



CambridgeSide 2.0 80 First Design Review Submittal

Submitted to:
City of Cambridge

Submitted by:
**NEW ENGLAND
DEVELOPMENT**

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80 First Design Review Narrative

The following narrative and attached graphic materials and reports are provided in accordance with Condition 4 of the Special Permit Decision for PB #364 (CambridgeSide 2.0) dated February 17, 2021 (the “Decision”), which addresses the design review requirements for buildings developed pursuant to the Decision. Simultaneous with this filing, and consistent with Conditions 2.c.ii and 15 of the Decision, the Applicant submitted a minor amendment to the Decision (the “Minor Amendment”) to allow for a reconfiguration of the Subsequent Phase building sites (and the uses and GFA proposed at same), largely in order to move the residential use to the corner of First Street and Cambridgeside Place in response to feedback from City staff, the Planning Board and the public (as detailed in the 150 Cambridgeside Place design review package also submitted simultaneously herewith). As detailed throughout this narrative, the proposed 80 First Street building, formerly known as the Upper Garage, is designed to be consistent with the Decision, as amended, which incorporates the approved Final Development Plan for the CambridgeSide 2.0 Project (as the same has been modified by the Design Review certificates for 20 CambridgeSide and 60 First Street, as well as the Minor Amendment).

Over the last three years of the rezoning and special permit process, the development team has met various times with City departments, including Community Development Department (CDD); Traffic, Parking and Transportation (TP&T); Housing Division (Housing); Department of Public Works (DPW) and the Water Department. These meetings have also included informal meetings most recently with CDD design staff to review detailed aspects of the 80 First Street building design, particularly the general massing and proposed façade articulation strategies. Materials presented herein reflect CDD design staff input.

Project Summary

As indicated in the design review graphic materials herein, the 80 First Street building will be located mid-block on the east side of First Street and will replace the existing six-story Upper Garage, an above-grade parking structure situated above two levels of below-grade parking.

The proposed construction will result in a 10-story office and laboratory building, and includes a building lobby, public access to the below-grade garage, retail and other Active Uses at ground level. The building will incorporate the existing shared loading dock, which supports three buildings on First Street in addition to the retail and office uses in the mall, and existing mall life safety, power and other existing infrastructure. Additional details regarding uses proposed in the 80 First Street building are provided on the Dimensional Form on page 3. In conformance with the Decision, the 80 First Street building will not exceed 155 feet in height, and will incorporate appropriate setbacks on First Street to complement the scale of surrounding buildings.

The existing Upper Garage foundation and structure, up to the second floor slab, will be retained and reinforced to support the new 9 story steel-framed structure that will be connected to the existing structure via structural transfer system directly above the existing Upper Garage second floor slab. Consistent with the approved Final Development Plan and as indicated on Exhibits 43 and 45 parking layouts and circulation at the two below grade levels will remain, altered for the new structural reinforcement and new building support functions as required to construct the 80 First Street building.

Vehicular circulation patterns within the garage will remain as they currently exist; parking spaces will be restriped around reinforced column and foundation structures, and elevator access will be provided to the street level and to the tower lobby above.

The existing core mall electrical service on the ground floor of the Upper Garage will be retained. The existing loading dock, which services a portion of the existing core retail and adjacent 60 First Street building (formerly Sears) in addition to the new construction at 80 First Street and the building replacing Best Buy to the south (150 Cambridgeside Place), will be renovated to accommodate project needs. The balance of the ground floor will be rebuilt to include ground-floor retail and lobby uses that will provide a welcoming and active pedestrian environment along the street frontage and into the proposed North Pocket Park and South Courtyard open spaces.

Design Intent Overview

The proposed design is consistent with the goals and design standards set forth in the approved Final Development Plan and the Decision, which standards incorporate policy

objectives identified in the earlier Eastern Cambridge design documents set forth in Section 13.107.5 of the Cambridge Zoning Ordinance (the "CZO"). The primary urban design goals include: a contextual massing approach that addresses multiple proximate neighborhood scales while reducing the perceived height of the building and mechanical penthouse; material and architectural expression which embraces contemporary conditions and uses; and ground-floor Active Uses that maximize visual connection to support the creation of an active, engaging streetscape.

Building Massing

The building massing, as indicated on Exhibits 18, 19 and 27 (sections and rendered view), incorporates a series of setbacks that help reduce the building's perceived mass while visually relating the building to the scale and height of buildings in the neighborhood.

Consistent with the approved Final Development Plan, the building's base massing includes the building's first 4 stories up to a first setback condition at a height of approximately 67 feet, which aligns with neighboring buildings. This approximately 11'-0" setback provides opportunity for a tenant to provide an exterior amenity terrace with neighborhood views.

The building's middle massing element extends 5 floors (levels 5-9) to a height of approximately 139 feet, in general conformance with the approved Final Development Plan which establishes a second setback at approximately 135 feet. The building massing steps back and arcs away from the street, creating a dynamic form which increases views and daylight to the adjacent residential building while reducing the perceived mass of the building. The setback creates the opportunity for a second exterior amenity terrace to be finished by the building's tenant. Additional terrace opportunities are provided on the northeast corner of the 8th and 9th floors, offering views to the Charles River and Boston. The Applicant will complete the upper-level exterior amenity terraces to be compliant with all building code requirements; any additional tenant work for the terraces will be limited (e.g., floor finishes) and completed as part of standard tenant fitout work, subject to receipt of a building permit for the same.

The building's top massing includes a partial 10th floor up to the building's maximum height of 155 feet, which height is consistent with the approved Final Development Plan. The balance of the 10th floor provides mechanical penthouse space for building and tenant use. The combined form of the 10th floor and two additional mechanical floors arcs away from the street and floors below. Consistent with the goals of the PUD-8 Design Guidelines and Principles, and as shown on Exhibits 14-17 and 27 (plans and rendered view), the arcing form effectively reduces the perceived bulk of the penthouse.

Such mechanical penthouse design is also responsive to both the architectural expression of the building and previous planning efforts such as the 1979 East Cambridge Riverfront Plan.

Building Character and Materiality

The overall massing of 80 First Street reflects a traditional tripartite composition of base, middle and top. As shown in Exhibits 20 and 24, the base, or lower volume, comprising floors 1 through 4, conforms to the street edge and relates to the masonry height of 60 First Street, the stepback of 150 Cambridgeside Place, and has a similar relationship to other buildings which line First Street. The pewter toned metal panels complement the brick neighbors, and the rigorous modulation of the façade reflects the planning module for the proposed office and laboratory uses.

As shown in Exhibit 29, the 80 First Street building entry is expressed as a two-story recessed volume framed in metal, echoing at a larger scale the one story framed openings in the building base. The two-story expression, on axis with Hurley Street, punctuates a metal cornice that visually and physically separates the ground floor Active Uses from the commercial space above. These ground floor uses, shown in exhibits 5 and 27-31, will engage pedestrians along the First Street frontage and activate the two new Publicly Beneficial Open Spaces. By shaping the southern edge of the 80 First building, pedestrians are invited into one new open space called the South Courtyard. At the second new open space, known as the North Pocket Park, the building is recessed and like the South Courtyard, new retail and Active Uses surround the space. The retail and Active Use storefronts that line First Street and the new open spaces will bring variety, detail, scale and visual interest to the ground level.

As shown in Exhibits 18, 21, 23, 25 and 27, the middle volume of the building is setback from the base, and to the south, curves away from the street, allowing more sunlight to reach both First Street and the resulting terrace on level 5. The setback and the curve together with the cantilever at the southern end of the building, also help to visually lighten the volume. The metal panels in this portion of the building are subtly manipulated; i.e. one side of the piers is angled, to appear lighter. The depth of the metal panels also helps mitigate solar heat gain by shading the glass.

As shown in Exhibits 14, 18, 21, 23, 26 and 27, the top of the building, which includes some office and laboratory space on the south end of the 10th floor in addition to the mechanical penthouse, is set back from the middle volume, creating an upper level terrace. The setback increases at the north end, as the façade curves away from the street, reducing the apparent overall height of the building. A rhythmic system of metal panels reflects the office and laboratory space as well as the mechanical uses in this portion of the building.

The building's materiality and visual expression holistically integrate strategies for building energy performance, emissions reductions and occupant comfort. The entire building will employ high performance triple glazing with low emissivity coatings and low to moderate reflectivity which will provide high thermal and solar performance and visual clarity. Thermal bridging will be reduced by utilizing large, unbroken glazing units. Increased insulation will be included in both the curtain wall shadow box and metal panel clad opaque areas of the building facades. A physical model of the proposed building, in its context, is available. The project team will make the model available for virtual viewing consistent with staff and Planning Board needs. Photographs of proposed building materials are incorporated within Exhibits 24-26.

Rooftop Penthouse

Significant design consideration has been given to the placement and design of the building's penthouse. The penthouse, as indicated on Exhibits 14-17 and 27, adopts an arcing form, which steps back the mechanical penthouse screening up to 65 feet from First Street, well beyond the recommended setback as described in the Final Development Plan. The geometry of the penthouse echoes the building's geometry, following the arced form of the middle floors and continuing the sweeping form to the northern end of the building. The penthouse is clad in metal consistent with the rest of the building, as indicated on Exhibit 26. As shown in Exhibit 22, louvers are concentrated on the penthouse east face, away from sight lines along First Street, and are integrated into the panelized cladding of the penthouse.

Ground Floor Uses and Activation

The ground floor of the 80 First Street building will incorporate new Active Uses and an engaging streetscape, as well as a ground floor main building entry with publicly accessible lobby and access to the existing below-grade parking garage.

As shown in Exhibits 27-29, the ground floor retail and Active Use space will benefit from up to 20 feet of glazing and storefront with unique identity and signage opportunities, enlivening the streetscape and encouraging pedestrian engagement with the goods and services that will line the building frontage. Guests will enter directly from the expanded sidewalk on First Street and from the South Courtyard.

Construction of the 80 First Street building will offer improvements to the existing First Street streetscape and will include enhanced landscaping, added sidewalk dimension and two new parks as indicated on Exhibits 39-42.

A curbside furnishings zone will include the street signage, infrastructure, lighting and street trees, which will benefit from enhanced and expanded soil conditions and drainage to allow them to grow and thrive. As described in Exhibit 4,

this area will be coordinated with the City's ongoing First Street Study to benefit the City by introducing a lively, safe and engaging multi-modal environment. A generous and flexible pedestrian sidewalk and outdoor seating zone will fill the remaining distance from the furnishings zone to the face of the building's retail and Active Use frontage on First Street.

The new North Pocket Park, which replaces the former entry ramp to the Upper Garage parking structure, is well proportioned to be activated by retail and restaurant spill out, or to be a quiet and intimate space for informal gathering at all times of the day.

The new South Courtyard is shared by the proposed 80 First Street and 150 Cambridgeside Place buildings. It is a generously proportioned space to allow for many types of programming. Guests, tenants and residents may use the Lower Garage elevators just off the South Courtyard to park their bikes in the bike parking area in 80 First, or may arrive into the 80 First lobby or South Courtyard having parked their car and taken the elevators to the ground floor. Like the North Pocket Park, the South Courtyard is surrounded by retail and Active Uses which may spill out into the courtyard. The generous landscape and ample seating proposed for the space will invite guests to linger, while additional activities to encourage play, dining and visiting may be introduced based on the needs and interests of the community. Similar to the Initial Phase Canal Park open space improvements, while the Applicant is seeking approval of the location, general dimensions and overall design intent of each of the North Pocket Park and the South Courtyard as part of these design review applications, the final programming (e.g., furnishings and fixtures) of such open spaces will be determined in coordination with the Open Space and Retail Advisory Committee to ensure that the design is responsive to community needs.

Lighting

The façade lighting strategy of 80 First Street adopts a similar and sensitive lighting approach to that of the neighboring developments at 20 CambridgeSide and 60 First Street. The exterior façade lighting will be minimal and quiet, while complementing the building's massing by accenting the soffit of the building setback at the 5th floor level. The warm soffit material will be softly washed by fully concealed fixtures and the peak candle power of these fixtures will be contained by the building soffit to avoid light spill up into the night sky. Supplemental down-lighting will be utilized at this level to illuminate the terrace without visible fixture source brightness.

Street level lighting will focus on the legibility of the building entry and parking entry for enhanced wayfinding. The building entry will have soft facade lighting to create a visual identity for the building. It is anticipated that the ground

floor retail signage band will be illuminated from concealed fixtures at that location.

At the South Courtyard between 80 First Street and 150 Cambridgeside Place, a warm and inviting evening atmosphere will be created through subtle landscape lighting, appropriate pedestrian scale lighting and possible catenary fixtures or other hardware appropriate for small urban plazas. A similar treatment may be considered for the North Pocket Park between 60 and 80 First Street.

The upper stories of the building will not receive façade lighting treatments, allowing the upper building massing to visually fade at night, effectively reducing the building's perceived scale at night and maintaining a visually quiet appearance in order to be sensitive to nearby neighbors. The exterior building and streetscape lighting will be dimmable to allow further flexibility with respect to neighborhood light level programming throughout the night. The proposed exterior lighting concepts are shown on Exhibit 33.

Additionally, consistent with the Decision, the 80 First Street building will comply with light mitigation requirements for a building containing laboratory use set forth in Section 13.107.3 of the CZO and Condition #9 of the Special Permit. In order to ensure that such interior lighting requirements for laboratory areas will be incorporated into a future tenant's interior fit out project, the development team has produced written tenant standards requiring tenant compliance with these requirements.

Technical Standard and Public Improvement Requirements

Over the last three years, the development team has met numerous times with various City departments regarding the more technical standards (such as transportation and Green Building requirements) and proposed public infrastructure improvements (e.g., stormwater improvements) associated with the CambridgeSide 2.0 Project.

The development team met, and had ongoing correspondence with TP&T over the course of the last three years to review and determine appropriate transportation measures, as summarized in the certified TIS for the CambridgeSide 2.0 Project and the transportation mitigation measures incorporated into the Decision. The approved Final Development Plan and Decision establish the mutually agreed upon approach to vehicular and bicycle parking across the PB-364 Development Parcel, as well as transportation mitigation measures that were reviewed at a conceptual stage. The development team is committed to continuing to coordinate with TP&T to finalize the specific design and implementation of the proposed transportation measures over the course of the project. Final design of the improvements within the First Street right of way, which abut the on-site North Pocket Park

and South Courtyard and the Subsequent Phase buildings, will be coordinated with City pending outcome of the First Street Study.

Since February 2020, the development team has coordinated with CDD staff to incorporate Article 22 Green Building requirements into the overall CambridgeSide 2.0 Project, including both the Initial and Subsequent Phase buildings. The overall CambridgeSide 2.0 Green Building Report was certified by CDD on August 12, 2020, and building specific Green Building Reports for 20 CambridgeSide and 60 First Street were certified by CDD on November 6, 2020. Further, the development team submitted the required Green Building Report materials for the 80 First Street building on October 20, 2021, and was certified by CDD on December 29, 2021. A summary of the key components of the 80 First Street Green Building Report materials is included in Exhibit 52, and the full set of materials is on file with CDD. With respect to the 80 First Street building, the development team will comply with the City's ongoing requirements for Green Building compliance as the building progresses to the building permit and certificate of occupancy stages of development.

Infrastructure

The development team has also worked with the Department of Public Works (DPW) and the Cambridge Water Department (CWD) to identify appropriate infrastructure upgrades to be implemented by the Applicant in order to meet the CambridgeSide 2.0 Project's I/I requirement. In May of 2019, the Applicant proposed an interceptor drain concept that will intercept the existing City drains in a new infiltration collection treatment and redirect their flows from the MWRA Marginal Conduit (a combined sewer) to the existing CAM 017 outfall on the downstream side of the Binney Street regulator (the "Land Boulevard I/I Project").

The relocation of the lab/office uses from the 110 First Street building (also known as 150 Cambridgeside Place) to 80 First Street will have a nominal increase in wastewater flow. However, the nominal increase will not affect the overall design of the proposed Land Boulevard I/I Project, which is estimated to remove approximately 380,000 gallons of stormwater from the MWRA Marginal Conduit. The proposed Land Boulevard I/I Project, currently in design, will provide sufficient 4:1, I/I mitigation for the wastewater flows from all the four (4) new buildings included as part of the CambridgeSide 2.0 Project.

The Land Boulevard I/I Project is intended to be completed in the Fall of 2022, prior to the construction of 80 First Street. In accordance with the DPW standards incorporated into the Decision and further described below, the development team will continue to follow other DPW and CWD requirements for utility and site improvements as construction of the project, including the 80 First Street building, commences.

Wastewater Infrastructure

Existing wastewater flows from CambridgeSide discharge to the City's separated sewers in the abutting streets. Per initial communication with the DPW the existing sewer infrastructure in the adjacent streets have adequate capacity to handle the CambridgeSide 2.0 Project's wastewater flows.

The proposed wastewater flow for the 80 First Street building is approximately 35,500 gallons per day (gpd), based on 310 CMR 15.203 Title 5 System Sewage Flow Design and is subject to change based on final tenants and seating capacities. The Applicant will continue to work with the DPW to coordinate new sewer service connections to the existing sewer mains as construction of the project, including the 80 First Street building, commences.

Water Infrastructure

There are several existing water mains adjacent to CambridgeSide that are interconnected and provide a loop completely around CambridgeSide. Per initial communication with the CWD, there are no known low-pressure concerns within the CambridgeSide 2.0 Project vicinity and the existing water mains currently serving CambridgeSide have adequate capacity to handle the CambridgeSide 2.0 Project's demand. The domestic water demand for the 80 First Street building is approximately 39,100 gpd, based on the Title 5 calculations with an additional 10% consumption factor. The Applicant will continue to work with the CWD to coordinate new domestic and fire protection service connections to the existing water mains as construction of the project, including the 80 First Street building, commences.

Stormwater Infrastructure

Under the existing conditions, CambridgeSide is almost entirely impervious covered by buildings.

Stormwater runoff from the First Street buildings is collected through roof leaders that discharge to the City's drain in First Street which discharges to a large culvert in Thorndike Way that empties into to the Lechmere Canal. The remainder of CambridgeSide discharges stormwater runoff to the Land Boulevard City drains. The CambridgeSide 2.0 Project will have a slight reduction in stormwater runoff and volume since there will be a reduction in impervious area with the proposed southern courtyard on First Street. The Applicant will continue to work with the DPW to coordinate stormwater improvements and Best Management Practices (BMPs) as construction of the project, including the 80 First Street building, commences.

Private Utilities

The CambridgeSide 2.0 Project is surrounded by a dense network of private utilities located in the abutting streets. These utilities have served the existing facility for the past 30 years and with the Project's proposed energy conservation measures will have adequate capacity to serve the CambridgeSide 2.0 Project. The Applicant will continue to work with the private utility companies to coordinate utility and site improvements as construction of the project, including the 80 First Street building, commences.

as described throughout this application, and grant in its approval any waivers required for the building as reflected in the design shown on the plans approved by the Board or as the Board otherwise deems appropriate.

Dimensional Form

Please see following Table 1: Dimensional Form.

Conclusion

As detailed throughout this application and demonstrated by the graphics included within the same, the 80 First Street building has been designed to conform to the applicable design review standards set forth in Condition 4 of the Decision, including with respect to the following criteria:

- The architectural design of building facades, with special attention to the ground level.
- The placement of rooftop mechanical equipment, along with the design of penthouses and other features meant to screen such equipment, and any other exterior features within or surrounding the building site.
- The configuration and design of pedestrian, bicycle and vehicular modes of access and egress.
- The design of landscape elements, and modifications to abutting street or sidewalk rights of way, with attention to pedestrian and bicycle circulation and comfort and management of potential conflicts between pedestrian and bicycle paths of travel.
- Any potential impacts of the proposed design on the public realm or on properties outside of the PUD, including but not limited to visual impacts, noise impacts, wind impacts, and effects on the safety and comfort of pedestrians, bicyclists and motorists in the area, and measures that are being taken to mitigate such impacts.
- The measures being implemented to promote highly sustainable design and development reflecting the goals and objectives established by the City.

Accordingly, we respectfully request that the Planning Board find that the 80 First Street building design as described and shown in this application maintains an architectural character consistent with the planning and design goals set forth in the PUD-8 Design Guidelines and Principles and approve the proposed design of the 80 First Street building

Dimensional Form

Table 1: Dimensional Form

CambridgeSide Development Program Update							
Building	GROSS FLOOR AREA					Net New GFA ¹	
	Retail	Office	Lab	Residential	Total	Existing	Net New
20 Cambridgeside Place	15,200	125,112	187,669	0	327,981	125,000	202,981
150 Cambridgeside Place	10,000	0	0	175,000	185,000	113,000	72,000
80 First **	10,000	149,888	295,112	0	455,000	273,000	182,000
60 First	25,000	0	171,365	0	196,365	124,000	72,365
Totals	60,200	275,000	654,146	175,000	1,164,346	635,000	529,346
Core Mall	315,000	140,000	0	0	455,000		
Grand Total	375,200	415,000	654,146	175,000	1,619,346		

PUD-8 Final Development Plan Shared Program ²			
	Final Development Plan	Existing	Upon Completion of the 80 First Building ²
Open Space (sq ft)	244,600 ³	234,820	245,820 ⁵
Off-Street Parking Spaces	1,695	2,490	1695 ⁴
Long-Term Bicycle Parking Spaces	450	143	259
Short-Term Bicycle Parking Spaces	146	87	91
Loading Bays	12-20	15	13

80 First Street Building Height and Setbacks			
	Final Development Plan		Upon Completion of the 80 First Building
Building Height (ft)	145-155		See Exhibit 18
Front Yard Setback (ft)	0		See Exhibit 18
Side Yard Setback (ft)	0		See Exhibit 18
Rear Yard Setback (ft)	0		See Exhibit 18

** As the design of the 80 First Street building progresses to the construction drawing and building permit stages of development, the proposed Gross Floor Area (GFA) will be further refined to account for allowable exemptions from the calculation of GFA.

¹ The Net New GFA available for development or reallocation is 296,037 sf following the Initial Phase buildings and does not account for the 72,000 sf of Net New GFA allocated 150 Cambridgeside Place, for which a Design Review application is being simultaneously submitted. A total of 45,654 sf of Net New GFA will be available for development or reallocation following completion of both Subsequent Phase buildings.

² Consistent with PB #364 and the Final Development Plan, requirements for Open Space, parking, bicycle parking and loading may be met across the PUD-8 Development Parcel, intended to serve the interconnected mixes proposed as part of the CambridgeSide 2.0 project, at full buildout. The numbers identified here do not account for any improvements to be constructed as part of the 150 Cambridgeside Place building (i.e., 191 long-term bicycle parking spaces and 56 short-term bicycle parking spaces). Following completion of both Subsequent Phase buildings, and in full satisfaction of the requirements of the PB #364 Decision, there will be a total of 245,820 sf of Open Space, approximately 1,695 off-street parking spaces (subject to footnote 4 below), 450 long-term bicycle parking spaces, 147 short-term bicycle parking spaces and 13 loading bays to serve the uses on the PUD-8 Development Parcel.

³ Per Section 13.105 of the CZO applicable to the PUD-8 District, Open Space includes (i) the off-site Public Open Space at Charles Park and Canal Park and (ii) the on-site Publicly Beneficial Open Space, to be comprised of the publicly accessible mall atrium space, the public easement for Cambridgeside Place and the new Mall connector in the 60 First Street building, new setbacks and new North Pocket Park and South Courtyard on First Street.

⁴ Consistent with PB #364 and the Final Development Plan, the total number of parking spaces on the PUD-8 Development Parcel will be reduced from 2,490 to approximately 1,695 at the time of demolishing the existing above-grade structured parking garage. All parking is subject to maximum ratios by use set forth in Section 13.106.4 of the CZO. Consistent with the PB #364 Decision, the Applicant will continue to work with TP&T on the coordination of parking to incorporate a flexible parking solution, if needed, that ensures adequate supply exists over the life of the Project.

⁵ The total Open Space accounts for the addition of the North Pocket Park and the South Courtyard, the location and general dimensions of which have been established but the programming (e.g., fixtures and furnishings) for which will be coordinated with the Open Space and Retail Advisory Committee and subject to a subsequent design review filing.


80 First Street




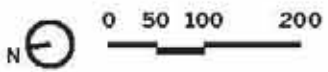
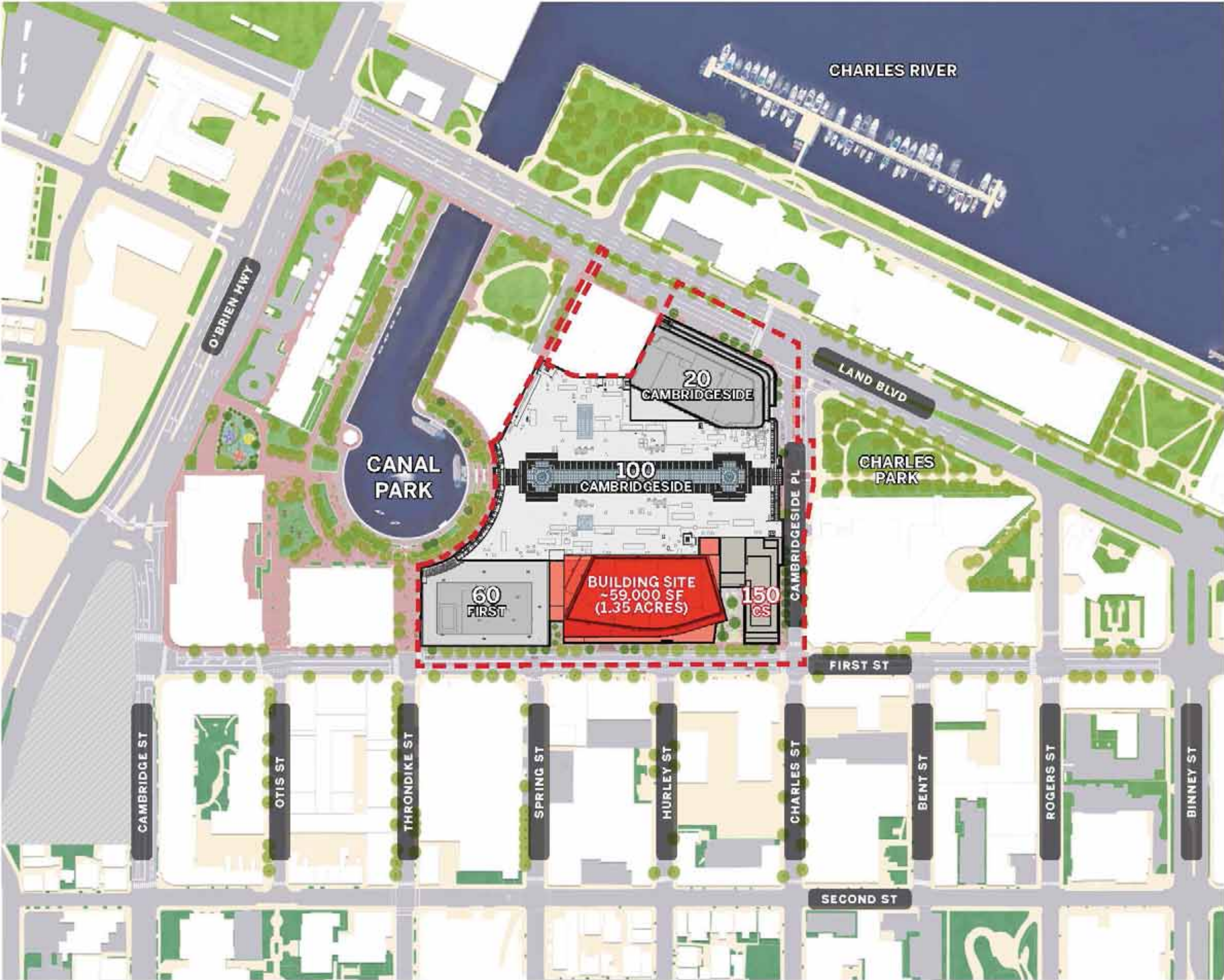
Building Design Review
80 First Street
 DEVELOPMENT PLAN

EXHIBIT 1

Legend

 PUD-8 DEVELOPMENT PARCEL

 80 FIRST STREET





Building Design Review
80 First Street
 EXISTING CONDITIONS PHOTOS

EXHIBIT 2

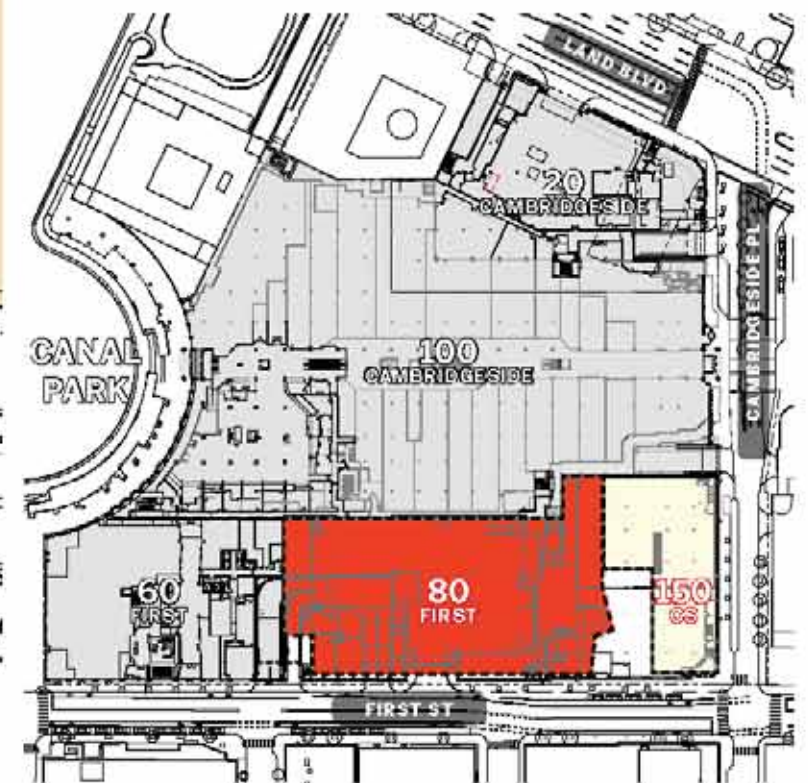
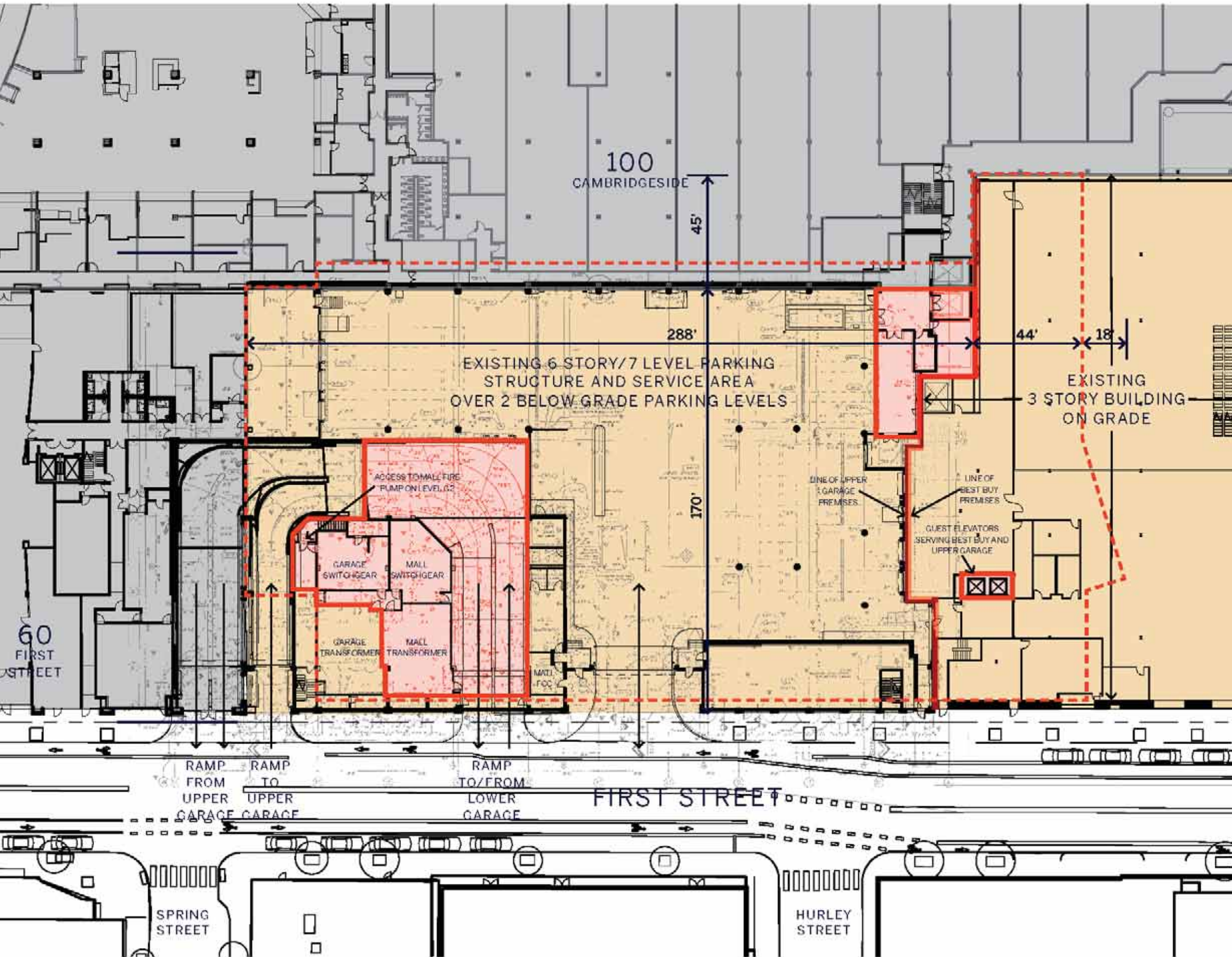


Building Design Review
80 First Street
 EXISTING CONDITIONS SITE PLAN

EXHIBIT 3

Legend

- BUILDING SITE
- DEMOLISHED STRUCTURE
- INFRASTRUCTURE TO REMAIN



Building Design Review 80 First Street PROPOSED SITE PLAN

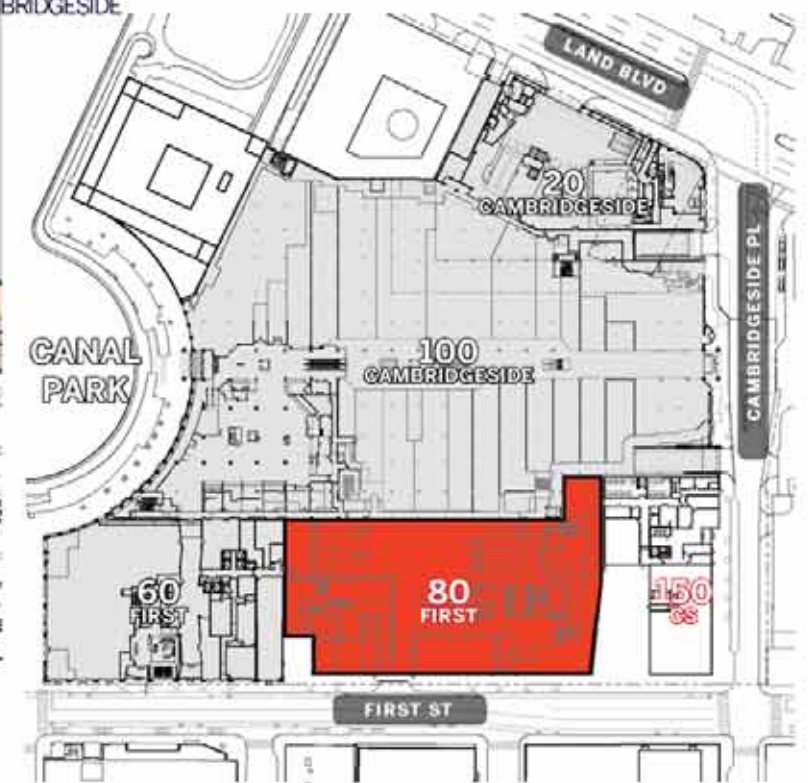
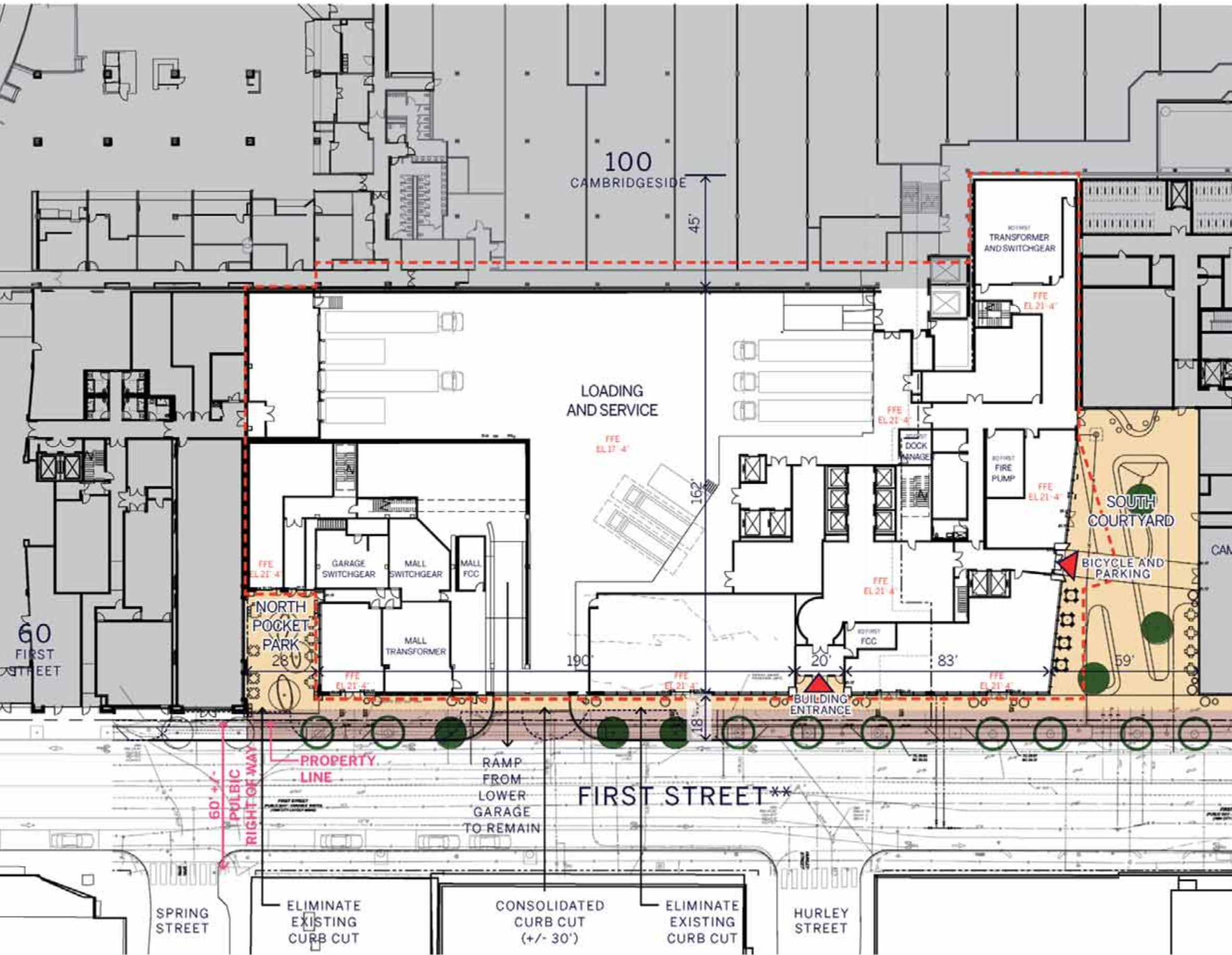
EXHIBIT 4

Legend

- BUILDING SITE
- NEW SIDEWALK AND PAVING*
- EXISTING AND REFURBISHED ZONE**
- EXISTING TREE
- NEW TREE

SEE GROUND FLOOR ENTRY, LANDSCAPE MATERIALS AND PLANTING PLANS FOR ADDITIONAL DETAIL

***SIDEWALK DIMENSION FROM FACE OF CURB IS MEASURED USING THE EXISTING FIRST STREET LAYOUT AND IS APPROXIMATE AS THE CURB LINE MAY VARY. CURB LOCATION IS SUBJECT TO FINAL DESIGN OF THE FIRST STREET/SECOND STREET STUDY.



* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY

Building Design Review

80 First Street

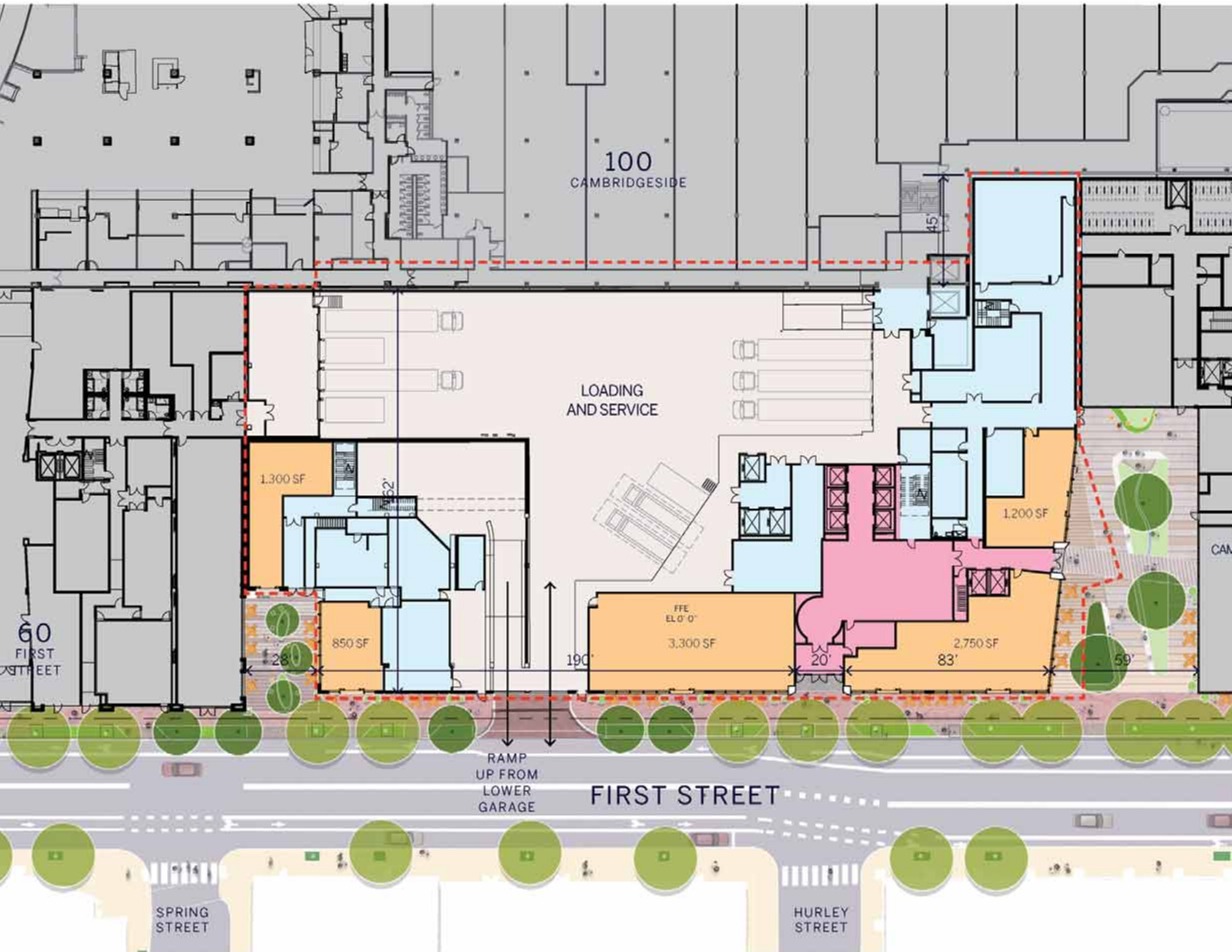
GROUND FLOOR PLAN

EXHIBIT 5

Legend

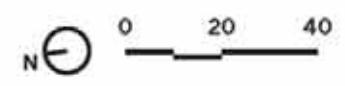
- BUILDING SITE
- RETAIL AND ACTIVE STOREFRONT
- LOBBY/GATHERING
- BACK OF HOUSE AND SERVICE
- PARKING AND LOADING
- OTHER DEVELOPMENT

DESIGN AND DEMISING OF THE RETAIL AND ACTIVE USE AREAS IS SUBJECT TO FINAL DESIGN AND LEASING AGREEMENTS.



* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY



Building Design Review

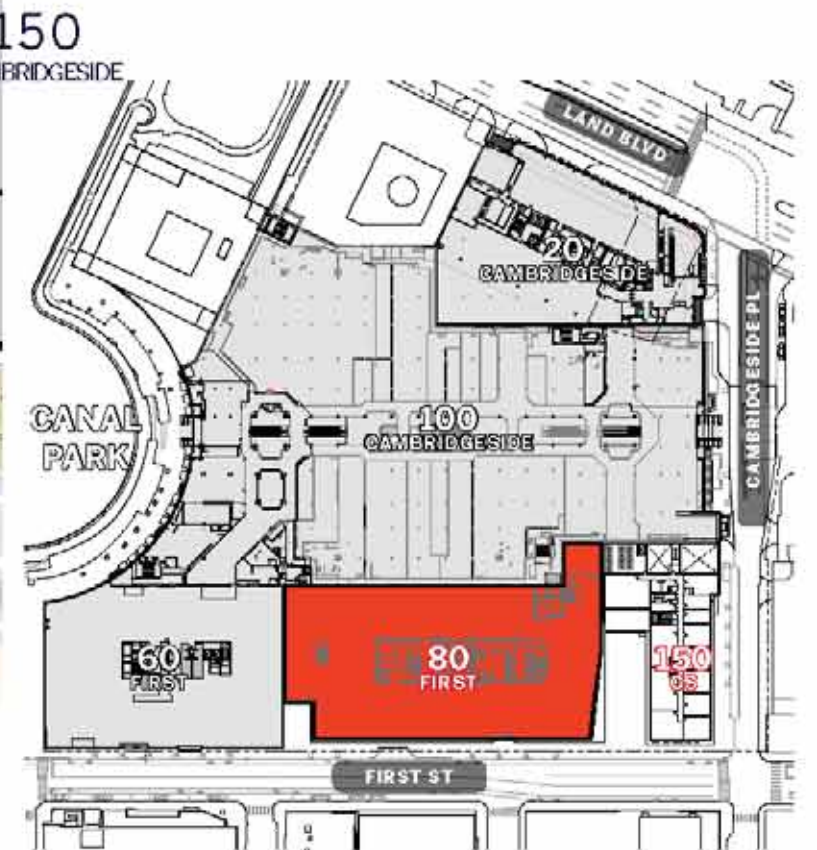
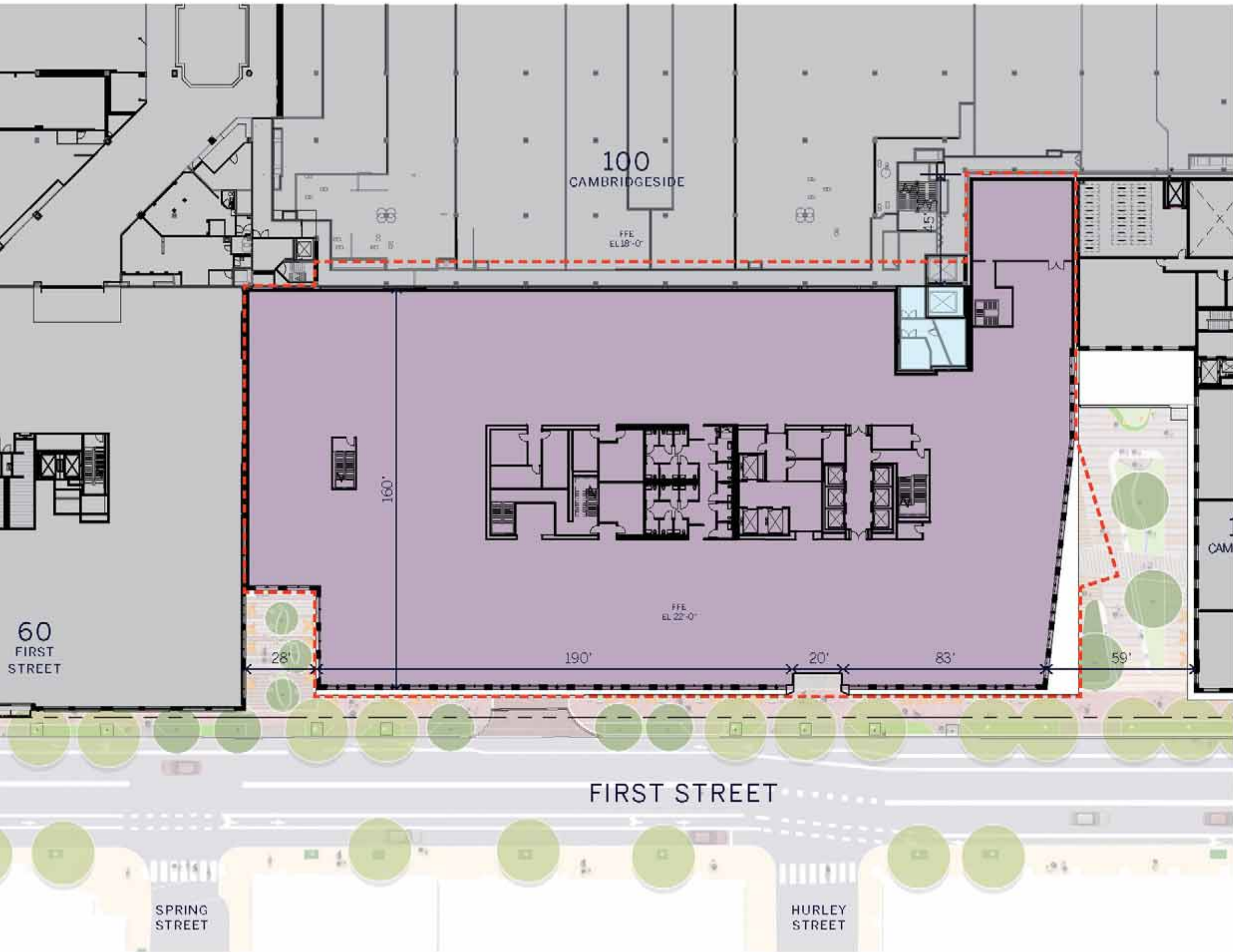
80 First Street

2ND FLOOR PLAN

EXHIBIT 6

Legend





- BUILDING SITE
- OFFICE AND LAB
- BACK OF HOUSE AND SERVICE
- OTHER DEVELOPMENT

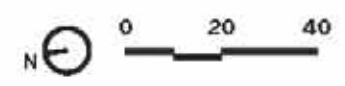
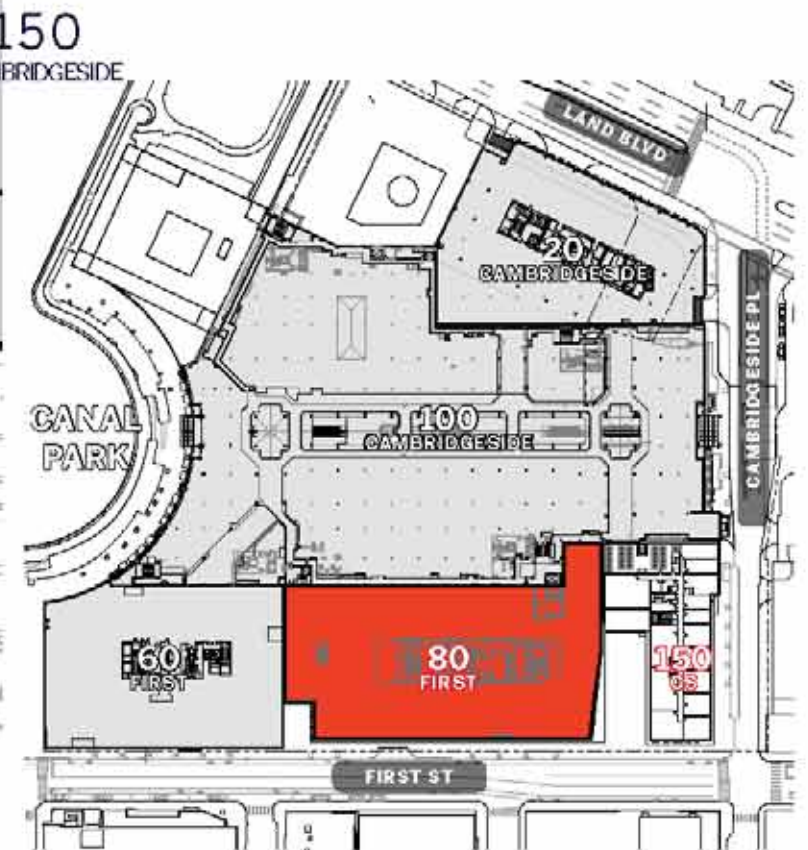
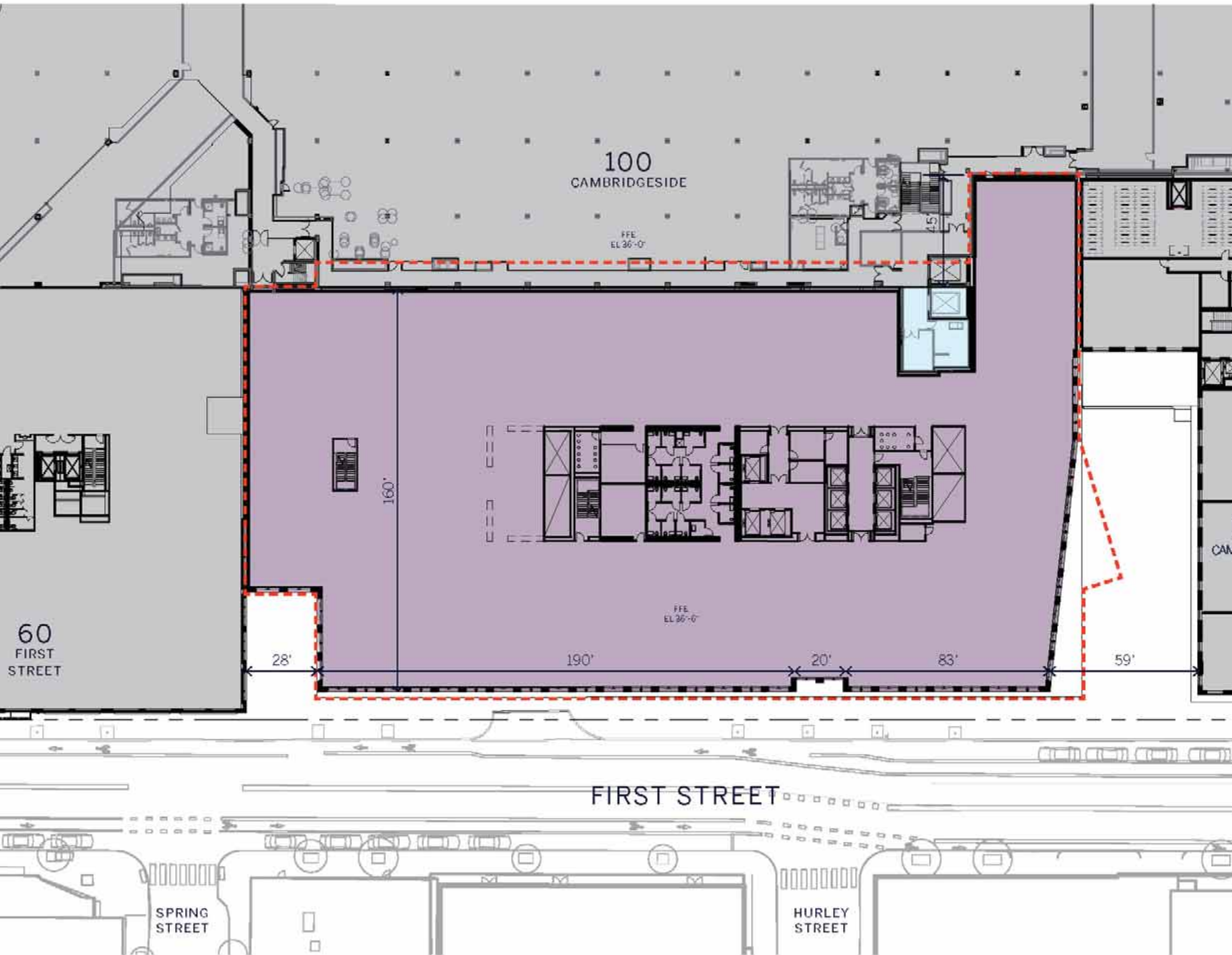


Building Design Review
80 First Street
 3RD FLOOR PLAN

EXHIBIT 7

Legend

-  BUILDING SITE
-  OFFICE AND LAB
-  BACK OF HOUSE AND SERVICE
-  OTHER DEVELOPMENT



Building Design Review

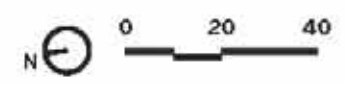
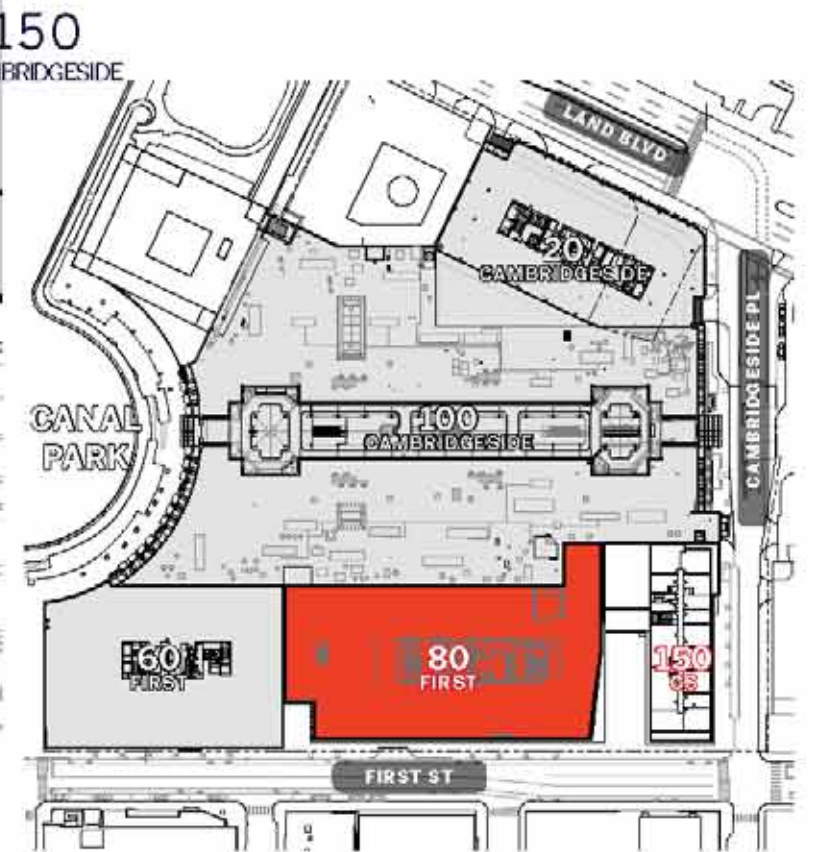
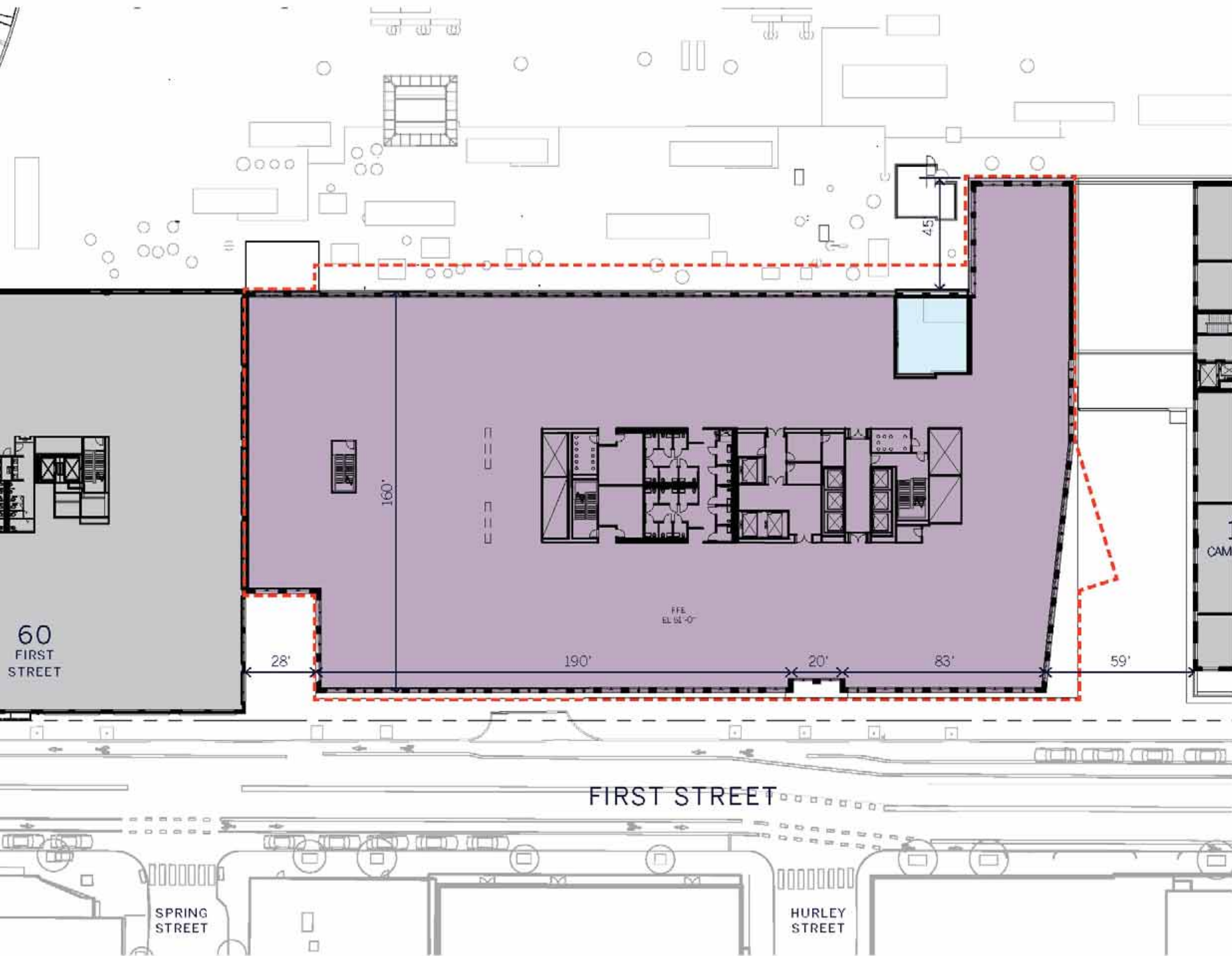
80 First Street

4TH FLOOR PLAN

EXHIBIT 8

Legend

- BUILDING SITE
- OFFICE AND LAB
- BACK OF HOUSE AND SERVICE
- OTHER DEVELOPMENT



Building Design Review

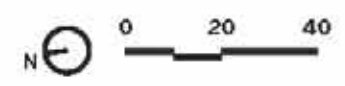
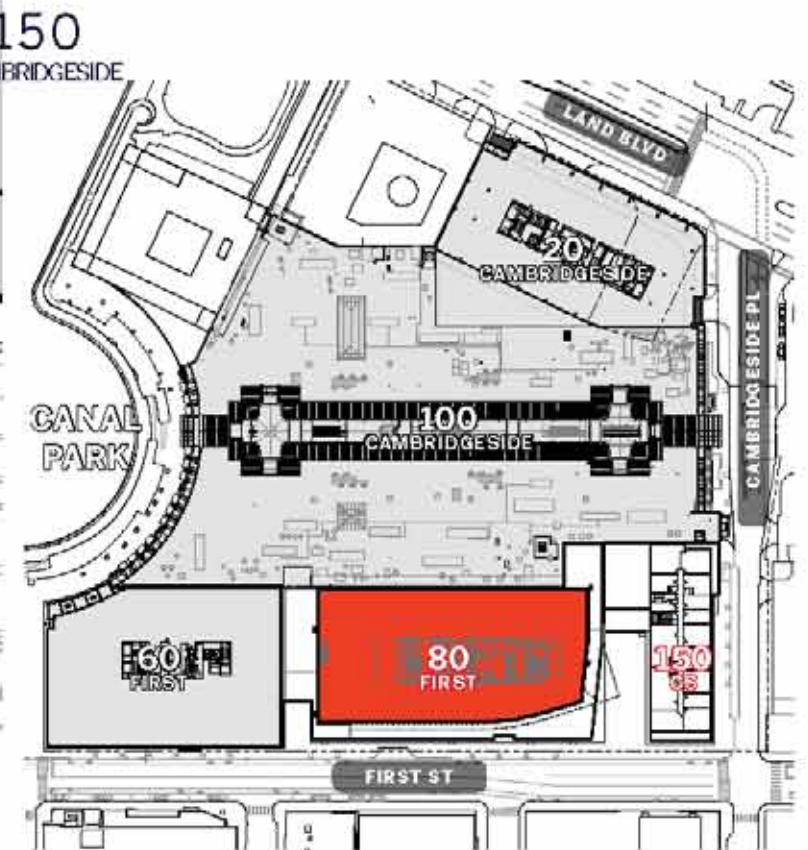
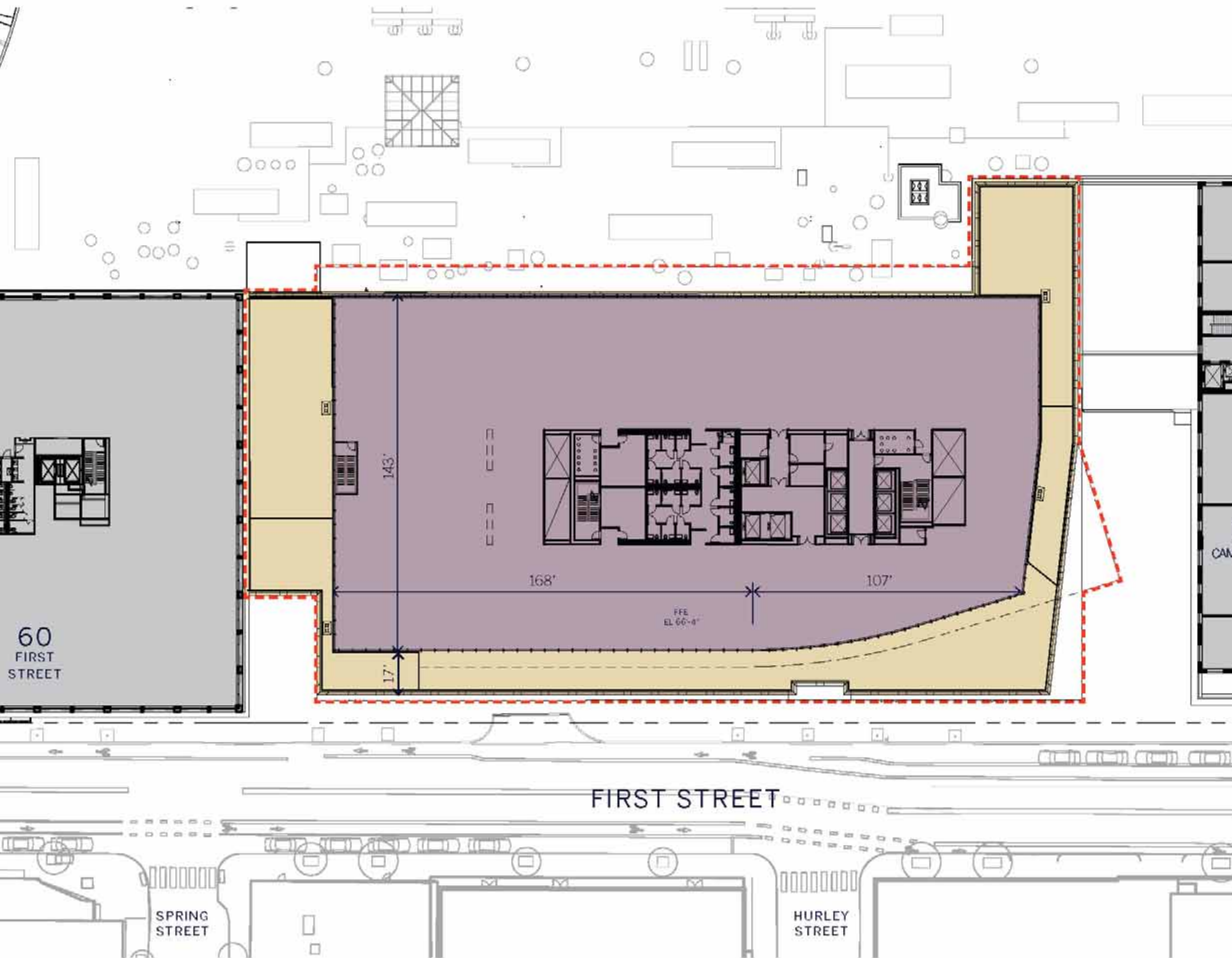
80 First Street

5TH FLOOR PLAN

EXHIBIT 9

Legend

-  BUILDING SITE
-  OFFICE AND LAB
-  TERRACE
-  OTHER DEVELOPMENT



Building Design Review

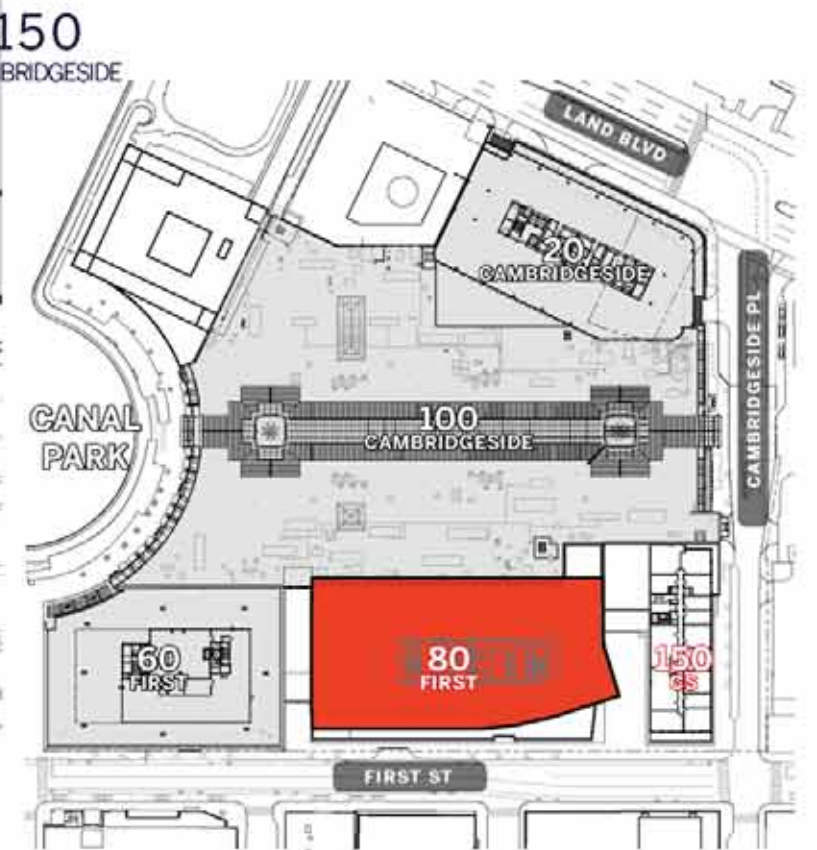
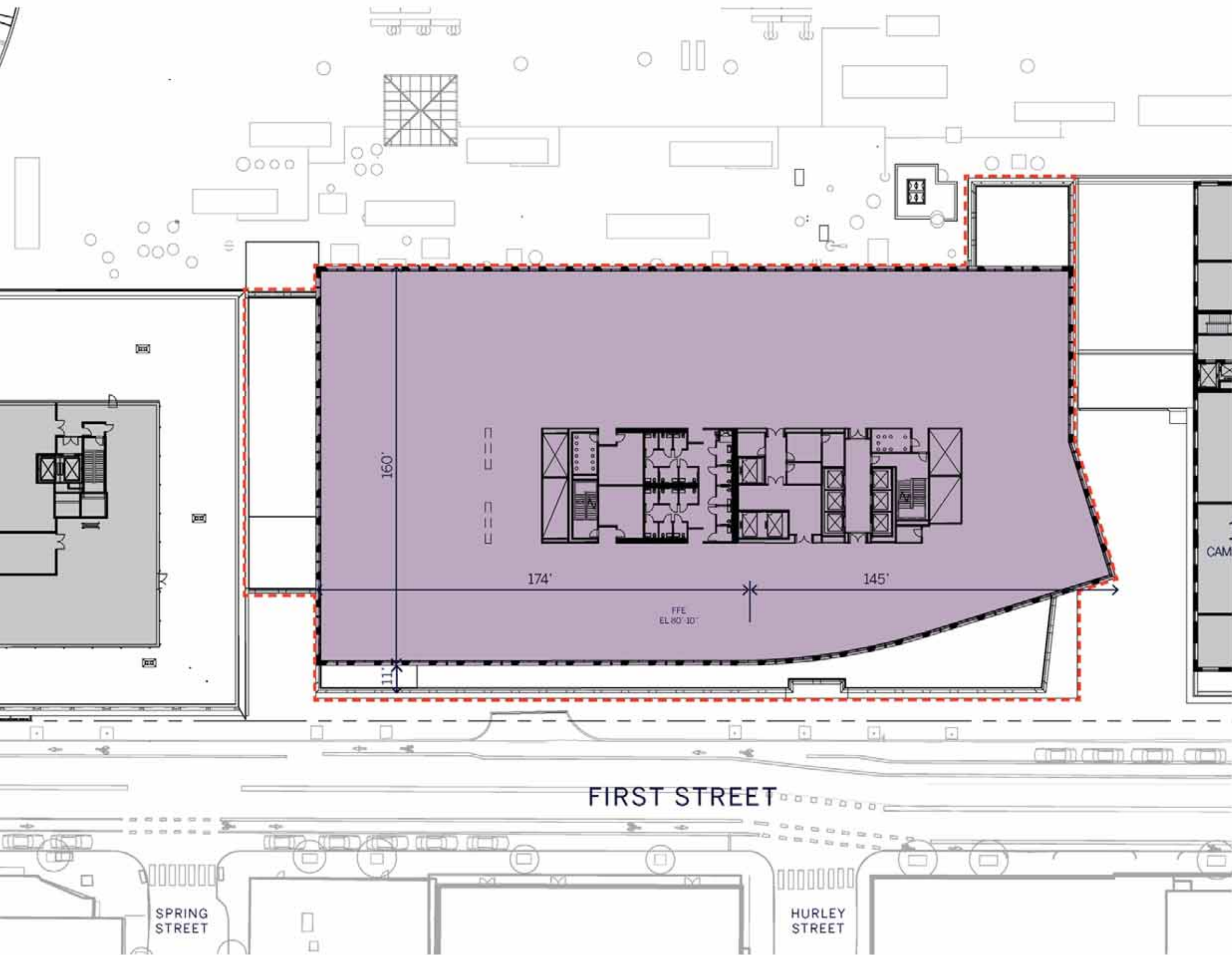
80 First Street

6TH FLOOR PLAN

EXHIBIT 10

Legend

-  BUILDING SITE
-  OFFICE AND LAB
-  OTHER DEVELOPMENT




Building Design Review

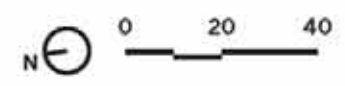
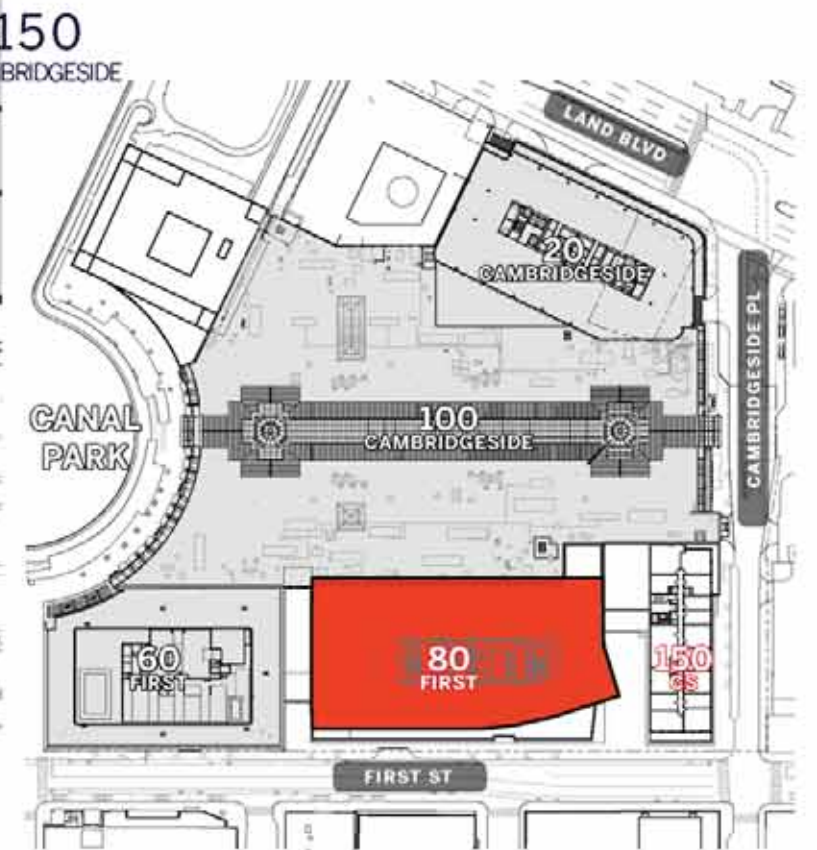
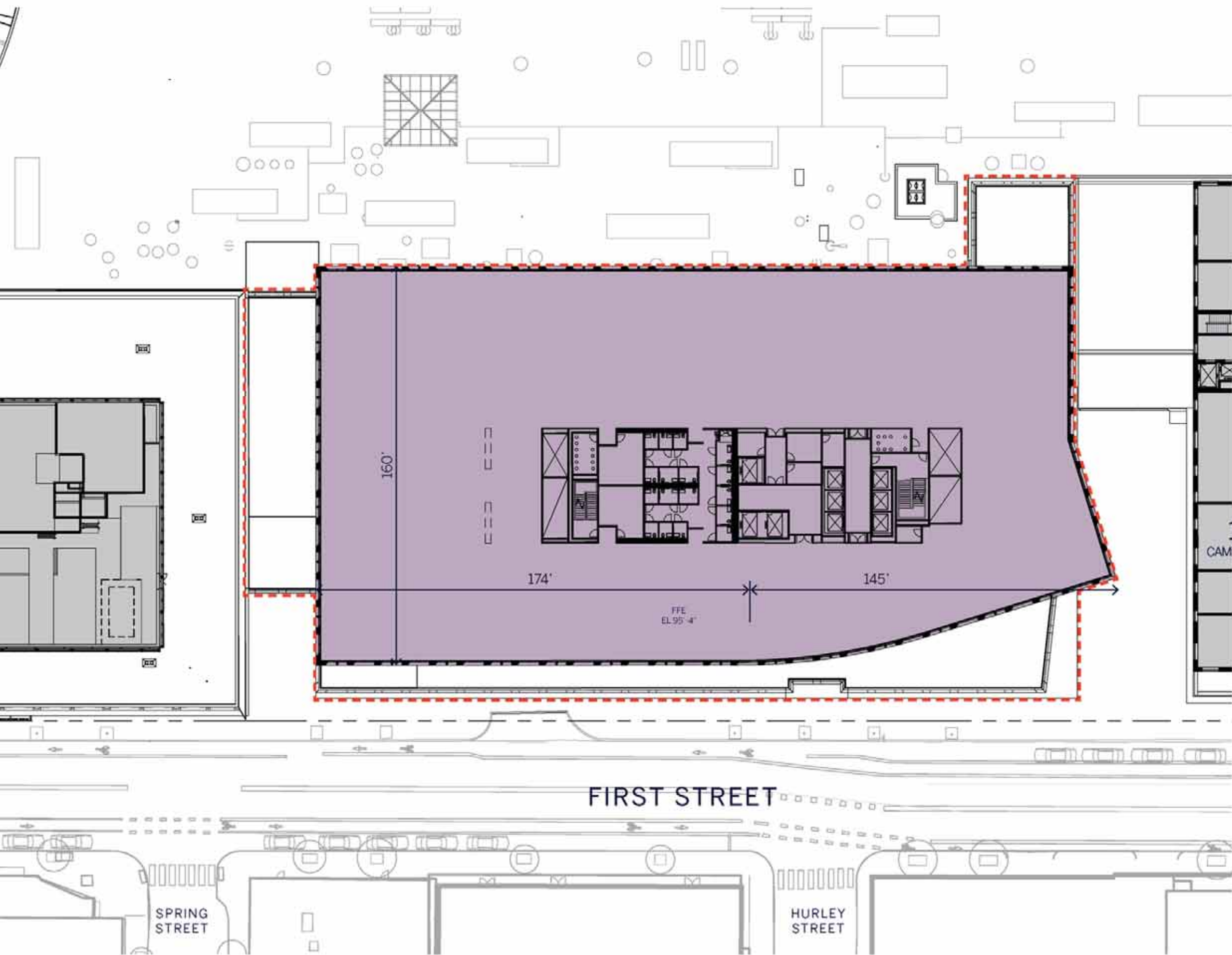
80 First Street

7TH FLOOR PLAN

EXHIBIT 11

Legend

-  BUILDING SITE
-  OFFICE AND LAB
-  OTHER DEVELOPMENT



Building Design Review

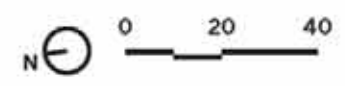
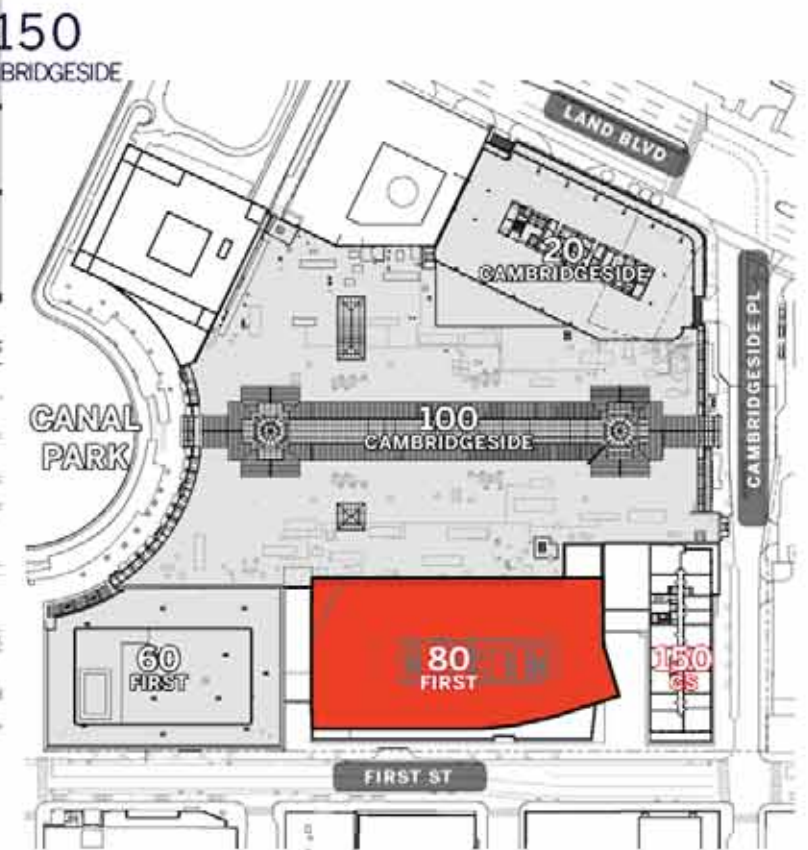
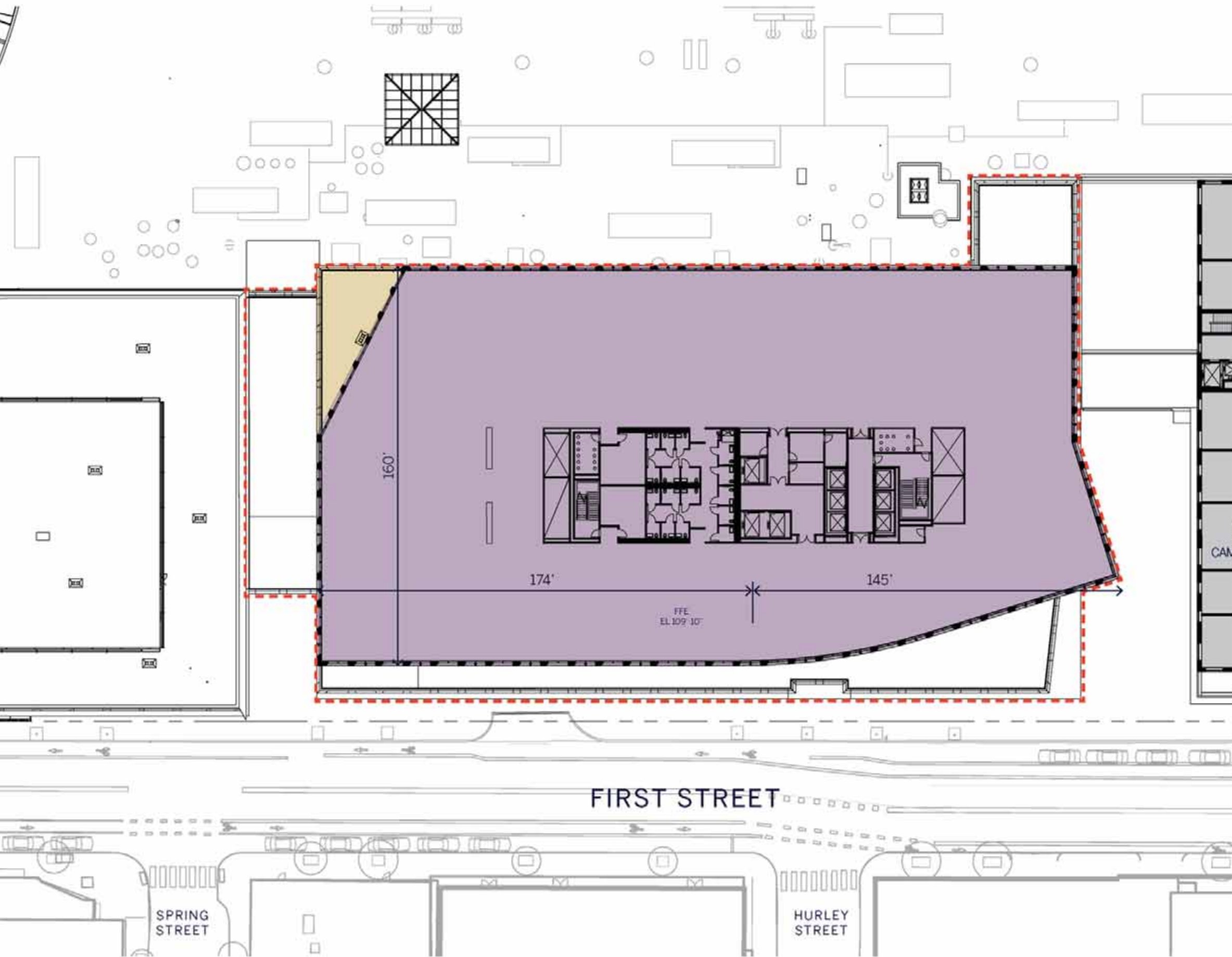
80 First Street

8TH FLOOR PLAN

EXHIBIT 12

Legend

- BUILDING SITE
- OFFICE AND LAB
- TERRACE
- OTHER DEVELOPMENT



Building Design Review

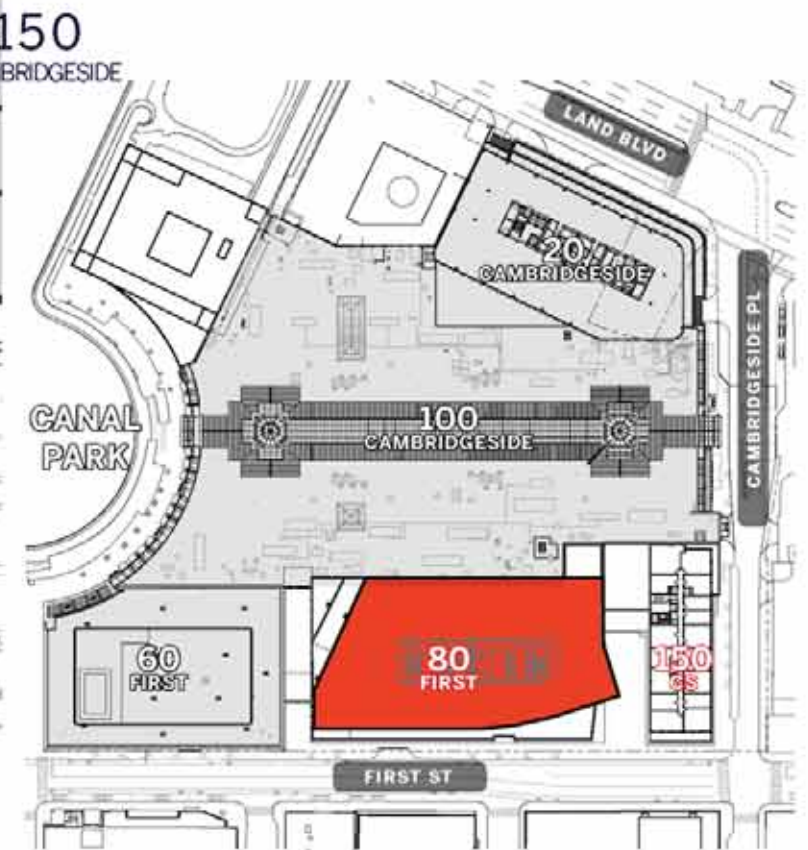
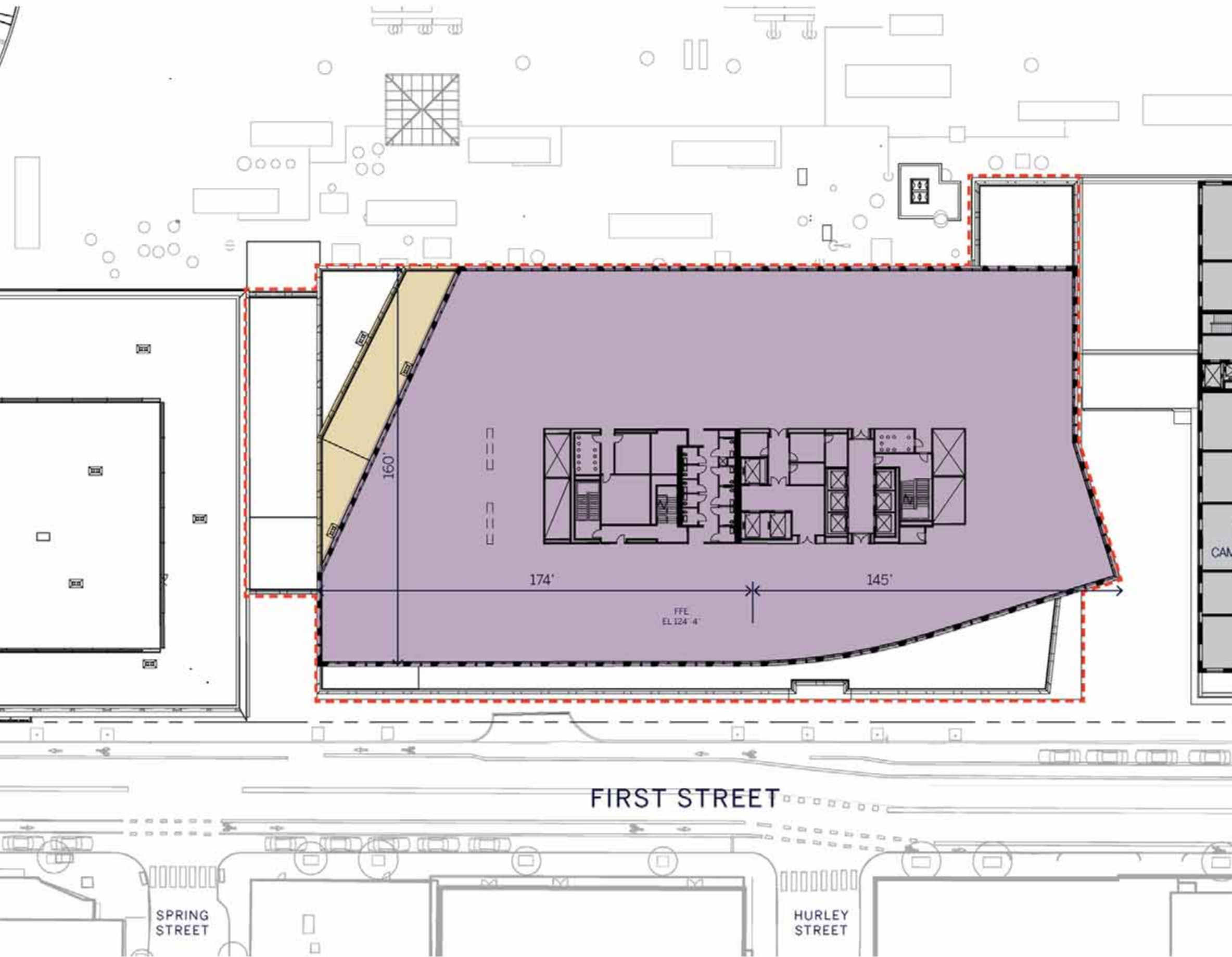
80 First Street

9TH FLOOR PLAN

EXHIBIT 13

Legend

-  BUILDING SITE
-  OFFICE AND LAB
-  TERRACE
-  OTHER DEVELOPMENT



Building Design Review

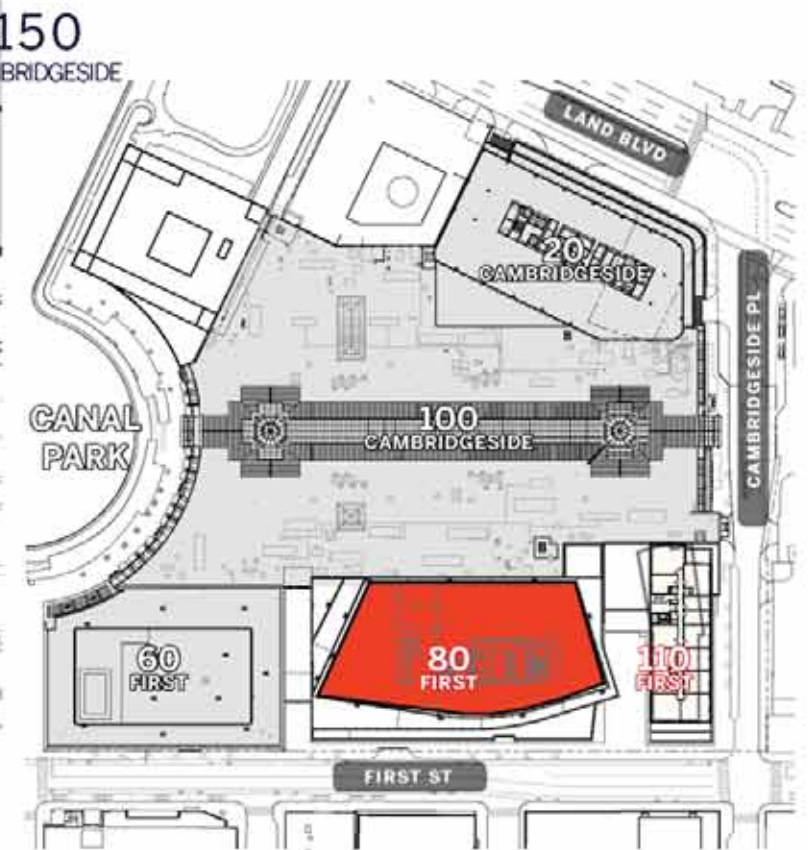
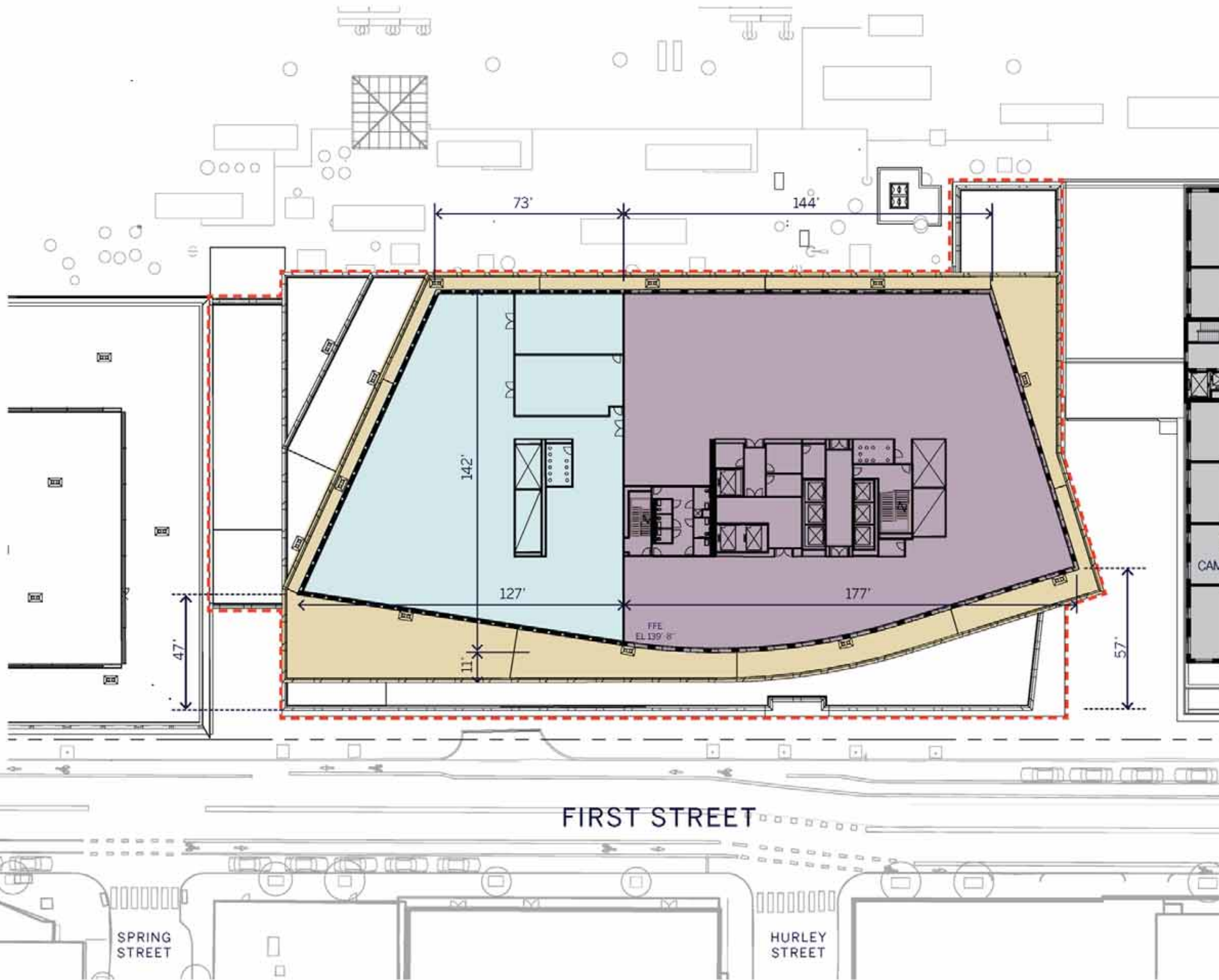
80 First Street

10TH FLOOR PLAN

EXHIBIT 14

Legend

- BUILDING SITE
- OFFICE AND LAB
- BACK OF HOUSE AND SERVICE
- TERRACE
- OTHER DEVELOPMENT

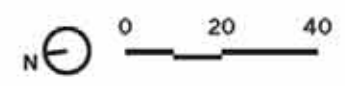
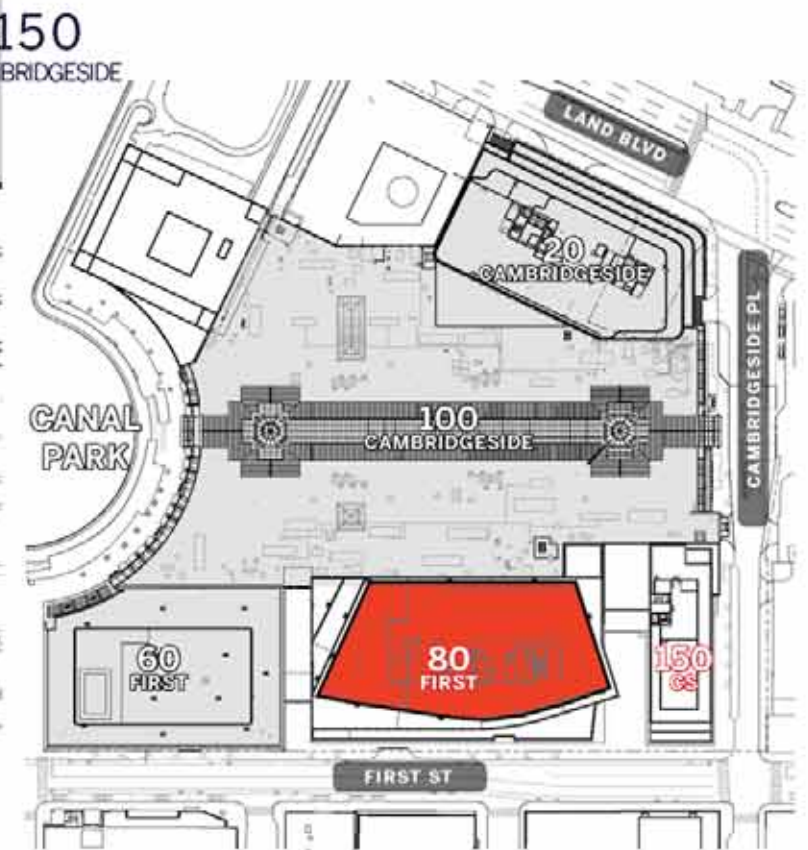
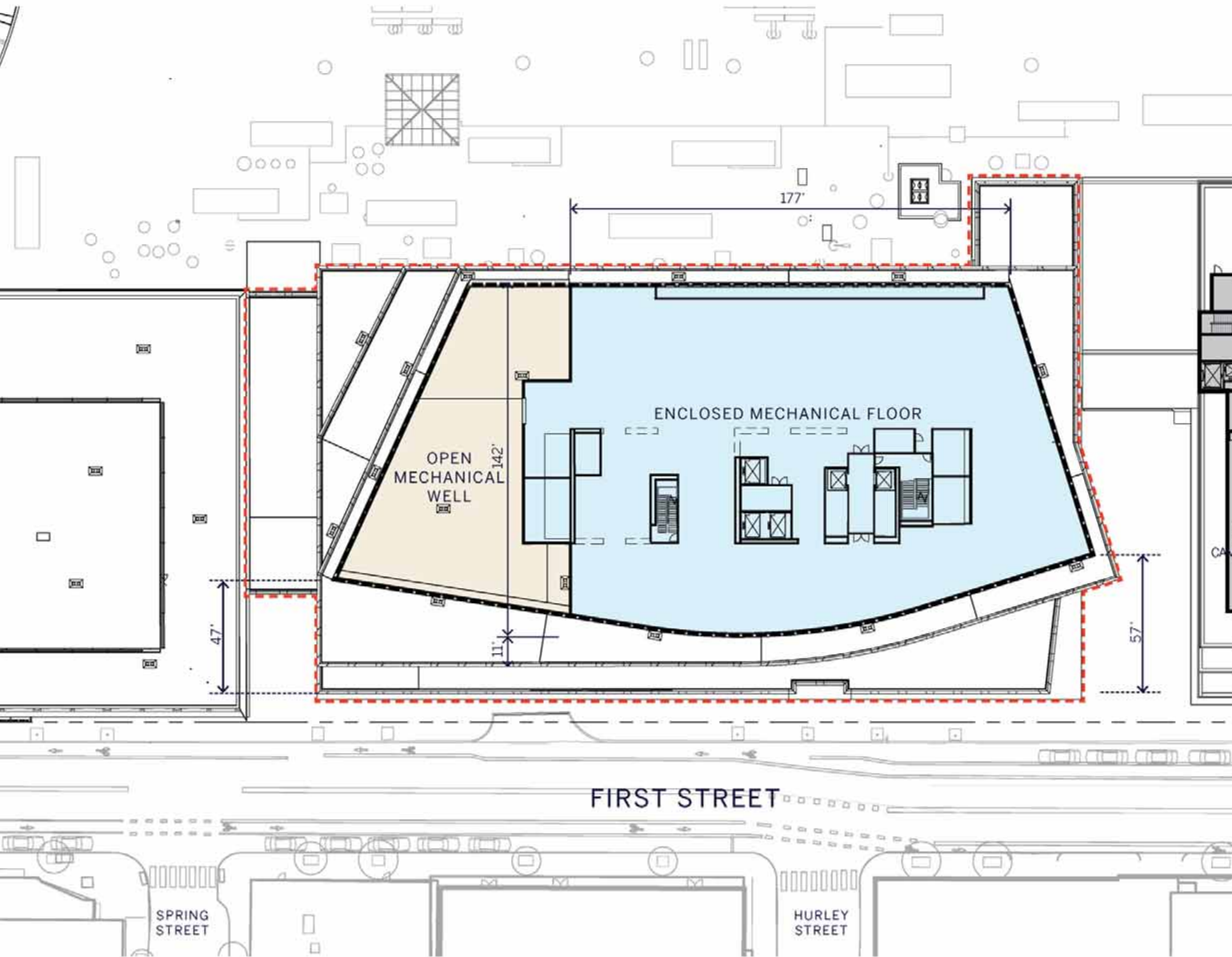


Building Design Review
80 First Street
 MECHANICAL LEVEL M1

EXHIBIT 15

Legend

- BUILDING SITE
- BACK OF HOUSE AND SERVICE
- ROOF
- OTHER DEVELOPMENT



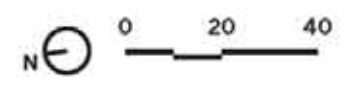
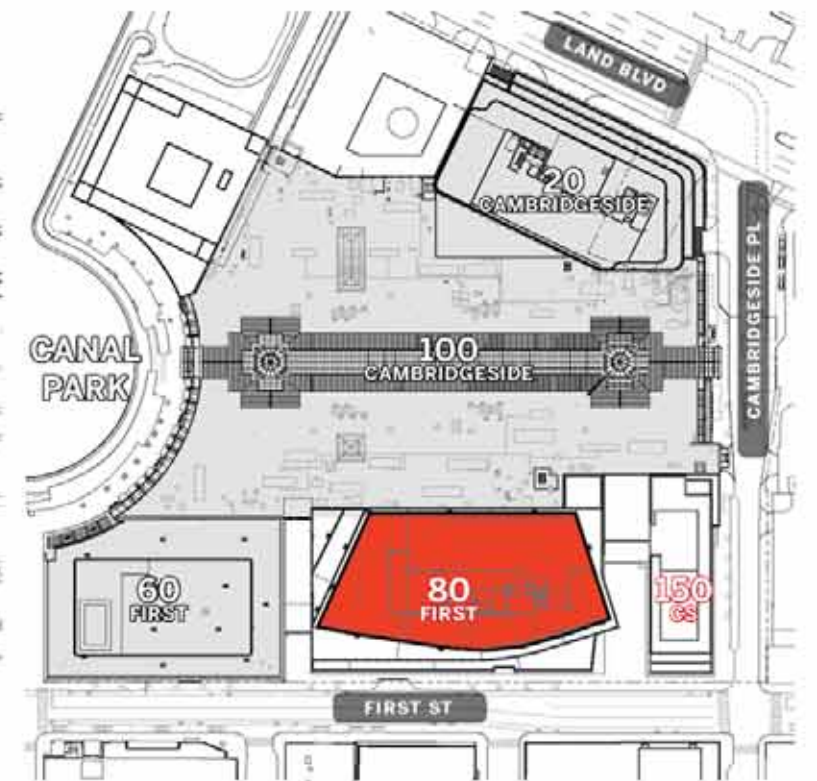
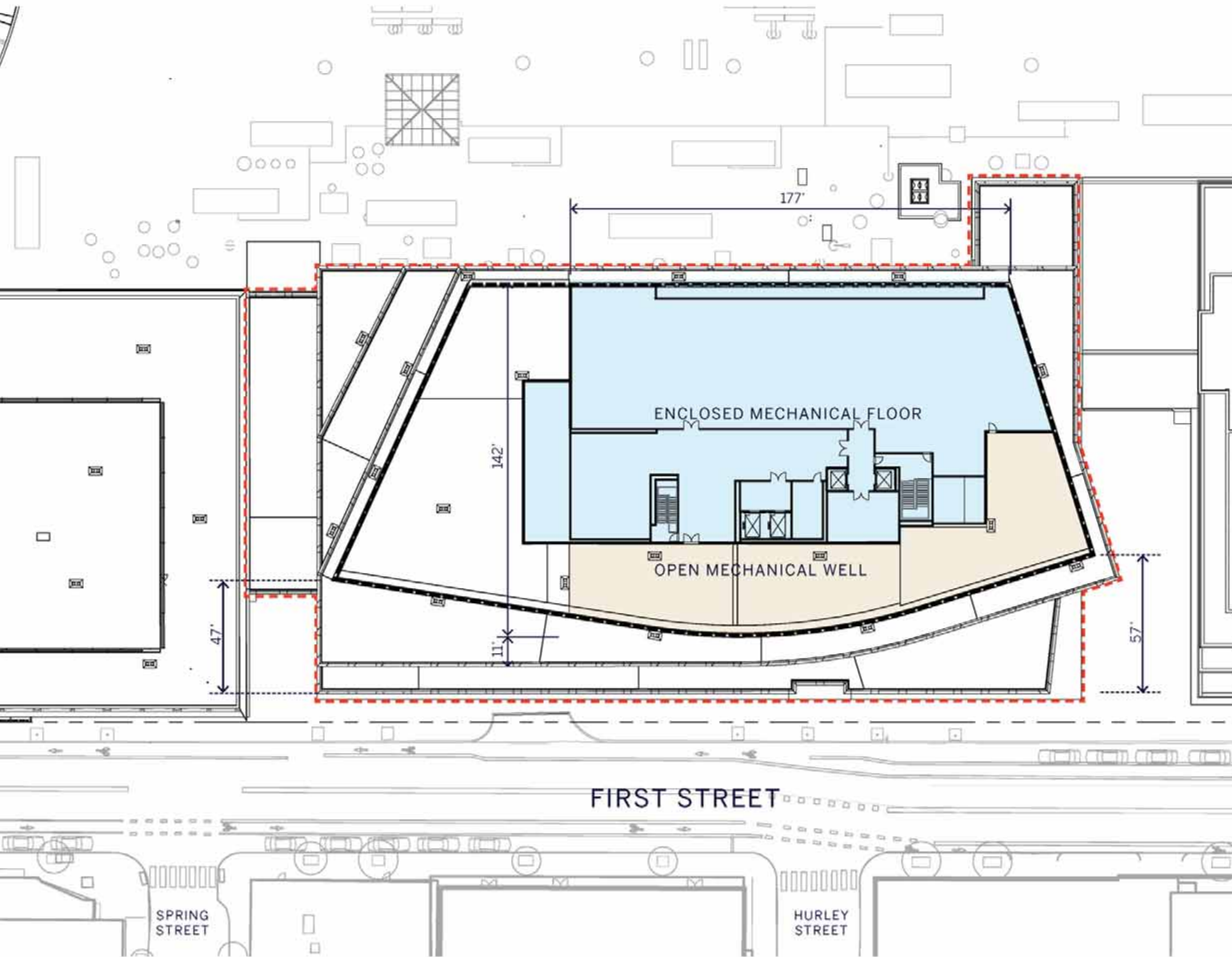
Building Design Review
80 First Street
 MECHANICAL LEVEL M2

EXHIBIT 16

Legend

- BUILDING SITE

- BACK OF HOUSE AND SERVICE
- ROOF



Building Design Review

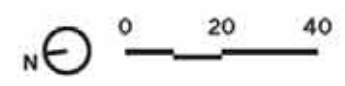
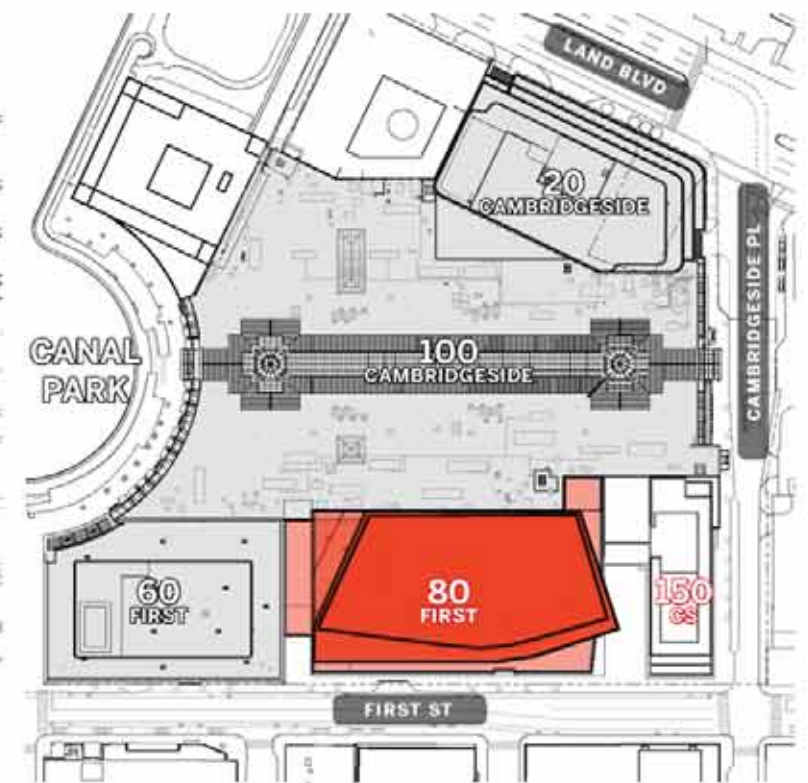
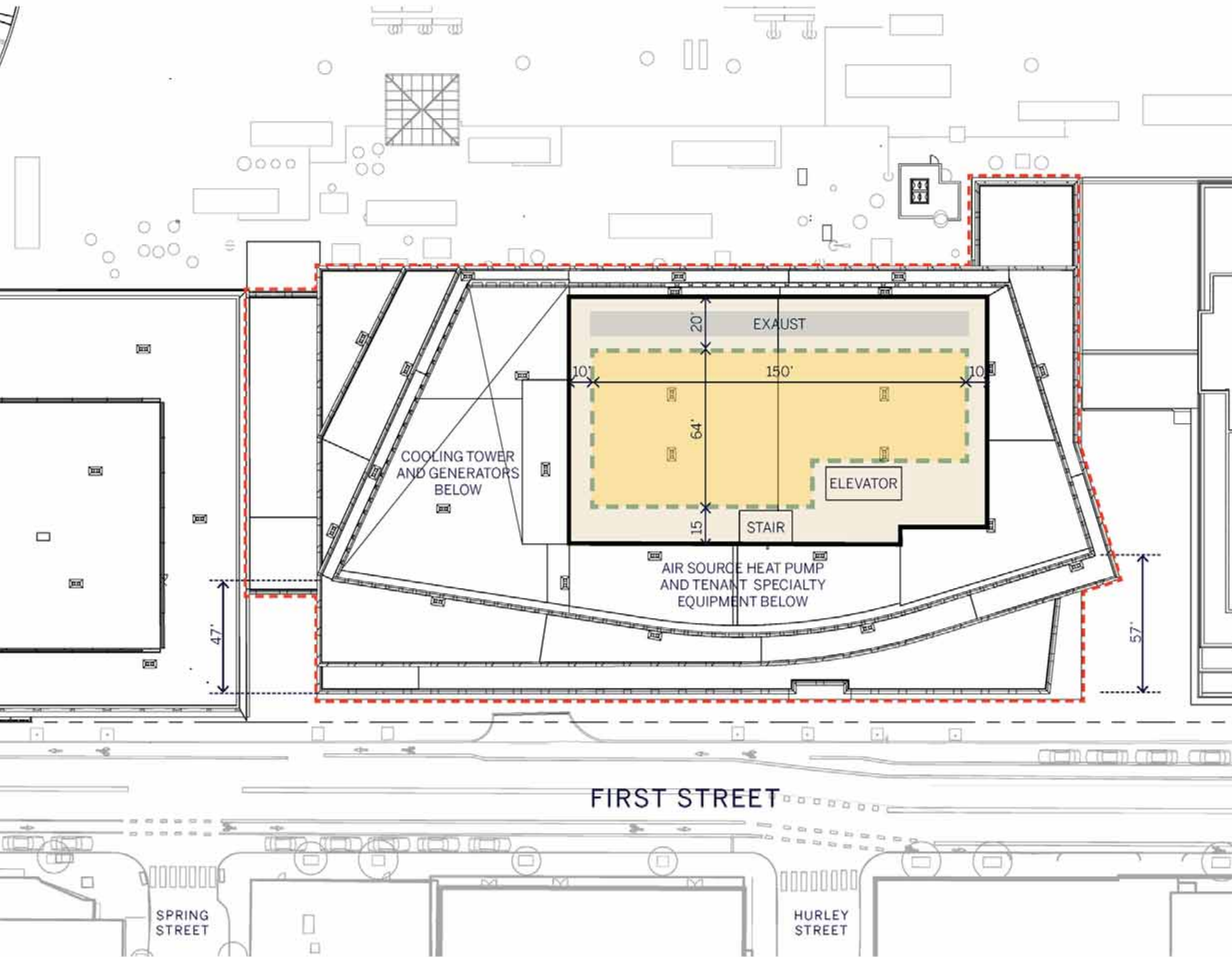
80 First Street

ROOF PLAN

EXHIBIT 17

Legend

- BUILDING SITE
- HIGH ROOF (16,235 SF)
- GREEN/SOLAR ROOF POTENTIAL (8,200 SF)

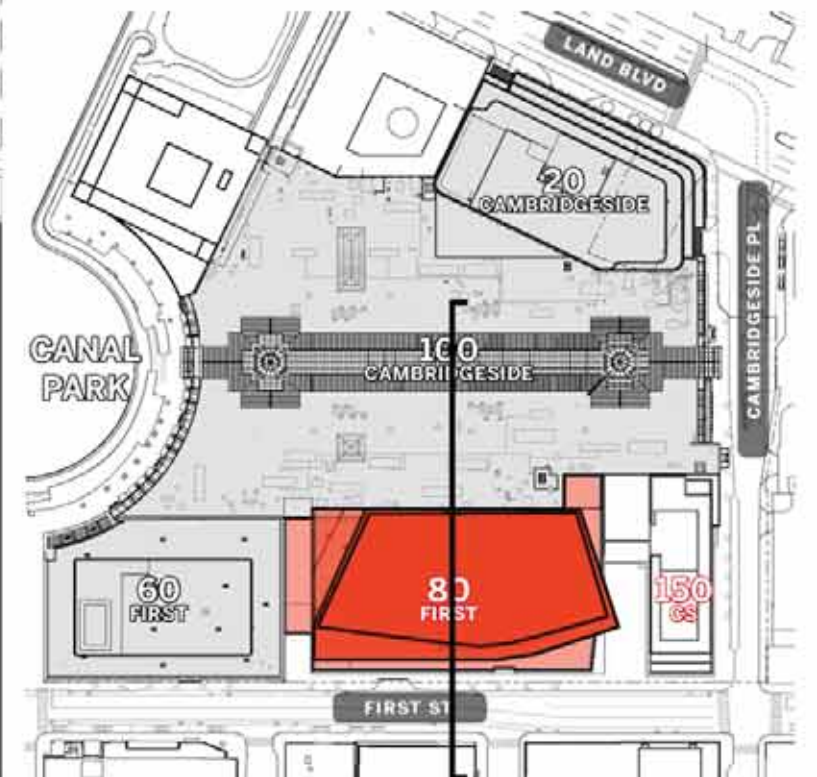
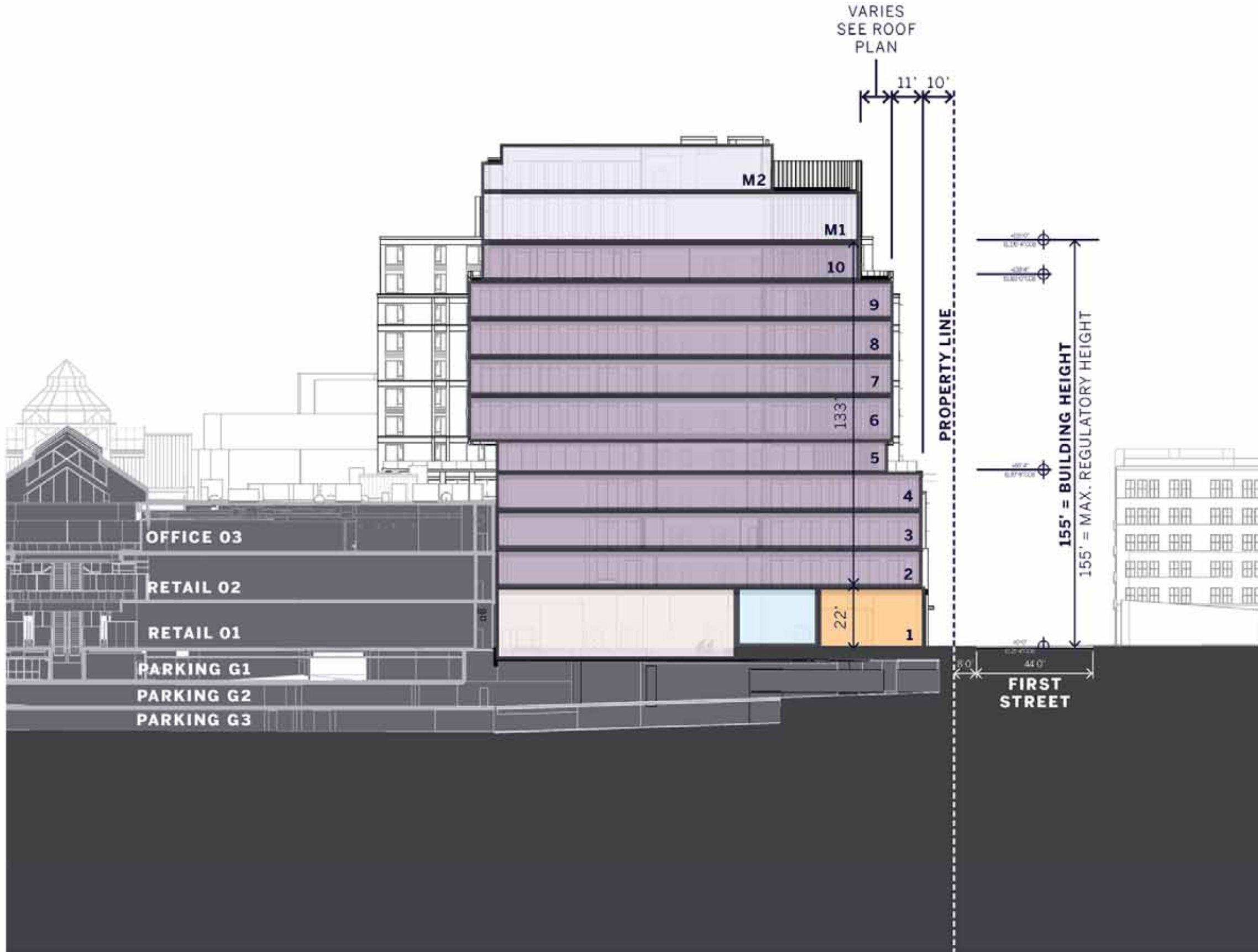


Building Design Review
80 First Street
 EAST / WEST SECTION

EXHIBIT 18

Legend

- BUILDING SITE
- RETAIL AND ACTIVE STOREFRONT
- OFFICE AND LAB
- BACK OF HOUSE AND SERVICE
- PARKING AND LOADING
- OTHER DEVELOPMENT



Building Design Review

80 First Street

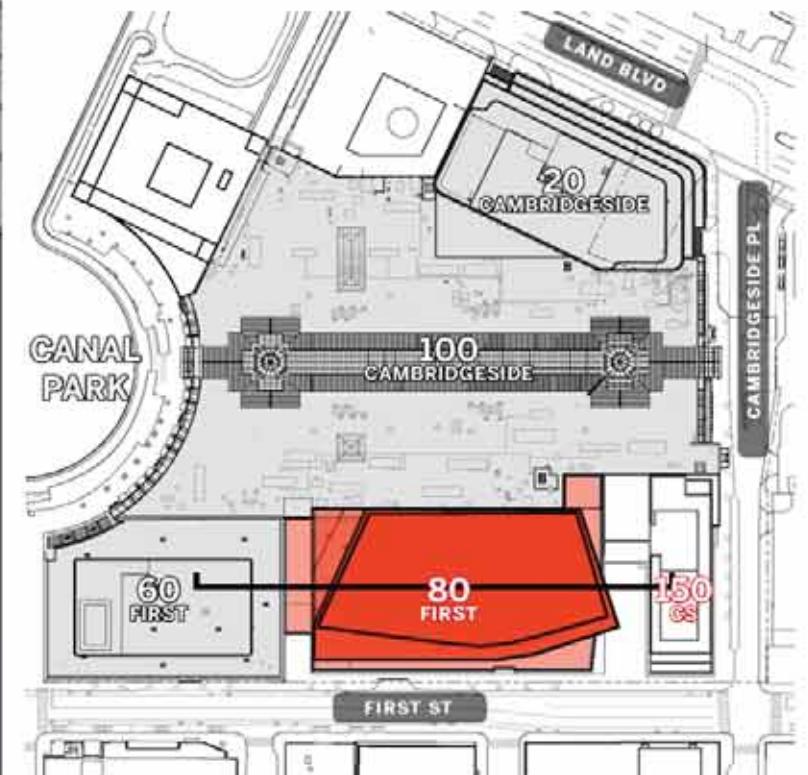
NORTH / SOUTH SECTION

EXHIBIT 19



Legend

- BUILDING SITE
- RETAIL AND ACTIVE STOREFRONT
- OFFICE AND LAB
- BACK OF HOUSE AND SERVICE
- PARKING AND LOADING
- OTHER DEVELOPMENT

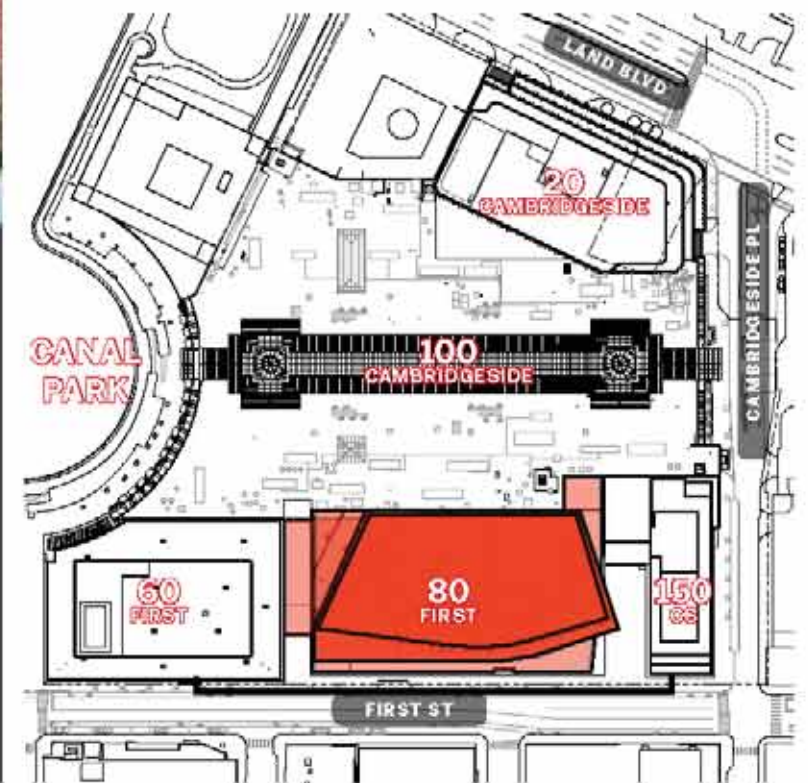


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Building Design Review
80 First Street
WEST ELEVATION
EXHIBIT 20



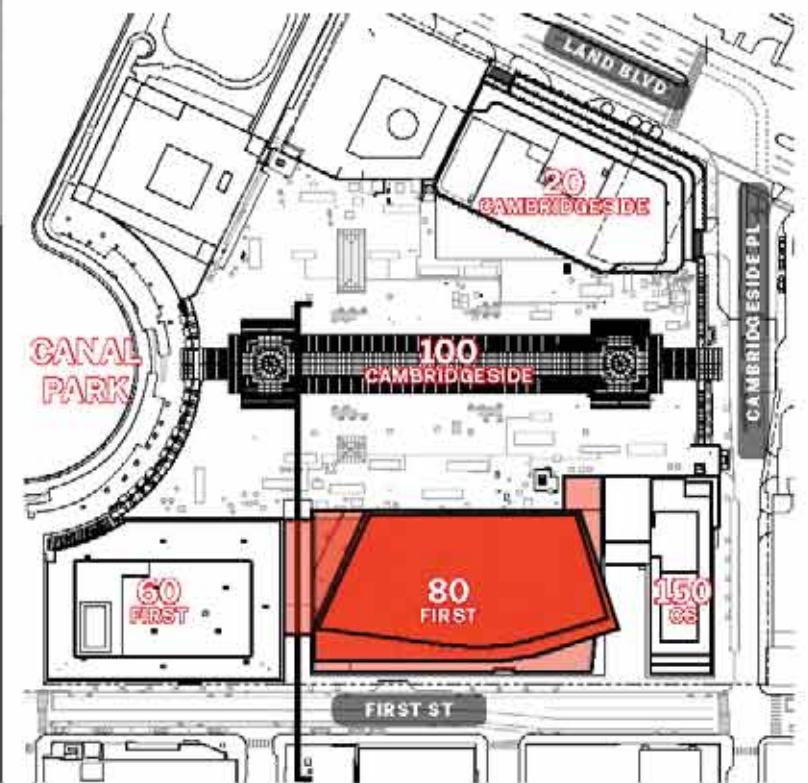
- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL AND GLASS GUARDRAIL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- GRANITE WATERTABLE AND WALL PANELS
- LOW IRON STOREFRONT



Building Design Review
80 First Street
 NORTH ELEVATION
 EXHIBIT 21



- METAL PANEL
- SHADOW BOX
- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL AND GLASS GUARDRAIL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- LOW IRON STOREFRONT
- GRANITE WATERTABLE AND WALL PANELS

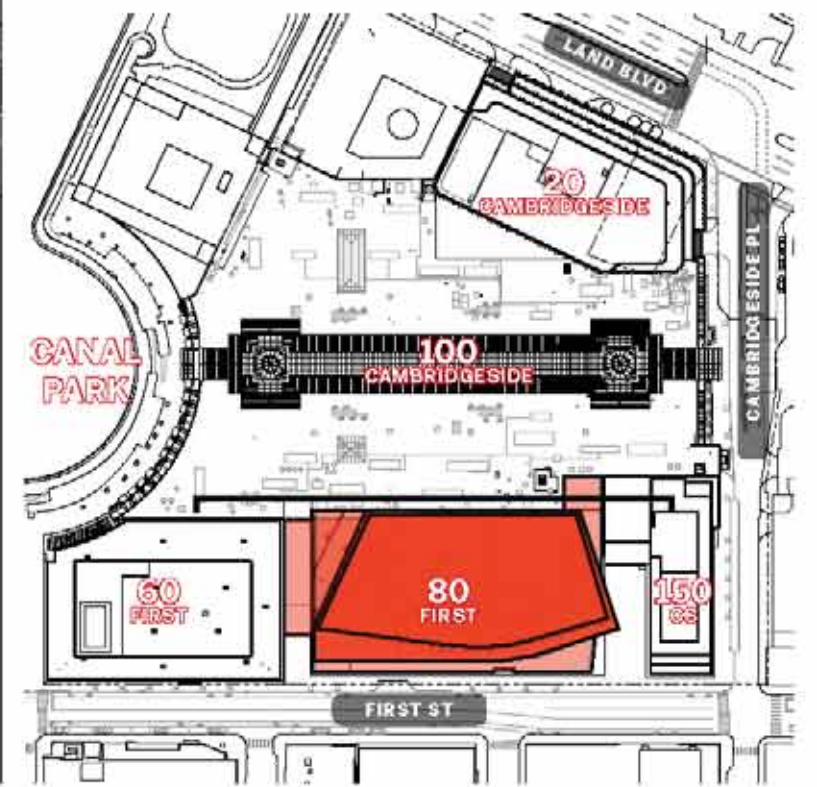


0 10 20 40

Building Design Review
80 First Street
 EAST ELEVATION
 EXHIBIT 22



- LOUVER
- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL PANEL
- METAL AND GLASS GUARDRAIL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL

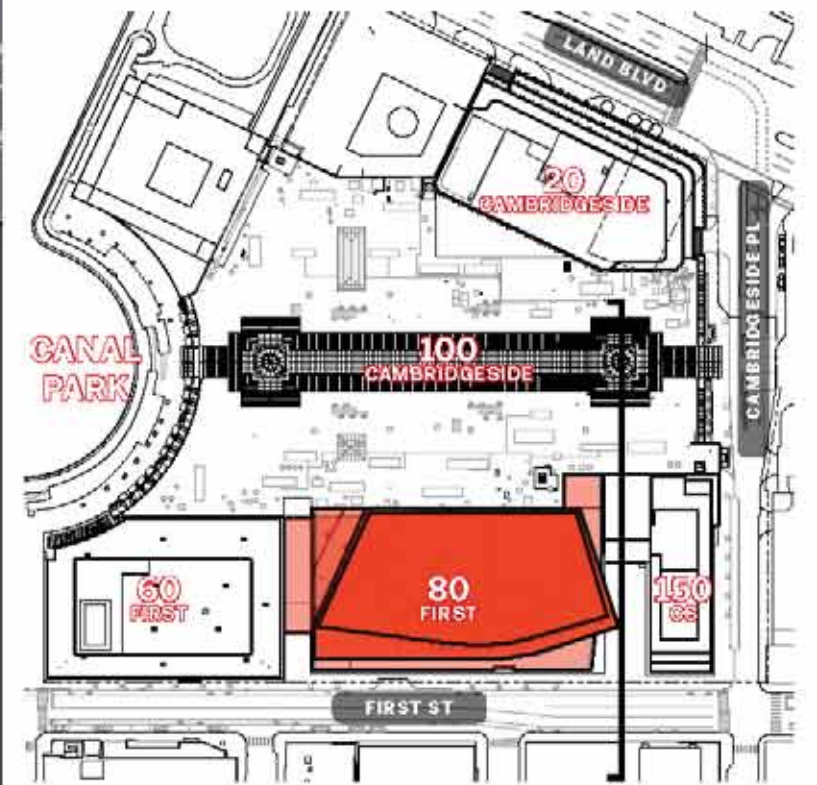


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Building Design Review
80 First Street
 SOUTH ELEVATION
 EXHIBIT 23



- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL PANEL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- METAL AND GLASS GUARDRAIL
- SHADOW BOX
- LOW E TRIPLE GLAZED CURTAIN WALL
- LOW IRON STOREFRONT
- GRANITE WATERTABLE AND WALL PANELS



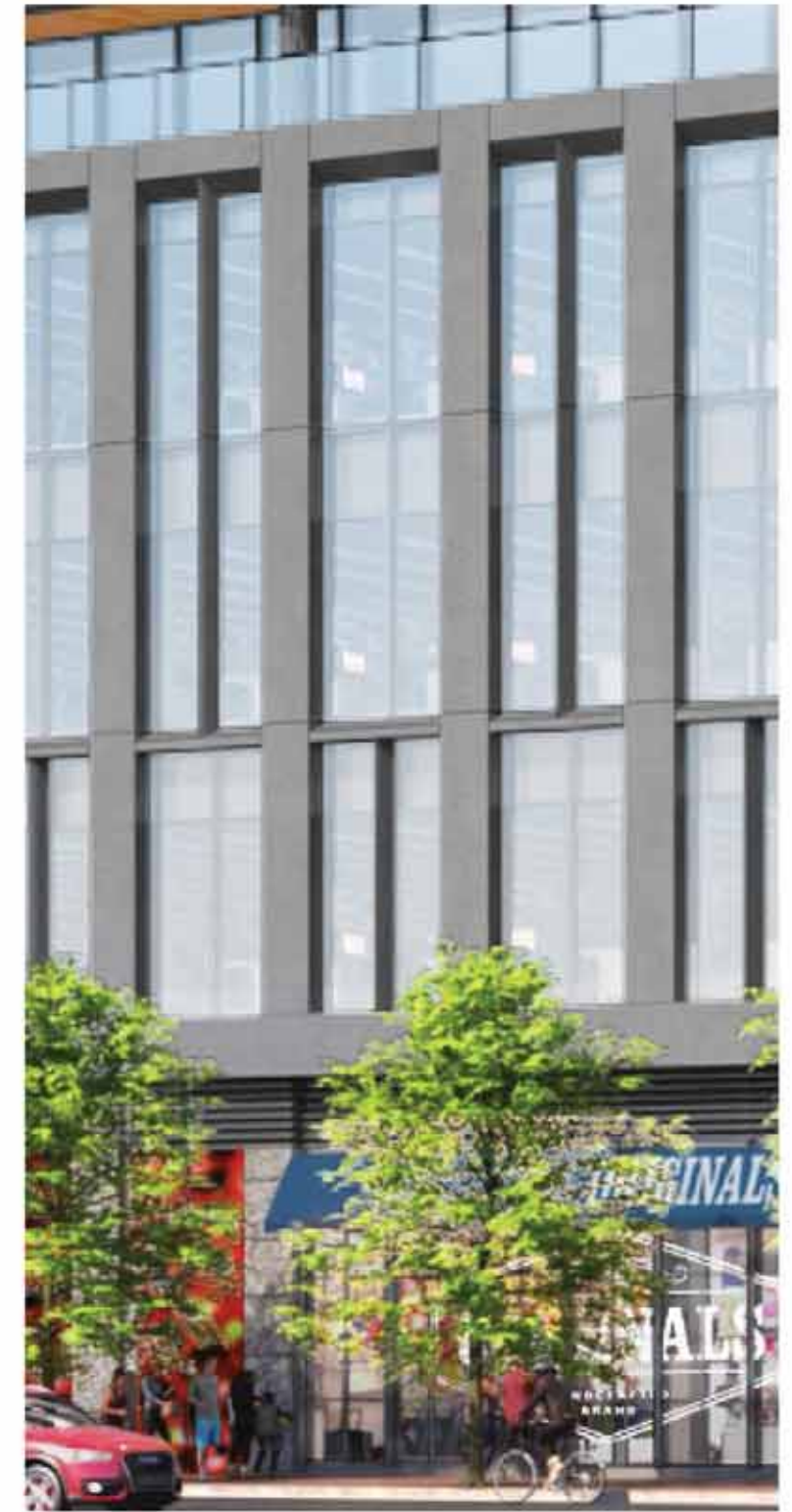
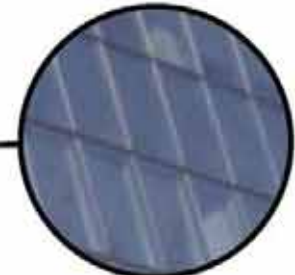
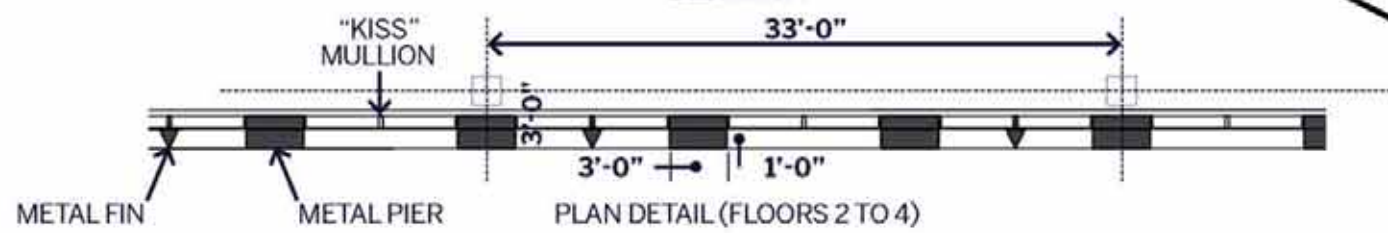
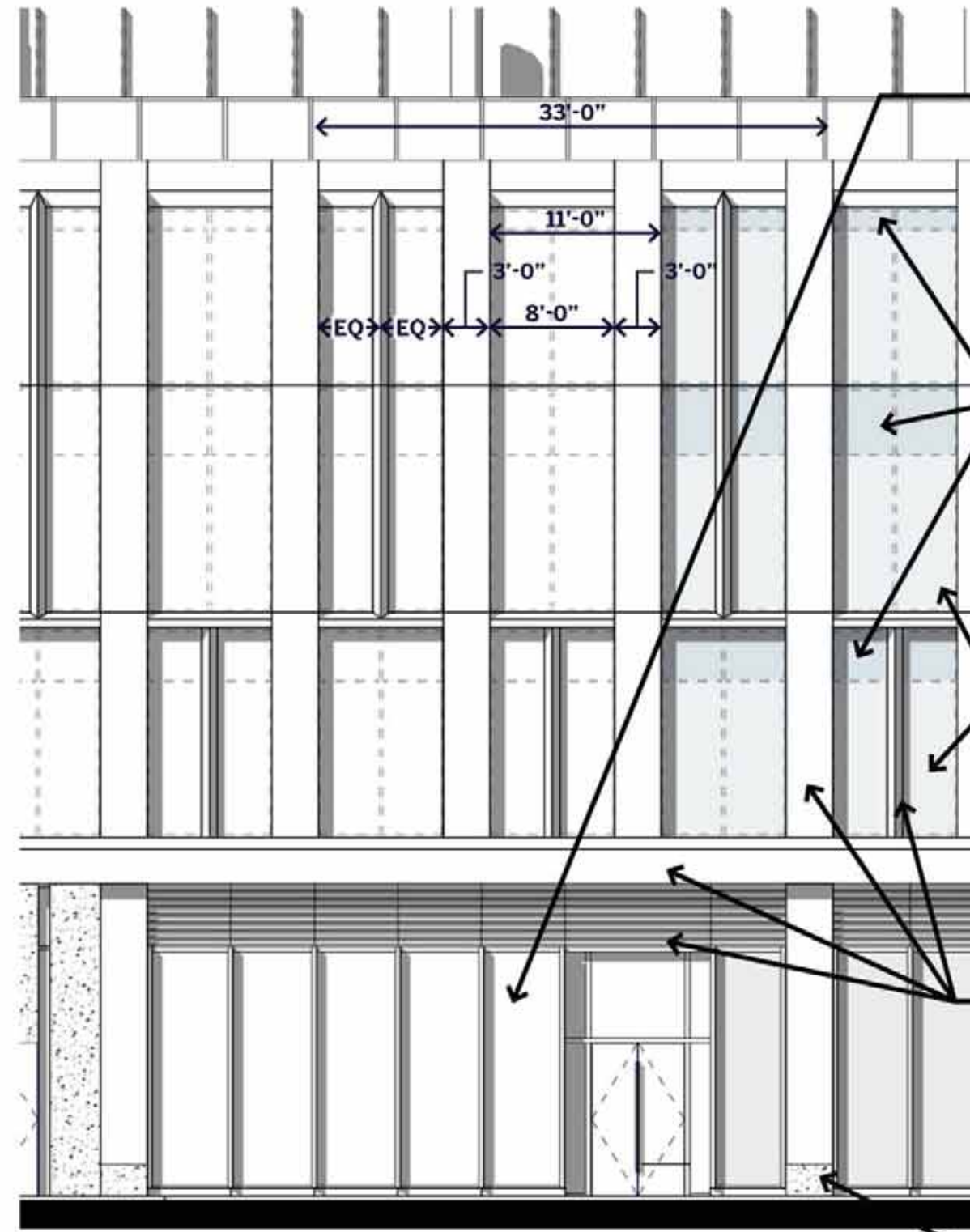
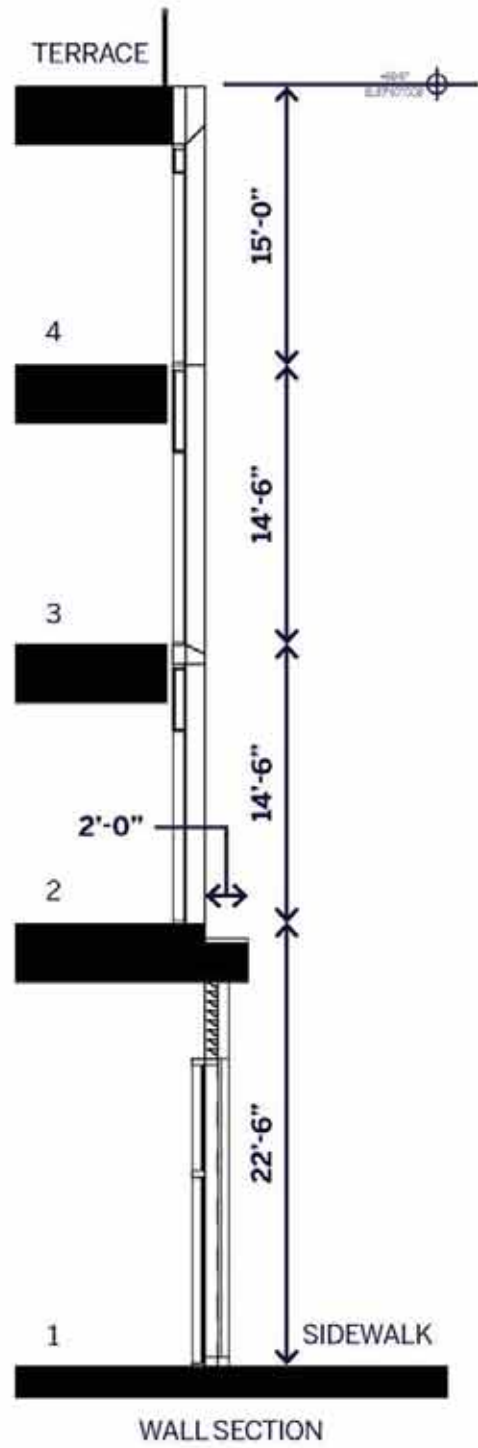
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NEW ENGLAND DEVELOPMENT

ELKUS | MANFREDI ARCHITECTS

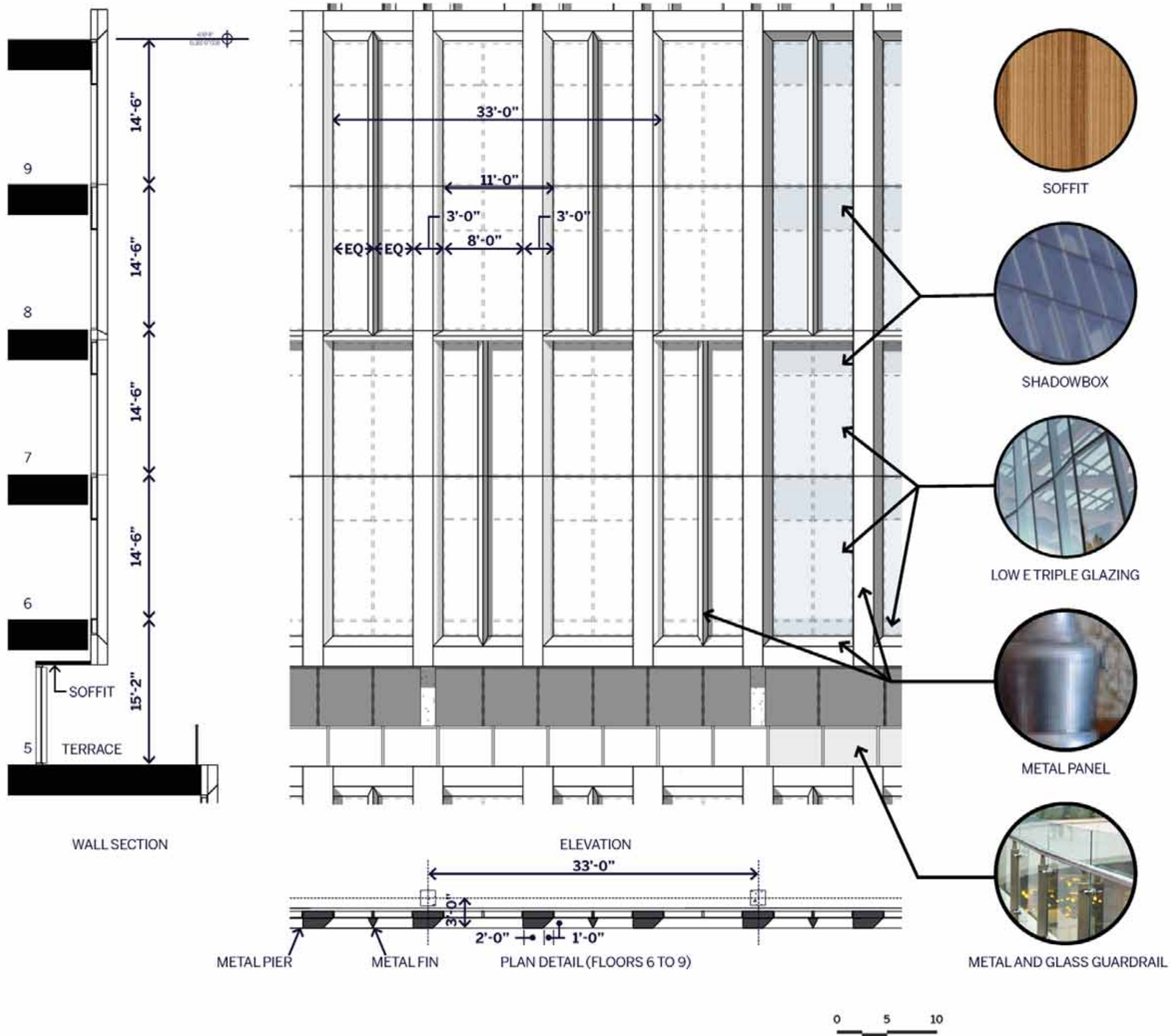


Building Design Review
80 First Street
 PODIUM FACADE DETAIL
 EXHIBIT 24



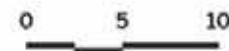
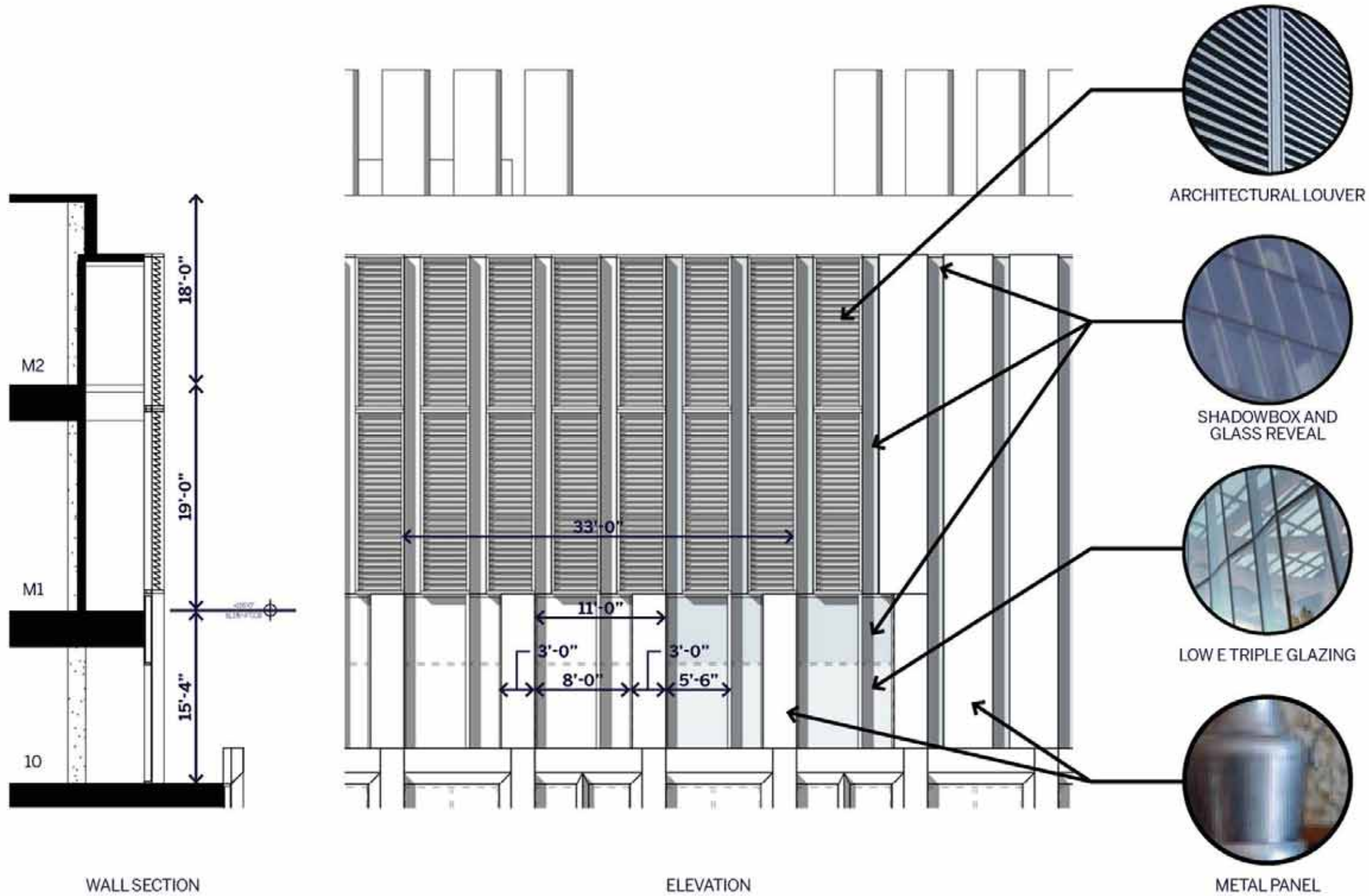
Building Design Review
80 First Street
 UPPER FACADE DETAIL

EXHIBIT 25



Building Design Review
80 First Street
 PENTHOUSE FACADE DETAIL

EXHIBIT 26



Building Design Review
80 First Street

RENDERED VIEW
EXISTING BUILDINGS IN FOREGROUND REMOVED

EXHIBIT 27



NEW ENGLAND
DEVELOPMENT

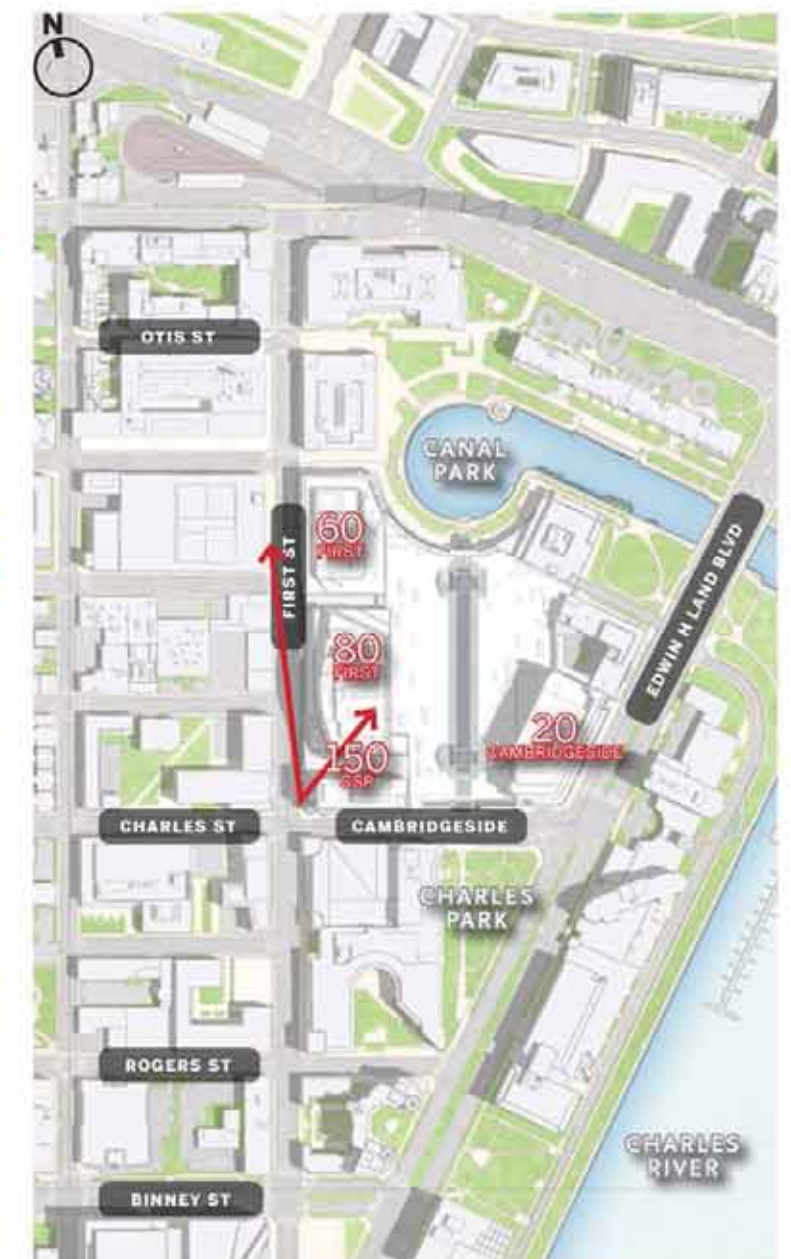
ELKUS | MANFREDI
ARCHITECTS





Building Design Review
80 First Street
 STREETScape VIEW

EXHIBIT 28



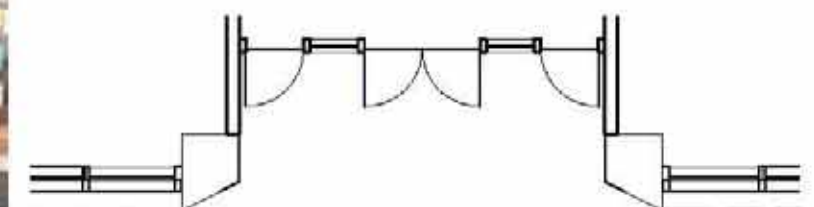
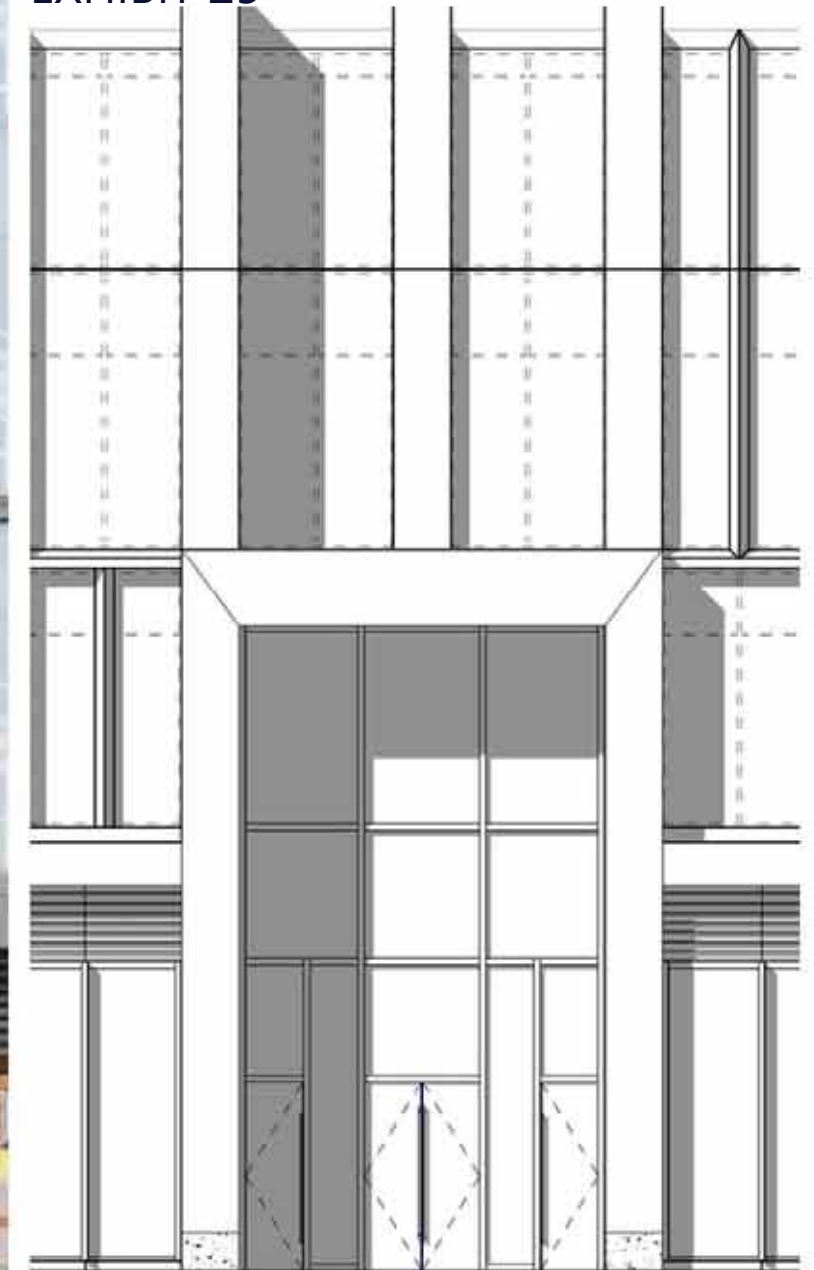
FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.



Building Design Review
80 First Street
BUILDING ENTRY

EXHIBIT 29



0 5 10

NEW ENGLAND
DEVELOPMENT

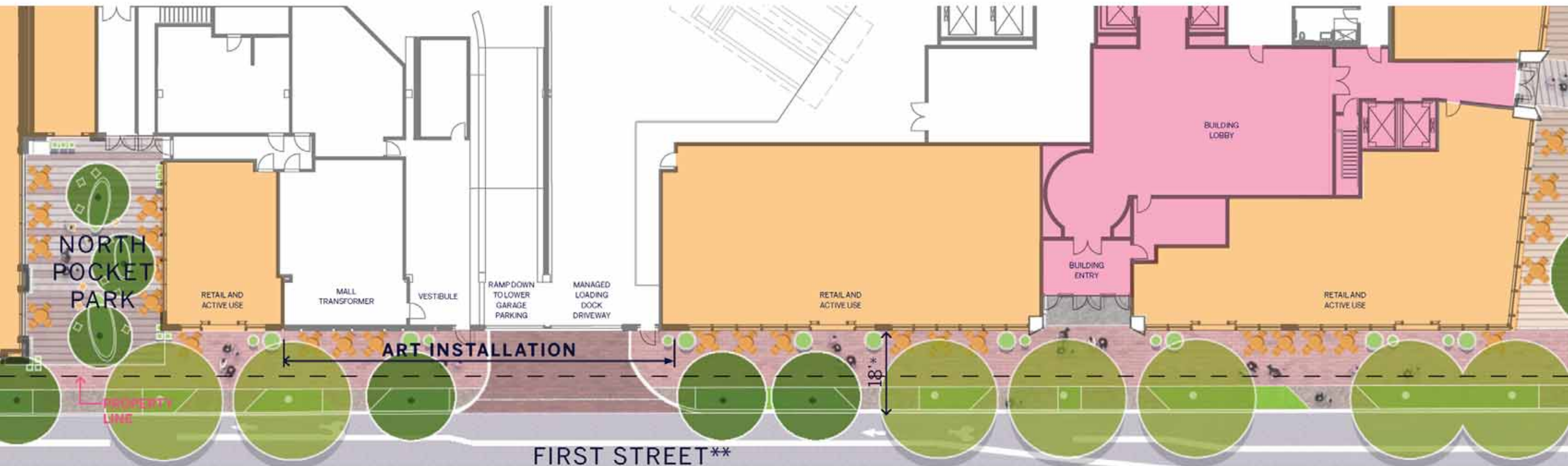
ELKUS | MANFREDI
ARCHITECTS



Building Design Review
80 First Street
 PEDESTRIAN ZONE WEST FACADE

EXHIBIT 30

← ART INSTALLATION →



SEE GROUND FLOOR ENTRY, LANDSCAPE MATERIALS AND PLANTING PLANS FOR ADDITIONAL DETAIL

* SIDEWALK DIMENSION FROM FACE OF BUILDING TO FACE OF CURB IS MEASURED USING THE EXISTING FIRST STREET LAYOUT AND IS APPROXIMATE AS THE CURB LINE MAY VARY. CURB LOCATION IS SUBJECT TO FINAL DESIGN OF THE FIRST STREET/SECOND STREET STUDY.

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY

0 5 10 20

NEW ENGLAND
 DEVELOPMENT

ELKUS | MANFREDI
 ARCHITECTS



Building Design Review
80 First Street
 POCKET PARK FACADES

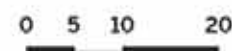
EXHIBIT 31







SEE GROUND FLOOR ENTRY, LANDSCAPE MATERIALS AND PLANTING PLANS FOR ADDITIONAL DETAIL

* SIDEWALK DIMENSION FROM FACE OF BUILDING TO FACE OF CURB IS MEASURED USING THE EXISTING FIRST STREET LAYOUT AND IS APPROXIMATE AS THE CURB LINE MAY VARY. CURB LOCATION IS SUBJECT TO FINAL DESIGN OF THE FIRST STREET/SECOND STREET STUDY.

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY

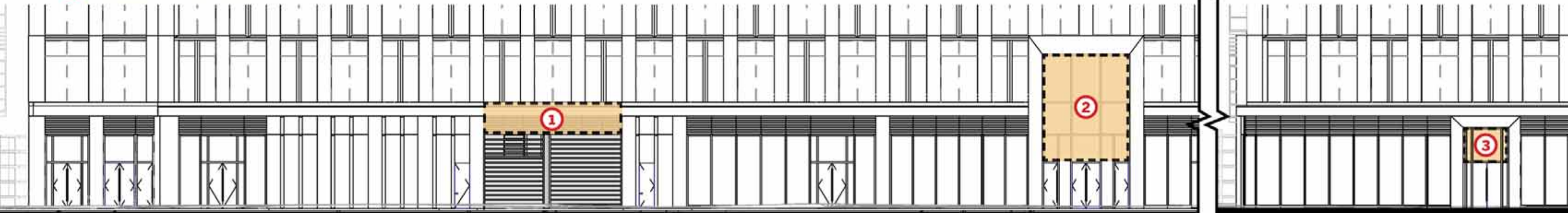


Legend

-  SIGNAGE ZONE
-  WAYFINDING (PARKING)
-  BUILDING ADDRESS
-  BUILDING ADDRESS

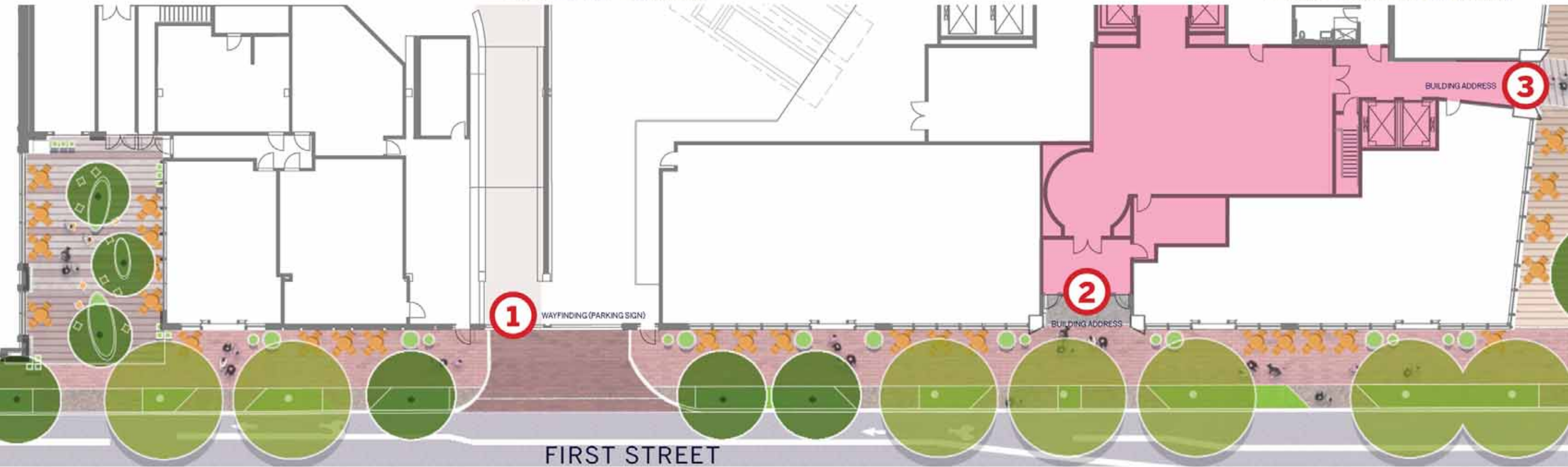
Building Design Review 80 First Street BUILDING ADDRESS AND WAYFINDING SIGNAGE

EXHIBIT 32



FIRST STREET ELEVATION

SOUTH COURTYARD ELEVATION



FIRST STREET

0 5 10 20

Building Design Review

80 First Street

EXTERIOR LIGHTING

EXISTING BUILDINGS IN FOREGROUND REMOVED



EXHIBIT 33

THE PRIMARY INTENT OF THE FACADE LIGHTING DESIGN IS TO CELEBRATE THE BUILDING'S UNIQUE FORM AND MASSING WHILE DOING SO IN A SENSITIVE AND MINIMALIST APPROACH, SIMILAR TO THE ADJACENT BUILDINGS AT 60 FIRST STREET AND 150 CAMBRIDGESIDE PLACE. THE LIGHTING WILL EMPHASIZE THE BUILDING MASSING BY SOFTLY WASHING THE EXTERIOR SOFFIT AT THE FIFTH FLOOR LEVEL; CREATING AN ACCENT ON THE SHIFTING ARCHITECTURAL FORMS AND SURFACES. A WASH OF LIGHT WILL EMPHASIZE THE 5TH FLOOR SETBACK, HIGHLIGHTING ITS DRAMATIC FORM. NO FAÇADE LIGHTING WILL BE UTILIZED ABOVE THIS LEVEL, ALLOWING THE UPPER MASSING OF THE BUILDING TO REMAIN QUIET AND SUBDUED.

A VISUAL HIERARCHY WILL BE CREATED BY ACCENTING BUILDING ENTRIES AND RETAIL SIGNAGE BANDS. THE MAIN BUILDING ENTRY WILL BE ACCENTED WITH SHIELDED LINEAR LIGHTS THAT WILL WASH THE EDGES OF THE ENTRY FRAME TO VISUALLY HIGHLIGHT ITS PLACE ON THE PODIUM FACADE. CONCEALED LINEAR DOWNLIGHTS, JUST ABOVE THE RETAIL SIGNAGE BAND, WILL DEFINE THE ACTIVE GROUND FLOOR BY ILLUMINATING THE SIGNAGE AND CONTRIBUTING ADDITIONAL LIGHTING TO THE GROUNDPLANE AND THE PEDESTRIAN APPROACH.

THIS LAYERED APPROACH TO THE FAÇADE LIGHTING WILL DRAW PEOPLE'S EYES TO IMPORTANT WAYFINDING AND STREETScape ELEMENTS WHILE STILL KEEPING THE OVERALL BUILDING EXPRESSION VISUALLY QUIET TO RESPECT THE CHARACTER AND NIGHTTIME QUALITY OF ADJACENT BUILDINGS AND THE NEARBY NEIGHBORHOOD.

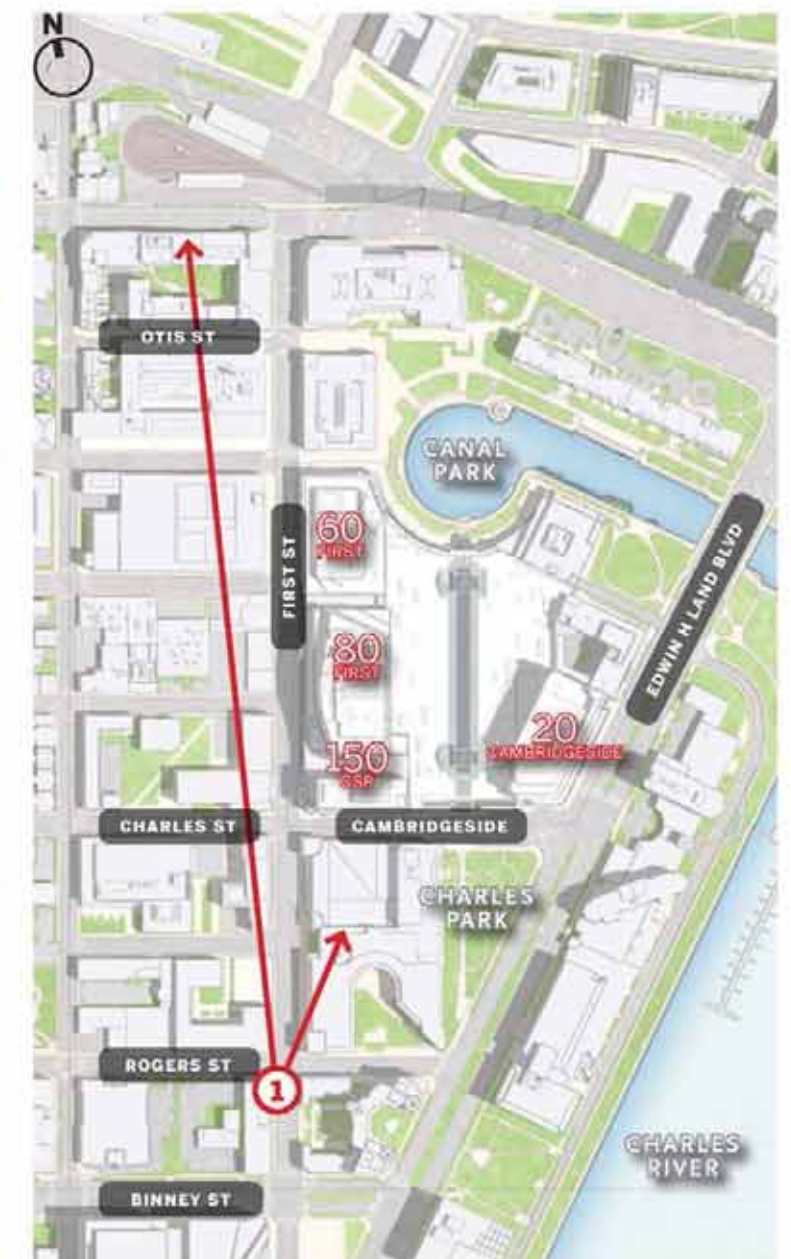
ALL OF THE EXTERIOR LIGHTING ON THE BUILDING WILL BE FULLY DIMMABLE TO BALANCE BRIGHTNESS AND CONTRAST RATIOS TO RESPECT NEIGHBORHOOD CONCERNS, WHILE PROVIDING DIFFERENT LIGHT SETTINGS THROUGHOUT THE NIGHT.



FROM ROGERS STREET LOOKING NORTH

Building Design Review
80 First Street
 ROGERS AND FIRST LOOKING NORTH

EXHIBIT 34



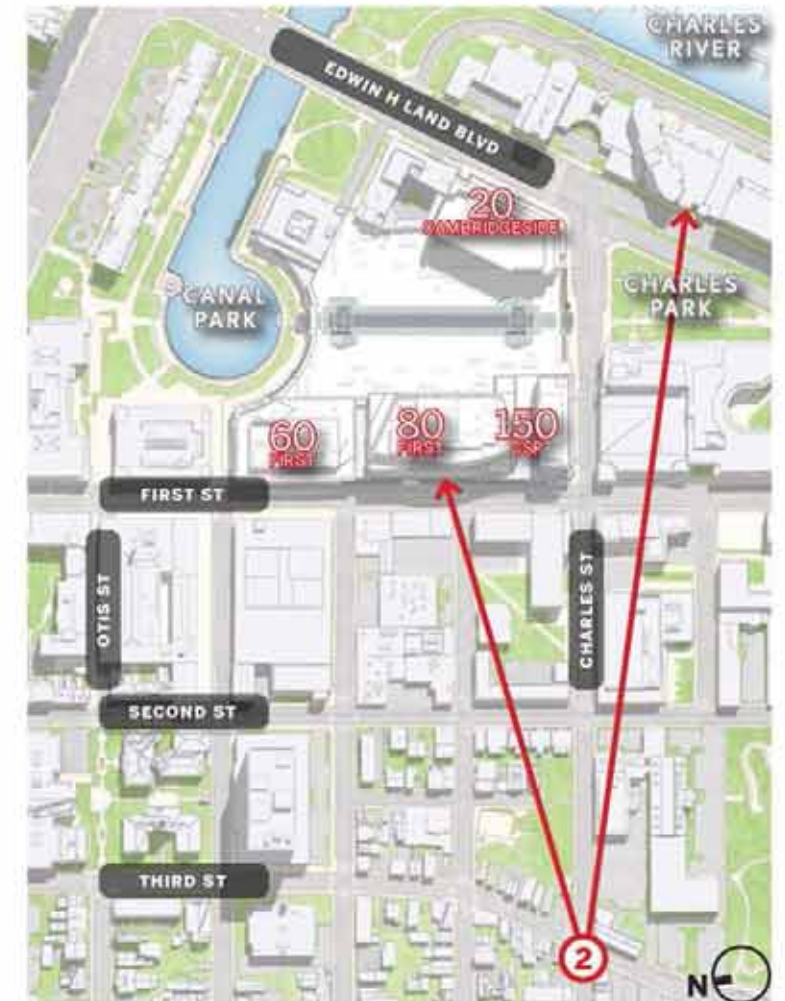
FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.

Building Design Review
80 First Street
CHARLES AND THIRD LOOKING EAST

EXHIBIT 35



FROM THIRD STREET LOOKING EAST



FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.

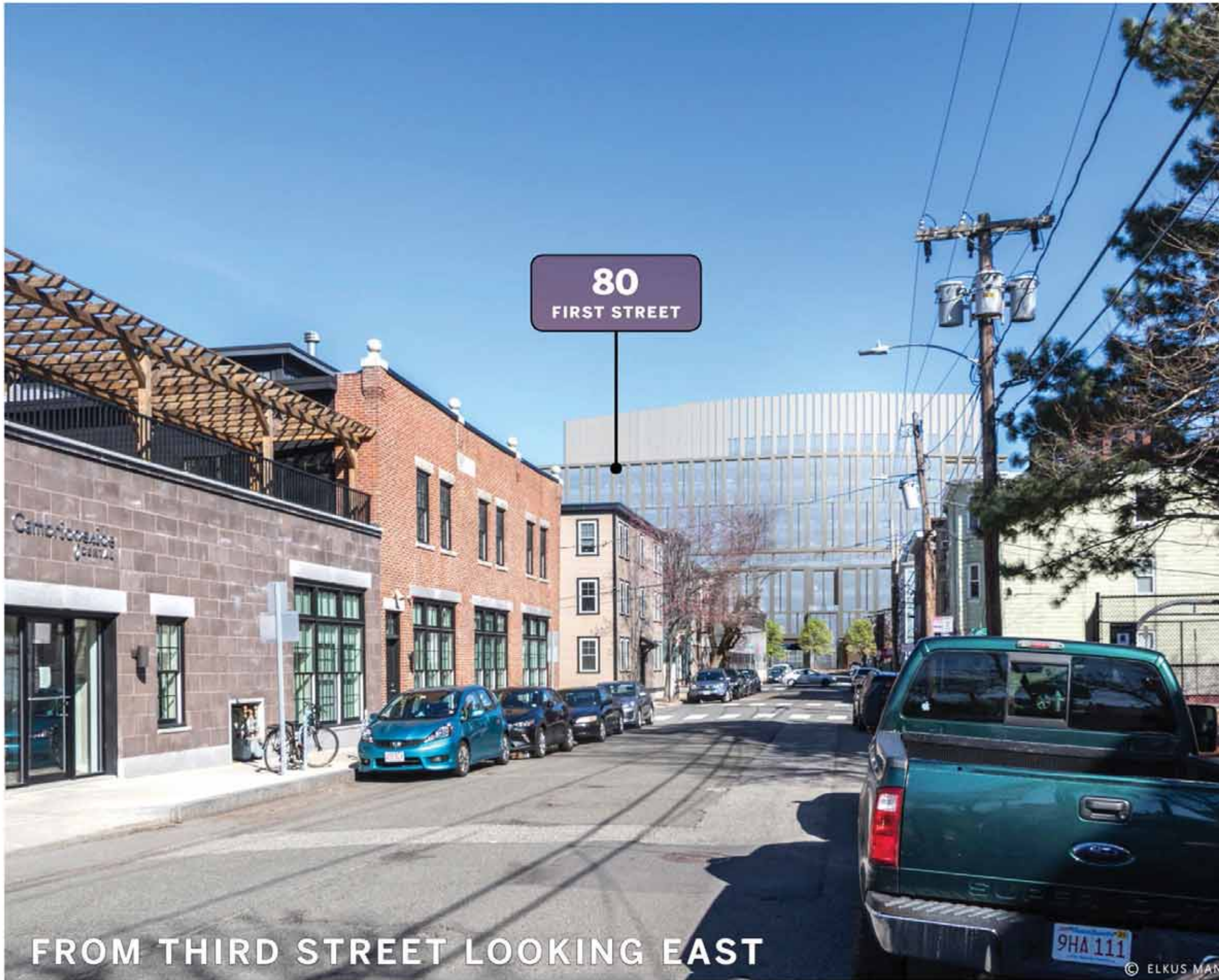
NEW ENGLAND
DEVELOPMENT

ELKUS | MANFREDI
ARCHITECTS

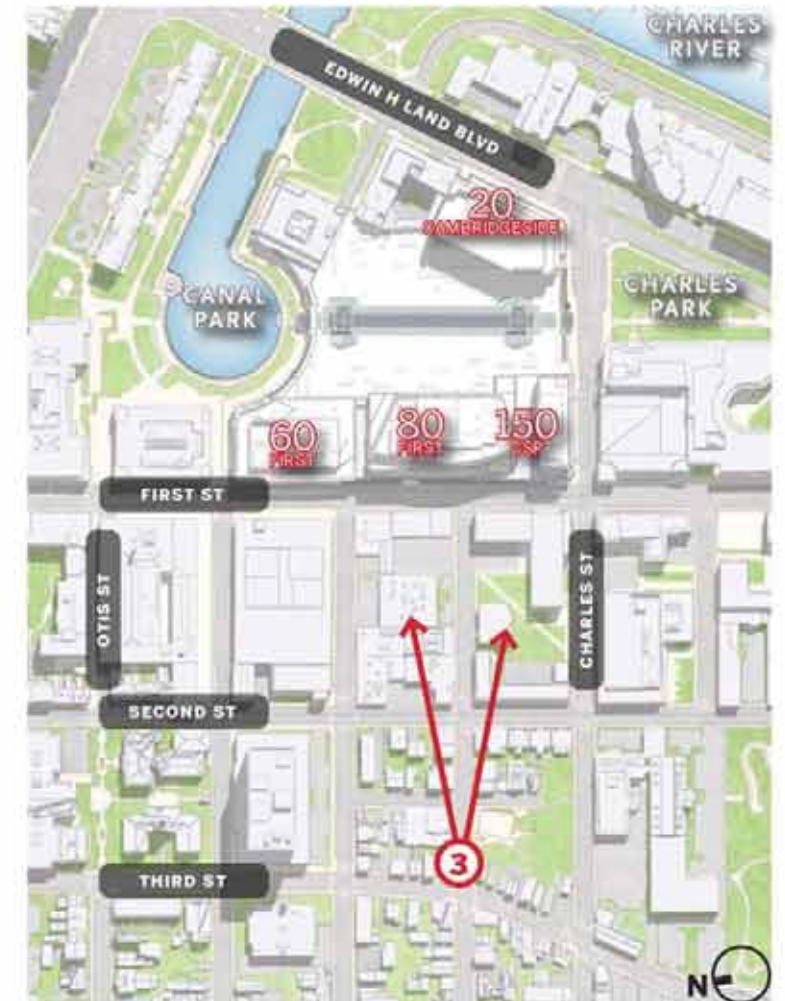


Building Design Review
80 First Street
HURLEY AND THIRD LOOKING EAST

EXHIBIT 36



FROM THIRD STREET LOOKING EAST



FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.

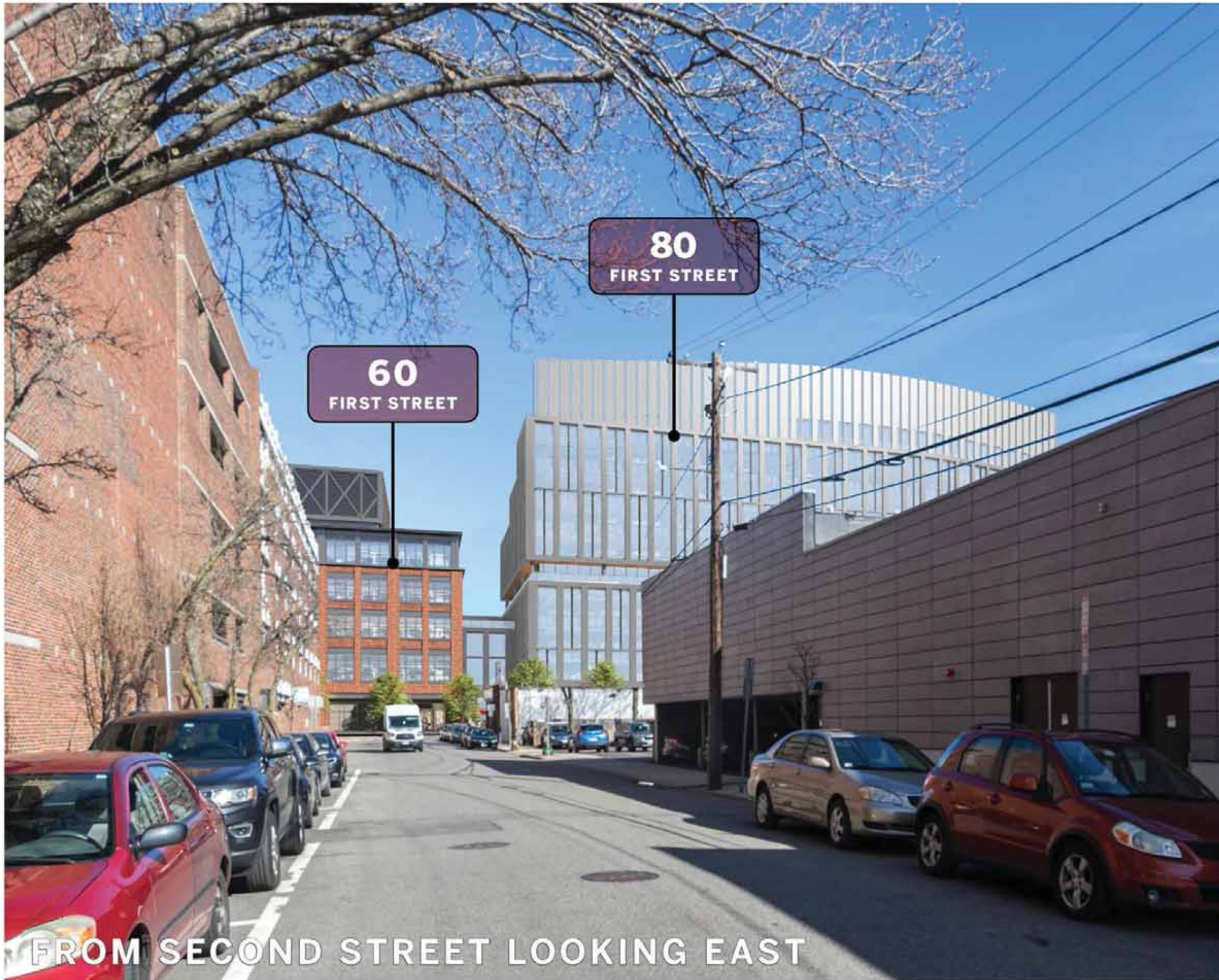
NEW ENGLAND
DEVELOPMENT

ELKUS | MANFREDI
ARCHITECTS

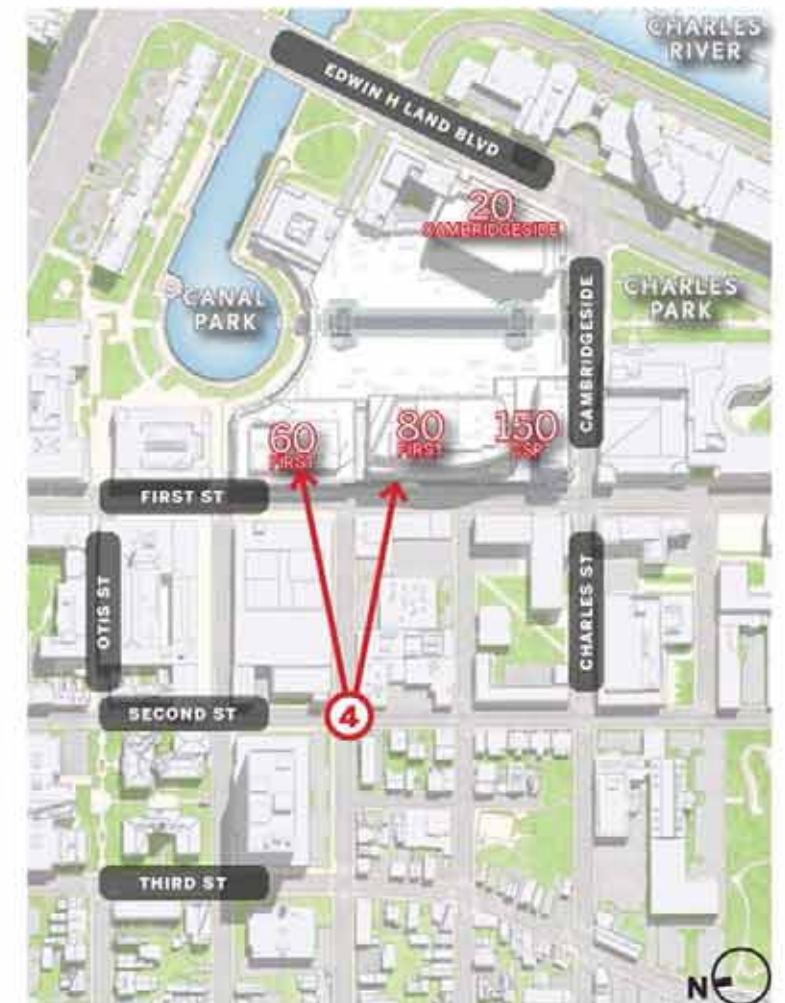


Building Design Review
80 First Street
SPRING AND SECOND LOOKING EAST

EXHIBIT 37



FROM SECOND STREET LOOKING EAST



FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.

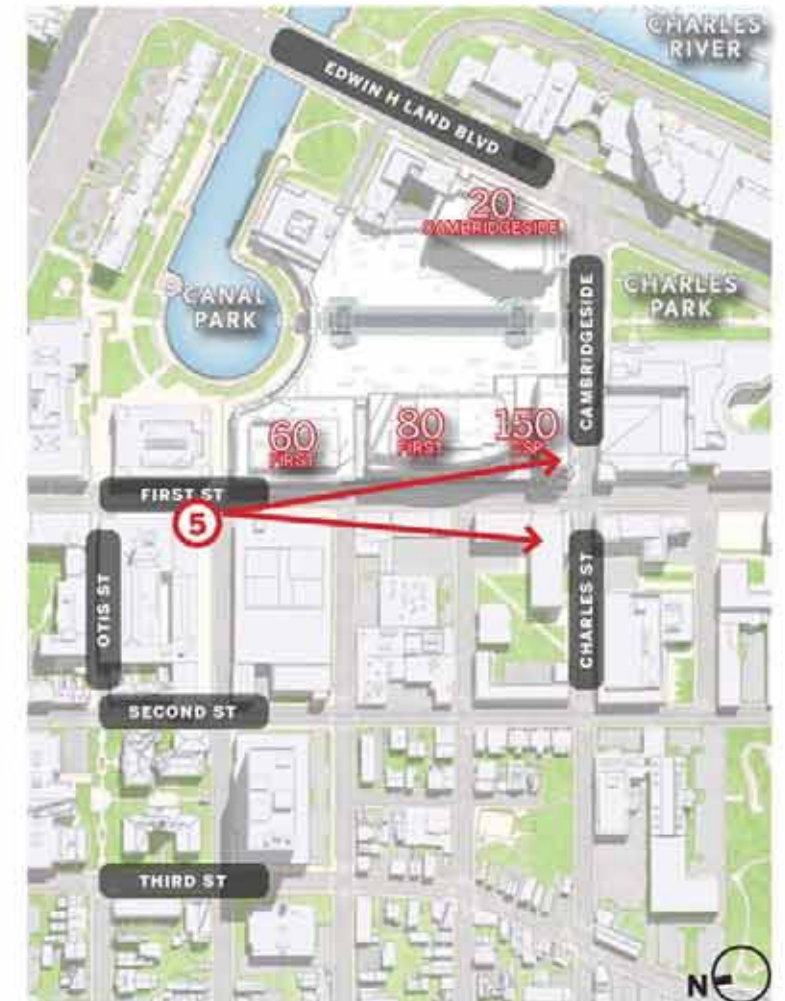
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DEVELOPMENT

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Building Design Review
80 First Street
 FIRST AND THORNDIKE LOOKING SOUTH

EXHIBIT 38



FROM THORNDIKE STREET LOOKING SOUTH

FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY. VIEW DEPICTS EXISTING CONDITIONS OF THE FIRST STREET PUBLIC RIGHT OF WAY.

NEW ENGLAND
 DEVELOPMENT

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Publicly Beneficial Open Space

Publicly Beneficial Open Space

As shown in the following Exhibits 39-42, the 80 First Street and 150 CambridgeSide Place developments continue the public realm improvements established by the 60 First Street development along First Street and provide enhanced open space for the public benefit in the form of a revitalized streetscape and pocket parks. Consistent with the Decision, the open space is shared across the entire PB-364 Development Parcel. The design also took cues from the Resilient Cambridge Handbook, including the following:

- Enhance pedestrian comfort.
- Reduce impervious surfaces.
- Employ green infrastructure.
- Expand open space.

The main pedestrian walkways along First Street will be constructed with the City's standard brick material. These walkways will be widened by setting back 80 First Street and 150 CambridgeSide Place 10 feet from the property line on First Street. The wider sidewalk will provide safe and comfortable movement along First Street while providing universal access to building entries and opportunities for retail and other Active Uses to spill out. 150 CambridgeSide Place will similarly setback 8 feet on CambridgeSide Place to lead pedestrians to the building entry and beyond to the mall retail, the entries to the 20 and 100 CambridgeSide buildings and out onto Land Boulevard.

As part of the streetscape, and as referenced in the Resilient Cambridge Handbook Section C, green infrastructure practices will be employed by using permeable pavers within the furnishing zones and open planters as stormwater infiltration. The planters will not only serve as green infrastructure but will reduce overall impervious surfaces along the streetscape.

Additionally, strategic placement of short-term bike parking is proposed as described herein, and will be coordinated with input from City staff, within the South Courtyard furnishing zone on First Street and on property within the PB-364 Development Parcel on CambridgeSide Place and along Land Boulevard. The short-term bike parking locations will be designed between the tree planters and will be mindful not to obstruct pedestrian movement from the street to the sidewalk.

The project will provide new Publicly Beneficial Open Space of approximately 11,000 sf. Along with the widened sidewalks provided by setting back 80 First Street and 150 CambridgeSide Place on both First Street and CambridgeSide Place, two new signature open spaces will be established to provide opportunities for guests, tenants, residents and the general public to engage with the new retail and Active Uses that will line First Street and CambridgeSide Place. These two signature spaces have been carved from the architectural

volumes to create 3 distinct buildings along First Street (60 and 80 First Street, and 150 CambridgeSide Place) replacing a single, 750 foot long uninterrupted wall to the neighborhood.

The two proposed open spaces will provide moments of discovery and extend the streetscape public realm. Lined with retail and Active Uses on all sides, the two new open spaces will invite pedestrians to pause, dwell, dine, and play throughout the day.

The North Pocket Park between 60 and 80 First Street replaces entry ramps which serve the existing Upper Garage. The North Pocket Park is currently envisioned to be a more relaxed, intimate space where the public is invited to grab a coffee, read a book or meet friends within an "outdoor living room" type of setting. Arrangements of planters, art, lighting, and furnishings provide a welcoming appearance.

Continuing along First Street toward 150 CambridgeSide Place, the South Courtyard is unveiled by a generous architectural expression, inviting pedestrians to explore deeper into the outdoor gathering space. Surrounded by retail and Active Uses, including entries to 80 First Street, the Lower Garage and 150 CambridgeSide Place, this courtyard offers ample opportunity for ground floor activation and engagement. Large trees planted in-ground with the possibility of overhead string lights provide comforting scale, shade, color and a sense of place. The Applicant currently anticipates that the courtyard will have a mixture of movable tables and chairs, fixed seating elements, and soft furnishings. Throughout the space, family-friendly activities are supported, culminating in a more whimsical environment near the 150 CambridgeSide Place secondary entry where it is anticipated that children's discovery and play will be programmed.

Similar to the Initial Phase Canal Park open space improvements, while the Applicant is seeking approval of the location, general dimensions and overall design intent of each of the North Pocket Park and the South Courtyard as part of these design review applications, the final programming (e.g., furnishings and fixtures) of such open spaces will be determined in coordination with the Open Space and Retail Advisory Committee to ensure that the design is responsive to community needs. Once the Applicant has received input from the Committee, it will return to the Planning Board for design review and approval of the final programming of the North Pocket Park and the South Courtyard. The Applicant will submit such design review materials to the Planning Board with adequate time to incorporate any comments from the Board into the final construction drawings. Once approved by the Planning Board, the North Pocket Park and the South Courtyard improvements will be constructed prior to the issuance of a



final certificate of occupancy for the third new building in the CambridgeSide 2.0 Project.

Final design of the improvements within the First Street right of way, which abut the on-site North Pocket Park and South Courtyard and the Subsequent Phase buildings, will be coordinated with City pending outcome of the First Street Study.

In June 2021, the Applicant created the Retail and Open Space Advisory Committee, comprised of various representatives from the City of Cambridge and East Cambridge residents. The Committee met on July 26, August 16, September 13, and October 25, 2021 to discuss opportunities for the improvement of Canal Park. The Committee identified 6 areas for improvement, including a) mall edge, b) Thorndike Way, c) the Great Lawn, d) the Play Area, e) Thomas Graves Landing terrace, and f) under the bridge. IBI Placemaking and HLB, the Applicant's landscape architect and lighting consultant, participated in each meeting, receiving feedback from the Committee and preparing concept plans for the proposed improvements. The proposed improvements recommended by the

Committee include landscape and hardscape improvements, lighting upgrades, enhanced seating and other activation opportunities, an upgraded play structure in the play area, public art opportunities, and accessibility upgrades. The Applicant continues to work with IBI and HLB to advance the plans to comport with the Committee's vision and will present the final design to the Planning Board in the spring of 2022. Once approved by the Planning Board, the Canal Park improvements will be constructed prior to the issuance of a final certificate of occupancy for the new 20 CambridgeSide building.

Legend

- RETAIL AND ACTIVE USE
- PUBLICLY BENEFICIAL OPEN SPACE
- LOBBY/GATHERING
- RESIDENTIAL
- BACK OF HOUSE AND SERVICE

Canal Park

Building Design Review 80 First Street PUBLICLY BENEFICIAL OPEN SPACE PLAN

EXHIBIT 39 Core Retail

Food Court

Cambridgeside Place

150
Cambridgeside
Place

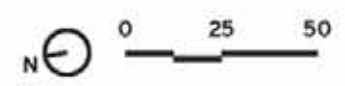
First Street

60
First
Street

80
First
Street

* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY



Building Design Review
80 First Street
 LANDSCAPE MATERIALS PLAN*

EXHIBIT 40

Legend

 BUILDING SITE



CAMBRIDGE CITY STANDARD BRICK



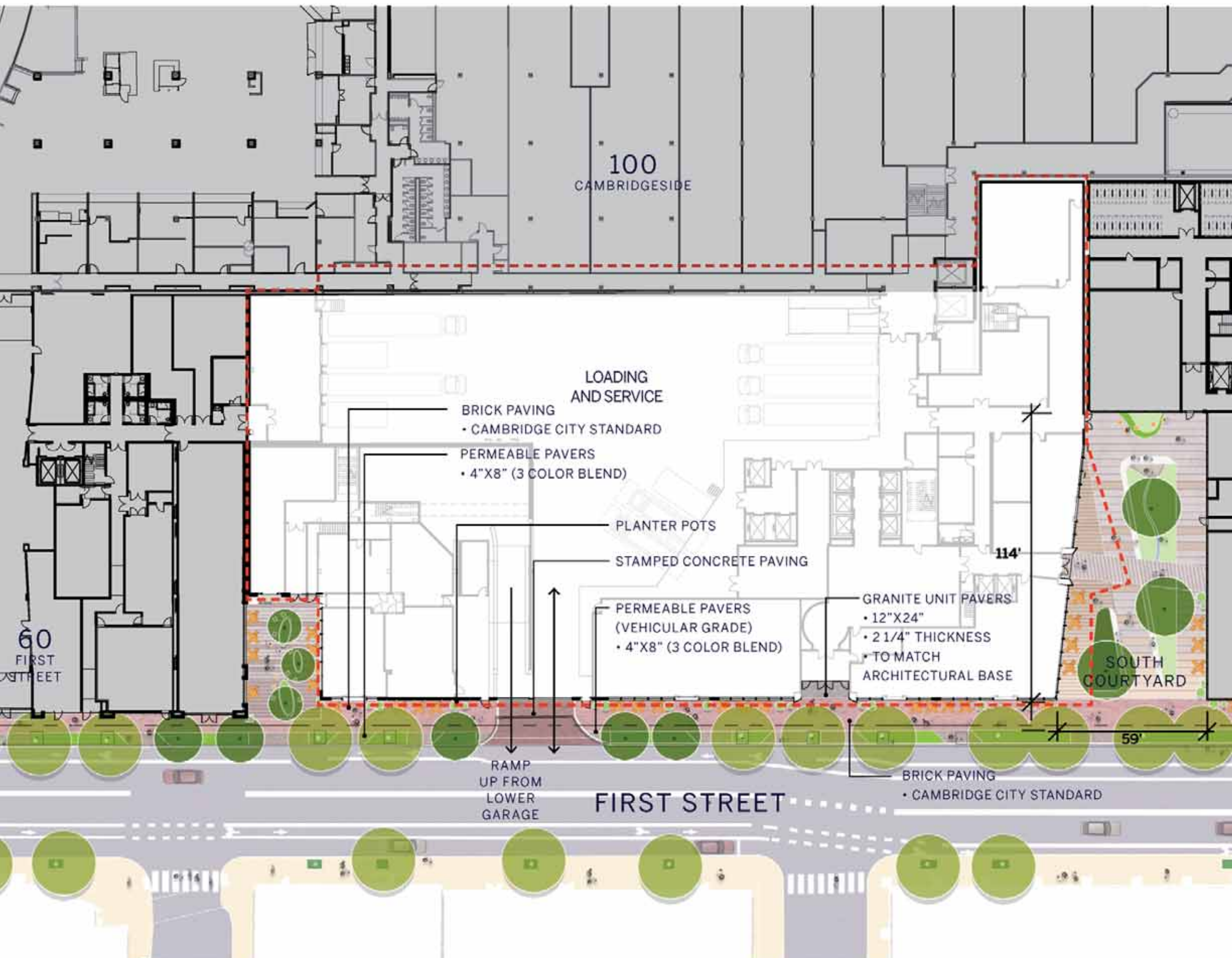
GRANITE ENTRANCE PAVING



PLANTER POTS



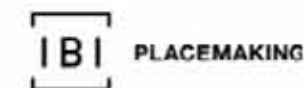
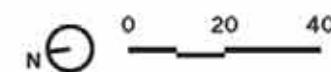
OUTDOOR SEATING



*FINAL DESIGN FROM EXISTING CURB TO PROPERTY LINE/R.O.W. TO BE COORDINATED WITH THE CITY PENDING OUTCOME OF THE FIRST STREET STUDY

* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

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Building Design Review

80 First Street

LANDSCAPE PLANTING PLAN

EXHIBIT 41

Legend

 BUILDING SITE



RED MAPLE



FLOWERING DOGWOOD



GRASSES



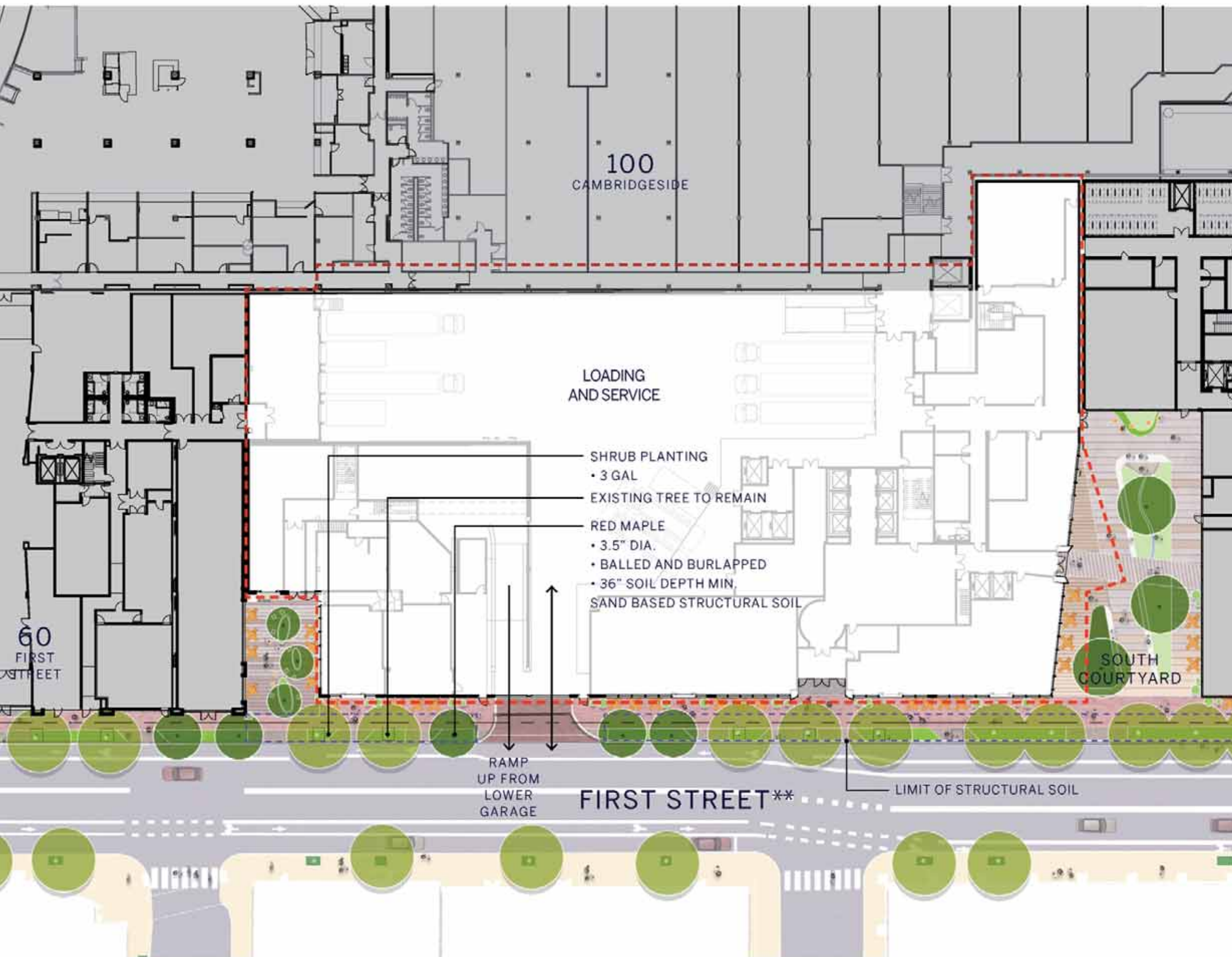
SHRUB PLANTING



FLOWERS

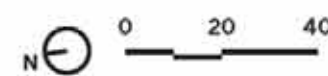


FLOWERS



* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

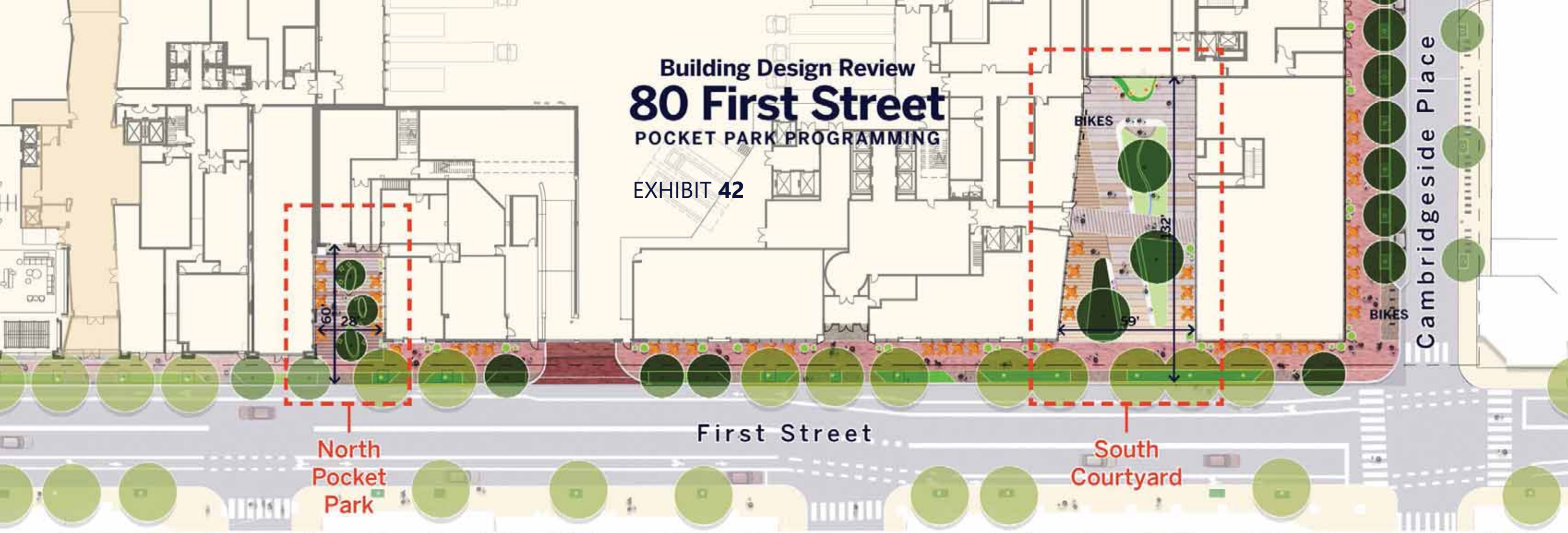
** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY



Building Design Review 80 First Street

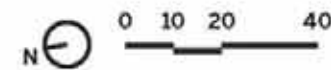
POCKET PARK PROGRAMMING

EXHIBIT 42



* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

** FINAL DESIGN OF THE IMPROVEMENTS WITHIN THE FIRST STREET RIGHT OF WAY WILL BE COORDINATED WITH CITY PENDING OUTCOME OF THE FIRST STREET STUDY





Parking, Loading and Circulation

Parking

As indicated on Exhibits 43-45, the proposed project includes renovation of the portion of the existing Lower Garage located underneath the 80 First Street building site area. The proposed renovations include structural foundation reinforcing required for the proposed 10-story structure. The existing garage access driveway ramp on First Street will be retained and new public elevator access to street level is proposed within the 80 First Street building footprint area.

Consistent with the Decision, all approved uses on the PB-364 Development Parcel (including those within the 80 First Street building) will be served by existing parking spaces on site, which will be reduced upon project completion from the existing 2,490 spaces to approximately 1,695 parking spaces.

Bicycle Parking

The Decision provides that the required number of bicycle parking spaces for the entire PB-364 Development Parcel at full buildout shall be 450 long-term spaces and 146 short-term spaces. Long-term bicycle parking spaces may be provided anywhere on the site and are permitted to serve all approved uses in the PUD. Upon completion of the 80 First Street building project, a total of 259 long-term bicycle parking spaces will be available on the PB-364 Development Parcel (with the remaining long-term bicycle spaces to be delivered in connection with construction of the 150 Cambridgeside Place building). The 116 long-term bicycle spaces located within the 80 First Street building, as indicated on Exhibits 47-49, will be accessed via one or more elevators suitable for bicycles at grade through the proposed South Courtyard, and will be stored on Level G2 and G3 of the existing Lower Garage directly beneath the building. Upon completion of the 80 First Street building project, a total of 91 short-term bicycle parking spaces will be available on the PB-364 Development Parcel, with new proposed short-term spaces on the 80 First Street site to be located in the South Courtyard as indicated on Exhibit 48.

Additionally, strategic placement of short-term bike parking is proposed as described herein, and will be coordinated with input from City staff, within the South Courtyard furnishing zone on First Street and on property within the PB-364 Development Parcel on Cambridgeside Place and along Land Boulevard. The short-term bike parking locations will be designed between the tree planters and will be mindful not to obstruct pedestrian movement from the street to the sidewalk. Following the completion of both 80 First Street and 150 Cambridgeside Place buildings, there will be a total of 450 long-term bicycle parking spaces and 147 short-term bicycle parking spaces on the PB-364 Development Parcel, in full satisfaction of the requirements of the Decision.

Loading/Service

Consistent with the Decision, loading facilities will be shared across the buildings and uses on the entire PB-364 Development Parcel, including the 80 First Street building site, in order to serve the interconnected mix of uses at the site. Upon completion of the Subsequent Phase buildings, a total of 13 loading bays will exist across the PB-364 Development Parcel, which is consistent with the approved range of loading bays for the site under the Decision (including the Phasing Timeline included on Appendix A of the Decision).

As part of the 80 First Street project, the existing Upper Garage loading dock accessed from First Street will be renovated. The renovated loading dock will maintain off-street loading for all loading dock users (including those serving the 80 First Street building). As indicated on Exhibits 50 and 51, truck maneuvering for entry and exit will continue to be accommodated within the enclosed loading dock area, including truck sizes up to a WB-50, with no on-street loading. The renovated loading dock arrangement within the loading dock will accommodate retail, residential and office and lab users. 7 truck loading bays are proposed. Additionally, 4 bays for garbage and recycling services are provided. New service elevators will be located within the loading dock area, serving office and laboratory users in the new 10-story structure. The loading dock will continue to be actively managed to allow for on-going coordination and oversight of loading dock activities and operations.

Consistent with Condition 2.b.viii of the Decision and the Final Development Plan, long-term bicycle parking for the CambridgeSide 2.0 Project may be provided across the PB #364 Development Parcel to serve all approved uses at the site. Following completion of both Subsequent Phase buildings, and in full satisfaction of the requirements of the Decision, there will be a total of 450 long-term bicycle parking spaces and 147 short-term bicycle parking spaces to serve the uses on the PUD-8 Development Parcel as outlined below.



Long-Term Bicycle Parking Spaces (Required)	450
Provided (Location)	
Core Retail / 100 Cambridgeside Place	46
20 Cambridgeside Place	61
60 First Street	36
80 First Street	116
150 Cambridgeside Place	191
TOTAL (Provided)	450

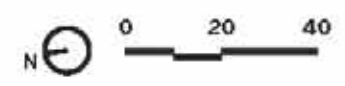
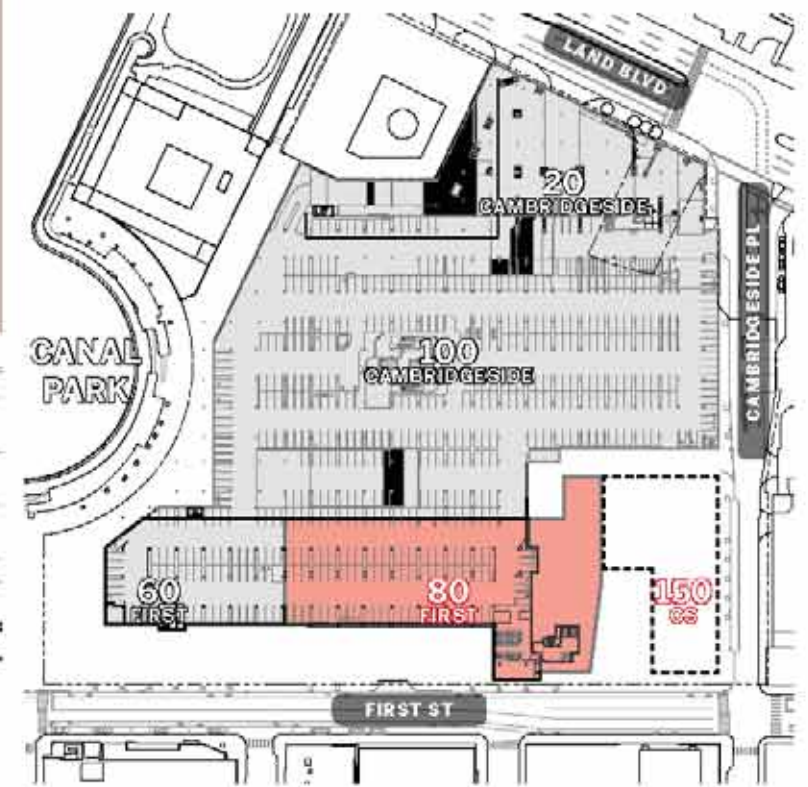
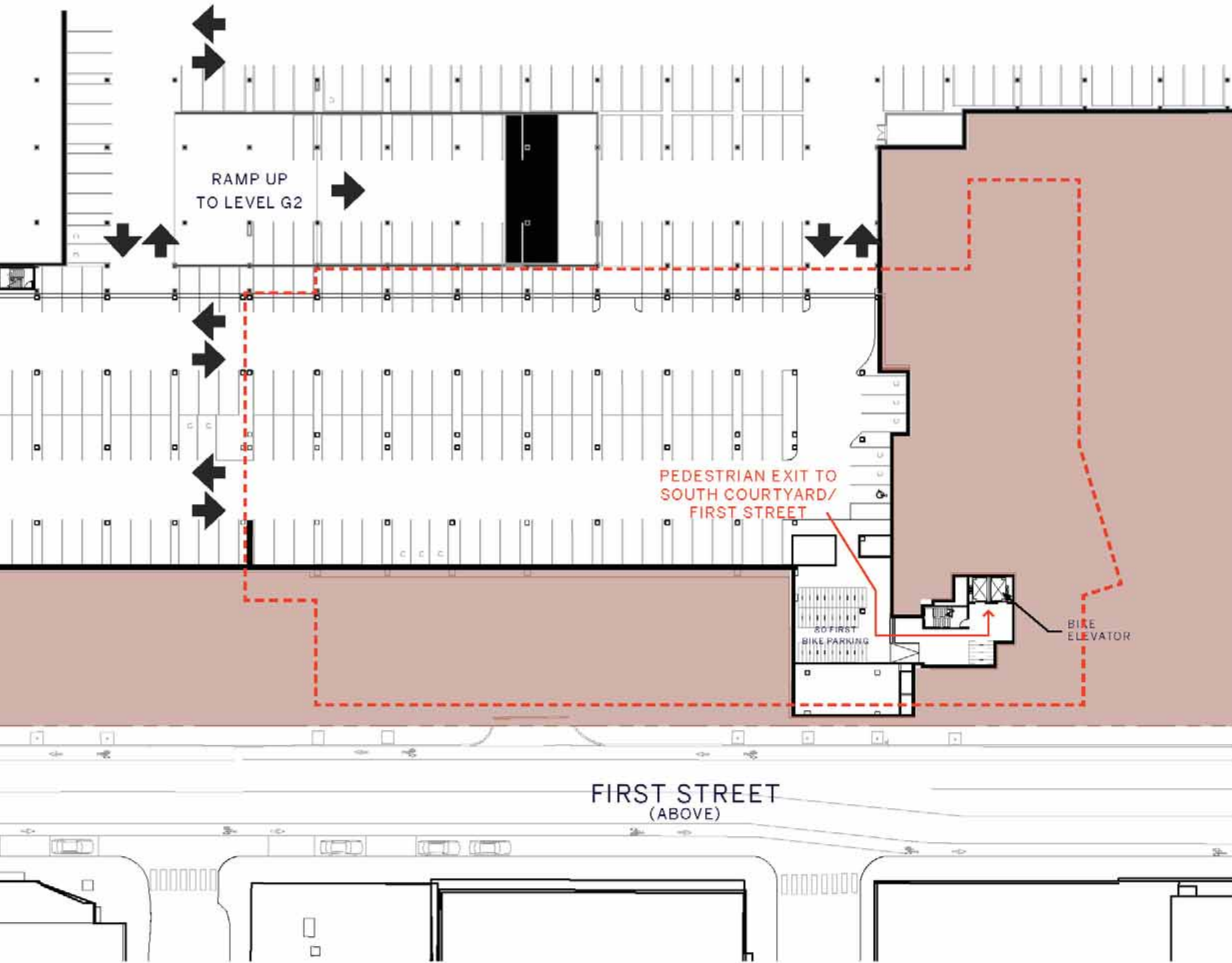
Short-Term Bicycle Parking Spaces (Required)	146
Provided (Location)	
Canal Park and Thorndike Way	57
First Street / South Courtyard	4
Cambridgeside Place	76
Land Boulevard	10
TOTAL (Provided)	147

Building Design Review
80 First Street
LOWER GARAGE LEVEL G3

EXHIBIT 43

Legend

-  BUILDING SITE
-  UNEXCAVATED

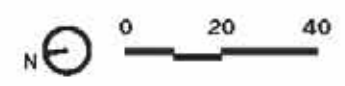
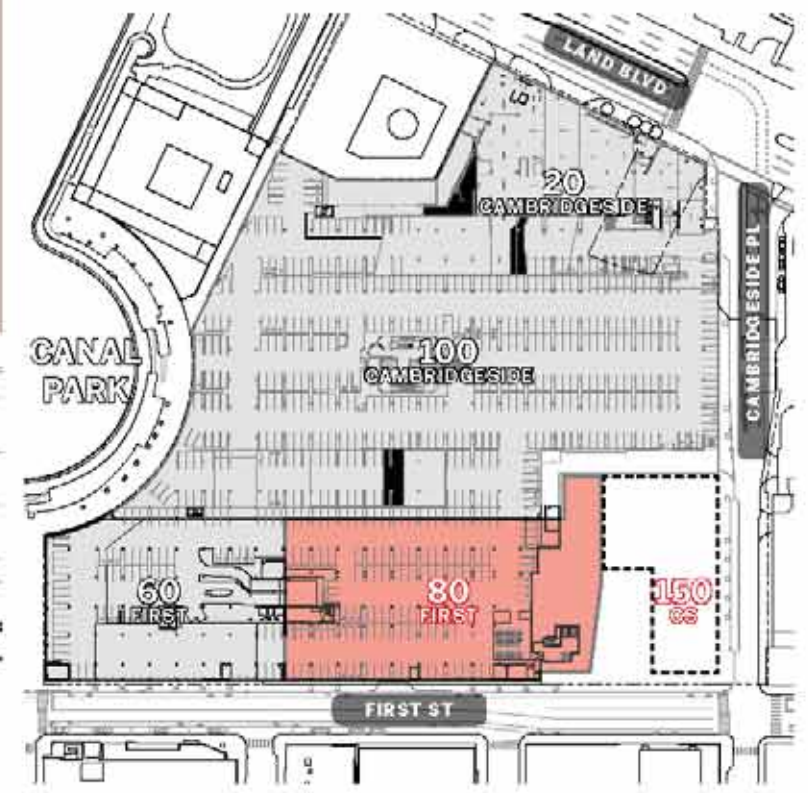
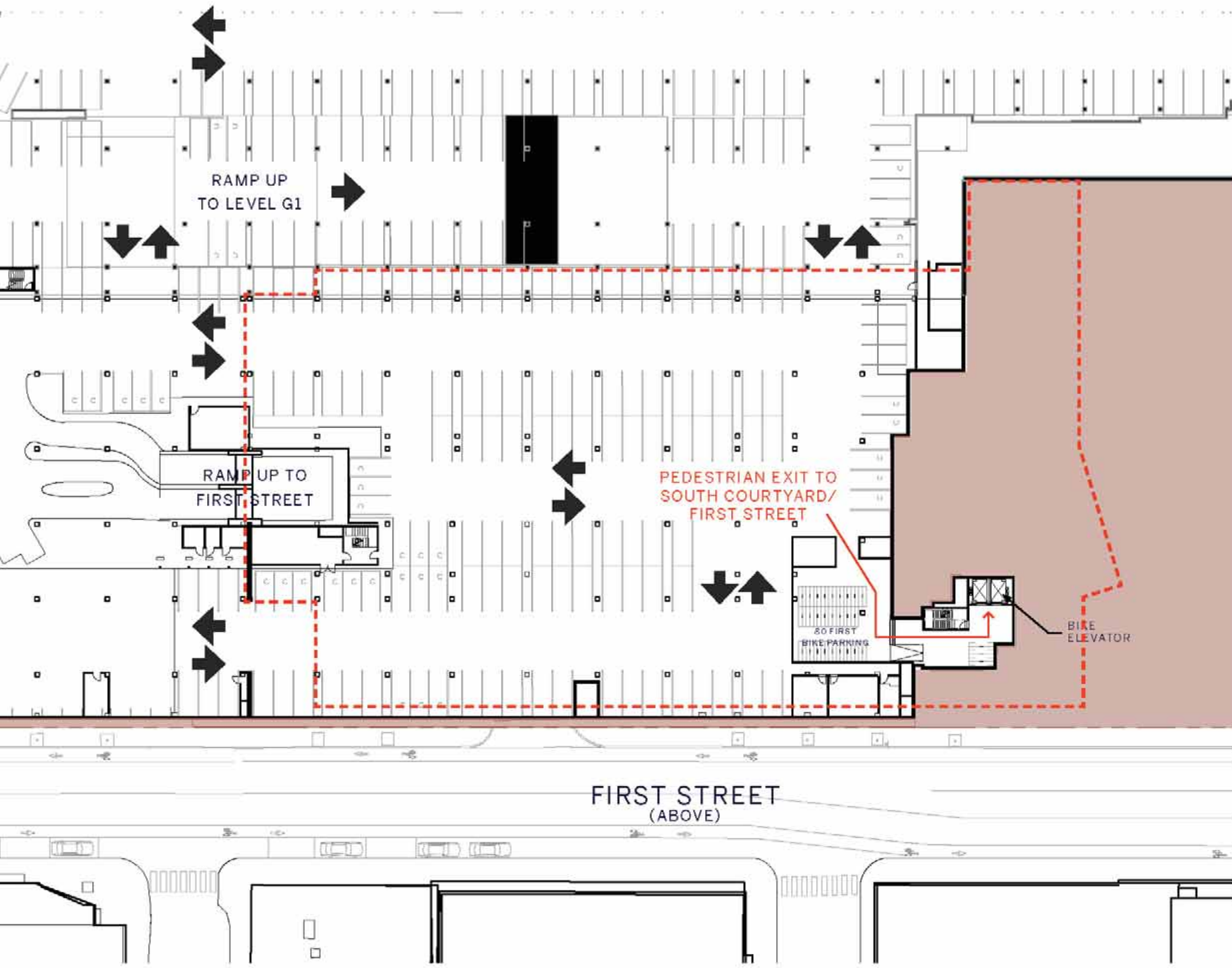


Building Design Review
80 First Street
 LOWER GARAGE LEVEL G2

EXHIBIT 44

Legend

- BUILDING SITE
- UNEXCAVATED





Building Design Review

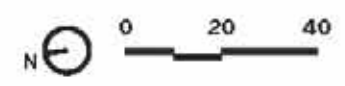
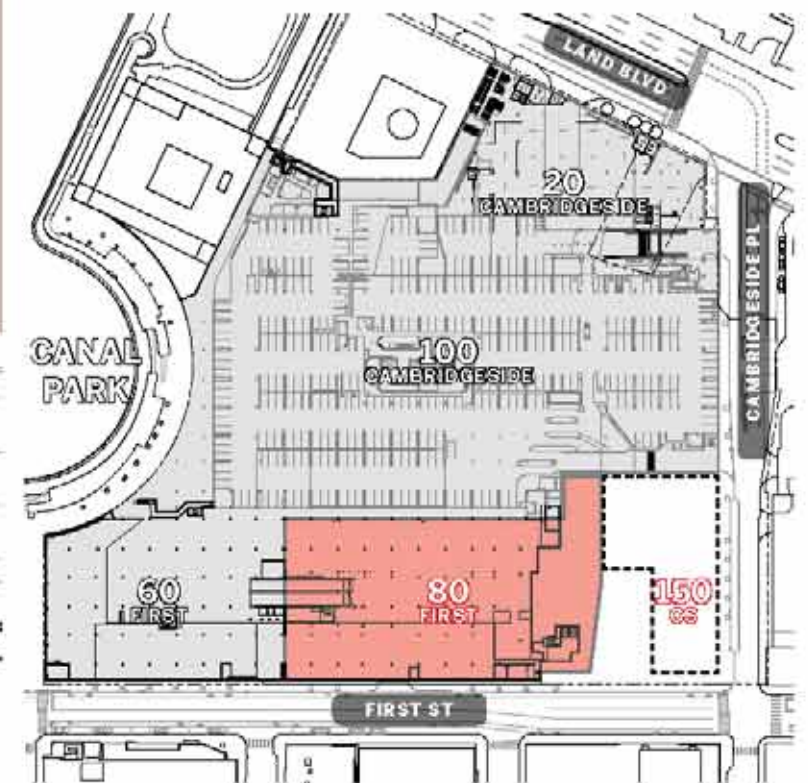
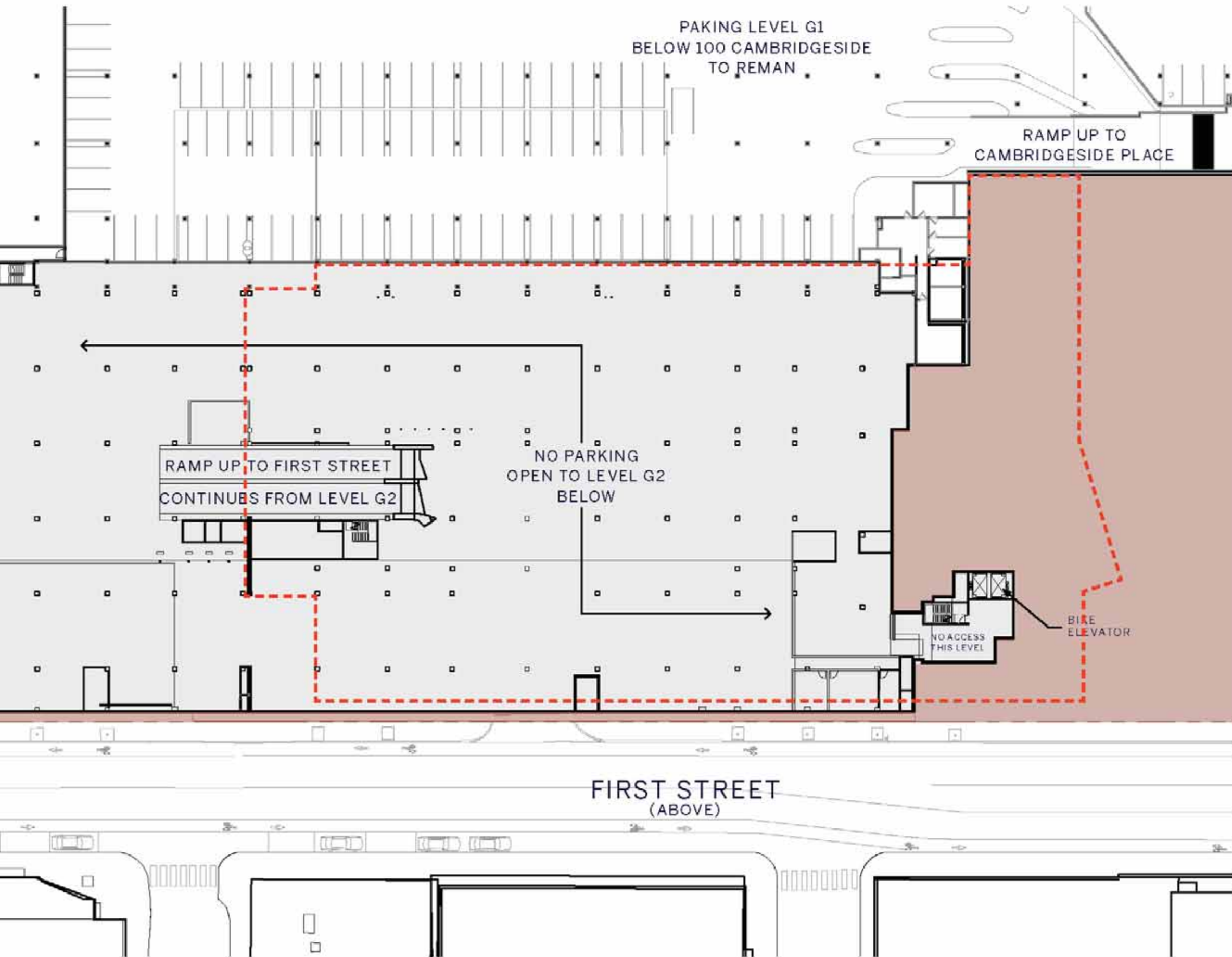
80 First Street

LOWER GARAGE LEVEL G1

EXHIBIT 45

Legend

-  BUILDING SITE
-  UNEXCAVATED



Building Design Review

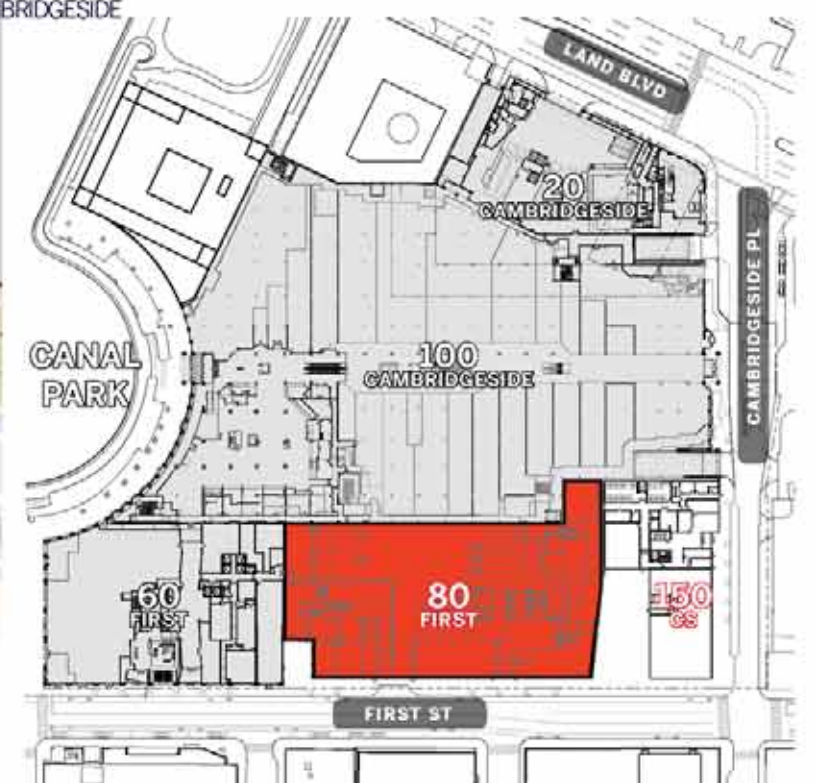
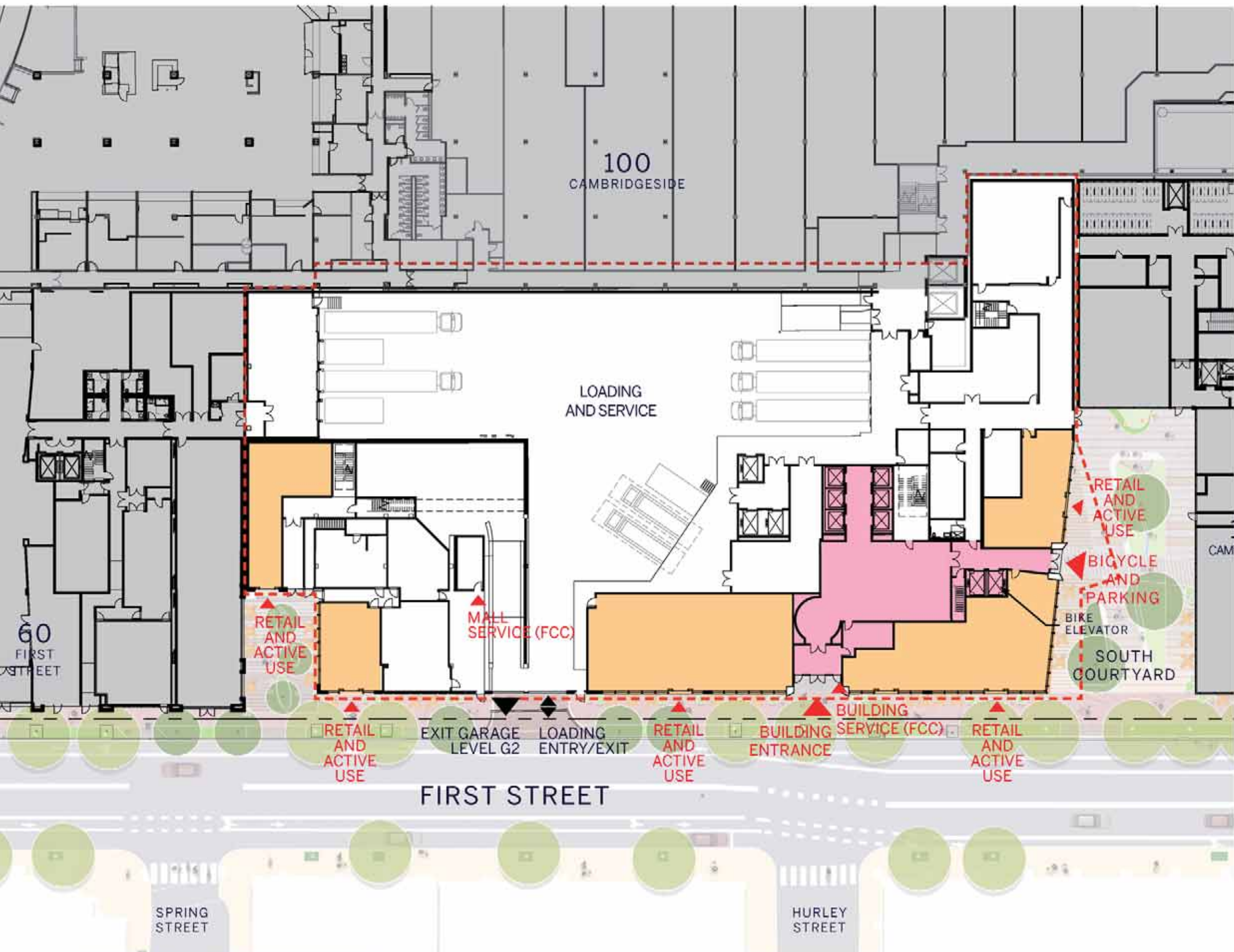
80 First Street

GROUND FLOOR ENTRY PLAN

EXHIBIT 46

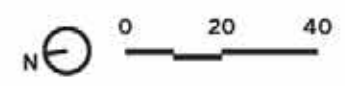
Legend

- BUILDING SITE
- RETAIL AND ACTIVE STOREFRONT
- LOBBY/GATHERING
- ▲ BUILDING ENTRY
- ▲ RETAIL ENTRY
- ◀ PARKING ENTRY
- ◀ SERVICE ENTRY



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Building Design Review

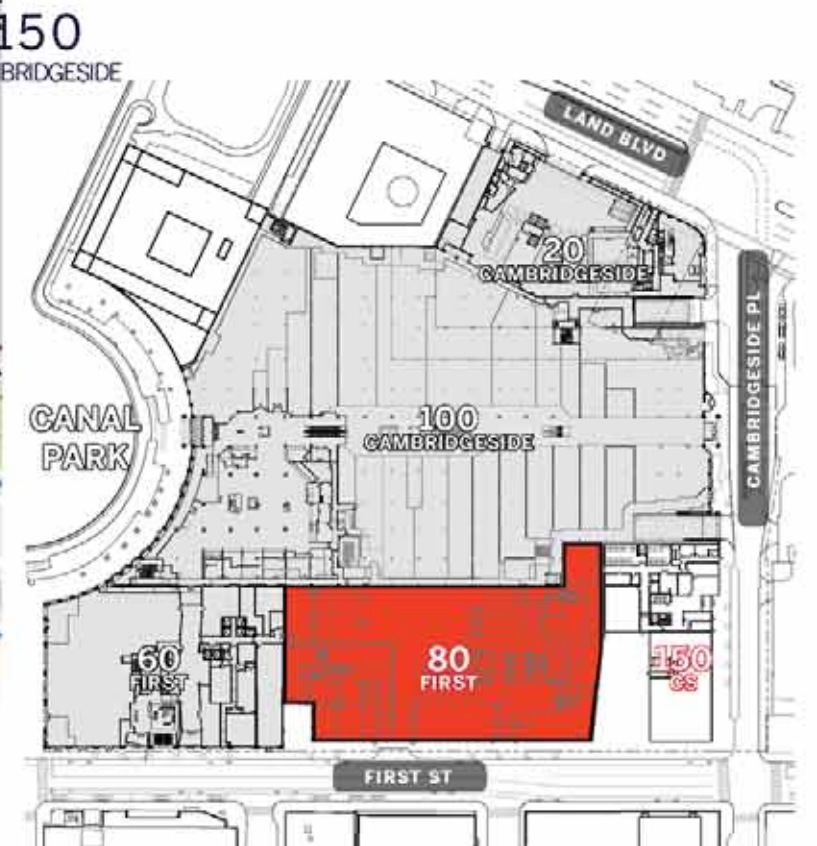
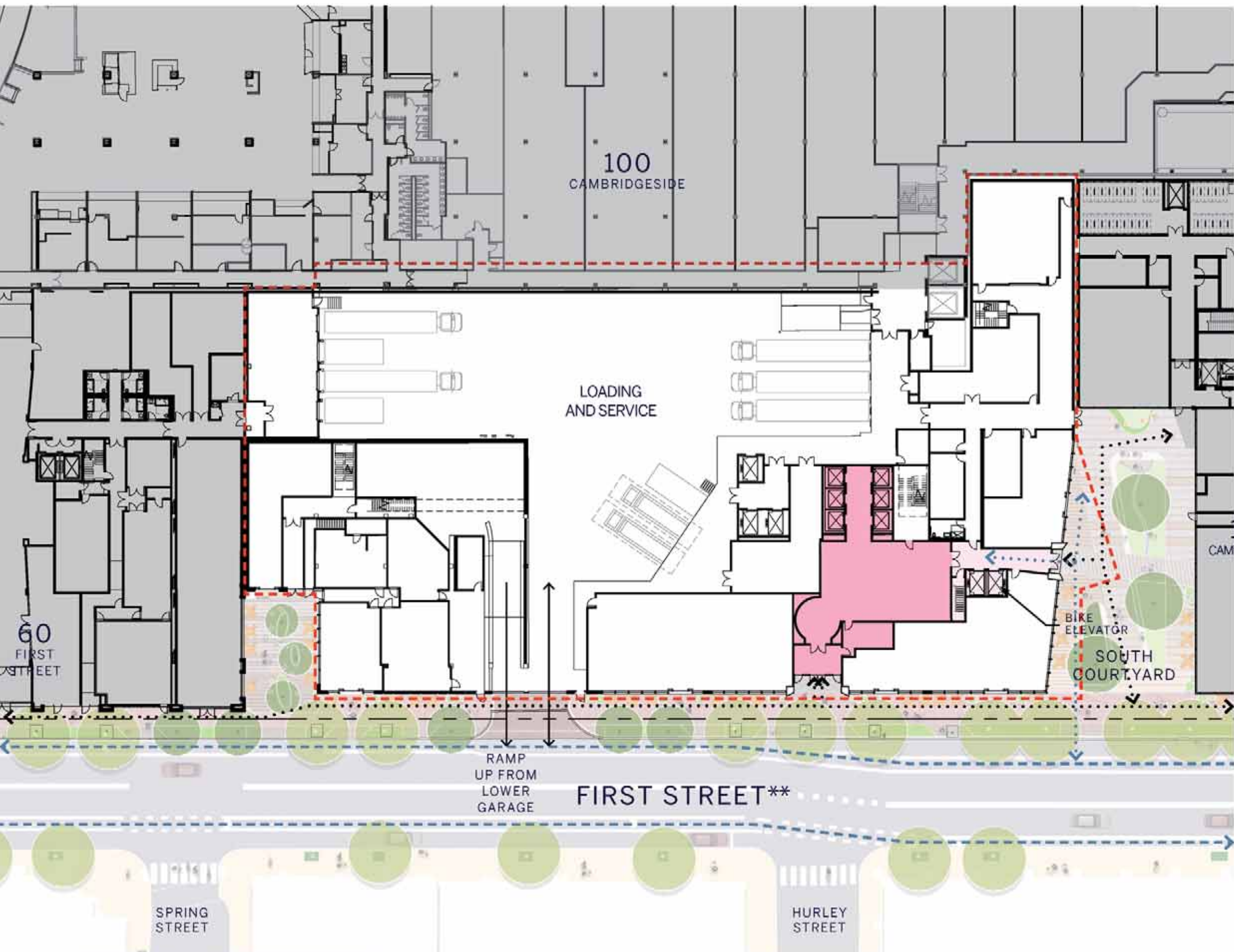
80 First Street

PEDESTRIAN/BICYCLE CIRCULATION DIAGRAM

EXHIBIT 47

Legend

- BUILDING SITE
- LOBBY/GATHERING
- BIKE ACCESS AND PARKING
- PEDESTRIAN CIRCULATION
- WALKED BICYCLE CIRCULATION
- BICYCLE CIRCULATION



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Building Design Review

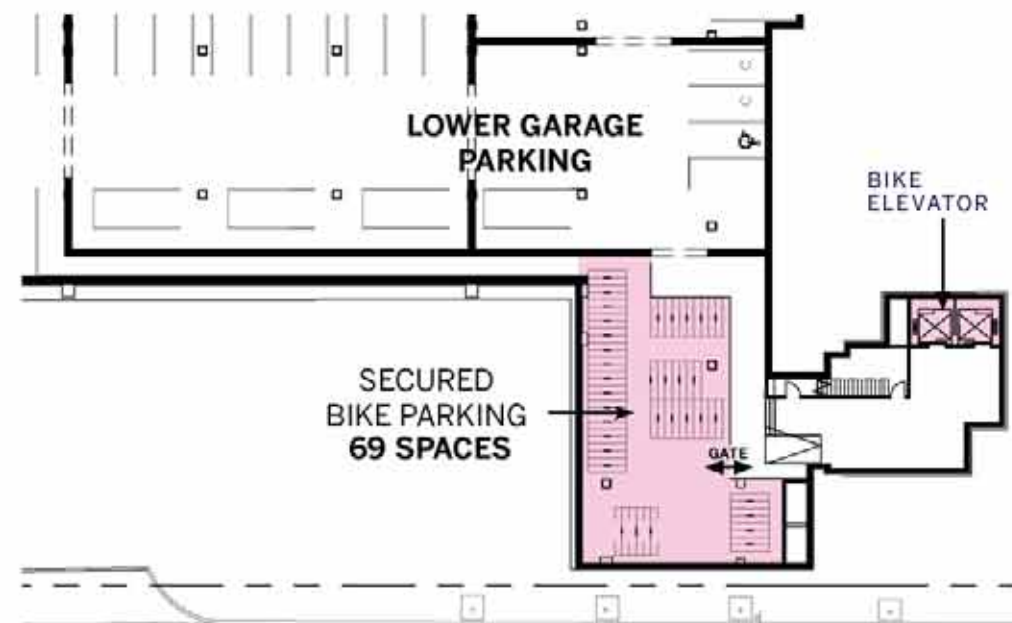
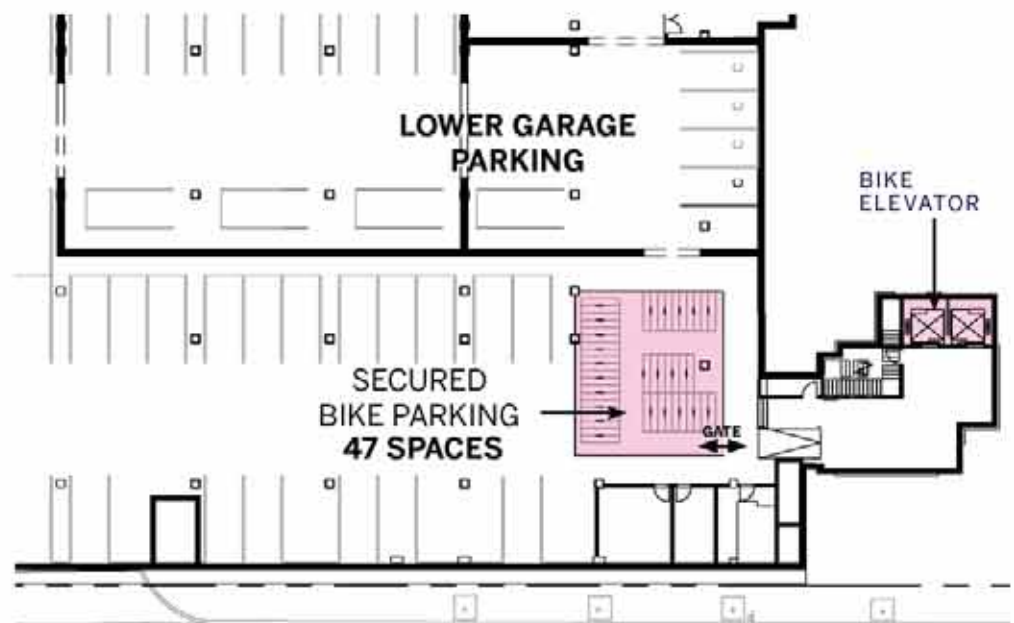
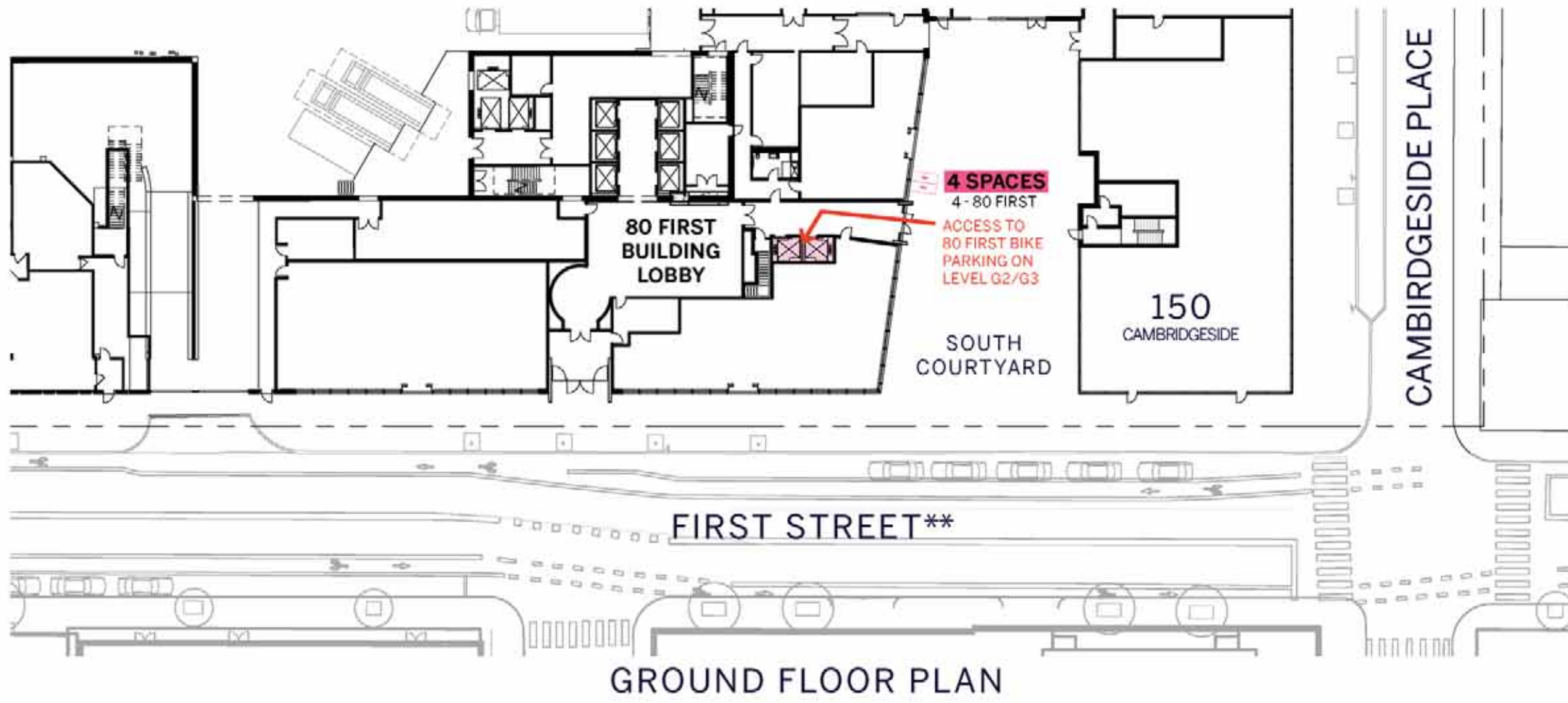
80 First Street

BIKE PARKING PLAN

EXHIBIT 48

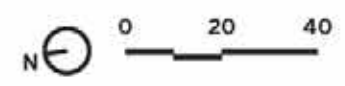
Legend

- LONG-TERM BIKE PARKING (116 INCL. 6 TANDEM)
- SHORT-TERM BIKE PARKING (4)
LAYOUT OF SHORT-TERM BIKE PARKING IN SOUTH COURTYARD TO BE PROVIDED WITH FINAL DESIGN OF SOUTH COURTYARD*



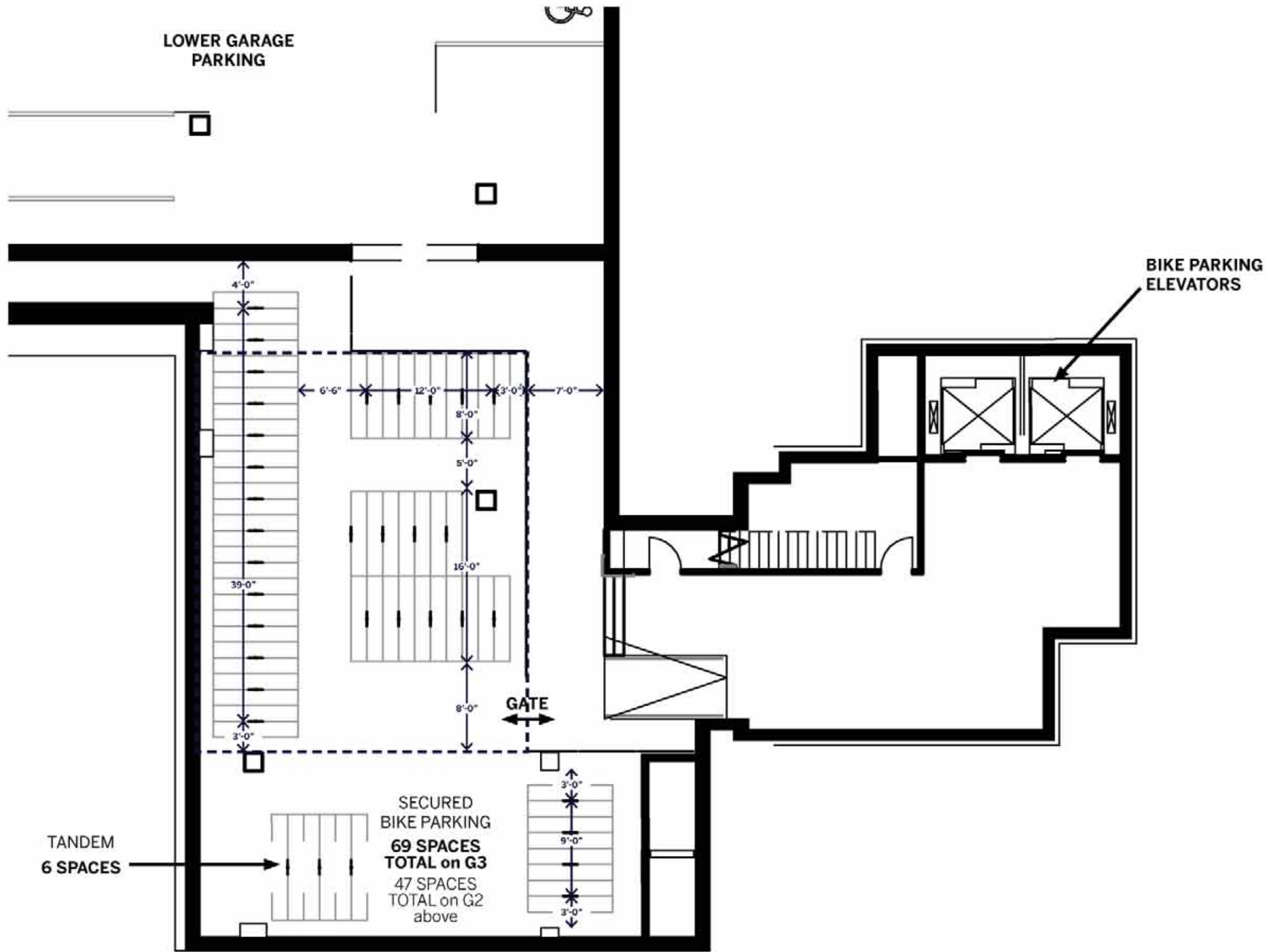
* FINAL PROGRAMMING OF THE NORTH POCKET PARK AND SOUTH COURTYARD WILL BE DETERMINED IN COORDINATION WITH THE OPEN SPACE AND RETAIL ADVISORY COMMITTEE AND IS NOT THE SUBJECT OF THIS DESIGN REVIEW APPLICATION

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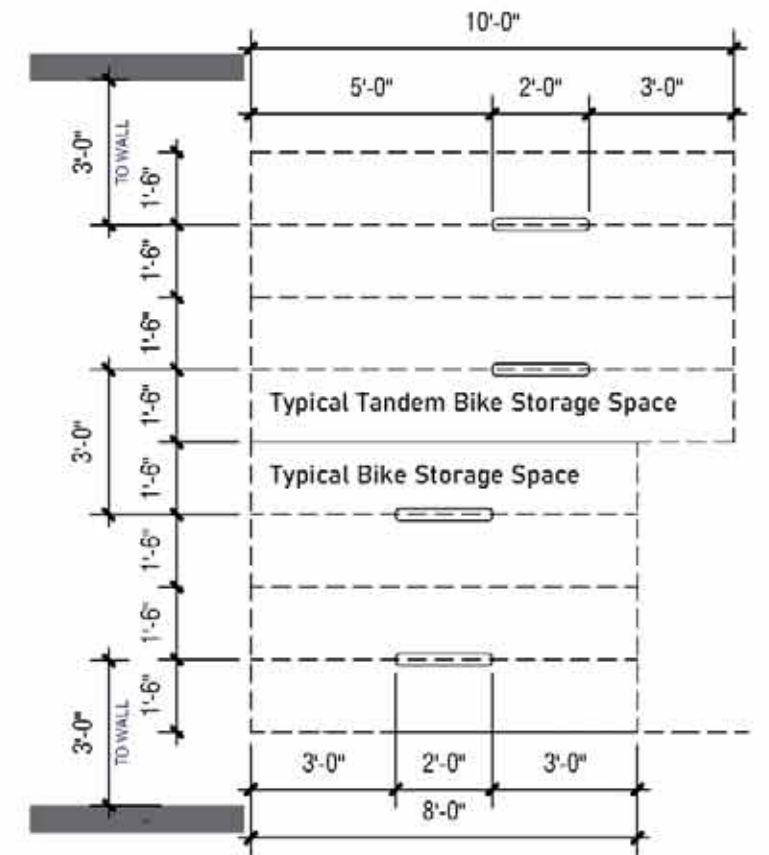


Building Design Review
80 First Street
 BIKE PARKING DETAIL PLAN

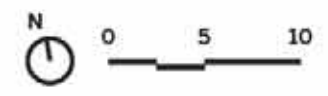
EXHIBIT 49



LEVEL G3 DETAIL FLOOR PLAN (G2 BOUNDARY SHOWN DASHED)






TYP. BIKE PARKING DETAIL

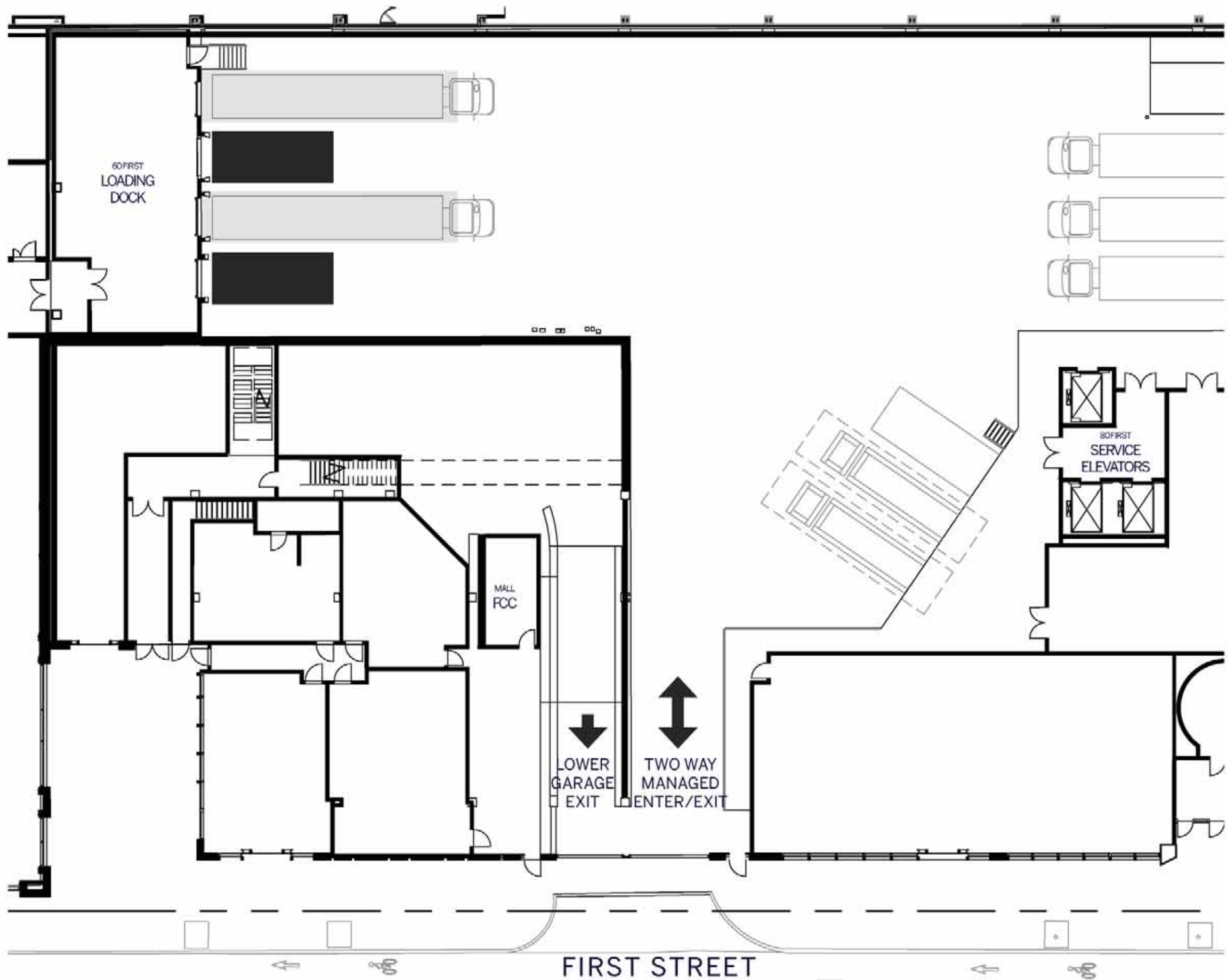


Building Design Review
80 First Street
 NORTH LOADING DOCK

EXHIBIT 50

Legend

-  DUMPSTER
-  10 X 30
-  10 X 50

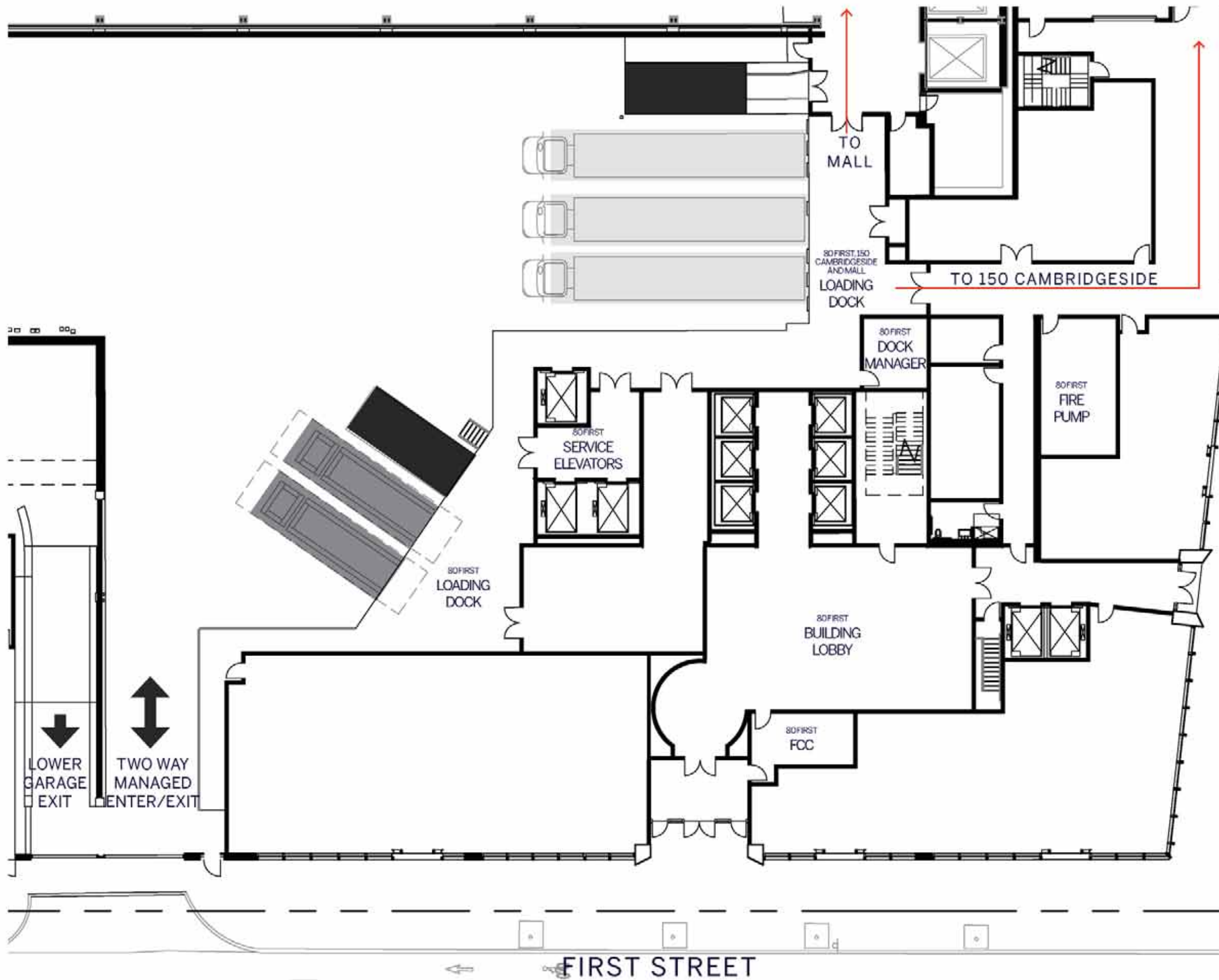


Building Design Review
80 First Street
 SOUTH LOADING DOCK

EXHIBIT 51

Legend

- DUMPSTER
- 10 X 30
- 10 X 50





Building Sustainability/ Green Building Review

Condition 11 Compliance

Building Sustainability/ Green Building Review

The 80 First Street building has been designed to meet the requirements of Section 22.20 of the CZO and has been registered with the United States Green Building Council under the LEED for Core and Shell Development version 4 rating system. The building is targeting 63 out of a possible 110 credit points with an additional 41 credit points still undergoing evaluation to determine feasibility of achievement. By targeting 63 credit points, the building anticipates meeting the City of Cambridge requirement to be LEED v4 Gold ‘certifiable’ and intends to seek such certification. Additionally, in accordance with Section 13.107.4 the following best practices have been incorporated into the 80 First Street building.

Energy and Emissions:

The building is designed to meet the requirements of the current Massachusetts Stretch Energy Code based on IECC 2018 with 2020 amendments. Based on current modeling, the design indicates a 34% site energy savings compared to the stretch code baseline. This corresponds to 11% source energy and 22% greenhouse gas reduction. Using the Alternative Energy Performance Metric for LEED (EApc95), the design demonstrates 21% savings compared to the LEED baseline, based on the average of source energy and carbon emissions.

Urban Site and Landscaping; Water Management:

Through the use of native/adaptive plant species selection, the building site’s landscape water requirement (as calculated by the EPA WaterSense Water Budget Tool) will be reduced by at least 30% from the calculated baseline for the site’s peak watering month. The landscape design will include softscape areas which will be planted with a diverse palette of materials which are native, adaptive, low-maintenance, with no irrigation requirements beyond establishment and have year-round aesthetic appeal. The 80 First Street building will meet the Cambridge DPW Stormwater Management Standards to the maximum extent practicable, including the implementation of best management practices (BMPs) such as permeable pavers and tree grates to provide additional water quality treatment measures and promote stormwater infiltration and groundwater recharge to the maximum extent practicable.

Cool Roofs & Site Cooling Strategies:

The roof and non-roof hardscape materials of the building will include light-colored surfaces to reduce the overall heat island effect impact on the building site. The roof membrane will be a high albedo roof product with an initial SRI value of 82 minimum.

Monitoring:

The building will conform to the requirements of the Cambridge Building Energy Use Disclosure Ordinance as required by Chapter 8.67 of the Municipal Code. A consultant will be retained to perform monitoring-based commissioning activities as they relate to the operations and maintenance of the building once it has been occupied.

Healthy Living and Working:

A direct line of sight to the outdoors will be provided for 75% of the regularly occupied floor area of the building, which may include unobstructed views, views to landscaped areas, sky, pedestrian walkways, and streetscapes.

Transportation:

The building’s location within East Cambridge provides various transportation options. The Project is located within ½ mile walking distance of the Lechmere T station, which provides users of the site with access to 424 weekday rides and 264 weekend rides via the MBTA Green B, C, D, and E lines, and MBTA bus lines 69, 80, 87, and 88. Visitors and employees working in the building will also be able to access the EZRide shuttle bus that passes adjacent to the site on First Street.

As described earlier in this application, exterior short-term and covered long-term bicycle storage is also planned for visitors and regular occupants of the building. The immediate neighborhood provides a direct connection to a local bicycle network that links to a variety of services with pedestrian and cyclist access. 10 shower rooms are provided throughout the building that can be accessed by building occupants in order to support cycling to and from the site.

Flood Resiliency:

The Applicant has reviewed the Climate Change Vulnerability Assessment (CCVA) Report and identified potential locations to address the potential future flood elevations and has taken a conservative approach to reflect the projected 2070 100-year flood elevations. The following table outlines the potential future flood elevations for different scenarios.

Future Potential 2070 Flood Scenarios

Flood Scenario	Elevation in Feet (Cambridge City Base)
2070 – 100-year SLR/SS*	18.7
2070 – 100-year Precipitation	20.3
2070 – 10-year SLR/SS*	N/A
2070 – 10-year Precipitation	N/A

*SLR – sea level rise, SS – storm surge

The proposed first-floor elevation of the 80 First Street building is approximately at elevation 21.3’ and will not be impacted by the projected 2070 100-year precipitation flood elevation. However, there may be potential locations which could be improved and will be addressed during project construction. To protect the Project from the 2070 100-year precipitation elevation, the Applicant is considering the following resilience measures:

- Bulkheading entrances/egress locations that are below the 2070 100-year precipitation elevation
- Employing a deployable barrier at the First Street garage and loading/service entrances to protect the project from the projected 2070 100-year SLR/SS flood elevation

In accordance with Conditions 4 and 11 of the Decision, the Applicant submitted the required Green Building Report materials for the 80 First Street building on October 20, 2021, and was certified by CDD on December 29, 2021. A summary of the key components of the 80 First Street Green Building Report materials is included as Exhibit 52, and the full set of materials is on file with CDD.

LEED V4 GOLD CORE AND SHELL
63 POINTS

HIGH PERFORMANCE ENVELOPE

TRIPLE GLAZED, DOUBLE LOW E ASSEMBLY

R-30 ROOF/ELEVATED SLAB ASSEMBLY
MEET AND EXCEED INFILTRATION RATES
ENVELOPE COMMISSIONING

TRANSITION TO ELECTRIFICATION

INCORPORATE AIR-TO-WATER HEAT PUMPS
PROVIDING BOTH HEATING AND COOLING

REDUCE FOSSIL FUEL USE:
EMERGENCY POWER
DOMESTIC HOT WATER
PEAK BOILER
RETAIL/RESTAURANT

HIGH EFFICIENCY HVAC

EXHAUST ENERGY RECOVERY
HIGH EFFICIENCY CHILLED WATER AND HOT WATER PLANTS

COMMISSIONING

FUNDAMENTAL, ENHANCED BUILDING SYSTEMS, MONITOR-BASED



Building Design Review
80 First Street
GREEN BUILDING REVIEW

EXHIBIT 52

EMBODIED CARBON

REUSE AND RENOVATION OF EXISTING FOUNDATION
AND STRUCTURE UP TO THE SECOND FLOOR

RESILIENCY

CRITICAL GEAR, LOBBY AND LOADING DOCK APRON
ELEVATED ABOVE 2070 FLOOD ELEVATION
DEPLOYABLE BARRIERS AT LOADING AND PARKING IF REQUIRED

SOLAR/GREEN ROOF READY AREA

POTENTIAL TO INSTALL GREEN ROOF, SOLAR OR A COMBINATION

FITWEL

- HIGH EFFICIENCY LED LIGHTING
- INCREASED VENTILATION
- HEALTHY INTERIOR AIR QUALITY
- INDOOR WATER USE REDUCTION
- EV CHARGING
- BICYCLE STORAGE AND AMENITIES

ACCESS TO OPEN SPACE

NORTH POCKET PARK AND EXPANDED SOUTH COURTYARD
MULTIPLE PRIVATE TERRACE OPPORTUNITIES



Environmental Comfort Plan Update

Wind & Shadow

Environmental Comfort Plan Update

In connection with establishing the development plan for the CambridgeSide 2.0 Project, the Applicant analyzed environmental conditions in the vicinity of the site and the potential impacts of the CambridgeSide 2.0 Project, as well as how to mitigate any such impacts.

The Applicant's environmental analysis focused on wind, shadow, lighting and noise impacts, and was approved by the Board in its issuance of the Decision.

In light of the reconfiguration of the Subsequent Phase buildings, as detailed in the Minor Amendment, the Applicant has attached updated wind and shadow studies to reflect such reconfiguration and its minimal impact on the previously approved studies.

The following sub-sections summarize the findings, and suggested mitigation measures (e.g., screening, building elements or other site improvements), resulting from these updated wind and shadow analyses. As further explained on the following pages, the potential impacts of the CambridgeSide 2.0 Project (including the reconfigured Subsequent Phase buildings) remain consistent with conditions that are typical in an urban environment and are minimal in comparison to the public benefits attributable to the CambridgeSide 2.0 Project.



Wind Study

Wind Study

Consistent with the Decision, which considered the effects of the entire CambridgeSide 2.0 Project, an updated Pedestrian Wind Study assessment was prepared for the entire CambridgeSide 2.0 Project, which includes the Initial Phase buildings (60 First Street and 20 CambridgeSide) and the proposed Subsequent Phase 80 First Street and 150 CambridgeSide, reconfigured as described in the Minor Amendment. This Wind Study was performed out of an abundance of caution to confirm that the reconfiguration of the Subsequent Phase buildings resulted in a condition similar to that which was previously approved by the Board, which is confirmed in the summary of the Wind Study that is attached on the following pages, with full study provided as Appendix A. The potential wind conditions were assessed based on actual wind tunnel testing of a constructed scale model of the CambridgeSide 2.0 Project, within a 1,600-foot radius of the site, with three different scenarios: “No Build”, “Build” and “Full Build” configurations. “No Build” is the existing buildings on the existing site with the existing surrounding buildings; “Build” is the proposed Project buildings with the existing surrounding buildings; and “Full Build” is the proposed Project buildings with the existing surrounding buildings and other proposed buildings in surrounding projects such as Cambridge Crossing. The testing, based upon local wind records, is compared to appropriate criteria for gauging wind comfort and safety in pedestrian areas.

The updated Pedestrian Wind Study analysis has been used during the design process to help guide the comfort of pedestrians along the street and around building access points, including with respect to the 80 First Street building. The key findings from the report are summarized below:

Mean Speed

- No dangerous mean wind speeds are predicted for the three configurations assessed.
- Relatively low mean speeds around the existing site are observed on an annual basis, with slightly higher wind activity to the south of the project site near Charles Park.
- Mean annual wind speeds on the streets bounding the project site are predicted to remain similar to those that currently prevail once the proposed development is added. These wind conditions are considered suitable for the intended pedestrian usages. An exception is the southwest corner of the 150 CambridgeSide Place where uncomfortable conditions are anticipated on an annual basis.
 - » The southwest corner is the location where pedestrians could be standing to wait for the intersection crossing signal.

- » Uncomfortable conditions occur in winter and spring. Refer to Table 2 in the Appendix.
- » There is no existing data for this location to understand the comparison to the built condition.

With the anticipated future surrounding buildings included, comparable mean speeds to the Build configuration are anticipated.

Conceptual wind control measures have been presented for select areas where mean wind speeds are slightly higher than desired.

Effective Gust

For all tested configurations, wind speeds at all locations are predicted to meet the effective gust criterion for pedestrian wind safety on both an annual and seasonal basis. No design modifications or mitigations are required to address wind safety issues.

Mitigation

Resolution of the single exceedance indicated in the updated report will be addressed by employing suggested design modifications, which may include relocating passive outdoor seating and entries from the location, as described in the full report attached as Appendix A.

Environmental Comfort Plan Wind Study REPORT

FINAL REPORT



80 FIRST STREET & 150 CAMBRIDGESIDE PLACE

CAMBRIDGE, MA

PEDESTRIAN WIND STUDY
RWDI # 2104370
November 8, 2021

SUBMITTED TO

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**NEW ENGLAND
DEVELOPMENT**

**ELKUS | MANFREDI
ARCHITECTS**



Environmental Comfort Plan Wind Study SUMMARY

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
RWDI #2104370
November 8, 2021



EXECUTIVE SUMMARY

Rowan Williams Davies & Irwin Inc. (RWDI) was retained to conduct a pedestrian wind assessment for the proposed 80 First Street & 150 Cambridgeside Place in Cambridge, MA (Image 1). The potential wind conditions have been assessed based on wind tunnel testing of the project under the No Build, Build and Full Build configurations (Images 2A through 2C), and the local wind records (Image 3) and compared to the Mean Speed and Effective Gust pedestrian wind criteria. The results of the assessment are shown on site plans in Figures 1A through 2C, and the associated wind speeds are listed in Tables 1 and 2. The key findings are summarized as follows:

Effective Gust

- For all tested configurations, wind speeds at all locations are predicted to meet the effective gust criterion for pedestrian wind safety on both an annual and seasonal basis.

Mean Speed

- No dangerous mean wind speeds are predicted for the three configurations assessed.
- Relatively low mean speeds around the existing site are observed on an annual basis, with slightly higher wind activity to the south of the project site near Charles Park.
- Mean annual wind speeds on the streets bounding the project site are predicted to remain similar to those that currently prevail once the proposed development is added. These wind conditions are considered suitable for the intended pedestrian usages. An exception is the southwest corner of the 150 Cambridgeside Place where uncomfortable conditions are anticipated on an annual basis.
- With the anticipated future surrounding buildings included, comparable mean speeds to the Build configuration are anticipated.
- Conceptual wind control measures have been presented for select areas where mean wind speeds are slightly higher than desired.

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PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
RWDI #2104370
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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed 80 First Street & 150 Cambridgeside Place in Cambridge, MA. The project (site shown in Image 1) is located on the north side of Charles St between First St and Edwin H Land Blvd. The proposed buildings are located at southwest corner of the existing retail shopping complex with a central mall.

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed.

This report presents the project objectives, background and approach, and discusses of the results from RWDI's assessment and provides conceptual wind control measures, where necessary.



Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)



2 BACKGROUND AND APPROACH

2.1 Physical Modeling

To assess the wind environment around the proposed project, a 1:400 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

- A - No Build: Existing site with existing surroundings (Image 2A),
- B - Build: Proposed project with existing surroundings (Image 2B), and,
- C - Full Build: Proposed project with existing and future surroundings (Image 2C).

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1600 ft radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 119 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 5 ft above local grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 directions in a 10-degree increment. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site and reviewed by design team.

Environmental Comfort Plan Wind Study MODEL

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
RWDI #2104370
November 8, 2021



Image 2A: Wind Tunnel Study Model - No Build Configuration

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
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Image 2B: Wind Tunnel Study Model - Build Configuration

Environmental Comfort Plan

Wind Study

MODEL AND DATA

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
RWDI #2104370
November 8, 2021

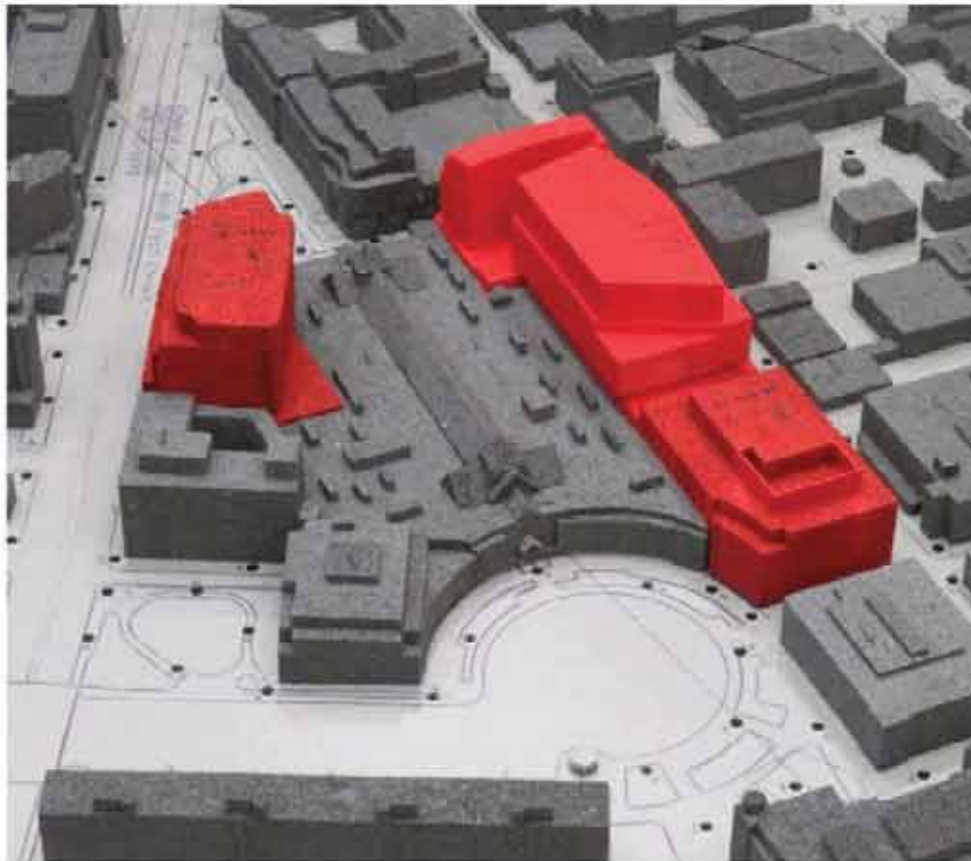


Image 2C: Wind Tunnel Study Model - Full Build Configuration

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
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November 8, 2021



2.2 Meteorological Data

The data from the wind tunnel tests was combined with long term meteorological data recorded during the years 1995 through 2020 at Boston Logan International Airport to predict full scale wind conditions. The analysis was performed separately for the entire year and for each of the four seasons. Images 3 and 4 present "wind roses", summarizing the annual and seasonal wind climates in the Boston area, respectively, based on the data from Logan Airport.

On an annual basis, the most common wind directions are those between north-northwest and south-southwest. Winds from the east-northeast to the east-southeast are also relatively common. In the case of strong winds, west-northwest, northwest, west and northeast are the dominant wind directions. A similar directional distribution is seen in the seasonal wind roses as well (image 4).

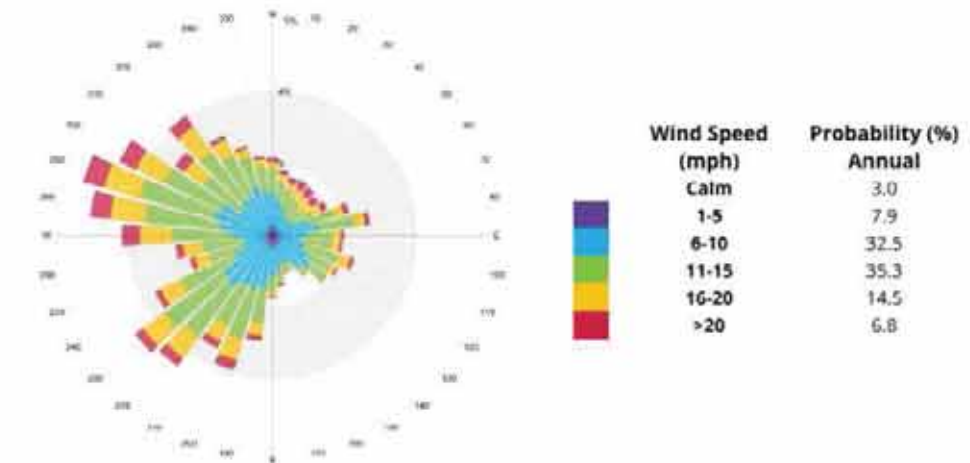


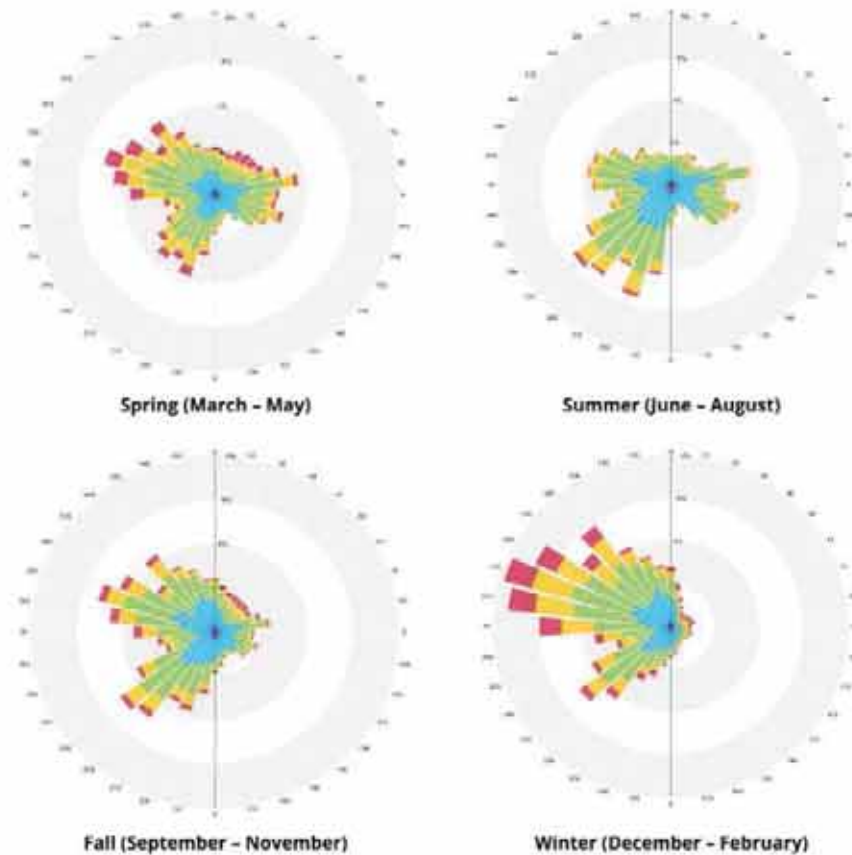
Image 3: Annual Directional distribution of winds approaching Boston Logan International Airport from 1995 through 2020

Environmental Comfort Plan

Wind Study

CRITERIA

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
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Wind Speed (mph)	Probability (%)			
	Spring	Summer	Fall	Winter
Calm	2.7	3.1	3.4	2.6
1-5	6.8	9.5	8.7	6.6
6-10	28.6	39.9	34.5	28.2
11-15	35.9	36.7	34.6	34.2
16-20	17.2	9.9	13.0	17.7
>20	8.8	1.9	5.9	10.7

Image 3: Seasonal Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 through 2020

PEDESTRIAN WIND STUDY
80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
RWDI #2104370
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2.3 Pedestrian Wind Criteria

The pedestrian wind criteria implemented for the current study uses two standards for assessing the relative wind comfort of pedestrians. First, the 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 1% of the time.

The second set of criteria used 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.

Wind Acceptability	Effective Gust Speed (mph)
Acceptable	≤ 31
Unacceptable	> 31

Comfort Category	Mean Wind Speed (mph)
Comfortable for Sitting	≤ 12
Comfortable for Standing	≤ 15
Comfortable for Walking	≤ 19
Uncomfortable for Walking	> 19
Dangerous	> 27

Effective gust and mean wind speeds are based on a 1% exceedance or 99 percentile wind speeds.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

This study involved state-of-the-art measurement and analysis techniques to predict wind conditions. Nevertheless, some uncertainty remains in predicting wind comfort, and this must be kept in mind. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Also, unforeseen changes in the project area, such as the construction or removal of buildings, can affect the conditions experienced at the site. Finally, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (1% of the time). Higher wind speeds will occur but on a less frequent basis.



3 RESULTS AND DISCUSSION

The predicted wind conditions in terms of mean and effective gust speeds pertaining to the tested configurations are graphically depicted on site plans in Figures 1A through 2C located in the "Figures" section of this report. These conditions and the associated wind speeds are presented in Tables 1 and 2, located in the "Tables" section. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested. 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.

Wind conditions comfortable for walking are appropriate for sidewalks and walkways as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing are preferred at main entrances where pedestrians are apt to linger. Wind speeds comfortable for sitting are ideal during the summer for areas intended for passive activities, such as plaza spaces or outdoor dining areas.

3.1 Wind Safety

Positively, the annual and seasonal effective gust criteria are expected to be met at all of the sensor locations around the site in all the test configurations (Figure 2A, 2B and 2C, and Table 2). No design modifications or mitigations are required to address wind safety issues.

3.2 Wind Comfort

3.2.1 No Build Configuration

In general, the annual mean wind speeds on the existing site are comfortable for sitting or standing, with a few locations categorized for walking to the south of the proposed developments near the Charles Park (Locations 10, 13, 14, 16 and 19 in Figure 1A). These conditions are appropriate for the current intended uses. There are no dangerous wind speeds observed on an annual or seasonal basis; however, uncomfortable wind conditions during the winter months currently prevail near Location 14 (refer to Table 2).

3.2.2 Build Configuration

The existing wind environment, which is suitable for standing or for more passive uses (Figure 1B), is expected to remain similar at the majority of locations once the proposed project is added. Calm wind speeds, comfortable for sitting on an annual basis, are also predicted at the outdoor seating areas near Locations 99 and 106 in Figure 1B. These conditions are considered appropriate for passive pedestrian use such as lounging or dining. An exception is close to southwest corner of the 150 Cambridgeside Place building (Location 95 in Figure 1B) where uncomfortable conditions on an annual basis are predicted. These conditions could be improved by utilizing vertical wind control measures such as 5-6 ft tall planters or wind screens situated upwind (i.e., to the west) of this area. Some examples of these features are presented in image 5. Furthermore, mean wind speeds along the Lechmere Canal are predicted to be similar to those observed in the No Build configuration. Furthermore, no dangerous wind speeds are expected in the Build configuration on an annual or seasonal basis (Figure 1B and Table 2).



Image 5: Vertical Wind Control Features Applicable to Grade Level

The main entrance locations of the 80 First Street & 150 Cambridgeside Place buildings are situated near sensors 94, 98 and 102 in Figure 1B. The mean speeds at all these entrances are predicted to be comfortable for sitting on an annual basis, which is considered suitable for entrances where pedestrians may linger.

3.2.3 Updated Massing

The latest design of the 150 Cambridgeside Place has undergone some changes since the wind tunnel test according to the latest model received on November 2, 2021. The main difference from a pedestrian wind impact perspective is the removal of the tower setbacks along the south side of the building, as shown in Image 6. As this façade is not exposed to a primary wind direction, the results from the wind tunnel study are anticipated to remain similar with the new massing in place.

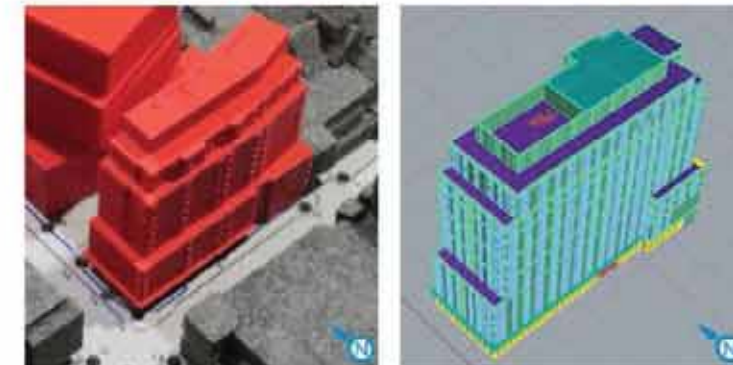


Image 6: Wind Tunnel Study Model (Left) Versus Updated Design (Right)

3.2.4 Full Build Configuration

With the anticipated future surrounding buildings included (shown in green in Image 2C), comparable mean speeds to the Build configuration are anticipated. Similarly, no dangerous mean wind speeds are predicted on an annual or seasonal basis (Figure 1C).

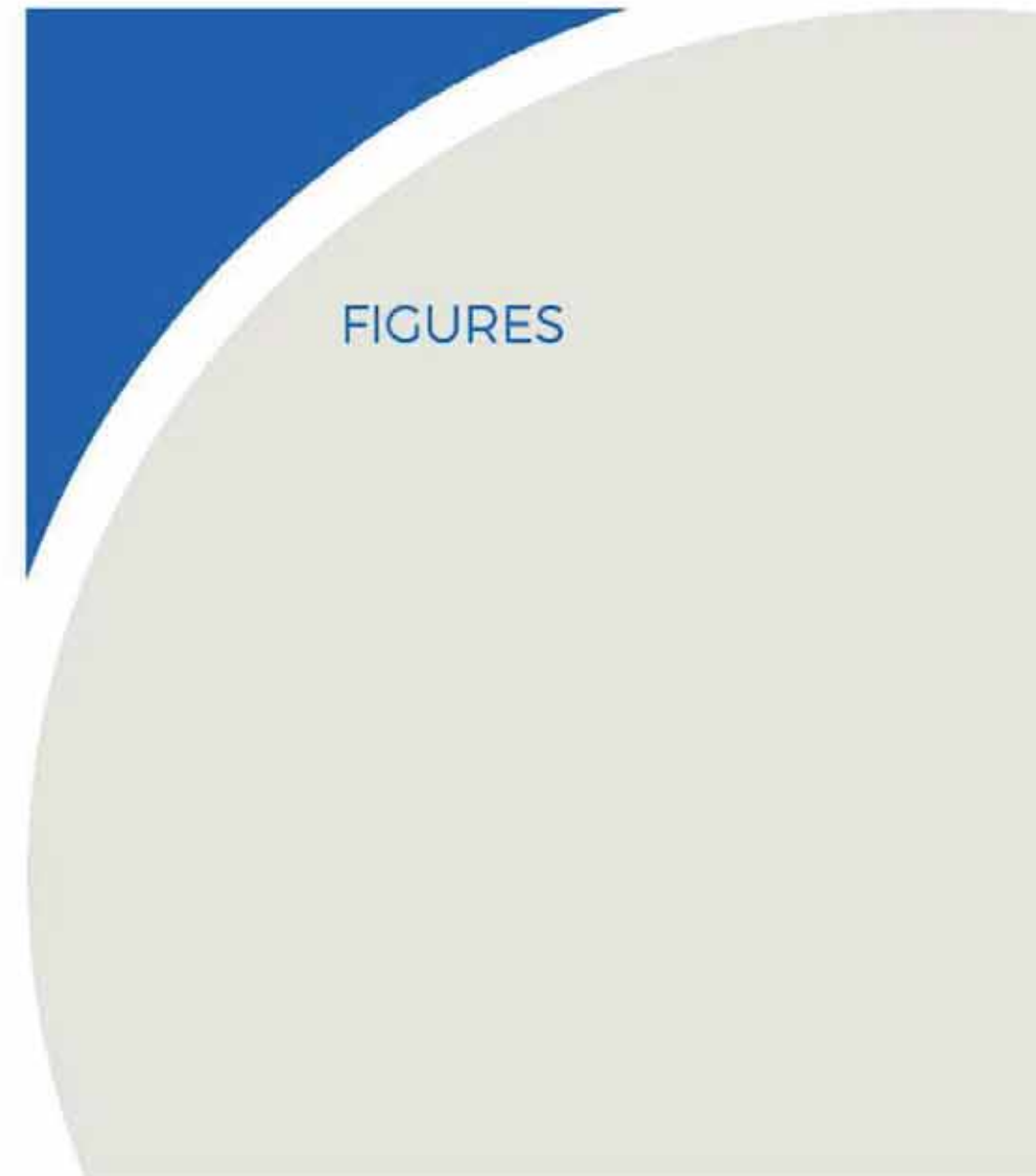
PEDESTRIAN WIND STUDY
 80 FIRST STREET & 150 CAMBRIDGESIDE PLACE
 RWDI #2104370
 November 8, 2021



4 APPLICABILITY OF RESULTS

The wind conditions presented in this report pertain to the model of the 80 First Street & 150 Cambridgeside Place constructed using the drawings and information listed below. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

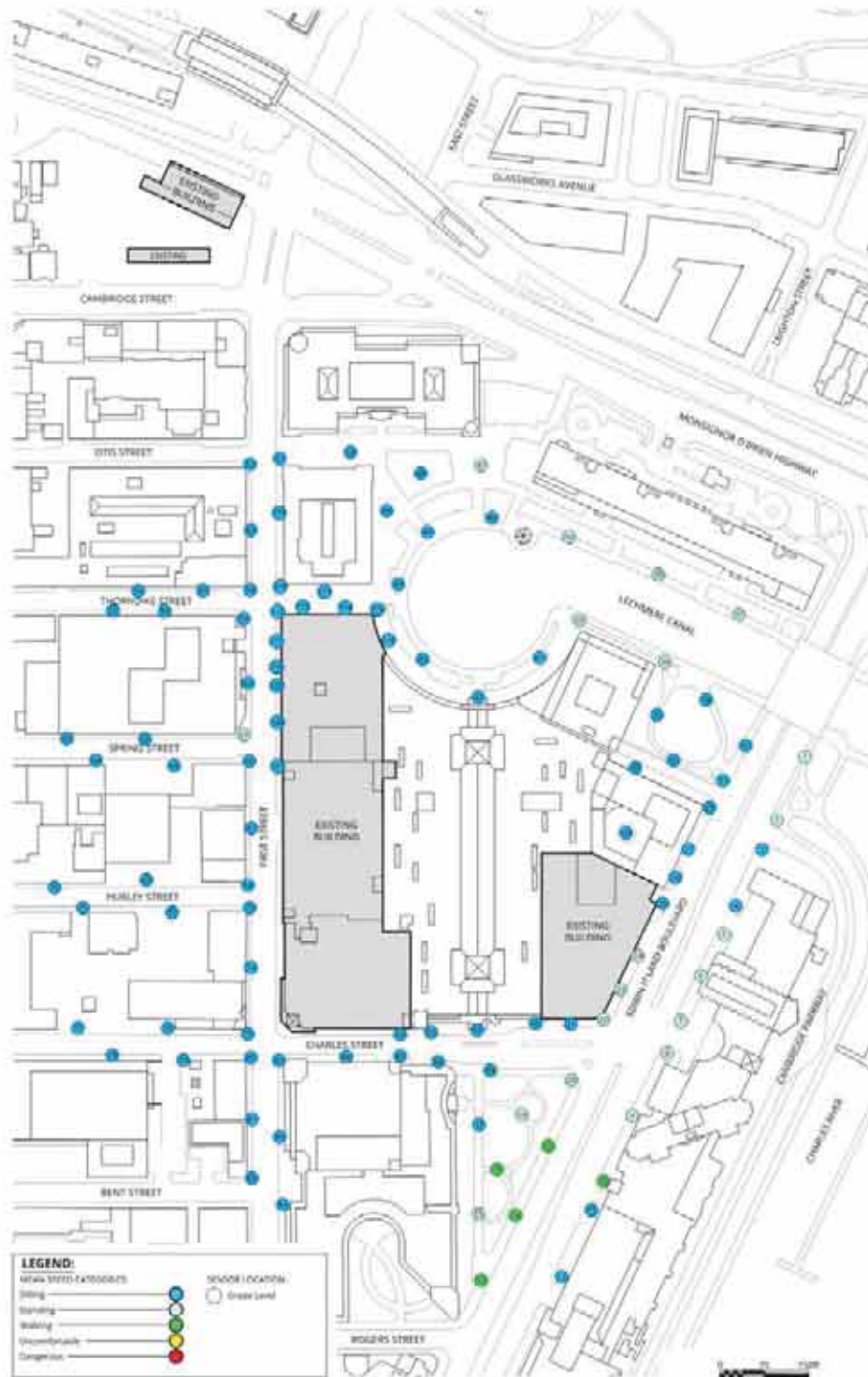
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CS-110_FIRST_STREET_MASSING-v18.rvt	3D Revit	24/08/2021
21_0824_CS_SitePlan	PDF	24/08/2021
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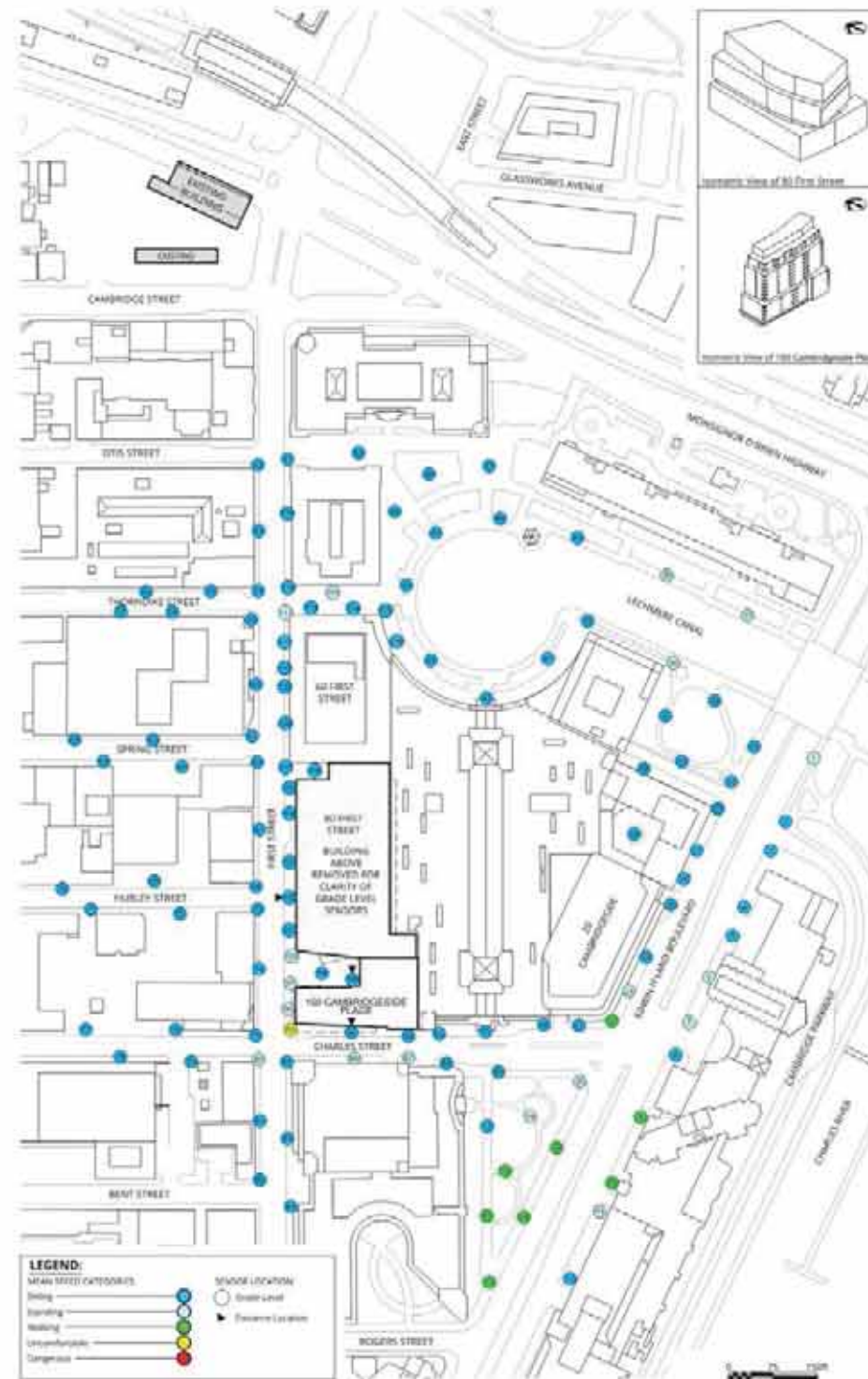
Environmental Comfort Plan

Wind Study

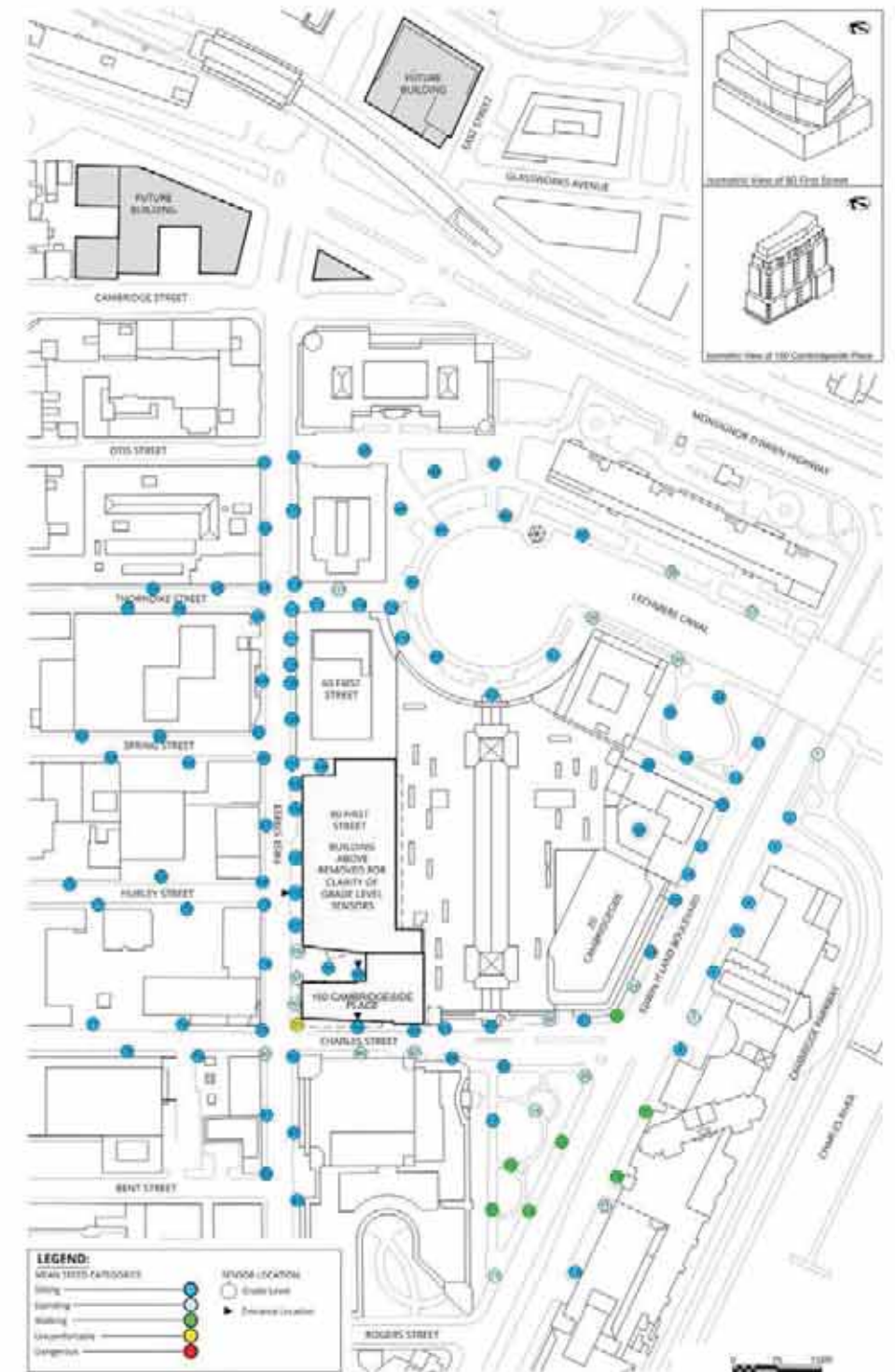
FIGURES : MEAN SPEED



Pedestrian Wind Conditions - Mean Speed
Full Build
Annual (January to December)
80 First Street & 100 Cambridge Place - Cambridge, MA
Drawn by: GRK | Figure: 1A
Approx. Scale: 1"=150'
Project #2104370 | Date Revised: Oct. 6, 2021



Pedestrian Wind Conditions - Mean Speed
Full Build
Annual (January to December)
80 First Street & 100 Cambridge Place - Cambridge, MA
Drawn by: GRK | Figure: 1B
Approx. Scale: 1"=150'
Project #2104370 | Date Revised: Oct. 6, 2021

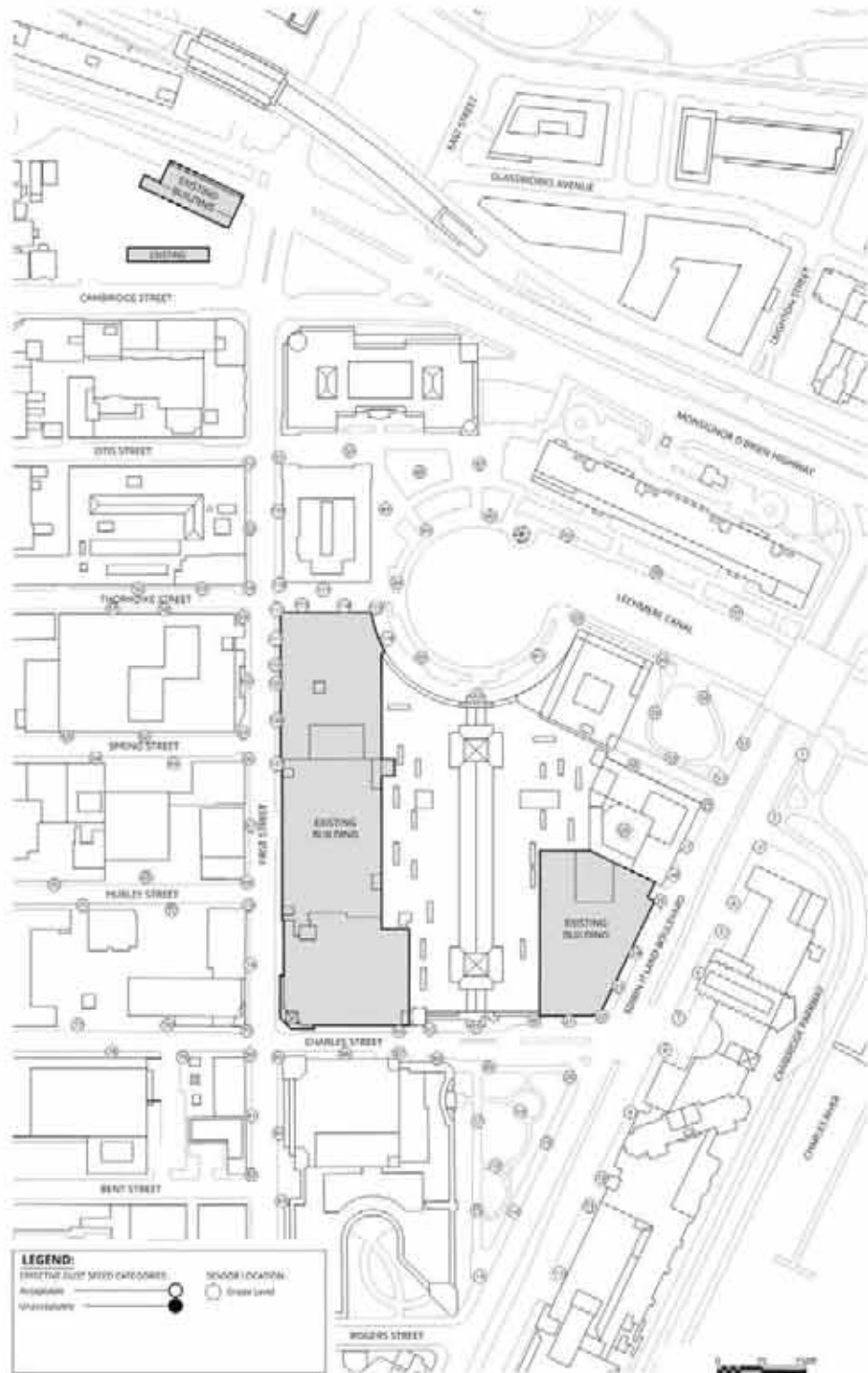


Pedestrian Wind Conditions - Mean Speed
Full Build
Annual (January to December)
80 First Street & 100 Cambridge Place - Cambridge, MA
Drawn by: GRK | Figure: 1C
Approx. Scale: 1"=150'
Project #2104370 | Date Revised: Oct. 6, 2021

Environmental Comfort Plan

Wind Study

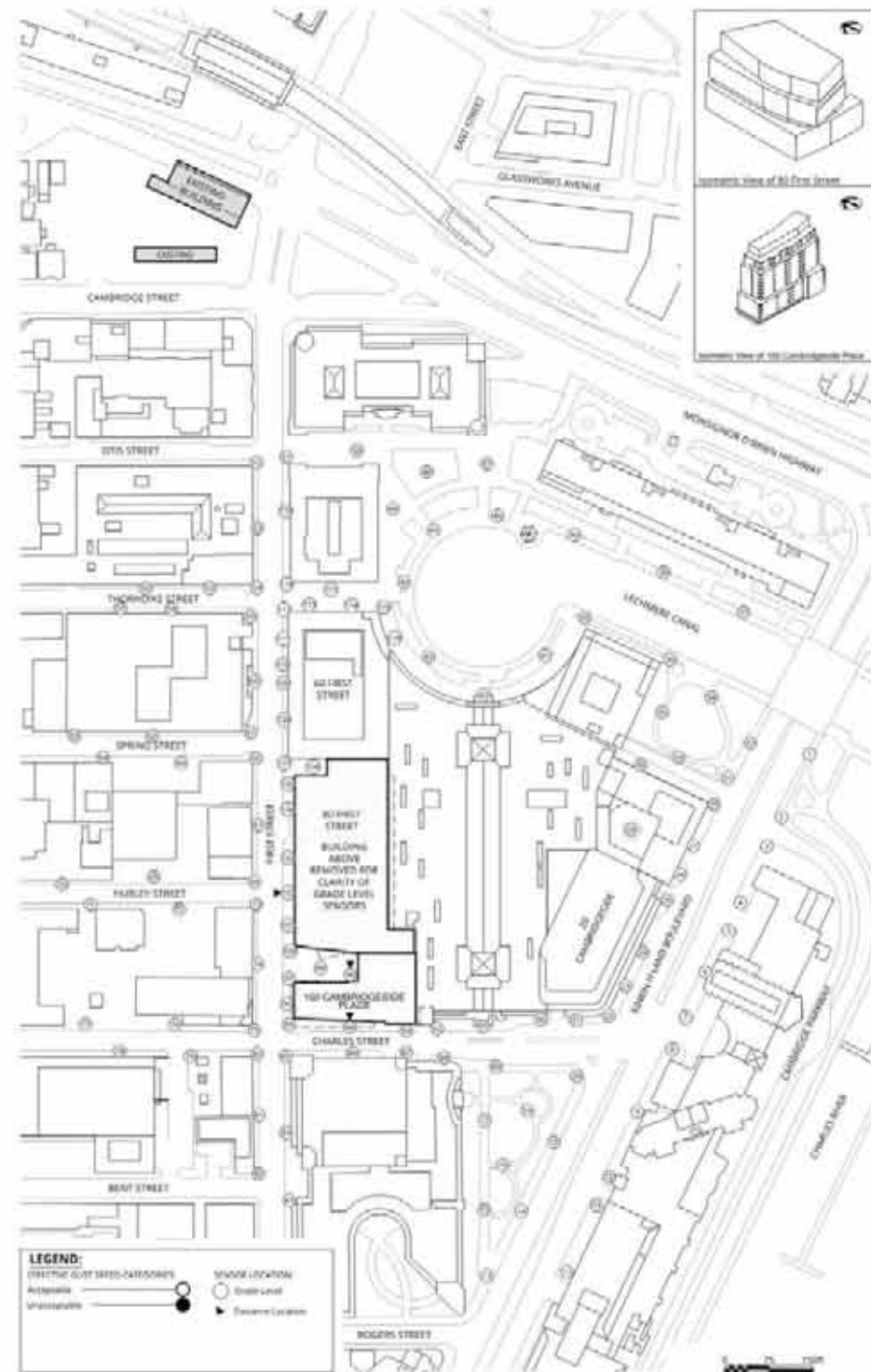
FIGURES : EFFECTIVE GUST SPEED



Pedestrian Wind Conditions - Effective Gust Speed
Full Build
Annual (January to December)

Drawn by: GRK Figure: 2A
Approx. Scale: 1"=150'

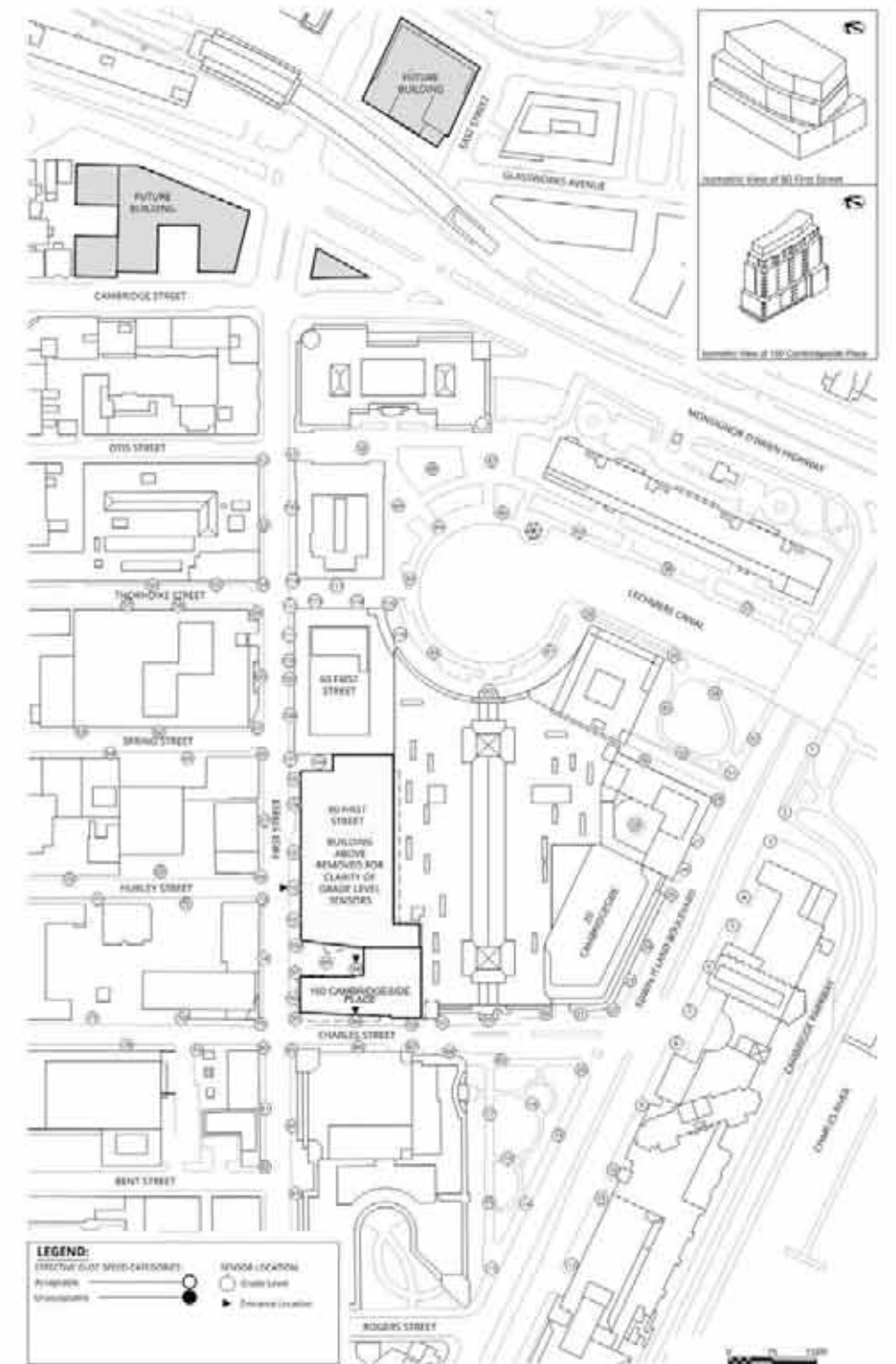
Project #2104370 Date Revised: Oct. 6, 2021



Pedestrian Wind Conditions - Effective Gust Speed
Full Build
Annual (January to December)

Drawn by: GRK Figure: 2B
Approx. Scale: 1"=150'

Project #2104370 Date Revised: Oct. 6, 2021



Pedestrian Wind Conditions - Effective Gust Speed
Full Build
Annual (January to December)

Drawn by: GRK Figure: 2C
Approx. Scale: 1"=150'

Project #2104370 Date Revised: Oct. 6, 2021



Shadow Study

Shadow Study

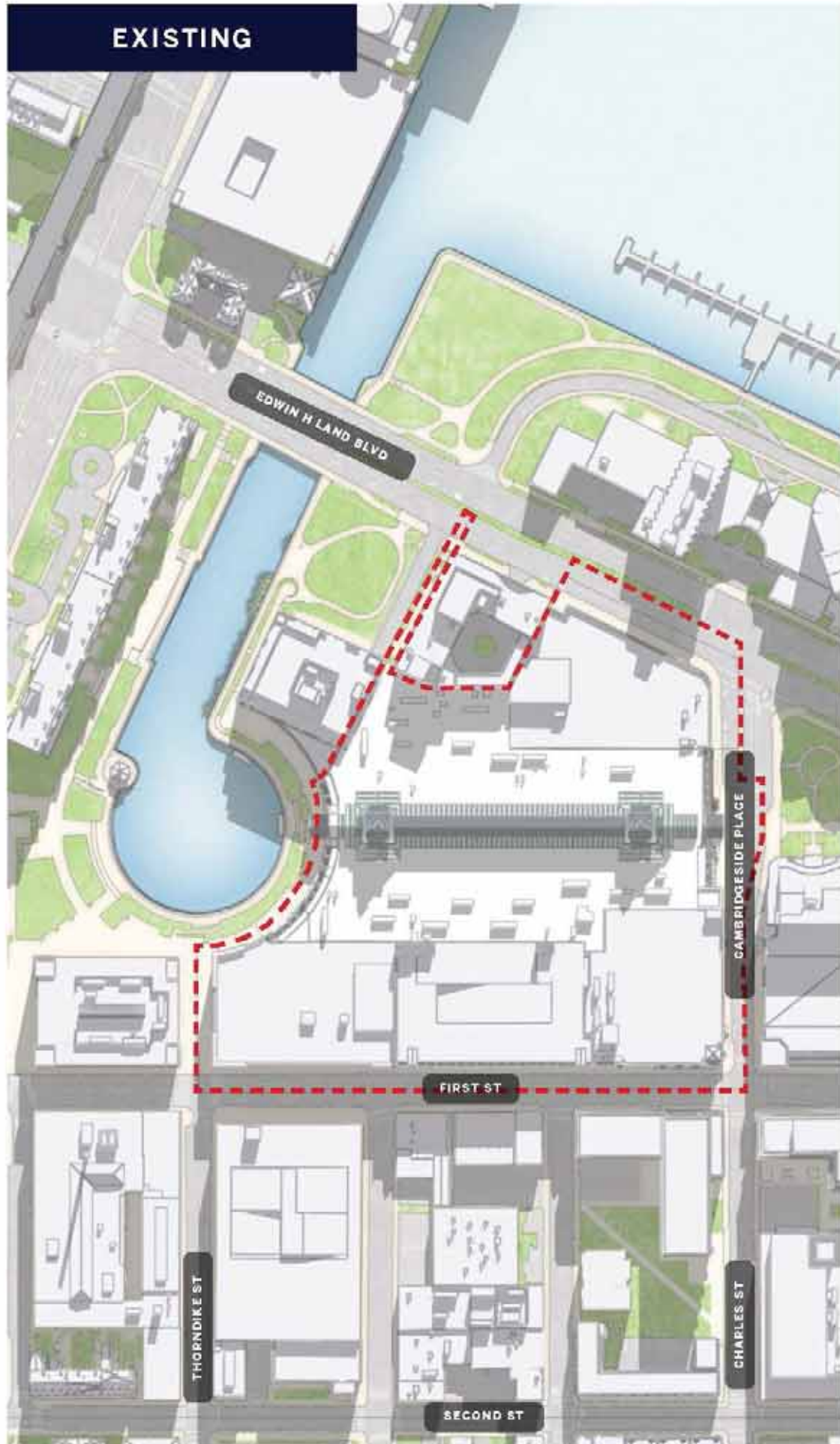
Consistent with the Decision, which considered the effects of the entire CambridgeSide 2.0 Project, an updated Shadow Study was undertaken to assess potential seasonal shadow impacts of the entire CambridgeSide 2.0 Project, which includes the Initial Phase buildings (60 First Street and 20 CambridgeSide) and the proposed Subsequent Phase 80 First Street and 150 CambridgeSide, reconfigured as described in the Minor Amendment, on the surrounding neighborhood and open space. This Shadow Study was performed out of an abundance of caution to confirm that the reconfiguration of the Subsequent Phase buildings resulted in condition similar to that which was previously approved by the Board, which is confirmed in the following shadow study diagrams.

In summary, shadow impacts were analyzed resulting both from existing conditions and the proposed CambridgeSide 2.0 Project design for March/September 21, June 21, and December 21 – at 9:00 AM, 12:00 PM, 3:00 PM and 6:00 PM.

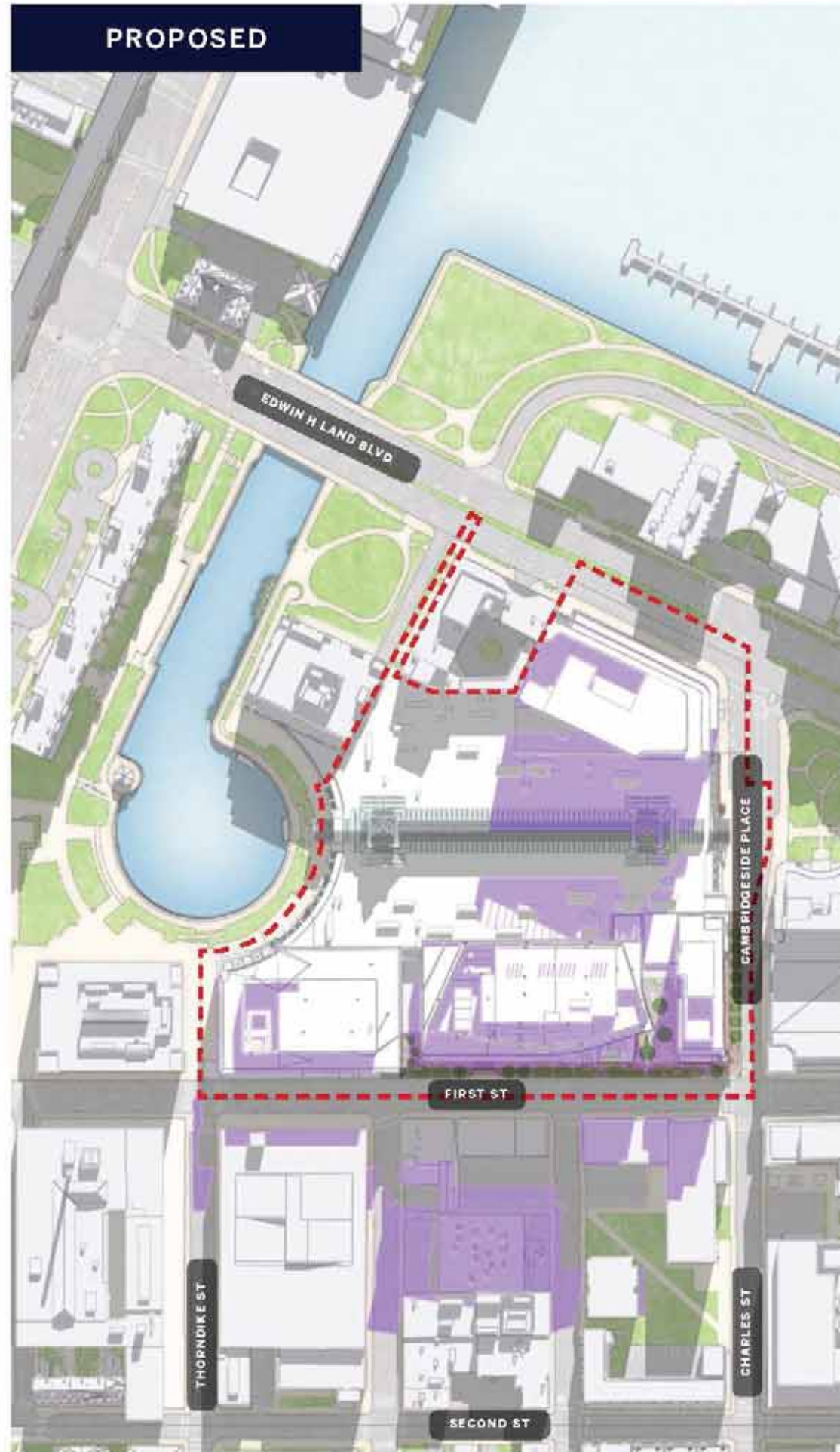
The scale and layout of the proposed CambridgeSide 2.0 Project buildings were designed to provide an environment that is compatible with the neighborhood, pedestrians, and for users of the water-dependent facilities on adjacent properties. The proposed buildings are stepped on their eastern, western and southern faces to lessen the impact of new shadows on the adjacent neighborhood and open spaces. Furthermore, the 80 First Street buildings steps back at the northeast corner of the 8th and 9th floors to further reduce impacts on Canal Park. New shadows generally fall on developed parcels, including the existing Mall, or on paved surfaces. New late day shadows in March, September and December fill in small areas in the existing, dense shadow map, primarily in areas where the pedestrian level is already shaded by trees.

As shown by the following Shadow Study, the shadows produced by the reconfigured Subsequent Phase buildings (i.e., 80 First Street and 150 CambridgeSide Place) are similar to those previously approved by the Board for the CambridgeSide 2.0 Project.

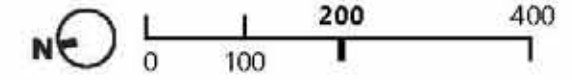
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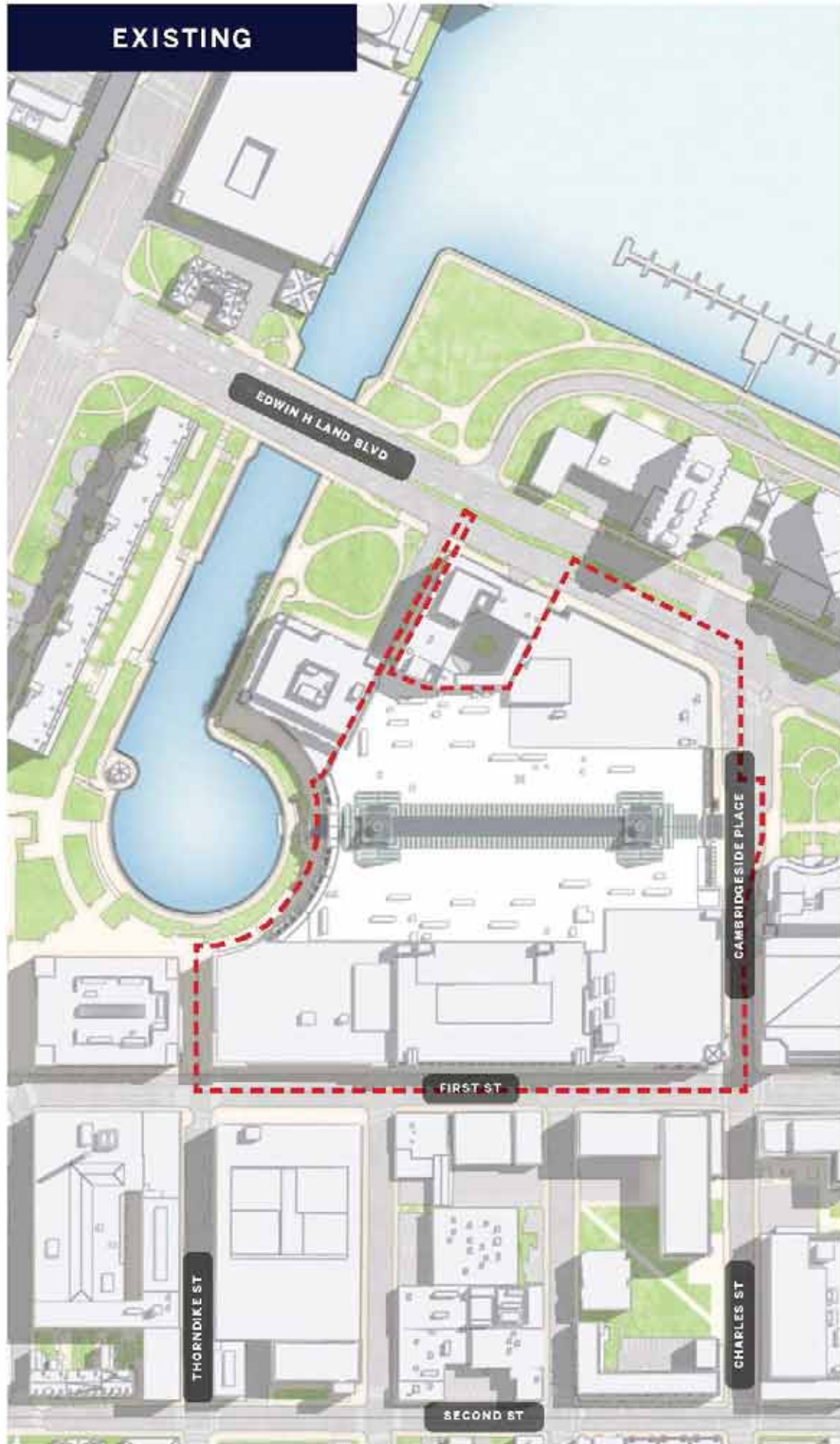
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Shadow Study
 March / September 21
 09:00



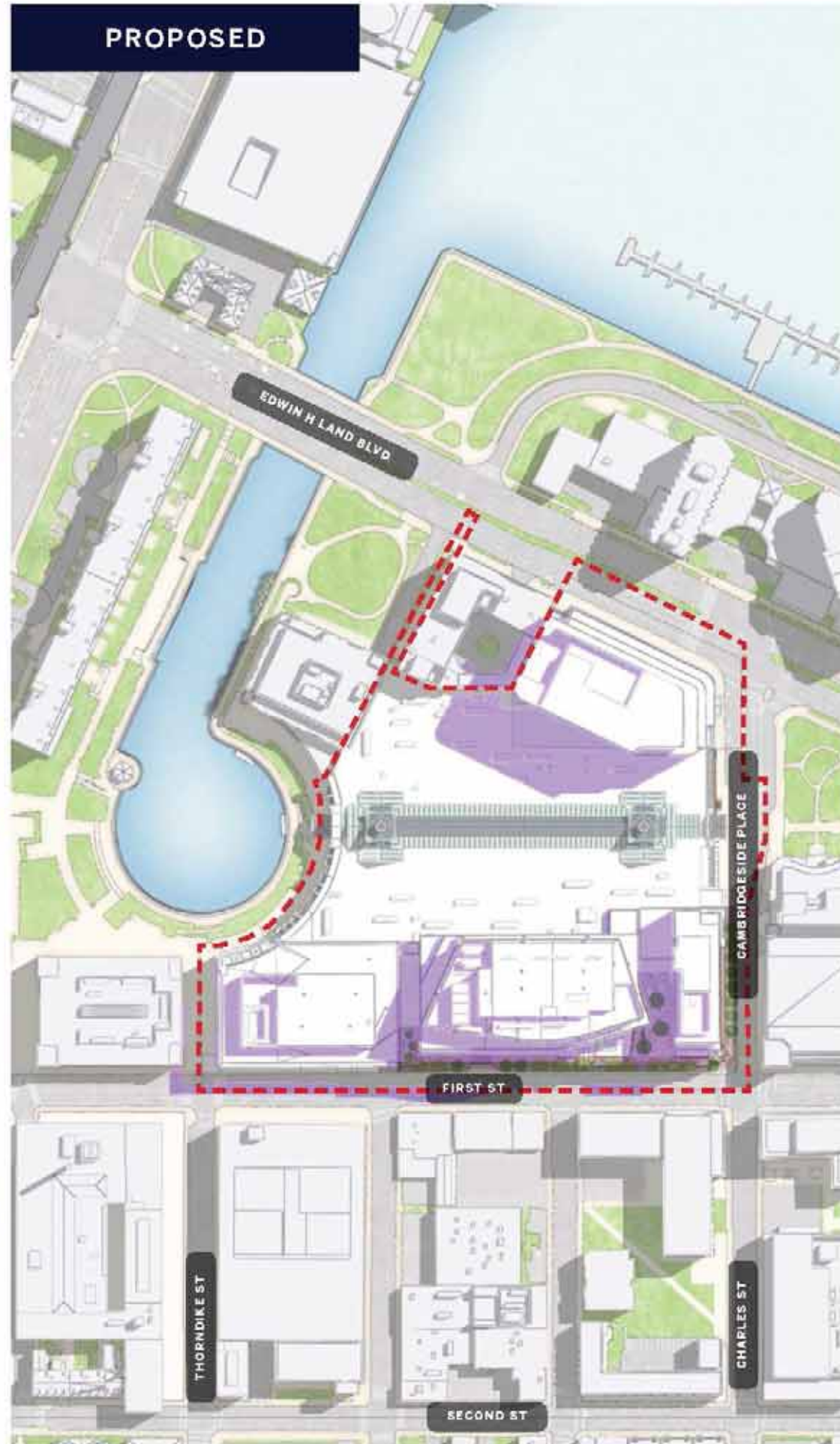
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- EXISTING SHADOW
- PROPOSED BUILDING SHADOW

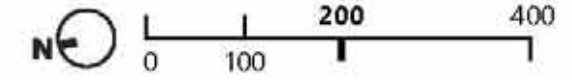
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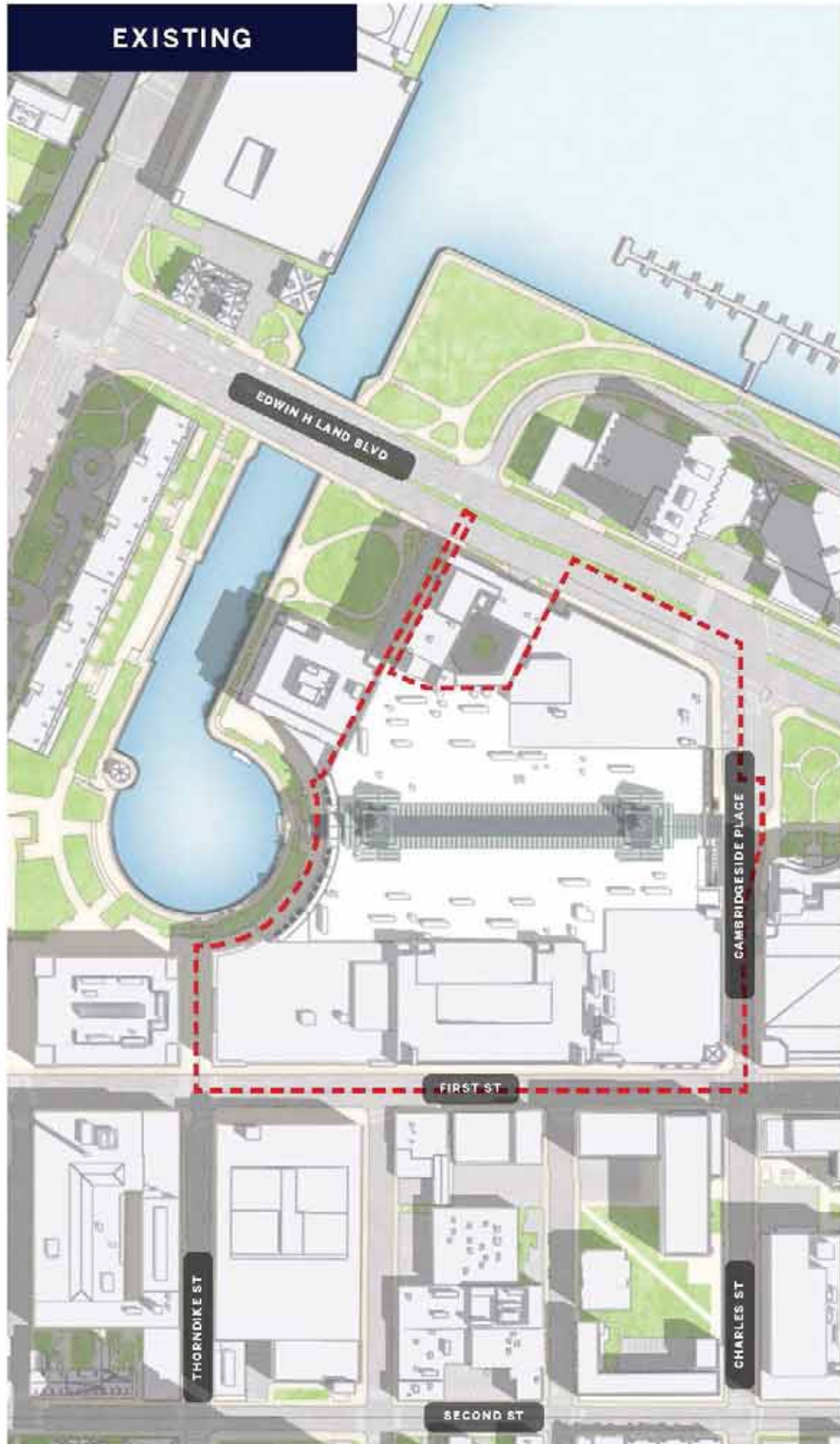
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Shadow Study
 March / September 21
 12:00



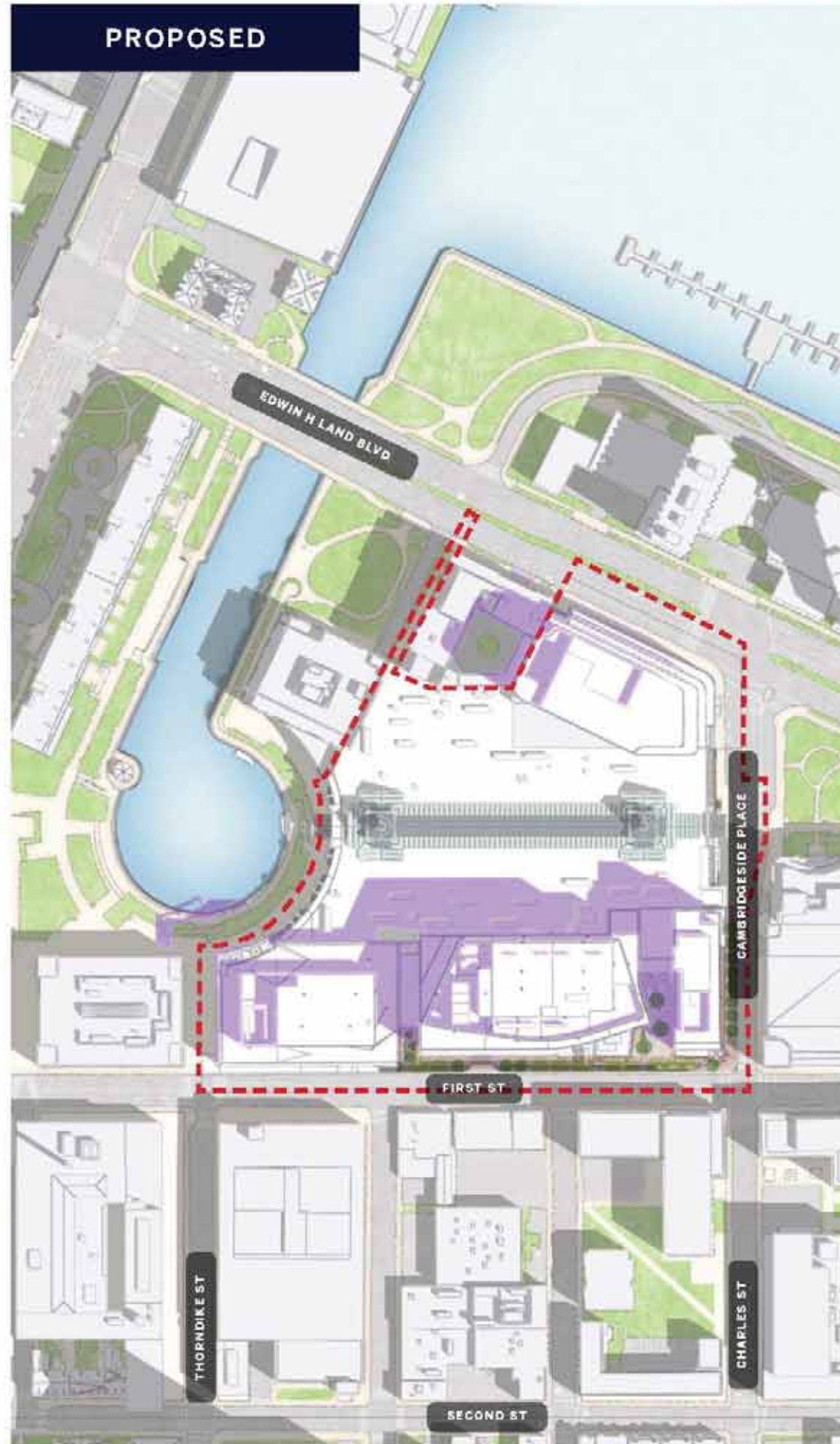
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- PUD BOUNDARY
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- NET NEW SHADOW

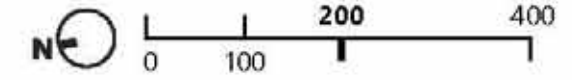
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Environmental Comfort Plan
Shadow Study
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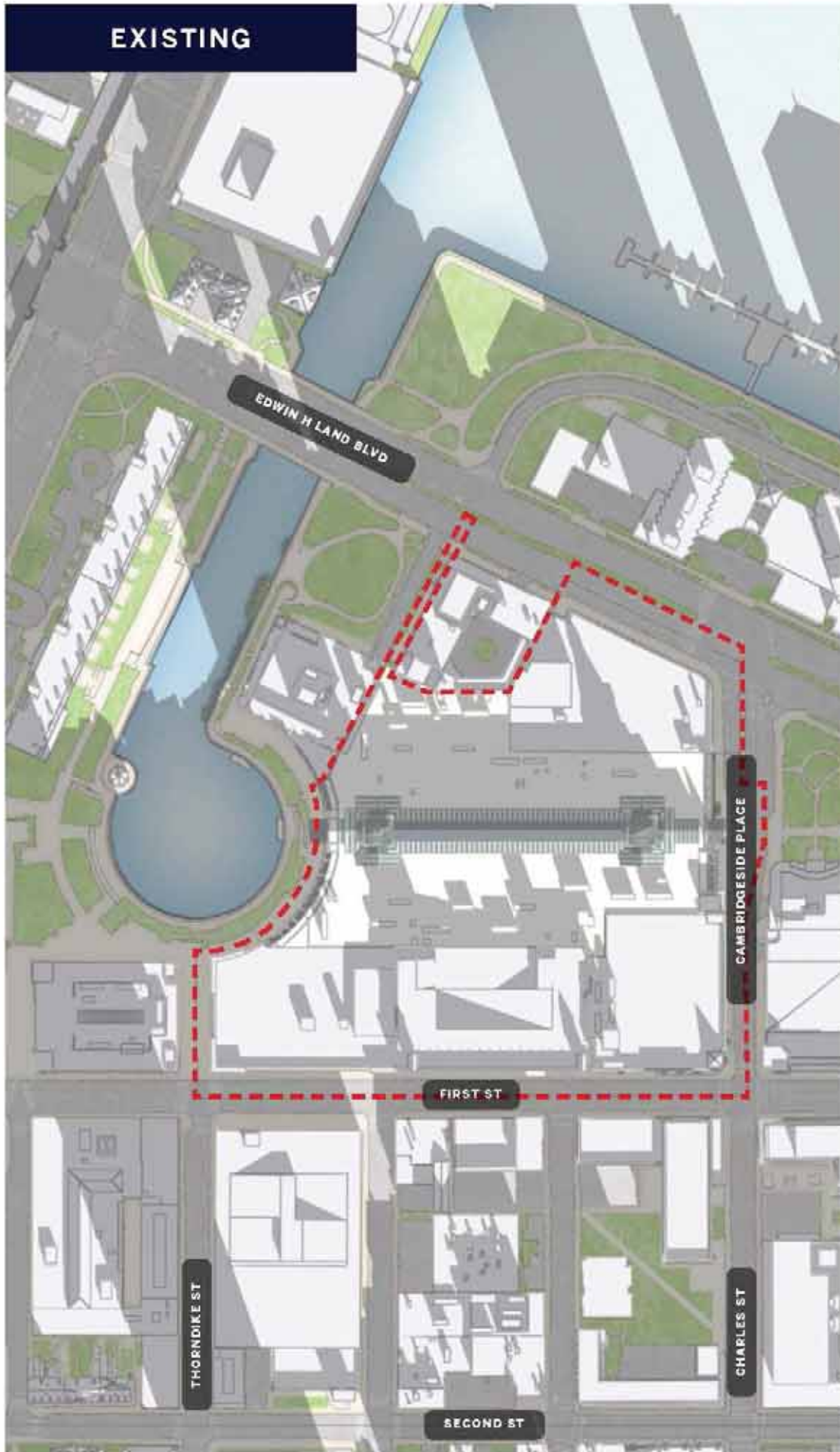


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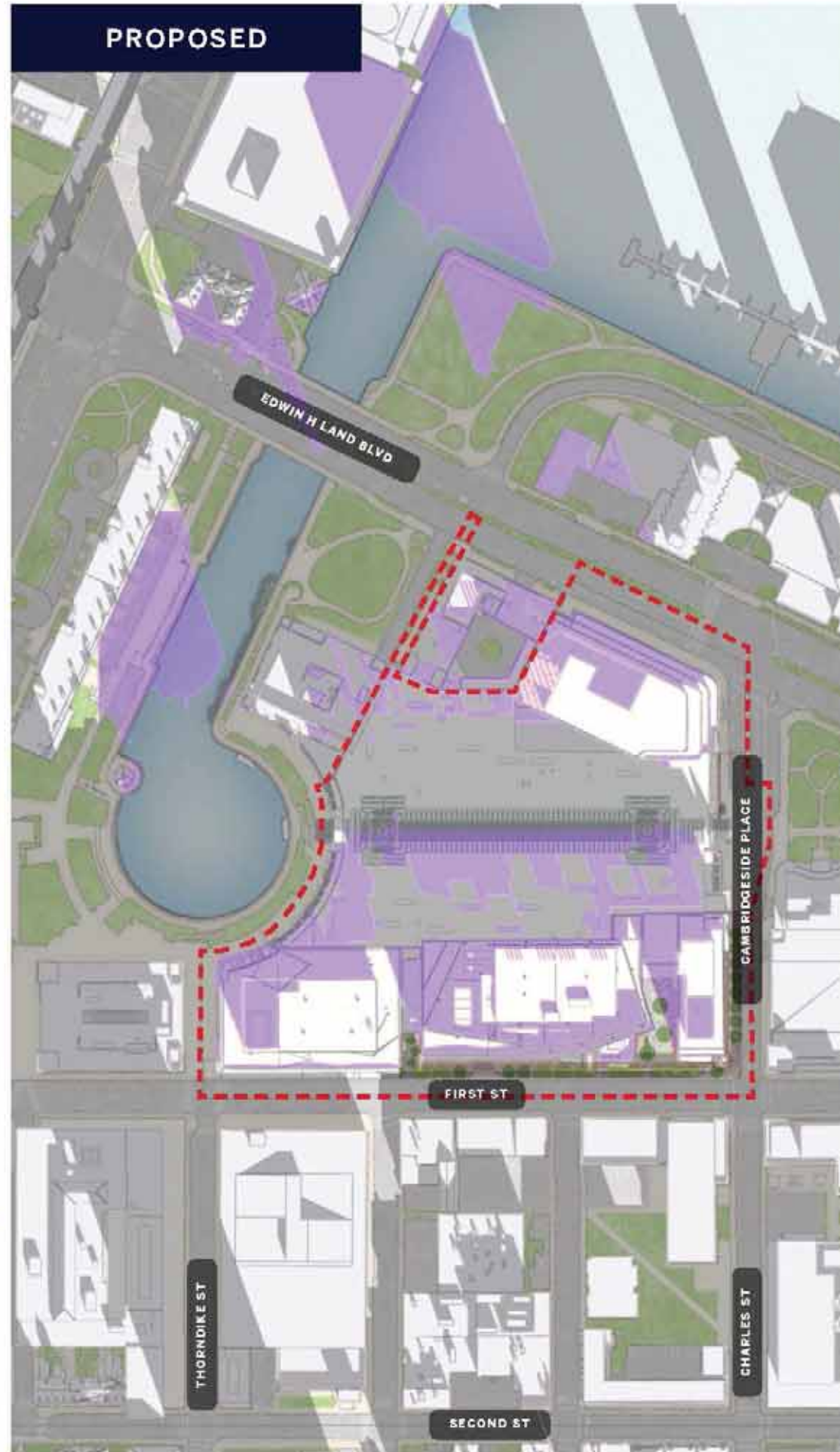
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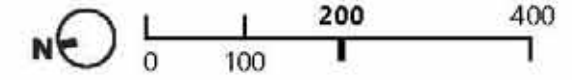
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PROPOSED



Environmental Comfort Plan
Shadow Study
 March / September 21
 18:00

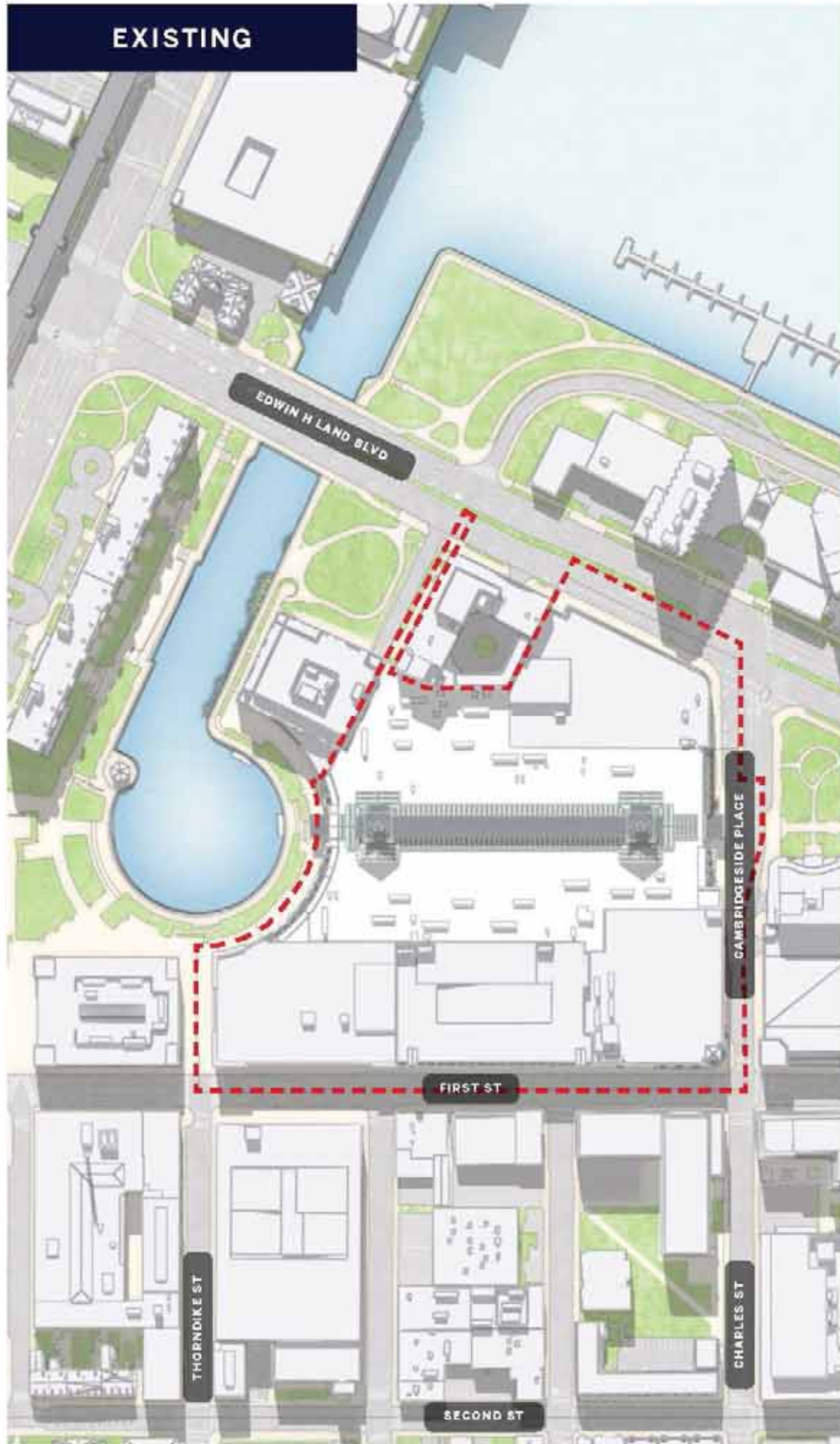


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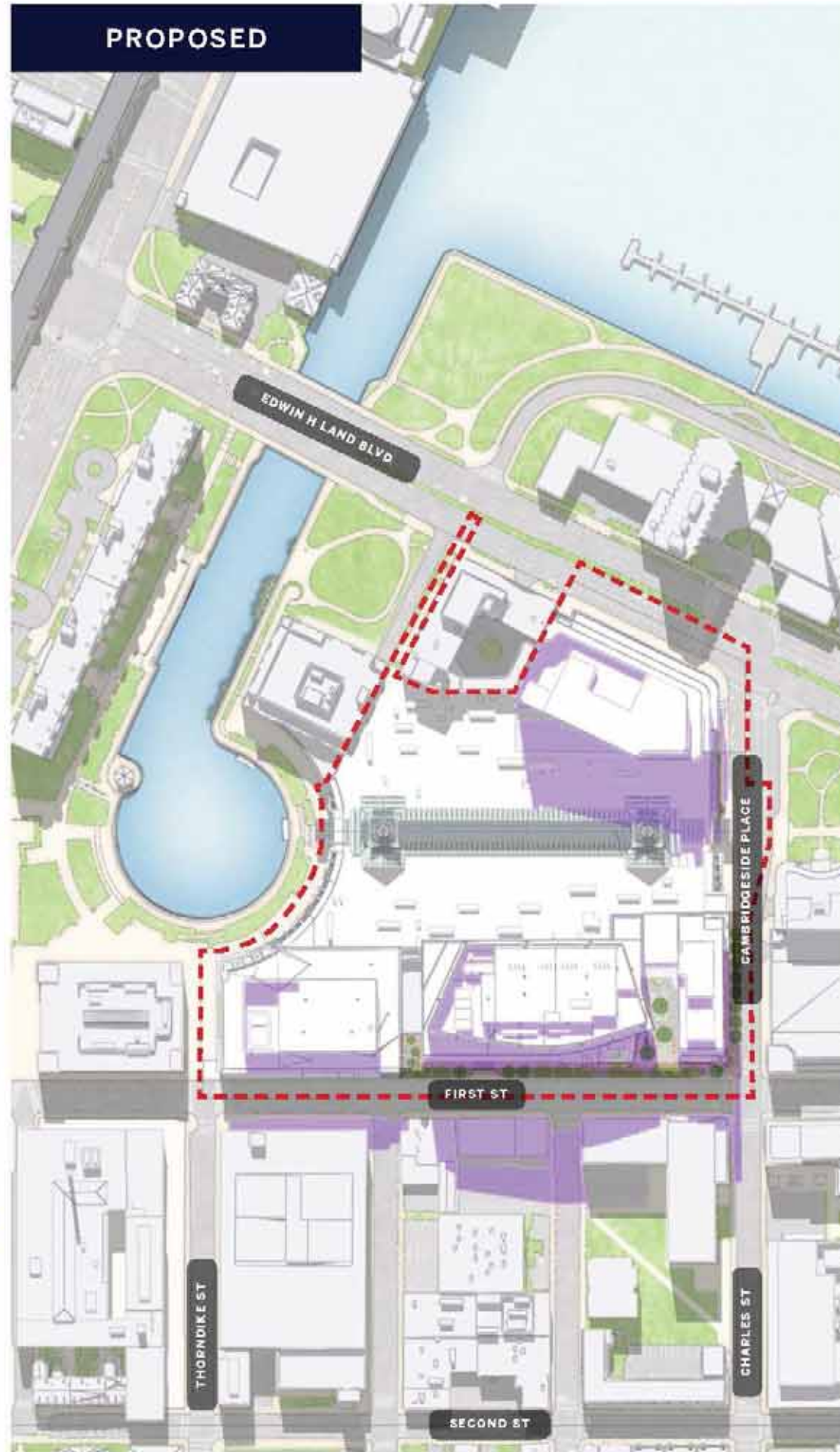
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- EXISTING SHADOW
- NET NEW SHADOW

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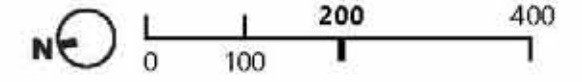


PROPOSED



Environmental Comfort Plan Shadow Study

June 21
09:00



Legend

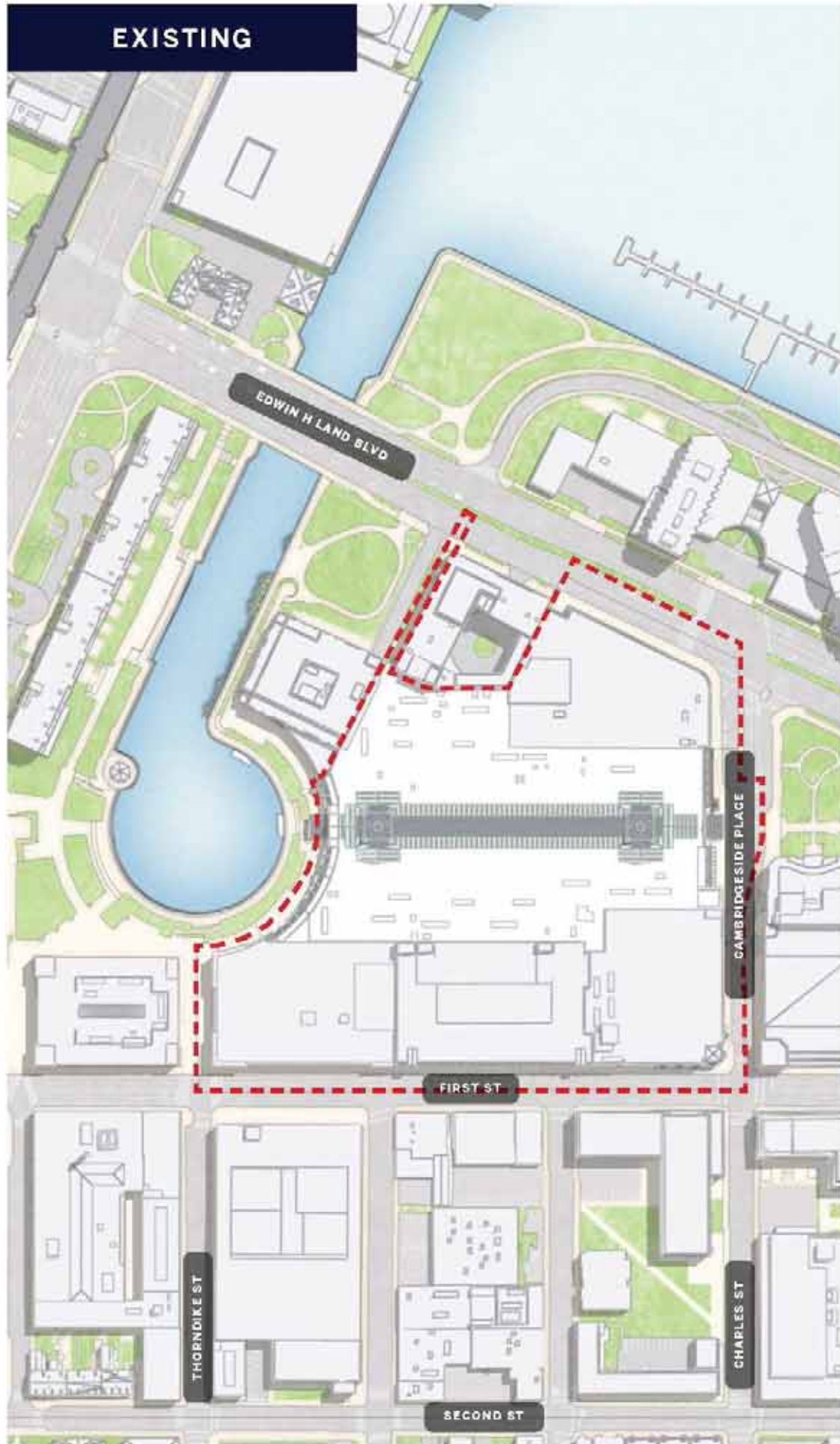
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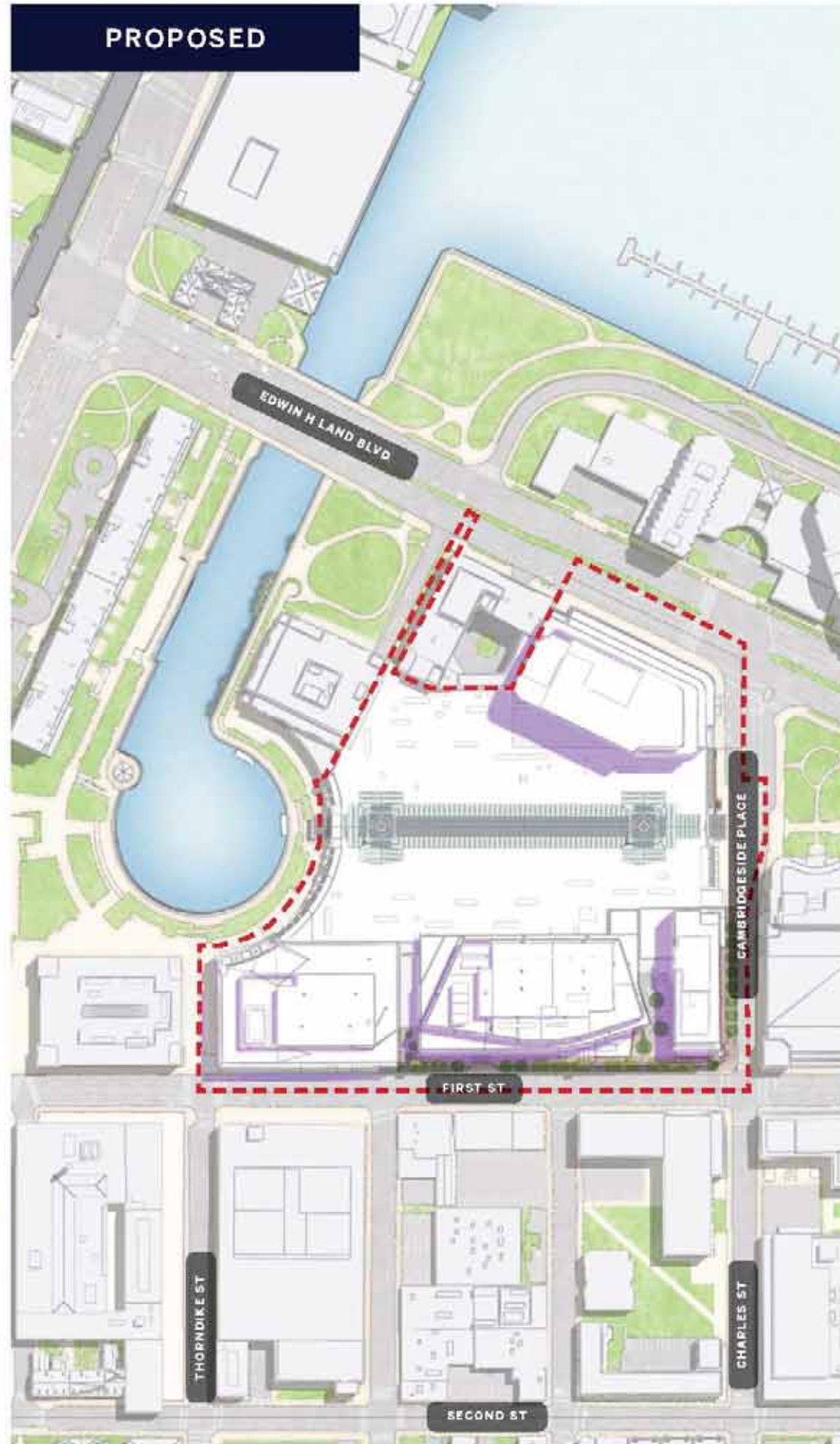
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NET NEW SHADOW

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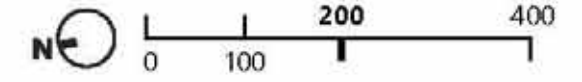


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Environmental Comfort Plan Shadow Study

June 21
12:00



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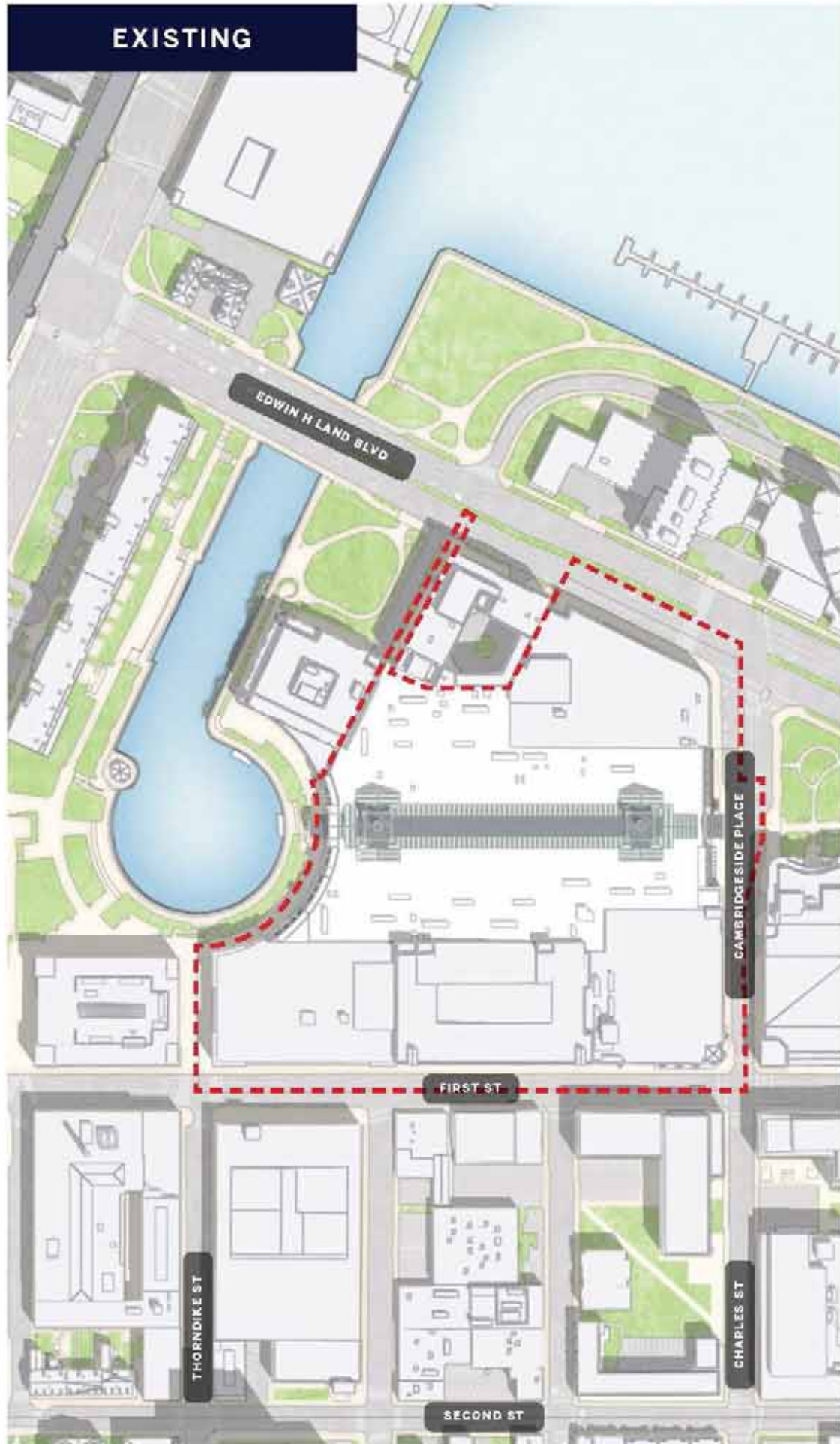
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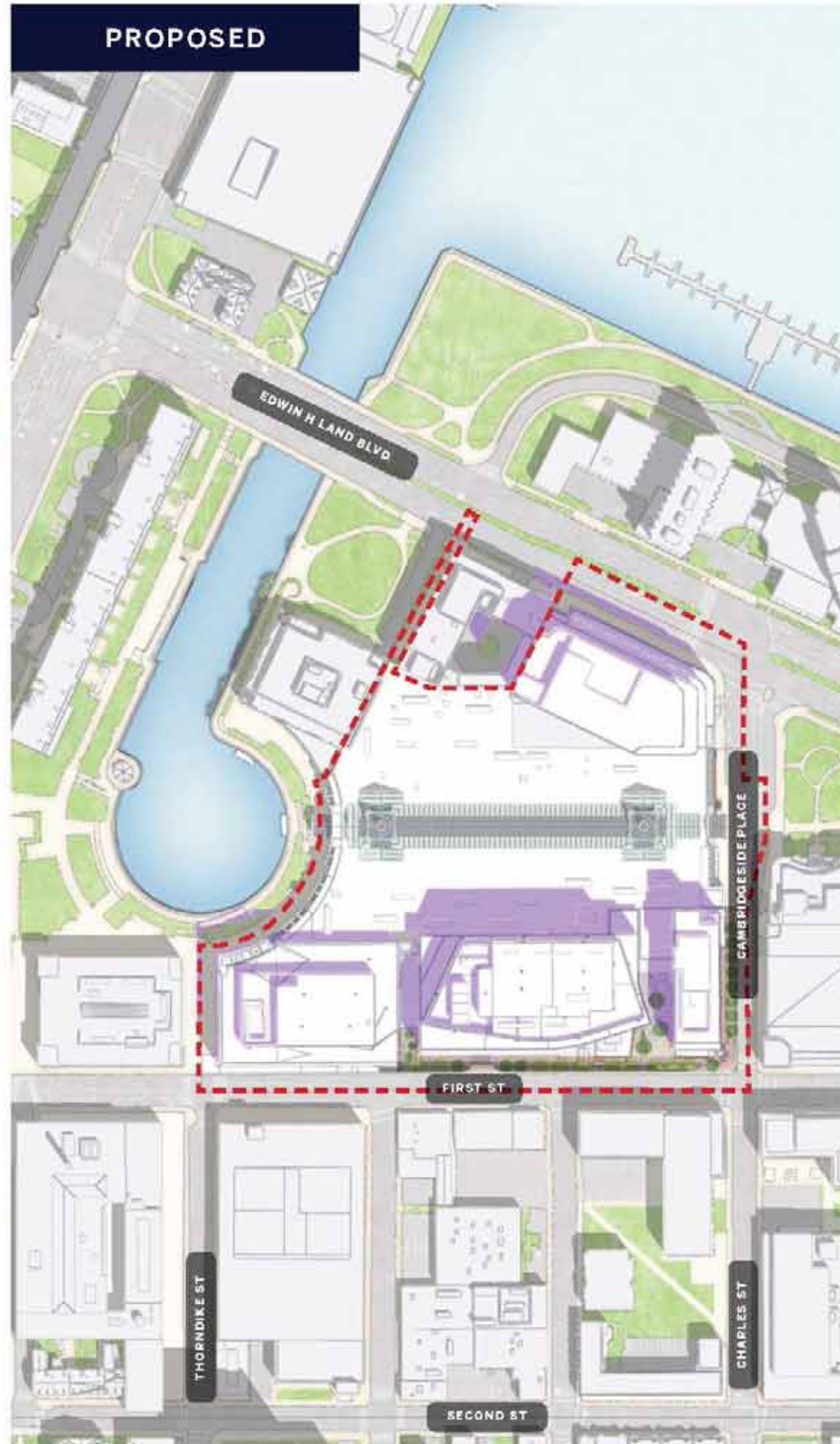
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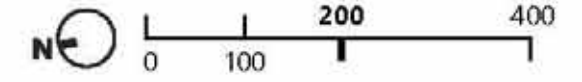


PROPOSED



Environmental Comfort Plan Shadow Study

June 21
15:00



Legend

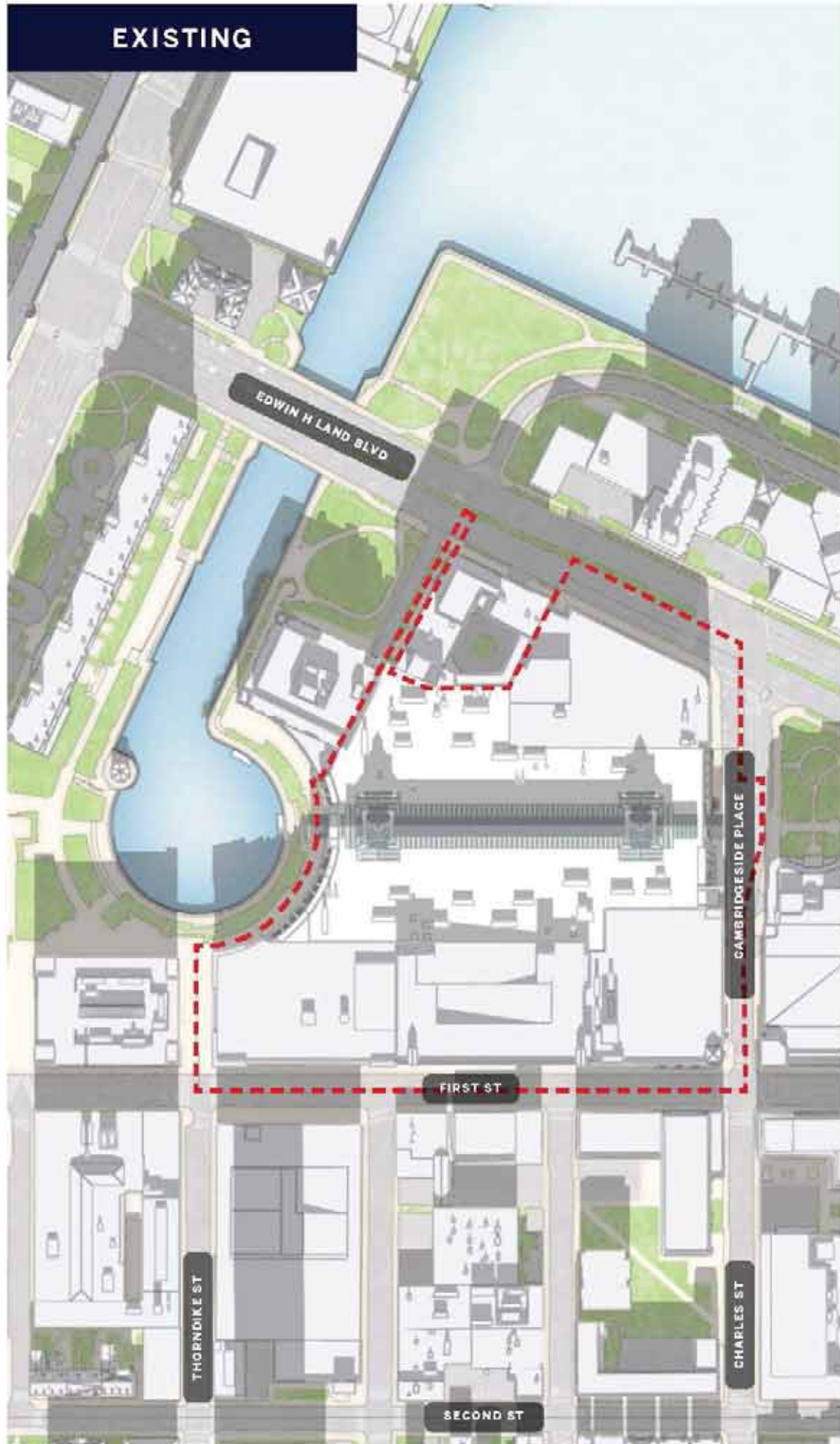
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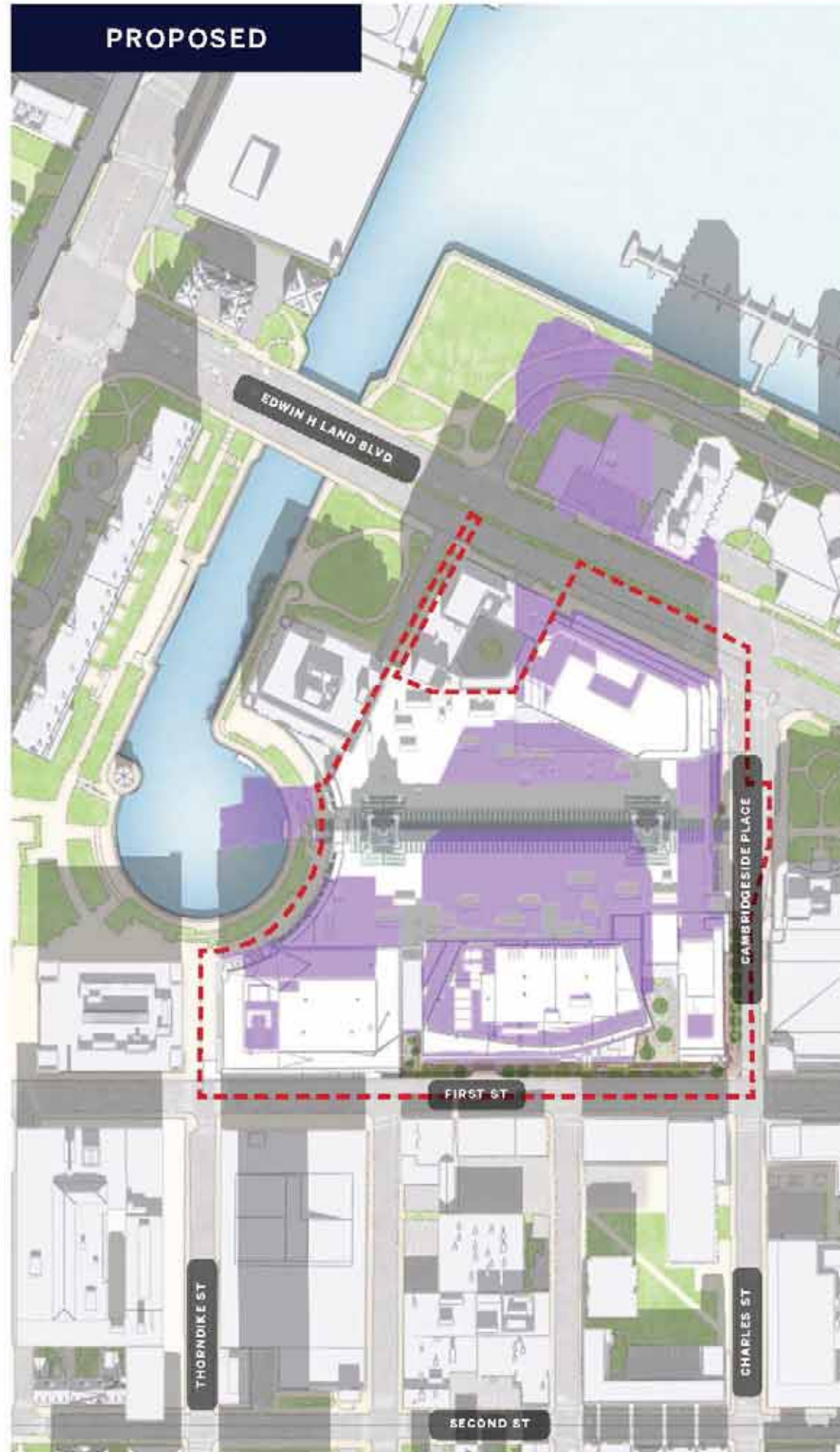
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NET NEW SHADOW

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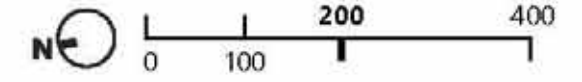


PROPOSED



Environmental Comfort Plan Shadow Study

June 21
18:00



Legend

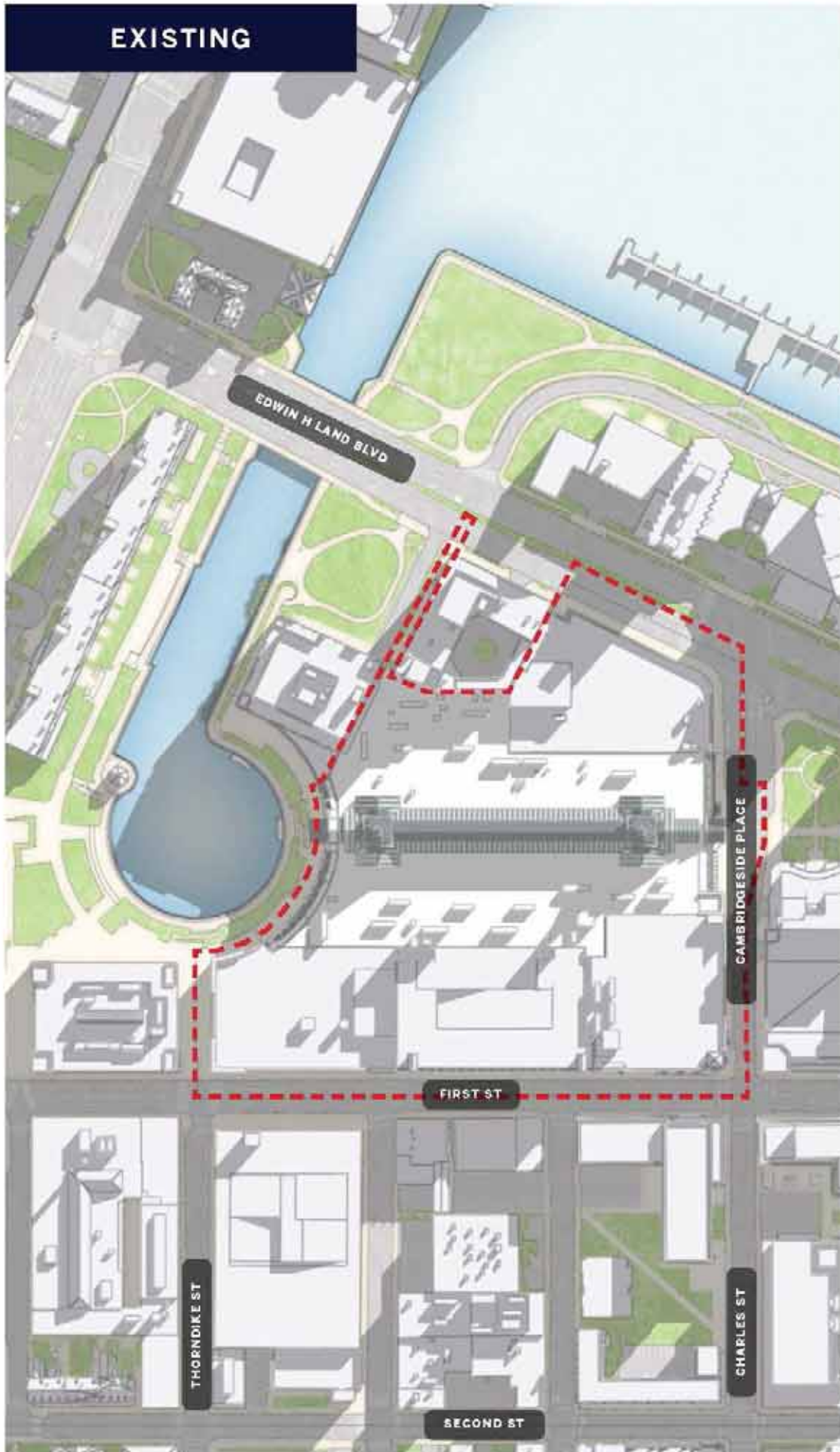
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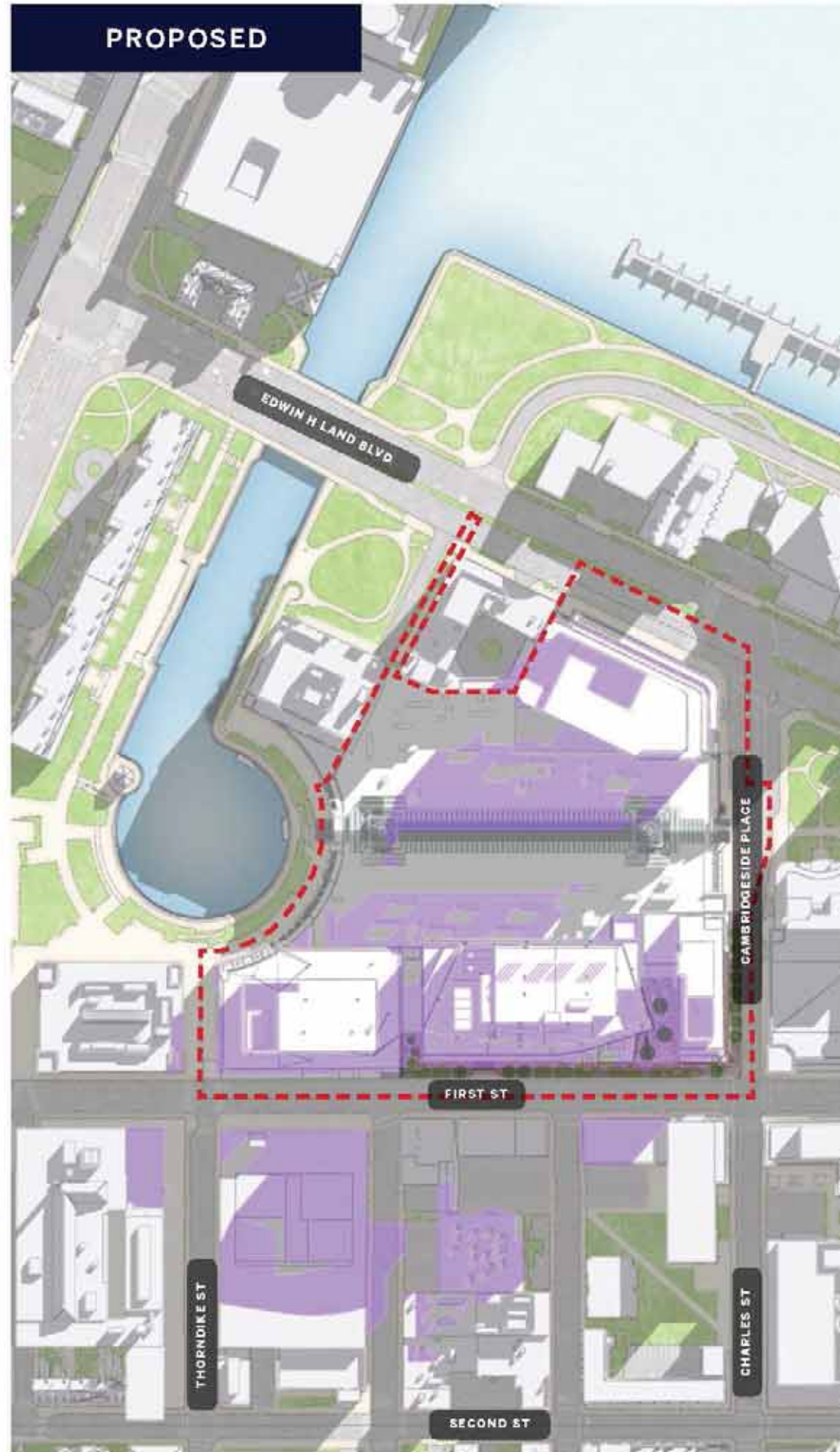
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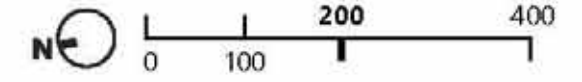
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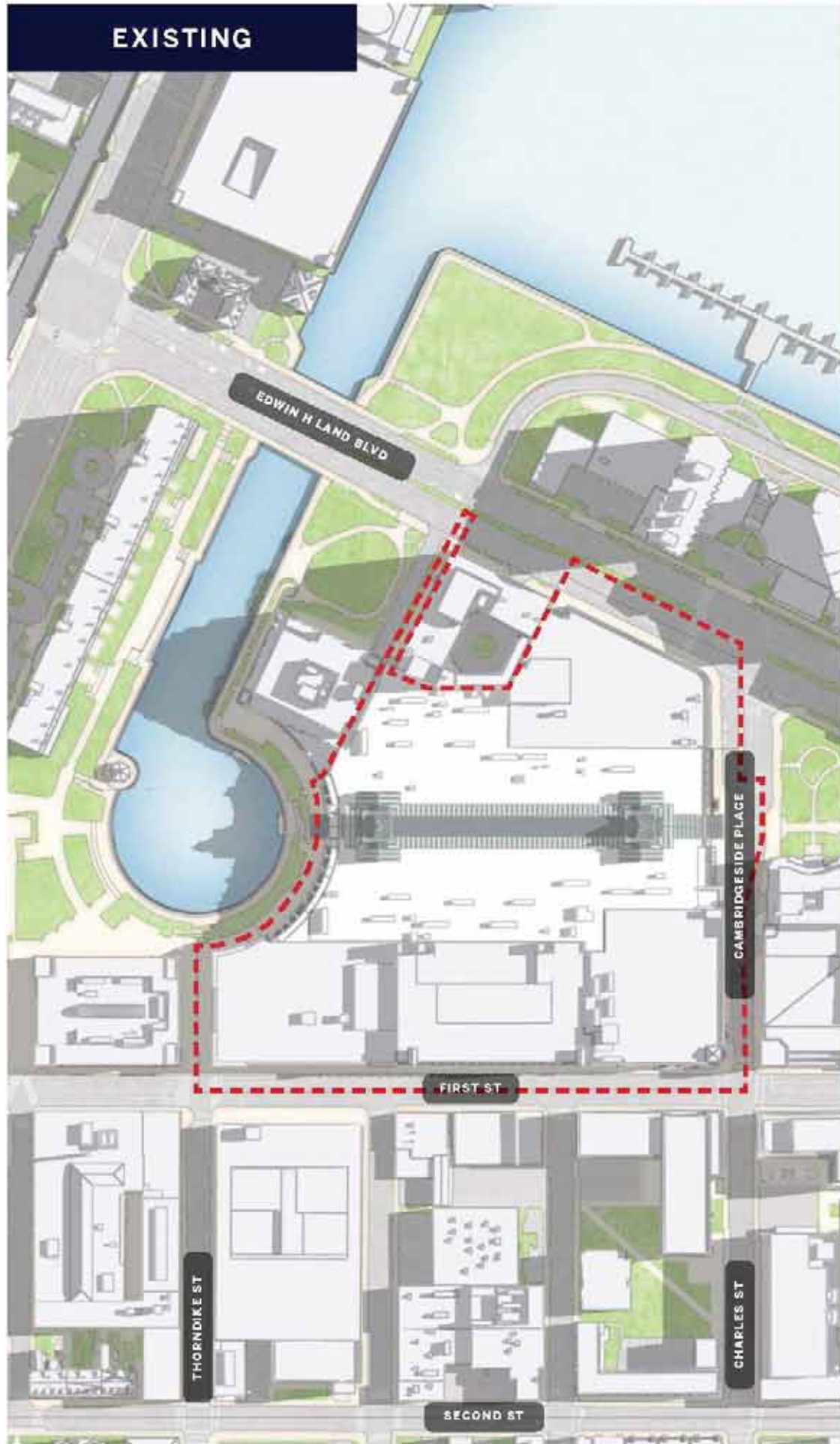
Environmental Comfort Plan
Shadow Study
 December 21
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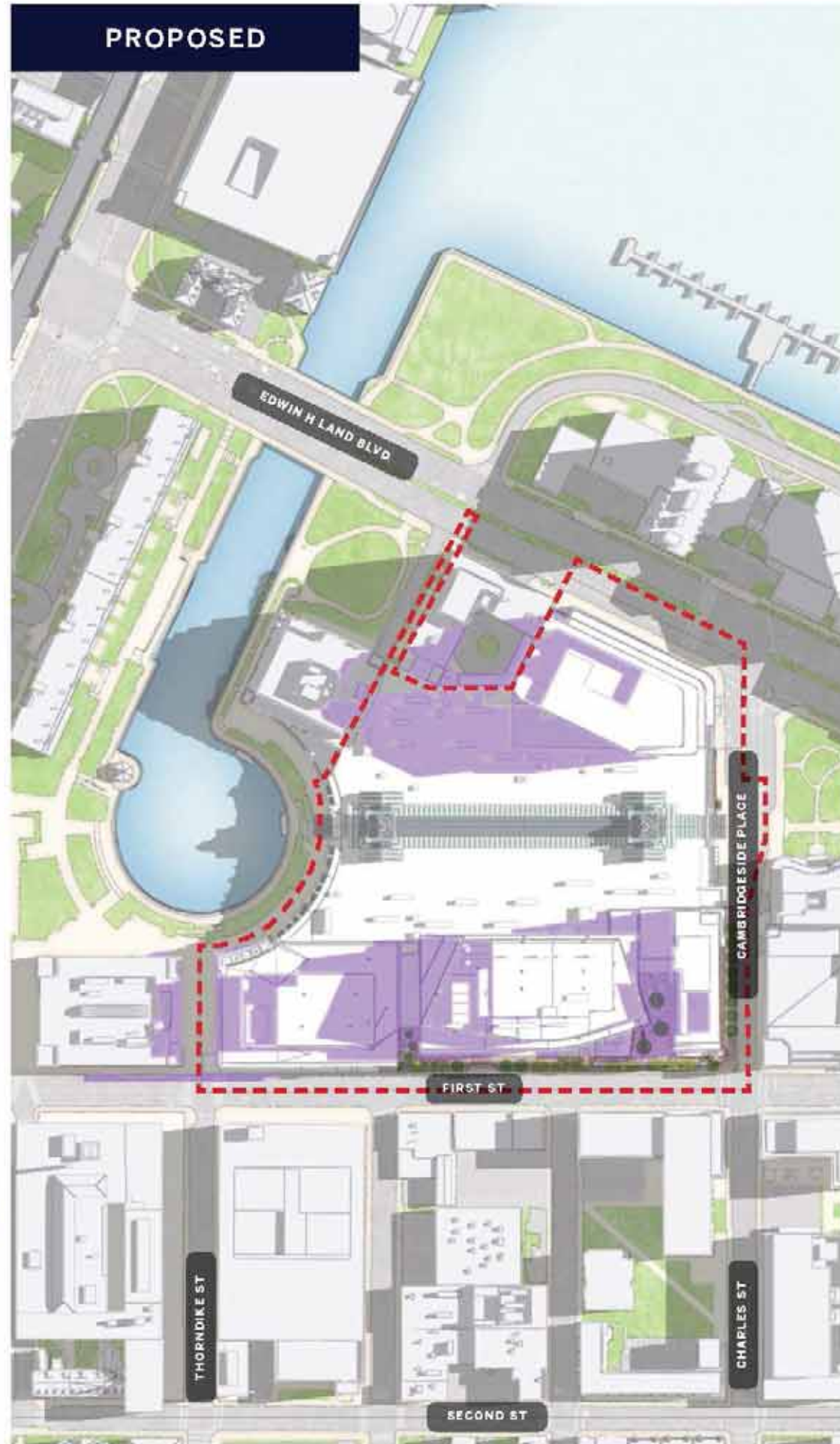
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- PUD BOUNDARY
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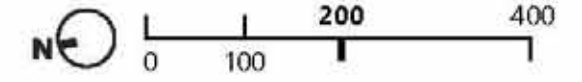


PROPOSED



Environmental Comfort Plan Shadow Study

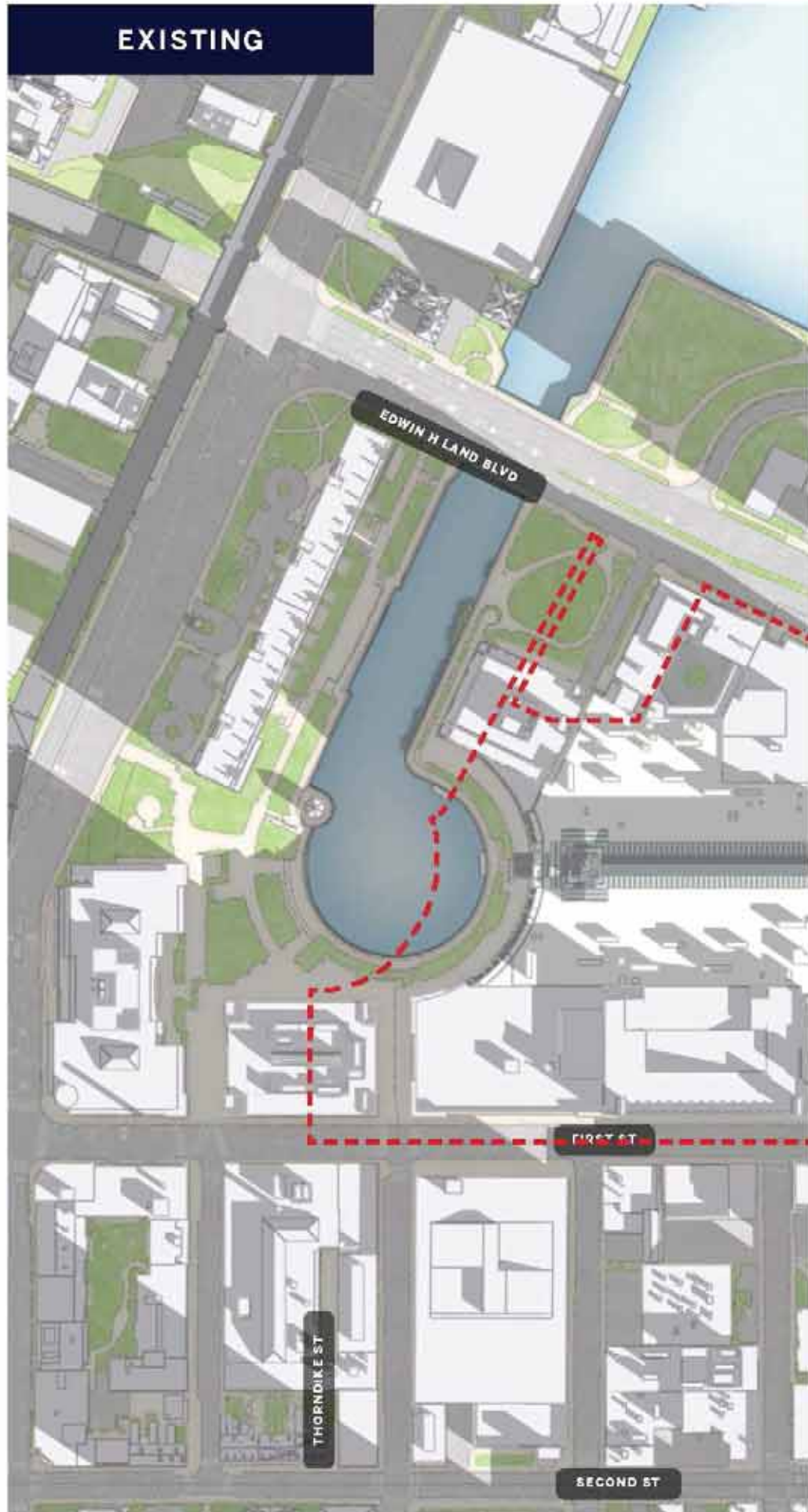
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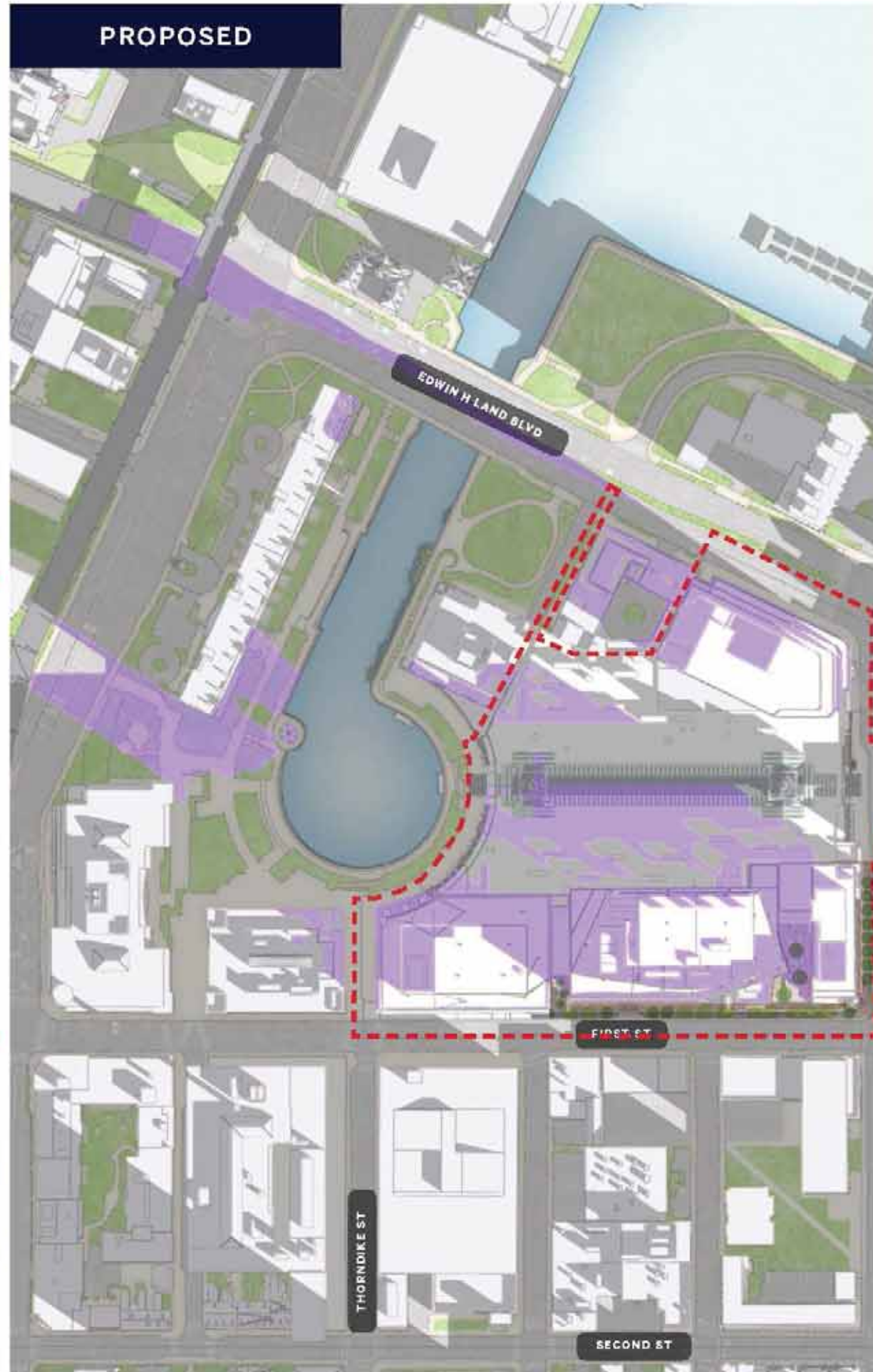
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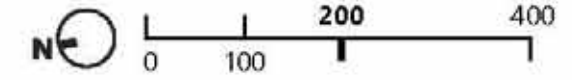


PROPOSED



Environmental Comfort Plan Shadow Study

December 21
15:00



Legend

- PUD BOUNDARY
- GREEN SPACE
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- NET NEW SHADOW



Noise Mitigation Study

Section 13.107.2 Compliance

Noise Mitigation Study

As demonstrated by the immediately following Environmental Sound Analysis, the 80 First Street building will conform to the requirements of the City of Cambridge Municipal Noise Ordinance and the Decision, which incorporates Section 13.107.2 of the CZO, for noise or vibration emanating from the building. Refer to the memo on the following pages for a summary of noise analysis and confirmation of compliance with City of Cambridge requirements.

Environmental Comfort Plan Noise Study

INTRODUCTION

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1 December 2021

Brian Roessler AIA, LEED AP
Senior Associate
Elkus Manfredi Architects
25 Drydock Avenue
Boston, MA 02210

Subject: 80 First Street and 150 CambridgeSide Place
Report on Rooftop Equipment Noise Controls and Exterior Noise Levels
Acentech reference: 634671b-80_First_&_150_CambridgeSide-Exterior Noise.docx

Dear Brian:

This letter presents a summary of our assessment of the noise levels expected to be emitted by the exterior rooftop mechanical equipment proposed for the last two major buildings under design for the CambridgeSide Redevelopment site: the core-and-shell laboratory/office building 80 First Street, and the multi-story residential building at 150 CambridgeSide Place. Reports on the individual acoustical performances of the other two major projects in the development, 20 CambridgeSide and 60 First Street, have been submitted previously. However, because noise emissions of the new projects along First Street (80 First and 150 CambridgeSide) will add to those produced by the rooftop equipment atop 60 First, the two new First Street buildings have the potential to affect overall ambient noise levels along First Street.

Figure 1, below, shows the First Street buildings in the context of the overall CambridgeSide master plan project:

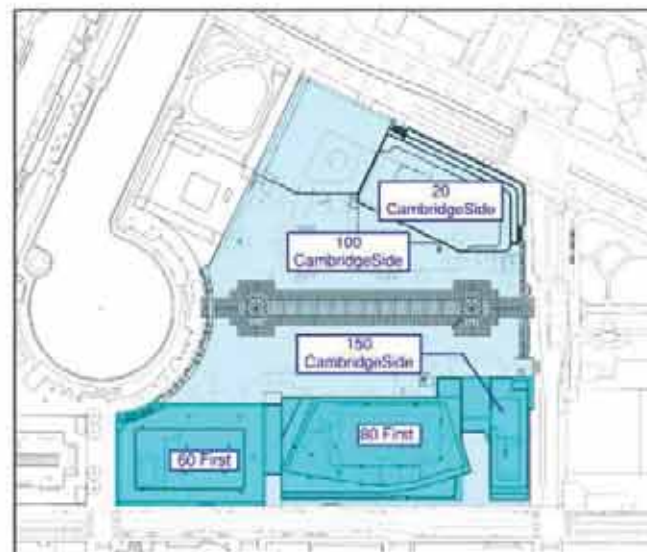


Figure 1: CambridgeSide Redevelopment project



This report will serve to supplement the analysis performed for 60 First, and will address both the noise emissions produced individually by the 80 First and 150 CambridgeSide buildings as well as the combined noise emissions of all three First Street buildings (60 and 80 First Street, and 150 CambridgeSide Place). The building at 20 CambridgeSide is sufficiently far from First Street that noise from its rooftop equipment will not appreciably affect sound levels expected along any of the noise-sensitive receivers along First Street.

As was done for the assessment of community noise from the other CambridgeSide projects, our analyses for 80 First Street and 150 CambridgeSide Place are based on manufacturers' data on the acoustical performance of the equipment to be installed and the effects of the various noise controls we have recommended that have been incorporated into the architectural and mechanical design of the building.

When each of these two projects is complete, each building individually, as well as the overall complex of buildings operating as a combined noise source, will comply with the noise level limits established in the City of Cambridge Noise Ordinance. They will also comply with the environmental noise guidelines outlined by the Massachusetts Department of Environmental Protection (MassDEP).

APPLICABLE NOISE REGULATION AND REQUIREMENTS

Massachusetts

The Massachusetts Department of Environmental Protection (MassDEP) prohibits facilities from creating a condition of "noise pollution." A noise source will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

- Increases the broadband sound level by more than 10 dB(A) above ambient, or
- Produces a "pure tone" condition – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and at the nearest inhabited residence. "Ambient" is defined as the background A-weighted sound level that is exceeded 90% of the time, measured during equipment operating hours, but may also be established by other means with consent of the Department.

City of Cambridge

The City of Cambridge Noise Ordinance regulates levels of noise allowed to be emitted from one property to another. The Ordinance establishes maximum permissible sound levels at the lot line of the property receiving the noise, depending on the use of the receiving property. Table 1, below, presents the sound limits established for Residential and Business/Commercial uses.

Octave Band Center Frequency of Measurement (Hz)	Residential Use, Daytime* (dB)	Residential Use, All Other Times (dB)	Commercial/Business, Anytime (dB)
31.5	76	68	79
63	75	67	78
125	69	61	73
250	62	52	68
500	56	46	62
1000	50	40	56
2000	45	33	51
4000	40	28	47
8000	38	26	44
Single Number Equivalent	60 dBA	50 dBA	65 dBA

*Daytime is defined as the period between 7AM and 6PM daily except Sundays and holidays.

Table 1: City of Cambridge Maximum Allowable Octave Band Sound Pressure Levels

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For the CambridgeSide project, the existing background sound levels are expected to be high enough in the project area that meeting the City of Cambridge Noise Ordinance will be the more stringent regulatory criteria.

80 FIRST STREET

Rooftop Mechanical Equipment

A list of outdoor rooftop mechanical equipment most likely to affect community sound levels in the area surrounding the 80 First Street project site is presented below:

- Four air handling units (AHUs), 126,000 cfm each, similar to Hakkon Industries, each with ten supply fans ("AcoustiFlow" plug fans) drawing outside air through Kinetics Model KCAL-1-12 acoustical louvers located on east face of sound-insulated penthouse; units enclosed in penthouse.
- Four exhaust air handling units (EAHUs), 126,000 cfm each, similar to Hakkon Industries, each with four exhaust fans (44" centrifugal fans); each fan exhaust stack equipped with tubular exhaust silencer similar to Vibro-Acoustics Model 48-CD-AR; unit housings located in a sound-insulated penthouse.
- One four coil cooling tower, similar to a Marley NC Steel tower, Model NC8409TCN4, with Ultra Quiet Fans on VFDs. The cooling towers are surrounded by sound absorptive screen walls.
- One 10-cell bank of MultiStack ARA030L Air Source Heat Pumps, equipped with exhaust silencers and compressor-wrap noise control packages
- Two 750 kW Caterpillar C27 Diesel Generator with Level 2 sound enclosure, with Miratech Model RC52-4234 exhaust muffler.

Figure 2, below, presents a layout plan of the mechanical equipment penthouse and outdoor equipment pen located on the roof of the 80 First Street building. The heavy blue line shows the outline of the enclosed mechanical equipment penthouse, and the dashed magenta line indicates the location of the appearance screen / noise barrier wall around the outdoor equipment sitting outside on the roof.

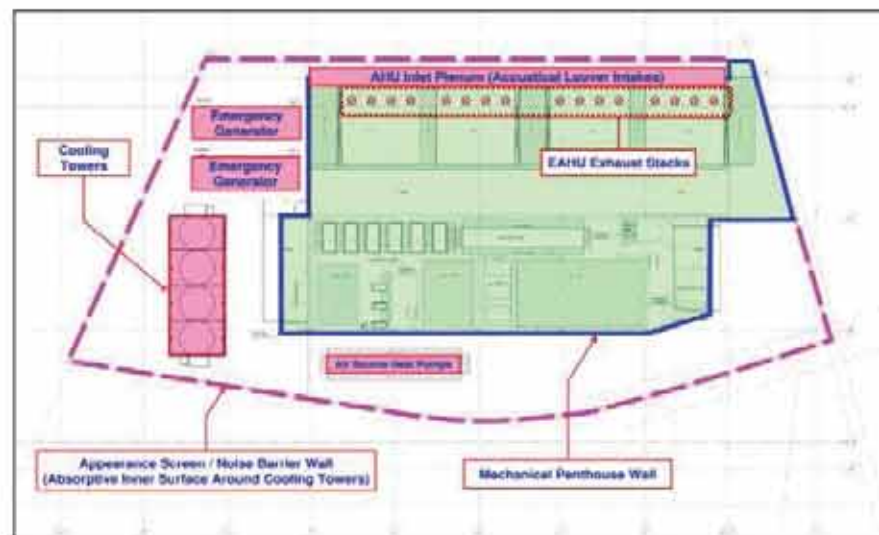


Figure 2 – 80 First Street: Outdoor Rooftop Mechanical Equipment

Sound Attenuating Features

A number of sound-attenuating features have been incorporated into the architectural and mechanical design of the project to mitigate noise emissions to the surrounding community, including:

- A 2-story appearance screen / noise barrier wall will be erected around the outdoor mechanical equipment on the penthouse mechanical level, shielding the neighboring area from noise emitted by the cooling towers, air source heat pumps, and the two generator sets. The portion of the screen-wall/noise barrier that surrounds the cooling towers will be sound-absorptive.
- The four cells of the cooling tower will all be equipped with the manufacturer's "Ultra Quiet" fans and variable-frequency drives.
- The exhaust stacks for the fans in the exhaust air handling units will be equipped with tubular sound attenuators.
- The main air handling units will draw outside air through a set of acoustical louvers in the east face of the mechanical penthouse.
- The bank of Air Source Heat Pumps will be equipped with discharge silencers on the fan decks and sound-attenuating wrap on the compressors.
- The two emergency generators will each be enclosed in the manufacturer's "Level 2" sound enclosures, and the diesel exhaust noise will be reduced through controlled by 10-foot long exhaust mufflers.

Predicted Equipment Sound Levels, 80 First Street Building

The physical locations and acoustical performance data (supplied by the project's mechanical engineers) for each of the major noise sources in the 80 First Street building was entered into the computer noise model, CadnaA, along with a 3-D representation of the project building and the buildings in the surrounding community. CadnaA uses industry-standard acoustical propagation calculations to estimate the resultant sound levels at various positions around the site.

Figures 3 and 4, below, present graphical representations of the community sound levels predicted by the CadnaA model for the 80 First Street building by itself; the levels are represented as A-weighted sound level contours for the nighttime period (the "All Other Times" category of the Cambridge Noise Ordinance) and daytime period, respectively. Because emergency generators will be tested only during daytime hours, the nighttime results include the acoustical contributions from all rooftop equipment except the emergency generators; the daytime results include noise produced by the emergency generators.

In both figures, the predicted sound levels from the rooftop mechanical equipment at 80 First Street are shown in the circled numbers on the residential buildings in the immediate vicinity of the First Street projects. The first number is the predicted maximum level at any point on the building façade produced by the operation of all equipment except the emergency generators (essentially the maximum "nighttime" level at the building); the second (higher) number is the maximum level predicted when the emergency generators atop the 80 First Street building are added to the mix. (The circled numbers are the same in both figures; only the sound level contours reflect the different nighttime and daytime sound levels predicted.)

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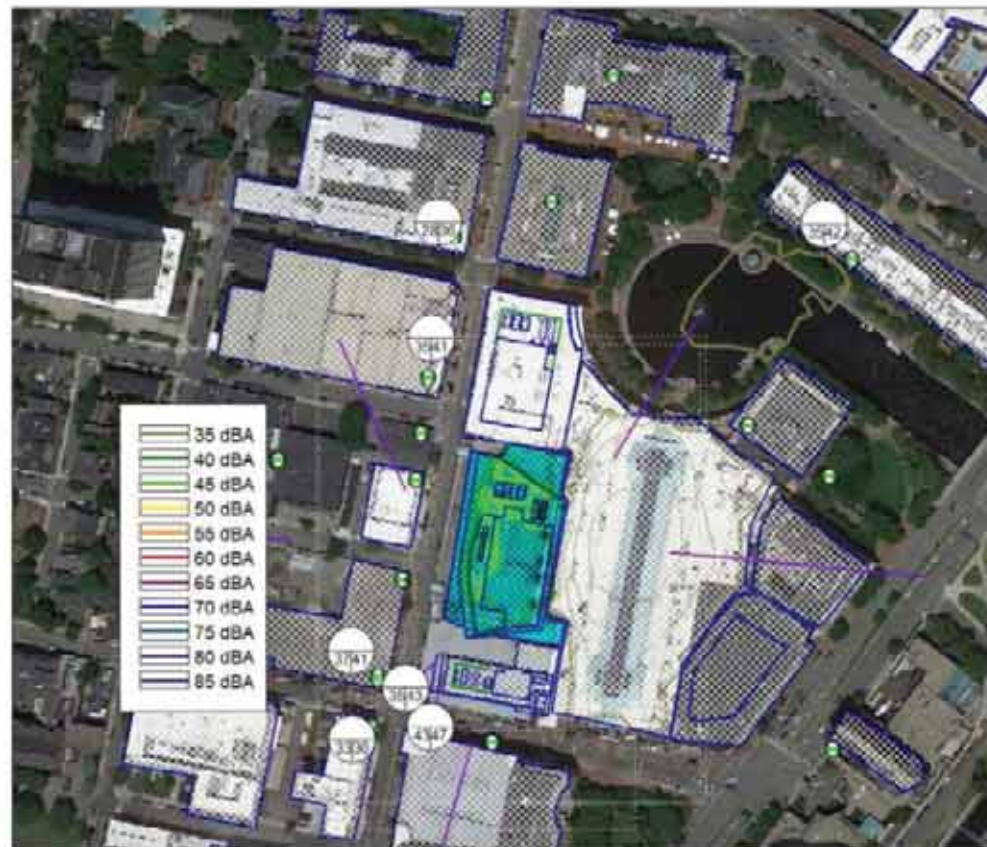


Figure 3 – 80 First Street: Predicted Community Noise Levels, "ALL OTHER TIMES" (Nighttime)
All equipment operating except emergency generators

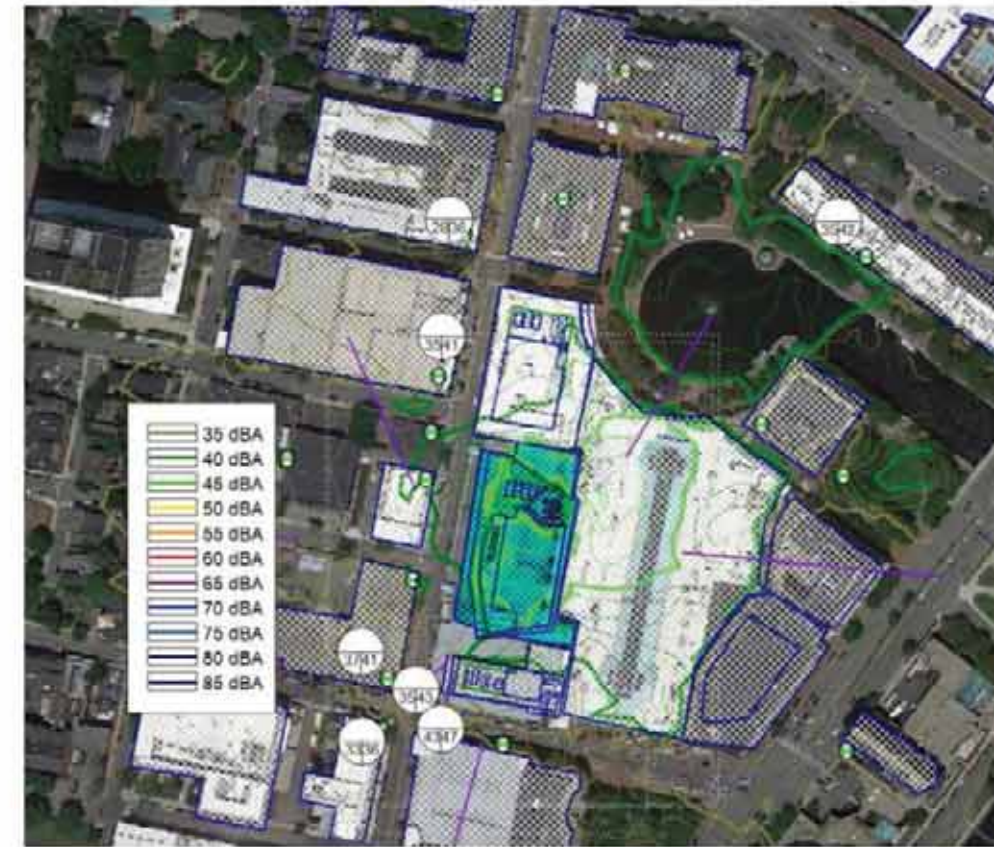


Figure 4 – 80 First Street: Predicted Community Noise Levels, "DAYTIME"
All equipment operating including emergency generators

Environmental Comfort Plan Noise Study

150 CAMBRIDGESIDE PLACE

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150 CAMBRIDGESIDE PLACE

Rooftop Mechanical Equipment

A list of outdoor rooftop mechanical equipment most likely to affect community sound levels in the area surrounding the 150 First Street project site is presented below:

- One two-cell cooling tower, similar to a Baltimore Air Coil Model S15E-1285-06KN, with "Whisper Quiet" fans on VFDs. The cooling towers are surrounded by sound absorptive screen walls.
- One 4-cell and one 3-cell banks of MultiStack ARA030L Air Source Heat Pumps, equipped with exhaust silencers and compressor-wrap noise control packages
- Two air-handling Energy Recovery Units (ERUs), similar to XNRGY Model P800-32, each with two 30,000 cfm supply fans and two 24,000 cfm exhaust fans.
- One 400 kW Caterpillar C13 Diesel Generator with Level 2 sound enclosure, with Miratech Model RCS2-4234 exhaust muffler.

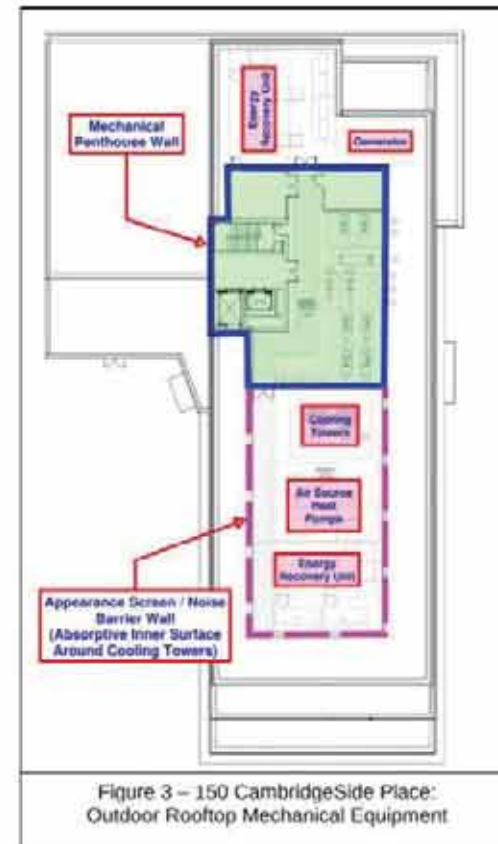


Figure 3 – 150 CambridgeSide Place: Outdoor Rooftop Mechanical Equipment

Figure 3, right, presents a layout plan of the mechanical equipment penthouse and outdoor equipment pen located on the roof of the 150 CambridgeSide Place building. The heavy blue line shows the outline of the enclosed mechanical equipment penthouse, and the dashed magenta line indicates the location of the appearance screen / noise barrier wall around the outdoor equipment sitting outside on the roof.

Sound Attenuating Features

A number of sound-attenuating features have been incorporated into the architectural and mechanical design of the 150 CambridgeSide Place building to mitigate noise emissions to the surrounding community, including:

- An appearance screen / noise barrier wall will be erected around the outdoor mechanical equipment on the penthouse mechanical level, shielding the cooling towers, air-source heat pumps and ERU. The portion of the screen-wall/noise barrier near the cooling towers will be sound-absorptive.
- The two cells of the cooling tower will all be equipped with the manufacturer's "Whisper Quiet" fans and variable-frequency drives.
- The two banks of Air Source Heat Pumps will each be equipped with discharge silencers on the fan decks and sound-attenuating wrap on the compressors.
- The emergency generator will be enclosed in the manufacturer's "Level 2" sound enclosures, and the diesel exhaust noise will be reduced through controlled by 10-foot long exhaust mufflers.

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Predicted Equipment Sound Levels, 150 CambridgeSide Place

As was done for the 80 First Street project, the physical locations and acoustical performance data supplied by the project's mechanical engineers for each of the major noise sources in the 150 CambridgeSide Place building was entered into the computer noise model, CadnaA, which was run to generate an estimate of the resultant operational sound levels in the community.

Figures 5 and 6, below, present the community sound levels predicted by CadnaA for the 150 CambridgeSide Place building by itself. Again, the levels are shown as A-weighted sound level contours for the nighttime ("All Other Times") and daytime periods, respectively. Again, emergency generators will be tested only during daytime hours, so the nighttime results include the acoustical contributions from all rooftop equipment except the emergency generators; the daytime results include noise produced by the emergency generators.

And again, in both figures, the predicted sound levels from the rooftop mechanical equipment are shown in the circled numbers on nearby residential buildings: the first number is the predicted maximum level at the building produced by the operation of all equipment except the emergency generators; the second (higher) number is the maximum level predicted when noise from the emergency generator is added to the mix.

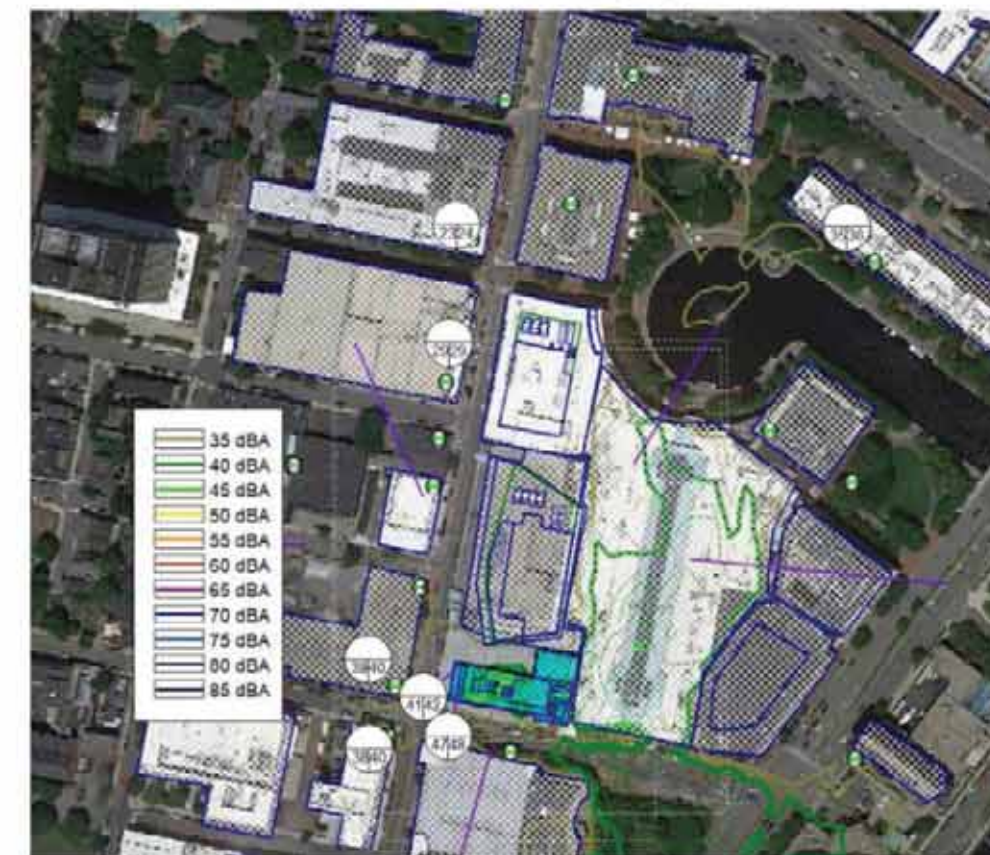


Figure 5 – 150 CambridgeSide Place: Predicted Community Noise Levels, "ALL OTHER TIMES" (Nighttime)
All equipment operating except emergency generators

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Environmental Comfort Plan Noise Study FIRST STREET COMBINED

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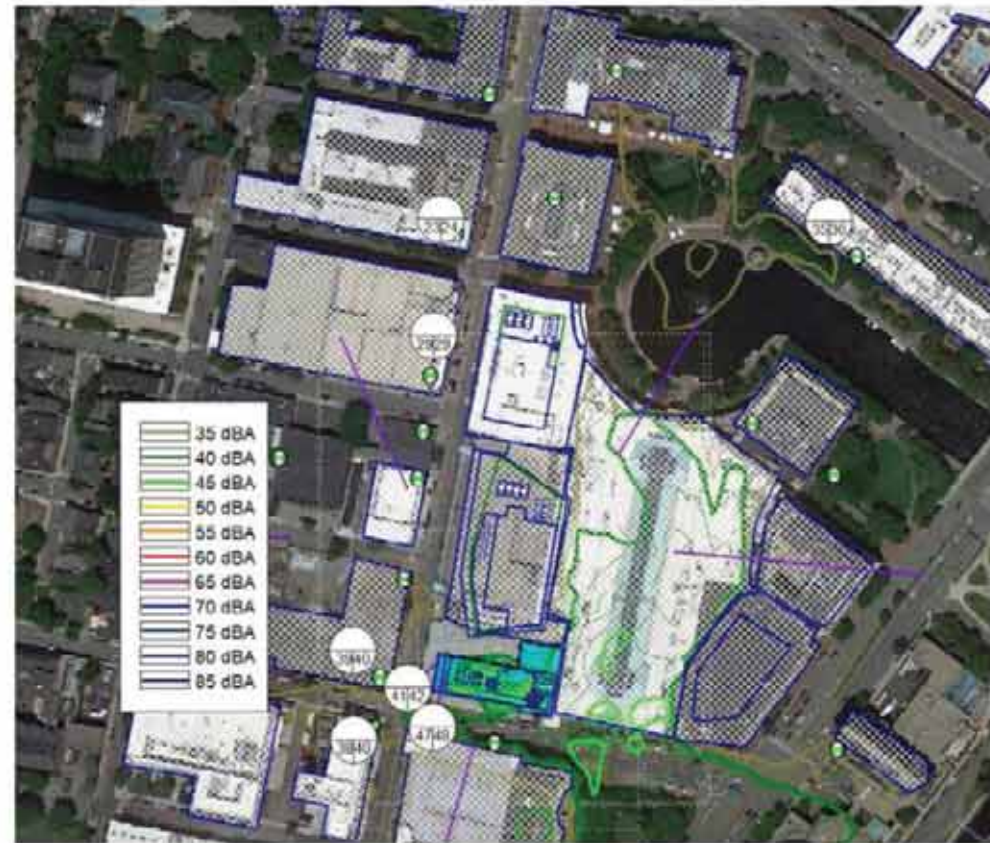


Figure 6 – 150 CambridgeSide Place: Predicted Community Noise Levels, "DAYTIME"
All equipment operating including emergency generators

PREDICTED OVERALL SOUND LEVELS FROM ALL THREE FIRST STREET PROJECTS COMBINED

A comprehensive noise study of the CambridgeSide 2.0 Development Plan was approved in February 2020 (PB-364 Decision). Understanding that this would be a phased project, it was determined that the multiple projects within the CambridgeSide 2.0 proposal would be aggregated and treated as one project. The CadnaA model we first created for the analysis of the acoustical performance of the 60 First Street project (documented in Acentech's 17 December 2020 report), was updated and used to assess the noise emissions of the 80 First Street and 150 CambridgeSide Place buildings, as described in this current report. The model was ultimately amended to include all the noise-producing mechanical equipment associated with the three First Street projects – 60 First Street, 80 First Street, and 150 CambridgeSide Place – and re-run to predict the noise levels from concurrent operation of all three CambridgeSide projects facing onto First Street.

Figure 7, below, presents a "bird's eye" view of the building geometry used by the CadnaA model to estimate the sound levels produced by the combined operation of the mechanical equipment at 60 First Street, 80 First Street, and 150 CambridgeSide Place projects.



Figure 7 – "Bird's-Eye" view of CadnaA noise model geometry

Figures 8 and 9, below, present the CadnaA-generated sound level contours around the three First Street projects, again for the nighttime (no generator operation) and daytime periods, respectively. The numbers in the circles again reflect the maximum nighttime (no generators) / daytime (with generators operating) levels expected at each building.

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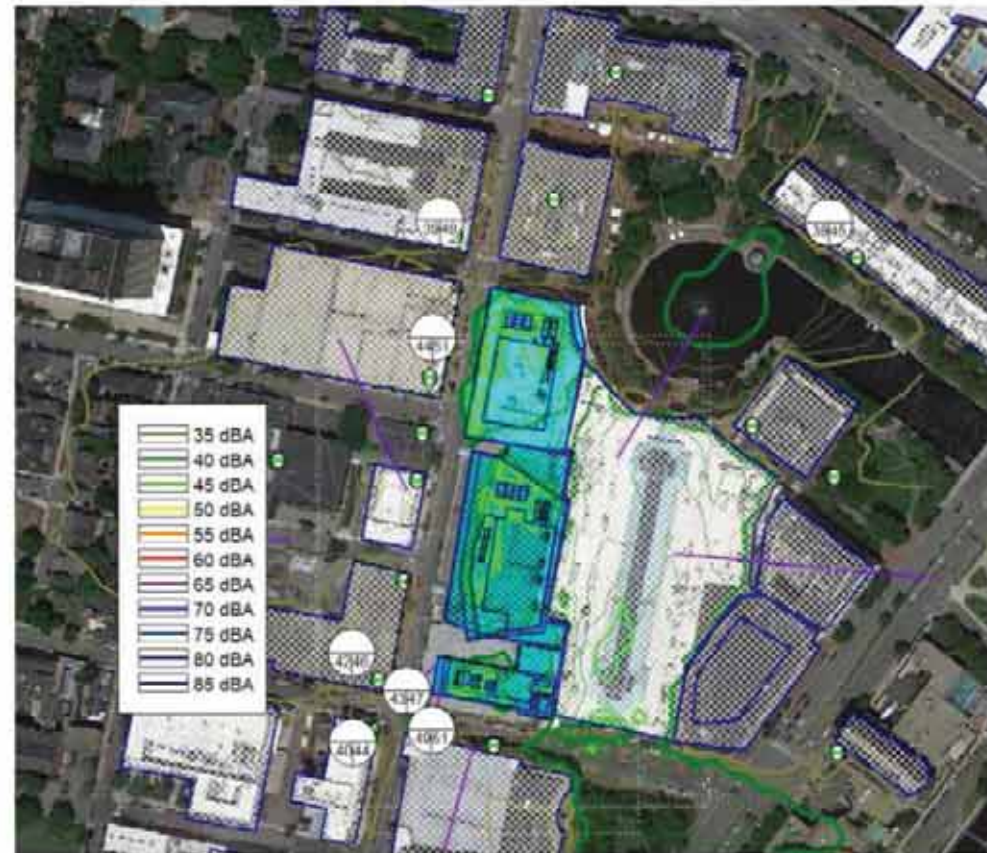


Figure 8 – Predicted First Street equipment noise levels, "ALL OTHER TIMES" (Nighttime)
All equipment operating except emergency generators

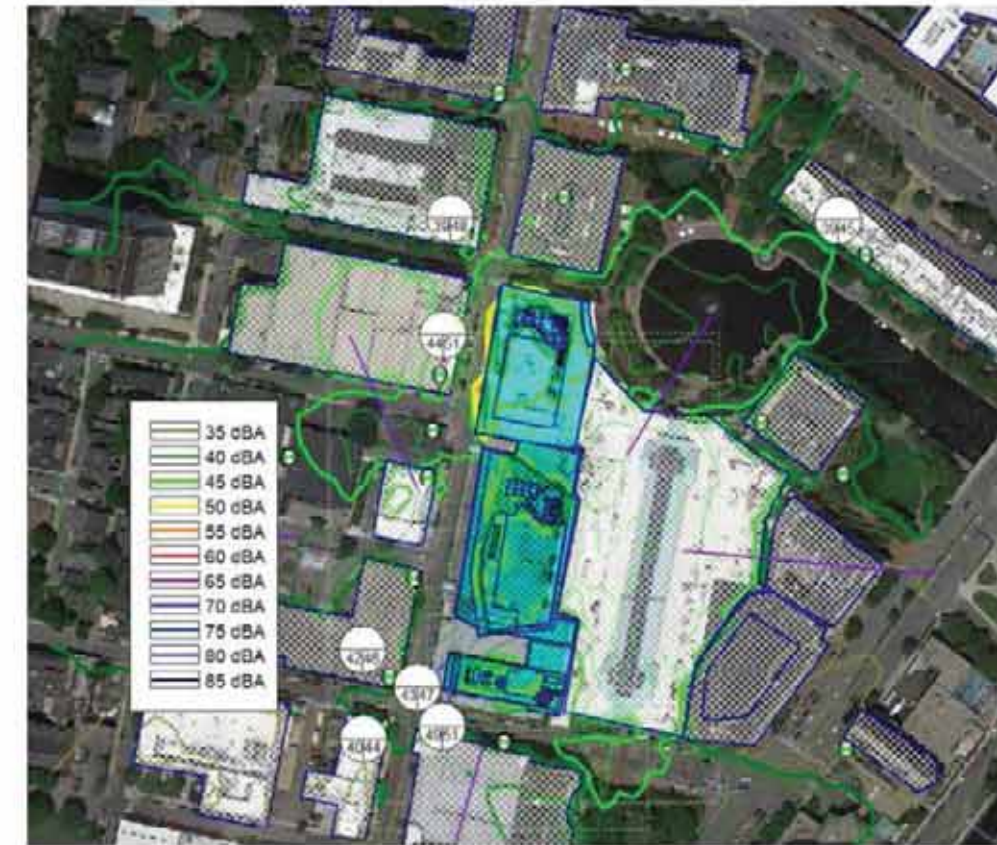


Figure 9 – Predicted First Street equipment noise levels, "DAYTIME"
All equipment operating including emergency generators

Comparison with Master Plan Projections

Back in 2020, Tech Environmental and the Master Plan team developed a similar CadnaA noise model of the whole CambridgeSide Redevelopment project to help ensure that the overall project would comply with the requirements of the Cambridge Noise Ordinance. Figure 10, below, is reproduced from Tech Environmental's 28 July 2020 report, "Acoustic Study for CambridgeSide", which documented their analyses of noise from rooftop equipment and exterior noise levels from the overall CambridgeSide Redevelopment project; the figure is used here to show the location of the individual noise-sensitive receivers at which Tech Environmental and the Master Plan team estimated community sound levels from the development's mechanical equipment.

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Figure 10 – Noise-Sensitive Receiver Locations Evaluated for Tech Environmental's Assessment of CambridgeSide Redevelopment Project Rooftop Noise Emissions

Compliance of Individual and Combined Noise Emissions from CambridgeSide Projects

The current CadnaA model used for the predictions documented in this report was also used to generate noise level estimates at the specific locations delineated in Tech Environmental's report.

Tables 2 and 3, below, present the applicable property-line limits outlined in the Cambridge Noise Ordinance for each of the specific receptor locations identified in Tech Environmental's study (Column 3), and compares the community sound levels of the Tech Environmental report (Column 4) with the levels calculated at those locations for each of the individual buildings discussed in this report (Columns 5-7); the last column of the table shows the levels predicted for the concurrent operation of the mechanical equipment of all three buildings. Table 2 presents the comparison for the nighttime period (the "All Other Times" category in the Cambridge Noise Ordinance); Table 3 presents a similar comparison for the daytime period.

As can be seen, Acentech's CadnaA model predicts levels well below those projected for the project by the Master Plan team. In addition, compliance with the City's noise level limits is predicted everywhere.

ID	Address	Cambridge Noise Ordinance Nighttime ("All Other Times") Limit	Tech Environmental Predicted Levels (dBA)	Acentech predictions for 60 First St (dBA)	Acentech predictions for 80 First St (dBA)	Acentech predictions for 150 CambridgeSide (dBA)	Acentech predictions for All three together (dBA)
R1	106-108 Second St	50	47	42	35	26	43
R2	43 Cambridge Pkwy	50	46	37	39	39	43
R3	23 Cambridge Pkwy	50	43	29	33	28	34
R4	17 Otis St #403	50	48	44	36	22	44
R5	4 Canal Park #606	50	49	41	40	34	44
R6	2-12 Canal Park	65	65	44	36	23	45
R7	One Canal Park	65	64	40	39	34	43
R8	21 Thorndike St	65	65	47	37	25	48
R9	61-69 First St	65	64	51	40	28	52
R10	75 First St	65	63	44	40	28	45
R11	14-24 Spring St	65	63	44	37	30	45
R12	18 Hurley St	50	49	44	41	36	46
R13	113-115 First St	65	60	38	36	40	43
R14	150 First St	65	64	31	36	43	44
R15	10 Canal Park	65	64	44	47	39	49
R16	10 Rogers Street	50	42	36	41	38	43
R17	25 Edwin H Land Blvd	50	43	42	35	26	43
R18	107 First St	50	46	37	39	39	43
R19	159 First St	50	47	29	31	28	34

Table 2: Comparison of Master Plan Predictions with Projected Nighttime Project Sound Levels (no operation of emergency generators)

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ID	Address	Cambridge Noise Ordinance Daytime Limit	Tech Environmental Predicted Levels (dBA)	Acentech predictions for 60 First St (dBA)	Acentech predictions for 80 First St (dBA)	Acentech predictions for 150 CambridgeSide (dBA)	Acentech predictions for All three together (dBA)
R1	106-108 Second St	60	54	34	31	26	36
R2	43 Cambridge Pkwy	60	53	28	34	37	39
R3	23 Cambridge Pkwy	60	47	19	23	25	28
R4	17 Otis St #403	60	54	36	32	21	38
R5	4 Canal Park #606	60	54	35	34	33	39
R6	2-12 Canal Park	65	64	36	28	23	37
R7	One Canal Park	65	61	32	32	33	37
R8	21 Thorndike St	65	64	38	31	25	39
R9	51-69 First St	65	64	44	35	28	44
R10	75 First St	65	62	36	33	28	38
R11	14-24 Spring St	65	62	36	32	30	38
R12	18 Hurley St	60	58	36	37	36	41
R13	113-115 First St	65	58	30	33	38	40
R14	150 First St	65	61	22	32	40	41
R15	10 Canal Park	65	60	37	39	39	43
R16	10 Rogers Street	60	43	28	39	36	41
R17	25 Edwin H Land Blvd	60	45	34	37	36	41
R18	107 First St	60	55	33	34	37	40
R19	159 First St	60	55	27	29	31	34

Table 3: Comparison of Master Plan Predictions with Projected Daytime Project Sound Levels (includes noise from emergency generators)

Pure Tone Evaluation

Based on the equipment sound data and the predicted sound levels to the closest receivers, we do not anticipate any of the buildings to emit tonal sound as defined by MassDEP.

CONCLUSION

The A-weighted community sound levels predicted from the operation of the rooftop mechanical equipment planned for the 60 First Street, 80 First Street, and 150 CambridgeSide Place projects will everywhere comply with the property-line sound level limits set in the Cambridge Noise Ordinance, both during the daytime and at "all other times." In addition, project noise emissions are expected to comply with the MassDEP's "10 dB over background" limits and will not result in a "pure tone" condition. Finally, predicted offsite equipment noise levels from the three First Street projects are well below the levels set by the Master Plan team at all offsite locations evaluated.

* * * * *

I trust this letter provides the information that you need at this time. If you have questions, please call me on my direct line at 617-499-8028, or e-mail me at rberens@acentech.com.

Sincerely,



Robert Berens
Principal Consultant