SPECIAL PERMIT APPENDIX COVER SHEET

180 FAWCETT ST – 5138.00

CAMBRIDGE, MA

02.23.2022

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SEWER SERVICE INFRASTRUCTURE NARRATIVE

1.1 Existing Sanitary Sewer System

Based on initial site visits and record mapping, sanitary sewer mains are present within both Smith Place and Fawcett Street. The City of Cambridge owns, operates, and maintains the sanitary sewer mains near the Project Site. Additionally, the sanitary sewer system is separate from the storm drainage system in the proximity of the Project Site based on a review of the site conditions, survey and available mapping.

A City of Cambridge-owned 12-inch vitrified concrete sanitary sewer main is located on the center of Fawcett Street and flows east from a sewer manhole located in the intersection with Smith Place down Fawcett Street. In addition, a City of Cambridge-owned 12-inch vitrified concrete sanitary sewer main also exists in Smith Place on the western side of the street and flows south to the intersection with Fawcett Street per the City's CityViewer GIS mapping service.

1. 2 Estimated Proposed Sanitary Flow

MassDEP establishes sewer generation rates for various types of establishments in a section of the State Environmental Code Title V ("Title 5"), 310 CMR 15.203. The Project will generate more wastewater flow than the business that currently operates in the building that occupies the Site. Based on an estimate of the Project's building program, **Table 1-2** gives the estimated proposed sanitary sewer flows expected to be generated by the Project. Based on these Title V sewer generation rates, the Project is expected to produce approximately 4,257 gallons per day (GPD) of sewer flow. The existing building and use generates approximately 1,195 GPD, which produces a net increase of 3,062 GPD. The threshold for a MADEP Sewer Connection Permit is 50,000 GPD, so a state permit will not be required. The proposed sewer generation calculation will be refined as final sewer generation flows are coordinated with City's Public Works Department as design progresses and tenants are identified.

Table 1-1 Existing Sewer Generation

	Unit Type	Program	Sewer Generation Rate	Sewer Flow (GPD)
Gymnasium Space	**Gymnasium**	40 Participants	25 GPD / Participant	1,000
Gymnasium Space	**Gymnasium**	15 Spectators	3 GPD / Spectator	45
Office Space	**Office**	2,000 SF	75 GPD / 1,000 SF	150
	Existing Sewer Generation			**1,195**

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Table 1-2 Proposed Sewer Generation

	Unit Type	Program	Sewer Generation Rate	Sewer Flow (GPD)
Office Space	**Office**	18,450 SF	75 GPD / 1,000 SF	1,384
Lab Space	**Factory, Industrial**	27,672 SF	15 GPD / Person	2,768*
Retail Store	**Retail**	2,088 SF	50 GPD / 1,000 SF	105
	Total New Sewer Generation			**4,257**
	Total Net New Sewer Generation			**3,062**
	Proposed Water Demand			**4,683****

**Assumed 150 SF per person for lab space sewer generation calculation using 310 CMR 15.203 System Sewage Flow Design Criteria for Factory, Industrial Plant, Warehouse or Dry Storage Space without a cafeteria.*

***Proposed water demand is based on total new sewer generation multiplied by a factor of 1.1.*

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Based on preliminary calculations and discussions with the City's Public Works Department, there are no known sewer capacity problems near the Project Site. The Project's engineer will coordinate final, proposed sewer flows and available capacity with City during Project design to ensure Project needs are met without disruption of service to the surrounding area.

1.3 Proposed Sanitary Sewer Connections

The service connection is anticipated to occur in Fawcett Street. The size and location of the service connection(s) will be coordinated between the Project's plumbing engineer and the City's Public Works Department. Floor drains from the underground level of the subsurface parking garage will be collected and routed through an approved oil/grease separator and sump pump prior to discharge into the City's sanitary sewer system. Additionally, a precast concrete sanitary sewer storage tank is proposed to provide control of the influent flow from the proposed building uses such that the mainline system does not surcharge in larger storm events. The tank will be designed such that storage can be provided for up to 24 hours prior to discharge into the City's mainline system via the existing main in Fawcett Street to achieve influent control. Inline backwater valves will also be installed to prevent sanitary sewer backups through the building's fixtures and will be installed by a licensed plumber according with the City's Wastewater and Stormwater Drainage Use Regulations.

Sewer connections will be constructed to minimize effects on adjacent streets, sidewalks, and other areas within the public right-of-way, and sewer service connections will be kept separate from storm drain connections in accordance with the City's standard requirements.

1.4 Sewer System Mitigation

The sanitary sewer connections are subject to approval by the municipal sewer system owner, City of Cambridge, as part of the Special Permit Project Review process. The City's inflow/infiltration (I/I) mitigation requirements will not apply to this Project because mitigation is only required within the Alewife Overlay District when the threshold of 15,000 GPD of net new sewer discharges is reached.

Proposed Stormwater Management

The proposed stormwater management system has been designed to comply with the City of Cambridge standards and the MADEP Stormwater Management Standards. Since the Project results in a reduction in overall impervious area, it falls under the category of a redevelopment project.

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The stormwater runoff from the Project will be collected by a combination of green roof areas or roof drains, and area/landscape drains and trench drains. The stormwater collected will be treated, retained and, contingent on environmental and geotechnical testing and site conditions, infiltrated utilizing subsurface stormwater systems. These systems retain a portion of the stormwater to reduce the peak rate of stormwater to the City's stormwater system. The post-project discharge hydrograph for the 25-year 24-hour rainfall event must be less than or equal to the 2-year 24-hour rainfall event pre-project discharge hydrograph, such that the total volume of runoff generated between the pre-project 2-year 24-hour storm discharge and the post-project 25-year 24-hour storm discharge must be retained or recharged on site per the City's Land Disturbance Regulations and stormwater Control Requirements. The stormwater system is anticipated to consist of a subsurface detention system located beneath the garage entry ramp and a crushed stone and perforated pipe infiltration system.

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WATER SERVICE INFRASTRUCTURE NARRATIVE

2.1 Existing Water Service

The City of Cambridge owns, operates, and maintains the water distribution systems near the Site. Based on initial site visits, survey and record mapping, water mains are present within both Fawcett Street and Smith Place. An existing fire hydrant is located on the eastern side of Smith Place, near the intersection with Fawcett Street, and another existing fire hydrant is located on the eastern side of Smith Place, near where the street transitions to become Mooney Street. There are no known issues with the existing water distribution system within the Project's vicinity, but hydrant flow testing will be performed prior to filing for a building permit. Survey mapping shows a 10-inch ductile iron (DI) main is located on the eastern side of Smith Place and a 10-inch ductile iron (DI) main is located on the southern side of Fawcett Street.

2.2 Estimated Proposed Water Demand

The estimated proposed water demand for the Project is based on the estimated sanitary sewer flow (see **Table 1-2**), with a factor of 1.1 applied to account for consumption, system losses and other usages. Based on this formula, the Project's estimated peak water demand for domestic uses is approximately 4,683 GPD. The domestic water will be supplied by the City of Cambridge water system.

Based on discussions with the City of Cambridge's Water Department (CWD), there are no expected water capacity issues near the Site. Prior to final design and Building Permit filing, this will be confirmed by hydrant flow testing in coordination with the City of Cambridge Water Department.

2.3 Proposed Water Service

It is anticipated that the Project's domestic and fire protection services will connect to the 10-inch main in Fawcett Street. Final service locations will be coordinated closely with CWD. If required, the Project will include internal booster pumps to ensure adequate water pressure to all standpipes and sprinkler systems. Appropriate gate valves and backflow prevention devices will also be installed on each side of the service connection point at the main to allow for the services to be shut off and to prevent potential backflow of non-potable water or other contaminants into the public water supply.

The Project will include new domestic and fire protection services. The Project proposes to connect to the existing 10-inch water main in Fawcett Street with the appropriate tee structures for the fire protection and domestic services. Following discussions with CWD, an additional redundant domestic service will also be proposed per the City's standard requirements for this type of building use. The layout and sizing of these service connections will be closely coordinated with CWD throughout the permitting and construction processes.

The existing hydrants are proposed to remain in their current location and will continue to be in service throughout the entirety of construction of the proposed building and associated site improvements. Fire pumps are not anticipated to be required, but will be evaluated as the design progresses.

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TREE STUDY

There are no Significant Trees (as defined in CZO 8.66.030) at 180 Fawcett Street. The Superintendent of Urban Forestry & Landscapes informed the Applicant on 7/16/2021 that the Tree Study for the Project is complete and meets all the requirements needed for certification by the City Arborist.

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TREE 1

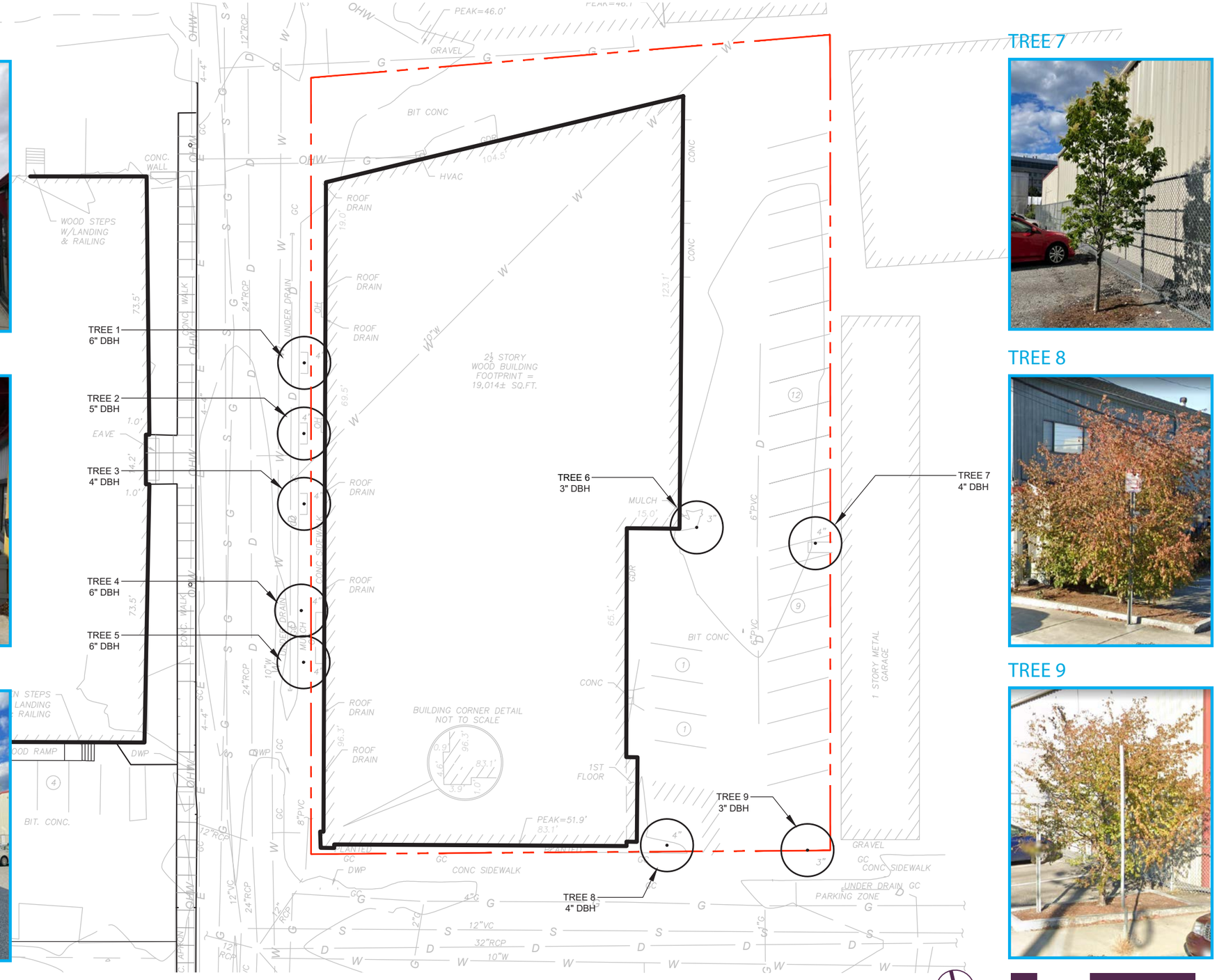
TREE 2

TREE 3

TREE 4

TREE 5

TREE 6

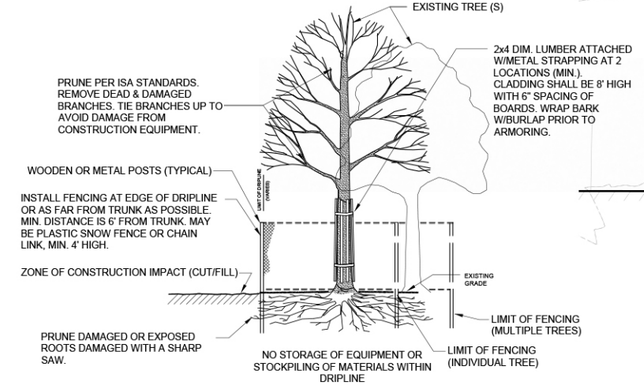


TREE 7

TREE 8

TREE 9

LANDSCAPE TREE SURVEY



TREE PROTECTION - EXISTING TREES

SCALE: 1/2"=1'-0"

TREE PROTECTION AND REMOVAL NOTES

1. THIS SHEET DESCRIBES EXISTING TREE PRESERVATION AND REMOVAL WORK ONLY. REFER TO CIVIL ENGINEER'S DRAWINGS FOR COMPLETE SITE PREP AND DEMO REQUIREMENTS.
2. TREE REMOVAL SCOPE SHALL INCLUDE THE FELLING, CUTTING, AND SATISFACTORY DISPOSAL OF ALL TREES, STUMPS AND VEGETATIVE DEBRIS PRODUCED THROUGH THE CLEARING OPERATIONS.
3. FELL TREES IN SUCH A WAY AS TO NOT INJURE TREES TO BE SAVED. EXCAVATION OR GRADING WITHIN THE BRANCH SPREAD OF TREES TO BE SAVED SHALL BE PERFORMED ONLY UNDER THE DIRECTION OF THE OWNER'S REPRESENTATIVE UNLESS OTHERWISE DIRECTED.
4. STUMPS TO BE REMOVED OUTSIDE THE TREE PRESERVATION AREA SHALL BE GRUBBED TO THEIR FULL DEPTH. ROOTS 3 INCHES AND LARGER SHALL BE REMOVED TO A DEPTH OF 2 FEET BELOW FINISHED GRADE. STUMPS SHALL BE LEGALLY DISPOSED OF OFF-SITE
5. STUMPS TO BE REMOVED WITHIN THE TREE PRESERVATION AREA SHALL BE GROUND DOWN USING A MECHANICAL STUMP GRINDER TO A DEPTH OF 2 FEET BELOW FINISHED GRADE.
6. TREE PROTECTION FENCING SHALL BE INSTALLED AS SHOWN ON THIS PLAN AND REMAIN THROUGHOUT THE TIME OF CONSTRUCTION AS SPECIFIED AND DIRECTED BY THE OWNER'S REPRESENTATIVE.
7. CONTRACTOR SHALL TAG ALL TREES TO BE REMOVED AND VERIFY WITH OWNER'S REPRESENTATIVE PRIOR TO THE START OF DEMOLITION.
8. FOR ALL SITE PREP AND DEMO WORK OUTSIDE TREE PROTECTION AREA, SEE CIVIL ENGINEER'S DRAWINGS.
9. NO STORAGE OF ANY TYPE OF MATERIAL, CHEMICAL OR EQUIPMENT SHALL BE ALLOWED IN THE PROTECTED FENCED IN AREA
10. BEFORE THE START OF ANY WORK ON THE SITE, PRECEDING THE ARRIVAL OF EQUIPMENT, MATERIALS OR VEHICLES TO THE SITE, AND PRIOR TO THE COMMENCEMENT OF ANY CLEARING ON THE SITE, THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION CONFERENCE ON THE SITE WITH THE OWNER'S REPRESENTATIVE AND THE LANDSCAPE ARCHITECT TO IDENTIFY TREES AND SHRUBS THAT ARE TO BE PROTECTED OR REMOVED. DO NO CLEARING WITHOUT A CLEAR UNDERSTANDING OF EXISTING CONDITIONS TO BE PRESERVED. REFER TO SPECIFICATION SECTION 01 56 39 FOR MORE INFORMATION.
11. REMOVE AND DISPOSE OF DEBRIS AS DIRECTED BY THE OWNER.
12. ALL EXCAVATION WITHIN THE TREE PROTECTION ZONE TO BE DONE BY HAND TO MINIMIZE DISTURBANCE TO ROOT ZONES.

TREE MITIGATION LEGEND

- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED
- TREE TO BE PROTECTED, TYP.
- PROPOSED TREE

EXISTING TREE SCHEDULE

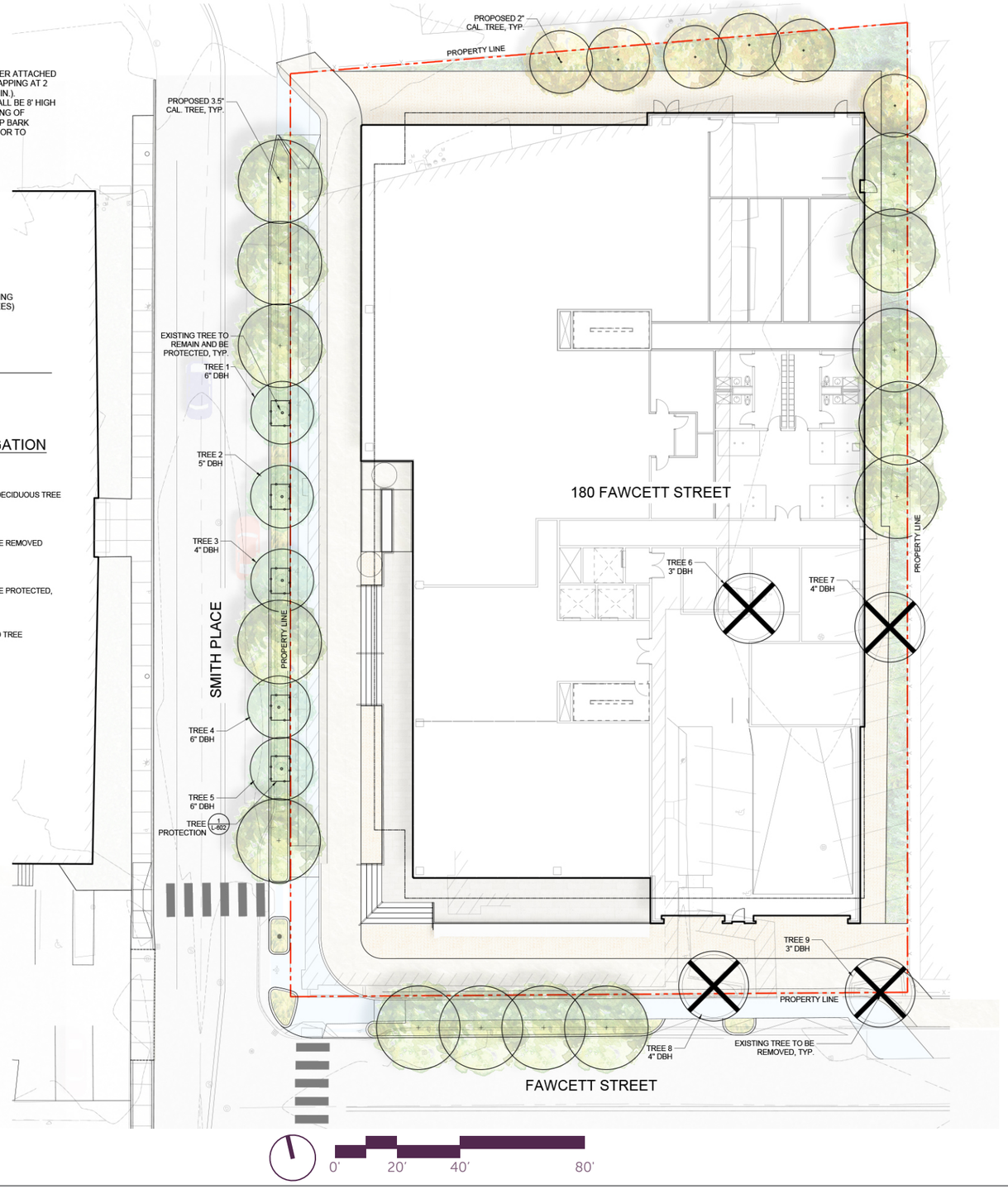
Reference	Species	DBH	CONDITION	STATUS
TREE 1	Zelkova serrata	6"	GOOD	PROTECT
TREE 2	Zelkova serrata	5"	GOOD	PROTECT
TREE 3	Zelkova serrata	4"	GOOD	PROTECT
TREE 4	Zelkova serrata	6"	GOOD	PROTECT
TREE 5	Zelkova serrata	6"	GOOD	PROTECT
TREE 6	Syringa reticulata	3"	POOR	REMOVE
TREE 7	Syringa reticulata	4"	FAIR	REMOVE
TREE 8	Prunus sp.	4"	FAIR	REMOVE
TREE 9	Prunus sp.	3"	FAIR	REMOVE

EXISTING TREE CALIPER TO BE REMOVED

Quantity of Trees	Size	Subtotal Caliper
2	3"	6"
2	4"	8"
Total Caliper: 14" inches of existing tree caliper removed		

PROPOSED TREE CALIPER

Quantity of Trees	Size	Subtotal Caliper
10	3.5" cal.	28"
6	2" cal.	16"
Total Caliper: 44 inches of tree caliper proposed		



LANDSCAPE TREE MITIGATION PLAN