CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

SPECIAL PERMIT APPLICATION • COVER SHEET

In accordance with the requirements of the City of Cambridge Zoning Ordinance, the undersigned hereby petitions the Planning Board for one or more Special Permits for the premises indicated below.

Location of Premises: 101 Rogers Street

Zoning District: IA-1 / PUD 4C

Applicant Name: City of Cambridge

Applicant Address: 795 Massachusetts Ave, Cambridge MA 02139

Contact Information: 617.349.4251 mblack@cambridgema.g

Telephone # Email Address Fax #

List all requested special permit(s) (with reference to zoning section numbers) below. *Note that the Applicant is responsible for seeking all necessary special permits for the project. A special permit cannot be granted if it is not specifically requested in the Application.*

- Special Permit for Performance Space use pursuant to Section 4.35.h
- Permission of relief from minimum Side Yard setback per Section 8.22.2.a
- Reduction in required number of Parking Spaces pursuant to Section 6.35.1
- Project Review Special Permit per Section 19.20

List all submitted materials (include document titles and volume numbers where applicable) below.

1. Application Forms
2. Project Narrative
3. Project Plans and Illustrations
4. Appendices: Transportation Impact Study; Sewer Service Infrastructure Narrative; Water Service Infrastructure Narrative; LEED Checklist and Narrative; Community Meeting Notes

Signature of Applicant:

For the Planning Board, this application has been received by the Community Development Department (CDD) on the date specified below:

Date Signature of CDD Staff

OWNERSHIP CERTIFICATE

Project Address: 101 Rogers Street **Application Date:**

This form is to be completed by the property owner, signed, and submitted with the Special Permit Application:

I hereby authorize the following Applicant: City of Cambridge

at the following address: 795 Massachusetts Ave. Cambridge MA

to apply for a special permit for: see page 1

on premises located at: 101 Rogers Street

for which the record title stands in the name of: City of Cambridge

whose address is: 795 Massachusetts Ave. Cambridge MA

by a deed duly recorded in the:

Registry of Deeds of County: Middlesex Book: 58257 Page: 379

OR Registry District of the Land Court, Certificate No.: Book: Page:

Signature of Land Owner (If authorized Trustee, Officer or Agent, so identify)

To be completed by Notary Public:

Commonwealth of Massachusetts, County of Middlesex

The above named Louis DeRosa personally appeared before me,

on the month, day and year 3/5/20 and made oath that the above statement is true.

Notary:

My Commission expires:

MARYELLEN VERA CARVELLO
Notary Public
Commonwealth of Massachusetts
My Commission Expires September 24, 2021

FEE SCHEDULE

Project Address: 101 Rogers Street **Application Date:** 03/05/2020

The Applicant must provide the full fee (by check or money order) with the Special Permit Application. Depending on the nature of the proposed project and the types of Special Permit being sought, the required fee is the larger of the following amounts:

- If the proposed project includes the creation of new or substantially rehabilitated floor area, or a change of use subject to Section 19.20, the fee is ten cents ($0.10) per square foot of total proposed Gross Floor Area.
- If a Flood Plain Special Permit is being sought as part of the Application, the fee is one thousand dollars ($1,000.00), unless the amount determined above is greater.
- In any case, the minimum fee is one hundred fifty dollars ($150.00).

Fee Calculation

New or Substantially Rehabilitated Gross Floor Area (SF): 50,200	× $0.10 =	n/a
Flood Plain Special Permit	Enter $1,000.00 if applicable:	n/a
Other Special Permit	Enter $150.00 if no other fee is applicable:	n/a
TOTAL SPECIAL PERMIT FEE	**Enter Larger of the Above Amounts:**	n/a

DIMENSIONAL FORM

Project Address: 101 Rogers Street **Application Date:** 03/05/2020

	Existing	Allowed or Required (max/min)	Proposed	Permitted
Lot Area (sq ft)	37,493 sf	5,000 sf	37,493 sf (existing)	
Lot Width (ft)	96 ft	50 ft	96 ft (existing)	
Total Gross Floor Area (sq ft)	52,200 sf	52,200 sf	50,200 sf	
Residential Base	n/a	n/a	n/a	
Non-Residential Base	52,200 sf	n/a	50,200 sf	
Inclusionary Housing Bonus	n/a	n/a	n/a	
Total Floor Area Ratio	1.39	3.00	1.34	
Residential Base	n/a	n/a	n/a	
Non-Residential Base	1.39	n/a	1.34	
Inclusionary Housing Bonus	n/a	n/a	n/a	
Total Dwelling Units	n/a	n/a	n/a	
Base Units	n/a	n/a	n/a	
Inclusionary Bonus Units	n/a	n/a	n/a	
Base Lot Area / Unit (sq ft)	n/a	n/a	n/a	
Total Lot Area / Unit (sq ft)	n/a	n/a	n/a	
Building Height(s) (ft)	43'-6"	45'-0"	45'-0"	
Front Yard Setback (ft)	0'-0"	0'-0"	0'-0"	
Side Yard Setback (ft)	0'-0"	0'-0"	0'-0"	
Side Yard Setback (ft)	23'-5"	33'-3"	23'-5"	
Rear Yard Setback (ft)	n/a	0'-0"	n/a	
Open Space (% of Lot Area)	37%	none required	34%	
Private Open Space	0%	n/a	0%	
Permeable Open Space	4,874 sf	none required	6,790 sf	
Other Open Space (Specify)	n/a	n/a	n/a	
Off-Street Parking Spaces	54	68	0	
Long-Term Bicycle Parking	0	11	11	
Short-Term Bicycle Parking	0	14	14	
Loading Bays	1	1	1	

Use space below and/or attached pages for additional notes:

See footnotes on next page for
bicycle parking quantity calculations

FOOTNOTES:

[i] Per Section 6.107.2 of City of Cambridge Zoning Ordinance:
Long-term bicycle parking (community center) : N5
=(12,950gsf/1,000)*0.08 = 1.04
Long-term bicycle parking (general office use) : N1
=(23,350gsf/1000)*.3 = 7.01
Long-term bicycle parking (theater) : N5
=(4,750gsf/1,000)*0.08 = 0.38
Long-term bicycle parking (art/craft studio) : N1
=(6,450gsf/1000)*.3 = 1.94
Total long-term parking required
= 1.04+7.01+0.38+1.94=10.36 = **11 spaces**

[ii] Per Section 6.107.3 of City of Cambridge Zoning Ordinance:
Short-term bicycle parking (community center) : N3
=(12,950gsf/1,000)*0.5 = 6.48
Short-term bicycle parking (general office use) : N5
=(23,350gsf/1000)*.06 = 1.40
Short-term bicycle parking (theater) : N1
=(4,750gsf/1,000)*1.00 = 4.75
Short-term bicycle parking (art/craft studio) : N5
=(6,450gsf/1000)*.06 = 0.39
Total short-term parking required
= 6.48+1.40+4.75+0.39=13.013 = **14 spaces**

CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

CERTIFICATION OF RECEIPT OF PLANS
BY CITY OF CAMBRIDGE TRAFFIC, PARKING & TRANSPORTATION

City Department/Office:

Project Address:

Applicant Name:

For the purpose of fulfilling the requirements of Section 19.20 and/or 6.35.1 and/or 5.28.2 of the Cambridge Zoning Ordinance, this is to certify that this Department is in receipt of the application documents submitted to the Planning Board for approval of a Project Review Special Permit for the above referenced development project: (a) an application narrative, (b) small format application plans at 11" x 17" or the equivalent and (c) Certified Traffic Study. The Department understands that the receipt of these documents does not obligate it to take any action related thereto.

Signature of City Department/Office Representative **Date**

CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

CERTIFICATION OF RECEIPT OF PLANS BY CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

City Department/Office:

Project Address:

Applicant Name:

For the purpose of fulfilling the requirements of Section 19.20 of the Cambridge Zoning Ordinance, this is to certify that this Department is in receipt of the application documents submitted to the Planning Board for approval of a Project Review Special Permit for the above referenced development project: (a) an application narrative and (b) small format application plans at 11" x 17" or the equivalent. The Department understands that the receipt of these documents does not obligate it to take any action related thereto.

Signature of City Department/Office Representative **Date**

CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

CERTIFICATION OF RECEIPT OF PLANS BY CITY OF CAMBRIDGE TREE ARBORIST

City Department/Office:

Project Address:

Applicant Name:

For the purpose of fulfilling the requirements of Section 4.26, 19.20 or 11.10 of the Cambridge Zoning Ordinance, this is to certify that this Department is in receipt of the application documents submitted to the Planning Board for approval of a MultiFamily, Project Review or Townhouse Special Permit for the above referenced development project: a Tree Study which shall include (a) Tree Survey, (b) Tree Protection Plan and if applicable, (c) Mitigation Plan, twenty one days before the Special Permit application to Community Development.

Signature of City Department/Office Representative **Date**

CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

CERTIFICATION OF RECEIPT OF PLANS
BY CITY OF CAMBRIDGE WATER DEPARTMENT

City Department/Office:

Project Address:

Applicant Name:

For the purpose of fulfilling the requirements of Section 19.20 of the Cambridge Zoning Ordinance, this is to certify that this Department is in receipt of the application documents submitted to the Planning Board for approval of a Project Review Special Permit for the above referenced development project: (a) an application narrative and (b) small format application plans at 11" x 17" or the equivalent. The Department understands that the receipt of these documents does not obligate it to take any action related thereto.

Signature of City Department/Office Representative **Date**

CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

CERTIFICATION OF RECEIPT OF PLANS BY CITY OF CAMBRIDGE LEED SPECIALIST

City Department/Office:

Project Address:

Applicant Name:

For the purpose of fulfilling the requirements of Section 22.20 of the Cambridge Zoning Ordinance, this is to certify that this Department is in receipt of the application documents submitted to the Planning Board for approval of a Special Permit for the above referenced development project: (a) an application narrative, (b) small format application plans at 11" x 17" or the equivalent and (c) completed LEED Project Checklist for the appropriate LEED building standard, accompanying narrative and affidavit. The Department understands that the receipt of these documents does not obligate it to take any action related thereto.

Signature of City Department/Office Representative **Date**

Architecture
Urban Design
Master Planning
Programming
Interior Design
Graphic Design
Exhibit Design

Stefanie Greenfield
Patricia E. Intrieri
Gary C. Johnson
Yongjoo Kim
Peter Kuttner
Timothy D. Mansfield
Adam P. Mitchell
Marc Rogers
Jose Silveira

Stefan Bold
Jan L. Brenner
Bradley Converse
Justin Crane
Chris Muskopf
James C. Puopolo
Penny J. Sander
Douglas Simpson
Peter Sollogub
Joslin Stewart
Pamela N. Sullivan
David E. Wiborg

Community Development Department
c/o Swaathi Joseph
City Hall Annex
344 Broadway
Cambridge, MA 02139

April 22, 2020

Re: Foundry Building – Special Permit Project Narrative

Dear Members of the Planning Board:

We are pleased to present to you this application for Planning Board Special Permit for the Foundry Building. Following is the narrative providing an overview of the project together with a list of special permits sought for the project, an explanation of requirements for zoning compliance, and a description of compliance with specific criteria required for receipt of a special permit.

I. Project Overview

The Foundry ("the Project"), a brick and timber frame industrial building built in 1890, is sited on a 37,493 sf lot ("the Property"). It is owned by the City of Cambridge ("the Applicant") and is located at 101 Rogers Street. A narrow open space to the east of the building is approximately 3,000 SF in area. The Rogers Street frontage includes the main entrance. The parcel is abutted to the east by a five-story residential development named 249 Third Street and completed in 2019; to the south by a three-story historic brick building converted into residential units; and to the north by single-story commercial structures with blank facades on Bent Street. The abutting parcel to the west contains Verizon's property with a high rise, windowless structure that houses communications equipment and a large parking lot.

The property has undergone multiple renovations by various owners, including a commercial renovation in 1982 adding infill floors to the high bay of the existing structure. The building is currently vacant.

The building has been designated a protected landmark by the City, and the design plans were approved by the Cambridge Historical Commission on December 3, 2019. The Commission delegated review and approval of construction details and materials and masonry restoration to the CHC staff.

The footprint of the existing historical masonry building is to be maintained (approximately 24,000 square feet). An existing stucco-clad addition will be demolished due to its seismic instability and replaced with a new addition with a slightly larger footprint. Combined, the total square footage of the proposed project is: 50,200 sf.

For reference, refer to the following table:

Use	GSF
Community Center	12,950
General Office Use	23,350
Theatre	4,750
Art/Craft Studio	6,450
Shared Building Service / Mechanical	2,700
Total	**50,200**

The Project is proposing that the Foundry be repurposed into a creative, innovative, and collaborative multipurpose center. Included in the programming are wood, metal, and fabric arts workshops, a STEM education workshop, an art studio including offices for two artists-in-residence, and a flexible performance space.

To deliver a high-quality space that achieves the community's vision, the City and the Cambridge Redevelopment Authority (CRA) have agreed to undertake the rehabilitation of the Foundry as a publicly-funded demonstration project.

The Applicant is requesting the following special permits from the Planning Board:

A. Special Permit for Performance Space use pursuant to Section 4.35.h
B. Permission of relief from minimum Side Yard setback per Section 8.22.2(a)
C. Reduction in required number of Parking Spaces pursuant to Section 6.35.1
D. Project Review Special Permit per Section 19.20

II. Compliance with Zoning

The Project is located within the Industrial A-1 District and within the Planned Unit Development 4C Overlay, Eastern Cambridge Housing Overlay (ECHO) and transfer of development rights (TDR) donating district. As indicated on the Dimensional Form, the Project will comply with all use and dimensional requirements of the underlying zoning (where applicable) and the ECHO District, with the exception of the east side yard setback as noted in Part III below.

We note here that the Project will likely pursue a variance from the Board of Zoning Appeal (BZA) for signage, specifically compliance with Criteria Specific to Special Permits under 7.10. Per the requirements under Section 7.10, the Applicant is requesting relief for historic signage. The historical signage was painted brick above the main entry. The Project is proposing to replicate that historical element. The signage falls within the 20' height limit, but The Project is asking relief from the square footage requirements so that the painted signage matches the scale of the historic lettering. This would require an increase from the allowed 60 sf to approximately 250 sf. This would be at both the Roger Street and Bent Street facades.

III. Compliance with Specific Criteria

A. Table of Use Regulations (Section 4.30)

As the Project has a Performance Space, per 4.35.h, the Project would comply upon receipt of a special permit for this use, as noted in the Table of Use Regulations line 4.35.h for Industrial A-1 zoning districts.

B. District Dimensional Regulations (Section 8.20)

The Project seeks relief from the side yard setback at the east side of the Property. A setback greater than zero and equal to H+L/7 is required due to the construction of residences in the abutting east parcel.

This setback is an existing condition. However, the existing structure's historic openings have been infilled. The project is proposing to replace bricked up windows with glass openings to match the historic pattern. As a result, the change to the nonconforming structure falls under paragraph 8.22.2, which allows for a special permit to be issued for the alteration of a nonconforming structure, as the alteration or enlargement will not be in further violation of the dimensional requirements in Article 5.000 or the off-street parking and loading requirements in Article 6.000.

The sought-after setback (23'-5") is greater than the 10'-0" minimum required setback that may be allowed on special permit.

C. Parking Quantity Requirements (Section 6.30)

The Applicant is requesting approval to provide no on-site parking, as off-site facilities adequately serve the new program type and the urban site is proximate to transit and services. According to the City's 1990 parking inventory, 101 Rogers Street was reported as having 54 parking spaces. These parking spaces have not been used since the building was vacated, and they will be eliminated as part of the Project so that the building's ground floor elevation can be lowered in order to have a universally-accessible entrance at ground level. The Project intends to provide two (2) accessible spaces along Rogers Street, a private roadway, opposite The Foundry Building.

For reference, a table of calculations per Article 6.36 is as follows. The Project seeks relief from the 83 spaces calculated below:

Use	GSF	Number of Seats	Parking Requirements	Parking Spaces	Referenced Article
Community Center	12,950		1 per 600 sq. ft.	21.58	6.36.3.e.2
General Office Use	23,350		1 per 800 sq. ft.	29.19	6.36.4.d
Theatre	4,750	130	1 per 5 seats	26	6.36.5.h
Art/Craft Studio	6,450		1 per 1000 sq. ft.	6.45	6.36.5.p
Shared Building Service / Mechanical	2,700				
Total	**50,200**			**83**	

The reduction of required parking is reasonable in light of the following, per 6.35.1:

- The Project is within walking distance of the Red Line, Green Line, the #64 and #69 buses, and the EZ-Ride shuttle.
- There are adequate commercial parking facilities nearby to serve the Project uses.
- Providing the minimum required parking spaces is not feasible at the exterior of the site due to its size. The existing building included parking at a submerged garage level, requiring a raised floor level and reduced floor-to-floor height. The ground floor was lowered to grade for universal access, with floor-to-floor heights increased as necessary to accommodate the workshop and classroom functions requested by the community.

D. Project Review Special Permit per Section 19.20

The Project includes a change of use and an addition to an existing building, within an Industrial A-1 Zoning District per Section 19.22(1).

The change of use is from General Office Use to: Community Center, General Office Use, Theatre, and Art/Craft Studio.

The area of the Project exceeds fifty thousand (50,000) gross square feet.

A Transportation Impact Study (TIS) was completed for this project, and is included as an Appendix to this submission. This Study shows that there are no substantial adverse impacts on city traffic. As noted within the TIS, the Project has only six estimated exceedances out of 125 data entries; Three of these are the result of no dedicated bicycle right of ways being present (on Third, Fifth, and Bent Streets). One of these is the result of no dedicated bicycle right of way being present on Rogers; however, the Project proposes a shared street design for Rogers Street.

The Urban Design impact of the Project is noted in detail below, in section IV(f).

IV. Compliance with General Special Permit Criteria (Section 10.43)

(a) It appears that requirements of this Ordinance can or will be met.

The project will meet specific requirements of the Ordinance, with the exception of those aforementioned items for which relief is sought.

(b) Traffic generated or patterns of access or egress will not cause congestion, hazard, or substantial change in established neighborhood character.

Providing the number of parking spaces required by the Ordinance is not feasible given the lot size and restrictions on development due to the building's landmark designation. Further, providing these spaces would encourage a modest increase (less than 10%) amount of driving on adjacent streets.

The site is located within walking distance to the Kendall/MIT and Lechmere Train Stations and several bus routes, which will further reduce the demand for parking due to higher numbers of car-free commuters and patrons.

The Project's shared street will also provide space in front of The Foundry Building for vehicles that are parked for a short duration of time to pick-up or drop-off passengers. Approximately five vehicles during the morning peak hour and three vehicles during the evening peak hour are anticipated to pick-up and drop-off passengers directly at the Site.

For those who do drive to the Site, it is anticipated that nearby parking garages will have availability to accommodate those users, particularly during off-peak periods when the Project is anticipated to have more ongoing activities. Based on a review of the Cambridge Parking Map on the Traffic Parking and Transportation website, the closest commercial parking facilities are the Kendall Center Blue Garage and the 350 Kendall Street Garage. Due to the location of the parking garages, some vehicles may not enter the study area intersections in order to access a garage from their point of origin.

Based on recent observations and occupancy studies in the surrounding area and as detailed in the certified Transportation Impact Study, it is believed that this parking demand will be accommodated in the nearby parking garages.

As discussed in the Eastern Cambridge Planning Study, the site location falls within what is labeled as a "Transition District". The report says that these areas "have the potential to create more pedestrian-oriented places with amenities serving nearby areas." By not providing on-site parking, this project is able to move closer toward making Rogers Street and the adjacent neighborhood a more pedestrian-friendly and less vehicle-dominated streetscape.

(c) The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance will not be adversely affected by the nature of the proposed use.

The Project will provide community resources for the surrounding neighborhood. As it is surrounded by the newly constructed residential development to the east, residential to the south, and the East Cambridge neighborhood to the north, the Foundry will provide a vibrant hub for community activity and engagement. The Theater Use, allowed by Special Permit, is to be operated prioritizing community organizations.

The west and north abutting properties house communications equipment and low-rise communications offices, and are not impacted by the Project.

(d) No nuisance or hazard would be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City.

No nuisance or hazard would be created by the Project. All community activities would be contained to the site.

Instead, the Project improves health, safety, and welfare by:

- Making an historic building structurally and seismically sound
- Improving the energy-efficiency of the building
- Providing cultural amenities available to the community

- Remediating the building and site
- Lowering the ground level to grade to allow for universal access

(e) The proposed use will not impair the integrity of the district or adjoining district, or otherwise derogate from the intent and purpose of this Ordinance.

When completed, it will provide public community space and programming for art, entrepreneurship, technology, and workforce education – all while keeping intact an historic industrial structure. The building will be accessible and inclusive to Cambridge residents of all ages and backgrounds, and its location in a Transition Zone between Kendall Square and East Cambridge provides an ideal opportunity to connect residents to some of the world's most visible companies in life sciences, technology and innovation, setting the tone for appropriate future development in the district.

(f) The new use or building construction is consistent with the Urban Design Objectives set forth in Section 19.30.

The Project meets the objectives set forth in the Citywide Urban Design Objectives in the Zoning Ordinance, as well as the Recommendations and Eastern Cambridge Design Guidelines established in the Eastern Cambridge Planning Study.

Citywide Urban Design Objectives are as follows:

19.31 New projects should be responsive to the existing or anticipated pattern of development: The Project does not abut a residential zoning district. Nonetheless, Third Street is a busy street for pedestrian and vehicular traffic to and from the East Cambridge neighborhood and is hosting new residential development. The Project's historic building setback has not changed. The height facing Third Street will increase by approximately one foot to accommodate new insulation; a new addition at the west side of the building remains at essentially the same height as (i.e. six inches higher than) the historic structure.

19.32 Development should be pedestrian and bicycle-friendly, with a positive relationship to its surroundings: The Project's historic facades will be renovated to add interest to the pedestrian realm by installing windows and doors in previously bricked-up openings. The building is being conserved and repurposed as a cultural hub within the East Cambridge neighborhood, with the ground floor space hosting maker spaces, multi-purpose rooms, art studios, a dance studio, theater, and community hall. The approach from both Rogers and Bent street will be welcoming, with prominent entries and landscaping elements. At the east side of the Property is "The Yard," an open space for community use that will complement the cultural activities occurring within the building.

The building has no parking on the site; however, the intent is to provide two (2) accessible parking spaces on Rogers Street, opposite the main entrance and dedicated to The Foundry through an agreement with the abutting property owner.

Proposed landscaping includes planting and extended curbs at the Bent Street and Rogers Street entrances to invite pedestrians from Third Street to the Project. Rogers Street is to be a shared street, with a shared zone for both pedestrians and vehicles, as well as a pedestrian zone adjacent to the building and separated from the shared zone

by planting and landscape elements. The shared street will extend to the Rogers and Third Street intersection to invite pedestrian traffic from the new Rogers Street Park.

19.33 The building and site design should mitigate adverse environmental impacts of a development upon its neighbors: Mechanical equipment is to be located on the addition's flat roof and surrounded by a sound barrier wall the same height as the equipment, so as to provide visual and acoustic screening for neighbors.

The design team made the decision to locate mechanical equipment on the rooftop to achieve long-term resiliency, as the existing sub-grade space may see regular flooding by 2070, per the City's FloodViewer online mapping tool.

Trash storage is to be contained within the building.

The new loading dock is proposed to be in its existing location, but set back further from the road to minimize visual impact to neighbors and passers-by.

Storm pipes and permeable paving will capture and control stormwater on the site, designed such that the post-development discharge for a 10-year event is less than or equal to a two-year rainfall event pre-development.

Open spaces that were previously neglected or covered in asphalt will be made destinations through planting, permeable pavers, and the creation of zones within "The Yard" that will be open to the public and will accommodate arts and making events that occur within the Project.

The massing of the Project does not affect the enjoyment of adjacent open space: on the west side is a lot used for Verizon employee parking and Verizon mechanical equipment; on the east side is a new residential development adjacent to the historic portion of the Project and therefore with unaffected access to the solar envelope.

There will be no structural retaining walls in the Project.

Windows facing the new residential development at 249 Third Street re-create historic fenestration patterns and do not worsen existing conditions. The level one windows in the Project will be blocked from the residential development by a new fence. The level three windows are set back 53 feet from the property line.

Outdoor lighting is designed to provide minimum lighting required to ensure adequate safety and comfort around the site, while minimizing light pollution with appropriate cut-offs.

There are no existing trees on the site; new trees are proposed to be added to the Yard and sidewalks.

19.34 Projects should not overburden the City infrastructure services: Low-flow plumbing fixtures, to the extent practical, have been chosen for toilets, urinals, and sinks within the building. As noted above, the amount of stormwater runoff has been minimized through the use of permeable pavers and a stormwater piping system that meets the 10:2 ratio for stormwater discharge.

Based on multiple hydrant flow tests performed around Rogers Street for the Project, it has been determined that there is adequate existing water pressure and volume available to meet Project needs. The only anticipated improvement to City-owned infrastructure is the relocation of a short portion of the exiting 8" water main on Rogers Street to avoid proposed shared street landscape features.

The Project anticipates achieving LEED Gold, and earning 13 out of 18 possible points for energy performance. This is achieved due to the provision of an anticipated 340 solar panels and the selection of energy-efficient Air Source VRF system, with air-to-air heat pumps and a Dedicated Outdoor Air System (DOAS) for heating, cooling, and ventilation. This results in a proposed EUI of 34.13, below the LEED baseline of 43.13, and projected energy cost savings of 21%.

19.35 New construction should reinforce and enhance the complex urban aspects of Cambridge as it has developed historically: The historic masonry structure is to be preserved and restored. A historic stucco and CMU structure at the west side of the Project will be removed because it is not seismically sound. This will be replaced by a new addition clad in metal wall panels, clearly differentiating it from the historic structure while continuing the tradition of frequent additions and replacements of accessory structures in Cambridge factory buildings.

The Project will also contribute to workforce development by providing maker spaces and STEAM learning classrooms that are open and accessible to the community.

19.36: Expansion of the inventory of housing: no housing is proposed in the Project.

19.37: Enhancement and expansion of open space amenities: As noted above, publicly-beneficial open space is provided in the form of The Yard – an open space supporting the community functions within the Project and articulated with permeable paving, planting, seating, and landscape furnishings.

Open spaces are designed to expand existing facilities for pedestrian and bicycling by turning Rogers Street into a shared street and by providing substantial bicycle parking, both short-term and long-term covered parking, to encourage pedestrian and bike traffic.

The abutting area currently provides very limited open space activities that are open to the public; the Project will provide a hardscaped area that will welcome a variety of uses, including gathering, eating, and working on community art and STEM projects.

The Foundry site falls within a "Transition Area," as defined within the Eastern Cambridge Planning Study. Goals for this Transition Area include:

Encouraging new residential development. While the Foundry itself is not a residential development, it does complement the adjacent residential neighborhood by providing services available to community members.

Use finely graduated heights. The addition to the Foundry Building is approximately the same height as the existing roof peak, keeping The Project in harmony with historic massing in the Transition Area.

Create better pedestrian and bicycle connections. As noted above, the Foundry Building encourages alternative modes of transit by providing adequate long- and short-term bicycle parking, and turning Rogers Street into a shared street. Further, its location nearby the Red Line Kendall Square stop, Green Line Lechmere stop, and EZ Ride Shuttle stops makes it easily accessed by visitors without private automobiles.

The Project aligns with the Eastern Cambridge Design Guidelines, as defined within the Eastern Cambridge Planning Study, as follows:

Street-Level Uses and Design guidelines pertain to large-scale development sites, and so are considered not directly applicable. Nonetheless, The Project keeps the historic building edge on the street and enlivens it by restoring historic fenestration, hosting community uses throughout the ground floor, and providing a new shared street and landscaping.

Building Height and Orientation:
The building remains at or under 45 feet in height and therefore does not require a setback. Usable open space has not been reduced from the existing configuration, and existing setbacks remain but are made more pedestrian friendly through the restoration of historic openings with double-hung windows and doors. The Yard will accommodate seating, benches, and open spaces for community uses. The loading dock is set back from the street, and located on the opposite side of the building from the 249 Third Street residences to screen it from residential development.

Scale, Massing, and Architectural Character: The historic scale and massing of the Project has been maintained, while the brick detailing and fenestration pattern are to be restored. The addition is set back from the historic facade to provide rhythm and variation, and features a change in material from the historic building for clear articulation and visual interest.

Environmental Guidelines: Please refer to item 19.34 from the Citywide Urban Design Objectives, above.

Parking: No parking is to be provided on site.

Open Space: The Project provides community open space that is connected to both the Rogers shared street and Bent Street, and provides multi-use spaces that may be programmed by the Project building operator.

Streets and Sidewalks: Trees, low planting, and lighting will support active pedestrian uses, and provide a new identity to Rogers and Bent Streets, while also providing a clear destination to pedestrians on Third Street and at Rogers Street Park. The Bent Street sidewalk will include a new extended curb to provide a more generous entrance to The Yard; the Rogers Street shared street will provide new pedestrian zone widths that meet

ADA accessibility requirements and the intent of the Cambridge Pedestrian Plan and Cambridge Bicycle Plan.

Connections: The Project augments the pedestrian realm on Rogers and Bent Streets – streets that had previously been industrial ways with few public amenities – and provides ample bicycle parking, helping to reinforce connections to future regional pathways and parks in the East Cambridge neighborhood.

Transportation: The Project's Rogers Street shared street plan includes a raised intersection at Rogers and Third, providing for pedestrian crossing that is accessible, safer from vehicular traffic, and more easily used during heavy rain and snowfall. Sheltered bicycle racks are provided per the Cambridge Zoning Ordinance, and short-term parking racks are provided at both the Bent and Rogers Streets sides of The Project.

In sum, the Project has been the result of more than five years of study and community outreach by the City of Cambridge and the Cambridge Redevelopment Authority. We intend the Foundry Building to be a self-sustaining center for creativity and collaboration for the Cambridge community, reinforcing these values through the design of its architecture, landscape, and streetscape.

We appreciate your consideration and are available to answer any questions you may have.

Sincerely,

Stefanie Greenfield, AIA
Principal
Cambridge Seven Associates, Inc.

CITY OF CAMBRIDGE
TRAFFIC, PARKING, + TRANSPORTATION

Joseph E. Barr, Director
344 Broadway, Suite 202
Cambridge, MA 02139

November 26, 2019

Sean Manning
VHB Inc.
99 High Street, 10th Floor
Boston, MA 02110

Michael Black
City of Cambridge
795 Massachusetts Avenue
Cambridge, MA 02139

RE: The Foundry Building TIS (101 Rogers Street)

Dear Sean and Michael:

The Cambridge Traffic, Parking, and Transportation Department (TP&T) received your Transportation Impact Study (TIS) on October 28, 2019 for a proposed project located at 101 Rogers Street in the Kendall Square/East Cambridge area, known as The Foundry Building, by The City of Cambridge.

The project includes adaptive reuse of an existing building that will include approximately 24,200 gross square feet of community/art space and 23,400 gross square feet of office space for a total of 51,200 gross square feet.

Based staff review of the previous TIS and a few corrections made for this updated TIS, the TIS dated November 26, 2019 is certified as complete and accurate.

We look forward to continuing to work with you on this project. Please contact Adam Shulman of my staff at 617-349-4645 if you have any questions or to set up a meeting.

Very truly yours,

Joseph E. Barr
Director

cc: Adam Shulman, Patrick Baxter, TP&T

The Foundry Building

Cambridge, Massachusetts

PREPARED FOR

Michael Black
City of Cambridge
795 Massachusetts Avenue
Cambridge, MA 02139

PREPARED BY

99 High Street
Boston, MA 02110
617.728.7777

November 26, 2019

UNDER THE DIRECTION OF

Sean M. Manning, P.E.
Massachusetts Registration No. 45812

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Introduction & Project Overview

On behalf of the City of Cambridge (the Owner), VHB, Inc. has conducted a Transportation Impact Study (TIS) for The Foundry Building (the Proposed Project), a proposed adaptive reuse of an existing building that will include 24,200 gross square feet of community/art space and 23,400 gross square feet of office space within the Kendall Square/East Cambridge area.

The TIS responds to the scope dated March 15, 2019, defined by the City of Cambridge Traffic, Parking and Transportation (TP&T) Department in response to VHB's Request for Scoping dated February 13, 2019. Copies of the City's scoping letter and VHB's Request for Scoping are included in the Appendix. The TIS has been prepared in conformance with the current City of Cambridge Guidelines for Transportation Impact Studies, as required under the Article 19 Special Permit Project Review. This document is comprised of three components, as follows:

1. Introduction and Project Overview – describing the framework in which the transportation component of this Project was evaluated;
2. Transportation Impact Study (TIS) – presenting the technical information and analysis results as required under the guidelines; and,
3. Planning Board Special Permit Criteria – summarizing the evaluation of the proposed Project as defined under the guidelines.

The required TIS Summary Sheets and Planning Board Criteria Performance Summary are included. Supplementary data and analysis worksheets are provided in the Appendix. Electronic files for Automatic Traffic Recorder (ATR) counts, Turning Movement Counts (TMC), and Synchro analyses are included on an accompanying flash drive.

Project Overview

The Proposed Project will consider the development of up to approximately 24,200 gross square feet of community/art space and 23,400 gross square feet of office space supported by three (3) accessible parking spaces, as well as approximately eleven (11) long-term bicycle parking spaces and fourteen (14) short-term bicycle parking spaces, in accordance with the City's Bicycle Parking Guidelines.

Figures listed below illustrate details of the proposed project program.

- **Figure A** presents a site location map.
- **Figure B** presents the existing conditions of the proposed site.
- **Figure C** presents the proposed site plan.
- **Figure D** presents the TIS study area.

- **Figure E.1** presents the proposed long-term bicycle parking spaces.
- **Figure E.2** presents the proposed short-term bicycle parking spaces at the front of the building.
- **Figure E.3** presents the proposed short-term bicycle parking spaces at the rear of the building.

As shown in Figures A and B, the Project will significantly renovate an existing building (52,200 gross square feet) on a 0.86-acre site on Rogers Street (private way) in Cambridge, Massachusetts. The existing site will be repurposed to contain ground floor community spaces with office space above on the second floor with supporting outdoor active use and open space. The Project will also accommodate required accessible parking spaces, short- and long-term bicycle parking spaces and a dedicated loading/service area. The Project includes a small community performance hall that seats approximately 130 guests, and it is expected that there may be approximately 50 performances throughout the year, many of these to occur on the weekends.

As shown in Figure C, the site currently contains an abandoned factory building of approximately 52,200 square feet that will be repurposed as part of the project. The existing ground floor elevation will have to be lowered so that the building access and egress will be at-grade. Therefore, existing parking located in the basement of the building will not remain in the proposed project.

TABLE A EXISTING SITE CONDITIONS AND USES

Existing Building	Size / Quantity
Square Footage	52,200 SF
Land Use	Industrial
Percent Occupancy	0 %
# of Employees	0 Full Time
	0 Part-time
# of Parking Spaces	Approx. 53 Vehicle Spaces
	0 Bike Spaces

Figure C presents the proposed Foundry Building site plan as well as the proposed Foundry Row pedestrian plaza to the east of the building. As previously noted, the site will include approximately 24,200 gross square feet of community/art space and 23,400 gross square feet of office space in the redeveloped building. No retail uses are proposed as part of this project.

It is currently envisioned that parking needs for the site will be accommodated by available opportunities in nearby, surrounding parking garages and surface lots. Since the Site is in close proximity to the residential neighborhoods of East Cambridge, it is likely that a measurable percentage of the Site users (Cambridge residents) will arrive via walking or bike, further reducing the demand for parking on-site. This provides an opportunity to use nearby parking facilities that have parking availability for those who do wish to drive. The redevelopment of

this Site includes plans to create a pick-up/drop-off area along Rogers Street in addition to converting Rogers Street into a one-way westbound roadway with the exception of the far west end of the street between Fifth Street and the Kendall Square Apartments vehicular entrance.

The Proposed Project program is summarized in Table B below.

TABLE B PROPOSED DEVELOPMENT PROGRAM

Project Component	Size / Quantity
Community/Art Space	20,700 NSF[1] (24,200 GSF[2])
Office Space	22,100 NSF (23,400 GSF)
Total	42,800 NSF (51,200 GSF)
Vehicle Parking	3 on-street accessible spaces
Bicycle Parking	11 long-term spaces, and 14 short-term spaces shared by all users

[1] Net Square Feet
[2] Gross Square Feet

TIS Study Area

The TIS study area for the Proposed Project, as defined by the City of Cambridge, is shown in Figure E. The study intersections include the following:

1. Third Street at Binney Street
2. Third Street at Rogers Street
3. Third Street at Bent Street
4. Fifth Street at Bent Street
5. Fifth Street at Rogers Street
6. Fifth Street at Binney Street

Planning Board Criteria Summary

Based on the TIS analysis, the Project has been evaluated within the context of the Planning Board Criteria to determine if the Project has any potential adverse transportation impacts. Exceeding one or more of the Criteria is indicative of a potentially adverse impact on the City's transportation network. However, the Planning Board will consider mitigation efforts, their anticipated effectiveness, and other information that identifies a reduction in adverse transportation impacts.

The Planning Board Criteria consider the Project's vehicular trip generation, impact to intersection level of service and queuing, as well as increase of volume on residential streets. In addition, pedestrian and bicycle conditions are considered. A discussion of the Criteria set forth by the Planning Board is presented in the final section of the TIS, and the Planning Board Criteria Performance Summary is presented below.

The Project has an estimated 6 exceedances out of 125 data entries. Most exceedances are due to existing pedestrian and bicycle infrastructure.

PROJECT

Project Name:	The Foundry Building
Project Address:	101 Rogers Street Cambridge, MA 02142
Owner/Developer Name:	City of Cambridge
Contact Person:	Michael Black
Contact Address:	795 Massachusetts Avenue Cambridge, MA 02139
Contact Phone Number:	617-201-2181

SIZE

ITE sq. ft. :	42,800 NSF (51,200 GSF), including Levels 1-3, BOH and 900 GSF at mechanical penthouse
Land Use Type:	Community Space and Office

PARKING

Existing Parking Spaces*:	53	Use: Industrial
New Parking Spaces:	Repurposing of 3 existing on-street spaces as accessible parking	Use: N/A
Net New Parking Spaces:	(-50)	

*1990 City of Cambridge Parking Inventory

TRIP GENERATION:

	Daily	Morning Peak Hour	Evening Peak Hour
Total Trips	1,100	154	130
Vehicle	400	62	48
Transit	304	42	36
Pedestrian	310	40	36
Bicycle	26	3	3
Other	60	7	7

MODE SPLIT (Person Trips)

	Office	Community Space
SOV	56%	25%
HOV	8%	3%
Transit	22%	29%
Walk	8%	35%
Bike	3%	2%
Other	3%	6%

CITY OF CAMBRIDGE
Special Permit – Transportation Impact Study (TIS)
Planning Board Criteria Performance Summary
The Foundry Building Planning Board Permit Number: _____TBD_____

TRANSPORTATION CONSULTANT

Company Name: VHB
Contact Name: Sean Manning, PE, PTOE
Contact Phone Number: 617-607-2971

Date of Building Permit Approval: _____

Total Data Entries = 125 **Total Number of Criteria Exceedances = 6**

Criteria A –Project Vehicle Trip Generation

Time Period	Criteria (trips)	Build	Exceeds Criteria?
Weekday Daily	2,000	400	No
Weekday Moring Peak Hour	240	62	No
Weekday Evening Peak Hour	240	48	No

Criteria B – Vehicular LOS

	Morning Peak Hour				Evening Peak Hour			
Intersection	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion?
Third Street at Binney Street	D	E	1.6%	Yes	D	D	1.6%	No

Criteria C – Traffic on Residential Streets

			Morning Peak Hour			Evening Peak Hour		
Roadway	**Segment**	**Amount of Residential**	**Existing[1]**	**Increase**	**Exceeds Criteria?**	**Existing[1]**	**Increase**	**Exceeds Criteria?**
Third Street	Binney St to Rogers St	1/3 or less	698	20	No	870	45	No
	Rogers St to Bent St	1/3 or less	615	15	No	800	13	No
Fifth Street	Binney St to Rogers St	1/3 or less	105	25	No	115	14	No
	Rogers St to Bent St	1/3 or less	100	16	No	130	14	No
Binney Street	Fifth St to Third St	1/3 or less	908	14	No	1085	13	No
Rogers Street	Fifth St to Third St	1/3 or less	48	-5	No	45	-1	No
Bent Street	Fifth St to Third St	1/3 or less	110	136	No	110	25	No

Criteria D – Lane Queue[1] (for signalized intersections)

Intersection	Lane	Morning Peak Hour			Evening Peak Hour		
		2019 Existing	2019 Build	Exceeds Criteria?	2019 Existing	2019 Build	Exceeds Criteria?
Third St at Binney St	Binney EB Left	2	3	No	7	7	No
	Binney EB Thru	3	3	No	7	7	No
	Binney EB Thru/Right	2	2	No	5	5	No
	Binney WB Left	5	5	No	2	2	No
	Binney WB Thru	4	4	No	3	3	No
	Binney WB Thru/Right	4	4	No	3	3	No
	Third NB Left/Thru	3	3	No	5	5	No
	Third NB Right	2	2	No	4	4	No
	Third SB Left/Thru/Right	8	9	No	4	5	No

[1] 50th Percentile Queue (Average Queue)

Criteria E – Pedestrian Delay

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		Existing	Build	Exceeds Criteria?	Existing	Build	Exceeds Criteria?
Third Street at Binney Street	East	D	D	No	D	D	No
	West	D	D	No	D	D	No
	North	D	D	No	D	D	No
	South	D	D	No	D	D	No
Third Street at Bent Street	East	A	A	No	A	A	No
	North	C	C	No	E	E	Yes
Fifth Street at Bent Street	East	A	A	No	A	A	No
	West	A	A	No	A	A	No
	North	A	A	No	A	A	No
	South	A	A	No	A	A	No
Binney Street at Fifth Street	North	A	A	No	A	A	No

Criteria E – Pedestrian and Bicycle Facilities

Adjacent Street	Link (between)	Sidewalk or Walkway Present	Exceeds Criteria?	Bicycle Facilities or Right of Ways Present	Exceeds Criteria?
Rogers Street	Third Street and Fifth Street	Yes	No	No	Yes
Bent Street	Third Street and Fifth Street	Yes	No	No	Yes
Third Street	Bent Street and Rogers Street	Yes	No	No	Yes
Fifth Street	Bent Street and Rogers Street	Yes	No	No	Yes

Transportation Impact Study

This Transportation Impact Study for the proposed Foundry Building (the Project) describes existing and future transportation conditions in the study area in accordance with the City of Cambridge Sixth Revision (November 28, 2011) of the Transportation Impact Study Guidelines. The study area for the TIS includes 1 signalized intersection and 5 unsignalized intersections as previously shown in Figure D.

This section includes inventories of physical and operational conditions in the study area including roadways, intersections, crosswalks, sidewalks, on-street and off-street parking, transit facilities, and land uses in the study area. Transportation data that were collected and compiled are presented, including automatic traffic recorder counts, intersection turning movement counts, pedestrian and bicycle counts, vehicle crash data, and transit service data.

1 Inventory of Existing Conditions

1.a Roadways

The Project Site is located at 101 Rogers Street, north of Binney Street, on the block between Third Street and Fifth Street in the Kendall Square neighborhood of East Cambridge. Figure D shows the roadway layout near the project site.

Third Street is a north-south roadway just east of the Project Site that connects the Kendall Square area and the Monsignor O'Brien Highway/Lechmere Station area. Fifth Street is a north-south roadway west of the Project Site that connects Binney Street to Cambridge Street. Rogers Street is an east-west roadway north of the Project Site that is directly adjacent to the back of the proposed building. Figures 1.a.1 through 1.a.5 provide detailed plans of these roadways surrounding the Project Site.

1.b Intersections

The project study area included the following six study intersections which were presented previously in Figure E and illustrated in Figures 1.b.1 through 1.b.6.

1. Third Street at Binney Street
2. Third Street at Rogers Street
3. Third Street at Bent Street
4. Fifth Street at Bent Street
5. Fifth Street at Rogers Street
6. Fifth Street at Binney Street

1.c Parking

According to the City's 1990 parking inventory, 101 Rogers Street was reported as having approximately 53 parking spaces. The existing parking spaces will be removed as part of this project because the existing building's ground floor will be lowered half a level to be brought to grade. Figure 1.c.1 presents existing on-street parking regulations in the area. On-street parking in the vicinity of the site is mainly unrestricted, private, or resident permit only. Three accessible spaces will be available adjacent to the building for visitors to the site.

1.d Transit Services

Public Transit Services

Figure 1.d.1 illustrates existing Massachusetts Bay Transportation Authority (MBTA) services in the study area. Although the site is not directly served by MBTA bus routes, there are several bus routes that are accessible north or south of the site. The routes 64, 68, 85, and CT2 stop south of the site in Kendall Square. These bus routes provide service to several locations such as Brighton, Harvard Square, Union Square, Sullivan Station and Ruggles Station. The route 69 stops along Cambridge Street before terminating at Lechmere station where the routes 80, 87, and 88 also terminate.

Kendall/MIT Station, the stop along the MBTA Red Line, is approximately a half-mile walk to the south of the Project via Third Street. During the peak hours, a Red Line train is scheduled to enter the station every 4.5 minutes with a northern terminus at Alewife and alternative destinations of Ashmont or Braintree to the south. Additionally, Lechmere Station, the end of the Green Line E Branch, is approximately a half-mile walk to the north of the Project via Third Street and Cambridge Street. During the peak hours, a Green Line E Branch train is scheduled to leave the station every 6 minutes. With the proposed shared pedestrian space proposed along the east side of the Foundry Building, there will be an equal opportunity for those taking the Red or Green Line to exit Rogers Street or Bent Street to access Third Street and travel to the respective rapid transit station.

Private Transit Services

The Charles River Transportation Management Association (TMA) is a membership based, non-profit association of businesses, institutions, and municipalities that work together for the purpose of providing and promoting transportation options for commuters. The shuttle service provides connections from North Station to Lechmere and Kendall/MIT. The closest stop in relation to the Site is located at Binney Street at Sixth Street, as illustrated in Figure 1.d.2. Service is provided at 8 – 10 minute headways during typical commuter peak periods in each direction between 6:20 AM and 8:00 PM on weekdays. EZRide shuttles do not run on the weekends.

Additionally, BlueBikes and Zipcar are available in the surrounding area with varying bicycles/vehicles supplied. Their locations are shown in Figure 1.d.2.

1.e Land Use

Figure 1.e.1 illustrates land uses in the area surrounding the Project site. The neighborhood is largely characterized by industrial, utility, and residential uses.

2 Data Collection

2.a ATR Counts

48-hour Automatic Traffic Recorder (ATR) counts were conducted on Wednesday, March 20th and Thursday, March 21st, 2019, to capture existing daily vehicle volumes within the Project study area. An ATR count was collected at the location of Bent Street west of Third Street, as requested in the TP&T Scoping Letter. Since Rogers Street was closed for construction to vehicles, pedestrians, and bicyclists, an ATR was not collected at this location.

A traffic volume summary for the ATRs is presented in Tables 2.a.1 and 2.a.2. Detailed count data sheets are included in the Appendix.

TABLE 2.A.1 EXISTING TRAFFIC VOLUME SUMMARY (MARCH 2019)

		Morning Peak Hour			Evening Peak Hour		
Location	**Daily[a]**	**Volume[b]**	**K[c]**	**Peak Dir**	**Volume**	**K**	**Peak Dir**
Bent Street *west of Third Street*	1,625	138	8.5%	WB	127	7.9%	EB

a vehicles per day
b vehicles per peak hour
c percentage of daily traffic that occurs during the peak hour

TABLE 2.A.2 EXISTING AVERAGE DAILY TRAFFIC SUMMARY (MARCH 2019)

	Bent Street *west of Third Street*		
Start Time	**EB**	**WB**	**Total**
12:00 AM	4	2	6
1:00 AM	3	1	4
2:00 AM	3	2	5
3:00 AM	2	6	8
4:00 AM	6	20	26
5:00 AM	17	60	77
6:00 AM	30	76	106
7:00 AM	45	93	138
8:00 AM	69	66	135
9:00 AM	41	58	99
10:00 AM	35	45	80
11:00 AM	48	37	85
12:00 PM	49	32	81
1:00 PM	43	42	85
2:00 PM	73	35	108
3:00 PM	51	42	93
4:00 PM	64	48	112
5:00 PM	65	62	127
6:00 PM	53	29	82
7:00 PM	35	20	55
8:00 PM	15	20	35
9:00 PM	17	14	31
10:00 PM	18	9	27
11:00 PM	12	8	20
Total	**798**	**827**	**1,625**

2.b Pedestrian and Bicycle Counts

Twelve-hour pedestrian and bicycle counts were performed on Wednesday, March 20, 2019, between 7:00 AM and 7:00 PM along Bent Street west of Third Street, near the Project site. Pedestrian count data is summarized in Table 2.b.1 and bicycle count data is presented in Table 2.b.2. The south sidewalk on Bent Street was closed for construction, so only counts for the north sidewalk were collected.

TABLE 2.B.1 EXISTING 12-HOUR PEDESTRIAN VOLUMES (MARCH 2019)

	Bent Street *west of Third Street*					
	North Sidewalk		**South Sidewalk***		**In Roadway**	
Start Time	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
7:00 AM	1	7	-	-	1	1
8:00 AM	27	19	-	-	1	0
9:00 AM	18	18	-	-	0	0
10:00 AM	2	9	-	-	0	0
11:00 AM	40	33	-	-	2	0
12:00 PM	18	13	-	-	0	1
1:00 PM	26	24	-	-	0	2
2:00 PM	6	8	-	-	3	5
3:00 PM	10	8	-	-	1	1
4:00 PM	8	6	-	-	0	0
5:00 PM	14	23	-	-	1	0
6:00 PM	2	7	-	-	1	2
Total	**172**	**175**	**-**	**-**	**10**	**12**

*South sidewalk closed due to construction at the time of the data collection effort

TABLE 2.B.2 EXISTING 12-HOUR BICYCLE VOLUMES (MARCH 2019)

	Bent Street *west of Third Street*					
	North Sidewalk		**South Sidewalk***		**In Roadway**	
Start Time	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
7:00 AM	0	0	-	-	2	0
8:00 AM	0	0	-	-	0	0
9:00 AM	0	0	-	-	4	0
10:00 AM	0	0	-	-	4	2
11:00 AM	0	0	-	-	0	0
12:00 PM	0	0	-	-	3	0
1:00 PM	0	1	-	-	2	0
2:00 PM	1	0	-	-	0	0
3:00 PM	0	0	-	-	1	0
4:00 PM	0	0	-	-	0	1
5:00 PM	0	0	-	-	1	2
6:00 PM	0	0	-	-	2	1
Total	**1**	**1**	**-**	**-**	**19**	**6**

*South sidewalk closed due to construction at the time of the data collection effort

2.c Intersection Turning Movement Counts and Queues

Turning movement counts (TMC), including vehicles, pedestrians, and bicycles, were conducted at all study area intersections on Wednesday, March 20, 2019. The results of these counts indicated that the peak hours for vehicular traffic in the study area are:

- Morning Peak Hour – 8:15 AM – 9:15 AM
- Evening Peak Hour – 4:45 PM – 5:45 PM

The existing morning and evening peak hour vehicle, pedestrian, and bicycle turning movement volumes are presented in Figures 2.c.1 through 2.c.6. It should be noted that based on a review of historical count information in the area, the volumes collected and presented in the *Binney Street Project TIS* (dated November 12, 2009) for the intersection of Binney St/Third St are higher than those collected in March 2019. Therefore, for this analysis, the vehicle volumes at Binney St/Third St have been adjusted to match the *Binney Street Project TIS*. The raw count data is included in the Appendix. Since Rogers Street was closed due to construction at the time of the counts, the vehicle turning movement counts at the intersections of Third Street at Rogers Street and Fifth Street at Rogers Street were determined through the use of historical counts from nearby projects and consultation with TP&T. This was only done for vehicle counts and there are no bicycle or pedestrian data at these locations.

VHB staff also conducted queue observations during the morning and evening peak hours at the signalized intersections on Wednesday, March 20, 2019, while TMCs were being captured. Table 2.c.1 presents the existing 50th percentile (average) queue observations for the signalized study area intersections. The longest average queue forms at the southbound approach along Third Street at Binney Street. A detailed queue analysis is provided in Section 7 of this report.

TABLE 2.C.1 INTERSECTION QUEUE OBSERVATIONS (AVERAGE # OF CARS)

		Average # of Observed Cars	
Intersection	**Lane**	Morning Peak Hour	Evening Peak Hour
Third St at Binney St (Signalized)	Binney Street EB Left	2	4
	Binney Street EB Thru	2	3
	Binney Street EB Thru/Right	2	4
	Binney Street WB Left	4	0
	Binney Street WB Thru	3	2
	Binney Street WB Thru/Right	4	2
	Third Street NB Left/Thru	2	6
	Third Street NB Right	1	1
	Third Street SB Left/Thru/Right	11	6
Third St at Bent St (Unsignalized)	Bent Street EB Left/Thru/Right	1	1
	Parking Lot WB Left/Thru/Right	0	0
Fifth St at Bent St (Unsignalized)	Bent Streets EB Left/Thru/Right	1	1
	Bent Streets WB Left/Thru/Right	1	1
	Fifth Streets NB Left/Thru/Right	1	1
	Fifth Streets SB Left/Thru/Right	1	1
Fifth St at Binney St (Unsignalized)	Fifth Streets SB Right	1	1

2.d Crash Analysis

Study area crash data was obtained from MassDOT's records for the most recent three-year period available, January 2014 through December 2016. Analysis of the crash data is summarized in Table 2.d.1 and includes the calculated crash rates (number of reported crashes per million entering vehicles) based on the evening peak traffic volumes. A detailed summary by crash type is presented in Table 2.d.2.

TABLE 2.D.1 MASSDOT CRASH ANALYSIS SUMMARY (JANUARY 2014 – DECEMBER 2016)

Location	**Total Crashes (3-year period)**	**Crashes Involving Pedestrians**	**Crashes Involving Bicycles**	**Calculated Crash Rate**
Third Street at Binney Street	9	0	0	0.45
Third Street at Rogers Street	2	0	0	0.20
Third Street at Bent Street	4	0	0	0.38
Fifth Street at Bent Street	1	0	0	0.33
Fifth Street at Rogers Street	1	0	0	0.42
Fifth Street at Binney Street	3	0	1	0.24

Source: MassDOT Interactive Crash Portal, Accessed on 3/29/2019

TABLE 2.D.2 MASSDOT CRASH ANALYSIS DETAILS (JANUARY 2014 – DECEMBER 2016)

	Third Street at Binney Street	Third Street at Rogers Street	Third Street at Bent Street	Fifth Street at Bent Street	Fifth Street at Rogers Street	Fifth Street at Binney Street
Signalized?	Yes	No	No	No	No	No
MassDOT Average Crash Rate	0.71	0.52	0.52	0.52	0.52	0.52
Calculated Crash Rate	0.45	0.20	0.38	0.33	0.42	0.24
Exceeds Average?	No	No	No	No	No	No
Year						
2014	6	0	1	0	0	1
2015	1	0	2	0	1	0
2016	2	2	1	1	0	2
Total	9	2	4	1	1	3
Collision Type						
Angle	2	1	0	0	0	1
Head-on	1	0	0	0	0	0
Rear-end	3	0	2	0	0	0
Sideswipe, opposite direction	0	0	0	0	0	0
Sideswipe, same direction	3	1	1	0	0	0
Single Vehicle Crash	0	0	1	0	0	2
Not reported	0	0	0	1	1	0
Total	9	2	4	1	1	3
Severity						
Fatal Injury	0	0	0	0	0	0
Non-Fatal Injury	2	0	1	0	0	1
Property Damage Only	5	1	3	0	0	0
Not Reported	2	1	0	1	1	2
Total	9	2	4	1	1	3
Time of Day						
Weekday, 7:00 AM – 9:00 AM	0	1	0	0	0	1
Weekday, 4:00 – 6:00 PM	1	0	2	0	0	0
Saturday 11:00 AM – 2:00 PM	1	0	1	0	0	0
Weekday, other time	6	1	1	1	1	2
Weekend, other time	1	0	0	0	0	0
Total	9	2	4	1	1	3
Pavement Conditions						
Dry	7	1	2	0	1	3
Wet	2	1	2	0	0	0
Snow	0	0	0	0	0	0
Other	0	0	0	0	0	0
Not reported	0	0	0	1	0	0
Total	9	2	4	1	1	3
Non-Motorist (Bike, Pedestrian)	0	0	0	0	0	1
Ambient Light						
Daylight	8	2	3	0	0	3
Dusk	0	0	0	0	1	0
Dark – lighted roadway	1	0	1	0	0	0
Not Reported	0	0	0	1	0	0
Total	9	2	4	1	1	3

Weather Condition						
Clear	5	1	2	0	1	3
Clear/Cloudy	1	0	0	0	0	0
Cloudy	1	0	0	0	0	0
Cloudy/Rain	1	1	1	0	0	0
Cloudy/Snow	0	0	0	0	0	0
Rain	1	0	1	0	0	0
Sleet, hail (freezing rain or drizzle)	0	0	0	0	0	0
Not Reported	0	0	0	1	0	0
Total	9	2	4	1	1	3

Source: MassDOT Interactive Crash Portal, Accessed on 3/29/2019

MassDOT has 6 districts within Massachusetts, and Cambridge falls under the jurisdiction of District 6. The average crash rate per million entering vehicles for District 6 is 0.71 for signalized intersections and 0.52 for unsignalized intersections. According to the data from the MassDOT database, all the study area intersections fall under the District 6 average for signalized and unsignalized intersections. The statewide crash rate, in comparison, is 0.78 for signalized intersections and 0.57 for unsignalized intersections. All study area intersections have crash rates lower than the statewide average for signalized and unsignalized intersections.

The intersection of Third Street at Binney Street had the highest number of crashes with nine crashes from 2014 through 2016. Rear-end and sideswipe (same direction) crashes occurred the most often, followed by angle and head-on crashes. Two-thirds of the crashes occurred during weekday off-peak hours. Seven crashes occurred during dry pavement and weather conditions, and two occurred during wet conditions. All but one crash occurred during daylight. None of the crashes involved pedestrians or bicyclists. Note: while it is not expected to have changed crash and safety conditions significantly, the eastern leg of Binney Street was reconstructed during this three-year period.

At the intersection of Fifth Street and Binney Street, one crash involved a bicyclist. Based on the crash data provided by MassDOT, a vehicle travelling westbound on Binney Street turned right onto Fifth Street and collided with a bicyclist, resulting in injury. No other intersections reported crashes involving a non-motorist during this three-year time period.

2.e Public Transit

Transit stops and stations closest to the site were shown previously in Figures 1.d.1 and 1.d.2. Daily weekday ridership as well as operating hours and peak-hour headway data are provided in Table 2.e.1 for bus routes accessible from the site and for the Red Line. A more detailed transit analysis is provided in Section 10 of this report.

TABLE 2.E.1 MBTA SERVICES

Route	Origin/Destination	Hours of Operation	Weekday Ridership[1]	Peak Hour Headways
Route 64	Oak Square – University Park or Kendall/MIT	5:31 AM – 1:26 AM	1,977	~ 20 – 24 minutes
Route 68	Harvard Square – Kendall/MIT	6:35 AM – 6:58 AM	468	~ 40 – 45 minutes
Route 69	Harvard Square – Lechmere Station	5:25 AM – 1:11 AM	3,185	~ 10 – 20 minutes
Route 80	Arlington Center – Lechmere Station	5:00 AM – 1:25 AM	2,058	~ 30 – 35 minutes
Route 85	Spring Hill – Kendall/MIT Station	5:45 AM – 7:58 PM	589	~ 15 – 50 minutes
Route 87	Arlington Center or Clarendon Hill – Lechmere Station	5:06 AM – 1:23 AM	3,796	~ 18 – 20 minutes
Route 88	Clarendon Hill – Lechmere Station	5:16 AM – 1:14 AM	4,075	~ 14 – 20 minutes
Route CT2	Sullivan Station – Ruggles Station	5:55 AM – 7:40 PM	2,815	~ 20 – 23 minutes
Red Line	Alewife/Ashmont-Braintree Combined	5:13 AM – 12:30 AM	272,684	~ 4.5 minutes
Green Line "E Branch"	Lechmere Station – Heath Street	5:01 AM – 12:47 AM	18,166	~ 6 minutes

Sources: MBTA Schedule Spring 2019
[1] MBTA Bluebook 2014 14th Edition
[2] Ashmont/Braintree Ridership Data is combined

2.f Parking

The existing building on the proposed Project Site, is currently vacant and has approximately 53 parking spaces. On Rogers Street within the Site's jurisdiction, there are 11 head-in parking spaces and 42 below-grade parking spaces provided.

Since the Foundry Building's ground floor elevation has to be lowered so that the ground floor level is brought down to grade, the parking below the building must be removed and turned into a void space. The on-street parking regulations within a quarter-mile from the Site were shown previously in Figure 1.c.1.

3 Project Traffic

3.a Mode Share

In coordination with the City of Cambridge, Traffic, Parking and Transportation Department (TP&T), mode shares for the Project were developed from data based on census surveys and information from the K2C2 study. Table 3.a.1 presents the TP&T approved mode share rates for this analysis.

TABLE 3.A.1 MODE SHARES

Mode	Community/Art Space	Office
Drive Alone	25%	56%
Rideshare	3%	8%
Transit	29%	22%
Bike	2%	3%
Walk	35%	8%
Other/Work at Home	6%	3%
Total	100%	100%

Sources: Office mode share based on American Community Survey 2006-2010 workforce in Census Tract 3523. Community/Art Space based on American Community Survey 2013-2017 for Residents in Census Tract 3523

3.b Trip Generation

The Institute of Transportation Engineers *Trip Generation Manual* (10th Edition) was used to determine the number of trips that will be generated by the Project. The trips generated by the community/art space was calculated using land use code (LUC) 495, Recreational Community Center. LUC 710, Office, was used for the office component of the Project.

Table 3.b.1 presents unadjusted project-generated trips for the proposed project.

TABLE 3.B.1 ITE UNADJUSTED PROJECT-GENERATED TRIPS

	Community/Art Space	Office	Total
Morning Peak Hour			
In	57	41	98
Out	29	7	36
Total	86	48	134
Evening Peak Hour			
In	39	5	44
Out	44	25	69
Total	83	30	113

Source: ITE Trip Generation Manual 10th Edition,
LUC 495 – Recreational Community Center (regression) and LUC 710 – Office (regression)

For transit, walking, and bicycling trips, the ITE unadjusted trip generation estimates were used to derive person-trips and applied to the appropriate, approved mode shares. Table 3.b.2 below shows the total project-generated trips using the proposed trip rates shown above for with the inclusion of the mode shares shown previously in Table 3.a.1.

The Project will also incorporate a small performance space, seating up to approximately 130 people. This performance space will be available for use for groups such as community theater groups, dance troupes, or community concerts. These types of events will be held mainly during the evening hours or on the weekends—outside of the typical weekday morning and evening peak hours. Since these performances will occur outside of standard work hours for the neighborhood, it is anticipated that the parking needs for this land use can be accommodated in the nearby parking garages that are primarily used for commuters. There may be up to 50 performances during the calendar year.

TABLE 3.B.2 TOTAL PROJECT-GENERATED TRIPS

	Vehicle Trips			Transit Trips			Bicycle Trips			Walk Trips		
	Morning Peak	Evening Peak	Daily	Morning Peak	Evening Peak	Daily	Morning Peak	Evening Peak	Daily	Morning Peak	Evening Peak	Daily
Community/ Art Space												
Entering	18	13	108	19	14	118	1	1	8	23	16	143
Exiting	10	14	108	10	15	118	1	1	8	12	18	143
Total	28	27	216	29	29	236	2	2	16	35	34	286
Office												
Entering	29	3	92	11	1	34	1	0	5	4	0	12
Exiting	5	18	92	2	6	34	0	1	5	1	2	12
Total	34	21	184	13	7	68	1	1	10	5	2	24
TOTAL												
Entering	47	16	200	30	15	152	2	1	13	27	16	155
Exiting	15	32	200	12	21	152	1	2	13	13	20	155
Total	62	48	400	42	36	304	3	3	26	40	36	310

Source: Institute of Transportation Engineers, *Trip Generation Manual* (10th Edition); LUC 495 and 710 and City approved mode shares (Table 3.a.1 of this TIS)

As previously stated, no trip credits (i.e. trips to be removed from roadway network due to removal of the existing land use) were taken for the existing site since the property has been vacant for several years.

3.c Trip Distribution and Assignment

K2C2 data for Sub-Area 5 was used to determine distribution of project vehicle trips onto the roadway network. Slight modifications to this distribution have been made, as directed by the TP&T. Nearly half of the project trips will enter and exit the site area using Binney Street. Table 3.c.1 and Figure 3.c.1 summarize the project-generated vehicle trip distribution.

TABLE 3.C.1 PROJECT-GENERATED VEHICLE TRIP DISTRIBUTION

		Distribution	
Trip Assignment	Direction	Inbound	Outbound
Binney Street	to/from west	42%	46%
Binney Street	to/from east	10%	0%
Rogers Street	to/from east	5%	0%
Rogers Street	to/from west	0%	4%
Third Street	to/from south	15%	18%
Third Street	to/from north	15%	27%
Fifth Street	to/from north	13%	5%

Source: K2C2 Study, Sub-Area 5

Vehicle trips were assigned to the roadway network according to this distribution with the assumption that most trips are destined for the two nearest parking garages to the site with available public parking spaces. The project will not provide dedicated vehicle parking, although three accessible spaces will be provided across from The Foundry Building front door along Rogers Street. A portion of project-generated vehicle trips were assumed to be drop-offs and pick-ups directly at the Site's front entrance, and the remaining trips were divided among the Kendall Center Blue Garage and the 350 Kendall Street Garage, the two nearest commercial parking facilities. The locations of these parking garages relative to the Site are shown in Figure 9.a.1.

The vehicle trip distribution also reflects that Rogers Street will be converted to one-way (westbound) in connection with the Project. Rogers Street from Fifth Street to the Lofts at Kendall Square Apartments garage driveway is proposed to remain two-way to accommodate vehicles entering and exiting the garage.

The resulting distributed project vehicle trips are presented in Figures 3.c.2 and 3.c.3 for the morning and evening peak hours, respectively.

3.d Service and Loading

The site will maintain the loading dock located on Rogers Street to the west of the building entrance. This dock will serve larger delivery vehicles and trucks while a designated on-street loading space on Bent Street will serve short-term deliveries and smaller vehicles. Daily mail and package delivery will be most likely be handled in this on-street area as well but is subject to agreement with the USPS and delivery vendors. Additionally, the Project will provide a drop-off area on Rogers Street 100 feet in length and approximately seven (7) feet wide to accommodate up to five (5) vehicles. The curb space outside of this drop-off area will be signed as "No Parking Anytime" to provide adequate space for vehicles turning in and out of the adjacent Equity driveway and Foundry loading dock. The travel lane width on Rogers Street will be approximately 13.75 feet while retaining the eight-foot wide parking lane along the southern portion of Rogers Street. The Project is proposing to modify and reconstruct the portion of Rogers Street adjacent to the Site. This includes modifying the curb line, bump out, and landscaping abutting 195 Binney Street.

Figure 3.d.1 indicates the loading and servicing zone for the Project.

4 Background Traffic

In accordance with the City's Scoping Letter and TIS Guidelines, a general background traffic growth of 0.5% per year for five years to the 2024 Future Condition was included in the Future condition analysis.

In addition, trips associated with specific planned projects in the area of the Project site have been incorporated into the 2024 Future Condition analysis. These specific projects include:

- 40 Thorndike Street
- 249 Third Street
- Alexandria Binney Street Development
- Kendall Square Urban Renewal Plan Amendment
- MIT Kendall Square Redevelopment

All buildings in the Alexandria Binney Street Development except for the properties at 161 First Street and 41 Linskey Way are built and occupied. Therefore, the future condition incorporated background traffic for this development associated with 161 First Street and 41 Linskey Way only.

5 Traffic Analysis

Traffic networks were developed in accordance with the TIS Guidelines, for the 2019 Existing, 2019 Build and 2024 Future Condition scenarios for both the morning and evening peak hours.

5.a 2019 Existing Condition

The 2019 Existing Condition analysis is based on existing vehicle, bicycle, and pedestrian counts at the study area intersections (see Section 2). Since Rogers Street, from Third Street to Fifth Street, was closed at the time of the traffic counts, historical data was used to make assumptions regarding the vehicle volumes during onto and out of Rogers Street at the intersections of Roger Street at Third Street and Rogers Street at Fifth Street. The 2019 Existing Condition networks were shown previously in Figures 2.c.1 and 2.c.2.

5.b 2019 Build Condition

The 2019 Build Condition assumes full occupancy of the community/art space and the office space. The 2019 Build Condition network consists of the 2019 Existing Condition volumes plus the project-generated trips. The 2019 Build Condition volume networks are shown in Figures 5.b.1 and 5.b.2.

The 2019 Build Condition assumes that Rogers Street will be converted to one-way (westbound) in connection with the Project. The conversion to a one-way street will allow The Foundry Building to enhance the pedestrian realm in front of the building, where automobile drop-offs and pick-ups will also occur. Rogers Street from Third Street to the Lofts at Kendall Square Apartments garage driveway is proposed to become one-way westbound, while Rogers Street from the garage driveway to Fifth Street is proposed to remain two-way to accommodate vehicles entering and exiting the garage. Proposed traffic operations along Rogers Street are shown in Figure 5.b.3. Existing vehicle trips were redistributed to reflect this change along Rogers Street in the 2019 Build Condition. To avoid having vehicles from traveling down Rogers Street from Fifth Street (vehicles not destined for the Lofts at Kendall Square Apartments garage driveway), signage and striping is proposed to indicate that the roadway is only two-way for a short segment to allow access to the garage. A conceptional plan of the Rogers Street traffic operations is provided in Figure 5.b.4.

5.c 2024 Future Condition

Background traffic growth was assumed to occur at one-half (0.5) percent per year for five years to the 2024 Future Condition. Additionally, volumes generated from background projects that are planned to come on-line during this five-year period were added to the network. The following background projects were included:

- Kendall Square Urban Renewal Plan Amendment No. 10
- 249 Third Street

- 40 Thorndike Street
- MIT Kendall Square Redevelopment
- Alexandria Binney Street Development

The resulting 2024 Future Condition represents the 2019 Build Condition plus background traffic growth and background project traffic. The traffic volume networks are shown in Figures 5.c.1 and 5.c.2.

6 Vehicle Capacity Analysis

6.a Capacity Analysis

Synchro 9 software was used to determine the vehicle level of service (VLOS) for the ten signalized and unsignalized study area intersection. Synchro software is based on the 2000 Highway Capacity Manual.

Results for the 2019 Existing, 2019 Build, and 2024 Future Conditions are presented in Table 6.a.1 and Table 6.a.2 for signalized intersections and Table 6.a.3 and Table 6.a.4 for unsignalized intersections. The tables also show the difference in delay between the Existing and Build conditions (delay due to project impact) and between the Existing and Future delay (total delay from project and other background growth). Figures 6.a.1 and 6.a.2 illustrate the overall VLOS for each intersection for the morning and evening peak hour, respectively. A summary of the analysis results follows.

TABLE 6.A.1 SIGNALIZED INTERSECTION LEVEL OF SERVICE RESULTS – MORNING PEAK HOUR

		Existing (2019)			Build (2019)				Future (2024)			
Intersection	**Movement**	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay	v/c	Delay	VLOS	Difference in Delay
Third Street at Binney Street	Binney St EB Left	0.79	61.0	E	0.82	65.6	E	4.6	0.92	86.2	F	20.6
	Binney St EB Thru/Right	0.43	30.2	C	0.44	30.5	C	0.3	0.70	38.5	D	8.0
	Binney St WB Left	0.82	53.5	D	0.83	53.5	D	0.0	0.91	64.6	E	11.1
	Binney St WB Thru/Right	0.50	25.5	C	0.50	25.7	C	0.2	0.61	28.3	C	2.6
	Third St NB Left/Thru	0.75	78.1	E	0.89	112.4	F	34.3	0.90	111.3	F	-1.1
	Third St NB Right	0.22	11.7	B	0.22	11.6	B	-0.1	0.26	11.0	B	-0.6
	Third St SB Left/Thru/Right	1.10	100.3	F	1.13	110.3	F	10.0	1.37	207.7	F	97.4
	Overall	**0.83**	**52.8**	**D**	**0.84**	**57.3**	**E**	**4.5**	**1.01**	**88.1**	**F**	**30.8**

v/c = volume-to-capacity ratio; Delay = average delay expressed in seconds per vehicle; VLOS = vehicular level of service

TABLE 6.A.2 SIGNALIZED INTERSECTION LEVEL OF SERVICE RESULTS - EVENING PEAK HOUR

		Existing (2019)			Build (2019)				Future (2024)			
Intersection	**Movement**	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay	v/c	Delay	VLOS	Difference in Delay
Third Street at Binney Street	Binney St EB Left	0.94	67.4	E	0.94	69.4	E	2.0	1.16	134.0	F	64.6
	Binney St EB Thru/Right	0.46	20.4	C	0.46	20.4	C	0.0	0.62	23.6	C	3.2
	Binney St WB Left	0.77	63.7	E	0.78	64.5	E	0.8	1.00	120.9	F	56.4
	Binney St WB Thru/Right	0.46	29.4	C	0.46	29.5	C	0.1	0.67	34.7	C	5.2
	Third St NB Left/Thru	0.80	43.9	C	0.81	45.0	D	1.1	0.93	60.2	E	15.2
	Third St NB Right	0.65	27.4	C	0.65	27.4	C	0.0	0.75	33.1	C	5.7
	Third St SB Left/Thru/Right	0.73	40.4	D	0.77	42.8	D	2.4	0.88	54.2	D	11.4
	Overall	**0.72**	**38.0**	**D**	**0.73**	**39.0**	**D**	**1.0**	**0.89**	**56.6**	**E**	**17.6**

The Project contributes very minor increases in delay at intersection approaches in the 2019 Build Condition with the exception of the Third Street northbound left/thru movement, which has a delay increase of 34.3 seconds during the morning peak hour. This increase in delay is caused by the existing sensitivity of the movement at LOS F, nine additional project-generated trips in the southbound thru direction, and the addition of only four project-generated trips at this approach. However, background projects in the 2024 Future Condition contribute larger increases in delay, most notably during the morning peak at the northbound and southbound approaches. Note: the decreases in delay and larger increases shown in the tables may be due to signal phase actuation as more vehicles are processed through certain lane movements.

TABLE 6.A.3 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE RESULTS – MORNING PEAK HOUR

		Existing (2019)			Build (2019)				Future (2024)			
Intersection	**Approach**	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay	v/c	Delay	VLOS	Difference in Delay
Third Street at Rogers Street	Rogers St EB Left/Right	0.05	9.9	A	-	-	-	-	-	-	-	-
	Rogers St WB Left/Thru/Right	0.04	9.7	A	0.0	9.8	A	0.1	0.05	10.3	B	0.5
Third Street at Bent Street	Bent St EB Left/Thru/Right	0.11	10.2	B	0.15	10.2	B	0.0	0.17	10.9	B	0.7
	Driveway WB Left/Thru/Right	0.00	0.0	A	0.00	0.0	A	0.0	0.00	0.0	A	0.0
Fifth Street at Bent Street	Bent St EB Left/Thru/Right	-	7.7	A	-	8.0	A	0.3	-	8.0	A	0.0
	Bent St WB Left/Thru/Right	-	7.9	A	-	8.0	A	0.1	-	8.0	A	0.0
	Fifth St NB Left/Thru/Right	-	7.8	A	-	8.0	A	0.2	-	8.0	A	0.0
	Fifth St SB Left/Thru/Right	-	7.5	A	-	7.7	A	0.2	-	7.7	A	0.0
Fifth Street at Rogers Street	Rogers St EB Left/Thru/Right	0.05	8.7	A	0.03	8.7	A	0.0	0.03	8.7	A	0.0
	Rogers St WB Left/Thru/Right	0.03	8.9	A	0.10	9.1	A	0.2	0.11	9.1	A	0.0
Binney Street at Fifth Street	Fifth St SB Right	0.14	12.2	B	0.20	12.8	B	0.6	0.21	12.6	B	-0.2

TABLE 6.A.4 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE RESULTS – EVENING PEAK HOUR

		Existing (2019)			Build (2019)				Future (2024)			
Intersection	**Approach**	v/c	Delay	VLOS	v/c	Delay	VLOS	Difference in Delay	v/c	Delay	VLOS	Difference in Delay
Third Street at Rogers Street	Rogers St EB Left/Right	0.06	11.4	B	-	-	-	-	-	-	-	-
	Rogers St WB Left/Thru/Right	0.05	11.1	B	0.05	11.2	B	0.1	0.06	12.6	B	1.4
Third Street at Bent Street	Bent St EB Left/Thru/Right	0.12	11.6	B	0.15	11.3	B	-0.3	0.19	12.4	B	1.1
	Driveway WB Left/Thru/Right	0.06	11.4	B	0.06	11.5	B	0.1	0.07	12.9	B	1.4
Fifth Street at Bent Street	Bent St EB Left/Thru/Right	-	7.7	A	-	7.8	A	0.1	-	7.9	A	0.1
	Bent St WB Left/Thru/Right	-	7.7	A	-	7.8	A	0.1	-	7.9	A	0.1
	Fifth St NB Left/Thru/Right	-	7.7	A	-	8.0	A	0.2	-	8.1	A	0.1
	Fifth St SB Left/Thru/Right	-	7.9	A	-	8.1	A	0.2	-	8.2	A	0.1
Fifth Street at Rogers Street	Rogers St EB Left/Thru/Right	0.01	8.9	A	0.01	8.9	A	0.0	0.01	8.9	A	0.0
	Rogers St WB Left/Thru/Right	0.02	9.4	A	0.08	10.0	B	0.6	0.10	10.2	B	0.2
Binney Street at Fifth Street	Fifth St SB Right	0.13	13.5	B	0.16	13.9	B	0.4	0.20	15.3	B	1.4

Side streets at the unsignalized study intersections experience very minimal increases in delay in the 2019 Build Condition and the 2024 Future Condition.

7 Queue Analysis

Queue analysis was performed in combination with the LOS analysis. Tables 7.a.1 and 7.a.2 show the Simtraffic results for the modeled average queues in the number of vehicles for each scenario for the morning and evening peak hour, respectively. VHB staff conducted queue observations during the morning and evening peak hours at the signalized intersections on Wednesday, March 20, 2019, while TMCs were being captured.

TABLE 7.A.1 INTERSECTION QUEUE ANALYSIS - MORNING PEAK HOUR

Intersection	Lane	Average Queue in Vehicles[1]			
		2019 Observed	2019 Existing	2019 Build	2024 Future
Third St at Binney St (Signalized)	Binney EB Left	2	2	3	3
	Binney EB Thru	2	3	3	4
	Binney EB Thru/Right	2	2	2	4
	Binney WB Left	4	5	5	7
	Binney WB Thru	3	4	4	5
	Binney WB Thru/Right	4	4	4	5
	Third NB Left/Thru	2	3	3	5
	Third NB Right	1	2	2	3
	Third SB Left/Thru/Right	11	8	9	9

1 Simtraffic analysis results.
Note: Synchro provides queue data in feet, and the table presents queue data in number of vehicles.
As directed by the TIS guidelines 1 vehicle = 25 ft

TABLE 7.A.2 INTERSECTION QUEUE ANALYSIS - EVENING PEAK HOUR

Intersection	Lane	Average Queue in Vehicles[1]			
		2019 Observed	2019 Existing	2019 Build	2024 Future
Third St at Binney St (Signalized)	Binney EB Left	6	7	7	9
	Binney EB Thru	6	7	7	18
	Binney EB Thru/Right	4	5	5	15
	Binney WB Left	0	2	2	3
	Binney WB Thru	2	3	3	5
	Binney WB Thru/Right	2	3	3	4
	Third NB Left/Thru	6	5	5	5
	Third NB Right	1	4	4	6
	Third SB Left/Thru/Right	6	4	5	9

1 Simtraffic analysis results.
Note: Synchro provides queue data in feet, and the table presents queue data in number of vehicles.
As directed by the TIS guidelines 1 vehicle = 25 ft

The queue analysis results presented in the tables above correspond to the level of service analyses conducted for the study area intersections, and the results of the modelled 2019 Existing Condition are in-line with the average queues observed.

The longest average queue was observed and analyzed to be at the southbound approach at the signalized intersection during the morning peak hour due to the single lane approach and high volume of vehicles at this time. Currently, the queue typically extends to the upstream intersection at Rogers Street. While the Project is anticipated to impact queues at this location minimally, general traffic growth and other development projects in the area are anticipated to extend the queue to the following upstream intersection at Bent Street in the Future Condition.

8 Residential Street Volume Analysis

Roadway segments within the study area with residential street frontage were evaluated to understand Project impacts. The peak hour volumes (both directions) traveling the analyzed roadway segments are presented in Tables 8.a.1 and 8.a.2, each taken as an average of the total volumes entering and exiting each end of the street segment. The analysis shows the percent increase in traffic along the roadway segments between Existing, Build, and Future volumes. Only one street segment sees vehicular traffic increases greater than 10% in the Build Condition. However, increases in vehicular traffic larger than 20% are seen on nearly all segments in the Future Condition due to other, non-Project impacts.

Determined by existing first floor use, none of the roadway segments in the study area are streets that have more than 1/3 of residential frontage. Most streets in the study area have no first floor residential frontage. These segments are evaluated in the Planning Board Criteria for increased volume on residential streets.

TABLE 8.A.1 TRAFFIC ON STUDY AREA ROADWAYS – MORNING PEAK HOUR

Roadway	Segment	Amount of Residential	Existing[1]	Build	Increase	Percent Increase	Future[2]	Increase	Percent Increase
Third Street	Binney St to Rogers St	1/3 or less	698	718	20	2.9%	863	165	23.6%
	Rogers St to Bent St	1/3 or less	615	630	15	2.4%	771	156	25.4%
Fifth Street	Binney St to Rogers St	1/3 or less	105	130	25	23.8%	137	32	30.5%
	Rogers St to Bent St	1/3 or less	100	116	16	16.0%	126	26	26.0%
Binney Street	Fifth St to Third St	1/3 or less	908	922	14	1.5%	1148	240	26.4%
Rogers Street	Fifth St to Third St	1/3 or less	48	43	-5	-13.2%	50	2	4.2%
Bent Street	Fifth St to Third St	1/3 or less	110	136	26	23.6%	144	34	30.9%

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, average volumes were calculated per street direction, and added together

2 Future accounts for area background project volumes, Project generated volumes, and a background growth rate of 0.5% per year

TABLE 8.A.2 TRAFFIC ON STUDY AREA ROADWAYS – EVENING PEAK HOUR

Roadway	Segment	Amount of Residential	Existing[1]	Build	Increase	Percent Increase	Future[2]	Increase	Percent Increase
Third Street	Binney St to Rogers St	1/3 or less	870	910	45	5.2%	1080	210	24.1%
	Rogers St to Bent St	1/3 or less	800	813	13	1.6%	973	173	21.6%
Fifth Street	Binney St to Rogers St	1/3 or less	115	129	14	12.2%	135	20	17.4%
	Rogers St to Bent St	1/3 or less	130	144	14	10.8%	156	26	20.0%
Binney Street	Fifth St to Third St	1/3 or less	1085	1098	13	1.2%	1465	380	35.0%
Rogers Street	Fifth St to Third St	1/3 or less	45	44	-1	-2.2%	55	10	22.2%
Bent Street	Fifth St to Third St	1/3 or less	110	135	25	22.7%	141	31	28.2%

1 Where driveways/on-street parking created a segment inflow/outflow volume imbalance, average volumes were calculated per street direction, and added together

2 Future accounts for area background project volumes, Project generated volumes, and a background growth rate of 0.5% per year

9 Parking Analysis

9.a Vehicle Parking

According to the City's 1990 parking inventory, 101 Rogers Street was reported as having 54 parking spaces. These parking spaces have not been used since the building was vacated, and they will be eliminated as part of the Project so that the building's ground floor elevation can be lowered in order to have an entrance at ground level. The Project will provide three (3) accessible spaces along Rogers Street, a private roadway, opposite The Foundry Building. The site is located within walking distance to the Kendall/MIT and Lechmere Train Stations and several bus routes, which will further reduce the demand for parking due to higher numbers of car-free commuters and patrons.

The Project will also provide a zone in front of The Foundry Building for vehicles that are parked for a short duration of time to pick-up or drop-off passengers. These vehicles will enter Rogers Street from Third Street, park briefly for passengers, and leave Rogers Street at Fifth Street. Approximately five vehicles during the morning peak hour and three vehicles during the evening peak hour are anticipated to pick-up and drop-off passengers directly at the Site. The pick-up/drop-off area and the three accessible parking spaces were shown previously in Figure 3.d.1.

For those who do drive to the Site, it is anticipated that nearby parking garages will have availability to accommodate those users, particularly during off-peak periods when the Project is anticipated to have more ongoing activities. Based on a review of the Cambridge Parking

Map on the TP&T website, the closest commercial parking facilities are the Kendall Center Blue Garage and the 350 Kendall Street Garage, as indicated in Figure 9.a.1. Due to the location of the parking garages, some vehicles may not enter the study area intersections in order to access a garage from their point of origin. A transportation coordinator will be available to community users and employees for parking and transportation information.

Based on the projected building occupancy, parking demand calculations were completed as shown in Table 9.a.1. Consistent with the K2C2 plan, the office population was estimated using a density 3.0 employees/KSF of office area. The table includes the anticipated number of people in each space during the weekday and special events with the performance space. Using these numbers, the auto mode shares were applied to calculate the adjusted vehicle parking spaces based on occupancy.

TABLE 9.A.1 PARKING DEMAND CALCULATIONS BASED ON ANTICIPATED OCCUPANCY

Land Use	Weekday Occupancy (People)	Special Event Occupancy (People)	Auto Mode Share	Weekday Parking Demand (Spaces)	Special Event Parking Demand (Spaces)
Community/ Art Space	35	150	28%	10	42
Performance Space	15	130	28%	4	36
Office	66	0	64%	40	0
TOTAL	**116**	**280**	**-**	**54**	**78**

Source: Cambridge Seven Architects occupancy projections

As shown in Table 9.a.1, the adjusted vehicle parking demand for the project is 54 spaces on a weekday and 78 spaces during a special event with the performance space. Based on recent observations and occupancy studies in the surrounding area, it is believed that this parking demand will be able to be accommodated in the nearby parking garages.

As discussed in the Envision Cambridge report[1], the site location falls within what is labeled as a "Transition District". The report says that these areas "have the potential to create more pedestrian-oriented places with amenities serving nearby areas." By not providing on-site parking, this project is able to move closer toward creating Rogers Street and the adjacent neighborhood into more of a pedestrian friendly and less vehicle dominated roadway.

According to the Zoning Ordinance Article 6, the parking requirements for the Project components are shown in Table 9.a.2.

[1] Envision Cambridge, 2019. http://envision.cambridgema.gov/wp-content/uploads/2019/06/201906_EnvisionCambridge-Final-Report.pdf

TABLE 9.A.2 CITY OF CAMBRIDGE ZONING ORDINANCE ARTICLE 6 OFF-STREET PARKING REQUIREMENT

Land Use Code	Vehicle Parking Rate	Calculated Vehicle Parking Space Requirement
Community/Art Space	1 space per 600 sf (min)	41
Office	1 space per 800 sf (min) 1 space per 400 sf (max)	30 - 59
TOTAL	**-**	**71 - 100**

Source: Community/Art Space is analyzed as Land Use Category 6.36.3 e.2 (Community Center) and office is analyzed as Land Use Category 6.36.4 d (General Office Use) for Zoning District Ind A-1

9.b Bicycle Parking

The Project will provide parking in accordance with the City of Cambridge's Bicycle Parking Zoning Ordinance. The specific site uses have been called out separately so that the appropriate bicycle parking requirements can be applied, as shown in Table 9.b.1.

TABLE 9.B.1 BICYCLE PARKING

Site Land Use	Long-Term Bicycle Parking Category	Long-Term Spaces Required	Short-Term Bicycle Parking Category	Short-Term Spaces Required
Community Center	N5	1.04	N3	6.48
General Office Use	N1	7.01	N5	1.40
Theatre	N5	0.38	N1	4.75
Art/Craft Studio	N1	1.94	N5	0.39
Total		**10.37**		**13.02**

Source: City of Cambridge Zoning Ordinance Article 6.0

The Project will provide eleven (11) long-term bicycle parking spaces in ground level bike rooms. The Project will also provide fourteen (14) short-term spaces located near building entrances, to support visitors to the site. The long-term bicycle parking spaces will be accommodated with bicycle lockers manufactured by Dero Single Locker™. Each locker, whether for standard or tandem/recumbent bikes, has the capacity for one bicycle with multiple locking options. These units are ideal for providing a long-term bicycle parking option with a narrower footprint where space is limited. Information on the proposed bike lockers can be found in the Appendix. The short-term bicycle parking spaces will be located near the entrances on Rogers Street and Bent Street.

Figure 3.d.1 illustrates the location and layout of the long-term and short-term bicycle parking spaces as well as tandem bicycle parking spaces. Figures E.1 and E.2 show the details of the bicycle parking configuration for the long-term and short-term spaces.

10 Transit Analysis

As requested by the City's Scoping Letter, a transit analysis has been conducted to support this Project. The analysis included a review of existing Red Line and bus operations and assessed the impacts of project-generated transit trips and future transit trips.

The following sections summarize existing transit services availability in the study area and provide an assessment of transit utilization and capacity for key transit lines that are expected to be used by the proposed Project. The Red Line (Kendall/MIT Station), the Green Line (E Branch at Lechmere Station) as well as many bus routes are accessible within a half-mile of the Project. The bus routes 64, 68, 69, 80, 85, 87, 88, and CT2 were analyzed in addition to the Charles River TMA EZRide.

This transit analysis was based on the following 8-step methodology:

1. Quantify the existing transit system capacity
2. Quantify the existing system ridership
3. Report on existing transit system utilization (ridership/capacity) – 2019 Existing Conditions
4. Develop and assign project-generated transit trips to the existing transit system
5. Report on project impacts to the transit system utilization - 2019 Build Conditions
6. Grow 2019 existing transit system ridership to year 2024
7. Compile area background project transit trips and assign to transit system network
8. Report on future transit system utilization (impacts from project as well as other background projects and general system growth) – 2024 Future Conditions

The V/C ratio (Volume to Capacity) is the resulting metric that, for the purposes of this study, is used to reflect the level of utilization for each transit service line. The V/C ratios (or utilization rates) are presented for the Existing Condition (2019), Build Condition (Existing + Project trips), and Future Condition (Existing + Project trips + background growth).

10.a Existing Transit System Capacity – Step 1

The capacity of a transit line depends on the number of trains (or buses) operating during a specified time period (frequency), the number of people that can be accommodated on a vehicle (a train car or bus), and the number of individual cars in each train.

The study period for this analysis includes the morning and evening transit peak hours defined as 8:15 AM to 9:15 AM and 4:45 PM to 5:45 PM, respectively.

Train and bus frequencies were compiled from latest published MBTA schedules[2] and MBTA Bus Ridecheck data from spring 2018, as reported in Table 10.a.1.

For the purposes of this study, the vehicle load standards (i.e. number of people safely and comfortably riding on a train car of bus) are based on the MBTA's Service Delivery Policy[3] and the MBTA Blue Book 14th Edition data (Red Line policy capacity of 167 passengers per car, with a standard operation of 6-car trains; Green Line policy capacity of 101 passengers per car with a standard operation of 2-car trains; MBTA Bus policy capacity of 54 passengers per vehicle).

The average Red Line on-time performance was adjusted by 93%, based on the 30-day average (October 1 to October 31, 2017) provided by the MBTA Dashboard. Similarly, the average Green Line on-time performance was adjusted by 77% based on the same 30-days. For the purposes of this study, the on-time performance adjustments reduced the number of available trains during peak hour to account for schedule irregularities and resulting wait times experienced by the passengers. Red Line ridership volume used for the transit analysis is from the Fall 2017 dataset—the most recent available information at the time of the transit analysis. To stay consistent with this data, October 2017 performance data was used to align with the same time period. The MBTA Bus service capacity was not adjusted for on-time performance.

Table 10.a.1 shows the resulting system capacities for the Red Line, Green Line, and Bus Routes based on MBTA provided data.

[2] MBTA schedules, April 2019
[3] MBTA Service Delivery Policy, approved by the Board of Directors in June 2010

TABLE 10.A.1 SYSTEM PEAK HOUR CAPACITY (PER MBTA DATA)

Mode	Frequency[a]	OTP Factor[b]	# Passengers / Vehicle[c]	# Cars / Train	Resulting Capacity[d] (# Passengers / Peak Hour)
Red Line at Kendall/MIT Station					
Inbound	13	0.93	167	6	12,114
Outbound	13	0.93	167	6	12,114
Green Line at Lechmere Station					
Inbound	10	0.77	101	2	1,555
Outbound	10	0.77	101	2	1,555
MBTA Bus					
Route 64 Inbound	3.5	n/a	54	n/a	189
Route 64 Outbound	2.5	n/a	54	n/a	135
Route 68 Inbound	2	n/a	54	n/a	108
Route 68 Outbound	2	n/a	54	n/a	108
Route 69 Inbound	5	n/a	54	n/a	270
Route 69 Outbound	4.5	n/a	54	n/a	243
Route 80 Inbound	3	n/a	54	n/a	162
Route 80 Outbound	2	n/a	54	n/a	108
Route 85 Inbound	2.5	n/a	54	n/a	135
Route 85 Outbound	2	n/a	54	n/a	108
Route 87 Inbound	3	n/a	54	n/a	162
Route 87 Outbound	3	n/a	54	n/a	162
Route 88 Inbound	3.5	n/a	54	n/a	189
Route 88 Outbound	3	n/a	54	n/a	162
Route CT2 Inbound	3	n/a	54	n/a	162
Route CT2 Outbound	3	n/a	54	n/a	162

Notes:

(a) Number of vehicles per hour, per MBTA published schedules (Red Line and Green Line) and MBTA Ridership Fall 2017 (Buses); average number of buses assumed where not same during morning and evening period

(b) On-Time Performance Factor from MBTA Dashboard as of October 31, 2017 (30-day average)

(c) Number of policy level capacity per MBTA Blue Book 14th Edition (Red Line, Green Line and Buses)

(d) Calculated Capacity = # of Trains x OTP Factor x # pax per vehicle x # of cars – shown as number of passengers per peak hour

10.b Existing Transit System Ridership and Utilization – Step 2 & 3

The MBTA Ridership data from Spring 2018 was used to obtain peak hour passenger loads for bus routes that are expected to be utilized by the future Project trips. These values were grown by 1.5% for one year to reflect the 2019 Existing Condition. The growth rate of 1.5% per year was taken from the "moderate" growth rate found in the June 2012 Urban Land Institute's Hub and Spoke report for the MBTA.

Red Line ridership for this analysis was based on data for Kendall/MIT Station from fall 2017. Inbound trains start their trip from Alewife Station and continue to Ashmont or Braintree, and Outbound trains end at Alewife Station from either Ashmont or Braintree. Green Line ridership for this analysis was based on data for Lechmere Station from fall 2017. Lechmere is last eastbound stop for the E Branch, and trains traveling westbound are destined for Heath Street in the Mission Hill neighborhood of Boston. Specific boarding and alighting volumes during the morning and evening peak hours are presented in the Appendix. Again, the growth rate of 1.5% per year was applied to the fall 2017 data to create the 2019 Existing Condition.

Combining the system capacity developed in Step 1 and the system ridership, the system's utilization rates were calculated and are presented in Table 10.b.1.

TABLE 10.B.1 EXISTING TRANSIT SERVICE UTILIZATION (PER MBTA DATA)

Route and Direction	Capacity	Morning Peak Hour Ridership	Evening Peak Hour Ridership	Morning Peak Hour V/C	Evening Peak Hour V/C
Red Line at Kendall/MIT Station					
Inbound Entering Kendall/MIT	12,114	9,364	3,766	0.77	0.31
Inbound Exiting Kendall/MIT	12,114	8,059	5,738	0.67	0.47
Outbound Entering Kendall/MIT	12,114	5,361	7,336	0.44	0.61
Outbound Exiting Kendall/MIT	12,114	3,018	8,279	0.25	0.68
Green Line at Lechmere Station					
Inbound Exiting Lechmere	1,555	708	724	0.46	0.47
Outbound Entering Lechmere	1,555	492	535	0.32	0.34
MBTA Bus					
Route 64 Inbound Entering	189	28	9	0.13	0.06
Route 64 Outbound Exiting	135	8	33	0.05	0.30
Route 68 Inbound Entering	108	13	8	0.12	0.08
Route 68 Outbound Exiting	108	4	18	0.04	0.17
Route 69 Inbound Entering	270	127	75	0.39	0.35
Route 69 Inbound Exiting	270	125	68	0.39	0.31
Route 69 Outbound Entering	243	59	96	0.22	0.44

Route 69 Outbound Exiting	243	59	96	0.22	0.44
Route 80 Inbound Entering	162	137	27	0.85	0.17
Route 80 Outbound Exiting	108	10	107	0.09	0.66
Route 85 Inbound Entering	135	90	6	0.56	0.06
Route 85 Outbound Exiting	108	4	40	0.03	0.37
Route 87 Inbound Entering	162	104	37	0.64	0.23
Route 87 Outbound Exiting	162	19	100	0.12	0.62
Route 88 Inbound Entering	189	150	30	0.69	0.18
Route 88 Outbound Exiting	162	16	134	0.10	0.83
Route CT2 Inbound Entering	162	96	31	0.59	0.19
Route CT2 Inbound Exiting	162	77	47	0.48	0.29
Route CT2 Outbound Entering	162	43	70	0.26	0.64
Route CT2 Outbound Exiting	162	28	85	0.17	0.79

As presented in Table 10.b.1, the existing Bus Routes are operating within MBTA capacity with V/C ratios below 1.0. The existing Red Line at Kendall/MIT Station and Green Line at Lechmere Station are operating with V/C ratios below 1.0 in the morning and evening inbound and outbound directions. The availability presented above is an average over the course of four consecutive 15-minute data intervals. These calculations may not align with the passenger experience/perception during the peak hours due to variations in ridership between trains that an individual may be riding.

10.c Development of Transit Project Trips – Step 4

The Project is expected to generate 42 transit trips (30 entering, 12 exiting) during the morning peak hour and 36 transit trips (15 entering, 21 exiting) during the evening peak hour, according to the ITE trip generation calculations presented in Section 3 of this report. No transit trip credits were considered for the existing, vacant building.

Project transit trip distribution, split between Red Line, Green Line and bus lines, was developed based on the KSURP Infill Development Concept Plan from June 2016. The report stated that that approximately 75% of transit riders would use the subway and 25% would use buses. Since the Project is equidistant from both the Kendall/MIT Red Line Station and the Lechmere Green Line Station, it was assumed that from the 75% of subway trips would be split evenly between the two subway lines (37.5% each). The bus trips were distributed onto bus routes proportionally using existing ridership levels. A detailed transit distribution by line, direction, and peak hour is presented in Table 10.c.1.

TABLE 10.C.1 TRANSIT TRIP DISTRIBUTION

Route and Direction	Morning Peak Hour		Evening Peak Hour	
	% OUT	% IN	% OUT	% IN
Red Line at Kendall/MIT Station				
Inbound	50%	50%	50%	50%
Outbound	50%	50%	50%	50%
Green Line at Lechmere Station				
Inbound	100%	0%	100%	0%
Outbound	0%	100%	0%	100%
MBTA Bus				
Route 64 Inbound	0%	4.9%	0%	5.8%
Route 64 Outbound	10.2%	0%	6.9%	0%
Route 68 Inbound	0%	2.3%	0%	6.2%
Route 68 Outbound	5.5%	0%	3.9%	0%
Route 69 Inbound	0.9%	0.5%	0%	5.9%
Route 69 Outbound	0.5%	0%	0%	0%
Route 80 Inbound	0%	24%	0%	20.5%
Route 80 Outbound	12.9%	0%	22.7%	0%
Route 85 Inbound	0.0%	15.7%	0%	4.6%
Route 85 Outbound	4.6%	0%	8.5%	0%
Route 87 Inbound	0%	18.2%	0%	28%
Route 87 Outbound	24.7%	0%	21.2%	0%
Route 88 Inbound	0%	26%	0%	22.8%
Route 88 Outbound	20.8%	0%	28.4%	0%
Route CT2 Inbound	15.9%	5.3%	4.4%	3.4%
Route CT2 Outbound	4%	3.1%	4%	2.8%
Total	100%	100%	100%	100%

Source: MBTA existing station ridership levels, Fall 2018

Transit distribution is then applied to the Project-generated transit trips in order to determine the Project-generated transit trips by line or route, as presented in Table 10.c.2.

TABLE 10.C.2 PROJECT-GENERATED TRANSIT TRIPS BY LINE

	Morning Peak Hour			Evening Peak Hour		
Route and Direction	Trips OUT (Boardings)	Trips IN (Alightings)	Trips Total	Trips OUT (Boardings)	Trips IN (Alightings)	Trips Total
Red Line at Kendall/MIT Station						
Inbound	3	6	9	4	3	7
Outbound	2	6	8	4	3	7
Green Line at Lechmere Station						
Inbound	4	0	4	8	0	8
Outbound	0	11	11	0	5	5
MBTA Bus						
Route 64 Inbound	0	1	1	0	0	0
Route 64 Outbound	0	0	0	0	0	0
Route 68 Inbound	0	0	0	0	0	0
Route 68 Outbound	0	0	0	0	0	0
Route 69 Inbound	0	0	0	0	0	0
Route 69 Outbound	0	0	0	0	0	0
Route 80 Inbound	0	2	2	0	1	1
Route 80 Outbound	1	0	1	2	0	2
Route 85 Inbound	0	1	1	0	0	0
Route 85 Outbound	0	0	0	0	0	0
Route 87 Inbound	0	1	1	0	1	1
Route 87 Outbound	1	0	1	2	0	2
Route 88 Inbound	0	2	2	0	1	1
Route 88 Outbound	1	0	1	1	0	1
Route CT2 Inbound	0	0	0	0	1	1
Route CT2 Outbound	0	0	0	0	0	0
Total*	12	30	42	21	15	36

*Total trips rounded to nearest whole number

10.d Build Transit System Utilization – Step 5

The Project-generated transit trips by line or route from Step 4 above are added to the existing route volumes to develop the "Build Condition" utilization scenario, where Existing + Project trips are assumed to be on the transit lines. Resulting v/c ratios are presented in Table 10.d.1.

TABLE 10.D.1 2019 BUILD CONDITION TRANSIT SERVICE UTILIZATION (PER MBTA DATA)

Route and Direction	Capacity Policy (from Step 1)	Morning Peak Hour Ridership (Existing + Project Trips)	Evening Peak Hour Ridership (Existing + Project Trips)	Morning Peak Hour V/C	Evening Peak Hour V/C
Red Line at Kendall/MIT Station					
Inbound Entering Kendall/MIT	12,114	9,370	3,769	0.77	0.31
Inbound Exiting Kendall/MIT	12,114	8,062	5,742	0.67	0.47
Outbound Entering Kendall/MIT	12,114	5,367	7,339	0.44	0.61
Outbound Exiting Kendall/MIT	12,114	3,020	8,283	0.25	0.68
Green Line at Lechmere Station					
Inbound Exiting Lechmere	1,555	712	732	0.46	0.47
Outbound Entering Lechmere	1,555	503	540	0.33	0.35
MBTA Bus					
Route 64 Inbound Entering	189	29	9	0.14	0.06
Route 64 Outbound Exiting	135	8	33	0.06	0.30
Route 68 Inbound Entering	108	13	8	0.12	0.08
Route 68 Outbound Exiting	108	4	18	0.04	0.17
Route 69 Inbound Entering	270	127	75	0.39	0.35
Route 69 Inbound Exiting	270	125	68	0.39	0.31
Route 69 Outbound Entering	243	59	96	0.22	0.44
Route 69 Outbound Exiting	243	59	96	0.22	0.44
Route 80 Inbound Entering	162	139	28	0.86	0.17
Route 80 Outbound Exiting	108	11	109	0.10	0.67
Route 85 Inbound Entering	135	91	6	0.56	0.06
Route 85 Outbound Exiting	108	4	40	0.03	0.37
Route 87 Inbound Entering	162	105	38	0.65	0.23
Route 87 Outbound Exiting	162	20	102	0.12	0.63
Route 88 Inbound Entering	189	152	31	0.70	0.19

Route 88 Outbound Exiting	162	17	135	0.11	0.83
Route CT2 Inbound Entering	162	96	32	0.59	0.20
Route CT2 Inbound Exiting	162	77	47	0.48	0.29
Route CT2 Outbound Entering	162	43	70	0.26	0.64
Route CT2 Outbound Exiting	162	28	85	0.17	0.79

As presented in Table 10.d.1, all of the bus routes are expected to operate within MBTA policy capacity (with V/C ratios below 1.0) in the 2019 Build Condition. The table also indicates that the Red Line and Green Line are expected to operate at similar levels in the 2019 Build Condition as under 2019 Existing Conditions with only minor increases, if any, in the V/C ratios due to the low number of project-generated transit trips.

10.e Development of Future Transit Trips – Step 6

To analyze the 2024 Future Condition for transit, the MBTA existing ridership was grown to year 2024 based on growth rates presented in the MIT Kendall Square TIS (July 2015), which included a 4% per year assumption for the Red Line and a 2% per year assumption for bus ridership. It was assumed that a 4% growth would occur on the Green Line as well to represent a conservative approach. The 2024 grown ridership is presented in Table 10.e.1.

TABLE 10.E.1 2024 FUTURE GROWTH TRANSIT SERVICE UTILIZATION (PER MBTA DATA)

Route and Direction	Capacity Policy	Morning Peak Hour Ridership	Evening Peak Hour Ridership	Morning Peak Hour V/C	Evening Peak Hour V/C
Red Line at Kendall/MIT Station					
Inbound Entering Kendall/MIT	12,114	11,393	4,582	0.94	0.38
Inbound Exiting Kendall/MIT	12,114	9,805	6,981	0.81	0.58
Outbound Entering Kendall/MIT	12,114	6,523	8,588	0.54	0.74
Outbound Exiting Kendall/MIT	12,114	3,672	10,072	0.30	0.83
Green Line at Lechmere Station					
Inbound Exiting Lechmere	1,555	862	881	0.55	0.57
Outbound Entering Lechmere	1,555	598	651	0.38	0.42
MBTA Bus					
Route 64 Inbound Entering	189	31	10	0.14	0.06
Route 64 Outbound Exiting	135	9	36	0.06	0.33
Route 68 Inbound Entering	108	14	9	0.13	0.08
Route 68 Outbound Exiting	108	5	20	0.05	0.19
Route 69 Inbound Entering	270	140	83	0.43	0.38
Route 69 Inbound Exiting	270	138	74	0.43	0.34
Route 69 Outbound Entering	243	65	106	0.24	0.49
Route 69 Outbound Exiting	243	65	106	0.24	0.49
Route 80 Inbound Entering	162	152	30	0.94	0.19
Route 80 Outbound Exiting	108	11	118	0.10	0.73
Route 85 Inbound Entering	135	99	7	0.61	0.06
Route 85 Outbound Exiting	108	4	44	0.04	0.41
Route 87 Inbound Entering	162	115	41	0.71	0.25
Route 87 Outbound Exiting	162	21	110	0.13	0.68
Route 88 Inbound Entering	189	166	33	0.77	0.20
Route 88 Outbound Exiting	162	18	148	0.11	0.91
Route CT2 Inbound Entering	162	106	34	0.65	0.21
Route CT2 Inbound Exiting	162	86	52	0.53	0.32
Route CT2 Outbound Entering	162	47	77	0.29	0.71
Route CT2 Outbound Exiting	162	30	94	0.19	0.87

Notes: All 2024 Future ridership counts were calculated using the grown 2018 MBTA Bus and grown 2017 MBTA Red and Green Line data and were grown by 2% per year (bus) and 4% per year (Red Line) for 5 years from 2019 Existing to 2024 Future Condition.

As presented in Table 10.e.1, all of the bus routes are expected to operate within MBTA policy capacity (with V/C ratios below 1.0) in the 2024 growth condition prior to the addition of background project transit trips. All future ridership numbers were developed with the assumption that the bus routes would remain the same, and no additional buses would be added to the existing Fall 2018 schedule. The table also indicates that the Red Line and Green Line are expected to operate within the policy capacity under the future growth. Future Red Line and Green Line improvements were not included in the future capacity assumptions.

10.f Compile and Assign Area Background Project Transit Trips – Step 7

In addition to growing the transit trips to 2024 Future Conditions, it is necessary to add transit trips from area projects that have not yet come on-line. The same projects listed in the traffic analysis were also used in this transit analysis. Transit trips for each background project, as presented in Tables 10.f.1 through 10.f.3 below, were included in the Future analysis.

TABLE 10.F.1 BACKGROUND PROJECT TRANSIT TRIPS – MBTA BUS

	Morning Peak Hour			Evening Peak Hour		
Project	In	Out	Total	In	Out	Total
Kendall Square Urban Renewal Plan Amendment	120	54	174	53	140	193
249 Third Street	1	3	4	4	3	7
40 Thorndike Street	36	8	44	9	37	46
MIT Kendall Square Redevelopment	36	21	57	16	68	84
Alexandria Binney Street Development	42	8	50	8	37	45
TOTAL	**235**	**94**	**329**	**90**	**285**	**375**

TABLE 10.F.2 BACKGROUND PROJECT TRANSIT TRIPS – MBTA RED LINE

	Morning Peak Hour			Evening Peak Hour		
Project	In	Out	Total	In	Out	Total
INBOUND						
Kendall Square Urban Renewal Plan Amendment	102	73	175	91	104	195
249 Third Street	2	5	7	7	4	11
40 Thorndike Street	0	0	0	0	0	0
MIT Kendall Square Redevelopment	178	90	268	129	198	327
Alexandria Binney Street Development	199	66	265	38	261	299
TOTAL	**481**	**234**	**715**	**265**	**567**	**832**
OUTBOUND						
Kendall Square Urban Renewal Plan Amendment	160	11	171	24	155	179
249 Third Street	1	5	6	6	4	10
40 Thorndike Street	0	0	0	0	0	0
MIT Kendall Square Redevelopment	279	13	292	34	295	329
Alexandria Binney Street Development	283	48	331	54	184	238
TOTAL	**723**	**77**	**800**	**118**	**638**	**756**

TABLE 10.F.3 BACKGROUND PROJECT TRANSIT TRIPS – MBTA GREEN LINE

	Morning Peak Hour			Evening Peak Hour		
Project	In	Out	Total	In	Out	Total
Kendall Square Urban Renewal Plan Amendment	0	0	0	0	0	0
249 Third Street	0	1	1	1	0	1
40 Thorndike Street	143	33	176	34	146	180
MIT Kendall Square Redevelopment	0	0	0	0	0	0
Alexandria Binney Street Development	89	32	121	30	87	117
TOTAL	**232**	**66**	**298**	**65**	**233**	**298**

Similarly, to the project generated transit trips, where the distribution between bus and subway was not explicitly stated, 75% of the background transit trips were assigned to the Red Line/Green Line and 25% were assigned to bus routes. For a detailed description of the transit distribution, refer to Table 10.d.2.

10.g Future Transit System Utilization – Step 8

The 2024 Future Condition transit scenario is based on grown ridership levels, combined with background project transit trips and Project-generated transit trips. The resulting transit ridership and calculated V/C ratios for morning and evening peak hours for 2024 Future Condition is shown in Table 10.g.1.

TABLE 10.G.1 2024 FUTURE CONDITION TRANSIT SERVICE UTILIZATION

Route and Direction	Capacity Policy	Morning Peak Hour Ridership	Evening Peak Hour Ridership	Morning Peak Hour V/C	Evening Peak Hour V/C
Red Line at Kendall/MIT Station					
Inbound Entering Kendall/MIT	12,114	11,880	4,850	0.98	0.40
Inbound Exiting Kendall/MIT	12,114	10,042	7,552	0.83	0.62
Outbound Entering Kendall/MIT	12,114	7,252	9,046	0.60	0.75
Outbound Exiting Kendall/MIT	12,114	3,751	10,714	0.31	0.88
Green Line at Lechmere Station					
Inbound Exiting Lechmere	1,555	932	1,122	0.60	0.72
Outbound Entering Lechmere	1,555	841	721	0.54	0.46
MBTA Bus					
Route 64 Inbound Entering	189	64	24	0.30	0.15
Route 64 Outbound Exiting	135	31	102	0.19	0.94
Route 68 Inbound Entering	108	56	25	0.52	0.23
Route 68 Outbound Exiting	108	27	76	0.25	0.70
Route 69 Inbound Entering	270	140	84	0.43	0.39
Route 69 Inbound Exiting	270	138	74	0.43	0.34
Route 69 Outbound Entering	243	65	106	0.24	0.49
Route 69 Outbound Exiting	243	65	106	0.24	0.49
Route 80 Inbound Entering	162	164	35	1.01	0.22
Route 80 Outbound Exiting	108	13	129	0.12	0.80
Route 85 Inbound Entering	135	159	25	0.98	0.23
Route 85 Outbound Exiting	108	23	109	0.21	1.01
Route 87 Inbound Entering	162	124	46	0.77	0.28
Route 87 Outbound Exiting	162	25	121	0.15	0.75

Route 88 Inbound Entering	189	178	37	0.82	0.23
Route 88 Outbound Exiting	162	21	160	0.13	0.99
Route CT2 Inbound Entering	162	161	53	0.99	0.33
Route CT2 Inbound Exiting	162	90	61	0.56	0.38
Route CT2 Outbound Entering	162	67	90	0.41	0.83
Route CT2 Outbound Exiting	162	50	153	0.31	1.42

As presented in Table 10.g.1, all of the bus routes are expected to operate within MBTA policy capacity (with V/C ratios below 1.0) in the 2024 Future Condition, with the exception of Route 80 Inbound entering Lechmere Station (V/C = 1.01), the Route 85 Outbound exiting Kendall/MIT Station (V/C = 1.01), and the Route CT2 Outbound exiting the Ames Street at Broadway bus stop (V/C = 1.42). All future ridership numbers were developed with the assumption that the bus routes would remain the same, and no additional buses would be added to the existing schedule that was analyzed. Additionally, it was assumed that all project generated transit trips would access the MBTA rather than a private shuttle service such as the Charles River TMA. This presents worst case scenario for the MBTA Red Line and key bus routes.

10.h Private Transit Analysis

As requested by the City of Cambridge, a utilization of the private transit services has also been conducted to support this Project. The analysis used existing Charles River TMA EZRide shuttle monthly ridership data, as included in the Appendix to this report.

The current site area is served by the Charles River TMA EZRide shuttle with the closest existing stop at the intersection of Binney Street and Second Street, as illustrated in Figure 1.d.2. Inbound shuttles are destined to North Station in Boston, and outbound shuttles are destined to MIT in Cambridge. Table 10.h.1 shows the existing system peak hour capacity.

TABLE 10.H.1 CHARLES RIVER TMA EZRIDE PEAK HOUR CAPACITY (PER CHARLES RIVER TMA DATA)

Direction	Frequency[a]	OTP Factor[b]	# Passengers / Vehicle[c]	Resulting Capacity[d] (# Passengers / Peak Hour)
Outbound toward Cambridge	8	1.00	53	424
Inbound toward North Station	8	1.00	53	424

Notes:
(a) Number of vehicles per peak hour, per EZRide shuttle schedule
(b) On-Time Performance Factor assumed to be 1.00
(c) Capacity based on new flyer model year 2016 Xcelsior 40-foot heavy duty transit buses. Seated capacity = 38 passengers; Standing capacity = 15 passengers minimum
(d) Calculated Capacity = # of Buses x OTP Factor x # pax per bus – shown as number of passengers per peak hour

The Charles River TMA data from June 2019 was used to obtain average daily ridership and the peak hour passenger loads for the EZRide shuttle. The resulting daily ridership at the Binney Street and Second Street shuttle stop and the corresponding shuttle service utilization at this stop are shown in Table 10.h.2.

TABLE 10.H.2 EXISTING EZRIDE SHUTTLE SERVICE UTILIZATION (PER CHARLES RIVER TMA DATA)

Direction	Capacity Policy	Morning Peak Hour Ridership[a]	Evening Peak Hour Ridership[a]	Morning Peak Hour V/C	Evening Peak Hour V/C
Outbound toward Cambridge	424	372	-	0.88	-
Inbound toward North Station	424	-	212	-	0.50

Notes:
(a) Ridership was based on average number of passengers boarding the bus during the morning and evening peak hours for the month of June 2019

The data shows that there is shuttle availability with V/C ratios of 0.88 and 0.50 during the morning and evening peak hours, respectively.

11 Pedestrian Analysis

Pedestrian crossing volumes at study area intersections are presented in Figures 2.c.3 and 2.c.4. The results of pedestrian level of service (PLOS) analysis at intersection crosswalks are presented in Table 11.a.1 for signalized intersections and Table 11.a.2 for unsignalized intersections, as well as graphically illustrated in Figures 11.a.1 and 11.a.2.

Pedestrian level of service at signalized intersections is dictated by the portion of the signal cycle dedicated to the pedestrian crossings. Accordingly, increasing pedestrian volumes does not alter pedestrian level of service at signalized intersections, and no changes in PLOS are projected under build or future conditions. It is assumed that the walk time and cycle length at these intersections will not change from existing and therefore PLOS will remain consistent.

For unsignalized intersections, the PLOS is calculated using the crosswalk length and the conflicting vehicle flow rates for morning and evening peak hours.

The only intersection that shows a slight change in PLOS with the addition of Project trips is Third Street at Bent Street in the 2024 Future Condition. The intersection's north crosswalk changes from PLOS C to D in the morning peak hour and from PLOS E to F in the evening peak hour. This change occurs due to the additional background project trips that are added to the network in the 2024 Future Condition. The increase in vehicles traveling north and south along Third Street conflict with the pedestrian movement as the vehicles pass through the north crosswalk. All other intersections show no change in PLOS with the addition of project trips or background growth. It should be noted that the PLOS for unsignalized intersections does not account for the State law that vehicles must yield to pedestrians at unsignalized intersections.

Figures 11.a.1 and 11.a.2 show the PLOS for the various conditions for morning and evening peak hour.

TABLE 11.A.1 SIGNALIZED INTERSECTION – PEDESTRIAN LOS SUMMARY

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		2019 Existing	2019 Build	2024 Future	2019 Existing	2019 Build	2024 Future
Third Street at Binney Street	East	D	D	D	D	D	D
	West	D	D	D	D	D	D
	North	D	D	D	D	D	D
	South	D	D	D	D	D	D

TABLE 11.A.2 UNSIGNALIZED INTERSECTION – PEDESTRIAN LOS SUMMARY

Intersection	Crosswalk	Morning Peak Hour			Evening Peak Hour		
		2019 Existing	2019 Build	2024 Future	2019 Existing	2019 Build	2024 Future
Third Street at Bent Street	East	A	A	A	A	A	A
	North	C	C	D	E	E	F
Fifth Street at Bent Street	East	A	A	A	A	A	A
	West	A	A	A	A	A	A
	North	A	A	A	A	A	A
	South	A	A	A	A	A	A
Binney Street at Fifth Street	North	A	A	A	A	A	A

12 Bicycle Analysis

12.a Conflicting Movements

Conflicting vehicle turning movements at the study area intersections are presented in Figure 2.c.5 and 2.c.6 and are summarized in Table 12.a.1 for 2019 Existing, 2019 Build, and 2024 Future Conditions.

TABLE 12.A.1 CONFLICTING BICYCLE/VEHICLE MOVEMENTS AT STUDY INTERSECTIONS

			Existing Peak Hour	Conflicting Vehicle Movements					
				2019 Existing		2019 Build		2024 Future	
Intersection	Time Period	Bicycle Direction	Bicycle Volume	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
Third Street at Binney Street	Morning	EB	9	30	95	31	99	52	116
		WB	25	20	195	21	197	23	239
		NB	5	90	45	90	48	112	51
		SB	15	115	70	119	70	142	73
	Evening	EB	11	30	315	33	321	91	396
		WB	21	40	80	40	81	44	108
		NB	7	200	50	200	52	233	54
		SB	5	65	45	66	45	79	47
Third Street at Rogers Street	Morning	WB	NA	20	15	20	17	21	17
		NB	NA	0	5	0	9	0	12
		SB	NA	5	0	6	0	6	0
	Evening	WB	NA	35	20	35	20	36	21
		NB	NA	0	10	0	13	0	22
		SB	NA	5	0	6	0	7	0
Third Street at Bent Street	Morning	EB	0	65	25	70	26	76	27
		WB	0	0	0	0	0	0	0
		NB	4	10	25	10	25	10	26
		SB	12	40	5	40	5	41	5
	Evening	EB	0	55	30	57	32	61	33
		WB	1	10	5	10	5	10	5
		NB	9	0	40	0	41	0	42
		SB	2	25	0	25	0	26	0
Fifth Street at Bent Street	Morning	EB	0	10	30	10	30	10	31
		WB	1	5	10	5	10	5	10
		NB	9	10	15	12	15	16	15
		SB	0	20	0	20	4	21	4
	Evening	EB	1	15	20	15	20	15	21
		WB	0	10	5	11	5	11	5
		NB	2	15	5	17	5	20	5
		SB	3	15	15	15	17	15	17
Fifth Street at Rogers Street	Morning	EB	NA	20	10	20	10	21	10
		WB	NA	15	30	18	32	25	36
		NB	NA	0	0	0	0	0	0
		SB	NA	5	5	5	5	5	6
	Evening	EB	NA	5	0	5	0	5	0
		WB	NA	20	10	22	12	28	15
		NB	NA	5	40	5	40	5	41
		SB	NA	40	15	40	15	41	18

			Existing Peak Hour	Conflicting Vehicle Movements					
				2019 Existing		2019 Build		2024 Future	
Intersection	Time Period	Bicycle Direction	Bicycle Volume	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]	Right Turn[a]	Left Turn[b]
Fifth Street at Binney Street	Morning	EB	24	0	0	0	0	0	0
		WB	31	50	0	50	0	51	0
		SB	0	75	0	80	0	89	0
	Evening	EB	13	0	0	0	0	0	0
		WB	35	70	0	71	0	73	0
		SB	0	55	0	58	0	62	0

a Advancing volume
b Opposing volume
NA Movement not available

13 Transportation Demand Management

The Owner will support a program of transportation demand management (TDM) actions to reduce automobile trips generated by the Project. The goal of the Project's TDM plan is to reduce the use of single occupant vehicles (SOVs) by encouraging carpooling and vanpooling, bicycle commuting and walking, and increased use of the area's public transportation system by community users and employees.

The Owner will consider the following TDM programs as part of the proposed Project to encourage employees to use alternatives to SOV travel:

- Make available 1 carshare parking spaces for a vehicle-sharing company in a nearby location.
- Encourage car/vanpooling in coordination with Charles River TMA or other private ride-matching service provider.
- Provide air pumps and other bike tools, such as a "fix-it" stand in the bicycle storage areas.
- Join the Charles River Transportation Management Association (TMA).
- Offer pre-tax MBTA transit passes
- Designate a transportation coordinator (TC) for the site to manage the TDM program.
- Post information in a prominent location in the building and on the building's website, social media and property newsletters promoting the use of transportation options and service information.

14 Transportation Mitigation

The proposed Project exceeds 6 out of 125 possible data entries, resulting in an 4.8% exceedance rate. As requested by the TP&T Department, Table 15.a.1 provides a listing of all Planning Board Special Permit Exceedances and indicates how transportation mitigation measures will or cannot mitigate the Project Exceedances.

TABLE 15.A.1 EXCEEDANCE MITIGATION SUMMARY TABLE

#	Location		Reason for Exceedance	Mitigation
	Criteria B Vehicle LOS			
1	Third Street at Binney Street	Level of Service – Morning	Build Condition to change to LOS E	No mitigation proposed
	Criteria E-1 Pedestrian Delay			
2	Third at Bent Street	North Crosswalk – Evening	Existing and Build PLOS = E. Threshold is PLOS D with the project	No mitigation proposed
	Criteria E-2 & 3 Pedestrian and Bicycle Facilities			
3	Rogers Street	Between Third Street and Fifth Street	No Bicycle Facilities or Right of Ways Present	No mitigation proposed
4	Bent Street	Between Third Street and Fifth Street	No Bicycle Facilities or Right of Ways Present	No mitigation proposed
5	Third Street	Between Bent Street and Rogers Street	No Bicycle Facilities or Right of Ways Present	No mitigation proposed
6	Fifth Street	Between Bent Street and Rogers Street	No Bicycle Facilities or Right of Ways Present	No mitigation proposed

Planning Board Special Permit Criteria

Criterion A – Project Vehicle Trip Generation

Table A-1 presents the Project vehicle trip generation criterion. Project vehicle trip generation is based on ITE trip rates, adjusted for local mode split and vehicle occupancy rates as discussed previously.

TABLE A-1 PROJECT VEHICLE TRIP GENERATION

Time Period	Criteria (trips)	Build	Exceeds Criteria?
Weekday Daily	2,000	400	No
Weekday Morning Peak Hour	240	62	No
Weekday Evening Peak Hour	240	48	No

The Project is not expected to exceed the Planning Board Criteria for daily, morning peak, and evening peak Project vehicle trip generation under the Build program.

Criterion B – Vehicle LOS

The criteria for a Project's impact to traffic operations at signalized intersections are summarized in Table B-1 below. These criteria are evaluated for each signalized study-area intersection and presented in Table B-2.

TABLE B-1 CRITERION - VEHICULAR LEVEL OF SERVICE

Existing	With Project
VLOS A	VLOS C
VLOS B, C	VLOS D
VLOS D	VLOS D or 7% roadway volume increase
VLOS E	7% roadway volume increase
VLOS F	5% roadway volume increase

TABLE B-2 VEHICULAR LEVEL OF SERVICE

Intersection	Morning Peak Hour				Evening Peak Hour			
	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion	Existing Condition	Build Condition	Traffic Increase	Exceeds Criterion
Third Street at Binney Street	D	E	1.6%	Yes	D	D	1.6%	No

Criterion C – Traffic on Residential Streets

This criterion considers the magnitude of Project vehicle trip generation during any peak hour that may reasonably be expected to arrive and/or depart by traveling on a residential street. The criteria, based on a Project-induced traffic volume increase on any two-block residential street segment in the study area, are summarized in Table C-1.

TABLE C-1 CRITERION – TRAFFIC ON RESIDENTIAL STREETS

Parameter 1: Amount of Residential[1]	Parameter 2: Current Peak Hour Street Volume (two-way vehicles)		
	< 150 VPH	150-400 VPH	> 400 VPH
1/2 or more	20 VPH[2]	30 VPH[2]	40 VPH[2]
>1/3 but <1/2	30 VPH[2]	45 VPH[2]	60 VPH[2]
1/3 or less	No Max.	No Max.	No Max

1 - Amount of residential for a two block segment as determined by first floor frontage
2 - Additional Project vehicle trip generation in vehicles per lane, both directions
VPH - Vehicles per hour

0 of the 7 roadway segments in the study area identified as street segments which have more than 1/3 of residential frontage and are evaluated against the traffic volume criteria, although there is no maximum volume for this type of residential street. The results are presented in Table C-2.

TABLE C-2 TRAFFIC ON RESIDENTIAL STREETS

Roadway	Segment	Amount of Residential	Morning Peak Hour			Evening Peak Hour		
			Existing[1]	Increase	Exceeds Criteria?	Existing[1]	Increase	Exceeds Criteria?
Third Street	Binney St to Rogers St	1/3 or less	698	20	No	870	45	No
	Rogers St to Bent St	1/3 or less	615	15	No	800	13	No
Fifth Street	Binney St to Rogers St	1/3 or less	105	25	No	115	14	No
	Rogers St to Bent St	1/3 or less	100	16	No	130	14	No
Binney Street	Fifth St to Third St	1/3 or less	908	14	No	1085	13	No

			Morning Peak Hour			Evening Peak Hour		
Roadway	**Segment**	**Amount of Residential**	**Existing[1]**	**Increase**	**Exceeds Criteria?**	**Existing[1]**	**Increase**	**Exceeds Criteria?**
Rogers Street	Fifth St to Third St	1/3 or less	48	-5	No	45	-1	No
Bent Street	Fifth St to Third St	1/3 or less	110	136	No	110	25	No

Criterion D – Lane Queue

The criteria for a project's impact to queues at signalized intersections are summarized in Table D-1 below. These criteria are evaluated for each lane group at study-area signalized intersections and presented in Table D-2.

TABLE D-1 CRITERION – VEHICULAR QUEUES AT SIGNALIZED INTERSECTIONS

Existing	With Project
Under 15 vehicles	Under 15 vehicles, or 15+ vehicles with an increase of 6 vehicles
15 or more vehicles	Increase of 6 vehicles

TABLE D-2 LENGTH OF VEHICULAR QUEUES AT SIGNALIZED INTERSECTIONS[1]

		Morning Peak Hour			Evening Peak Hour		
Intersection	**Lane**	2019 Existing	2019 Build	Exceeds Criteria?	2019 Existing	2019 Build	Exceeds Criteria?
Third St at Binney St	Binney EB Left	2	3	No	7	7	No
	Binney EB Thru	3	3	No	7	7	No
	Binney EB Thru/Right	2	2	No	5	5	No
	Binney WB Left	5	5	No	2	2	No
	Binney WB Thru	4	4	No	3	3	No
	Binney WB Thru/Right	4	4	No	3	3	No
	Third NB Left/Thru	3	3	No	5	5	No
	Third NB Right	2	2	No	4	4	No
	Third SB Left/Thru/Right	8	9	No	4	5	No

[1] 50th Percentile Queue (Average Queue)

Criterion E – Pedestrian and Bicycle Facilities

Criteria 1: Pedestrian Delay

Pedestrian delay is a measure of the pedestrian crossing delay on a crosswalk during the peak hour as determined by the pedestrian level of service analysis in the HCM 2000.

Table E-1 presents the indicators for this criterion. Tables E-2 present the evaluation of PLOS criteria for each crosswalk at study area intersections under existing and full build conditions.

TABLE E-1 CRITERION – PLOS INDICATORS

Existing	With Project
PLOS A	PLOS A
PLOS B	PLOS B
PLOS C	PLOS C
PLOS D	PLOS D or increase of 3 seconds
PLOS E, F	PLOS D

TABLE E-2 SIGNALIZED AND UNSIGNALIZED INTERSECTION PLOS SUMMARY

		Morning Peak Hour			Evening Peak Hour		
Intersection	Crosswalk	Existing	Build	Exceeds Criteria?	Existing	Build	Exceeds Criteria?
Third Street at Binney Street	East	D	D	No	D	D	No
	West	D	D	No	D	D	No
	North	D	D	No	D	D	No
	South	D	D	No	D	D	No
Third Street at Bent Street	East	A	A	No	A	A	No
	North	C	C	No	E	E	Yes
Fifth Street at Bent Street	East	A	A	No	A	A	No
	West	A	A	No	A	A	No
	North	A	A	No	A	A	No
	South	A	A	No	A	A	No
Binney Street at Fifth Street	North	A	A	No	A	A	No

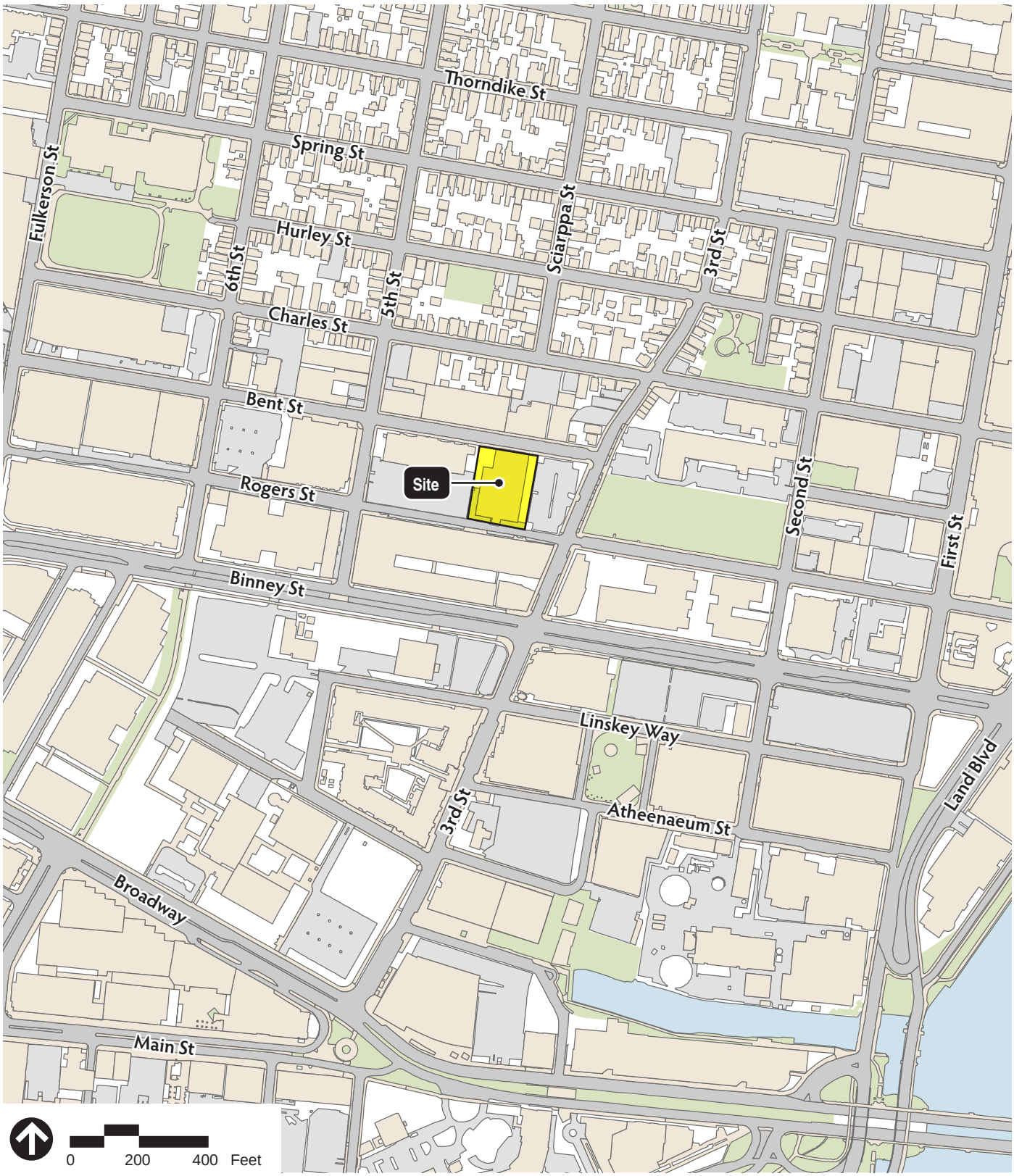
Criteria 2 & 3: Safe Pedestrian and Bicycle Facilities

Safe pedestrian and bicycle facilities are off-road or non-street bicycle lanes and sidewalks that are along a publicly-accessible street.

Table E-3 presents the indicators for this criterion. The evaluation of sidewalks or walkways and bicycle facilities are displayed.

TABLE E-3 PEDESTRIAN AND BICYCLE FACILITIES

Adjacent Street	Link (between)	Sidewalk or Walkway Present	Exceeds Criteria?	Bicycle Facilities or Right of Ways Present	Exceeds Criteria?
Rogers Street	Third Street and Fifth Street	Yes	No	No	Yes
Bent Street	Third Street and Fifth Street	Yes	No	No	Yes
Third Street	Bent Street and Rogers Street	Yes	No	No	Yes
Fifth Street	Bent Street and Rogers Street	Yes	No	No	Yes

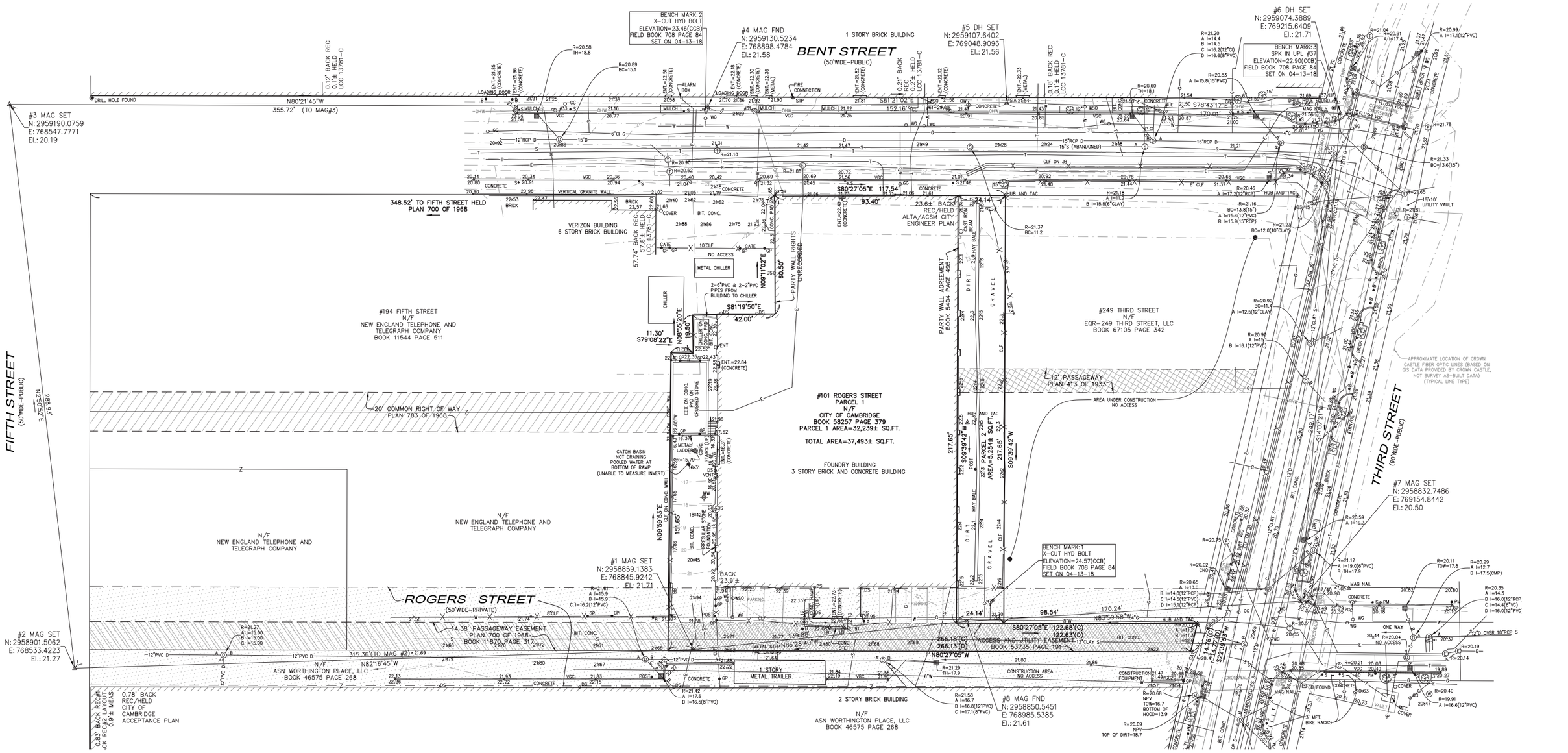


Source: City of Cambridge

Figure A

Site Location Map

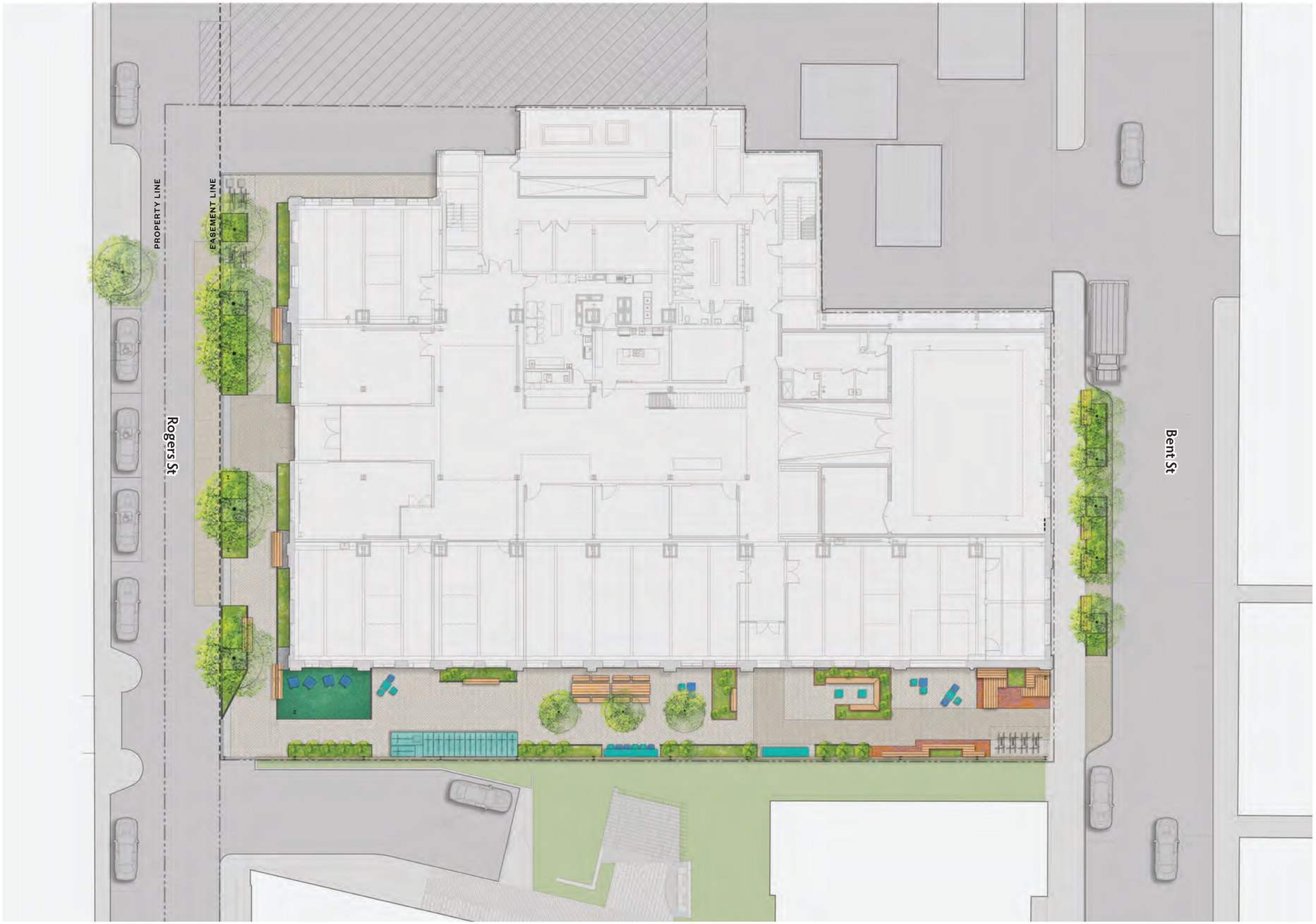
The Foundry Building
Cambridge, Massachusetts



Source: Cambridge Seven Associates

Figure B
Existing Site Conditions

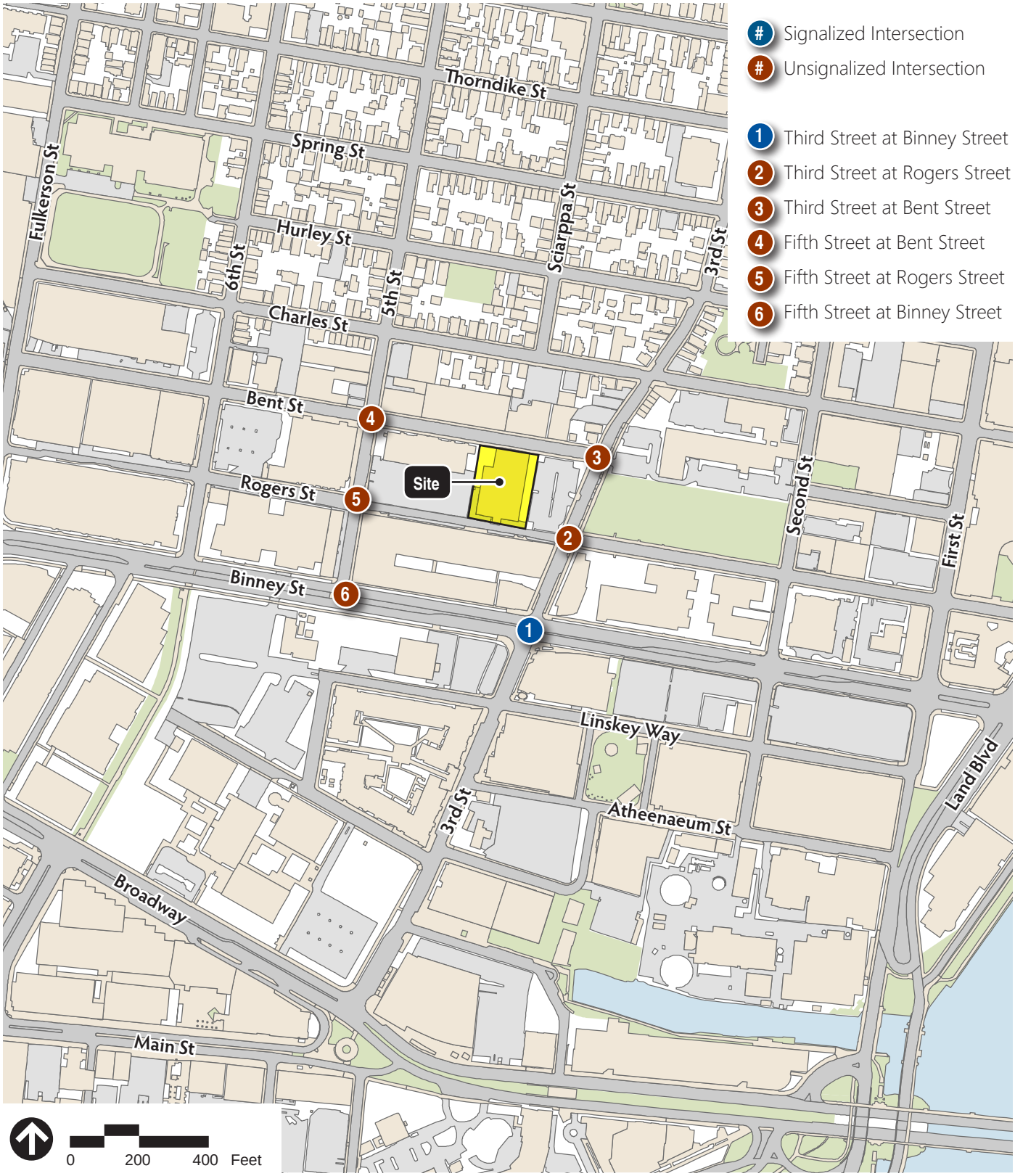
The Foundry Building
Cambridge, Massachusetts



Source: Cambridge Seven Associates

Figure C
Proposed Site Plan

The Foundry Building
Cambridge, Massachusetts



Source: City of Cambridge

Figure D

TIS Study Area

The Foundry Building
Cambridge, Massachusetts

\\vhb\gbl\proj\Boston\14496.00 Cambridge 7 Foundry\Graphics\FIGURES\Bike Layouts_20191025.dwg

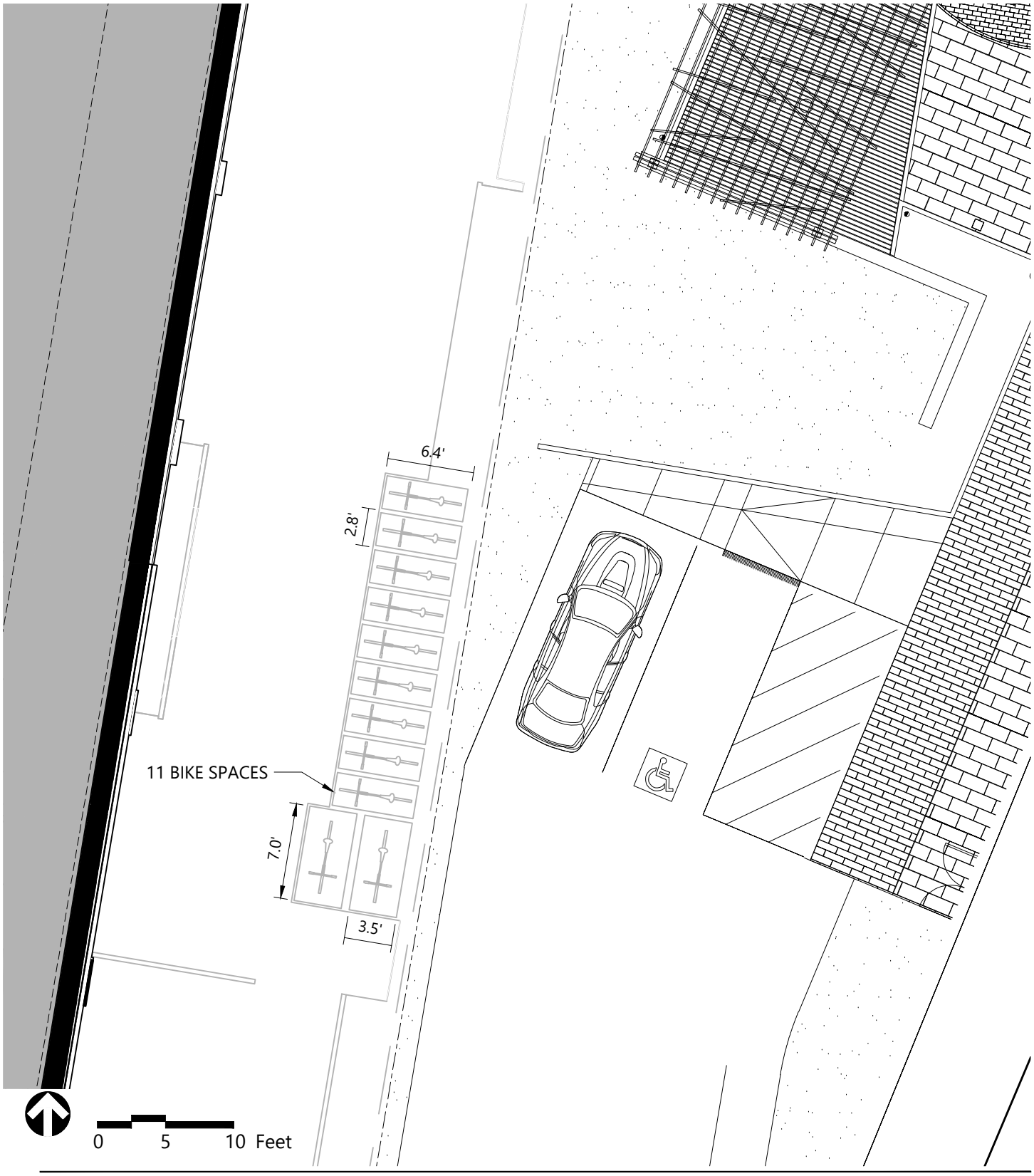


Figure E.1

Long-Term Bicycle Parking

The Foundry Building
Cambridge, Massachusetts

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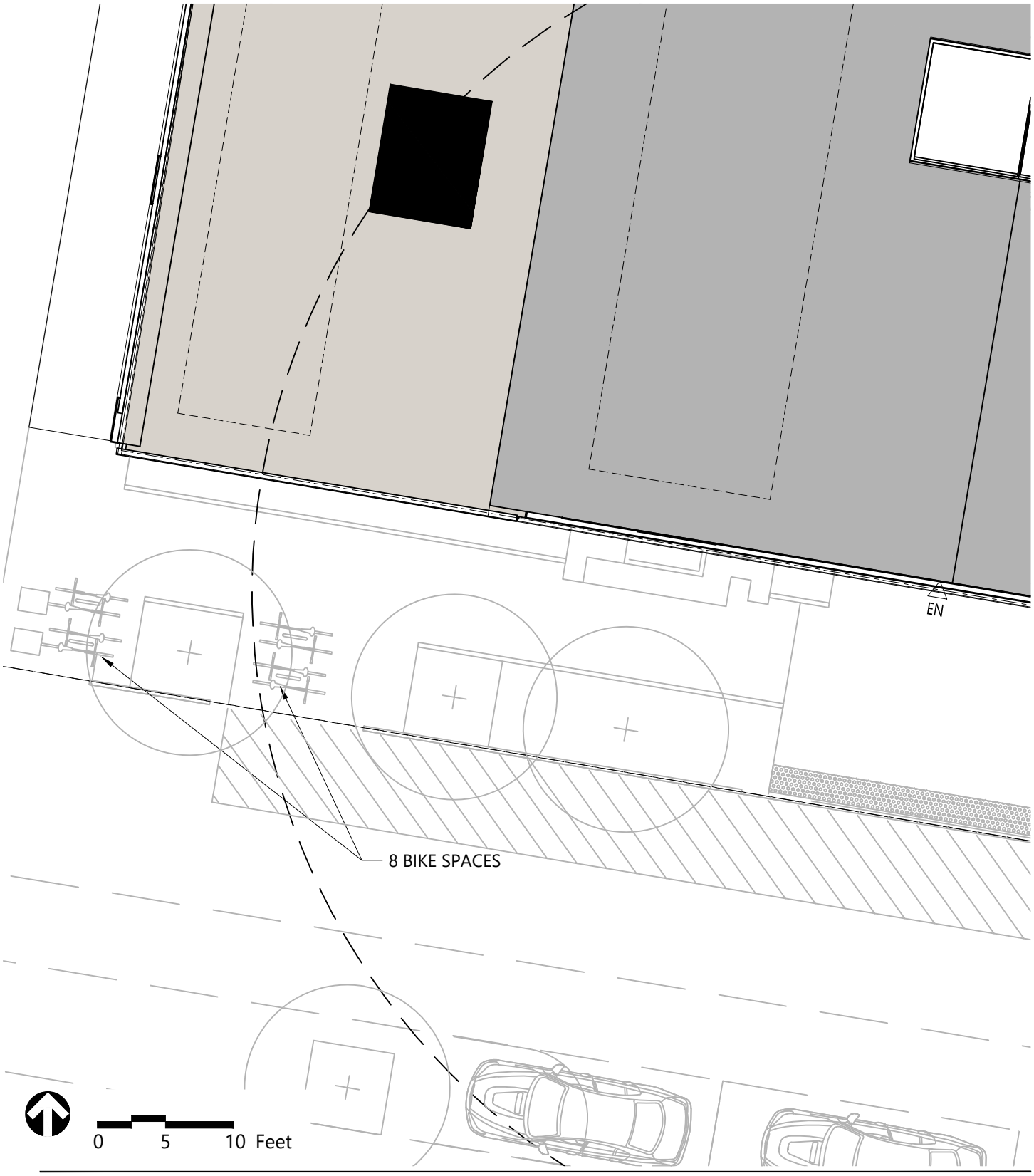


Legend

EN Main Entrance

50' Radius

Figure E.2

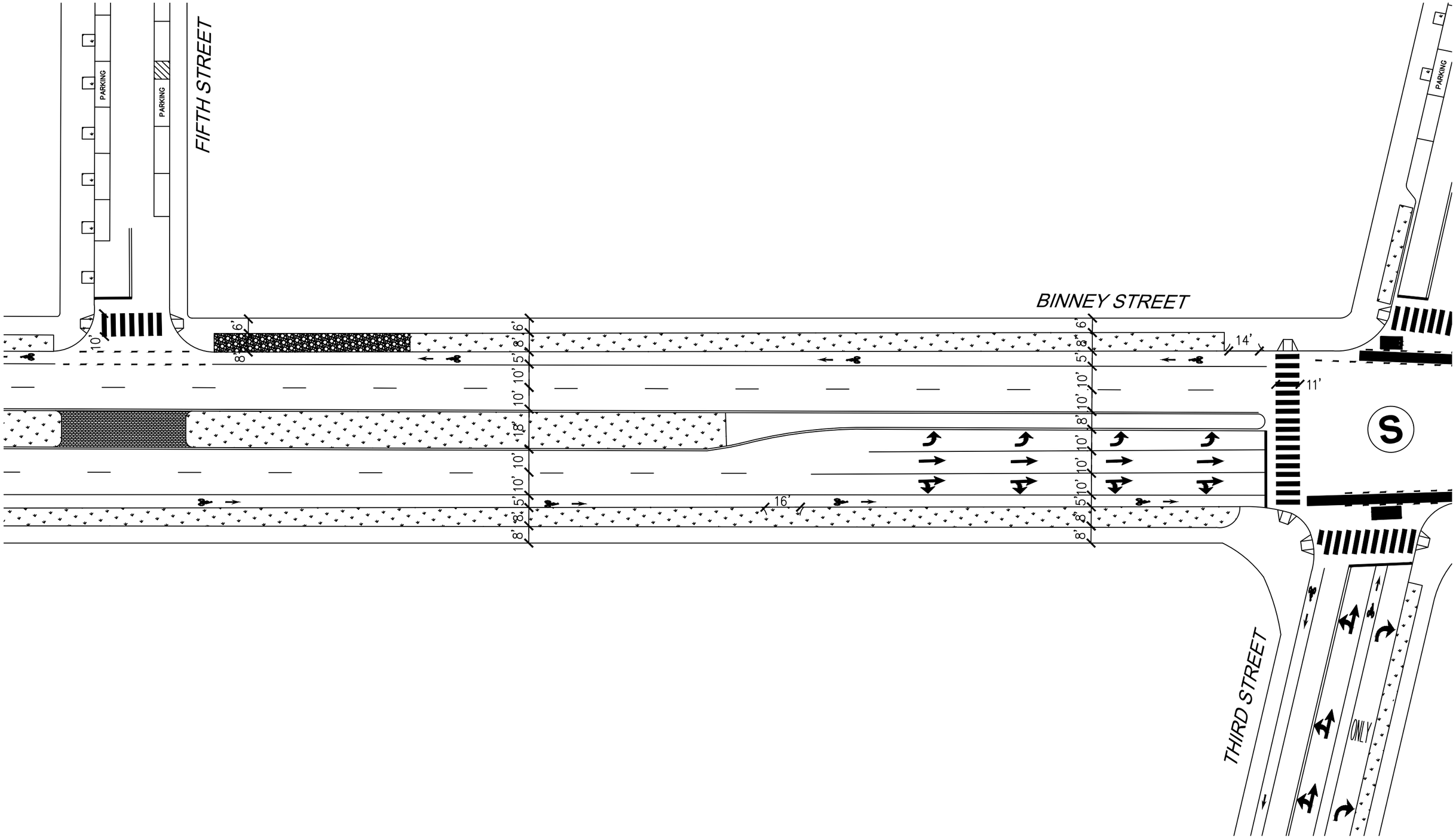
Short-Term Bicycle Parking

The Foundry Building
Cambridge, Massachusetts

Figure E.3

Short-Term Bicycle Parking

The Foundry Building
Cambridge, Massachusetts



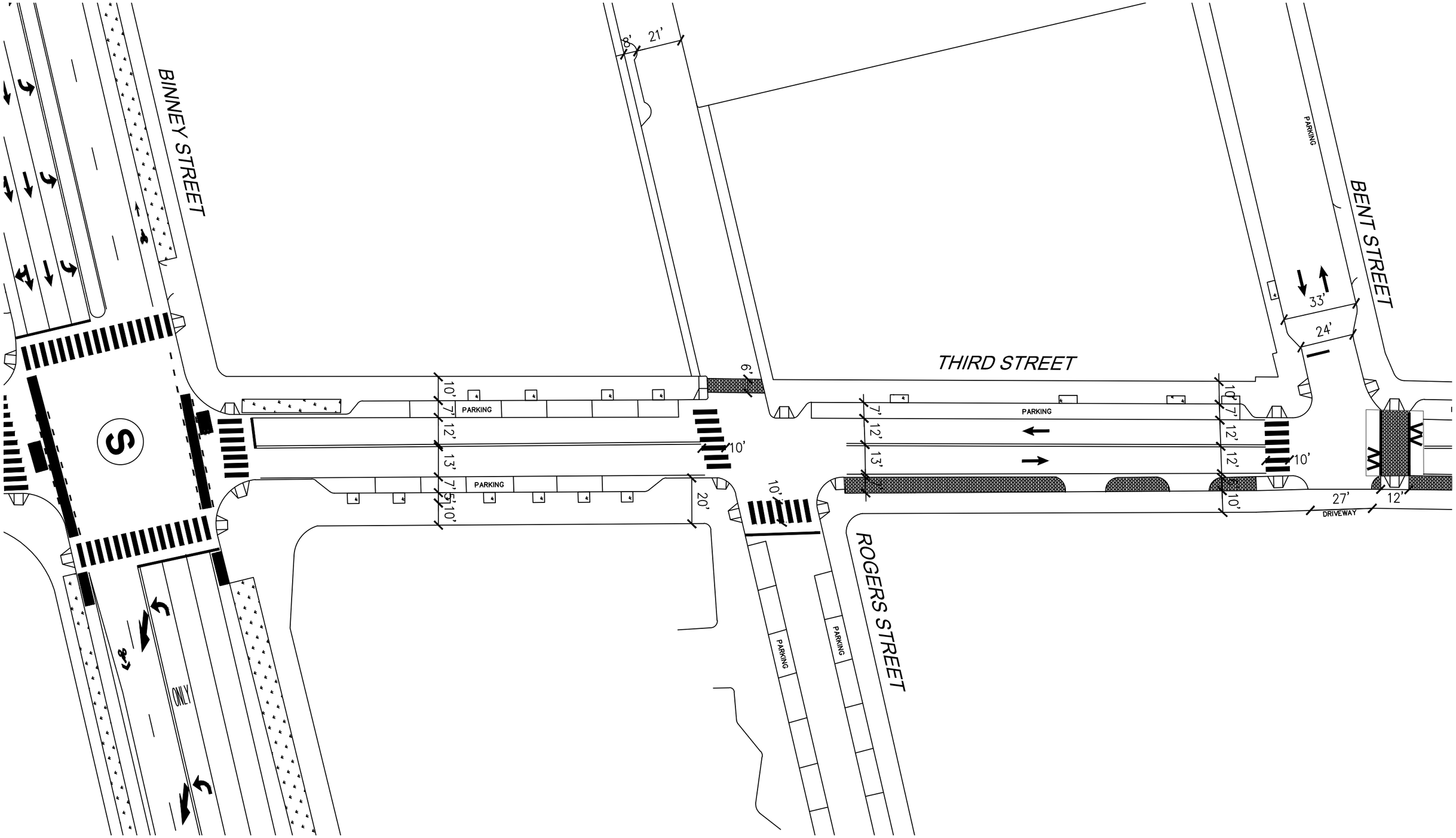
0 20 40 Feet

Date: October 2019

Note: All dimensions and pavement markings are approximate

Figure 1.a.1
Existing Conditions Roadway Sketch
Binney Street between Fifth Street and Third Street
The Foundry Building
Cambridge, MA

\\vhb\gbl\proj\Boston\14496.00 Cambridge 7 Foundry\Graphics\FIGURES\Foundry Roadways.dwg



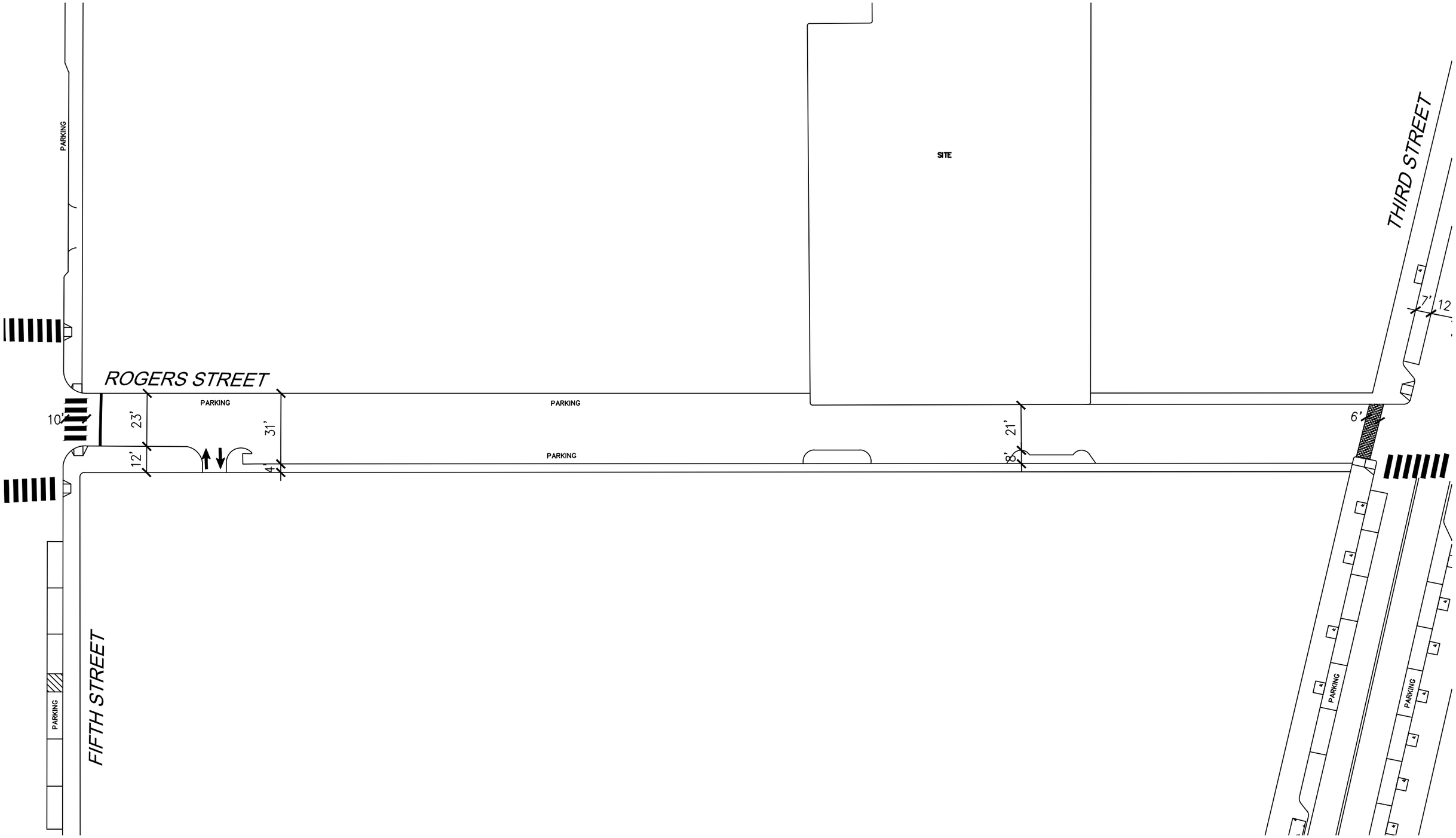
Note: All dimensions and pavement markings are approximate

0 20 40 Feet

Date: October 2019

Figure 1.a.2
Existing Conditions Roadway Sketch
Third Street between Binney Street and Bent Street
The Foundry Building
Cambridge, MA

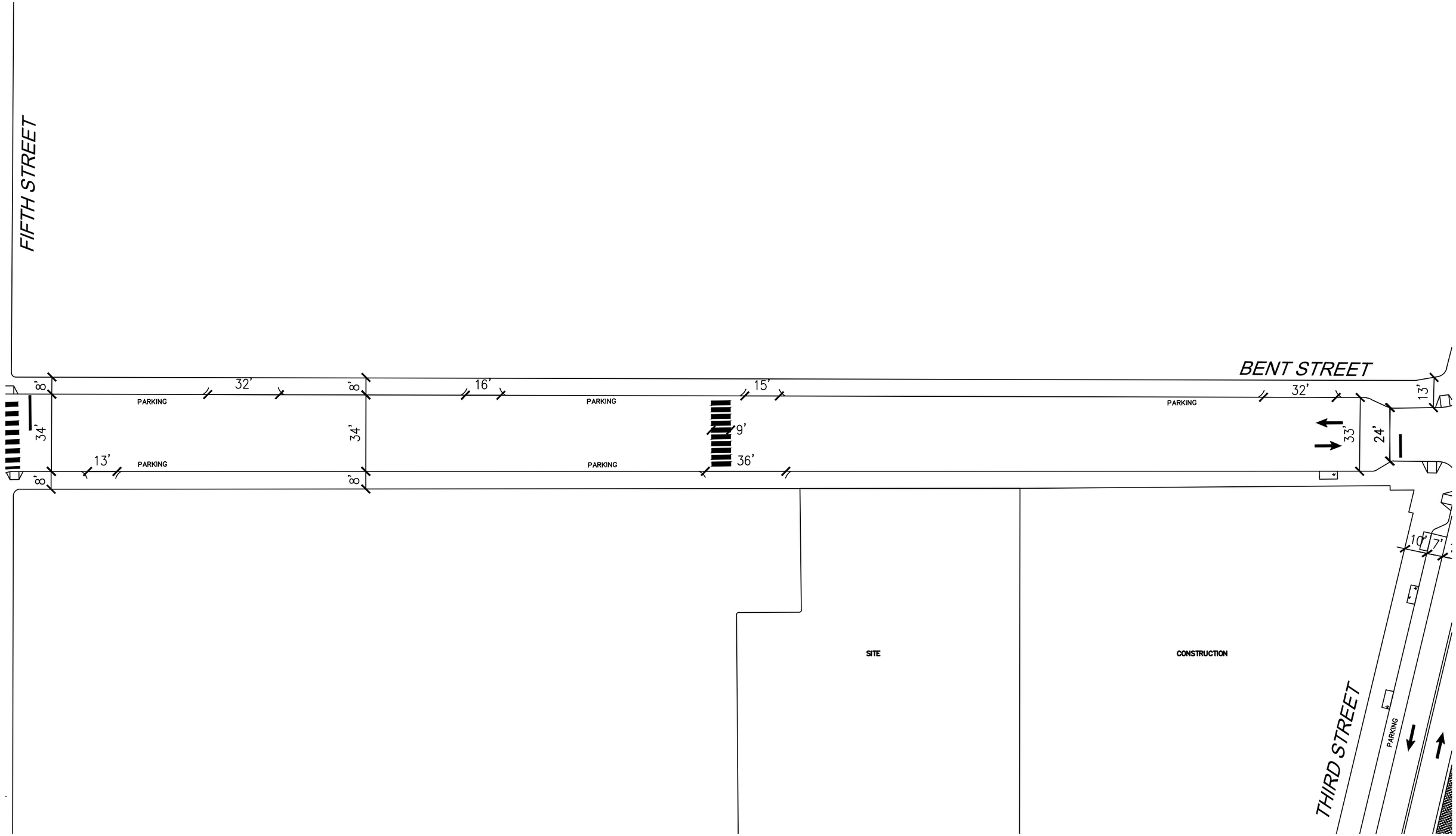
\\vhb\gbl\proj\Boston\14496.00 Cambridge 7 Foundry\Graphics\FIGURES\Foundry Roadways.dwg



Note: All dimensions and pavement markings are approximate

Date: October 2019

Figure 1.a.3
Existing Conditions Roadway Sketch
Rogers Street between Fifth Street and Third Street
The Foundry Building
Cambridge, MA

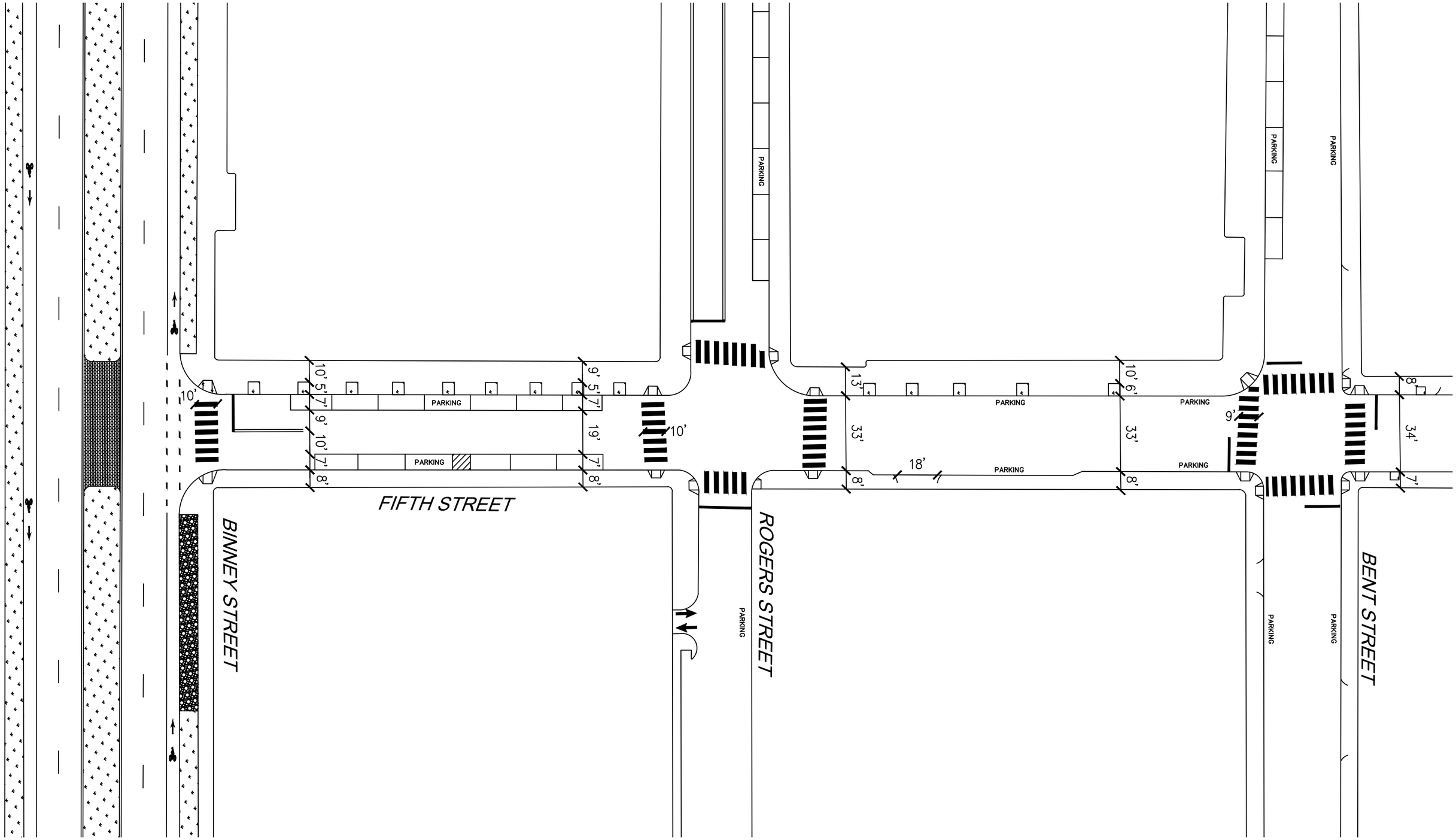


Note: All dimensions and pavement markings are approximate

0 20 40 Feet

Date: October 2019

Figure 1.a.4
Existing Conditions Roadway Sketch
Bent Street between Fifth Street and Third Street
The Foundry Building
Cambridge, MA

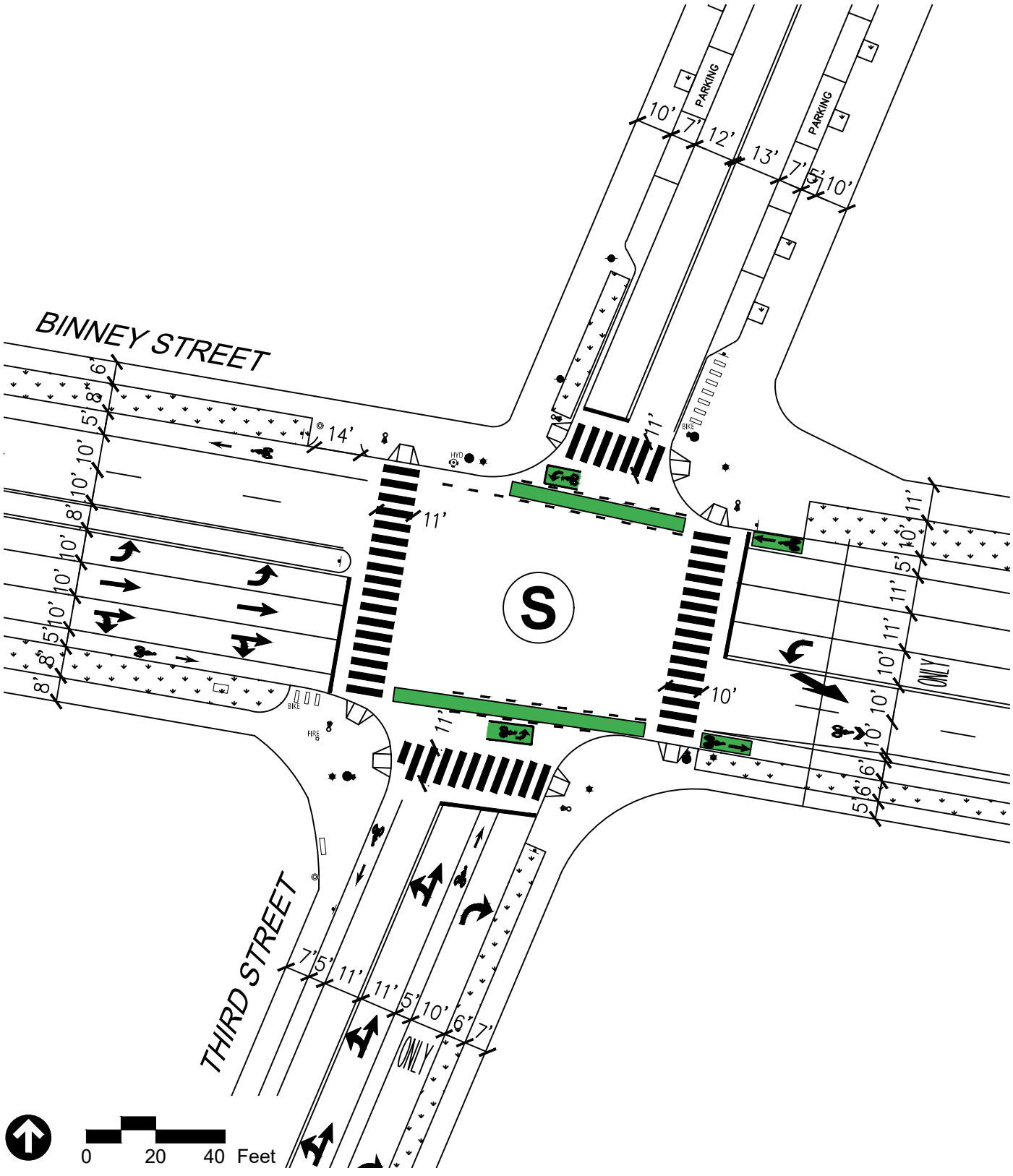


Note: All dimensions and pavement markings are approximate

0 20 40 Feet

Date: October 2019

Figure 1.a.5
Existing Conditions Roadway Sketch
Fifth Street between Binney Street and Bent Street
The Foundry Building
Cambridge, MA

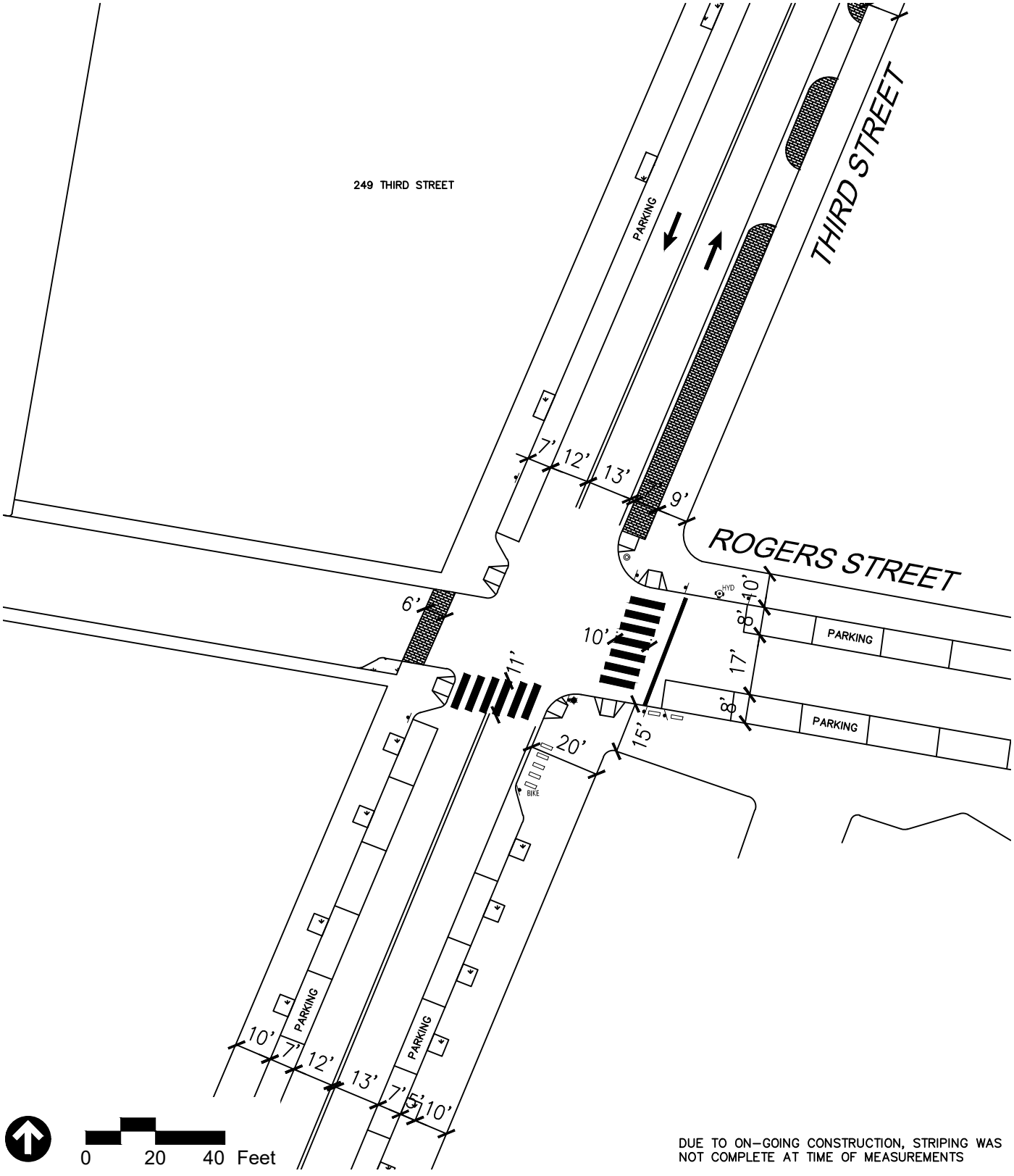


Date: October 2019

Figure 1.b.1

Existing Conditions Intersection Sketch
Third Street at Binney Street

The Foundry Building
Cambridge, MA

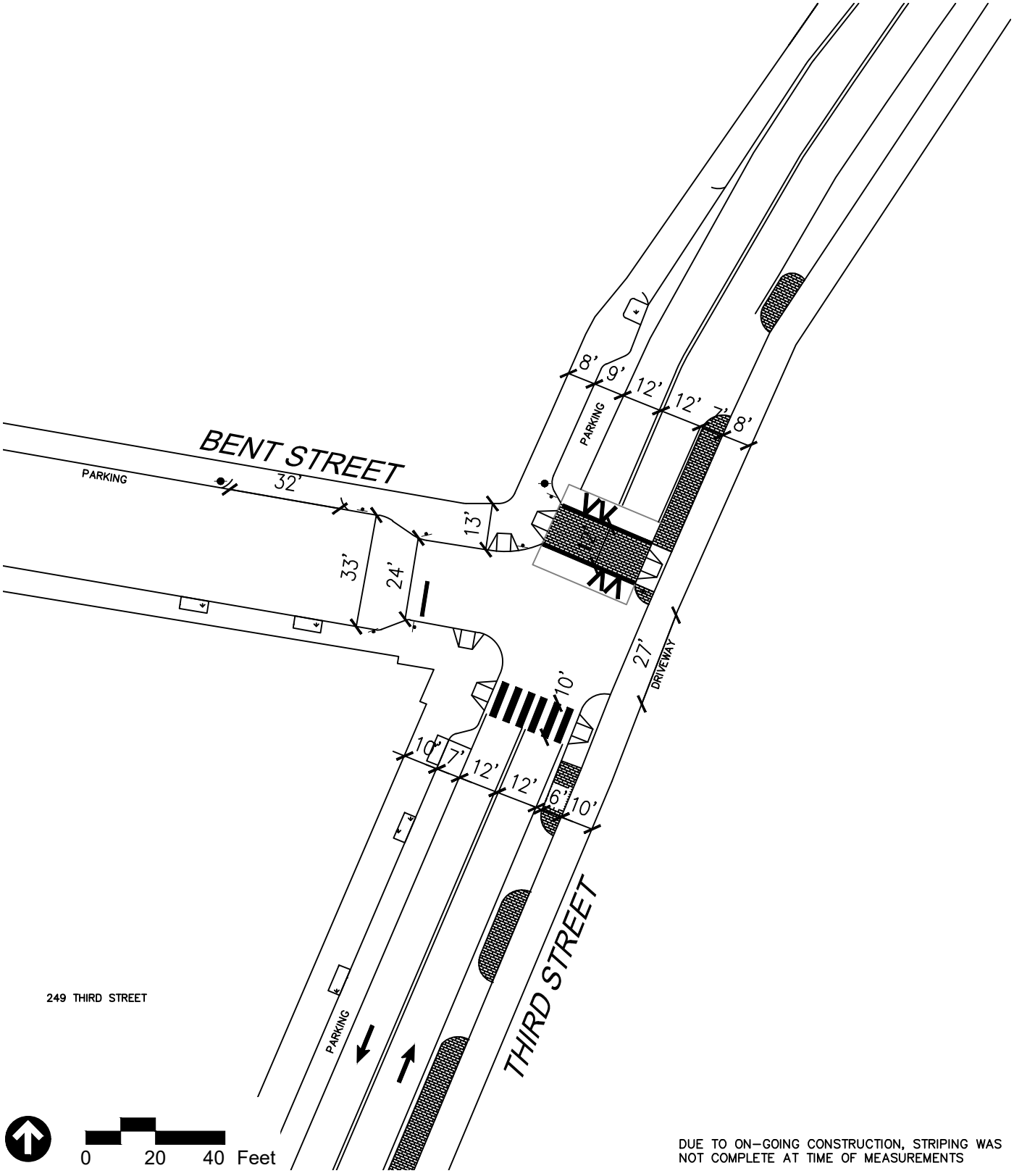


Date: October 2019

Figure 1.b.2

Existing Conditions Intersection Sketch
Third Street at Rogers Street

The Foundry Building
Cambridge, MA

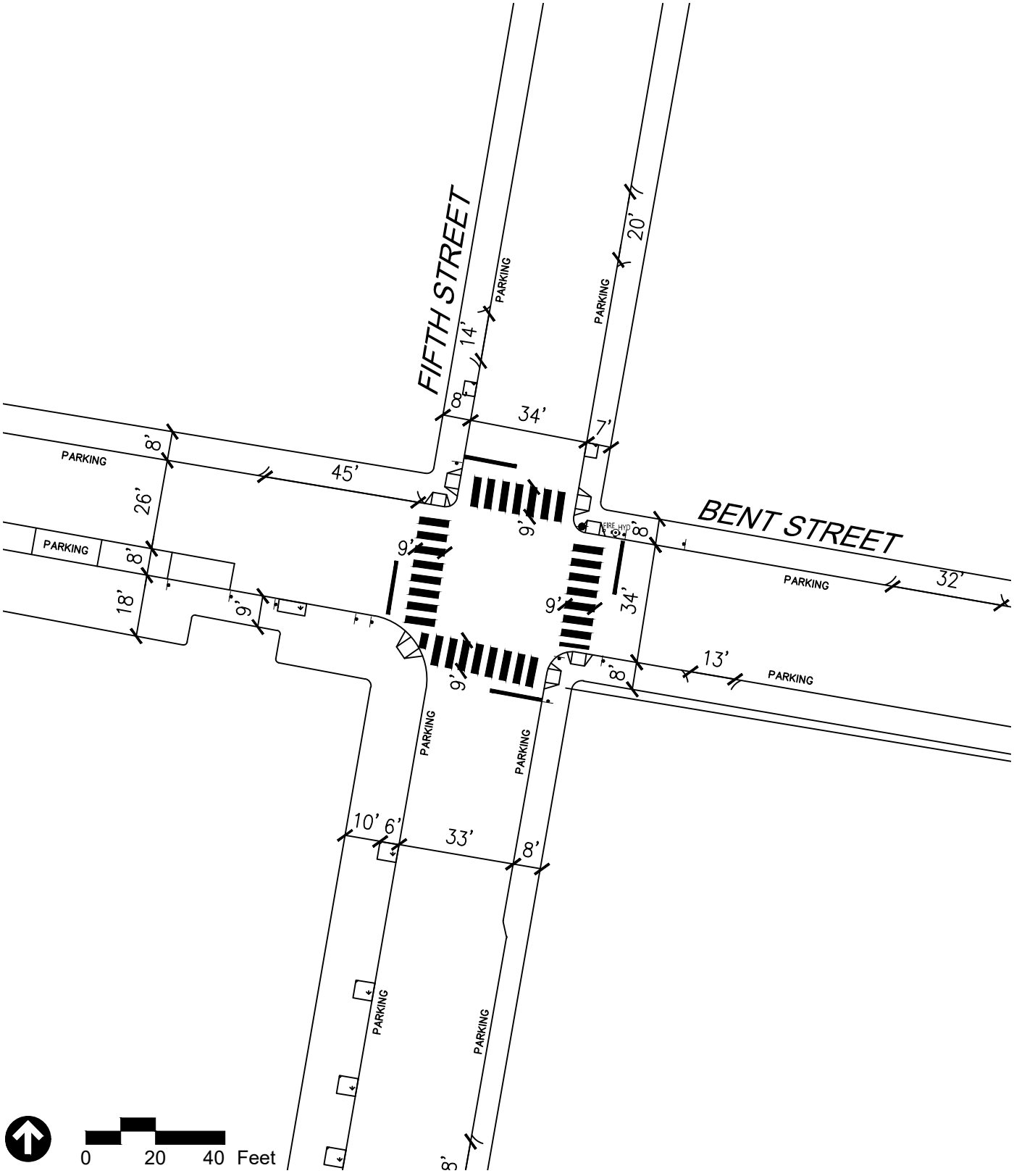


Date: October 2019

Figure 1.b.3

Existing Conditions Intersection Sketch
Third Street at Bent Street

The Foundry Building
Cambridge, MA



Date: October 2019

Figure 1.b.4

Existing Conditions Intersection Sketch
Fifth Street at Bent Street

The Foundry Building
Cambridge, MA

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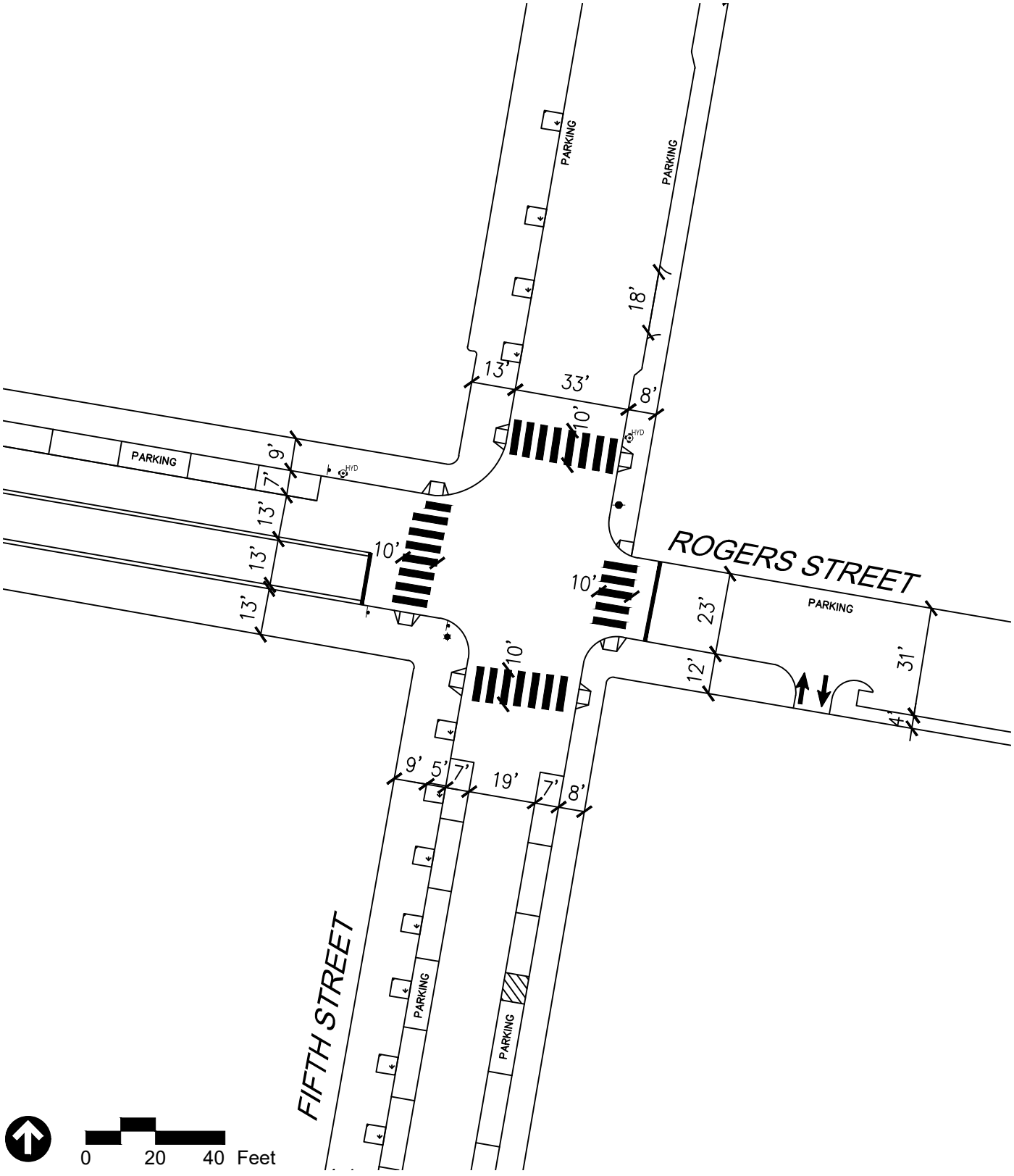
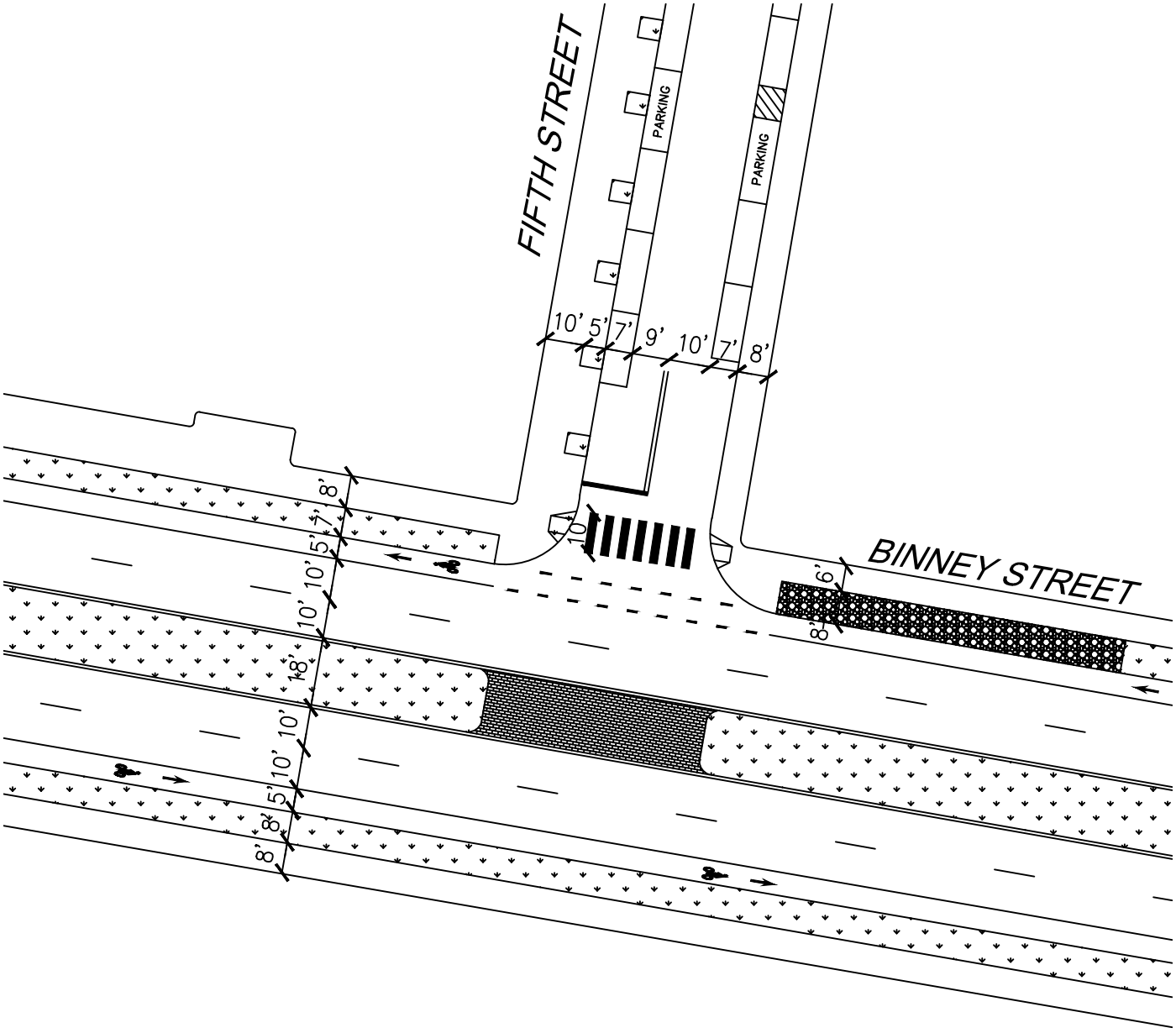


Date: October 2019

Figure 1.b.5

Existing Conditions Intersection Sketch
Fifth Street at Rogers Street

The Foundry Building
Cambridge, MA



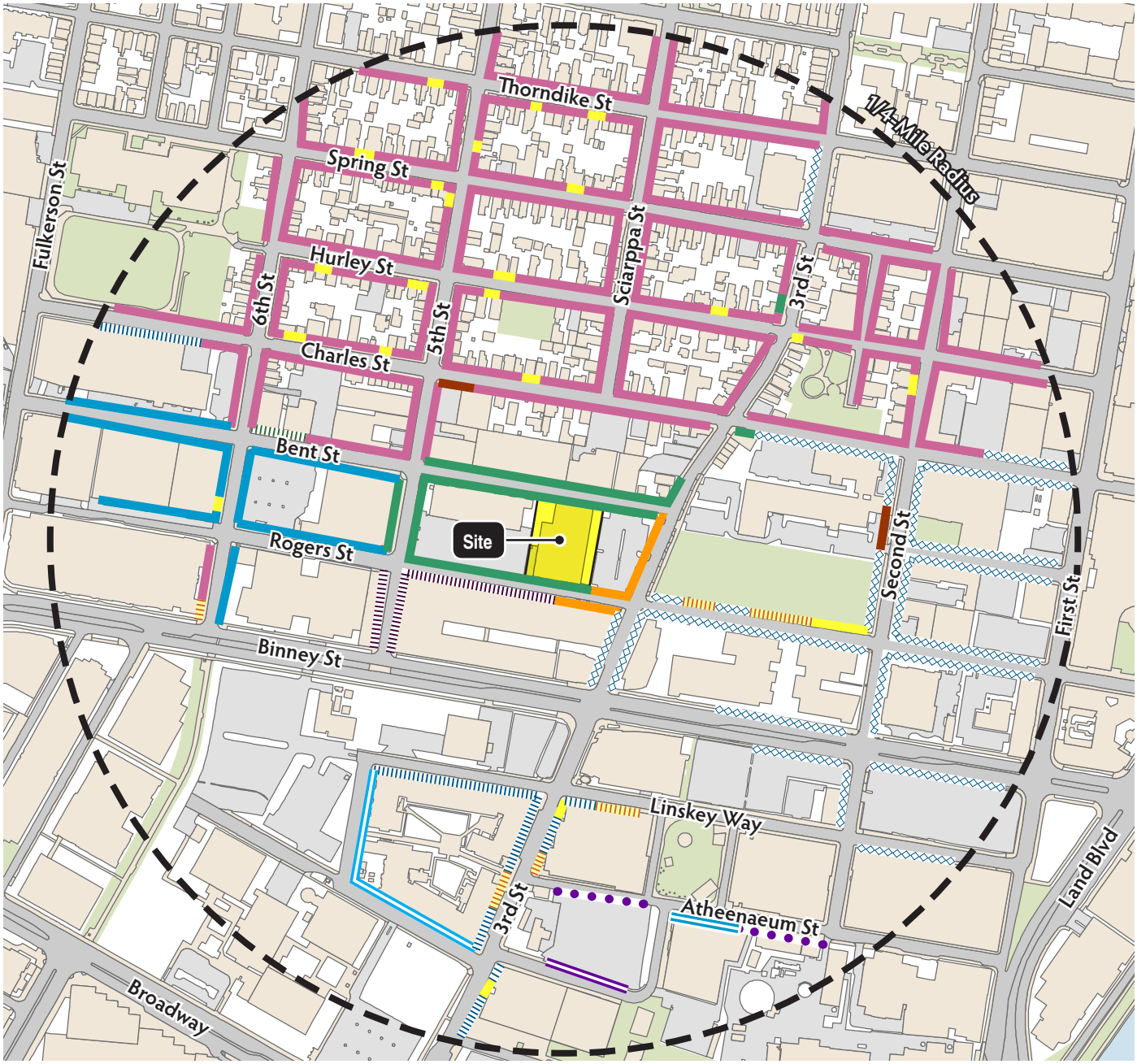
0 20 40 Feet

Date: October 2019

Figure 1.b.6

Existing Conditions Intersection Sketch
Fifth Street at Binney Street

The Foundry Building
Cambridge, MA

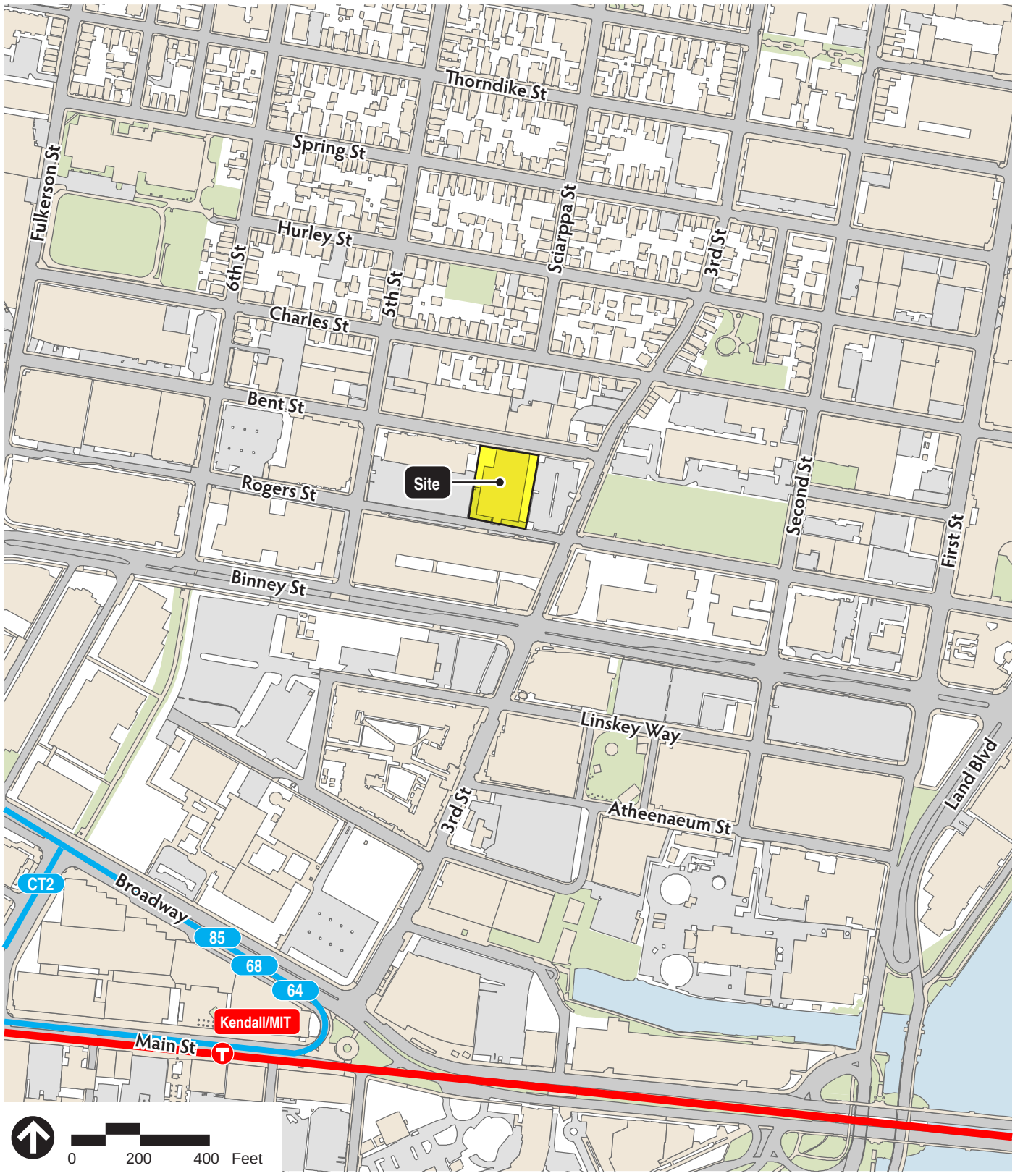


Source: City of Cambridge

Figure 1.c.1

On-Street Parking Regulations

The Foundry Building
Cambridge, Massachusetts



Source: City of Cambridge

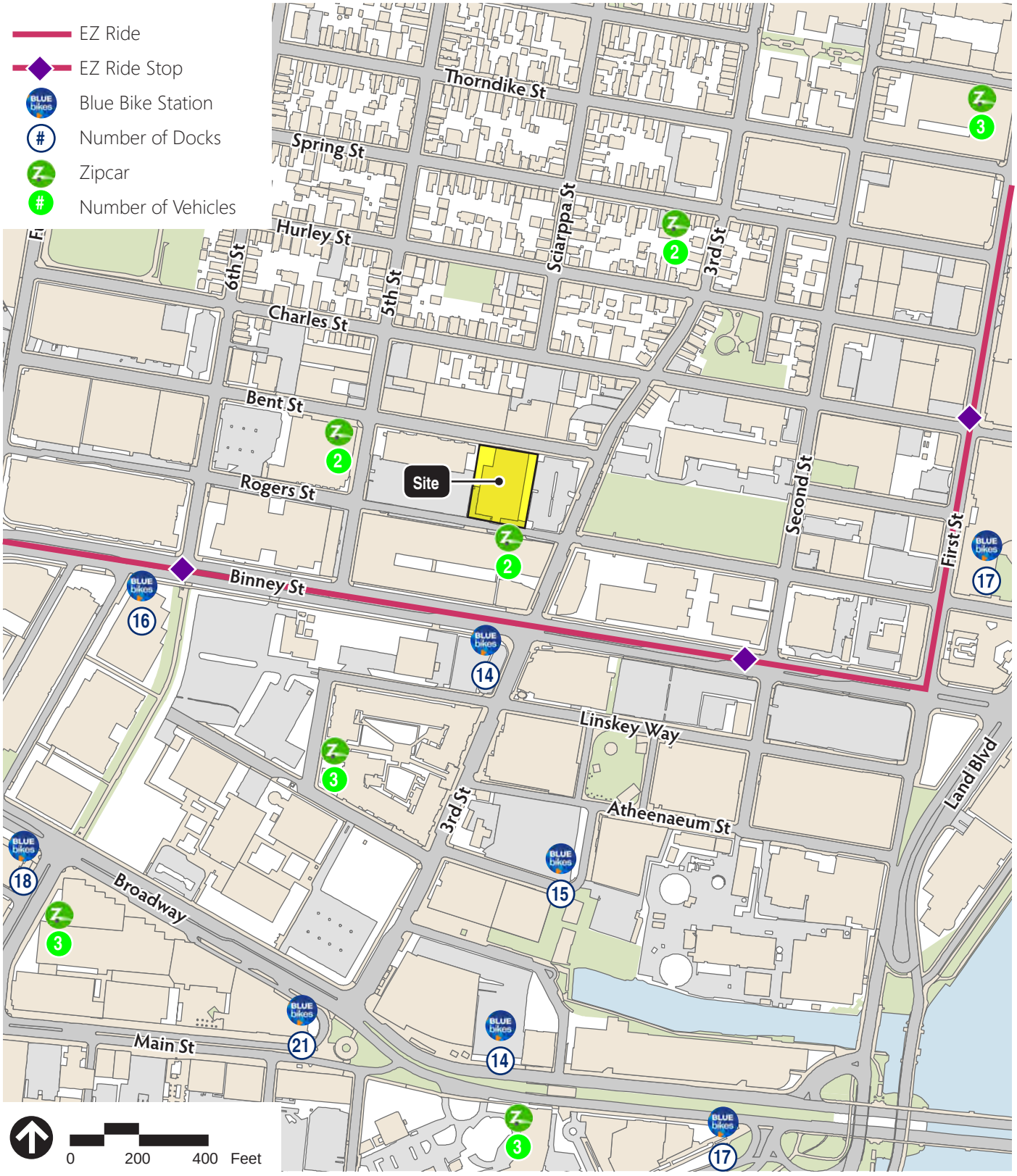
MBTA Red Line

MBTA Bus

Figure 1.d.1

Public Transportation

The Foundry Building
Cambridge, Massachusetts

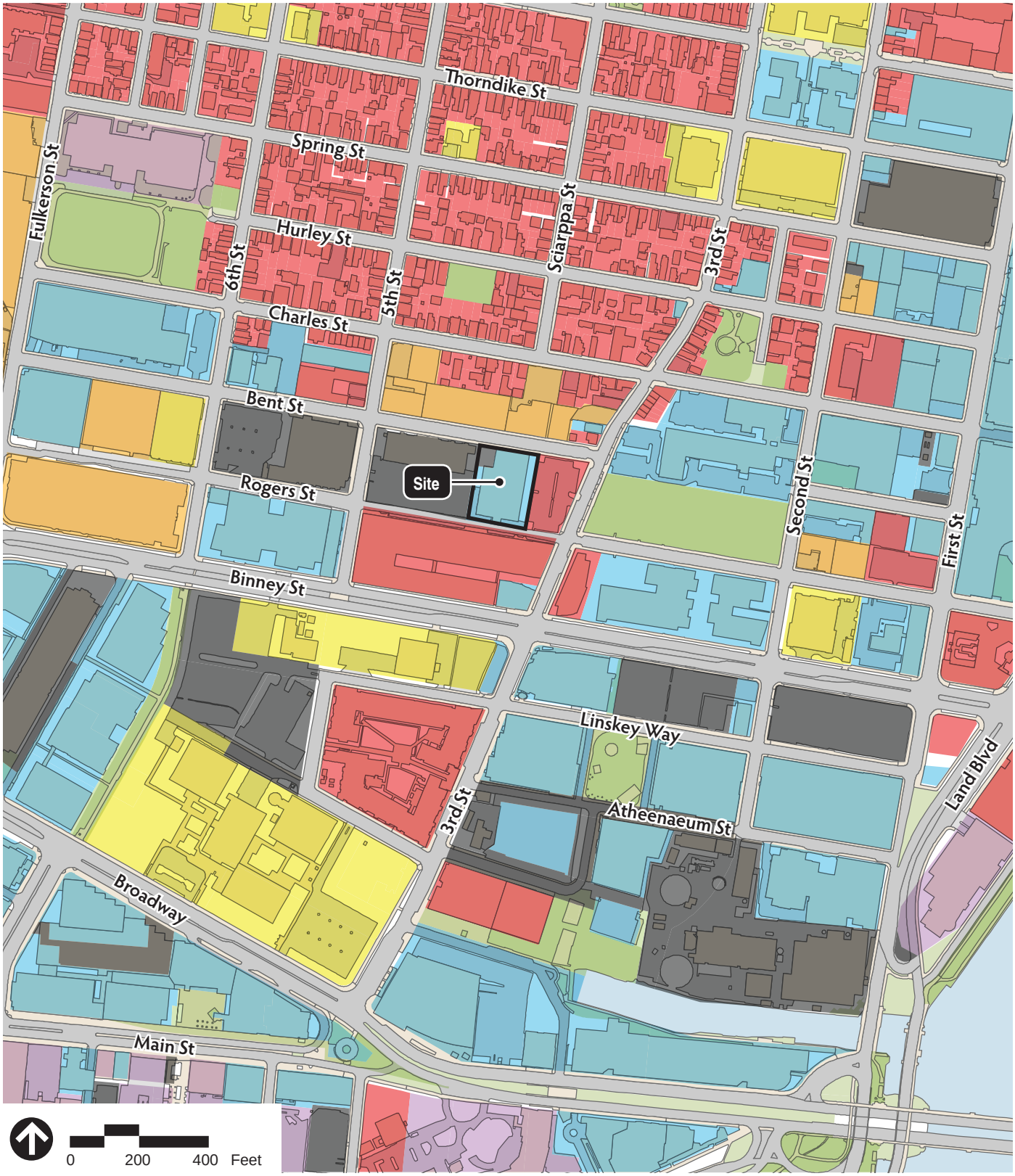


Source: City of Cambridge

Figure 1.d.2

Private Transportation Services

The Foundry Building
Cambridge, Massachusetts



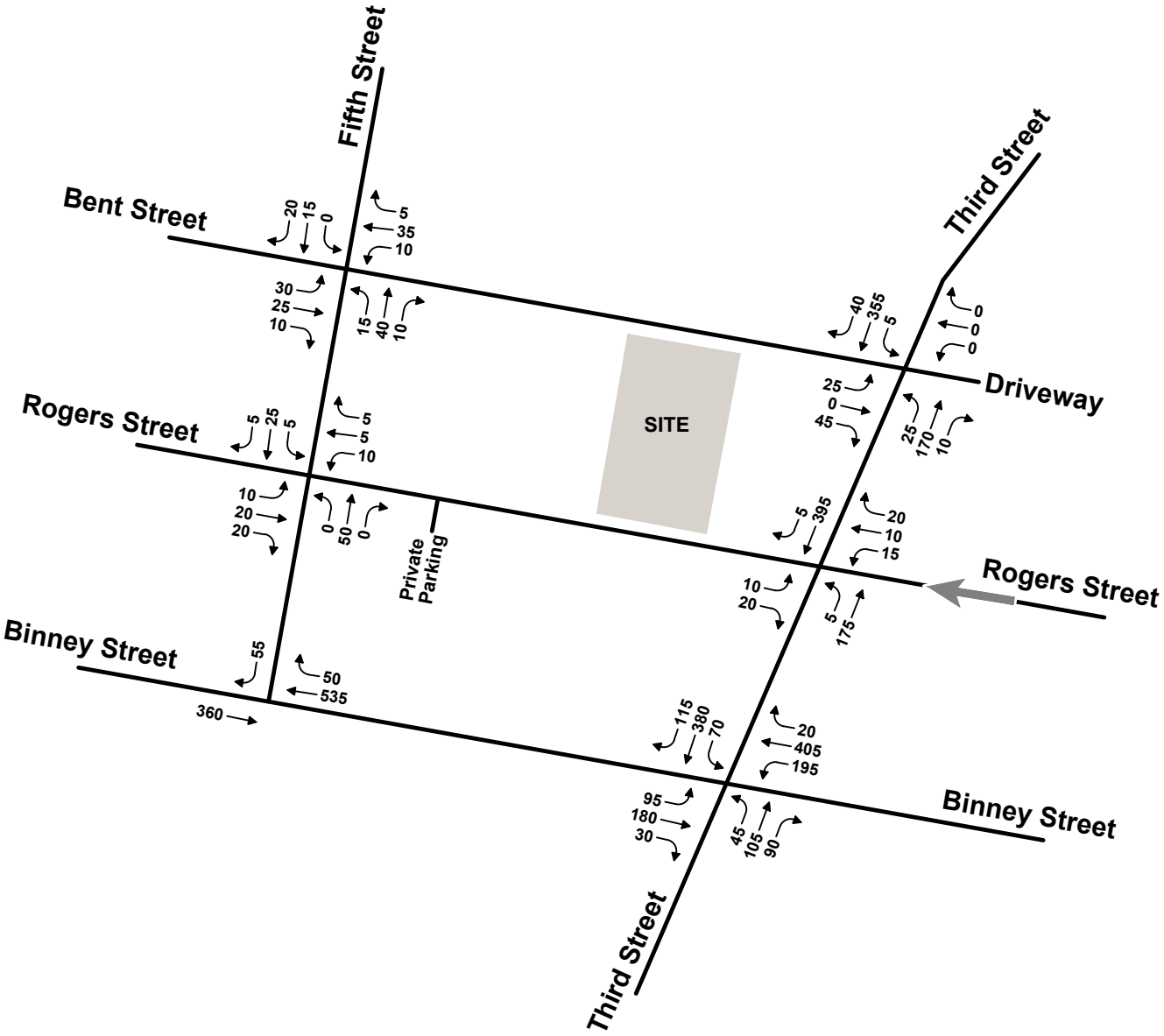
Source: City of Cambridge

- Residential
- Commercial/Office
- Industrial
- Education
- Government/Health
- Transportation/Utility
- Open Space

Figure 1.e.1

Land Uses

The Foundry Building
Cambridge, Massachusetts



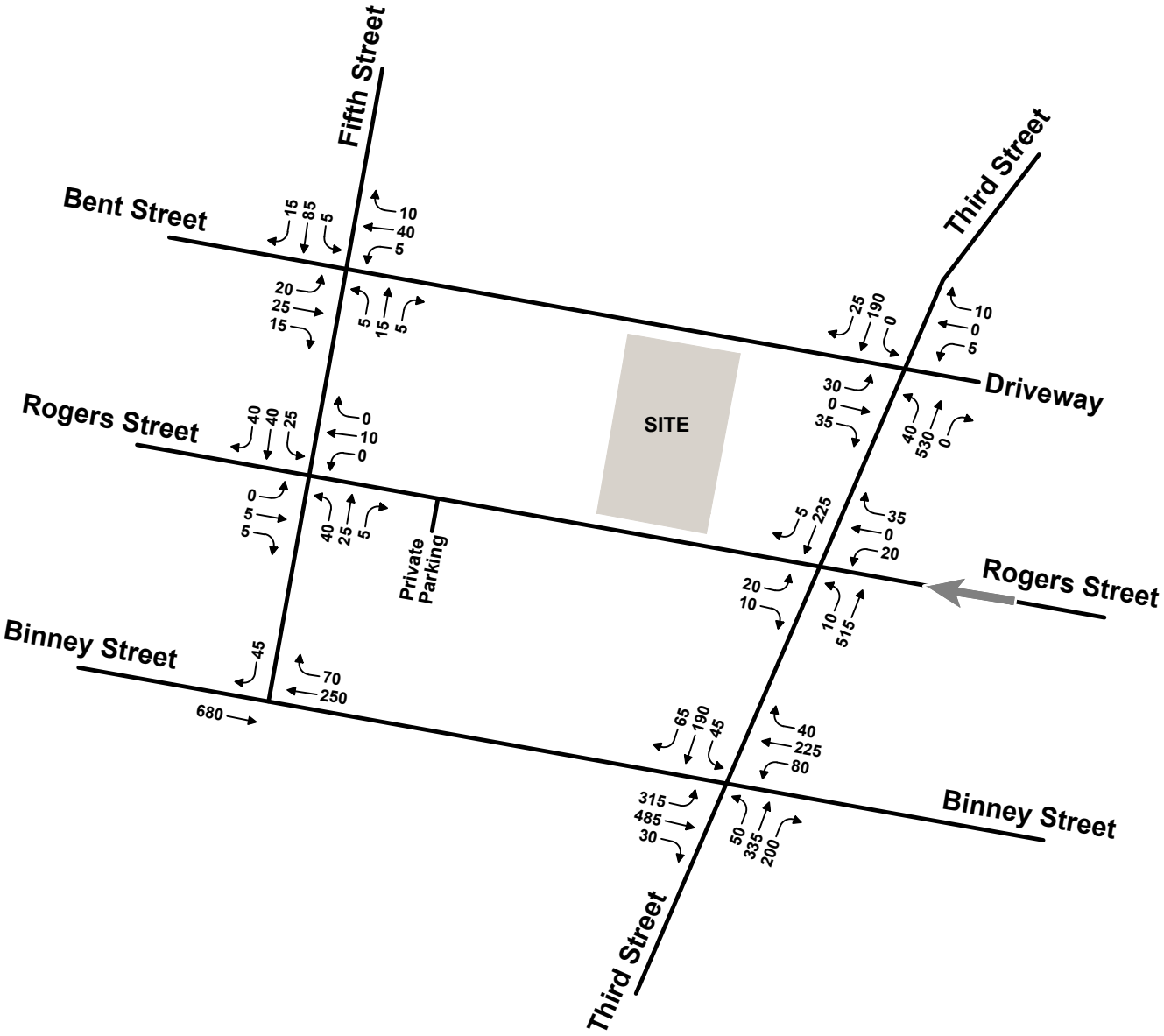
Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Vehicle volumes at Third St/Binney St are from the 2009 *Binney Street Project TIS*.
Turning movement counts were not collected at Rogers Street intersections due to construction.
Traffic volumes were estimated based on the counts collected at the other study intersections and were approved through conversation and communication with Cambridge TP&T.

Not to Scale

Figure 2.c.1

2019 Existing Condition Vehicle Volumes
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



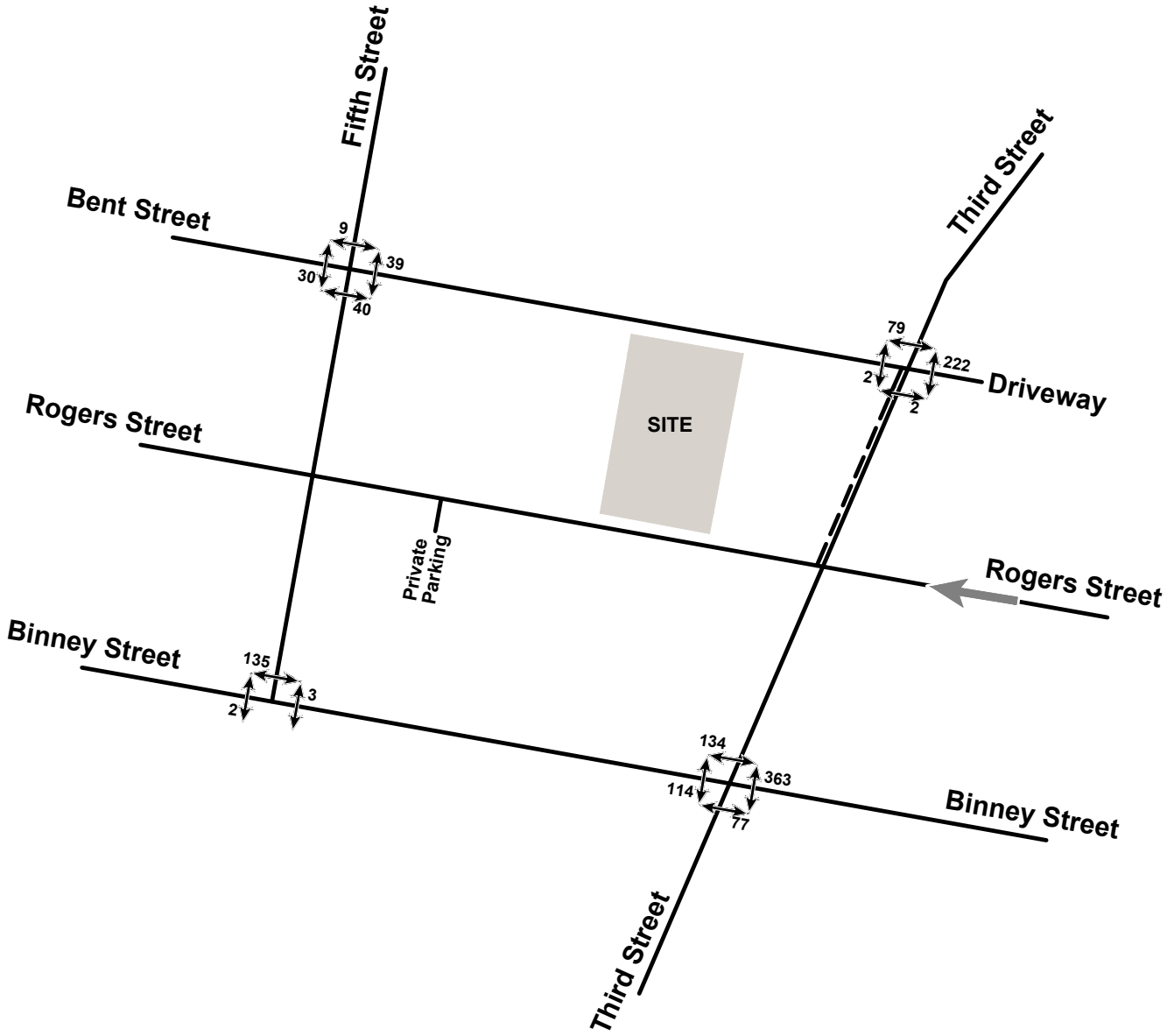
Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Vehicle volumes at Third St/Binney St are from the 2009 *Binney Street Project TIS*.
Turning movement counts were not collected at Rogers Street intersections due to construction.
Traffic volumes were estimated based on the counts collected at the other study intersections and were approved through conversation and communication with Cambridge TP&T.

Not to Scale

Figure 2.c.2

2019 Existing Condition Vehicle Volumes
PM Peak Hour

The Foundry Building
Cambridge, Massachusetts



Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Turning movement counts were not collected at Rogers Street intersections due to construction.

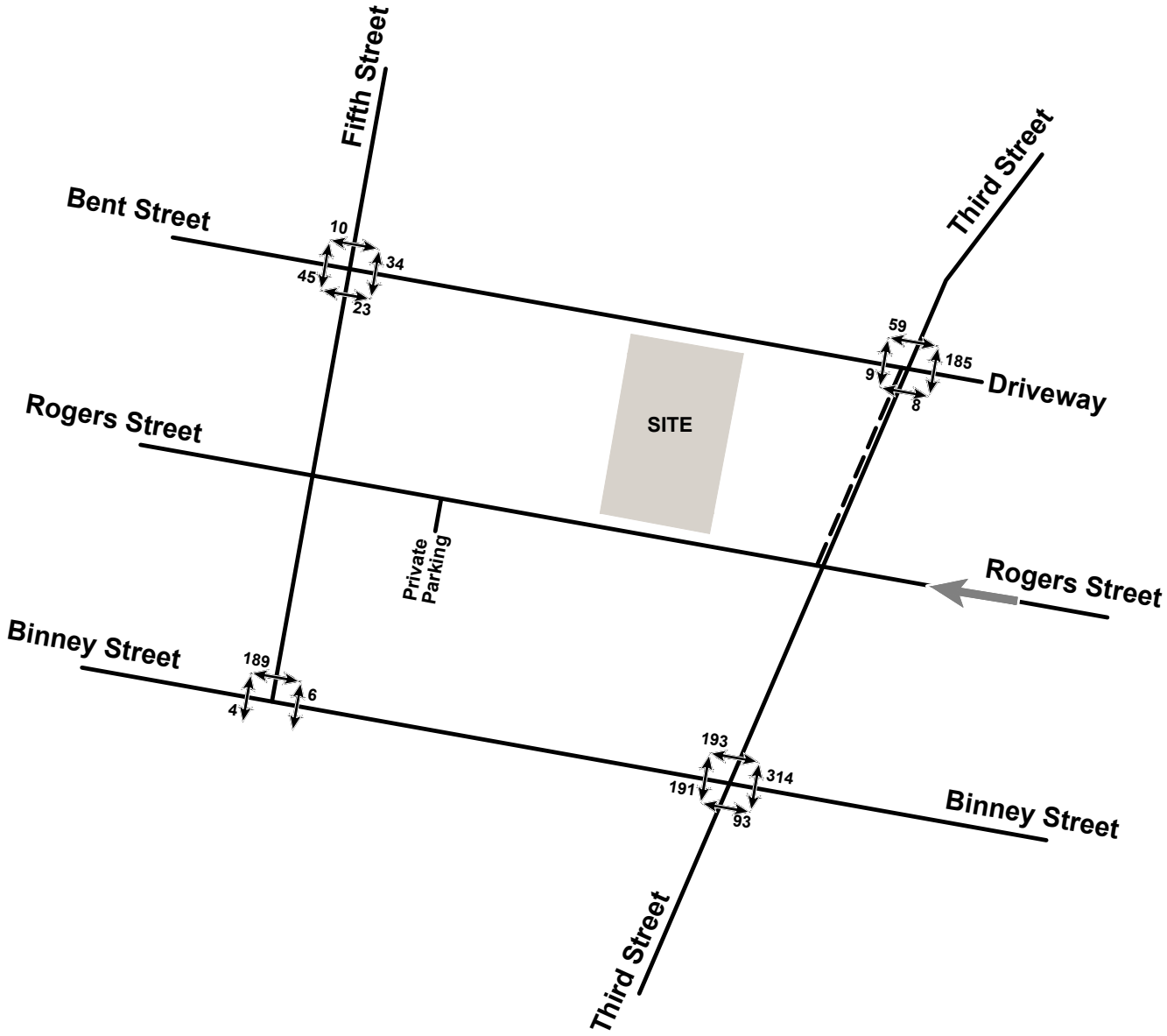
Not to Scale

Sidewalk closed during construction

Figure 2.c.3

2019 Existing Condition Pedestrian Volumes
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Turning movement counts were not collected at Rogers Street intersections due to construction.

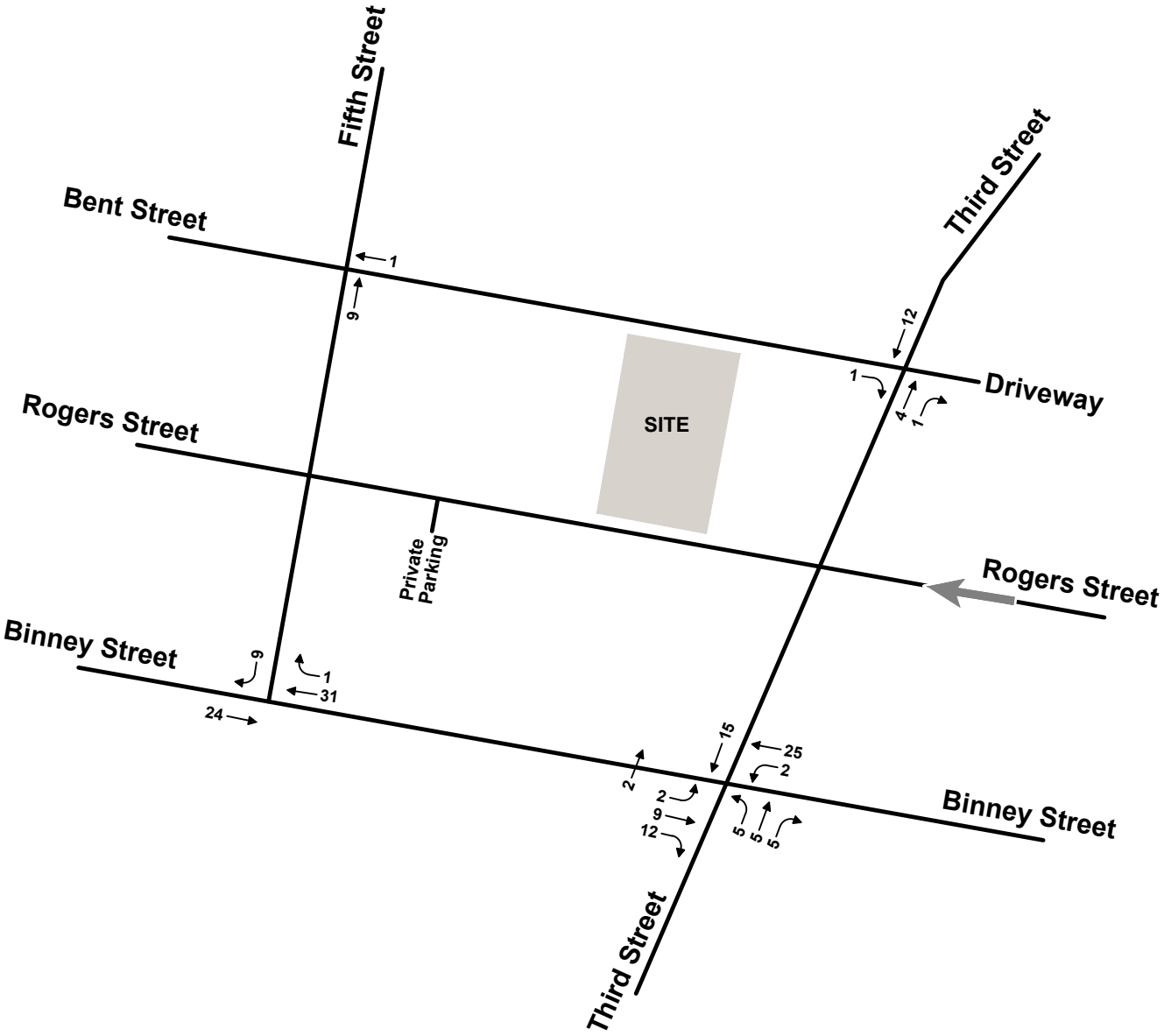
Not to Scale

Sidewalk closed during construction

Figure 2.c.4

2019 Existing Condition Pedestrian Volumes
PM Peak Hour

The Foundry Building
Cambridge, Massachusetts



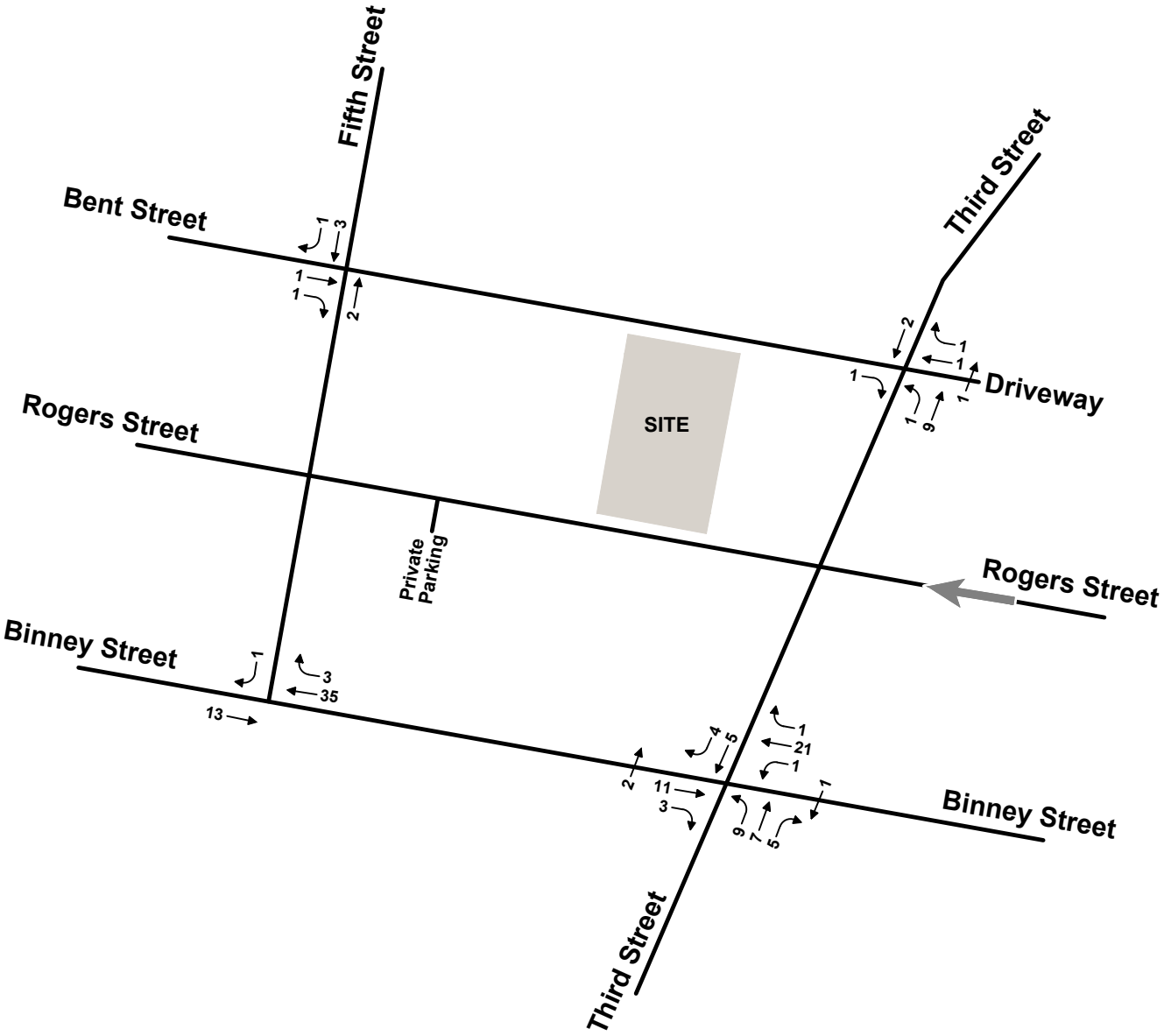
Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Turning movement counts were not collected at Rogers Street intersections due to construction.

Not to Scale

Figure 2.c.5

2019 Existing Condition Bicycle Volumes
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



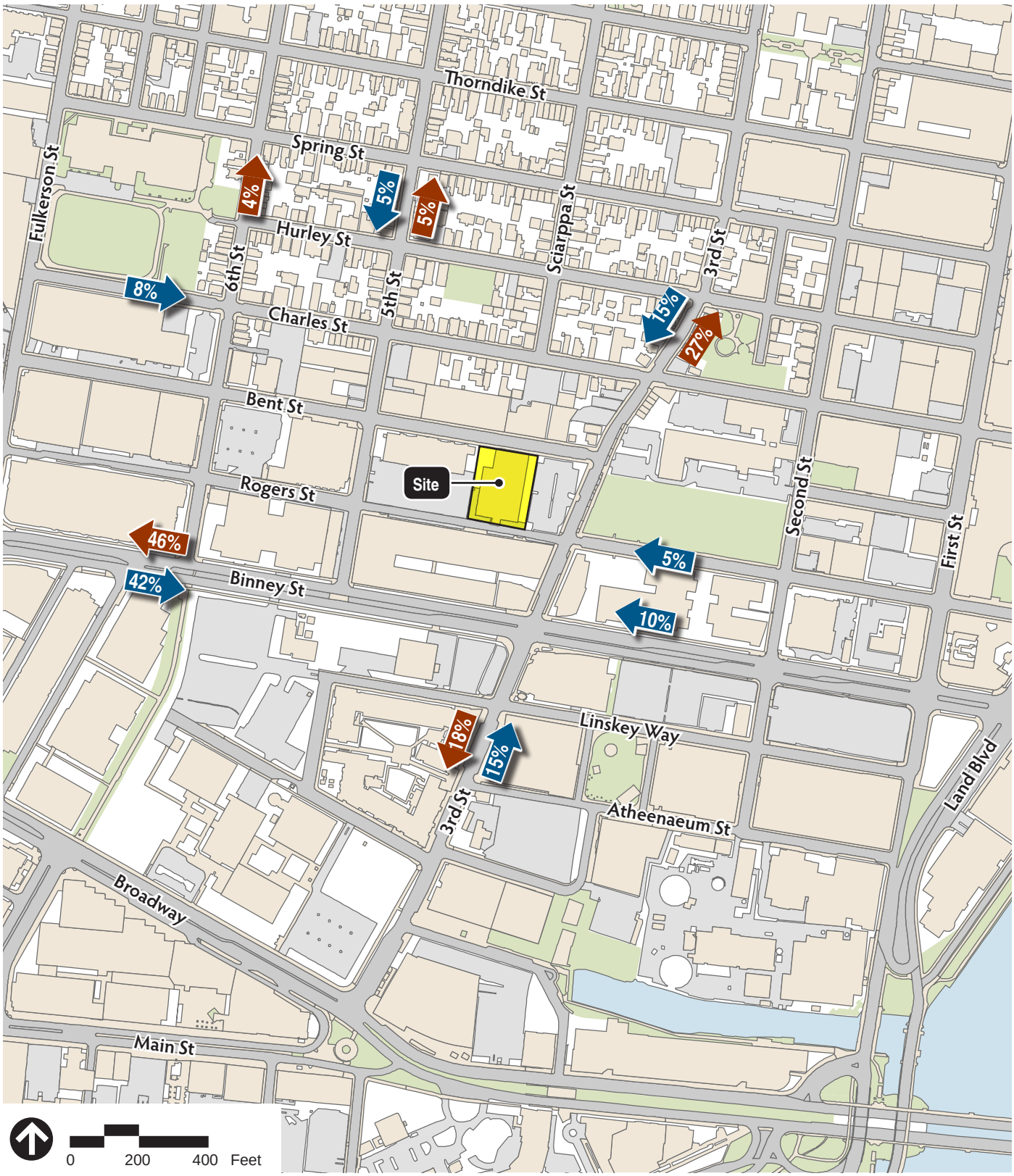
Notes:
Turning movement counts were conducted on Wednesday, March 20, 2019, for vehicles, pedestrians, and bicycles.
Turning movement counts were not collected at Rogers Street intersections due to construction.

Not to Scale

Figure 2.c.6

2019 Existing Condition Bicycle Volumes
PM Peak Hour

The Foundry Building
Cambridge, Massachusetts



Source: City of Cambridge

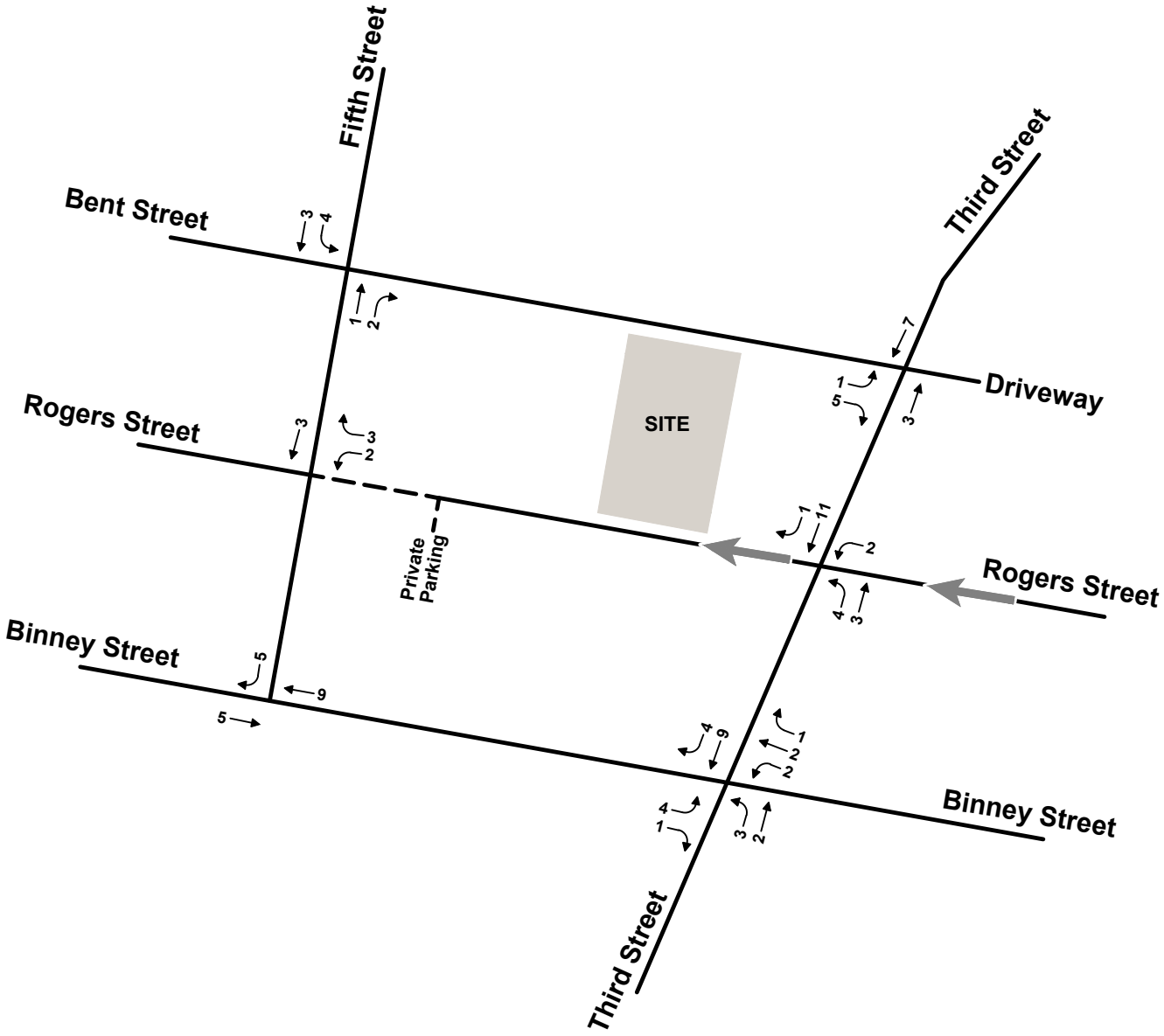
% Inbound

% Outbound

Figure 3.c.1

Project Generated Vehicle Trip Distribution

The Foundry Building
Cambridge, Massachusetts



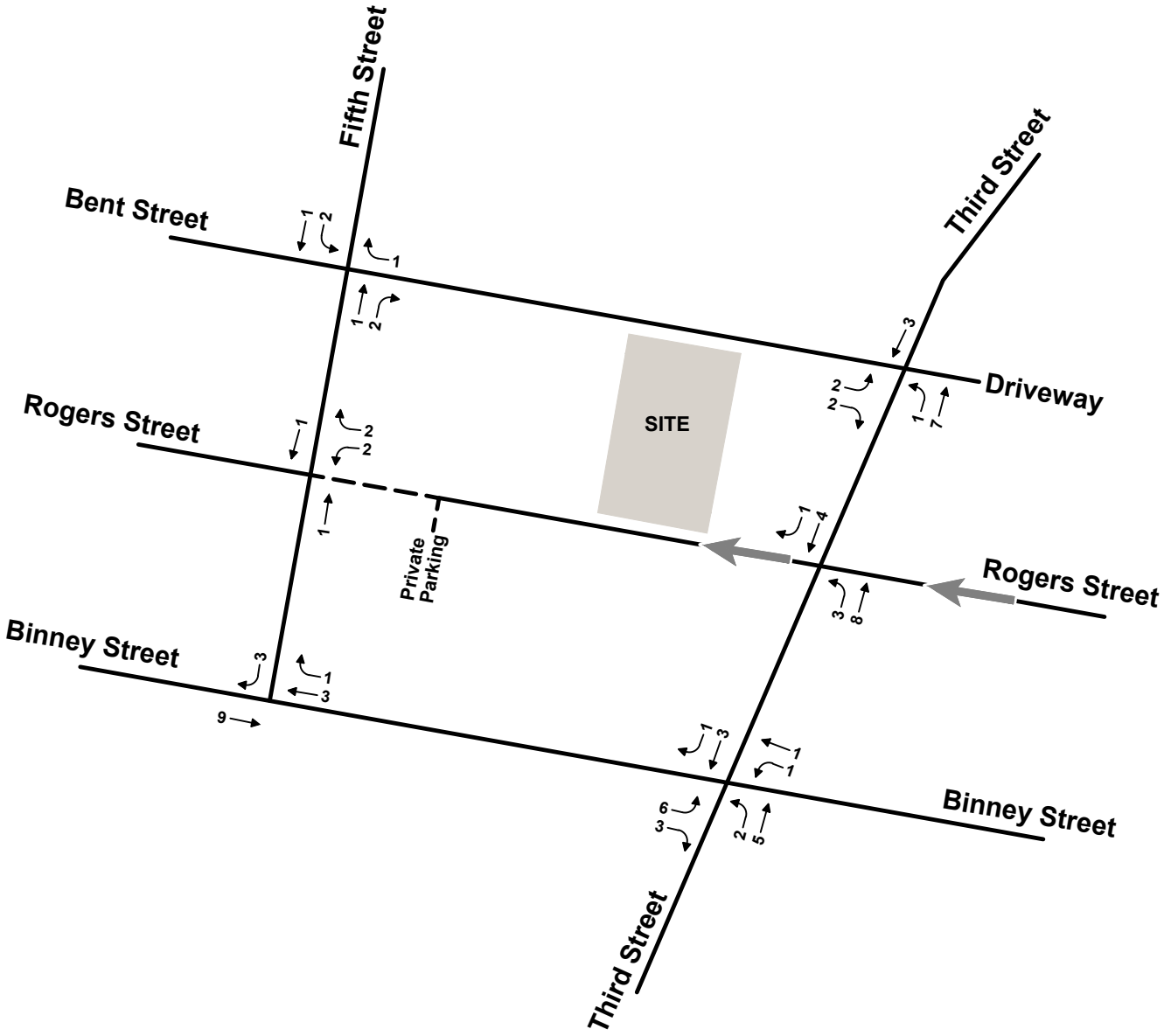
Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 3.c.2

Project Generated Trips
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 3.c.3

Project Generated Trips
PM Peak Hour

The Foundry Building
Cambridge, Massachusetts

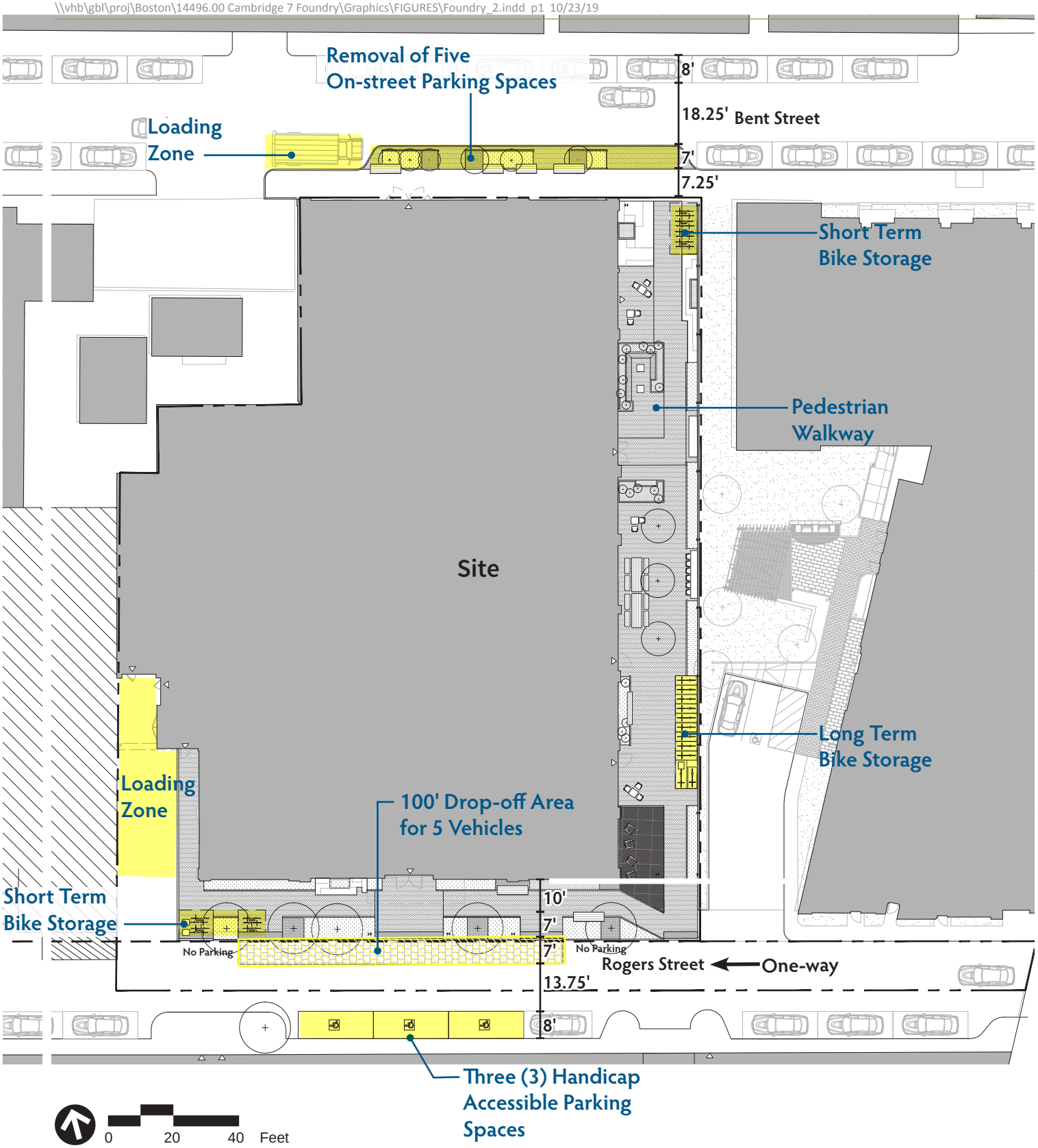
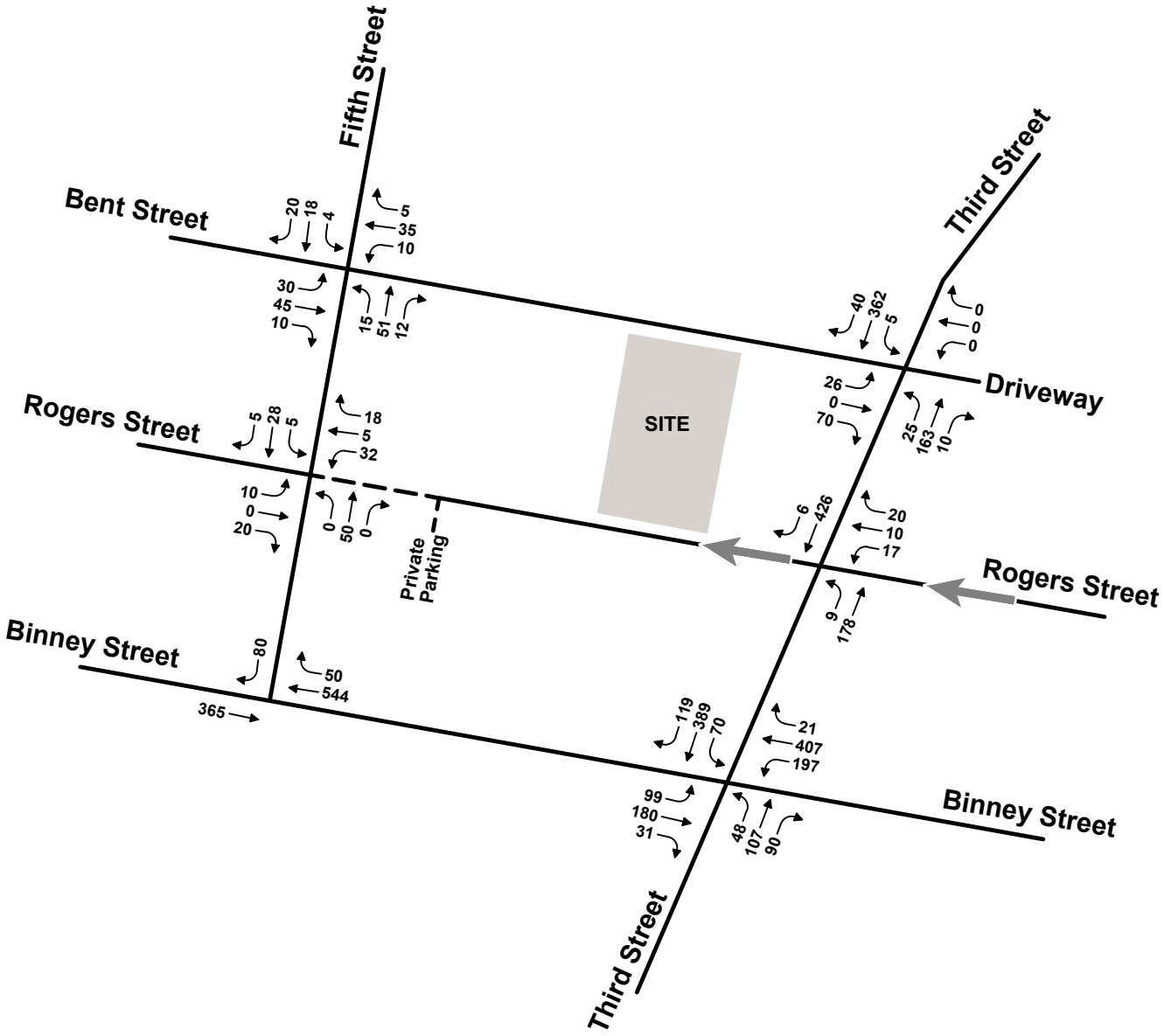


Figure 3.d.1
Proposed Site Access, Egress, and Parking

The Foundry Building
Cambridge, Massachusetts



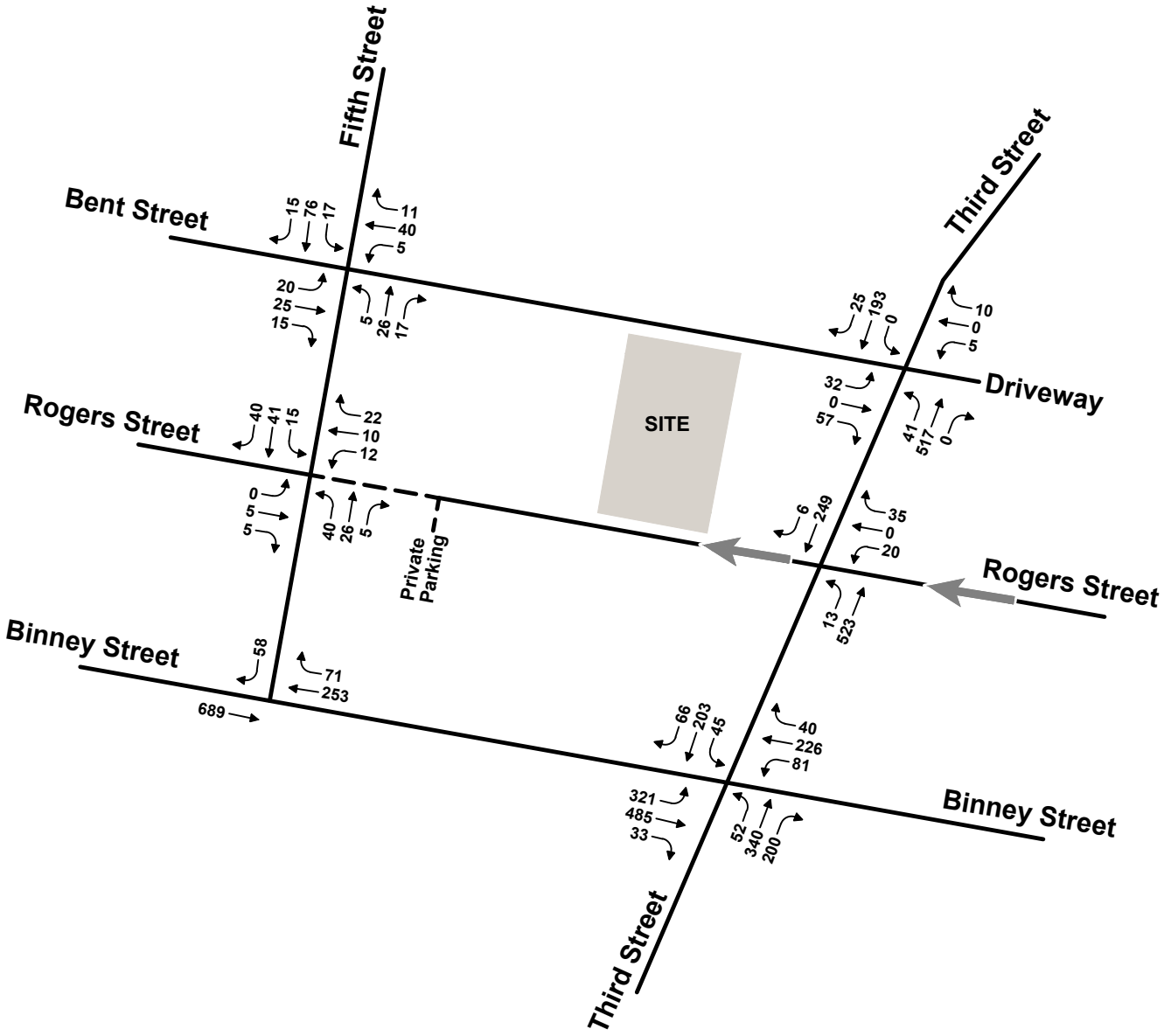
Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 5.b.1

2019 Build Condition Vehicle Volumes
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



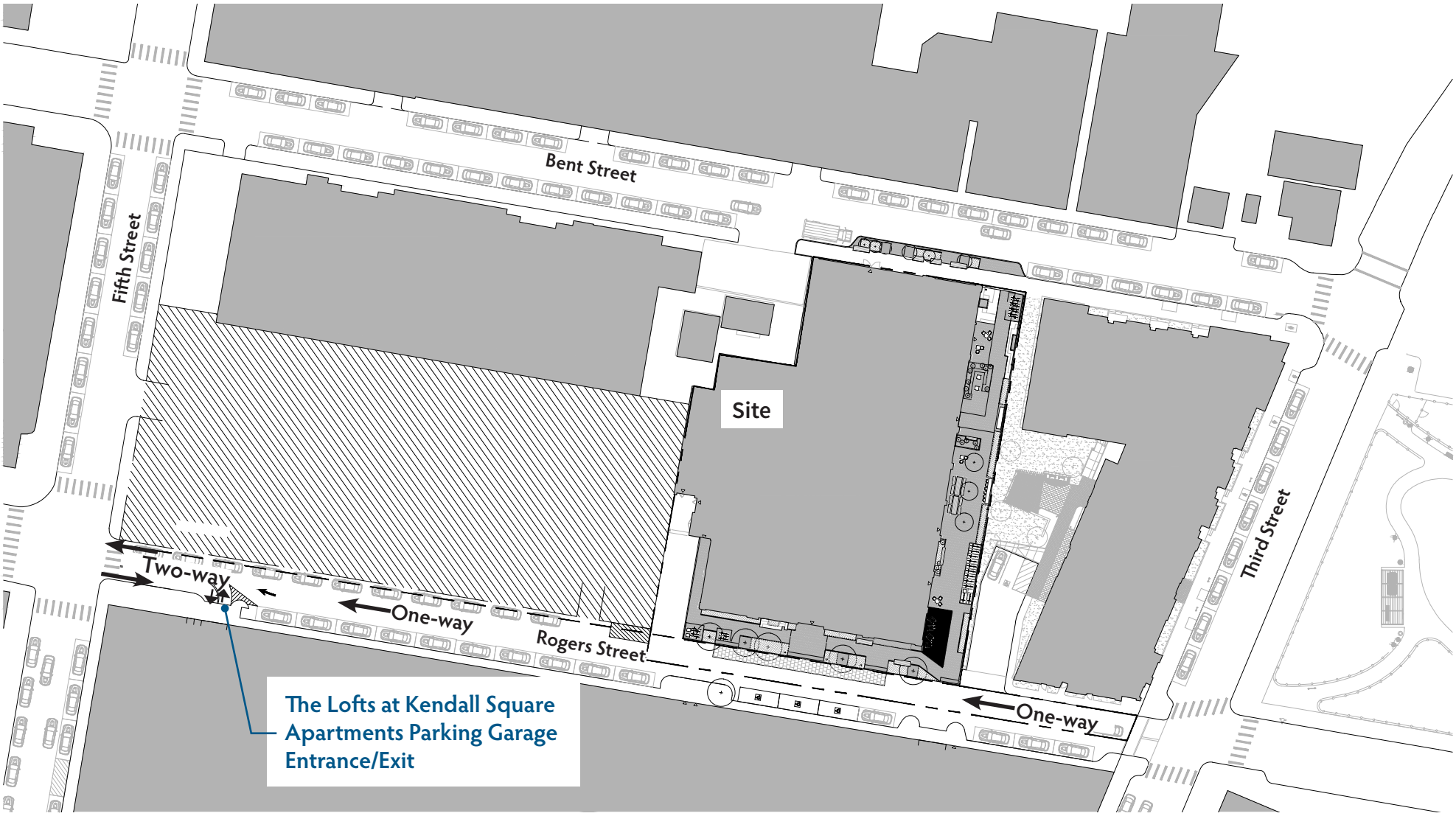
Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 5.b.2

2019 Build Condition Vehicle Volumes
PM Peak Hour

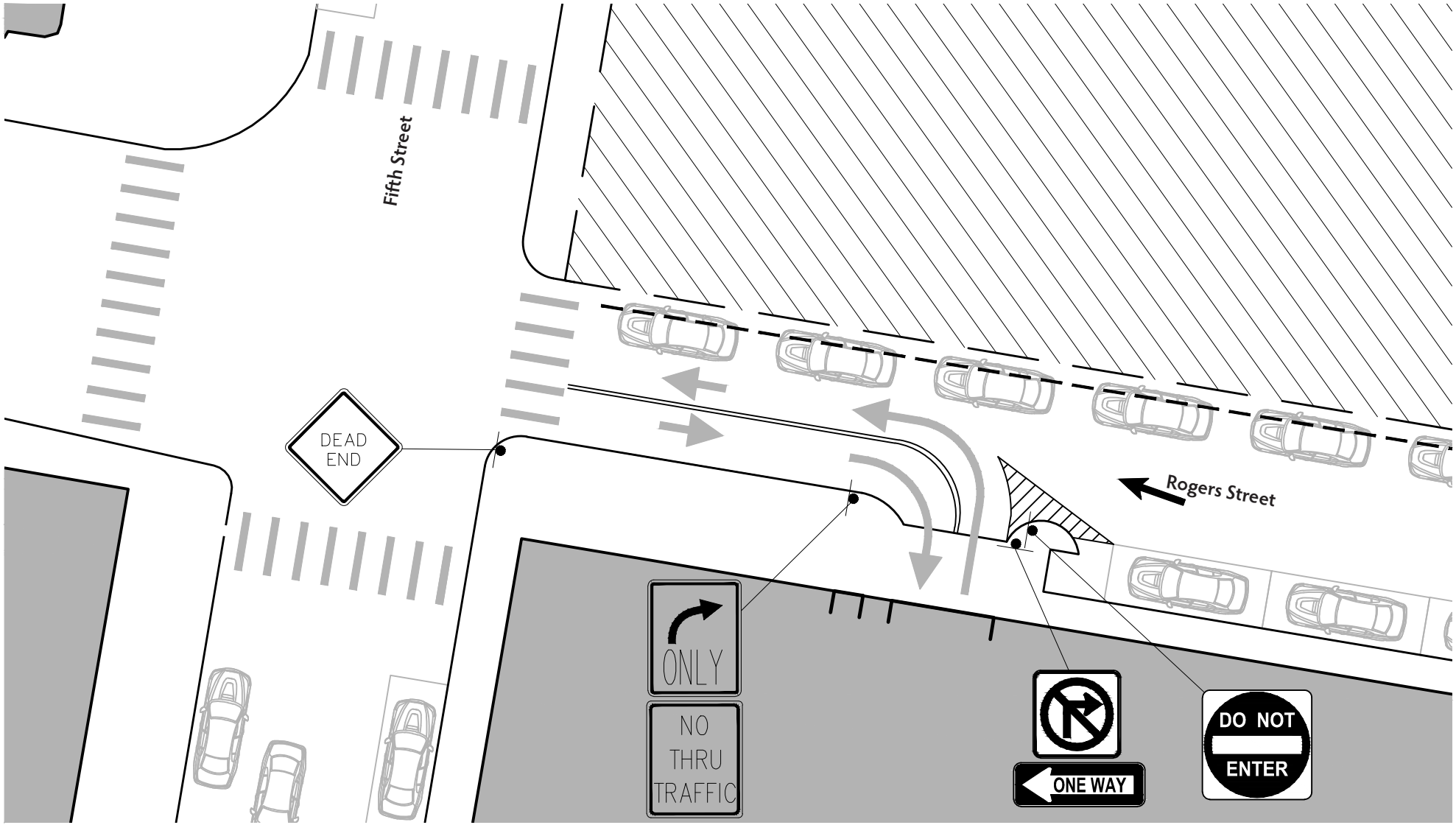
The Foundry Building
Cambridge, Massachusetts



0 40 80 Feet

Figure 5.b.3
Proposed Rogers Street
T

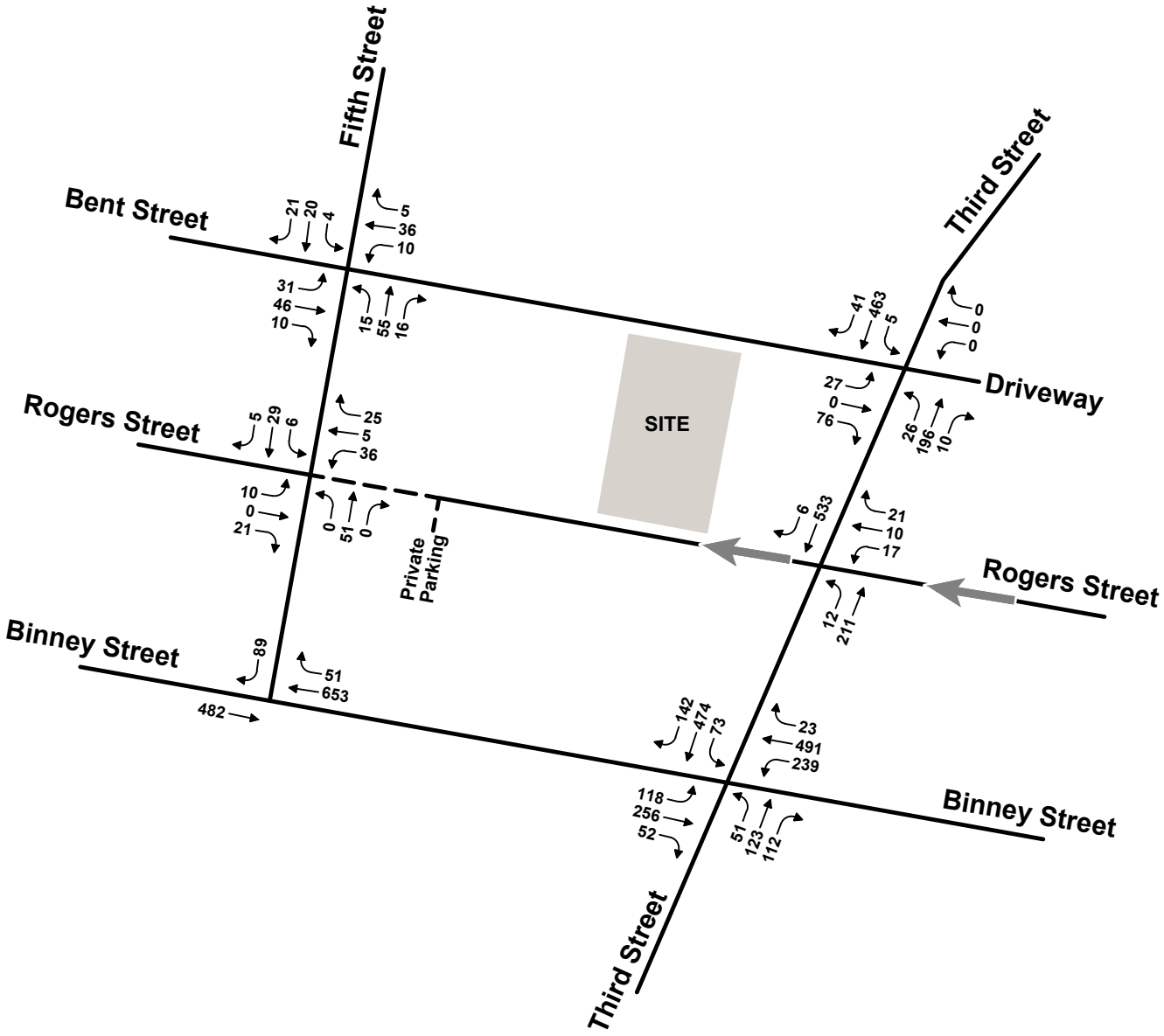
The Foundry Building
Cambridge, Massachusetts



0 10 20 Feet

Figure 5.b.4
Conceptual Rogers Street
T

The Foundry Building
Cambridge, Massachusetts



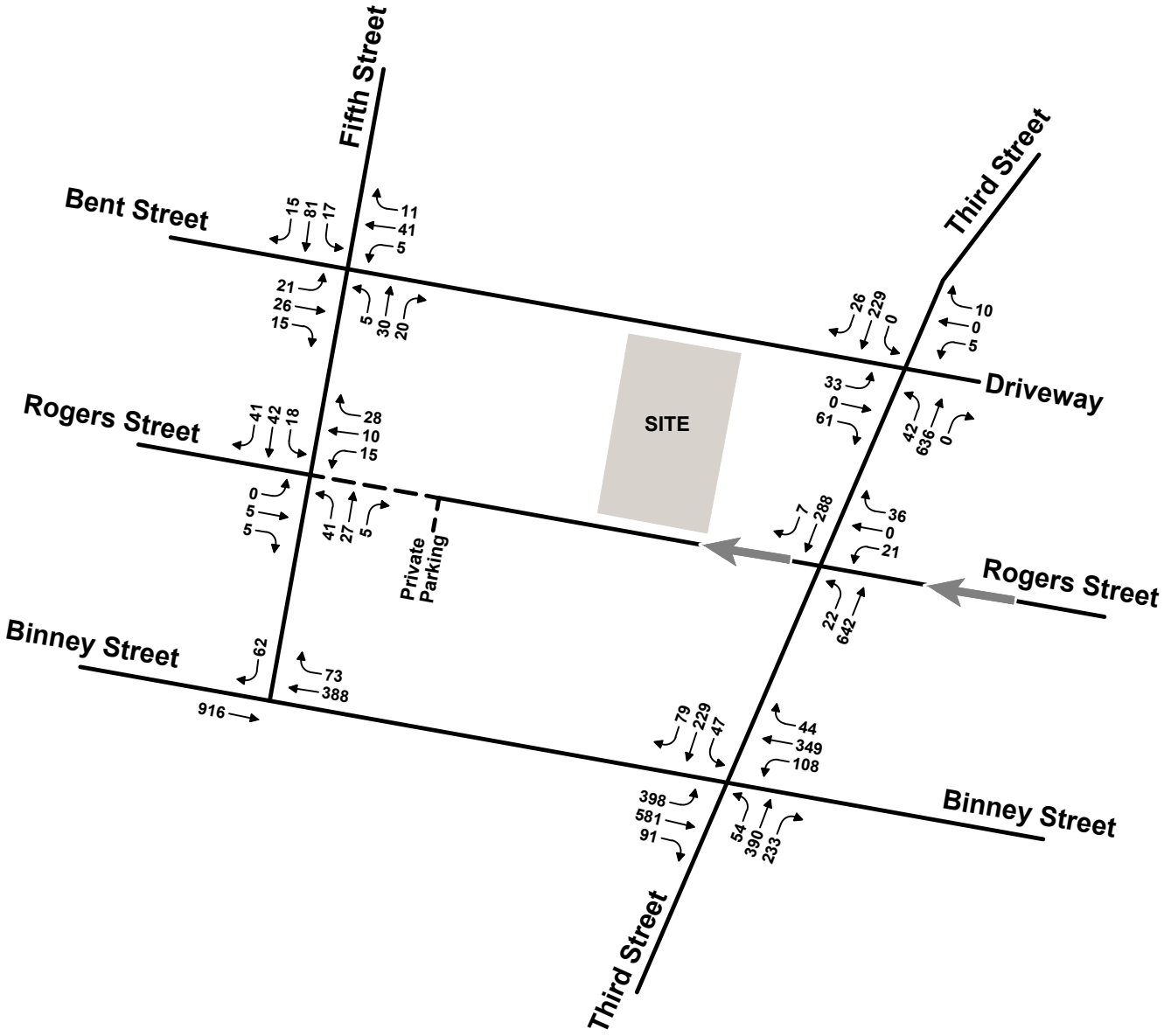
Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 5.c.1

2024 Future Condition Vehicle Volumes
AM Peak Hour

The Foundry Building
Cambridge, Massachusetts



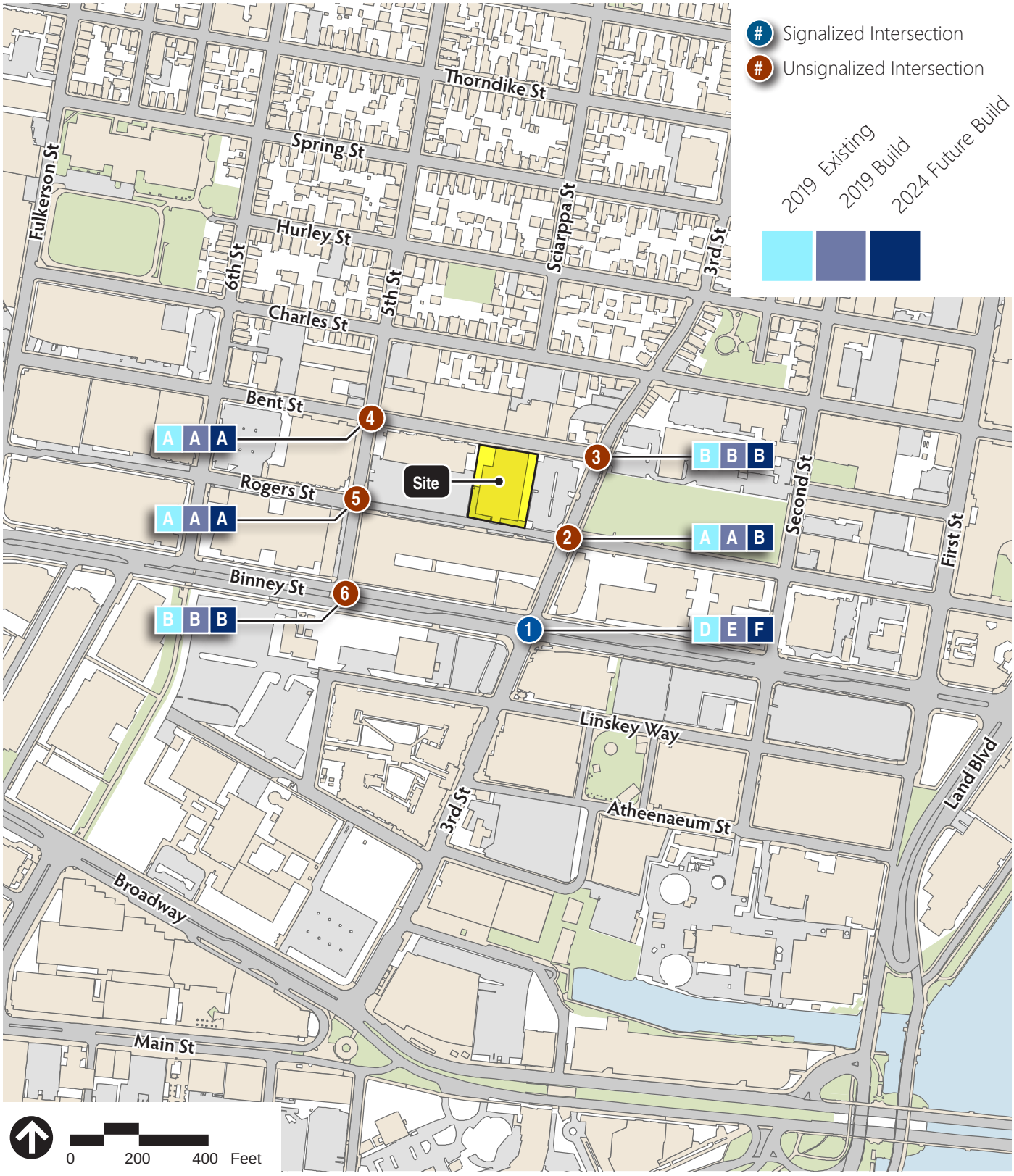
Not to Scale

Segment of Rogers Street proposed to remain two-way to maintain access to the parking garage for the Lofts at Kendall Square Apartments.

Figure 5.c.2

2024 Future Condition Vehicle Volumes
PM Peak Hour

The Foundry Building
Cambridge, Massachusetts

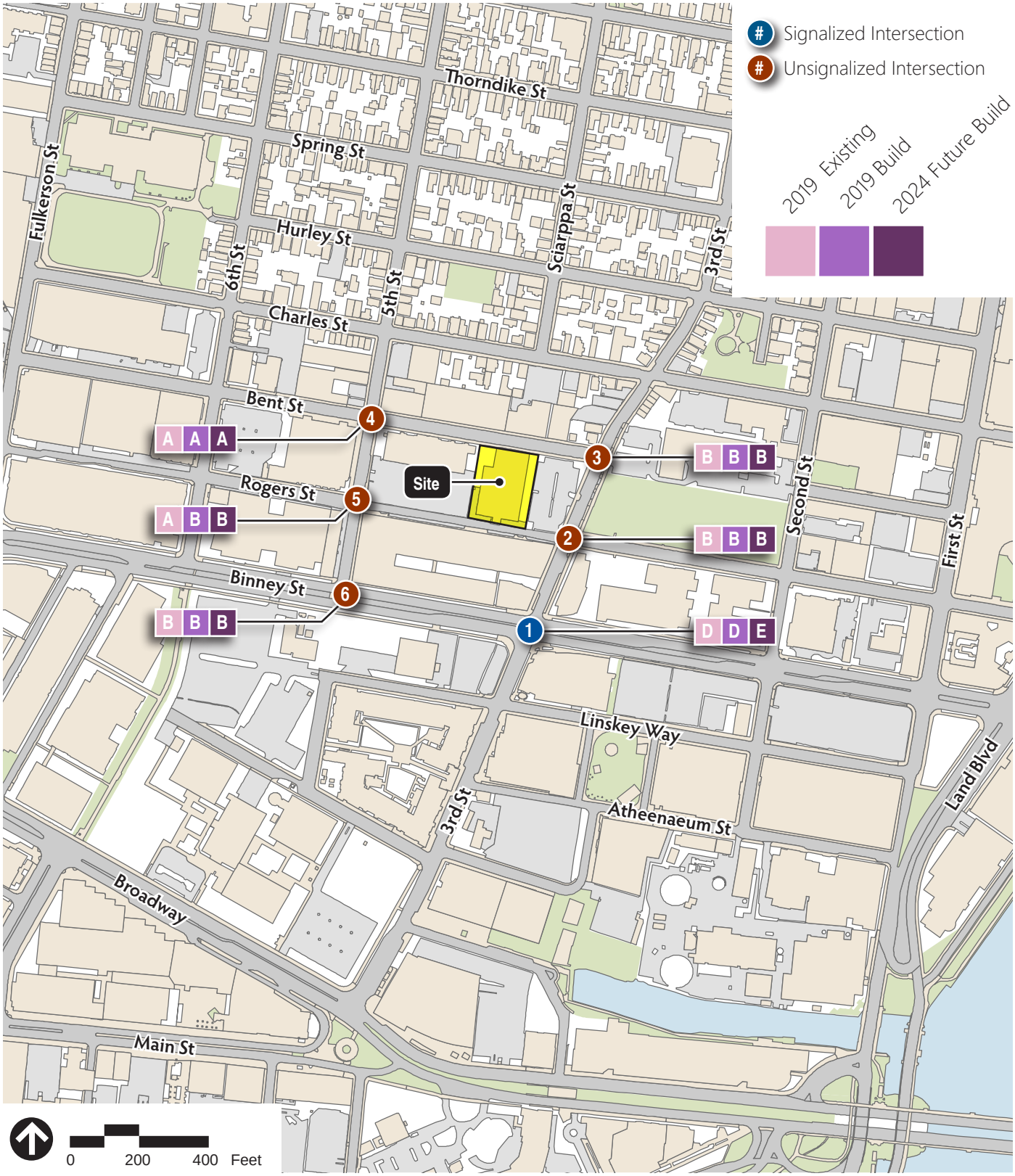


Source: City of Cambridge

Figure 6.a.1

Vehicular Level of Service Summary
Morning Peak Hour

The Foundry Building
Cambridge, Massachusetts

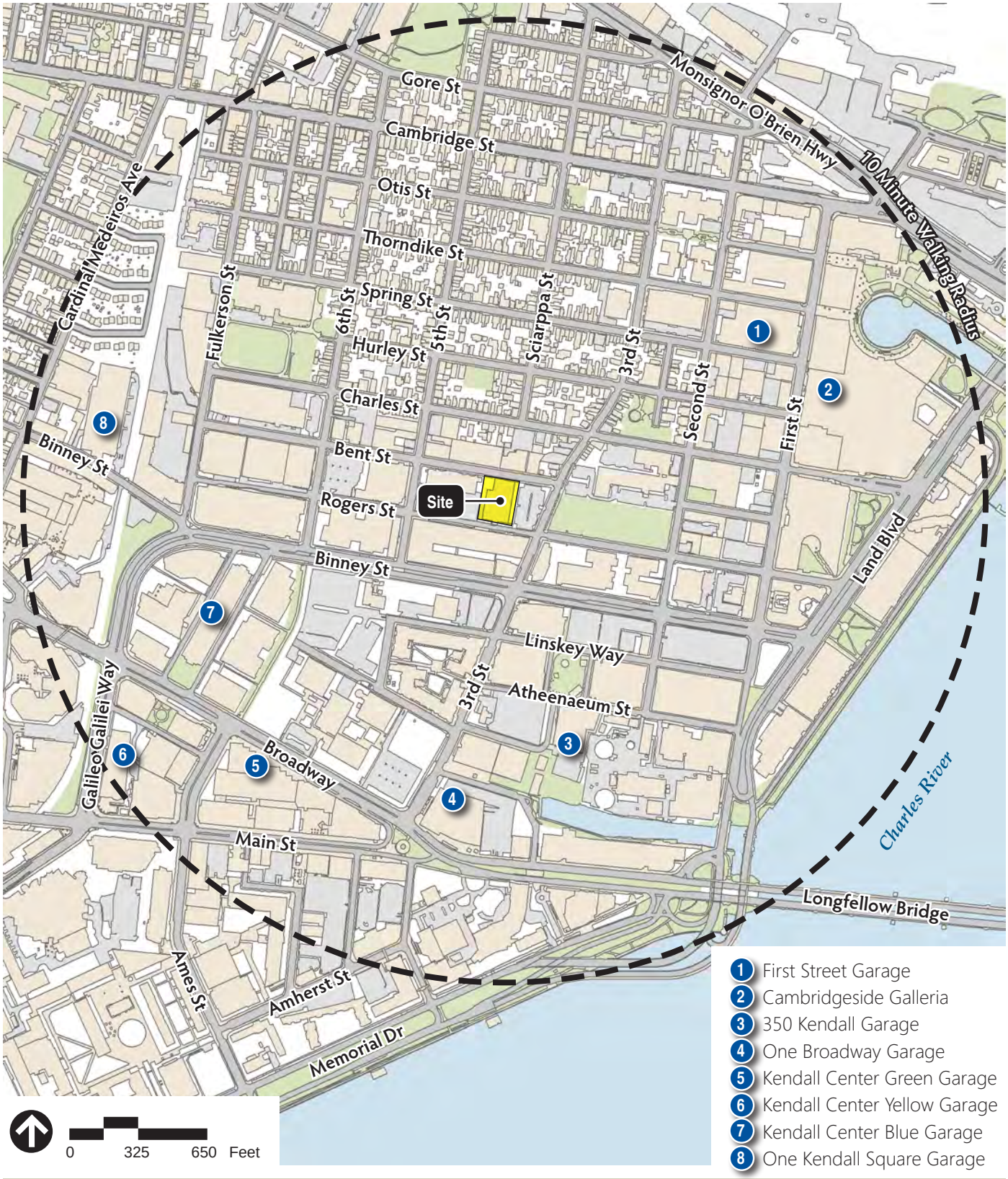


Source: City of Cambridge

Figure 6.a.2

Vehicular Level of Service Summary
Evening Peak Hour

The Foundry Building
Cambridge, Massachusetts

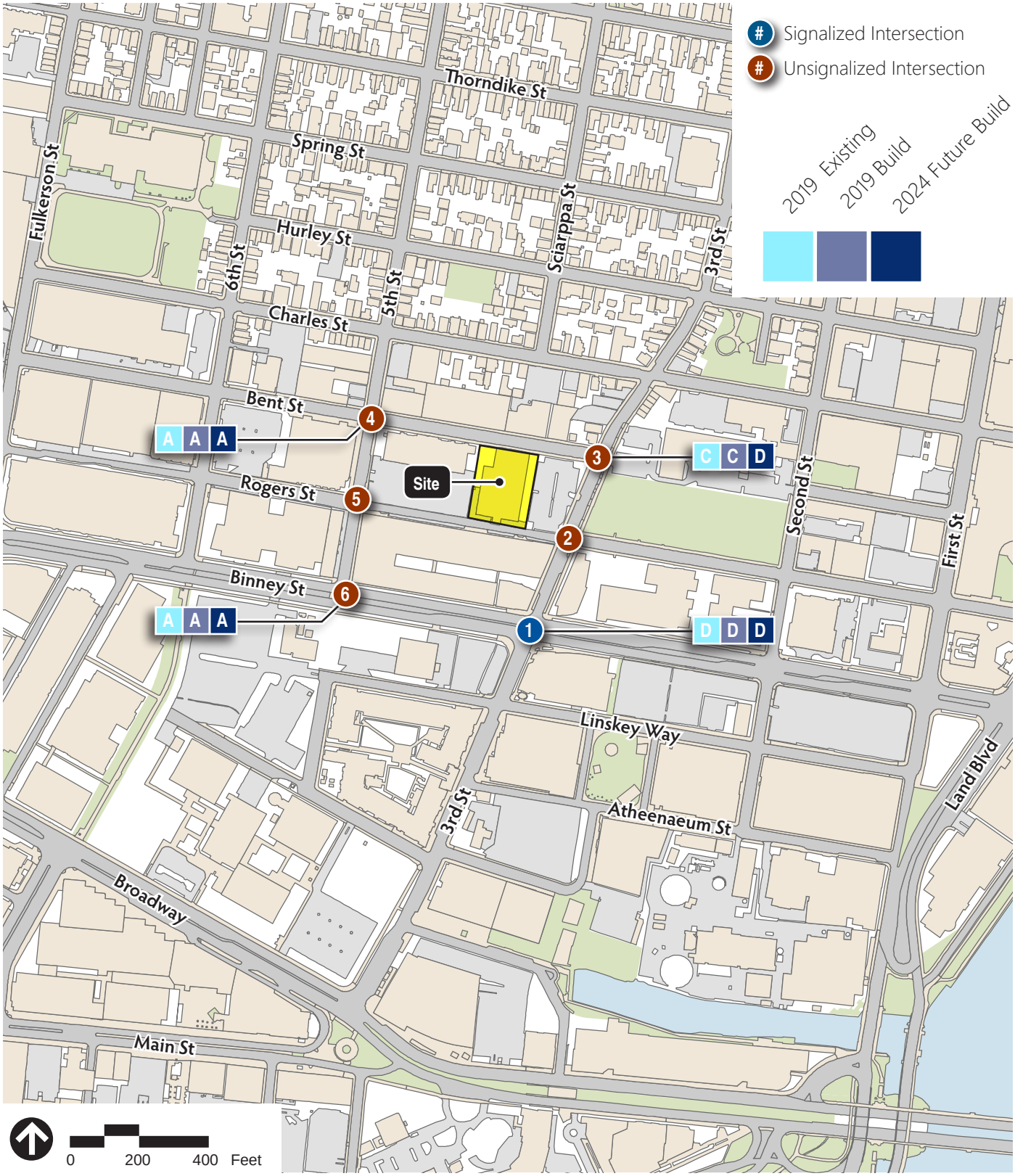


Source: City of Cambridge

Figure 9.a.1

Area Parking Opportunities

The Foundry Building
Cambridge, Massachusetts

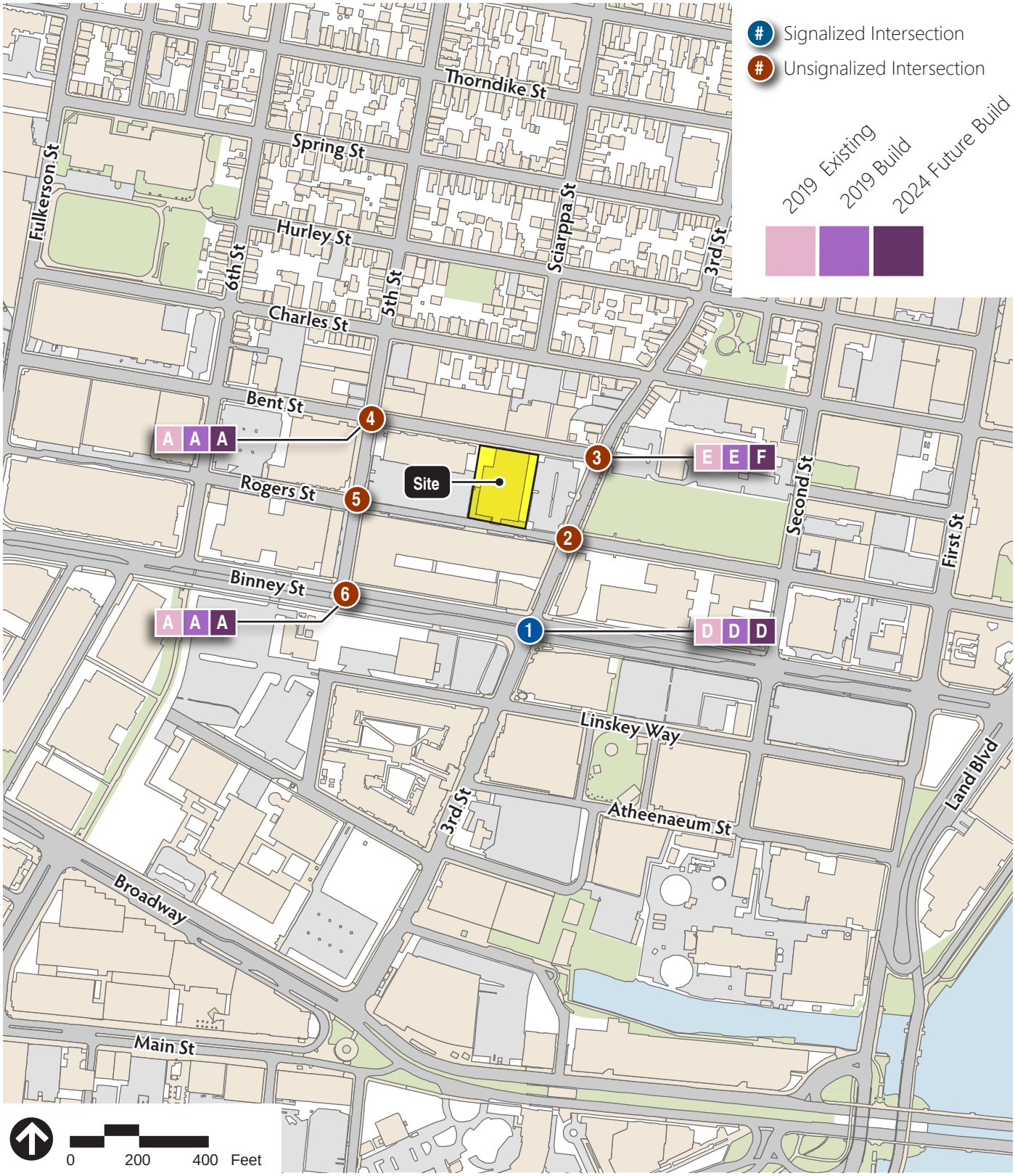


Source: City of Cambridge

Figure 11.a.1

Pedestrian Level of Service Summary
Morning Peak Hour

The Foundry Building
Cambridge, Massachusetts



Source: City of Cambridge

Figure 11.a.2

Pedestrian Level of Service Summary
Evening Peak Hour

The Foundry Building
Cambridge, Massachusetts

I. SEWER SERVICE INFRASTRUCTURE NARRATIVE

Report detailing the anticipated impact of the project on the city's sanitary, stormwater, and combined sewer infrastructure. The requirements are set forth in Section 19.24{5}.

Sewer Service Infrastructure Narrative. The application shall include a report by the applicant detailing the anticipated impact of the project on the city's sanitary, stormwater, and combined sewer infrastructure. It shall indicate the adequacy of the preliminary site plan in meeting city, state, and federal requirements or established standards for implementation of best management practices for stormwater management and the likely improvements to infrastructure necessary to accommodate the impacts of the proposed project. Where such determinations cannot be made at the time of application, the report shall indicate what investigations must be undertaken by the applicant to make such determination, their anticipated costs, and the schedule for their completion. The applicant shall provide certification that this report has been submitted to the Department of Public Works.

The following strategies and technologies will be employed in the plumbing design, which aid in water conservation and limiting sanitary sewer flows from the proposed building:

- Low-flow plumbing fixtures in restrooms
- Reduced or eliminated irrigation by use of native, tolerant plant species

Additionally, the site will be designed to meet the provisions of MassDEP's Stormwater Management Policy for a redevelopment project and standard engineering practices in the State of Massachusetts. Stormwater management strategies for the proposed building and site improvements will provide mitigation of stormwater runoff as required by the City of Cambridge standards (25-2 rate deduction and phosphorous removal) to the maximum extent practicable. Mitigation measures will include the use of Cambridge-approved BMP's including underground detention systems, deep sump catch basins and area drains, and pervious pavers that will help to control peak rates of runoff and quality of runoff. Also, where possible, site stormwater will be directed into landscaping or porous surfaces to promote increased infiltration.

The capacity and condition of drinking water and wastewater infrastructure systems are shown to be adequate, or the steps necessary to bring them up to an acceptable level are identified.

The project sewerage service will have one new location exiting the building on its north face and will connect to the fifteen-inch municipal sewer system in Bent Street. Refer to the memorandum provided by the plumbing engineer for anticipated sewer flows from the proposed building. Storm sewer flows (roof drain connections and site drainage) from the site will be connected to the municipal storm system located in Bent Street. Routing the storm runoff to Bent Street takes storm flows that currently discharge to the combined sewer in Rogers Street and routes it to a dedicated storm drain effectively reducing the overall flows in the sewer system on Rogers Street. Storm sewer flows for the proposed project will reduce the existing flows from the project site to the maximum extent practicable. Both sewer and storm drainage will be connected to dedicated municipal systems. Based on discussions with the City of Cambridge DPW, the capacity and condition of the sewer and storm sewer mains in Bent Street are known to be adequate and in good condition. It is not anticipated that upgrades to the existing municipal infrastructure will be required.

II. WATER SERVICE INFRASTRUCTURE NARRATIVE

Report detailing the anticipated impact of the project on the city's water delivery infrastructure and supply. The requirements are set forth in Section 19.24 Paragraph {6}.

Water Service Infrastructure Narrative. The application shall include a report by the applicant detailing the anticipated impact of the project on the city's water delivery infrastructure and supply. It shall indicate the likely improvements to infrastructure necessary to accommodate the identified impacts. Where such determinations cannot be made at the time of application, the report shall indicate what investigations must be undertaken by the applicant to make such determination, their anticipated costs, and the schedule for their completion. The applicant shall provide certification that this report has been submitted to the Water Department.

Domestic water for the proposed building will be provided by a single four-inch connection to the municipal water system in Rogers Street. Refer to the memorandum provided by the plumbing engineer for anticipated domestic water demand for the building. Fire water service for the proposed building will be provided by a single six-inch connection to the same municipal system in Rogers Street as the domestic service.

The following strategies and technologies will be employed in the plumbing design, which aid in water conservation and limiting water demands from the proposed building:

- Low-flow plumbing fixtures in restrooms
- Reduced or eliminated irrigation by use of native, tolerant plant species

Based on conversations with the Cambridge Water Department, there are currently no water capacity issues in the vicinity of the project site. Hydrant flow tests have been performed to determine the capacity of the water main in Rogers Street and other surrounding streets. It has been determined that there is adequate pressure and volume available and it is not anticipated that a booster pump will be provided as part of the project. Refer to the plumbing narrative for further discussion. Additionally, it is not anticipated that any improvements to the City owned infrastructure will be required for this project except for potentially relocating a short portion of the existing eight-inch water main in Rogers Street to avoid proposed project landscape features.

Memorandum

Date: 01/23/2020
To: Justin Crane
CambridgeSeven
From: Deanna Champagne
AKF Group
Re: The Foundry Building
Cambridge, MA:
Anticipated Sewer Flow and
Water Usage Estimation

COMMENTS:

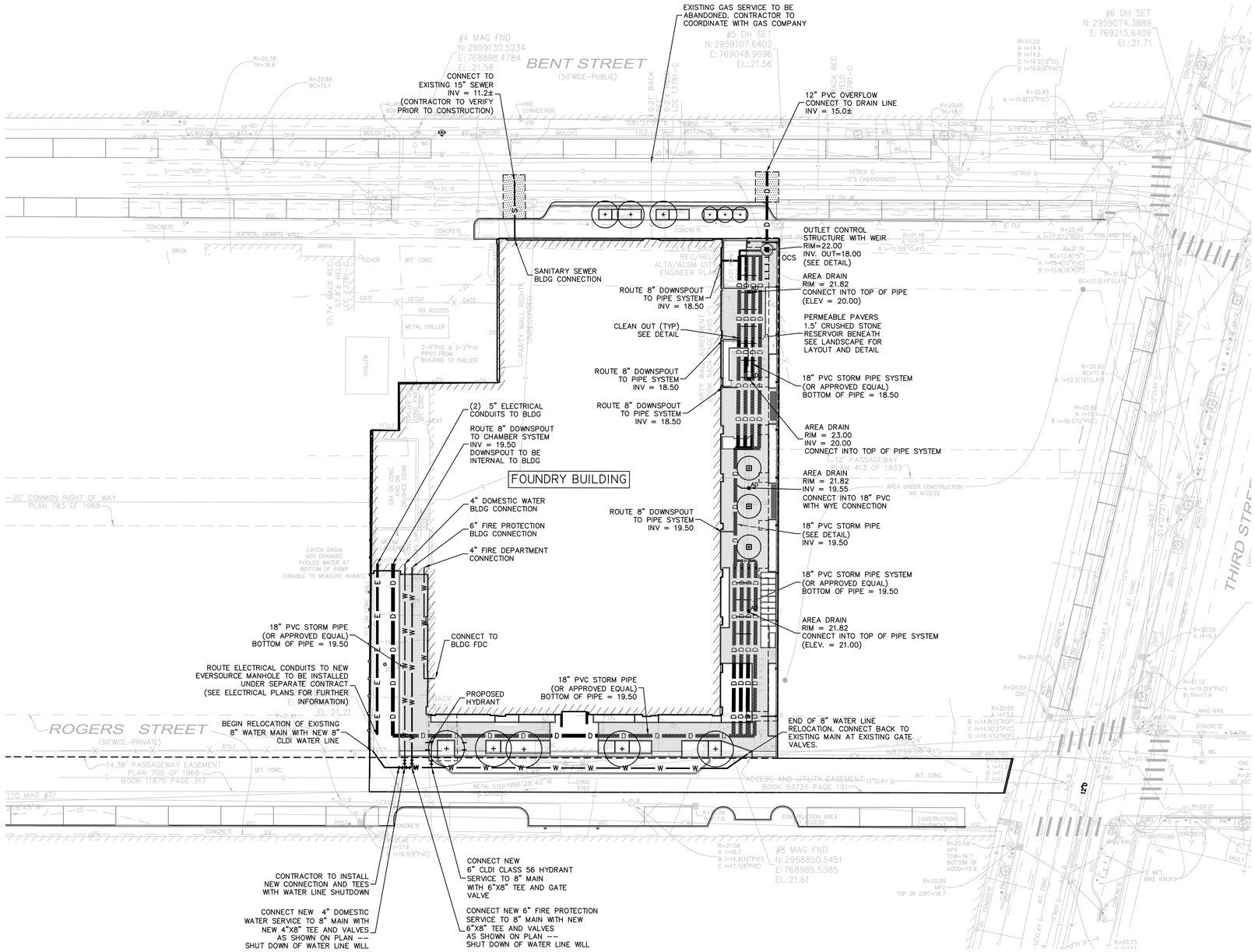
Sewer flow estimations is Per MA 310 CMR 15.00 (Title 5) table of Sewage flow design criteria, as amended through September 9, 2016.

- Office building: 75 GPD per 1,000 sf (200 GPD Min)
  - Level 1: 23,310 sf x 75 GPD/1,000 sf = 1,748.25 GPD
  - Level 2: 12,000 sf x 75 GPD/1,000 sf = 900 GPD
  - Level 3: 13,100 sf x 75 GPD/1,000 sf = 982.5 GPD
- Theater space: 3 GPD per seat
  - Level 1: 134 seats x 3 GPD = 402 GPD

- Total sewer flow = 4,033 GPD

Domestic water usage estimation is based on typical industry factor of 1.2 times estimated sewer flow.

- Estimated domestic water usage
  - 4,033 GPD X 1.2 = 4,840 GPD



NOTE: UNDERGROUND STORMWATER PIPE ELEVATIONS TO BE COORDINATED WITH FINAL GRADING BY LANDSCAPE ARCHITECT AND MANUFACTURER REQUIREMENTS FOR MINIMUM COVER OVER PIPE SYSTEM.

SCALE:
1" = 20'
20 10 0 20 40

3/5/2019 4:11:29 PM

City of Cambridge

The Foundry Building

101 Rogers Street

Nitsch Engineering

Number	Revision	Date

EARLY BID PACKAGE #2
SITE & STRUCTURE

CambridgeSeven

Architects and Planners

1050 Massachusetts Avenue
Cambridge, MA 02138
617-492-7000 Fax 492-7007

Job #	12591
Project	The Foundry Building
Drawn By	CJ
Checked	MC
Date	JANUARY 31, 2020
Scale	1" = 20'

Drawing Title

CIVIL UTILITY LAYOUT

C1.00

THE FOUNDRY BUILDING LEED NARRATIVE

- **PROJECT DESCRIPTION**

The *Foundry Building* is meeting the Special Permit application requirement with a minimum of LEED Gold Certification for New Construction and Major Renovations version 4. The project is currently tracking 73 points and 13 possible points.

- **AFFIDAVIT**

I, Douglas Flandro, do hereby affirm that I have thoroughly reviewed the supporting documents for **LEED V4 New Construction and Major Renovations** and confirm that the Foundry Building is on track to meet the requirement for **LEED Silver (**and a project goal to reach LEED Gold) with an anticipated **73 points** and 13 possible additional points. The Foundry Building, 101 Rogers Street, Cambridge, MA has been designed to meet the green building requirement under Article 22.20 of the Cambridge Zoning Ordinance.

Douglas Flandro
LEED Administrator and Sustainability Consultant
Registered 27 Oct 2011 ID+C; 30 Jan 2018 BD+C

- **LEED V4 NEW CONSTRUCTION AND MAJOR RENNOVATIONS CHECKLIST**

A. Please see attached for the official checklist

B. The project meets the silver certification requirement achieving 67 points and 19 possible points.

Integrative Process	[1 point]	
Location and Transportation	[15 points]	
Sustainable Sites	[1 point]	[2 possible points]
Water Efficiency	[5 points]	[1 possible point]
Energy and Atmosphere	[23 points]	[5 possible points]
Materials and Resources	[10 points]	[3 possible points]
Indoor Environmental Quality	[10 points]	[2 possible points]
Innovation	[6 points]	
Regional Priority	[2 points]	[0 possible point]
Total Points	**[73 points]**	**[13 possible points]**

- **NARRATIVE FOR LEED CREDITS**

The *Foundry Building* fulfills all the prerequisites for all categories.

A. INTEGRATIVE PROCESS (IP)

IPc1: Integrative Process

Pre-design meetings analyzed:

- ***Site conditions.*** *Shading, exterior lighting, hardscape, landscaping, and adjacent site conditions.*
- ***Massing and orientation****. Massing and orientation of historic building and how it affects HVAC sizing, energy consumption, lighting, and renewable energy opportunities.*
- ***Basic envelope attributes****. Insulation values, window-to-wall ratios, glazing characteristics, shading, and window operability.*
- ***Lighting levels.*** *Interior surface reflectance values and lighting levels in occupied spaces.*
- ***Thermal comfort ranges****. Thermal comfort range options.*
- ***Plug and process load needs****. Reducing plug and process loads through programmatic solutions (e.g., equipment and purchasing policies, layout options).*
- ***Programmatic and operational parameters****. Multifunctioning spaces, operating schedules, space allotment per person, reduction of building area, and anticipated operations and maintenance.*

These studies resulted in a September 4, 2018 BOD. An April 26th, 2019 meeting was held with full project team to review site, early energy models and water assumptions and opportunities for design synergies. After some research and on initial assumptions and goals, a follow-up integrative process meeting was then held on May 15, 2019 to solidify cross-disciplinary goals and identify specific LEED Gold credit targets.

Key recommendations for the design include:

- *A low carbon, low energy Air Source VRF system.*
- *No combustion or fossil fuels on-site.*
- *Planting of new deciduous trees on the site for summer shading*
- *Insulation: Roof: R-30ci, Attic R-38, Mass Walls: R-11 + 4ci; Metal Framed Walls: R-13 + R-7.5ci; Walls Below Grade R-7.5ci, Floors: R10ci, Joists and Framing: R-30, Unheated Slab on Grade: R-10 for 24" and below,*
- *All interior lighting shall be energy efficient LED Lighting systems complying with minimum efficiency sand performance requirements of ASHRAE Standard 90.1-2007*
- *Low-flow fixtures for lavatories and water closets*
- *Optimize roof for maximum PV generation*
- *Reduction of the number of skylights to prevent glare in workspaces as well as to limit heat gain from insolation and increase area available for pv panels.*
- *PV was considered for the skylights but was eliminated for cost and because the optimal number of skylights was reduced to two.*
- *Operable windows*

B. LOCATION AND TRANSPORATION (LT)

LTc2: Sensitive Land Protection **[1 point]**

The Foundry Project achieves this credit by building on previously developed land. CambridgeSeven will provide required documentation.

LTc3: High-Priority Site **[2 points]**

When the project receives a declaration that contaminated soils have been remediated to their satisfaction, we will include this documentation. This will be submitted with the construction review near the end of construction.

LTc4: Surrounding Density and Diverse Uses **[5 points]**

The Foundry Project achieves 3 points for this credit by selecting a site with over 35,000 sq. ft. of built space per acre of buildable land within ¼ mile of the site. The project achieves another 2 points by having more than 8 diverse types of retail and services within ½ mile walking distance from the main entrance of the building. Diverse uses need to include food retail, community-serving retail, services, civic and community facilities and commercial offices with more than 100 full time equivalents (FTE). Documentation provided by CambridgeSeven.

LTc5: Access to Quality Transit **[5 points]**

The Foundry project achieves points by siting the project in a location where building users can access public buses within ¼ mile walking distance from the main entry and rapid transit trains within ½ mile walking distance from the main entry. The project achieves the full five points for this credit due to the number of daily trips provided by the EZ Ride, which is within ¼ mile from the project site and the red line, and green line rapid transit stops within ½ mile walking distance from the project entry. Building users will have access to more than 360 weekday trips and more than 216 weekend trips per day. CambridgeSeven is providing documentation for this credit.

LTc6: Bicycle Facilities **[1 point]**

This project achieves this point by providing a minimum of 14 short-term bicycle storage spaces at the front of the building and 11 long-term bicycle storage spaces at the side of the building. One shower and changing facility for building users is also required. CambridgeSeven is providing documentation that the building is connected to a network of bicycle paths connected to 10 diverse uses. ***See drawing L1.01.***

LTc7: Reduced Parking Footprint **[1 point]**

The project achieves this credit by providing no parking spaces on site. There will be a loading dock. We are also pursuing an agreement with an abutter to provide three accessible parking spaces off-site which is less than 80% of the base ratios provided by the Parking Consultants Council as provided in the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4. Documentation will be provided on the site plan developed by Mikyoung Kim Design, Landscape Architects. ***See drawing L1.01.***

C. SUSTAINABLE SITES (SS)

SSp1: Construction Activity Pollution Prevention **[Required]**

W.T. Rich, the general contractor will provide an erosion and sedimentation plan that conforms to the local codes and the EPA erosion and sedimentation requirements of the 2012 EPA Construction General Permit (GCP).

SSc6: Light Pollution Reduction **[1 point]**

The project achieves light pollution reduction by meeting the uplight and light trespass requirements using the backlight-uplight-glare (BUG) method for lighting zone 2 (moderate ambient lighting). Light fixture documentation will be provided by LAM Partners, Architectural Lighting Designers.

D. WATER EFFICIENCY (WE)

WEp1: Outdoor Water Use Reduction **[Required]**

The Foundry project will meet this prerequisite by providing outdoor plantings that do not

require permanent irrigation beyond a two-year establishment period.

WEp2: Indoor Water Use Reduction **[Required]**

The project achieves this credit by implementing strategies that allow 20% reduction in water use. The main strategies are using low flow plumbing fixtures. These fixtures will be implemented through all the restrooms and the kitchen to reduce water use. Documentation will be provided by AKF Group, Engineering Consultants

WEp3: Building Level Water Metering **[Required]**

The project will install building-level water metering for total potable water use for the building and associated grounds. The data will be compiled into monthly and annual summaries and shared with USGBC for a five year period after LEED certification. Documentation will be provided by AKF Group, Engineering Consultants

WEc1: Outdoor Water Use Reduction **[2 points]**

The Foundry project will meet this prerequisite by providing outdoor plantings that do not require permanent irrigation beyond a two-year establishment period.

WEc2: Indoor Water Use Reduction **[2 points]**

The project will achieve this credit by implementing strategies that provide a minimum of a 30% reduction in water use. The main strategies are using low flow plumbing fixtures. These fixtures will be implemented through all the restrooms and the kitchen to reduce water use. Documentation will be provided by AKF Group, Engineering Consultants

WEc4: Water Metering **[1 points]**

Water metering in the building will be used to monitor domestic hot water and indoor plumbing fixtures and fittings. Documentation will be provided by AKF Group, Engineering Consultants

E. ENERGY AND ATMOSPHERE (EA)

EAp1: Fundamental Commissioning of Building Energy Systems **[Required]**

The team will develop an OPR and a BOD. The city has hired a commissioning agent (Stephen Turner, Inc.) to review and oversee the commissioning process activities including heating, ventilating, air conditioning, and refrigeration systems and associated controls, lighting and daylighting controls, domestic hot water systems, and renewable energy systems.

EAp2: Minimum Energy Performance **[Required]**

The project will have an energy consultant that will evaluate the energy performance of the building. The current prediction for energy reduction is 18%. The project will achieve a higher energy standard than ASHRAE 90.1-2010 for major building components such as the envelope, HVAC, lighting, and domestic hot water. ***See drawings M1.00 thru E2.01.***

EAp3: Building-Level Energy Meeting **[Required]**

Building level energy meters will be installed in the building.

EAp4: Fundamental Refrigerant Management **[Required]**

The building does not use any chlorofluorocarbon-based refrigerants.

EAc1: Enhanced Commissioning **[4 points]**

A commissioning authority will be designated to oversee the completion of all commissioning process activities. The CxA will conduct design review, review contractor submittals, develop a system manual, verify seasonal testing, review building operations 10 months after substantial completion, verify the requirements for training operating personnel, review the operation of the building with operations and maintenance staff and

occupants, and develop an on-going commissioning plan including developing monitoring-based commissioning measuring and evaluating energy and water consumption. Envelope commissioning will not be pursued for this project.

EAc2: Optimize Energy Performance **[15 points]**

The project is planning to achieve 15 points of the Optimize Energy Performance credits by investing on on-site solar generation. The project will have an energy consultant that will evaluate the energy performance of the building. The current prediction for energy reduction is 18%. The project will achieve a higher energy standard than ASHRAE 90.1-2010 for major building components such as the envelope, HVAC, lighting, and domestic hot water. ***See drawings M1.00 thru E2.01.***

EAc3: Advanced Energy Metering **[1 point]**

Building level energy meters will be installed in the building. In addition, advanced energy meters will be installed for any building use that represents 10% or more of the total annual consumption of the building. Possible submetering will include for anticipated tenant rented spaces, for the theater, and for the VRF farm.

EAc5: Renewable Energy Production **[3 points]**

Photovoltaic panels will be installed on the roof. These panels will generate a minimum of 10% of the building's annual energy use based on cost. ***See drawing E1.04.***

F. MATERIAL & RESOURCES (MR)

MRp1: Storage and Collection of Recyclables **[Required]**

The Foundry will have a dedicated recycling area and use local waste handlers to collect mixed paper, corrugated cardboard, glass, plastic, metals using a single stream recycling pick-up. The project will have a quarterly electronics recycling and battery pick-ups. These items will be collected in the trash and recycling room located near the loading dock. ***See drawing A1.01.***

MRp2: Construction and Demolition Waste Management Plan **[Required]**

The Foundry intends to recycle or divert from landfills 75% of the construction and demolition waste. The general contractor will draft a Construction and Demolition Waste Management Plan (CDW plan) subject to approval by CambridgeSeven and the client. We anticipate that the waste will be collected commingled on site and sorted by a recycling and waste sorting contractor. We anticipate that concrete, wood, metal, gypsum and paper and cardboard will be diverted from the landfill.

MRc1: Building Life-Cycle Impact Reduction **[5 point]**

The Foundry is listed as a historic landmark building by the City of Cambridge and will achieve the credit under Option 1: Historic Building Reuse. The Cambridge Historical Commission has been involved with design decisions for the building and will approve any demolition or additions.

MRc2: Building Produce Disclosure and Optimization - EPD **[1 point]**

The Foundry project will achieve one point for this credit through option 1: Environmental Product Declarations. We will specify materials that earn 20 points for qualifying Environmental Product Declarations.

MRc3: Building Produce Disclosure and Optimization – Raw Materials **[1 point]**

The project will achieve one point through option 2 of this credit by using 25% products by cost that meet at least one sustainable extraction practice. These practices include: extended producer responsibility, bio-based material, FSC wood, salvaged, recycled or

reused products or products with recycled content. Products sources within 100 miles of the project will be valued at 200% of cost.

MRc4: Building Produce Disclosure and Optimization – Material Ingredient **[1 point]**

The Foundry project will achieve one point for this credit through option 1 Material Ingredient Reporting. We will specify materials that earn 20 points for qualifying Health Product Declarations or qualifying Cradle to Cradle certification.

MRc5: Construction and Demolition Waste Management Planning **[2 points]**

75% of construction and demolition waste will be diverted from the landfill. The general contractor will draft a Construction and Demolition Waste Management Plan (CDW plan) subject to approval by CambridgeSeven and the client. We anticipate that the waste will be collected commingled on site and sorted by a recycling and waste sorting contractor. We anticipate that concrete, wood, metal, gypsum and paper and cardboard will be diverted from the landfill. We will also explore the possibility of donating building materials to an organization like Boston Building Resources or reusing crushed concrete onsite.

G. INDOOR ENVIRONMENTAL QUALITY (EQ)

EQp1: Minimum IAQ Performance **[Required]**

The project will be designed to meet the minimum requirements of ASHRAE 62.1-2010 sections 4-7, Ventilation for Acceptable Indoor Air Quality. ***See drawings M1.01 thru M1.04.***

EQp2: Environmental Tobacco Smoke (ETS) control **[Required]**

The project achieves this credit by prohibiting smoking in the building and by placing signage on all doors, ground floor air intakes, and ground floor operable windows prohibiting smoking within 25 feet of building entries.

EQc1: Enhanced Indoor Air Quality Strategies **[2 points]**

The foundry building will achieve this credit by designing 10ft walk-off systems at regularly used building entries. Spaces with potential hazardous gases or chemicals may be used will be contained by deck-to-deck partitions and self-closing doors and sufficiently exhausted to create negative pressure. These spaces may include the trash room, janitor's closets, workshops and art studios. Before occupancy, ventilation systems supplying air to occupied spaces will have their air filters will be replaced with MERV 13 air filters. Densely occupied spaces will have $C0_2$ monitors installed in the breathing zone within the densely occupied spaces. Densely occupied spaces include the theater and the dance studio. ***See drawings A1.01 and M1.01 thru M1.04.***

EQc2: Low-emitting Materials **[2 point]**

The project will achieve 2 of 3 points for this credit by meeting the TVOC requirements for Interior paints and coatings, Interior adhesives and sealants applied on site, flooring, and composite wood. We will also attempt to meet this requirement for ceilings, walls and acoustical and thermal insulation. This would give us an additional 3rd point.

EQc3: Construction Indoor Air Quality Management Plan **[1 point]**

The general contractor will develop an indoor air quality management plan for construction and pre-occupancy phases of the building. The plan will meet all requirements of the listed in the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition 2007, ANSI/SMACNA 008-2008, chapter 3. The contractor will protect absorptive materials from moisture damage. The contractor will not operate permanently installed

air-handling equipment during construction unless filtration media with a minimum efficiency reporting value (MERV) of 8 are installed at each return air grille and return or transfer duct inlet opening such that there is no bypass around the filtration media. These filtration media will be replaced immediately before occupancy.

EQc4: Indoor Air Quality Assessment **[2 points]**

After construction ends and before occupancy, the building will be tested by an accredited professional under ventilation conditions similar to occupancy. These air tests will demonstrate that air int the building do not exceed concentrations listed: Formaldehyde, 27 ppb; Particulates, PM10 – 50 micrograms per cubic meter, PM2.5 – 15 micrograms per cubic meter; TVOCs, 500 micrograms per cubic meter; Target chemicals listed in CDPH Standard Method v1.1(Table 4-1, except formaldehyde), Allowable concentrations according to Table 4-1); Carbon Monoxide (CO), 9 ppm, no more than 2 ppm above outdoor levels.

EQc5: Thermal Comfort **[1 point]**

HVAC systems will be designed in accordance with ASHRAE Standard 55-2010, Thermal Comfort Conditions for Human Occupancy, with errata. 50% of single occupancy spaces and all shared occupancy spaces will have thermal comfort controls to control at least one of the following in their local environment: air temperature, radiant temperature, or air speed.

EQc6: Interior Lighting **[2 point]**

- *LIGHTING CONTROL - A minimum of 90% of individual occupant spaces will have individual lighting controls to suit individual tasks and preferences with at lest three lighting levels or scenes. All multi-occupant spaces will have controls to adjust lighting to meet group needs and preferences with at least three lighting levels or scenes. Lighting for presentation or projection walls will be separately controlled. Switches will be located in the same spaces as the luminaries with a direct line of sight to the controlled luminaries.*
- *LIGHTING QUALITY – For all regularly occupied spaces, light fixtures will have a luminance of less than 2,500 cd/m^2 between 45 and 90 degrees from nadir except wall wash fixtures and adjustable fixtures. All light sources will have a CRI of 80 or higher, except for colored lighting in theater and on the site. At least 75% of the lighting load will use light sources that have a rated life of at least 24,000 hours. And the foundry will use direct-only overhead lighting for 25% or less of the total connected lighting load for all regularly occupied spaces.* ***See drawings E1.01 thru E1.04.***

EQc8: Quality Views **[1 point]**

Of the 28,164 sq. ft. of regularly occupied space in the building, 23,020 or 82% has access to quality views through one of the four metrics in the credit. 15% of the regularly occupied spaces have qualifying views into an interior atrium. 85% of the qualifying views are to the exterior.

H. INNOVATION IN DESIGN (IN)

INc1: Innovation: O+M Started Kit – Green Cleaning Policy **[1 point]**

For this innovation credit, the city will work together with the building operator to develop a green cleaning plan for the building to avoid hazardous and toxic chemical use in the building. The plan will create standard operating procedures for effective cleaning and maintenance of all types of flooring. It will address the protection of vulnerable occupants

during cleaning, address the appropriate use of disinfectants and sanitizers including promoting hand hygiene among building occupants, and develop guidelines for safe handling and storage of cleaning chemicals including a plan to manage hazardous spills. The plan will develop goals and strategies to promote the conservation of energy, water and chemicals used for cleaning.

INc2: Innovation: Green Building Education **[1 point]**

Green Building Education. For this innovation credit the client or city will develop a case study booklet showcasing sustainable aspects of the building. This case study will be designed to share information with other municipalities or other users interested in designing a sustainable building with a similar program or a similar major renovation. The client or city will also develop the script for a self-guided tour designed to inform building users of sustainable aspects of the building.

INc3: Pilot Credit : IPpc89 Social Equity within the Community **[1 point]**

The client will fill out the SEED Evaluator Tool form, parts one and two and submit for comments from the SEED Reviewers. (seednetwork.org).

INc4: Pilot Credit : IPpc98 Assessment and Planning for resilience **[1 point]**

Client will conduct a hazard assessment for the project site including filling out the "Assessment and Planning for Resilience Workbook" which summarizes hazards with reference documents and determination of priorities. The client will also complete a preliminary assessment form as part of the American Red Cross Reading Rating program. This should be finished before the beginning of design development. A written disclosure form to the Red Cross is necessary to share the Red Cross assessment form with GBCI.

INc5: Exemplary Performance: LTc7 Reduced Parking Footprint **[1 point]**

The project achieves this credit by providing no parking spaces on site. See strategies above under Location and Transportation credits. ***See drawing L1.01.***

INc6: LEED Accredited Professional **[1 point]**

Douglas Flandro, LEED AP BD+C will be working as LEED Administrator on the project.

I. REGIONAL PRIORITY (RP)

RPc1: Regional Priority: EAc2 Optimize Energy Performance **[1 point]**

The project achieves this credit by achieving the 8 point threshold for the Optimize Energy Performance credit.

RPc2: Regional Priority: EAc5 Renewable Energy Production **[1 point]**

The project achieves this credit by achieving the 2 point threshold for the Renewable Energy Production credit.

J. Tenant Design and Construction Guidelines

The project will submit a letter of commitment, signed by the owner, indicating that the remaining incomplete spaces will satisfy the requirements of each LEED prerequisite and credit achieved by this project if and when completed by the owner. This letter will cover the commitment in general terms and will not address each prerequisite or credit individually. The project will also submit a set of nonbinding tenant design and construction guidelines, with a brief explanation of the project circumstances.

The tenant lease agreement will have legally binding language requiring tenants to meet design minimums for all LEED prerequisites and for any credits where the building claims environmental

performance or benefit beyond the baseline for the incomplete spaces. This language will include requirements for HVAC systems, ventilation, lighting controls, quality views, thermal comfort, tobacco use, water fixtures, a green cleaning policy, and low emitting materials.

- **PROJECT TEAM**

Architect	**CambridgeSeven** Stefanie Greenfield, Principal in Charge Justin Crane, Project Manager Danielle McDonough, Project Architect Wonyeop Seok, Architect Douglas Flandro, LEED Project Administrator
Landscape Designer	**Mikyoung Kim Design** Bryan Chou Jessica Hamilton
Lighting Designer	**Lam Partners** Dan Weissman Jamie Perry Srushti Krishnakumar
Acoustical Engineer	**Acentech** Jonah Sacks Kristen Murphy
Civil Engineer	**Nitsch Engineering** Aaron Gallagher Michelle Callahan
Electrical Engineer	**AKF** Frank Dodge Adam Roy
Energy Modeler	**InPosse** Robert Diemer Michael Sweeney
Mechanical Engineer	**AKF** Jeff Jansen David Calvesbert
Plumbing and Fire Protection Engineer	**AKF** Stephen Fitzgerald Deanna Champagne
Envelope Consultant	**Simpson Gumpertz and Heger** Helena M. Currie
Architectural Specifications	**Kalin Associates** Mark Kalin Jason Ford
General Contractor	**W.T. Rich Company, Inc.** Brian Santos Evan Moore
Building Operator	**Cambridge Redevelopment Authority** Tom Evans
Owner	**City of Cambridge** Michael Black Robert Garner

LEED-NC v4 Project Work Plan
The Foundry Building

Cambridge, MA | 02142 US

14 February 2020

				Project Information			**Task**	**Notes**
			D	Form 1	**Minimum Program Requirements**		CambridgeSeven	Ready for Review
			D	Form 2	**Project Summary Details**		CambridgeSeven	Ready for Review
			D	Form 3	**Occupant and Usage Data**		CambridgeSeven	Ready for Review
			D	Form 4	**Schedule and Overview Documents**		CambridgeSeven	Ready for Review

Yes	?	No							
1					**Integrative Process (IP)**	1 Point	**Task**	**Notes**
1			D	Credit 1	**Integrative Process**	1	AKF	Need Spreadsheet
15		1			**Location and Transportation (LT)**	16 Points	**Task**	**Notes**
			D	Credit 1	**LEED for Neighborhood Development Location**	16		
1			D	Credit 2	**Sensitive Land Protection**	1	CambridgeSeven	Ready for Review
2			D	Credit 3	**High Priory Site**	2	CambridgeSeven	Need declaration from AHJ
5			D	Credit 4	**Surrounding Density and Diverse Uses**	5	CambridgeSeven	Ready for Review
5			D	Credit 5	**Access to Quality Transit**	5	CambridgeSeven	Ready for Review
1			D	Credit 6	**Bicycle Facilities**	1	CambridgeSeven	Ready for Review
1			D	Credit 7	**Reduced Parking Footprint**	1	MYKD	Ready for Review
		1	D	Credit 8	**Green Vehicles**	1		
1	2	7			**Sustainable Sites (SS)**	10 Points		**Notes**
Y			C	Prereq 1	**Construction Activity Pollution Prevention**	Required	W.T. Rich	
	1		D	Credit 1	**Site Assesment**	1	Nitsch	Looking into what it would take to earn
	1	1	D	Credit 2	**Site Development - Protect or Restore Habitat**	2	City of Cambridge	Could achieve by paying $14,998 to a qualifying land conservancy organization.
		1	D	Credit 3	**Open Space**	1		
		3	D	Credit 4	**Rainwater Management**	3		
		2	D	Credit 5	**Heat Island Reduction**	2		
1			D	Credit 6	**Light Pollution Reduction**	1	LAM	Will need to change Rogers Street Lamps to Bollards
5	1	5			**Water Efficiency (WE)**	11 Points		**Notes**
Y			D	Prereq 1	**Outdoor Water Use Reduction**	Required	MYKD	Need name of Shrub 2 and establishment irr. Plan
Y			D	Prereq 2	**Indoor Water Use Reduction**	Required	AKF	
Y			D	Prereq 3	**Building Level Water Metering**	Required	AKF	
2			D	Credit 1	**Outdoor Water Use Reduction**	2	MYKD	
2	1	3	D	Credit 2	**Indoor Water Use Reduction**	6	AKF	Possibly change some fixtures for 3 points
		2	D	Credit 3	**Cooling Tower Water Use**	2		
1			D	Credit 4	**Water Metering**	1	AKF	Narrative including submeter locations
23	5	5			**Energy and Atmosphere (EA)**	33 Points		**Notes**
Y			C	Prereq 1	**Fundamental Commissioning and Verification**	Required	W.T. Rich	
Y			D	Prereq 1	**Minimum Energy Performance**	Required	AKF	
Y			D	Prereq 1	**Building-Level Energy Metering**	Required	AKF	
Y			D	Prereq 1	**Fundamental Refrigerant Management**	Required	AKF	
4		2	C	Credit 1	**Enhanced Commissioning**	6	AKF	
15	1	2	D	Credit 2	**Optimize Energy Performance**	18	AKF	ETA for CD Energy Model Early April
1			D	Credit 3	**Advanced Energy Metering**	1	AKF	List of advance metering, cut sheets
	2		C	Credit 4	**Demand Response**	2	AKF	
3			D	Credit 5	**Renewable Energy Production**	3	AKF	Regional Priority 2pt threshold
		1	D	Credit 6	**Enhanced Refrigerant Management**	1		
	2		C	Credit 7	**Green Power and Carbon Offsets**	2	City of Cambridge	$
10	3				**Material and Resources (MR)**	13 Points		**Notes**
Y			D	Prereq 1	**Storage and Collection of Recyclables**	Required	CambridgeSeven	Ready for Review
Y			C	Prereq 2	**Construction and Demolition Waste Management Planning**	Required	W.T. Rich	
5			C	Credit 1	**Building Life-Cycle Impact Reduction**	5	CambridgeSeven	Ready for Review
1	1		C	Credit 2	**Building Product Disclosure and Optimization - EPD**	2	W.T. Rich	
1	1		C	Credit 3	**Building Product Disclosure and Optimization - Raw Materials**	2	W.T. Rich	
1	1		C	Credit 4	**Building Product Disclosure and Optimization - Material Ingred.**	2	W.T. Rich	
2			C	Credit 5	**Construction and Demolition Waste Management Planning**	2	W.T. Rich	
10	2	4			**Indoor Environmental Quality (EQ)**	16 Points		**Notes**
Y			D	Prereq 1	**Minumum Indoor Air Quality Performance**	Required	AKF	
Y			D	Prereq 2	**Environmental Tobacco Smoke Control**	Required	CambridgeSeven	Add "No Smoking" Signage to DD set.
2			D	Credit 1	**Enhanced Indoor Air Quality Strategies**	2	AKF	
2	1		C	Credit 2	**Low-emitting Materials**	3	W.T. Rich	
1			C	Credit 3	**Construction Indoor Air Quality Management Plan**	1	W.T. Rich	
2			C	Credit 4	**Indoor Air Quality Assessment**	2	W.T. Rich	
1			D	Credit 5	**Thermal Comfort**	1	AKF	
1		1	D	Credit 6	**Interior Lighting**	2	LAM	
	1	2	D	Credit 7	**Daylight**	3	LAM	Looking into possibility of some credit here.
1			D	Credit 8	**Quality Views**	1	CambridgeSeven	Ready for Review
		1	D	Credit 9	**Acoustic Performance**	1		
6					**Innovation (IN)**	6 Points		**Notes**
1			C	Credit 1	**Innovation Credit: Green Building Education**	1	City of Cambridge	
1			D	Credit 2	**Innovation Credit: O+M Starter Kit - Green Cleaning Policy**	1	City of Cambridge	
1			D	Credit 3	**Pilot Credit: IPpc89 Social Equity within the Community**	1	City of Cambridge	
1			D	Credit 4	**Pilot Credit: IPpc98 Assesment and Planning for Resilience**	1	City of Cambridge	
1			D	Credit 5	**Exemplary Performance: Reduced Parking Footprint**	1	MYKD	Ready for Review
1			D	Credit 6	**LEED Accredited Professional**	1	CambridgeSeven	Ready for Review
2		2			**Regional Priority (RP)**	4 Points		**Notes**
1			D	Credit 1.0	**Regional Priority : EAc2 Optimize Energy Performance (8pt. Thres**	1	AKF	
1			D	Credit 2.0	**Regional Priority : EAc5 Renewable Energy Production (2pt. Thres**	1	AKF	
		1	D	Credit 3.0	**Regional Priority : WEc2 Indoor Water Use Reduction (4pt. Thresh**	1		
		1	D	Credit 4.0		1		

Yes	?	No			
73	13	24	**Project Totals**	(pre-certification estimates)	111 Points

Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80-111 points

CambridgeSeven

AKF

Transition to Net Zero Energy Narrative

The Foundry Building

101 Rogers Street
Cambridge, MA

February 12, 2020

AKF Project 197142-000

| 99 Bedford Street, 2nd Floor, Boston, MA 02111 | T: 617.737.1111 | akfgroup.com |

INTRODUCTION:

The City of Cambridge has committed to a goal of achieving citywide net-zero emissions by 2050. In support of that goal, building projects should strive for low site energy use, utilize building systems that do not contribute to on-site greenhouse gas emissions and, where possible, harvest renewable energy on site. In addition to the emissions goal, the City requires project to achieve LEED certification. The Foundry Building project is currently on-track to achieve a LEED Gold certification.

The Foundry Building, at 101 Rogers Street, Cambridge, MA is a historic structure built in the 1890's. The building is being repurposed in order to create a self-sustaining center for creativity and collaboration for the Cambridge community. The building will provide space and programs for visual and performing arts, entrepreneurship, technology and workforce education, as well as market rate office space.

The proposed renovation includes the existing building, which will be retrofitted, as well as a new three-story building on the west side of the existing structure. The total building area for the completed project will be approximately 50,000 square feet.

The project design contributes towards the City's net zero emissions goal in the following ways:

- Upgrades to the thermal performance of the existing building envelope through increases in roof insulation and retrofitting of windows and skylights.
- High-performance building envelope designs for all new construction.
- Elimination of on-site greenhouse gas emissions through the utilization of high-efficiency all electric HVAC systems.
- Use of energy recovery and active control strategies such as demand control ventilation to reduce HVAC energy use.
- Low energy lighting systems with daylight dimming and occupancy based controls.
- Projected on site energy use that will be approximately 20% below the LEED baseline resulting in an expected energy use intensity (EUI) of 34.1 kbtu/SF/year.
- Generation of on-site renewable energy that will offset approximately 28% of annual on-site energy use through roof mounted photovoltaic arrays.

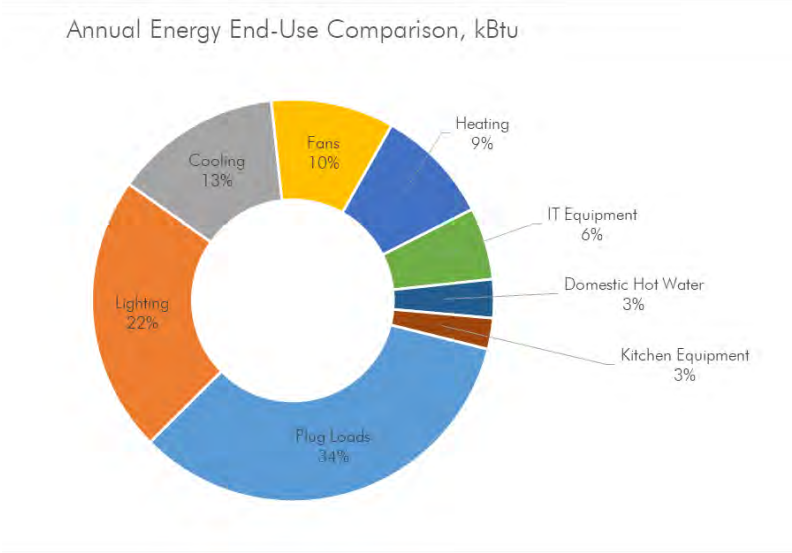
The project design incorporates all of the elements required for the building to support the City's goals with a clear path towards future net zero emissions operations.

PROJECTED ENERGY PERFORMANCE:

Current projected energy performance based on the project energy model:

Annual Energy and Cost Summary	LEED Baseline	Proposed Design
Total Consumption (MMBtu)	2,088.57	1,652.62
EUI (kBtu/sf/yr)	43.13	34.13
Annual Energy Cost ($)	104,796	82,922
Energy Cost Savings (%)	-	21%
LEED Points, excluding PV	-	8
LEED Points including PV (estimated)*	-	15

Projected energy end use:



Greenhouse Gas Emissions Summary:

ANNUAL GREENHOUSE GAS EMISSIONS SUMMARY	MMBTU	kWh	GHG (metric tons)	% SAVNGS
LEED BASELINE (ASHRAE 90.1-2010)	2,088	611,958	274.36	
PROPOSED DESIGN	1,652	484,174	217.07	21%
ON-SITE RENEWABLE ENERGY	471	137,900	61.82	
PROPOSED DESIGN - SITE RENEWABLE ENERGY	1,181	346,274	155.24	43%

GHG CONVERSION FACTOR

0.00044833 metric tons co2 per kwh (source: eia annual avg 2016 - 2018)

DESIGNING FOR NET ZERO EMISSIONS:

The design process for The Foundry Building included a careful balancing of the goal for net-zero emissions with other important project priorities including budget and program. The re-use of an existing masonry building that is over 100-years old avoided significant carbon emissions due to material extraction and processing as well as building construction activities but also introduced limitations that prevented achievement of some performance enhancements.

Several over-arching design objectives guided the project team through-out the design process including:

- Utilization of the most efficient all electric building systems possible given the project limits so as to reduce on-site energy use and not create on-site emissions from building operations.
- Focus on performance improvements to the existing building envelope in the areas that would have the greatest impact.
- Maximize the amount of on-site renewable energy production within the project limits.

BUILDING ENVELOPE PERFORMANCE:

Early on it was determined that thermal performance improvements for the existing building roof, windows and skylights should be prioritized. The addition of insulation to the existing solid masonry walls was explored but ultimately not included in the project. Due to the historic nature of the building, the addition of external insulation was not allowed and internal insulation was not included in the design due to concerns with moisture management and potential durability issues. It was determined that significant insulation could be added above existing roof decking. High performance replacement windows and skylights have been selected to harmonize with the historic building. The new building addition is designed with higher than code required thermal performance for windows, walls and roofs.

Current building envelope performance:

	LEED Baseline (ASHRAE 90.1-2010)	Proposed Design
Window-to-Wall Ratio (Gross wall - floor-to-floor)	Same as Proposed	Window-to-Wall Ratio: 27.1%
Glazing Performance (assembly values)	Vertical Fenestration: - SHGC: 0.4 - U: 0.45 Skylights: - U-1.17 - SHGC: 0.39	Vertical Fenestration: - SHGC (All Glass Types): 0.4 (S/E/W), 0.53 (N) - Windows (Addition): U: 0.38 - Windows (Historical Building): U: 0.45 - Glazed Entrance Doors: 0.77 Skylights: - U: 0.5 - SHGC: 0.4
External Shades	None	Gabled roof overhangs provide mild shading, and building shades self between new office area and existing structure.

	LEED Baseline (ASHRAE 90.1-2010)	Proposed Design
Above Grade Walls, Steel Frame	U-Assembly: 0.064	New Building 3" Mineral wool insulation @ R-4.3/in plus 6" Batt Insulation @ R-4/in. - U-Assembly: 0.028 Existing Building Existing Masonry: ~14" brick assembly without additional insulation.
Roof – Insulation entirely above deck	U- Assembly: 0.048	New Building: EPDM Membrane, 6" Polyiso Insulation @ R-5.7/in - U-Assembly: 0.025 Existing Building: EPDM Membrane, 6" Polyiso Insulation @ R-5.7/in, Existing 3" Wood Decking @ R-1.5/in - U-Assembly: 0.025

ENERGY USING SYSTEMS:

HVAC: In support of the net zero emissions goal, options for HVAC systems that do not utilize fossil fuels were analyzed for the project. The two systems that were considered initially were a ground-coupled geo-exchange water-to-air heat pump system (geothermal) and high efficiency air-to-air heat pumps with energy recovery utilizing variable refrigerant flow (VRF) inverter driven compressors.

Due to the very tight site it was not feasible to locate a sufficient number of closed loop geo-exchange wells to meet the building loads. In addition, the project budget did not allow for even a partial geo-exchange system. The project design incorporates the VRF system for terminal heating and cooling with energy recovery dedicated outside air units providing ventilation. The large performance space is served by a dedicated air-cooled roof-top HVAC unit.

The project utilizes demand control ventilation which varies the amount of ventilation air provided to spaces based on the actual occupancy and actual, real-time ventilation requirements. This control approach coupled with the very efficient VRF system provides significant energy performance improvements over a comparable baseline system

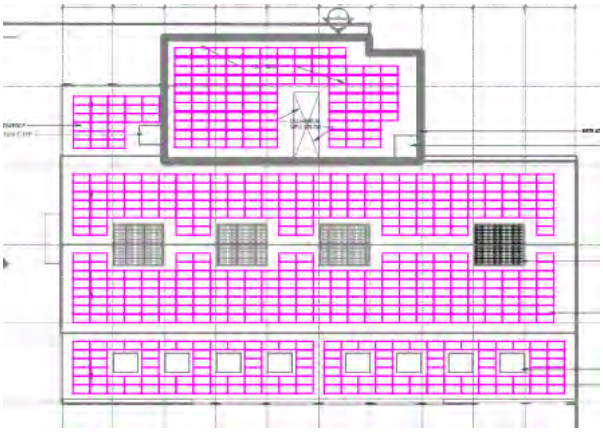
Plumbing: The building utilizes low-flow plumbing fixtures to limit the amount of hot water use and reduce the annual energy used for domestic hot water heating.

Lighting: The building utilizes low energy LED lighting throughout along with daylight responsive dimming controls and occupancy based sensors (occupancy or vacancy) to ensure lighting energy use is as low as possible.

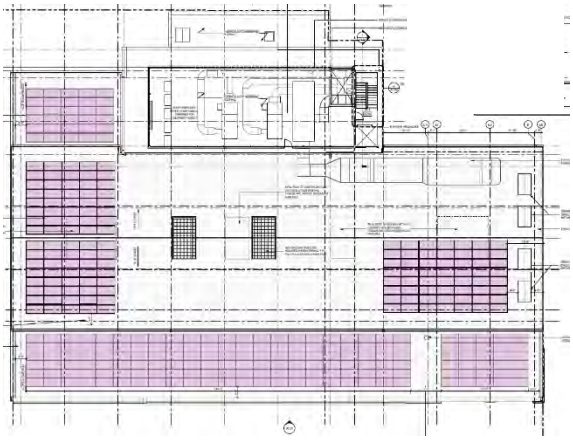
ON SITE RENEWABLE ENERGY

Due to the very tight building site, the only available area for locating renewable energy systems is the building roof. A preliminary layout for full coverage of the roof with photovoltaic panels (PV), including the mechanical equipment well, was completed during the Schematic Design phase to understand the potential for on-site renewable energy generation. Full roof coverage would allow for the installation of a 221.6 kW system with an annual energy generation of approximately 230,000 kWh/year. This would be enough renewable energy to offset approximately 47.5% of projected annual on-site energy use.

Due to the limited project budget it is not feasible to install the necessary structure over the mechanical equipment well to locate PV panels in that location. In addition, an analysis of the existing wood trusses supporting the existing roof uncovered capacity limitations that don't allow for full coverage of the existing roof with PV panels. The total array size that can be installed is 127.9 kW with an estimated annual renewable energy generation of 137,890 kWh which would offset approximately 28.5% of the projected annual on-site energy use.



Preliminary Layout with Full Roof Coverage
(221.6 kW System)



Current Roof Coverage
(127.9 kW System)

PATHWAY TO NET ZERO EMISSIONS:

The current design is projected to offset 28.5% of annual energy use and emissions with renewable energy generated on-site.

It may be possible to add additional photovoltaic panels above the existing roof mounted mechanical equipment at a later date. There is the potential for a 15 to 25 kW array in this area that could generate an additional 16,000 kWh to 26,800 kWh of renewable energy and further offset annual energy use.

Annual energy use and resultant emissions can be impacted by building operations and occupant behavior and actions. Through careful attention to building operations and full engagement of building occupants and visitors in reducing their energy use it is possible that the annual energy use

could be less than what is projected. This would increase the percentage of annual energy use offset by on-site renewable energy.

Ultimately, full net zero emissions operations can be achieved with the purchase of off-site renewables or carbon offsets to make up any short-fall.

CAMBRIDGE REDEVELOPMENT AUTHORITY

Foundry Public Meeting Notes
October 2, 2019
Fletcher-Maynard Academy Gymnasium
6:30 – 8:30 pm

The meeting opened with an introduction by Deputy City Manager, Lisa Peterson, explaining the process to date and the format of the evening. She noted that the City Council will vote on the appropriation of the construction budget in coming weeks. That budget will be supported by funds from the City of Cambridge and the Cambridge Redevelopment Authority (CRA).

Tom Evans, Executive Director of the CRA walked through the governance structure, noting that the City owns the property, the CRA has a master lease and responsibility for the success of the mission, the Foundry Advisory Committee is providing oversight for the City and CRA and that the Foundry Consortium a new nonprofit that is forming, will be operating the building. He also shared a graph showing that the commercial office space on upper floors will contribute significantly to support the building's operations. Other sources of revenue to support operating costs will include non-profit office rental income and user fees from some users of the first floor program space.

Stephanie Couch of Lemelson-MIT, representing the Foundry Consortium, gave an overview of community outreach completed to date. This has included conversations with non-profit organizations, churches, senior centers, and resident leaders in the Cambridge Community Engagement Team, an online and paper survey, and many other informal conversations with interested stakeholders. The purpose of these discussions was to hear about the kinds of programs that residents and organizations might want to participate in or lead. A key finding is that the *culture and feel* of the Foundry is a priority for residents. Many respondents emphasized that they want to ensure the building feels welcoming for everyone. Stephanie Couch also noted that the Foundry Consortium has incorporated in Massachusetts and is awaiting certification of its nonprofit status from the IRS. The nonprofit will start building staff capacity in 2020.

Evan Moore from the project's Construction Manager At Risk, WT Rich, gave an overview of the staging plans for the initial phases of construction. Michael Black of the City of Cambridge Construction walked through the construction timeline. The City has started to set up its staging for construction. Early demolition and abatement work will begin in November. The building will be completed by summer 2021.

Stefanie Greenfield of Cambridge Seven Architects gave an overview of the design, demonstrating how it relates to the building's history as a Foundry, but also is meant to be open with glass walls that create connections between the activities happening inside. She reviewed updated floor plans and images of the kinds of activities that will take place in the range of maker spaces (woodworking; jewelry making and soldering; sewing and fabric arts;

and digital fabrication, including 3D printing). She also gave an overview of the exterior plan, including reviewing designs for a courtyard to run along the building and plans for handicapped parking spaces.

After the presentations, the public was invited to visit six stations set up around the room, where they could talk to representatives from the City, CRA and Foundry Consortium to share their ideas and write comments directly onto copies of building plans.

The stations were focused on:

1. Maker and Arts Spaces
2. Performance Space
3. Café, multi-purpose rooms, Community Hall
4. Facade, Landscaping, Urban Context
5. Operator/Foundry Consortium and ideas for fostering inclusiveness

Comments were recorded directly on copies of floor plans and on post up notes at each of the stations, as summarized below:

Exterior/Courtyard
• Crosswalk across Rogers Street
• Native plant garden
• Micro-forest (like in Tokyo)
• Pollinator plants
• Have art gallery display space in courtyard
• Interactive
• Art/Craft display area
• Allow for outdoor performances
• Area for digital display or mural?
• Crosswalk in front of main entrance
• Green Roof on the addition: generate power, collect water, sink carbon, grow veggies

General
• Signs in multiple languages: Amharic, Haitian Creole, Spanish
• Could food trucks park in front of the Foundry?
• Have signs with what's happening at the main entrance
• Need more storage!! Perhaps Portable armoires on wheels
• Need coat room
• Wayfinding, signage and web presence to know what's happening online and once you enter
• Gallery space, especially for resident artists
• Natural materials for internal finishes – biophilic design
• Coat room by mechanical area is too far away from the rest; better by art nook/theatre

Performance Space

- Provide reusable, flexible stage sets, flats, lights, ramps and stairs to stage, platforms, etc.
- Flexible configurations of risers and seating is important.
- Need to have live streaming capacity with both bandwidth and hardware
- The internal acoustics should be well designed by the architect
- Need to plan for a lighting grid, but also provide poles for side lighting (in addition to grid)
- Actors will need to enter at different points, so will need to allow for hanging side curtains to mask this movement in different configurations
- Where is the box office?
- Loading through the Bent Street door should allow for straight in access, unimpeded by street trees and furniture; ideally the truck could park on the street right near door.
- Dancers need space, especially with Green Street closing. Will they be able to use Multipurpose #1 in addition to the dance studio?

Maker /Artist Spaces

- Needs more storage space – consider flat vs vertical storage
- Workshop 4 is a great training ground (as it's also a classroom)
- Will there be a shop bot in the maker space?
- Make the two studios for Artists in Residence the same size
- Need gallery space for resident artists to show their work
- Ability to do ceramics?
- Kiln?
- Laser cutter?
- Workshop 1 looks big and useful, which will lead to empowerment
- Will there be a shop bot?
- Include specialized sewing equipment

Multi-purpose and Dance Studio

- Ensure acoustic separation between dance performance room and other spaces
- Dancers will want to use the dance room and Multi 1, esp. since Green St. studios is closing
- Have accordion wall between the dance room and multipurpose room
- Move the dance room closer to the Theatre
- Add extra acoustic separation/sound proofing for dance room walls – there could be loud drumming inside
- Have acoustic separation/sound proofing around multipurpose room – also to allow for drumming
- Ability to open/flex walls between Multi 1 and smaller multi-purpose rooms
- Ability to open walls between smaller multi-purpose rooms
- Use this as flex space for traveling classes
- Will the multi-purpose room have strong ventilation?
- Shades or other option to ensure privacy in multi-purpose rooms – for programs for undocumented immigrants or other groups
- Meeting space for community, civic, theatre groups for 20 – 50 people
- Combining the small multipurpose rooms could make a cool gallery space

- Design may be too transparent to be comfortable for some community members; meeting space for immigrant groups or others should provide shades

Café/Community Hall
- Café share the kitchen –time when café uses kitchen for prep, when there's no programs

Office Space
- Option for smaller offices with just 2 – 3 desks
- How will market rate tenants be selected? – they should have a reason for being in the building

Program/Operating Ideas *(to be shared with the Foundry Consortium, operator of the building)*
- Production staff: how will this work? Need to allow for volunteers to keep costs affordable for some productions, but should have some system for training and certification to use the audio/visual equipment.
- Participants gave examples of how they booked space in other facilities, e.g. booking a seven-day block to run a five-night show to allow for set up and break down; art salons that are booked for three hours on a Sunday, once a month; theater tech classes that might be booked 3 hours/week for a 14-week semester (eg from Bunker Hill Community College)
- Have doggie/pet days at the Foundry (with the café serving dog biscuits)
- Have costume making nights at the Foundry (like at Garment District – turn old stuff into something else)
- Have intro maker classes that are open, welcoming, accessible
- How to maintain your sewing machine (for those who also sew at home)
- Social nights
- Food trucks
- Artist Markets
- Machinery maintenance night
- Programs by Eliot School
- Focus on youth
- Look into having more pure space for leasing
- Youth take over and run the cafe for one night; make and sell simple things; cookies etc
- On-site supplies for purchase for maker spaces
- In Kind donations of maker equipment (and have volunteers from company who donated teach a class)
- Linked maker classes: how to make a sewing pattern and how to start a small business (for example if someone wanted to start a dog outfit business)
- Maker Space and studios should be available to individuals who are not (or no longer) affiliated with major education institutions

Foundry Building

Community Meeting

The City of Cambridge
Cambridge Redevelopment Authority
The Foundry Consortium

2 October 2019

CambridgeSeven

Agenda

Welcome	City of Cambridge
Project Overview	Cambridge Redevelopment Authority (CRA)
Operator Update	Foundry Consortium
Design Overview	CambridgeSeven
Construction Schedule	City of Cambridge
Next Steps	City of Cambridge / CRA
Discussion Stations	All

The Foundry Mission Statement

An adaptive reuse project to build a self-sustaining center for **creativity and collaboration** for the Cambridge community.

At the intersection of the Kendall Square Innovation District and the East Cambridge neighborhood, the Foundry building will provide space and programs for the **visual and performing arts, entrepreneurship, technology and workforce education** within its historic, industrial setting.

The Foundry will **facilitate access for residents, especially underrepresented communities and adjacent neighborhoods**, to the dynamic working and learning environment of Kendall Square

The Foundry in Cambridge – Project Overview

Governance Structure:

Building Owner – City of Cambridge

Master Lease – CRA

Partners in the building's redevelopment

Operator – Foundry Consortium (501c3 Board)

Tenants – Market Rate & Non-Profit Office

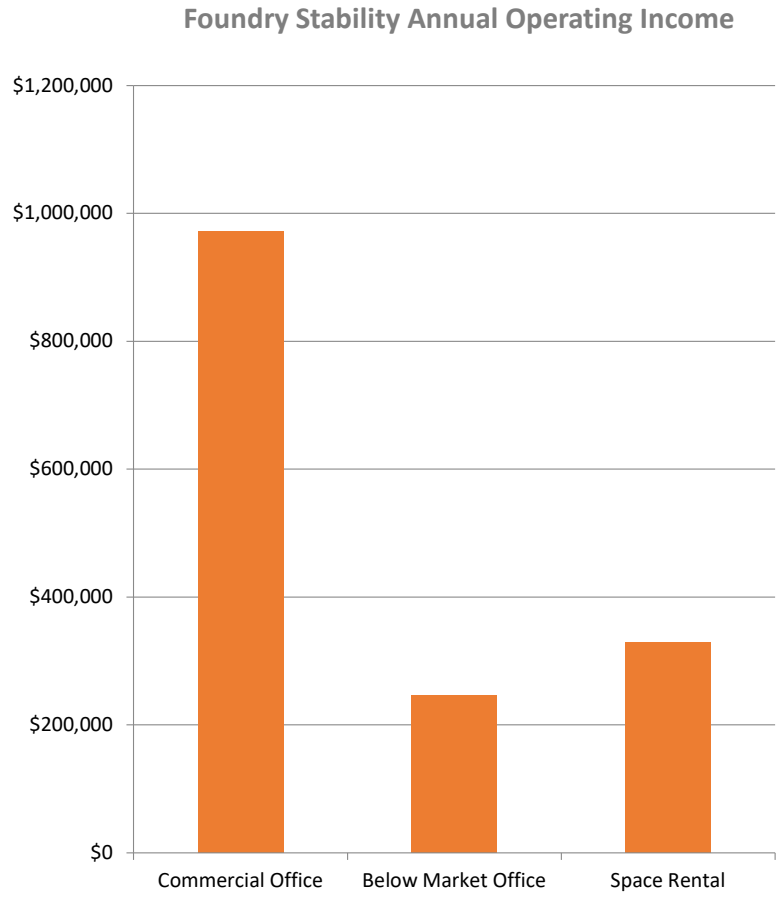
Users – Community Organizations & Individuals

Foundry Advisory Committee oversight to City and CRA

The Foundry in Cambridge – Project Overview

Self Sufficient Operating Model:

- Estimated operating budget of $1.5 million
- Office rent covers majority of expenses
- User fees on sliding scale for reserved spaces
- Public space and community programs
- 60% of building's usable space dedicated to community uses:
  - Arts (visual and performing)
  - Education / workforce development
  - Maker Workshops
  - Meeting / gathering space
  - Non-profit office



Foundry Consortium's Vision in Response to Operator RFP

Forge new and sustained connections between individuals, families, community organizations and business leaders through shared use of space (accessible to all) and programming that fosters creativity, invention, innovation and the acquisition of workplace competencies.

A New Form of Civic Engagement – Fostered by a Space Like No Other That We Know Of As of This Date.

Outreach and Engagement Through July 1, 2019

- Three makerspace meetings
- Several performance/visual arts meetings to discuss physical design and programming
- March 2019: Foundry Coffee Chat to provide neighborhood residents with an update and to solicit feedback on programming
- Since April, 2018, a total of 213 individual meetings and 63 group meetings!
- Online survey fielded over four-months (February 21, 2019 – June 30, 2019) yielded responses from 89 participants.

Zip codes reported:

- 02138
- 02139
- 02140
- 02141
- 02142
- 02143
- 02145
- 02155
- 02771

Top Ranked Pre-Set Choices for Foundry Experiences (in rank order)

1. Cook or take a yoga class
2. Meet a friend at the café
3. Watch a play
4. Rent space for an event
5. Experience an exhibition
6. Tinker in the maker space
7. Learn or share a new job skill
8. Other STEAM related programs
9. Create and display your own artwork
10. Read a book
11. Teach an art or maker class
12. Dance or sing in a performance
13. Enroll your child in an afterschool program
14. Team up on a theater production
15. Explore set design
16. Invent a new product
17. Rehearse a performance
18. Sew a costume

Desired Program Offerings - Categories of Open-Ended Responses from Residents

- Civic, community and cultural engagement (highly cited category)
- Cooking and food
- Health & well-being
- Enjoying theater
- Enjoying or displaying art
- Tinkering in the maker Space
- Pursuing hobbies
- Gaining job skills and employment
- Engaging with technology
- Other educational pursuits
- Reading books
- Enjoying dance
- Enjoying music
- Enjoying films
- Children, families & leisure space
- Ensuring accessibility
- General operations
- General space

Factors That Would Impact Use of Foundry

- Culture and climate (highly cited category)
- No parking
- Mix of space uses
- Time, a job and busy schedule
- Financial issues
- Operations
- Hours of operation
- Public transportation
- Parent responsibilities
- Distance from home
- Safety
- Health issues
- Accessibility
- Bad weather
- Nothing
- Maintenance
- Traffic
- Sustainability
- Demographics
- Lack of information
- Beverages

The Foundry Consortium

- Selected as the Operator in the spring of 2018

- Working with the Cambridge Redevelopment Authority and the City of Cambridge to obtain public input on the design and operations

- Establishing the consortium as a new nonprofit
  - Pro Bono legal services from Kirkland & Ellis LLC
  - Articles of incorporation filed 9/29/19

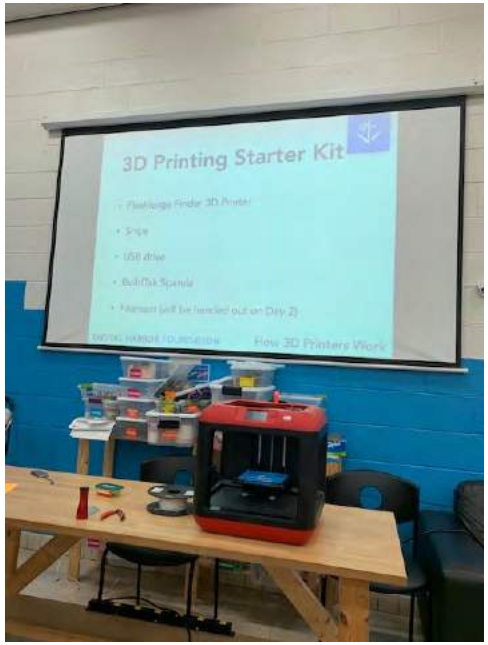
- Will be starting a search for an Executive Director in new year with hope of getting that person on board by August, 2020

- Seeking funding to support operations until the Foundry opens from sources that do not compete with local nonprofits.

Foundry Consortium: National Rec-to-Tech $5000 Prize Winner!

https://www.digitalharbor.org/rec-to-tech-national-design-challenge/

https://blueprint.digitalharbor.org/workshops/3dprinting/



Fostering Inclusiveness & Meeting Residents' Needs

- What are your ideas for ways the Foundry Consortium can:

  - ensure a warm and welcoming climate for all?

  - foster inclusiveness?

  - meet residents' needs?

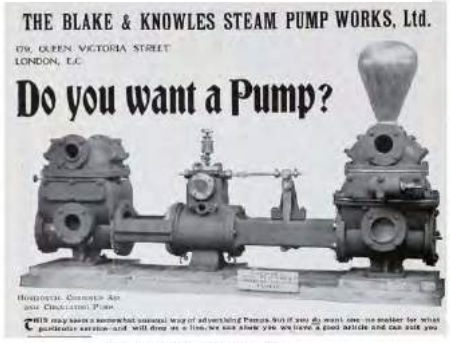
Landmark Status – Cambridge Historical Commission

Blake & Knowles Works, ca. 1910. Arrow indicates Foundry Building CHC collection

Blake and Knowles Foundry - 1890
George Blake - invented and engineered water meters + pumps

Women's Movement History - 1912
Hours logged by women in the Foundry led to the first Minimum Wage Act for Women in 1912

"Lithuanians, Polanders, Portugese" at a YMCA noontime educational class at the Blake & Knowles plant, ca. 1910. CHC collection



Grace's Guide, February 1901

Building Analysis – Timeline of Uses

1890	Blake and Knowles Foundry
1929	Perrin-Walsh Co Automotive Storage
1951	Lombard Brothers Trucking Company
1968	Ambassador Taxi Company
1982	Exeter Equities Office Space
1988	Rogers Bent Realty Trust
2009	Alexandria Real Estate Equities Inc.
2010	City of Cambridge

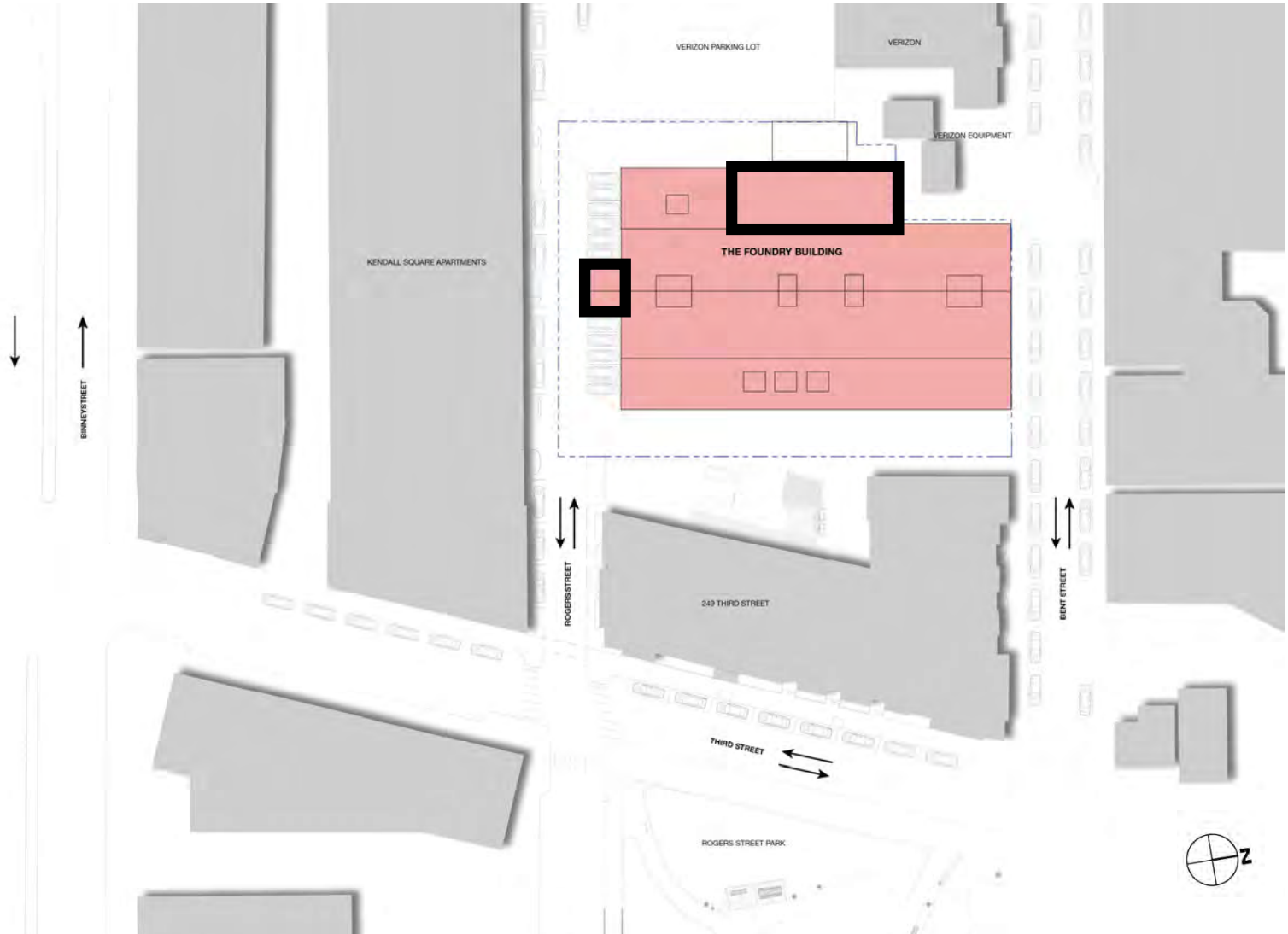
Program Summary

Workshops	*4,300 sf*
Multi-Purpose Rooms	*4,000 sf*
Performance Space	*4,900 sf*
Dance Studio	*700 sf*
Art Studio	*2,400 sf*
Demonstration Cooking	*600 sf*
Café	*500 sf*
Community Hall	*5,600 sf*
Office Space	*19,200 sf*
Support	*8,200 sf*
storage, restrooms, mechanical ,circulation	
Total GSF	*50,400 sf*

Foundry View from Rogers Street

Existing Site

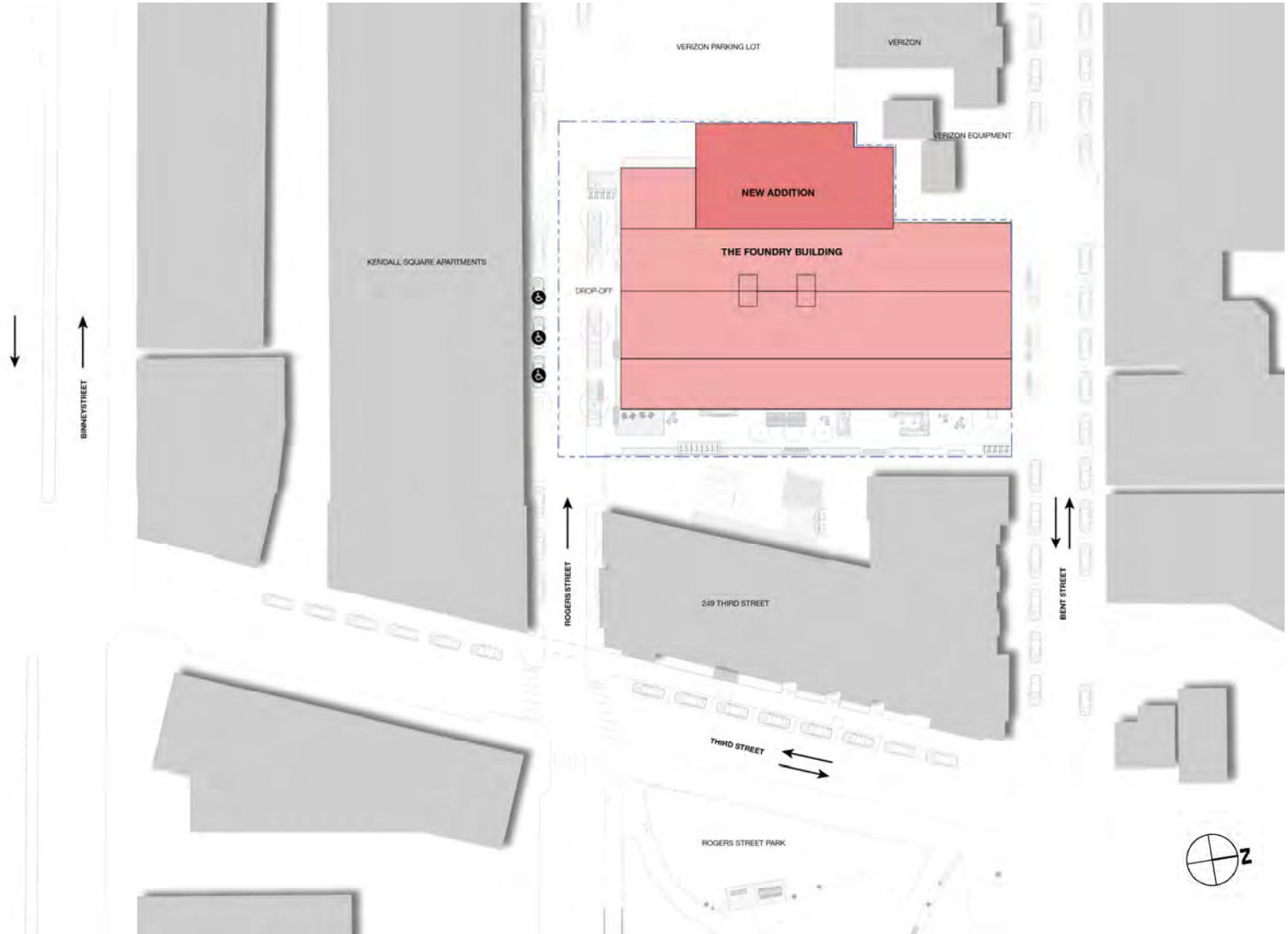
Removals Plan



1980's Entry Foyer

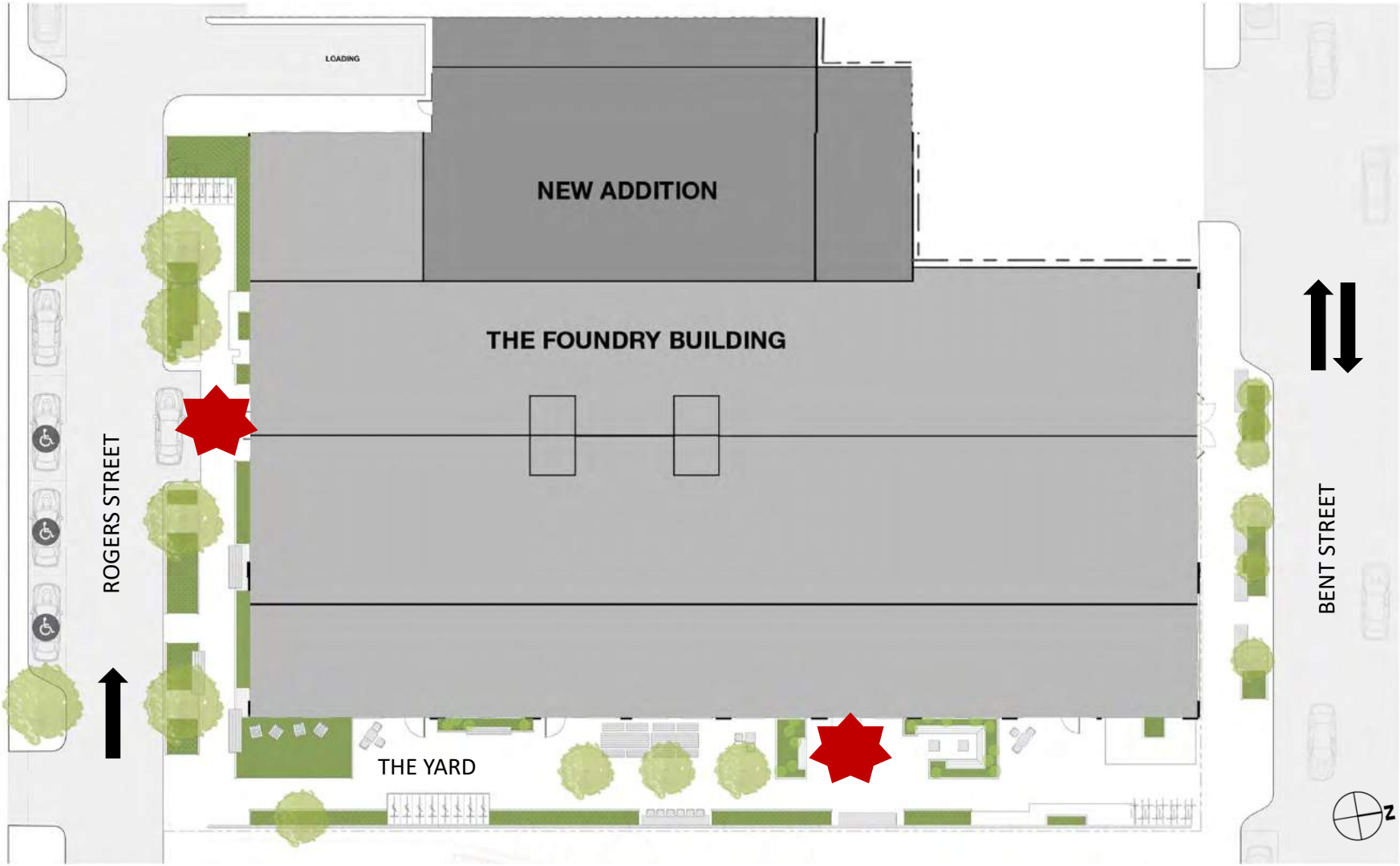
Furnace Building
structurally non reinforced

Proposed Site

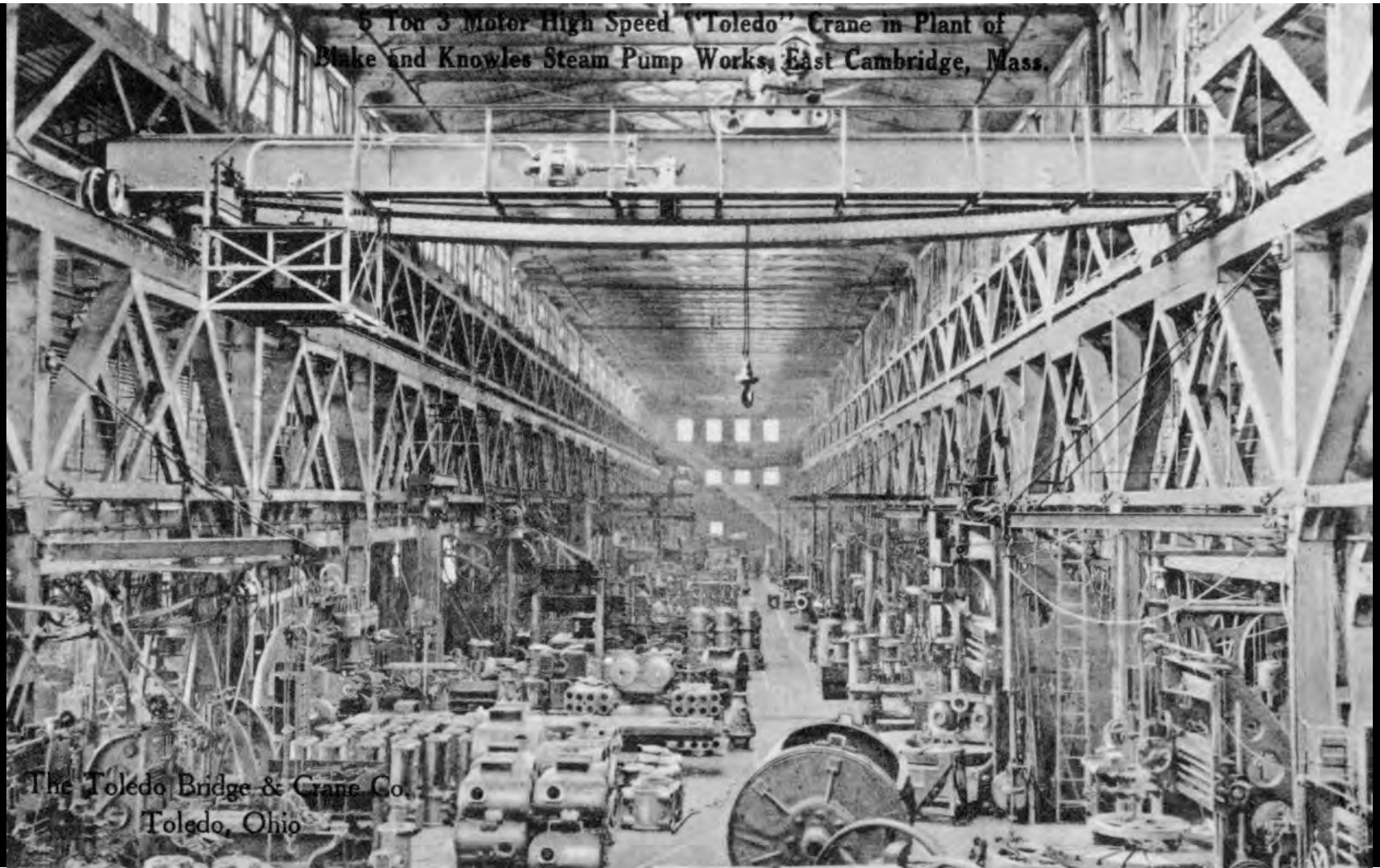


New Program	37,100 sf
New Addition	13,300 sf
Total GSF	50,400 sf

Site Plan

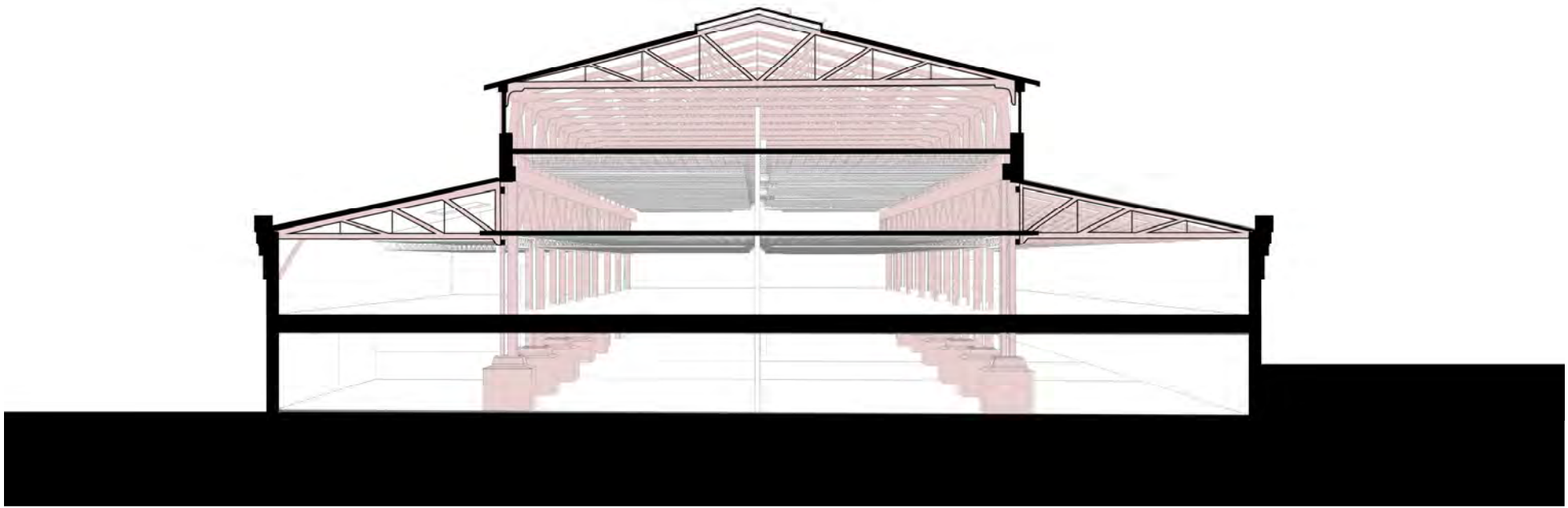

LOADING
NEW ADDITION
THE FOUNDRY BUILDING
ROGERS STREET
BENT STREET
THE YARD

Similar Erecting Hall ca.1910

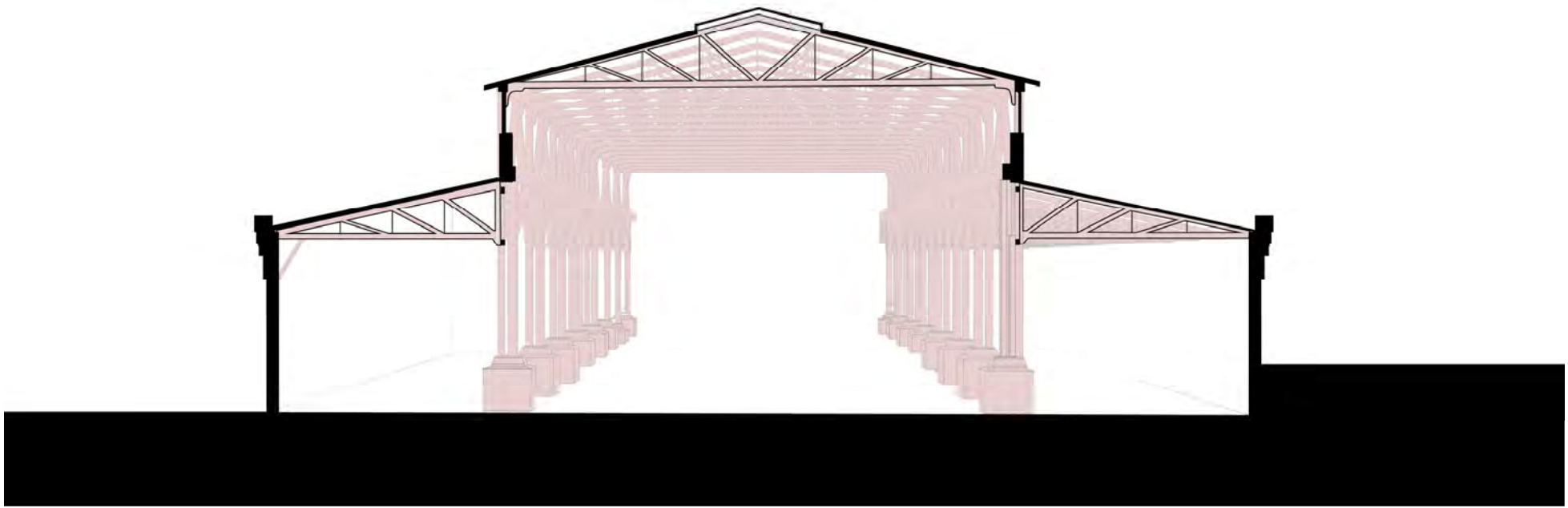


Today

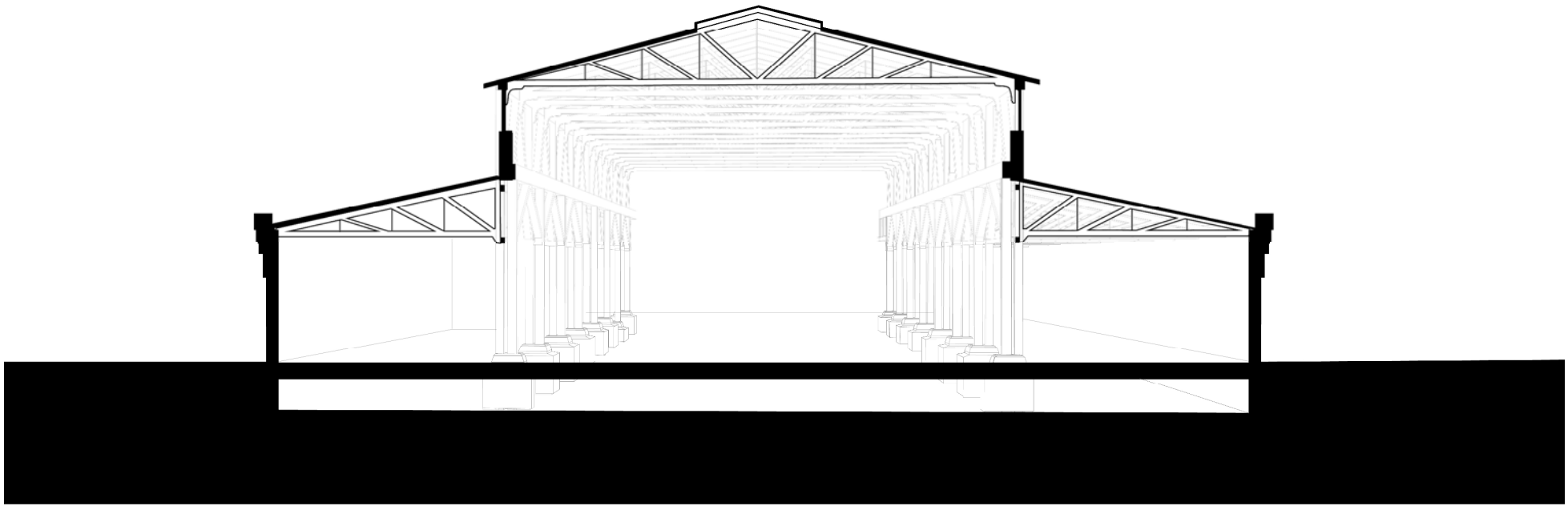
Section Diagram – Existing



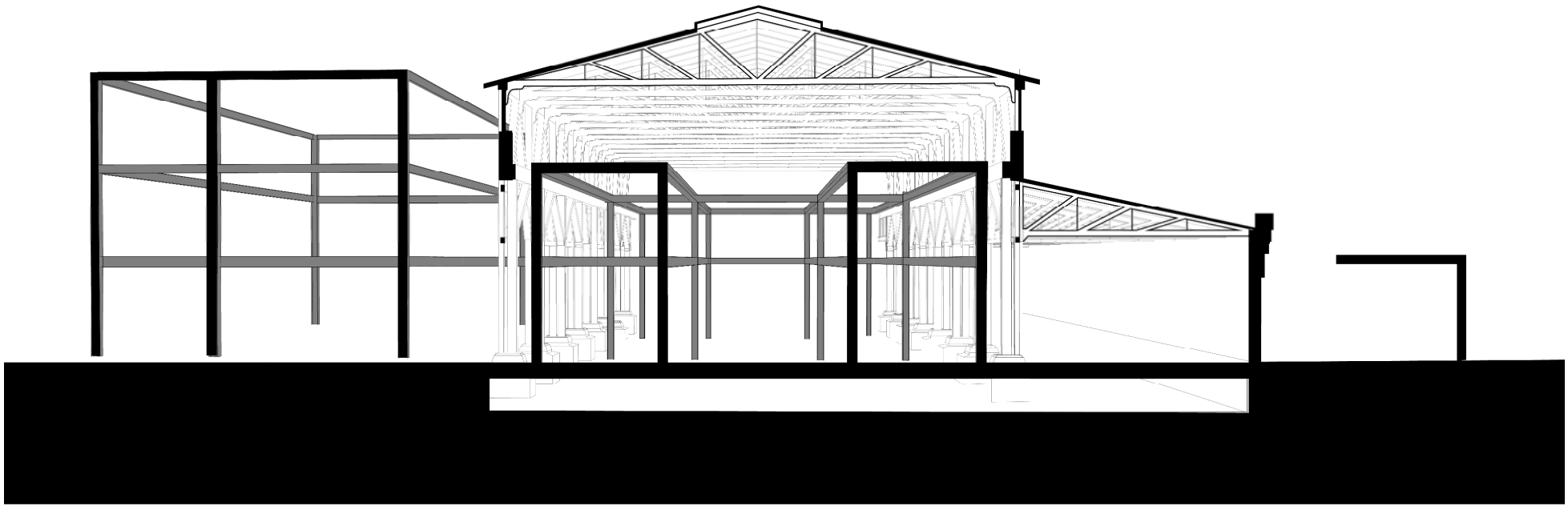
Section Diagram – Floor Removals



Section Diagram – Universal Access



Concept Section



Workshop – Woodwork

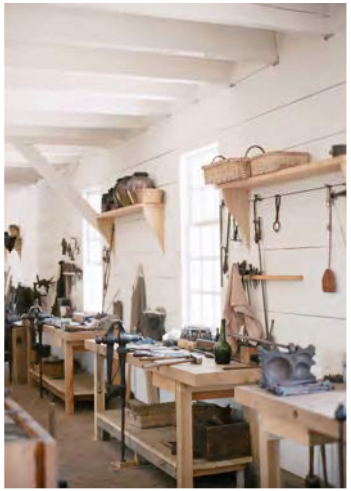


TABLE SAW BELT SANDER DRILL PRESS MITER SAW BAND SAW

Workshop – Jewelry and Light Metals

BRAZING SOLDERING ANVIL BUFFERING KILN

Workshop – Fiber Arts

TEXTILES CUTTING TABLES SEWING MACHINES IRONING EMBROIDERY MACHINE

Workshop – Digital Fabrication / STEM Classroom

WORK TABLES POWER 3D PRINTER LASER CUTTER COMPUTERS

Visual and Performing Arts

ART STUDIOS RESIDENT ARTISTS SPRUNG WOOD FLOOR BALLET BAR MIRRORS GREEN ROOM DRESSING ROOM STORAGE

Community Hall | Demonstration Cooking | Café

COOKTOP OVEN FREEZERS REFRIGERATION 3 BAY SINK DISHWASH CATERING PANTRY COMMUNAL DINING

Public Art | Elisa Hamilton

A jukebox stocked with recordings of community stories will be the public art for The Foundry.

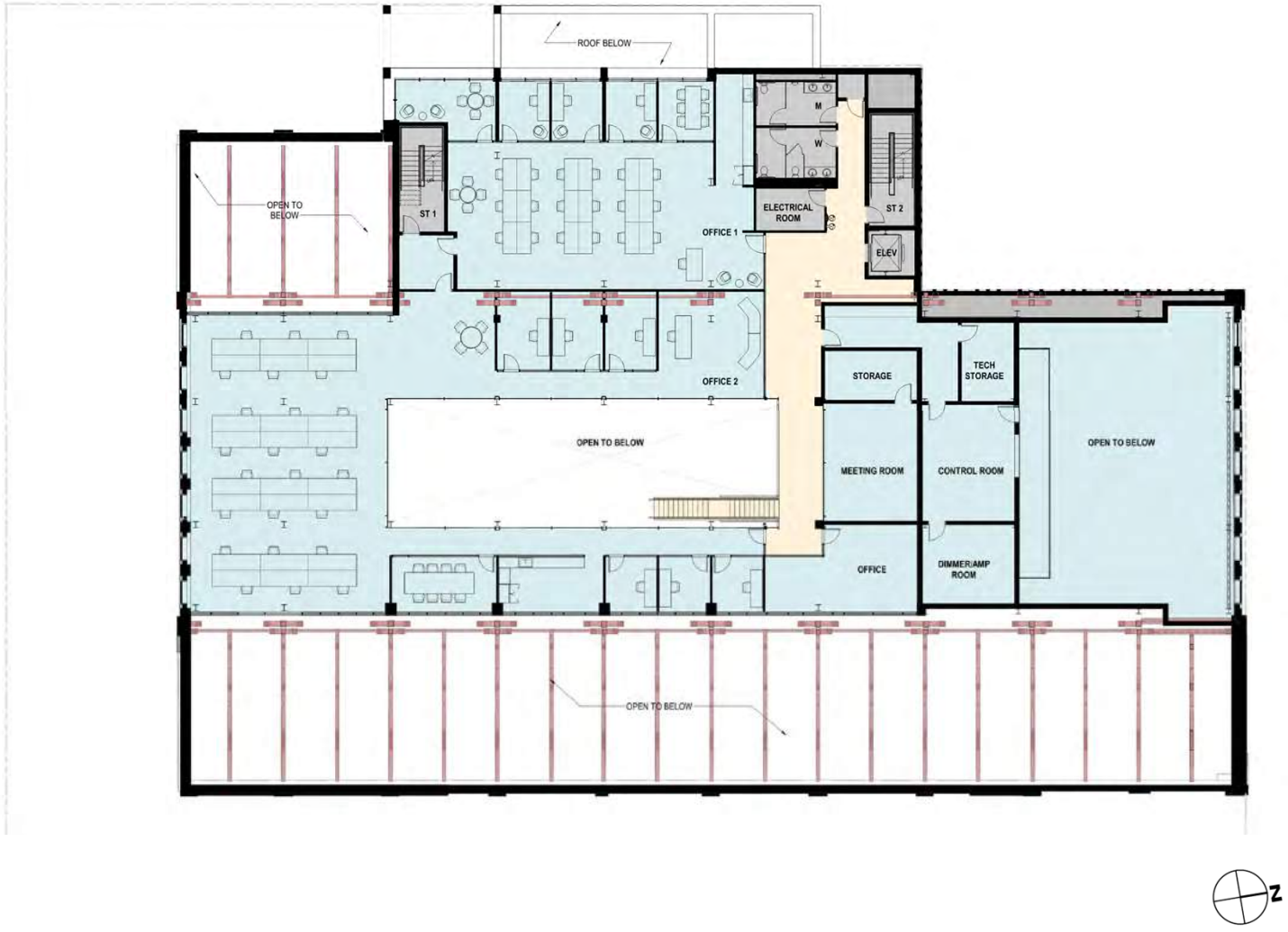
The mission of *Jukebox* is to bring together the Cambridge Community by creating a centerpoint for listening to and connecting with one another's stories.

Schematic Design - Ground Floor Plan

Ground	24,600 SF
Level 2	11,800 SF
Level 3	14,000 SF

Schematic Design - Second Floor Plan

Ground	24,600 SF
Level 2	11,800 SF
Level 3	14,000 SF



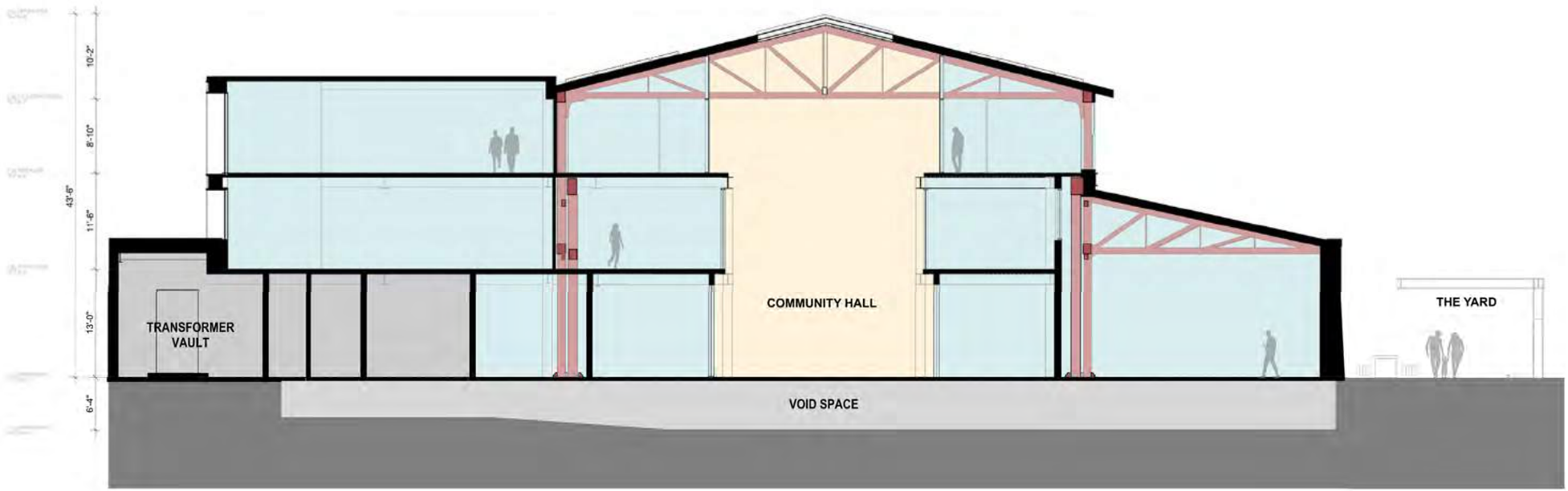
Schematic Design - Third Floor Plan

Ground	24,600 SF
Level 2	11,800 SF
Level 3	14,000 SF

LEGEND

- PROGRAM SPACE
- COMMON SPACE
- SUPPORT SPACE
- HISTORIC STRUCTURE

Building Cross Section



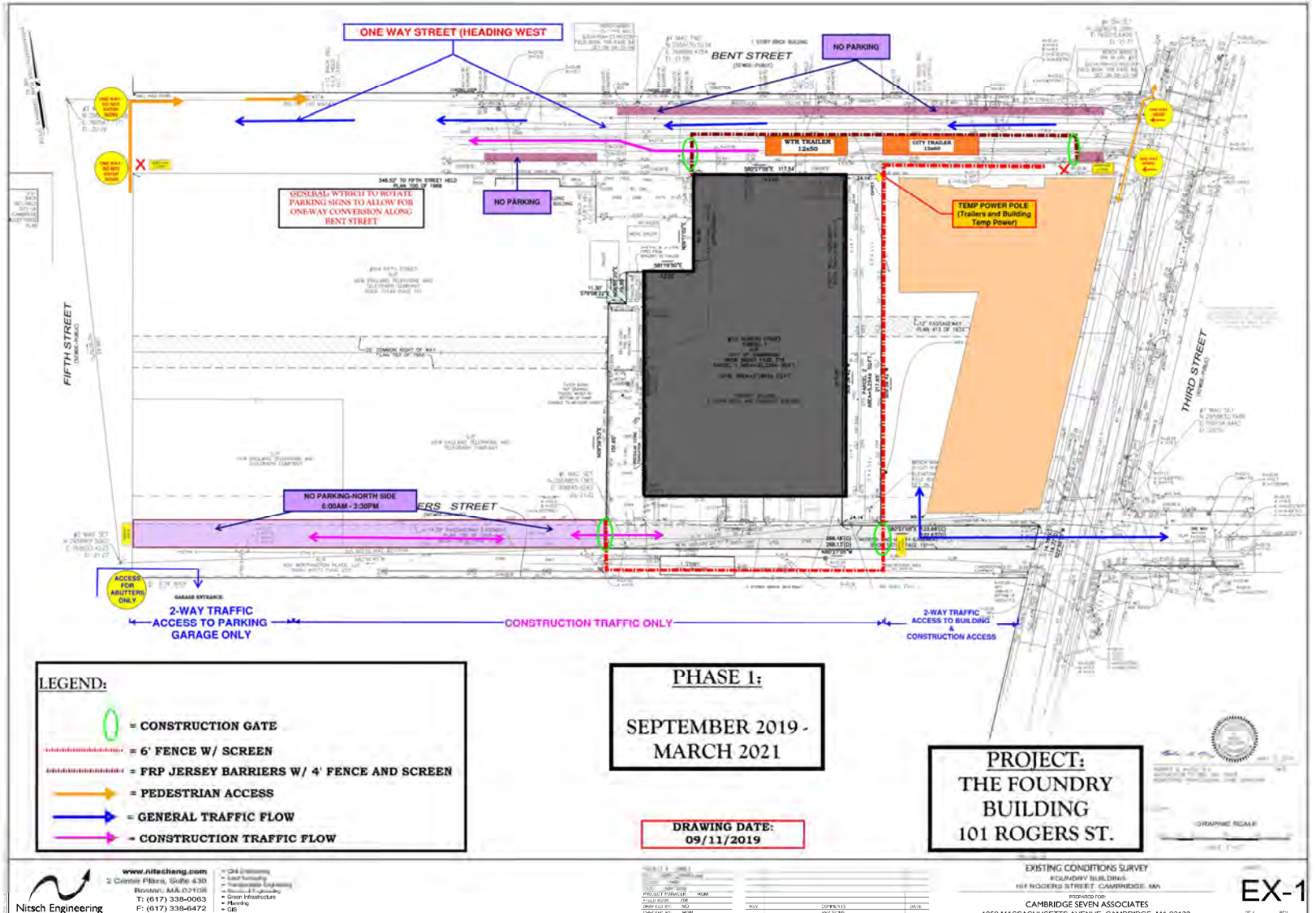

THE FOUNDRY
THEATER
GET PUMPED FOR...
ART
WOODWORK
METALWORK
TECH
SCIENCE
COOKING
THEATER
DANCE
MEETING

View from Rogers Street Toward New Addition

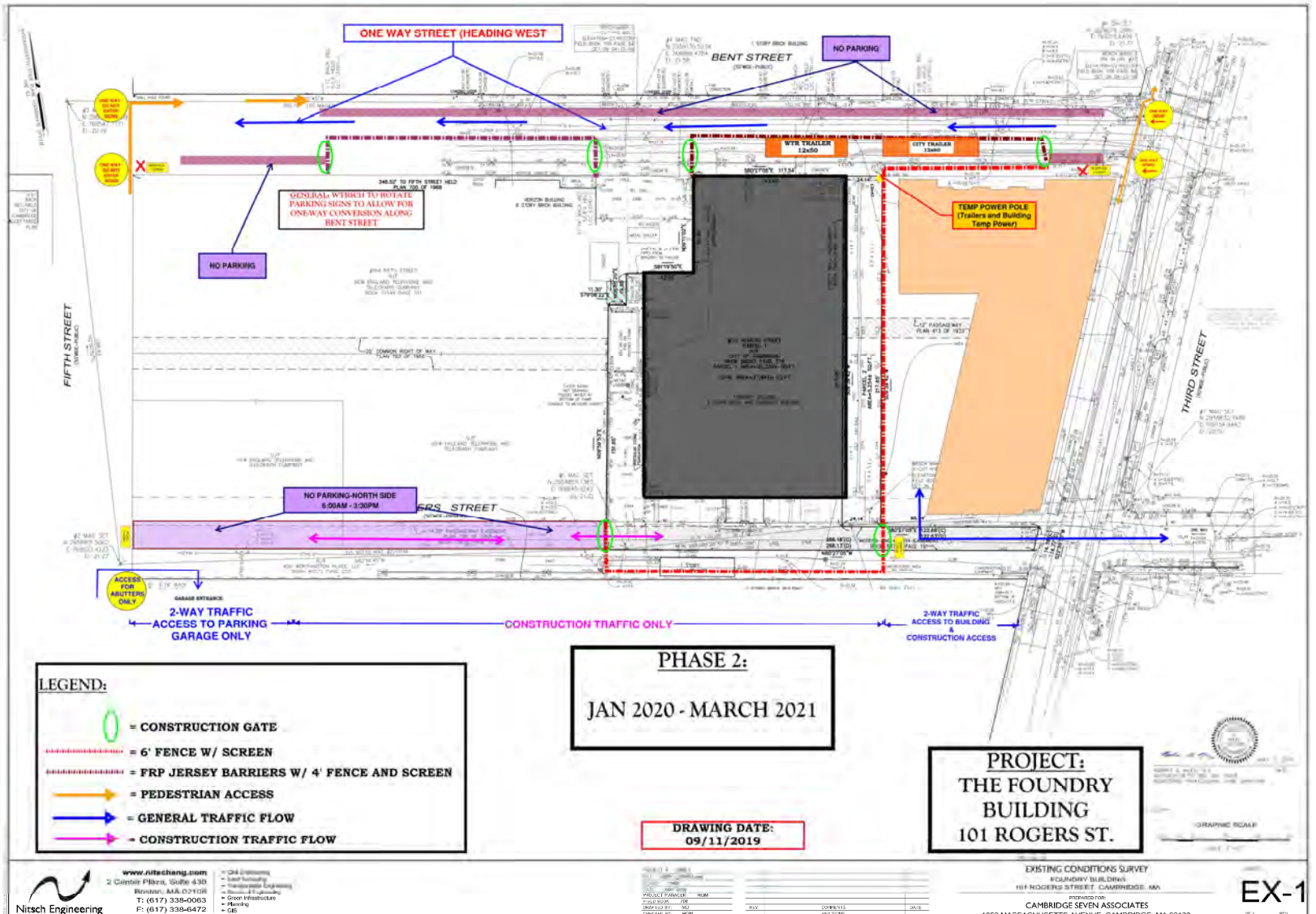
View From Rogers Street


FOUNDRY BUILDING
THE YARD

Phase 1


ONE WAY STREET (HEADING WEST
BENT STREET
NO PARKING
WTR TRAILER 12x50
CITY TRAILER 12x60
GENERAL: WTRICH TO ROTATE PARKING SIGNS TO ALLOW FOR ONE-WAY CONVERSION ALONG BENT STREET
NO PARKING
TEMP POWER POLE (Trailers and Building Temp Power)
FIFTH STREET
THIRD STREET
NO PARKING-NORTH SIDE 6:00AM - 3:30PM
ACCESS FOR ABUTTERS ONLY
2-WAY TRAFFIC ACCESS TO PARKING GARAGE ONLY
CONSTRUCTION TRAFFIC ONLY
2-WAY TRAFFIC ACCESS TO BUILDING & CONSTRUCTION ACCESS
LEGEND:
= CONSTRUCTION GATE
= 6' FENCE W/ SCREEN
= FRP JERSEY BARRIERS W/ 4' FENCE AND SCREEN
= PEDESTRIAN ACCESS
= GENERAL TRAFFIC FLOW
= CONSTRUCTION TRAFFIC FLOW
PHASE 1:
SEPTEMBER 2019 - MARCH 2021
DRAWING DATE: 09/11/2019
PROJECT:
THE FOUNDRY BUILDING
101 ROGERS ST.
Nitsch Engineering
www.nitsch.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472
EXISTING CONDITIONS SURVEY
FOUNDRY BUILDING
101 ROGERS STREET, CAMBRIDGE, MA
PREPARED FOR:
CAMBRIDGE SEVEN ASSOCIATES
1050 MASSACHUSETTS AVENUE, CAMBRIDGE, MA 02138
EX-1

Phase 2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= CONSTRUCTION TRAFFIC FLOW
PHASE 2:
JAN 2020 - MARCH 2021
DRAWING DATE:
09/11/2019
PROJECT:
THE FOUNDRY
BUILDING
101 ROGERS ST.
Nitsch Engineering
www.nitscheng.com
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EX-1

Schedule

Design Phases

Design Development	October 2019 - December 2019
Construction Documents	January 2020 - March 2020
Trade Bids	March 2020 - April 2020

Construction

Early Abatement and Demolition	November 2019 - January 2020
Early Foundation, Steel and Sitework Bidding	February - March 2020
Trade Bids	April 2020
Construction Duration	November 2019 – Summer 2021

Occupancy

Summer 2021

Agenda

Welcome	City of Cambridge
Project Overview	Cambridge Redevelopment Authority (CRA)
Operator Update	Foundry Consortium
Design Overview	CambridgeSeven
Construction Schedule	City of Cambridge | WT Rich
Next Steps	City of Cambridge / CRA
Discussion Stations	All