	1,011,320

Planned Parking	Parking Spaces
(P1) Garage	990
(P2) Garage	495
(P3) Garage	143
On Grade Parking	127
	1,755

Required spaces @1.5/1000 at full build out	1,517
Total office/retail/R&D spaces at full build out	1,755
Surplus	238
Residential spaces	78
Total spaces	1,833

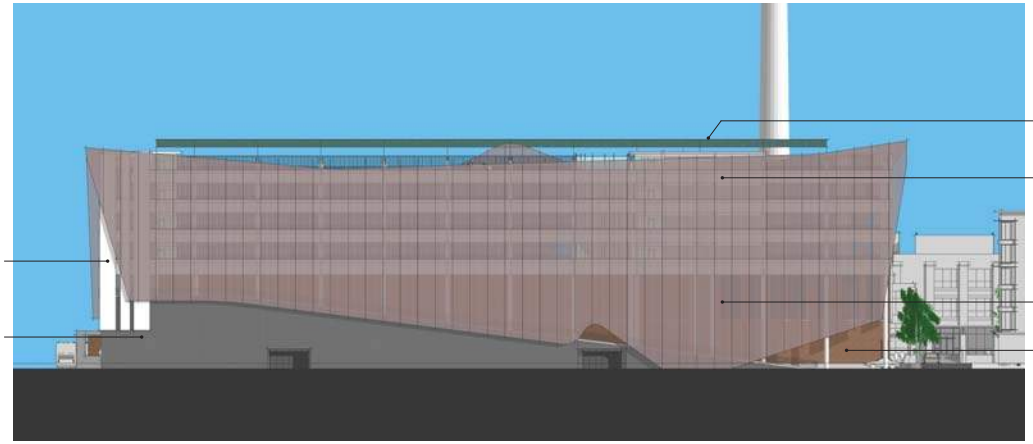
Comparative Building Area Analysis
Hood Park PDA Master Plan
December 1, 2017

Building No. / Building Name	2016 Master Plan GFA (ex. Parking)	2017 Master Plan (as Proposed) GFA (ex. Parking)
(1) 570 Rutherford Avenue Cooler Building Renovation	55,000	55,000
(2) 480 Rutherford Avenue	168,000	168,000
(3) 510 Rutherford Avenue Power Building Renovation	20,000	20,000
(4) 520 Rutherford Avenue	218,130	218,130
(4a) Garage P1-100 Hood Park Drive		75,000
(5) 500 Rutherford Avenue Renovation	368,750	368,750
(6) 550 Rutherford Avenue	102,160	27,160
(7) 570 Rutherford Avenue	291,780	291,780
Demolition of Cooler Building 570 Rutherford Avenue	(55,000)	(55,000)
Total GFA (excluding parking)	1,168,820	1,168,820



East Elevation

North Elevation



South Elevation

West Elevation

100 Hood Park Drive

Charlestown, Massachusetts

North Elevation View from Site

Northeast Aerial View

Northeast Corner View from Site Entrance

Southwest Aerial View

100 Hood Park Drive

Charlestown, Massachusetts

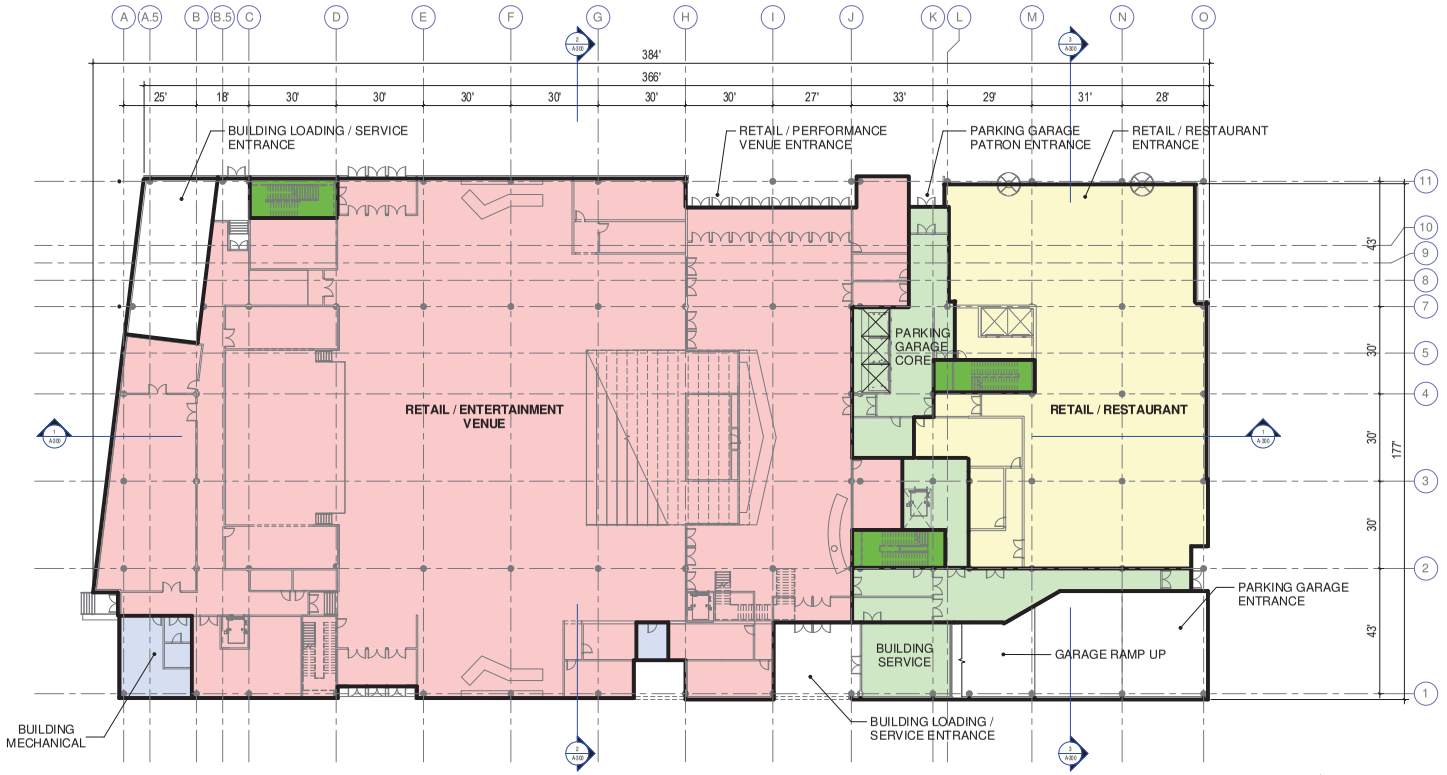
Hood Colliers INTERNATIONAL SMMA

Northeast Corner View from Site Entrance

100 Hood Park Drive

Charlestown, Massachusetts

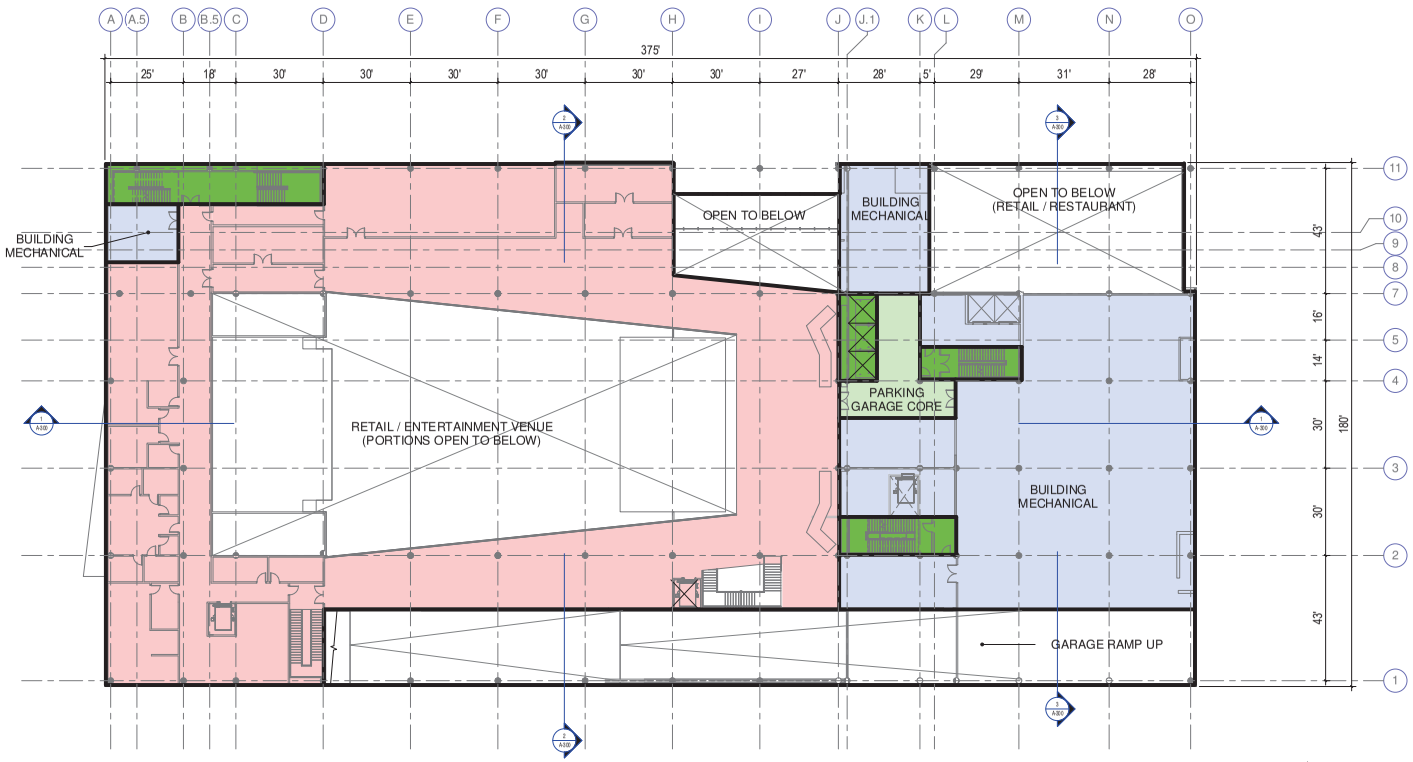
Hood Colliers INTERNATIONAL SMMA



GROUND FLOOR PLAN

100 Hood Park Drive

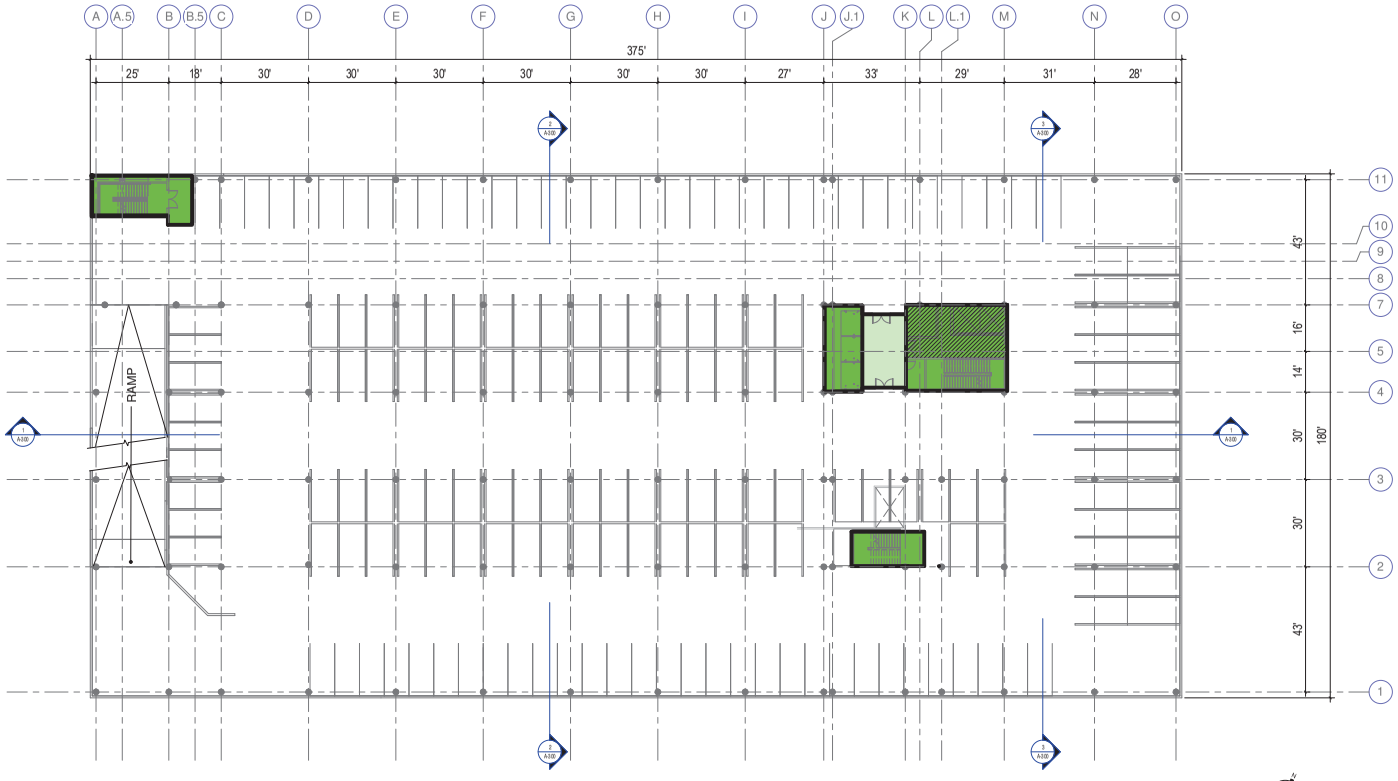
Charlestown, Massachusetts



SECOND FLOOR PLAN

100 Hood Park Drive

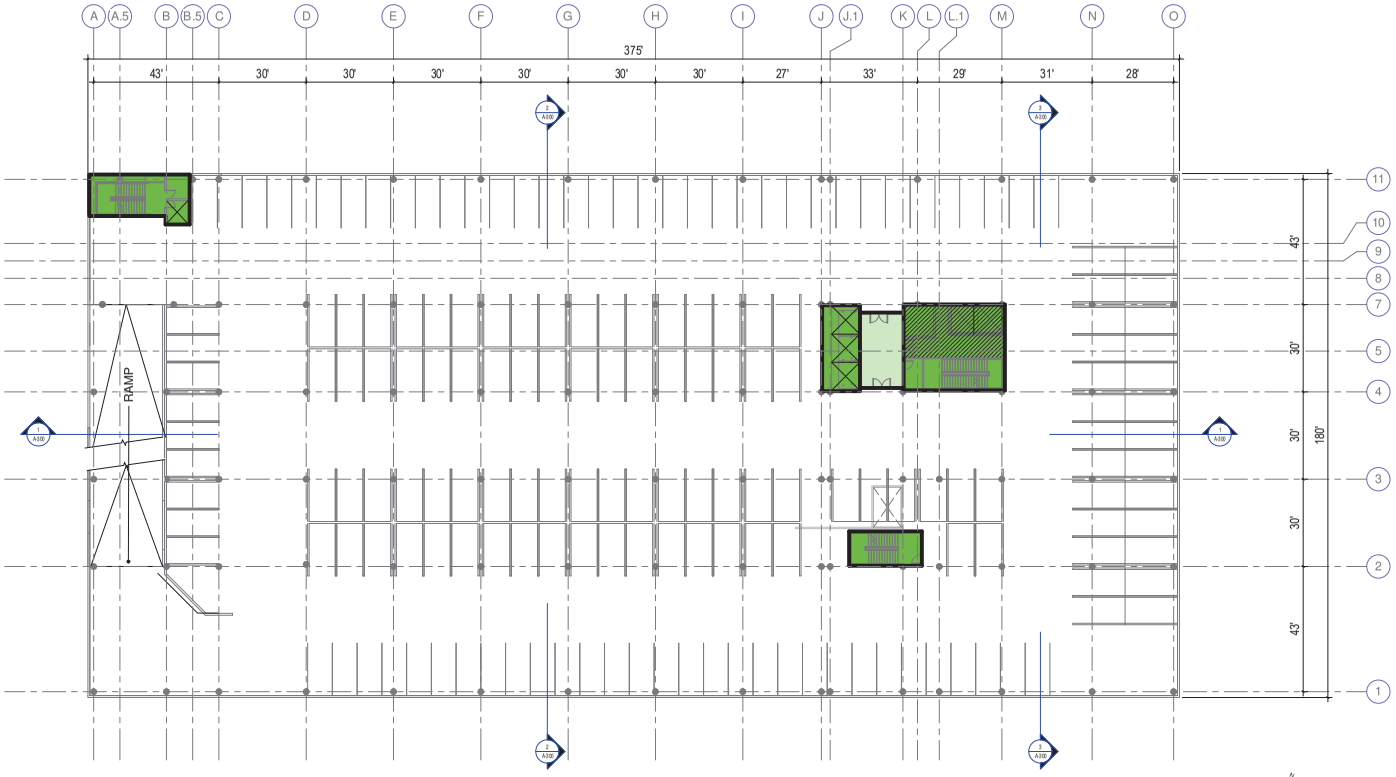
Charlestown, Massachusetts



THIRD FLOOR PLAN - P1

100 Hood Park Drive

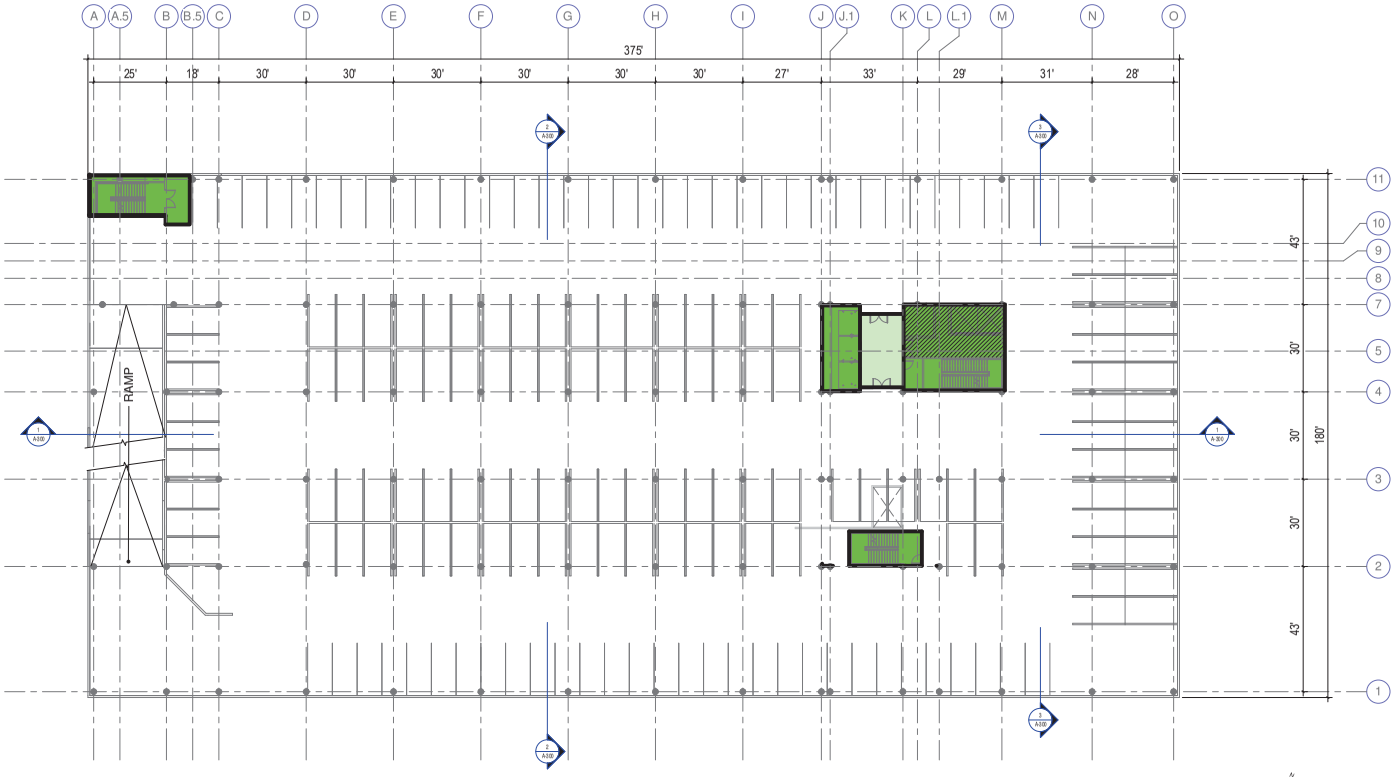
Charlestown, Massachusetts



FOURTH FLOOR PLAN - P2

100 Hood Park Drive

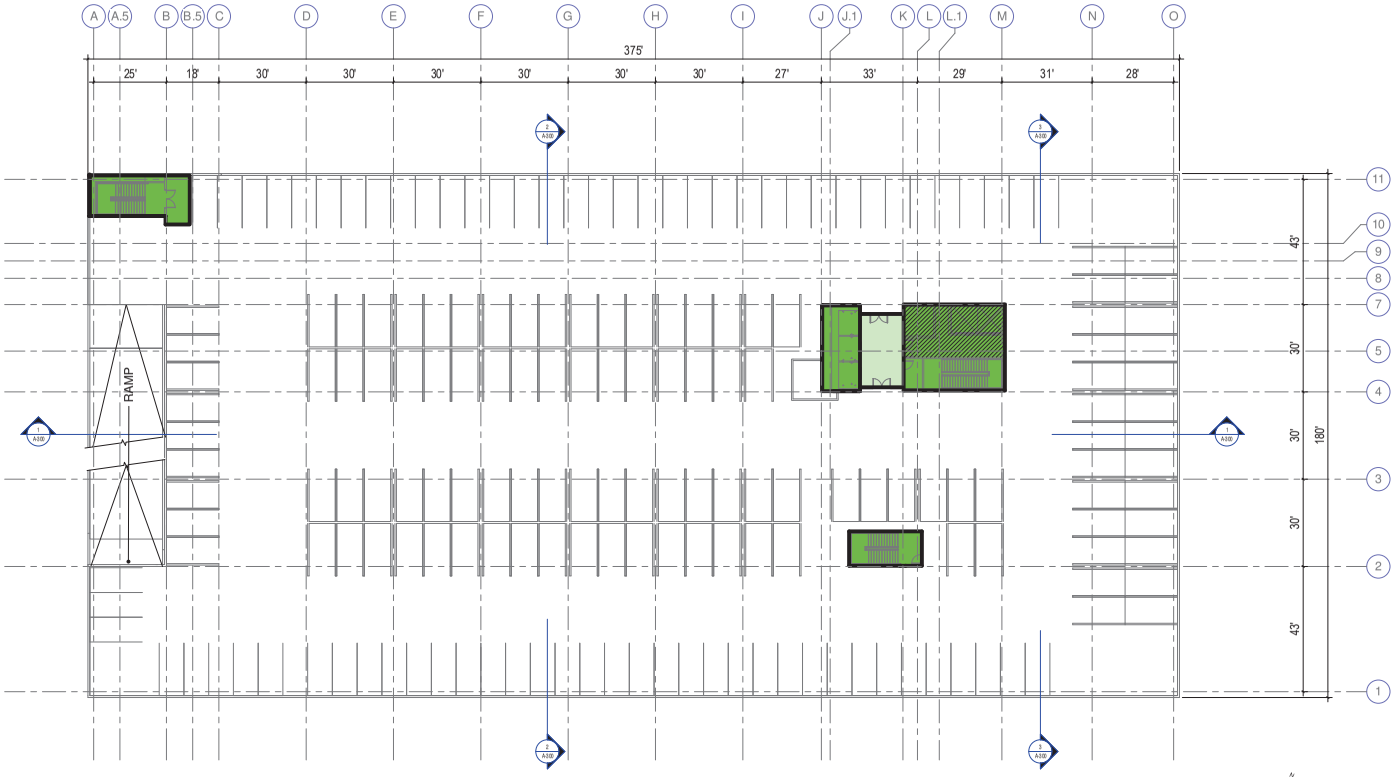
Charlestown, Massachusetts



FIFTH FLOOR PLAN - P3

100 Hood Park Drive

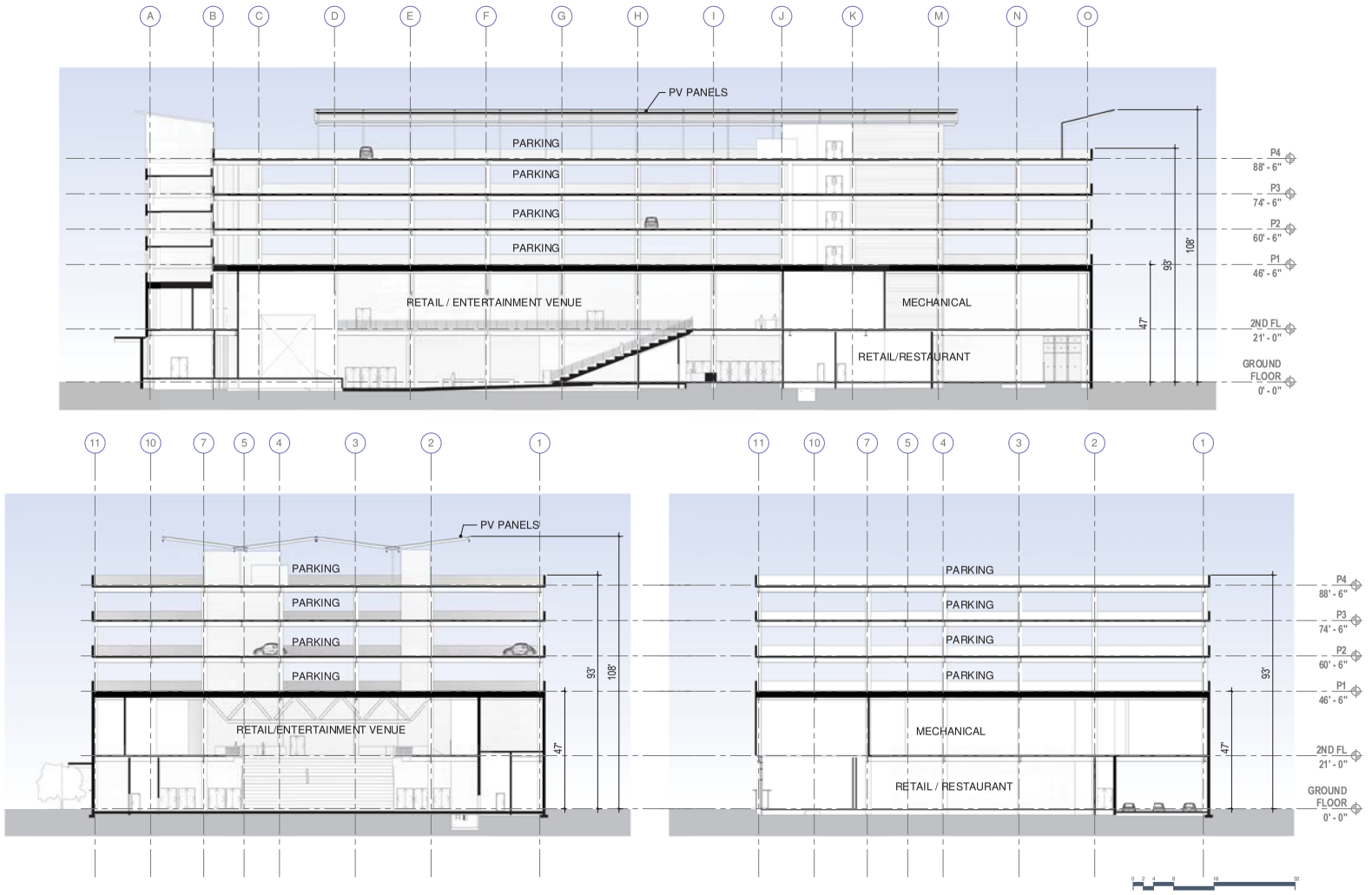
Charlestown, Massachusetts



SIXTH FLOOR PLAN - P4

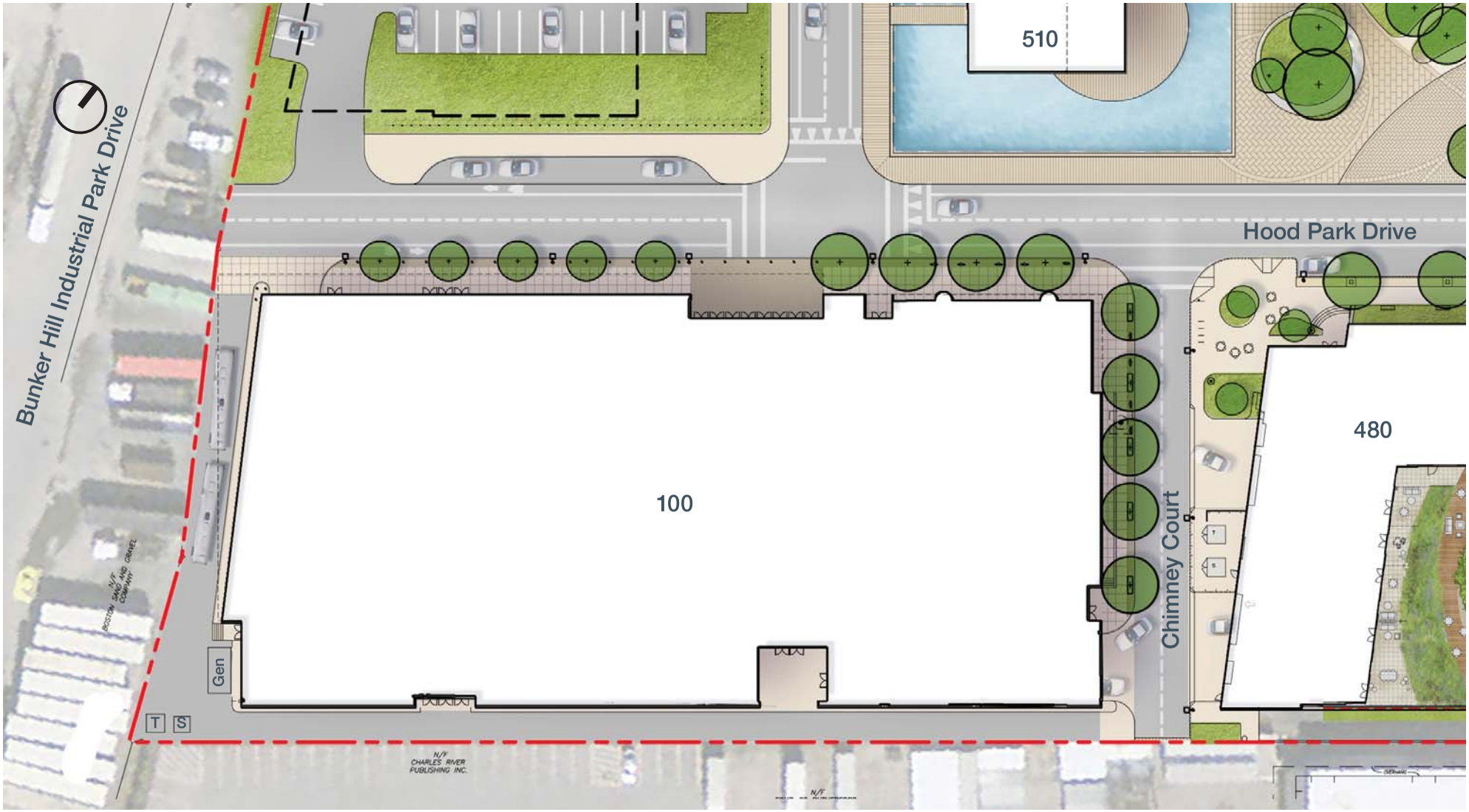
100 Hood Park Drive

Charlestown, Massachusetts



100 Hood Park Drive

Charlestown, Massachusetts



40' 20' 0 40

100 Hood Park Drive

Site Plan

Charlestown, Massachusetts

Hood · Colliers International · SMMA

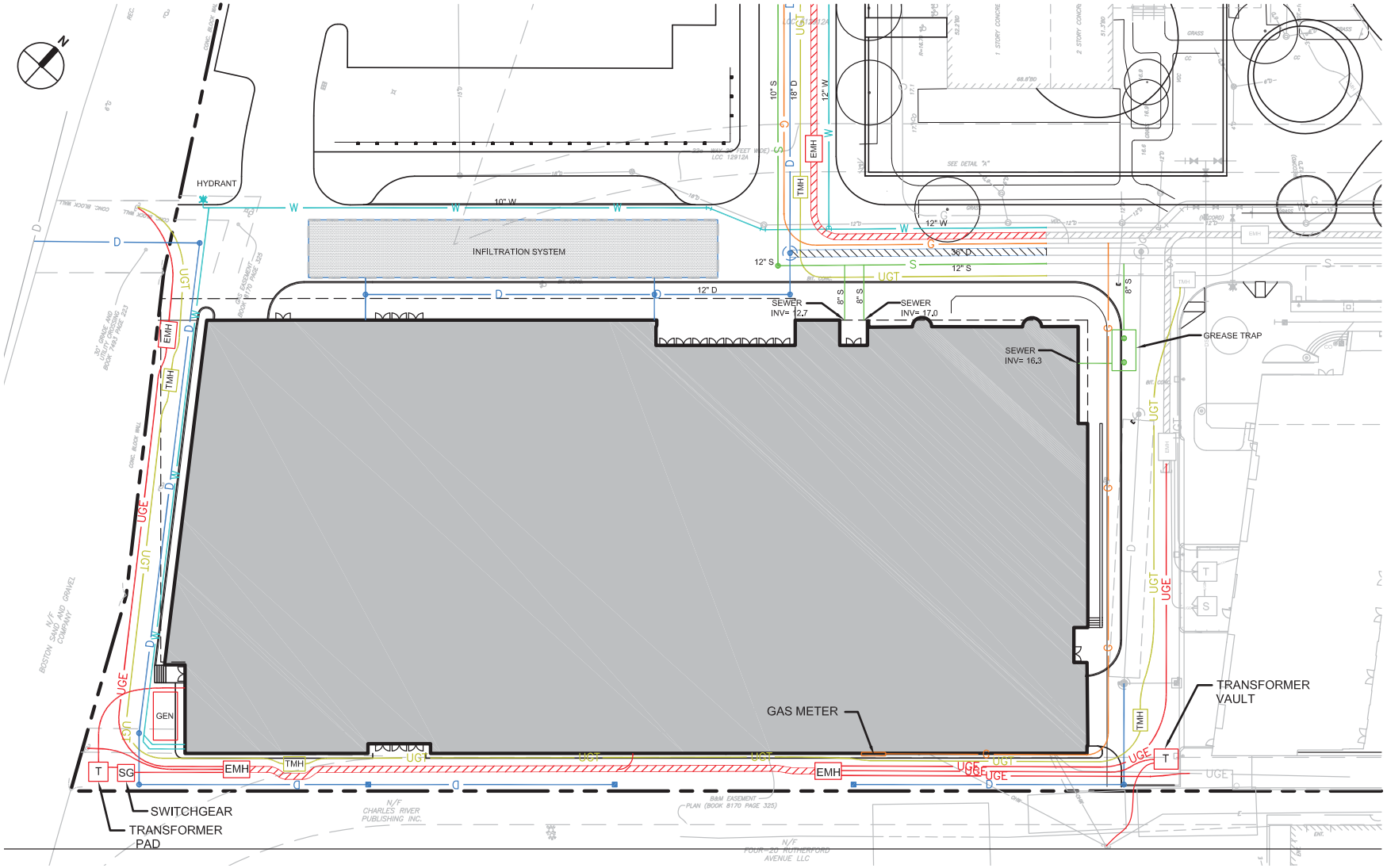
80' 40' 0 80

100 Hood Park Drive

Overall Site Plan

Charlestown, Massachusetts

Hood Colliers INTERNATIONAL SMMA



100 Hood Park Drive

Utility Figure

Charlestown, Massachusetts

2016 Approved Master Plan

2017 Proposed Master Plan

100 Hood Park Drive

Charlestown, Massachusetts

Comparative Master Plan

Hood

Colliers INTERNATIONAL

SMMA

100 Hood Park Drive

Landscape Phase

Charlestown, Massachusetts

Hood Colliers INTERNATIONAL SMMA

100 Hood Park Drive NPC

TO: Mark Rosenshein, Geoffrey Lewis DATE: December 1, 2017

FROM: Brian J. Beisel; Mike White

SUBJECT: Notice of Project Change

As part of the Hood Park Planned Development Area Master Plan (PDA Project), the building program of the P1 Parking Garage parcel is proposed to be changed. In the approved PDA Project this parcel consists of an above ground parking garage. This Notice of Project Change (NPC) modifies the building program to continue to consist of an above ground garage; in addition, the NPC proposes to activate the ground floor of the building via a 4,000 seat performance venue with an associated restaurant (NPC Project). This 75,000 square feet of new active uses on this parcel will not increase the square footage of the approved PDA, however, as it is proposed to take the place of the same square footage of office space from other parcels in the approved PDA Project.

Hood Park is located in the Charlestown neighborhood of Boston. The PDA Project parcel (100 Hood Park Drive) is bounded by Hood Park Drive to the north, Chimney Court to the east, and buildings within the existing Bunker Hill Industrial Park to the south and west.

Site Circulation

The site is conveniently located within walking distance to both the Sullivan Square and Community College MBTA stations. In addition to the subway, non-auto alternatives in the area include multiple MBTA bus lines at Sullivan Square Station, Zipcar locations within a half mile, and a Hubway bicycle share station within a half mile.

VEHICLE ACCESS

On the east side of the parcel, a proposed garage ramp will approach Chimney Court at the southern edge of the building from the south. Chimney Court consists of one lane in each direction to provide vehicle access and egress to the site. At the conclusion of events, Chimney Court can be converted to one way northbound to Hood Park Drive in order to provide a more efficient exiting experience.

PEDESTRIAN ACCESS

New sidewalks will be installed adjacent to the Project site. The buildings main entrance will be located on Hood Park Drive. This entrance will provide access to the performance venue and restaurant.

LOADING AND SERVICE

The Project includes a loading/trash area for the performance venue on Hood Park Drive at the western edge of the building. All trash, delivery, and performance equipment loading activity can be handled at this location providing direct access to the backstage area. Trash and loading for the restaurant and garage uses is located on the southern side of the building.

Trip Generation Comparison

The parking garage, as an ancillary passive use, will not generate any vehicle trips that are not already accounted for through the other uses on site. Therefore, the trip generation comparison for the NPC consists of comparing the combined 75,000 square feet of performance venue/restaurant space and 75,000 square feet of office space that it will be replacing.

For the purpose of evaluating the transportation impacts of the NPC Project compared to the previously approved PDA Project, the trip generation estimates for the previous building program was developed based on rates derived from the Institute of Transportation Engineer's (ITE) *Trip Generation* (10th Edition), 2017. Land Use Code (LUC) 710 (General Office Building) was utilized. The ITE trip generation rates produce vehicle trip estimates, which are then converted to person trips using vehicle occupancy rates (VOR) based on the 2009 National Household Travel Survey data and other local data. Using travel mode split information for this area of Boston provided by BTD, the total person trips are then allocated to vehicle, transit, and walk/bicycle trips.

The person trips associated with the proposed use was determined based on the venue capacity. Using the BTD mode split data and VOR data the total person trips are then allocated to vehicle, transit, and walk/bicycle trips.

VEHICLE TRIP GENERATION COMPARISON

The vehicle mode share for the Charlestown neighborhood of Boston is 67% of the trips for the office land use and 50% for the retail/restaurant/entertainment land uses. The vehicle trip generation during a typical weekday for the previously approved PDA Project and the currently proposed NPC Project are compared in **Table 1**.

Table 1. Vehicle Trip Generation Comparison

Time Period	Direction	Previous	Proposed NPC	Net Impact
Daily	In	244	1,227	+983
	Out	244	1,227	+983
	Total	488	2,454	+1,966
a.m. Peak Hour	In	50	7	-43
	Out	9	2	-7
	Total	59	9	-50
p.m. Peak Hour	In	9	83	+74
	Out	48	29	-19
	Total	57	112	+55

As shown in **Table 1**, when compared to the previous program, during a weekday with an event in the evening, the NPC Project would result in approximately 1,966 more daily vehicle trips, 50 fewer vehicle trips during the weekday a.m. peak hour, and 55 more vehicle trips during the weekday p.m. peak hour. During non-event weekdays, the NPC Project will have similar daily traffic volumes and fewer peak hour traffic volumes than the PDA Project.

TRANSIT TRIP GENERATION COMPARISON

The transit mode share for this area is estimated to be 23% of the trips for the office land use and 35% of the trips for the retail/restaurant/entertainment land uses. **Table 2** shows a comparison of transit trip generation for the previous program and the proposed NPC Project.

Table 2. Transit Trip Generation Comparison

Time Period	Direction	Previous	Proposed NPC	Net Impact
Daily	In	95	1,400	+1.305
	Out	95	1,400	+1,305
	Total	190	2,800	2,610
a.m. Peak Hour	In	20	8	-12
	Out	3	0	-3
	Total	23	8	-15
p.m. Peak Hour	In	4	127	+123
	Out	19	0	-19
	Total	23	127	+104

As shown in **Table 2**, the proposed NPC Project will typically generate 2,610 more weekday transit trips, 15 fewer transit trips during the weekday a.m. peak hour, and 104 more transit trips during the weekday p.m. peak hour.

WALK/BIKE TRIP GENERATION COMPARISON

The walk/bike mode share for this area is estimated to be 10% of trips for the office land use and 15% of the trips for the retail/restaurant/entertainment land uses. **Table 3** shows the walk/bicycle trip generation for the two building programs.

Table 3. Walk/Bike Trip Generation Comparison

Time Period	Direction	Previous	Proposed NPC	Net Impact
Daily	In	41	600	559
	Out	41	600	559
	Total	82	1,200	1,118
a.m. Peak Hour	In	9	18	+9
	Out	1	0	-1
	Total	10	18	+8
p.m. Peak Hour	In	2	55	+53
	Out	8	0	-8
	Total	10	55	+45

As shown in **Table 3**, walk/bike trips are expected to increase by 1,118 pedestrians/bicyclists throughout the course of a weekday, increase by 8 pedestrians/bicyclists during the weekday a.m. peak hour, and increase by 45 pedestrians/bicyclists during the weekday p.m. peak hour.

Parking Demand

As stated previously, in the approved PDA Project, 100 Hood Park Drive consists of an above ground parking garage. As proposed in the NPC Project, the garage will be constructed to accommodate up to 990 of the 1,765 parking spaces that are permitted in the PDA Project. This garage will need to partially support the existing Hood Business Park (approximately 445,000 square feet of office space), as well as the performance venue/restaurant. During peak events when all 4,000 seats are occupied, the parking demand is expected to be 590 parking spaces. This parking demand is determined based the same calculations as the trip generation estimates detailed above. The calculations utilize the peak occupancy (4,000), the vehicle mode share (50%), the VOR (2.2), as well as locally collected taxi/ride share data that shows 35% of the vehicle trips to entertainment venues consist of taxi/ride share. This taxi/ride share component does not utilize on-site parking.

Since the events at the performance venue will occur at night, the office parking demand will be minimal. It is expected that during events, the existing office space parking demand will be less than 20 vehicles. This shared parking demand is expected to be accommodated by the proposed garage even during the transition time between uses as office employees leave the spaces to be occupied by performance venue visitors arriving at the site.

Summary

During the typical weekday, when there are not events at the performance venue, the proposed NPC Project is not materially different in terms of transportation impacts than the portion of the previously approved PDA Project building program that will be replaced. During weekdays when events will occur during the evening, the NPC Project increases the trip generation across all modes except during the weekday a.m. peak hour when the NPC Project results in a net reduction in transportation impact. The parking and loading demand will both be accommodated on site without adversely impacting the existing uses in the area or impeding the further development of the PDA Project.

LEED v4 for BD+C: Core and Shell

Project Checklist

Project Name: Hood Park, Building 100

Date: 1-Dec-17

Y	?	N			
1			Credit	Integrative Process	1

11	5	4	Location and Transportation		20
			Credit	LEED for Neighborhood Development Location	20
2			Credit	Sensitive Land Protection	2
2		1	Credit	High Priority Site	3
4	2		Credit	Surrounding Density and Diverse Uses	6
1	2	3	Credit	Access to Quality Transit	6
1			Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

5	2	4	Sustainable Sites		11
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
		1	Credit	Open Space	1
	2	1	Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
1			Credit	Tenant Design and Construction Guidelines	1

4	3	4	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
	1	1	Credit	Outdoor Water Use Reduction	2
3	2	1	Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

12	10	11	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
3	2	1	Credit	Enhanced Commissioning	6
8	4	6	Credit	Optimize Energy Performance	18
		1	Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
1	1	1	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

2	2	10	Materials and Resources		14
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		6	Credit	Building Life-Cycle Impact Reduction	6
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

4	1	5	Indoor Environmental Quality		10
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
1	1	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
		3	Credit	Daylight	3
		1	Credit	Quality Views	1

5	0	1	Innovation		6
4		1	Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

0	1	3	Regional Priority		4
	1		Credit	Regional Priority: Rainwater Management	1
		1	Credit	Regional Priority: Specific Credit	1
		1	Credit	Regional Priority: Specific Credit	1
		1	Credit	Regional Priority: Specific Credit	1

44	24	42	TOTALS	Possible Points:	110

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

NEW ECOLOGY
Community-Based Sustainable Development

15 Court Square, Suite 420
Boston, MA 02108

Article 37 Compliance

Hood Park – Building 100

Boston, MA

December 1, 2017

I. Overview

The 100 Hood Park Drive project (the "Proposed Project") is a one-story commercial structure with a large parking structure located above located in Hood Park on Rutherford Avenue in Charlestown. The commercial structure will include an approximately 63,000 square footconcert hall and an approximately 12,000sf restaurant (the "Commercial Component"). The parking structure will serve the Commercial Component as well as existing and additional future buildings at Hood Park. The project will be designed and constructed under the guidelines of U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Building Design and Construction (BD+C) Core and Shell Version 4 (v4) rating system. The building will meet, or exceed, the Article 37 requirement of "LEED certifiability." The following is an outline of the preliminary LEED compliance strategy for this project.

II. LEED BD+C: Core and Shell v4 Scorecard

New Ecology, Inc. (NEI) has reviewed the preliminary project scope and understands the credit summary presented in Table 1: Summary Scorecard to be reasonable and achievable – the subsequent Narrative identifies the project's current approach to compliance with all checklist prerequisites and applicable, optional credits. Attached in Appendix A, please find the official preliminary checklist.

Table 1: Summary Scorecard

Category	**Yes Points**	**Maybe Points**
Integrative Process	1	0
Location and Transportation	11	5
Sustainable Sites	5	2
Water Efficiency	4	3
Energy and Atmosphere	12	10
Materials and Resources	2	2
Indoor Environmental Quality	4	1
Innovation	5	0
Regional Priority	0	1
Total Points	44	24

III. Narrative for LEED Credits

The Projects will fulfill all the prerequisites for all categories.

Note: Only credits that will be pursued by the Project are discussed below; credits that will not be pursued are not included.

A. Integrative Process

IP Integrative Process	1 point
In compliance with credit requirements, the project will complete the following tasks: 1. A preliminary "Box" Energy Model: during the schematic design phase, the team will model the project's design and assess potential strategies associated with the limited site conditions, the extensive massing and required building orientation, the basic envelope design, lighting levels within the regularly occupied spaces, the thermal comfort ranges of the occupants, the plug and process load needs, and the programmatic and operational parameters of the building. All iterations and results will be documented and shared with the design team prior to final design decisions. 2. A preliminary Water-Use systems Analysis: also during the schematic design phase, the team will explore methods of reducing potable water loads within the building as well as any potable water required for irrigation of the building site and process water necessary for equipment within the building.	

B. Location and Transportation

LT Sensitive Land Protection	2 yes points
The project is located on a previously developed lot, located in downtown Boston, satisfying the credit conditions.	
LT High Priority Site	2 yes points
The project is located in a U.S. Department of Housing and Urban Development Difficult Develoment Area and therefore receives 1 point for this credit.	
LT Surrounding Density and Diverse Uses	4 yes points; 2 maybe points
Option 1. Surrounding Density. the project is located in Hood Park, a master planned, mixed-use development located near downtown Boston, the surrounding ¼-mile of development will meet, and exceed, the credit thresholds for 3 points under Option 1. Surrounding Density.	
Option 2. Diverse Uses. The project is located in the Sullivan Square area of Boston, and has significant access to community resources. The project will likely meet the credit requirement of eight (8) uses within a ½-mile walking distance of the main entrance.	
LT Access to Quality Transit	1 yes points; 2 maybe points
The project site is located within a short walk of the Sullivan Square MBTA subway and bus station. This station will provide at least 72 weekday trips and 40 weekend trips, qualifying for 1 point via the applicable LEED thresholds. The project team will evaluate additional transportation access options to determine if additional LEED points are available for this credit.	
LT Bicycle Facilities	1 yes point
The project will ensure that the LEED requirements for protected and covered bike storage are supplied within the building.	

LT Reduced Parking Footprint	1 maybe point
The project will include on-site parking and the project team will evaluate means of reducing parking below the LEED baseline parking demand.	
LT Green Vehicles	1 yes point
The project wil designate 5% of all parking spaces as preferred parking for green vehicles.	

C. Sustainable Sites

SS Construction Activity Pollution Prevention	Required
The project's construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the NPDES. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the site in accordance with the requirements for the US EPA's National Pollutant Discharge Elimination System Construction General Permit. These documents will be used to document compliance with this prerequisite.	
SS Site Assessment	1 yes point
The project will complete and document an assessment of the site including the following information: 1. Topography – contours and sloping, 2. Hydrology – flood hazards and existing water bodies, 3. Climate – solar exposure and sun angles, 4. Vegetation – vegetation types and greenfield spaces, 5. Soils – soils delineation, prime farmland, and disturbed soils, 6. Human Use – enhanced views, availability of transportation, and future building potential, and 7. Human Health Effects – population assessment, physical fitness, and existing air pollution sources.	
SS Rainwater Management	2 maybe points
The project is providing an extensive network of stormwater storage and infiltration equipment below the ground surface. This system with hold 1" of rainfall, which is less than the 1.5" of rainfall equivalent to the 95th percentile rainfall event that would qualify the project for 2 LEED points. The project team is evaluating whether the system capacity can be increased to accommodate the additional rainfall required to be eligible for this credit.	
SS Heat Island Reduction	2 yes points
The project will utilize high albedo materials for all hardscapes onsite, including both nonroof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values.	
SS Light Pollution Reduction	1 yes point
The project will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up lighting will be utilized and fixtures will the project team will	

evaluate nighttime dimming options to keep the site safe while minimizing light pollution.	
SS Tenant Design and Construction Guidelines	1 yes point
The project will educate commercial tenants in implementing sustainable design and construction features in their build-outs by providing documentation of the sustainable design and construction features incorporated in the building and recommendations for additional sustainable strategies, products, materials, and services to include in their use of the space.	

D. Water Efficiency

WE Outdoor Water Use Reduction	Required
The project will reduce the landscape water requirement by at least 30% below the EPA WaterSense Water Budget Tool calculated amount, satisfying this prerequisite.	
WE Indoor Water Use Reduction	Required
The project will reduce demand for potable water at least 20% below the aggregate water consumption baseline through high efficiency fixtures within the commercial restrooms and service areas – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures and the following flow rates: • Shower: 1.5 GPM, • Bath Lavatory: 0.5 GPM, and • Toilet: 1.1 GPF	
WE Building-Level Water Metering	Required
The project will comply with the requirements of this credit by installing a water meter for the building.	
WE Outdoor Water Use Reduction	1 maybe point
The project team will investigate opportunities to reduce the landscape water requirement by 50% below the EPA WaterSense Water Budget Tool calculated amount or more, potentially adding 1 LEED point for this credit.	
WE Indoor Water Use Reduction	3 yes points; 2 maybe points
The project will reduce demand for potable water through high efficiency fixtures within the commercial restrooms and service areas – this design will have a goal of 35% reduction and will seek additional efficiencies to improve that percentage. The design will specify WaterSense labeled fixtures and the following flow rates: • Shower: 1.5 GPM, • Bath Lavatory: 0.5 GPM, and • Toilet: 1.1 GPF	

WE Water Metering	1 yes point
The project will include water sub-metering for at least two end uses to potentially include irrigation, dishwashing, domestic hot water, or indoor plumbing fixtures.	

E. Energy and Atmosphere

EA Fundamental Commissioning and Verification	Required
The project team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the project Basis of Design and Owner's Project Requirements as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.	
EA Minimum Energy Performance	Required
The project will meet this prerequisite, as well as the Massachusetts Stretch Energy Code through the following design resulting in an ASHRAE 90.1- 2010 Appendix G model demonstrating a minimum energy use reduction of 20%, and the team will explore additional strategies to reduce energy use further to 29%: • Above code levels of insulation within the cavity as well as continuous exterior insutlated sheathing, • Very high efficiency equipment mechanical systems, • LED lighting and sophisticated, automated controls, • ENERGY STAR appliances, and • Energy Recovery for all ventilation.	
EA Building-Level Energy Metering	Required
The project will include a building-level energy meter for all energy consumption including electricity and natural gas.	
EA Fundamental Refrigerant Management	Required
The project's HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.	
EA Enhanced Commissioning	3 yes points; 2 maybe points
The project team will include an experienced Commissioning (Cx) Agent . In addition to fundamental commissioning, the Cx Agent will review contractor submittals, verify inclusion of system manual requirements in construction documents, verify operator and occupant training deliver, verify seasonal testing, perform a 10-month seasonal review of building operations after substantial completion, and develop an ongoing commissioning plan for 3 points. The project team will also investigate options for envelope comissionign for an additional 2 points.	

EA Optimize Energy Use	8 yes points, 4 maybe points
The project will be designed to achieve a minimum energy use reduction of 20%, as demonstrated through ASHRAE 90.1- 2010 Appendix G modeling, and the team will explore additional strategies to reduce energy use further to 29%: • Above code levels of insulation within the cavity as well as continuous exterior insutlated sheathing, • Very high efficiency equipment mechanical systems, • LED lighting and sophisticated, automated controls, • ENERGY STAR appliances, and • Energy Recovery for all ventilation.	
EA Renewable Energy Production	1 yes point, 1 maybe point
The project team will provide a rooftop solar photovoltaic system for the building using current financial incentives and available equipement. The project will target meeting 5% of the annual building energy demand with the solar photovoltaic system.	
EA Enhanced Refrigerant Management	1 maybe point
The project will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.	
EA Green Power	2 maybe points
If the project budget allows, the team will explore options for Green Power and Carbon Offset purchasing to counteract the environmental toll of fossil fuel production for creation of building energy.	

F. Materials and Resources

MR Storage and Collection of Recyclables	Required
The project will provide a designated storage point for recyclable materials; management will then move all refuse to the street for city collection. Collected materials will include the following: • Mixed paper, • Corrugated cardboard, • Glass, • Plastics, • Metals, • Batteries, and • Mercury Containing Lamps.	
MR Construction and Demolition Waste Management Planning	Required
The project will implement a Construction and Demolition Waste Management Plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.	

MR Building Product Disclosure and Optimization – Environmental Product Declarations	1 maybe point
The project will seek to document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents. The project team will explore the most cost-effective products to be specified to meet the credit requirements.	
MR Building Product Disclose and Optimization – Material Ingredients	1 maybe point
The project will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification. The project team will explore the most cost-effective products to be specified to meet the credit requirements.	
MR Construction and Demolition Waste Management	2 yes points
The team is committed to reducing construction waste through at least 75% diversion including four material streams. The project team will document the means of meeting this diversion target and the details of the end use of recycled materials through the Construction and Demolition Waste Management Plan.	

G. Indoor Environmental Quality

IEQ Minimum Indoor Air Quality Performance	Required
The project will ensure that all ventilation systems meet the minimum requirements of Sections 4 through 7 of the ASHRAE 62.1-2010 standard for Acceptable Indoor Air Quality in all indoor spaces.	
IEQ Environmental Tobacco Smoke Control	Required
The project will prohibit smoking inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be indicated in all leasing agreements and will be displayed via onsite signage.	
IEQ Enhanced Indoor Air Quality Strategies	2 yes points
The project will be designed to include the following enhanced indoor air quality strategies: • Ppermanent entryway systems (walk-off mats) at least 10-feet long in the primary direction of travel, • Direct exhaust of all housekeeping and hazardous gas and chemical storage and use areas to prevent cross-contamination, • MERV 13 filtration on all ventilation systems, • CO2 monitoring and ventilation controls within all densely occupied spaces.	

IEQ Low Emitting Materials	1 yes point; 1 maybe point
The project team will specify paints, coatings, flooring, adhesives, sealants, composite wood, and furniture that comply with California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, Office Scenario and meet all applicable VOC content requirements. The project team will also explore including ceiling, wall, thermal, and accousitc insulation that meets these requirements for an additional 1 point.	
IEQ Construction Indoor Air Quality Management Plan	1 yes point
The general contractor will develop an Indoor Air Quality Management Plan meeting the SMACNA IAQ Guidelines for Occupied Buildigns Under Construction, 2nd Edition, 2007, ANSI/SMACNA 008-2008, Chapter 2. The contractor will protect absorptive materials stored and installed on site from moisture damage,ensure that all installed ductwork is adequately protected throughout the construction phase, not operate permanent air handling equipment during construction unless with MERV 8 filtration, replace filter media before occupancy, and prohibit smoking anywhere on site. This protection will be verified through site inspections by NEI.	

H. Innovation in Design

ID Innovation in Design	4 yes points; 1 maybe points
The project will seek to achieve at least 4 our of 5 applicable Innovation points; potential credits include: Purchasing – Low Mercury Lamps, Walkable Project Sit, LEED O&M Starter Kit, and Occupant Comfort Survey.	
ID LEED Accredited Professional	1 yes point
Thomas Chase, LEED AP, is coordinating the Article 37 Compliance process and LEED certification for this project.	

I. Regional Priority

RP Regional Priority	1 maybe credit
The project team will evaluate opportunities to meet the threshold for at least 1 Regional Priority credit point, potential Regional Priority credits include: • EA Optimize Energy Performance, • SS Rainwater Management, and • WE Indoor Water Use Reduction.	

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	100 Hood Park Drive
Project Address Primary:	Hood Park
Project Address Additional:	100 Hood Park Drive
Project Contact (name / Title / Company / email / phone):	Geoffrey Lewis Vice President, Development & Consulting Services Colliers International 160 Federal Street, Floor 11 Boston, MA 02110 Geoffrey.Lewis@colliers.com (617) 330-8046

A.2 - Team Description

Owner / Developer:	Hood Park, LLC
Architect:	SMMA
Engineer (building systems):	SMMA
Sustainability / LEED:	New Ecology, Inc.
Permitting:	Colliers International
Construction Management:	Lee Kennedy
Climate Change Expert:	New Ecology, Inc.

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Commercial
List the First Floor Uses:	Restauran, Performance Hall

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

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*98,150 SF*	Building Area:	*+/- 72,000 SF (excluding parking structure)*
Building Height:	*97 Ft. (including parking structure)*	Number of Stories:	*1 Floor (5 floors parking above)*

First Floor Elevation (reference Boston City Base):	***20.0' Elev.***	Are there below grade spaces/levels, if yes how many:	***No*** / *Number of Levels*

A.5 - Green Building

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

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

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	***Yes*** / No	Certified:	***Yes*** / No
	(Pending)		

A.6 - Building Energy

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

Electric:	TBD *(kW)*	Heating:	TBD *(MMBtu/hr)*
What is the planned building Energy Use Intensity:	TBD *(kBtu/SF)*	Cooling:	TBD *(Tons/hr)*

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

Electric:	*0 (kW)*	Heating:	*0 (MMBtu/hr)*
		Cooling:	*0 (Tons/hr)*

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

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

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

7/ 91 Deg.

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

TBD *Deg.*	**TBD** *Days*	**TBD** *Events / yr.*

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

TBD *Days*	**TBD** *Events / yr.*

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

TBD *Inches / yr.*	**TBD** *Inches*	**TBD** *Events / yr.*

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

TBD *Peak Wind*	**TBD** *Hours*	**TBD** *Events / yr.*

B.2 - Mitigation Strategies

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

Building energy use below code:	**17-26** *% (goal)*
How is performance determined:	Performance will be determined through ASHRAE 90.1-2013 Appendix G modeling

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

Select all appropriate:	**High performance building envelope**	**High performance lighting & controls**	Building day lighting	**Energy Star appliances**
	High performance HVAC equipment	**Energy recovery ventilation**	No active cooling	No active heating
Describe any added measures:				

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

Roof:	*R* = **TBD**	Walls / Curtain Wall Assembly:	*R* = **TBD**
Foundation:	*R* = **TBD**	Basement / Slab:	*R* = **TBD**
Windows:	*U* = **TBD**	Doors:	*R* = **TBD**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

***Yes** / No*

Describe site conditions?

Site Elevation – Low/High Points:	*Low: El. 20.0'* *High: El. 20.0'*
Building Proximity to Water:	*Approx. 2,000'*

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

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

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

2013 FEMA Prelim. FIRMs:	*Yes / **No***	Future floodplain delineation updates:	*Yes / **No***

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

0'

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

Sea Level Rise:	*6 Ft.*	Frequency of storms:	*1 per year*

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*XX Ft.*	First Floor Elevation:	*20.0 Ft.*

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

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

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

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

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

***Yes** / No*

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

*Yes / **No***	If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*	

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

***Yes** / No*	
If Yes, describe:	Landscape plantings

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

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

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

C.4 - Building Resilience and Adaptability

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

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

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

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

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

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

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

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

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

REPORT

HOOD PARK

CHARLESTOWN, MA

PEDESTRIAN WIND ASSESSMENT

PROJECT #1800157

DECEMBER 1, 2017

SUBMITTED TO

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INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by SMMA to assess the wind comfort conditions for the proposed Hood Park, Building 100 in Charlestown, MA (**Image 1**). This assessment is based on the following:

- a review of regional long-term meteorological data from Boston Logan International Airport;
- design drawings and documents received by RWDI in October, 2017;
- wind-tunnel studies undertaken by RWDI for similar projects in the Boston Area;
- our engineering judgement and knowledge of wind flows around buildings[1-3]; and,
- use of software developed by RWDI (Windestimator[2]) for estimating the potential wind conditions around generalized building forms.

This qualitative approach provides a screening-level estimation of potential wind conditions for re-zoning applications. Conceptual wind control measures to improve wind comfort are recommended, where necessary. In order to quantify these conditions or refine any conceptual wind control measures, physical scale-model tests in a boundary-layer wind tunnel would be required.

Note that other wind issues, such as those related to cladding and structural wind loads, air quality, door operability, etc., are not considered in the scope of this assessment.

Image 1: Aerial view of the site and surroundings (Google™ Earth)

1. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", 10th International Conference on Wind Engineering, Copenhagen, Denmark.
2. H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", ASCE Structure Congress 2004, Nashville, Tennessee.
3. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", Journal of Wind Engineering and Industrial Aerodynamics, vol.104-106, pp.397-407.

SITE & BUILDING INFORMATION

As shown in **Image 1**, the proposed development, Building 100, is located on the southwest corner of the block between the I-93 and Rutherford Avenue, to the south of Cambridge St. The existing site is currently a surface-parking lot surrounded by single to double story commercial buildings and open lots (**Images 2** and **3**).

The proposed development is, approximately, a 95ft tall parking structure, close to 25' taller than the neighboring buildings to the east. A future building is planned in the lot to the north of the building as part of the Hood Park masterplan (**Image 2**).

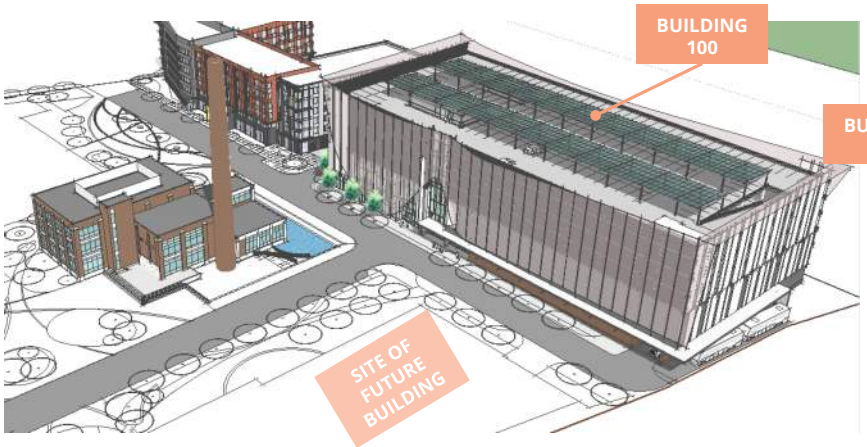


Image 2: Isometric View of Proposed Building

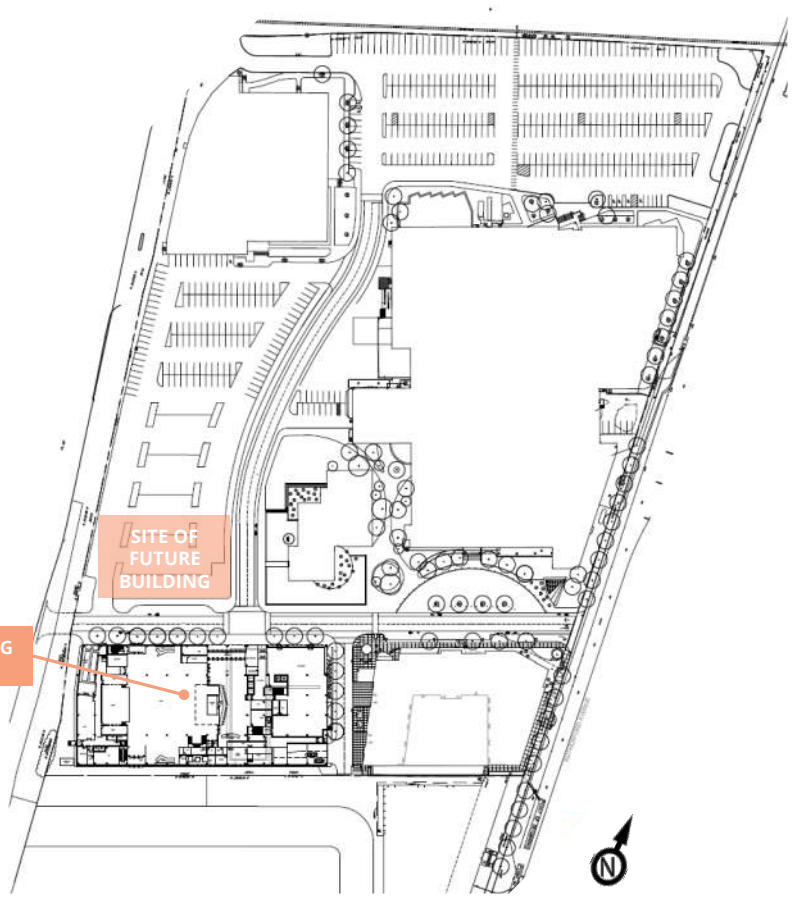


Image 3: Proposed Site Plan

METEOROLOGICAL DATA

Wind statistics at Boston Logan International Airport between 1990 and 2015, inclusive, were analyzed for the spring (March to May), summer (June to August), fall (September to November) and winter (December to February) seasons. **Image 4** graphically depicts the distributions of wind frequency and directionality for the four seasons and for the annual period. When all winds are considered (regardless of speed), winds from the northwest and southwest quadrants are predominant. Northeasterly winds are also frequent, especially in the spring.

Strong winds with mean speeds greater than 20 mph (red bands in the images) are prevalently from the northwesterly directions throughout the year, while the southwesterly and northeasterly winds are also frequent.

Winds from the northwest and west directions are considered most relevant to the current study, although winds from other directions were also considered in our assessment.

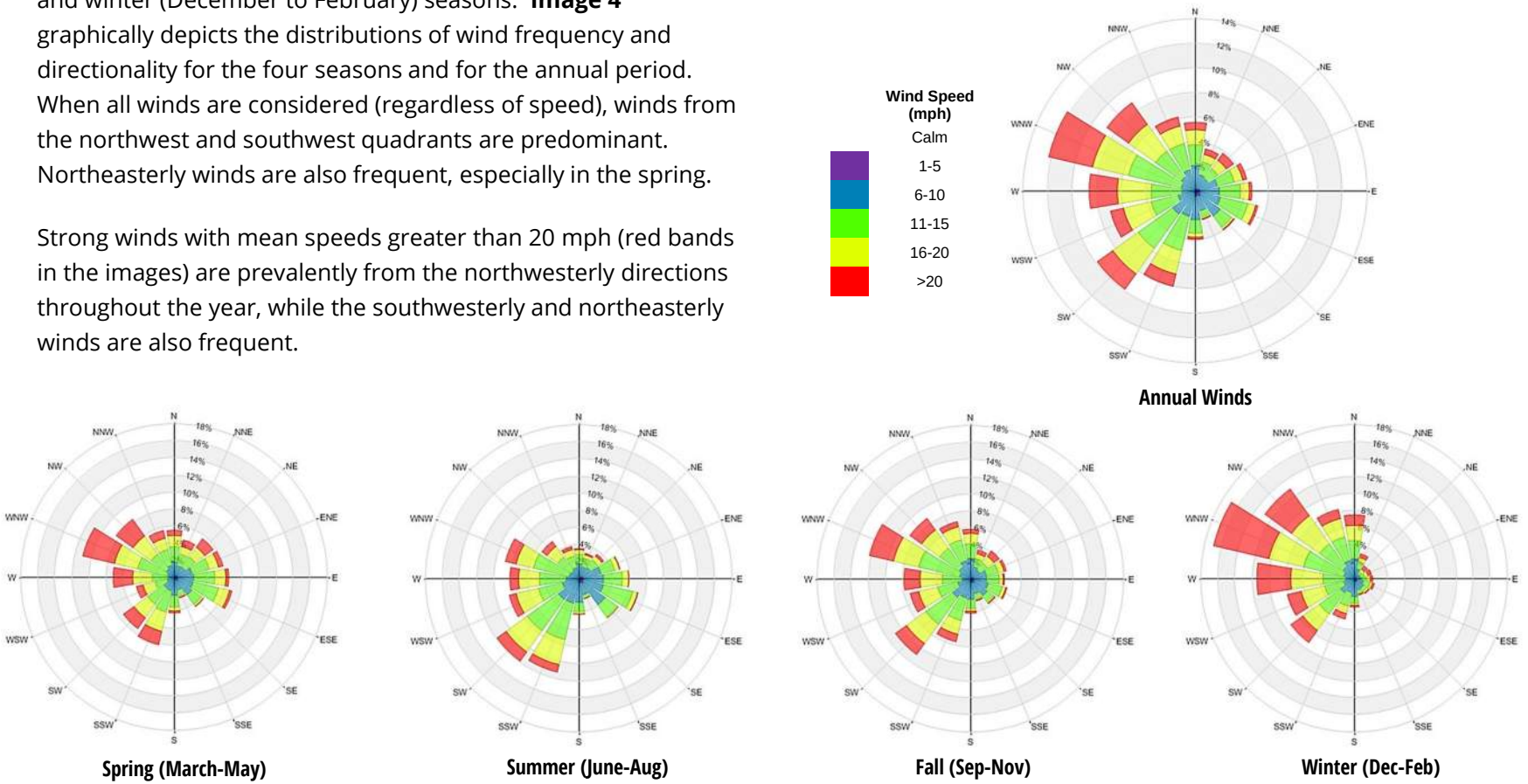


Image 4 – Directional Distribution of Winds Approaching Boston Logan International Airport (1990 – 2015)

BPDA WIND CRITERIA

The Boston Planning and Development Agency (BPDA) has adopted two standards for assessing the relative wind comfort of pedestrians.

First, the BPDA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time.

The second set of criteria used by the BPDA to determine the acceptability of specific locations is based on the work of Melbourne . This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows:

BPDA Mean Wind Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 and ≤ 27 mph
Comfortable for Walking	> 15 and ≤ 19 mph
Comfortable for Standing	> 12 and ≤ 15 mph
Comfortable for Sitting	≤ 12 mph

*Applicable to the hourly mean speed exceeded one percent of the time.

Pedestrians on sidewalks and parking lots will be active and wind speeds comfortable for walking are appropriate. Lower wind speeds comfortable for standing are desired for building entrances where people are apt to linger. For any outdoor amenity at and above grade, low wind speeds comfortable for sitting are desired in the summer, when it is typically in use.

The wind climate found in a typical location in Charlestown is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BDPA effective gust velocity criterion of 31 mph at most areas, while windier conditions may be expected near the corners of tall buildings exposed to the prevailing winds. However, without any mitigation measures, this wind climate is likely to be frequently unsuitable for more passive activities such as sitting.

Discussions related to pedestrian wind comfort and safety will be based on the annual wind climate. Typically the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds.

Background

Predicting wind speeds and occurrence frequencies is complicated. It involves the assessment of geometry, orientation, position and height of buildings on the site, surrounding buildings, upstream terrain and the local wind climate. Over the years, RWDI has conducted thousands of wind-tunnel model studies on pedestrian wind conditions around buildings, yielding a broad knowledge base. This knowledge has been incorporated into RWDI's proprietary software that allows, in many situations, for a qualitative, screening-level numerical estimation of pedestrian wind conditions without wind tunnel testing.

Tall buildings tend to intercept stronger winds at higher elevations and redirect them to the ground level. Such a Downwashing Flow (**Image 5a**) is the main cause for increased wind activity around tall buildings at the pedestrian level. Oblique winds also cause wind accelerations around the downwind building corner (**Image 5b**). If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable conditions.

Podium structures under towers are beneficial for wind control, as they reduce the direct impact of any downwashing winds from the towers to the grade (**Image 5c**). Similarly, stepping the windward façade (**5d**) is also a positive design strategy that can be used for wind control. However, increased wind activity will be created on the podium/ terraces.

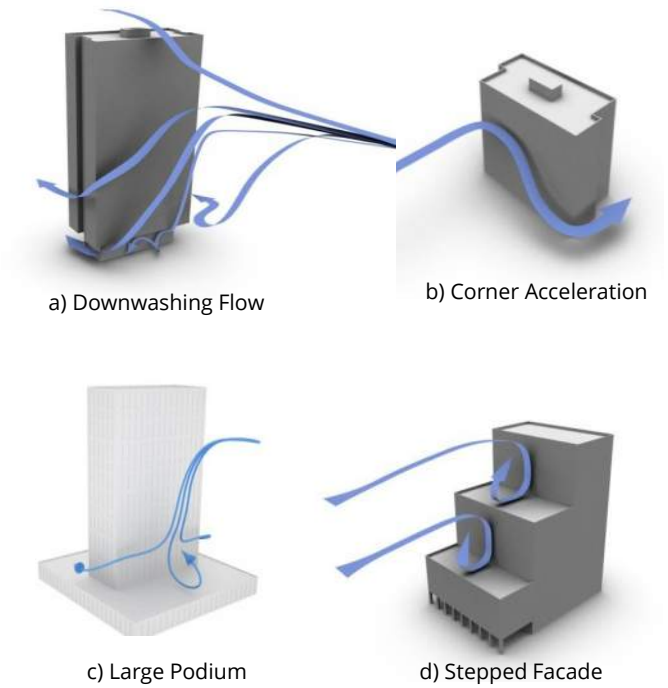


Image 5: Typical wind flow patterns

On-site Sidewalks

As shown in **Images 1 and 2**, the proposed development site is surrounded by relatively low buildings of similar height. Although it is exposed to the west with no buildings in the immediate surrounds, wind conditions around the existing buildings and sidewalks around the site are expected to be comfortable for the current use of the area.

The proposed building is exposed to the westerly winds and is expected to intercept winds from higher elevations and redirect these down to grade level (**Image 5a**), causing increased wind speeds around building corners (**Image 5b**). The resultant wind speeds, however, are expected to meet the effective gust criterion. Although the wind speeds around exposed building corners may become uncomfortable from time to time in the winter and spring seasons, they are predicted to be generally suitable for pedestrian walking. The proposed trees along sidewalks (**Image 3 and 6**), if coniferous or marcescent, would improve the wind conditions throughout the year.

Entrances of Building 100

Entrances to the proposed building are expected to be located along the north face. The winds mentioned in the previous paragraph could have an adverse effect on the sidewalks close to the study building along this face; however, the set back and canopy at this location is a positive design feature and is expected to shelter these entrances from the downwashing winds (**Image 6**).

The proposed landscape plan along the north face of the building is expected to protect this area further (**Image 3**). The trees shown should be evergreen or marcescent to ensure protection remains for the winter months (examples in **Image 7**).

Image 6: Northwest and Westerly winds

PEDESTRIAN WIND CONDITIONS

Off-site Walkways and Parking Lot

Pedestrians on walkways and parking lots are typically active and can tolerate relatively high wind speeds. This criterion is predicted to be satisfied in the surrounding areas for all seasons.

Future Buildings

The future building planned to the north is expected to provide shelter to Building 100 from northerly winds. It is not expected to affect the southwesterly winds; however, winds from the northeast and northwest may become channeled between the two buildings and cause an increase in wind activity.

Depending upon the size and design of the adjacent building, the increased winds may cause some areas to become uncomfortable or unacceptable. This should be handled in the design of the future building.

PEDESTRIAN WIND CONDITIONS

Image 7: Examples of Evergreen Landscaping
RWDI Project #1800157
December 1, 2017

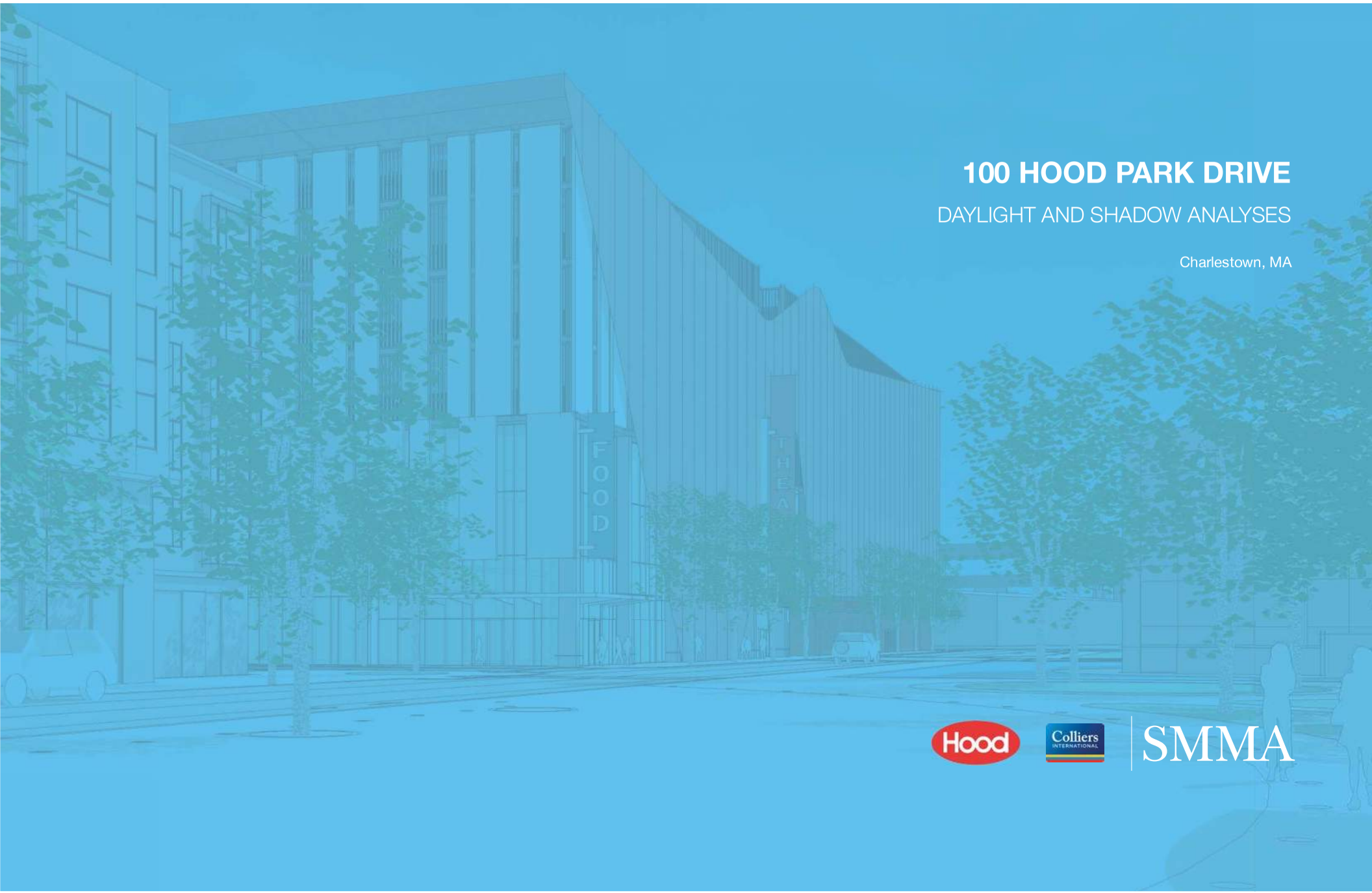
SUMMARY

Wind conditions on and around the proposed Hood Park, Building 100, development are discussed in this report, based on the local wind climate, surrounding buildings and our past experience with wind tunnel testing of similar buildings.

The proposed project is not expected to have a negative impact on the wind conditions on the surrounding sidewalks and buildings. Wind speeds on and around the project are predicted to meet the effective gust criterion with the addition of Building 100. This may change with the addition of the future buildings.

Landscaping is recommended as a wind control measure if required once the proposed building is in place. Photo examples are provided in the report for consideration.

Wind tunnel tests should be conducted at a later design stage to quantify these wind conditions and to develop wind control solutions.



100 HOOD PARK DRIVE

DAYLIGHT AND SHADOW ANALYSES

Charlestown, MA

Hood | Colliers INTERNATIONAL | SMMA

Shadow

Introduction and Methodology

A shadow impact analysis was conducted to investigate shadow impacts from the Project during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and winter solstice (December 21). Shadow studies were also conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox. The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. Additionally a base line shadow impact analysis of a similar footprint building at 75' tall was conducted for comparison.

The shadow analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures SA-1 to SA-14.

Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the Northwest. A small shadow will be cast onto Bunker Hill Industrial Park Drive. No new shadow will be cast onto public open space.

At 12:00 p.m., new shadow from the Project will be cast to the North. No new shadow will be cast onto nearby bus stops or public open space.

At 3:00 p.m., new shadow from the Project will be cast to the Northwest. No new shadow will be cast onto public open space.

Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow from the Project will be cast to the Northwest.

No new shadow will be cast onto public open space.

At 12:00 p.m., new shadow from the Project will be cast to the North. No new shadow will be cast onto nearby bus stops or public open space.

At 3:00 p.m., new shadow from the Project will be cast to the East. No new shadow will be cast onto public open space.

At 6:00 p.m., new shadow from the Project will be cast to the East. New shadow will be cast onto B Street, C Street and Bunker Hill Industrial Park Drive. No new shadow will be cast onto public open space.

Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal Equinox, new shadow from the Project will be cast to the Northwest. No new shadow will be cast onto public open space.

At 12:00 p.m., new shadow from the Project will be cast to the North. No new shadow will be cast onto nearby bus stops or public open space.

At 3:00 p.m., new shadow from the Project will be cast to the East. No new shadow will be cast onto public open space.

At 6:00 p.m., new shadow from the Project will be cast to the East. New shadow will be cast across Rutherford Avenue, Main Street, Russell Street, Bunker Hill Street and their sidewalks. New shadow will be cast onto Main Street line bus stops, however no new shadow will be cast onto public open space. New shadow will be cast onto B Street, C Street and Bunker Hill Industrial Park Drive. No new shadow will be cast onto public open space.

Winter Solstice (December 21)

The sun angle during the winter solstice is lower than in any other season, causing the shadows in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m. during the winter solstice new shadow from the Project will be cast to the

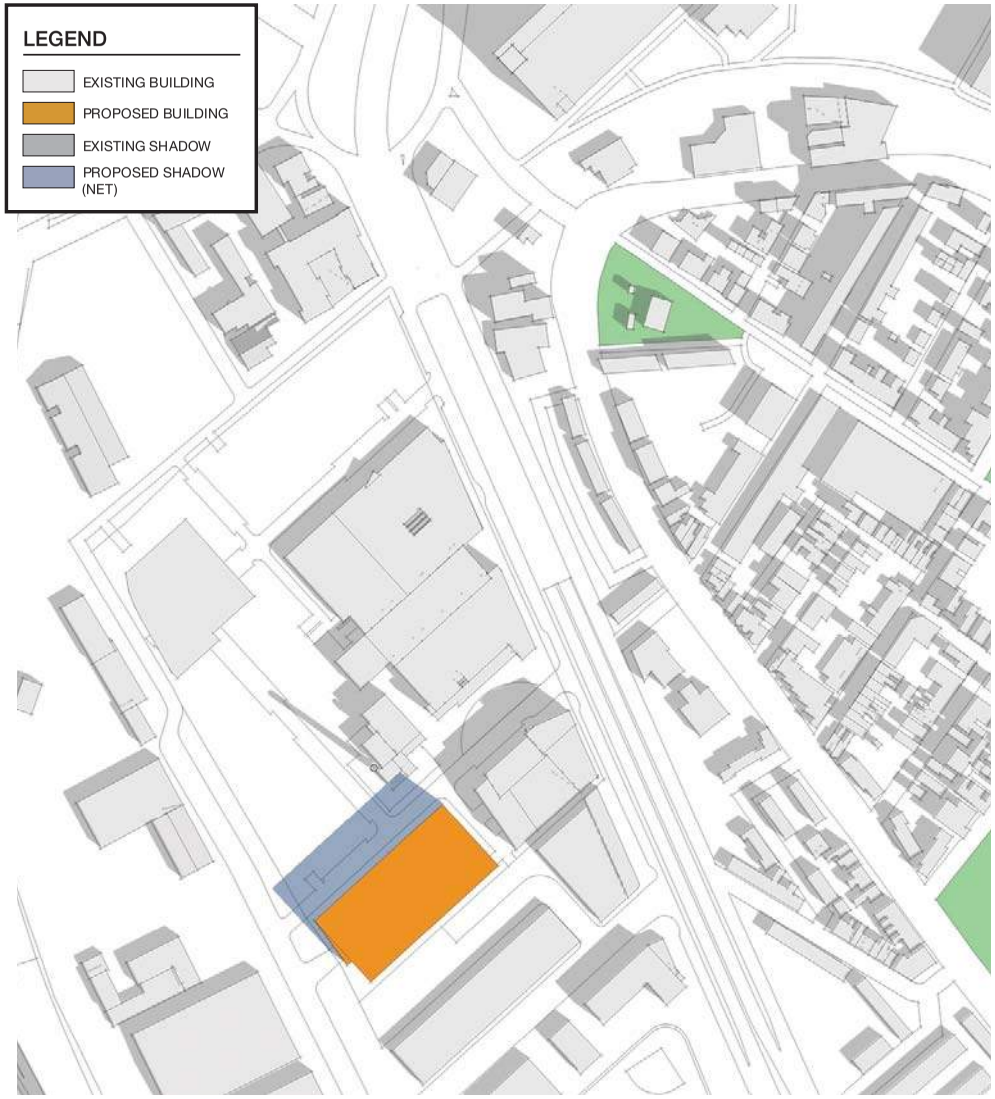
Northwest. No new shadow will be cast onto public open space.

At 12:00 p.m., new shadow from the Project will be cast to the North. No new shadow will be cast onto nearby bus stops or public open space.

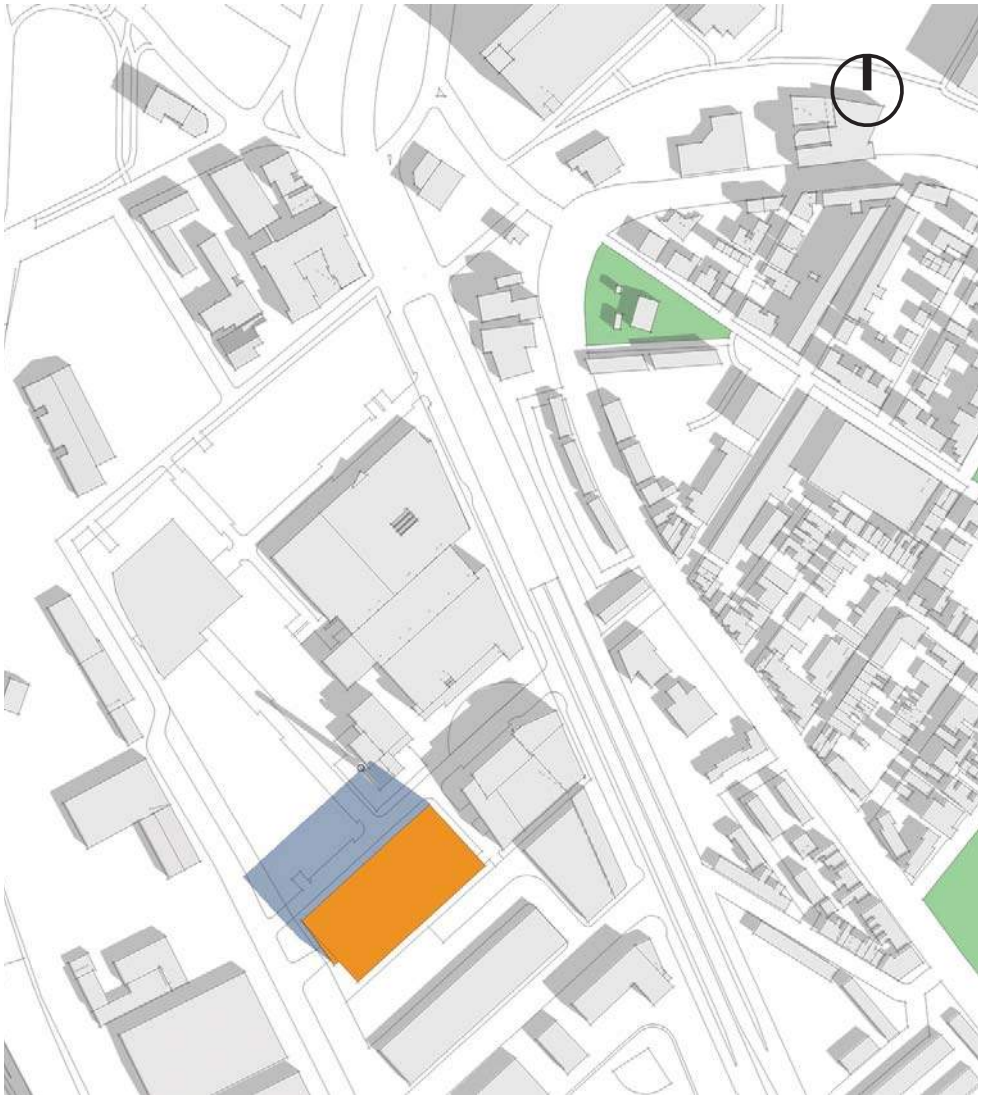
At 3:00 p.m., new shadow from the Project will be cast to the Northeast. New shadow will be cast across Rutherford Avenue and its sidewalks. No new shadow will be cast onto public open space.

Conclusion

Typical of a densely built urban area, some new shadow will be cast on the surrounding streetscapes and neighborhoods. No new shadows from the Proposed Project will fall on any of the surrounding area's existing open spaces.



March 21 9:00 AM - 75' Height Base Line



March 21 9:00 AM - Proposed Height

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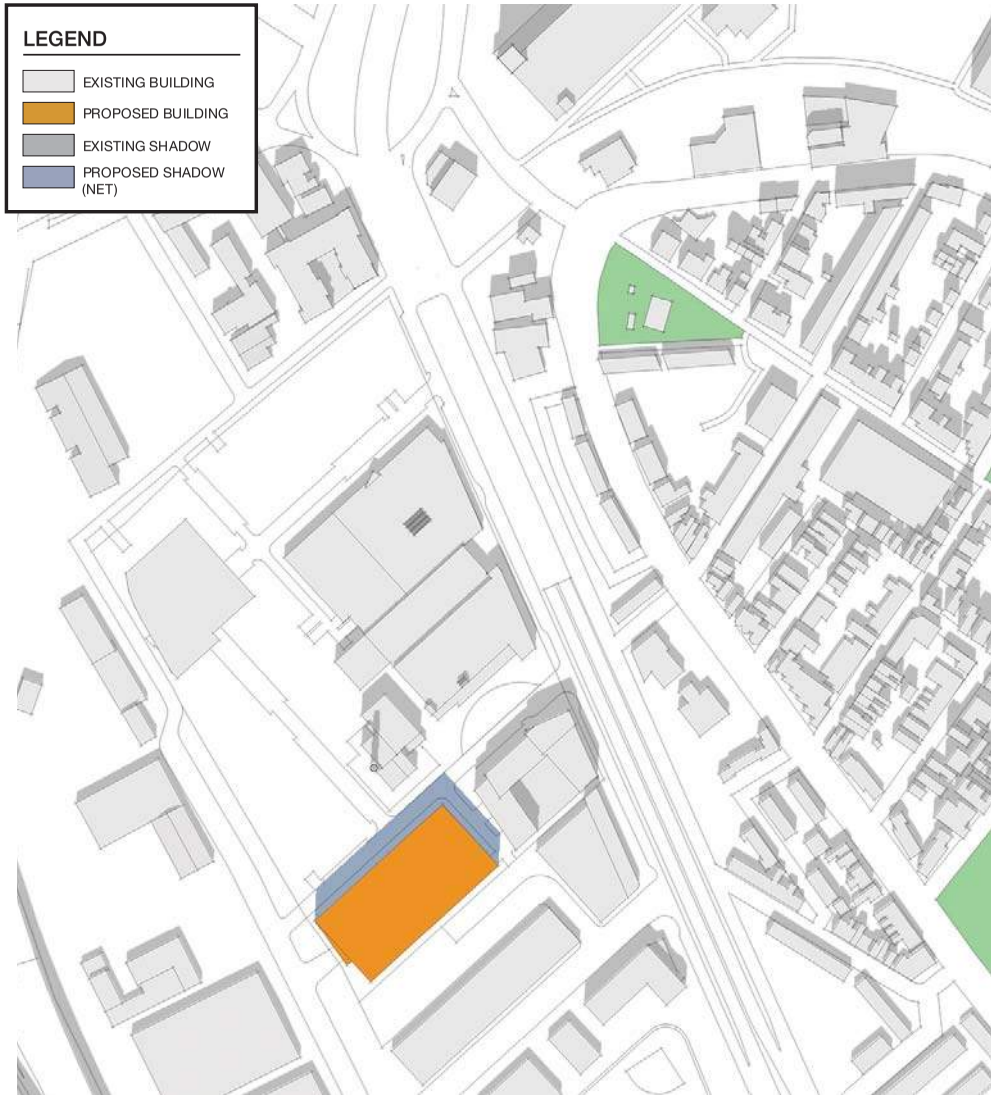
Shadow Study Analysis

Charlestown, Massachusetts

Hood Colliers International SMMA



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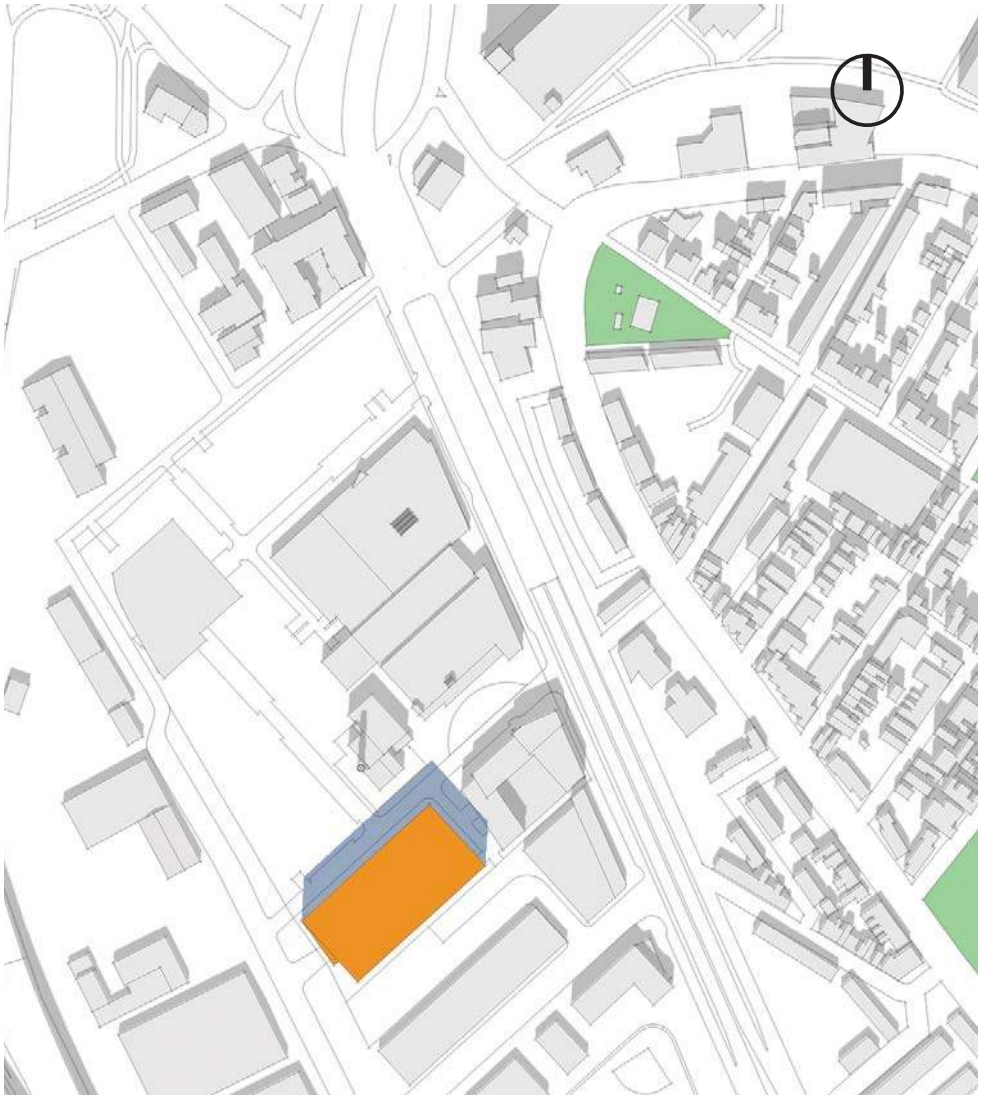

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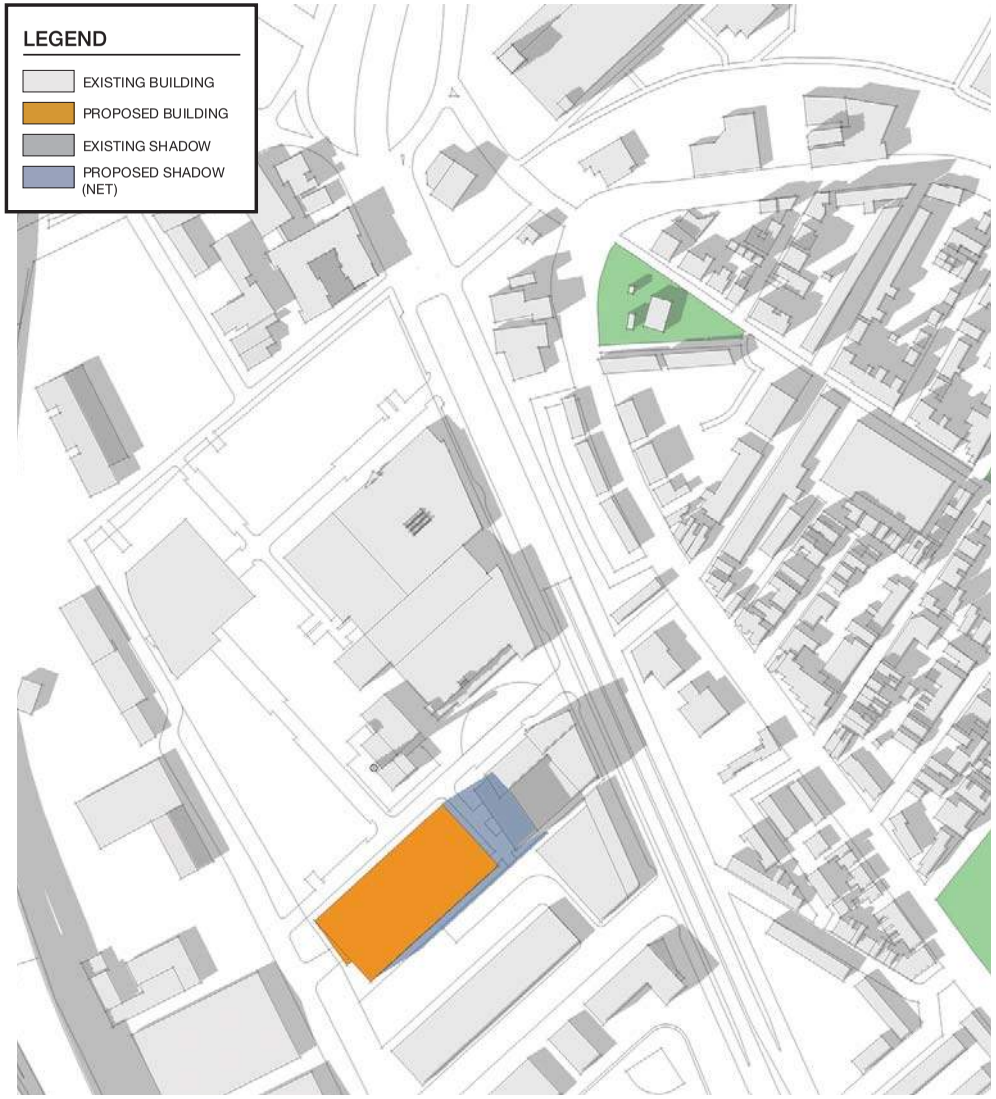

March 21 3:00 PM - 75' Height Base Line

March 21 3:00 PM - Proposed Height

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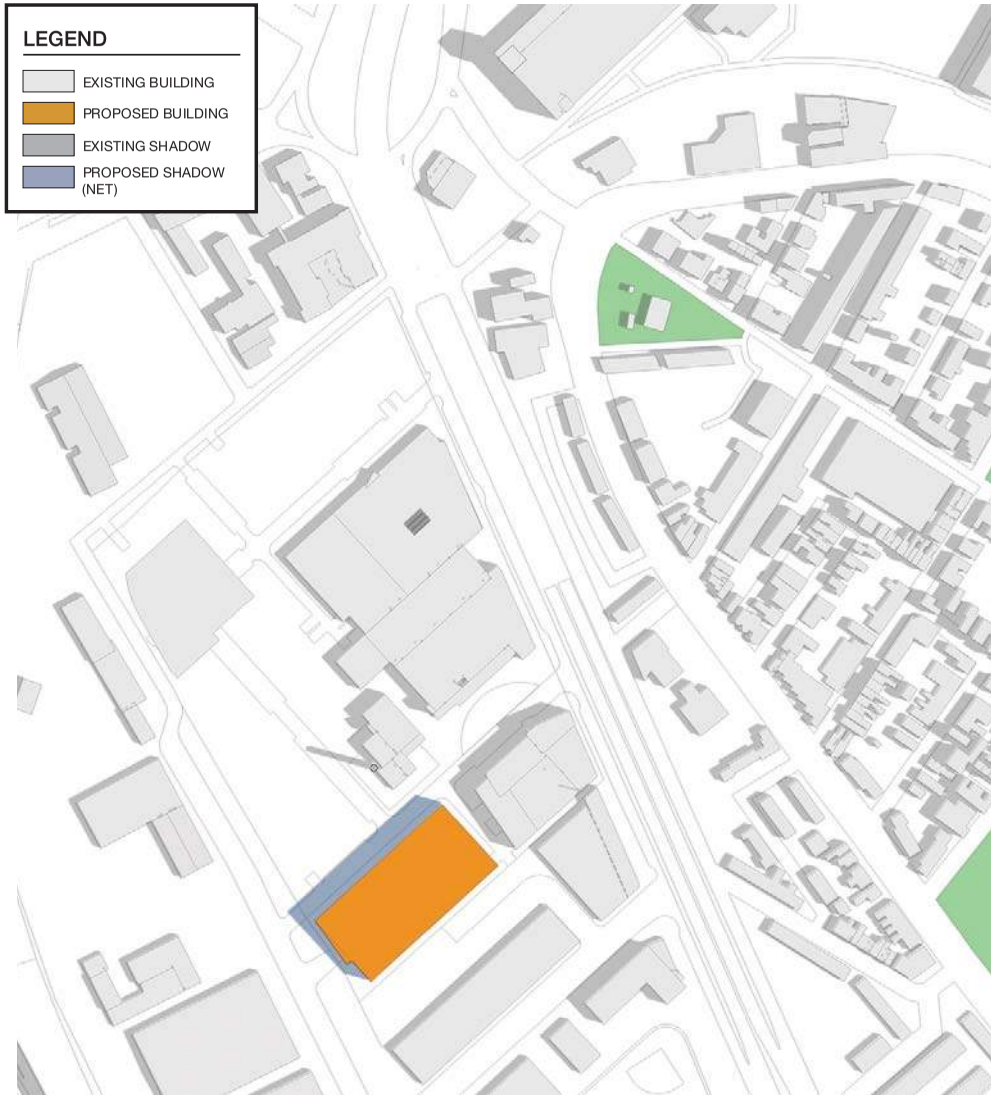
Shadow Study Analysis

Charlestown, Massachusetts

Hood Colliers INTERNATIONAL SMMA



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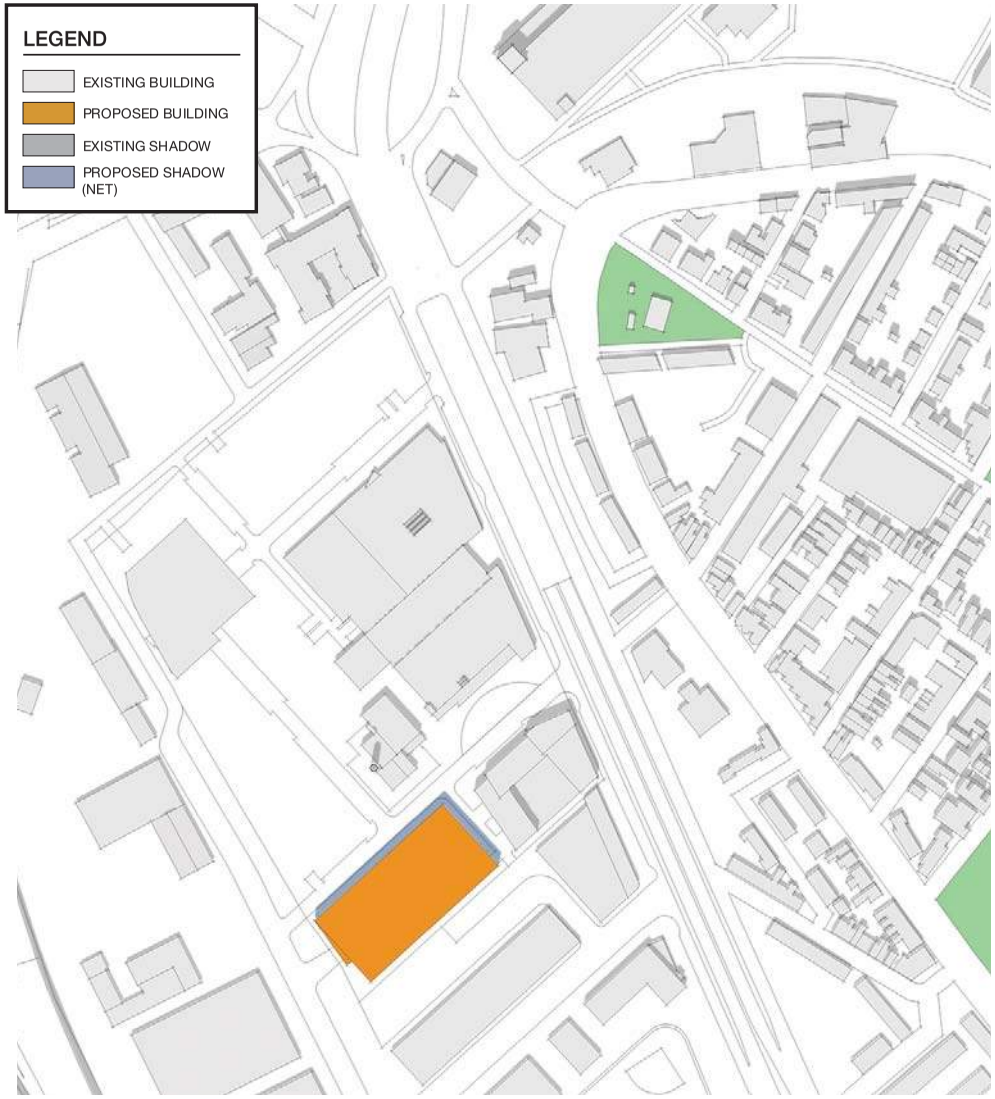
June 21 9:00 AM - Proposed Height



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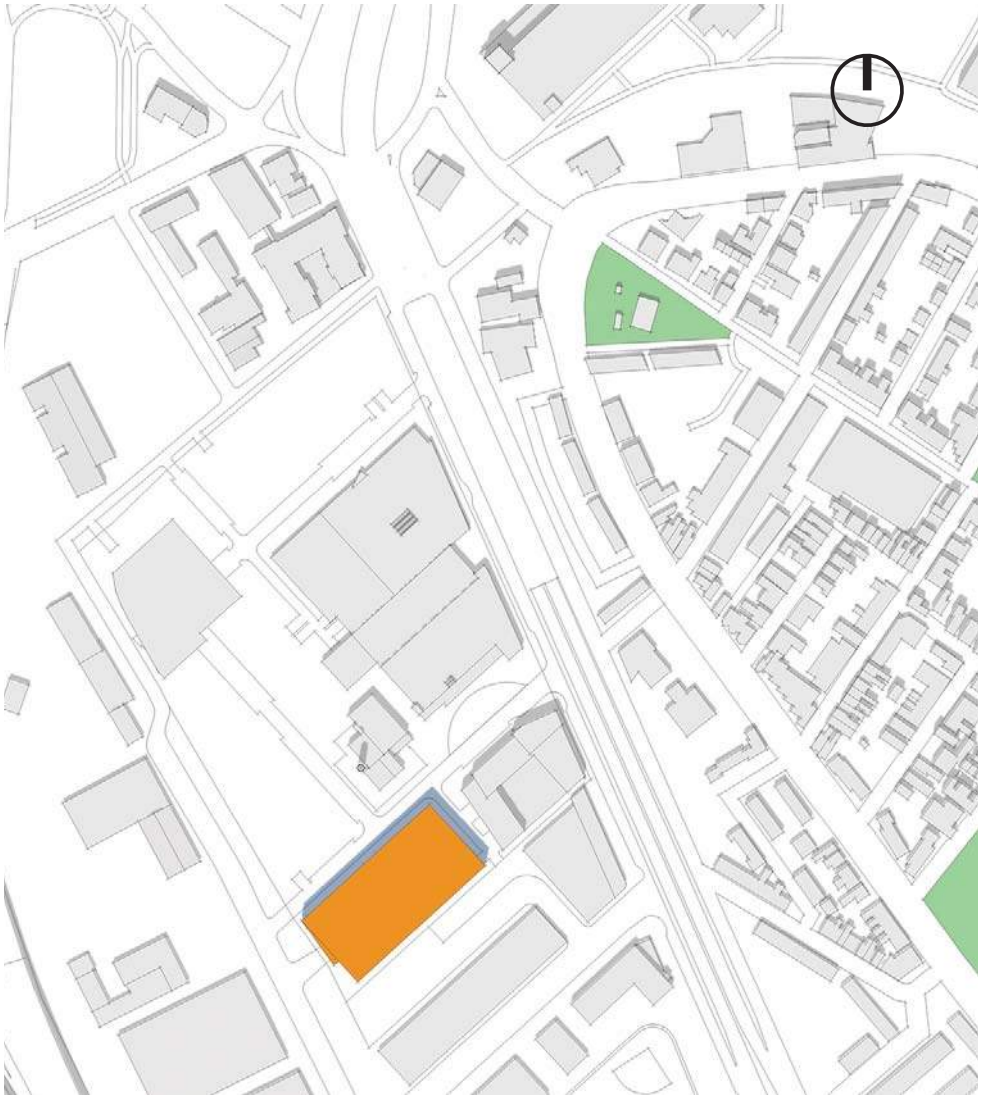

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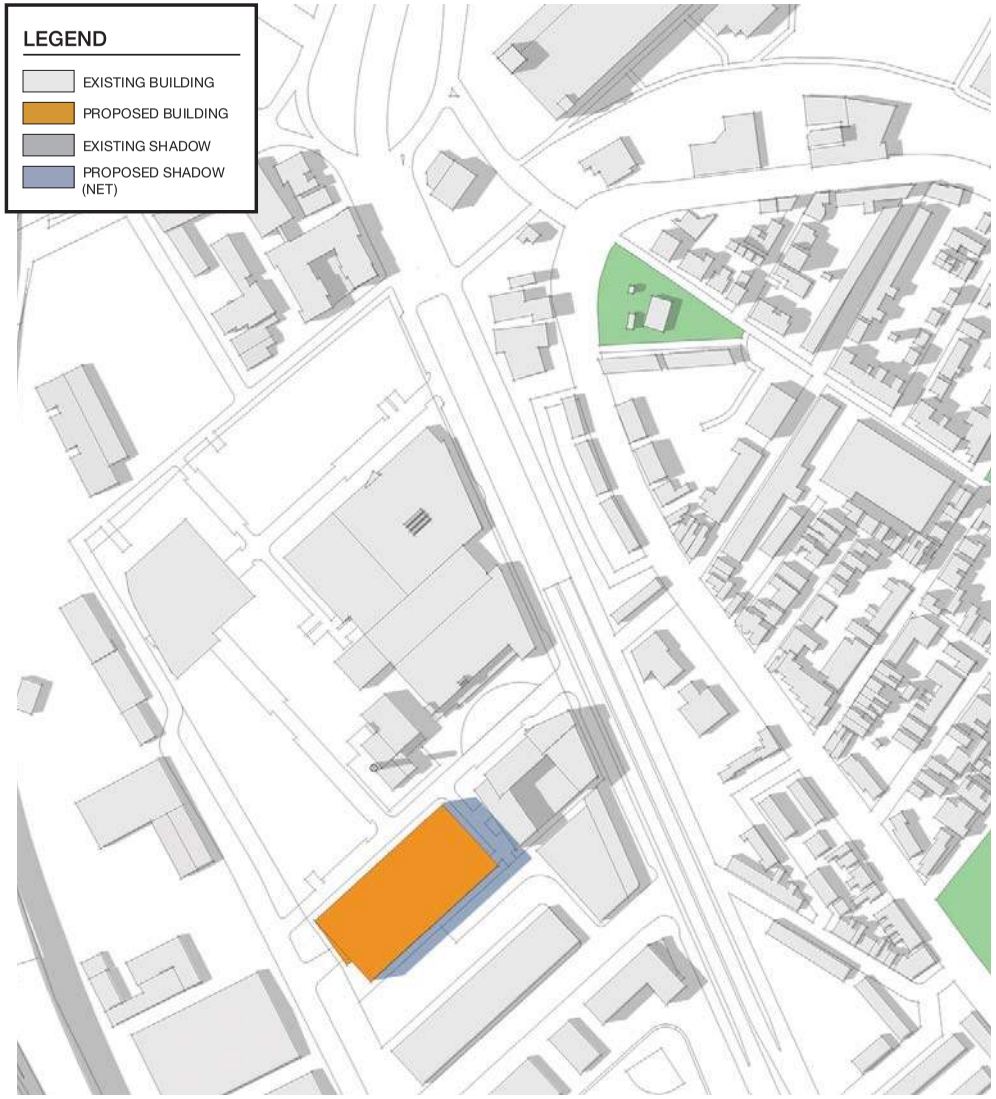
Shadow Study Analysis

Charlestown, Massachusetts



June 21 3:00 PM - 75' Height Base Line

June 21 3:00 PM - Proposed Height

June 21 6:00 PM - 75' Height Base Line

June 21 6:00 PM - Proposed Height

Hood Park Notice of Project Change

Shadow Study Analysis

Charlestown, Massachusetts

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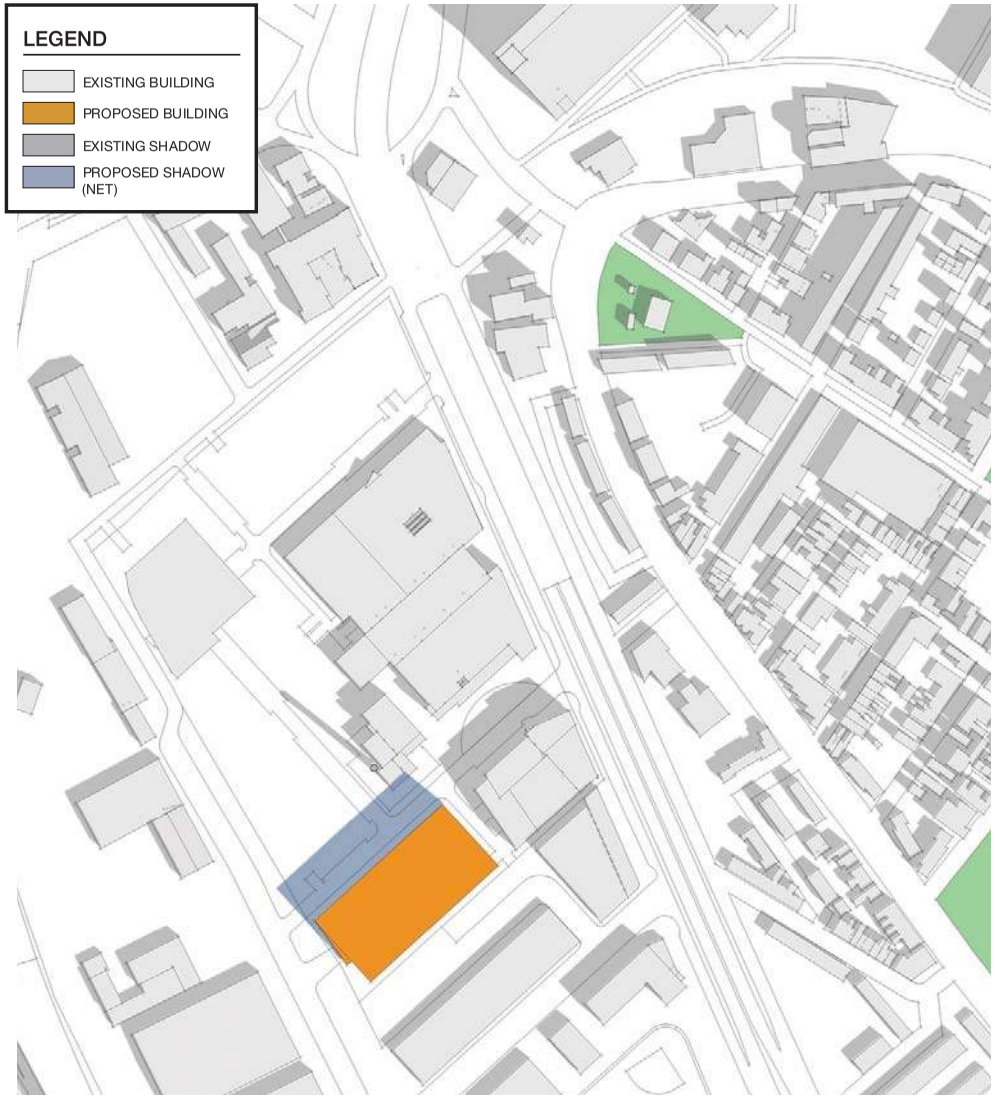

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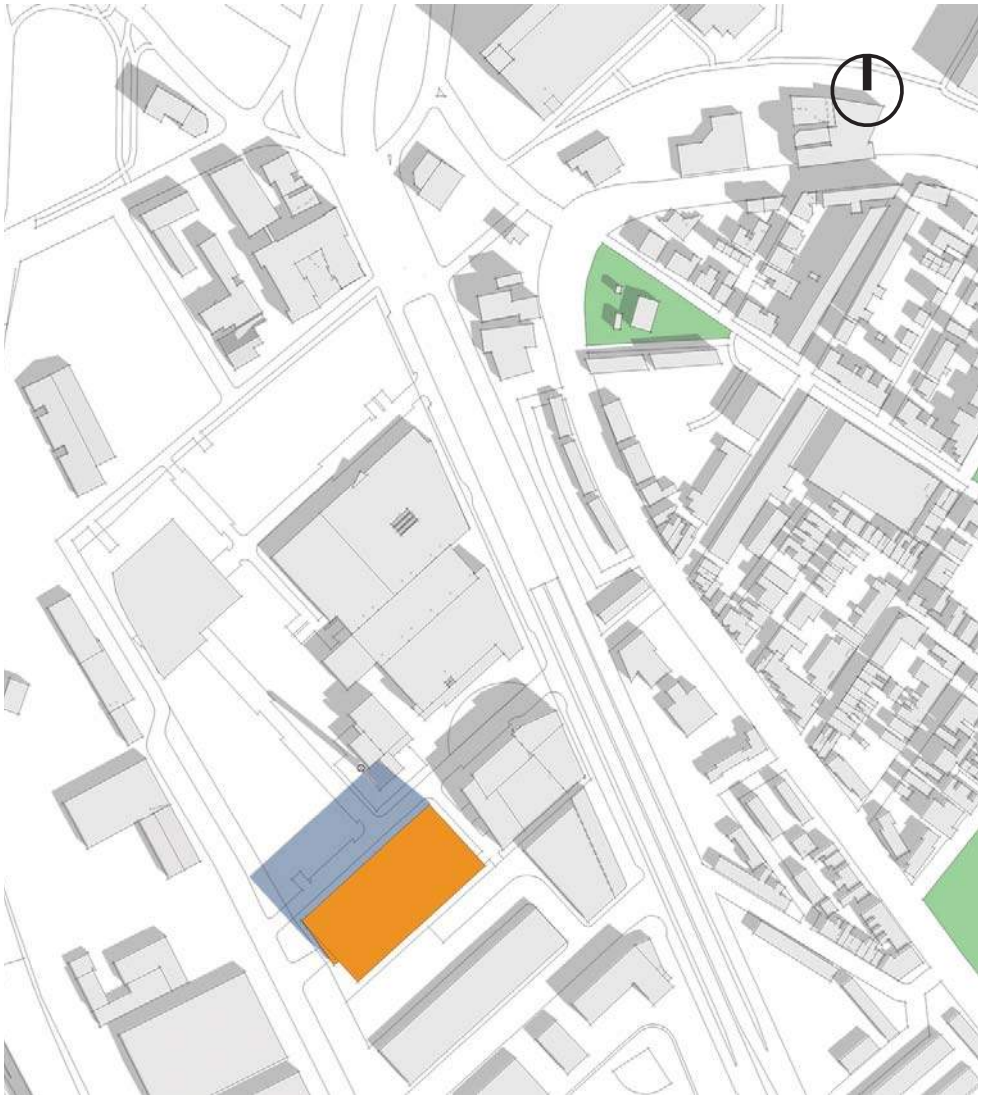

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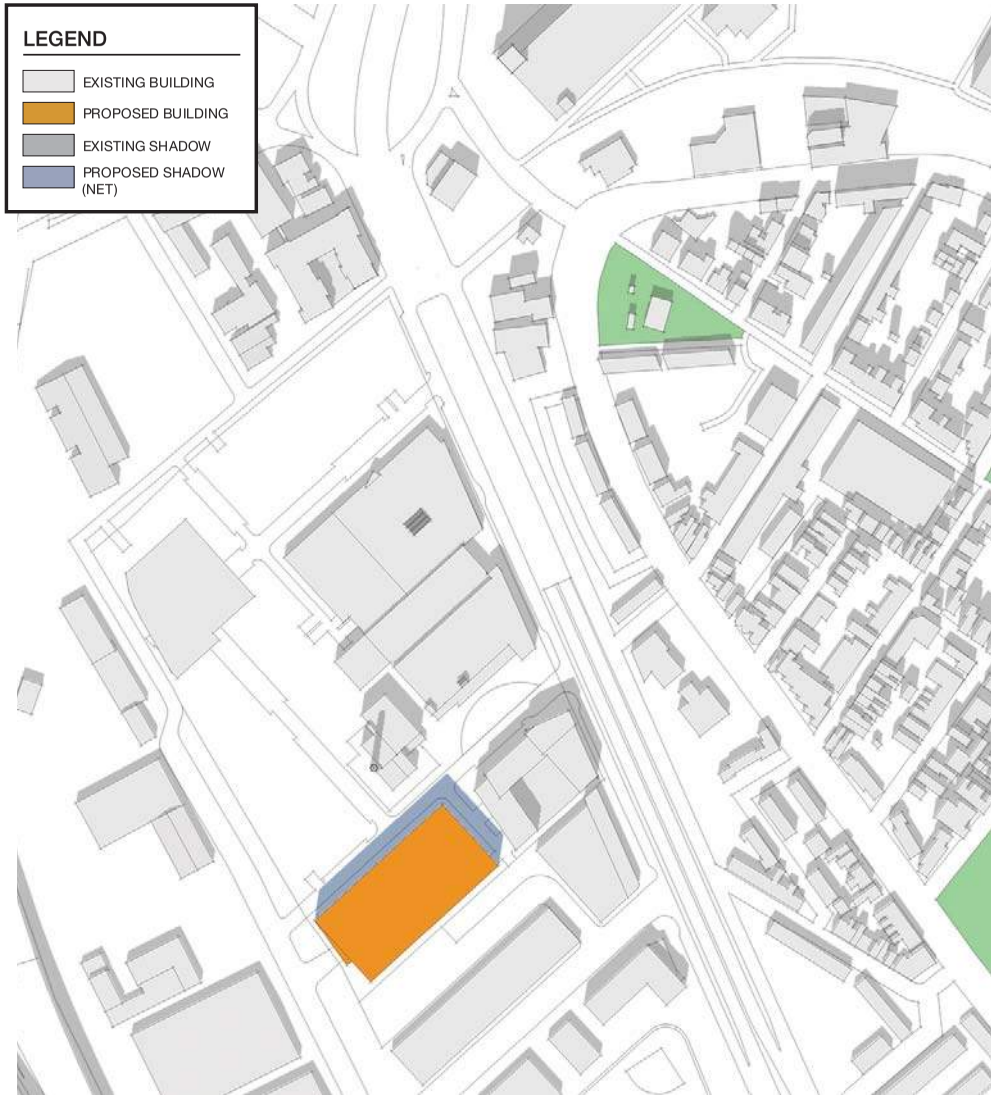

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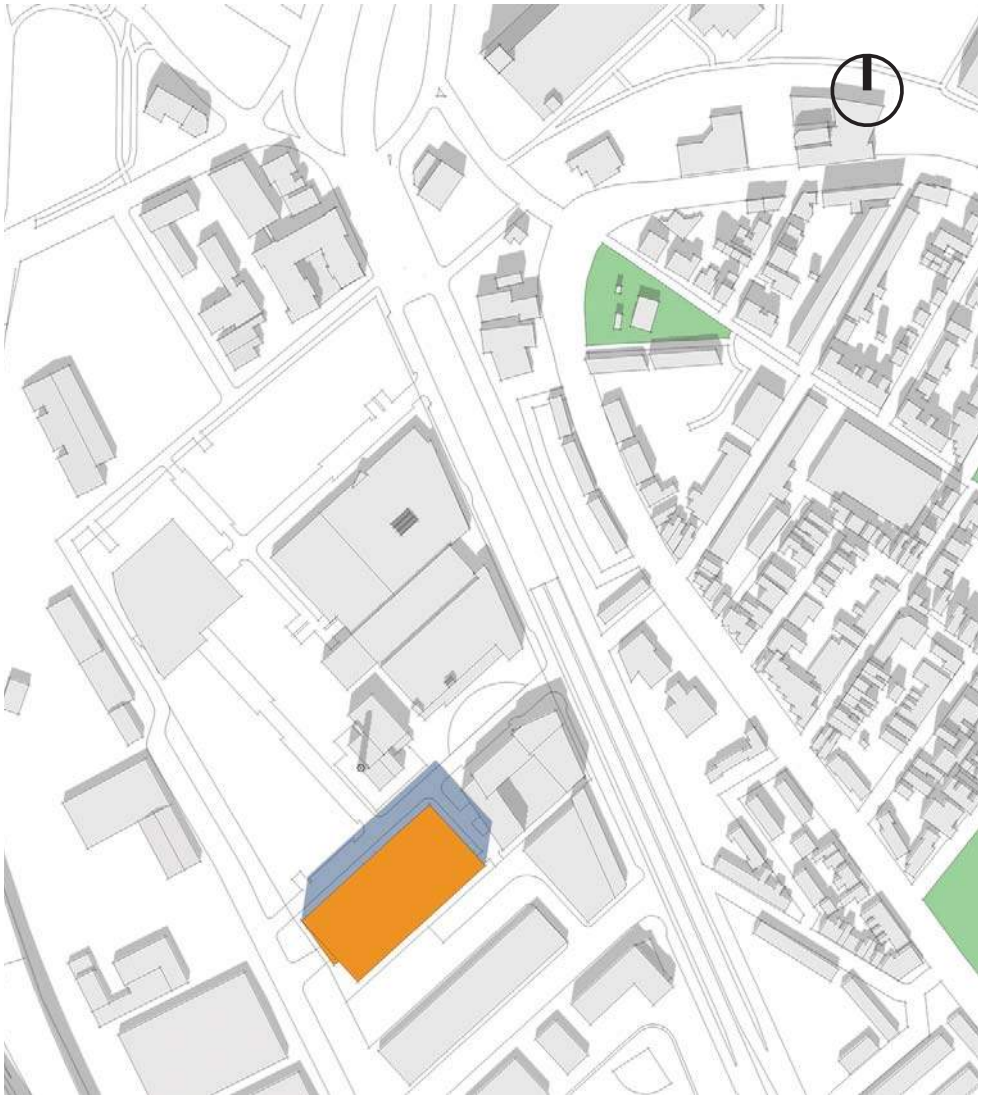

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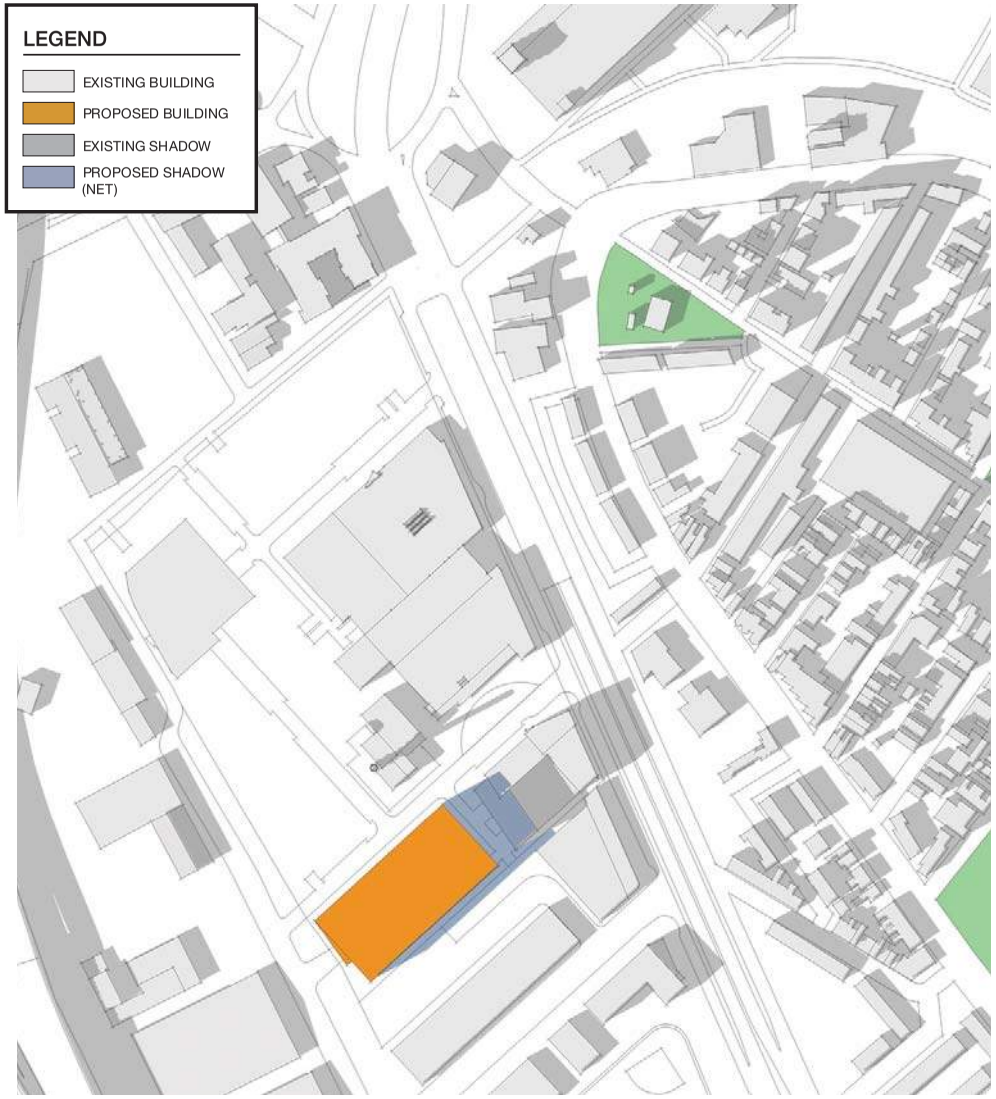
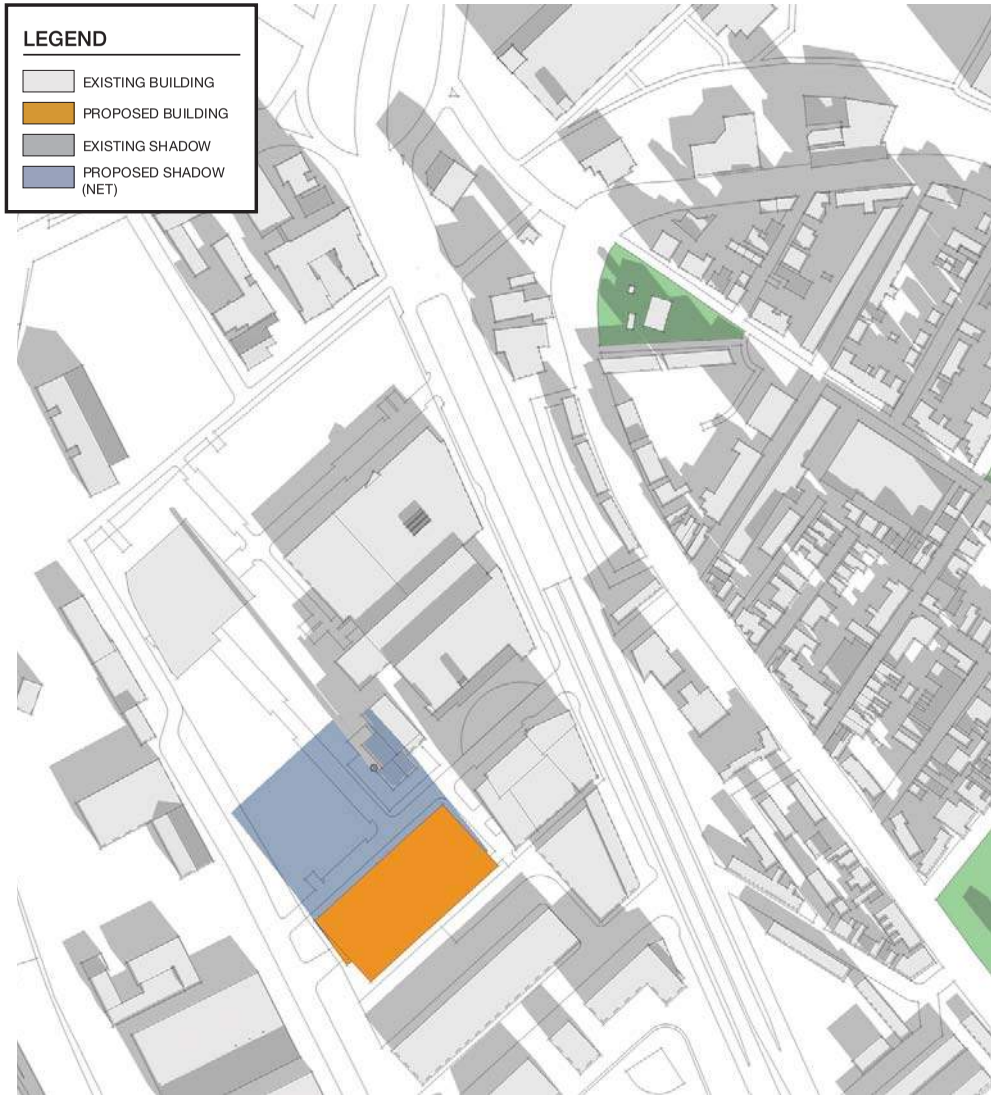


September 21 3:00 PM - 75' Height Base Line

September 21 3:00 PM - Proposed Height

September 21 6:00 PM - 75' Height Base Line

September 21 6:00 PM - Proposed Height



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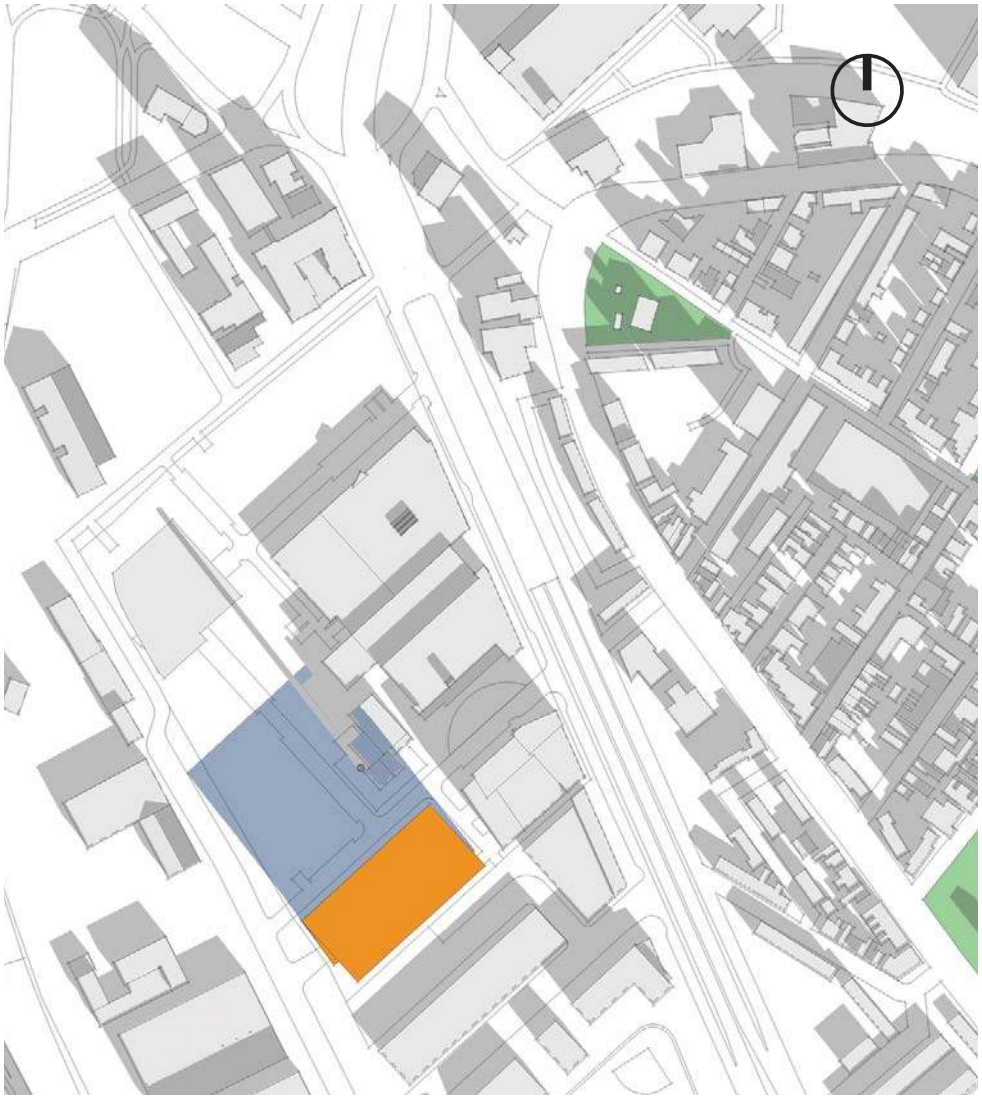

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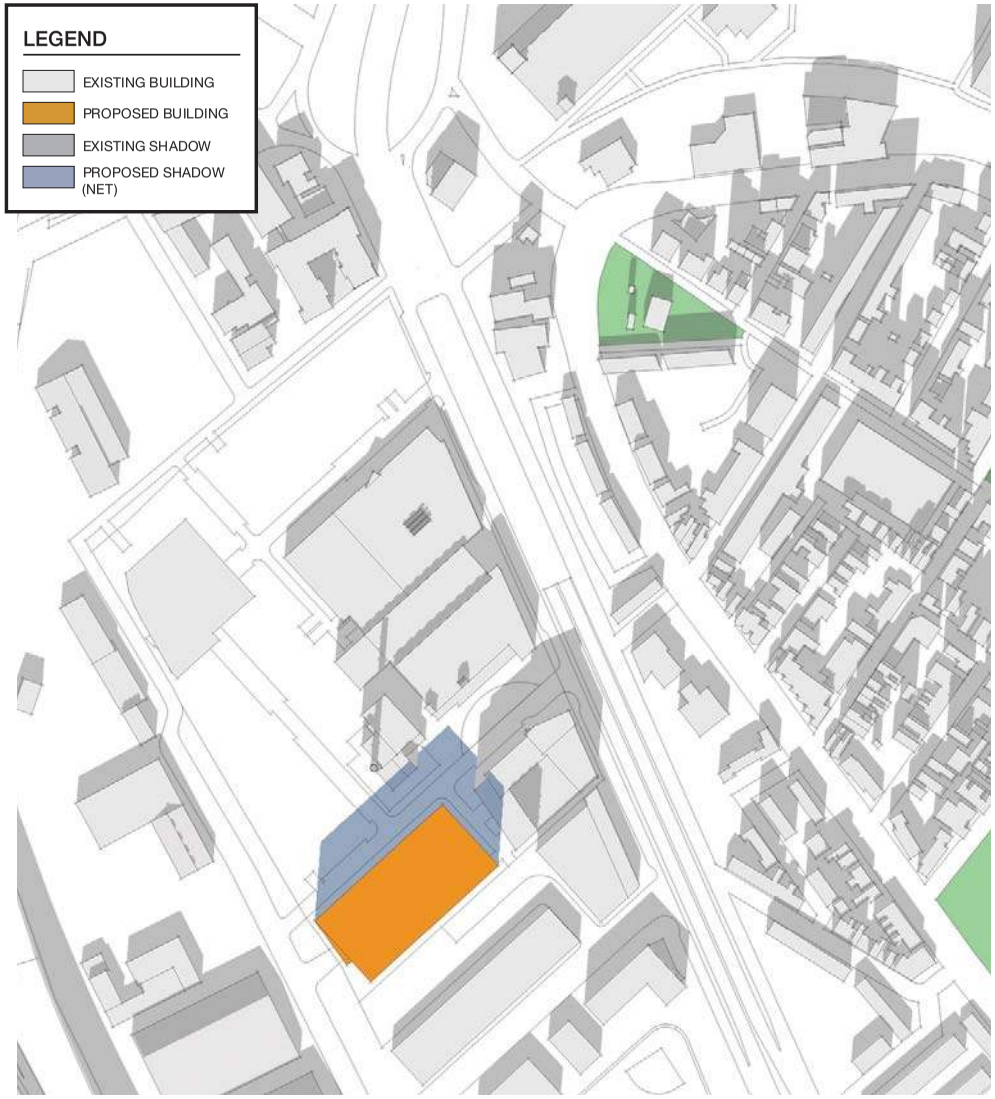

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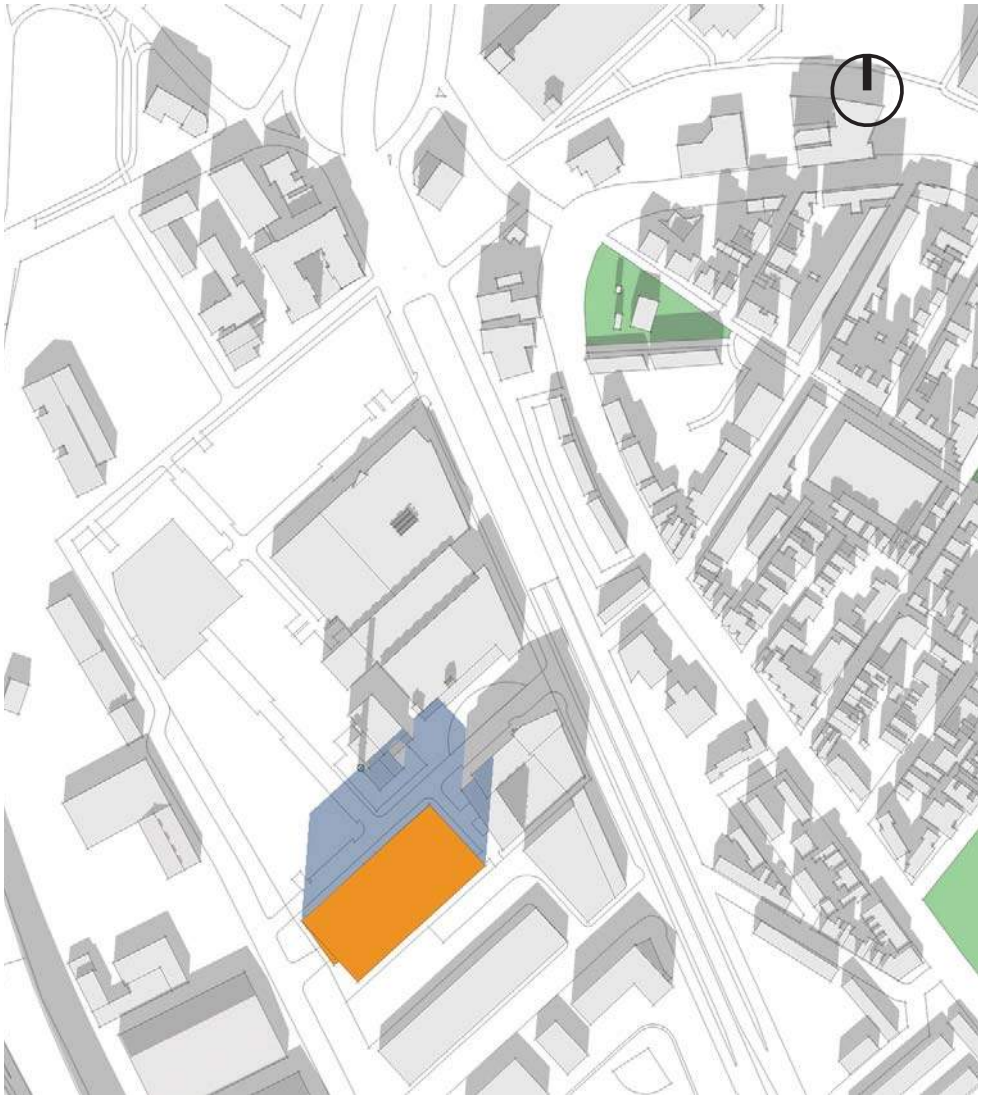

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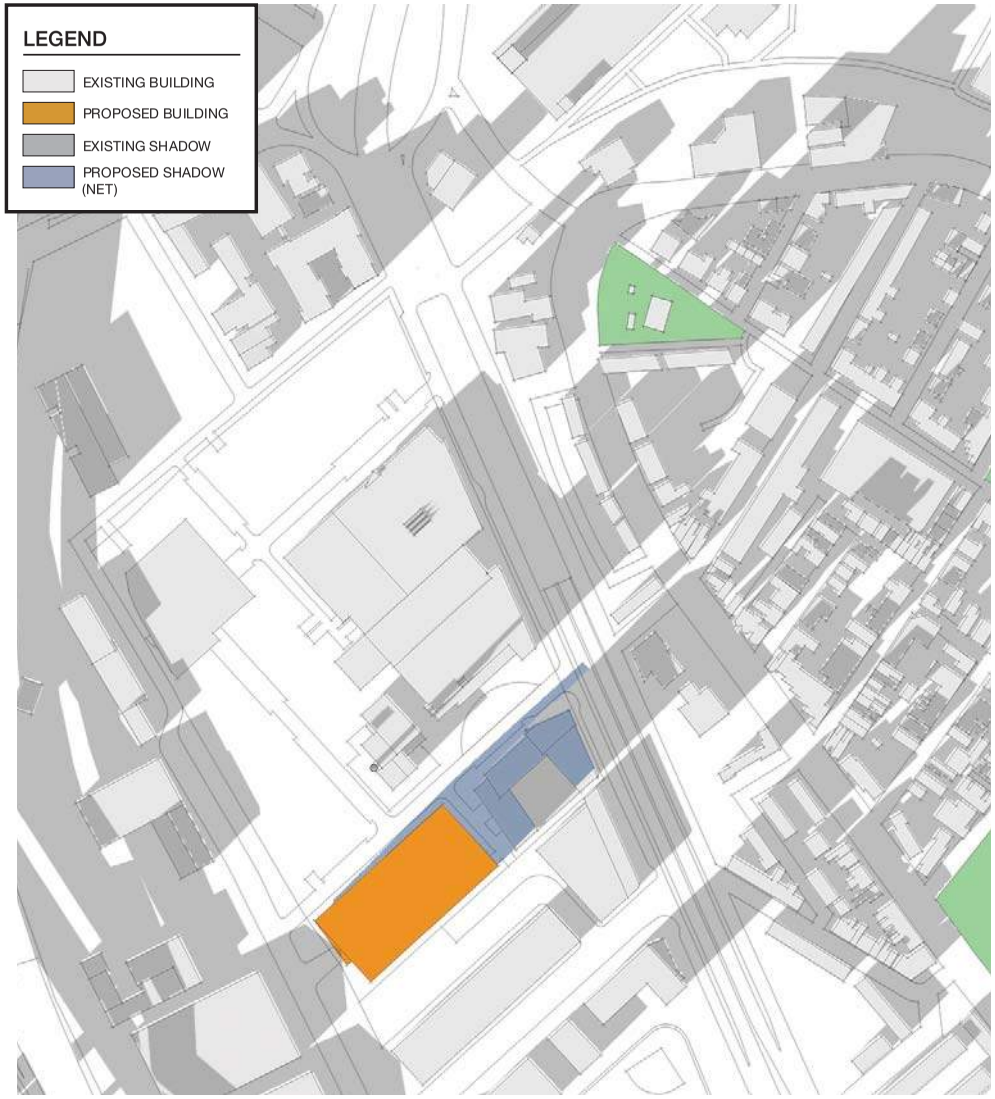

December 21 3:00 PM - 75' Height Base Line

December 21 3:00 PM - Proposed Height

Hood Park Notice of Project Change

Shadow Study Analysis

Charlestown, Massachusetts

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Daylight Analysis

100 Hood Park Drive

Introduction

SMMA performed a Daylight Analysis using the Boston Redevelopment Authority Daylight Analysis ("BRADA") computer program to estimate the amount of daylight reaching public and private roadways adjacent to the proposed project. In accordance with the conditions of the Hood Park PDA, the analysis contrasted the proposed project with existing context and with a building in the same location as the proposed project at a building height of 75 feet (baseline scenario).

The three viewpoints were chosen at the following locations to evaluate daylight obstruction:

- **Viewpoint 1** - View from Hood Park Drive (private roadway) looking south at the north proposed building façade.
- **Viewpoint 2** - View from Chimney Court (private roadway) looking west at the east proposed building façade.
- **Viewpoint 3** - View from Bunker Hill Industrial Park Drive (public roadway) looking east at the west proposed building façade.

The project site currently consists of parking lots and is adjacent to the 480 Rutherford Avenue building currently under construction. Viewpoint 1 models the 480 Rutherford Avenue building under existing conditions. Viewpoint 2 is located along the internal circulation Chimney Court in lieu of the Rutherford Avenue public right-of-way because the BRADA software limits the building setback distance to 200 feet presuming buildings at that distance will not impact daylight obstruction. The east proposed building façade is located approximately 300 feet from Rutherford Avenue. Similarly, the 480 Rutherford Avenue building was not modeled in Viewpoint 3 existing conditions because it exceeds the building setback distance. For the purposes of this analysis, it is assumed there is zero daylight obstruction under existing conditions at Viewpoint Locations 1 and 2.

Results

The results for each viewpoint under each scenario are described in Table 1. Figure 1 illustrates the viewpoint locations and BRADA results for each analysis.

Table 1 – Daylight Obstruction Values

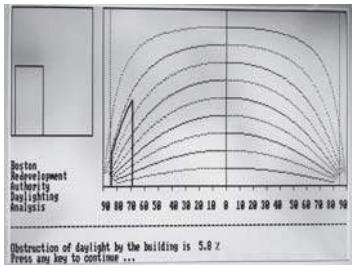
Viewpoint Location	Viewpoint Description	Existing Conditions	Baseline Scenario (75' Building Height)	Proposed Project
1	Hood Park Drive looking south at north building façade	5.8%	52.1%	57.1%
2	Chimney Court looking west at east building façade	—	76.1%	82.3%
3	Bunker Hill Industrial Park Drive looking east at west building façade	—	28.4%	37.5%

Conclusion

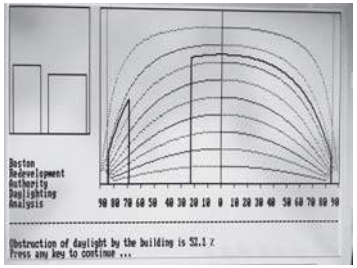
The results of the BRADA daylight analysis indicate that the proposed project building height will not obstruct daylight to adjacent roadways substantially more than the baseline scenario building height of 75 feet.

Viewpoint 1 - Hood Park Drive facing South

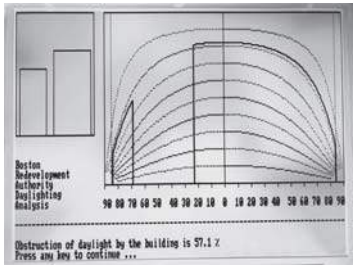
Existing Conditions



Baseline Scenario

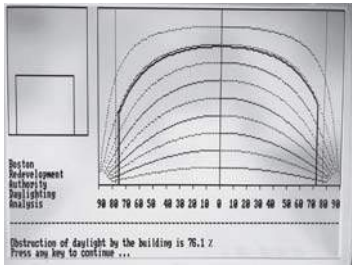


Proposed Project

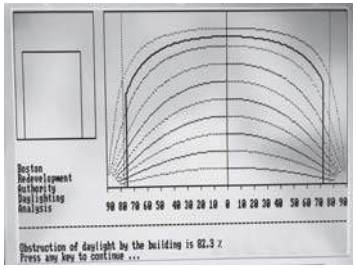


Viewpoint 2 - Chimney Court facing West

Baseline Scenario

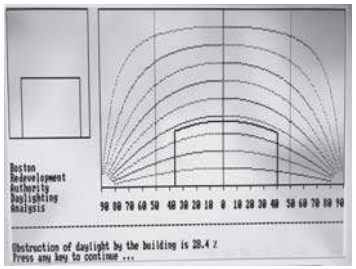


Proposed Project

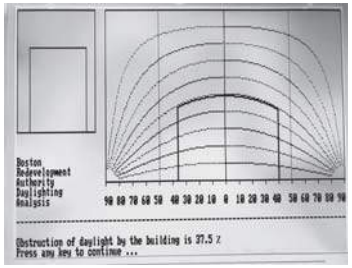


Viewpoint 3 - Bunker Hill Industrial Park Drive facing East

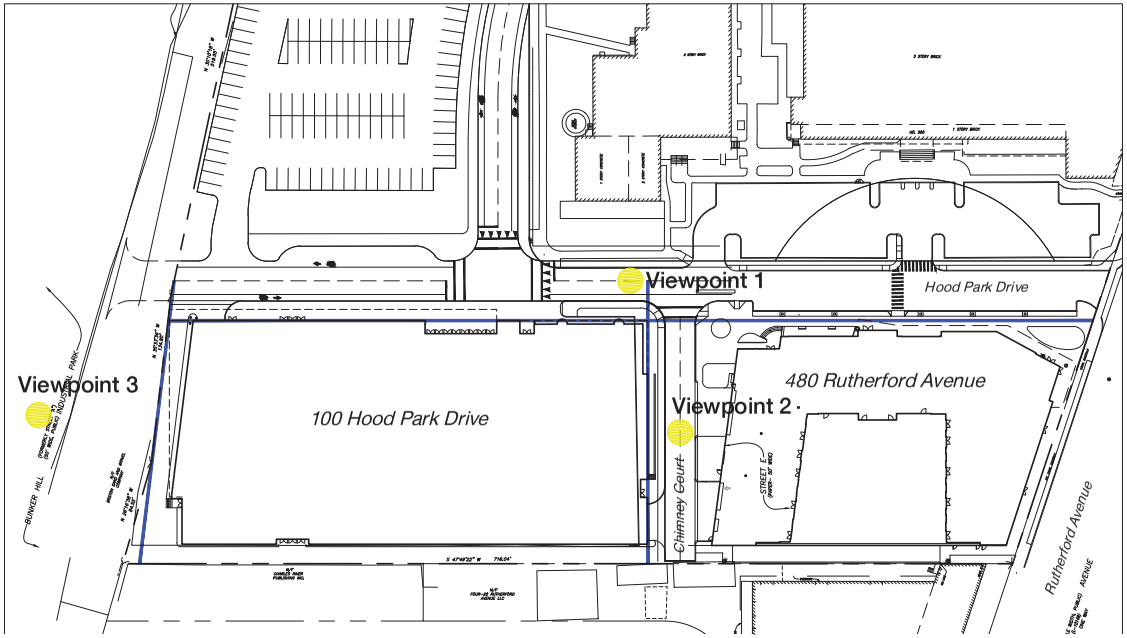
Baseline Scenario

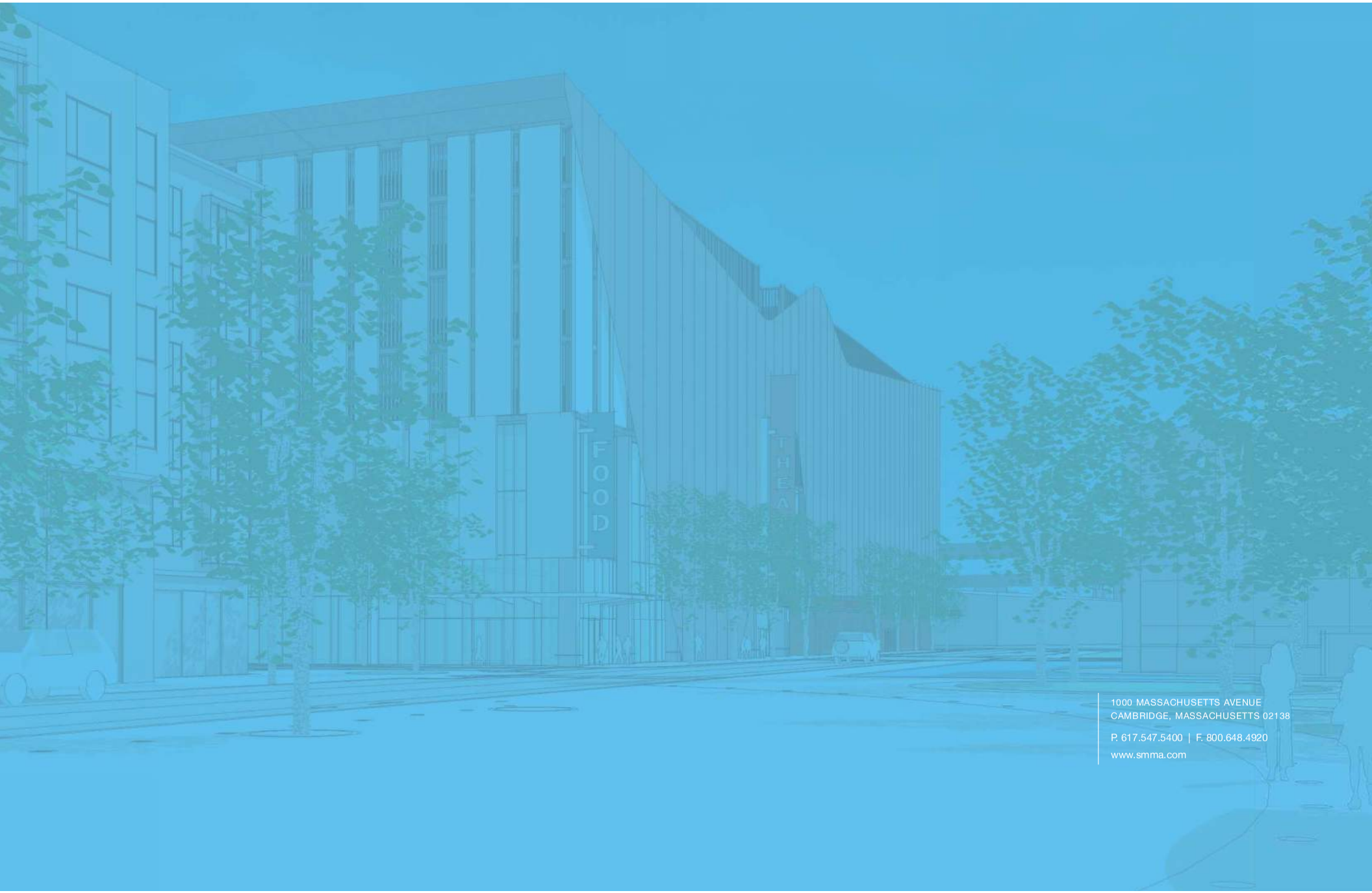


Proposed Project



Key Plan





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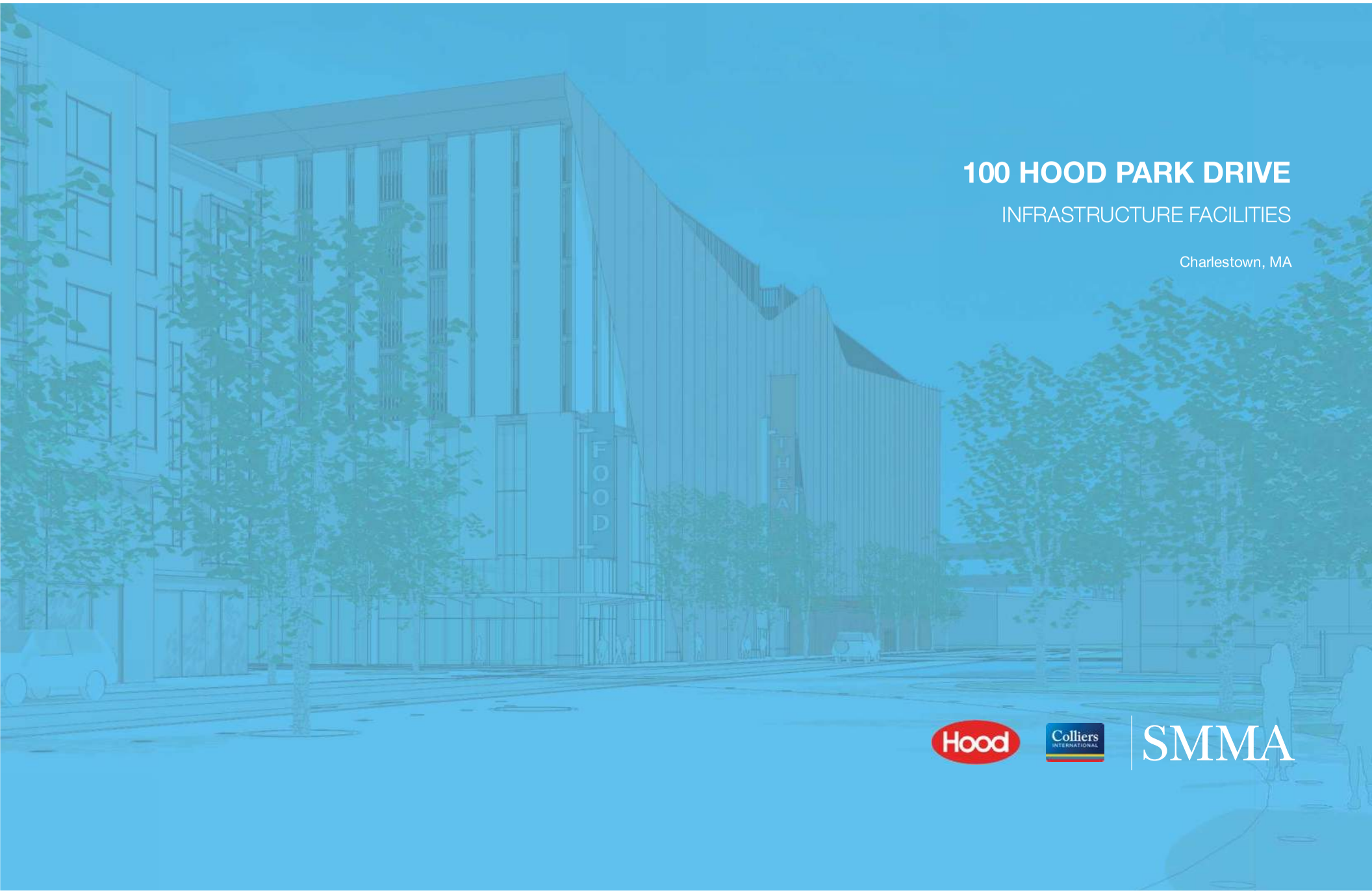


100 HOOD PARK DRIVE

INFRASTRUCTURE FACILITIES

Charlestown, MA

Hood

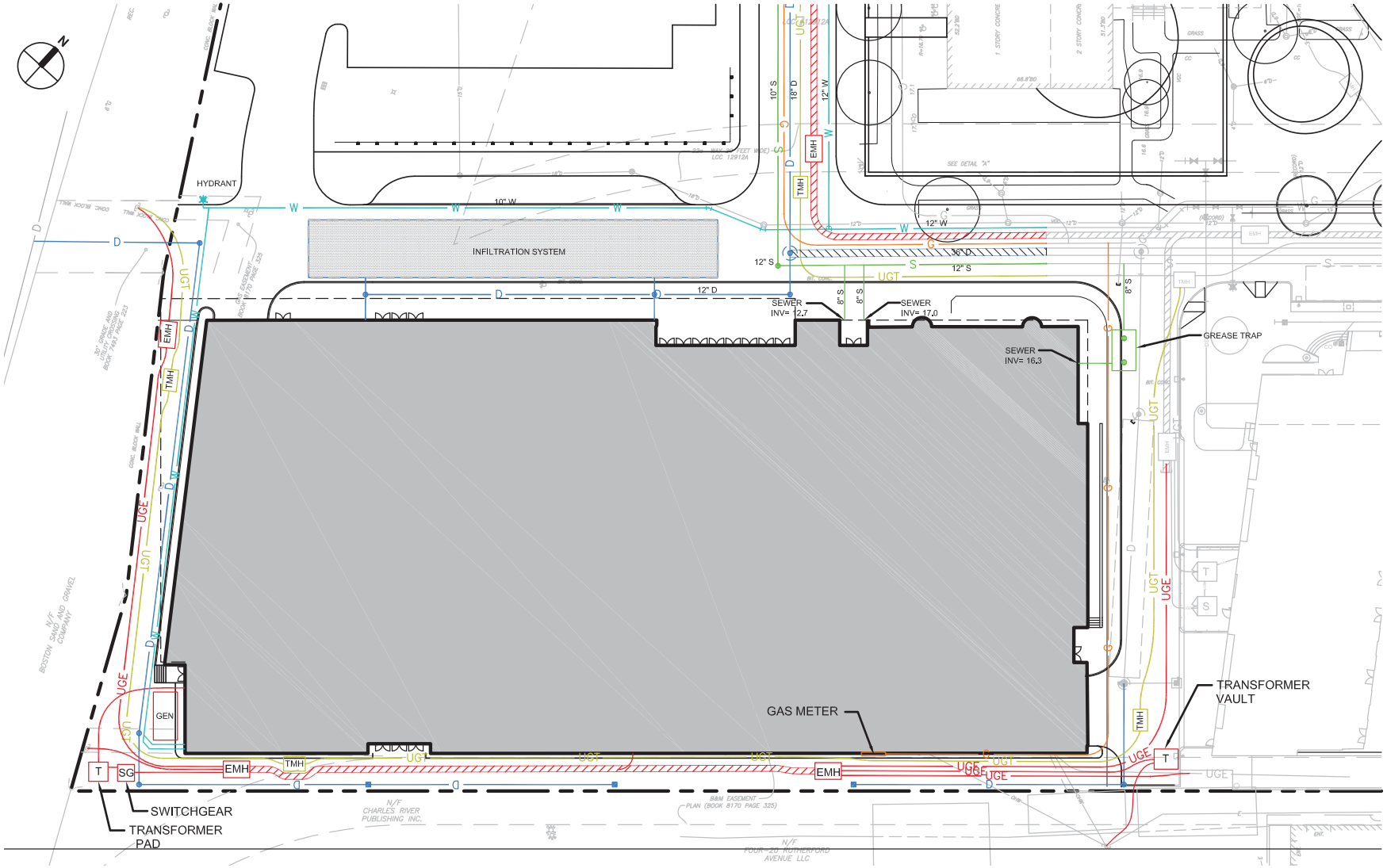
Colliers INTERNATIONAL

SMMA

Utility Narrative

The proposed building will be served by extension of the master planned utility network within Hood Park. The initial phase of the master planned utility network is currently being installed as part of the reconstruction of Hood Park Drive and the 480 Rutherford Avenue project. The utility network will be extended west to serve 100 Hood Park Drive as shown on the attached Utilities Figure

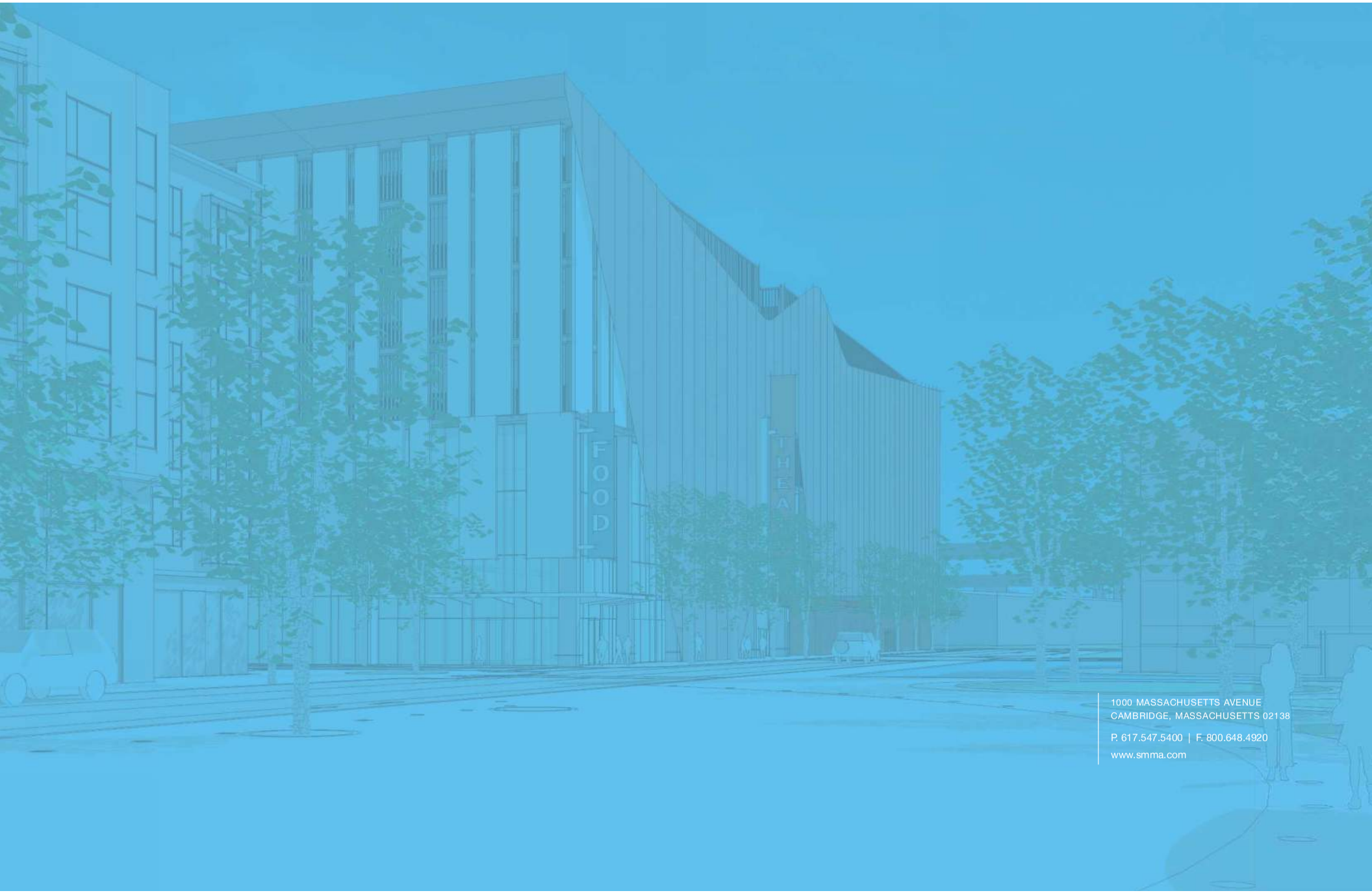
- **Sewer:** Building sewer will connect from the north side of the building to the recently installed 12" sewer main in Hood Park Drive. If a restaurant sewer connection is required it will exit the northeast corner of the building and connect via a grease trap in B Street (Chimney Court).
- **Storm Drain:** Connections will discharge to the north side of the building. These connections will discharge to an infiltration system in Hood Park Drive prior to discharging into the recently installed 36" drainage main. The recharge system is designed to comply with BWSC and DEP requirements.
- **Water:** Connections for domestic and fire protection will be provided at the southwest corner of the building, and serviced by an extension of the recently installed 12" water main in Hood Park Drive. A hydraulic model has been prepared to confirm that adequate flow and pressure is available in the system.
- **Electric:** A proposed duct bank along the south side of the building will connect to the recently installed duct bank extension in B Street (Chimney Court). Transformers will be located at the southwest corner of the building.
- **Tel/Data:** A telecommunications duct bank is proposed along the south side of 100 Hood Park Drive parallel to the proposed electrical system. Telecommunications connections will be located at the southwest corner of the building.
- **Gas:** The project will include an extension of the gas main recently installed in Hood Park Drive. The proposed building service will connect to the gas main via B Street (Chimney Court); the meter will be located at the southeast corner of the building.



100 Hood Park Drive

Utility Figure

Charlestown, Massachusetts



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R E P O R T #476

Hood Park:
Building #100 Acoustic Evaluation

Charlestown, Massachusetts

November 30, 2017

Prepared for:
SMMA
1000 Massachusetts Avenue
Cambridge, MA 02138

Project No. 629529

Submitted by:
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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Acentech has been retained to prepare an acoustic study for Building #100 within the Hood Park development. Hood Park is a master-planned urban development spread over a 20-acre campus and will include comprehensive improvements to existing buildings, and a series of new buildings which will consist of a variety of mixed uses. Building #100 will include a multi-story parking garage, restaurant and 4,000-person performance venue.

Noise limits from both the Commonwealth of Massachusetts and the City of Boston are applicable to this project. Acentech conducted a background noise survey in order to quantify the ambient sound levels at the property lines of Hood Park. The noise survey was performed in accordance with a test protocol developed by Acentech.

Sound levels from Building #100 mechanical equipment were calculated using environmental modeling software. The acoustic model was used to compute both daytime and nighttime sound levels. The difference was that the daytime noise level includes all equipment and the nighttime noise level does not include the Emergency Generator. It is planned that operation of the Emergency Generator would be for maintenance and testing purposes and as such this function would be done during the day. The computed sound pressure levels are below the City and State limits.

The performance venue will be located in Building #100 which is relatively distant from critical residential receivers across Rutherford Avenue. This results in the largest attenuation as possible due to distance between the venue and sensitive receptors. In addition the roof and wall systems are being designed with sound mitigation in mind. It is further expected that the venue tenant will undergo additional sound proofing as the design of the venue is developed. We believe that the venue will not exceed any City of State limits with the assumption that sound inside the venue could be as high as 110 dBA.

Building #100 is expected to comply with all of the City of Boston and Commonwealth of Massachusetts noise regulations. The evaluation included the use of acoustic louvers for the second level mechanical room within Building #100. No screening was included for Building #100 rooftop equipment. Acentech believes the performance venue will achieve the City of Boston noise limits by proper design of the base building and the eventual venue fit-up.

SECTION ONE

1.0 INTRODUCTION

Acentech has been retained by SMMA to prepare an acoustic study for Building #100 within the Hood Park Development. Hood Park is a master-planned urban development spread over a 20-acre campus located between I-93 and Rutherford Avenue in Charlestown, Massachusetts, as shown in Figure 1. The development will include comprehensive improvements to existing buildings, and a series of new buildings which will consist of a variety of mixed uses. Building #100 will include a multi-story parking garage, restaurant and 4,000-person performance venue. Acentech's scope-of-work included a background noise study and building-wide evaluation of sound from mechanical systems and other tenant operations.

SECTION TWO

2.0 NOISE REGULATIONS

Noise limits from both the Commonwealth of Massachusetts and the City of Boston are applicable to this project. As noted below, the Commonwealth sound limit is relative and based on the existing background noise levels. The City's noise limit is fixed and dependent on the time of day and zoning. Section 3.4 of this report will compare both regulations and will present the prevailing noise level limit.

2.1 Commonwealth of Massachusetts

The Commonwealth of Massachusetts has enacted regulations for the control of air pollution (310 CMR 7.10). To enforce these regulations, the Massachusetts Department of Environmental Protection (MassDEP) has issued guidelines that limit noise levels to the property lines. These limitations are: (a) not to increase the residual overall A-weighted background sound pressure level (SPL) by more than 10 dB and (b) not to produce a pure tone condition; where the SPL in one octave band exceeds the levels in the two adjacent octave bands by 3 dB or more.

2.2 City of Boston

The Boston Municipal Code (Chapter 16-26.1) sets the noise standard for noise that is unreasonable or excessive:

- Anything louder than 50 dBA from 11 p.m. to 7 a.m. is considered unreasonable.
- Anything louder than 70 dBA is considered too much at any time, except for permitted construction.

The City of Boston also has regulations by the Air Pollution Control Commission (APCC), which set forth noise regulations to apply to various zoning areas. The APCC established the standards outlined in Table 2-1. Daytime is defined as the hours between 7:00 a.m. and 6:00 p.m. daily except Sunday.

TABLE 2-1: Maximum Allowable Octave Band Sound Pressure Levels (dB)
Table of Boston Zoning District Noise Standards

Octave Band Center Frequency of Measurement	Residential		Residential/Industrial		Business	Industrial
	Daytime	All Other	Daytime	All Other	Anytime	Anytime
31.5	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
Single Number Equivalent	**60 dBA**	**50 dBA**	**65 dBA**	**55 dBA**	**65 dBA**	**70 dBA**

SECTION THREE

3.0 BASELINE NOISE ENVIRONMENT

Acentech conducted a background noise survey in order to quantify the ambient sound levels at the property lines of Hood Park. The noise survey was performed in accordance with a test protocol developed by Acentech (dated October 12, 2017). The test protocol is provided in Appendix A. The results of this evaluation determine the SPL limits in accordance with the State noise guidelines as previously discussed in Section 2.1.

3.1 Noise Measurement Instrumentation

The background noise survey was conducted using four Type 1 logging sound level meters (SLM), Rion model NL-52. The SLM's were configured to measure continuously for a period of seven days in one-hour increments and with a "fast" response rate. The instruments recorded overall A-weighted and one-third octave band SPL metrics including: L_{EQ}, L_{01}, L_{10}, L_{50}, L_{90} and L_{99}). The one-third octave band SPL was measured from 31.5 to 16,000 hertz bands. All instrumentation was laboratory calibrated by NIST traceable lab in the past 24 months and were field calibrated by personnel onsite before and after use. Wind screens were used on all microphones.

3.2 Noise Measurement Locations

The SLM's were installed at four locations shown in Figure 2. These locations are generally representative of the acoustic activity on each side of Hood Park. A summary description of these four locations is given in Table 3-1. Figures 3 through 6 are photographs of the instrumentation at each of the four locations.

TABLE 3-1: Summary of Noise Monitoring Locations

LOC #	GENERAL DESCRIPTION	SPECIFIC LOCATION	SOURCES OF BACKGROUND NOISE
1	Eastern Property Line @ centerline	About 10ft south from the existing black gate opening inside construction fence. (See Figure 3)	Street traffic from Rutherford Avenue
2	Norther Property Line @ centerline	Opposite side of a construction fence within small tree. (See Figure 4)	Pass by traffic on road/driveway (Massport right of way). Demolition of building directly north of the project site.
3	Western Property Line @ centerline	At 2ft concrete wall with microphone and instrumentation hidden at small tree. (See Figure 5)	Traffic from I-93, MBTA Orange Line and tractor trailers traffic from adjacent warehouses.
4	Southern Property Line @ centerline	Microphone at the chain-linked fence between the openings of two cargo vans. Instrumentation to be 20ft away so as to be out of way of potential construction. (See Figure 6)	Light construction on site just north of the microphone. Traffic from Rutherford Avenue and I-93.

3.3 Baseline Ambient Noise Levels

The background noise survey was performed at locations #1 through #4 from October 18 to 25, 2017. However, there was an instrument failure at Location #1 which was then repeated from October 25 to November 2, 2017. The results of the background noise survey are given in Figures 7 through and 10 showing the resulting data for locations #1 through #4, respectively. Each graph includes the L_{EQ}, L_{10} and L_{90} SPL statistical metrics.[1]

According to the MassDEP, the L_{90} metric is used to define the background noise level. Figure 11 is a compilation of all the L90 date for each of Locations #1 through #4. The average L_{90} values for the daytime (7am to 7pm), evening (7pm to 10am) and nighttime (10am to 7am) are given in Table 3-2. As expected, the lowest background noise level occurs during the nighttime with L_{90} SPL ranging from 52 to 60 dBA. The lowest L_{90} value of 52 dBA (occurred at Location #4) would result in a MassDEP noise limit of 62 dBA. This value is above the City of Boston noise limit for residential-in-industrial for all times at 55 dBA. The daytime L90 values would result in MassDEP limits for daytime greater than the City of Boston daytime limit. Therefore the prevailing limit for daytime is 65 dBA and for nighttime is 55 dBA for all locations. These limits will be used to evaluate the acoustic modeling results given in Section 4 below.

[1] The L90 level represents the amplitudes that were exceeded 90% of the time, and the L10 level represents the amplitudes that were exceeded only 10 percent of the time. The L90 is typically used as a measure of the background noise level, the SPL with all intermittent noise events factored out. The L10 provides the sound level from the sustained peak and intermittently loud events, while excluding any single high peak SPL's.

TABLE 3-2: Average Background (L_{90}) SPL by Location & Time Period

Location #	Daytime (7am-7pm)	Evening (7pm to 10pm)	Night (10pm to 7am)
1	66	64	60
2	58	58	56
3	59	58	57
4	55	54	52

SECTION FOUR

4.0 ACOUSIC MODELING METHODLOGY

Sound levels from the completed build-out of the Hood Park project were calculated using environmental modeling software. The inputs to this model were the sound power levels for typical equipment to be located on the roof and mechanical room of Building #100. The details are given below.

4.1 Acoustic Model

Acentech used the environmental modeling software, Cadna/A to compute the property-line sound levels from mechanical equipment on the roof of Building #100. Cadna/A follows the standardized sound propagation algorithms of ISO 9613-2. The model assumes a flat ground plane, without any specific topography or terrain. All sources are modeled as single "point" sources with the exception of three pieces of equipment located in an interior mechanical room in the Building #100. Figure 12 is a picture of the Cadna/A noise model.

TABLE 4-1: Summary of the Proposed Hood Park Buildings.

Building No.	Height (ft)	Height (m)	Areas (square feet)							Expected Equipment Tag#
			Residential	Hotel	Office	Lab	Assembly	Retail	Total	
100 Assembly	111	33.8	-	-	-	-	63,000	12,000	75,000	1, 3, 6, 7, 8, 9
480	75	22.9	157,284	-	-	-	-	10,021	167,305	n/a
500	32-50	10-15	-	-	293,750	75,000	-	-	368,750	n/a
510	52[2]	16	-	-	24,800	-	-	10,000	34,800	n/a
570	23	7	-	-	-	-	-	-	-	n/a

4.2 Inputs to Acoustic Model

The inputs to the Cadna/A acoustic model are the sound power levels for the rooftop and mechanical room at Building #100. Table 4-1 lists the equipment tag numbers for equipment. Table 4-2 lists the equipment details. Figure 12 shows a diagram of the location of each of the tag numbers listed in Table 4.2. The location of the Emergency Generator (Tag #6a) has been assumed to be a worst case location; on the ground level in the southwest corner of Building #100. It is also possible that the Emergency Generator could be located on the roof or within a mechanical room in the building. Table 4-3 lists the sound power levels used in the acoustic model.

It was further planned that for Building #100 there would be a 100 x 75 foot mechanical room on the 2nd floor. This mechanical room would house the DOAS Unit (Tag #3), the kitchen MAU (Tag #8) and the Condenser-less Chiller Unit (Tag #9 indoor) or similar. These units are the current basis of design from SMMA. The sound output from this mechanical room would emanate from two louvers. The air intake louver would be located on the west side of the building and would be 210 square feet. The exhaust louver would be located on the south side of the building and would be 460 square feet. Both louvers were modeled as area sources located on each side of the building as noted above.

[2] Building 510 is 52 feet high with a 10 foot screen.

TABLE 4-2: List of Typical Equipment

TAG* NO.	PROJECT QTY	EQUIPEMENT DESCRIPTION	TYPICAL Mfg & Equipment Model Number	Overall Sound Power, dBA	Height, m
3	12	DOAS	York, YC-108X60	88.5	2.8
6a	11	Generator - Standard Enclosure	Caterpillar, C9 (w/ enclosure)	96.2	1.6
7	8	Kitchen Exhaust Fan	Greenheck, CUBE-360XP-30	78.3	1.0
8	8	Kitchen MAU	Greenheck, DGX-120-H32	90.8	1.2
9(indoor)	1	Condenser-less Chiller Unit (indoor)	SMARDT Condenser-less Unit	88.9	2.2
9(outdoor)	1	Air Cooled Condenser (outdoor)	SMARDT Air Cooled Condenser	89.5	2.8

** Tag Numbers are taken from the master report of which some equipment was not part of this report.*

TABLE 4-3: List of Equipment Sound Power Levels, dB re picoWatt.

TAG*	Octave Band Center Frequency, Hz										
NO.	31.5	63	125	250	500	1000	2000	4000	8000		dBA
3	88	85	86	91	86	81	79	78	72		88.5
6a	73	84	91	91	90	92	91	85	78		96.2
7	82	79	82	77	74	74	71	64	60		78.3
8	103	100	92	87	87	85	84	81	77		90.8
9(indoor)	82	79	78	81	82	86	82	75	79		88.9
9(outdoor)	85	82	84	83	83	86	82	76	79		89.5

** Tag Numbers are taken from the master report of which some equipment was not part of this report.*

SECTION FIVE

5.0 FUTURE SOUND LEVELS; MECHANICAL SYSTEMS

The acoustic model described in Section 4 was used to compute both daytime and nighttime sound levels. The difference was that the daytime SPL includes all equipment and the nighttime SPL does the Emergency Generator. It is planned that operation of the Emergency Generators would be for maintenance and testing purposes and as such this function would be done during the daytime.

5.1 Daytime

The daytime SPL included operation of all equipment including the Emergency Generator (Tag #6A). The computation did not include any noise control accessories for equipment located on the roof of any building. The project site drawings show screens on many of the building rooftops, but at this time no acoustical attenuation has been taken into account. However, the intake and exhaust louvers on the Building 100 are planned to have acoustical louvers which provide the transmission loss as given in Table 5-1. A vendor data sheet is given in Appendix B. The results are shown in Figure 13 and summarized in Table 5-2.

TABLE 5-1: Transmission Loss for Building #100 Mechanical Room Acoustic Louvers

Octave Band Center Frequency, Hz	31.5	63	125	250	500	1000	2000	4000	8000
Transmission Loss, dB	4	8	7	7	10	14	17	13	13

TABLE 5-2: Hood Park Building #100 **DAYTIME** Noise Prediction Results, dBA

Location #	Zoning	Calculated Project SPL, dBA	Boston/APPC Limit, dBA	MADEP Limit, dBA[3]
1	Residential/Industrial	25	65	76
2	Industrial	29	70	68
3	Industrial	28	70	69
4	Industrial	49	70	65
4-Aa	Industrial	60	70	65

5.2 Nighttime

The nighttime SPL included operation of all equipment with the exception of the Emergency Generator (Tag #6A). All other conditions described in Section 5.1 apply to the nighttime computations. The results are shown in Figure 14 a summarized in Table 5-3.

TABLE 5-3: Hood Park Building #100 **NIGHTTIME** Noise Prediction Results, dBA

Location #	Zoning	Calculated Project SPL, dBA	Boston/APPC Limit, dBA	MADEP Limit, dBA[4]
1	Residential/Industrial	22	55	70
2	Industrial	24	70	66
3	Industrial	25	70	67
4	Industrial	49	70	62
4-A	Industrial	49	70	62

SECTION SIX

6.0 FUTURE SOUND LEVELS; PERFORMANCE VENUE

The performance venue will be located in Building #100 which is relatively distant from critical residential receivers across Rutherford Avenue. This results in the largest attenuation as possible due to distance between the venue and sensitive receptors.

6.1 Sound Level Limits

Sound levels in the performance venue are to be limited to have peak sound levels no greater than 110 dBA as controlled in the mid to higher frequencies and not more than 110 dBC in individual lower frequency octave bands. To control exterior noise emissions, consistent with the City codes, will require that the venue generate no more than 55 dBA at nearby residential property line (Location #1) and 70 dBA for adjacent industrial property lines (Locations #2, #3 & #4).

6.2 Roof & Wall Design

For specific wall locations and the roof, where the performance space is exposed directly to the exterior skin, the basic wall and roof construction will weigh at least 100 pounds per square foot (psf). There will be a separated inner skin construction that is held separate from or is resiliently supported to the massive building construction element. The separate inner construction will weigh between 5 to 10 psf, depending on the spacing from the basic mass. In the case of wall constructions, there may be a further exterior finish skin for architectural reasons, but we are not counting on this to provide significant additional sound isolation. Special details are planned for where support is needed for interior building systems to avoid the need to penetrate the inner skin and risk reduced isolation benefit of the inner skin. However, there may be some heavier than nominal loads that need to be supported from a major structural elements, and in these cases there are special penetration sealing details planned.

[3] Average L_{90} for each location as given in Table 3-2.

[4] Average L_{90} for each location as given in Table 3-2.

6.3 Other Features

In many cases the design has been developed to have closed buffer spaces between the interior of the performance venue and the exterior construction and here, the basic 100 psf mass of the building envelope will continue, but the inner skin construction will be reduced because the construction of the buffer space will provide the desired additional sound isolation.

Entrances and egresses from the facility will be via vestibule arrangements with two sets of doors that are separated by a modest length vestibule as may be required by code for passage of people. The vestibule doors will have acoustical gaskets. Emergency egress doors will be at the front of the space and will remain closed except in the event of an emergency. Normal entrance and egress will be by way of doors to/from the lobby buffer space at the rear of the venue. Sound levels in the lobby area are expected to be at least a significant step lower than the sound levels in the main performance space. So, sound leakage from the main entrance/exit doors is expected to be small.

Based on the above, sound levels just outside the walls of the performance venue are expected to be no greater than 60 dBA and the sound levels off site at the closest neighboring properties are expected to be slightly lower than this. Peak sound levels from the performance venue at the closest off-site residential receivers are expected to be well below the city nighttime noise requirement of 55 dBA which is the controlling criterion at the site.

SECTION SEVEN

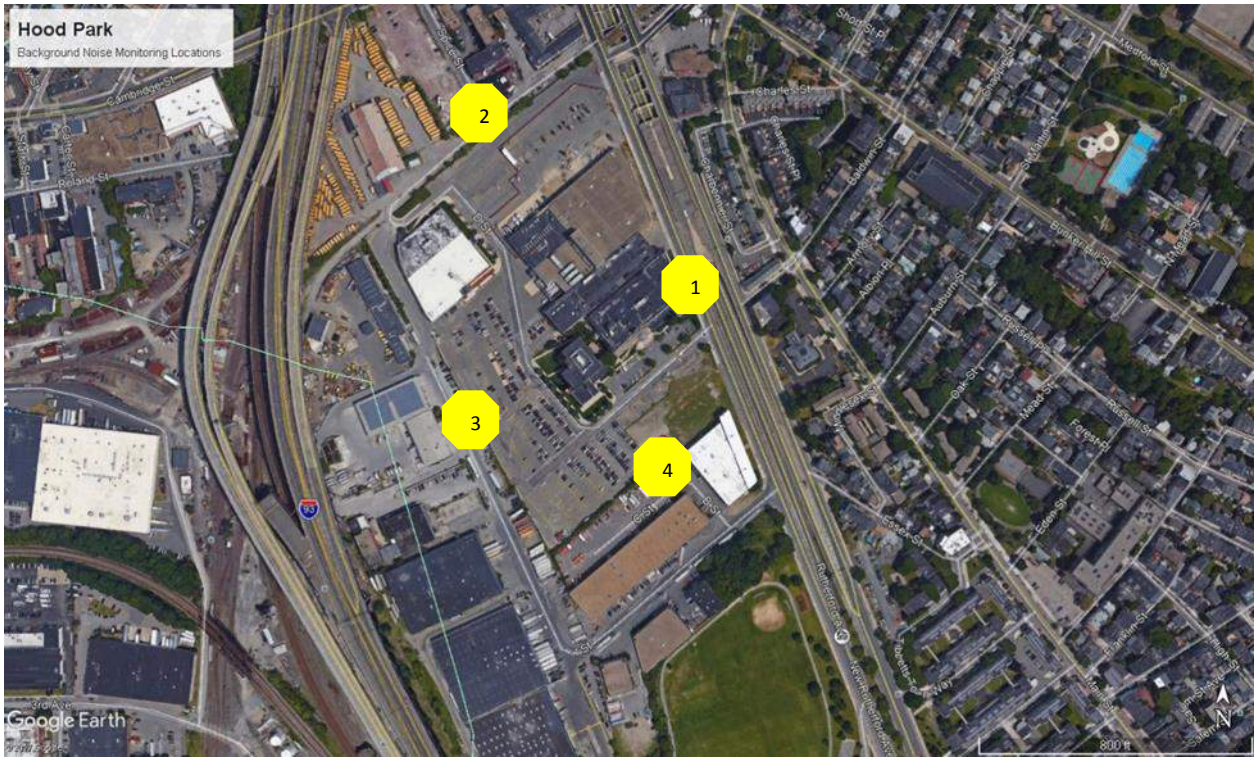
7.0 CONCULSIONS

This evaluation shows that Building #100 within the Hood Park development is expected to comply with all of the City of Boston and Commonwealth of Massachusetts noise regulations. Both the mechanical equipment and a proposed performance venue will be compliant with these regulations. The mechanical systems will be compliant with the installation of acoustic louvers for the second level mechanical room within Building #100. It was found that no rooftop screening (or noise barriers) will be necessary for Building #100. Acentech believes that the performance venue will comply with the City of Boston noise limits based on planned design of the base building and then proper design and operation of the venue space fit-out.

FIGURE 1

SMMA concept drawing plan of Hood Park, Building #100.

FIGURE 2



Aerial photograph of Hood Park with the location of four logging sound level meters.

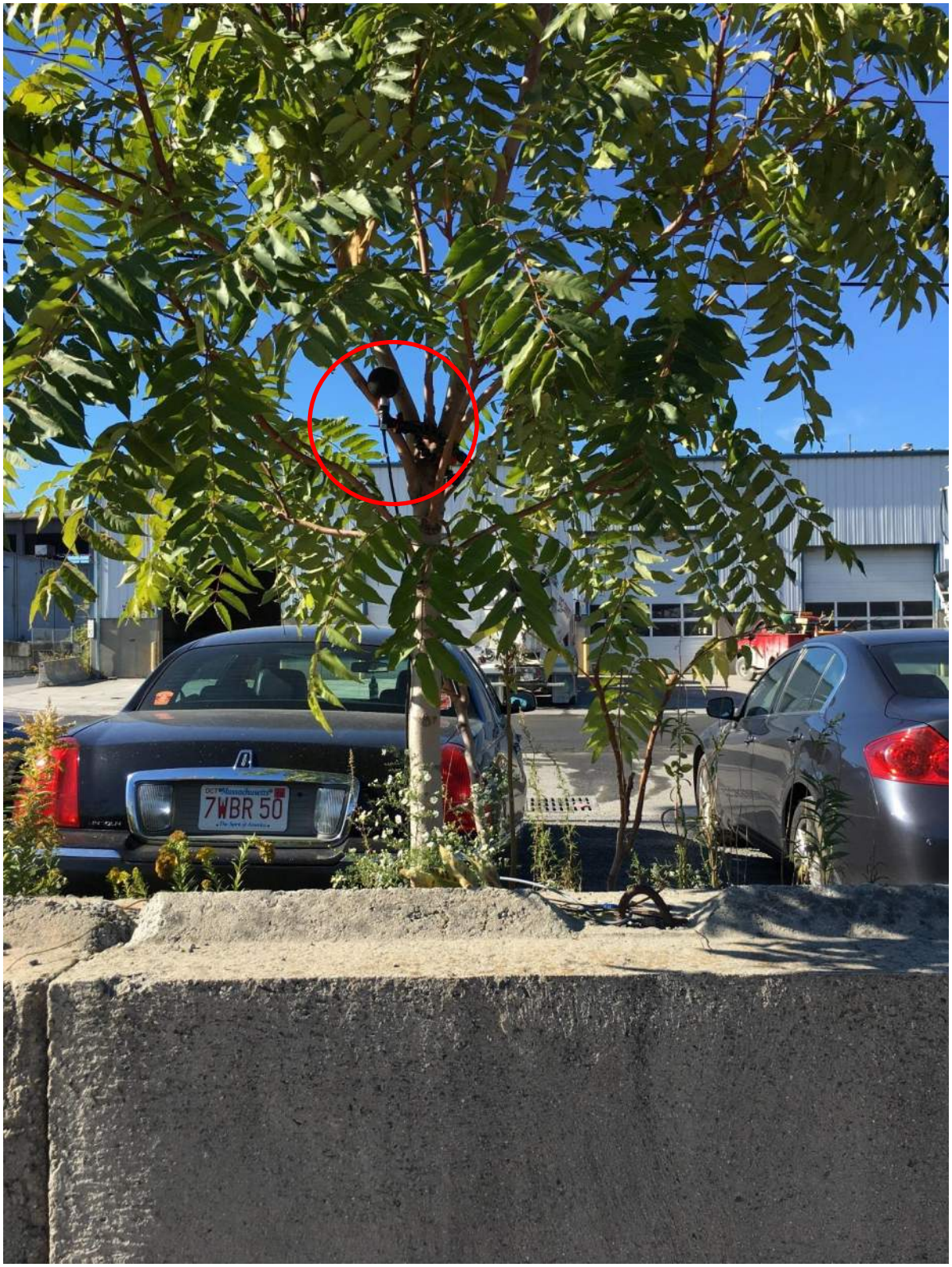
FIGURE 3

Photograph of Acentech logging Sound Level Meter as installed at Location #1. Microphone at red circle.

FIGURE 4

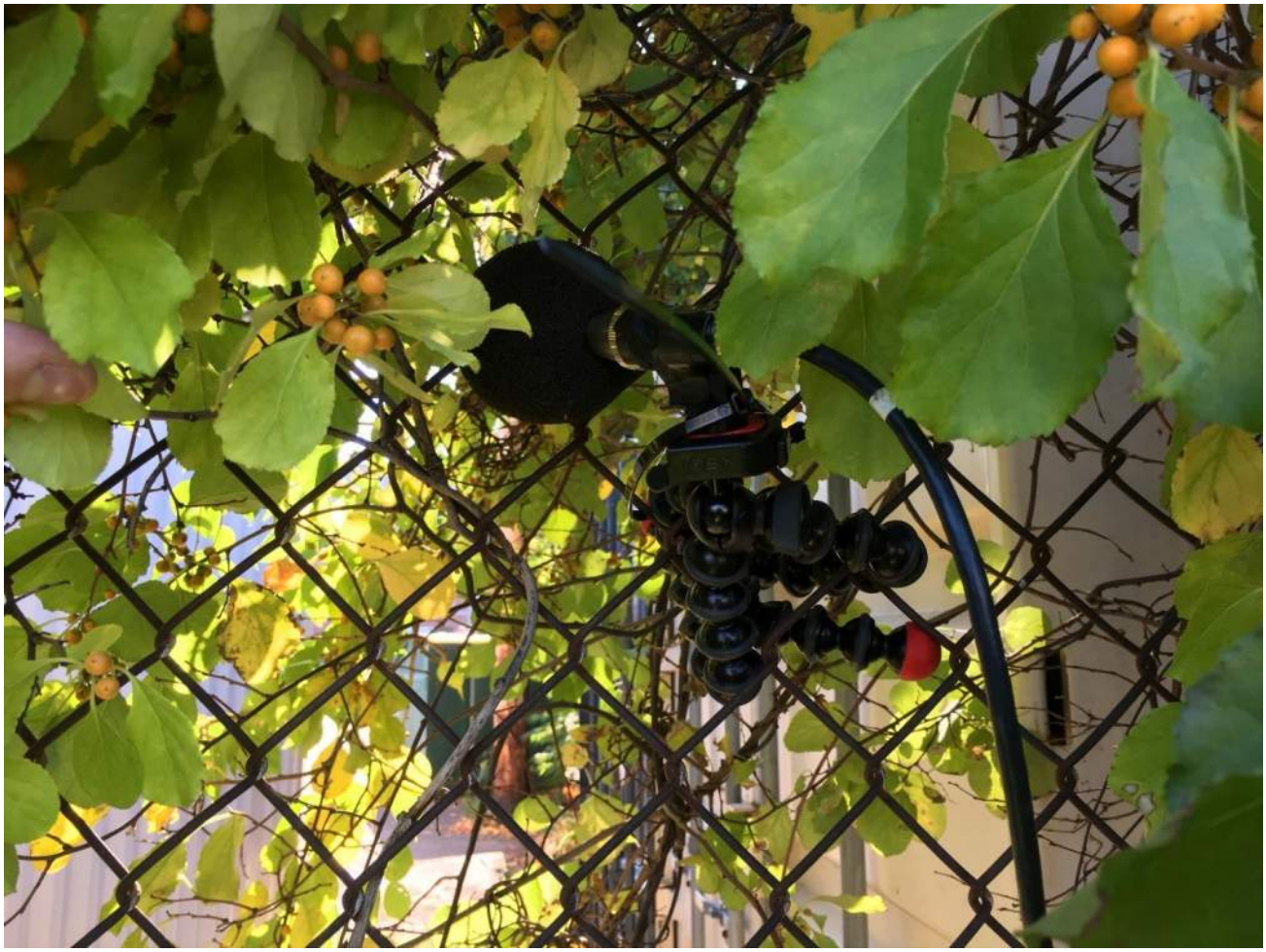
Photograph of Acentech logging Sound Level Meter as installed at Location #2. Microphone at red circle.

FIGURE 5



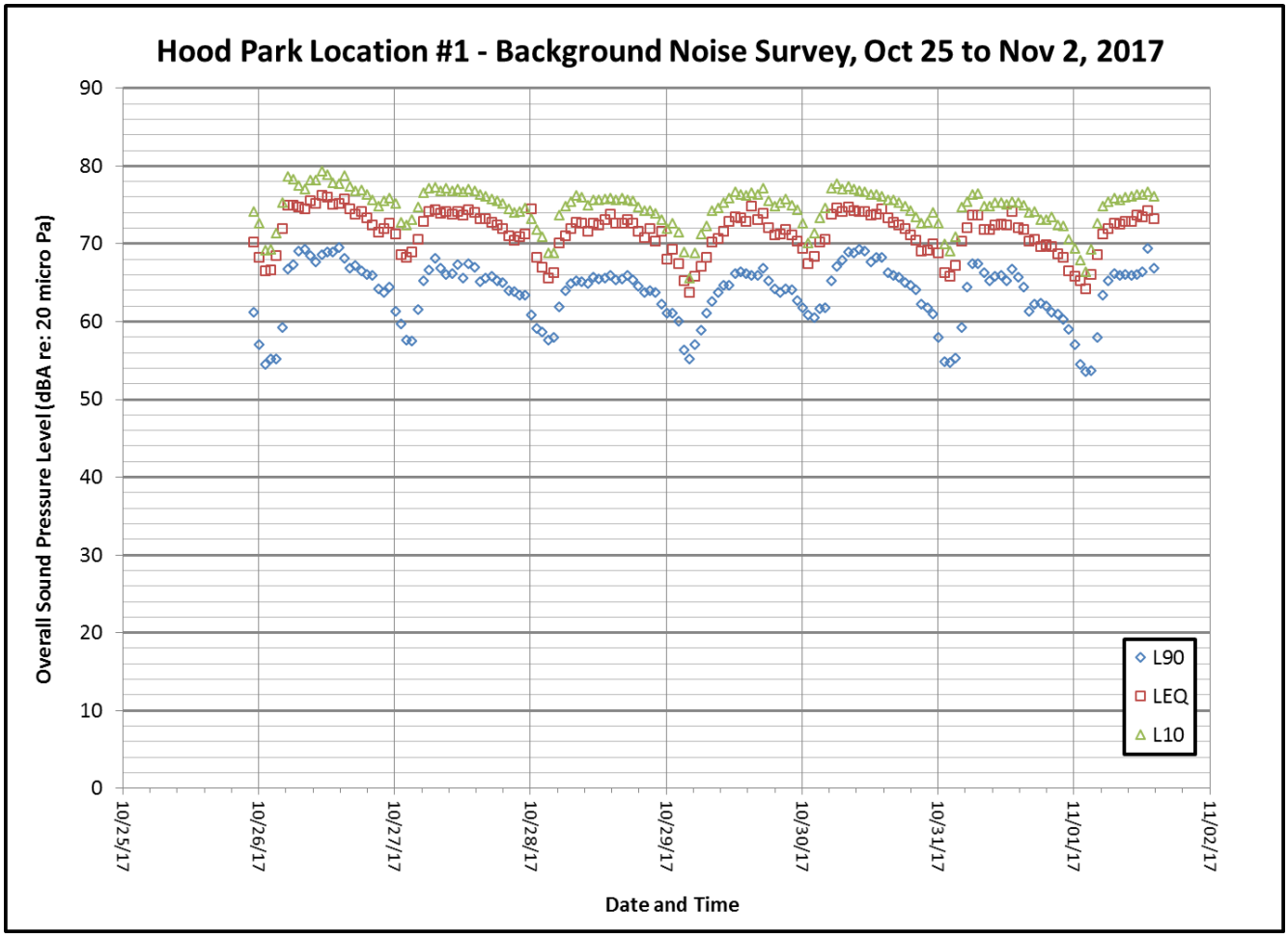
Photograph of Acentech logging Sound Level Meter as installed at Location #3. Microphone at red circle.

FIGURE 6



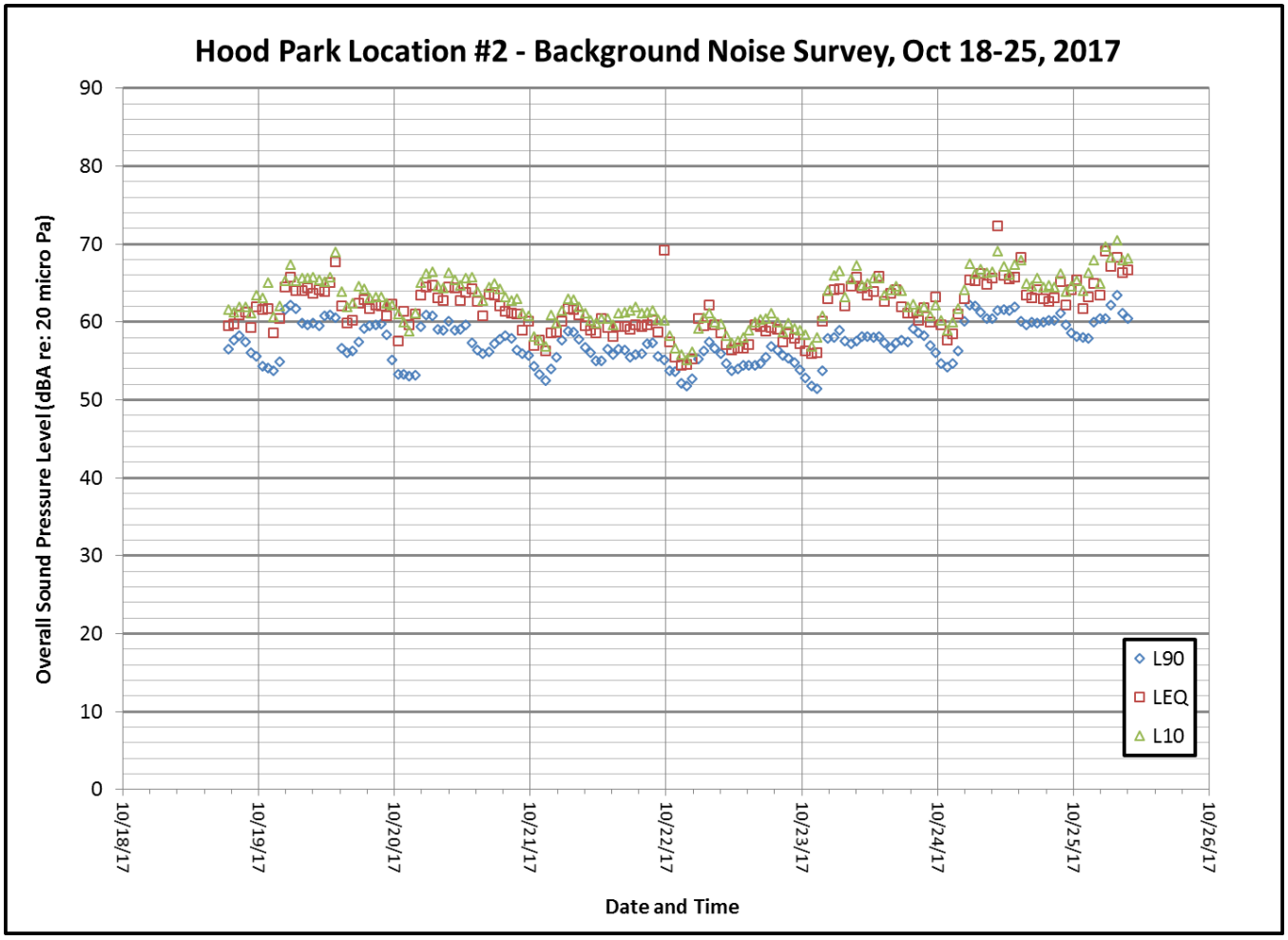
Photograph of Acentech logging Sound Level Meter as installed at Location #4.

FIGURE 7



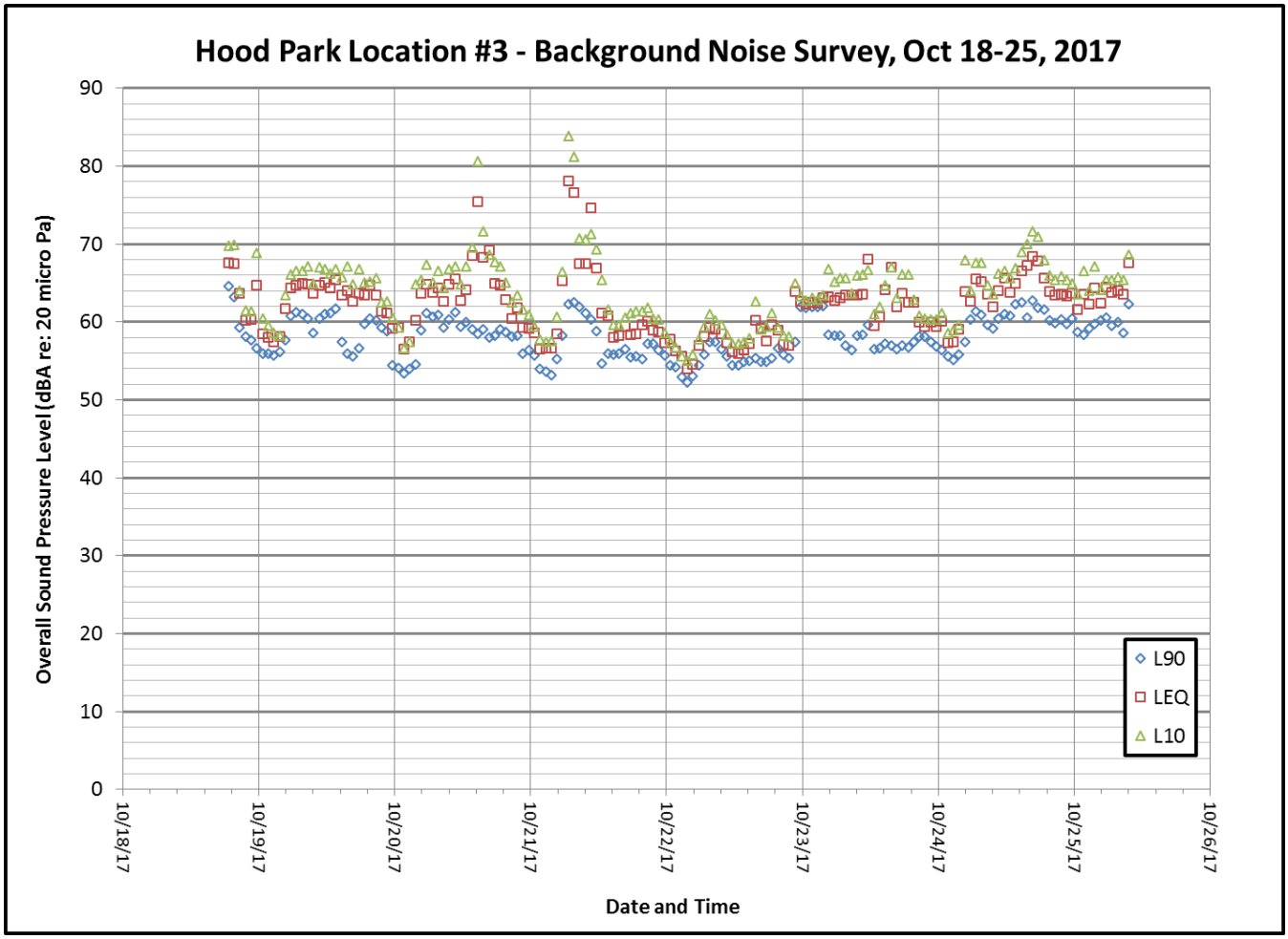
Background Survey Data for Location #1.

FIGURE 8



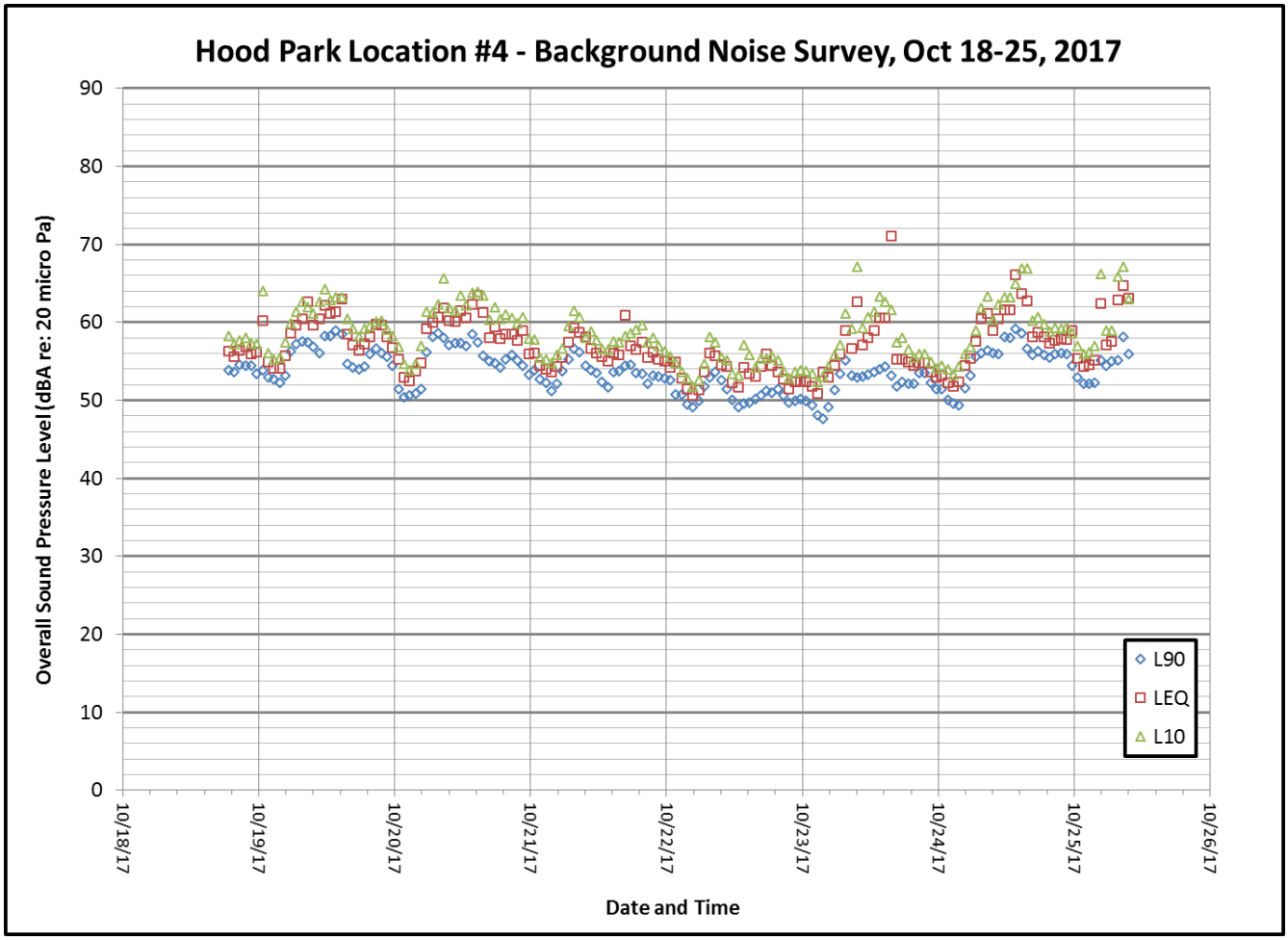
Background Survey Data for Location #2.

FIGURE 9



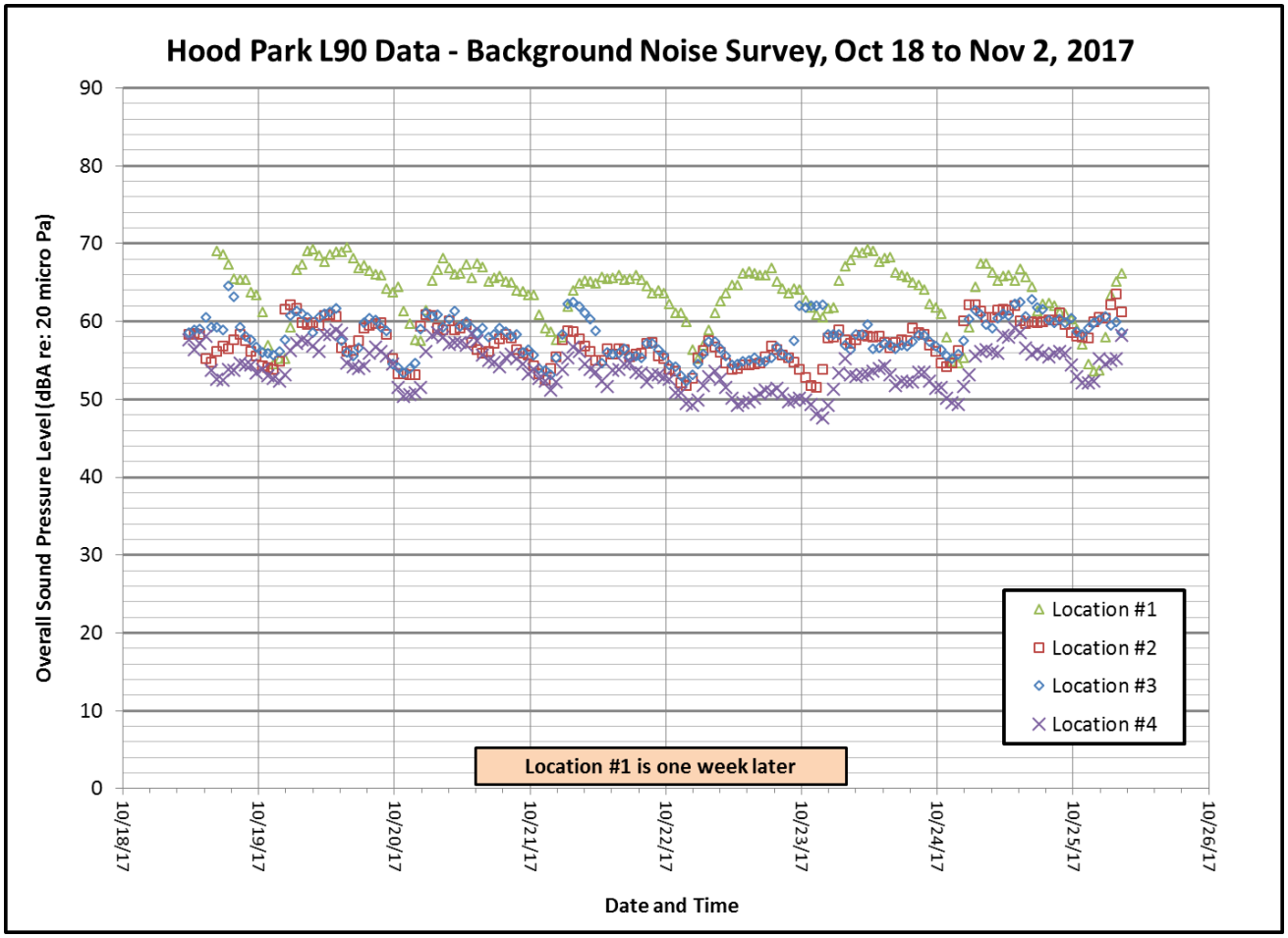
Background Survey Data for Location #3.

FIGURE 10



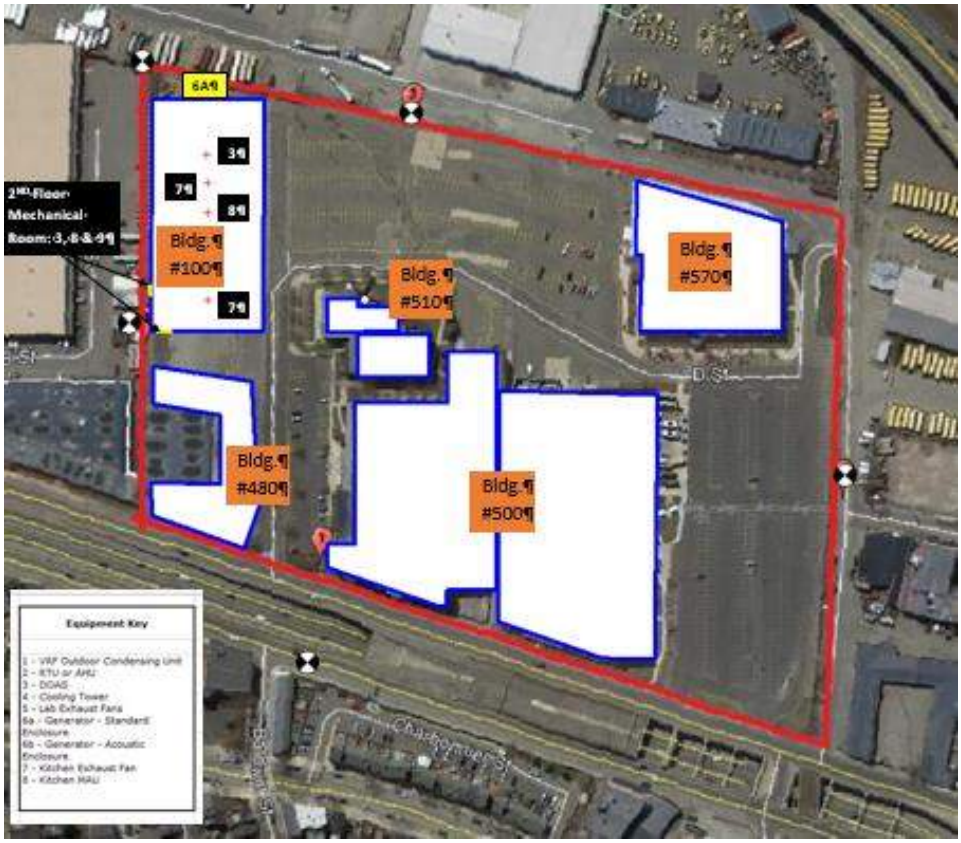
Background Survey Data for Location #4.

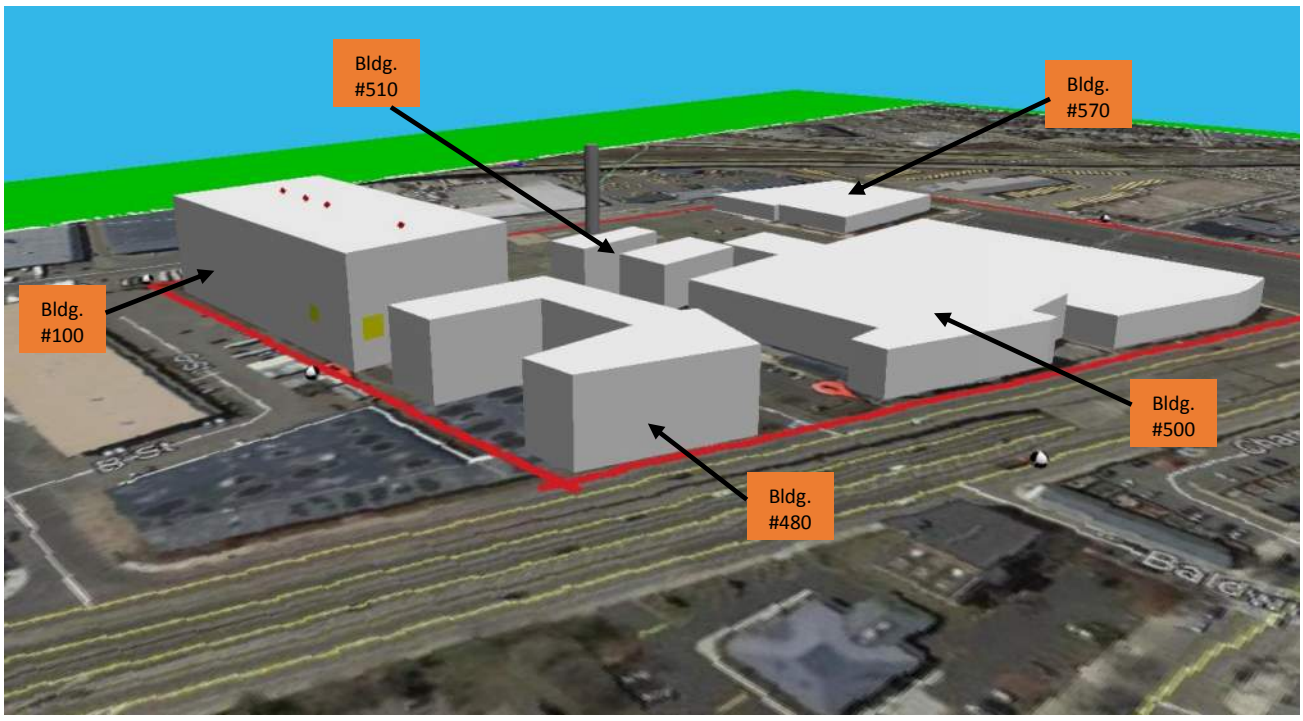
FIGURE 11



Background noise level (L_{90}) for all measurement locations.

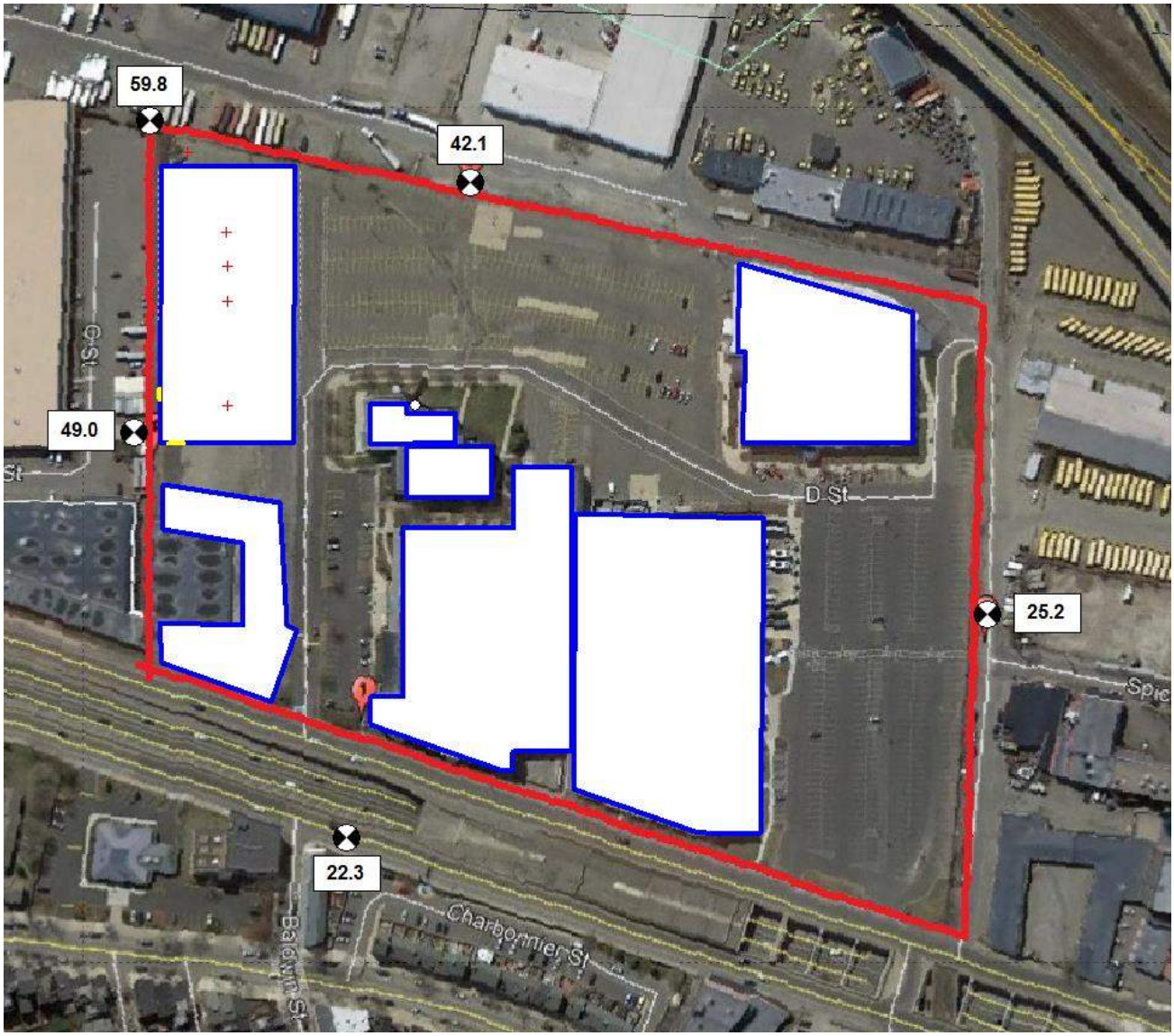
FIGURE 12





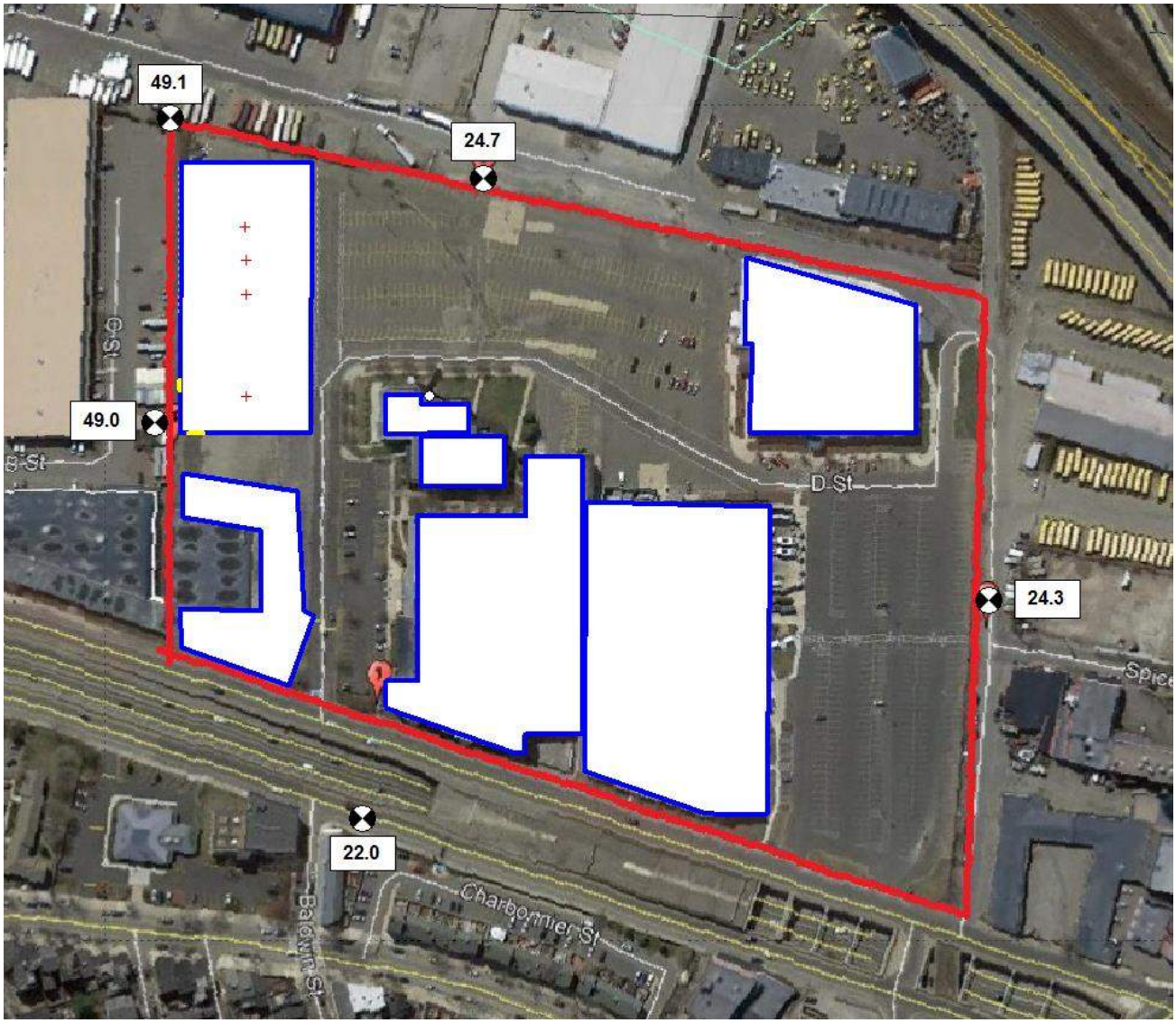
Cadna/A acoustic model plan view image (top) and isometric image (bottom).
Red "+" and dots are the rooftop machinery units, Yellow squares are mechanical room louvers.

FIGURE 13



Mechanical Equipment Noise Prediction Results for Daytime Conditions.

FIGURE 14



Mechanical Equipment Noise Prediction Results for Nighttime Conditions.

APPENDIX A

Hood Park
Noise Monitoring Protocol

ACENTECH

33 Moulton Street
Cambridge MA 02138
617 499 8000
acentech.com

October 12, 2017

Mr. Brian Lawlor, PE
Symmes Maini & McKee Associates
1000 Massachusetts Avenue
Cambridge, MA 02138

Sent Via Email: *blawlor@smma.com*

Subject **Hood Park Noise Monitoring Protocol**
Charlestown, MA
Acentech Job No. 629529

Dear Brian:

This letter documents the measurement protocol that Acentech will employ for conducting a background sound survey in support of our noise evaluation of the Hood Park mixed use development in Charlestown, Massachusetts. The purpose of this survey is to collect background (or ambient) sound pressure levels that characterize the acoustic environment at the periphery of the project.

Unattended (Long-Term) Measurements

Acentech will install a logging sound level meter (SLM) at four locations shown in Figure 1. These locations are generally representative of the acoustic activity on each side of the large parcel of land. A list of the four locations is given in Table 1. Figures 2 through 7 are photographs at each of the four locations.

TABLE 1: Summary of Noise Monitoring Locations

LOC #	GENERAL DESCRIPTION	SPECIFIC LOCATION	SOURCES OF BACKGROUND NOISE
1	Eastern Property Line @ centerline	About 10ft south from the existing black gate opening inside construction fence. (See Figures 2 & 3)	Street traffic from Rutherford Avenue
2	Norther Property Line @ centerline	Opposite side of a construction fence within small tree. (See Figure 4)	Pass by traffic on road/driveway (Massport right of way). Demolition of building directly north of the project site.
3	Western Property Line @ centerline	At 2ft concrete wall with microphone and instrumentation hidden at small tree. (See Figure 5-6)	Traffic from I-93, MBTA Orange Line and tractor trailers traffic from adjacent warehouses.
4	Southern Property Line @ centerline	Microphone at the chain-linked fence between the openings of two cargo vans. Instrumentation to be 20ft away so as to be out of way of potential construction. (See Figure 7)	Light construction on site just north of the microphone. Traffic from Rutherford Avenue and I-93.

Acentech SLM's will measure continuously for a period of seven days. The data to be recorded will include overall A-weighted sound pressure levels (SPL), statistical SPL (L_{01}, L_{10}, L_{50}, L_{90}, L_{99}) and one-third octave band SPL in the 31.5 to 16,000 hertz bands. Measurements will be logged in 1-hour intervals.

All data will be compiled back in our office after the survey is completed. The hourly averaged L90 data will be used to determine the appropriate background noise level for the site for the purpose of evaluating the project noise against the MADEP noise regulations. This data will be documented in the Acentech report for the noise evaluation of the Hood Park project.

At this time, we do not intend to conduct short term (attended) noise measurements.

****

If you have any questions or concerns regarding this test protocol, please feel free to email (mbahtiarian@acentech.com) or call 617-499-8058.

Sincerely yours,
ACENTECH INCORPORATED

Michael Bahtiarian, INCE Bd. Cert.

Cc: Doug Sturz, Nick Dragoni (Acentech)

FIGURE 1: Aerial Photograph showing four monitoring locations at Hood Park.

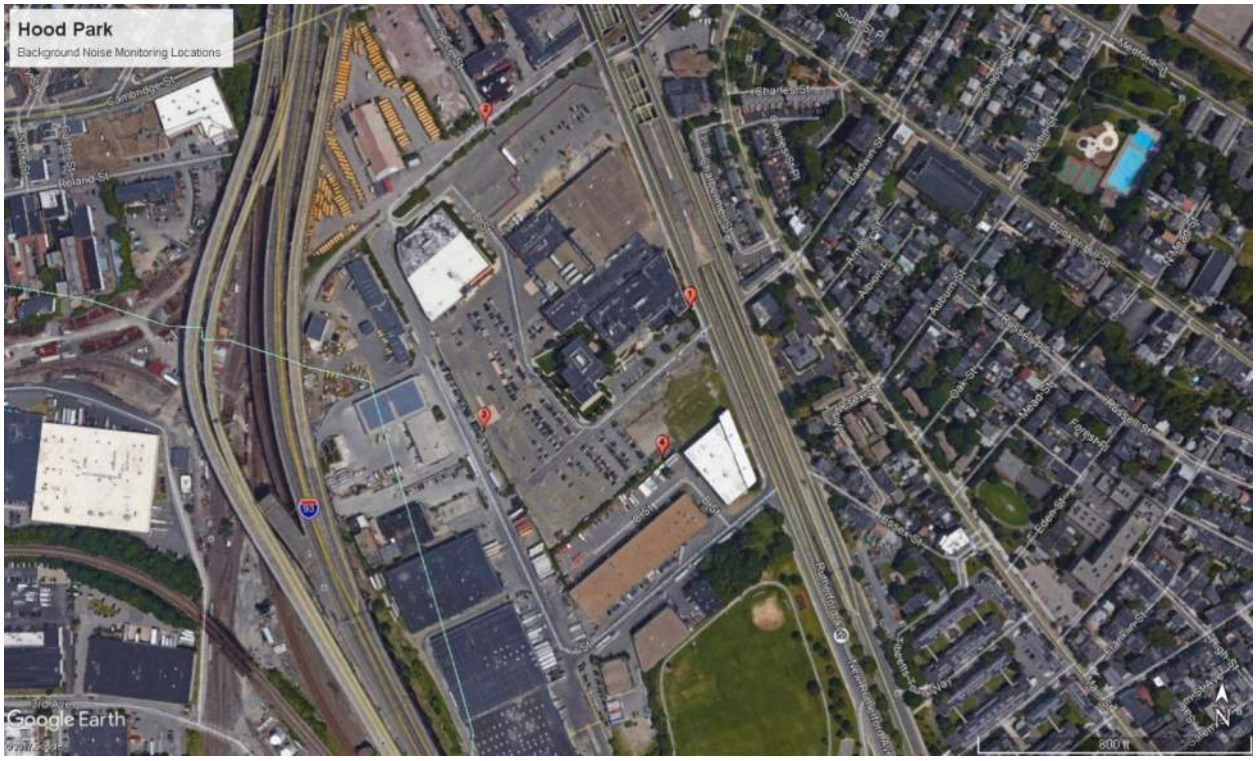


FIGURE 2: Location #1 between existing and construction fences. Red marks indicated the microphone (oval) and the instrumentation & battery pack (rectangle).

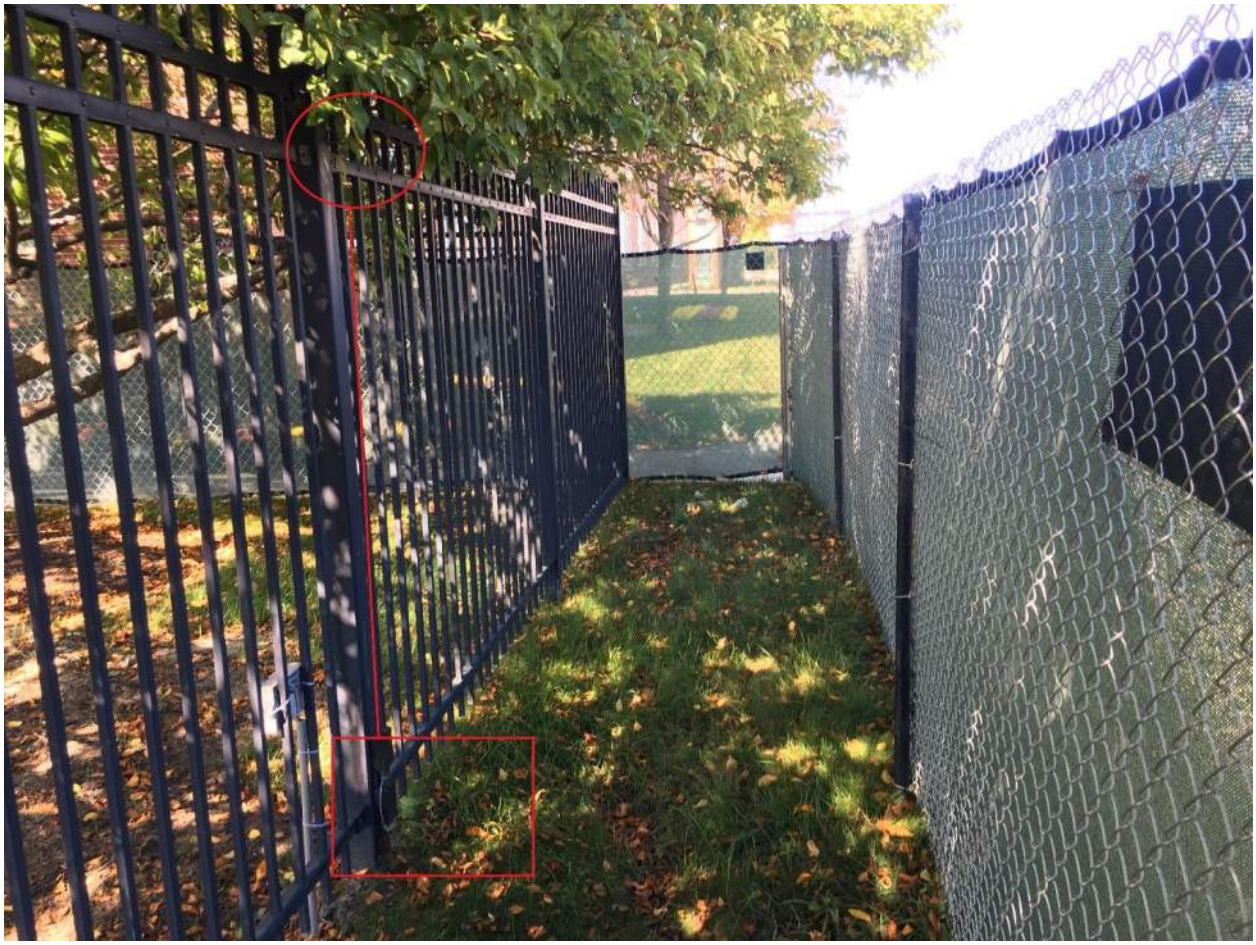


FIGURE 3: Location #1 from Rutherford Avenue Side. Red circle indicates location of microphone.

FIGURE 4: Location #2 with microphone (oval) located off tree branch. Leaves around microphone to be removed. Instrumentation to be located behind tree trunk and fence.

FIGURE 5: Location #3 microphone (oval) located off tree branch. Leaves around microphone to be removed. Instrumentation to be located on the opposite side of the concrete block on the ground.

FIGURE 6: Side view at Location #3 microphone (oval) located off tree branch. Leaves around microphone to be removed. Instrumentation to be located on the opposite side of the concrete block on the ground.

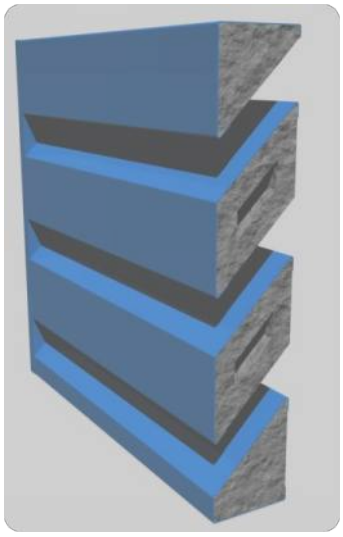
FIGURE 7: Location #4 the microphone to be mounted at the chain-linked fence between the opening of two cargo vans. Instrumentation to be 20ft back (right-side end of redline) to be out of way of potential construction.

APPENDIX B

Acoustic Louver
Vendor Data Sheet

MODEL A6370

C/S 6″(152.4 mm) STANDARD FIXED ACOUSTICAL LOUVER



AIRFLOW DATA

For a 4 Foot by 4 Foot Unit. *Tested with mill finish and no screen.*

- Free area = 3.46 ft^2
- Percent free area = 21.6%
- Free area velocity at point of beginning water penetration (@0.01oz./ft^2 =1046 FPM (5.31 m/s)
- Maximum recommended air intake velocity = 846 FPM (4.30 m/s)
  Air volume @ 846 FPM free area velocity = 2927 CFM (1.38 m^3/s)
  Pressure drop @ 846 FPM intake velocity = 0.08 in. H_2O (19.9 Pa)
- Maximum recommended air exhaust velocity = 1750 FPM (8.89 m/s)
  Air volume @ 1750 FPM free area velocity = 6055 CFM (2.86 m^3/s)
  Pressure drop @ 1750 FPM exhaust velocity = 0.34 in. H_2O (84.4 Pa)

SUGGESTED SPECIFICATIONS:

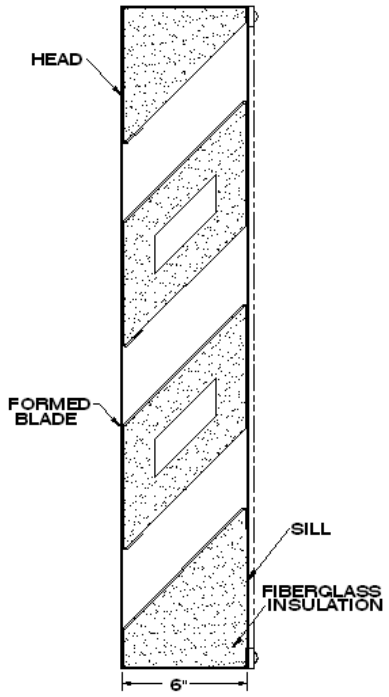
GENERAL: Furnish and install where indicated on the drawings C/S 6″ (152.4 mm) STANDARD FIXED ACOUSTICAL LOUVER **MODEL A6370** as manufactured by Construction Specialties, Inc. Cranford, New Jersey. Complete details shall be submitted to the architect for approval prior to fabrication. Supplier must be a member of AMCA or BSRIA.

MATERIAL: Fixed blades and frame to be formed from 1100 series aluminum alloy. Jambs and slideable interlocking mullions to be 6063-T6 extruded structural members. Interior acoustical material to be fiberglass insulation protected by a woven fire retardant (self-extinguishing) 100% polyester sheeting Material thickness shall be as follows: Heads, sills, jambs, mullion, and fixed blades to be: 0.081" (2.06 mm). All fasteners to be non-corrosive. All louvers to be furnished with 5/8" (15.87 mm) flattened expanded mesh, aluminum bird screen with a .055" (1.4 mm) thick extruded aluminum frame. Screens and screen frames to be standard mill finish.

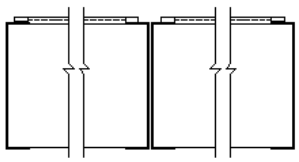
STRUCTURAL DESIGN: Structural supports shall be designed and furnished by the louver manufacturer to carry a wind load of not less than_____ psf (Pascals). (Note: If this paragraph is omitted or if the design wind load is not specified, the louvers will be manufactured in self-supporting units up to a maximum of 5′ (1524 mm) wide by 8′ (2438 mm) high. Any additional structural supports required to adequately secure these units within the opening shall be the responsibility of others.)

TEST DATA: The louver manufacturer shall submit test data from an accredited acoustical laboratory in accordance with ASTM Standard E90-90. The minimum acceptable performance through all octave bands is as follows: STC = 13

Frequency (hz)	63	125	250	500	1000	2000	4000	8000
Transmission Loss	8	7	7	10	14	17	13	13
Noise Reduction	14	13	13	16	20	23	19	19



SECTION VIEW



PLAN VIEW

FINISH: All louvers shall be finished with C/S Powder Coat, a coating to be 1.5 to 3 mil. thick full strength **100% resin Fluoropolymer coating. Finish to allow zero VOCs** to be emitted into facility of application. Finish to adhere to a 4H Hardness rating. All finishing procedures shall be one continuous operation in the plant of the manufacturer. **The coating shall meet or exceed all requirements of AAMA specification 2605** "Voluntary Specification for High Performance Organic Coatings on Architectural extrusions and Panels." The louver manufacturer shall supply an industry standard **20-year limited warranty against failure or excessive fading** of the Fluoropolymer Powder Coat finish. This limited warranty shall begin on the date of material shipment.

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