NEEDHAM PLANNING BOARD
Tuesday, November 15, 2022
7:00 p.m.

Public Services Administration Building
Charles River Room, 500 Dedham Avenue
AND
Virtual Meeting using Zoom
Meeting ID: **880 4672 5264**
(Instructions for accessing below)

To view and participate in this virtual meeting on your phone, download the "Zoom Cloud Meetings" app in any app store or at www.zoom.us. At the above date and time, click on "Join a Meeting" and enter the following Meeting ID: 880 4672 5264

To view and participate in this virtual meeting on your computer, at the above date and time, go to www.zoom.us click "Join a Meeting" and enter the following ID: 880 4672 5264

Or to Listen by Telephone: Dial (for higher quality, dial a number based on your current location): US: +1 312 626 6799 or +1 646 558 8656 or +1 301 715 8592 or +1 346 248 7799 or +1 669 900 9128 or +1 253 215 8782 Then enter ID: 880 4672 5264

Direct Link to meeting: https://us02web.zoom.us/j/88046725264

1. Public Hearings:

   7:00 p.m. Major Project Site Plan Special Permit No. 2022-03: WELL Belfour Needham Landlord LLC, 4500 Dorr Street, Toledo, Ohio, 43615, Petitioner. (Property located at 100-110 West Street, Needham, MA). Regarding proposal to redevelop the property to include 155 units of senior housing, consisting of 127 Assisted Living apartments and 28 Alzheimer's/Memory Care units. *Please note: this hearing has been continued from the August 16, 2022, September 20, 2022 and October 18, 2022 meetings of the Planning Board. The Petitioner has requested that this hearing be further continued.*

   8:15 p.m. Major Project Site Plan Special Permit No. 2022-04: BTE Development, LLC, 13 Eaton Court, Wellesley, MA 02481, Petitioner. (Property located at 40 & 50 Central Avenue, Needham, MA, Needham, MA). Regarding proposal to demolish the two existing commercial buildings and construct a new mixed-use building with retail on the first floor and 15 total residential units on the second and third floors, with associated surface parking.

2. Decision: Amendment to Major Project Site Plan Special Permit No. 99-2: BP 140 Kendrick Street LLC c/o Boston Properties Limited Partnership, 800 Boylston Street, Suite 1900, Boston, MA, Petitioner. (Property located at 140 Kendrick Street, Needham, Massachusetts). Regarding proposal for solar array canopy.

3. Deliberation: Major Project Site Plan Special Permit No. 2022-02: 557 Highland, LLC, an affiliate of The Bulfinch Companies, Inc., 116 Huntington Avenue, Suite 600, Boston, MA, Petitioner. (Property located at 557 Highland Avenue, Needham, Massachusetts). Regarding proposal to redevelop the Property with approximately 496,694 square feet of office, laboratory and research and development uses. The proposal also includes construction of one-level of below grade parking under each building and a separate stand-alone parking garage, as well as approximately 10,000 square feet of retail and restaurant uses. See legal notice and application for more details).

4. Committee Appointment – Design Review Board.

5. Minutes.

6. Report from Planning Director and Board members.

7. Correspondence.

(Items for which a specific time has not been assigned may be taken out of order.)

FRIEZE CRAMER ROSEN & HUBER LLP
COUNSELLORS AT LAW

60 WALNUT STREET, WELLESLEY, MASSACHUSETTS 02481
781-943-4000 • FAX 781-943-4040

EVANS HUBER
781-943-4043
EH@128LAW.COM

November 4, 2022

Members of the
Needham Planning Board

And

Lee Newman
Director of Planning and Community Development
Public Services Administration Building
500 Dedham Ave
Needham, MA 02492

Re: 100 West Street, Needham

Dear Planning Board Members and Ms. Newman:

At its meeting on October 18, this Board granted the applicant's request for a continuance of the hearing on the application for a Special Permit for this location. As explained at the time, the applicant was seeking an extension in order to explore possible revisions or modifications to its currently proposed project, and needed additional time to do so.

Since (and, indeed, prior to) that time Welltower has been working continuously on potential changes to the project that might respond to the concerns raised by the Board and the public, including possible significant programmatic changes. Welltower's work has also been affected by uncertainty and volatility in the capital markets, as well as significant increases in construction and operational costs, making its financial analysis of potential changes to the currently proposed programs more challenging.

Accordingly, the applicant requests that the hearing on this matter be continued for 30 days. In making this request Welltower wishes to assure the Planning Board that it is actively working to come up with the best proposal it can for this property, taking into account the numerous zoning, financial, and operational considerations that must be balanced in order to present a viable project that will be acceptable to the Board.

Thank you for your cooperation and consideration of this request.

Sincerely,

Evans Huber

PLANNING & COMMUNITY DEVELOPMENT
PLANNING DIVISION

LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of M.G.L., Chapter 40A, S.11; the Needham Zoning By-Laws, Sections 7.4, 1.4.6, 3.2.3.2(g), 3.2.3.2(h), 3.2.3.2(j), 3.2.3.2(q), 4.4.12(a), 4.4.12(b), 5.1.1.5, 5.1.2 and 5.1.3, the Needham Planning Board will hold a public hearing on Tuesday, November 15, 2022 at 8:15 p.m. in the Charles River Room, Needham Public Services Administration Building, 500 Dedham Avenue, Needham, MA, as well as by Zoom Web ID Number 880 4672 5264 (further instructions for accessing by zoom are below), regarding the application of BTE Development, LLC, 13 Eaton Court, Wellesley, MA 02481, for a Major Project Special Permit under Site Plan Review, Section 7.4 of the Needham Zoning By-Law.

The subject property is located at 40 & 50 Central Avenue, Needham, MA, located in the Neighborhood Business Zoning District. The property is shown on Assessors Plan No. 80 as Parcels 9 and 10 containing a total of 32,058 square feet. The requested Major Project Site Plan Review Special Permit, would, if granted, permit the Petitioner to demolish the two existing commercial buildings and construct a new mixed-use building with retail on the first floor and 15 total residential units on the second and third floors, with associated surface parking, driveways and other site improvements, all as further described in the application materials.

In accordance with the Zoning By-Law, Section 7.4, a Site Plan Special Permit is required. In accordance with the Zoning By-Law, Section 1.4.6, a Special Permit is required, if applicable, for the change and extension of a lawful, pre-existing, non-conforming use, and the alteration, enlargement and reconstruction of a lawful, pre-existing, non-conforming structure. In accordance with the Zoning By-Law, Section 3.2.3.2(g) of the Zoning By-Law, a Special Permit is required for retail sales of ice cream, frozen yogurt and similar products for consumption on or off the premises, in a space less than two thousand (2,000) square feet (for Panella's Market). In accordance with the Zoning By-Law, Section 3.2.3.2(h) of the Zoning By-Law, a Special Permit is required for a take-out food counter as an accessory to a food retail or other non-consumptive retail establishment (for Panella's Market). In accordance with the Zoning By-Law, Section 3.2.3.2(j) of the Zoning By-Law, a Special Permit is required for more than one non-residential use on a lot where such uses are not detrimental to each other and are in compliance with all other requirements of this By-Law. In accordance with the Zoning By-Law, Section 3.2.3.2(q) of the Zoning By-Law, a Special Permit is required for apartment or multi-family dwelling use above the first floor where the first floor is used for a nonresidential use allowed in Section 3.2.3.1 or Section 3.2.3.2. In accordance with the Zoning By-Law, Section 4.4.12(a) of the Zoning By-Law, a Special Permit is required to increase the maximum floor area ratio to 0.7 and the building height to three (3) stories and forty (40) feet. In accordance with the Zoning By-Law, Section 4.4.12(b) of the Zoning By-Law, a Special Permit is required to reduce the minimum side setback adjoining a residential district to twenty (20) feet. In accordance with the Zoning By-Law, Sections 5.1.1.5, a Special Permit is required to waive strict adherence with the off-street parking requirements of Section 5.1.2 of the By-Law and the parking design requirements of Section 5.1.3 of the Zoning By-Law. In accordance with the Zoning By-Law, Section 7.4.4 of the Zoning By-Law, a waiver of strict compliance with the following requirements of Section 7.4.4, may be necessary: (1) Requirement of subparagraph (b) concerning location of structures within 100 feet

of property line; (2) Requirements of subparagraph (d) concerning cross and longitudinal views of the proposed structure(s) in relation to proposed site layout, together with an elevation line to show the relationship to the center of the street; and (3) Requirements of subparagraph (o) concerning projected traffic volume.

To view and participate in this virtual meeting on your phone, download the "Zoom Cloud Meetings" app in any app store or at www.zoom.us. At the above date and time, click on "Join a Meeting" and enter the following Meeting ID: 880 4672 5264

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Direct Link to meeting: https://us02web.zoom.us/j/88046725264

The application may be viewed at this link: https://www.needhamma.gov/Archive.aspx?AMID=146&Type=&ADID= . Interested persons are encouraged to attend the public hearing and make their views known to the Planning Board. This legal notice is also posted on the Massachusetts Newspaper Publishers Association's (MNPA) website at (http://masspublicnotices.org/).

NEEDHAM PLANNING BOARD

Needham Hometown Weekly, October 27, 2022 and November 3, 2022.

TOWN OF NEEDHAM
MASSACHUSETTS

2022 SEP 22 PM 4:50

Room 20, Town Hall
Needham, MA 02492
781-455-7526

PLANNING BOARD

APPLICATION FOR SITE PLAN REVIEW

Project Determination: (circle one) Major Project Minor Project

This application must be completed, signed, and submitted with the filing fee by the applicant or his representative in accordance with the Planning Board's Rules as adopted under its jurisdiction as a Special Permit Granting Authority. Section 7.4 of the By-Laws.

Location of Property 40 & 50 Central Avenue, Needham, MA 02494,
Name of Applicant BTE Development, LLC
Applicant's Address 13 Eaton Court, Wellesley, MA 02481
Phone Number 781-589-8239 - Paul Bevilacqua, Manager

Applicant is: Owner _____ Tenant _____
Agent/Attorney _____ Purchaser X

Property Owner's Name Michael J. Panella 1992 Trust & VP Realty Trust
Property Owner's Address C/O George R. Jabour, Esq., 30 Eastbrook Rd, Suite 201, Dedham, MA 02026
Telephone Number 781-467-0044

Characteristics of Property: Lot Area 32,058 SF Present Use Mixed Use: Office & Retail w/ accessory take-out
Map # 80 Parcel # 9 & 10 Zoning District Neighborhood Business (NBD)

Description of Project for Site Plan Review under Section 7.4 of the Zoning By-Law:

Demolition of two existing commercial buildings and construction of a new mixed use building with retail on the first floor and 15 total residential units on the second and third floor, with associated surface parking, driveways and other site improvements; as described at Addendum A attached hereto and shown on the plans sbumitted herewith, all of which are hereby incorporated herein.

Signature of Applicant (or representative) _____
Address if not applicant George Giunta, Jr., Esq., 281 Chestnut Street, Needam, MA 02492
Telephone # 781-449-4520
Owner's permission if other than applicant See Authorization Provided Herewith

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SUMMARY OF PLANNING BOARD ACTION

Received by Planning Board _____ Date 9/22/22
Hearing Date _____ Parties of Interest Notified of Public Hearing _____
Decision Required by _____ Decision/Notices of Decision sent _____
Granted _____
Denied _____ Fee Paid _____ Fee Waived _____
Withdrawn _____
NOTE: Reports on Minor Projects must be issues within 35 days of filing date.

ADDENDUM A
TO
APPLICATION FOR SITE PLAN REVIEW
OF
BTE Development, LLC
40 & 50 Central Avenue
Needham, Massachusetts

The following relief is or may be required, and is hereby requested:

1. Pursuant to the criteria of Section 7.4.2 of the By-Law, the proposed redevelopment of the Premises constitutes a "major project" and therefore requires Major Project Site Plan Review and the issuance of a special permit pursuant thereto.

2. In addition, the following relief is, or may be required:

a. Issuance of a Special Permit pursuant to Section 1.4.6 for the change and extension of a lawful, pre-existing, non-conforming use, and the alteration, enlargement and reconstruction of a lawful, pre-existing, non-conforming structure;

b. Issuance of a Special Permit pursuant to Section 3.2.3.2(g) for retail sales of ice cream, frozen yogurt and similar products for consumption on or off the premises, in a space less than two thousand (2,000) square feet (for Panella's Market);

c. Issuance of a Special Permit pursuant to Section 3.2.3.2(h) for a take-out food counter as an accessory to a food retail or other non-consumptive retail establishment (for Panella's Market);

d. Issuance of a Special Permit pursuant to Section 3.2.3.2(j) for more than one non-residential use on a lot where such uses are not detrimental to each other and are in compliance with all other requirements of this By-Law;

e. Issuance of a Special Permit pursuant to Section 3.2.3.2(q) for apartment or multi-family dwelling use above the first floor where the first floor is used for a nonresidential use allowed in Section 3.2.3.1 or Section 3.2.3.2;

f. Issuance of a Special Permit pursuant to Section 4.4.12(a) to increase the maximum floor area ratio to 0.7 and the building height to three (3) stories and forty (40) feet;

g. Issuance of a Special Permit pursuant to Section 4.4.12(b) to reduce the minimum side setback adjoining a residential district to twenty (20) feet;

h. Issuance of a Special Permit pursuant to Section 5.1.1.5 waving strict adherence with the off-street parking requirements of Section 5.1.2 of the By-Law and the parking design requirements of Section 5.1.3 of the Zoning By-law;

i. Waiver of strict compliance with the following requirements of Section 7.4.4, to the extent necessary and applicable:

1. Requirement of subparagraph (b) concerning location of structures within 100 feet of property line;
2. Requirements of subparagraph (d) concerning cross and longitudinal views of the proposed structure(s) in relation to proposed site layout, together with an elevation line to show the relationship to the center of the street; and
3. Requirements of subparagraph (o) concerning projected traffic volume; and

j. Any and all additional relief required or appropriate for the redevelopment of the Premises for mixed use purposes in a new building, with retail on the first floor and residential above.

3. The Applicant requests that any and all relief granted by the Board in connection with the within application shall run with the land and that the movement, change and alteration of interior layout, including, without limitation, walls and interior fixtures, furniture and the like, not require any further review, provided the total useable square footage of the building and of the commercial space, the total parking demand and the total number of residential units remain fixed and unchanged.

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2022 NOV 15 PM 2:38

September , 2022

Town of Needham
Planning Board
Needham, Massachusetts 02492

Attn: Lee Newman, Planning Director

Re: BTE Development, LLC
Application for Major Project Site Plan Review
40 & 50 Central Avenue

Dear Mrs. Newman,

Please accept this letter as confirmation that the Michael J. Panella 1992 Trust and the VP Realty Trust, current owners of the properties known and numbered 40 & 50 Central Avenue, Needham, MA, have authorized BTE Development, LLC, prospective purchaser, through their attorney George Giunta, Jr., Esquire, to make application to the Planning Board for major project site plan review and for all special permits and other zoning relief that may be required or appropriate in connection with the redevelopment of the aforesaid properties for multi-use development, in a new 3 story building, with commercial uses on the first floor and residential units above. In connection therewith, Attorney Giunta is specifically authorized to execute, sign, deliver and receive all necessary documentation related thereto, including, without limitation, Application for Site Plan Review.

Sincerely,

Daryl Panella

Jeanne Bolio -(9/17/2022)

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2022 NOV 15 PM 2:38

September 21ST, 2022

Town of Needham
Planning Board
Needham, Massachusetts 02492

Attn: Lee Newman, Planning Director

Re: BTE Development, LLC
Application for Major Project Site Plan Review
40 & 50 Central Avenue

Dear Mrs. Newman,

Please accept this letter as confirmation that the Michael J. Panella 1992 Trust and the VP Realty Trust, current owners of the properties known and numbered 40 & 50 Central Avenue, Needham, MA, have authorized BTE Development, LLC, prospective purchaser, through their attorney George Giunta, Jr., Esquire, to make application to the Planning Board for major project site plan review and for all special permits and other zoning relief that may be required or appropriate in connection with the redevelopment of the aforesaid properties for multi-use development, in a new 3 story building, with commercial uses on the first floor and residential units above. In connection therewith, Attorney Giunta is specifically authorized to execute, sign, deliver and receive all necessary documentation related thereto, including, without limitation, Application for Site Plan Review.

Sincerely,

MICHAEL J. PANELLA 1992 TRUST

Michael E. Panella

BY: **Michael E. Panella, as Trustee only and not Individually**

David Panella

BY: **David Panella, as Trustee only and not Individually**

Brian Panella

BY: **Brian Panella, as Trustee only and not Individually**

GEORGE GIUNTA, JR.
ATTORNEY AT LAW*
281 Chestnut Street
Needham, MASSACHUSETTS 02492
*Also admitted in Maryland
TELEPHONE (781) 449-4520 FAX (781) 465-6059

September 19, 2022

Planning Department
Town of Needham
Public Services Administration Building
500 Dedham Avenue
Needham, MA 02492

Re: Application for Zoning Relief
BTE Development, LLC
40 & 50 Central Avenue, Needham, MA

Dear Lee,

Please be advised that I represent BTE Development, LLC (hereinafter, the "Applicant") relative to the adjacent properties known and numbered 40 & 50 Central Avenue (together, the "Premises"). In connection therewith, submitted herewith, in electronic and hard copy format please find the following:

1. Complete Site Plan Review Application with Addendum;

2. Authorization letter;

3. Architectural Plan Set titled "Central Ave Development", prepared by MGD+ LLC, 411 Lexington St., Newton, MA 02466, consisting of five sheets as follows: Sheet 1, SP.00, Cover Page, dated September 18, 2022, Sheet 2, SP.01, Architectural Site Plan, dated September 18, 2022, Sheet 3, SP.02, Floor Plans, dated September 18, 2022, Sheet 4, SP.03, Elevations, dated September 18, 2022, Sheet 5, SP.04, and 3D Views dated September 18, 2022;

4. Site Plan Set, prepared by Verne T. Porter, Jr., PLS, Land Surveyors – Civil Engineers, 354 Eliot Street, Newton, MA 02464, consisting of three sheets as follows: Sheet 1, Existing Conditions Site Plan, dated September 12, 2022, Sheet 2, Proposed Parking and Building Location, dated September 12, 2022, and Sheet 3, Proposed Conditions Site Plan dated Setpember 12, 2022;

5. Drainage Summary, Proposed Mixed-Use Building, 40-50 Central Ave, Needham, Massachusetts, dated September 12, 2020; and

6. Check no. 19062 in the amount of $2,007.20 for the applicable filing fee.

The Premises consists of two parcels of land identified as Parcel 9 and Parcel 10 on Town of Needham Assessor's Map No. 80. It is located within the Neighborhood Business District (the "NBD") and contains approximately 32,058 square feet of area, with approximately 139.98 feet of frontage on Central Avenue and approximately 196.78 of frontage on Reservoir Avenue. The Premises is currently fully developed, with one parcel occupied by a one-story commercial building and the other being occupied by a two-story commercial building, as well as associated parking and driveway areas. The one-story building at 40 Central Avenue is currently vacant, and the two-story building at 50 Central Avenue is currently occupied by Panella's Market on the first floor and office space on the second floor.

The Applicant desires to demolish both existing buildings and replace them with a single, new building, to be used for mixed use purposes. The new building will be three stories high and contain approximately 20,072 square feet of space, with retail on the first floor, and 15 residential units on the second and third floors. It is currently contemplated that one of the retail bays on the first floor will be occupied by Panella's Market and that three of the residential units will be affordable, as defined by the Zoning By-Law. The entire site will be redeveloped and in addition to the new building, landscaping and other site improvements will also be installed, as shown on the plans submitted herewith.

Analysis

I. Use

Whereas the existing buildings are proposed to be demolished, no comment or analysis is made relative to the use thereof. With respect to the proposed new building, same is to be used for mixed purposes, including retail and residential, with one of the retail spaces intended for use by the current tenant, Panella's Market. Pursuant to Section 3.2.3.1 of the Zoning By-Law, certain retail uses are allowed by right in the NBD, specifically including a retail shop for the sale of convenience goods and a grocery store. In addition, pursuant to Section 3.2.3.2, retail sales of ice cream, frozen yogurt and similar products for consumption on or off the premises, a take-out food counter as an accessory to a food retail or other non-consumptive retail establishment, and more than one non-residential use on a lot are all allowable by special permit.

Finally, pursuant to Section 3.2.3.2, apartment or multi-family dwelling use above the first floor is allowable by special permit, provided the first floor is used for a nonresidential use allowed in Section 3.2.3.1 or Section 3.2.3.2 and further provided that the proposed apartment or multi-family dwelling complies with the lot area per unit requirements for apartments in the A-1 district as detailed in Section 4.3, and as affected by the provisions of Section 6.12(b).[1] Therefore, provided the Board approves the requested special permits, the proposed use of the Premises for mixed purposes, including retail and residential will comply with the By-Law.

[1] The lot area per unit requirement for apartments in the A-1 district set forth in Section 4.3 is 18 units per acre. Whereas the Premises consists of 32,058 square feet, that equates to a maximum total of 13.25 units. However, Section 6.12(b) provides that "the minimum lot area per dwelling unit normally required in the A-1 zoning district (as applicable to the Neighborhood Business District), shall be reduced by that amount necessary to permit up to two additional units (one affordable unit and one market unit) on the lot over the number required in section 6.12(a) above. As a result, the maximum allowable number of units is 15, being 13 + 2.

II. Dimensional and Density Requirements

A. Lot Area and Frontage

As indicated above, the Premises contains approximately 32,058 square feet of area, with approximately 139.98 feet of frontage on Central Avenue and approximately 196.78 of frontage on Reservoir Avenue. Pursuant to Section 4.4.1 of the By-Law, lots in the NBD are currently required to contain a minimum of 10,000 square feet of area and to have a minimum of 80 feet of frontage. Therefore, the Premises exceeds both the minimum frontage and the minimum area requirements.

B. Building Related Dimensional and Density Requirements

Pursuant to Section 4.4.2(d) of the By-Law, the maximum floor area ratio ("FAR") applicable to the Premises is 0.5. However, pursuant to Section 4.4.12(a), the Planning Board may issue a special permit for mixed use buildings allowed by special permit under Subsection 3.2.3.2 (q) in the Neighborhood Business District to increase the FAR to .7. The FAR for the new building is .63.[2] Therefore, provided the requested special permit is granted, the proposed new building will comply with the applicable FAR requirement.

Pursuant to Section 4.4.3 of the By-Law, the maximum height allowed as of right in the NBD is two and one-half (2 ½) stories, not to exceed thirty-five feet. However, pursuant to Section 4.4.12(a), the Planning Board may issue a special permit for mixed use buildings allowed by special permit under Subsection 3.2.3.2 (q) in the Neighborhood Business District to increase the maximum height to three stories and 40 feet. The proposed building is three stories and 39 feet high to the top of the elevator penthouse. As a result, provided the requested special permit issues, the building will comply with the height limitations of the By-Law.

As applied to the Premises, Section 4.4.4 of the By-Law requires a front yard setback of 20 feet. Whereas the proposed new building is set back 22.5 feet from Central Avenue at its closest point, it complies with such requirement.

Pursuant to Section 4.4.5 of the By-Law, no more than two driveways are allowed for every 150 feet of frontage, and two-way driveways of the kind proposed for the Premises must be no less than 18 feet wide and no more than 25 feet wide. Whereas only two, two-way driveways are proposed, and whereas each driveway opening is 20 feet wide, same will comply with the applicable driveway opening conditions of Section 4.4.5.

Pursuant to Section 4.4.8.4 of the By-Law,

> no building or structure for a use not allowed in a residential district shall be placed within fifty (50) feet of a residential district boundary, and the ten feet closest to such boundary shall be suitable landscaped as specified at Section 4.4.8.5. The remainder of the setback may be used for an accessory use not including a building or structure.

[2] The FAR of .63 does not include the open area, used for driveway and surface parking, located adjacent to the first floor and underneath the second floor. If such space were included, the FAR would increase to .69, and would still comply, provided the requested special permit issues.

However, pursuant to Section 4.4.12(b), the Planning Board may issue a special permit for mixed use buildings allowed by special permit under Subsection 3.2.3.2 (q) in the Neighborhood Business District to reduce the minimum side and/or rear setback adjoining a residential district to twenty (20) feet provided said strip is suitably landscaped in accordance with the specifications in Section 4.4.8.5.

The proposed side yard setback adjoining the Single Residential B District to the northeast is 27.2 feet, and the setback area is proposed to be landscaped as required. Therefore, provided the requested special permit is granted, the building will comply with the applicable side-yard setback requirement.

Pursuant to Section 4.4.9 of the By-Law, first-floor commercial spaces are required to have individual entrances accessed from the exterior of the building. In addition, building entrances providing access to first and second-floor space must be available from one or more streets on which the building fronts and the primary building entrance must be from Central Avenue or Reservoir Street. Whereas the three commercial bays all have separate entrances on either Central Avenue or Reservoir Street, and whereas the main entrance to the residential space on the second and third floors is on Central Avenue, the requirements of Section 4.4.9 are met.

II. Parking

A. Demand

Total parking demand for the Premises, as redeveloped and used for retail purposes on the first floor and 15 residential units on the second and third floor (with two, one bedroom affordable units) is 31 spaces, calculated as follows:

13 Residential Units @ 1.5 spaces / unit = 19.5 spaces = 20 spaces required
2 1-bedroom affordable unit @ 1 space / unit[3] = 2 spaces required
2,542 SF Retail @ 1 space / 300 SF = 8.47 spaces = 9 spaces required
20 + 2 + 9 = 31 total spaces required

The foregoing is for the base building, and does not take into account the anticipated use of one of the retail spaces by the Panella's Market. When such use is taken into account, the overall parking demand increases to 41 total spaces, calculated as follows:

13 Residential Units @ 1.5 spaces / unit = 19.5 spaces = 20 spaces required
2 1-bedroom affordable unit @ 1 space / unit[3] = 2 spaces required
2,542 SF Retail @ 1 space / 300 SF = 8.47 spaces = 9 spaces required
1 Take-Out Station @ 10 spaces = 10 spaces required
20 + 2 + 9 +10 = 41 total spaces required

There are a total of 28 parking spaces provided on site. In addition, six new on-street parking spaces, immediately adjacent to the Premises, are being proposed. However, pursuant to the By-Law, on-street may not be included in the parking calculation to determine compliance.

[3] See Section 6.12(h) of the By-Law, which provides that: "For affordable units with not more than one bedroom, the minimum number of parking spaces under Section 5.1 shall be reduced to one space per unit".

As a result, under both the base condition and with the Panella's market taken into account, there is a shortfall of parking spaces, and a parking waiver is required. The waiver for the base condition is three spaces (31 required – 28 provided = 3), and taking the Panella's Market use into account, the waiver is 13 spaces (41 required – 28 provided).

The Applicant asserts that, in this instance, the requested waiver is appropriate. Under the base condition, the waiver is only for three spaces, and the Applicant is proposing to add six on-street spaces; double the shortfall. So, while the on-street spaces may not be included in the compliance calculation, they will provide sufficient parking under the base condition.

Moreover, the additional parking demand for the Panella's Market use is solely due to the By-Law requirement of ten parking spaces for a take-out station. As the Board has recognized in connection with prior projects involving a take-out station, this requirement is arbitrary, and is not necessarily reflective of real world conditions. Moreover, the take-out station parking requirement is applied in addition to the parking requirement for the area of the space, essentially imposing a double parking requirement.

Finally, 22 of the required spaces are associated with the proposed residential use. While it is true that some workers have continued to work from home as the Covid-19 pandemic has eased, many have returned to their workplace. Moreover, over time, it is expected that an increasing number of people will shift back to the workplace. As a result, it is anticipated that at least several, if not most of the spaces required by the residential component will be vacant during the morning and mid-day periods when Panella's Market is expected to experience its peak demand.

B. Design

In addition to a waiver for the number of require spaces, limited parking design waivers are required as well, as follows:

> A. Parking Lot Illumination – The By-Law requires that all parking areas shall provide an illumination level of an average of one foot candle. The illumination proposed for the Premises is limited to modest lights, primarily or exclusively mounted on the building, which are expected to produce an illumination level of less than one foot candle in portions of the parking area.
>
> B. Parking Setbacks – As applicable to the Premises, the By-Law requires that parking spaces and maneuvering aisles shall be setback a minimum of twenty (20) feet from a front lot line or street right-of-way line. The first couple of parking spaces adjacent to the driveway off Reservoir Avenue, in the southwest corner of the parking lot, are less than 20 feet from Reservoir Street.

III. Site Plan Analysis

(a) Protection of adjoining premises against seriously detrimental uses by provision for surface water drainage, sound and sight buffers and preservation of views, light, and air.

The Applicant asserts that the mixed use of the Premises for retail and residential purposes, as proposed, does not constitute a "seriously detrimental use" within the terms of the By-Law. Furthermore, the side of the Premises adjacent to the residential district will be landscaped with over 20 feet of landscaping. And considering that the Premises is bounded on the other side by a fully developed commercial property, the Applicant asserts that no additional sound and sight buffers are required, and that views, light and air are not materially affected.

(b) Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets, the location of driveway openings in relation to traffic or to adjacent streets and, when necessary, compliance with other regulations for the handicapped, minors and the elderly.

The Applicant is of the opinion that it has provided for safe and convenient vehicular and pedestrian movement within the site and on adjacent streets. The driveways serving the parking area are of adequate width and in appropriate locations, and the building is accessed by a walkway.

(c) Adequacy of the arrangement of parking and loading spaces in relation to the proposed uses of the premises.

Parking is arranged around the building and is readily accessible. The proposed mixed retail and residential use of the building is not expected to require any special or dedicated loading spaces. Therefore, based on the proposed use, the Applicant is of the opinion that the arrangement of parking and loading spaces is adequate.

(d) Adequacy of the methods of disposal of refuse and other wastes resulting from the uses permitted on the site.

The proposed mixed use of the Premises is not anticipated to generate any significant wastes or trash. Nevertheless, it will be a requirement for the occupants of the building that all trash, waste and debris be removed on a regular basis, as necessary and appropriate. Furthermore, an area, in the southeast corner of the parking area has been designated for a trash area and will be suitably enclosed. Therefore, the Applicant asserts that the methods of waste disposal are adequate for the Premises and its proposed use.

(e) Relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area and compliance with other requirements of the By-Law.

There is no significant natural landscape to speak of in the vicinity of the Premises. The property is bounded on one side by an existing residential dwelling and on the other side by a fully developed commercial property. As a result, the proposed redevelopment of the Premises for mixed use is not anticipated to have any significant negative effect on any community assets or any adjacent landscape, buildings and structures.

(f) Mitigation of adverse impacts on the Town's resources including the effect on the Town's water supply and distribution system, sewer collection and treatment, fire protection, and streets.

No significant impact to the Town's resources is proposed or anticipated. The use of the Premises for retail and residential purposes is consistent with both other current uses in the NBD and the uses allowed pursuant to the By-Law. As a result, the proposed redevelopment of the Premises and use thereof for mixed purposes is not anticipated to substantially or materially increase or alter the need for any Town resources

Conclusion

Based on all the foregoing, the Applicant asserts that the proposed redevelopment of the Premises, and use thereof for mixed, commercial and residential purposes, as set forth above and in the materials submitted herewith, is both proper and appropriate. The proposed use of the Premises is allowed by right, in part, and allowable by special permit, in part. Provided the requested special permits are granted, the proposed new building will comply with all applicable density and dimensional requirements, and, while parking waivers are required, same are appropriate considering the proposed redevelopment and use of the Premises, and the surrounding area and abutting properties.

Please schedule this matter for the next available hearing of the Board. In the meantime, if you have any questions, comments or concerns relative to the foregoing, please do not hesitate to contact me so that I may be of assistance.

Your courtesy and attention are appreciated.

Sincerely,

George Giunta, Jr.

September , 2022

Town of Needham
Planning Board
Needham, Massachusetts 02492

Attn: Lee Newman, Planning Director

Re: BTE Development, LLC
Application for Major Project Site Plan Review
40 & 50 Central Avenue

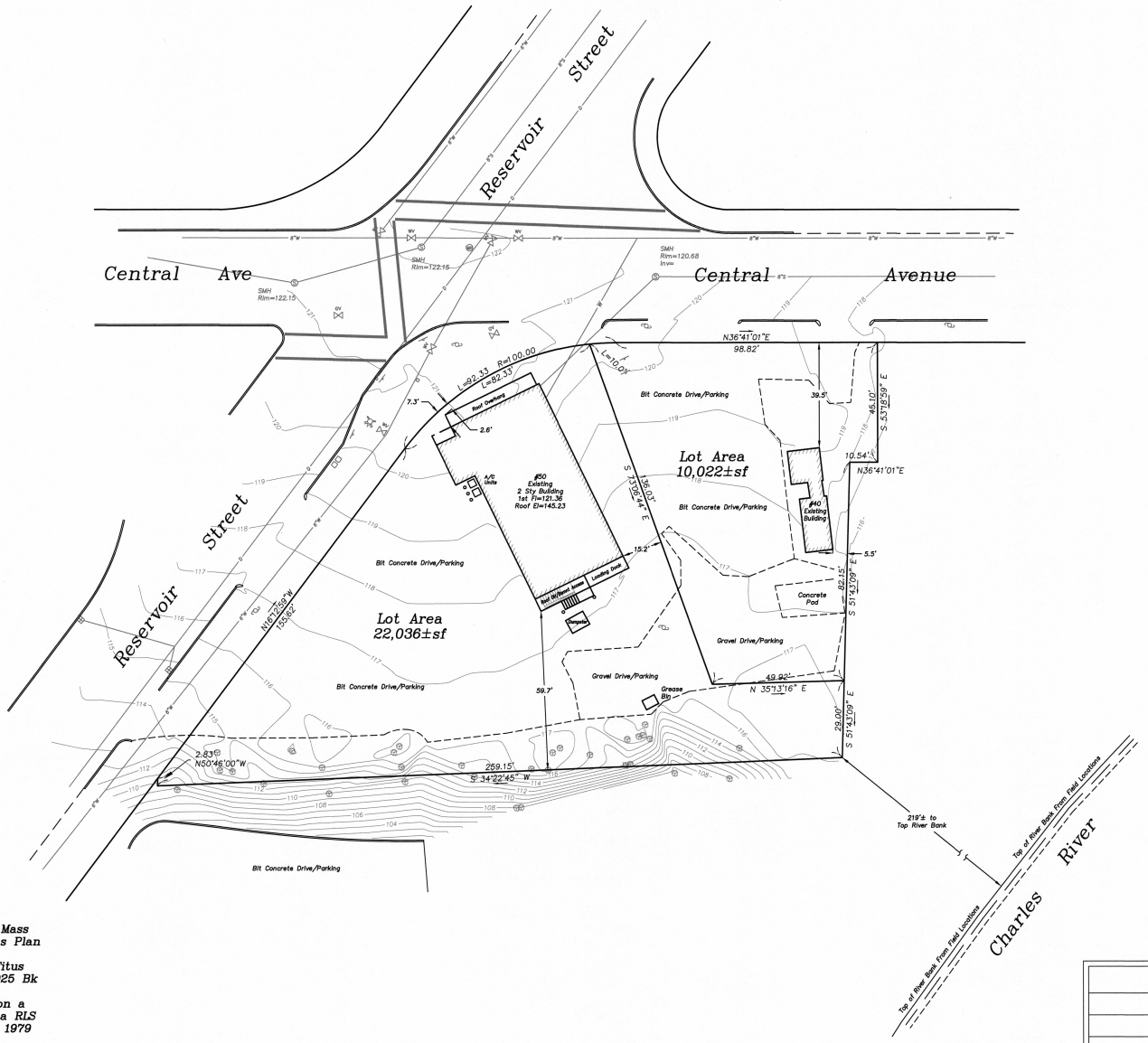
Dear Mrs. Newman,

Please accept this letter as confirmation that the Michael J. Panella 1992 Trust and the VP Realty Trust, current owners of the properties known and numbered 40 & 50 Central Avenue, Needham, MA, have authorized BTE Development, LLC, prospective purchaser, through their attorney George Giunta, Jr., Esquire, to make application to the Planning Board for major project site plan review and for all special permits and other zoning relief that may be required or appropriate in connection with the redevelopment of the aforesaid properties for multi-use development, in a new 3 story building, with commercial uses on the first floor and residential units above. In connection therewith, Attorney Giunta is specifically authorized to execute, sign, deliver and receive all necessary documentation related thereto, including, without limitation, Application for Site Plan Review.

Sincerely,

Deanne Bolio -(9/17/2022)

Dig Safe
•Excavators
Before you dig contact the Dig Safe Center. To prevent damage to telephone, gas or electric underground facilities of member utilities, call toll free
Massachusetts state law requires notification at least three business days before you start digging operations. In an emergency, call immediately.



Applicant:
Bevilacqua Builders
13 Eaton Court
Wellesley, MA 02481
Owners:
Michael J Panella 1992 Trust
and the VP Realty Trust
Title Reference:
Bk 10567 Pg 675 and Bk 11216 Page 659
Parcels I and II

Plan References:
Parcel I is shown on a Plan of Land in Needham Mass by UM Schiavone dated March 26, 1949 recorded as Plan No 541 of 1950 Bk 2913 Pg 350
Parcel II is shown on a Plan of Land by John E Titus dated June 23, 1925 reorded as Plan No 772 of 1925 Bk 1659 Pg 306
Parcel I and II are also shown as Lots 9 and 10 on a Plan of Land in Needham Mass by George N Giunta RLS dated March 24, 1979 recorded as Plan No 222 of 1979 Bk 5584 Pg 357

Zoning District:
Neighborhood Business

Note: Existing zoning district information is based on information obtained from the Town of Needham on-line data base and property deeds and plans obtained from Norfolk County Registry of Deeds. Final zoning district and requiremnts to be determined by the Town of Needham Buildinig Department.

Existing utilities shown are from field locations and available plans of record and may or may not be correct. Contact Dig Safe and field verify all locations prior to any excavation.

REVISIONS	
DATE	DESCRIPTION

40 & 50 Central Avenue

Needham, Massachusetts

Existing Conditions Site Plan

Scale: 1"=20' September 12, 2022

VERNE T. PORTER Jr., PLS
Land Surveyors – Civil Engineers
354 Elliot Street Newton, Massachusetts 02464

0 20 40 60 80

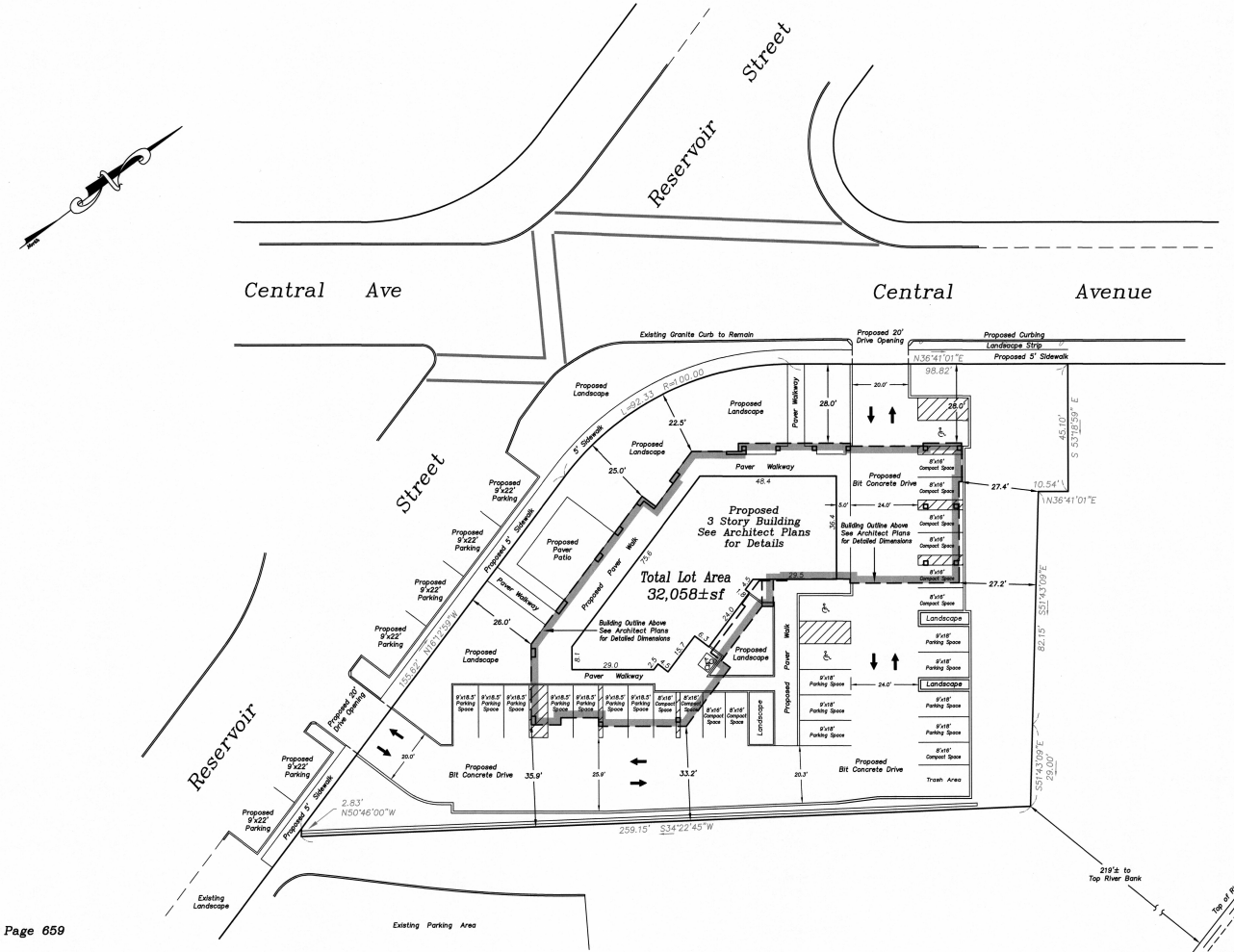
Sheet 1 of 3

Project: 21037

Checked By: V. Porter Jr.

Drawn By: R. Jardine Jr.

Dig Safe
•Excavators
Before you dig contact the Dig Safe Center. To prevent damage to telephone, gas or electric underground facilities of member utilities, call toll free
Massachusetts state law requires notification at least three business days before you start digging operations. In an emergency, call immediately.



Zoning	Required/Allowed	Existing	Proposed
Lot Area	10,000 sf	32,058 sf	32,058 sf
Frontage	80'	139.98 (Central) 196.78 (Reservoir)	139.98 (Central) 196.78 (Reservoir)
Front Setback	20'	2.6'	22.5'
Side Setback	50'/20'[1]	5.5'	27.2'
Rear Setback	N/A	59.7'	33.2'
Height–Stories	2.5/3[2]	2	3
Height–Feet	35'/40'[3]	27.23'	39.0'
F.A.R.	.5/.7/[4]	.26	.63[6]
Max Units	13/15[5]	N/A	15

Notes:
1. Setback of 20' allowable by special permit– Section 4.4.12(b).
2. Maximum height of 3 stories allowable by special permit– Sections 4.4.12(a).
3. Maximum height of 40' allowable by special permit– Section 4.4.12(a).
4. Maximum FAR of .7 allowable by special permit– Section 4.4.12(a).
5. 15 Maximum units allowable pursuant to Section 6.12(b).
6. FAR of .63 does not include the surface parking area adjacent to the first floor and located underneath the second floor of the building. If such area were included, FAR would be .69.

Parking Analysis
Base Building: 31 Total Spaces Required

14 Residential Units @ 1.5 spaces/unit=21 spaces required
1 1–bedroom affordable unit @ 1 space/unit*=1 space required
21+1+9=31 total spaces required

With Panella's Market: 41 Total Spaces Required

14 Residential Units @ 1.5 spaces/unit=21 spaces required
1 1–bedroom affordable unit @ 1 space/unit*=1 space required
2,542 SF Retail @ 1 space/300 SF=8.47 spaces=9 spaces required
1 Take–Out Station @ 10 spaces=10 spaces required
21+1+9+10=41 total spaces required

*See By–Law Section 6.12(b)

28 On Site Spaces Provided
Additional 6 On Street Spaces Proposed

Applicant:
Bevilacqua Builders
13 Eaton Court
Wellesley, MA 02481
Owners:
Michael J Panella 1992 Trust
and the VP Realty Trust
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Bk 10567 Pg 675 and Bk 11216 Page 659
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REVISIONS	
DATE	DESCRIPTION

VERNE T. PORTER JR. LAND SURVEYOR 37767 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

40 & 50 Central Avenue

Needham, Massachusetts

Proposed Parking and Building Location

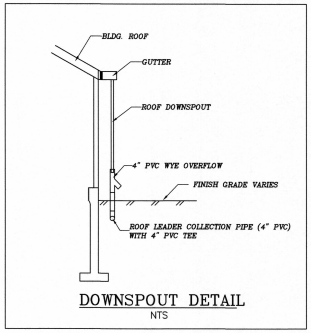
Scale: 1"=20' September 12, 2022

VERNE T. PORTER Jr., PLS
Land Surveyors – Civil Engineers
354 Elliot Street Newton, Massachusetts 02464

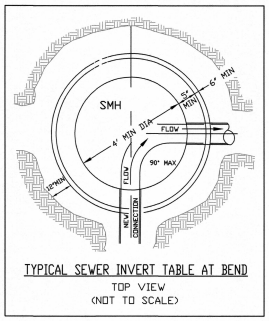
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Sheet 2 of 3

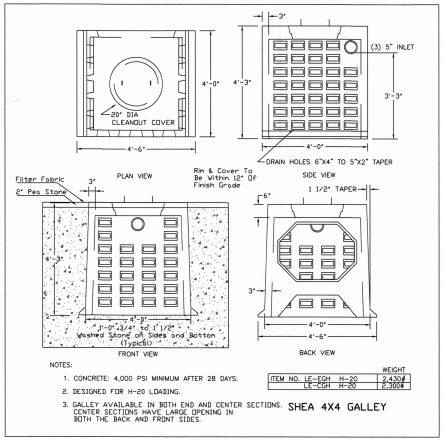
Project: 21037
Checked By: V. Porter Jr.
Drawn By: R. Jardine Jr.



DOWNSPOUT DETAIL
NTS



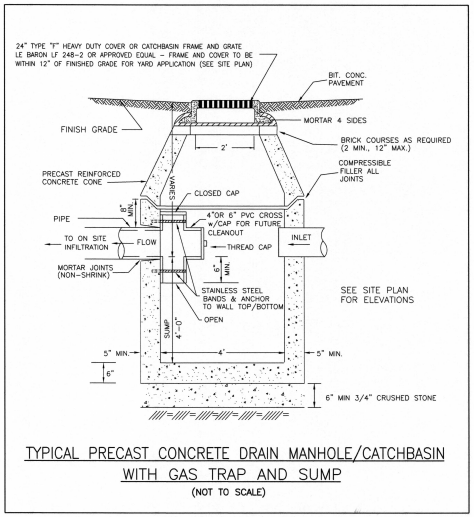
TYPICAL SEWER INVERT TABLE AT BEND
TOP VIEW
(NOT TO SCALE)



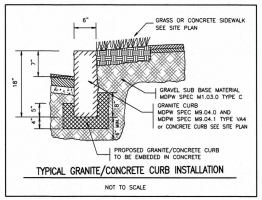
NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR H-20 LOADING.
3. GALLEY AVAILABLE IN BOTH END AND CENTER SECTIONS. CENTER SECTIONS HAVE LARGE OPENING IN BOTH THE BACK AND FRONT SIDES

ITEM NO.	LE-EGH	H-20	WEIGHT 2,430#
	LE-CGH	H-20	2,300#

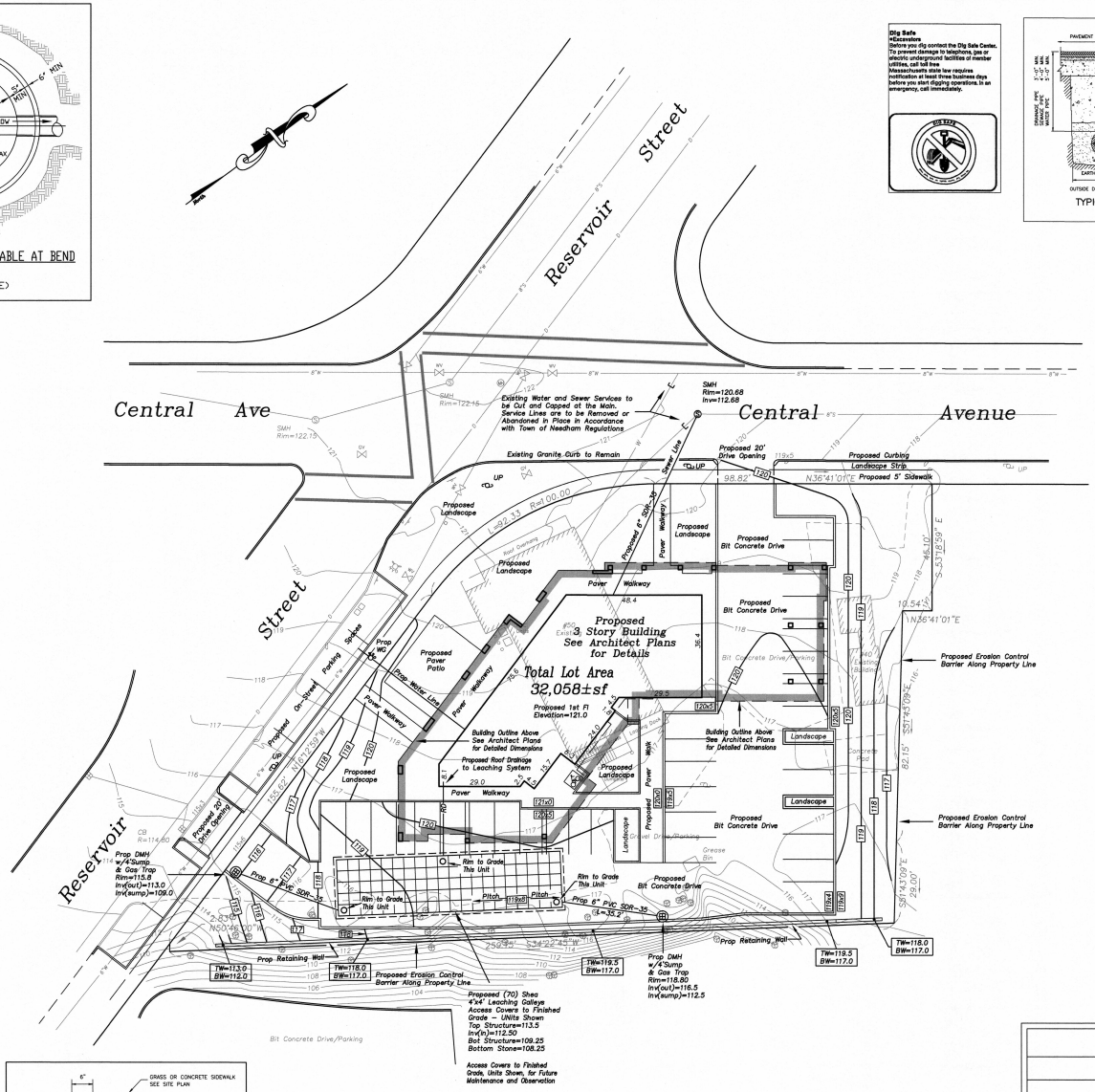
SHEA 4X4 GALLEY

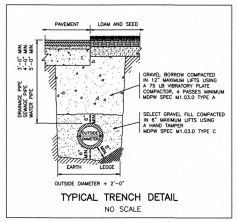


TYPICAL PRECAST CONCRETE DRAIN MANHOLE/CATCHBASIN WITH GAS TRAP AND SUMP
(NOT TO SCALE)

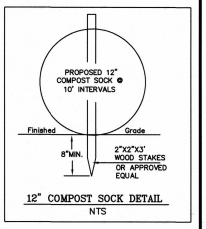


TYPICAL GRANITE/CONCRETE CURB INSTALLATION
NOT TO SCALE





TYPICAL TRENCH DETAIL
NO SCALE



12" COMPOST SOCK DETAIL
NTS

Notes:
1. *The utilities shown are from field locations and available plans of utility companies and may or may not be correct. Contractor is to contact Dig Safe, all local utility companies and field verify all locations as required prior to any excavation.*

2. *All work shall be done in accordance with Town of Needham Specifications and shall be subject to inspection and approval by the Town of Needham Engineering Department.*

3. *An erosion control barrier shall be in place around the exiting property prior to any demolition/construction and all materials must be contained on site.*

4. *The existing water and sewer services shall be cut and capped at the main. Service lines are to be removed or abandoned in place in accordance with Town of Needham regulations.*

5. *The contractor shall be responsible for all proposed grading as shown on plan. Any variations to proposed grading shown and/or any changes to proposed structure may result in non compliance with zoning regulations.*

6. *All roof drains are to be connected to proposed drainage system as shown on plan. Drainage design and accompanying drainage calculations meet the minimum requirements for drainage per Town of Needham Engineering Department.*

7. *Soil conditions are to be determined at the time of excavation. Proposed drainage design and calculations may need to be revised based on soil testing results.*

Impervious Surfaces	
EXISTING	
Buildings	3635 sf
Bit Conc Drive	17653 sf
Conc Pad	307 sf
Gravel Drive	3559 sf
PROPOSED	
Building	8930 sf
Drive	10048 sf
Walks/Patios	1574 sf

REVISIONS	
DATE	DESCRIPTION

COMMONWEALTH OF MASSACHUSETTS VERNE T. PORTER JR. LAND SURVEYOR 37726 REGISTERED LAND SURVEYOR

COMMONWEALTH OF MASSACHUSETTS PAUL J. TYBUREL CIVIL No. 40970 REGISTERED PROFESSIONAL ENGINEER

40 & 50 Central Avenue

Needham, Massachusetts

Proposed Conditions Site Plan

Scale: 1"=20' September 12, 2022

VERNE T. PORTER Jr., PLS
Land Surveyors – Civil Engineers
354 Elliot Street Newton, Massachusetts 02464

0 20 40 60 80

Sheet 3 of 3

Project: 21037
Checked By: V. Porter Jr.
Drawn By: R. Jardine Jr.

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

SPECIAL PERMIT SET

PROJECT DIRECTORY

APPLICANT:
BTE DEVELOPMENT, LLC
13 EATON COURT
WELLESLEY - MA 02481

OWNER:
MICHAEL J. PANELLA 1992 TRUST &
THE VP REALTY TRUST
TITLE REFERENCES: 10567/675 & 11216/659

PROFESSIONAL DESIGNER:
MGD+ LLC
411 LEXINGTON ST
NEWTON - MA 02466

ARCHITECT:
RON JAREK
487 WATERTOWN ST
NEWTONVILLE, MA 02460



SHEET LIST

SHEET NUMBER	SHEET NAME
SP.00	COVER PAGE
SP.01	ARCHITECTURAL SITE PLAN
SP.02	FLOOR PLANS
SP.03	ELEVATIONS
SP.04	3D VIEWS

Area Schedule (FAR)

LEVEL	AREA (SF)	NOTES:
Area		
01 - First Floor	3696 SF	
02 - Second Floor	8597 SF	
03 - Third Floor	7779 SF	
TOTAL FLOOR AREA (FAR)	20072 SF	
LOT AREA = 32,058 SF	***FAR = 0.63[1]***	

1. FAR OF .63 DOES NOT INCLUDE THE SURFACE PARKING AREA ADJACENT TO THE FIRST FLOOR AND LOCATED UNDERNEATH THE SECOND FLOOR OF THE BUILDING. IF SUCH AREA WERE INCLUDED, FAR WOULD BE .69.

UNIT AREAS

Name	AREA (SF)	NOTES:
01 - First Floor		
COMMERCIAL UNIT #1	742 SF	
COMMERCIAL UNIT #2	708 SF	
COMMERCIAL UNIT #3	682 SF	
02 - Second Floor		
UNIT #1	1018 SF	2 Bedroom
UNIT #2	705 SF	1 Bedroom
UNIT #3	874 SF	2 Bedroom
UNIT #4	993 SF	2 Bedroom
UNIT #5	750 SF	1 Bedroom
UNIT #6	937 SF	2 Bedroom
UNIT #7	701 SF	1 Bedroom
UNIT #8	701 SF	1 Bedroom / AFFORDABLE UNIT
03 - Third Floor		
UNIT #9	1062 SF	2 Bedroom
UNIT #10	819 SF	2 Bedroom / AFFORDABLE UNIT
UNIT #11	995 SF	2 Bedroom
UNIT #12	736 SF	1 Bedroom
UNIT #13	935 SF	2 Bedroom
UNIT #14	707 SF	1 Bedroom
UNIT #15	701 SF	1 Bedroom / AFFORDABLE UNIT

*(** AFFORDABLE UNITS HIGHLIGHTED IN YELLOW **)*

TOTAL AFFORDABLE UNITS = 3
(2) ONE BEDROOM UNIT & (1) TWO BEDROOM UNIT

12.5% OF 13 UNITS = 1.625 (2 REQUIRED)
13 + 2 + 1* = 15 UNITS & 3 AFFORDABLE

a. (SECTION 6.12(b) INCREASE BY 2 UNITS - ONE OF WHICH IS AFFORDABLE)

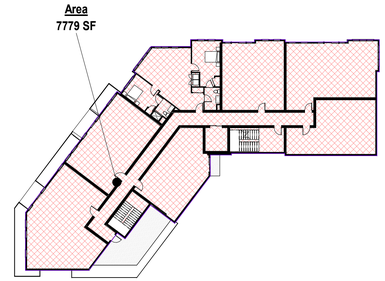
AREA LEGEND

- RESIDENTIAL ONE (1) BEDROOM UNIT
- RESIDENTIAL TWO (2) BEDROOM UNIT
- COMMERCIAL UNIT
- COMMON SPACE (COMMON)
- RESIDENTIAL LOBBY (COMMON)
- AFFORDABLE UNIT

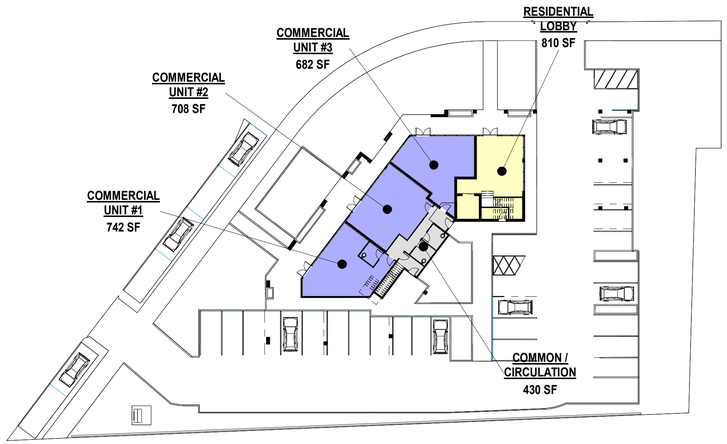


3 First Floor - FAR Calculation
1" = 30'-0"

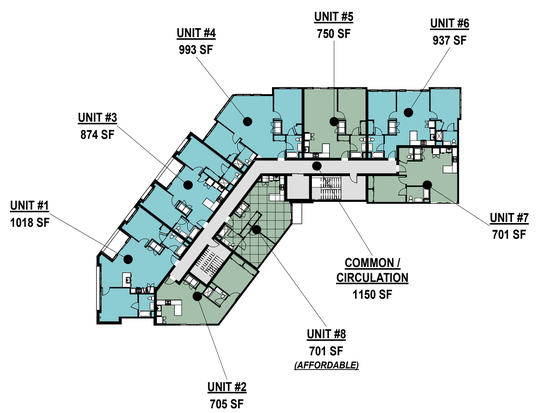
4 Second Floor - FAR Calculation
1" = 30'-0"



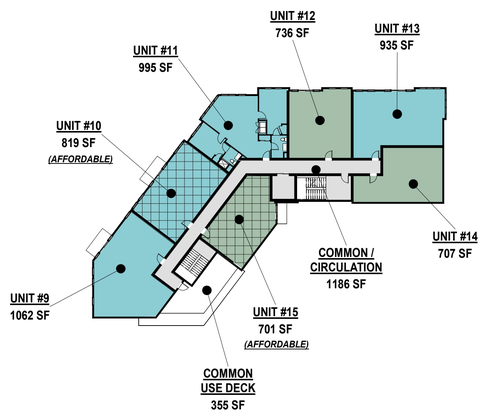
5 Third Floor - FAR Calculation
1" = 30'-0"



7 First Floor - Units
1" = 30'-0"



2 Second Floor - Units
1" = 30'-0"



6 Third Floor - Units
1" = 30'-0"

MGD
HABITAT DESIGN

411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP

SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

COVER PAGE

Project number	22-007
Date	9/18/22
Drawn by	TCO
Checked by	MGD

SP.00

Scale 1" = 30'-0"



1 01 - Architectural Site Plan
3/32" = 1'-0"

PARKING ANALYSIS:

BASE BUILDING: **31 TOTAL SPACES REQUIRED**

13 RESIDENTIAL UNITS @ 1.5 SPACES / UNIT = 20 SPACES REQUIRED

2 1-BEDROOM AFFORDABLE UNIT @ 1 SPACE / UNIT* = 2 SPACE REQUIRED

2,542 SF RETAIL @ 1 SPACE / 300 SF = 8.47 SPACES = 9 SPACES REQUIRED

20 + 2 + 9 = 31 TOTAL SPACES REQUIRED

WITH PANELLA'S MARKET: **41 TOTAL SPACES REQUIRED**

13 RESIDENTIAL UNITS @ 1.5 SPACES / UNIT = 20 SPACES REQUIRED

1 1-BEDROOM AFFORDABLE UNIT @ 1 SPACE / UNIT* = 2 SPACE REQUIRED

2,542 SF RETAIL @ 1 SPACE / 300 SF = 8.47 SPACES = 9 SPACES REQUIRED

1 TAKE-OUT STATION @ 10 SPACES = 10 SPACES REQUIRED

20 + 2 + 9 +10 = 41 TOTAL SPACES REQUIRED

*SEE BY-LAW SECTION 6.12(H)

28 ON SITE SPACES PROVIDED
11 COMPACT; 14 FULL SIZE ; 3 ADA

ADDITIONAL 6 ON STREET SPACES PROPOSED (PARALLEL)

PARKING NOTES:
1. 50% COMPACT PARKING CAN BE USED (8' x 16') - 5.1.3(e)
2. 20 FT DRIVE LANE REQUIRED FOR 2 WAY TRAFFIC 5.1.3 (i)

Parking Schedule		
Parking Type	Type	Qty
01 - First Floor		
Parking Space	8' x 16' - 90 deg - Compact	11
Parking Space - ADA	9' x 18' (8' Aisle)	3
Parking Space	9' x 18.5' - 90 deg	14
Parking Space	9' x 22' - Parallel	6

*(**NOTE - 6 SPACES ALONG PUBLIC WAY)*

34

MGD
HABITAT DESIGN

411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP

SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

ARCHITECTURAL SITE PLAN

Project number	22-007
Date	9/18/22
Drawn by	TCO
Checked by	MGD

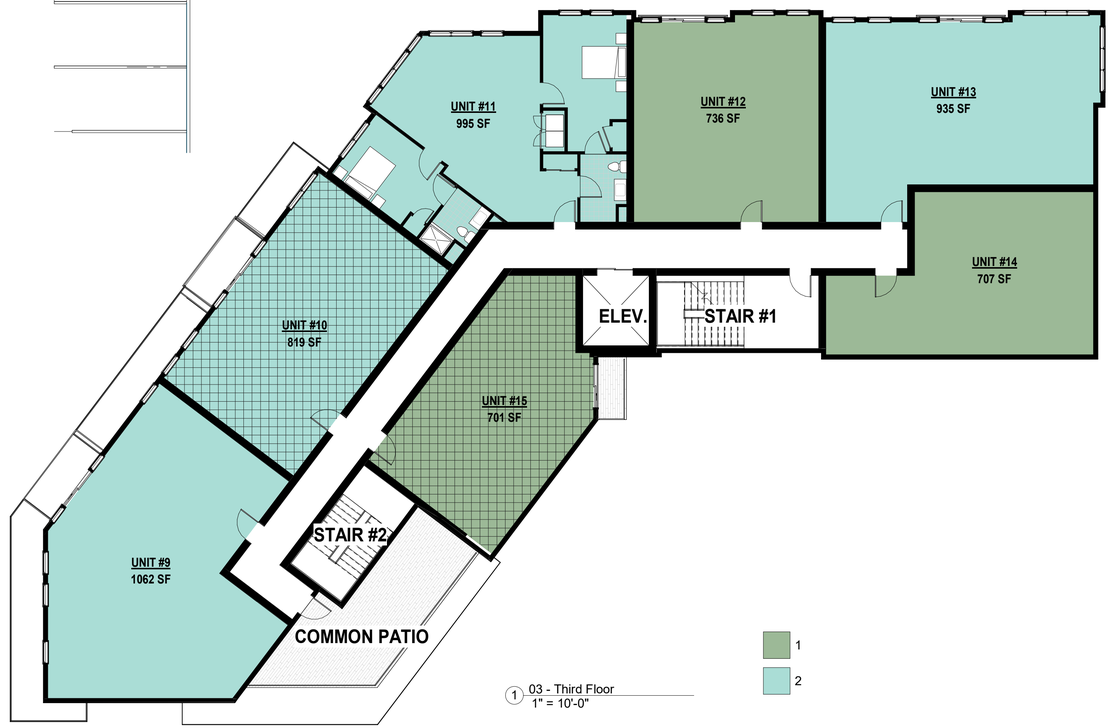
SP.01

Scale 3/32" = 1'-0"



2 02 - Second Floor
1" = 10'-0"

1
2



1 03 - Third Floor
1" = 10'-0"

1
2

UNIT AREAS

Name	AREA (SF)	NOTES:
01 - First Floor		
COMMERCIAL UNIT #1	742 SF	
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UNIT #15	701 SF	1 Bedroom / AFFORDABLE UNIT

MGD
HABITAT DESIGN

411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP

SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

FLOOR PLANS

Project number	22-007
Date	9/18/22
Drawn by	TCO
Checked by	MGD

SP.02

Scale 1" = 10'-0"



2 Central Avenue Elevation
1/8" = 1'-0"



1 Reservoir Street Elevation
1/8" = 1'-0"

MGD
HABITAT DESIGN

411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP

SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

ELEVATIONS

Project number	22-007
Date	9/18/22
Drawn by	TCO
Checked by	MGD

SP.03

Scale 1/8" = 1'-0"



2 Intersection View



3 Reservoir Street View



1 Central Ave Driveway View

MGD
HABITAT DESIGN

411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP

SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

3D VIEWS

Project number	22-007
Date	9/18/22
Drawn by	TCO
Checked by	MGD

SP.04

Scale

DRAINAGE SUMMARY

PROPOSED MIXED-USE BUILDING
40-50 CENTRAL AVE
NEEDHAM, MASSACHUSETTS



September 12, 2020

VERNE T. PORTER JR., PLS
LAND SURVEYORS – CIVIL ENGINEERS
354 ELLIOT STREET
NEWTON, MA 02464

DRAINAGE SUMMARY
PROPOSED MIXED-USE BUILDING
40-50 CENTRAL AVE
NEEDHAM, MASSACHUSETTS

The proposed project consists of the demolition of an existing two-story commercial building and the construction of a new mixed-use building, which includes commercial space on the lower level and apartments on the upper floors. In addition, the project includes, including new bituminous concrete parking areas and drainage improvements, on two lots located at 40 & 50 Central Ave in Needham, MA, under the requirements of the City of Needham Stormwater By-Law.

The on-site soils in the area are shown as "104D – Hollis-rock outcrop-Charlton complex, 15 to 35 percent slopes" soils on the NRCS Soils Survey map of the area, which are areas that fall within the Hydrological Soil Groups A & D, as well as "602-Urban Land, 0 to 15 percent slopes" which are areas that have not soil group designation. For purposes of our design, we made a conservative assumption and assumed a D soil with an infiltration rate of 0.09 in/hr.

Ground cover on the site is an existing building and a mix of gravel and bituminous concrete parking/driveway areas. The existing drainage on the site flows overland from Central Ave, towards the rear of the property. Overall, the site will maintain the current flow pattern, however new collection systems for the proposed mixed-us building and proposed parking areas have been provided to collect the runoff and attenuate offsite flows.

The Charles Rive is located east of the subject parcel, however the site is more than 200-ft from the top of bank. There are no other wetlands Resource Areas within 100-feet of the lot. The proposed drainage controls are designed to capture & contain the runoff from the proposed building and proposed site improvements. This system will store the runoff from the addition and allow the stored water to slowly infiltrate after the storm event and overflow offsite.

Under the proposed conditions, with the new building and new driveway, the rate of site runoff from the re-developed lot area will be greater than the existing conditions for the 2, 10, 25 & 100-year storm events. The proposed controls have been designed to store this increase to maintain the pre and post runoff rates.

COMPLIANCE WITH STORMWATER STANDARDS

Untreated Stormwater (Standard 1)

The project is designed so that new stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, existing wetlands.

Post-Development Peak Rates (Standard 2)

A hydrologic study was performed to determine the rate of runoff for the 2, 10, 25 and 100-year storm events under pre-development (existing) conditions. Unmitigated post-development rates were then computed in a similar manner. The study point where the peak rates were compared were taken at one (1) location at the existing offsite flow area. From these analyses, it was determined that the proposed project and its stormwater management system would not increase the peak runoff rates above existing levels. It is the intent of the stormwater management system to minimize impacts to drainage patterns, and downstream property prior to its release from the site or discharge to wetlands.

The *United States Department of Agriculture (U.S.D.A)*. Soil Conservation Service (SCS) Technical Release 55 (TR-55), 1986, was used as the procedure for estimating runoff. A SCS TR-20-based computer program was used for estimating peak discharges. TR-55 is a generally accepted model for use on small sites that begin with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). CN is based on soils, plant cover, impervious areas, interception, and surface storage. Runoff is then transformed into a hydrograph that depends on runoff travel time through segments of the watershed.

Development in a watershed changes the watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which can result in significantly higher peak rates of runoff. The volume of runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, antecedent rainfall, type of vegetal cover, impervious surfaces, and surface retention. Travel time is determined primarily by slope, flow length, depth of flow, and roughness of flow surfaces. Peak rates of discharge are based on the relationship of the above parameters, as well as the total drainage area of the watershed, the location of the development in relation to the total drainage area, and the effect of any flood control works or other manmade storage. Peak rates of discharge are also influenced by the distribution of rainfall within a given storm event.

Stormwater management computations for the full-build were performed using a SCS-based *HYDROCAD* for existing and proposed conditions, curve numbers, time of concentrations and unit hydrograph computations.

Existing Conditions

Table 1. Shows the curve numbers, areas and times of concentration used to develop the pre-development hydrologic model of the site.

Table 1. – Existing Conditions					
Sub-Areas	**Surface Cover**	**Curve Number (CN)**	**Area (SF)**	**Tc (Mins.)**	**Remarks**
Area #1				6.0	
	Exist Bldgs.	98	3,635		
	Exist. Bit.	98	17,653		
	Exist. Gravel	98	3,559		
	Exist. Conc. Pad	98	307		
	Lawn Areas	84	6,904		
		Total Area	32,058		
*CN based on Class D soils.					

Proposed Conditions

The proposed conditions will result in a new collection system that will collect the site run-off from the proposed building and proposed parking areas and direct it to underground leaching systems prior to overflowing off-site.

Table 2. Shows the curve numbers, areas and times of concentration used to develop the post-development hydrologic model of the site.

Table 2. – Proposed Conditions					
Sub-Areas	**Surface Cover**	**Curve Number (CN)**	**Area (SF)**	**Tc (Mins.)**	**Remarks**
Area #1				6.0	
	Lawn Area	84	11,506		
	Proposed Patio	98	1,574		Incls. Walks
Area #2				6.0	
	Prop. Building	98	8,930		
	Prop. Bit. Conc.	98	10,048		
		Total Area	32,058		
*CN based on Class D soils.					

Peak Rate Summary

Table 3. Shows the peak runoff for the existing, as well as for the developed site at 100-year design storms.

Areas	Design Storm	Existing Runoff* (CFS)	Existing Volume* (Ac-Ft)	Proposed Runoff* (CFS)	Proposed Volume* (Ac-Ft)
Offsite Flow					
	2-yr.	2.12	0.163	0.58	0.045
	10-yr.	3.32	0.262	1.03	0.081
	25-yr.	4.25	0.341	1.38	0.135
	100-yr.	6.15	0.502	2.29	0.291

Recharge to Groundwater (Standard 3)

The change in groundcover for the new development will change by increasing the impervious areas by approximately 4,602 sf. Groundwater infiltration will be achieved through the individual underground storage areas.

Required Recharge Volume for the entire site was calculated in accordance with the Massachusetts Stormwater Management Standards:

Rv = F * impervious area (in acres)
Rv = (0.10/12) * 0.471 = 0.004 Ac-ft. = 171.27 CF

Rv = Required Recharge Volume;
F = Target Depth Factor (0.10 in. for soils of Hydrologic Soil Group D);
Impervious area = building, pavement on site in post development condition (0.471 Ac).

The proposed onsite leaching systems will store and infiltrate over 171.27 cf in just the 2-year storm event.

In addition to MA Stormwater Standards for recharge, the Town of Needham has a requirement of 1" of the total proposed impervious area to be recharged.

The total SF of the impervious area in the proposed development is 20,552 sf (including the unit pavers). This results in 1,712.67 cf of runoff. The proposed leaching gallies provide 7,013 cf of available storage.

Removal of TSS (Standard 4)

To handle the TSS removal of the proposed parking areas, a 4' deep sump has been provided in the proposed catchbasins..

Land Uses with Higher Potential Pollutant Loads (Standard 5)

The use proposed does not differ from the current use of the space and has no higher potential for pollution.

Critical Areas (Standard 6 – Water Quality Treatments)

This site does not lie within a critical area. One-half inch (1/2") of runoff is the standard for treatment relative to water quality, but as stated prior, the proposed use will not create pollutants in excess of what exists today.

Redevelopment (Standard 7)

Redevelopment projects are those that involve development, rehabilitation or expansion on previously developed sites provided the redevelopment results in no net increase in impervious area. Furthermore, components of redevelopment project, which include development of previously undeveloped sites, do not fall under Standard 7. In addition, redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

The project, as proposed, is mixed-use building on an existing developed site, with a reduction in impervious areas. VTP has considered this project a re-development and we have met all the applicable standards of the Massachusetts Stormwater Policy to the maximum extent possible.

Erosion and Sedimentation Controls (Standard 8)

Erosion Control measures have been provided on the plans that accompany this application.

Operation and Maintenance Plan (Standard 9)

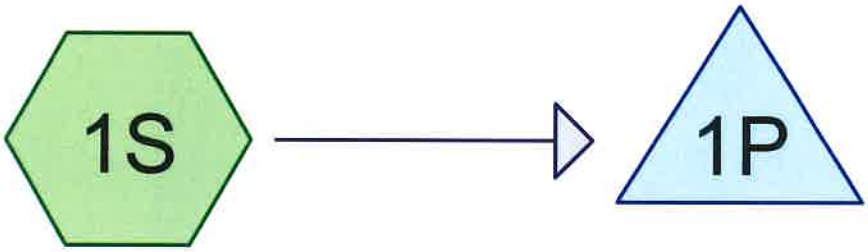
An Operation and Maintenance (O&M) Plan is provided as part of the application.

Prohibition of Illicit Discharges

The Owner and User of the facility, assures that there will not be illicit discharges to the nearby wetlands from the proposed facility.

Floodplain (310 CMR 10.57)

The project site does not fall with a floodplain district.



40-50 Central Ave

Offsite

Subcat Reach Pond Link

Routing Diagram for Central Ave - Pre Development
Prepared by HP, Printed 9/12/2022
HydroCAD® 10.00-24 s/n 08768 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.158	84	50-75% Grass cover, Fair, HSG D (1S)
0.082	98	Exist. Gravel Drive (1S)
0.405	98	Existing Bit. Conc. (1S)
0.083	98	Existing Buildings (1S)
0.007	98	Existing Conc. Pad (1S)
0.736	**95**	**TOTAL AREA**

Summary for Subcatchment 1S: 40-50 Central Ave

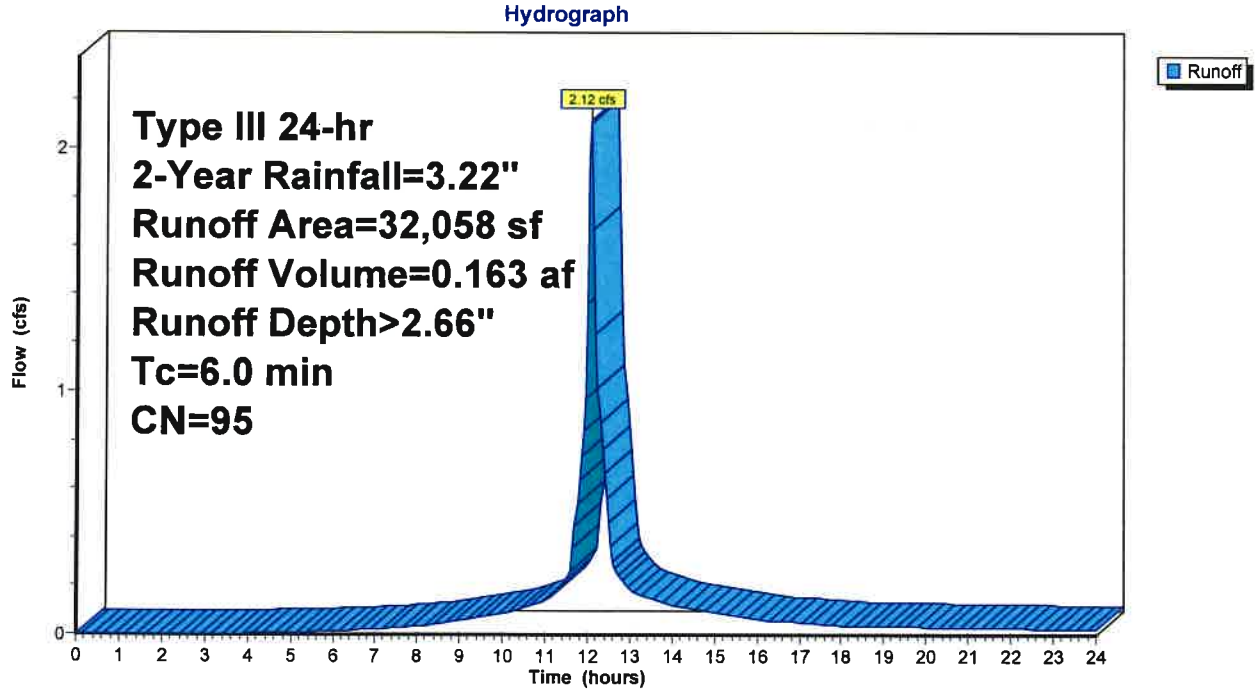
Runoff = 2.12 cfs @ 12.09 hrs, Volume= 0.163 af, Depth> 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

	Area (sf)	CN	Description
*	3,635	98	Existing Buildings
*	3,559	98	Exist. Gravel Drive
*	17,653	98	Existing Bit. Conc.
*	307	98	Existing Conc. Pad
	6,904	84	50-75% Grass cover, Fair, HSG D
	32,058	95	Weighted Average
	6,904		21.54% Pervious Area
	25,154		78.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: 40-50 Central Ave

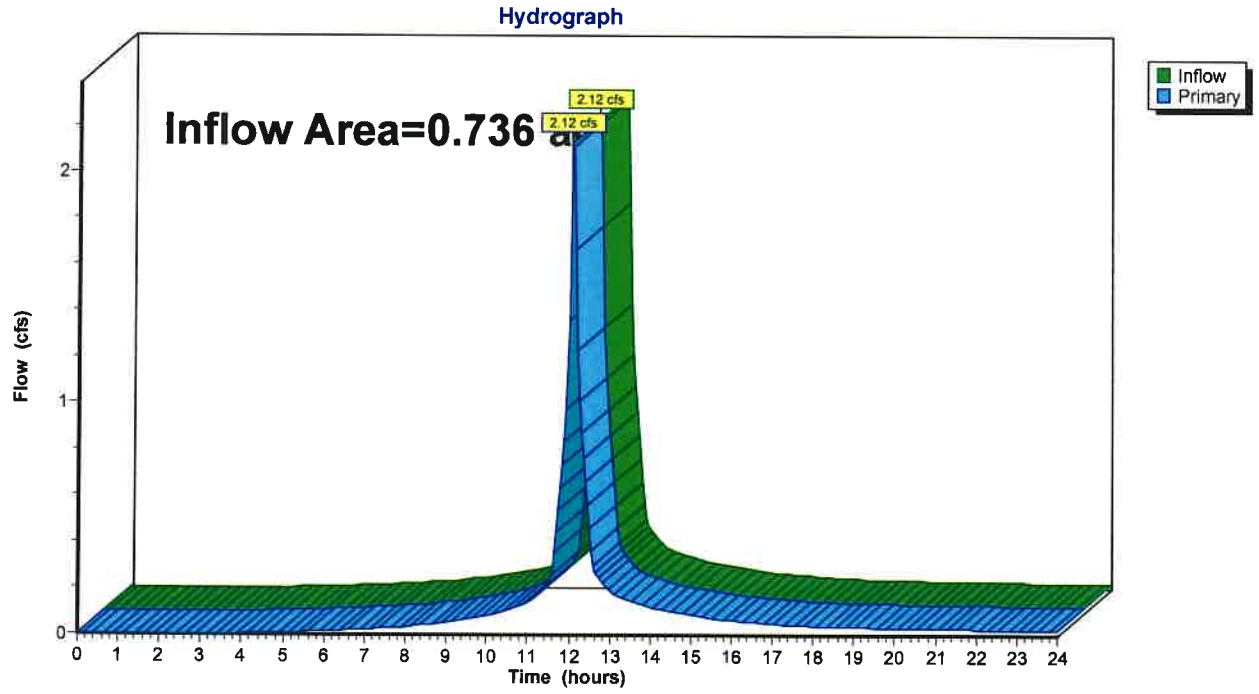


Summary for Pond 1P: Offsite

Inflow Area = 0.736 ac, 78.46% Impervious, Inflow Depth > 2.66" for 2-Year event
Inflow = 2.12 cfs @ 12.09 hrs, Volume= 0.163 af
Primary = 2.12 cfs @ 12.09 hrs, Volume= 0.163 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Subcatchment 1S: 40-50 Central Ave

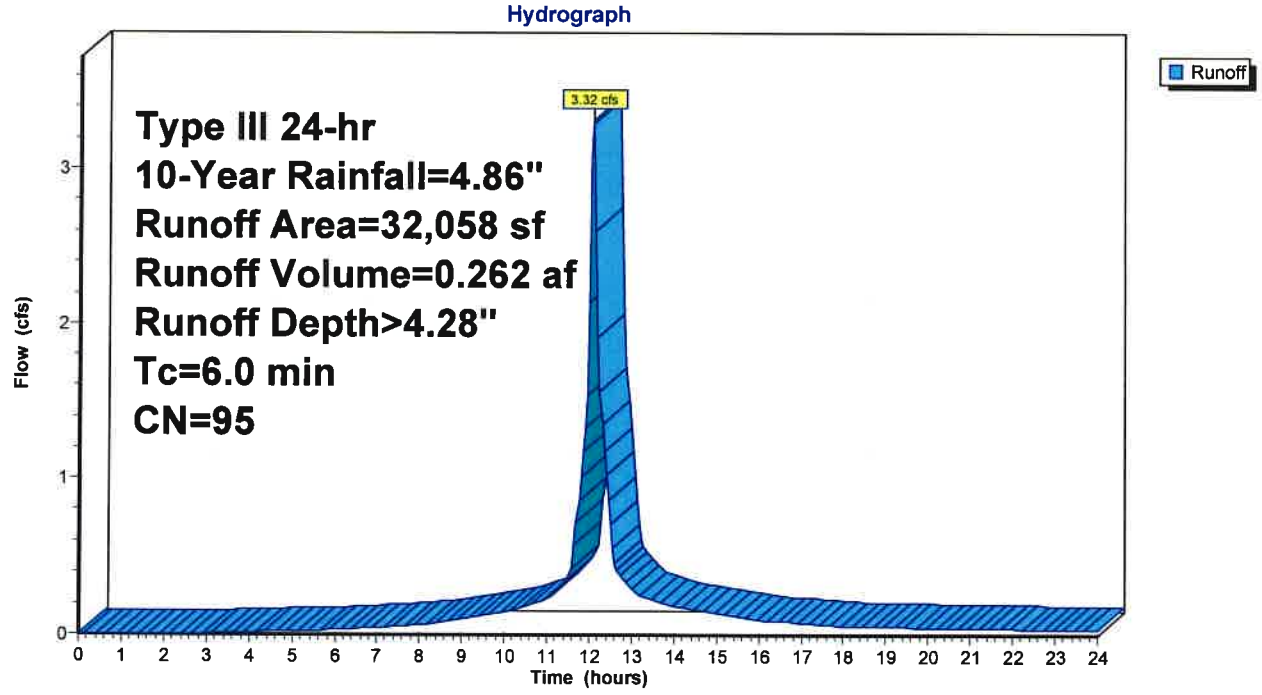
Runoff = 3.32 cfs @ 12.09 hrs, Volume= 0.262 af, Depth> 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
*	3,635	98	Existing Buildings
*	3,559	98	Exist. Gravel Drive
*	17,653	98	Existing Bit. Conc.
*	307	98	Existing Conc. Pad
	6,904	84	50-75% Grass cover, Fair, HSG D
	32,058	95	Weighted Average
	6,904		21.54% Pervious Area
	25,154		78.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: 40-50 Central Ave

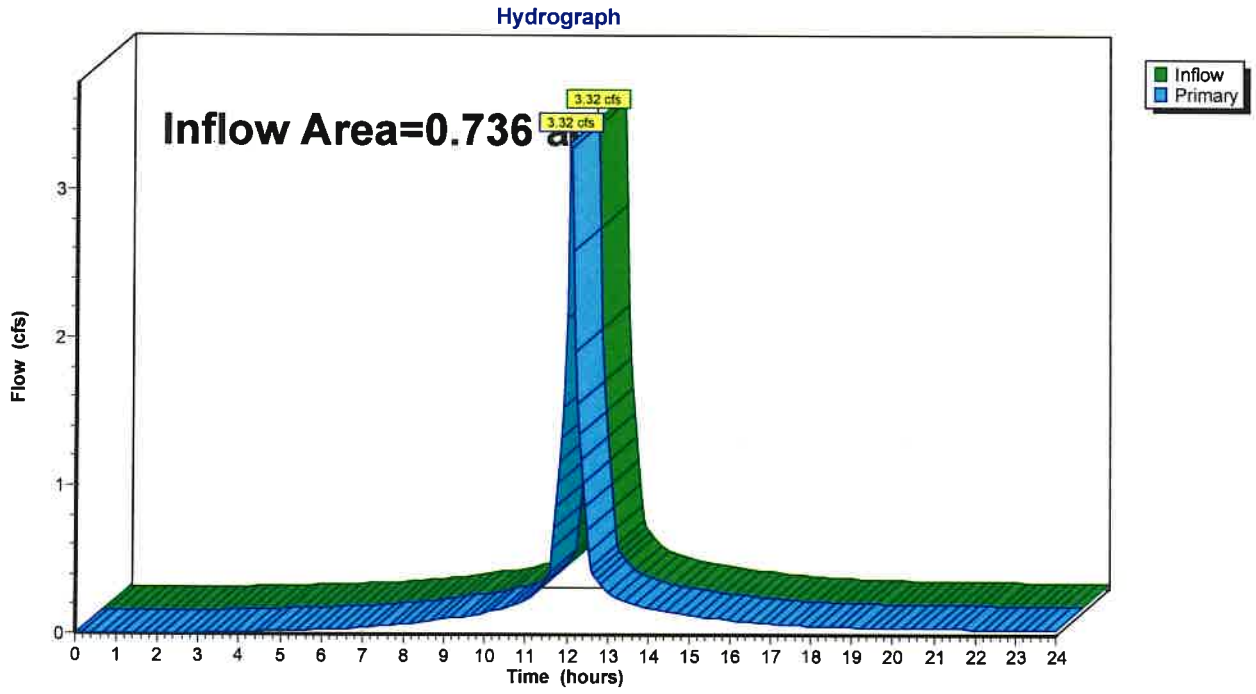


Summary for Pond 1P: Offsite

Inflow Area = 0.736 ac, 78.46% Impervious, Inflow Depth > 4.28" for 10-Year event
Inflow = 3.32 cfs @ 12.09 hrs, Volume= 0.262 af
Primary = 3.32 cfs @ 12.09 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Subcatchment 1S: 40-50 Central Ave

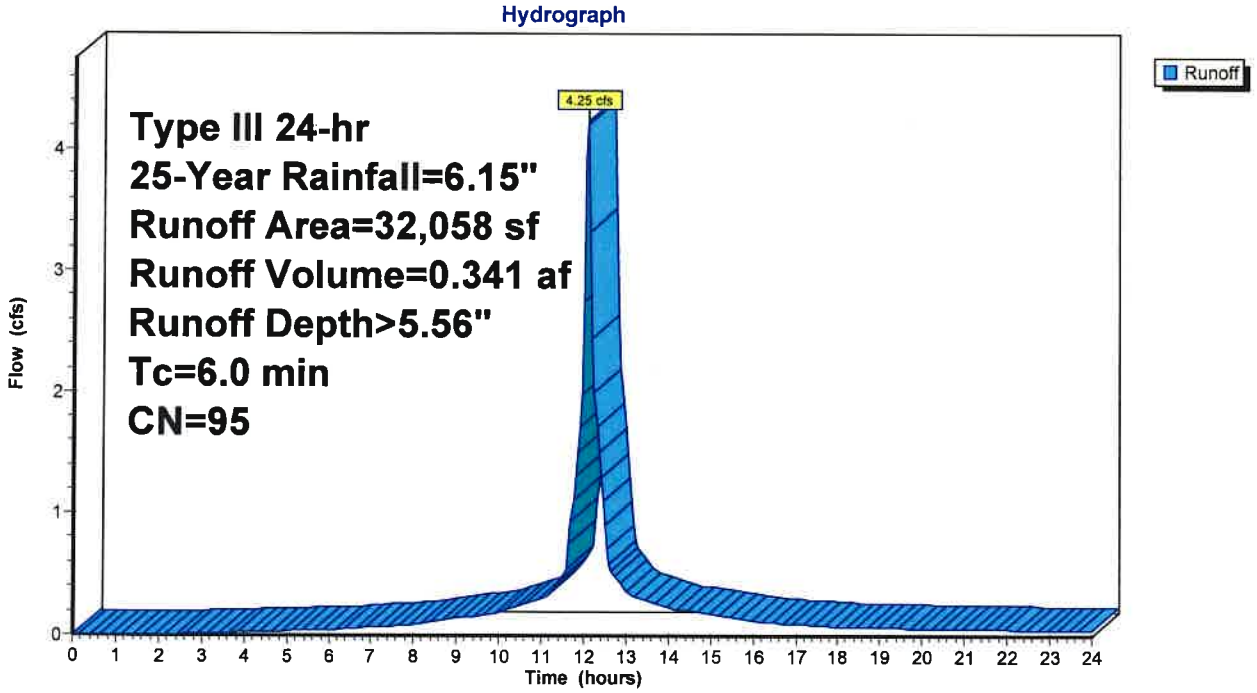
Runoff = 4.25 cfs @ 12.09 hrs, Volume= 0.341 af, Depth> 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

	Area (sf)	CN	Description
*	3,635	98	Existing Buildings
*	3,559	98	Exist. Gravel Drive
*	17,653	98	Existing Bit. Conc.
*	307	98	Existing Conc. Pad
	6,904	84	50-75% Grass cover, Fair, HSG D
	32,058	95	Weighted Average
	6,904		21.54% Pervious Area
	25,154		78.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: 40-50 Central Ave

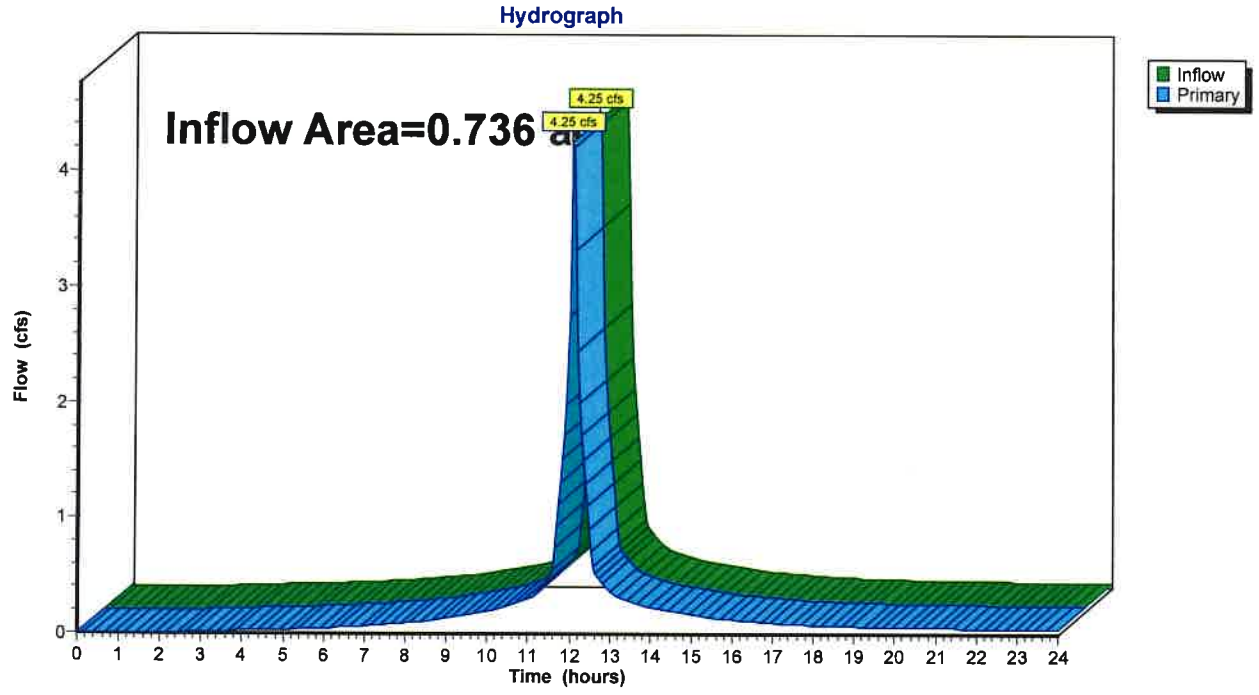


Summary for Pond 1P: Offsite

Inflow Area = 0.736 ac, 78.46% Impervious, Inflow Depth > 5.56" for 25-Year event
Inflow = 4.25 cfs @ 12.09 hrs, Volume= 0.341 af
Primary = 4.25 cfs @ 12.09 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Subcatchment 1S: 40-50 Central Ave

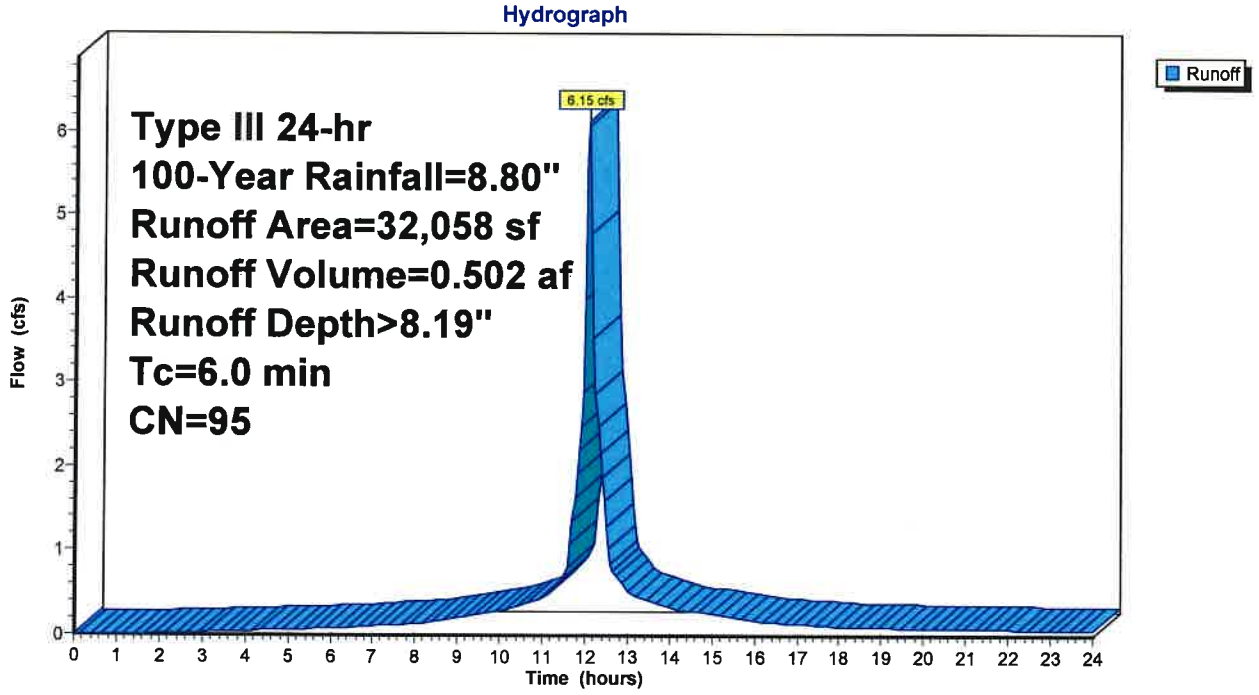
Runoff = 6.15 cfs @ 12.09 hrs, Volume= 0.502 af, Depth> 8.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

	Area (sf)	CN	Description
*	3,635	98	Existing Buildings
*	3,559	98	Exist. Gravel Drive
*	17,653	98	Existing Bit. Conc.
*	307	98	Existing Conc. Pad
	6,904	84	50-75% Grass cover, Fair, HSG D
	32,058	95	Weighted Average
	6,904		21.54% Pervious Area
	25,154		78.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: 40-50 Central Ave

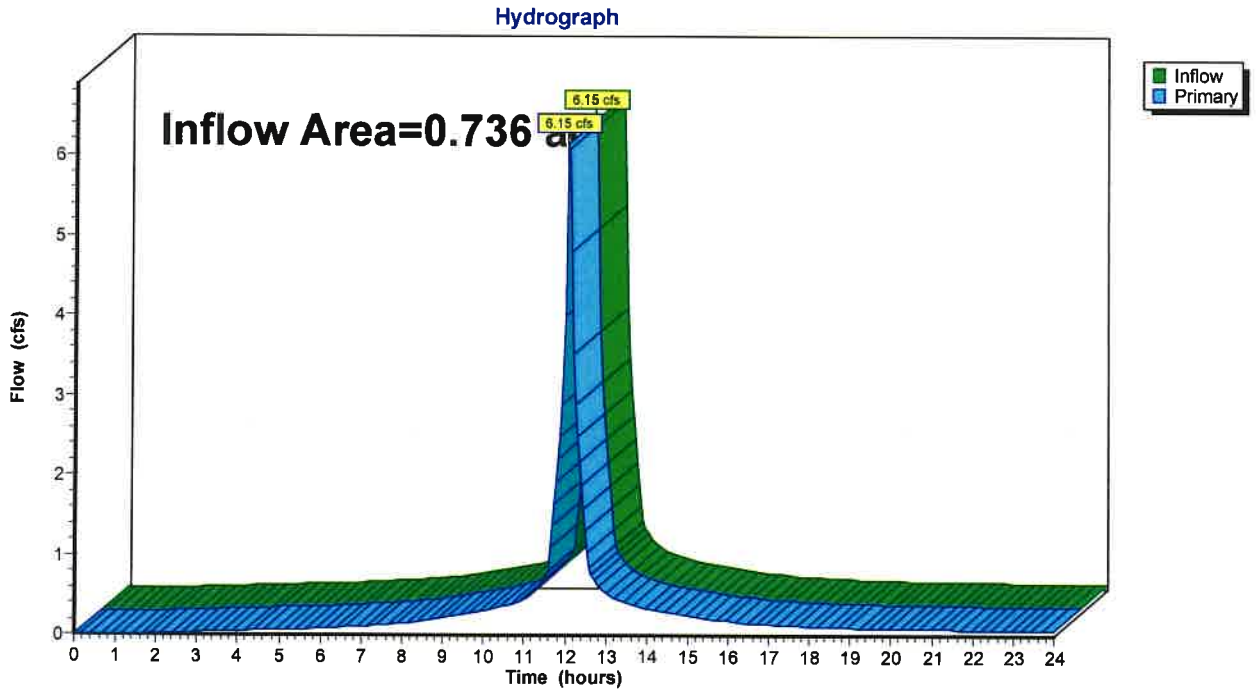


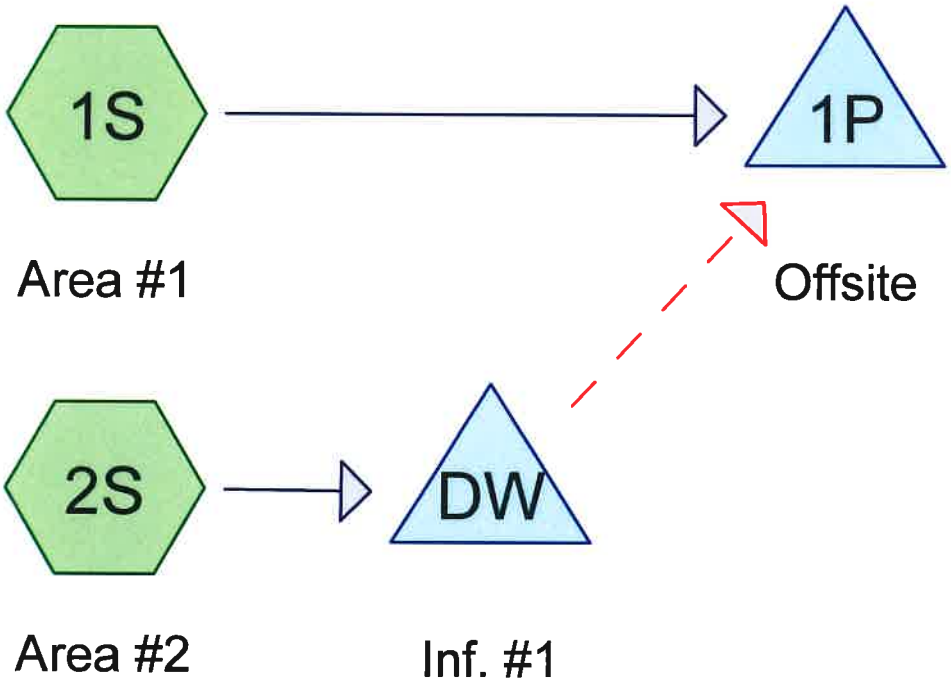
Summary for Pond 1P: Offsite

Inflow Area = 0.736 ac, 78.46% Impervious, Inflow Depth > 8.19" for 100-Year event
Inflow = 6.15 cfs @ 12.09 hrs, Volume= 0.502 af
Primary = 6.15 cfs @ 12.09 hrs, Volume= 0.502 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite





Subcat Reach Pond Link

Routing Diagram for Central Ave - Post Development
Prepared by HP, Printed 9/12/2022
HydroCAD® 10.00-24 s/n 08768 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.264	84	50-75% Grass cover, Fair, HSG D (1S)
0.205	98	Proposed Buildings (2S)
0.036	98	Proposed Walkways & Patio (1S)
0.231	98	Proposed parking (2S)
0.736	**93**	**TOTAL AREA**

Summary for Subcatchment 1S: Area #1

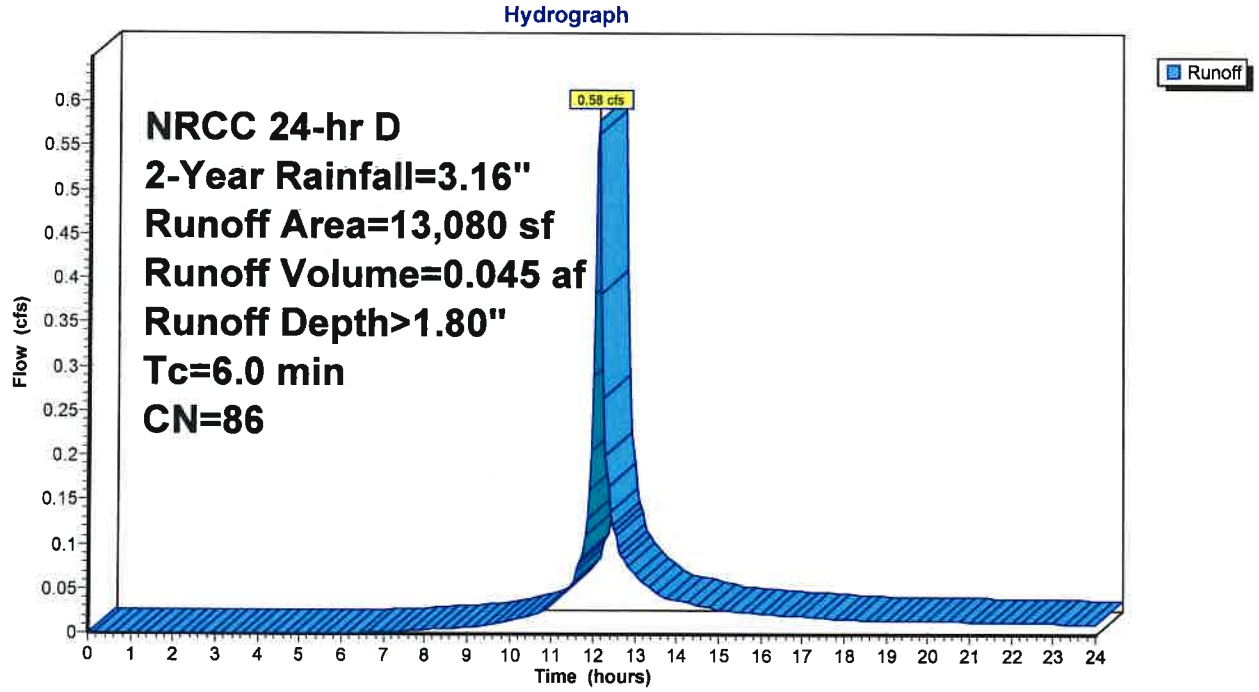
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 0.045 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
	11,506	84	50-75% Grass cover, Fair, HSG D
*	1,574	98	Proposed Walkways & Patio
	13,080	86	Weighted Average
	11,506		87.97% Pervious Area
	1,574		12.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: Area #1



Summary for Subcatchment 2S: Area #2

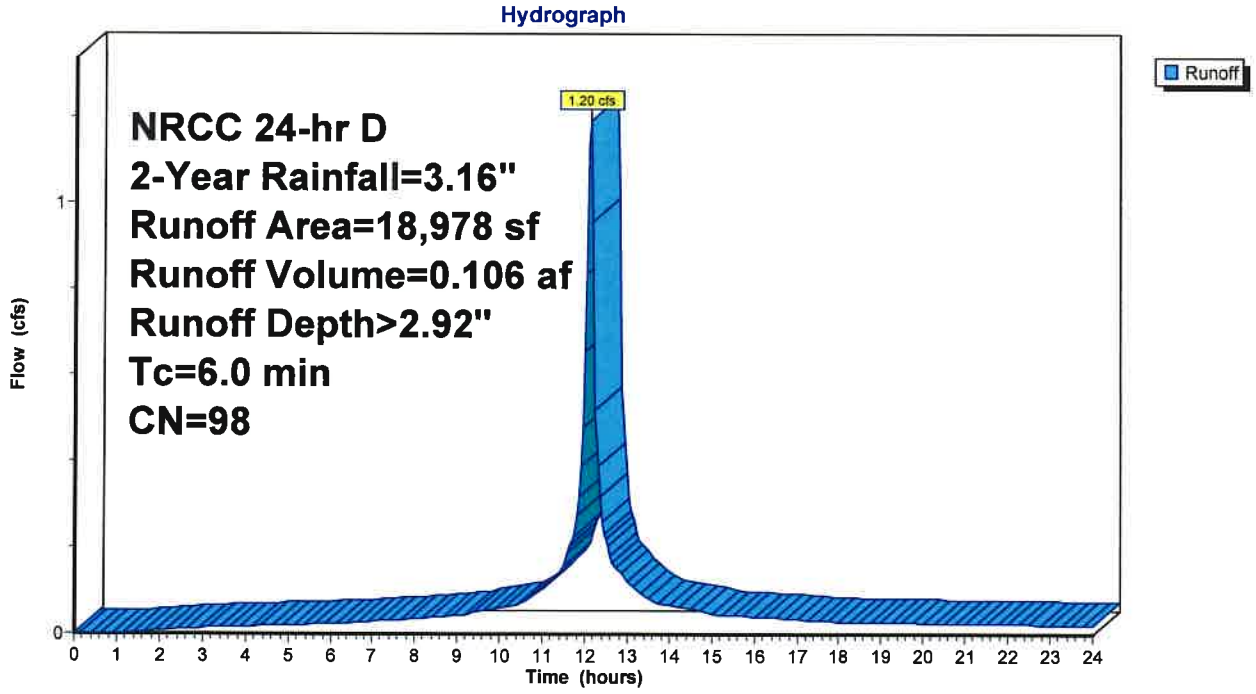
Runoff = 1.20 cfs @ 12.13 hrs, Volume= 0.106 af, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.16"

	Area (sf)	CN	Description
*	8,930	98	Proposed Buildings
*	10,048	98	Proposed parking
	18,978	98	Weighted Average
	18,978		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Area #2

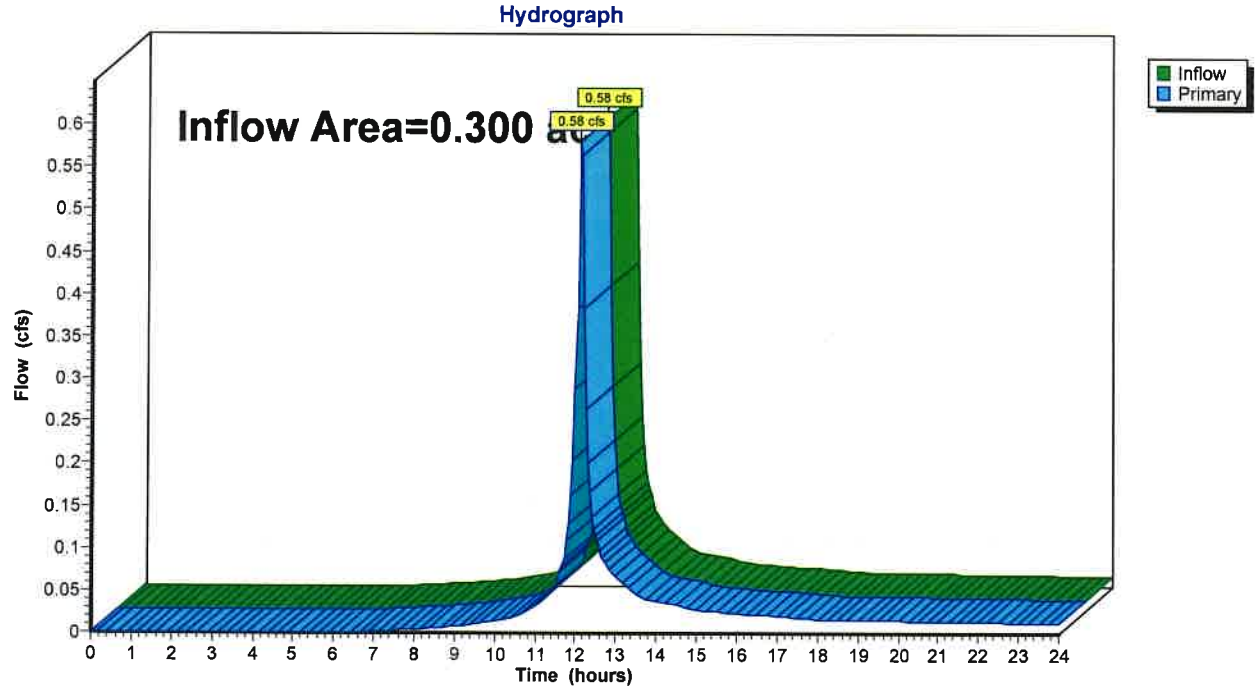


Summary for Pond 1P: Offsite

Inflow Area = 0.300 ac, 12.03% Impervious, Inflow Depth > 1.80" for 2-Year event
Inflow = 0.58 cfs @ 12.13 hrs, Volume= 0.045 af
Primary = 0.58 cfs @ 12.13 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Pond DW: Inf. #1

Inflow Area =	0.436 ac,100.00% Impervious,	Inflow Depth >	2.92"	for 2-Year event
Inflow =	1.20 cfs @	12.13 hrs, Volume=	0.106 af	
Outflow =	0.00 cfs @	4.00 hrs, Volume=	0.008 af,	Atten= 100%, Lag= 0.0 min
Discarded =	0.00 cfs @	4.00 hrs, Volume=	0.008 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 111.36' @ 24.00 hrs Surf.Area= 0.049 ac Storage= 0.098 af

Plug-Flow detention time= 520.5 min calculated for 0.008 af (7% of inflow)
Center-of-Mass det. time= 45.0 min (805.0 - 760.0)

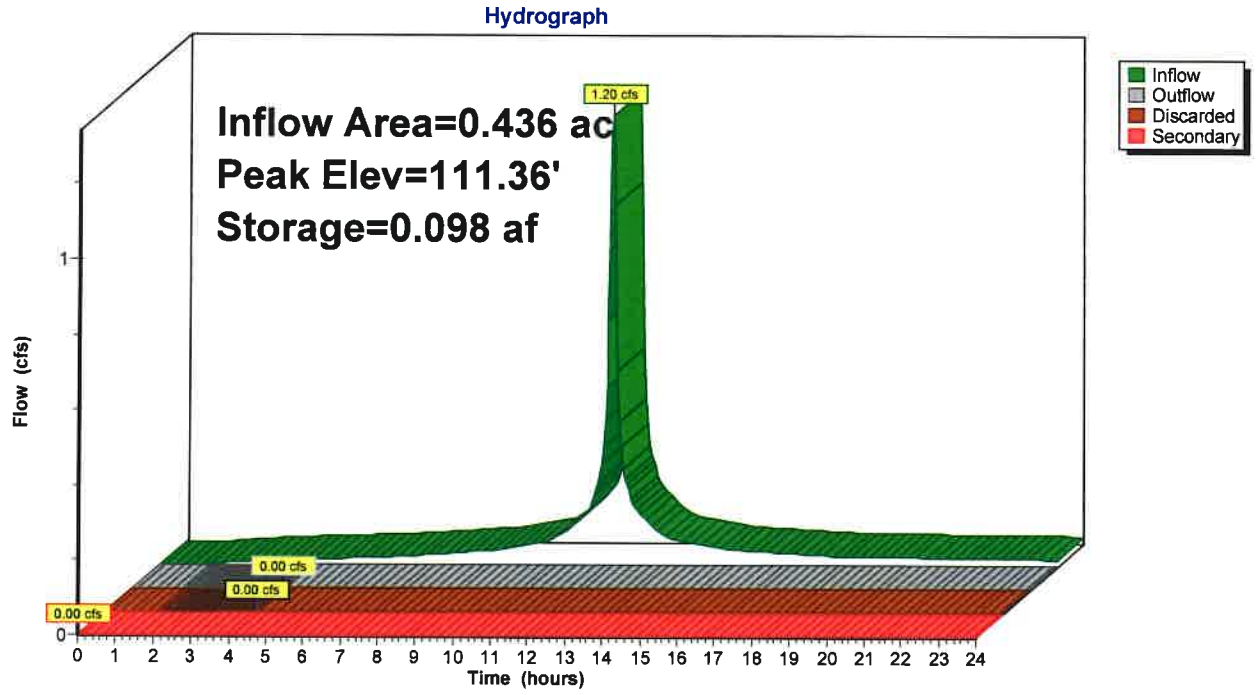
Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.055 af	**22.00'W x 98.00'L x 5.25'H Gravel**
			0.260 af Overall - 0.123 af Embedded = 0.137 af x 40.0% Voids
#2	109.25'	0.123 af	**4.00'W x 4.50'L x 4.25'H Leaching Galley**x 70 Inside #1
		0.178 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.25'	**0.090 in/hr Exfiltration over Surface area**
#2	Secondary	118.50'	**24.0" x 24.0" Horiz. CB @ Driveway** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 4.00 hrs HW=108.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=108.25' (Free Discharge)
↑—**2=CB @ Driveway** (Controls 0.00 cfs)

Pond DW: Inf. #1


Hydrograph
Inflow Area=0.436 ac
Peak Elev=111.36'
Storage=0.098 af
1.20 cfs
0.00 cfs
0.00 cfs
0.00 cfs
Inflow
Outflow
Discarded
Secondary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Summary for Subcatchment 1S: Area #1

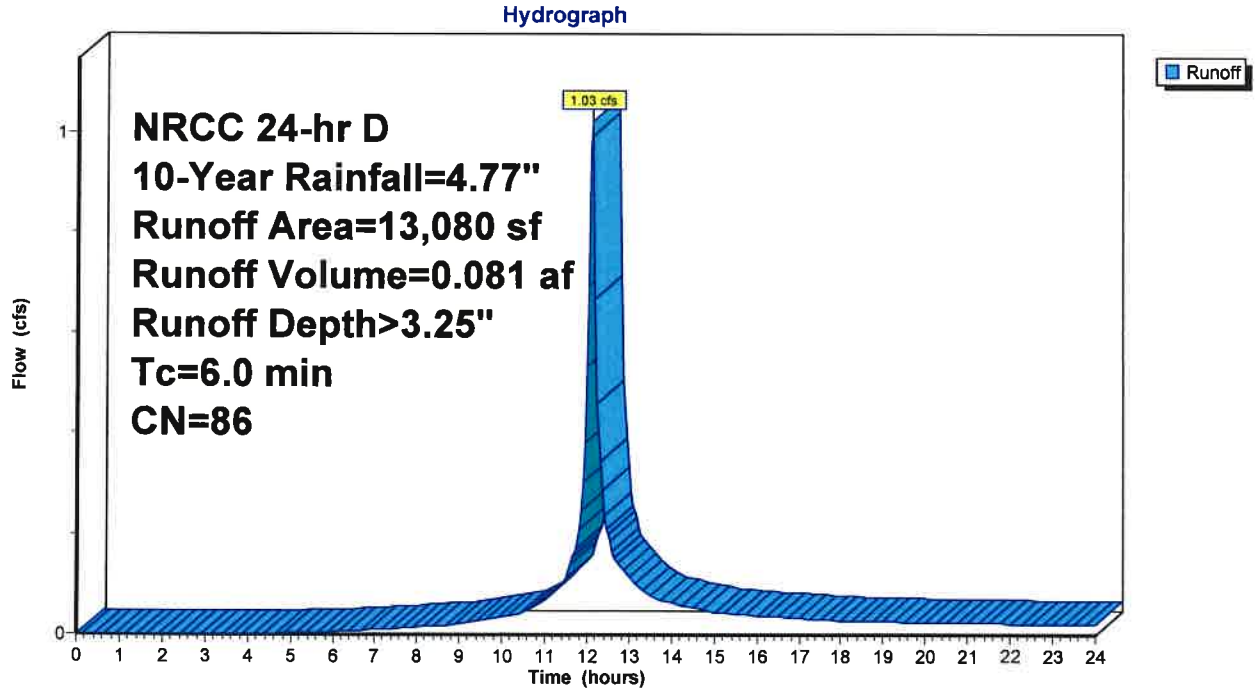
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 0.081 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
	11,506	84	50-75% Grass cover, Fair, HSG D
*	1,574	98	Proposed Walkways & Patio
	13,080	86	Weighted Average
	11,506		87.97% Pervious Area
	1,574		12.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: Area #1



Summary for Subcatchment 2S: Area #2

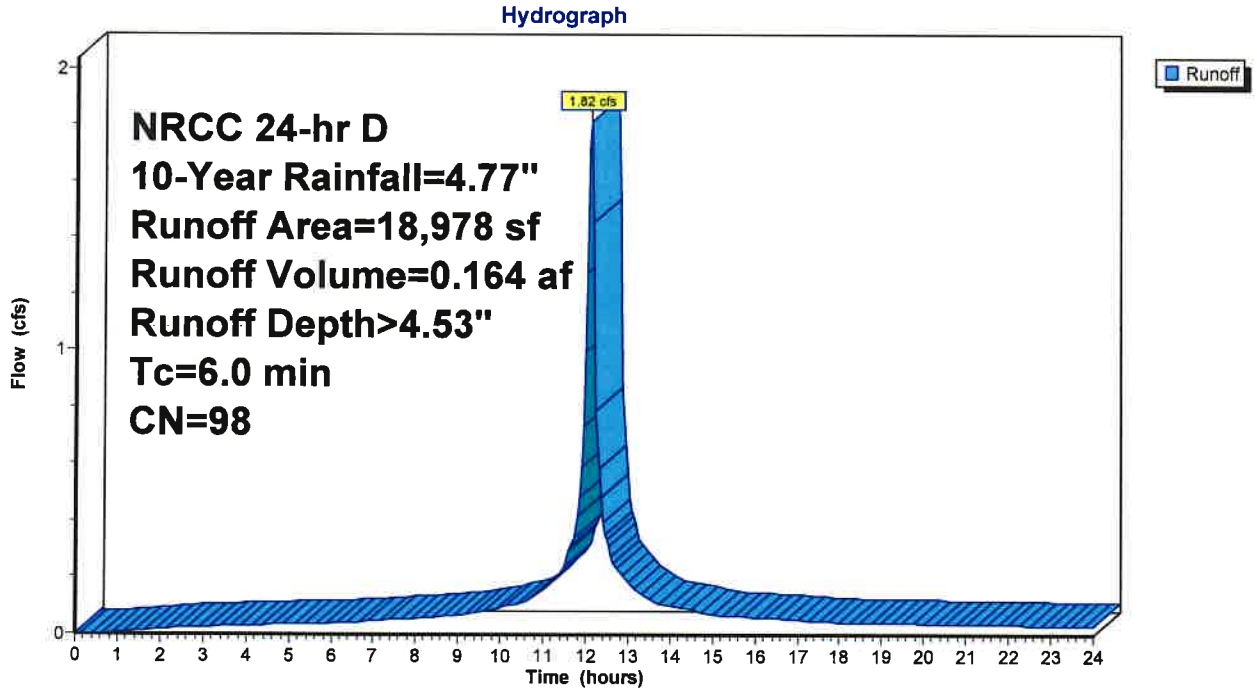
Runoff = 1.82 cfs @ 12.13 hrs, Volume= 0.164 af, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

	Area (sf)	CN	Description
*	8,930	98	Proposed Buildings
*	10,048	98	Proposed parking
	18,978	98	Weighted Average
	18,978		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Area #2

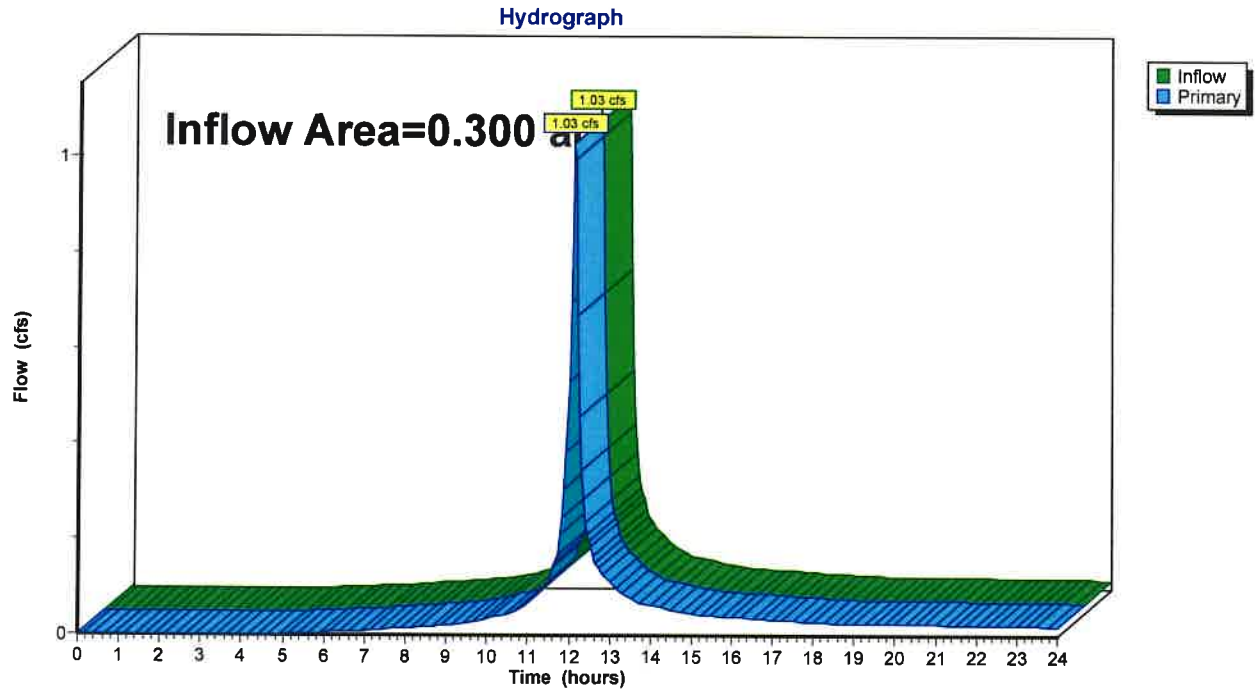


Summary for Pond 1P: Offsite

Inflow Area = 0.300 ac, 12.03% Impervious, Inflow Depth > 3.25" for 10-Year event
Inflow = 1.03 cfs @ 12.13 hrs, Volume= 0.081 af
Primary = 1.03 cfs @ 12.13 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Pond DW: Inf. #1

Inflow Area =	0.436 ac,	100.00% Impervious,	Inflow Depth >	4.53" for 10-Year event
Inflow =	1.82 cfs @	12.13 hrs, Volume=	0.164 af	
Outflow =	0.00 cfs @	2.70 hrs, Volume=	0.008 af,	Atten= 100%, Lag= 0.0 min
Discarded =	0.00 cfs @	2.70 hrs, Volume=	0.008 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 112.92' @ 24.00 hrs Surf.Area= 0.049 ac Storage= 0.156 af

Plug-Flow detention time= 574.3 min calculated for 0.008 af (5% of inflow)
Center-of-Mass det. time= 27.8 min (778.5 - 750.7)

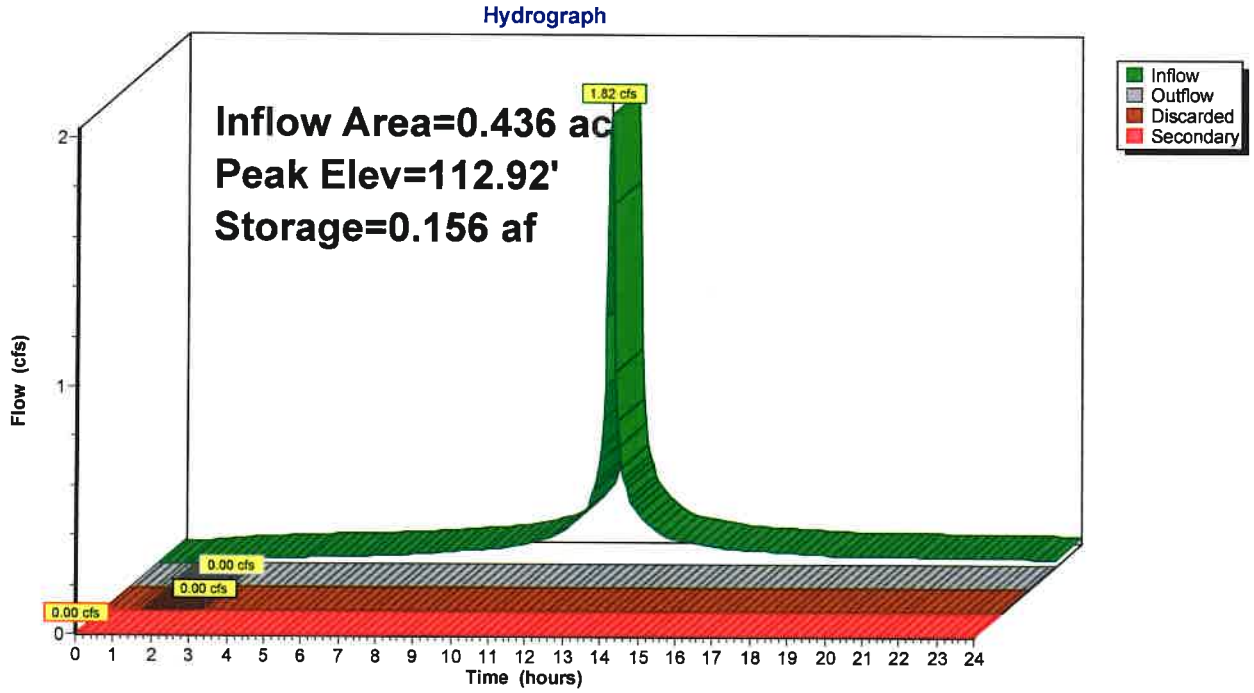
Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.055 af	**22.00'W x 98.00'L x 5.25'H Gravel**
			0.260 af Overall - 0.123 af Embedded = 0.137 af x 40.0% Voids
#2	109.25'	0.123 af	**4.00'W x 4.50'L x 4.25'H Leaching Galley**x 70 Inside #1
		0.178 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.25'	**0.090 in/hr Exfiltration over Surface area**
#2	Secondary	118.50'	**24.0" x 24.0" Horiz. CB @ Driveway** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 2.70 hrs HW=108.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=108.25' (Free Discharge)
↑—**2=CB @ Driveway** (Controls 0.00 cfs)

Pond DW: Inf. #1


Hydrograph
Inflow Area=0.436 ac
Peak Elev=112.92'
Storage=0.156 af
1.82 cfs
0.00 cfs
0.00 cfs
0.00 cfs
Inflow
Outflow
Discarded
Secondary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Summary for Subcatchment 1S: Area #1

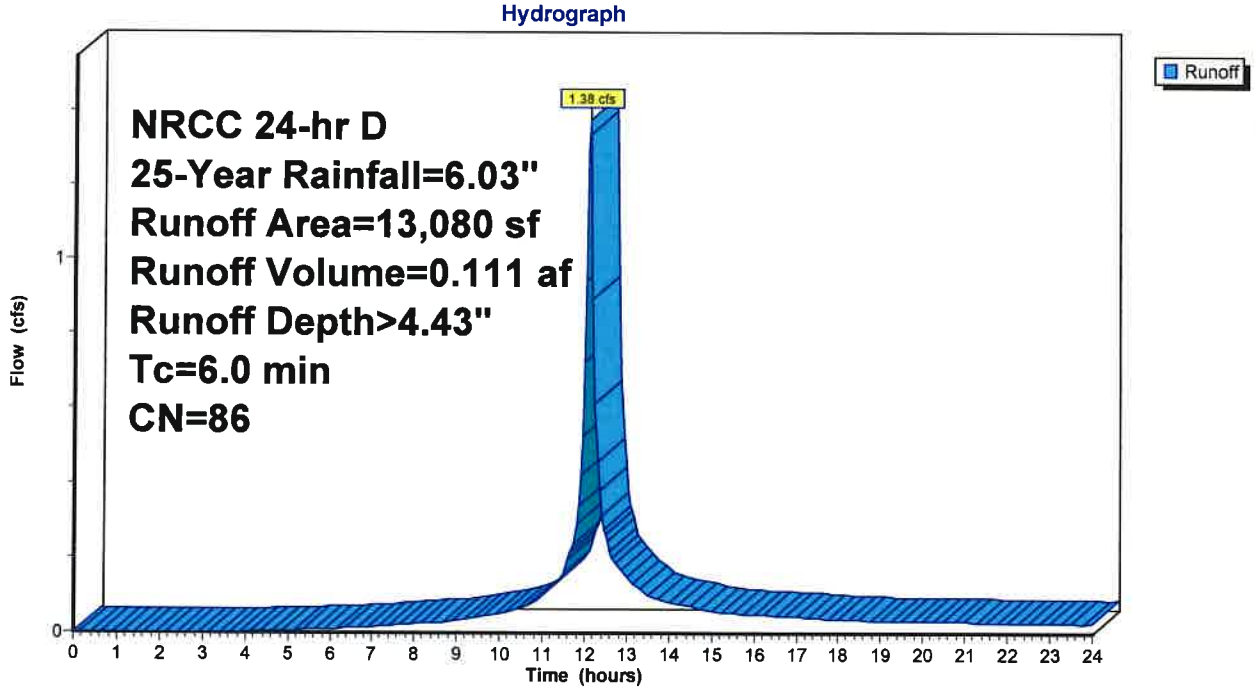
Runoff = 1.38 cfs @ 12.13 hrs, Volume= 0.111 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
	11,506	84	50-75% Grass cover, Fair, HSG D
*	1,574	98	Proposed Walkways & Patio
	13,080	86	Weighted Average
	11,506		87.97% Pervious Area
	1,574		12.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: Area #1



Summary for Subcatchment 2S: Area #2

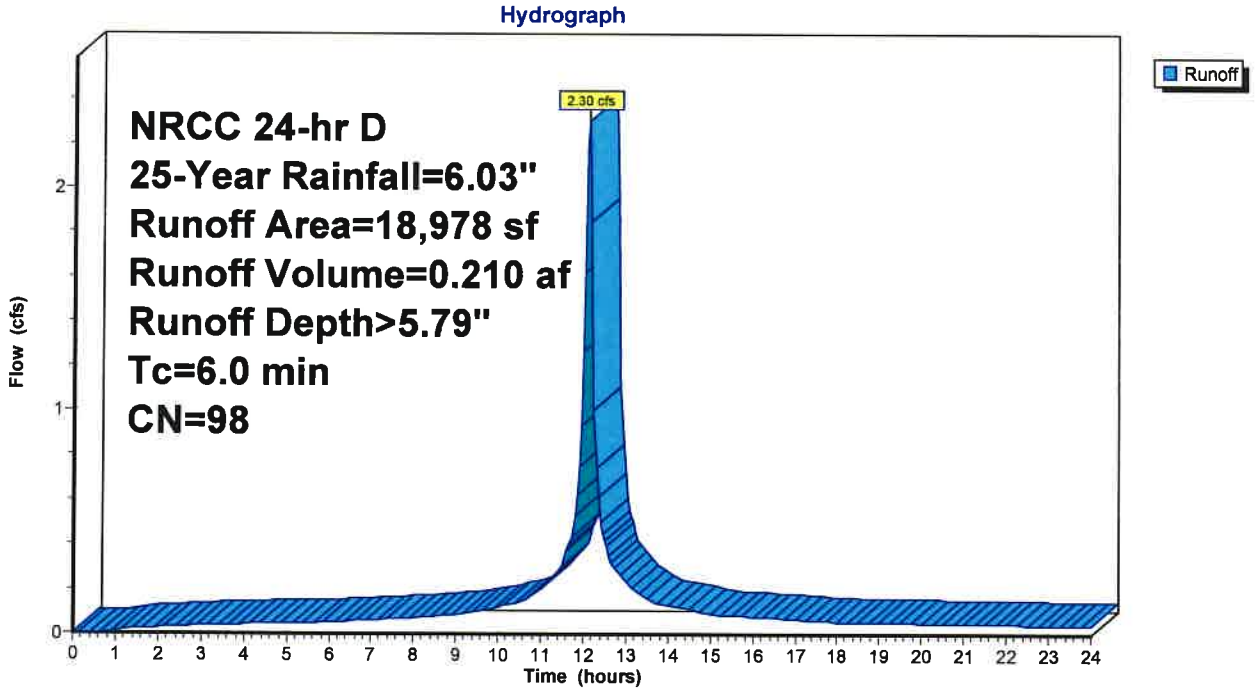
Runoff = 2.30 cfs @ 12.13 hrs, Volume= 0.210 af, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.03"

	Area (sf)	CN	Description
*	8,930	98	Proposed Buildings
*	10,048	98	Proposed parking
	18,978	98	Weighted Average
	18,978		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Area #2

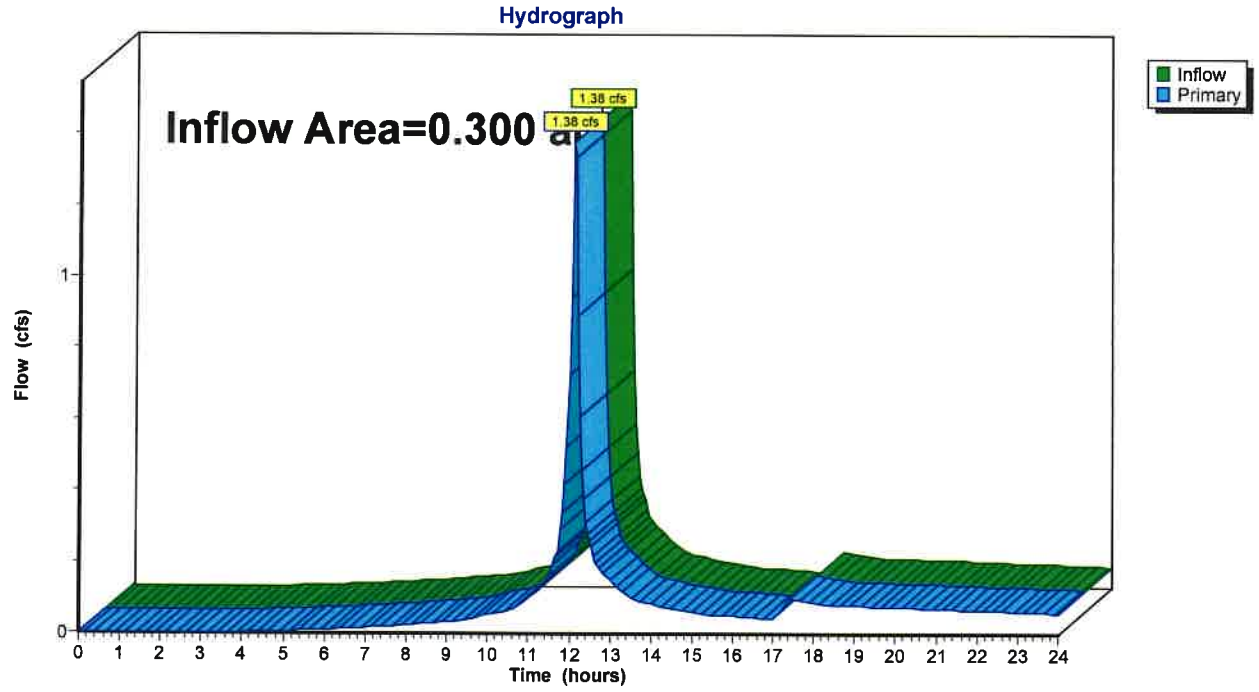


Summary for Pond 1P: Offsite

Inflow Area = 0.300 ac, 12.03% Impervious, Inflow Depth > 5.39" for 25-Year event
Inflow = 1.38 cfs @ 12.13 hrs, Volume= 0.135 af
Primary = 1.38 cfs @ 12.13 hrs, Volume= 0.135 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Pond DW: Inf. #1

Inflow Area =	0.436 ac,100.00% Impervious,	Inflow Depth >	5.79"	for 25-Year event
Inflow =	2.30 cfs @	12.13 hrs, Volume=	0.210 af	
Outflow =	0.07 cfs @	17.25 hrs, Volume=	0.032 af,	Atten= 97%, Lag= 307.4 min
Discarded =	0.00 cfs @	2.20 hrs, Volume=	0.008 af	
Secondary =	0.06 cfs @	17.25 hrs, Volume=	0.024 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 118.51' @ 17.25 hrs Surf.Area= 0.049 ac Storage= 0.178 af

Plug-Flow detention time= 750.5 min calculated for 0.032 af (15% of inflow)
Center-of-Mass det. time= 357.0 min (1,103.4 - 746.4)

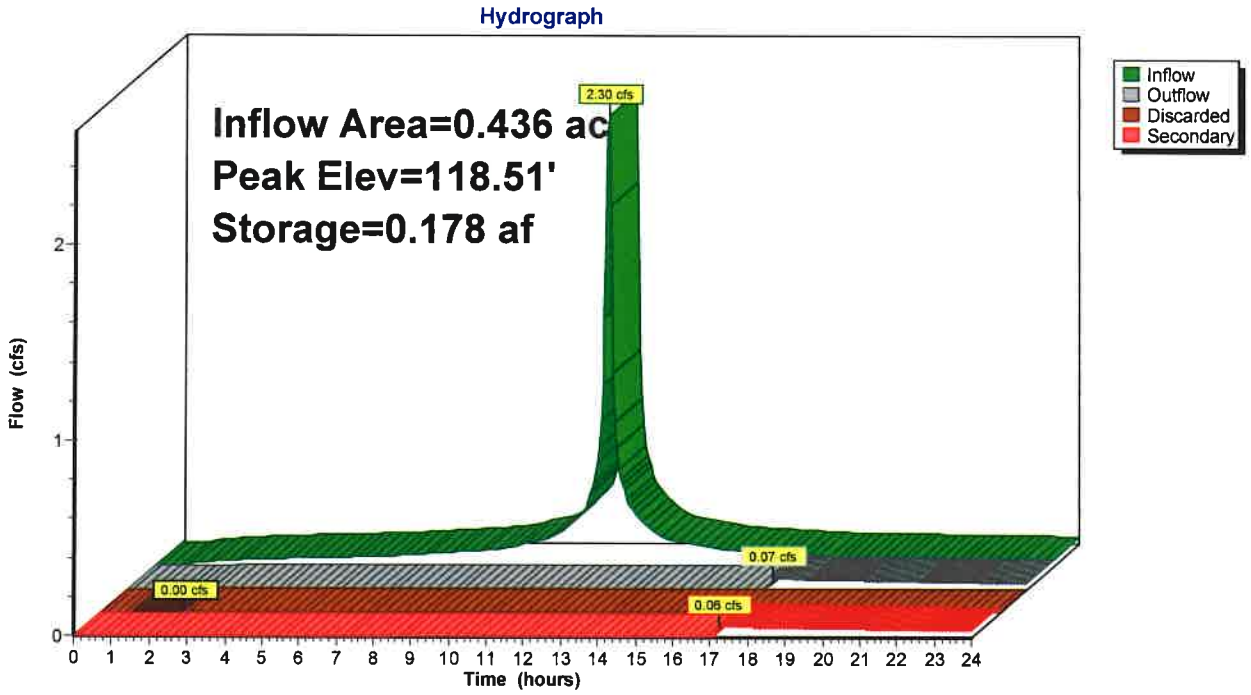
Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.055 af	**22.00'W x 98.00'L x 5.25'H Gravel**
			0.260 af Overall - 0.123 af Embedded = 0.137 af x 40.0% Voids
#2	109.25'	0.123 af	**4.00'W x 4.50'L x 4.25'H Leaching Galley**x 70 Inside #1
		0.178 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	108.25'	**0.090 in/hr Exfiltration over Surface area**
#2	Secondary	118.50'	**24.0" x 24.0" Horiz. CB @ Driveway** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 2.20 hrs HW=108.36' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=0.02 cfs @ 17.25 hrs HW=118.51' (Free Discharge)
↑—**2=CB @ Driveway** (Weir Controls 0.02 cfs @ 0.28 fps)

Pond DW: Inf. #1


Hydrograph
Inflow Area=0.436 ac
Peak Elev=118.51'
Storage=0.178 af
2.30 cfs
0.07 cfs
0.00 cfs
0.06 cfs
Inflow
Outflow
Discarded
Secondary
Flow (cfs)
Time (hours)
0
1
2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Summary for Subcatchment 1S: Area #1

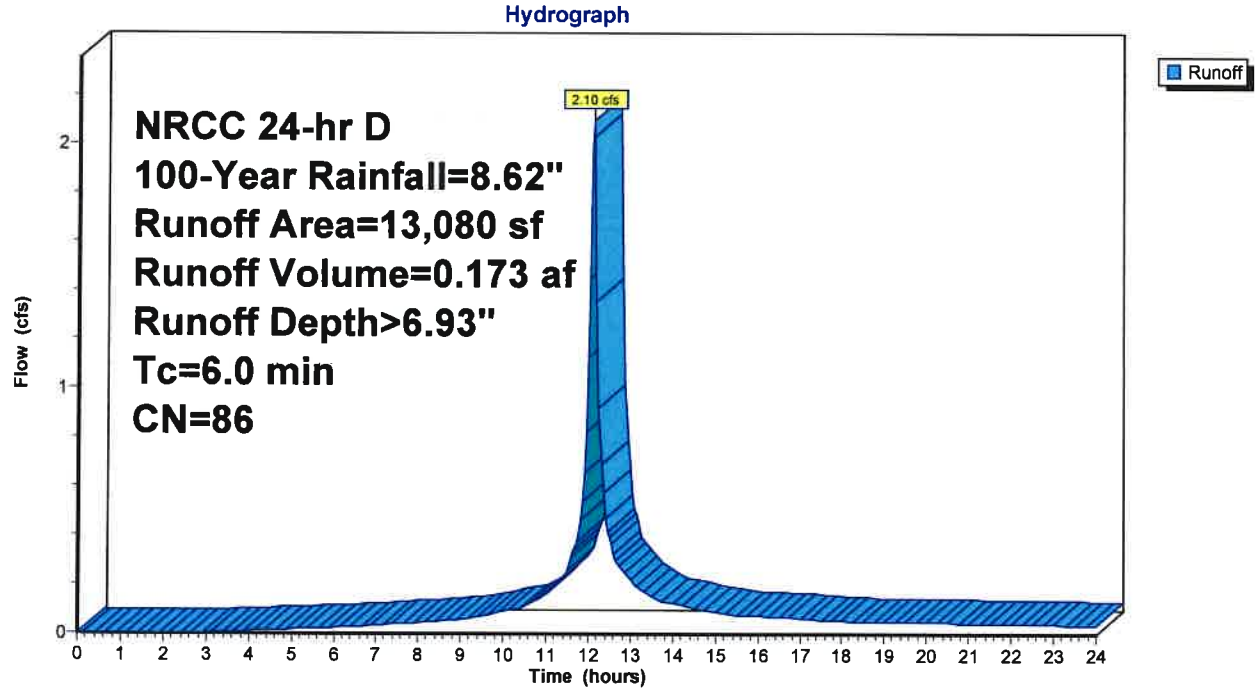
Runoff = 2.10 cfs @ 12.13 hrs, Volume= 0.173 af, Depth> 6.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

	Area (sf)	CN	Description
	11,506	84	50-75% Grass cover, Fair, HSG D
*	1,574	98	Proposed Walkways & Patio
	13,080	86	Weighted Average
	11,506		87.97% Pervious Area
	1,574		12.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct Entry**

Subcatchment 1S: Area #1



Summary for Subcatchment 2S: Area #2

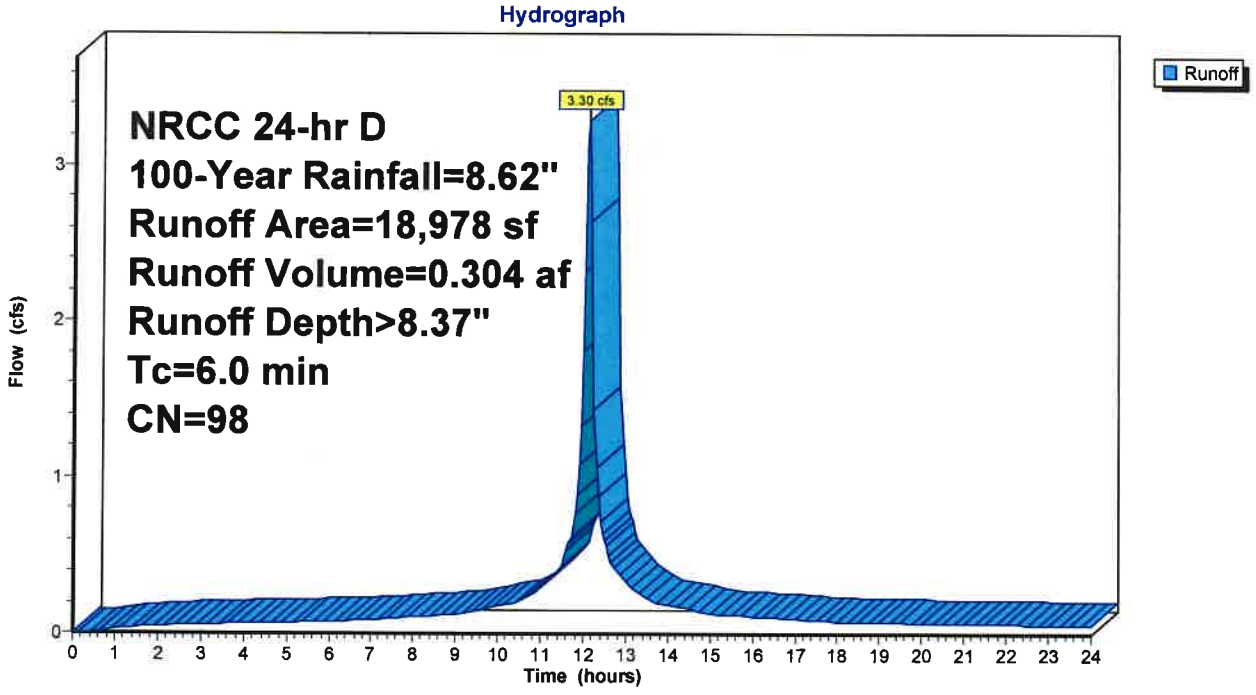
Runoff = 3.30 cfs @ 12.13 hrs, Volume= 0.304 af, Depth> 8.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.62"

	Area (sf)	CN	Description
*	8,930	98	Proposed Buildings
*	10,048	98	Proposed parking
	18,978	98	Weighted Average
	18,978		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2S: Area #2

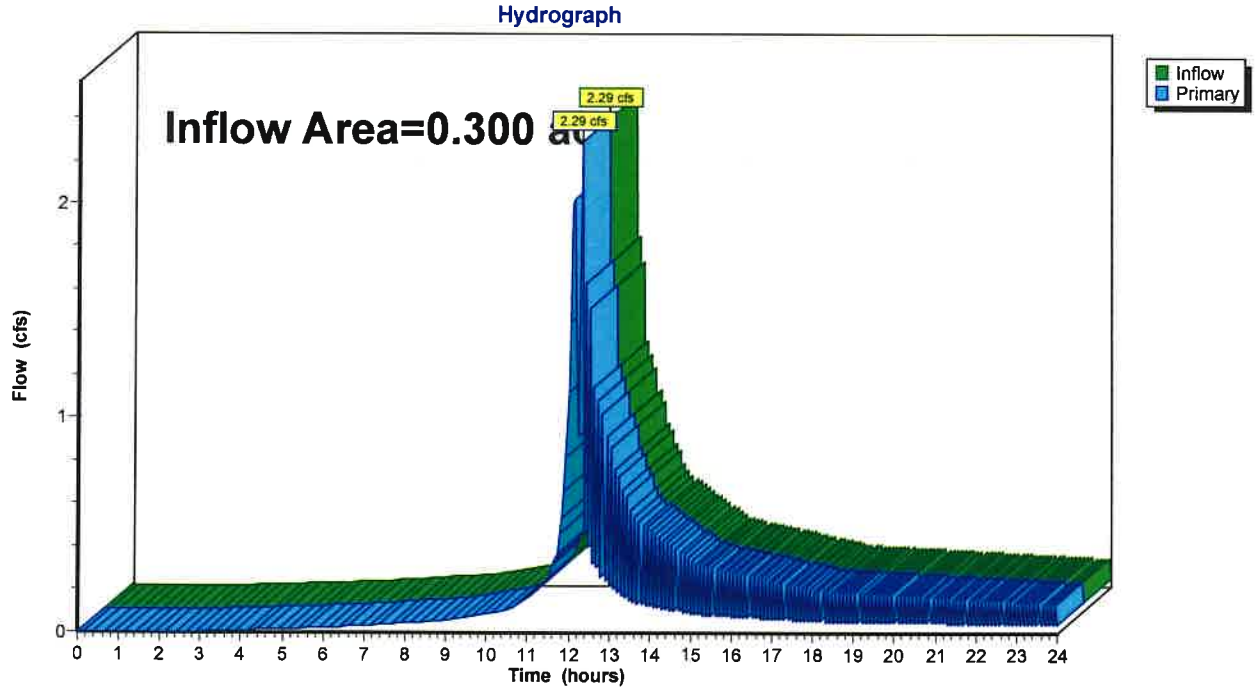


Summary for Pond 1P: Offsite

Inflow Area = 0.300 ac, 12.03% Impervious, Inflow Depth > 11.63" for 100-Year event
Inflow = 2.29 cfs @ 12.35 hrs, Volume= 0.291 af
Primary = 2.29 cfs @ 12.35 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: Offsite



Summary for Pond DW: Inf. #1

Inflow Area =	0.436 ac,100.00% Impervious,	Inflow Depth >	8.37"	for 100-Year event
Inflow =	3.30 cfs @	12.13 hrs, Volume=	0.304 af	
Outflow =	1.72 cfs @	12.35 hrs, Volume=	0.126 af,	Atten= 48%, Lag= 13.3 min
Discarded =	0.00 cfs @	1.60 hrs, Volume=	0.009 af	
Secondary =	1.72 cfs @	12.35 hrs, Volume=	0.118 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 118.66' @ 12.35 hrs Surf.Area= 0.049 ac Storage= 0.178 af

Plug-Flow detention time= 396.4 min calculated for 0.126 af (41% of inflow)
Center-of-Mass det. time= 195.5 min (936.5 - 741.0)

Volume	Invert	Avail.Storage	Storage Description
#1	108.25'	0.055 af	**22.00'W x 98.00'L x 5.25'H Gravel**
			0.260 af Overall - 0.123 af Embedded = 0.137 af x 40.0% Voids
#2	109.25'	0.123 af	**4.00'W x 4.50'L x 4.25'H Leaching Galley**x 70 Inside #1
		0.178 af	Total Available Storage

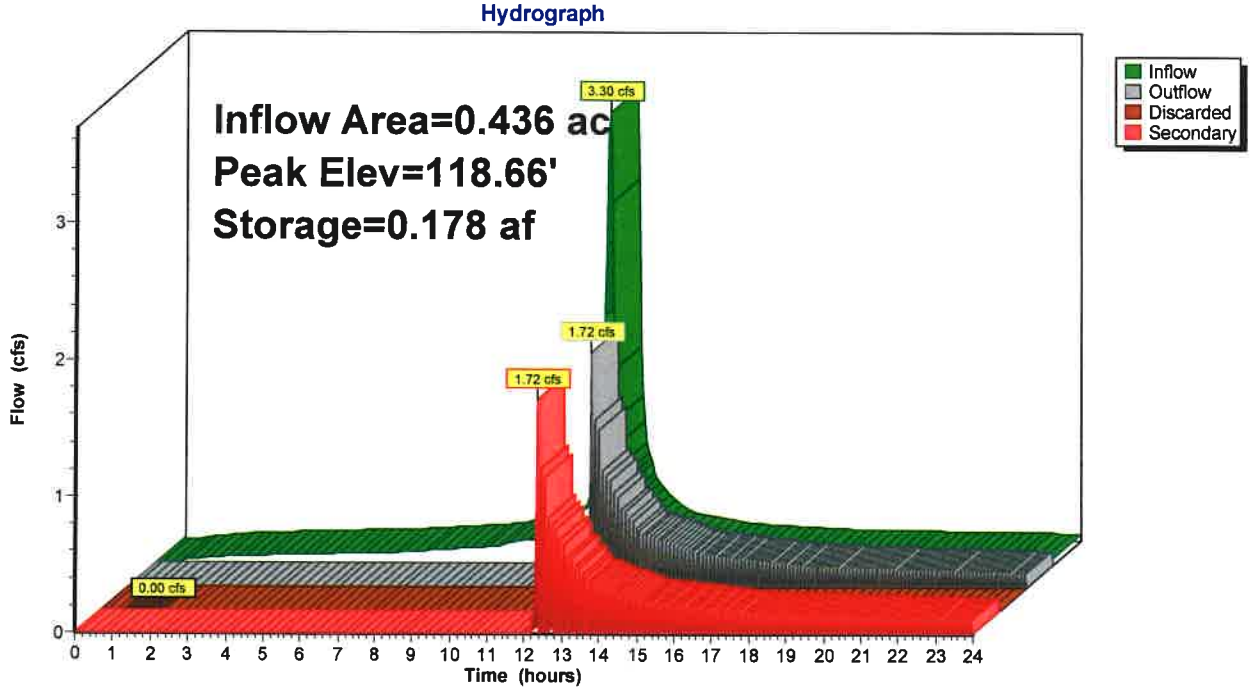
Device	Routing	Invert	Outlet Devices
#1	Discarded	108.25'	**0.090 in/hr Exfiltration over Surface area**
#2	Secondary	118.50'	**24.0" x 24.0" Horiz. CB @ Driveway** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.00 cfs @ 1.60 hrs HW=108.36' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Secondary OutFlow Max=1.58 cfs @ 12.35 hrs HW=118.65' (Free Discharge)
↑—**2=CB @ Driveway** (Weir Controls 1.58 cfs @ 1.28 fps)

Pond DW: Inf. #1

Hydrograph





Map Scale: 1:524 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 25 50 100 150

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104D	Hollis-Rock outcrop-Charlton complex, 15 to 35 percent slopes	0.3	48.8%
602	Urban land, 0 to 15 percent slopes	0.3	51.2%
Totals for Area of Interest		**0.6**	**100.0%**

OPERATION & MAINTENANCE PLAN

STORMWATER MANAGEMENT FACILITIES
PROPOSED MIXED-USE BUILDING
40-50 CENTRAL AVE
NEEDHAM, MASSACHUSETTS

September 12, 2022

VERNE T. PORTER JR., PLS
LAND SURVEYORS – CIVIL ENGINEERS
354 ELLIOT STREET
NEWTON, MA 02464

OPERATION & MAINTENANCE PLAN
STORMWATER MANAGEMENT FACILITIES
PROPOSED MIXED-USE BUILDING
40-50 CENTRAL AVE
NEEDHAM, MA

The proposed project includes stormwater runoff controls associated with the construction of a new mixed-use building and associated site improvements. The major components associated with maintenance needs are the proposed leaching systems that will handle runoff from the proposed roof and parking areas. These will need to be cleaned periodically as noted below. Cleaning of this structures shall be done by the property owner or by a specialty contractor with hydraulic cleaning ability. The following outlines the major maintenance issues associated with the project:

Catchbasin Inspection/Cleaning:

Have all catchbasins cleaned out completely twice annually during April and October, if required.

Leaching Galley Cleaning:

The proposed leaching gallies should be inspected monthly during the first year, and then every third year following the 1-year inspection.

The leaching gallies are equipped with a frame and cover. After removal of the cover, a stadia rod should be used to measure the depth of sediment. If the depth of sediment is in excess of 3", then the sediment should be removed.

Street Sweeping

Have the driveway swept bi-annually in April and October.

MAINTENANCE RESPONSIBILITIES

The maintenance of the Drainage System is the responsibility of the Property Owners. The actual work can be accomplished by the Owner or can be subcontracted to a company that specializes in the cleaning of storm drainage facilities. Inspections should be performed by independent individual such as the design engineer or other experienced individual in the field.

The General Contract must take precautions during construction to protect all infiltration structures/systems during construction.

Construction period pollution control

Erosion and sedimentation control measures will be implemented prior to and during construction activities to minimize impacts from land disturbance activities. Erosion and sedimentation control measures implemented on the site will include, at a minimum, dust control measures, the installation of silt fence barriers on the up-gradient side of resource areas and catch basin inlet protection. Controls may also include temporary sedimentation basins and diversion swales and temporary seeding. The erosion and sedimentation controls will be inspected at the end of the day if precipitation is forecast, and after each rainfall event of 0.5 inches or more. Should construction occur during winter months, seasonally appropriate stabilization measure will be utilized.

Below is a summary of the minimum construction period pollution control requirements. These topics are presented as a means of demonstrating understanding of pollution control but are not meant to supplant preparation of the SWPPP. Please refer to the SWPPP for complete construction activity details.

a. Dust Control

Mitigation measures will be implemented to control fugitive dust during construction activities. Dust control measure may include seeding, wet suppression, application of soil stabilization agents, or other measures to control dust generated by construction activities. The Contractor shall confirm with state and local regulations to see if the use of calcium chloride for dust suppression is allowed.

b. Erosion Control Barriers

Prior to any ground disturbance, erosion control barriers will be installed at the limit of work at down-gradient positions on the site. The barriers will consist of silt fence and staked hay bales and will be entrenched in the soil to prevent underflow.

c. Catch Basin Inlet Protection

All existing and newly installed catch basin shall be protected during construction with a filter insert system. These sedimentation control measures will be regularly maintained until the drainage area tributary to the catch basin has been stabilized.

d. Temporary Sedimentation Basins and Diversion Swales

If necessary, temporary sedimentation basins will be constructed to prevent transport of fine-grained sediment into wetland resource areas and other off-site areas. These temporary basins will be located where appropriate, as determined by the contractor. Temporary diversion swales or berms may be used to convey runoff from construction areas to temporary or previously constructed basins.

e. Temporary Seeding

Temporary seeding will be used where vegetative cover is required for less than one year on disturbed soil areas. Such areas will be seeded if the soils will be exposed without construction activity for more than 30 days. Rapidly growing annual grasses, such as annual rye grass, oats, perennial rye grass or winter rye will be uniformly applied. Depending on the slope, the soil may be covered with a layer of straw mulch, an erosion control blanket, or a bonded fiber matrix.

f. Permanent Seeding

Upon completion of the final grading, any areas not covered by pavement, other forms of stabilization, including landscaping, will be seeded with rapidly growing annual rye grass/red fescue seed mix.

STORMWATER MANAGEMENT REPORT
PROPOSED MIXED-USE BUILDING
40-50 CENTRAL AVE
NEEDHAM, MASSACHUSETTS

INSPECTION REPORT:

Inspection Firm: _____

Inspectors Name: _____ Date: _____

Components Inspected: _____

Signed: _____

SYSTEM MAINTENANCE:

Maintenance Firm: _____ Date: _____

Catchbasin Inspected: Yes ____ No ____ Comments: _____

_____

Catchbasin Cleaned: Yes ____ No ____ Comments: _____

Leaching Gallies Inspected: Yes____No__Comments:_____

_____

Leaching Gallies Cleaned: Yes____No__Comments:_____

Estimate of Material Removed: _____

Other Comments: _____

_____

_____

Signed: _____

Norfolk and Suffolk Counties, Massachusetts

104D—Hollis-Rock outcrop-Charlton complex, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: vkvh
Elevation: 20 to 610 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 35 percent
Rock outcrop: 30 percent
Charlton and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Shallow, friable loamy ablation till derived from igneous and metamorphic rock

Typical profile

H1 - 0 to 3 inches: fine sandy loam
H2 - 3 to 14 inches: gravelly fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 35 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Igneous and metamorphic rock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Description of Charlton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy ablation till derived from granite

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 36 inches: fine sandy loam
H3 - 36 to 60 inches: fine sandy loam

Properties and qualities

Slope: 15 to 35 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Chatfield

Percent of map unit: 5 percent
Hydric soil rating: No

Canton

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

Norfolk and Suffolk Counties, Massachusetts

602—Urban land, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: vkyj
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

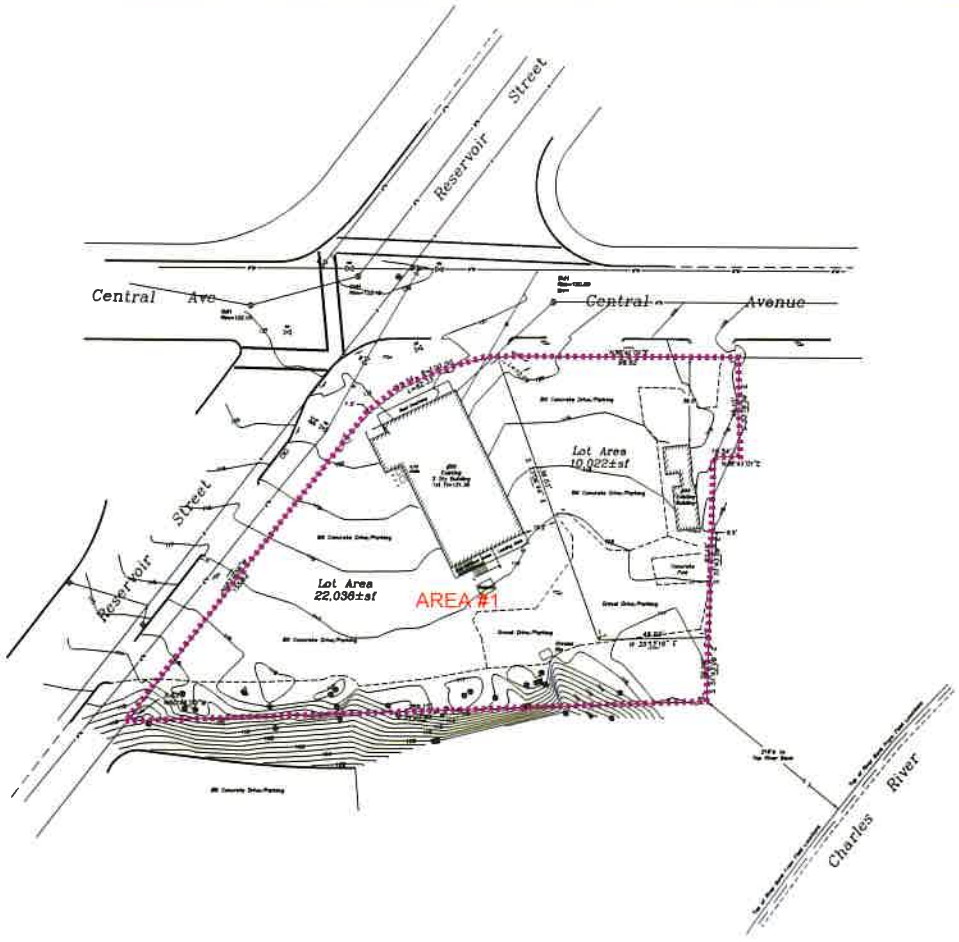
Minor Components

Rock outcrops

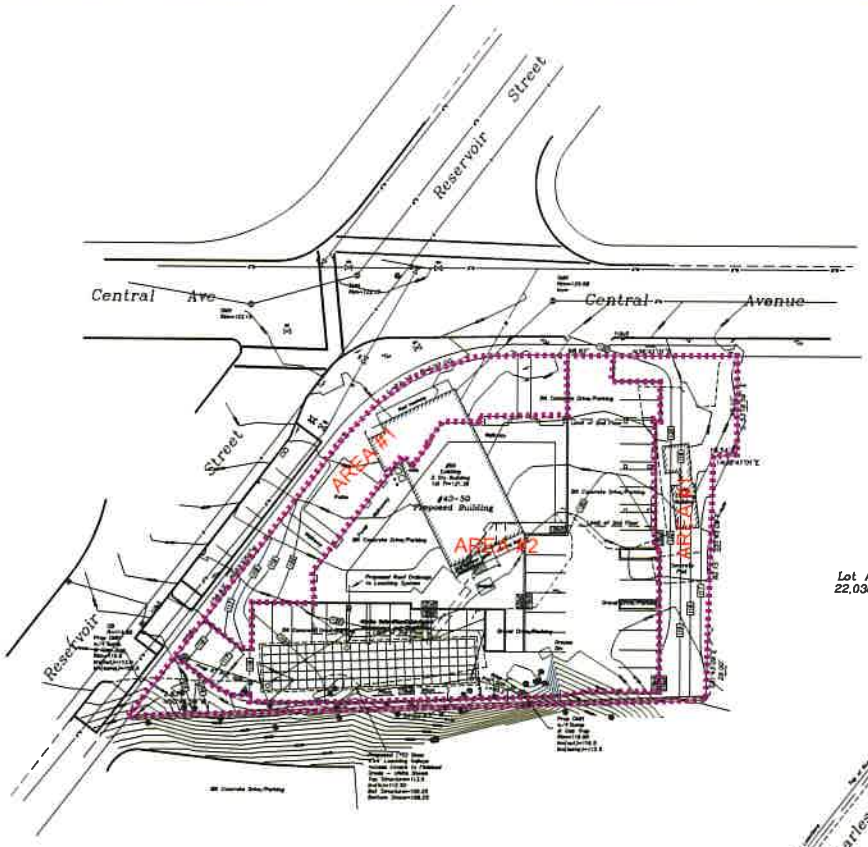
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021



40 & 50 Central Avenue	
Needham, Massachusetts	
Pre Development Catchment Area Plan	
Scale: n.t.s. Sept. 12, 2022	
VERNE T. PORTER Jr., PLS Land Surveyors – Civil Engineers 354 Elliot Street Newton, Massachusetts 02464	
Sheet 1 of 2	Project: 21627 Checked By: V. Porter Jr. Drawn By: R. Jordine Jr.



Existing utilities shown are from field locations and available plans of record and may or may not be correct. Contact Dig Safe and field verify all locations prior to any excavation.

Lot Area 22,036±sf

Lot Area 10,022±sf

Charles River

40 & 50 Central Avenue	
Needham, Massachusetts	
Post Development Catchment Area Plans	
Scale: n.t.s. Sept. 12, 2021	
VERNE T. PORTER Jr., PLS Land Surveyors – Civil Engineers 354 Elliot Street Newton, Massachusetts 02464	
Sheet 3 of 3	Project: 21027 Checked By: V. Porter Jr. Drawn By: R. Jardine Jr.



1 Landscape Plan
Not To Scale

HARD SURFACES

POURED ASPHALT PARKING
APPEARANCE:



CONCRETE PAVERS
APPEARANCE:



BLUESTONE PAVERS
APPEARANCE:



COMMUNITY GARDEN



TRASH ENCLOSURE



PLANTING

ARB THUJA ARBORVITAES "EMERALD GREEN"
COMMON NAME: EMERALD GREEN ARBORVITAE
MATURE SIZE: 10-15' H x 2-3' W
INSTALL SIZE: 1-2' W
QUANTITY: 8
APPEARANCE:

JDW CORNUS KOUSA "KOUSA DOGWOOD"
COMMON NAME: JAPANESE DOGWOOD
MATURE SIZE: 15-25' I I x 25' W
INSTALL SIZE: 8' H
QUANTITY: 12
APPEARANCE:

HGM ACER CAMPESTRE "HEDGE MAPLE"
COMMON NAME: HEDGE MAPLE
MATURE SIZE: 25-30' H x 25-30' W
INSTALL SIZE: 10' H
QUANTITY: 4
APPEARANCE:

WBH HYDRANGEA MACROPHYLLA "WHITE"
COMMON NAME: WHITE BIGLEAF HYDRANGEA
MATURE SIZE: 4-6' H x 4-6' W
INSTALL SIZE: 3' W
QUANTITY: 11
APPEARANCE:

JBW BUXUX MICROPHYLLA JAPONICA
COMMON NAME: JAPANESE BOXWOOD
MATURE SIZE: 2-3' H x 3-4' W
INSTALL SIZE: 2' W
QUANTITY: 10
APPEARANCE:

WTG THUJA OCCIDENTALIS "EVERGREEN" (CAN SUB. "NIGRA")
COMMON NAME: WINTERGREEN
MATURE SIZE: 15' H x 5' W
INSTALL SIZE: 10' H
QUANTITY: 8
APPEARANCE:

GBB PICEA PUNGENS "GLAUCA BABY BLUE EYES"
COMMON NAME: GLAUCA BABY BLUE EYES
MATURE SIZE: 20-25' H
INSTALL SIZE: MIN. 10' H
QUANTITY: 4
APPEARANCE:

JFG HAKONECHLOA MACRA "AUREOLA"
COMMON NAME: GOLDEN JAPANESE FOREST GRASS
MATURE SIZE: 1'-6" H x 1'-6" W
INSTALL SIZE: 1' W
QUANTITY: 14
APPEARANCE:

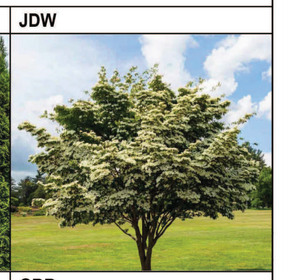
EX EXISTING TREES
ALL EXISTING TREES ON SITE T.B.C. BY G.C.
APPEARANCE:

PLANTING IMAGES

ARB



JDW



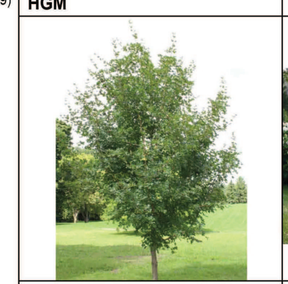
WTG



GBB



HGM



WBH



JBW



JFG



LIGHTING

LAMP (LMP)



WALL POST LIGHTING THROUGHOUT PARKING LOT (BEGA 77 180)



BOLLARD (BLD)



BOLLARD LIGHTING THROUGHOUT LANDSCAPED LAWNS (BEGA 99 727)

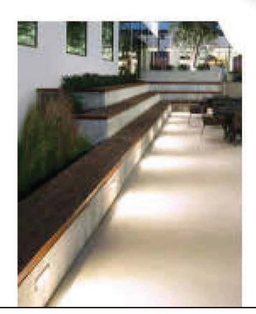


SCONCE (SCN)

WALL SCONCE ALONG EXT. OF CURTAIN WALL (BEGA 66 519) (SCN1)



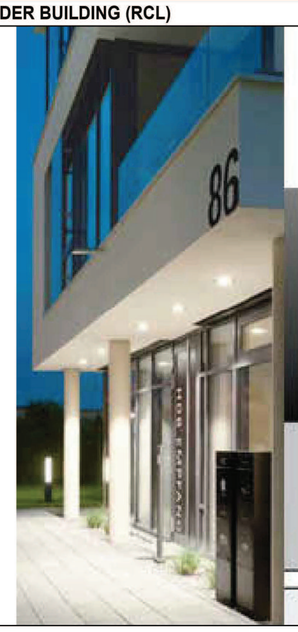




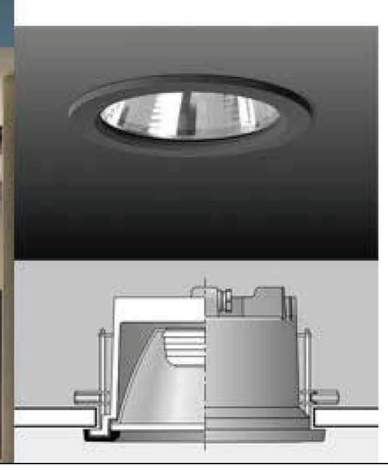


WALL SCONCE AT STAIRS AND EXT. COLUMNS (BEGA 33 059) (SCN 2)

UNDER BUILDING (RCL)



RECESSED CAN LIGHTS ALONG UNDERSIDE OF BUILDING ABOVE. (BEGA 66 519)



MGD
HABITAT DESIGN
411 Lexington St,Newton - MA 02466
mgdplus.com
info@mgdplus.com

STAMP



SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

LANDSCAPE PLAN

Project number	22-007
Date	10/06/2022
Drawn by	BAC
Checked by	MGD

SP.06

Scale



1 Building Rear Elevation
1/8" = 1'-0"



2 Building Rear Elevation 2
1/8" = 1'-0"

MGD
HABITAT DESIGN

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mgdplus.com
info@mgdplus.com

STAMP

REGISTERED ARCHITECT
RONALD F. JANUS
No. 4653
NEWTON
MASS.
COMMONWEALTH OF MASSACHUSETTS

SPECIAL PERMIT SET

No.	Description	Date
1	Landscape plan and Rear elevations added	10/30/2022

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

ELEVATIONS 2

Project number	22-007
Date	9/18/2022
Drawn by	Author
Checked by	Checker

SP.03.2

Scale 1/8" = 1'-0"







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REGISTERED ARCHITECT
RONALD F. JANUS
No. 4653
NEWTON
MASS.
COMMONWEALTH OF MASSACHUSETTS

SPECIAL PERMIT SET

No.	Description	Date
1	Landscape plan and Rear elevations added	10/30/2022

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

3D VIEWS 2

Project number	22-007
Date	9/18/2022
Drawn by	Author
Checked by	Checker

SP.05

Scale





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SPECIAL PERMIT SET

No.	Description	Date

CENTRAL AVE DEVELOPMENT

40-50 Central Ave, Needham, MA

3D VIEWS 3

Project number	22-007
Date	9/18/2022
Drawn by	Author
Checked by	Checker

SP.06

Scale









Transportation Impact Assessment

Received by
Needham Planning
Board
November 10, 2022

Proposed Residential Development
40-50 Central Avenue
Needham, Massachusetts

Prepared for:

BTE Development, LLC
Wellesley, Massachusetts

November 2022

Prepared by:

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

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1	2022 Existing Roadway Traffic-Volume Summary
2	Motor Vehicle Crash Data Summary
3	Trip Generation Summary
4	Trip-Distribution Summary
5	Peak Hour Traffic-Volume Increases
6	Level-of-Service Criteria for Unsignalized Intersections
7	Unsignalized Intersection Level-Of-Service Summary

EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) in order to evaluate the potential traffic impacts associated with the proposed redevelopment of existing commercial properties located at 40-50 Central Avenue in Needham, Massachusetts, in order to accommodate a proposed 15-unit residential apartment development that will provide a total of 28 on-site parking spaces. This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project.

As documented in this assessment:

- Project-related traffic increases are expected to amount to 11 new vehicle trips (4 entering and 7 exiting) during the weekday morning peak hour and 22 new vehicle trips (12 entering and 10 exiting) during the weekday evening peak hour;

- No notable safety deficiencies were identified within the study area, with all study area intersections exhibiting motor vehicle crash rates below the MassDOT state average, and available sight lines exceeding the minimum requirements to ensure safe access to and from the Project;

- In comparison to future No-Build traffic volumes, Project-related traffic increases amount to an increase in peak hour traffic volumes of approximately 0.7 to 1.0 percent;

- Project-related traffic conditions are expected to amount to only minor increases to delays as compared to future No-Build conditions.

The following recommendations are provided to ensure safe and efficient access to the Project.

RECOMMENDATIONS

Site Access

Access to the Project site is proposed via new curb cuts on the southern side of Central Avenue and eastern side of Reservoir Street. The proposed driveways will provide a single entering and exiting lane of travel. It is recommended that the proposed driveways be placed under STOP-sign control, with a painted STOP bar at the driveway approaches to Central Avenue and Reservoir Street. In order to ensure safe and efficient access to the Project and that adequate sightlines are provided in both directions, all signs and landscaping should be designed as to not impede lines of sight in both directions. Additionally, existing vegetation that currently limits sight lines to the south from the Reservoir Street driveway location should be removed and regularly maintained to ensure adequate sight lines are maintained to and from the south.

Transportation Demand Management

In order to minimize the number of single occupancy vehicles (SOVs) arriving and departing the Project, and to take advantage of transit, bicycle and pedestrian facilities that are available to residents of the Project, the proponent is committed to implementing a comprehensive Transportation Demand Management (TDM) Plan. Elements of the plan include the following measures:

- ***Orientation Packets:*** Prior to move in activities, the Proponent will provide orientation packets to new residents and tenants containing information on site access and circulation; and available transportation choices, including transit routes/schedules and nearby vehicle sharing locations and bicycle facilities.

- ***Bicycle Accommodation:*** The Proponent will provide interior and exterior bicycle storage in secure sheltered areas for residents and visitors of the Project.

CONCLUSION

In summary, the addition of Project-related traffic to study area roadways and intersections is not anticipated to significantly impact traffic operations within the study area over No-Build conditions. As documented in this report, Project-related traffic increases do not result in significant impact to area traffic operations, with only minimal increases to motorist delays projected along the Central Avenue and Reservoir Street corridors. With implementation of the above recommendations, the proposed Project can be built with minimal traffic impact on the surrounding roadway system.

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) in order to evaluate the potential traffic impacts associated with the proposed redevelopment of existing commercial properties located at 40-50 Central Avenue in Needham, Massachusetts, in order to accommodate a proposed 15-unit residential apartment development that will provide a total of 28 on-site parking spaces. This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project.

PROJECT DESCRIPTION

The Project site is situated on an approximate 0.7± acre parcel of land located in the southeast quadrant of the intersection of Central Avenue and Reservoir Street in Needham, Massachusetts. The Project site is generally bounded by private properties to the east, and south, and by Central Avenue and Reservoir Street to the north and west, respectively. The Project site currently houses a two story building that accommodates Panella's Market on the ground floor and office space on the second floor as well as a vacant building and parking lot on the eastern side of the site that previously housed a used car dealership. Under existing conditions, access to the Project site is provided via two unsignalized driveways onto the southern side of Central Avenue and two unsignalized driveways onto the eastern side of Reservoir Street.

The Project entails the razing of the existing buildings on site and the construction of a new 15-unit multi-family apartment building providing a total of 28 on-site parking spaces. An additional six on-street parking spaces are also proposed along the Reservoir Street site frontage. Additionally, the Project would provide approximately 2,542± sf of limited ground level commercial space, divided into three separate units. Access to the Project is proposed via reconstructed driveways onto both Central Avenue and Reservoir Street, that would provide direct access to the on-site ground level parking lot.

The location of the Project site relative to the surrounding roadway network is displayed in Figure 1.



Figure 1

Site Location Map

Vanasse & Associates inc

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STUDY METHODOLOGY

This study was prepared in consultation with the Town of Needham and in accordance with the Massachusetts Department of Transportation (MassDOT) Guidelines for traffic impact assessments and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages. The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian facilities; observations of traffic flow; review of safety characteristics along area roadways and collection of daily and peak period traffic counts. In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for analyses consistent with state guidelines for the preparation of TIAs. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues. The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in October of 2022. The field investigation consisted of an inventory of existing roadway geometrics, pedestrian facilities, traffic volumes, and operating characteristics; as well as posted speed limits and land use information for the major roadways that provide access to the Project including Central Avenue and Reservoir Street, and the key intersections which are expected to accommodate the majority of Project-related traffic. The study area for the project and traffic count locations is listed below and graphically depicted in Figure 2.

1. Central Avenue at Reservoir Street
2. Central Avenue at site driveway
3. Reservoir Street at site driveway

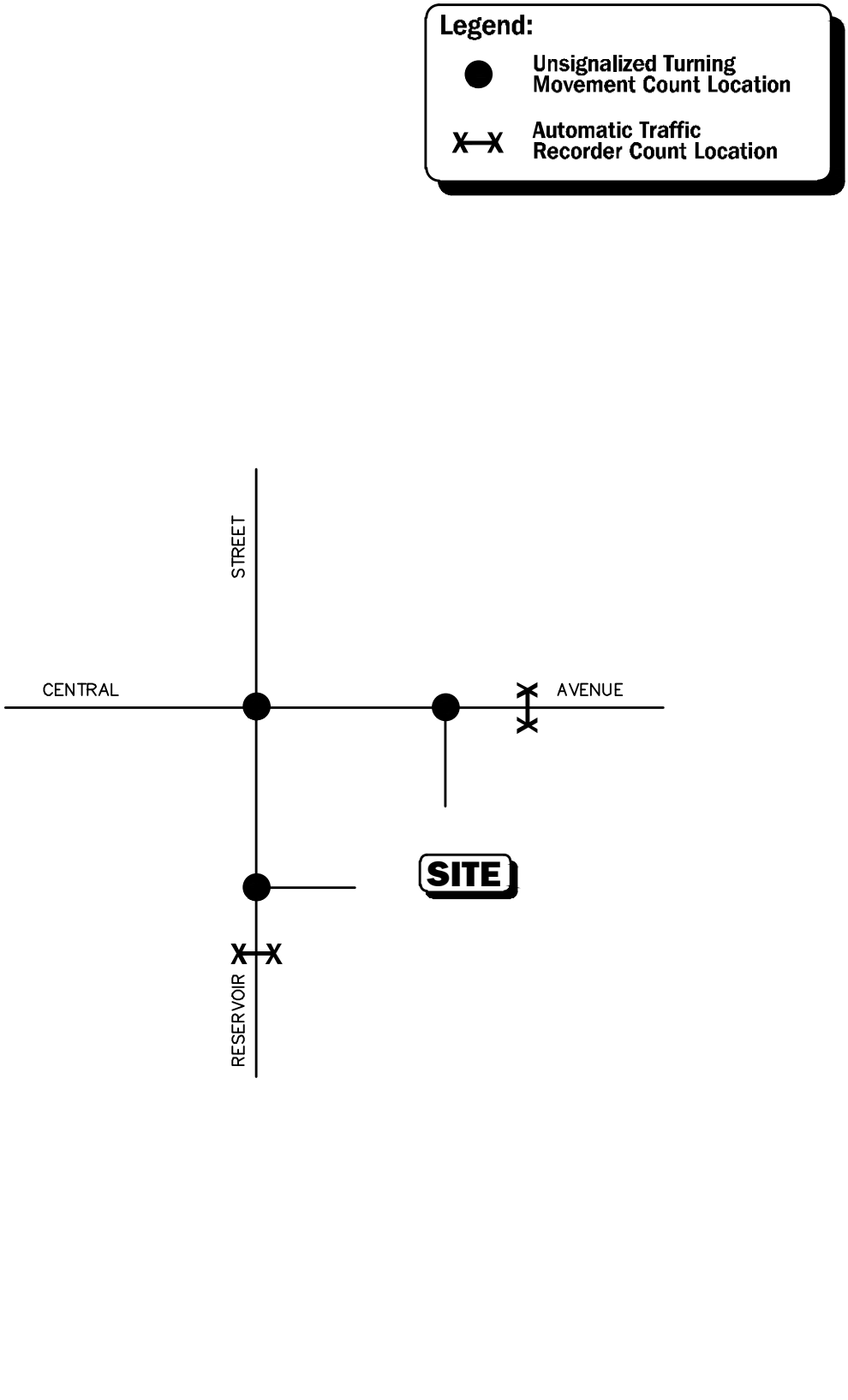
The following describes the study area roadways and intersections:

GEOMETRY

Roadways

Central Avenue

Central Avenue is a two-lane rural collector roadway under both Town of Needham and MassDOT jurisdiction that traverses the study area in a general east-west direction, providing connections to Elliot Street and Chestnut Street to the east and Centre Street to the west. In the vicinity of the Project site, Central Avenue provides a single approximately 12-foot lane of travel in each direction, separated by a painted double-yellow center line, with shoulders of variable width provided along both sides of the corridor. Sidewalk is provided continuously along both sides of the Central Avenue with the study area. The posted speed limit along the corridor, in the vicinity of the Project site is 25 miles per hour (mph). Land use in the vicinity of the Project consists primarily of commercial and residential uses. Street lighting is provided by way of overhead street lights mounted on utility poles.



Not To Scale

Figure 2

Study Area Intersections

Vanasse & Associates inc

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Reservoir Street

Reservoir Street is a two-lane local roadway under Town of Needham jurisdiction that traverses the study area in a general north-south orientation, between its northern and southern dead end termini. Reservoir Street provides a single approximate 12-foot lane of travel in each direction, with on-street parking allowed along the site frontage. North of Central Avenue Reservoir Street provides access to a number of residential homes, while south of Central Avenue land use along the corridor is primarily commercial in nature. Sidewalk is provided along the site frontage, but does not extend further south. Street lighting is provided by way of overhead street lights mounted on utility poles. The speed limit on Reservoir Street is not posted.

Intersections

Central Avenue at Reservoir Street

Reservoir Street intersects Central Avenue from the north and south to form a four-way intersection that operates under STOP-sign control. The Central Avenue eastbound and westbound approaches provide a single lane of travel, with a channelized right-turn lane provided for eastbound traffic turning right onto Reservoir Street. The northbound and southbound Reservoir Street approaches provide an approximate 20-foot wide approach, allowing right-turn traffic to bypass vehicles waiting to turn left onto Central Street. Both Reservoir Street approaches operate under STOP-sign control. Crosswalks are provided along the westbound, northbound, and southbound approaches to this intersection, with sidewalk provided along both sides of Central Avenue and a limited stretch of Reservoir Street along the Project site frontage. Land use in the vicinity of this intersection consists of a mix of commercial and residential uses.

EXISTING TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, traffic counts were conducted along Central Avenue and Reservoir Street by way of an automatic traffic recorder (ATR) count in October 2022. Additionally, peak period turning movement counts were conducted at all study area locations between the hours of 7:00 and 9:00 AM, and 4:00 and 6:00 PM. These time periods represent the peak period of roadway and residential traffic. Based on a review of the collected data, the peak hours of roadway traffic occurred between 8:00 and 9:00 AM during the weekday morning, and between 4:45 and 5:45 PM during the weekday evening.

Seasonal Variation

In order to identify whether traffic volumes collected in October are representative of typical traffic conditions, seasonal adjustment data published by MassDOT were reviewed. Based on this data, October traffic volumes are higher than average month conditions and therefore represent a conservative analysis scenario.

Central Avenue, in the vicinity of the Project, was found to accommodate approximately 10,052 vehicles on an average weekday (24-hour, two-way volume), with approximately 998 vehicles per hour (vph) during the weekday morning peak hour and 1,089 vph during the weekday evening peak hour.

Reservoir Street, in the vicinity of the Project, was found to accommodate approximately 2,174 vehicles on an average weekday, with approximately 181 vph during the weekday morning peak hour and 307 vph during the weekday evening peak hour.

The 2022 Existing traffic volumes are summarized in Table 1, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figures 3.

Table 1
EXISTING ROADWAY TRAFFIC-VOLUME SUMMARY

		Weekday Morning Peak Hour (8:00 – 9:00 AM)			Weekday Evening Peak Hour (4:40 – 5:40 PM)		
Location	Daily Volume (vpd)[a]	Volume (vph)[b]	Percent of Daily Traffic[c]	Predominant Flow	Volume (vph)	Percent of Daily Traffic	Predominant Flow
Central Avenue, east of Reservoir Street	10,052	998	9.9	69% EB	1,089	10.8	55% WB
Reservoir Street, south of Central Avenue	2,174	181	8.3	79% SB	307	14.1	63% NB

Source: Automatic traffic recorder counts and manual turning movement counts conducted in October 2022.
[a]Two-way daily traffic expressed in vehicles per day.
[b] Manual turning movement counts conducted in October 2022.
[c]The percent of daily traffic that occurs during the peak hour.
EB = eastbound, WB = westbound, NB = northbound, SB = southbound

PEDESTRIAN AND BICYCLE FACILITIES

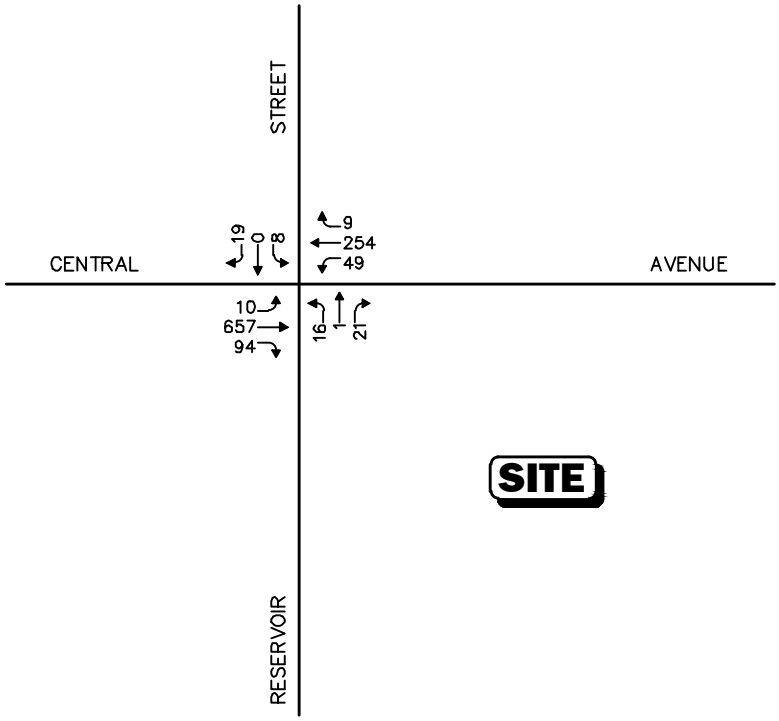
A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in October of 2022. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study area roadways and at the study area intersections. In general, sidewalk is currently provided continuously along Central Avenue, in the vicinity of the Project, with crosswalks provided at its intersection with Reservoir Street. Limited sidewalk is provided along the eastern side of Reservoir Street, south of Central Avenue along the site frontage. Formal bicycle accommodations are not currently provided within the study area.

PUBLIC TRANSPORTATION

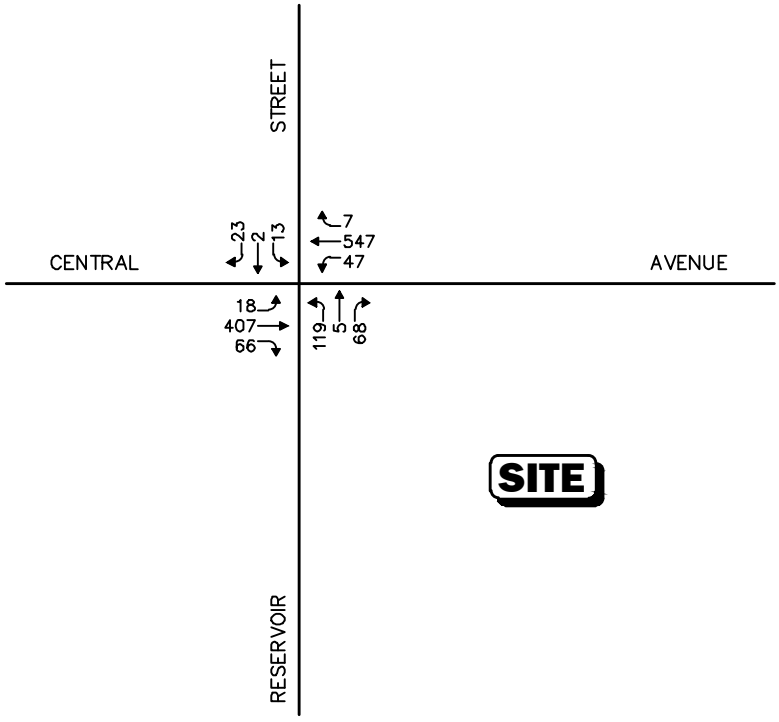
The study area is served by public transportation services provide by the Massachusetts Bay Transit Authority (MBTA). Specifically, the study area is served by the following bus routes:

MBTA Bus Route 59 - Needham Junction via Needham Street – The MBTA Bus Route 59 travels between Watertown Square in Watertown and Needham Junction in Needham via Newton. The nearest stop to the Project Site is at the intersection of Central Avenue and Reservoir Street. Bus Route 59 runs seven days a week and during peak periods has a frequency of approximately 30-40 minutes. Bus Route 59 provides connections to the D Branch of the Green Line at Newton Highlands, to the Needham Line of the commuter rail at Needham Highlands, Needham Center, and Needham Junction, and to the Worcester Line of the MBTA Commuter Rail at Newtonville.

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale

Figure 3

2022 Existing
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2016 through 2020 inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, and severity, and is presented in Table 2.

As summarized in Table 2, the intersection of Central Avenue with Reservoir Street experienced a total of seven (7) collisions over the five year review period, averaging 1.4 crashes per year. The majority of accidents involved property damage only, occurred on dry pavement, and involved angle collisions. Not fatalities were reported at this location. The motor vehicle crash rate for this location falls well below MassDOT's average crash rate for unsignalized intersections in this MassDOT District. No motor vehicle collisions were reported at the existing site driveway intersections with Central Avenue or Reservoir Street.

The Highway Safety Improvement Program (HSIP) database was also reviewed to identify whether any of the study area intersections are listed as HSIP-eligible clusters in the most recent (2017-2019) HSIP cluster listing. Based on this review, no study area intersections are identified as HSIP-eligible cluster locations.

SIGHT DISTANCE ANALYSIS

In order to ensure safe and efficient access will be provided to and from the Project site, a sight distance analysis was conducted for the proposed site driveways with Central Avenue and Reservoir Street. Specifically, available sight lines at the proposed driveway locations were compared to the sight distance requirements as defined by the American Association of State Highway and Transportation Officials (AASHTO).

As previously noted, the posted speed limit along Central Avenue is 25 miles per hour, with the speed limit on Reservoir Street unposted. In conjunction with the ATR data, vehicle speeds were recorded along both Central Avenue and Reservoir Street in order to identify prevailing travel speeds along the corridors. Specifically, the 85th percentile travel speeds, which are utilized for design purposes and are the basis for sight distance analyses were reviewed.

Based on the collected data, the 85th percentile travel speed on Central Avenue is 22 mph in the eastbound direction and 23 mph in the westbound direction. As these speeds are lower than the posted speed limit, the higher 25 mph travel speed was utilized. Along Reservoir Street the 85th percentile travel speeds were determined to be 27 mph in the northbound direction and 31 mph in the southbound direction, which were utilized for the sight distance analysis.

Based on these travel speeds, a minimum of 155 feet of sight distance is required to the east and west at the proposed Central Avenue driveway locations. Field measurements indicate that in excess of 450 feet of sight distance is available to and from the east, with in excess of 325 feet available to and from the west, well exceeding the AASHTO requirement.

At the proposed Reservoir Street site driveway location, a minimum of 210 feet of sight distance is required to and from the north, with a minimum of 175 feet of sight distance required to and from the south. Field measurements indicate that in excess of 275 feet of sight distance is provided to and from the north, exceeding the AASHTO design criteria. Sight lines to the south are currently obstructed due to overgrown vegetation at the southern end of the Project site. Following the removal of this vegetation in conjunction with the Project, in excess of 300 feet is available, exceeding the AASHTO requirements.

Table 2
MOTOR VEHICLE CRASH DATA SUMMARY[a]

Scenario	Central Avenue at Reservoir Street
Year:	
2016	0
2017	2
2018	4
2019	1
2020	0
Total	7
Average[b]	1.4
Crash Rate[c]	0.31
Significant[d]	No
Type:	
Angle	5
Rear-End	1
Head-On	0
Sideswipe	0
Fixed Object	1
Unknown/Other	0
Total	7
Day:	
Weekday	5
Saturday	1
Sunday	1
Total	7
Lighting Conditions:	
Daylight	7
Dawn/Dusk	0
Dark (lit)	0
Dark (unlit)	0
Unknown	0
Total	7
Pavement Conditions	
Dry	7
Wet	0
Snow	0
Ice	0
Unknown(Other)	0
Total	7
Severity:	
Property Only	4
Injury Accident	1
Fatal Accident	0
Unknown/Other	2
Total	7

[a]Source: MassDOT, 2016 through 2020
[b]Average crashes over five-year period.
[c]Crash rate per million entering vehicles (mev).
[d]Unsignalized intersections are significant if rate >0.57 crashes per million vehicles
[e]Signalized intersections are significant if rate >0.73 crashes per million vehicles

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2029, which reflects a seven-year planning horizon consistent with State Traffic Study Guidelines. Independent of the Project, traffic volumes on the roadway network in the year 2029 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon this 2029 No-Build traffic network reflect the 2029 Build conditions with the Project.

FUTURE TRAFFIC GROWTH

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

Background Traffic Growth

In order to account for background growth in traffic, independent of any specific area development projects, a one percent annual compounded growth rate was applied to area traffic volumes over the seven year planning horizon. This growth rate is consistent with the background growth rate utilized for other recently conducted area traffic assessments.

Specific Developments by Others

In addition to the aforementioned background growth rate, traffic volumes associated with the following area development projects were identified based on consultation with the Town of Needham's Planning & Community Development Department, and have been incorporated into the analysis of future traffic conditions.

Highland Science Center - Needham, Massachusetts **–** The Highland Science Center redevelopment project entails the redevelopment of the former Muzi Ford and Chevrolet automobile dealership, service center and car wash, in order to accommodate approximately 496,694± sf of office, laboratory and research and development space, as well as limited retail and restaurant uses. Additional traffic associated with this project were determined based on a review of the traffic impact assessment[1] prepared for this project and have been included in the analysis of future traffic conditions.

No other developments were identified that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

ROADWAY IMPROVEMENT PROJECTS

The Town of Needham's Planning & Community Development Department was contacted to identify if any roadway or traffic signal improvement projects are proposed within the study area that would affect future traffic operations along the either the Central Avenue or Reservoir Street corridors. Based on these discussions, no improvements were identified outside of routing maintenance operations.

NO-BUILD TRAFFIC VOLUMES

The 2029 No-Build peak-hour traffic-volume networks were developed by applying the background growth rate to the 2022 Existing traffic volumes, as well as traffic associated with the aforementioned background development project. The resulting 2029 No-Build weekday morning and weekday evening peak-hour traffic volume networks are shown on Figure 4.

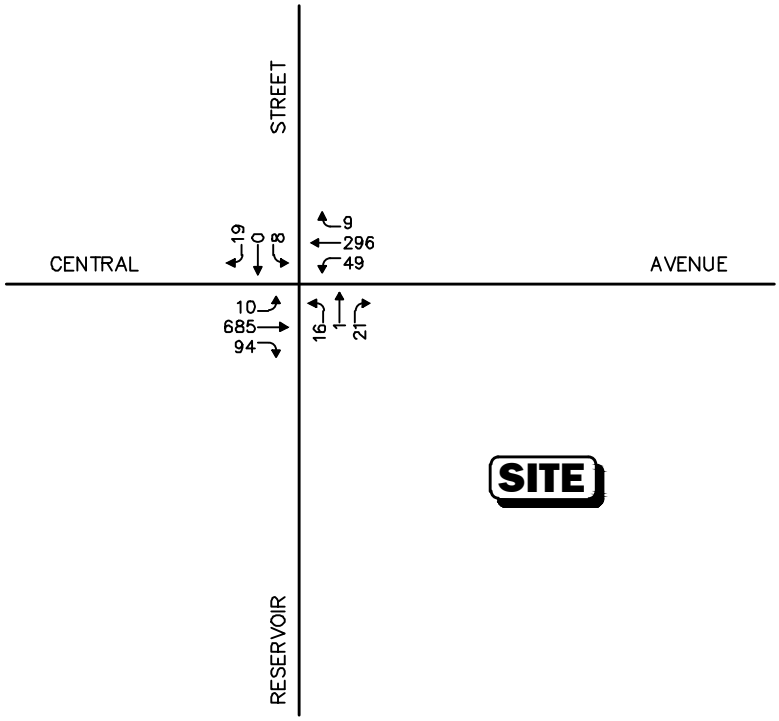
PROJECT-GENERATED TRAFFIC

The proposal entails the development of a multi-unit residential building that will provide a total of 15 apartment units, as well as approximately 2,542± sf of ground level commercial space. In order to develop the traffic characteristics of this proposal, trip-generation statistics published by the Institute of Transportation Engineers (ITE)[2] as part of the *Trip Generation* manual for LUC 220 – *Multifamily Housing (Low-Rise) Not Close to Rail Transit* were used. This land use code represent the most appropriate category for the proposed redevelopment of the site. Additionally, ITE data for LUC 822 – Strip Retail Plaza were utilized to develop the trip generation characteristics of the limited ancillary ground level commercial space. This land use code, which is new to the 11th edition of the manual, is intended for small commercial developments, and likely represents a conservative projection of trips

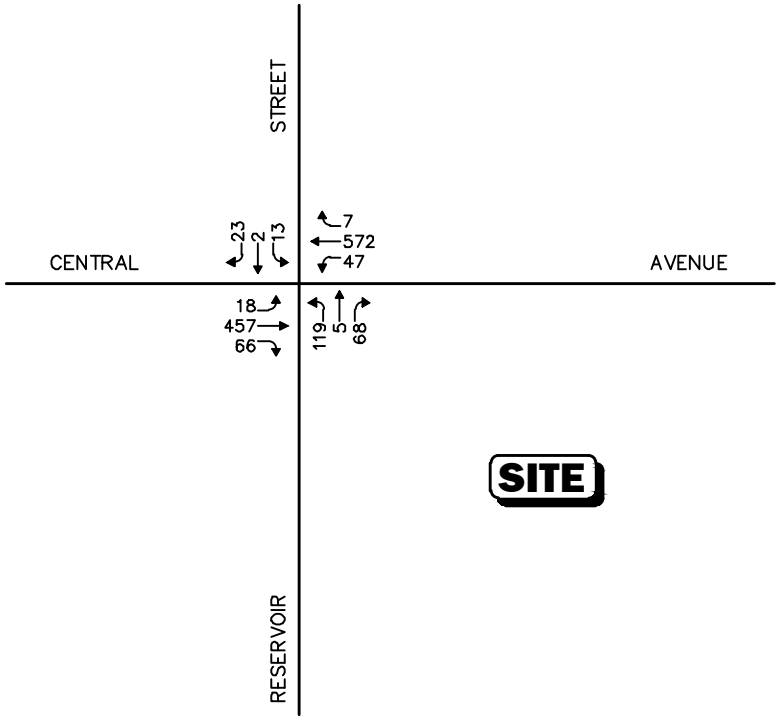
[1] *Transportation Impact and Access Study – Highland Innovation Center, 557 Highland Avenue, Needham, Massachusetts;* VHB, March 2022.

[2] *Trip Generation*, 11th Edition; Institute of Transportation Engineers; Washington, DC; September 2021.

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale

Figure 4

2029 No-Build
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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associated with the commercial space. Given the proximity of the Project site to surrounding residential and commercial uses, it is conservatively assumed that a modest 15 percent of traffic associated with this space will be non-auto in nature, including pedestrian, bicycle and public transit trips.

The trip generation projections are summarized in Table 3.

Table 3
TRIP GENERATION SUMMARY[a]

Time Period/ Directional Distribution	Residential Trips	Commercial Trips	**Total Trips**
Weekday Daily	102	118	**220**
Weekday Morning Peak Hour:			
Entering	1	3	**4**
Exiting	5	2	**7**
Total	6	5	**11**
Weekday Evening Peak Hour:			
Entering	5	7	**12**
Exiting	3	7	**10**
Total	8	14	**22**

[a]Based on ITE LUC 221 – Multifamily Housing (Mid-Rise) Not Close to Rail Transit, 15 units.
[b]Based on ITE LUC 822 – Strip Retail Plaza, 2,542 sf, adjusted to reflect 15% non-auto trips.

As summarized in Table 3, the Project is expected to generate approximately 220 vehicle trips on a typical weekday (110 entering and 110 exiting), including 11 vehicle trips (4 entering and 7 exiting) during the weekday morning peak hour and 22 vehicle trips (12 entering and 10 exiting) during the weekday evening peak hour.

It is noted that these projections do not reflect the elimination of existing traffic activity arriving and departing the Project site under current conditions. The project currently houses Panella's Market and Deli, which based on field observations generates moderate traffic activity, particularly during lunch time hours. Additionally, approximately 5 employee vehicles were observed parked in the area that serves the second story office. It is also noted that the eastern portion of the Project site previously housed a use car sales lot. In total, these uses when operational, likely generated traffic that is similar to the proposed Project. However, in an effort to provide a conservative assessment of Project impacts, no reduction to area traffic was applied to account for the elimination of these existing and prior uses of the Project site.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated trips to and from the proposed development was determined based on a review of existing traffic patterns along the Central Avenue corridor and the anticipated arrival and distribution patterns for commuter traffic. In general, it is expected that 70 percent

of Project-related traffic will be oriented to and from Central Avenue, east of the site, with the remaining 30 percent oriented to and from Central Avenue, west of the site.

The general trip distribution for the project is summarized in Table 4. The weekday morning and weekday evening peak-hour traffic volumes expected to be generated by the Project were assigned on the study area roadway network based on these patterns, as shown on Figure 5.

Table 4
TRIP-DISTRIBUTION SUMMARY

Roadway	Direction (To/From)	Percentage (%)
Central Avenue	East	70%
Central Avenue	West	30%
TOTAL		**100%**

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2029 Build condition networks consist of the 2029 No-Build traffic volumes with the anticipated Project-generated traffic added to them. The 2029 Build weekday morning and weekday evening peak-hour traffic volume networks are graphically depicted on Figure 6.

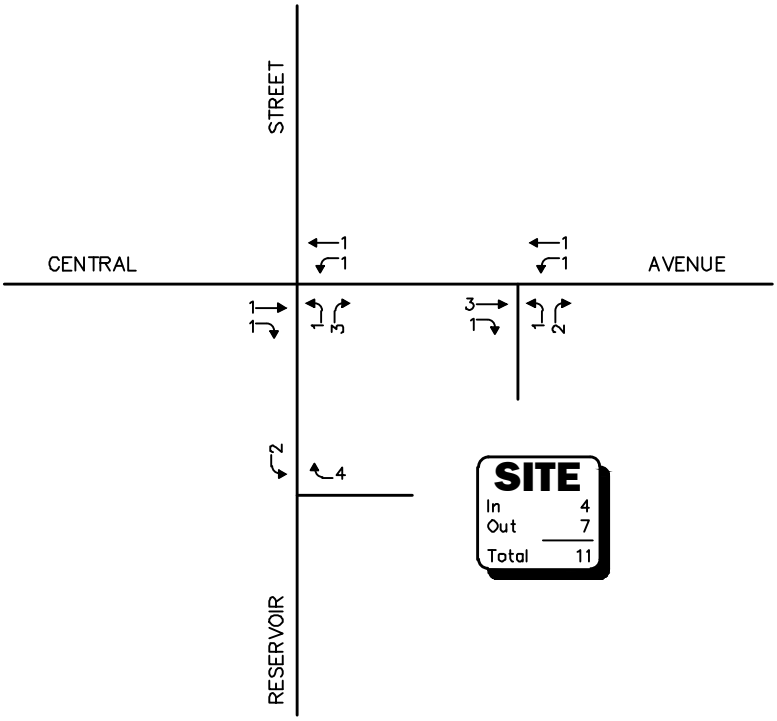
A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 5. These volumes are based on the expected increases from the Project.

Table 5
PEAK HOUR TRAFFIC-VOLUME INCREASES

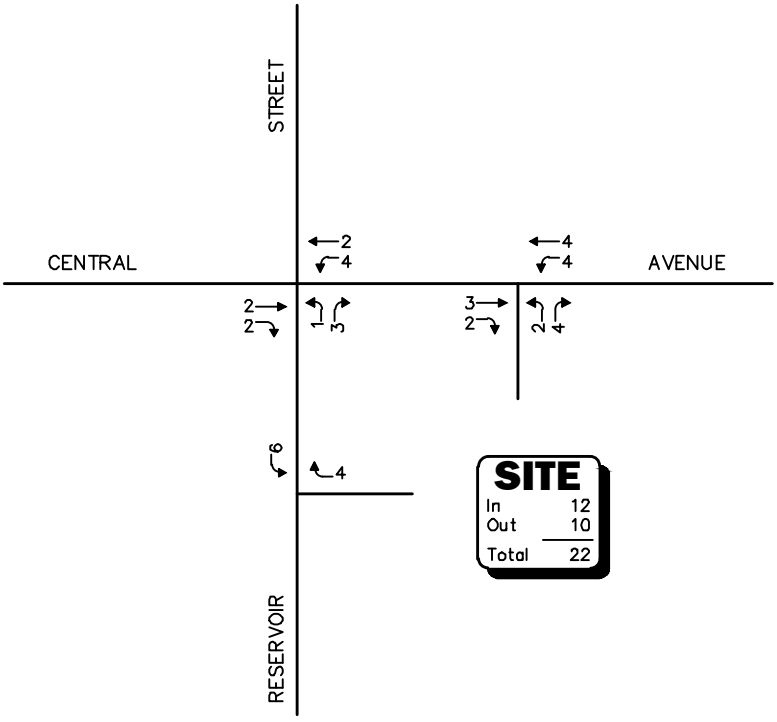
Location/Peak Hour	2029 No-Build	2029 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
Central Avenue at Reservoir Street:				
Weekday Morning	1,208	1,216	8	0.7
Weekday Evening	1,397	1,411	14	1.0

As summarized in Table 5, in comparison to future 2029 No-Build conditions, overall traffic volumes are expected to increase by approximately 0.7 to 1.0 percent at all off-site locations evaluated as part of this assessment, with overall volumes expected to increase by approximately 8 to 14 vehicles per hour, or approximately one new vehicle trip every 4 to 7 minutes. This level of traffic increase is unlikely to be notable to area motorists.

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale

Figure 5

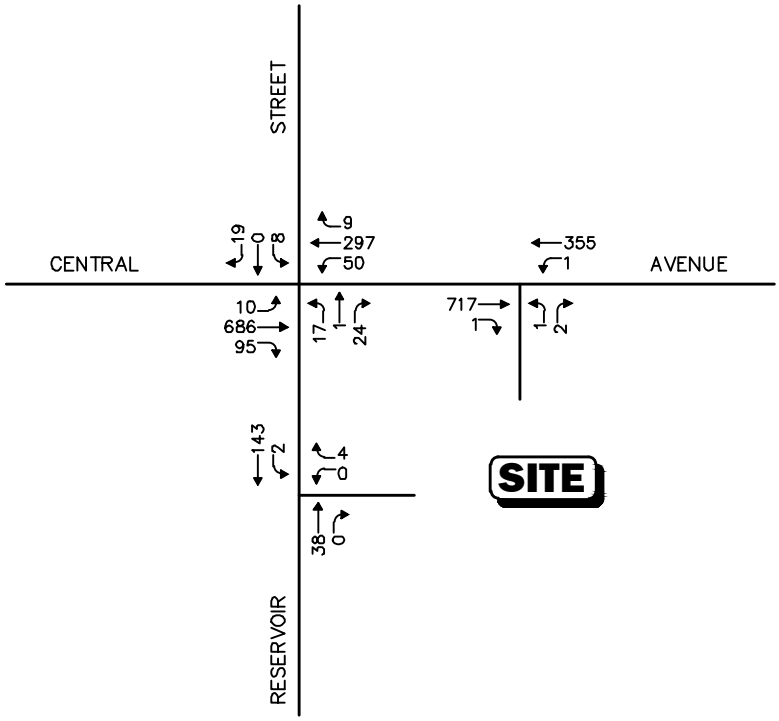
Project-Generated Peak-Hour Traffic Volumes

Vanasse & Associates inc

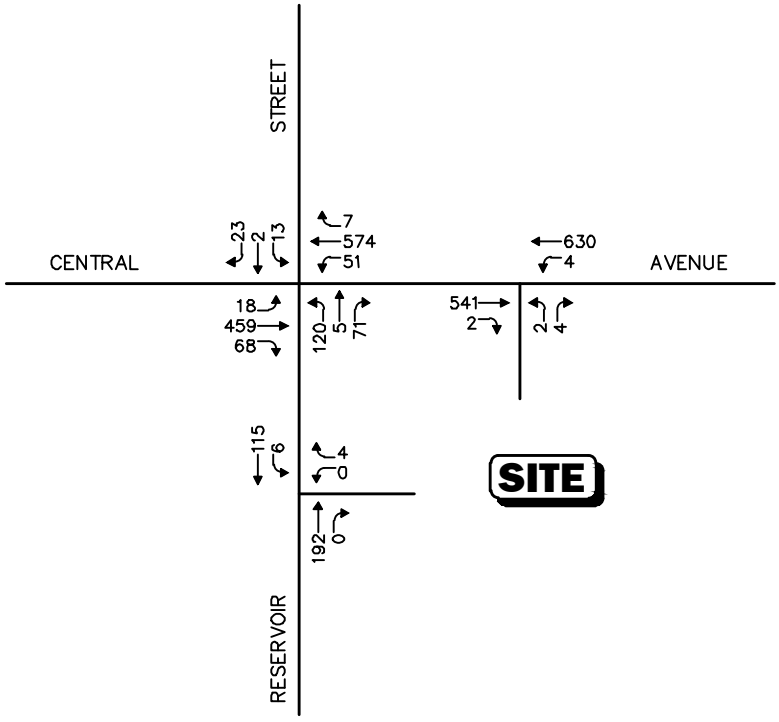
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WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale

Figure 6

2029 Build
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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TRAFFIC OPERATIONS ANALYSIS

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build and Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[3] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.

[3]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, DC; 2010.

- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual.*[4] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 6 summarizes the relationship between level of service and average control delay for two way stop controlled and all-way stop controlled intersections.

Table 6
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
v/c ≤ 1.0	v/c > 1.0	
A	F	≤10.0
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	>50.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

ANALYSIS RESULTS

Level-of-service analyses were conducted for 2022 Existing, 2029 No-Build and 2029 Build conditions for the intersections within the study area. The results of the intersection capacity analyses for signalized and unsignalized intersections are summarized in Table 7, with detailed analysis results provided in the Appendix. The following is a summary of the level-of-service and delay analyses for the intersections within the study area:

[4]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Table 7
UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

	2022 Existing			2029 No-Build			2029 Build		
Location/Time Period/Movement	V/C[a]	Delay[b]	LOS[c]	V/C	Delay	LOS	V/C	Delay	LOS
Central Avenue at Reservoir Street									
Weekday Morning Peak Hour									
Central Avenue EB	0.01	<5	A	0.01	<5	A	0.01	<5	A
Central Avenue WB	0.07	<5	A	0.07	<5	A	0.07	<5	A
Reservoir Street NB	0.13	21	C	0.14	23	C	0.15	23	C
Reservoir Street SB	0.07	17	C	0.08	18	C	0.09	18	C
Weekday Evening Peak Hour									
Central Avenue EB	0.02	<5	A	0.02	<5	A	0.02	<5	A
Central Avenue WB	0.05	<5	A	0.05	<5	A	0.06	<5	A
Reservoir Street NB	>1.2	>80	F	>1.2	>80	F	>1.2	>80	F
Reservoir Street SB	0.17	26	D	0.21	29	D	0.21	30	D
Central Avenue at Site Driveway									
Weekday Morning Peak Hour									
Central Avenue WB	--	--	--	--	--	--	0.00	<5	A
Site Driveway NB	--	--	--	--	--	--	0.01	17	C
Weekday Evening Peak Hour									
Central Avenue WB	--	--	--	--	--	--	0.00	<5	A
Site Driveway NB	--	--	--	--	--	--	0.02	17	C
Reservoir Street at Site Driveway									
Weekday Morning Peak Hour									
Site Driveway WB	--	--	--	--	--	--	0.00	9	A
. Reservoir Street SB	--	--	--	--	--	--	0.04	<5	A
Weekday Evening Peak Hour									
Site Driveway WB	--	--	--	--	--	--	0.00	8	A
. Reservoir Street SB	--	--	--	--	--	--	0.00	<5	A

[a]Volume to capacity ratio.
[b]Delay in seconds per vehicle.
[c]Level of service.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound

Unsignalized Capacity Analysis Results

Central Avenue at Reservoir Street

Under 2022 Existing conditions, mainline traffic volumes along Central Avenue, at its intersection with Reservoir Street currently operate at LOS A conditions during both the weekday morning and weekday evening peak hours, with northbound movements from Reservoir Street operating at LOS C during the weekday morning peak hour and LOS F during the weekday evening peak hour. Under future 2029 No-Build conditions, mainline traffic volumes on Central Avenue are projected to continue to operate at LOS A, with northbound Reservoir Street continuing to operate at LOS C during the weekday morning and LOS F during the weekday evening peak hour. Under future 2029 Build conditions, mainline traffic volumes on Central Avenue are projected to continue to operate at LOS A, with northbound Reservoir Street continuing to operate at LOS C during the weekday morning peak hour and LOS F during the weekday evening peak hour.

It is noted that field observations indicate lower delays for northbound traffic than the capacity analysis model suggests. This is likely due to motorists exiting the commercial side of Reservoir Street being familiar with area traffic patterns and utilizing smaller gaps in traffic than the model assumes. It is noted that during periods where longer delays on Reservoir Street occur, exiting motorist may use the Central Avenue driveway as a means to exit the site.

Central Avenue at Site Driveway

Under 2029 Build conditions, mainline traffic volumes along Central Avenue, at the proposed site driveway location, are projected to operate at LOS A during both peak periods, with the site driveway operating at LOS C, with minimal vehicular queueing.

Reservoir Street at Site Driveway

Under 2029 Build conditions, mainline traffic volumes along Reservoir Street, at the proposed site driveway location, are projected to operate at LOS A during both peak periods, with the site driveway operating at LOS A, with minimal vehicular queueing.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

As documented in this assessment:

- Project-related traffic increases are expected to amount to 11 new vehicle trips (4 entering and 7 exiting) during the weekday morning peak hour and 22 new vehicle trips (12 entering and 10 exiting) during the weekday evening peak hour;

- No notable safety deficiencies were identified within the study area, with all study area intersections exhibiting motor vehicle crash rates below the MassDOT state average, and available sight lines exceeding the minimum requirements to ensure safe access to and from the Project;

- In comparison to future No-Build traffic volumes, Project-related traffic increases amount to an increase in peak hour traffic volumes of approximately 0.7 to 1.0 percent;

- Project-related traffic conditions are expected to amount to only minor increases to delays as compared to future No-Build conditions.

The following recommendations are provided to ensure safe and efficient access to the Project.

RECOMMENDATIONS

Site Access

Access to the Project site is proposed via new curb cuts on the southern side of Central Avenue and eastern side of Reservoir Street. The proposed driveways will provide a single entering and exiting lane of travel. It is recommended that the proposed driveways be placed under STOP-sign control, with a painted STOP bar at the driveway approaches to Central Avenue and Reservoir Street. In order to ensure safe and efficient access to the Project and that adequate sightlines are provided in both directions, all signs and landscaping should be designed as to not impede lines of sight in both directions. Additionally, existing vegetation that currently limits sight lines to the south from the Reservoir Street driveway location should be removed and regularly maintained to ensure adequate sight lines are maintained to and from the south.

Transportation Demand Management

In order to minimize the number of single occupancy vehicles (SOVs) arriving and departing the Project, and to take advantage of transit, bicycle and pedestrian facilities that are available to residents of the Project, the proponent is committed to implementing a comprehensive Transportation Demand Management (TDM) Plan. Elements of the plan include the following measures:

- ***Orientation Packets:*** Prior to move in activities, the Proponent will provide orientation packets to new residents and tenants containing information on site access and circulation; and available transportation choices, including transit routes/schedules and nearby vehicle sharing locations and bicycle facilities.

- ***Bicycle Accommodation:*** The Proponent will provide interior and exterior bicycle storage in secure sheltered areas for residents and visitors of the Project.

CONCLUSION

In summary, the addition of Project-related traffic to study area roadways and intersections is not anticipated to significantly impact traffic operations within the study area over No-Build conditions. As documented in this report, Project-related traffic increases do not result in significant impact to area traffic operations, with only minimal increases to motorist delays projected along the Central Avenue and Reservoir Street corridors. With implementation of the above recommendations, the proposed Project can be built with minimal traffic impact on the surrounding roadway system.

APPENDIX

TRAFFIC COUNT DATA
MOTOR VEHICLE CRASH DATA
BACKGROUND DEVELOPMENT PROJECTS
TRIP GENERATION DATA
CAPACITY ANALYSIS RESULTS

TRAFFIC COUNT DATA

Accurate Counts

978-664-2565

Location : Central Avenue 95140002
Location : East of Reservoir Street
City/State: Needham, MA
Direction: EB,

10/25/2022 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	2	3	4	5	0	0	0	0	0	0	14
1:00	0	0	0	0	1	0	4	1	1	0	0	0	0	0	7
2:00	0	0	0	0	1	1	1	0	1	0	0	0	0	0	4
3:00	0	0	0	0	2	0	0	3	0	0	0	0	0	0	5
4:00	0	0	0	0	3	1	3	7	1	1	1	0	0	0	17
5:00	0	0	0	0	0	12	27	17	5	0	0	0	0	0	61
6:00	0	0	0	6	35	53	83	52	15	1	1	0	0	0	246
7:00	0	0	5	21	139	145	119	42	8	4	0	0	0	1	484
8:00	0	0	66	84	107	90	120	19	15	2	1	0	0	0	504
9:00	0	0	4	17	102	123	111	32	10	1	2	0	0	0	402
10:00	0	0	2	10	55	79	63	13	8	7	4	0	0	0	241
11:00	0	0	3	9	55	72	84	15	11	6	3	1	1	0	260
12:00 PM	0	0	1	13	48	79	74	20	4	4	1	0	0	1	245
1:00	0	0	0	7	28	57	99	34	6	7	3	1	0	0	242
2:00	0	0	1	9	61	56	105	31	14	9	3	1	0	0	290
3:00	0	0	9	14	53	77	72	41	15	10	6	7	1	2	307
4:00	0	0	4	5	46	77	106	52	21	6	9	6	1	0	333
5:00	0	0	5	10	49	77	127	40	19	17	3	5	3	0	355
6:00	0	0	1	6	48	83	131	32	15	12	4	4	1	0	337
7:00	0	0	0	4	26	53	56	29	8	2	2	0	1	0	181
8:00	0	0	0	2	17	34	49	17	5	0	0	0	0	0	124
9:00	0	0	0	2	15	24	31	9	3	1	0	0	0	0	85
10:00	0	0	2	1	6	8	8	0	1	0	1	0	0	0	27
11:00	0	0	0	0	1	1	1	2	0	0	0	0	0	0	5
Total	0	0	103	220	900	1205	1478	513	186	90	44	25	8	4	4776
			Percentile	15th	50th	85th	95th								
			Speed	14	17	21	25								
		Mean Speed (Average)		18.0											
		10 MPH Pace Speed		12-21											
		Number in Pace		3744											
		Percent in Pace		78.4%											
		Number > 21 MPH		870											
		Percent > 21 MPH		18.2%											
Grand Total	0	0	103	220	900	1205	1478	513	186	90	44	25	8	4	4776
Stats			Percentile	15th	50th	85th	95th								
			Speed	14	18	22	26								
		Mean Speed (Average)		18.4											
		10 MPH Pace Speed		12-21											
		Number in Pace		3744											
		Percent in Pace		78.4%											
		Number > 21 MPH		2450											
		Percent > 21 MPH		24.5%											

Accurate Counts
978-664-2565

Location : Central Avenue 95140002
Location : East of Reservoir Street
City/State: Needham, MA
Direction: WB,

10/25/2022 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	2	2	3	2	3	0	1	1	0	0	14
1:00	0	0	0	0	0	0	2	3	1	0	0	0	0	0	6
2:00	0	0	0	0	0	1	1	0	1	0	0	0	0	0	3
3:00	0	0	0	0	0	0	1	1	3	0	0	0	0	0	5
4:00	0	0	0	0	0	2	3	0	4	0	0	0	0	0	9
5:00	0	0	0	1	2	2	3	4	2	3	0	0	1	0	18
6:00	0	0	4	3	19	24	23	24	10	1	1	0	0	0	109
7:00	0	0	6	10	32	42	60	33	15	3	1	1	0	0	203
8:00	0	0	12	11	42	44	65	40	19	6	2	2	0	0	243
9:00	0	0	7	24	46	55	79	42	27	3	1	0	0	0	284
10:00	0	0	3	2	43	60	61	39	16	6	3	0	0	0	233
11:00	0	0	5	12	56	78	84	50	20	13	2	1	0	0	321
12:00 PM	0	0	4	18	49	69	74	68	31	17	3	0	0	0	333
1:00	0	0	10	16	42	72	102	67	37	8	1	2	0	0	357
2:00	0	0	7	20	76	88	130	63	28	7	2	1	0	0	422
3:00	0	0	10	28	84	114	158	101	32	4	2	2	0	0	535
4:00	0	0	11	25	70	102	158	107	40	16	4	0	0	0	533
5:00	0	0	17	28	79	111	184	113	30	15	1	3	0	0	581
6:00	0	0	12	19	55	93	109	75	41	12	2	1	0	0	419
7:00	0	0	4	8	13	35	68	56	37	14	7	1	0	0	243
8:00	0	0	1	13	20	26	46	30	18	9	0	0	0	0	163
9:00	0	0	0	6	17	36	47	20	7	4	0	0	0	0	137
10:00	0	0	0	2	5	10	21	9	10	2	1	1	0	0	61
11:00	0	0	0	0	1	0	3	6	1	0	0	0	0	0	11
Total	0	0	113	246	753	1066	1485	953	433	143	34	16	1	0	5243
			Percentile	15th	50th	85th	95th								
			Speed	14	19	23	26								
		Mean Speed (Average)		18.8											
		10 MPH Pace Speed		14-23											
		Number in Pace		3748											
		Percent in Pace		71.5%											
		Number > 21 MPH		1580											
		Percent > 21 MPH		30.1%											
Grand Total	0	0	113	246	753	1066	1485	953	433	143	34	16	1	0	5243
Stats			Percentile	15th	50th	85th	95th								
			Speed	14	19	23	26								
		Mean Speed (Average)		18.8											
		10 MPH Pace Speed		14-23											
		Number in Pace		3748											
		Percent in Pace		71.5%											
		Number > 21 MPH		1580											
		Percent > 21 MPH		30.1%											

Accurate Counts

978-664-2565

Location : Central Avenue 95140002
Location : East of Reservoir Street
City/State: Needham, MA

10/25/2022	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	59			5	75				
12:15	3	53			5	81				
12:30	5	51			2	85				
12:45	5	82	14	245	2	92	14	333	28	578
1:00	2	71			4	75				
1:15	0	50			1	92				
1:30	3	63			1	92				
1:45	2	58	7	242	0	98	6	357	13	599
2:00	2	71			1	96				
2:15	1	78			1	104				
2:30	0	60			0	124				
2:45	1	81	4	290	1	98	3	422	7	712
3:00	0	67			0	130				
3:15	0	87			0	126				
3:30	2	66			2	136				
3:45	3	87	5	307	3	143	5	535	10	842
4:00	2	72			1	127				
4:15	2	83			0	140				
4:30	8	79			3	128				
4:45	5	99	17	333	5	138	9	533	26	866
5:00	10	92			1	148				
5:15	7	91			6	154				
5:30	25	93			4	147				
5:45	19	79	61	355	7	132	18	581	79	936
6:00	32	99			10	115				
6:15	46	86			32	118				
6:30	71	76			25	91				
6:45	97	76	246	337	42	95	109	419	355	756
7:00	129	69			44	66				
7:15	141	40			52	56				
7:30	112	35			50	64				
7:45	102	37	484	181	57	57	203	243	687	424
8:00	132	42			51	47				
8:15	129	19			65	49				
8:30	120	33			49	37				
8:45	123	30	504	124	78	30	243	163	747	287
9:00	100	42			87	45				
9:15	119	19			61	34				
9:30	87	15			70	32				
9:45	96	9	402	85	66	26	284	137	686	222
10:00	69	12			52	11				
10:15	72	6			57	22				
10:30	54	4			58	20				
10:45	46	5	241	27	66	8	233	61	474	88
11:00	69	5			80	11				
11:15	62	1			85	13				
11:30	65	2			72	11				
11:45	64	3	260	11	84	3	321	38	581	49
Total	2245	2537			1448	3822			3693	6359
Percent	46.9%	53.1%			27.5%	72.5%			36.7%	63.3%
Grand Total	2245	2537			1448	3822			3693	6359
Percent	46.9%	53.1%			27.5%	72.5%			36.7%	63.3%
ADT		ADT: 10,052		AADT: 10,052						

Accurate Counts
978-664-2565

Location : Central Avenue 95140002
Location : East of Reservoir Street
City/State: Needham, MA

10/25/2022	EB,	WB,		
Time				Total
12:00 AM	14	14		28
1:00	7	6		13
2:00	4	3		7
3:00	5	5		10
4:00	17	9		26
5:00	61	18		79
6:00	246	109		355
7:00	484	203		687
8:00	504	243		747
9:00	402	284		686
10:00	241	233		474
11:00	260	321		581
12:00 PM	245	333		578
1:00	242	357		599
2:00	290	422		712
3:00	307	535		842
4:00	333	533		866
5:00	355	581		936
6:00	337	419		756
7:00	181	243		424
8:00	124	163		287
9:00	85	137		222
10:00	27	61		88
11:00	5	11		16
Total	4776	5243		10019
Percent	47.7%	52.3%		
AM Peak	8:00	11:00		8:00
Volume	504	321		747
PM Peak	5:00	5:00		5:00
Volume	355	581		936
Grand Total	4776	5243		10019
Percent	47.7%	52.3%		
ADT		ADT: 10,052	AADT: 10,052	

Accurate Counts

978-664-2565

Location : Reservoir Street 95140001
Location : South of Central Avenue
City/State: Needham, MA
Direction: NB,

10/18/2022 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7
2:00	0	0	0	1	0	0	1	1	0	0	0	0	0	0	3
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
6:00	0	0	0	1	1	4	3	0	1	2	1	0	0	0	13
7:00	0	0	1	0	3	2	4	8	4	3	2	0	0	0	27
8:00	0	0	0	1	2	4	5	12	10	1	2	0	0	0	37
9:00	0	0	1	2	6	7	5	8	11	5	2	0	0	0	47
10:00	0	0	0	0	2	6	3	10	6	0	0	1	0	0	28
11:00	0	0	2	4	11	6	6	6	8	2	2	0	1	0	48
12:00 PM	0	0	6	14	8	19	15	14	13	4	1	1	0	1	96
1:00	0	0	2	8	9	10	8	11	10	5	1	0	0	0	64
2:00	0	0	1	4	11	13	10	14	8	9	3	1	0	0	74
3:00	0	0	1	4	8	15	11	29	15	11	8	0	0	0	102
4:00	0	0	1	4	15	17	13	26	23	9	1	1	0	0	110
5:00	0	0	3	6	23	25	26	21	31	6	1	1	0	0	143
6:00	0	0	2	6	8	11	9	16	12	4	3	0	0	0	71
7:00	0	0	1	0	6	4	9	25	19	6	2	0	0	0	72
8:00	0	0	1	0	0	3	1	9	2	3	1	4	0	0	24
9:00	0	0	0	0	2	7	14	14	11	3	0	1	0	0	52
10:00	0	0	0	0	0	0	1	0	1	2	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	29	55	115	153	144	226	185	75	30	10	1	1	1024
			Percentile	15th	50th	85th	95th								
			Speed	14	22	27	30								
		Mean Speed (Average)		20.6											
		10 MPH Pace Speed		17-26											
		Number in Pace		605											
		Percent in Pace		59.1%											
		Number > 24 MPH		302											
		Percent > 24 MPH		29.5%											
Grand Total	0	0	29	55	115	153	144	226	185	75	30	10	1	1	1024
Stats			Percentile	15th	50th	85th	95th								
			Speed	14	22	27	30								
		Mean Speed (Average)		20.6											
		10 MPH Pace Speed		17-26											
		Number in Pace		605											
		Percent in Pace		59.1%											
		Number > 24 MPH		302											
		Percent > 24 MPH		29.5%											

Accurate Counts
978-664-2565

Location : Reservoir Street 95140001
Location : South of Central Avenue
City/State: Needham, MA
Direction: SB,

10/18/2022 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	1	3	0	0	0	0	0	4
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
5:00	0	0	1	0	0	3	2	1	2	2	1	0	0	0	12
6:00	0	0	0	1	0	2	1	4	6	8	6	2	1	0	31
7:00	0	0	0	0	0	8	6	12	11	15	7	7	1	0	67
8:00	0	0	0	2	3	17	17	10	28	22	17	8	0	0	124
9:00	0	0	0	1	5	11	10	13	24	20	13	10	2	2	111
10:00	0	0	0	2	3	9	18	11	15	5	2	2	0	0	67
11:00	0	0	0	4	11	13	13	10	7	8	10	0	1	1	78
12:00 PM	0	0	0	2	16	15	19	7	9	13	3	0	0	0	84
1:00	0	0	1	3	10	9	8	9	13	8	7	2	0	0	70
2:00	0	0	0	2	9	10	12	9	12	10	8	3	0	0	75
3:00	0	0	1	1	12	13	14	17	16	13	16	6	2	0	111
4:00	0	0	0	2	7	9	13	13	11	10	9	3	2	0	79
5:00	0	0	0	0	9	9	5	17	17	20	14	8	2	1	102
6:00	0	0	0	1	3	1	3	6	15	20	11	4	0	0	64
7:00	0	0	0	0	0	1	1	2	5	10	6	2	1	0	28
8:00	0	0	0	0	0	0	2	1	9	9	3	1	0	0	25
9:00	0	0	0	0	0	0	1	0	6	4	2	0	0	0	13
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	21	88	130	145	143	210	197	135	58	13	4	1147
			Percentile	15th	50th	85th	95th								
			Speed	17	25	31	34								
		Mean Speed (Average)		24.4											
		10 MPH Pace Speed		20-29											
		Number in Pace		597											
		Percent in Pace		52.0%											
		Number > 24 MPH		617											
		Percent > 24 MPH		53.8%											
Grand Total	0	0	3	21	88	130	145	143	210	197	135	58	13	4	1147
Stats			Percentile	15th	50th	85th	95th								
			Speed	17	25	31	34								
		Mean Speed (Average)		24.4											
		10 MPH Pace Speed		20-29											
		Number in Pace		597											
		Percent in Pace		52.0%											
		Number > 24 MPH		617											
		Percent > 24 MPH		53.8%											

Accurate Counts

978-664-2565

Location : Reservoir Street 95140001
Location : South of Central Avenue
City/State: Needham, MA

10/18/2022	NB,		Hour Totals		SB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	24			0	19				
12:15	0	24			0	20				
12:30	0	16			0	26				
12:45	0	32	0	96	0	19	0	84	0	180
1:00	7	14			0	12				
1:15	0	19			0	20				
1:30	0	16			0	22				
1:45	0	15	7	64	0	16	0	70	7	134
2:00	0	18			3	16				
2:15	2	18			0	18				
2:30	0	20			0	17				
2:45	1	18	3	74	1	24	4	75	7	149
3:00	0	23			0	20				
3:15	0	12			0	14				
3:30	0	20			0	26				
3:45	0	47	0	102	0	51	0	111	0	213
4:00	0	38			0	21				
4:15	0	20			0	22				
4:30	0	28			0	10				
4:45	0	24	0	110	2	26	2	79	2	189
5:00	0	48			1	20				
5:15	0	33			0	44				
5:30	2	43			6	23				
5:45	0	19	2	143	5	15	12	102	14	245
6:00	1	19			4	12				
6:15	1	18			8	9				
6:30	4	14			9	9				
6:45	7	20	13	71	10	34	31	64	44	135
7:00	11	45			17	16				
7:15	2	11			12	6				
7:30	4	7			17	2				
7:45	10	9	27	72	21	4	67	28	94	100
8:00	9	4			29	1				
8:15	8	5			21	8				
8:30	10	12			27	5				
8:45	10	3	37	24	47	11	124	25	161	49
9:00	23	39			43	9				
9:15	11	3			19	3				
9:30	3	9			27	0				
9:45	10	1	47	52	22	1	111	13	158	65
10:00	10	3			18	0				
10:15	7	1			16	0				
10:30	5	0			17	0				
10:45	6	0	28	4	16	0	67	0	95	4
11:00	20	0			20	0				
11:15	11	0			22	0				
11:30	14	2			20	1				
11:45	3	0	48	2	16	0	78	1	126	3
Total	212	814			496	652			708	1466
Percent	20.7%	79.3%			43.2%	56.8%			32.6%	67.4%
Grand Total	212	814			496	652			708	1466
Percent	20.7%	79.3%			43.2%	56.8%			32.6%	67.4%
ADT		ADT: 2,174		AADT: 2,174						

Accurate Counts
978-664-2565

Location : Reservoir Street 95140001
Location : South of Central Avenue
City/State: Needham, MA

10/18/2022	NB,	SB,		
Time				Total
12:00 AM	0	0		0
1:00	7	0		7
2:00	3	4		7
3:00	0	0		0
4:00	0	2		2
5:00	2	12		14
6:00	13	31		44
7:00	27	67		94
8:00	37	124		161
9:00	47	111		158
10:00	28	67		95
11:00	48	78		126
12:00 PM	96	84		180
1:00	64	70		134
2:00	74	75		149
3:00	102	111		213
4:00	110	79		189
5:00	143	102		245
6:00	71	64		135
7:00	72	28		100
8:00	24	25		49
9:00	52	13		65
10:00	4	0		4
11:00	0	0		0
Total	1024	1147		2171
Percent	47.2%	52.8%		
AM Peak	11:00	8:00		8:00
Volume	48	124		161
PM Peak	5:00	3:00		5:00
Volume	143	111		245
Grand Total	1024	1147		2171
Percent	47.2%	52.8%		
ADT		ADT: 2,174	AADT: 2,174	

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 1

Groups Printed- Cars - Trucks

	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	3	0	5	10	39	1	4	0	7	2	150	7	228
07:15 AM	2	0	2	6	49	1	1	0	2	4	192	7	266
07:30 AM	4	0	4	5	40	1	1	0	2	5	186	14	262
07:45 AM	0	0	6	9	63	2	4	0	3	5	162	11	265
Total	9	0	17	30	191	5	10	0	14	16	690	39	1021
08:00 AM	1	0	4	9	63	3	4	0	6	3	145	24	262
08:15 AM	3	0	5	14	69	2	4	0	3	2	193	13	308
08:30 AM	1	0	4	9	69	3	4	0	5	2	159	21	277
08:45 AM	3	0	6	17	53	1	4	1	7	3	160	36	291
Total	8	0	19	49	254	9	16	1	21	10	657	94	1138
Grand Total	17	0	36	79	445	14	26	1	35	26	1347	133	2159
Apprch %	32.1	0	67.9	14.7	82.7	2.6	41.9	1.6	56.5	1.7	89.4	8.8	
Total %	0.8	0	1.7	3.7	20.6	0.6	1.2	0	1.6	1.2	62.4	6.2	
Cars	17	0	35	78	437	14	26	1	34	25	1332	132	2131
% Cars	100	0	97.2	98.7	98.2	100	100	100	97.1	96.2	98.9	99.2	98.7
Trucks	0	0	1	1	8	0	0	0	1	1	15	1	28
% Trucks	0	0	2.8	1.3	1.8	0	0	0	2.9	3.8	1.1	0.8	1.3

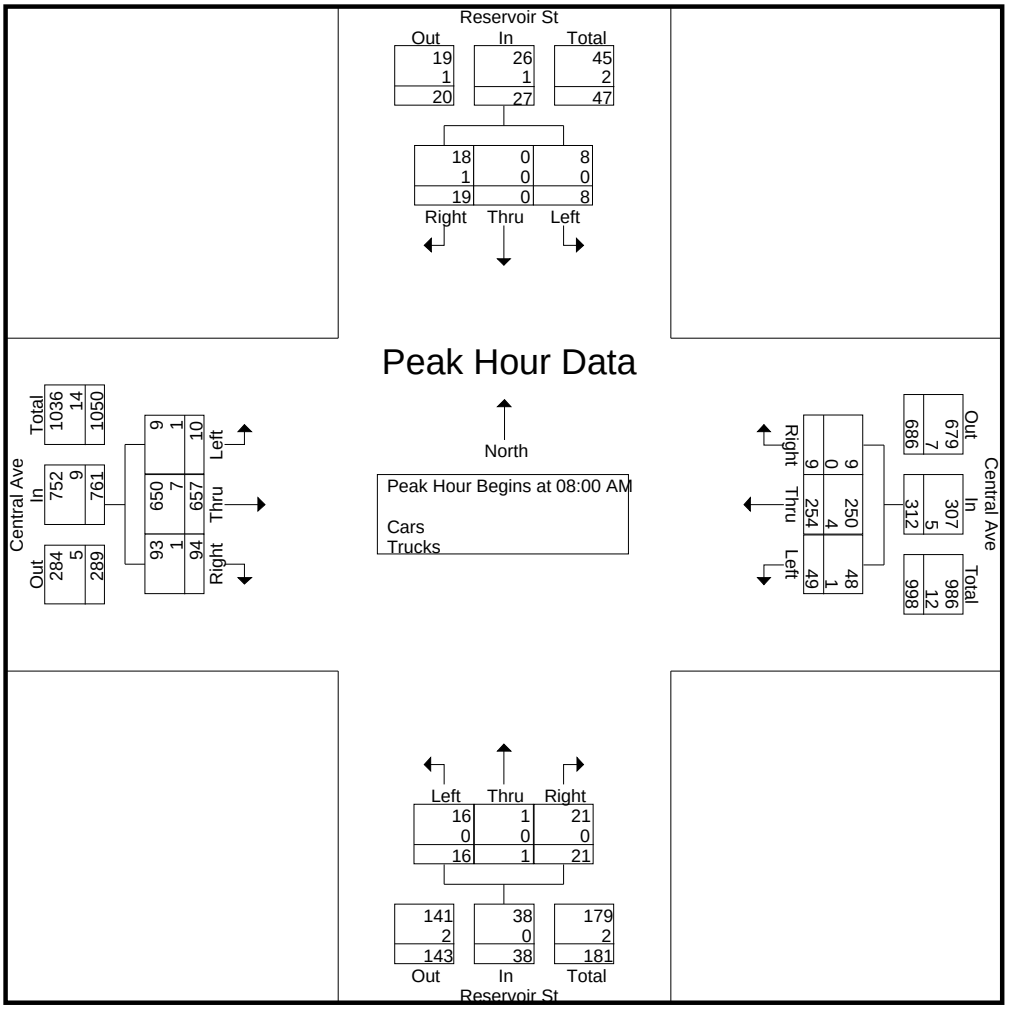
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	0	4	5	9	63	**3**	75	**4**	0	6	10	**3**	145	24	172	262
08:15 AM	**3**	0	5	8	14	**69**	2	**85**	4	0	3	7	2	**193**	13	**208**	**308**
08:30 AM	1	0	4	5	9	69	3	81	4	0	5	9	2	159	21	182	277
08:45 AM	3	0	**6**	**9**	**17**	53	1	71	4	**1**	**7**	**12**	3	160	**36**	199	291
Total Volume	8	0	19	27	49	254	9	312	16	1	21	38	10	657	94	761	1138
% App. Total	29.6	0	70.4		15.7	81.4	2.9		42.1	2.6	55.3		1.3	86.3	12.4		
PHF	.667	.000	.792	.750	.721	.920	.750	.918	1.00	.250	.750	.792	.833	.851	.653	.915	.924
Cars	8	0	18	26	48	250	9	307	16	1	21	38	9	650	93	752	1123
% Cars	100	0	94.7	96.3	98.0	98.4	100	98.4	100	100	100	100	90.0	98.9	98.9	98.8	98.7
Trucks	0	0	1	1	1	4	0	5	0	0	0	0	1	7	1	9	15
% Trucks	0	0	5.3	3.7	2.0	1.6	0	1.6	0	0	0	0	10.0	1.1	1.1	1.2	1.3

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

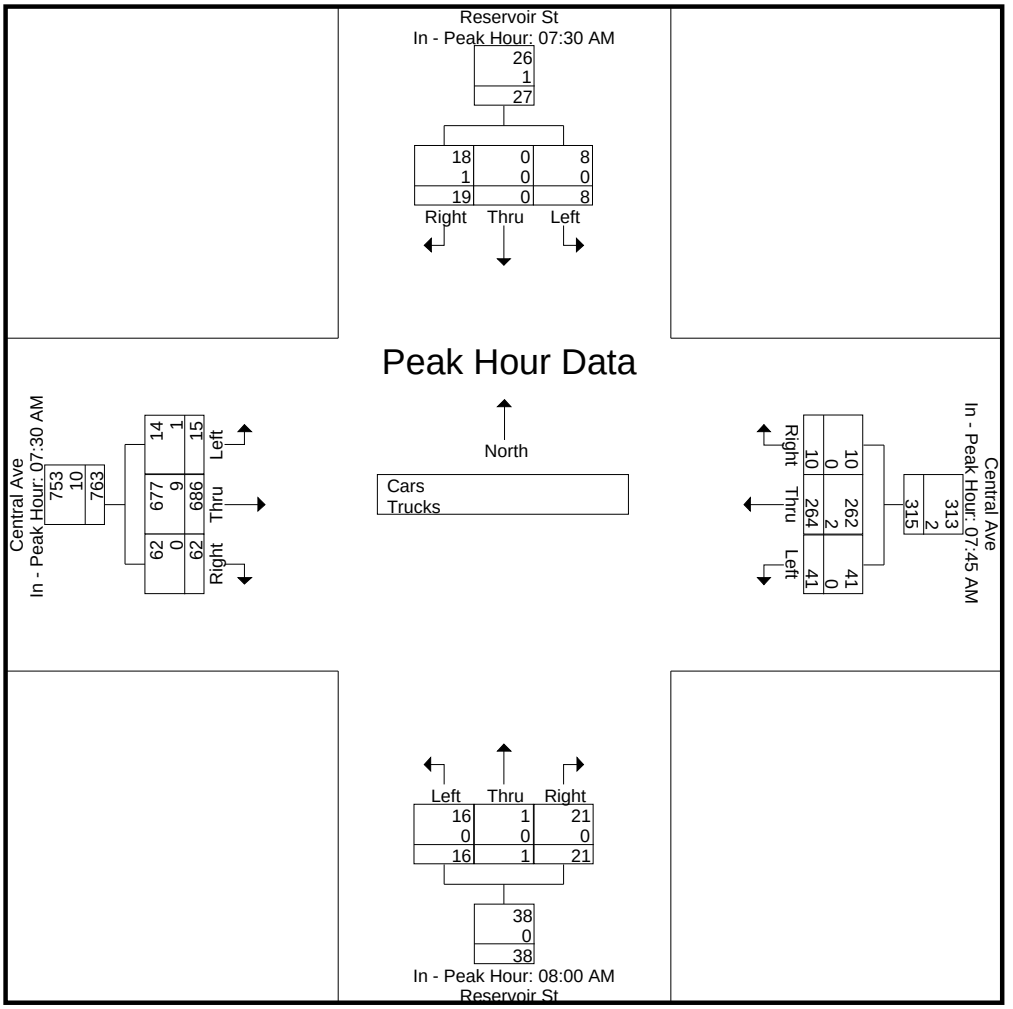
	07:30 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	**4**	0	4	**8**	9	63	2	74	**4**	0	6	10	**5**	186	14	205
+15 mins.	0	0	**6**	6	9	63	**3**	75	4	0	3	7	5	162	11	178
+30 mins.	1	0	4	5	**14**	**69**	2	**85**	4	0	5	9	3	145	**24**	172
+45 mins.	3	0	5	8	9	69	3	81	4	**1**	**7**	**12**	2	**193**	13	**208**
Total Volume	8	0	19	27	41	264	10	315	16	1	21	38	15	686	62	763
% App. Total	29.6	0	70.4		13	83.8	3.2		42.1	2.6	55.3		2	89.9	8.1	
PHF	.500	.000	.792	.844	.732	.957	.833	.926	1.000	.250	.750	.792	.750	.889	.646	.917
Cars	8	0	18	26	41	262	10	313	16	1	21	38	14	677	62	753
% Cars	100	0	94.7	96.3	100	99.2	100	99.4	100	100	100	100	93.3	98.7	100	98.7
Trucks	0	0	1	1	0	2	0	2	0	0	0	0	1	9	0	10
% Trucks	0	0	5.3	3.7	0	0.8	0	0.6	0	0	0	0	6.7	1.3	0	1.3

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 4

Groups Printed- Cars

	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	3	0	5	10	38	1	4	0	7	2	149	7	226
07:15 AM	2	0	2	6	47	1	1	0	2	4	191	7	263
07:30 AM	4	0	4	5	40	1	1	0	2	5	184	14	260
07:45 AM	0	0	6	9	62	2	4	0	2	5	158	11	259
Total	9	0	17	30	187	5	10	0	13	16	682	39	1008
08:00 AM	1	0	3	9	62	3	4	0	6	2	143	24	257
08:15 AM	3	0	5	14	69	2	4	0	3	2	192	13	307
08:30 AM	1	0	4	9	69	3	4	0	5	2	157	20	274
08:45 AM	3	0	6	16	50	1	4	1	7	3	158	36	285
Total	8	0	18	48	250	9	16	1	21	9	650	93	1123
Grand Total	17	0	35	78	437	14	26	1	34	25	1332	132	2131
Apprch %	32.7	0	67.3	14.7	82.6	2.6	42.6	1.6	55.7	1.7	89.5	8.9	
Total %	0.8	0	1.6	3.7	20.5	0.7	1.2	0	1.6	1.2	62.5	6.2	

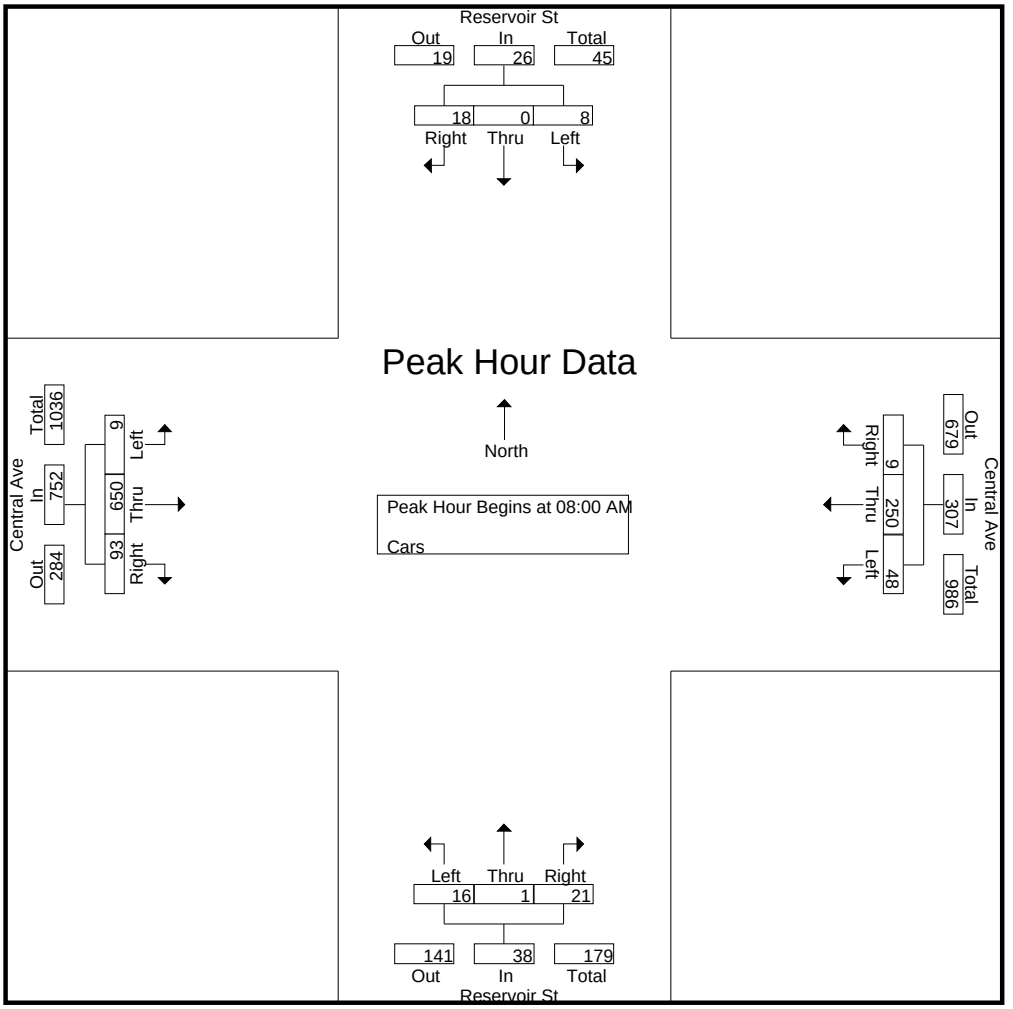
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	0	3	4	9	62	**3**	74	**4**	0	6	10	2	143	24	169	257
08:15 AM	**3**	0	5	8	14	**69**	2	**85**	4	0	3	7	2	**192**	13	**207**	**307**
08:30 AM	1	0	4	5	9	69	3	81	4	0	5	9	2	157	20	179	274
08:45 AM	3	0	**6**	**9**	**16**	50	1	67	4	**1**	**7**	**12**	**3**	158	**36**	197	285
Total Volume	8	0	18	26	48	250	9	307	16	1	21	38	9	650	93	752	1123
% App. Total	30.8	0	69.2		15.6	81.4	2.9		42.1	2.6	55.3		1.2	86.4	12.4		
PHF	.667	.000	.750	.722	.750	.906	.750	.903	1.00	.250	.750	.792	.750	.846	.646	.908	.914

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

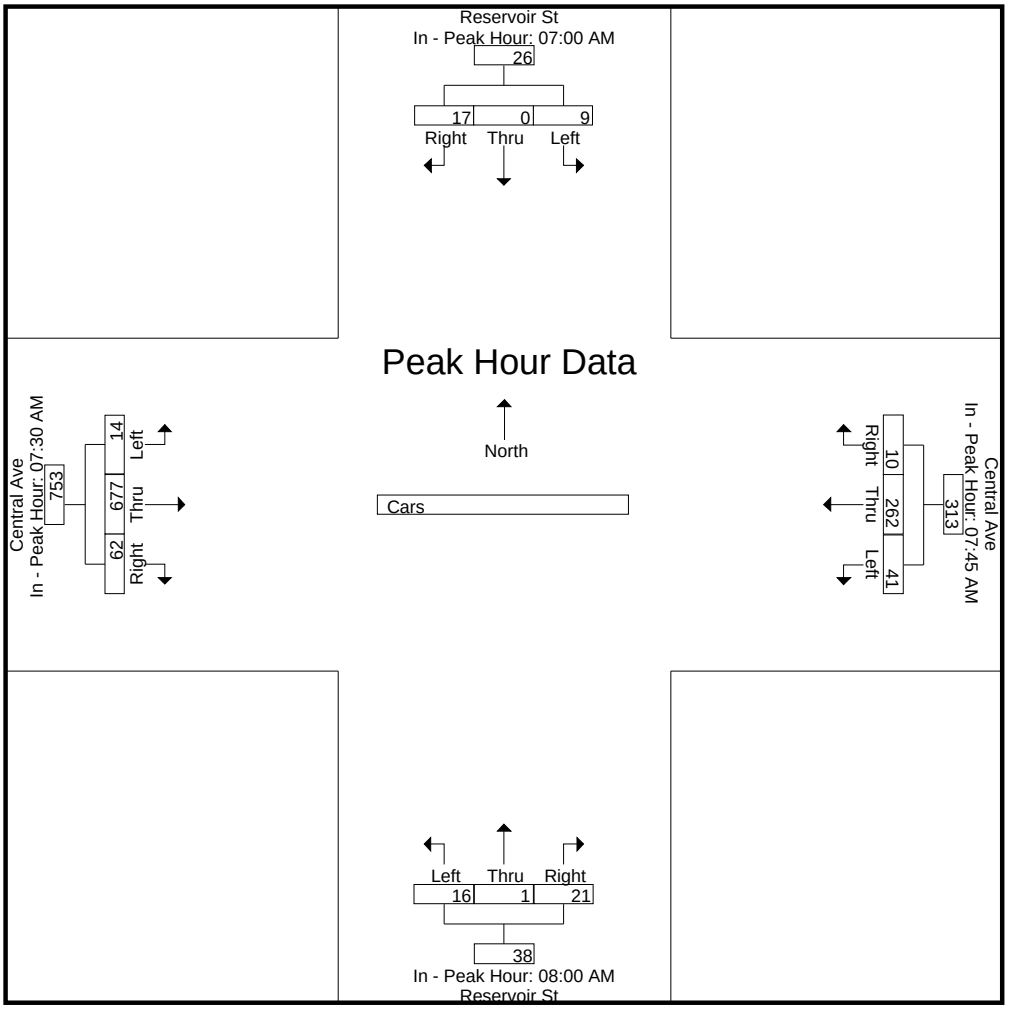
	07:00 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	3	0	5	**8**	9	62	2	73	**4**	0	6	10	**5**	184	14	203
+15 mins.	2	0	2	4	9	62	**3**	74	4	0	3	7	5	158	11	174
+30 mins.	**4**	0	4	8	**14**	**69**	2	**85**	4	0	5	9	2	143	**24**	169
+45 mins.	0	0	**6**	6	9	69	3	81	4	**1**	**7**	**12**	2	**192**	13	**207**
Total Volume	9	0	17	26	41	262	10	313	16	1	21	38	14	677	62	753
% App. Total	34.6	0	65.4		13.1	83.7	3.2		42.1	2.6	55.3		1.9	89.9	8.2	
PHF	.563	.000	.708	.813	.732	.949	.833	.921	1.000	.250	.750	.792	.700	.882	.646	.909

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 7

Groups Printed- Trucks

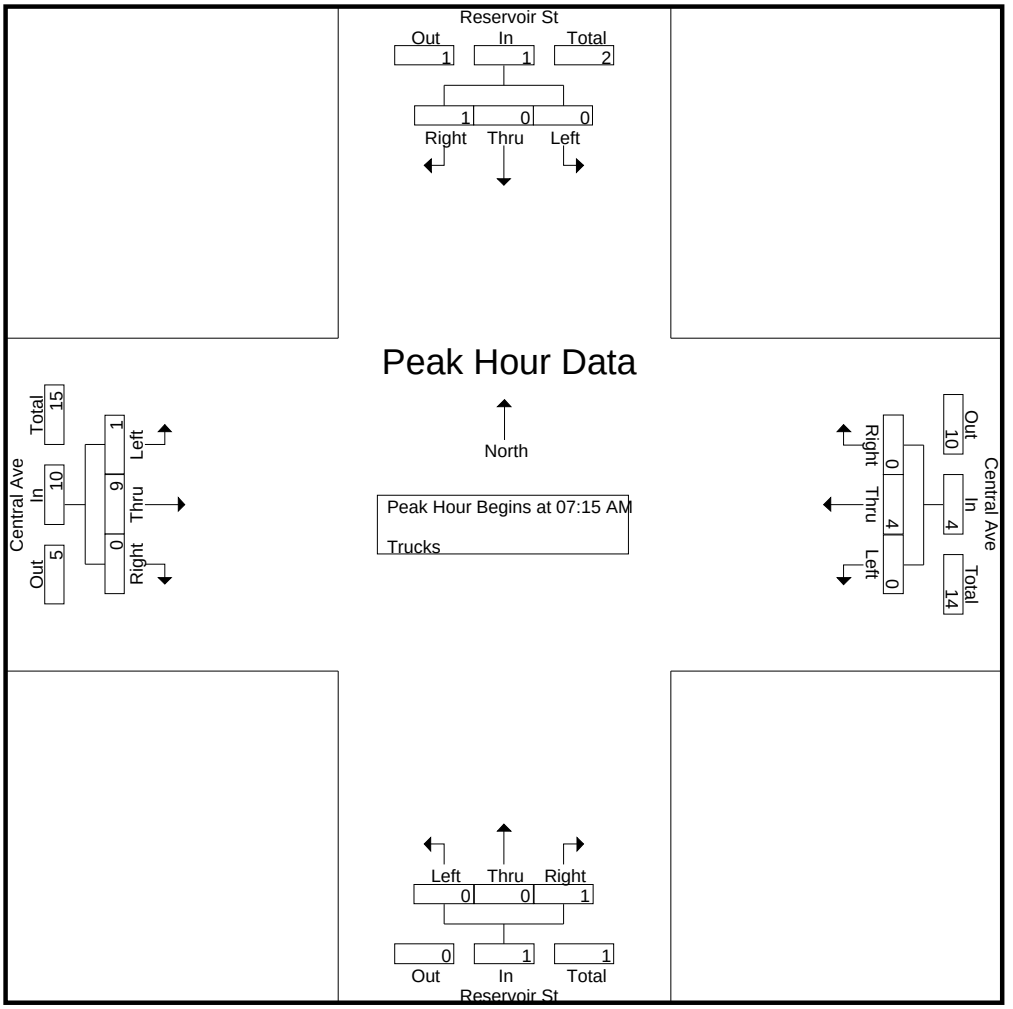
	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
07:15 AM	0	0	0	0	2	0	0	0	0	0	1	0	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
07:45 AM	0	0	0	0	1	0	0	0	1	0	4	0	6
Total	0	0	0	0	4	0	0	0	1	0	8	0	13
08:00 AM	0	0	1	0	1	0	0	0	0	1	2	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	2	1	3
08:45 AM	0	0	0	1	3	0	0	0	0	0	2	0	6
Total	0	0	1	1	4	0	0	0	0	1	7	1	15
Grand Total	0	0	1	1	8	0	0	0	1	1	15	1	28
Apprch %	0	0	100	11.1	88.9	0	0	0	100	5.9	88.2	5.9	
Total %	0	0	3.6	3.6	28.6	0	0	0	3.6	3.6	53.6	3.6	

	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	1	0	1	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
07:45 AM	0	0	0	0	0	1	0	1	0	0	**1**	**1**	0	**4**	0	**4**	**6**
08:00 AM	0	0	**1**	**1**	0	1	0	1	0	0	0	0	**1**	2	0	3	5
Total Volume	0	0	1	1	0	4	0	4	0	0	1	1	1	9	0	10	16
% App. Total	0	0	100		0	100	0		0	0	100		10	90	0		
PHF	.000	.000	.250	.250	.000	.500	.000	.500	.000	.000	.250	.250	.250	.563	.000	.625	.667

Accurate Counts
978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 8



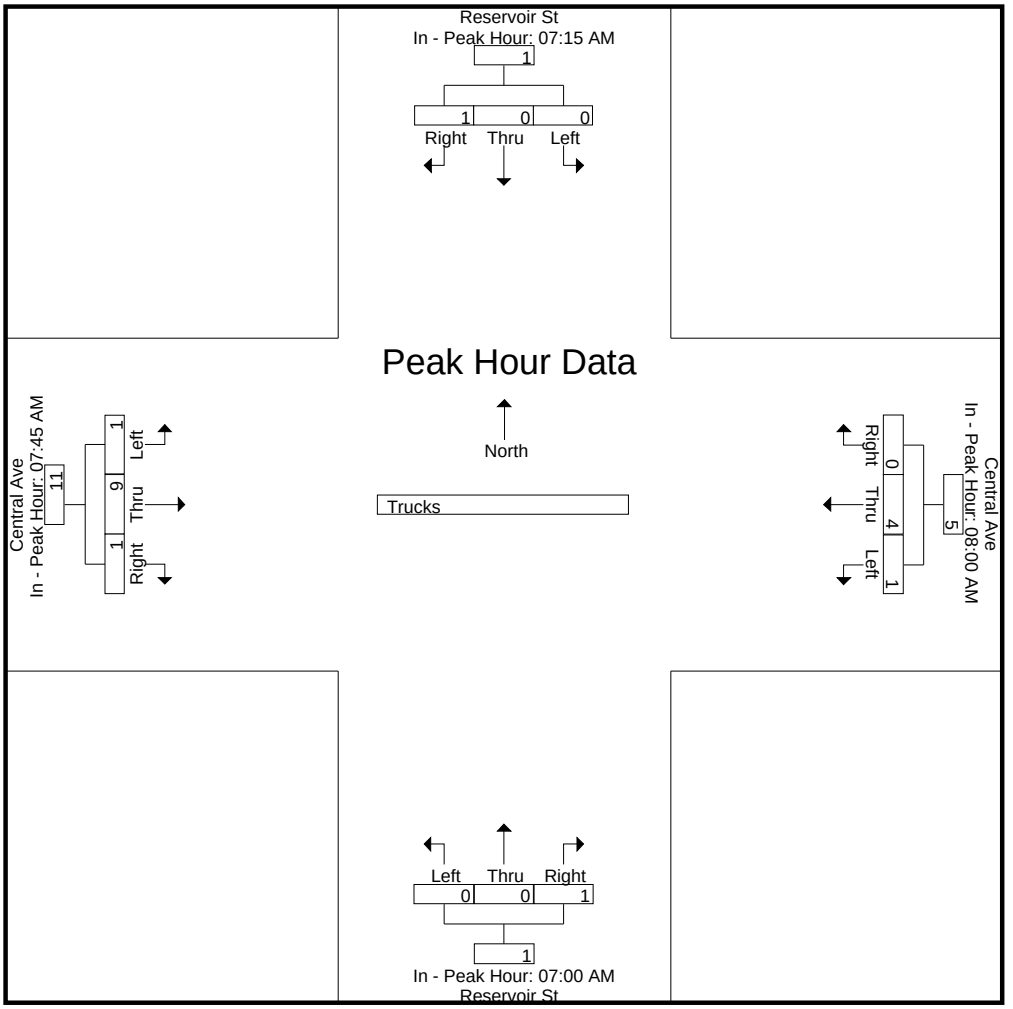
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**4**	0	**4**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	**1**	2	0	3
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	**1**	**1**	**1**	**3**	0	**4**	0	0	**1**	**1**	0	2	**1**	3
Total Volume	0	0	1	1	1	4	0	5	0	0	1	1	1	9	1	11
% App. Total	0	0	100		20	80	0		0	0	100		9.1	81.8	9.1	
PHF	.000	.000	.250	.250	.250	.333	.000	.313	.000	.000	.250	.250	.250	.563	.250	.688

Accurate Counts
978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022

Groups Printed- Bikes Peds

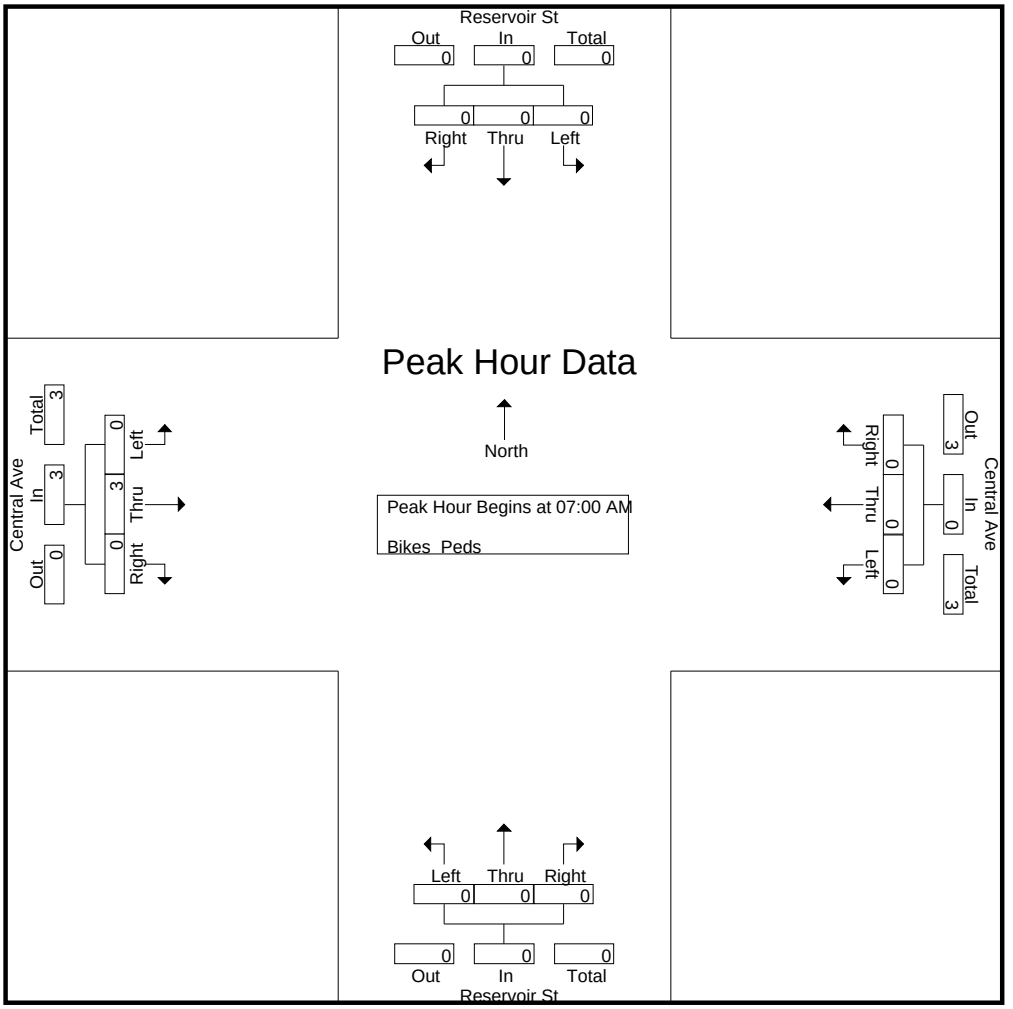
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	2	2	4
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0	5	7	3	10
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	2	1	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	3	1	4
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	10	10	2	12
Grand Total	0	0	0	0	0	1	0	0	0	0	0	2	0	4	0	15	17	5	22
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	20	0		0	0	0		0	80	0		77.3	22.7	

	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**2**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.000	.375	.375

Accurate Counts
978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 11

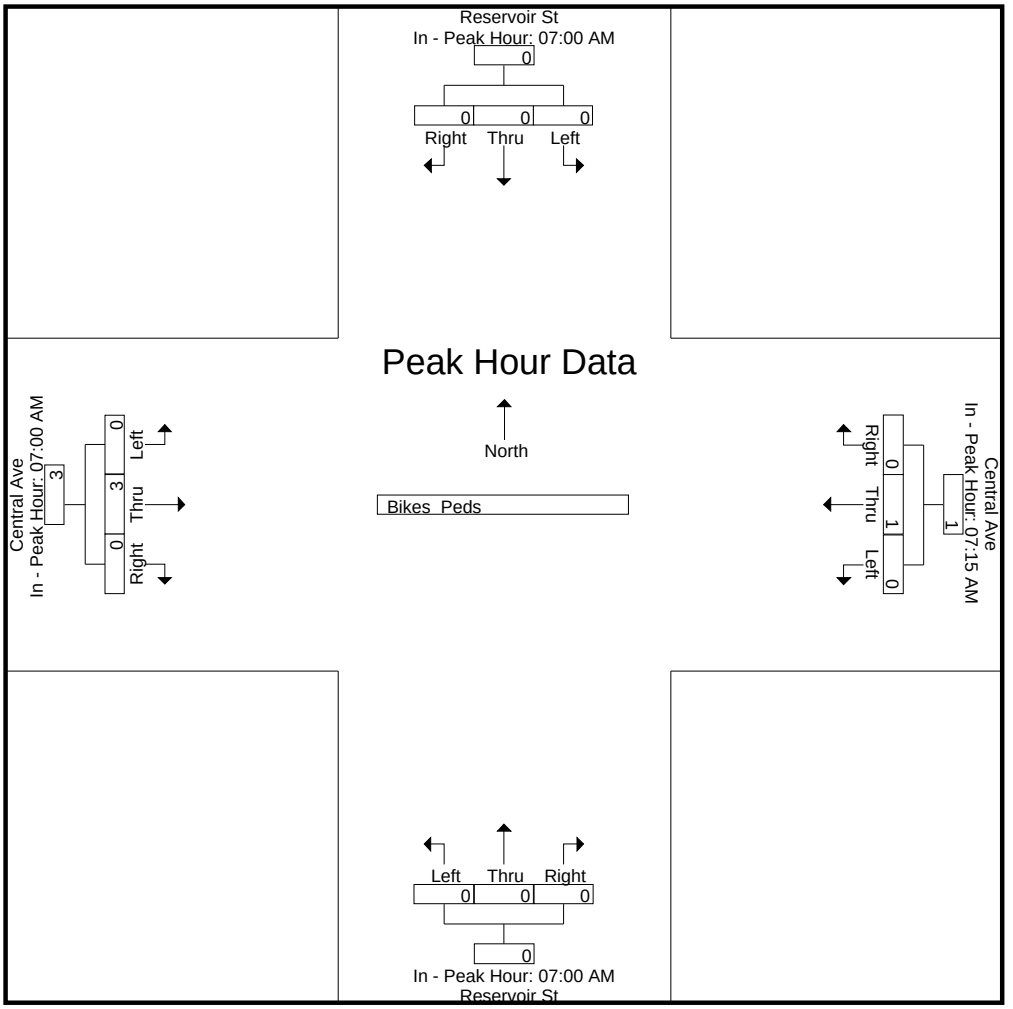


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**2**	0	**2**
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.375	.000	.375

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 1

Groups Printed- Cars - Trucks

	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	0	6	11	144	5	24	0	21	4	82	11	310
04:15 PM	3	0	6	14	159	2	11	0	10	3	73	6	287
04:30 PM	0	0	9	6	127	4	22	0	16	5	93	3	285
04:45 PM	4	0	2	13	124	3	15	0	14	6	94	10	285
Total	9	0	23	44	554	14	72	0	61	18	342	30	1167
05:00 PM	3	0	5	8	132	0	37	0	21	4	117	12	339
05:15 PM	2	2	7	15	140	3	24	1	16	4	113	29	356
05:30 PM	4	0	9	11	151	1	43	4	17	4	83	15	342
05:45 PM	4	0	5	8	118	7	9	0	12	2	89	9	263
Total	13	2	26	42	541	11	113	5	66	14	402	65	1300
Grand Total	22	2	49	86	1095	25	185	5	127	32	744	95	2467
Apprch %	30.1	2.7	67.1	7.1	90.8	2.1	58.4	1.6	40.1	3.7	85.4	10.9	
Total %	0.9	0.1	2	3.5	44.4	1	7.5	0.2	5.1	1.3	30.2	3.9	
Cars	22	2	49	86	1089	25	185	5	126	32	738	94	2453
% Cars	100	100	100	100	99.5	100	100	100	99.2	100	99.2	98.9	99.4
Trucks	0	0	0	0	6	0	0	0	1	0	6	1	14
% Trucks	0	0	0	0	0.5	0	0	0	0.8	0	0.8	1.1	0.6

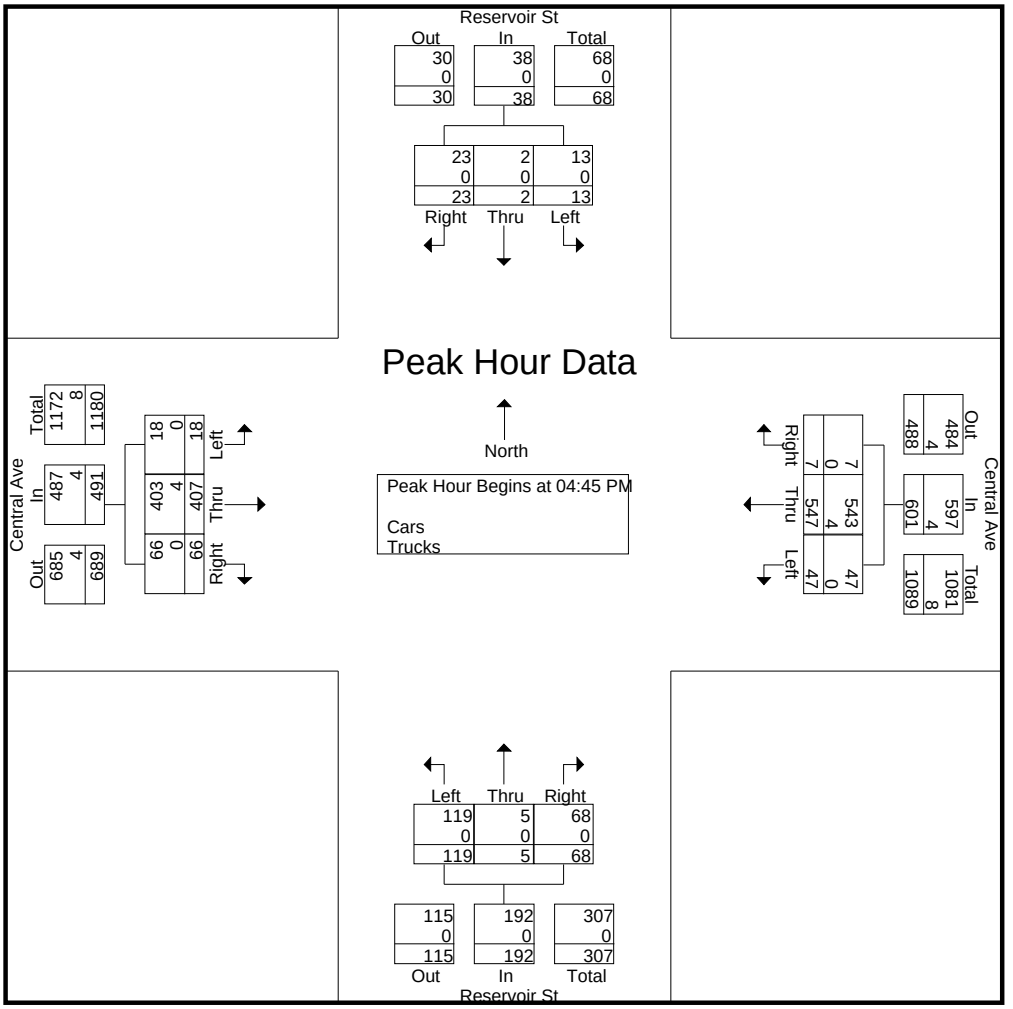
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	0	2	6	13	124	**3**	140	15	0	14	29	**6**	94	10	110	285
05:00 PM	3	0	5	8	8	132	0	140	37	0	**21**	58	4	**117**	12	133	339
05:15 PM	2	**2**	7	11	**15**	140	3	158	24	1	16	41	4	113	**29**	**146**	**356**
05:30 PM	4	0	**9**	**13**	11	**151**	1	**163**	**43**	**4**	17	**64**	4	83	15	102	342
Total Volume	13	2	23	38	47	547	7	601	119	5	68	192	18	407	66	491	1322
% App. Total	34.2	5.3	60.5		7.8	91	1.2		62	2.6	35.4		3.7	82.9	13.4		
PHF	.813	.250	.639	.731	.783	.906	.583	.922	.692	.313	.810	.750	.750	.870	.569	.841	.928
Cars	13	2	23	38	47	543	7	597	119	5	68	192	18	403	66	487	1314
% Cars	100	100	100	100	100	99.3	100	99.3	100	100	100	100	100	99.0	100	99.2	99.4
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0	4	8
% Trucks	0	0	0	0	0	0.7	0	0.7	0	0	0	0	0	1.0	0	0.8	0.6

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

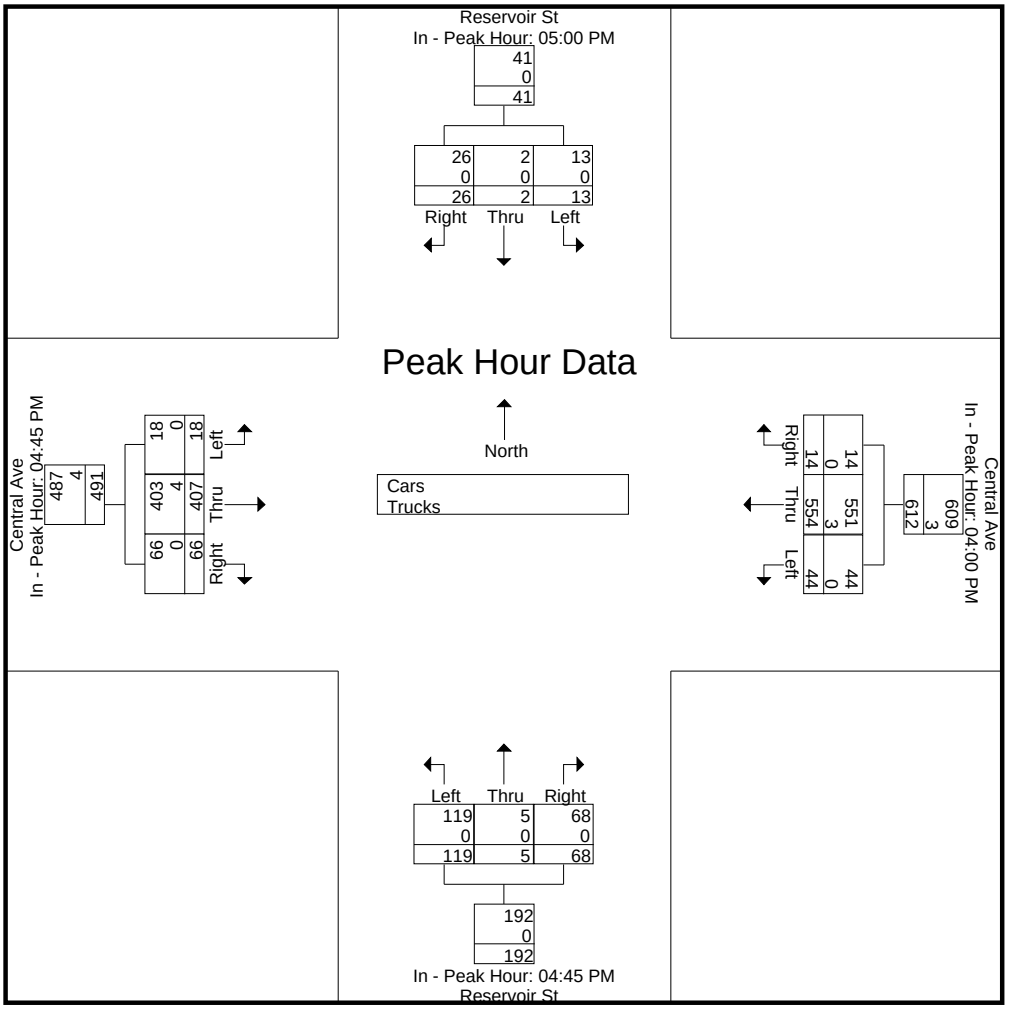
	05:00 PM				04:00 PM				04:45 PM				04:45 PM			
+0 mins.	3	0	5	8	11	144	**5**	160	15	0	14	29	**6**	94	10	110
+15 mins.	2	**2**	7	11	**14**	**159**	2	**175**	37	0	**21**	58	4	**117**	12	133
+30 mins.	**4**	0	**9**	**13**	6	127	4	137	24	1	16	41	4	113	**29**	**146**
+45 mins.	4	0	5	9	13	124	3	140	**43**	**4**	17	**64**	4	83	15	102
Total Volume	13	2	26	41	44	554	14	612	119	5	68	192	18	407	66	491
% App. Total	31.7	4.9	63.4		7.2	90.5	2.3		62	2.6	35.4		3.7	82.9	13.4	
PHF	.813	.250	.722	.788	.786	.871	.700	.874	.692	.313	.810	.750	.750	.870	.569	.841
Cars	13	2	26	41	44	551	14	609	119	5	68	192	18	403	66	487
% Cars	100	100	100	100	100	99.5	100	99.5	100	100	100	100	100	99	100	99.2
Trucks	0	0	0	0	0	3	0	3	0	0	0	0	0	4	0	4
% Trucks	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0	1	0	0.8

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 4

Groups Printed- Cars

	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	0	6	11	143	5	24	0	20	4	81	10	306
04:15 PM	3	0	6	14	158	2	11	0	10	3	72	6	285
04:30 PM	0	0	9	6	127	4	22	0	16	5	93	3	285
04:45 PM	4	0	2	13	123	3	15	0	14	6	94	10	284
Total	9	0	23	44	551	14	72	0	60	18	340	29	1160
05:00 PM	3	0	5	8	131	0	37	0	21	4	115	12	336
05:15 PM	2	2	7	15	139	3	24	1	16	4	112	29	354
05:30 PM	4	0	9	11	150	1	43	4	17	4	82	15	340
05:45 PM	4	0	5	8	118	7	9	0	12	2	89	9	263
Total	13	2	26	42	538	11	113	5	66	14	398	65	1293
Grand Total	22	2	49	86	1089	25	185	5	126	32	738	94	2453
Apprch %	30.1	2.7	67.1	7.2	90.8	2.1	58.5	1.6	39.9	3.7	85.4	10.9	
Total %	0.9	0.1	2	3.5	44.4	1	7.5	0.2	5.1	1.3	30.1	3.8	

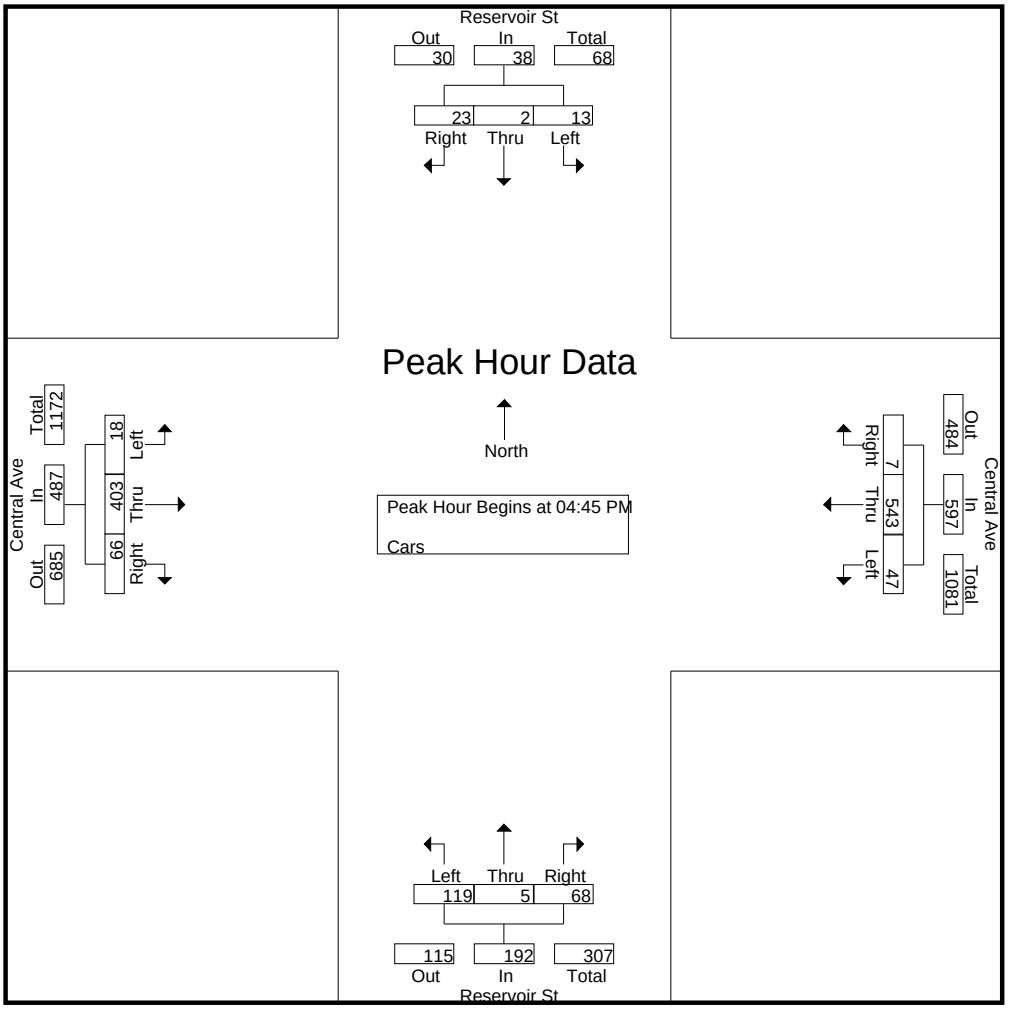
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**4**	0	2	6	13	123	**3**	139	15	0	14	29	**6**	94	10	110	284
05:00 PM	3	0	5	8	8	131	0	139	37	0	**21**	58	4	**115**	12	131	336
05:15 PM	2	**2**	7	11	**15**	139	3	157	24	1	16	41	4	112	**29**	**145**	**354**
05:30 PM	4	0	**9**	**13**	11	**150**	1	**162**	**43**	**4**	17	**64**	4	82	15	101	340
Total Volume	13	2	23	38	47	543	7	597	119	5	68	192	18	403	66	487	1314
% App. Total	34.2	5.3	60.5		7.9	91	1.2		62	2.6	35.4		3.7	82.8	13.6		
PHF	.813	.250	.639	.731	.783	.905	.583	.921	.692	.313	.810	.750	.750	.876	.569	.840	.928

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

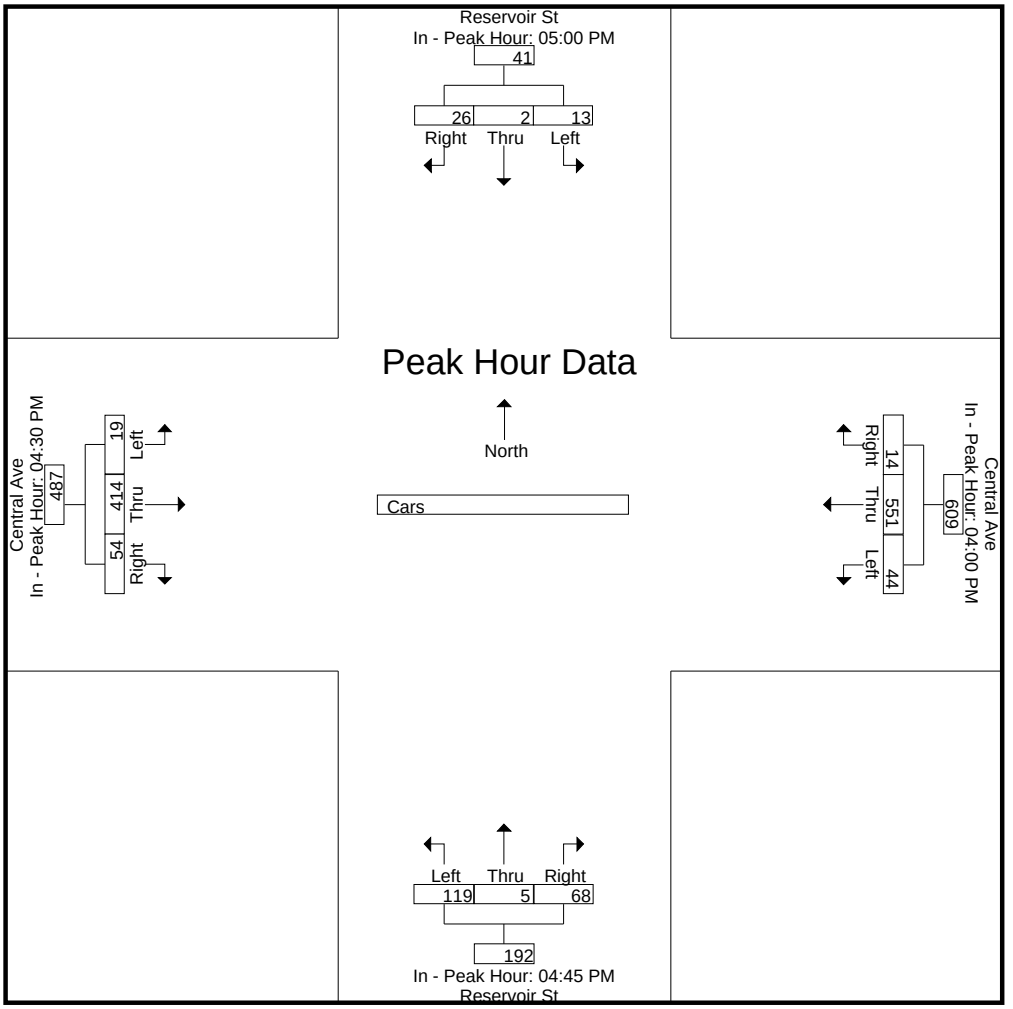
	05:00 PM				04:00 PM				04:45 PM				04:30 PM			
+0 mins.	3	0	5	8	11	143	**5**	159	15	0	14	29	5	93	3	101
+15 mins.	2	**2**	7	11	**14**	**158**	2	**174**	37	0	**21**	58	**6**	94	10	110
+30 mins.	**4**	0	**9**	**13**	6	127	4	137	24	1	16	41	4	**115**	12	131
+45 mins.	4	0	5	9	13	123	3	139	**43**	**4**	17	**64**	4	112	**29**	**145**
Total Volume	13	2	26	41	44	551	14	609	119	5	68	192	19	414	54	487
% App. Total	31.7	4.9	63.4		7.2	90.5	2.3		62	2.6	35.4		3.9	85	11.1	
PHF	.813	.250	.722	.788	.786	.872	.700	.875	.692	.313	.810	.750	.792	.900	.466	.840

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022

Groups Printed- Trucks

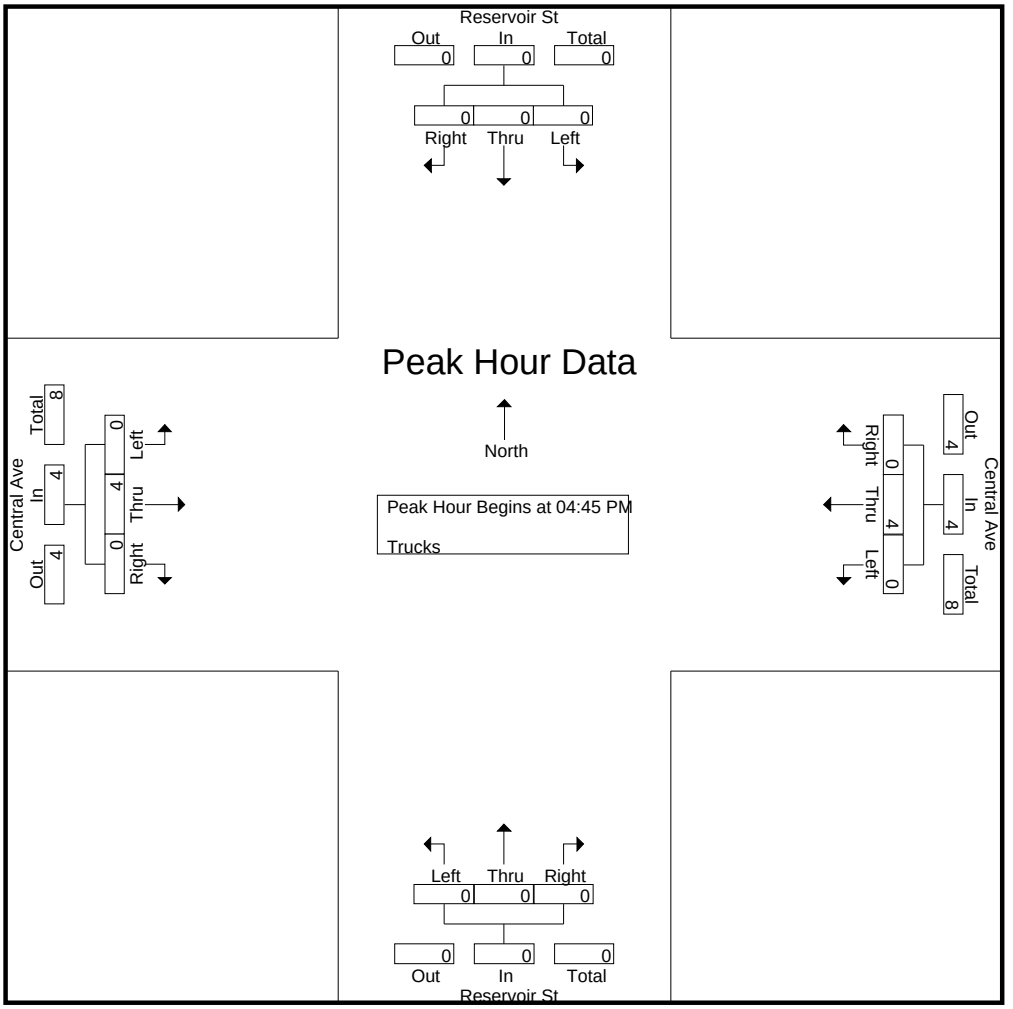
	Reservoir St From North			Central Ave From East			Reservoir St From South			Central Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	1	0	0	0	1	0	1	1	4
04:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	3	0	0	0	1	0	2	1	7
05:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
05:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	0	0	0	0	0	4	0	7
Grand Total	0	0	0	0	6	0	0	0	1	0	6	1	14
Apprch %	0	0	0	0	100	0	0	0	100	0	85.7	14.3	
Total %	0	0	0	0	42.9	0	0	0	7.1	0	42.9	7.1	

	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	0	**2**	**3**
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0	4	8
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	1.00	.000	1.00	.000	.000	.000	.000	.000	.500	.000	.500	.667

Accurate Counts
978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

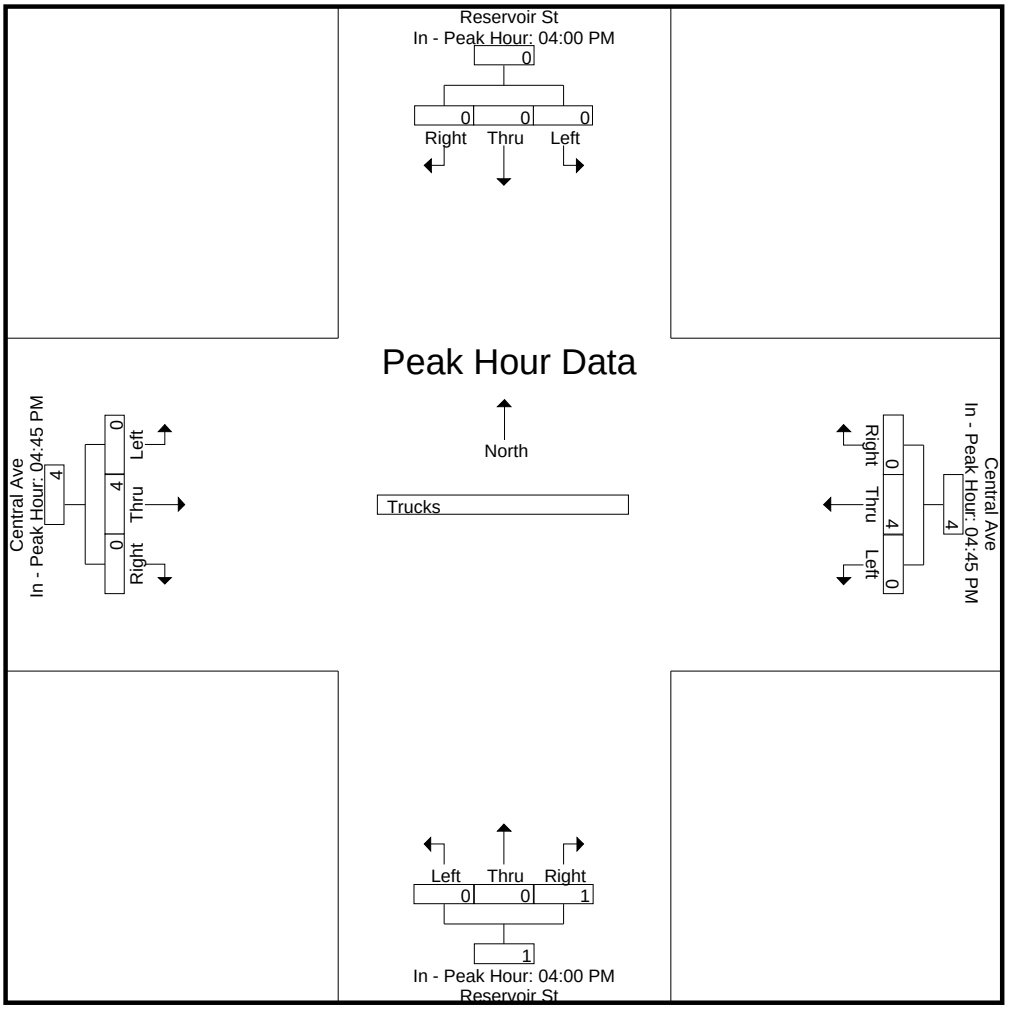
	04:00 PM				04:45 PM				04:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	**1**	0	**1**	0	0	**1**	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**2**	0	**2**
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	4	0	4	0	0	1	1	0	4	0	4
% App. Total	0	0	0		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.000	.000	.000	1.000	.000	1.000	.000	.000	.250	.250	.000	.500	.000	.500

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 10

Groups Printed- Bikes Peds

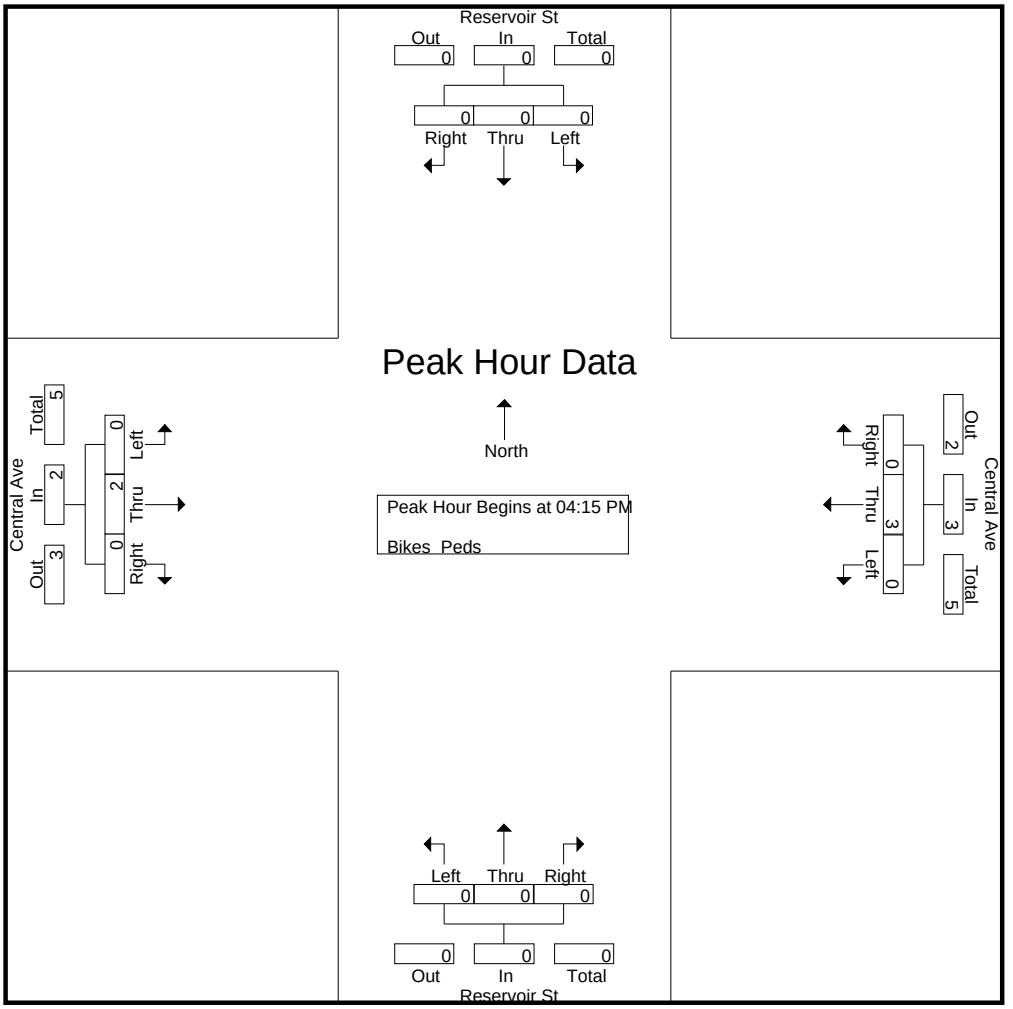
	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	2	4	1	5
04:15 PM	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	1	2	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	2	1	3
Total	0	0	0	0	0	3	0	3	0	0	0	1	0	1	0	4	8	4	12
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	2	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
05:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	0	3
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	2
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	5	6	4	10
Grand Total	0	0	0	0	0	4	0	4	0	0	0	1	0	4	0	9	14	8	22
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	50	0		0	0	0		0	50	0		63.6	36.4	

	Reservoir St From North				Central Ave From East				Reservoir St From South				Central Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.250	.000	.250	.625

Accurate Counts
978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

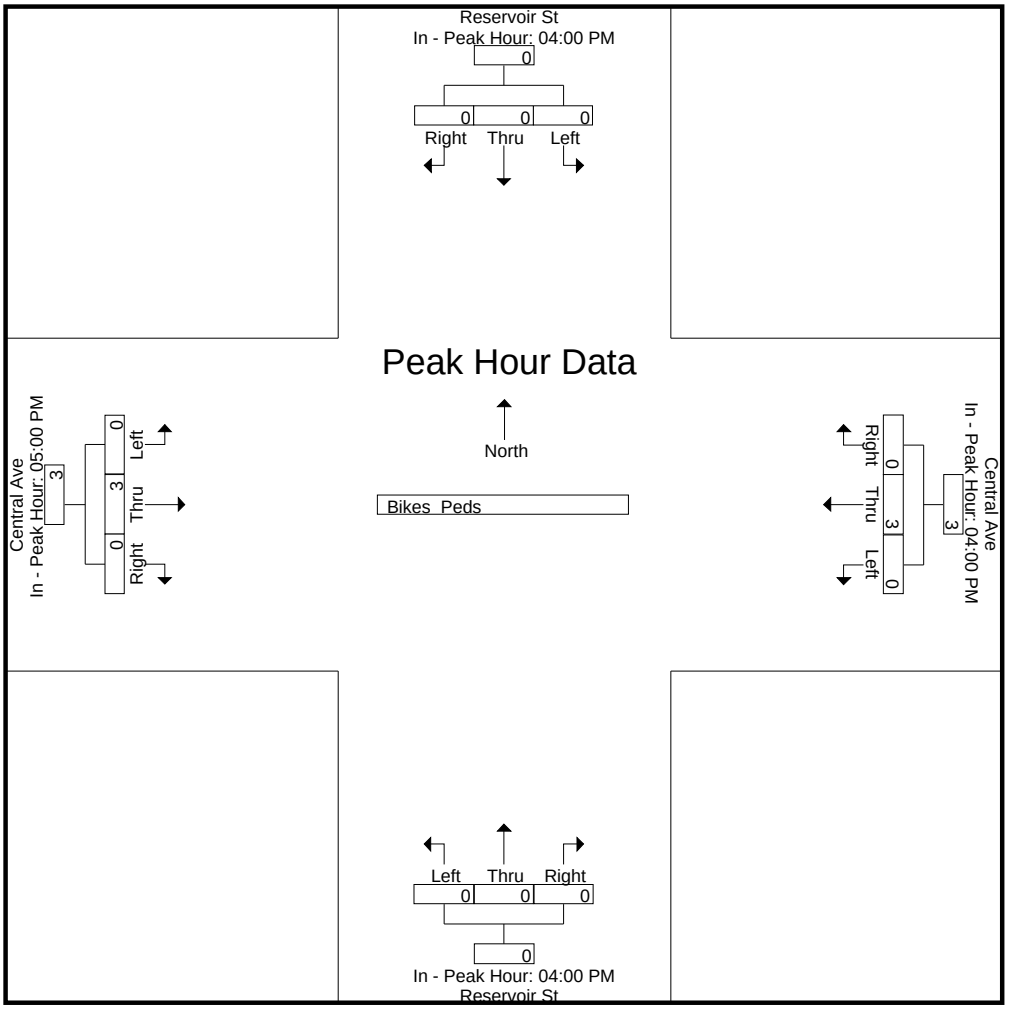
	04:00 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.375	.000	.375

Accurate Counts

978-664-2565

N/S Street : Reservoir Street
E/W Street : Central Avenue
City/State : Needham, MA
Weather : Rain / Clear

File Name : 95140001
Site Code : 95140001
Start Date : 10/18/2022
Page No : 12



MOTOR VEHCILE CRASH DATA

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Number of Vehicles	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions	Street Number	Roadway
4400904	NEEDHAM	Sunday, April 16, 2017	Non-fatal injury	10:55 AM	1	Daylight	Single vehicle crash	Dry	Clear	39	CENTRAL AVE
4480042	NEEDHAM	Tuesday, November 7, 2017	Property damage only (none injured)	12:03 PM	2	Daylight	Angle	Dry	Cloudy		RESERVOIR ST / CENTRAL AVE
4536445	NEEDHAM	Thursday, February 8, 2018	Property damage only (none injured)	10:10 AM	3	Daylight	Angle	Dry	Clear		CENTRAL AVE / RESERVOIR ST
4592069	NEEDHAM	Wednesday, August 29, 2018	Unknown	10:46 AM	2	Daylight	Angle	Dry	Clear	189	RESERVOIR ST
4613319	NEEDHAM	Monday, September 3, 2018	Unknown	11:29 AM	2	Daylight	Angle	Dry	Clear	41	CENTRAL AVE
4613902	NEEDHAM	Monday, September 10, 2018	Property damage only (none injured)	8:53 AM	2	Daylight	Rear-end	Dry	Clear	189	RESERVOIR STREET
4787792	NEEDHAM	Saturday, October 19, 2019	Property damage only (none injured)	8:07 AM	2	Daylight	Angle	Dry	Clear	50	CENTRAL AVENUE / RESERVOIR STREET / CENTRAL AVENUE

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : NEEDHAM COUNT DATE : 2022

DISTRICT : 6 UNSIGNALIZED : X SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : CENTRAL AVENUE ST #

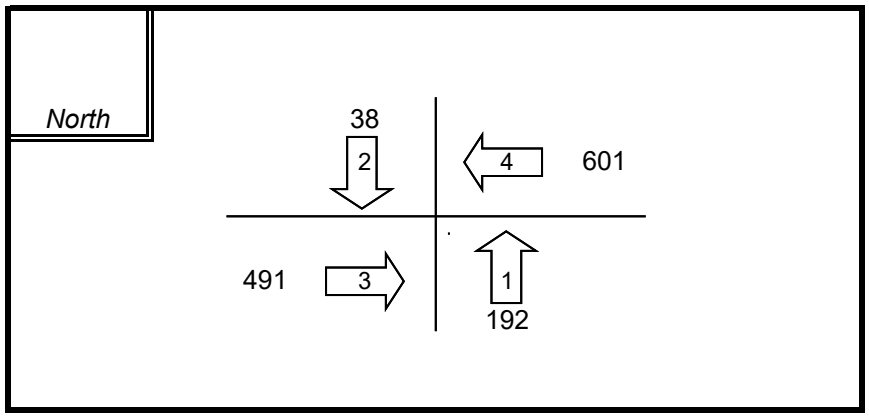
MINOR STREET(S) : RESERVOIR STREET ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (AM/PM) :	192	38	491	601		1,322

" K " FACTOR : 0.108 APPROACH ADT : 12,241 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 7 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 1.40

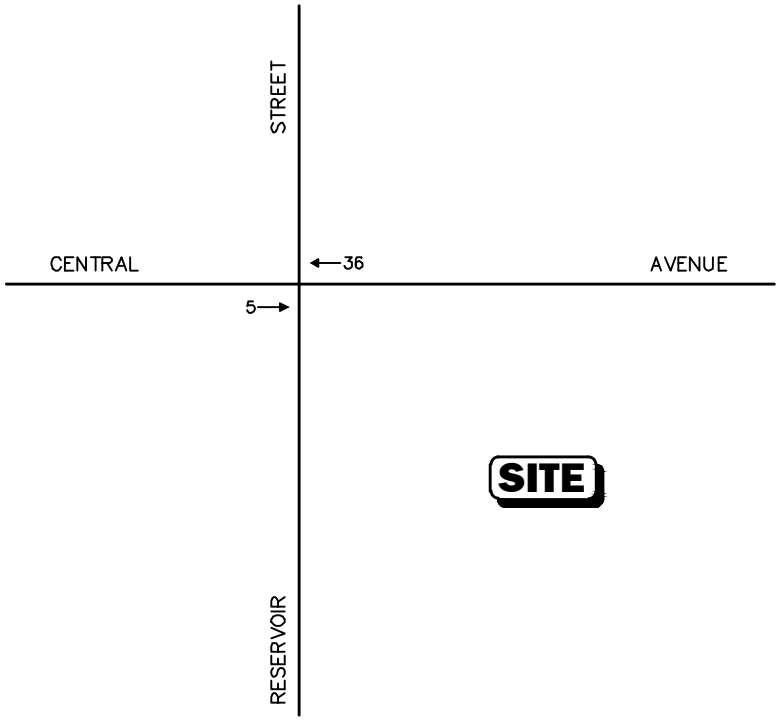
CRASH RATE CALCULATION : 0.31 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 6 signalized intersections = 0.71

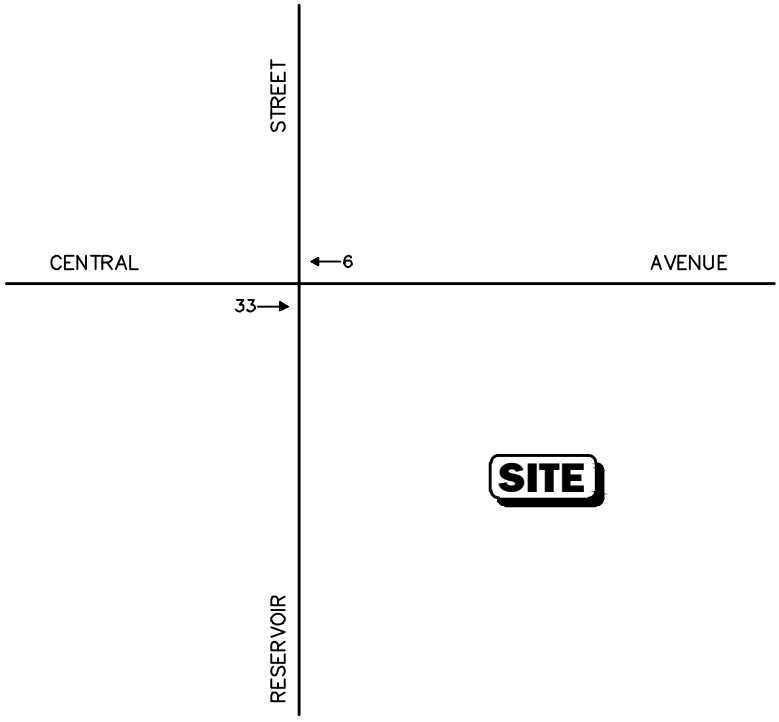
Accident Rate for District 6 unsignalized intersections = 0.52

BACKGROUND DEVELOPMENT PROJECTS

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



N

Not To Scale

Figure A-1

**Background Development Project
Highland Science Center
Project-Generated
Peak-Hour Traffic Volumes**

Vanasse & Associates inc

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TRIP GENERATION DATA

Institute of Transportation Engineers (ITE)
Trip Generation, 11 th Edition
Land Use Code (LUC) 220 - Multifamily Housing (Low-Rise) Not Close to Rail Transit

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 15

AVERAGE WEEKDAY DAILY

T = 6.74
T = 6.74 * 15
T = 101.10
T = 102 vehicle trips
with 50% (51 vpd) entering and 50% (51 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.40 * (X)
T = 0.40 * 15
T = 6.00
T = 6.00
T = 6 vehicle trips
with 24% (1 vph) entering and 76% (5 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.51 * (X)
T = 0.51 * 15
T = 7.65
T = 7.65
T = 8 vehicle trips
with 63% (5 vph) entering and 37% (3 vph) exiting.

SATURDAY DAILY

T = 4.55 * (X)
T = 4.55* 15
T = 19.55
T = 20 vehicle trips
with 50% (10 vpd) entering and 50% (10 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.41 * (X)
T = 0.41 * 15
T = 6.15
T = 6 vehicle trips
with 50% (3 vph) entering and 50% (3 vph) exiting.

Directional Distrubution unavaliable assumed 50/50 split.

Institute of Transportation Engineers (ITE)
Trip Generation, 11 th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza (<40K)

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Leasable Area
Independent Variable (X): 2.542

AVERAGE WEEKDAY DAILY

T = 54.45 * X
T = 54.45 * 2.542
T = 138.41
T = 138 vehicle trips
with 50% (69 vpd) entering and 50% (69 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.36 * (X)
T = 2.36 * 2.542
T = 6.00
T = 6 vehicle trips
with 60% (4 vph) entering and 40% (2 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.59 * X
T = 6.59 * 2.542
T = 16.75
T = 17 vehicle trips
with 50% (9 vph) entering and 50% (8 vph) exiting.

Trip Generation Summary - Proposed Residential Development - Needham, MA

Land Use	Residential	Commercial	Non-Auto	Total
Size	15	2542	--	--
Time Period				
Weekday Morning Peak Hour				
Entering	1	4	-1	4
Exiting	5	2	0	7
Total	6	6	-1	11
Weekday Evening Peak Hour				
Entering	5	9	-2	12
Exiting	3	8	-1	10
Total	8	17	-3	22
Weekday Daily	102	138	-20	220

CAPACITY ANALYSIS RESULTS

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	657	94	49	254	9	16	1	21	8	0	19
Future Vol, veh/h	10	657	94	49	254	9	16	1	21	8	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	79	79	79	75	75	75
Heavy Vehicles, %	10	1	1	2	2	0	0	0	0	0	0	5
Mvmt Flow	11	714	102	53	276	10	20	1	27	11	0	25

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	286	0	0	816	0	0	1136	1128	714	1188	1225	281
Stage 1	-	-	-	-	-	-	736	736	-	387	387	-
Stage 2	-	-	-	-	-	-	400	392	-	801	838	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1232	-	-	812	-	-	181	206	435	167	180	751
Stage 1	-	-	-	-	-	-	414	428	-	641	613	-
Stage 2	-	-	-	-	-	-	630	610	-	381	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1232	-	-	812	-	-	162	187	435	145	163	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	187	-	145	163	-
Stage 1	-	-	-	-	-	-	407	421	-	630	565	-
Stage 2	-	-	-	-	-	-	561	562	-	351	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.5	21.1	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	162	410	1232	-	-	812	-	-	145	751
HCM Lane V/C Ratio	0.125	0.068	0.009	-	-	0.066	-	-	0.074	0.034
HCM Control Delay (s)	30.4	14.4	7.9	0	-	9.7	0	-	31.8	10
HCM Lane LOS	D	B	A	A	-	A	A	-	D	B
HCM 95th %tile Q(veh)	0.4	0.2	0	-	-	0.2	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	24.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	407	66	47	547	7	119	5	68	13	2	23
Future Vol, veh/h	18	407	66	47	547	7	119	5	68	13	2	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	92	92	92	75	75	75	73	73	73
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	21	485	79	51	595	8	159	7	91	18	3	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	603	0	0	564	0	0	1246	1232	485	1317	1307	599
Stage 1	-	-	-	-	-	-	527	527	-	701	701	-
Stage 2	-	-	-	-	-	-	719	705	-	616	606	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	984	-	-	1018	-	-	~ 152	179	586	136	161	505
Stage 1	-	-	-	-	-	-	538	532	-	433	444	-
Stage 2	-	-	-	-	-	-	423	442	-	481	490	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	984	-	-	1018	-	-	~ 129	160	586	103	144	505
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 129	160	-	103	144	-
Stage 1	-	-	-	-	-	-	521	516	-	420	411	-
Stage 2	-	-	-	-	-	-	364	409	-	389	475	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	141.2	25.5
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	129	496	984	-	-	1018	-	-	103	421
HCM Lane V/C Ratio	1.23	0.196	0.022	-	-	0.05	-	-	0.173	0.081
HCM Control Delay (s)	219.3	14	8.7	0	-	8.7	0	-	47.1	14.3
HCM Lane LOS	F	B	A	A	-	A	A	-	E	B
HCM 95th %tile Q(veh)	9.8	0.7	0.1	-	-	0.2	-	-	0.6	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	685	94	49	296	9	16	1	21	8	0	19
Future Vol, veh/h	10	685	94	49	296	9	16	1	21	8	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	79	79	79	75	75	75
Heavy Vehicles, %	10	1	1	2	2	0	0	0	0	0	0	5
Mvmt Flow	11	745	102	53	322	10	20	1	27	11	0	25

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	332	0	0	847	0	0	1213	1205	745	1265	1302	327
Stage 1	-	-	-	-	-	-	767	767	-	433	433	-
Stage 2	-	-	-	-	-	-	446	438	-	832	869	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1184	-	-	790	-	-	160	185	417	147	162	707
Stage 1	-	-	-	-	-	-	398	414	-	605	585	-
Stage 2	-	-	-	-	-	-	595	582	-	366	372	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1184	-	-	790	-	-	143	167	417	127	146	707
Mov Cap-2 Maneuver	-	-	-	-	-	-	143	167	-	127	146	-
Stage 1	-	-	-	-	-	-	391	407	-	594	537	-
Stage 2	-	-	-	-	-	-	527	534	-	335	365	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.4	23.1	17.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	143	390	1184	-	-	790	-	-	127	707
HCM Lane V/C Ratio	0.142	0.071	0.009	-	-	0.067	-	-	0.084	0.036
HCM Control Delay (s)	34.3	14.9	8.1	0	-	9.9	0	-	35.9	10.3
HCM Lane LOS	D	B	A	A	-	A	A	-	E	B
HCM 95th %tile Q(veh)	0.5	0.2	0	-	-	0.2	-	-	0.3	0.1

Intersection	
Int Delay, s/veh	31.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	457	66	47	572	7	119	5	68	13	2	23
Future Vol, veh/h	18	457	66	47	572	7	119	5	68	13	2	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	92	92	92	75	75	75	73	73	73
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	21	544	79	51	622	8	159	7	91	18	3	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	630	0	0	623	0	0	1332	1318	544	1403	1393	626
Stage 1	-	-	-	-	-	-	586	586	-	728	728	-
Stage 2	-	-	-	-	-	-	746	732	-	675	665	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	962	-	-	968	-	-	~ 133	159	543	118	143	488
Stage 1	-	-	-	-	-	-	500	500	-	418	432	-
Stage 2	-	-	-	-	-	-	409	430	-	447	461	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	962	-	-	968	-	-	~ 112	141	543	87	127	488
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 112	141	-	87	127	-
Stage 1	-	-	-	-	-	-	483	483	-	404	397	-
Stage 2	-	-	-	-	-	-	349	395	-	355	445	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	192.9	29.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	112	454	962	-	-	968	-	-	87	398
HCM Lane V/C Ratio	1.417	0.214	0.022	-	-	0.053	-	-	0.205	0.086
HCM Control Delay (s)	$ 302	15.1	8.8	0	-	8.9	0	-	56.7	14.9
HCM Lane LOS	F	C	A	A	-	A	A	-	F	B
HCM 95th %tile Q(veh)	11.2	0.8	0.1	-	-	0.2	-	-	0.7	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	686	95	50	297	9	17	1	24	8	0	19
Future Vol, veh/h	10	686	95	50	297	9	17	1	24	8	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	79	79	79	75	75	75
Heavy Vehicles, %	10	1	1	2	2	0	0	0	0	0	0	5
Mvmt Flow	11	746	103	54	323	10	22	1	30	11	0	25

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	333	0	0	849	0	0	1217	1209	746	1271	1307	328
Stage 1	-	-	-	-	-	-	768	768	-	436	436	-
Stage 2	-	-	-	-	-	-	449	441	-	835	871	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1183	-	-	789	-	-	159	184	417	146	161	706
Stage 1	-	-	-	-	-	-	397	414	-	603	583	-
Stage 2	-	-	-	-	-	-	593	580	-	365	371	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1183	-	-	789	-	-	142	166	417	124	145	706
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	166	-	124	145	-
Stage 1	-	-	-	-	-	-	390	407	-	592	534	-
Stage 2	-	-	-	-	-	-	524	531	-	331	364	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.4	23	18.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	142	393	1183	-	-	789	-	-	124	706
HCM Lane V/C Ratio	0.152	0.081	0.009	-	-	0.069	-	-	0.086	0.036
HCM Control Delay (s)	34.8	15	8.1	0	-	9.9	0	-	36.7	10.3
HCM Lane LOS	D	C	A	A	-	A	A	-	E	B
HCM 95th %tile Q(veh)	0.5	0.3	0	-	-	0.2	-	-	0.3	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	38	0	2	143
Future Vol, veh/h	0	4	38	0	2	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	41	0	2	155

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	200	41	0	0	41	0
Stage 1	41	-	-	-	-	-
Stage 2	159	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	789	1030	-	-	1568	-
Stage 1	981	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	788	1030	-	-	1568	-
Mov Cap-2 Maneuver	788	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1030	1568	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	717	1	1	355	1	2
Future Vol, veh/h	717	1	1	355	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	779	1	1	386	1	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	780	0	1168	780
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	837	-	214	395
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	837	-	214	395
Mov Cap-2 Maneuver	-	-	-	-	214	-
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	-	-	837	-
HCM Lane V/C Ratio	0.011	-	-	0.001	-
HCM Control Delay (s)	16.8	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	34.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	459	68	51	574	7	120	5	71	13	2	23
Future Vol, veh/h	18	459	68	51	574	7	120	5	71	13	2	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	92	92	92	75	75	75	73	73	73
Heavy Vehicles, %	10	1	1	2	2	0	0	0	0	0	0	5
Mvmt Flow	21	546	81	55	624	8	160	7	95	18	3	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	632	0	0	627	0	0	1344	1330	546	1418	1407	628
Stage 1	-	-	-	-	-	-	588	588	-	738	738	-
Stage 2	-	-	-	-	-	-	756	742	-	680	669	-
Critical Hdwy	4.2	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	913	-	-	955	-	-	~ 130	156	541	116	140	477
Stage 1	-	-	-	-	-	-	499	499	-	413	427	-
Stage 2	-	-	-	-	-	-	403	425	-	444	459	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	913	-	-	955	-	-	~ 108	137	541	84	123	477
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 108	137	-	84	123	-
Stage 1	-	-	-	-	-	-	481	481	-	398	389	-
Stage 2	-	-	-	-	-	-	340	387	-	348	442	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	208.5	30.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	108	453	913	-	-	955	-	-	84	388
HCM Lane V/C Ratio	1.481	0.224	0.023	-	-	0.058	-	-	0.212	0.088
HCM Control Delay (s)	$ 330.9	15.2	9	0	-	9	0	-	59	15.2
HCM Lane LOS	F	C	A	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	11.7	0.8	0.1	-	-	0.2	-	-	0.7	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	12	0	6	115
Future Vol, veh/h	0	4	12	0	6	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	13	0	7	125

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	152	13	0	0	13	0
Stage 1	13	-	-	-	-	-
Stage 2	139	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	840	1067	-	-	1606	-
Stage 1	1010	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	836	1067	-	-	1606	-
Mov Cap-2 Maneuver	836	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1067	1606	-
HCM Lane V/C Ratio	-	-	0.004	0.004	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	541	2	4	630	2	4
Future Vol, veh/h	541	2	4	630	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	588	2	4	685	2	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	590	0	1282	589
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	693	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	985	-	182	508
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	985	-	181	508
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	493	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	317	-	-	985	-
HCM Lane V/C Ratio	0.021	-	-	0.004	-
HCM Control Delay (s)	16.6	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Town of Needham
Building Department
500 Dedham Ave.
Needham, MA 02492

Tel.781-455-7550 x 308

November 17, 2022

Town of Needham Planning Board
Lee Newman / Town Planner
500 Dedham Ave.
Needham, MA. 024902

Re: 40 & 50 Central Avenue.

Dear Planning Board Members,

I have reviewed the proposed redevelopment of 40 & 50 Central Avenue and have the following comments. I assume that if approved, that the applicant will be filing a consolidation plan to combine the two parcels. I am in favor of the creation of parallel parking spaces along Reservoir Street, because I think that customers using the retail spaces would probably park along the curb causing issues at the intersection. In the site, along the rear property line, I would also install no parking signage, parking in this area would block two-way traffic and interfere with the parking along the back of the building. The driveway that connects Reservoir Street and Central Ave. should have stop signs at both ends as well as crosswalks. Basic conceptual restrooms have been shown on the plan, but all retail spaces must comply with the Massachusetts Plumbing Code for fixture counts based on use and occupancy. I would also suggest that any roof top equipment installed be suitably screened for appearance and noise.

Any Questions please contact my office.

David A Roche
Building Commissioner
Town of Needham

From: Tom Conroy
To: Alexandra Clee
Subject: RE: Request for comment - 40 & 50 Central
Date: Wednesday, November 9, 2022 7:06:27 AM

All good with Fire dept.

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Tuesday, November 8, 2022 11:05 PM
To: David Roche <droche@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Justin Savignano <jsavignano@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: RE: Request for comment - 40 & 50 Central

Dear all,

If you haven't yet commented on this, please send your comments to me by tomorrow. THanks!

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

From: Alexandra Clee
Sent: Friday, October 14, 2022 5:05 PM
To: David Roche <droche@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Justin Savignano <jsavignano@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: Request for comment - 40 & 50 Central

Dear all,

We have received an application materials for a proposed amendment to 40 & 50 Central. The proposal is to demolish both existing buildings and replace them with a single, new building, to be used for mixed use purposes. The new building will be three stories high and contain approximately 20,072 square feet of space, with retail on the first floor, and 15 residential units on the second and third floors. It is currently contemplated that one of the retail bays on the first floor will be occupied by Panella's Market and that three of the residential units will be affordable, as defined by the Zoning By-Law. The entire site will be redeveloped and in addition to the new building, landscaping and other site improvements will also be installed.

More information can be found in the application, which is attached.

The Planning Board has scheduled this matter for November 15, 2022. Please send your comments by Wednesday November 9, 2022 at the latest.

The documents attached for your review are as follows:

1. Application for a Major Project Special Permit No. 2022-04, with Addendum A.

2. Letter from George Giunta Jr., Attorney, dated September 19, 2022.

3. Letter to Lee Newman, by [names I cannot read], dated September, 2022.

4. Plan set consisting of 3 sheets, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA: Sheet 1, Existing Conditions Site Plan, dated September 12, 2022; Sheet 2, Proposed Parking and Building Location, dated September 12, 2022; Sheet 3, Proposed Conditions Site Plan, dated September 12, 2022.

5. Plan set entitled "Central Avenue Development," consisting of 5 sheets, prepared by MGD plus, 411 Lexington Street, Newton, MA: Sheet 1, Sheet SP.00, entitled "Cover Page", dated September 18, 2022; Sheet 2, Sheet SP.01, entitled "Architectural Site Plan," dated September 18, 2022; Sheet 3, Sheet SP.02, entitled "Floor Plans," dated September 18, 2022; Sheet 4, Sheet SP.03, entitled "Elevations," dated September 18, 2022; Sheet 5, Sheet SP.04, entitled "3D Views," dated September 18, 2022.

6. Drainage Summary, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA, dated September 12, 2020 [maybe meant to be 2022?].

Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

From: Tara Gurge
To: Alexandra Clee
Subject: RE: Public Health Division Planning Board comments for 40 & 50 Central Ave. project -
Date: Wednesday, November 9, 2022 8:46:15 AM
Attachments: image002.png
image003.png

Hello Alex –

Here are the Public Health Division comments for the proposed Planning Board amendment for the project located at **#40 & 50 Central Avenue**. See below:

- Any retail/food establishments proposed in the new building located on this property would need an online Food Permit Plan Review application completed, along with proposed food establishment design plans, which will need to be submitted and reviewed and approved by the Public Health Division prior to start of construction. Here is the direct link to the online Food Establishment Permit Plan Review application - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006516 .
- Please keep in mind, if a retail food establishment plan review is approved, sufficient space must be made available in the parking lot for both a solid waste (trash) dumpster and a separate recycling dumpster, for each food establishment, along with waste oil/grease containment (if applicable.) These dumpsters must be placed in an easily accessible area outside of the new facility, close to each food establishment. An exterior grease interceptor may also need to be installed.
- Prior to demolition, the owner must apply for this Demolition review online, via our online permit application system. See direct link to this permit review application - -https://needhamma.viewpointcloud.com/categories/1073/record-types/1006508. This form will need to be completed along with the submittal of the required supplemental report documents for our review and approval (as noted on the form.) **PLEASE NOTE**: Pest control reports, along with the asbestos sampling reports, etc., must be uploaded to our online system for review for each structure to be demolished, prior to the issuance of Demolition permits by the Building Department.
- On-going pest control must be conducted during demolition of the structures AND on-going pest control must be conducted throughout construction.

Please let us know if you have any follow-up questions or if you need any additional information from us on those requirements.

Thanks,



TARA E. GURGE, R.S., C.E.H.T., M.S. (she/her/hers)
ASSISTANT PUBLIC HEALTH DIRECTOR
Needham Public Health Division
Health and Human Services Department
178 Rosemary Street
Needham, MA 02494
Ph- (781) 455-7940; Ext. 211/Fax- (781) 455-7922

Mobile- (781) 883-0127
Email - tgurge@needhamma.gov
Web- www.needhamma.gov/health



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Follow Needham Public Health on Twitter!

From: Alexandra Clee
Sent: Friday, October 14, 2022 5:05 PM
To: David Roche <droche@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Justin Savignano <jsavignano@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: Request for comment - 40 & 50 Central

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The Planning Board has scheduled this matter for November 15, 2022. Please send your comments by Wednesday November 9, 2022 at the latest.

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Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

TOWN OF NEEDHAM
TOWN HALL
1471 Highland Avenue
Needham, MA 02492-2669

Design Review Board

Memo: Project review, 40 and 50 Central Avenue

November 7, 2022

The Board reviewed the design drawings for the development at 40 and 50 Central Avenue.

The DRB reviewed the project from the perspectives of overall site organization, landscaping, building massing, materials, and site and building lighting.

The Board approved of the general site organization. There was a discussion of the parking layout and how the columns in the parking area would be protected. The applicant stated the base will be concrete. The Board noted that many columns are in above standard parking spaces which should help. There are compact spaces in the parking lot, the Board suggests these spaces be identified with marking or signs on the low wall in front of those spaces.

The site slopes to the Reservoir side lot line and will require a retaining wall along the property line. The maximum height is approximately 4 ft. The material will be stacked block. The adjacent property has mature landscaping along that slope so the wall will not have a real visual impact. The Board approves this design.

The amenity in the front labeled as a Deck will actually be a grade level stone patio. The seating area in the rear is screened with 3 ft high boxwoods, these tend to end up looking shabby over time due to disease and improper maintenance. We might suggest either:
Ilex glabra 'Gem Box' or 'Strongbox'. Both are similar sized at 2-3' x 2-3'H dwarf dainty mounding. Strongbox has larger leaves, but both can be left alone as a hedge or can be sheered like boxwood.

The Board had suggestions for the landscaping of the rest of the site. There is a fair amount of lawn, which can be a maintenance issue for projects like this unless irrigated. We recognize that this is mostly a residential project, so some lawn areas might be desirable for the tenants, but the Board suggested alternative ground covers in some of the proposed lawn areas, especially areas too small to really be used as activity spaces. In the front and side areas, a mix of grasses like Carex Pennsylvanica, mixed with Arctostphylos uva-ursi' Massachusetts' or Tiarella cordifolia ground covers, and Hosta mixed in the grasses. We did not define an amount of area to be planted, but suggested the applicant review the amount of lawn with these comments in mind.

An alternative to the Hydrangea proposed would be Hydrangea paniculate "Bobo", a low maintenance choice.

The proposal is for a single type of dogwood tree along the street, "Cornus Kousa". The Board suggested mixing in some other varieties for a more varied look. Cornus Rutgans, or Cornus Florida, which has several varieties which have good drought resistance.

The trash bin location was discussed, a corner location can sometimes be difficult access. The applicant explained they would be rolling out the bins for pickup. The dark colored solid fencing is a good choice for screening the bins.

The Board liked the scale of the building. The color palette of red brick, and a grey composite Board and batten finish, along with light-colored composite panels, is good. The panel pattern will be created with a recessed metal channel. The brick is used on the Reservoir Street façade to make a connection to the adjacent neighborhood. The cornice will be built up with composite trim of various sizes, with a metal coping. The colors will vary to match the wall materials below. The building elevations vary in depth, color, and use of "Juliet" balconies and accessible balconies. The Board approves of the building design and believe it will be a good addition to a somewhat tired neighborhood.

Building lighting will consist of recessed lights in the overhanging second story. They propose accent up/down fixtures on the columns facing the streets. The only down side is the "dark sky" issue, with some sky wash occurring with this type of fixture. The Board approves of the building lighting.

The Board also approved of the bollard lighting and pole light fixtures. There was not a lighting plan to review but there are minimal pole fixtures used so there should be no offsite impacts.

End of comments

TOWN OF NEEDHAM, MASSACHUSETTS
PUBLIC WORKS DEPARTMENT
500 Dedham Avenue, Needham, MA 02492
Telephone (781) 455-7550 FAX (781) 449-9023

November 10, 2022

Needham Planning Board
Needham Public Service Administration Building
Needham, MA 02492

RE: Amendment to Major Project Special Permit No. 99-2
140 Kendrick Street- Boston Properties

Dear Members of the Board,

The Department of Public Works has completed follow up discussions with the applicant and with the Needham Building Department regarding our application review comments on the solar panel roof storm drainage system.

Our comments and recommendations are as follows:

- We concur with the Building Department's follow up letter dated November 1, 2022, to the Planning Board, and the applicant's follow up proposal to infiltrate ½ inch of stormwater from the solar panel roof run off.
- We have no objections for this agreement be referenced as a site plan modification submittal in the Planning Board's decision.

If you have any questions regarding the above, please contact our office at 781-455-7538.

Truly yours,

Thomas Ryder
Town Engineer

PLANNING & COMMUNITY DEVELOPMENT
PLANNING DIVISION

MAJOR PROJECT SITE PLAN REVIEW SPECIAL PERMIT
AMENDMENT TO DECISION
Application No. 99-2

November 15, 2022

BP 140 Kendrick Street LLC c/o Boston Properties Limited Partnership
(Original Decision dated June 15, 1999, amended December 1, 2020, and July 12, 2022)

DECISION of the Planning Board (hereinafter referred to as the Board) on the petition of BP 140 Kendrick Street LLC c/o Boston Properties Limited Partnership, 800 Boylston Street, Suite 1900, Boston, MA, (hereinafter referred to as the Petitioner) for property located at 140 Kendrick Street, Needham, Massachusetts. Said property is shown on Assessors Plan No. 300 as Parcels 1 and 3 and containing 621,402 square feet in the New England Business Center Zoning District.

This Decision is in response to an application submitted to the Board on September 22, 2022, by the Petitioner for: a Major Project Site Plan Review Special Permit amendment under Section 7.4 of the Needham Zoning By-Law (hereinafter the By-Law) and Section 3.2 of Major Project Site Plan Review Special Permit No. 99-2.

The requested Major Project Site Plan Review Special Permit Amendment, would, if granted, permit the Petitioner to construct and operate a solar garage roof on and above the existing parking garage. There are currently 1,334 parking spaces on site. The proposal shows that the battery storage equipment would be located such that 3 parking spaces would need to be relocated.

After causing notice of the time and place of the public hearing and of the subject matter thereof to be published, posted and mailed to the Petitioner, abutters and other parties in interest as required by law, the hearing was called to order by the Chair, Adam Block, on Tuesday, November 1, 2022 at 7:20 p.m. in the Powers Hall, Needham Town Hall, 1471 Highland Avenue, Needham, MA, as well as by Zoom Web ID Number 880 4672 5264. Board members Adam Block, Jeanne S. McKnight, Paul S. Alpert, Natasha Espada and Artie Crocker were present throughout the November 1, 2022 proceedings. The record of the proceedings and the submission upon which this Decision is based may be referred to in the office of the Town Clerk or the office of the Board.

Submitted for the Board's deliberation prior to the close of the public hearing were the following exhibits:

Exhibit 1 Application for an Amendment to Major Project Site Plan Review Special Permit No. 99-2, dated September 22, 2022.

Exhibit 2 Letter from Frederick J. DeAngelis, Attorney, dated September 20, 2022.

Exhibit 3 Plan prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, Sheet C1.00, entitled "Parking Plan," dated September 12, 2022.

Exhibit 4 Plan set consisting of 13 sheets, prepared by Parasol Structures: Sheet 1, Sheet PV-000, dated August 8, 2022, revised September 8, 2022; Sheet 2, Sheet PV-001, dated August 8, 2022, revised September 8, 2022; Sheet 3, Sheet PV-005, dated August 8, 2022, revised September 8, 2022; Sheet 4, Sheet PV-010, dated August 8, 2022, revised September 8, 2022; Sheet 5, Sheet PV-100, dated August 8, 2022, revised September 8, 2022; Sheet 6, Sheet PV-101, dated August 8, 2022, revised September 8, 2022; Sheet 7, Sheet PV-102, dated August 8, 2022, revised September 8, 2022; Sheet 8, Sheet PV-103, dated August 8, 2022, revised September 8, 2022; Sheet 9, Sheet PV-104, dated September 8, 2022; Sheet 10, Sheet PV-300, dated August 8, 2022, revised September 8, 2022; Sheet 11, Sheet PV-400, dated September 8, 2022; Sheet 12, Sheet PV-401, dated September 8, 2022; Sheet 13, Sheet PV-402, dated September 8, 2022.

Exhibit 5 Parasol Renderings of 140 Kendrick Street, consisting of 10 sheets, dated August 16, 2022.

Exhibit 6 Email from Frederick J. DeAngelis, Attorney, dated September 26, 2022, transmitting Plan prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, Sheet C2.00, entitled "Drainage Plan," dated September 22, 2022.

Exhibit 7 Letter from the Design Review Board with comments dated October 3, 2022 and October 17, 2022.

Exhibit 8 Lighting information received in response to Design Review Board meeting of October 3, 2022, consisting of 9 pages.

Exhibit 9 Rendering information received in response to Design Review Board meeting of October 3, 2022, consisting of 5 pages.

Exhibit 10 Interdepartmental Communication (IDC) to the Board from Chief Tom Conroy, Needham Fire Department, dated October 26, 2022; IDC to the Board from Chief John Schlittler, Police Department, dated October 26, 2022; IDC to the Board from Tara Gurge, Needham Health Department, dated October 26, 2022; IDC to the Board from Thomas Ryder, Town Engineer, dated October 27, 2022 and November 10, 2022; and IDC to the Board from David Roche, Building Commissioner, dated October 26, 2022, and November 1, 2022.

EXHIBITS 1, 2, 3, 4, 5, 6, 8 and 9 are referred to hereinafter as the Plan.

FINDINGS AND CONCLUSIONS

1.1. The property is the subject of Major Project Site Plan Review Special Permit No. 99-2, dated June 15, 1999 which permitted the redevelopment of a 262,670 square foot warehouse/office building to a single tenant 400,000 square foot office/research and development facility, including three interconnected buildings, a pavilion and one parking garage, 1,334 off street parking spaces, landscaping and a pedestrian walkway easement to the Metropolitan District Commission for access to Cutler park reservation were also provided.

By Decision dated December 1, 2020, the Petitioner was granted permission to renovate the existing single tenant space to allow for multiple tenants to lease buildings. Exterior improvements were limited to adding entrance locations to the buildings, patio improvements, an added trail linkage to Cutler Lake, accessible parking and landscape improvements at the new entrance locations, and a service walkway at the rear of Building A.

By Decision dated July 12, 2022, the Petitioner was further granted permission to construct and operate a rooftop deck on the roof of the low-rise building.

1.2 The Petitioner is now requesting permission to construct and operate a solar garage roof on and above the existing parking garage. There are currently 1,334 parking spaces on site. The proposal shows that the battery storage equipment would be located such that 3 parking spaces would need to be relocated. The total number of parking spaces will not change and there will be no addition to pavement. They are taking some standard size parking spaces and converting them to compact size to accommodate the additional 3 spaces in the existing site.

1.3 Boston Properties expressed that they are committed to sustainable and energy efficient measures in its properties. To date, they have completed 13 projects totaling 8 megawatts (MW) of on-site solar photovoltaic capacity on rooftops, garages and surface parking in Massachusetts and New Jersey. Their first solar roof was over a parking garage in Waltham at Bay Colony. Since then, they stated that they have completed a second phase at Bay Colony and a third garage project at CityPoint in Waltham.

1.4 At 140 Kendrick Street, the Petitioner is proposing to install a similar solar garage roof on/over the existing parking garage. The purpose of the solar roof is to:

a. Provide on-site generation of renewable energy that will result in net zero carbon operation of 140 Kendrick Street Building A. This is to be Boston Properties first fully net zero project and will serve as a model project for net zero carbon office building design and redevelopment.

b. Generate approximately 1,300 megawatt-hours (MWh) of renewable energy on-site from 2,900 405-watt (W) modules.

c. Advance the transition to a low carbon economy by building a high-quality distributed energy generation system with storage (336 kW). This project is emblematic of projects Boston Properties is pursuing to achieve carbon neutral operations by 2025 and to meet our climate action goals, which include a science-based emissions reduction target for the company.

As part of this project, the Petitioner will also be better insulating the buildings and providing other energy efficient measures within the buildings at the site. The garage solar canopy will produce more energy than the site utilizes.

1.5 The Petitioner appeared before the Design Review Board approval on October 3, 2022 and October 17, 2022 and received Design Review Board approval of the project.

1.6 Adjoining premises will be protected against seriously detrimental uses on the site by provision of surface water drainage, sound and site buffers, and preservation of views, light and air. The site is presently fully developed and the proposed solar roof canopy has been approved by the Design Review Board (DRB). The DRB reviewed the lighting and the views of the canopy from abutting streets. Though it is partially visible from certain streets, the

DRB was satisfied with the proposal.

1.7 Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets, the location of driveway openings in relation to traffic or to adjacent streets and, when necessary, compliance with other regulations for the handicapped, minors and the elderly has been assured. 3 parking spaces are being eliminated to house the solar battery equipment and will be relocated elsewhere on-site so that there is no change to the total number of parking spaces on-site and there will continue to be 1,334 parking spaces.

1.8 Adequacy of the arrangement of parking and loading spaces in relation to the proposed uses of the premises has been assured. As noted, 3 parking spaces are being relocated. No change is proposed to the number of spaces nor to the loading area.

1.9 Adequate methods for disposal of refuse and waste will be provided. The project will not generate additional refuse.

1.10 Relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area and compliance with other requirements of this By-law has been assured. The existing site is fully developed. The project has been reviewed and approved by the Design review Board.

1.11 The proposed project will not have any adverse impacts on the Town's resources, including the Town's water supply and distribution system, sewer collection and treatment, fire protection and streets. The project has been reviewed by the Department of Public Works, who has recommended that the storm water infiltration system be sized to infiltrate 0.50 inch of stormwater from the solar panel roof runoff. The Petitioner has agreed to this.

1.12 Under Section 7.4 of the By-Law, a Major Project Site Plan Review Special Permit amendment may be granted within the New England Business Zoning District provided the Board finds that the proposed development will be in compliance with the provisions of the By-Law. On the basis of the above findings and conclusions, the Board finds the proposed development Plan, as conditioned and limited herein, for the site plan review, to be in harmony with the purposes and intent of the By-Law, to comply with all applicable By-Law requirements, to have minimized adverse impact, and to have promoted a development which is harmonious with the surrounding area.

THEREFORE, the Board voted 5-0 to GRANT: (1) a Major Project Site Plan Review Special Permit amendment under Section 7.4 of the Needham Zoning By-Law and Section 3.2 of Major Project Site Plan Review Special Permit No. 99-2, subject to and with the benefit of the following Plan modifications, conditions, and limitations.

PLAN MODIFICATIONS

Prior to the issuance of a building permit or the start of any construction on the site, the Petitioner shall cause the Plan to be revised to show the following additional, corrected, or modified information. The Building Commissioner shall not issue any building permit, nor shall he permit any construction activity on the site to begin on the site until and unless he finds that the Plan is revised to include the following additional corrected, or modified information. Except where otherwise provided, all such information shall be subject to the approval of the Building Commissioner. Where approvals are required from persons other than the Building Commissioner, the Petitioner shall be responsible for providing a written copy of such approvals to the Building Commissioner before the Commissioner shall issue any building permit or permit for any construction on the site. The

Petitioner shall submit nine copies of the final Plans as approved for construction by the Building Commissioner to the Board prior to the issuance of a Building Permit.

2.0 The Plans shall be modified to include the requirements and recommendations of the Board as set forth below. The modified plans shall be submitted to the Board for approval and endorsement.

a. The Plan shall be modified to show that the storm water infiltration system has been sized to infiltrate 0.50 inch of stormwater from the solar panel roof runoff, pursuant to the comments from the Department of Public Works and the Building Department.

CONDITIONS

3.0 The following conditions of this approval shall be strictly adhered to. Failure to adhere to these conditions or to comply with all applicable laws and permit conditions shall give the Board the rights and remedies set forth in Section 3.16 hereof.

3.1 The conditions and limitations set forth in a Major Project Site Plan Review Special Permit No. 99-2, dated June 15, 1999, amended December 1, 2020, and July 12, 2022, as further amended by this Amendment are ratified and confirmed.

3.2 The Board approves the solar roof canopy, associated battery storage equipment, and relocation of 3 parking spaces, as shown on the Plan, as modified by this decision. The development of the site shall be as described under the support materials provided under Exhibits 1, 2, 3, 4, 5, 6, 8 and 9 of this decision. Any changes, revision or modifications to the Plan shall require approval by the Board.

3.3 The buildings, parking areas, driveways, walkways, landscape areas, and other site and off-site features shall be constructed in accordance with the Plan, as modified by this decision. Any changes, revisions or modifications to the Plan, as modified by this decision, shall require approval by the Board.

3.4 All new utilities, including telephone and electrical service, shall be installed underground from the street line.

3.5 The maintenance of the site and associated infrastructure and landscaping shall be the responsibility of the Petitioner and the site, infrastructure and landscaping shall be maintained in good condition.

3.6 1,334 parking spaces shall be provided at all times.

3.7 All construction staging shall be on-site. No construction parking shall be on public streets. Construction parking shall be all on-site or a combination of on-site and off-site parking at locations in which the Petitioner can make suitable arrangements. If required by the Building Commissioner, construction staging plans shall be included in the final construction documents prior to the filing of a Building Permit and shall be subject to the review and approval of the Building Commissioner.

3.8 The Petitioner shall seal all abandoned drainage connections and other drainage connections where the developer cannot identify the sources of the discharges.

3.9 The Petitioner shall secure from the Needham Department of Public Works a Street Opening Permit, if applicable.

3.10 In constructing and operating the solar roof canopy pursuant to this Special Permit, due diligence shall be exercised, and reasonable efforts be made at all times to avoid damage to the surrounding areas or adverse impact on the environment.

3.11 The following interim safeguards shall be implemented during construction:

a. The hours of construction shall be 7:00 a.m. to 5:00 p.m. Monday through Saturday not at all on Sundays and holidays.

b. The Petitioner's contractor shall provide temporary security chain-link or similar type fencing around the portions of the project site which require excavation or otherwise pose a danger to public safety.

c. The Petitioner's contractor shall designate a person who shall be responsible for the construction process. That person shall be identified to the Police Department, the Department of Public Works, the Building Commissioner, and the abutters and shall be contacted if problems arise during the construction process. The designee shall also be responsible for assuring that truck traffic and the delivery of construction material does not interfere with or endanger traffic flow on Kendrick Street, First Avenue or surrounding streets.

3.12 No building permit shall be issued in pursuance of the Special Permit and Site Plan approval for the solar roof canopy until:

a. The final plans are in conformity with those approved by the Board (including any Plan Modifications), and a statement certifying such approval shall have been filed by this Board with the Building Commissioner.

b. A construction management and staging plan has been submitted to the Police Chief and Building Commissioner for their review and approval.

c. The Petitioner has recorded with the Norfolk County Registry of Deeds a certified copy of this decision granting this Special Permit and Site Plan Approval with the appropriate reference to the book and page number of the recording of the Petitioner's title deed or notice endorsed thereon.

3.13 No portion of the solar roof canopy shall be occupied or utilized until the following conditions are met:

a. An as-built plan, supplied by the engineer of record showing that the site improvements were installed according to the approved documents, shall be submitted to the Board and Department of Public Works. The as-built plan shall show the building, and all final improvements on-site, in its true relationship to the lot lines. In addition to the engineer of record, said plan shall be certified by a Massachusetts Registered Land Surveyor.

b. There shall be filed with the Building Commissioner and Board a statement by the Department of Public Works certifying that the site improvements have been constructed to the standards of the Town of Needham Department of Public Works and in accordance with the approved Plan.

c. There shall be filed with the Board and Building Commissioner a Final Construction Control Document signed by a registered structural engineer upon completion of construction.

d. There shall be filed with the Board and Building Commissioner a Final Construction Control Document signed by a registered architect upon completion of construction.

3.14 In addition to the provisions of this approval, the Petitioner must comply with all requirements of all state, federal, and local boards, commissions or other agencies, including, but not limited to the Building Commissioner, Fire Department, Department of Public Works, Conservation Commission, Police Department, and Board of Health.

3.15 The Petitioner, by accepting this Approval, warrants that the Petitioner has included all relevant documentation, reports, and information available to the Petitioner in the application submitted, and that this information is true and valid to the best of the Petitioner's knowledge.

3.16 Violation of any of the conditions of this Approval shall be grounds for revocation of any building permit or certificate of occupancy granted hereunder as follows: In the case of violation of any conditions of this Approval, the Town will notify the owner of such violation and give the owner reasonable time, not to exceed thirty (30) days, to cure the violation. If, at the end of said thirty (30) day period, the Petitioner has not cured the violation, or in the case of violations requiring more than thirty (30) days to cure, has not commenced the cure and prosecuted the cure continuously, the permit granting authority may, after notice to the Petitioner, conduct a hearing in order to determine whether the failure to abide by the conditions contained herein should result in a recommendation to the Building Commissioner to revoke any building permit or certificate of occupancy granted hereunder. This provision is not intended to limit or curtail the Town's other remedies to enforce compliance with the conditions of this Approval including, without limitation, by an action for injunctive relief before any court of competent jurisdiction. The Petitioner agrees to reimburse the Town for its reasonable costs in connection with the enforcement of the conditions of this Approval if the Town prevails in such enforcement action.

LIMITATIONS

4.0 The authority granted to the Petitioner by this permit is limited as follows:

4.1 This permit applies only to the site improvements, which are the subject of this petition. All construction to be conducted on-site shall be conducted in accordance with the terms of this permit and shall be limited to the improvements on the Plan, as modified by this decision.

4.2 There shall be no further development of this site without further site plan approval as required under Section 7.4 of the By-Law. The Board, in accordance with M.G.L., Ch. 40A, Section 9 and said Section 7.4, hereby retains jurisdiction to (after hearing) modify and/or amend the conditions to, or otherwise modify, amend or supplement, this decision and to take other action necessary to determine and ensure compliance with the decision.

4.3 This decision applies only to the requested Special Permits and Site Plan Review. Other permits or approvals required by the By-Law, other governmental boards, agencies or bodies having jurisdiction shall not be assumed or implied by this decision.

4.4 No approval of any indicated signs or advertising devices is implied by this decision.

4.5 The foregoing restrictions are stated for the purpose of emphasizing their importance but are not intended to be all-inclusive or to negate the remainder of the By-Law.

4.6 This Site Plan Special Permit shall lapse on November 15, 2024, if substantial use thereof has not sooner commenced, except for good cause. Any requests for an extension of the time limits set forth herein must be in writing to the Board at least 30 days prior to November 15, 2024. The Board herein reserves its rights and powers to grant or deny such extension without a public hearing. The Board, however, shall not grant an extension as herein provided unless it finds that the use of the property in question or the construction of the site has not begun, except for good cause.

4.7 This decision shall be recorded in the Norfolk District Registry of Deeds and shall not become effective until the Petitioner has delivered a certified copy of the document to the Board. In accordance with M.G.L. Chapter 40A, Section 11, this Major Site Plan Review Special Permit shall not take effect until a copy of this decision bearing the certification of the Town Clerk that twenty (20) days have elapsed after the decision has been filed in the office of the Town Clerk and either that no appeal has been filed or the appeal has been filed within such time is recorded in the Norfolk District Registry of Deeds and is indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The person exercising rights under a duly appealed Special Permit does so at the risk that a court will reverse the permit and that any construction performed under the permit may be ordered undone.

The provisions of this Special Permit shall be binding upon every owner or owner of the lots and the executors, administrators, heirs, successors and assigns of such owners, and the obligations and restrictions herein set forth shall run with the land, as shown on the Plan, as modified by this decision, in full force and effect for the benefit of and enforceable by the Town of Needham.

Any person aggrieved by this decision may appeal pursuant to the General Laws, Chapter 40A, Section 17, within twenty (20) days after filing of this decision with the Needham Town Clerk.

Witness our hands this 15th day of November 2022.

NEEDHAM PLANNING BOARD

_____
Adam Block, Chair

_____
Jeanne S. McKnight, Vice Chair

_____
Paul S. Alpert

_____
Artie Crocker

_____
Natasha Espada

COMMONWEALTH OF MASSACHUSETTS

_____2022

On this _____day of November, 2022, before me, the undersigned notary public, personally appeared _____, one of the members of the Planning Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

_____
Notary Public
My Commission Expires: _____

TO WHOM IT MAY CONCERN: This is to certify that the 20-day appeal period on the Amendment to Decision of the project proposed by the BP 140 Kendrick Street LLC c/o Boston Properties Limited Partnership, 800 Boylston Street, Suite 1900, Boston, MA, for property located at 140 Kendrick Street, Needham, Massachusetts, has passed,

____and there have been no appeals filed in the Office of the Town Clerk or
____there has been an appeal filed.

_____ _____
Date Theodora K. Eaton, Town Clerk

Copy sent to:

Petitioner - Certified Mail #	Board of Selectmen
Town Clerk	Engineering
Building Commissioner	Fire Department
Director, PWD	Police Department
Board of Health	Frederick J. DeAngelis, Attorney
Conservation Commission	Parties in Interest

goulston&storrs
counsellors at law

August 15, 2022

BY HAND DELIVERY, OVERNIGHT DELIVERY
& ELECTRONIC MAIL

Town of Needham Planning Board Members
Public Service Administration Building
500 Dedham Avenue
Needham, MA 02492
Attn: Lee Newman, Planning Director

Re: Highland Innovation Center – 557 Highland Avenue, Needham Heights, Massachusetts (the "Property") – Application for Major Project Site Plan Review and Special Permits – Revisions dated as of September 7, 2022 Planning Board Public Hearing Letter #3

Dear Planning Board Members:

As you know, we are counsel to 557 Highland, LLC, an affiliate of The Bulfinch Companies, Inc. (the "Applicant"), in connection with the redevelopment of the Property with a new, mixed-use development of office, laboratory, research and development, and retail/restaurant uses (the "Project"), all as described in our letter dated April 5, 2022 and supplemental letter dated June 30, 2022 (collectively, the "Prior Letters") transmitting the Application for Site Plan Review and issuance of Special Permits in connection with development of the Project (the "Application").

Since submission of our April 5, 2022 letter, the Applicant has undertaken an extensive community engagement process including seven (7) community meetings and two (2) public hearings with the Planning Board. At the first Planning Board public hearing, on June 7, 2022, the Applicant presented an overview of the Project and heard feedback and discussion from the Planning Board and general public. At the second Planning Board public hearing, on July 7, 2022, the Applicant and the Applicant's traffic engineers presented the Project's transportation aspects and heard additional feedback from the Planning Board and the general public.

Responding to feedback from the Planning Board, several Town departments, neighbors, and the community at large, the Applicant has further refined the Project design. This letter describes those refinements. The description of the Project in this letter is meant to restate the characteristics of the Project in their entirety from our letter of April 5, 2022 and to identify the refinements. ***Significant revisions from our submission of April 5, 2022 are indicated by italic/bold text***.

In support of the Application, the Applicant is submitting the following additional materials and information as requested for the next Planning Board public hearing on September 7, 2022:

1. ***Revised Plan Set entitled "Special Permit Package R1, August 15, 2022 for September 7, 2022 Planning Board Special Permit Public Hearing" (the "Plan Set");***

2. ***Memorandum from Stantec Architecture and Engineering P.C., Re: Special Permit Package R1 (08/16/2022 for 09/07/2022 Planning Board public hearing), dated August 16, 2022;***

3. ***Letter from VHB, Inc., Re: Transportation Updates to Special Permit Submission, dated August 15, 2022;***

4. ***Letter from VHB, Inc., Re: 557 Highland Ave – Highland Innovation Center – Plan Revisions for Permitting, dated August 15, 2022;***

5. ***Memorandum from Paul Finger Associates, Re: 557 Highland Ave – Special Permit Summary of Plan Revisions -01, dated August 15, 2022;***

6. ***Preliminary Exterior/Community Noise Evaluation/Narrative – Revision 2, prepared by Acentech Incorporated, dated August 15, 2022;***

7. ***Fiscal Impact Analysis, prepared by Fougere Planning & Development, Inc., dated May 16, 2022;***

8. ***Plan entitled "Conveyance Plan" prepared by Feldman Geospatial dated August 15, 2022, prepared for September 7, 2022 Planning Board public hearing (the "Conveyance Plan").***

* * *

ZONING ANALYSIS DISCUSSION:

Background and Overview:

The Property is the former site of the Muzi Ford and Chevrolet automotive dealership and service centers and the Muzi car wash. ***The former Muzi property consists of 403,933 square feet (sq. ft.) of land area totaling approximately 9.273 acres***. The Property is bordered by Highland Avenue to the south, Interstate 95/Route 128 to the east, Gould Street to the west, and TV Place (formerly known as Permil Road), a private way, to the north. ***As part of the Applicant's redevelopment revised plans, the Applicant proposes to widen Gould Street***

between the intersection with Highland Avenue and TV Place. To that end, the Applicant proposes to convey to the Town of Needham a portion of the Property along Gould Street containing approximately 12,080 sq. ft. of land (the "Conveyance Area"). This widening of Gould Street will shift the street line toward Interstate 95/Route 128, with corresponding shifts in the 50 and 200 foot setbacks from Gould Street required by the HC-1 zoning. Shifting these setbacks requires a reduction of the Buildings' total gross floor area by 16,694 sq. ft., and will reduce the Garage's gross floor area by 5,412 sq. ft., eliminating 18 parking spaces. The Plan Set includes a view of the reduced Garage from the westerly side of Gould Street.

The Applicant is proposing to redevelop the Property with approximately ***479,948*** sq. ft. of office, laboratory, and research and development uses, approximately ***10,052*** sq. ft. of retail and restaurant uses (yielding a total project program of ***490,000*** sq. ft.), construction of one level of below-grade parking under each building, and a separate stand-alone parking garage (the "Project"). The Project will include two buildings, one on the northerly portion of the Property (the "North Building") and one on the southerly portion of the Property (the "South Building"), together with a shared connector atrium (the "Atrium").

Based on input from the community, the neighborhood, and representatives of the Town, including the Town's traffic consultant, the Applicant has relocated the Multi-Use Walkway (defined below) constructed for the benefit of the Town and maintained by the Applicant, all as further shown in the Plan Set. In addition, the Applicant's transfer of the Conveyance Area will improve the street alignment of Hunting Road and Gould Street to make for more efficient traffic flow. The transfer of valuable land in the Conveyance Area to the Town for nominal consideration will improve the Town's roadway network, providing significant benefit to the Town.

As described below, the HC-1 District zoning allows a maximum Floor Area Ratio ("FAR") of 1.35 for the Property, generating a maximum build out of ***545,310*** sq. ft.[1] The Project, ***following conveyance to the Town of a portion of the Property for public benefit***, proposes an FAR of 1.25, based on a buildout of ***490,000*** sq. ft., which is ***39,002*** sq. ft. less than the maximum buildout.

As mentioned in our Prior Letters, the materials and studies submitted with this Application previously and in the Project's MEPA Environmental Notification Form have conservatively studied and presented an analysis based on a significantly higher build out for the Property of approximately 531,000 sq. ft. As a result of the reduced buildout, the traffic generation numbers in these materials and studies should be reduced by approximately *8*%, yielding lesser impacts than what was studied.

Pursuant to the Town of Needham Zoning Map, as amended by Article 6 of the Annual Town Meeting held on May 3, 2021 (as amended, the "Zoning Map"), the Property is located

[1] After transfer of the Conveyance Area to the Town, the remaining Property would support a maximum build out of 529,002 sq. ft. at an FAR of 1.35.

within the Highway Commercial 1 District (the "HC-1 District"). The HC-1 District was established by an amendment to the Town of Needham Zoning By-Law (as amended, the "By-Law") adopted by a 168-37 vote of Town Meeting pursuant to Article 5 of the Annual Town Meeting held on May 3, 2021. According to the Zoning Map, the Property is not located within any overlay districts.

The creation of the HC-1 District was the result of an extensive planning effort by the Town of Needham (the "Town"). The Town's Council of Economic Advisors ("CEA") began an evaluation of the Town's Industrial Zoning Districts in 2013. The CEA held public meetings with residents, neighbors, public officials, businesses, and landowners (collectively, the stakeholders) in 2014 and obtained a build-out analysis and a traffic impact report. The CEA made preliminary recommendations to the public and Select Board to upgrade the zoning adjacent to I-95/Route 128 to make these areas more economically competitive.

The Planning Board and Select Board decided to move forward with rezoning of the former Industrial-1 Zoning District circumscribed by I-95/Route 128, Highland Avenue, Gould Street, and the MBTA right of way, and occupied by the Muzi Ford and Chevrolet dealership, a car wash, and WCVB Channel 5. A Warrant Article proposing to rezone this Industrial-1 Zoning District was developed and presented to the October 2019 Special Town Meeting, where it received a majority vote but less than the required two-thirds.

In response to public concerns about density, traffic impacts, permitted and special permit uses, and environmental issues, a Town-wide community meeting was held with stakeholders in January 2020 to discuss overall land use goals for the HC-1 District. A working group, including representatives from the Planning Board, Select Board, Finance Committee, and CEA was formed. The working group then commissioned an updated traffic study of the area, to analyze the ability of the Town's traffic infrastructure to accommodate development at various densities and use profiles, as well as an updated fiscal impact analysis. From these efforts, the Planning Board drafted a revised Zoning Article to establish the HC-1 District. The revised Zoning Article reduced maximum floor area ratios and building height, increased building setback distances, required additional landscape buffering along Gould Street and Highland Avenue, increased open space requirements and established green building standards for issuance of a special permit.

In connection with the above process, the Town commissioned the Fiscal Analysis to study the potential financial benefit of such rezoning. Based on the Fiscal Analysis, a full-build out of the Property and the adjacent land owned by Channel 5 and related entities in the HC-1 District at 1.35 FAR would yield an annual net financial benefit to the Town of approximately $8,342,400. Without the adjacent land[2], the Project, as proposed, will result in a prorated annual net financial benefit of approximately $5,000,000 to the Town. ***The Fougere Report confirmed this approximate benefit to the Town***.

[2] The Applicant is unaware of any current plans by the Channel 5 entities to redevelop the approximately 260,000 sq. ft. of its land in the HC-1 District.

The Applicant proposes the Project to realize the goals of this re-zoning.

Proposed Project:

Use

As described above, the Property was most recently used as an automotive dealership and car wash making up a nearly entirely impervious surface which included parking for approximately 532 vehicles. The Project will remove environmentally hazardous materials and redevelop the existing underutilized site to include approximately ***479,948*** sq. ft. of office, laboratory, and research and development uses. The Project will also feature approximately ***10,052*** sq. ft. of retail and/or restaurant uses and accessory parking use in the form of underground parking beneath the North and South Buildings and separate stand-alone Garage. A breakdown of proposed uses and the approximate square footage of such uses is as follows:

USES	PROPOSED
Office	***239,974*** sq. ft.
Lab/Research and Development	***239,974*** sq. ft.
Retail/Restaurant	***10,052*** sq. ft.
Accessory Parking	***1,390 total parking spaces of which 362 will be located beneath the buildings, 998 will be located in a stand-alone parking garage, and 30 will be surface parking. This represents a reduction in 18 spaces from our prior submission.***

Because the specific square footage breakdown is subject to final tenant demands, the Applicant requests that the Board allow the allocation among the uses (and floor plans) to change from time to time without further Board review or approval as long as the Project maintains the number of parking spaces required by the approvals. The Applicant requests the ability to construct the Project in phases, including the right to obtain a final certificate of occupancy for the parking garage and/or either building prior to completion of construction of both buildings.[3]

Pursuant to By-Law Section 3.2.7, professional, business, or administrative offices and laboratory uses are allowed by-right in the HC-1 District. Retail uses are also allowed by-right so

[3] If a bond is required in connection with the issuance of a Certificate of Occupancy for the North or South Building or the Garage before completion of the other buildings, the Applicant requests that the amount of the bond be limited to the costs of completing internal roadways and landscaping, excluding the costs of any unfinished (or unstarted)) other buildings.

long as no single retail establishment contains more than 5,750 square feet of gross floor area. Light-manufacturing uses— including manufacture of pharmaceutical, bio-pharmaceutical, medical, robotic, and micro-biotic products, which may be part of the Project tenants' laboratory uses—are allowed by right and also as an accessory use to any lab/research development use. The Applicant anticipates that light-manufacturing uses accessory to research and development uses, including the production of prototypes, may be part of the Project depending upon the ultimate tenanting of the Project.

By-Law Section 3.2.7.1(m) allows all by right customary and proper uses accessory to lawful principal uses. Given that the accessory parking on the Property is intended to provide parking incidental to operation of the main uses described above, such accessory use is allowed by-right. Formerly, the Property showed 532 lined spaces, a portion of which were used for parking for customers and employees, and the balance of which were used for parking of new and used car inventory and auto repair activities in connection with the dealership on the Property. These spaces do not include any employees or visitors for the car wash.

The Applicant anticipates that the retail space may contain a tenant in excess of approximately *6,052* sq. ft., and a restaurant of approximately 4,000 sq. ft. Accordingly, the Project will require a Special Permit for the potential occupancy of a single retail tenant in excess of 5,750 sq. ft. and a Special Permit for restaurant use.

Parking

The Applicant plans to construct a total of ***1,390*** parking spaces (***an 18 space reduction from our prior submission***) to be provided between a one-level underground parking structure beneath the buildings and a separate above-ground parking garage.[4] The following chart describes the number of parking spaces required pursuant to By-Law Section 5.1.2.

Use	Space Required by Zoning	Proposed Parking Spaces
Research facilities/laboratories	***800*** spaces (1 space per 300 sq. ft.)*	
Office	***800*** spaces (1 space per 300 sq. ft.)	
Retail	***up to 34*** **s**paces (1 space per 300 sq. ft.)	
Restaurant	***up to 44*** spaces, for a 100 seat restaurant with one take-out service station (1 space per 3 seats plus 10 spaces per take-out service station)	

[4] The stand-alone garage will contain two levels of underground parking as shown in the Plan Set.

Total	***up to 1,678, assuming 6,052 sf of retail use and 4,000 sf restaurant with 100 seats and one take-out service station***	***1,390 total parking spaces of which 362 will be located beneath the buildings, 998 will be located in a stand-alone parking garage, and 30 will be surface parking. This represents a reduction in 18 spaces from our prior submission.***
*Provided that occupancy by a single tenant of more than 50,000 sq. ft. shall require one space per 300 sq. ft. for the first 50,000 sq. ft. and 1 space per 400 sq. ft. in excess of 50,000 sq. ft. Thus, the number of required parking spaces will be reduced if a single tenant occupies all of the North Building or the South Building, or both.		

As shown above, the Applicant proposes ***1,390*** parking spaces. However, the By-Law's parking requirements assume a higher employee density than is typical for lab/research & development uses. The By-Law also assumes that each employee will commute alone and does not take into account the Applicant's proposed use of carpool, walking, biking, and public transit alternatives that will reduce the number of vehicles required to be parked on-site. Furthermore, the By-Law does not consider the potentially permanent changes in commuting patterns resulting from the COVID-19 pandemic, including hybrid/remote work programs. For these reasons, the Applicant's proposed number of parking spaces is more reflective of expected demand than the parking requirement under the By-Law. Therefore, the Project will require a Special Permit from the Planning Board, waiving strict adherence to the minimum number of required parking spaces for the ***288*** space difference between the proposed ***1,390*** spaces and the ***1678*** required spaces under zoning owing to these special circumstances, or for less than ***1,390*** total spaces, as the Planning Board may deem sufficient based on a review of the Application.[5]

The parking spaces provided will comply with all design guidelines prescribed by By-Law Section 5.1.3 as shown on the Plan Set included with the Application.

Dimensional Requirements

The following chart sets forth dimensional requirements applicable to the Project:

Item	Required	Project	Compliance with Zoning?
Minimum Lot Area	20,000 sq. ft.	***391,846*** sq. ft**	YES
Minimum Lot Frontage	100 ft.	At least 100 ft.	YES

[5] As described below, the Planning Board is the special permit granting authority for all special permit relief for Major Projects under Section 7.4.3 of the By-Law, and accordingly may grant relief under Section 5.1.1.5 from both parking space requirements under Section 5.1.2 and parking plan under Section 5.1.3.

Item	Required	Project	Compliance with Zoning?
Maximum Floor Area Ratio	0.70 as-of-right Up to 1.35 by special permit	1.25	**YES – Special Permit Required**
Front Setback from Highland Avenue and Gould Street	15 ft.	North Building: 200 ft. South Building: 50 ft.	YES
Landscape Buffer	50 ft. along Highland Ave. and Gould Street	50 ft.***	YES
Increased Height Setback	200 ft. from Highland Ave. and Gould Street	North Building: 200ft.	YES
Side/Front Setback on Rt. 95	20 ft.	20 ft.	YES
Rear Setback	20 ft. (along TV Place)	20 ft.	YES
Maximum Lot Coverage	65%	***47.9***%	YES
Maximum South Building Height* (within 200 ft. height limitation zone)	35 ft. as-of-right 42 ft. by special permit	42 ft.	**YES – Special Permit Required**
Maximum Building North Height* (outside 200 ft. height limitation zone)	56 ft. as-of-right 70 ft. by special permit	70 ft.	**YES – Special Permit Required**
Maximum Garage Height*	44 ft. as-of-right 55 ft. by special permit	55 ft.	**YES – Special Permit Required**

Item	Required	Project	Compliance with Zoning?
Maximum Stories* (within 200 ft. height limitation zone)	2.5 stories as-of-right Up to 3 stories by special permit	3 stories (South Building)	**YES – Special Permit Required**
Maximum Stories* (outside 200 ft. height limitation zone)	4 stories as-of-right Up to 5 stories by special permit	5 stories (North Building)	**YES – Special Permit Required**
Maximum Garage Footprint	42,000 sq. ft.	***41,361*** sq. ft.	YES
Minimum Open Space	25%	***>25%***	YES
Maximum Uninterrupted Façade Length	200 ft.	200 ft.****	YES
Building Parapet Height	5 ft.	5 ft.	YES

*Pursuant to Section 4.11.1(e), structures erected on a building and not used for human occupancy, including mechanical equipment, may exceed the maximum building height provided that no part of such structures extends more than 15 ft. above the maximum allowable building height (e.g., 57 ft and 85 ft., respectively for each building) and such structures do not cover more than 25% of the building roof.

** ***This area calculation is based on the reduction of the Property area's after transfer to the Town of Needham of the 12,080 sq. ft. Conveyance Area***. Separately, the Applicant's property on the north side of TV Place (known as 0 Gould Street) containing approximately 7,127 sq. ft. is not included in calculation of lot area and other measurements.

*** ***Pursuant to Section 4.11.1(1)(d) of the By-Law, sidewalks and walkways, including the Multi-Use Walkway (defined below), may be located within the 50 ft. setback buffer along Highland Avenue and Gould Street***.

**** As shown in the Plan Set, the Garage's façade will be broken up through the use of banners which will provide uninterrupted façade lengths of less than 200 ft.

Based on the foregoing, the Project will require Site Plan Review (described below) and Special Permits from the Planning Board as follows: (i) to allow a maximum Floor Area Ratio of 1.25; (ii) to allow a maximum height of 70 feet for the North Building; (iii) to allow a maximum of 5 stories in height for the North Building; (iv) to allow a maximum height of 42 feet for the

South Building; (v) to allow a maximum of 3 stories in height for the South Building; and (vi) to allow a maximum building height of 55 feet for the above-ground parking structure.

With respect to clause (i) above, pursuant to By-Law Section 4.11.1(5) the Planning Board may allow an FAR of up to 1.35 by issuance of a Special Permit. The grant of a Special Permit pursuant to this section must consider the factors detailed further below.

With respect to clauses (ii) through (vi) above, pursuant to By-Law Section 4.11.1(1), buildings within 200 ft. of Highland Avenue and Gould Street are limited to a height of 35 ft. and 2.5 stories. The Planning Board may grant a Special Permit to increase the height of buildings within the 200 ft. height limitation zone to 42 ft. and 3 stories and may further increase the height of buildings beyond the 200 ft. height limitation zone to up to 70 ft. and 5 stories. The 200 ft. height limitation envelopes allowing for such height increases are depicted in Figure 1 and Figure 2 of By-Law Section 4.11.1(f), which provides for such figures to clarify the limits of the required setbacks and allowed envelopes. Additionally, pursuant to Section 4.11.2, the Planning Board may grant a Special Permit to increase the height of a parking structure up to 55 ft.[6]

The Project will also require a Special Permit to allow for retaining wall height greater than 4 ft. and other applicable design requirements for retaining walls pursuant to By-Law Section 6.11.5.

Major Project Site Plan Review and Special Permit:

Site Plan Review and Approval, in the form of a Planning Board Special Permit, is required for any "Major Project". Pursuant to Section 7.4.2 a "Major Project" is any project in the HC-1 District that involves the construction of 10,000 or more square feet, an increase in gross floor area of 5,000 or more square feet, or the creation of 25 or more new off-street parking spaces. The Project will exceed each of the foregoing thresholds and therefore qualifies as a Major Project subject to Site Plan Review.

Pursuant to By-Law Section 7.4.3, "the special permit granting authority for all permits the issuance of which is necessary for the construction or use of a Major Project shall be the Planning Board."

Based on the above, the Project will require Site Plan Review and Approval pursuant to By-Law Section 7.4 from the Planning Board and subject to review by the Design Review Board. Additionally, as a Major Project, the Project will require a Special Permit from the Planning Board in connection with Site Plan Review. As provided by By-Law Section 7.4.3, the Planning Board may also issue any other Special Permits required for the Project given its status as a Major Project.

[6] In lieu of applying the height/story limitation in Section 4.11.1, the By-Law sets parking garage height at 44 ft. and allows an increase up to 55 ft. by Special Permit pursuant to Section 4.11.2(1).

Relief Requested:

Based on the foregoing analysis and in accordance with By-Law Sections 3.2.7.2, 4.11, 5.1.1.5, 6.11.5, 7.2, 7.4, 7.5 and 7.6, and such other By-Law Sections as may apply, the following items of zoning relief are requested:

1. Special Permit in accordance with By-Law Section 4.11.1(5) for an FAR of 1.25 for the Project.

2. Special Permit, in accordance with By-Law Section 4.11.1(1) for a building height of 70 feet for the North Building.

3. Special Permit, in accordance with By-Law Section 4.11.1(1) for 5 stories for the North Building.

4. Special Permit, in accordance with By-Law Section 4.11.1(1) for a building height of 42 feet for the South Building.

5. Special Permit, in accordance with By-Law Section 4.11.1(1) for 3 stories for the South Building.

6. Special Permit, in accordance with By-Law Section 3.2.7.2 (g), for restaurant use.

7. Special Permit, in accordance with By-Law Section 3.2.7.2 (d), for retail use by a single tenant of between 5,750 – 10,000 sq. ft.

8. Special Permit, in accordance with By-Law Section 4.11.2(1) for a parking garage structure height of 55 feet.

9. Site Plan Review and Approval of the Project as a Major Project in accordance with Section 7.4.

10. Special Permit, in accordance with By-Law Section 5.1.1.5, for a waiver of approximately ***288*** parking spaces from the required parking space number under By-Law Section 5.1.2 to be provided as part of the Project.

11. Special Permit, in accordance with By-Law Section 6.11.5, for deviation from the design requirements for retaining walls.

12. Any additional Special Permits required for the permitting of the Project.

Satisfaction of Criteria for Granting Relief Requested:

In connection with granting the above-requested relief, the Planning Board must make certain findings related to the Project as set forth in the applicable Sections of the By-Law. The applicable criteria are set forth in bold below and are followed by the Applicant's description of how the Project complies or will comply with such criteria. Explanatory notes from the By-Law are provided in italics.

I. Pursuant to By-Law Section 7.6.1, the Planning Board must make the following findings and determinations when issuing a Special Permit, as delineated in By-Law Section 7.5.2.1:

*Prior to granting a special permit, the Planning Board, shall make a finding and determination that the proposed use, building structure, off-street parking or loading, modification of dimensional standards, screening or landscaping, or other activity, which is the subject of the application for the special permit***:**

(a) Complies with such criteria or standards as may be set forth in the section of this By-Law which refers to the granting of the requested special permit;

As set forth below, the Project complies with the specific criteria and standards for the special permit relief requested herein.

(b) is consistent with: 1) the general purposes of this By-Law as set forth in subparagraph 1.1, and 2) the more specific objectives and purposes applicable to the requested special permit which may be set forth elsewhere in this By-Law, such as, but not limited to, those at the beginning of the various sections;

The Project is consistent with the general purposes of the By-Law, including the promotion of health, safety, convenience, morals, and welfare for Needham residents because it redevelops an underutilized and environmentally compromised site into an economically viable and eco-friendly development with public amenities.

The Project will promote the welfare of the inhabitants of Needham through a significant increase in property tax revenues, providing approximately $5,000,000[7] ***(based on both the Barret and Fougere Fiscal Analyses)*** in annual additional real estate and personal property taxes which will support the Town's educational and recreational programs, housing initiatives, community and open spaces, and other Town priorities. The Project includes traffic mitigation measures and bicycle lane improvements to lessen congestion on area streets. This is an appropriate use of the land, specifically contemplated by the recent rezoning of the area. With the requested

[7] As described above, this is an approximate proration based on the development scenarios for a full-buildout of the Property and the adjacent parcels described in the Fiscal Analysis and as applied to the Project, which is for approximately 60% of the full-buildout scenario.

special permits, the Project will comply with the applicable use, height, area, and building location requirements of the By-Law.

By-Law Section 1.2 requires that any building or structure erected and any use of premises established must be in conformity with the By-Law. With the requested special permits, the Project will be in conformity with the By-Law.

(c) is designed in a manner that is compatible with the existing natural features of the site and is compatible with the characteristics of the surrounding area.

The site has few natural features, as it is almost entirely covered with the foundations of the former car dealership and car wash buildings and associated impervious areas used for parking and for the display of motor vehicles for sale. The Project is compatible with the characteristics of the surrounding area. The orientation of the buildout with the parking garage located near the "rear" of the Property will result in limited visibility of the parking structures from the major surrounding roads, including Highland Avenue and Gould Street. Extensive landscaping will be provided around the entire Project site, including a ***multi-use fitness/access walkway*** with exercise stations for use by tenants' employees, neighbors, and the general public.

Where the Planning Board determines that one or more of the following objectives are applicable to the particular application for a special permit, the Planning Board shall make a finding and determination that the objective will be met:

(d) the circulation patterns for motor vehicles and pedestrians which would result from the use or structure which is the subject of the special permit will not result in conditions that unnecessarily add to traffic congestion or the potential for traffic accidents on site or in the surrounding area; and

The Transportation Impact and Access Study ("TIAS") prepared by VHB analyzes existing traffic conditions on area roadways and at area intersections, under current conditions and as projected to exist in seven years with and without construction of the Project. The TIAS recommends, and the Applicant has committed to implement, several measures to prevent the Project from increasing traffic congestion or the potential for traffic accidents. These measures include widening and reconfiguring Gould Street at the intersection with Highland Avenue and at the intersection with the Property entrance (opposite the Wingate Residences entrance), and construction of a ***shared multi-use walkway on the Property along Gould Street (the "Multi-Use Walkway")*** for use by neighbors and residents. The internal circulation pattern has been designed to control vehicle speeds and to reduce vehicle-pedestrian interactions by providing wide sidewalks. Therefore, the circulation patterns for motor vehicles and pedestrians which would result from the Project will not result in conditions that

unnecessarily add to traffic congestion or the potential for traffic accidents on the Property or in the surrounding area.

(e) the proposed use, structure or activity will not constitute a demonstrable adverse impact on the surrounding area resulting from:

1) **excessive noise, level of illumination, glare, dust, smoke, or vibration which are higher than levels now experienced from uses permitted in the surrounding area,**
2) **emission or discharge of noxious or hazardous materials or substances, or**
3) **pollution of water ways or ground water.**

The proposed use, structures and activity at the Property resulting from the Project will not have a demonstrable adverse impact on the surrounding area. Any minimal noise, illumination or glare associated with the Project will be mitigated with thoughtful design features, including landscaping and cut-off lighting, as more particularly shown in the Plan Set. No noxious or hazardous substances are anticipated to be emitted as a result of the Project, and no waterways or groundwater will be polluted.

As referenced in the foregoing criteria, certain Sections of the By-Law prescribe additional criteria to be considered for particular Special Permit relief. Such criteria, and how the Project complies or will comply with such criteria, are provided below:

1. <u>Special Permit criteria for relief for FAR of 1.25, pursuant to By-Law Section 4.11.1(5)</u>:

In granting such special permit, the Planning Board shall consider the following factors:

(i) the ability of the existing or proposed infrastructure to adequately service the proposed facility without negatively impacting existing uses or infrastructure, including but not limited to, water supply, drainage, sewage, natural gas, and electric services;

As set forth in the Stormwater Report, the TIAS, and based on the Applicant's engineer's independent review of the infrastructure, the existing or proposed infrastructure can adequately service the Project without negatively impacting existing uses or infrastructure, including but not limited to, water supply, drainage, sewage, natural gas, and electric services.

(ii) impact on traffic conditions at the site, on adjacent streets, and in nearby neighborhoods, including, but not limited to, the adequacy of the roads and intersections to safely and effectively provide access and egress;

As set forth in the TIAS and elsewhere in this letter, the Project will include significant off-site mitigation, including traffic improvements, that will counterbalance the intersection capacity impacts of the additional Project-generated trips added to the roadway network. The Project will also include a robust Traffic Demand Management (TDM) program to incentivize reduced single occupant driving and increase use of alternative forms of transportation.

(iii) the Environmental impacts of the proposal; and

Regarding direct environmental impacts, the Applicant will take feasible steps to reduce carbon emissions and minimize energy usage and has designed the Project accordingly. Energy modeling will evaluate several emissions mitigation measures including hybrid electric/gas heating with electric heating being the first to operate whenever capacity allows, high efficiency glycol heat recovery loop, reduced laboratory exhaust through exhaust monitoring, electric water heating, and more. The Applicant also studied options to include photovoltaic solar panels at the roof of the Garage and roof of the North & South Buildings. In addition to these emission reduction strategies, the Project will utilize the LEED v4 BD+C rating system for the Core and Shell building components to incorporate other sustainability strategies. The Applicant anticipates the Project will be LEED Silver Certified with higher targets possible.

In addition, the Project has utilized the MEPA Environmental Justice tool, which demonstrates that this Project is not within 1-mile of any Environmental Justice community. The Project will not exceed any air quality thresholds or cause impacts outside of the 1-mile radius and therefore will not negatively impact such communities.

Regarding future impacts due to Sea Level Rise/Storm Surge and other climate change considerations, the Project is not exposed to Sea Level Rise/Storm Surge or Extreme Precipitation-Riverine Flooding. Although the Property has a high risk of Extreme Precipitation-Urban Flooding and a high risk of Extreme Heat, the Project will combat these risks by including measures to reduce the threat of urban flooding from extreme precipitation and developing appropriate strategies for a changing climate in the near term, as well as planning for a longer-term adaptation strategy over the course of the Project's life span.

No part of the Property has a historic structure, or a structure within a historic district listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth.

(iv) the fiscal implications of the proposal to the Town

Based on the Barret Fiscal Analysis, ***and confirmed in the Fougere Fiscal Analysis***, full-build out of the Property and the adjacent parcels at 1.35 FAR would yield a net annual financial benefit to the Town of approximately $8,342,400. As described above, the Project proposes a build-out of approximately 90% of the Property's full-build out potential, which results in a prorated net annual financial benefit of approximately $5,000,000 to the Town from development of the Project, plus personal property taxes which would also generate significant additional revenue.

(v) In granting a special permit, the Planning Board shall also consider any proposed mitigation measures and whether the proposed project's benefits to the Town outweigh the costs and adverse impacts, if any, to the Town.

The Project will include significant mitigation as described above and below. In addition, based on the Barret Fiscal Analysis, ***and confirmed in the Fougere Fiscal Analysis***, the Project is anticipated to provide a net annual financial benefit to the Town of approximately $5,000,000, plus personal property taxes which would also generate significant additional revenue.

2. <u>Pursuant to By-Law Section 4.11.3, in addition to the foregoing criteria, the Planning Board must consider the below design guidelines when issuing a Special Permit for relief under By-Law Section 3.2.7.2 and/or Section 4.11</u>:

(a) The proposed development should provide or contribute to providing pedestrian and neighborhood connections to surrounding properties, e.g., by creating inviting buildings or street edge, by creating shared publicly accessible green spaces, and/or by any other methods deemed appropriate by the Planning Board;

The Project will contain various pedestrian and neighborhood connections and amenities. The south end of the South Building, near the intersection of Gould Street and Highland Avenue will contain the Project's "retail zone" of approximately ***10,052*** sq. ft. of retail and/or restaurant use. This area is being developed with retail plaza and landscapes visible from the public streets, making it a vibrant and cohesive part of the neighborhood. A multi-use fitness/access walkway is planned around the Property, with various exercise areas planned at intervals on the loop, and including a pond and water feature.

(b) Any parking structure should have a scale, finish and architectural design that is compatible with the new buildings and which blunts the impact of such structures on the site and on the neighborhood;

The Garage will be constructed primarily of structural precast concrete columns and spandrel beams with color and finish intended to coordinate with the color and finish of the lab buildings. In addition, the overall scale of the stand-alone Garage will be broken up through the use of fabric banners hung from the upper levels, which will result in visual interruptions and a softening of the façades on the sides most visible to the neighborhood. These design elements will create interruptions in the Garage façade so that uninterrupted façade length is less than 200 ft., in compliance with Section 4.11.2(3) of the By-Law. The Garage will be in the northeast corner of the site, downgradient and well way from Gould Street. Its presence will be masked to the south and southwest by the North Building. The Garage will comply with the specific dimensional criteria developed for this district to integrate with the surrounding area, as shown on the plans.

(c) The proposed development should encourage creative design and mix of uses which create an appropriate aesthetic for this gateway to Needham, including but not limited to, possible use of multiple buildings to enhance the corner of Highland Avenue and Gould Street, possible development of a landscape feature or park on Gould Street or Highland Avenue, varied façade treatments, streetscape design, integrated physical design, and/or other elements deemed appropriate by the Planning Board;

The Project will include two buildings, the North Building on the northerly portion of the Property, and the South Building on the southerly portion of the Property, as well as a shared Atrium to connect them that will help break down the scale of the overall project into smaller pieces. As noted above, the south end of the South Building, near the intersection of Gould Street and Highland Avenue is planned to contain the "retail zone" which will have approximately ***10,052*** sq. ft. of public retail or restaurant use. This area is being developed with retail plaza featuring soft and hardscape landscaping, outdoor seating, and a water feature at the former location of Muzi pond at the Gould Street and Highland Avenue intersection. Together the proposed R&D, Office, and Lab uses mixed with Retail/Restaurant uses at the corner will create an active gateway condition visible from the public streets. As described above a multi-use fitness/access walkway is planned around the Property, with various exercise areas planned at intervals around the buildings, and including a pond and water feature.

(d) The proposed development should promote site features and a layout which is conducive to the uses proposed;

The buildings' massing was designed to take advantage of unique view corridors, interesting topography, solar orientation, and comply with the zoning requirements outlined above. The buildings will provide flexible floorplates that are desirable for today's tenants looking for access to light and views and opportunities for shared

indoor and outdoor amenities, including, among other amenities, the previously described multi-use fitness/access walkway.

(e) The proposed development should incorporate as many green building standards as practical, given the type of building and proposed uses;

The Applicant is committed to taking all feasible steps to reduce carbon emissions and minimize energy usage. Energy modeling will evaluate several emissions mitigation measures including hybrid electric/gas heating with electric heating being the first to operate whenever capacity allows; high efficiency glycol heat recovery loop; high efficiency chilled water plant; reduced laboratory exhaust through exhaust monitoring; electric water heating; improved envelope insulation and infiltration without thermal bridging; and high-performance lighting and controls.

In addition to emission reduction strategies, the Project will utilize the LEED v4 BD+C rating system for the core and shell building components to incorporate other sustainability strategies such as: green vehicle parking; open space; rainwater management; heat island reduction; construction and demolition waste management; and building product disclosure and optimization. The current goal is to achieve LEED Silver Certified with higher targets being evaluated. In addition, the Project will be Energy Star rated and certified as a WELL Building.

The WELL Building Standard takes a holistic approach to health in the built environment addressing behavior, operations and design. WELL is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and well-being, through air, water, nourishment, light, fitness, comfort and mind. WELL is grounded in a body of medical research that explores the connection between the buildings where we spend more than 90 percent of our time, and the health and wellness impacts on us as occupants. WELL Certified™ spaces can help create a built environment that improves the nutrition, fitness, mood, sleep patterns and performance of its occupants.

(f) The proposed development should be designed and conditioned to reduce or mitigate adverse impacts on adjacent properties or the surrounding area such as those resulting from excessive traffic congestion or excessive demand for parking; and

The Project will include off-site mitigation that will counterbalance the intersection capacity impacts of the additional Project-generated trips added to the roadway network. The prior use of the Property as a car wash previously reported 1,360 peak daily vehicle trips to/from the car wash during the winter months, or roughly 600 vehicles daily during peak periods. The car wash coupled with Muzi employees,

visitors, new and used car sales, parts distribution, etc., yielded an additional 600 single occupancy vehicles such that there will be little, if any, increase in traffic from the Project. Furthermore, the Applicant will implement significant traffic mitigation measures as described herein, including traffic improvements and the Multi-Use Walkway. As set forth above, the Project will also include a robust TDM program to incentivize reduced single occupant driving and increase use of alternative forms of transportation. Based on the TIAS, the roadway network, as improved through the Project's proposed transportation mitigation, can safely and adequately handle the trips associated with the Project.

(g) The proposed development shall include participation in a transportation demand management program to be approved by the Planning Board as a traffic mitigation measure, including but not limited to, membership and participation in an integrated or coordinated shuttle program.

As set forth above, the Project will also include a robust TDM program to incentivize reduced single occupant driving and increase use of alternative forms of transportation. The Applicant will explore and look to implement shuttle connectivity through its future proactive involvement in the Route 128 Business Council to improve public transportation access and accessibility to the Property. The Applicant will incentivize reduced single occupant driving and increased use of alternative forms of transportation

3. <u>Pursuant to By-Law Section 6.11.5, the Planning board must consider the specific criteria given below when issuing a Special Permit for relief from retaining wall requirements in By-Law 6.11:</u>

(a) That the retaining wall will not cause an increase of water flow off the property;

The 4-6 foot high retaining wall proposed along the eastern Property boundary will be located along the side of the proposed multi-use fitness/access walkway and adjacent to the I-95/Route 128 off ramp. The retaining wall will direct stormwater discharge toward the site's proposed drainage system and not to the MassDOT's ROW. This is a significant improvement over existing conditions, under which sheet drainage discharges untreated runoff off to adjacent properties and roadways.

(b) That the requested retaining wall will not adversely impact adjacent property or the public;

The requested retaining walls will face the Exit 35C ramp from I-95/Route 128 to Highland Avenue. As such, they will have little, if any, impact on adjacent

property or the public. Additionally, each retaining wall has a low profile and there is a wide vegetated shoulder from the roadway before the wall.

(c) That the report of the Design Review Board has been received and considered.

The Applicant will continue to consider and integrate any comments from the Design Review Board into the Project.

II. Special Permit in accordance with By-Law Section 5.1.1.5 waiving adherence to the required number of parking spaces and/or parking design requirements:

Such a special permit waiving strict adherence to the minimum number of required parking spaces may be granted only after it is demonstrated by an applicant that either:

(i) special circumstances in a particular use of structure does not warrant the minimum number of spaces required under Section 5.1.2; or

There are special circumstances relating to the proposed uses of the Project that do not warrant the minimum number of parking spaces required under Section 5.1.2. The Applicant plans to construct a total of ***1,390*** parking spaces, which is less than the required amount under the By-Law of ***1,678***. The TIAS reports that actual parking demand for the Project is anticipated to be approximately 1,355 spaces. The By-Law's required parking ratios assume a higher employee density than is typical for lab/research & development uses. The By-Law also assumes that each office employee will commute alone, by motor vehicle. The Applicant is committed to a transportation demand management program to encourage the use of carpool, walking, biking, and public transit alternatives to single occupancy vehicle trips. Also, the By-Law's parking ratio does not consider the potentially permanent changes in commuting patterns resulting from the COVID-19 pandemic, including hybrid/remote work programs. Additionally, the Project will construct significant traffic improvements and implement TDM measures making transportation by multiple methods more feasible. For these reasons, the minimum number of spaces that would be required under the By-Law is not warranted for the Project.

(ii) the extent of existing building coverage on a particular lot is such that in laying out parking spaces in accordance with the design requirements of Subsection 5.1.3, the requirement for minimum number of spaces under Section 5.1.2 cannot be met.

As noted above, the proposed quantity of parking spaces is sufficient to satisfy the anticipated parking demand for the Project.

In reviewing a request for a special permit under this Section 5.1.1.5, the Planning Board shall consider the following:

(a) The issuance of a special permit will not be detrimental to the Town or to the general character and visual appearance of the surrounding neighborhood and abutting uses, and is consistent with the intent of this Zoning By-Law;

The Project redevelops an underutilized site into an economically viable development with public amenities. The addition of the Project will be a source of employment for Needham residents, will generate significant additional tax revenues for the Town, introduces uses, including retail/restaurant uses, which will contribute to making the Project a vibrant and cohesive part of the neighborhood and will be designed to enhance the aesthetic of a prominent entry to Needham.

(b) In the case of waiving strict adherence to the requirements of Section 5.1.2 under subparagraph (i) above, the special permit shall define the conditions of the use of structure so as to preclude changes that would alter the special circumstances contributing to the reduced parking need or demand;

The Applicant anticipates working with the Board to incorporate appropriate conditions regarding such changes.

(c) [Not Applicable]

(d) Provisions to demonstrate the ability to provide for additional parking consistent with Section 5.1.2 and/or parking designed in accordance with the particular requirements of Section 5.1.3; and

As noted above, the proposed quantity of parking spaces is sufficient to satisfy the anticipated parking demand for the Project.

(e) The granting of a special permit under this Section shall not exempt a structure, use or lot from future compliance with the provisions of Section 5.1.2 and/or 5.1.3.

The special permit decision will not so exempt the structure, use, or lot.

III. Site Plan Review and Special Permit for Major Project

In conducting the Site Plan Review, the Planning Board shall consider the following matters:

(a) Protection of adjoining premises against seriously detrimental uses by provision for surface water drainage, sound and sight buffers and preservation of views, light, and air;

The Project has adequately protected adjoining premises against serious detriment. The Project maintains a significant landscape buffer between the proposed structures and Highland Avenue and Gould Street, which streets themselves provide a buffer for the nearby residential neighborhoods and other properties. The Project's landscape buffer includes berms planted with shade trees and conifers. The Project's buildings are far enough from the Property line (in conformance with By-Law setbacks) so there will be no shade cast towards any residential properties beyond the Property boundary. Except for a small surface parking lot next to Gould Street, all parking will be contained below the buildings or within the Garage. Service and loading areas are located within the buildings. As described above, the Project will provide a multi-use fitness/access walkway around the perimeter of the Property, adding another buffer. Adjoining premises will be protected against any seriously detrimental uses on the Property through provision of surface water drainage, a retention pond, sound and sight buffers, and the addition of natural landscaping and green space to the Property. As detailed in the Stormwater Report, stormwater will be contained within the Property and catch basins with sumps and hoods, oil/water separators, rain gardens, and vegetated swales to improve storm water quality discharges, are provided. Stormwater will be infiltrated to mitigate storm water volumes. The retention pond is incorporated along the multi-use fitness/access walkway as an attractive feature.

(b) Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets, the location of driveway openings in relation to traffic or to adjacent streets and, when necessary, compliance with other regulations for the handicapped, minors and the elderly;

As described in greater detail above, the Project will provide enough parking to accommodate all vehicles on the Property and the parking spaces provided will comply with the design criteria set forth in By-Law Section 5.1.3 (with deviations as necessary and granted pursuant to the requested Special Permit). The Project will provide a primary entrance on Gould Street, across from the existing curb cut for the Wingate senior housing community via a newly signalized intersection. An internal drive loop will mitigate traffic queuing in and out of the Property. There will be a secondary entrance/exit from the Garage to TV Place. The Applicant will construct significant traffic mitigation, including the Traffic Improvements, which will widen Gould Street to better handle traffic movements and volume. Internal sidewalks and the Multi-Use Walkway connected to Gould Street will encourage multimodal transportation opportunities. Bicycle storage for short-term and long-term use is incorporated into the Project design. Handicapped parking will be provided in compliance with applicable requirements. All access walks and paths are designed

with slopes of less than 5%, so no ramps will be needed. Crosswalks are proposed at the Gould Street signalized intersection.

(c) Adequacy of the arrangement of parking and loading spaces in relation to the proposed uses of the premises;

Parking and loading spaces have been adequately arranged in relation to the proposed uses on the Property, and in compliance with parking plan and design requirements under By-Law Section 5.1.3. Structured parking is provided under the buildings, and in a parking garage. A small surface parking area will provide handicapped parking near the primary building entrances, and parking for adjacent retail and/or restaurant space. Loading areas are included in each section of the buildings.

(d) Adequacy of the methods of disposal of refuse and other wastes resulting from the uses permitted on the site;

The Project will provide adequate methods for disposal of refuse and waste. Solid waste and refuse will be disposed of in compliance with all applicable rules and regulations. The wastewater system will be connected to the municipal sewer system. The Applicant will require Tenants to comply with all applicable regulations regarding the handling and disposal of wastes.

(e) Relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area and compliance with other requirements of this By-Law; and

The Project will comply with the setback and landscape buffer requirements of the By-Law that were specifically developed to create an appropriate relationship between the Project and the surrounding area. As stated above, a multi-use fitness/access walkway is proposed along the perimeter of the Property, to be available for use by the general public. Fitness stations will be provided along the walkway.

(f) Mitigation of adverse impacts on the Town's resources including the effect on the Town's water supply and distribution system, sewer collection and treatment, fire protection, and streets; and may require when acting as the Special Permit Granting Authority or recommend in the case of minor projects, when the Board of Appeals is acting as the Special Permit Granting Authority, such appropriate conditions, limitations, and safeguards necessary to assure the project meets the criteria of a through f.

The Project will not have any adverse impact on the Town's water supply and distribution system, sewer collection and treatment, fire protection, or streets. The

Project will not have any adverse impact on the Town's water or wastewater infrastructure. Sufficient pump stations provide support for the area. The proposed buildings will be fully accessible for the Town's firefighting apparatus.

As detailed above and in the materials submitted herewith and in our Prior Letters, the Project, as refined, continues to satisfy each of the applicable criteria for the requested relief.

We appreciate your attention to this matter. The Applicant and Project team will be prepared to answer any questions you may have at the next public hearing with the Planning Board for the Project on Wednesday September 7, 2022.

Very truly yours,

Timothy W. Sullivan
Attorney for Applicant

Enclosures

557 HIGHLAND AVENUE - SPECIAL PERMIT R1

BOUNDARY DESCRIPTION PREPARED BY FELDMAN SURVEYORS

BOUNDARY DESCRIPTION (PER SURVEY)

A CERTAIN PARCEL OF LAND SITUATED IN THE TOWN OF NEEDHAM, COUNTY OF NORFOLK AND THE COMMONWEALTH OF MASSACHUSETTS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT OF TANGENCY ON THE SOUTHEASTERLY SIDELINE OF TV PLACE. THENCE RUNNING SOUTHEASTERLY ALONG A CURVE TO THE RIGHT FORMING THE INTERSECTION WITH THE NORTHEASTERLY SIDELINE OF GOULD STREET, HAVING A RADIUS OF 119.49 FEET, AN ARC LENGTH OF 32.76 FEET TO THE POINT OF BEGINNING. THENCE;

CONTINUING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 119.49 FEET, A CHORD BEARING OF S 11°25'24" W, A CHORD DISTANCE OF 61.26 FEET, A DELTA ANGLE OF 29°42'24" AND AN ARC LENGTH OF 61.95 FEET TO A POINT OF TANGENCY ON SAID GOULD STREET;

THENCE RUNNING S 03°25'48" E, BY SAID GOULD STREET, A DISTANCE OF 284.30 FEET TO A POINT OF CURVATURE;

THENCE RUNNING ALONG SAID GOULD STREET, BY A CURVE TO THE LEFT, HAVING A RADIUS OF 505.00 FEET, A CHORD BEARING OF S 18°06'58" E, A CHORD DISTANCE OF 256.06 FEET, A DELTA ANGLE OF 29°22'20" AND AN ARC LENGTH OF 258.88 FEET TO A POINT OF COMPOUND CURVATURE;

THENCE RUNNING ALONG SAID GOULD STREET, BY A CURVE TO THE LEFT, HAVING A RADIUS OF 44.00 FEET, A CHORD BEARING OF S 71°42'32" E, A CHORD DISTANCE OF 55.27 FEET, A DELTA ANGLE OF 77°48'49" AND AN ARC LENGTH OF 59.76 FEET TO A POINT OF NON-TANGENCY;

THENCE RUNNING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 39.30 FEET, A CHORD BEARING OF N 62°20'24" W, A CHORD DISTANCE OF 40.83 FEET, A DELTA ANGLE OF 62°35'17" AND AN ARC LENGTH OF 42.93 FEET TO A POINT OF NON-TANGENCY;

THENCE RUNNING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 466.51 FEET, A CHORD BEARING OF N 27°59'42" W, A CHORD DISTANCE OF 69.69 FEET, A DELTA ANGLE OF 08°34'03" AND AN ARC LENGTH OF 69.76 FEET TO A POINT OF COMPOUND CURVATURE;

THENCE RUNNING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 623.02 FEET, A CHORD BEARING OF N 19°51'38" W, A CHORD DISTANCE OF 83.68 FEET, A DELTA ANGLE OF 07°42'05" AND AN ARC LENGTH OF 83.74 FEET TO A POINT OF COMPOUND CURVATURE;

THENCE RUNNING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS OF 91.71 FEET, A CHORD BEARING OF N 09°22'22" W, A CHORD LENGTH OF 21.20, A DELTA ANGLE OF 13°16'27" AND AN ARC LENGTH OF 21.25 FEET TO A POINT OF NON-TANGENCY;

THENCE TURNING AND RUNNING N 03°17'17" W, A DISTANCE OF 141.32 FEET TO A POINT;

THENCE TURNING AND RUNNING N 09°43'54" W, A DISTANCE OF 87.70 FEET TO A POINT OF CURVATURE;

THENCE RUNNING ALONG A CURVE TO THE RIGHT, HAVING A RADIUS 25.00 FEET, A CHORD BEARING OF N 06°30'35" W, A CHORD DISTANCE OF 2.81 FEET, A DELTA ANGLE OF 6°26'37" AND AN ARC LENGTH OF 2.81 FEET TO A POINT OF TANGENCY;

THENCE RUNNING N 03°17'17" W, A DISTANCE OF 165.38 FEET TO A POINT;

THENCE TURNING AND RUNNING N 07°25'09" W, A DISTANCE OF 29.14 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINING 12,087 SQUARE FEET.

557 HIGHLAND AVENUE - SPECIAL PERMIT R1

REVISION LETTERS

August 15, 2022

Ref: 15306.00

Lee Newman
Director of Planning and Community Development
Town of Needham
500 Dedham Avenue
Needham, MA 02492

Re: 557 Highland Ave – Highland Innovation Center – Plan Revisions for Permitting

The following is a list of changes to the Highland Innovation Center Civil Permitting Plans that have been made since the initial submission (plans dated 2022-03-30):

- North building, South building, and Garage footprints updated (per revised property line and setbacks)
- Underground Telephone and Electrical conduits between the North building and Garage adjusted
- Waterline connection in intersection of Highland Ave and Gould Street updated to address DPW comments
- Hydrant, waterline, and fire protection lines adjusted above the South building to address DPW comments
- Various Drain locations, rims, and inverts adjusted to match revised grading
- Parking requirements and summary tables updated per revised building square footages

Sincerely,

VHB

Nicholas Skoly, P.E.
Project Manager

August 15, 2022

Ref: 15306.00

Lee Newman
Director of Planning and Community Development
Town of Needham
500 Dedham Avenue
Needham, MA 02492

Re: Transportation Updates to Special Permit Submission

Dear Ms. Newman:

This letter serves as an update of the transportation elements for the Special Permit application for the proposed 557 Highland Avenue project in Needham, Massachusetts. Key updates that have been made since our last Planning Board presentation on July 7, 2022, include the following:

- VHB conducted a Traffic Impact and Access Study (TIAS) for the project, which was included as part of the initial Special Permit submission on April 5, 2022. The Town of Needham contracted with Greenman-Pedersen Inc. (GPI) to peer review the TIAS and a Traffic Peer Review letter was submitted by GPI on May 27, 2022. VHB provided a Response to the Traffic Peer Review comments on June 29, 2022, ahead of the Planning Board public hearing on July 7, 2022.

- Based upon ongoing coordination with the Town of Needham and GPI, the roadway mitigation has been modified to accommodate the following features based on direct feedback from GPI, Town of Needham staff, and the community:
    - A two-way multi-use walkway has been included along the east side (Project side) of Gould Street between Highland Avenue and the abandoned railroad right-of-way north of TV Place to accommodate all non-motorized roadway users.
    - A new crosswalk has been placed across Gould Street at the location of the abandoned railroad right-of-way north of TV Place with a supporting rapid rectangular flashing beacon (RRFB) to alert drivers.
    - A four-foot unmarked bicycle-accommodating shoulder on west side of Gould Street is also now included to accommodate southbound bicyclists who wish to travel on-road.
    - A revised cross-section on Gould Street with three southbound lanes approaching Highland Avenue and one northbound lane approaching TV Place to limit the amount of new pavement added while providing a suitable level of vehicle operations

- As noted in the revised Special Permit application dated August 15, 2022, the building program has been reduced in size by approximately 41,000 square feet (from 531,000 square feet to 490,000 square feet), the TIAS has not been updated to reflect this reduction in size. The analyses presented in the TIAS can be considered conservative as it is expected that the actual project will generate fewer trips than what was estimated in the TIAS due to the reduction in square footage. The proposed comprehensive transportation mitigation is still based on the larger building program presented in the TIAS to accommodate all roadway traffic (the proposed roadway mitigation is based on the concept developed by GPI as part of the rezoning of the Site which included potential redevelopment of the Channel 5 site that is not included in this project).

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- The proposed parking supply on-site has been reduced by 18 parking spaces, from 1,408 parking spaces to 1,390 parking spaces. The project will require a Special Permit from the Planning Board, as the proposed parking supply is 274 spaces fewer than the up to 1,664 parking spaces that is required based on Town of Needham zoning requirements. The project is not expected to require the full amount of parking required by zoning due to the lower employee density of lab/research & development uses over traditional office uses and the anticipated use of public transit, walking, and bicycling by some employees to access the site. The proposed parking supply of 1,390 parking spaces is expected to accommodate the anticipated parking demand while providing sufficient buffer so that visitors and employees to the site do not park on nearby residential streets.

Please call me at (617) 607-2971 if you have any questions.

Very truly yours,

Sean M. Manning, PE, PTOE
Principal

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pfa
LANDSCAPE ARCHITECTS • PLANNERS
CIVIL ENGINEERS • WETLAND SCIENTISTS
PAUL FINGER ASSOCIATES

Memorandum

TO: Eric Weyant, Stantec

FROM: Eric Joseph

DATE: August 15, 2022

RE: 557 Highland Ave – Special Permit
Summary of Plan Revisions -01

The Landscape Plans & Details Sheets (L1.0-L5.1) provided as part of the original Special Permit Plan Set dated 03-30-2022 have been revised and updated through August 15th as part of the project's pending supplemental submission. The revisions are in response to comments and requests noted during the various neighbor and town meetings since the projects original submission and include:

- General:
  - Reduced building and garage footprints, and realignment of the retail portion of the building away from Highland Ave (see plans and elevations by project architect);
  - Relocation of loading area for South Building farther away from Gould Street (see plans and elevations by project architect);
  - Relocation of loading area for North Building to north side of building to eliminate visibility of loading area from Gould Street (see plans and elevations by project architect);
  - Revised roadway and bike lane layout for Gould Street and TV Place in coordination with the neighbors and the Town's traffic consultant (see plans/ exhibits by project traffic engineer);
  - Added Community Open Space areas for the public including pickle ball courts (2) and open lawn/ turf areas (2);
  - Expanded Multi-Use Walkway along Gould Street from 8' wide to 18' wide;
  - Realigned Multi-Use Fitness/ Access Walkway along Highland Avenue in order to provide a greater landscape buffer from traffic along Highland Avenue;
  - Added planting beds and raised planters within Retail Plaza to further soften plaza area, as well as provide locations for potential artwork in conjunction with Needham Council for Arts & Culture;

- L-1.0 Site Plan **(see attached):**
  - Revisions associated with the additional site improvements as described above;
  - Relocated transformers for North Building and Garage further out of view from TV Place;

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info@pfai.net

  - Added several walks from the proposed buildings for egress purposes as required.
  - Relocated surface parking entry farther north to improve truck turning movements for relocated loading area;
  - Increased size of water feature at corner of Highland and Gould for improved visibility and enjoyment by the public;
  - Provided additional descriptions of materials to be used.

- L-2.0 Grading Plan **(see attached):**
  - Revisions associated with the additional site improvements as described above;
  - Raised elevations along building and garage perimeters to reduce visible building heights as much as possible;
  - Minimized slopes within Community Open Space areas along Gould Street in order to help facilitate the possibility of installing portable ice-skating rink.

- L-3.0 Planting Plan **(see attached):**
  - Revisions associated with the additional site improvements as described above;
  - Provided greater detail on proposed plant materials (species, quantities and sizes);
  - Significantly increased density of proposed planting areas with additional trees, shrubs, groundcover and greater diversity of plant material;
  - Significantly limited proposed lawn areas;
  - Increased number of street trees to help soften views of proposed project.

- L-4.0 Lighting Plan **(see attached):**
  - Revisions associated with the additional site improvements as described above;
  - Provided greater photometric details with Isoline Contours and photometric summaries of retail and parking lot areas;
  - Further reduced potential of off-site light spillage by relocating perimeter light fixtures along Highland Avenue and Gould Street farther into the site.

- L-5.0 Site Details #1 **(see attached):**
  - Provided additional lighting details/ specifications for proposed lighting, including shielding to be used;
  - Revised labels to improve identification of fixtures to be used and their locations.

- L-5.1 Site Details #2 **(see attached):**
  - Primarily no changes.

Stantec

Memo

To:	Needham Planning Board (Lee Newman / Alexandra Clee) Planning Department, Suite 118 Town of Needham Public Services Administration Building 500 Dedham Avenue Needham, MA 02492	From:	Thomas Urtz, AIA Stantec Architecture
File:	Special Permit Package R1 (08/16/2022 for 09/07/2022 Planning Board public hearing)	Date:	August 16, 2022

Reference: Special Permit Package R1 (Submitted 8/16/2022) Dated: September 7, 2022

As a result of community input and previous meetings with the Planning Board please find the attached list of updates included as part of our Revision 1 package. We have organized the side-by-side list below outlining the Revision 1 updates compared to the previously submitted package to the Needham Planning Board: Special Permit Package (03/30/2022).

1. **Parking Spaces**: The layout of the free-standing parking garage has been modified to comply with the revised property line and setback. To minimize loss of spaces the layout of parking below the building has been modified.

Special Permit Package 03/30/2022	**Special Permit Package R1 - 08/16/2022 for 09/07/2022 Planning Board public hearing**
Office/Lab Building: 343 Spaces Garage: 1021 Spaces Surface Parking: 44 Spaces* Total Parking: 1408 Spaces	**Office/Lab Building: 362 Spaces** **Garage: 998 Spaces** **Surface Parking: 30 Spaces*** **Total Parking: 1390 Spaces** **(Loss of 18 spaces due to revised setback line)**
*Surface parking: Reference civil and landscape drawings.	

2. **Revised Setbacks & Gross Square Footage**: The layout of the North Building and South Building have been modified to comply with the revised Gould Street property line and setback restrictions. The west end of the North Building shifted east approximately 29'-6" across the upper levels of the building to comply with the modified setback and height restrictions (see item 3 below for additional information). The west end of the South Building shifted east approximately 22'-6", and has been pulled back from the corner of the Highland/Gould intersection to enlarge the retail plaza area.

Special Permit Package 03/30/2022	**Special Permit Package R1 - 08/16/2022 for 09/07/2022 Planning Board public hearing**

Reference: **Special Permit Package R1 (Submitted 8/16/2022)** **Dated: September 7, 2022**

Office/Lab Building: 506,694 GSF Garage: 332,298 GSF	**Office/Lab Building: Revised West Façade at North & South Buildings.** **490,000 GSF** **(Loss of 16,694 GSF due to revised setback line)** **Garage: Revised West Façade.** **326,886 GSF** **(Loss of 5,412 GSF due to revised setback line)**

3. **Stepped Massing on the west facade at North & South Building near Gould Street:** Both the North and South Buildings front Gould Street with new lower massing than presented in the original special permit package. In an effort to transition the massing of the North Building down towards Gould Street, the massing now includes a step down from 70' to 42', in conjunction with the revised building setback line location. In addition, the massing has been carved away from the North Building facing Gould and TV Place which allows for a softer, landscaped corner "pocket park", and better visibility for access to the below building garage and loading dock which have been relocated to the north façade of the building.

Special Permit Package 03/30/2022	**Special Permit Package R1 - 08/16/2022 for 09/07/2022 Planning Board public hearing**
North Building: (Gould Façade): Continuous façade, 70' height	**North Building: Stepped massing at tenant space, with potential for terrace at roof at Level 4. Stepped façade from 70' down to 42'.** **Reference revised GSF numbers in item number 2.**

Stantec Architecture & Engineering P.C.
40 Water Street, 3rd Floor
Boston, MA 02109

Thomas Urtz AIA, LEED AP
Senior Associate

Mobile: 857 210-2615

Stantec Architecture & Engineering P.C.

557 HIGHLAND AVENUE - SPECIAL PERMIT R1

PRELIMINARY EXTERIOR/COMMUNITY NOISE EVALUATION/NARRATIVE

ACENTECH

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

August 15, 2022

Mr. Robert Schlager, CPM
Bulfinch Companies
116 Huntington Avenue, Suite 600
Boston, MA 02116
Via email: RAS@Bulfinch.com

Subject **Preliminary Exterior/Community Noise Evaluation/Narrative – Revision 2**
557 Highland Avenue (former Muzi Ford Site), Office & Lab Conversion
Needham, MA
Acentech Project J635632.00

Dear Robert:

This letter provides a preliminary discussion of the community (exterior) noise emissions at 557 Highland Avenue, the proposed research and development office at the former Muzi Ford dealership site in Needham, Massachusetts. We understand this project consists of two buildings and a parking garage. The South Building will be 3-stories with 215,000 square feet of office and lab space. The North Building will have 5-stories with 255,000 square feet of office and lab space. There will be a connecting glass atrium of 2-stories between the two buildings. Sound from the proposed campus described above will have to comply applicable noise limits from the Town of Needham and the Commonwealth of Massachusetts as discussed below.

SOUND LIMITS

TOWN OF NEEDHAM

It is our understanding that the Town of Needham does not have numerical noise limits that are part of the town bylaws. We have identified Section 3.8, Noise Regulation of the Town's General bylaws dated July 2021. Section 3.8.1 simply states:

> *Except in an emergency, construction activity conducted pursuant to a building permit, which causes noise that extends beyond the property line, shall be limited to the hours of 7AM to 8PM unless authorized by rules or regulations adopted by the Select Board. The penalty for violation of this regulation shall be a $50 fine.*

COMMONWEALTH OF MASSACHUSETTS

The Commonwealth of Massachusetts has enacted regulations for the control of air pollution (310 CMR 7.10[1]). To enforce these regulations, the Massachusetts Department of Environmental Protection (MassDEP) has issued guidelines that limit noise levels at property lines and the nearest residence. These limitations are: (a) not to increase the residual overall A-weighted background sound level by more than 10 dB and (b) not to produce a pure tone condition; where the sound pressure level (SPL) in one octave band exceeds the levels in the two adjacent octave bands by 3 dB or more.

[1] 310 Massachusetts Regulation 7.10, U Noise: https://casetext.com/regulation/code-of-massachusetts-regulations/department-310-cmr-department-of-environmental-protection/title-310-cmr-700-air-pollution-control/section-710-u-noise

BACKGROUND SOUND SURVEY

In order to determine compliance with the MassDEP noise limits, a background sound survey was performed from March 2 to 7, 2022. Acentech deployed two sound levels meters at the locations (A and B) shown in Figure 1. We monitored sound continuously for a period over 6 days. During this period, we measured the A-weighted ninetieth percentile sound pressure level (L_{90}) on an hourly basis 24 hours per day along with other metrics that can be reported as needed.

INSTRUMENTATION

We used Type 1 sound level meters (SLMs) in accordance with IEC 61672-1. The SLMs were factory-calibrated to National Institute of Standards and Technology (NIST) traceable sources within the previous 12 months; the laboratory calibration certificates are available upon request. Each SLM was also field-calibrated before and after the start of the survey. Each SLM was set to slow response, and recorded L_{90} sound pressure levels in one hour increments in octave-bands with center frequencies between 31.5 and 8,000 Hz. The equivalent continuous (L_{EQ}) A-weighted sound level (dBA), and unweighted (dBZ) octave-band SPLs were also recorded and will be used as necessary.

RESULTS

Figure 2 is a graph of the A-weighted L_{90} sound levels for the 6-day period. For unknown reasons, the data collection at Location A (Gould Street) abruptly stopped after 19-hours of monitoring. Given the limited amount of data, we retested Location A only from June 28 to July 6, 2022. We have compiled the L_{90} sound level and determined the lowest L_{90} sound level for the daytime (7:00 am to 10:00 pm), and nighttime (10:00 pm to 7:00 am) as given in Table 1.

TABLE 1: Summary of L_{90} Sound Levels and MassDEP Limits

PERIOD	Day (7:00 am-10:00 pm)	Night (10:00 pm-7:00 am)
Location A (Gould Street)	44	40
Location B (I-95 Ramps)	49	42
MassDEP Limit (min + 10 dB)	**54**	**50**

PROJECT NOISE LIMIT

The project noise limit is 10 dB higher than the minimum of the two locations. For daytime the limit would be 54 dBA (44 dBA + 10 dB), and for nighttime the limit is 50 dBA (40 dBA + 10 dB).

NOISE MODELING

The equipment that will generate sound from this Project includes:

- Two Air Handling Units (AHU)
- Two Cooling Towers (CT)
- Loading dock Exhaust Fans
- Multiple Garage Exhaust Fans
- Multiple General Exhaust Fans
- Multiple Exhaust Air Handling Unit (EAHU)
- Multiple Emergency Generators

All of the above equipment will be located on the roof of Building A or Building B. We will conduct a noise evaluation using Cadna/A acoustic modeling software, which complies with the international standard ISO 9613-2, “Attenuation of sound during propagation outdoors -- Part 2: General method of calculation”. All rooftop equipment will be evaluated for sound transmission to abutting properties, especially the Wingate Residences at Needham located at 235 Gould Street. As necessary to achieve noise limits, we will recommend noise control features such as acoustic screens/barriers, silencers, acoustic louvers, enclosures, and other treatments.

SUMMARY

We have been retained by Bulfinch to insure that the Project at 557 Highland Avenue will be compliant with the local and State limits noted above, given the potential use of sound mitigation. Once we have completed our evaluation, a final report will be issued that will document the predicted sound levels at various receptor points.

Please contact me at 617-499-8058 or mBahtiarian@acentech.com with any questions or comments.

Sincerely,
ACENTECH INCORPORATED



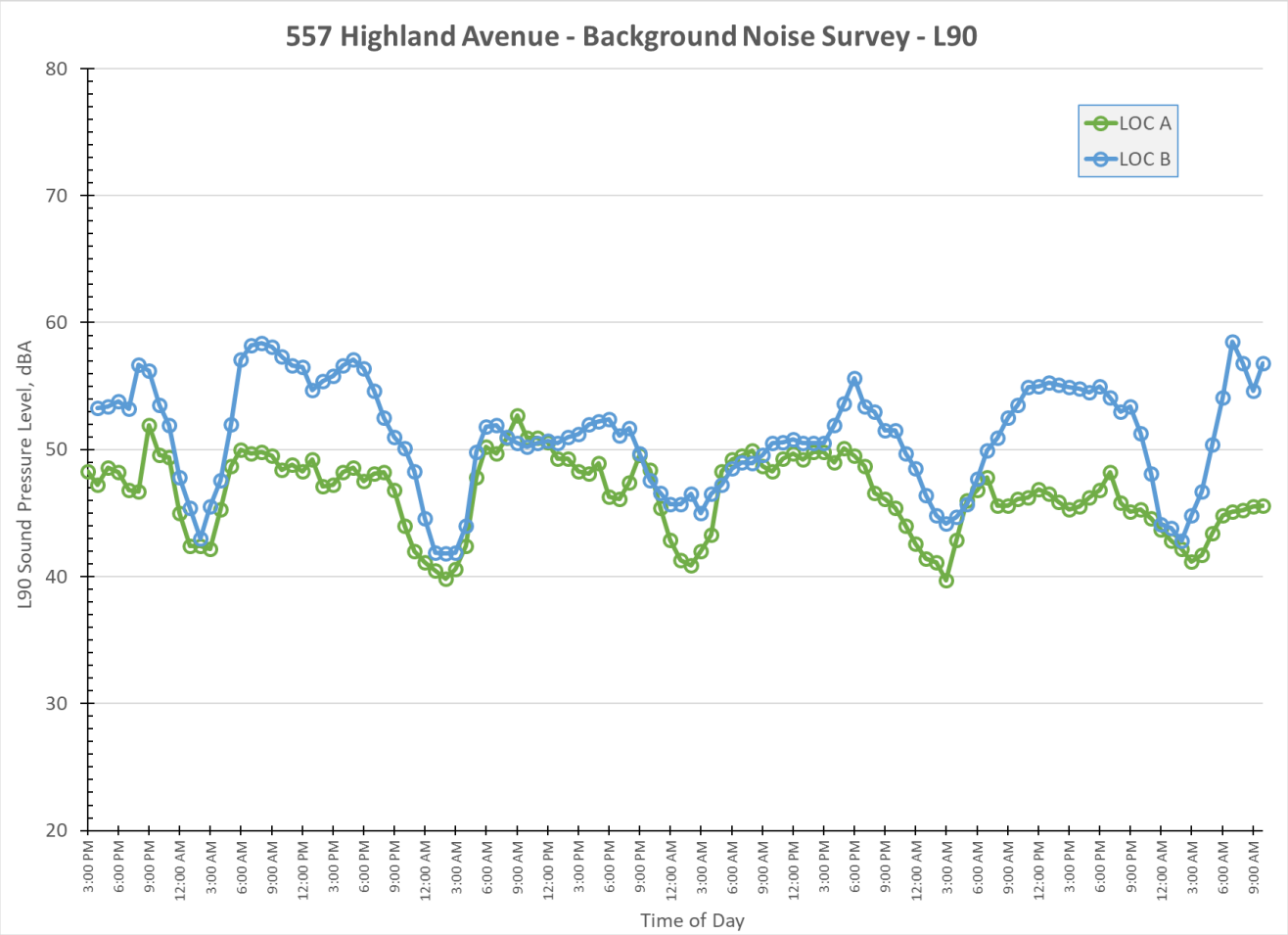
Michael Bahtiarian, INCE Bd. Cert.

Cc: Marc Newmark, Acentech
Ben Stracco, Stantec

FIGURE 1: Background Sound Survey Monitoring Locations, A & B



FIGURE 2: Background Sound Levels, hourly L_{90}, dBA





557 Highland Ave
Needham, MA 02494

Needham Special Permit Package R1

08/15/2022 (FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Bulfinch

Stantec



Proposed

Site Plan



Aerial – Looking North



Aerial – Looking West



Aerial – Looking South



Aerial – West Entry Drive

Site Aerial - Proposed



557 Parking – Looking North-East



Gould Street – Looking North-East



Fitness Loop – Looking South



Gould Street – Looking North-East

Street View - Proposed

Bulfinch

HIGHLAND INNOVATION CENTER

557 Highland Ave
Needham, MA 02494





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DRAWING INDEX

NO.	DRAWING NAME	SPECIAL PERMIT PACKAGE 2022.03.18	SPECIAL PERMIT PACKAGE R1 2022.08.15
GENERAL			
G-000a	COVER SHEET	•	•
G-005	ZONING AREA PLANS	•	•
CIVIL			
C-01	LEGEND AND GENERAL NOTES	•	•
C-02	OVERALL SITE PLAN - REVISION	•	•
C-02B	OVERALL SITE PLAN		•
C-03	DRAINAGE AND EROSION CONTROL PLAN	•	•
C-04	UTILITY PLAN	•	•
C-05	SITE DETAILS	•	•
C-06	SITE DETAILS	•	•
TRANSPORTATION			
TR-001	OFF-SITE ROADWAY IMPROVEMENTS #1		•
TR-002	OFF-SITE ROADWAY IMPROVEMENTS #2		•
SURVEY/MAPPING			
CONVEYANCE PLAN	CONVEYANCE PLAN		•
LANDSCAPE			
EX1.0	CONVEYANCE		•
L-1.0	SITE PLAN	•	•
L-2.0	GRADING PLAN	•	•
L-3.0	SITE PLANTING PLAN	•	•
L-4.0	SITE LIGHTING PLAN	•	•
L-5.0	SITE DETAILS #1	•	•
L-5.1	SITE DETAILS #2	•	•

DRAWING INDEX

NO.	DRAWING NAME	SPECIAL PERMIT PACKAGE 2022.03.18	SPECIAL PERMIT PACKAGE R1 2022.08.15
ARCHITECTURAL			
A-100G1	GARAGE LEVEL G1 - OVERALL PLAN & PARKING LEGEND	•	•
A-101	LEVEL 1 - OVERALL PLAN	•	•
A-102	LEVEL 2 - OVERALL PLAN	•	•
A-103	LEVEL 3 - OVERALL PLAN	•	•
A-104	LEVEL 4 / SOUTH BUILDING PENTHOUSE - OVERALL PLAN	•	•
A-105	LEVEL 5 / SOUTH BUILDING UPPER ROOF - OVERALL PLAN	•	•
A-106	NORTH BUILDING PENTHOUSE - OVERALL PLAN	•	•
A-107	FULL ROOF PLAN	•	•
A-201	BUILDING ELEV - LOCATOR ELEVATIONS	•	•
A-202	BUILDING ELEV - NORTH BLDG - NORTH	•	•
A-203	BUILDING ELEV - NORTH BLDG - SOUTH & EAST	•	•
A-204	BUILDING ELEV - SOUTH BLDG - SOUTH EAST		•
A-205	BUILDING ELEV - NORTH BLDG (SOUTHWEST) & SOUTH BLDG (SOUTH)	•	•
A-206	BUILDING ELEV - NORTH BLDG (WEST) & SOUTH BLDG (NORTH & WEST)	•	•
A-207	BUILDING ELEV - SOUTH BLDG - NORTH & EAST	•	•
A-211	BUILDING SECTIONS - OVERALL	•	•
A-212	BUILDING SECTIONS - NORTH BLDG	•	•
A-213	BUILDING SECTIONS - SOUTH BLDG		•
ARCHITECTURAL - GARAGE			
AG-100.B2	GARAGE LEVEL B2	•	•
AG-100.B1	GARAGE LEVEL B1	•	•
AG-101	GARAGE LEVEL 1	•	•
AG-102	GARAGE LEVEL 2	•	•
AG-103	GARAGE LEVEL 3 (LEVEL 4-5 SIM.)	•	•
AG-106	GARAGE LEVEL 6	•	•
AG-201	ELEVATIONS - NORTH & EAST	•	•
AG-202	ELEVATIONS - SOUTH & WEST	•	•
AG-211	GARAGE SECTIONS	•	•
AG-212	GARAGE SECTIONS	•	•
TOTAL: 47			

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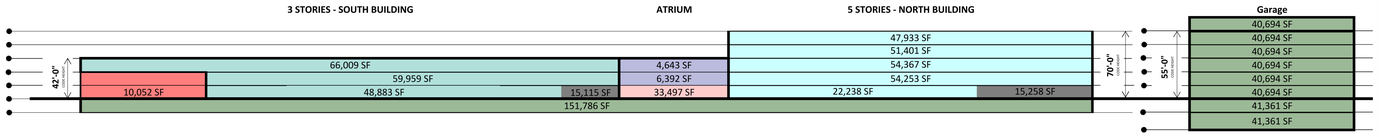
218421343

SPECIAL PERMIT PACKAGE R1 - 08/15/2022

(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

© 2023 Stantec
<Pick Location> | Project Information>
<Author> | <Date>
DESIGNATE SHEET - ARCH 01

Project Stats: Highland Ave
Date: 9/7/2022
Stantec **DRAFT**



Garage
40,694 SF
40,694 SF
40,694 SF
40,694 SF
40,694 SF
40,694 SF
41,361 SF
41,361 SF

GROUND FLOOR	
Program	SF
A1 Retail	10,052 SF
A2 Amenity	33,497 SF
A3 Office/Lab	405,043 SF
A4 Tenant Bridge	11,035 SF
A5 BOH	30,373 SF
A6 PARKING & GARAGE (TOTAL)	478,672 SF
A7 **Total FAR SF (A1 + A2 + A3 + A4 + A5)**	**490,000 SF**

Garage	
Program	SF
Garage	**326,886 SF**

Parking Space Totals

Building Parking Count (Below Grade)					
Level	**Standard**	**Parallel**	**Compact**	**ADA - VAN**	**ADA**
Level G1	182	3	169	2	6
Total by Type	**182**	**3**	**169**	**2**	6
Total Parking			**362**		

Garage Parking Count					
Level	**Standard**	**Compact**	**ADA - VAN**	**ADA**	TOTAL BY LEVEL
Level B2	61	52	0	3	116
Level B1	60	56	0	3	119
Level 1	55	67	3	1	126
Level 2	52	76	0	3	131
Level 3	51	79	0	2	132
Level 4	51	79	0	2	132
Level 5	51	79	0	2	132
Roof	67	41	0	2	110
Total by Type	**448**	**529**	**3**	**18**	
Total Parking		**998**			

EV SPACES:

Site Totals

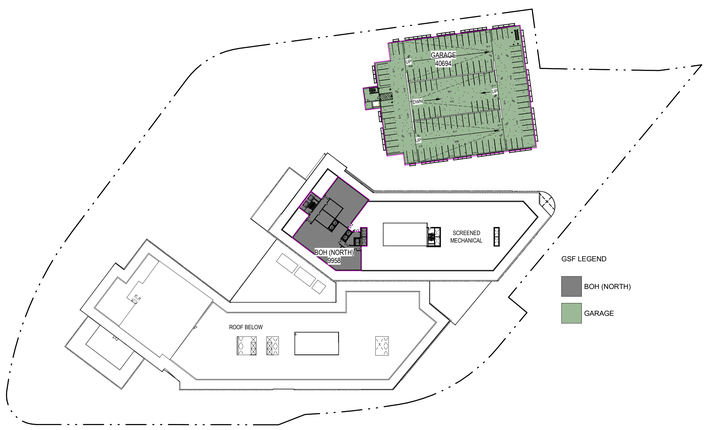
Program		
		Proposed
Total FAR SF (Office + Garage)		**490,000 SF**
TOTAL SITE SF		**391,846 SF**
SITE FAR		**1.25**

Site Parking Totals	
	Proposed
SP1 Surface Parking	30
SP2 Office/Lab Building	362
SP3 Garage	998
SP4 **Total Parking** (SP1 + S	**1390**
Total Compact Spaces (Office/Lab & Garage)	**698**
SP5 **Total % Compact On-Site**	**50%**

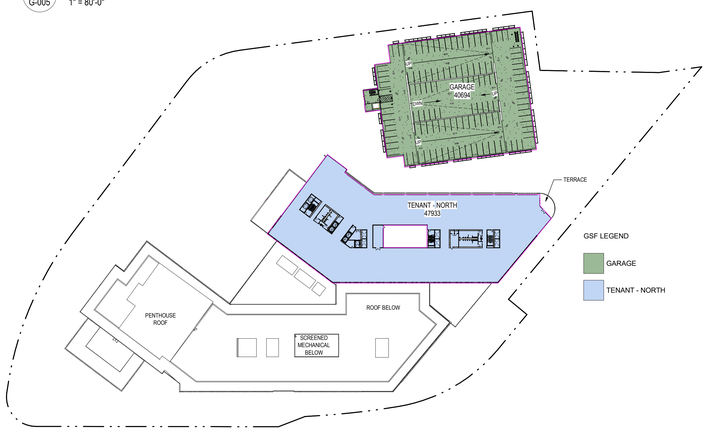
AREAS - LAB (GROSS - OFFICE ONLY)			
BUILDING	GSF (SF)	Comments
LEVEL G1			
PARKING	151786	EXCLUDED
	151786	
LEVEL 1			
ATRIUM	33497	
BOH (NORTH)	15258	
BOH (SOUTH)	15115	
RETAIL	10052	
TENANT - NORTH	22238	
TENANT - SOUTH	48883	
	145043	
LEVEL 2			
TENANT - BRIDGE	6392	
TENANT - NORTH	54253	
TENANT - SOUTH	59959	
	120604	
LEVEL 3			
TENANT - BRIDGE	4643	
TENANT - NORTH	54367	
TENANT - SOUTH	66009	
	125019	
LEVEL 4			
BOH (SOUTH)	11160	EXCLUDED
TENANT - NORTH	51401	
	62561	
LEVEL 5			
TENANT - NORTH	47933	
	47933	
PENTHOUSE - NORTH			
BOH (NORTH)	9958	EXCLUDED
	9958	

AREAS - GARAGE (GROSS - GARAGE ONLY)		
BUILDING	GSF (SF)	Comments
GARAGE - LEVEL B2		
GARAGE	41361	
	41361	
LEVEL G1		
GARAGE	41361	EXCLUDED
	41361	
LEVEL 1		
GARAGE	40694	
	40694	
LEVEL 2		
GARAGE	40694	
	40694	
LEVEL 3		
GARAGE	40694	
	40694	
LEVEL 4		
GARAGE	40694	
	40694	
LEVEL 5		
GARAGE	40694	
	40694	
PENTHOUSE - NORTH		
GARAGE	40694	
	40694	
TOTAL	326884	

GENERAL NOTE: ALL AREAS ARE IN PROGRESS AND SHOULD NOT BE CONSIDERED FINAL.



6 G-005 **FLOOR AREA - ROOF**
1" = 80'-0"



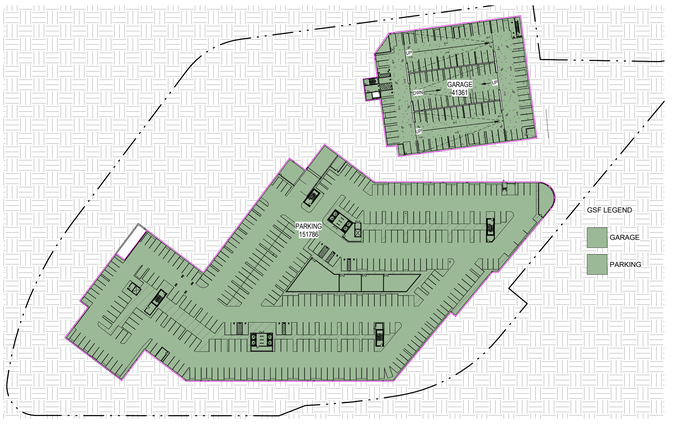
5 G-005 **FLOOR AREA - LEVEL 5**
1" = 80'-0"



4 G-005 **FLOOR AREA - LEVEL 4**
1" = 80'-0"



2 G-005 **FLOOR AREA - LEVEL 2**
1" = 80'-0"



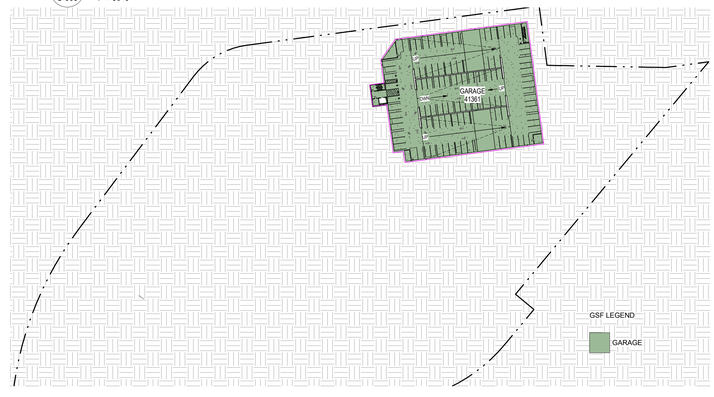
G1 G-005 **FLOOR AREA - LEVEL G1**
1" = 80'-0"



3 G-005 **FLOOR AREA - LEVEL 3**
1" = 80'-0"



1 G-005 **FLOOR AREA - LEVEL 1**
1" = 80'-0"



7 G-005 **GARAGE - LEVEL B2**
1" = 80'-0"

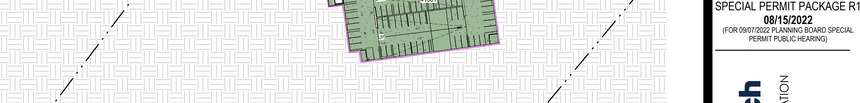
Stantec
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40 Wantor Street - 3rd Floor
Boston, MA 02135-7076
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Consultant

No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1		2022.08.15	
2	30% DESIGN SUBMISSION		2022.03.25	

Permit/Seal



SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1" = 80'-0"

Author	Designer	Checker	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
ZONING AREA PLANS

Revision:
Drawing No.
G-005

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9/7/2022 10:57:19 AM
ORIGINAL SHEET - ARCH E

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Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
		PARKING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
		WETLAND LINE WITH FLAG
		FLOODPLAIN
BLSF		BORDERING LAND SUBJECT TO FLOODING
BZ		WETLAND BUFFER ZONE
NDZ		NO DISTURB ZONE
200'RA		200' RIVERFRONT AREA
		GRAVEL ROAD
EOP	EOP	EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VGC	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
		SILT SOCK / STRAW WATTLE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
10	10	PARKING COUNT
	C10	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		BUILDINGS
		RIPRAP
		CONSTRUCTION EXIT
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75×	132.75×	SPOT ELEVATION
45.0 TW× 38.5 BW	45.0 TW× 38.5 BW	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D	DRAIN
6"RD	6"RD	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	E	ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
CATV	CATV	CABLE TV
		CATCH BASIN CONCENTRIC
		CATCH BASIN ECCENTRIC
		DOUBLE CATCH BASIN CONCENTRIC
		DOUBLE CATCH BASIN ECCENTRIC
		GUTTER INLET
		DRAIN MANHOLE CONCENTRIC
		DRAIN MANHOLE ECCENTRIC
TD		TRENCH DRAIN
		PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
		SEWER MANHOLE CONCENTRIC
		SEWER MANHOLE ECCENTRIC
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		FIRE DEPARTMENT CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
W	W	WATER WELL
GG	GG	GAS GATE
GM	GM	GAS METER
E	EMH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
T	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
		MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EX	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PIV	POST INDICATOR VALVE
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
RIM=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes

General

1. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).
4. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6 INCHES LOAM AND SEED.
5. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, THE SITE CONTRACTOR SHALL PERFORM EARTHWORK OPERATIONS REQUIRED UP TO SUBGRADE ELEVATIONS.
6. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
7. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
8. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
9. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
10. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
11. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
12. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
13. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
14. THIS PROJECT DISTURBS MORE THAN ONE ACRE OF LAND AND FALLS WITHIN THE NPDES CONSTRUCTION GENERAL PERMIT (CGP) PROGRAM AND EPA JURISDICTION. PRIOR TO THE START OF CONSTRUCTION CONTRACTOR IS TO FILE A CGP NOTICE OF INTENT WITH THE EPA AND PREPARE A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE NPDES REGULATIONS. CONTRACTOR SHALL CONFIRM THE OWNER HAS ALSO FILED A NOTICE OF INTENT WITH THE EPA.

Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
4. RIM ELEVATIONS FOR DRAIN AND SEWER MANHOLES, WATER VALVE COVERS, GAS GATES, ELECTRIC AND TELEPHONE PULL BOXES, AND MANHOLES, AND OTHER SUCH ITEMS, ARE APPROXIMATE AND SHALL BE SET/RESET AS FOLLOWS:
   A. PAVEMENTS AND CONCRETE SURFACES: FLUSH
   B. ALL SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   C. LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EARTH TO THE RIM ELEVATION.
5. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
6. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
7. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
   A. WATER PIPES SHALL BE CLASS 52 CEMENT LINED DUCTILE IRON (CLDI).
   B. SANITARY SEWER PIPES SHALL BE SDR 35 POLYVINYL CHLORIDE (PVC).
   C. STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HDPE).
   D. PIPE INSTALLATION AND MATERIALS SHALL COMPLY WITH THE STATE PLUMBING CODE WHERE APPLICABLE. CONTRACTOR SHALL COORDINATE WITH LOCAL PLUMBING INSPECTOR PRIOR TO BEGINNING WORK.
8. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.
9. CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.
10. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN.) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS AND LOCAL MUNICIPAL STANDARDS. FOR MANHOLES THAT ARE 20 FEET IN DEPTH AND GREATER, THE MINIMUM DIAMETER SHALL BE 5 FEET.

Layout and Materials

1. DIMENSIONS ARE FROM THE FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
2. CURB RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
3. CURBING SHALL BE VERTICAL GRANITE WITHIN THE SITE UNLESS OTHERWISE INDICATED ON THE PLANS.
4. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.
5. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LAND SURVEYOR.
6. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.

Demolition

1. PROJECT PRESENTED HEREIN IS THE ADAPTIVE REUSE OF AN EXISTING SITE. TO THE EXTENT REQUIRED TO BUILD THE PROJECT, CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS, AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF TEN (10) FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS.
2. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
4 THE DEMOLITION LIMITS DEPICTED IN THE PLANS IS INTENDED TO AID THE CONTRACTOR DURING THE BIDDING AND CONSTRUCTION PROCESS AND IS NOT INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
5. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH. MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS (MINIMUM) OR AS REQUIRED PER THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

Existing Conditions Information

1. BASE PLAN: THE PROPERTY LINES AND EXISTING CONDITIONS ARE SHOWN BASED ON "ALTA/NSPS LAND TITLE SURVEY 557 HIGHLAND AVENUE", PREPARED BY FELDMAN LAND SURVEYORS, DATED 12/09/2021.
2. TOPOGRAPHY: ELEVATIONS ARE BASED ON NAVD88.
3. GEOTECHNICAL DATA INCLUDING TEST PIT AND BORING LOCATIONS AND ELEVATIONS WERE OBTAINED FROM A MEMO ENTITLED "PRELIMINARY EVALUATION OF SOIL HYDRAULIC CONDUCTIVITY", PREPARED BY MCPHAIL ASSOCIATES, DATED MARCH 18, 2022.

Document Use

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2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

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By	Appvd	YYYY.MM.DD	Issued/Revision
		2022.08.15	SPECIAL PERMIT PACKAGE R1
		2022.09.07	PLANNING BOARD PACKAGE

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS J. SKOLY
CIVIL
No. 52677
PROFESSIONAL ENGINEER

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
NEEDHAM, MA 02494

Project No.: 15306.00
Title Name: N/A
Scale:

Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
LEGEND AND GENERAL NOTES

Revision:
Drawing No.
C-01

Saved Friday, August 12, 2022 9:33:41 AM SDIAMOND Plotted Tuesday, August 16, 2022 9:15:56 AM Sean Diamond
ORIGINAL SHEET - ARCH E

Parking Summary Chart

Description	Size Required	Size Provided	Spaces Required	Spaces Provided
STANDARD SPACES	9 x 18.5	9 x 18.5		661[1]
COMPACT SPACES (50% ALLOWED)	8 x 16	8 x 16	-	698[2]
STANDARD ACCESSIBLE SPACES	8 x 18.5	8 x 18.5	20[3]	24[4]
VAN ACCESSIBLE SPACES	8 x 18.5	8 x 18.5	4[3]	7[5]
TOTAL SPACES			1,678	1,390[6]
LOADING BAYS			**	2

1. REQUIRED ACCESSIBLE SPACES BASED ON TOTAL PROVIDED SPACES PER ADA/MAAB REQUIREMENTS.
2. INCLUDES 633 GARAGE/BUILDING SPACES.
3. INCLUDES 698 GARAGE/BUILDING SPACES.
4. INCLUDES 24 GARAGE/BUILDING SPACES.
5. INCLUDES 5 GARAGE/BUILDING SPACES.
6. APPLICANT IS REQUESTING A SPECIAL PERMIT FOR DEVIATION FROM THE REQUIRED NUMBER OF PARKING SPACES.

** ADEQUATE OFF-STREET LOADING FACILITIES SHALL BE PROVIDED.

Parking Requirements:

OFFICE	239,974 SF	x	1 SPACES	/ 300	=	800 SPACES
R&D	239,974 SF	x	1 SPACES	/ 300	=	800 SPACES
RETAIL	10,052 SF	x	1 SPACES	/ 300	=	34 SPACES
RESTAURANT	100 SEATS	x	1 SPACES	/ 3 SEAT	=	34 SPACES
	1 TAKEOUT STATION	x	10 SPACES	/ 1 TAKEOUT STATION	=	10 SPACES
				TOTAL PARKING REQUIRED	=	1,678 SPACES

Zoning Summary Chart

Zoning District(s): Highway Commercial 1

Overlay District(s):

Zoning Regulation Requirements	Required*	Provided
MINIMUM LOT AREA	0.5 Acres	391,846 SF
FRONTAGE	100 Feet	> 100 Feet
FRONT YARD SETBACK	See Plan	> 50 Feet
SIDE YARD SETBACK	See Plan	> 10 Feet
REAR YARD SETBACK	See Plan	> 20 Feet
MINIMUM LOT WIDTH	100 Feet	> 100 Feet
MAXIMUM FLOOR AREA RATIO	0.70 [1]	1.25
MAXIMUM BUILDING HEIGHT	56 Feet [2,3,4]	42 / 70 Feet
MAXIMUM LOT COVERAGE	65.0 %	47.9 %
MINIMUM OPEN SPACE	25.0 %	> 25.0%
INTERIOR PARKING LANDSCAPING PERCENTAGE	10.0 %	> 10%

* Zoning regulation requirements as specified in Zoning By-Law of the Town of Needham dated June, 2020, and amended through August 21, 2021.

1. Floor area ratio of up to 1.35 may be allowed by a Special Permit from the Planning Board per §4.11.1(5).
2. Buildings within 200 feet of Highland Avenue or the extension of the right-of-way line or within 200 feet of Gould Street shall be limited to a height of 35 feet and 2.5 stories as-of-right. The maximum height may be increased to 42 feet and 3 stories by Special Permit from the Planning Board per §4.11.1(1)(a,b).
3. The maximum building height may be increased to 70 feet and 5 stories by Special Permit from the Planning Board, provided the building is not located within 200 feet of Highland Avenue or the extension of the right-of-way line or within 200 feet of Gould Street per §4.11.1(1)(b).
4. The height of a parking garage may not exceed 44 feet. The maximum height may be increased to 55 feet by Special Permit from the Planning Board per §4.11.2(1).

Notes

1. REFER TO LANDSCAPE PLANS FOR DETAILED SITE LAYOUT AND MATERIALS INFORMATION.
2. REFER TO ARCHITECTURAL PLANS FOR PROPOSED GARAGE PARKING SPACES.

0 15 30 60 Feet

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE			2022.08.15

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS J. SKOLY
CIVIL
No. 52677
REGISTERED PROFESSIONAL ENGINEER

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
NEEDHAM, MA 02494

Project No.: 15306.00
File Name: N/A
Scale: 1" = 30'-0"

Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
OVERALL SITE PLAN-REVISION

Revision:

Drawing No.
C-02

Saved Tuesday, August 16, 2022 9:25:38 AM SSNAMOND Plotted Tuesday, August 16, 2022 9:26:05 AM Sean Diamond
ORIGINAL SHEET - ARCH E

Parking Summary Chart

Description	Size Required	Size Provided	Spaces Required	Spaces Provided
STANDARD SPACES	9 x 18.5	9 x 18.5		661[1]
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2. REFER TO ARCHITECTURAL PLANS FOR PROPOSED GARAGE PARKING SPACES.

0 15 30 60 Feet

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1		TYP/MAU	2022.08.15

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS J. SKOLY
CIVIL
No. 52677
PROFESSIONAL ENGINEER

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

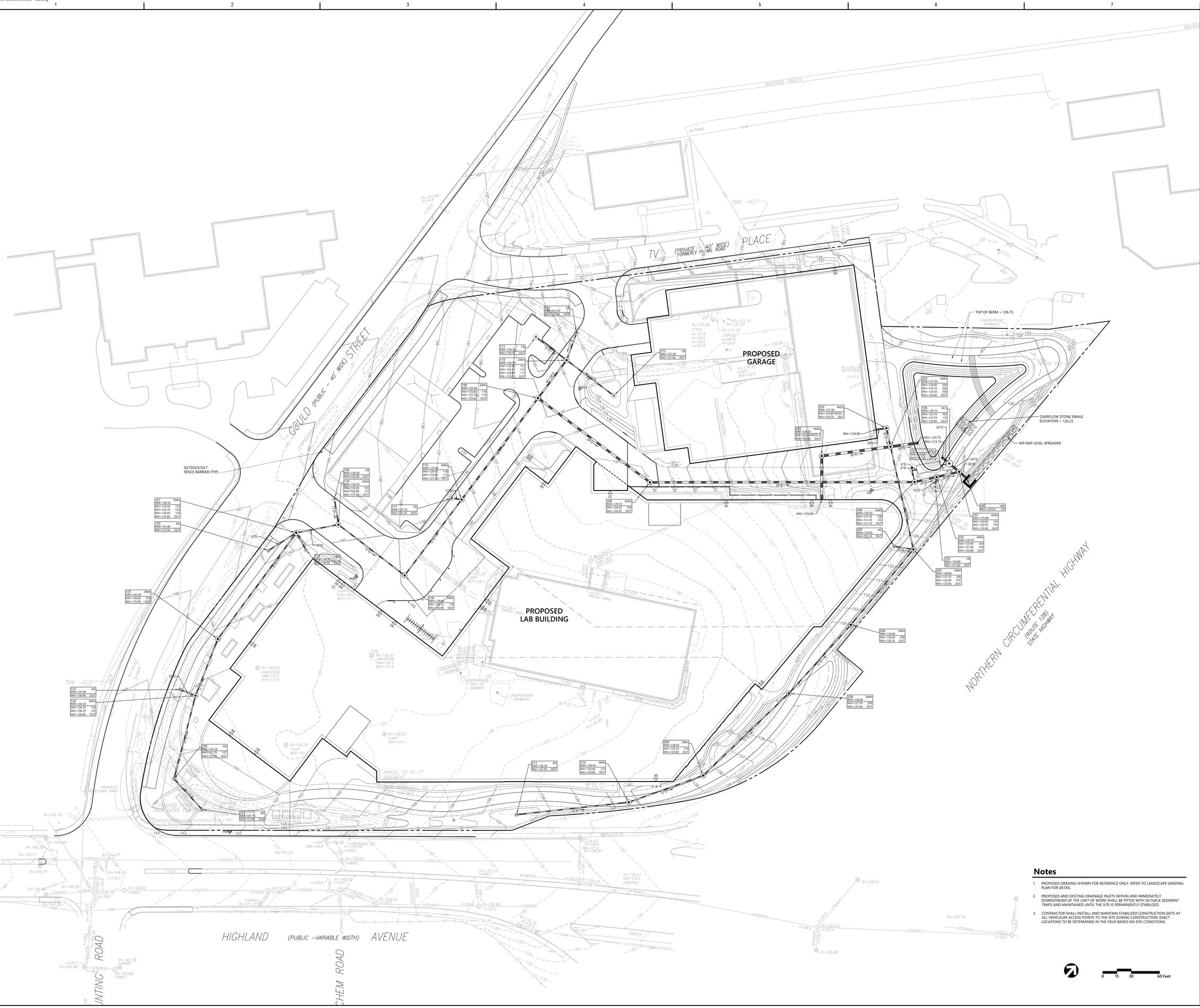
Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
NEEDHAM, MA 02494

Project No.: 15306.00
File Name: N/A
Scale: 1" = 30'-0"

Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
OVERALL SITE PLAN

Revision:
Drawing No.
C-02B



Notes

1. PROPOSED GRADING SHOWN FOR REFERENCE ONLY. REFER TO LANDSCAPE GRADING PLAN FOR DETAIL.
2. PROPOSED AND EXISTING DRAINAGE INLETS WITHIN AND IMMEDIATELY DOWNSTREAM OF THE LIMIT OF WORK SHALL BE FITTED WITH SILTSACK SEDIMENT TRAPS AND MAINTAINED UNTIL THE SITE IS PERMANENTLY STABILIZED.
3. CONTRACTOR SHALL INSTALL AND MAINTAIN STABILIZED CONSTRUCTION EXITS AT ALL VEHICULAR ACCESS POINTS TO THE SITE DURING CONSTRUCTION. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD BASED ON SITE CONDITIONS.

0 15 30 60 Feet

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Issued/Revision	By	Appd	YYYY.MM.DD
25% DESIGN DEVELOPMENT			2022.03.18
100% DESIGN DEVELOPMENT			2022.05.06

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
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SPECIAL PERMIT PACKAGE R1
08/15/2022
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Client/Project
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Project No.: 15306.00
File Name: N/A
Scale: 1" = 30'-0"

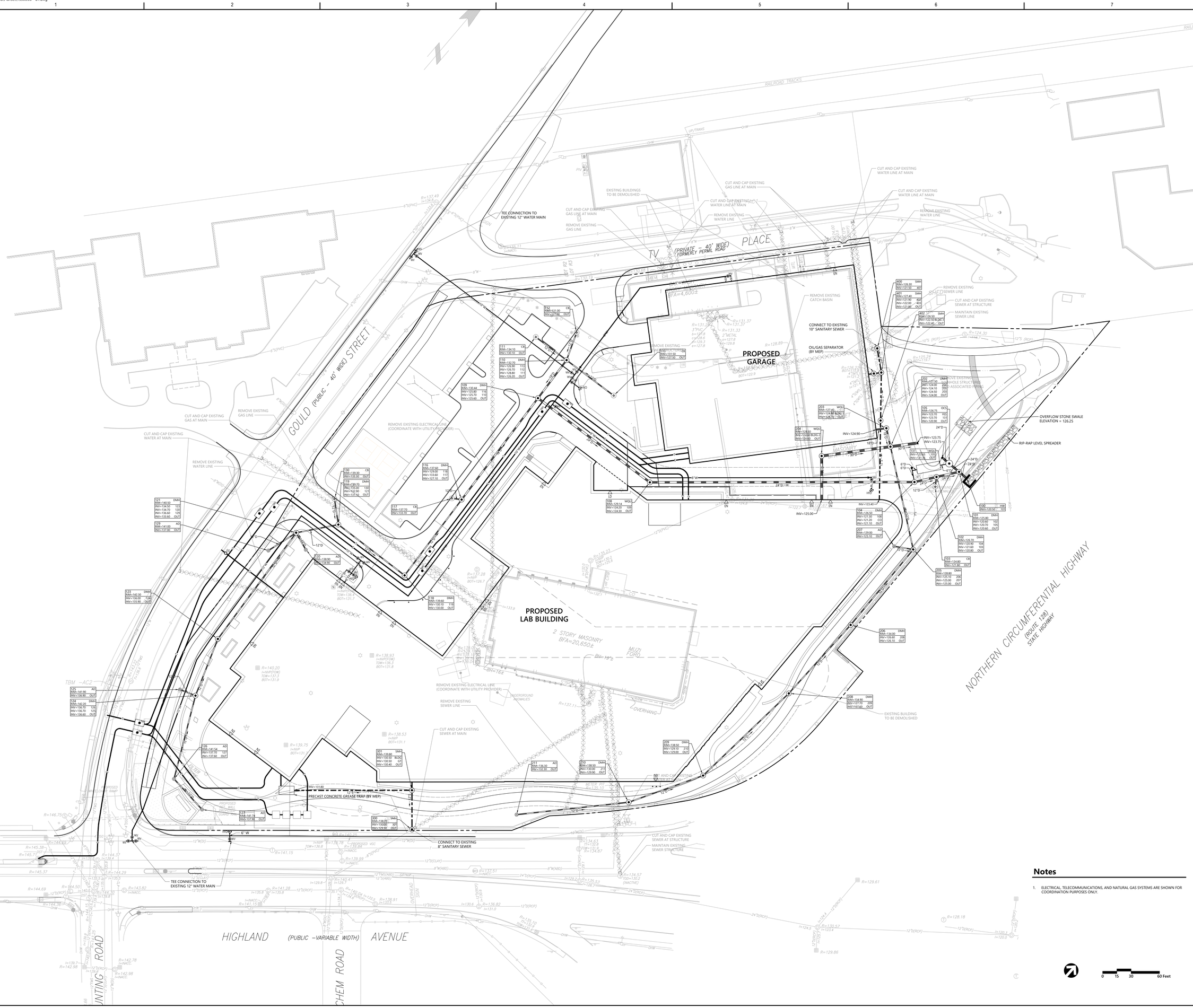
Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

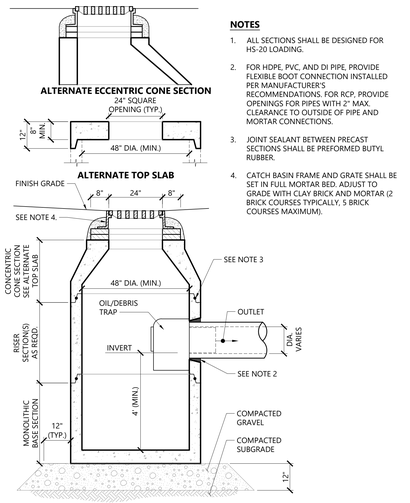
Title
DRAINAGE AND EROSION CONTROL PLAN

Revision:

Drawing No.
C-03

Saved Friday, August 12, 2022 10:27:57 AM SDIAMOND Plotted Tuesday, August 16, 2022 9:19:26 AM Sean Diamond
ORIGINAL SHEET - ARCH E


GOULD (PUBLIC – 40' WIDE) STREET
HIGHLAND (PUBLIC –VARIABLE WIDTH) AVENUE
TV PLACE (PRIVATE – 40' WIDE) FORMERLY PERMIL ROAD
NORTHERN CIRCUMFERENTIAL HIGHWAY (ROUTE 128) STATE HIGHWAY
PROPOSED GARAGE
PROPOSED LAB BUILDING
2 STORY MASONRY BFA=20,650±
MASONRY
MUZI FORD
SHED
EXISTING BUILDINGS TO BE DEMOLISHED
EXISTING BUILDING TO BE DEMOLISHED
TEE CONNECTION TO EXISTING 12" WATER MAIN
TEE CONNECTION TO EXISTING 12" WATER MAIN
CONNECT TO EXISTING 10" SANITARY SEWER
CONNECT TO EXISTING 8" SANITARY SEWER
OIL/GAS SEPARATOR (BY MEP)
PRECAST CONCRETE GREASE TRAP (BY MEP)
OVERFLOW STONE SWALE ELEVATION = 126.25
RIP-RAP LEVEL SPREADER
REMOVE EXISTING CATCH BASIN
REMOVE EXISTING SEWER LINE
CUT AND CAP EXISTING SEWER AT MAIN
CUT AND CAP EXISTING SEWER AT STRUCTURE
MAINTAIN EXISTING SEWER STRUCTURE
MAINTAIN EXISTING SEWER LINE
REMOVE EXISTING SEWER STRUCTURE (WHOLE STRUCTURE AND ASSOCIATED PIPING)
CUT AND CAP EXISTING GAS AT MAIN
REMOVE EXISTING GAS LINE
CUT AND CAP EXISTING GAS LINE AT MAIN
REMOVE EXISTING GAS LINE
CUT AND CAP EXISTING WATER AT MAIN
REMOVE EXISTING WATER LINE
CUT AND CAP EXISTING WATER LINE AT MAIN
REMOVE EXISTING WATER LINE
CUT AND CAP EXISTING WATER LINE AT MAIN
REMOVE EXISTING ELECTRICAL LINE (COORDINATE WITH UTILITY PROVIDER)
UNDERGROUND ANOMALIES
OVERHEAD SIGN
OVERHANG
METER PIT
TBM –AC2
TBM –AC1
RAILROAD TRACKS
GAS
OHW
UP/TRANS
6"W
8"W
12"W(DI)
12"D
24"D
18"D
6"D
8"D
12"D(CLAY)
12"D(RCP)
24"D(RCP)
12"D(ABD)
8"W(ABD)
12"D(CMP)
12"D(PVC)
12"D(RCP)
24"D(RCP)
12"D(RCP)
12"D(RCP)
12



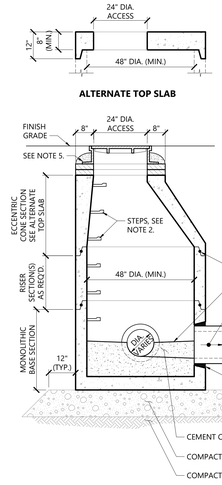
NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).

Catch Basin (CB) With Oil/Debris Trap

3/21

N.T.S. Source: VHB LD_101



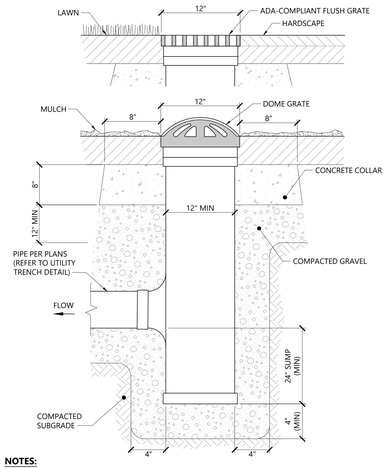
NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING. DIAMETER OF STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Drain Manhole (DMH)

11/19

N.T.S. Source: VHB LD_115



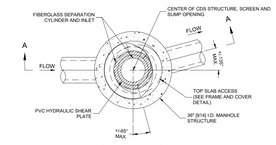
NOTES:

1. AREA DRAINS SHALL BE NYLOPLAST 12" DIAMETER DRAIN BASIN, OR APPROVED EQUAL.
2. GRATES SHALL BE NYLOPLAST 12" PEDESTRIAN MODEL 1299CGP OR 12" DOME GRATE MODEL 1299CGD (OR APPROVED EQUAL).

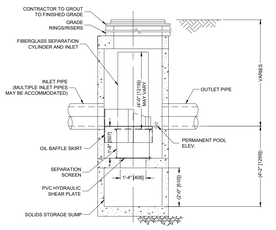
Area Drain (AD) Type 1

12/19

N.T.S. Source: VHB LD_193



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

CDS1515-3-C DESIGN NOTES
CDS1515-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.
THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WQU-203 (CDS1515-3)

N.T.S. Source: Contech

PLAN VIEW B-B
N.T.S.

ELEVATION A-A
N.T.S.

CDS2020-5-C DESIGN NOTES
CDS2020-5-C RATED TREATMENT CAPACITY IS 2.2 CFS, OR PER LOCAL REGULATIONS.
THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.
CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO H520 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

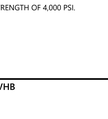
WQU-204 (CD2020-5)

N.T.S. Source: Contech

PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

ELEVATION VIEW

JELLYFISH DESIGN NOTES				
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD				
CARTRIDGE SELECTION				
CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	5'-4"	5'-4"	4'-3"	3'-3"
PEAK RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

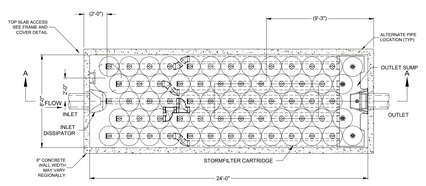
24"
TRENCH COVER
(LENGTH VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-858, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

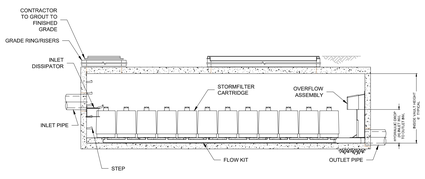
INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

WQU-108 (Jellyfish JFPD0806-8-2)

N.T.S. Source: Contech

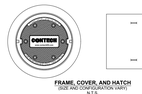


PLAN VIEW
VAULT STYLE: OUTLET SUMP (NB)



SECTION A-A

STORMFILTER DESIGN NOTES										
STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD VAULT STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (81). VAULT STYLE OPTIONS INCLUDE INLET BAY (56), INLET BAY/OUTLET BAY (51), OUTLET BAY (59), INLET BAY/FULL HEIGHT BAFFLE WALL (45), FULL HEIGHT BAFFLE WALL (54). STORMFILTER 8X24 PEAK HYDRAULIC CAPACITY IS 1.8 CFS. IF THE SITE CONDITIONS EXCEED 1.8 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.										
CARTRIDGE SELECTION										
CARTRIDGE HEIGHT	27"			18"			LOW DROP			
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			1.8'			
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	10	8.35	5	
* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY										



FRAME, COVER, AND HATCH
(SIZE AND CONFIGURATION VARY)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO H520 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONFORMING TO ASTM C-857 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER VAULT (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL VAULT SECTIONS AND ASSEMBLE VAULT.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

WQU-131 (StormFilter SF0824 with 57-18" Cartridges)

N.T.S. Source: Contech

Overflow Stone Swale

1/16

N.T.S. Source: VHB REV LD_161

PLAN VIEW

SECTION A-A

NOTES

1. SHOP DRAWINGS FOR PLACEMENT OF REINFORCING SHALL BE SUBMITTED TO THE ENGINEER BY THE CONTRACTOR.
2. CONCRETE SHALL BE 6% ±1.5% AIR ENTRAINED TYPE II CEMENT WITH MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
3. SAFETY BARS TO BE OMITTED WHERE INDICATED ON PLANS.
4. SAFETY BARS SHALL BE SET TO CREATE EQUAL OPENING DIMENSIONS.

Directional Headwall

10/20

N.T.S. Source: VHB LD_135

Stantec
Stantec Architecture and Engineering P.C.
40 Wantz Street, 3rd Floor
Allendale, NJ 07401
Tel: (617) 234-3100 • www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing. Any errors or omissions shall be reported to Stantec without delay. Reproduction or publication of this drawing, in whole or in part, and the information contained thereon without the written permission of Stantec is prohibited.

Consultant

vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	PLANNING BOARD SPECIAL PERMIT PACKAGE			2022.08.15

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
NICHOLAS J. SKOLY
CIVIL
No. 52677
REGISTERED PROFESSIONAL ENGINEER

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
NEEDHAM, MA 02494

Project No.: 15306.00
File Name: N/A
Scale:

Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
Site Details

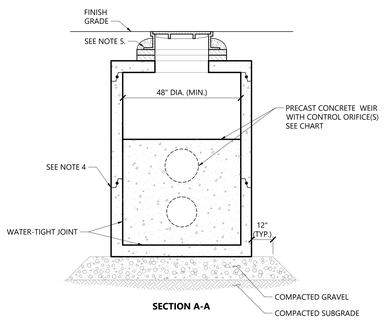
Revision:
Drawing No.
C-05

Outlet Control Structure with Weir (OCS)

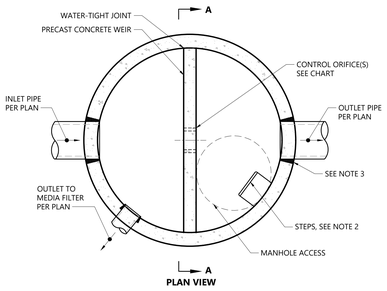
N.T.S. Source: VHB REV LD_162A 3/20

OUTLET STRUCTURE CHART

DETENTION BASIN	STRUCTURE NUMBER	TOP OF WEIR ELEVATION	DIMENSIONS ORIFICE A	INVERT ORIFICE A	DIMENSIONS ORIFICE B	INVERT ORIFICE B
P1	105	125.0	N/A	N/A	N/A	N/A



SECTION A-A



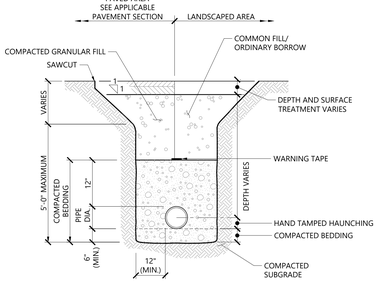
PLAN VIEW

NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING. DIAMETER OF STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Utility Trench

N.T.S. Source: VHB LD_300 11/19

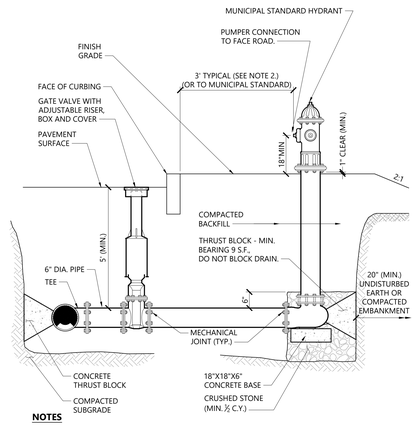


NOTES

1. WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
2. USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.
3. COMPACTED GRANULAR FILL MAY CONSIST OF GRAVEL, CRUSHED STONE, SAND, OR OTHER MATERIAL AS APPROVED BY ENGINEER.

Hydrant Construction

N.T.S. Source: VHB LD_250 12/19



NOTES

1. CONCRETE THRUST BLOCKS TO BE USED ONLY WHERE THEY CAN BEAR ON UNDISTURBED EARTH AS SHOWN. USE CLAMPS AND TIE RODS OR OTHER ACCEPTABLE METHOD OF JOINT RESTRAINT WHERE SOIL CONDITIONS PROHIBIT THE USE OF THRUST BLOCKS.
2. HYDRANT IN SIDEWALK AREAS TO BE LOCATED TO PROVIDE MINIMUM CLEAR SIDEWALK PASSAGE WIDTH OF 3 FEET AT HYDRANT.
3. A 36-INCH CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF THE HYDRANT UNLESS OTHERWISE APPROVED BY AUTHORITY HAVING JURISDICTION.

Restrained Joints for Water Pipe

N.T.S. Source: VHB LD_261 3/20

RESTRAINED JOINTS

FITTINGS	NUMBER OF JOINTS TO RESTRAIN ON EITHER SIDE OF FITTING (BASED ON 18-FOOT PIPE LENGTH)
90 DEGREE BEND	3
45 DEGREE BEND	2
22-1/2 DEGREE BEND	2
TEE:	
BRANCH	3
RUN	2

NOTES

1. PIPE WITH RESTRAINED JOINTS SHALL BE INSTALLED IN ALL AREAS WHERE THE PIPE IS WITHIN FILL MATERIALS AND ALSO AT LOCATIONS SHOWN ON THE DRAWINGS. RESTRAINED JOINTS SHALL BE INSTALLED AT BENDS, REDUCERS, TEES, VALVES, DEAD ENDS, AND HYDRANTS. THE MINIMUM LENGTH OF PIPE TO BE RESTRAINED ON EITHER SIDE OF THE JOINT SHALL BE AS SHOWN ON THE TABLE ABOVE THE FITTINGS OF THE NEW PIPING SHALL BE FOR RESTRAINED JOINTS, AS MARKED ON THE DRAWINGS.
2. NO RESTRAINING IS REQUIRED IN THE DIRECTION OF THE EXISTING PIPE IF ONLY A SHORT LENGTH OF IT IS EXPOSED IN THE TRENCH FOR MAKING A CONNECTION.
3. RESTRAINED JOINT ASSEMBLIES FOR PUSH-ON PIPE AND FITTINGS SHALL BE MADE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.

Level Spreader Section

N.T.S. Source: VHB

Precast Concrete Grease Trap (GT)

N.T.S. Source: VHB LD_211 12/19

PLAN VIEW

SECTION

NOTES

1. STRUCTURE SHALL BE DESIGNED FOR HS-20 LOADING.
2. EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. STANDARD 30-INCH SEWER MANHOLE FRAME AND COVER SHALL BE LOCATED OVER CROSSES AND SET IN FULL MORTAR BED. ADJUST TO GRADE WITH SEWER BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)
5. PIPING SHALL BE SCH 40 PVC WITH SOLVENT WELDED JOINTS. INTERNAL PIPE DIAMETER SHALL BE SAME SIZE AS OUTLET PIPE.
6. FINAL DESIGN OF GREASE TRAP TO BE BY PLUMBING ENGINEER.
7. THE INSTALLATION OF GREASE TRAP, THE PIPING TO AND 10 FEET BEYOND IS BY PLUMBER.

GREASE TRAP

SIZE (GAL.)	LIQUID DEPTH
4,000	4'-0"
5,000	5'-0"
6,000	6'-0"
7,000	7'-0"
8,000	8'-0"
9,000	9'-0"
10,000	10'-0"

Sanitary Sewer Manhole (SMH)

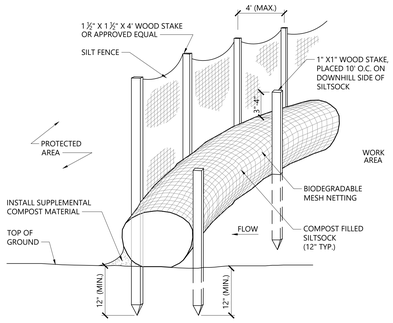
N.T.S. Source: VHB LD_200 1/16

NOTES

1. STRUCTURES SHALL BE PRECAST CONCRETE, DESIGNED FOR HS-20 LOADING.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. STANDARD SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH SEWER BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Siltsock / Silt Fence Barrier

N.T.S. Source: VHB LD_658-A 10/20

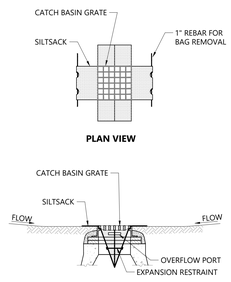


NOTES

1. SILTSOCK SHALL BE FILTREXX SILTSOXX, OR APPROVED EQUAL.
2. SILTSOCKS SHALL OVERLAP A MINIMUM OF 12 INCHES.
3. SILTSOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
4. UPON SITE STABILIZATION, COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
5. IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Siltsack Sediment Trap

N.T.S. Source: VHB LD_674 1/20



PLAN VIEW

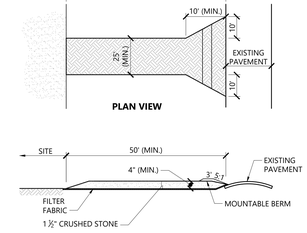
SECTION VIEW

NOTES

1. INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND HAY BALES HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED

Stabilized Construction Exit

N.T.S. Source: VHB LD_682 1/16



CROSS-SECTION

NOTES

1. EXIT WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

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Consultant
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Issued/Revision	By	Appvd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE			2022.08.15
DESIGN REVIEW PACKAGE			2022.06.24

Permit/Seal



SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
537 Highland Ave.
NEEDHAM, MA 02494

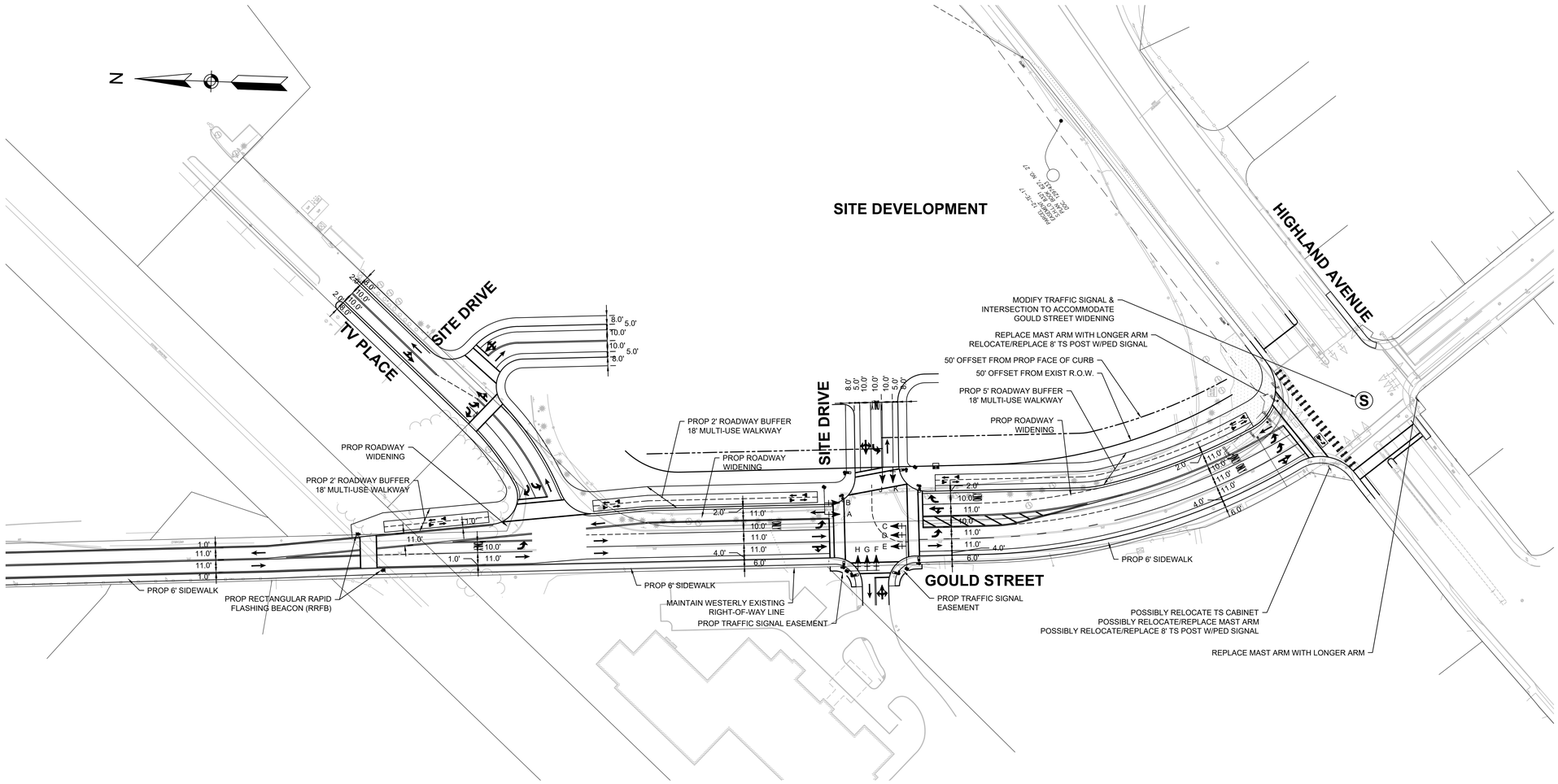
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File Name: N/A
Scale:

Author	Designer	Checker	2022.09.07
Dwn.	Dsgn.	Chkr.	YYYY.MM.DD

Title
Site Details

Revision:
Drawing No.
C-06

GOULD STREET BETWEEN HIGHLAND AVENUE
AND FORMER RAILROAD ROW
OFFSITE ROADWAY IMPROVEMENT PLAN



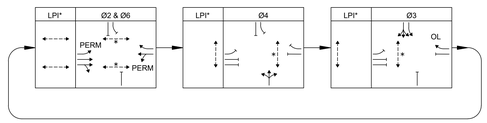
0 40 100 160
SCALE: 1" = 40'

SIGNAL HEAD DATA

A,D,E,H,K	B	C	F	G,J	ALL
R Y G	R Y G Y G	R Y FY	R Y G	R Y G G	W/COUNTDOWN TIMER
ALL 12" LENS					

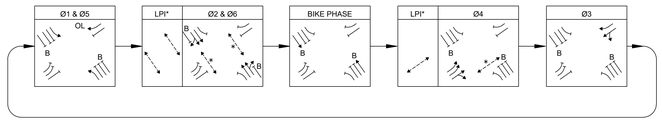
NOTES:
1. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED.
2. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"x NON- LOUVERED BACKPLATES. ALL BACKPLATES SHALL CONTAIN A 3" WIDE YELLOW REFLECTIVE BORDER.
3. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH TUNNEL VISORS.
4. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

SITE DRIVEWAY
PREFERENTIAL PHASE SEQUENCE



* NORMALLY DW, W/FDW UPON PEDESTRIAN PUSH BUTTON ACTUATION
PERM = PERMISSIVE
LPI = LEADING PEDESTRIAN INTERVAL

HIGHLAND AVENUE
PREFERENTIAL PHASE SEQUENCE



* NORMALLY DW, W/FDW UPON PEDESTRIAN PUSH BUTTON ACTUATION
OL = OVERLAP
LPI = LEADING PEDESTRIAN INTERVAL
B = HIGHLAND AVENUE SEPARATED BIKE LANE

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	90% SUBMISSION			2022.07.29
3	SPECIAL PERMIT PACKAGE			2022.06.17

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
KYLE J. LANGLOIS
CIVIL
No. 52648
REGISTERED PROFESSIONAL ENGINEER

8/15/2022



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.: 218421343
File Name: N/A
Scale: As indicated

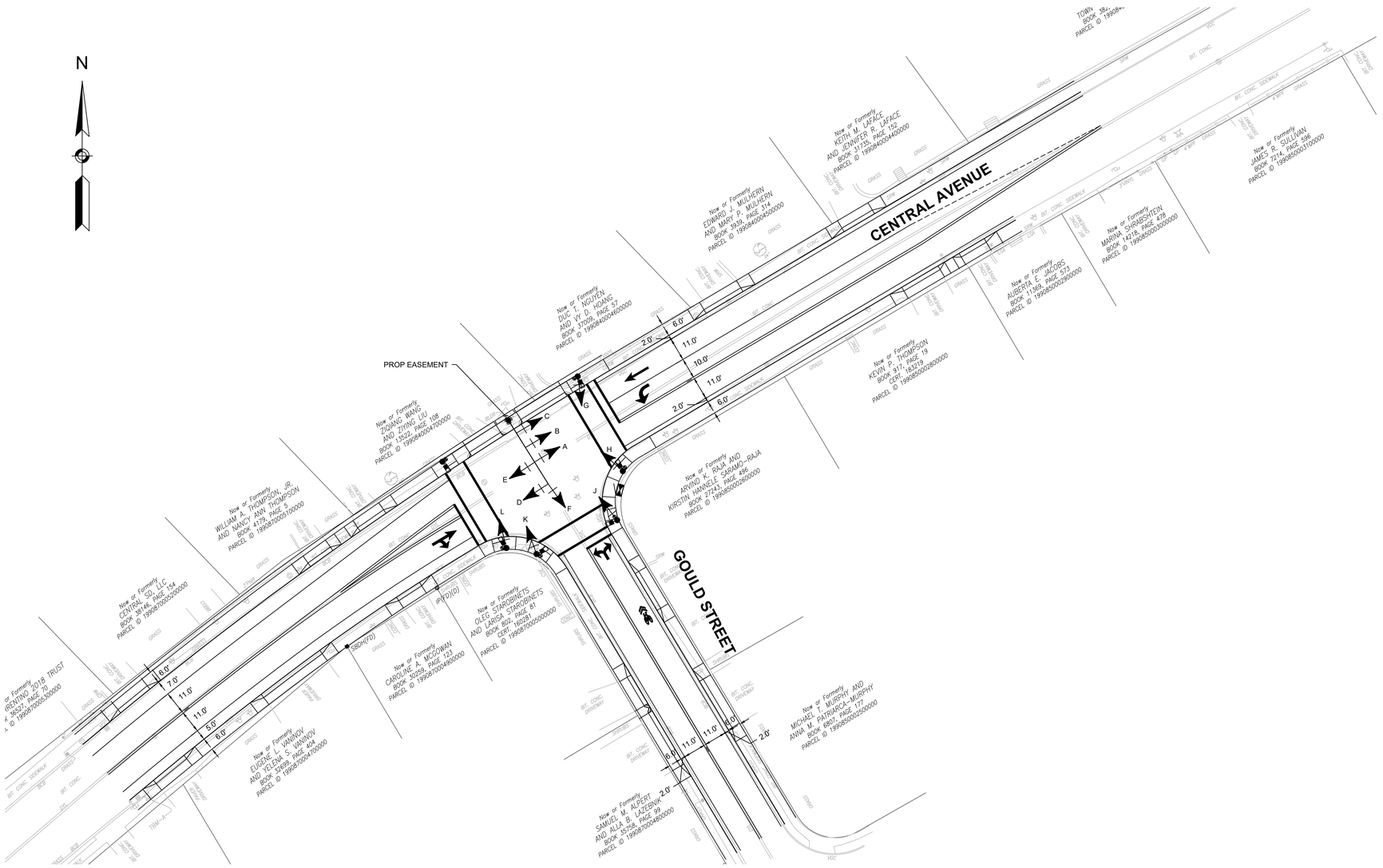
KL	KL	TM	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
OFF-SITE ROADWAY IMPROVEMENTS #1

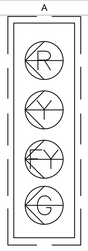
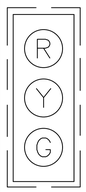
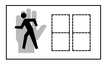
Revision:
Drawing No.
TR-001

ORIGINAL SHEET - ARCH E

GOULD STREET AT CENTRAL AVENUE
OFFSITE ROADWAY IMPROVEMENT PLAN

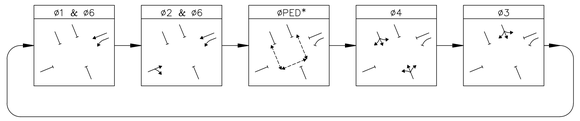


SIGNAL HEAD DATA

A	B,C,D,E,F,G,H,J,K,L	ALL
		 W/COUNTDOWN TIMER
ALL 12" LENS		

NOTES:
1. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED.
2. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"± NON- LOUVERED BACKPLATES. ALL BACKPLATES SHALL CONTAIN A 3" WIDE YELLOW REFLECTIVE BORDER.
3. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH TUNNEL VISORS.
4. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

PREFERENTIAL PHASE SEQUENCE



* UPON PEDESTRIAN PUSH BUTTON ACTUATION

0 20 50 100
SCALE: 1" = 20'

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	PEER REVIEW PACKAGE R1			2022.08.02
1	90% SUBMISSION			2022.06.17
0	SPECIAL PERMIT PACKAGE			2022.05.13

Permit/Seal



8/2/2022

KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: As indicated

KL	KL	TM	2022.09.07
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

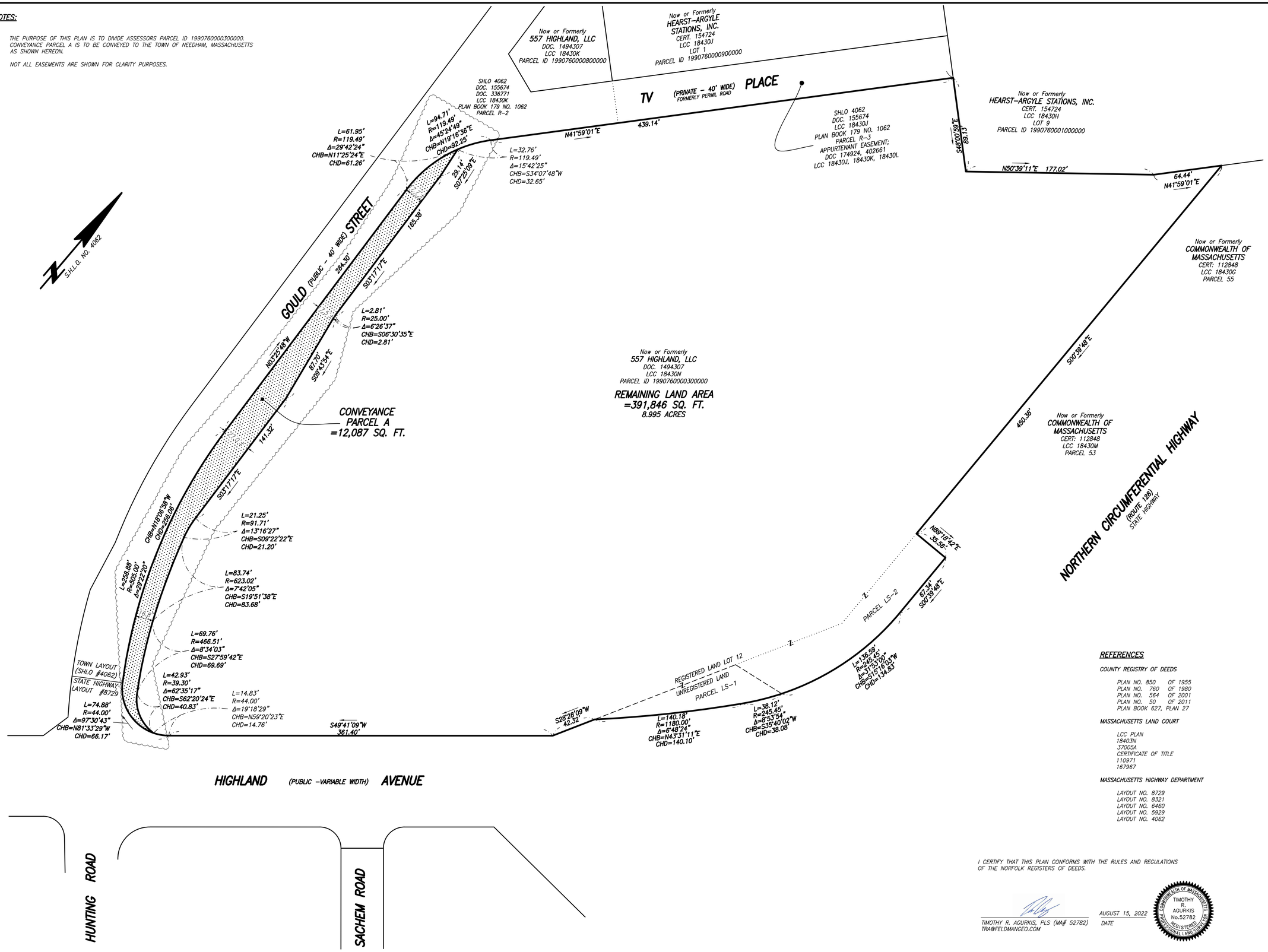
Title
OFF-SITE ROADWAY IMPROVEMENTS #2

Revision:
Drawing No.
TR-002

File Location: Project Information\...
8/5/2022 3:33:13 PM
ORIGINAL SHEET - ARCH E

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DIVIDE ASSESSORS PARCEL ID 1990760000300000. CONVEYANCE PARCEL A IS TO BE CONVEYED TO THE TOWN OF NEEDHAM, MASSACHUSETTS AS SHOWN HEREON.
2. NOT ALL EASEMENTS ARE SHOWN FOR CLARITY PURPOSES.



REFERENCES

COUNTY REGISTRY OF DEEDS

PLAN NO. 850 OF 1955
PLAN NO. 760 OF 1980
PLAN NO. 564 OF 2001
PLAN NO. 50 OF 2011
PLAN BOOK 627, PLAN 27

MASSACHUSETTS LAND COURT

LCC PLAN
18403N
37005A
CERTIFICATE OF TITLE
110971
167967

MASSACHUSETTS HIGHWAY DEPARTMENT

LAYOUT NO. 8729
LAYOUT NO. 8321
LAYOUT NO. 6460
LAYOUT NO. 5929
LAYOUT NO. 4062

I CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE NORFOLK REGISTERS OF DEEDS.

TIMOTHY R. AGURKIS, PLS (M#) 52782
TRA@FELDMANGEO.COM

AUGUST 15, 2022
DATE

COMMONWEALTH OF MASSACHUSETTS
TIMOTHY R. AGURKIS
No. 52782
REGISTERED PROFESSIONAL LAND SURVEYOR

FELDMAN GEOSPATIAL

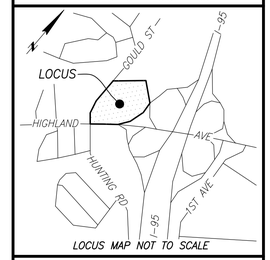
BOSTON HEADQUARTERS
152 HAMPDEN STREET
BOSTON, MA 02119

WORCESTER OFFICE
27 MECHANIC STREET
WORCESTER, MA 01608

(617)357–9740
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LOCUS MAP NOT TO SCALE

ADDRESS:

557 HIGHLAND AVENUE
NEEDHAM, MASS.

RESEARCH: MDH	FIELD CHIEF:
PROJ MGR: TRA	APPROVED:
CALC: MDH	CADD: MDH
FIELD CHK:	CRD FILE:

REVISIONS:

DRAWING NAME:

CONVEYANCE PLAN

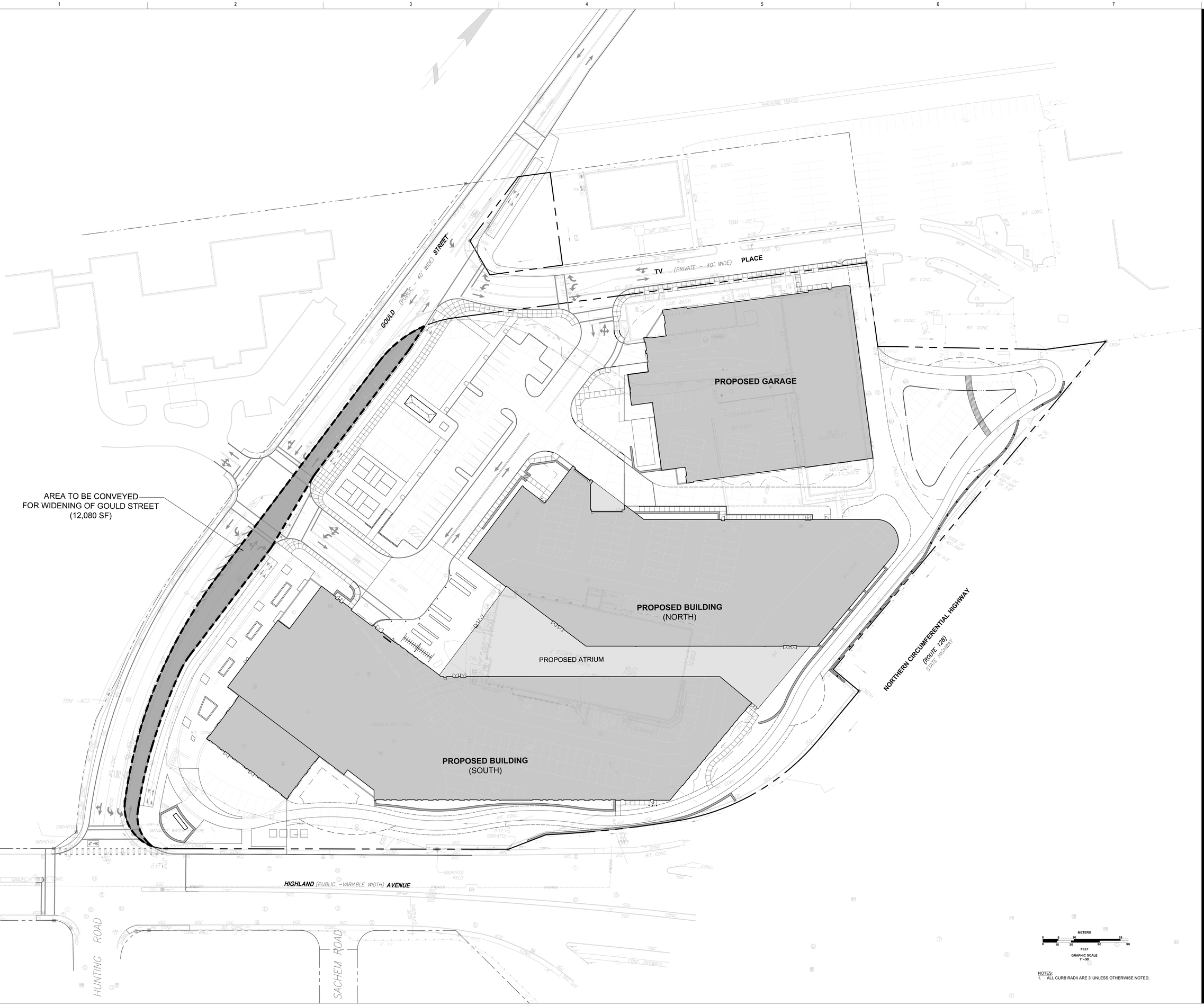
SPECIAL PERMIT PACKAGE R1
8/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

DATE: AUGUST 15, 2022

40 0 20 40 80

SCALE: 1"=40'

SHEET NO. 1 OF 1



ORIGINAL SHEET - ARCH E

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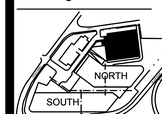
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Consultant

pfa
Landscape Architects + Planners
Civil Engineers + Land Surveyors
PAUL FINGER ASSOCIATES
14 Mount Vernon Street
Milford, Massachusetts 01757-4029
(508) 482-0030

Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1	DBF	SWM	2022.08.15
PEER REVIEW COMMENTS	DBF	SWM	2022.07.13
SPECIAL PERMIT PACKAGE	DBF	SWM	2022.03.30

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.: 218421343
File Name:
Scale: 1" = 30'-0"

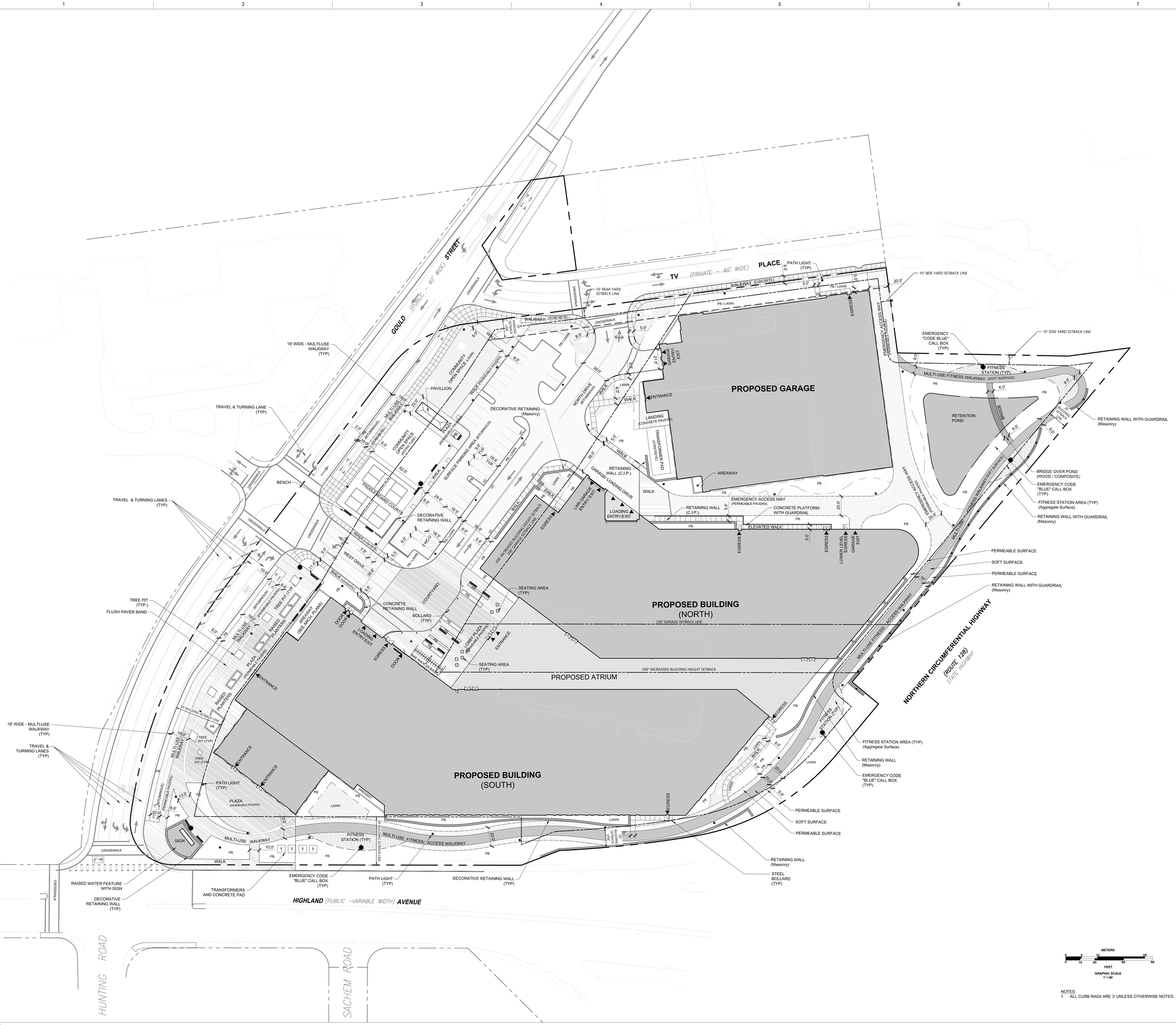
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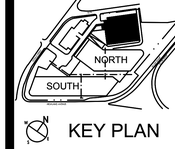
Title
CONVEYANCE

Revision:
Drawing No.
EX-1.0

METERS
0 5 10 20
0 15 30 60 90
FEET
GRAPHIC SCALE
1" = 30'

NOTES:
1. ALL CURB RADII ARE 3' UNLESS OTHERWISE NOTED.





KEY PLAN

NOTES:
1. ALL CURB RADII ARE 3' UNLESS OTHERWISE NOTED.

METERS 0 5 10 25 / 0 15 30 60 90 FEET
GRAPHIC SCALE 1" = 30'

Stantec
Stantec Architecture and Engineering P.C.
40 Wantor Street, 3rd Floor
Boston, MA 02135
Tel: (617) 234-3100 • www.stantec.com

Consultant
pfa Landscape Architects + Planners
Urban Design + Historic Preservation
PAUL FINGER ASSOCIATES
14 Story Street
Boston, Massachusetts 02444-4429
617 227 4900

No.	By	Appd	YYYY.MM.DD
1			2022.08.15
2			2022.07.13
3			2022.07.12
4			2022.03.30

Issued/Revision
SPECIAL PERMIT PACKAGE R1
DRB SUBMISSION
SPECIAL PERMIT PACKAGE
SPECIAL PERMIT PACKAGE R1

Permit/Seal
COMMONWEALTH OF MASSACHUSETTS REGISTERED LANDSCAPE ARCHITECT

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.: 218421343
File Name:
Scale: 1" = 30'-0"
Dwn. Dsgn. Chkd. YYYY.MM.DD

Title
SITE PLAN

Revision:
Drawing No.
L-1.0

ORIGINAL SHEET - ARCH E



KEY PLAN

NOTES:
1. ALL CURB RADII ARE 3' UNLESS OTHERWISE NOTED.

METERS 0 5 10 25 / FEET 0 15 30 60 90
GRAPHIC SCALE 1"=30'

Stantec

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Boston MA 02135
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Consultant

pfa
Landscape Architects – Planners
Urban Designers – Preservationists
PAUL FINGER ASSOCIATES
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617 227 8870
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Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1	DSF	SMM	2022.08.15
DSF SUBMISSION	DSF	SMM	2022.07.15
SPECIAL PERMIT PACKAGE	DSF	SMM	2022.07.12
SPECIAL PERMIT PACKAGE	DSF	SMM	2022.03.30

Permit/Seal

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.: 218421343
File Name:
Scale: 1" = 30'-0"

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GRADING PLAN

Revision:
Drawing No.
L-2.0

ORIGINAL SHEET - ARCH E



NO MOW LAWN MIX
HARD FESCUE (Festuca brevipila), SHEEP FESCUE (Festuca ovina), CHEWING FESCUE (Festuca rubra subs. fallax), RED FESCUE (Festuca rubra), CREEPING RED FESCUE(Festuca rubra var. rubra)

NEW ENGLAND CONSERVATION MIX (MEADOW MIX)
Virginia Wild Rye (Elymus virginicus), Little Bluestem (Schizachyrium scoparium), Big Bluestem (Andropogon gerardii). Red Fescue (Festuca rubra), Switch Grass (Panicum virgatum), Partridge Pea (Chamaecrista fasciculata), Panicledleaf Tick Trefoil (Desmodium paniculatum), Indian Grass (Sorghastrum nutans), Blue Vervain (Verbena hastata), Butterfly Milkweed (Asclepias tuberosa), Black Eyed Susan (Rudbeckia hirta), Common Sneezeweed (Helenium autunale), Heath Aster (AsterpiosusSymphyotrichum pilosum). Early Goldenrod (Solidago juncea), Upland Bentgrass (Agrostis perennans).

GROUND COVERS	QTY	BOTANICAL / COMMON NAME	CONT	ITEM		
	360	ASCLEPIAS INCARNATA SWAMP MILKWEED	FLAT 20 MIN.			18" o.c.
	858	ASTER NOVAE-ANGLIAE NEW ENGLAND ASTER	FLAT 20 MIN.			18" o.c.
	444	CAREX X 'SILVER SCEPTRE' SILVER SCEPTRE SEDGE	1 GAL			8" o.c.
	354	EUPATORIUM FISTOLOSUM JOE PYE WEED	1 GAL			18" o.c.
	283	GAULTHERIA PROCUMBENS WINTERGREEN	FLAT 20 MIN.			12" o.c.
	36	LIATRIS PYCNOSTACHYA GAYFEATHER	FLAT 20 MIN.			18" o.c.
	138	OSMUNDA CINNAMOMEA CINNAMON FERN	1 GAL			18" o.c.
	647	RHUS AROMATICA 'GRO-LOW' GRO-LOW FRAGRANT SUMAC	3 GAL			24" o.c.
	397	VERNONIA NOVEBORACENSIS COMON IRONWEED	FLAT 20 MIN.			18" o.c.
	714	WALDSTEINIA FRAGARIOIDES APPALACHIAN BARREN STRAWBERRY	FLAT 20 MIN.			12" o.c.

EVERGREEN	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NATIVE	
PG	34	PICEA GLAUCA WHITE SPRUCE	B & B	5-6' HT		
TS	45	THUJA OCCIDENTALIS 'SMARAGD' EMERALD GREEN ARBORVITAE	B & B	6-7' HT		
TM	71	TAXUS X MEDÍA 'HICKSII' HICKS YEW	B & B	4' - 5' HT		
ORNAMENTAL	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NATIVE	
CK	8	CORNUS KOUSA KOUSA DOGWOOD	B & B	3"CAL		
MS	16	MALUS X 'SPRING SNOW' SPRING SNOW CRABAPPLE	B & B	3"CAL		
SHADE TOLERANT	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NATIVE	
AC	21	AMELANCHIER CANADENSIS CANADIAN SERVICEBERRY	B & B	7-8' HT.	MULTI-STEM	
HV	40	HAMAMELIS VIRGINIANA COMMON WITCH HAZEL	B & B	6-7' HT		
SHADE TREES	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NATIVE	
AA2	3	ACER X FREEMANII 'ARMSTRONG' ARMSTRONG FREEMAN MAPLE COLUMNAR	B & B	3-4" CAL.		
BN	13	BETULA NIGRA `HERITAGE` HERITAGE RIVER BIRCH	B & B	3-4" CAL.		
BP	5	BETULA POPULIFOLIA GRAY BIRCH	B & B	3-3.5" CAL		
GI	12	GLEDITSIA TRIACANTHOS INERMIS THORNLESS HONEY LOCUST	B & B	3-4" CAL.		
LS	10	LIQUIDAMBAR STYRACIFLUA SWEET GUM	B & B	3-4" CAL.		
NS	12	NYSSA SYLVATICA TUPELO	B & B	3-4" CAL.		
QB	4	QUERCUS BICOLOR SWAMP WHITE OAK	15 GAL	3-4" CAL.		
QP	11	QUERCUS PALUSTRIS PIN OAK	B & B	3-4" CAL.		
TA	4	TILIA AMERICANA AMERICAN LINDEN	B & B	3-4" CAL.		
SHRUBS	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NOTES	
CO	65	CORNUS SERICEA 'VARIEGATA' VARIEGATED RED TWIG DOGWOOD	5 GAL	24"-36"		
HI	86	HYDRANGEA PANICULATA 'LIMELIGHT' LIMELIGHT PANICLE HYDRANGEA	5 GAL	24"-36"		
Iv	185	ILEX VERTICILLATA 'JIM DANDY' JIM DANDY WINTERBERRY	3 GAL	18"-24"		
Ir	17	ILEX VERTICILLATA 'RED SPRITE' RED SPRITE WINTERBERRY	5 GAL	24"-36"		
Jc	112	JUNIPERUS CONFERTA SHORE JUNIPER	3 GAL	12"		
Va	27	VACCINIUM ANGUSTIFOLIUM LOWBUSH BLUEBERRY	2 GAL	12"		
EVERGREEN	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NOTES	
Ig	150	ILEX GLABRA INKBERRY HOLLY	5 GAL	24"-36"		
Kl	110	KALMIA LATIFOLIA MOUNTAIN LAUREL	5 GAL	24"-36"		
Pg2	17	PICEA PUNGENS 'GLAUCA GLOBOSA' BLUE GLOBE COLORADO SPRUCE	5 GAL	24"-36"		
Rc	81	RHODODENDRON X 'CUNNINGHAM'S WHITE' CUNNINGHAM'S WHITE RHODODENDRON	5 GAL	24"-36"		
GRASSES	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NOTES	
Ce	347	CALAMAGROSTIS X ACUTIFLORA 'EL DORADO' EL DORADO FEATHER REED GRASS	3 GAL			
Pn	177	PANICUM VIRGATUM 'NORTHWIND' NORTHWIND SWITCH GRASS	2 GAL			
Ps	33	PANICUM VIRGATUM 'SHENANDOAH' SHENANDOAH SWITCH GRASS	2 GAL			
PERENNIALS	QTY	BOTANICAL / COMMON NAME	SIZE	SIZE	NOTES	
Rk	106	ROSA SHRUB 'KNOCK OUT' KNOCK OUT ROSE	5 GAL			
Rh	141	RUDBECKIA HIRTA BLACK-EYED SUSAN	2 GAL			

Stantec
Stantec Architecture and Engineering P.C.
40 Wantz Street, 3rd Floor
Danvers, MA 01923
Tel: (617) 234-3100 • www.stantec.com

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Landscape Architects + Planners
Urban Designers + Preservationists
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(617) 492-4600

Issued/Revision	By	Appvd
SPECIAL PERMIT PACKAGE R1	TYP	TYP
DRB SUBMISSION	MJS	MJS
SPECIAL PERMIT PACKAGE	MJS	MJS
SPECIAL PERMIT PACKAGE	MJS	MJS

2022.08.15
2022.07.19
2022.06.21
2022.03.30

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
MICHAEL J. SCHMITT
No. 3 FINGER
REGISTERED LANDSCAPE ARCHITECT

KEY PLAN
NORTH
SOUTH

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

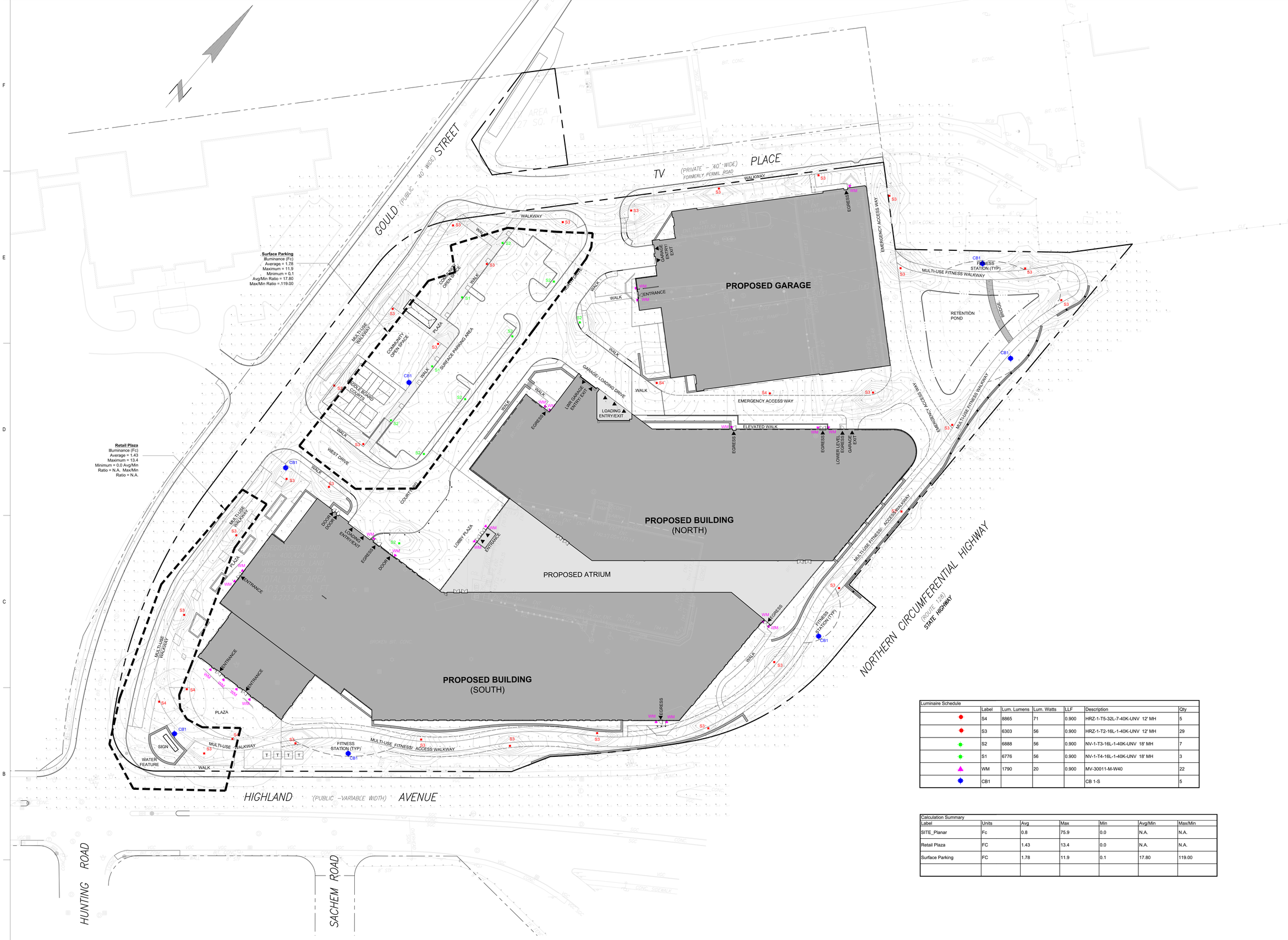
Project No.: 218421343
File Name: SPLANTING PLAN.DWG
Scale: 1" = 30'-0"

Dwn. | Dsgn. | Chkd. | YYYY.MM.DD

Title
SITE PLANTING PLAN

Revision:
Drawing No.
L-3.0

ORIGINAL SHEET - ARCH E



Luminaire Schedule						
	Label	Lum. Lumens	Lum. Watts	LLF	Description	Qty
	S4	8865	71	0.900	HRZ-1-T5-32L-7-40K-UNV 12' MH	5
	S3	6303	56	0.900	HRZ-1-T2-16L-1-40K-UNV 12' MH	29
	S2	6888	56	0.900	NV-1-T3-16L-1-40K-UNV 18' MH	7
	S1	6776	56	0.900	NV-1-T4-16L-1-40K-UNV 18' MH	3
	WM	1790	20	0.900	MV-30011-M-W40	22
	CB1				CB 1-S	5

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE_Planar	Fc	0.8	75.9	0.0	N.A.	N.A.
Retail Plaza	FC	1.43	13.4	0.0	N.A.	N.A.
Surface Parking	FC	1.78	11.9	0.1	17.80	119.00

METERS 0 5 10 20
FEET 0 15 30 60 90
GRAPHIC SCALE 1"=30'

Stantec
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Danvers, MA 01923
Tel: (617) 234-3100 • www.stantec.com

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Consultant

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SPECIAL PERMIT PACKAGE R1	EFJ	TYP.MM.DD
DRB SUBMISSION	EFJ	2022.08.15
SPECIAL PERMIT PACKAGE R1	EFJ	2022.07.13
SPECIAL PERMIT PACKAGE	EFJ	2022.03.30

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.: 218421343
File Name: SLT-LIGHTING PLAN.DWG
Scale: 1" = 30'-0"

Dwn.	Dsgn.	Chkd.
EFJ	LH	EFJ
		2022.03.30
		YYYY.MM.DD

Title
SITE LIGHTING PLAN

Revision:
Drawing No.
L-4.0

ORIGINAL SHEET - ARCH E

CB 1-S SIGNATURE HELP POINT®

Code Blue



Product Description

The CB 1-s is our most-popular pedestal Help Point. Highlighted by a high intensity area light that provides added visibility, this blue light emergency tower provides direct contact with first responders and is an excellent choice for walkways, parking lots, open campus areas and more.

Standard Features

- Durable quarter-inch steel construction
- Trademarked cylindrical design
- 9 feet tall
- 12.75" diameter
- LED faceplate light

Popular Applications

Open Spaces, Entry Points, Infrastructure

Popular Upgrades

Public Address, Overhead Camera Mount, Dual Faceplates, Mounting Rings, AED Housing



Get It Customized

We know your installation is unique. From paint and graphics to height and mountings, if you dream it, we can make it. Contact Customer Service at customerservice@codeblue.com or 800-205-7186 to learn more.

Technical Features

Code Blue

Specifications
- **Height:** 9' (274.32 cm)
- **Weight:** 330 lbs. (149.69 kg)
- **Diameter:** 12.75" (32.38 cm)
- **Material & thickness:** 0.25" steel
- **Access doors:** 15.88" x 9.64" (40.34 x 24.49 cm)

Power
- **Standard:** 12-24V AC/DC
- **Optional:** 120, 240, 277V AC
  - Hardwire
  - NightCharge®
  - PoE

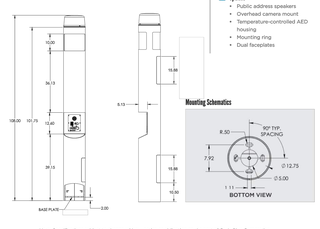
Communication
- **Speakerphone Options**
  - **IPS500:** Full duplex, SIP compatible VoIP phone.
  - **IA4100:** Analog full duplex phone.
- Hardwire
- Cellular
- IP wireless

Lighting
- LED faceplate light
- Beacon/strobe
- Area light

Style
- **Standard wet coat colors:** Dark Bronze, Gloss White, Gloss Black, Safety Blue, Safety Red, Safety Yellow, Bright Silver
- **Graphics text:** Assistance, Emergency
- **Graphics colors:** Black, Blue, White

Compliance
- UL 2017
- UL 60950-1
- NEMA 3S
- ADA

Options
- Public address speakers
- Overhead camera mount
- Temperature-controlled AED housing
- Mounting ring
- Dual faceplates



Note: Specifications subject to change without notice or obligation on the part of Code Blue Corporation.

CODE BLUE LIGHTS (CB1)
NOT TO SCALE

NV-1
NLS LIGHTING — AREA LIGHTING



FORM AND FUNCTION
- Sleek, low profile housing
- Spec grade performance
- Engineered for optimum thermal management
- Low depreciation rate
- Reduces energy consumption and costs up to 65%
- Exceeds IES foot candle levels utilizing the least number of poles and fixtures per project
- Optical system designed for:
  - Parking Lots
  - Auto Dealerships
  - General Area Lighting

CONSTRUCTION
- Die Cast Aluminum
- External cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP-65 seal for electronics compartment
- One-piece Optics Plate® mounting silicone Micro Optics
- Two-piece silicone Micro Optic system ensures IP-67 level seal around each PCB
- Grade 2 Clear Anodized Optics Plate® standard

FINISH
- 3-5 mils electrostatic powder coat.
- NLS' standard high-quality finishes prevent corrosion protects against and extreme environmental conditions

WARRANTY
Five-year limited warranty for drivers and LEDs.

LISTINGS
- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- DesignLights Consortium® (DLC)
- DesignLights Consortium Premium® (DLCP)
- IP65/ IP67 Rated
- 3G Vibration Rated per ANSI C136.31-2010

LED WATTAGE CHART

	16L	32L	48L	64L
350 milliamps	11w	-	-	-
530 milliamps	20w	-	-	-
700 milliamps	26w	51w	104w	136w
1050 milliamps	38w	108w	156w	205w

Project Name: Type:

Cat#	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
NV-1 (NV-1)	Type 2 (T2) / Type 2 Short (T2S)● / Type 3 (T3) / Type 4 (T4) / Type 5 (T5)● / Nema 2 24" Narrow Beam (N2) / Nema 3 30" Narrow Beam (N3)	16 (16L) / 32 (32L) / 48 (48L) / 64 (64L)	350 (350) / 530 (530) / 700 (700) / 1050 (1050)●	2700K, 80 CRI (2700K)● / 3000K, 70 CRI (300K) / 3500K, 80 CRI (3500K)● / 4000K, 70 CRI (400K7) / 4000K, 80 CRI (4000K)● / 5000K, 70 CRI (500K7) / 5000K, 80 CRI (5000K)●	120-277V (UNV) / 347-480 (HV)	Direct Pole 3" Arm Single (SP3) / Direct Pole 3" Arm 0180, 090, 270, 2-Tenon, Quad (SP3T)● / Direct Pole 7" Arm (SP7) / Knuckle Mount (NM) / Wall Mount (WM) / Trunnion Mount (TM)● / Tenon Arm (TA) / Mast Arm (MA)	Bronze Textured (BRZ) / White Textured (WHT) / Smooth White Gloss (SWT) / Silver (SVR) / Black Textured (BLK) / Smooth Black Gloss (SBK) / Graphite Textured (GPH) / Grey Textured (GRY) / Custom (CS)	Bird Spikes (BS) / Marine Grade Finish (MGF) / Optic Plate Painted to Match Fixture (OPP) / Photocell Receptacle (PCR) / Photocell + Receptacle (PCR) / Receptacle + Shorting Cap (PER) / FSP-211 with Motion Sensor (Universal Voltage) (FSP-40)● / 40' Height Limit (FSP-40)● / 50' Height Limit (Quick Mount Bracket (QMB) / Retrofit Mount Bracket (RQMB) / Receptacle Only (Shorting Cap Not Included) (RSN) / Round Pole Adapter 5"-6" Pole (RPA5) / Rotated Optic Left (ROL) / Rotated Optic Right (ROR) / Automotive House Side Shield (AHS) / House Side Shield (HSS)●

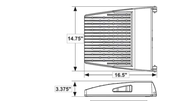
Notes:
- Consult Factory for Lead Time. Consult Factory for fill ON Requests.
- Not available in 64L and 700mA
- Standard finish is stainless steel. Can be painted to match fixture
- Not available above 120-277
- HSS not applicable with Nema 2 and Nema 3 Optics

ELECTRICAL
- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver by Philips Advance
- Driver power factor at maximum load is ≥ 95, THD maximum load is 15%
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP-65 compartment
- Lumileds Luxeon MX LED's
- CRI 70, 80 or 90
- Color temperatures: 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KVA supplies as standard.

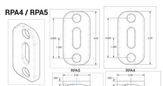
OPTIONS
- **BIRD SPIKES (BS)**—Offers effective and humane deterrent for larger bird species and provides cost-effective long-term solution to nuisance bird infestations and protect your property.
- **MARINE GRADE FINISH (MGF)**—A multi-step process creating protective finishing coat against harsh environments.
  - Chemically washed in a 5 stage cleaning system.
  - Pre-baked
  - Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer.
  - 1-2 feet inside pole coverage top and bottom.
  - Oven Baked.
  - Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- **SHIELDS (HSS, AHS)**—House Side Shield (HSS) is designed for full property line cut off. Automotive House Side Shield (AHS) is a single-sided shield allowing partial cut-off on either side or front of luminaire.
- **ROUND POLE ADAPTER (RPA)**— When using round poles, specify Round Pole Adapter (RPA). Specify RPA4 when installing on 3"-4" round poles, and RPA5 when installing on 5"-6" round poles.

CONTROLS
- **FSP-211 (FSP-X)**—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5-dimming event cycles, 0-10V dimming with motion sensing, reprogrammable in the field.
- **NEMA 7-PIN RECEPTACLE (PE7)**—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.

OPTICS
Silicone optics high photothermal stability and light output provides higher powered LEDs with maximized lumen designation LED life. UV and thermal stability with scratch resistance increases exterior application durability.
- IES Types



RPA4 / RPA5



HOUSE SIDE SHIELD — AUTOMOTIVE HOUSE SIDE SHIELD

FSP-211

TYPE II (T2) TYPE III (T3) TYPE IV (T4) TYPE V (T5) NEMA 3 (N3)

NLS LIGHTING — 701 Kingshill Place, Carson, CA 90746 — Call Us Today (310) 341-2037 — nlslighting.com

LUMENS

PART NUMBER	N3	LM/W	T2	LM/W	DLC	T3	LM/W	DLC	T3 HSS	LM/W	T4	LM/W	DLC	T4 AHS	LM/W	T4 HSS	LM/W	T5	LM/W	DLC	W
NV1-16L-35-30K	2016	113	2106	117	P	2106	117	P	1134	63	2337	116	P	1206	67	1116	62	2221	118	P	18
NV1-16L-35-40K	2068	115	2268	126	P	2286	127	P	1295	67	2250	125	P	1368	76	1188	66	2304	128	P	18
NV1-16L-35-50K	2184	120	2376	132	P	2394	133	P	1278	71	2358	131	P	1440	80	1260	70	2412	134	P	18
NV1-16L-53-30K	3136	112	3192	114	P	3220	115	P	1764	63	3119	113	P	2016	72	1736	62	3248	116	P	28
NV1-16L-53-40K	3248	116	3472	124	P	3472	124	P	1876	67	3444	123	P	2128	76	1848	66	3500	125	P	28
NV1-16L-53-50K	3360	120	3612	129	P	3640	130	P	1988	71	3584	128	P	2240	80	1960	70	3668	131	P	28
NV1-16L-7-30K	4033	113	3960	110	P	3960	110	P	2268	63	3973	109	P	2592	72	2232	62	3906	111	P	36
NV1-16L-7-40K	4176	116	4428	123	P	4284	119	P	2412	67	4212	117	P	2736	76	2376	66	4320	120	P	36
NV1-16L-7-50K	4320	120	4644	129	P	4500	125	P	2556	71	4428	123	P	2880	80	2520	70	4500	125	P	36
NV1-16L-10-30K	5272	112	5160	110	S	5384	114	P	3528	63	5232	112	P	4032	72	3472	62	5440	115	P	56
NV1-16L-10-40K	5499	116	5922	125	S	5688	120	P	3752	67	5616	119	P	4256	76	3696	66	5600	118	P	56
NV1-16L-10-50K	5656	119	6027	127	S	5874	124	P	3976	71	5774	122	P	4480	80	3920	70	5824	123	P	56
NV1-32L-7-30K	7992	112	7810	110	S	7810	110	S	4473	63	7715	109	S	5112	72	4402	62	7881	111	S	71
NV1-32L-7-40K	8226	116	8617	122	P	8449	119	P	4757	67	8307	117	P	5396	76	4686	66	8529	120	P	71
NV1-32L-7-50K	8520	120	9159	129	P	8875	125	P	5041	71	8733	123	P	5680	80	4970	70	8945	126	P	71
NV1-32L-10-30K	11872	112	11660	110	S	12084	114	S	6678	63	11600	112	S	7632	72	6572	62	11760	113	S	106
NV1-32L-10-40K	12296	116	12932	122	P	13038	123	P	7102	67	12926	121	P	8056	76	6996	66	13144	124	P	106
NV1-32L-10-50K	12720	120	13668	129	P	13674	129	P	7526	71	13462	127	P	8480	80	7420	70	13780	130	P	106
NV1-48L-7-30K	11648	112	11440	110	S	11440	110	S	6552	63	11336	109	S	7488	72	6448	62	11544	111	S	104
NV1-48L-7-40K	12064	116	13208	127	P	12376	119	P	6968	67	13168	127	P	7904	76	6864	66	13480	130	P	104
NV1-48L-7-50K	12480	120	13520	130	P	13000	125	P	7384	71	12792	123	P	8320	80	7280	70	13104	126	P	104
NV1-48L-10-30K	17472	112	17160	110	S	17784	114	S	9828	63	17472	112	S	11232	72	9672	62	17640	113	S	156
NV1-48L-10-40K	18096	116	19032	122	P	19188	123	P	10452	67	19876	121	P	11856	76	10296	66	19344	124	P	156
NV1-48L-10-50K	18720	120	19968	128	P	20124	129	P	11076	71	19812	127	P	12480	80	10920	70	20286	130	P	156
NV1-64L-7-30K	15232	112	14960	110	S	14960	110	S	8568	63	14824	109	S	9792	72	8432	62	15096	111	S	136
NV1-64L-7-40K	15776	116	17272	127	P	16184	119	P	9112	67	17238	127	P	10336	76	8976	66	17544	129	P	136
NV1-64L-7-50K	16320	120	17680	130	P	17000	125	P	9656	71	16728	123	P	10880	80	9520	70	17136	126	P	136
NV1-64L-10-30K	22960	112	22550	110	S	23370	114	S	12916	63	22960	112	S	14760	72	12716	62	23576	115	S	205
NV1-64L-10-40K	23760	116	25010	122	P	25176	123	P	13716	67	24804	121	P	15560	76	13516	66	25420	124	P	205
NV1-64L-10-50K	24600	120	26240	128	P	26440	129	P	14556	71	26035	127	P	16400	80	14350	70	26650	130	P	205

*DLC S= Standard P= Premium

BUG RATINGS

PART NUMBER	T2	T3	T3 HSS	T4	T4 HSS	T5
NV1-16L-35-30K	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G0
NV1-16L-35-40K	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G0
NV1-16L-35-50K	B1-U0-G1	B1-U0-G1	B0-U0-G0	B1-U0-G1	B0-U0-G0	B2-U0-G0
NV1-16L-53-30K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-53-40K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-53-50K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-7-30K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-7-40K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-7-50K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B3-U0-G1
NV1-16L-10-30K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B4-U0-G2
NV1-16L-10-40K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B4-U0-G2
NV1-16L-10-50K	B1-U0-G1	B1-U0-G1	B0-U0-G1	B1-U0-G1	B0-U0-G1	B4-U0-G2
NV1-32L-7-30K	B2-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B4-U0-G2
NV1-32L-7-40K	B2-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B4-U0-G2
NV1-32L-7-50K	B2-U0-G2	B2-U0-G2	B0-U0-G1	B2-U0-G2	B0-U0-G1	B4-U0-G2
NV1-32L-10-30K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-32L-10-40K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-32L-10-50K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-48L-7-30K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-48L-7-40K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-48L-7-50K	B2-U0-G2	B2-U0-G2	B0-U0-G2	B2-U0-G2	B0-U0-G2	B4-U0-G2
NV1-48L-10-30K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV1-48L-10-40K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV1-48L-10-50K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B5-U0-G3
NV1-64L-7-30K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV1-64L-7-40K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV1-64L-7-50K	B3-U0-G3	B3-U0-G3	B1-U0-G2	B3-U0-G3	B1-U0-G2	B4-U0-G2
NV1-64L-10-30K	B3-U0-G3	B3-U0-G3	B2-U0-G3	B3-U0-G3	B2-U0-G3	B5-U0-G3
NV1-64L-10-40K	B3-U0-G3	B3-U0-G3	B2-U0-G3	B3-U0-G3	B2-U0-G3	B5-U0-G3
NV1-64L-10-50K	B3-U0-G3	B3-U0-G3	B2-U0-G3	B3-U0-G3	B2-U0-G3	B5-U0-G3

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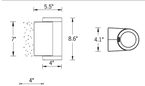
PARKING AREA LIGHTS (S1 - * & S2 - ** : MOUNTING HEIGHT 18' POLE MOUNTED)
NOT TO SCALE

UMV-30041
Marvik 5 Surface Up/Downlight

LIGMAN LIGHTING USA



2x15W COB 2x1245 Lumens
IP65 - Suitable For Wet Locations
IK08 - Impact Resistant (Vandal Resistant)
Weight 6 lbs





Mounting Detail

Construction

Aluminum
Less than 0.1% copper content - Marine Grade 6060 extruded & LM6 Aluminum High Pressure die casting provides excellent heat dissipation properties, clean detailed products lines and excellent heat dissipation.

Pre-paint
8 step degrease and phosphate process that includes deoxidizing and etching as well as a zinc and nickel phosphate process before product painting.

Memory Retentive Silicon Gasket
Precision engineered, computer modeled "fit for purpose" long life high temperature memory retentive silicon gaskets. Maintains the gaskets exact profile and seal over years of use and compression.

Thermal management
Engineered for maximum to excellent mechanical strength and thermal dissipation properties in low and high ambient temperatures, The superior thermal heat sink design by Lignan utilizes maximum surface area to dissipate heat and keep the critical temperature range to ensure maximum luminous flux output, as well as providing long LED service life and ensuring less than 10% lumen depreciation at 50,000 hours.

Surge Suppression
Standard 10kv surge suppressor provided with all fixtures.

BUG Rating
B1 - U0 - G2

Finishing
All Lignan products go through an extensive finishing process that includes Nothing to improve paint adherence.

Paint
UV Stabilized 4.5Mil thick powder coat paint and baked at 200 Deg. C. This process ensures that Lignan products can withstand harsh environments. Rated for use in natatoriums.

Inspired by Nature Finishes
The Lignan Nature Finishing Technology is a unique system of decorative powder coating. Our metal decoration process can easily transforms the appearance of metal or aluminum product into a wood grain finish.

This patented technology enables the simulation of wood grain, stone and exotic granite finish through the use of decorative powder coating.

The wood grain finish is so realistic that it's almost undistinguishable from real wood, even from a close visual inspection. The system of coating permeates the entire surface of the product, so that the wood grain finish will not be removed by normal rubbing, chipping, or scratching.

The Coating Process
After pre-treatment the prepared parts are powder coated with a specially formulated polyurethane powder. This powder coating is then cured in an oven to provide a durable finish of corrosion and acts as the relief base color for the finalized metal decoration.

The component is then wrapped with a sheet of non-porous film with the selected decoration pattern printed on it using special high temperature inks.

This printed film transfer is vacuum-sealed to the surface for a period of time sufficient to allow the pattern to be completely heat-seen. The oven transforms the ink into different forms within the paint layer before it becomes solid. Finally, the film is removed, and a wood timber look on aluminum remains.

Wood grain coating can create beautiful wood-looking products that are the ideal way to use wood resources that are currently in use. Wood grains can be made with different colors, designs, etc.

Our powder coatings are certified for indoor and outdoor applications and are backed by a comprehensive warranty. Lignan's wood grain finish is environmentally standard of performance excellence and design innovation.

Added Benefits:
- Resistance to salt-acid room, accelerated aging
- Boiling water, lime and condensed water resistant
- Resistant to UV, Scratch Resistant, Anti-Scratch
- Super durable (UV resistant)
- TIGC free (non-toxic)

Hardware
Provided Hardware is Marine grade 316 Stainless steel.

Anti Seize Screw Holes
Tapped holes are infused with a special anti seize compound that prevents the threads from corroding together due to the electrolytes from heat, corrosive atmospheres and moisture.

Crystal Clear Low Iron Glass Lens
Provided with tempered, impact resistant crystal clear low iron glass ensuring no green glass tinge.

Optics & LED
Precise optic design provides exceptional light control and maximum efficiency of light.
LED CRI > 80

Lumen - Maintenance Life
L80: 50k at 50,000 hours (This means that at least 90% of the LED still achieve 80% of their original flux)

Cylindrical, single or double-sided wall family. Compact and decorative appearance belies powerful outputs and technical optics for perfect task illumination

A stunning new waterproof & dust proof wall cylinder range, designed with no visible fasteners, a one-piece body and integrated driver housing.
This smart mechanical modern designed luminaire with cylindrical body provides a stylish solution to wall mounted cylinders.

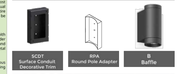
This innovative design houses a variety of COB wattages to suit designer's specific requirements as well as a selection of field interchangeable reflector optics, that include narrow, medium, wide and very wide distributions. This series is available in 3 different diameters, namely 3", 4" & 6" to suit lighting design requirements.

These luminaires are suitable for various facade lighting requirements along with accent lighting, building columns and architectural highlighting etc. The Marvik 1 protrudes 4" from the wall, making this product suitable for ADA applications.

This luminaire range can be provided with a bayonet lock baffle to reduce glare, as well as a frosted lens option. The SCE surface conduit entry box option can be provided as an option for an attractive solution to surface conduit entry.

Ligman can also provide custom made boxes to fit on a pole, bollard, pillar or pole.

Additional Options (Consult Factory For Pricing)





Ligman Lighting USA reserves the right to change specifications without prior notice, please contact factory for latest information. Due to the continual improvements in LED technology data and components may change without notice.

HORIZON PT
NLS LIGHTING — ARCHITECTURAL LIGHTING

Horizon Post Top luminaire is a blend of beautiful luminaire design which is a compliment to commerical or recreational pathways. It is named the Horizon because the luminaire is intended to be a vehicle of which the horizon can be viewed through the inside and around the luminaire without obstruction.

This Dark Sky Friendly Full Cutoff luminaire utilizes silicone Micro Optics to distribute light uniformly as its LEDs are recessed and hidden. Its performance exceeds IES minimum foot candle levels at lower wattage and extends maintenance cycles throughout its lifetime. Horizon MA is available in (warm) 3000, (neutral) 4000 and (cool) 5000 Kelvin temperatures and a range of 18 to 205 watts.

Built to conform to the strictest Made in America standards. Designed, tooled, fabricated and assembled in the USA.



MICRO OPTIC SYSTEM

Our new cell-inclosed, micro optic silicone modules produce high clarity and outstanding performance.

LED WATTAGE CHART

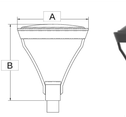
	16L	32L	48L	64L
350 millamps	11w	-	-	-
530 millamps	20w	50w	-	-
700 millamps	26w	71w	104w	136w
1050 millamps	38w	108w	156w	205w

Project Name: Type:

Cat #	Light Dist.	No. of LEDs	Milliamps	Kelvin	Volts	Mounting	Color	Options
Horizon 1 (HRZ-1)	Type 2● (T2) / Type 3 (T3) / Type 4 (T4) / Type 5●● (T5)	16 (16L)● / 32 (32L)●● / 48 (48L) / 64 (64L)	350 (35) / *Std. Only / 530 (53) / 700●● (7) / 1050● (1)	3000 (30K) / 4000●● (40K) / 5000 (50K)	120-277●● (UNV) / 347-480 (HV)	Post Top Over 3" OD (PT2) / Post Top●● Over 3" OD (PT3) *Standard / Post Top Over 3-1/2" OD (PT312)	Bronze (BRZ) / White (WHT) / Silver (SVR) / Hunter Green (HGN) / Black (BLK) / Graphite (GPH) / Grey (GRY) / Custom (CS)	Dome Top (DT) / Marine Grade Finish (MGF) / House Side Shield (HSS) / Nema 7-Pin Receptacle (PE7) / Receptacle + Short Cap (PER) / Photocell (10K) *Universal Voltage 120-277 / Surge Protector (T10K) / FSP-211 with Motion Sensor (Universal Voltage) (FSP-9)*For 9' + Below (FSP-20)*For 9'-20' (FSP-40)*For 21' to 40'

DIMENSION	HRZ-1
A	24.00 in
B	25.75 in

EPA	STD TOP	DOME TOP
HRZ-1	1.15	1.40



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PRODUCT SPECIFICATIONS

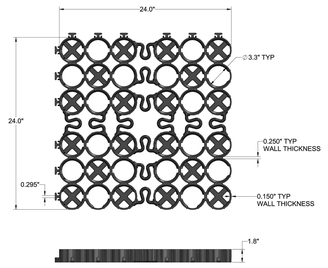
Housing: Low Profile Cast, Spun Aluminum Housing + Frame
LED: Lumileds Luxeon MX, CRI 70
Optics: Micro Optics; T2, T3, T4 and T5
Watts: 18-205
L70 Depreciation: 483,000 Hours (@77°F/ 25°C)
LSG: 70,000
Listings: Conforms to UL 1598 Standards

Driver: 0-10V Dimming driver as standard by Philips Advance
THD @ Max Load < 15%
Power Factor @ Max Load < 0.95
Kelvin: 3000, 4000, or 5000
Finish: 3-5 mils Powder Coat
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

LUMEN DATA CHART

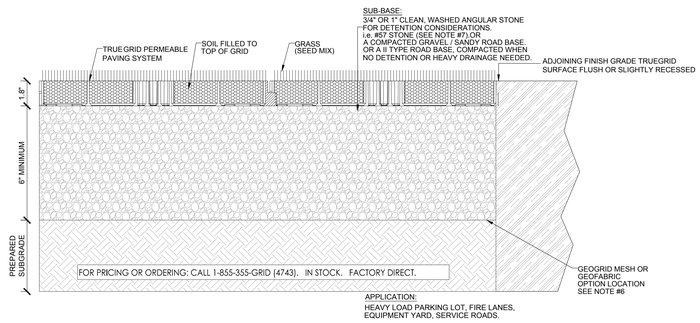
PART NUMBER	T2 LUMENS	T2 LM/W	T3 LUMENS	T3 LM/W	T3-HSS LUMENS	T3-HSS LM/W	T4 LUMENS	T4 LM/W	T4-HSS LUMENS	T4-HSS LM/W	T5 LUMENS	T5 LM/W	Watts
HRZ-1-16L-35-30K	2142	119	2088	116	1044	58	2070	115	1026	57	2160	120	18
HRZ-1-16L-35-40K	2304	128	2247	125	1116	62	2227	124	1098	61	2322	129	18
HRZ-1-16L-35-50K	2356	131	2297	128	1188	66	2277	127	1170	65	2376	132	18
HRZ-1-16L-53-30K	3276	117	3192	114	1624	58	3185	113	1596	57	3304	118	28
HRZ-1-16L-53-40K	3524	126	3435	123	1736	62	3405	122	1708	61	3556	127	28
HRZ-1-16L-53-50K	3920	129	3511	125	1848	66	3482	124	1820	65	3640	130	28
HRZ-1-16L-7-30K	4100	114	4115	111	2080	58	4003	111	2002	57	4176	116	36
HRZ-1-16L-7-40K	4411	123	4305	119	2232	62	4308	120	2196	61	4500	125	36
HRZ-1-16L-7-50K	4510	125	4396	122	2376	66	4404	122	2340	65	4608	128	36
HRZ-1-16L-10-30K	5995	105	5712	102	3248	58	5661	101	3192	57	5880	105	56
HRZ-1-16L-10-40K	6303	113	6146	110	3472	62	6091	109	3416	61	6328	113	56
HRZ-1-16L-10-50K	6441	115	6283	112	3696	66	6227	111	3640	65	6496	116	56
HRZ-1-32L-53-30K	5858	105	6712	102	3248	58	5661	101	3192	57	5880	105	56
HRZ-1-32L-53-40K	6303	113	6146	110	3472	62	6091	109	3416	61	6328	113	56
HRZ-1-32L-53-50K	6443	115	6283	112	3696	66	6227	111	3640	65	6496	116	56
HRZ-1-32L-7-30K	7427	105	7881	111	4118	58	7896	111	4547	57	8295	116	71
HRZ-1-32L-7-40K	7991	113	8490	119	4432	62	8496	120	4331	61	8875	125	71
HRZ-1-32L-7-50K	8186	115	8689	122	4686	66	8685	122	4615	65	9082	128	71
HRZ-1-32L-10-30K	11069	106	10812	102	6148	58	10715	101	6042	57	11130	105	106
HRZ-1-32L-10-40K	11628	113	11834	110	6872	62	11829	109	6466	61	11978	113	106
VSH-1-32L-1-50K	12195	115	11993	112	6996	66	11787	111	6890	65	12296	116	106
HRZ-1-48L-7-30K	11844	106	11544	111	6032	58	11448	112	5928	57	12068	116	104
HRZ-1-48L-7-40K	12744	123	12421	119	6488	62	12444	120	6344	61	12985	125	104
HRZ-1-48L-7-50K	13028	125	12696	122	6944	66	12760	123	6756	65	13275	128



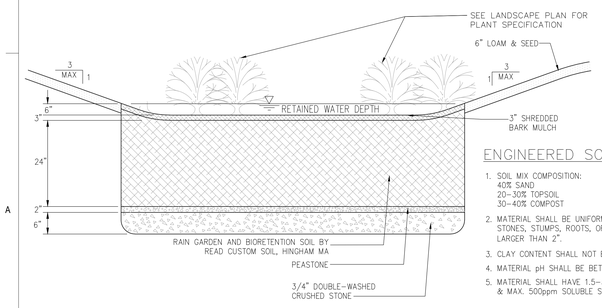
NOTES:

1. SUB-BASE DEPTH AND PREPARATION IS DEPENDENT ON SITE CONDITIONS PLUS LOADING REQUIREMENTS.
2. TRUEGRID PRO PLUS PRODUCTS ARE SUFFICIENTLY RATED FOR H-20 /HS-20 LOADING AND GREATER.
3. TYPICAL SEEDING OR HYDROSEEDING METHODS FOR GRASS GROWTH ARE ACCEPTABLE WITH TRUEGRID.
4. SOD CAN BE LAID ON SOIL FILLED GRID FOR IMMEDIATE GRASS (TYPICAL FOR FIRE LANES)
5. FOR HIGHER TRAFFIC SOD INSTALLATIONS, RECESS SOIL LEVEL WITHIN TRUEGRID AND PRESS IN SOD SO THAT TOP OF GRID IS AT SOIL LEVEL.
6. GEOGRID MESH OR GEOFABRIC MAY BE REQUIRED BETWEEN SUBGRADE & SUBBASE FOR CERTAIN SOILS AND SITE SPECIFIC REQUIREMENTS.
7. FILTER FABRIC MAY BE REQUIRED BETWEEN TRUEGRID AND SUB-BASE MATERIAL IF HIGH VOID RATIO IN SUB-BASE MATERIAL.
8. NO STAKING NECESSARY WITH TRUEGRID PRO PLUS WHEN SLOPE IS BELOW 10 DEGREES. ASSESS PROJECT, AS NEEDED.
9. FINAL ENGINEERED CROSS SECTION AGGREGATES AND DEPTH SHOULD ALLOW FOR EXPECTED INFILTRATION RATES,STORAGE CAPACITIES, OUTLET FLOW RATES, AND OTHER SITE SPECIFIC CONDITIONS AND LOAD REQUIREMENTS.
10. THIS CROSS SECTION IS FOR INFORMATION ONLY.

REINFORCED LAWN - PLAN VIEW



REINFORCED LAWN
NOT TO SCALE



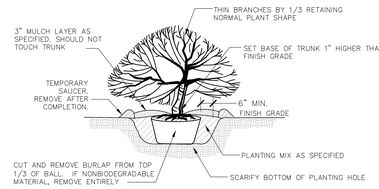
ENGINEERED SOIL MIX SPECIFICATIONS

1. SOIL MIX COMPOSITION:
   40% SAND
   20-30% TOPSOIL
   30-40% COMPOST
2. MATERIAL SHALL BE UNIFORM, FREE FROM STONES, STUMPS, ROOTS, OR OBJECTS LARGER THAN 2".
3. CLAY CONTENT SHALL NOT EXCEED 5%
4. MATERIAL pH SHALL BE BETWEEN 5.5-6.5.
5. MATERIAL SHALL HAVE 1.5-3% ORGANIC CONTENT & MAX. 500ppm SOLUBLE SALT.
6. SAND COMPONENT SHALL MEET ASTM D 422 AND THE FOLLOWING GRADATION:

SIEVE SIZE	% PASSING
2-INCH	100
3/4 INCH	70-100
1/4 INCH	50-80
No. 4	15-40
No. 200	0-3

7. TOPSOIL SHALL BE A SANDY LOAM, LOAMY SAND, OR LOAM.
8. COMPOST SHALL BE PROCESSED FROM YARD WASTE IN ACCORDANCE WITH DEP GUIDELINES AND SHALL NOT CONTAIN BIO-SOLIDS.

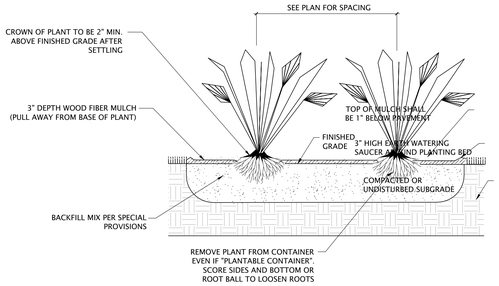
RAIN GARDEN
NOT TO SCALE



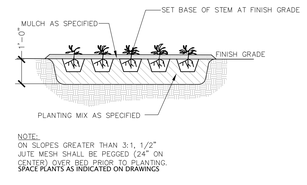
SHRUB PLANTING
NOT TO SCALE



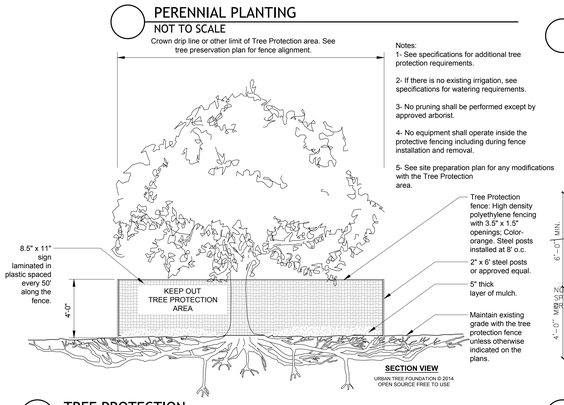
TYPICAL SEEDED NO-MOW LAWN
NOT TO SCALE



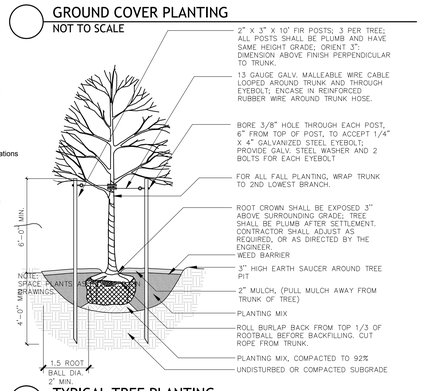
PERENNIAL PLANTING
NOT TO SCALE



GROUND COVER PLANTING
NOT TO SCALE



TREE PROTECTION
NOT TO SCALE



TYPICAL TREE PLANTING
NOT TO SCALE

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Danvers MA 01923
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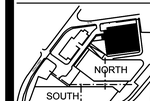
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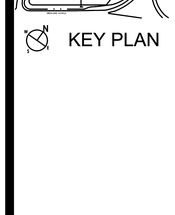
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www.paulfinger.com

Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
DRB SUBMISSION			2022.07.13
SPECIAL PERMIT PACKAGE R1			2022.06.17
SPECIAL PERMIT PACKAGE			2022.03.30

Permit/Seal





KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.: 218421343
File Name: SPK-L0-0-SITE DETAILS.dwg
Scale: As Specified

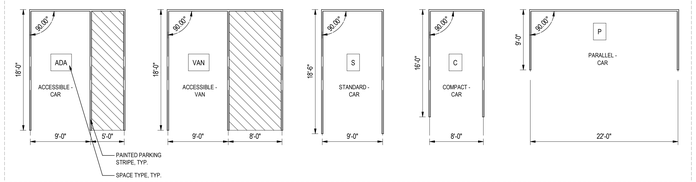
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
SITE
DETAILS #2

Revision:
Drawing No.
L-5.1

ORIGINAL SHEET - ARCH E

PARKING LEGEND



STRUCTURED GARAGE - SEE AG SERIES DWGS

GARAGE LEVEL G1 PLAN
1" = 20'-0"

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	DEP SUBMISSION			2022.07.15
3	30% CONCEPT SUBMISSION			2022.03.30
4	30% CONCEPT SUBMISSION - R1			2022.04.29

Permit/Seal



KEY PLAN

PARKING COUNT	
Type Comments	Count

LEVEL G1	
ACCESSIBLE	4
ACCESSIBLE - EV SPACE	2
ACCESSIBLE VAN	1
ACCESSIBLE VAN - EV SPACE	1
COMPACT	151
COMPACT - EV SPACE	18
PARALLEL	3
STANDARD	112
STANTARD - EV SPACE	70
LEVEL G1: 362	362
GRAND TOTAL: 362	362

PARKING SYMBOLS

ADA =	ACCESSIBLE
ADA-EV =	ACCESSIBLE ELECTRIC VEHICLE
VAN =	ACCESSIBLE VAN
B =	BOLLARD - EMBEDDED IN SLAB
EV =	ELECTRIC VEHICLE
P=	PARALLEL
S =	STANDARD
WF =	WHEELED FIRE EXTINGUISHER

STALL STRIPING

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: As indicated

Author	Designer	Checker	2022.04.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

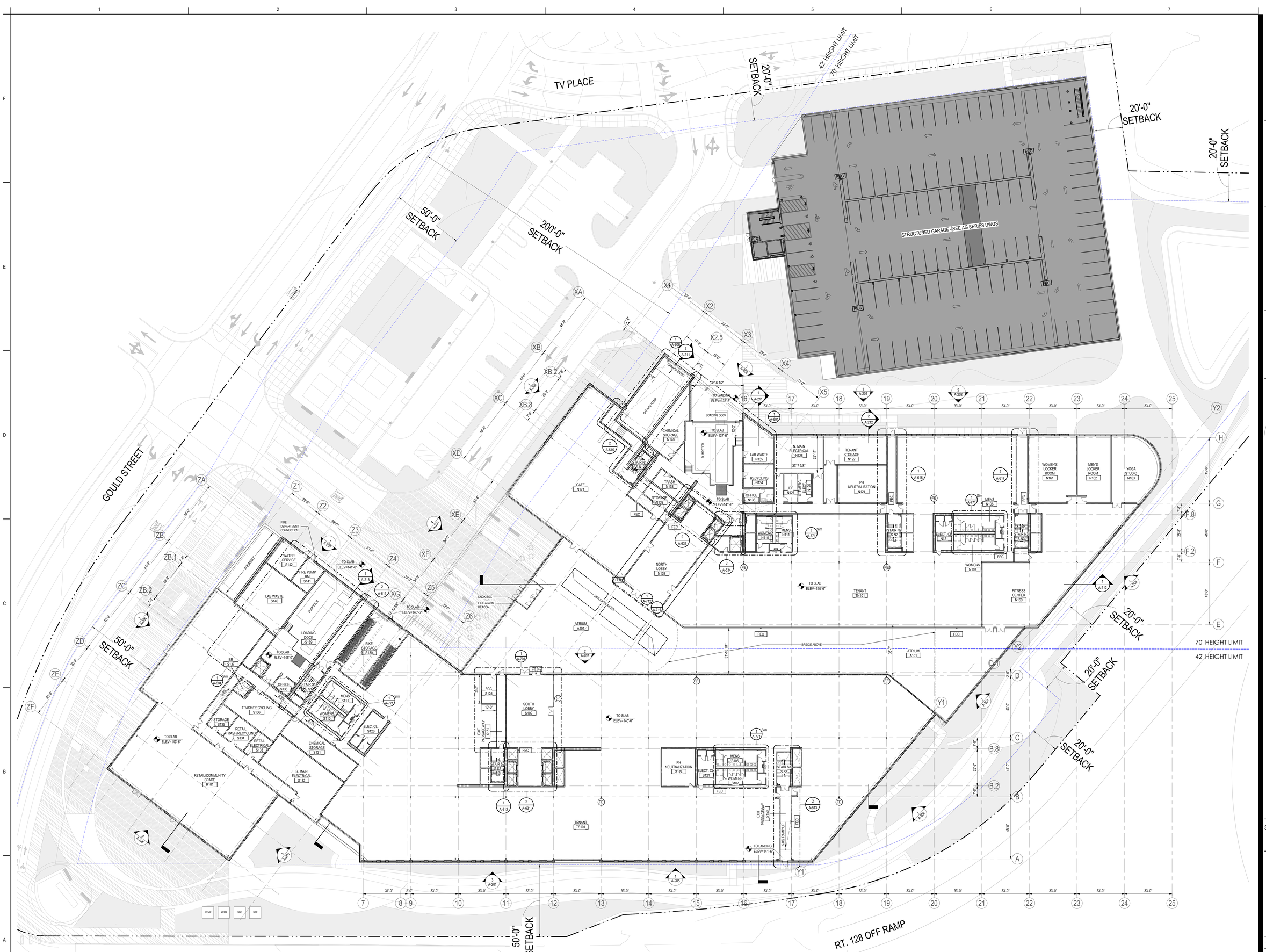
Title
GARAGE LEVEL G1 - OVERALL PLAN & PARKING LEGEND

Revision:

Drawing No.
A-100G1

*Pro Bulfinch Project Information
6/30/2022 3:23:14 PM

ORIGINAL SHEET - ARCH E



1 A-101 **LEVEL 1 - OVERALL PLAN**
1" = 20'-0"

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Issued/Revision

No.	Description	Date	By
1	SPECIAL PERMIT PACKAGE R1	2022.08.15	Author
2	DEIR SUBMISSION	2020.07.15	Author
3	SPECIAL PERMIT PACKAGE R1	2020.03.20	Author
4	SITE PLAN SUBMISSION	2019.12.20	Author

Permit/Seal

THOMAS M. LOMBARDO — REGISTERED ARCHITECT — No. 30500 — COMMONWEALTH OF MASSACHUSETTS



KEY PLAN

LEGEND

- WF — WHEELED FIRE EXTINGUISHER
- FE — FIRE EXTINGUISHER BRACKET WALL MTD
- FEC — FIRE EXTINGUISHER CABINET WALL MTD

75'-0" MAX. DISTANCE PER CODE, TYP.

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

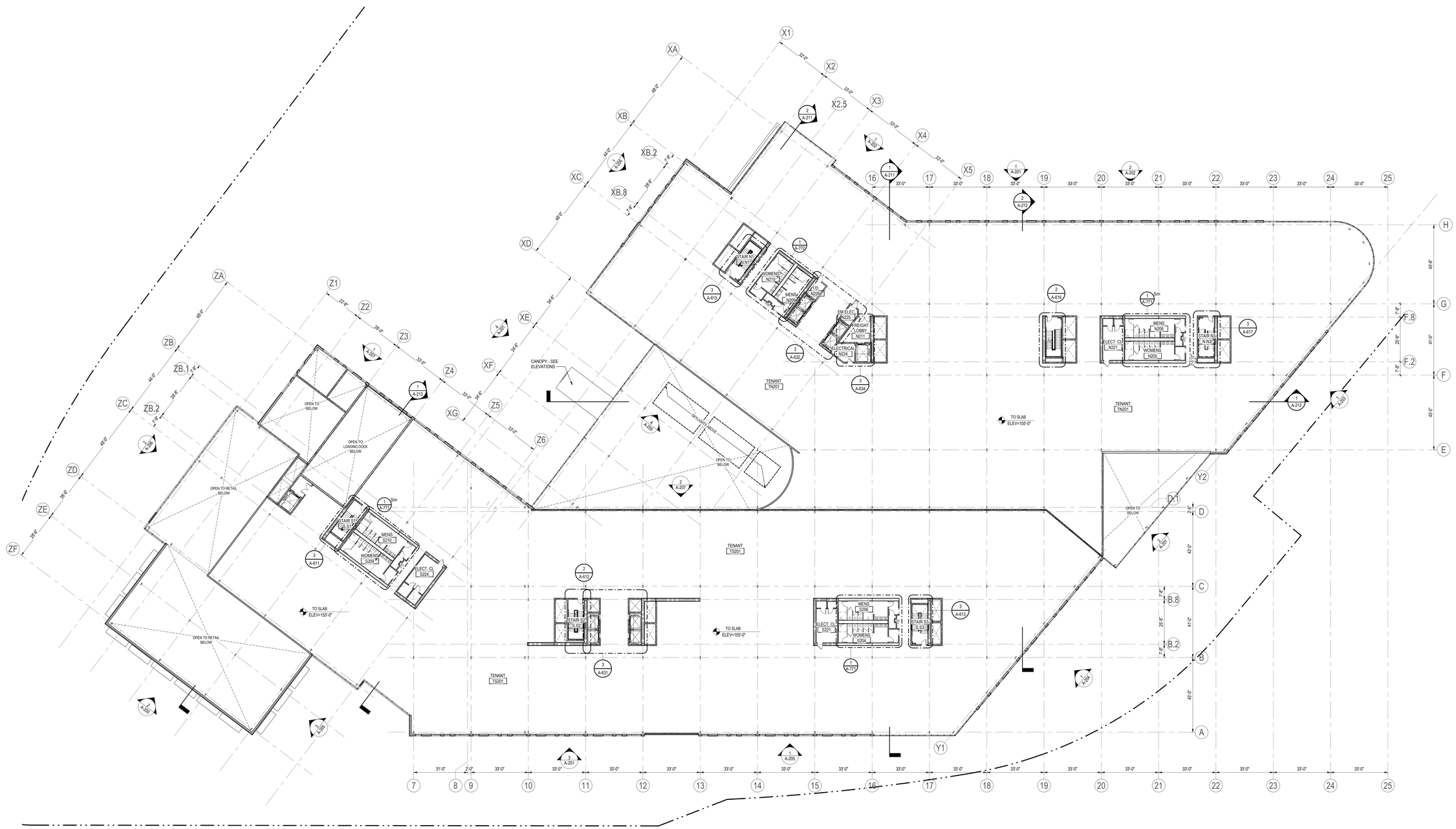
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File Name: N/A
Scale: As indicated

Author	Designer	Checker	2022.04.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
LEVEL 1 - OVERALL PLAN

Revision:
Drawing No.
A-101

<Title Block Information>
ORIGINAL SHEET - ARCH E



1 A-102 **LEVEL 2 PLAN - OVERALL PLAN**
1" = 20'-0"

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No.	Issued/Revision	By	Appd	YYYY.MM.DD
1	3RD PLANNING BOARD SUBMISSION			2022.08.15
2	2ND PLANNING BOARD SUBMISSION			2022.07.15
3	1ST PLANNING BOARD SUBMISSION			2022.03.30
4	DEP SUBMISSION			2021.12.17
5	3RD CITY PEER REVIEW PACKAGE R1			2021.11.22

Permit/Seal

THOMAS M. LOMBARDO No. 30500 REGISTERED ARCHITECT COMMONWEALTH OF MASSACHUSETTS

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: As indicated

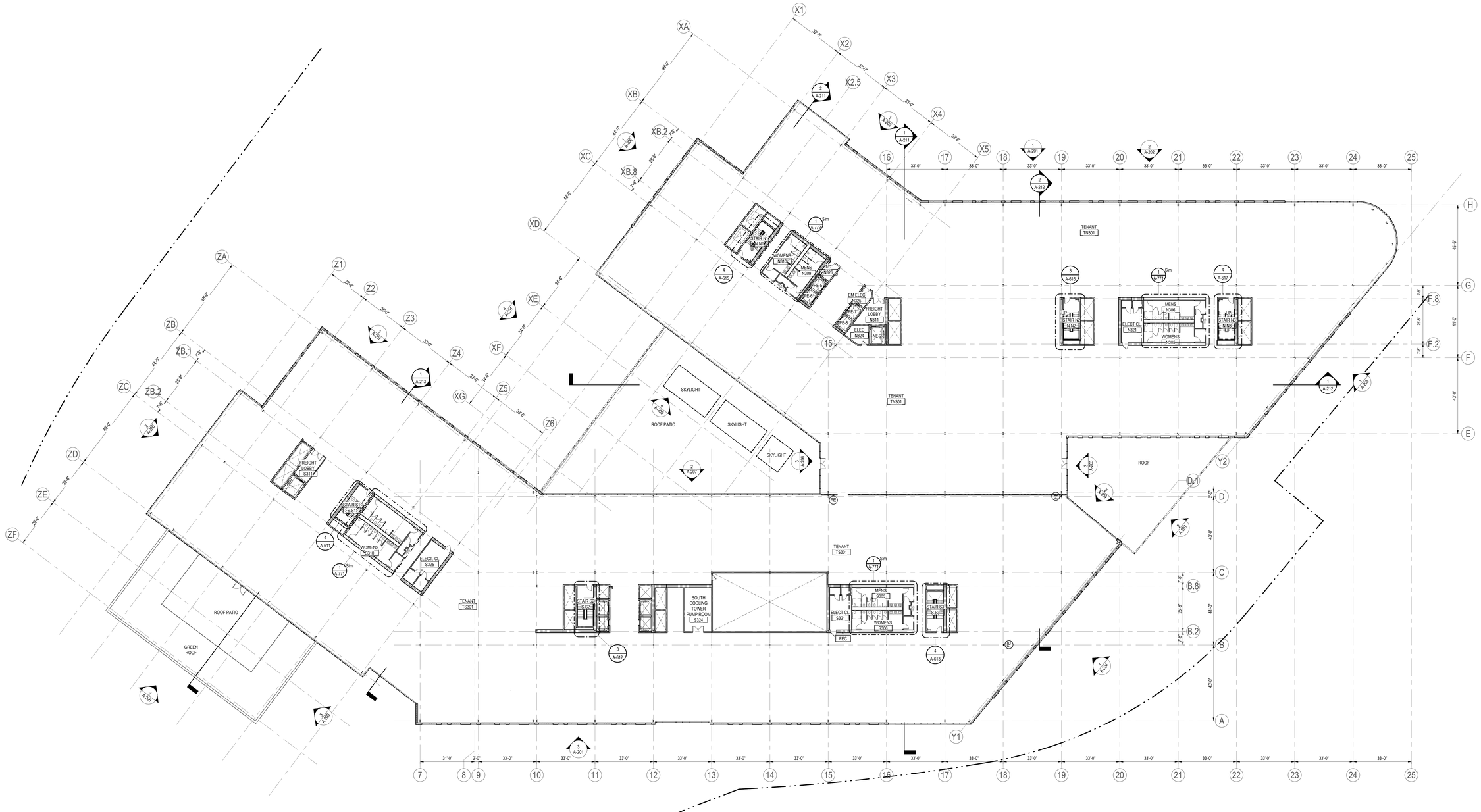
Author	Designer	Checker	2022.04.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
LEVEL 2 - OVERALL PLAN

Revision:
Drawing No.
A-102

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ORIGINAL SHEET - ARCH E



1 LEVEL 3 - OVERALL PLAN
A-103 1" = 20'-0"

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No.	By	Appd	YYYY.MM.DD
1			2022.08.15
2			2022.07.13
3			2022.03.30
4			2022.06.24

1ST FULL REMEDIATION
DEB SUBMISSION
30% DESIGN DEVELOPMENT
SPECIAL PERMIT PACKAGE R1

Permit/Seal



KEY PLAN

LEGEND

- WHEELED FIRE EXTINGUISHER
- FIRE EXTINGUISHER BRACKET WALL MTD
- FEC FIRE EXTINGUISHER CABINET WALL MTD

75'-0" MAX. DISTANCE PER CODE, TYP.

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

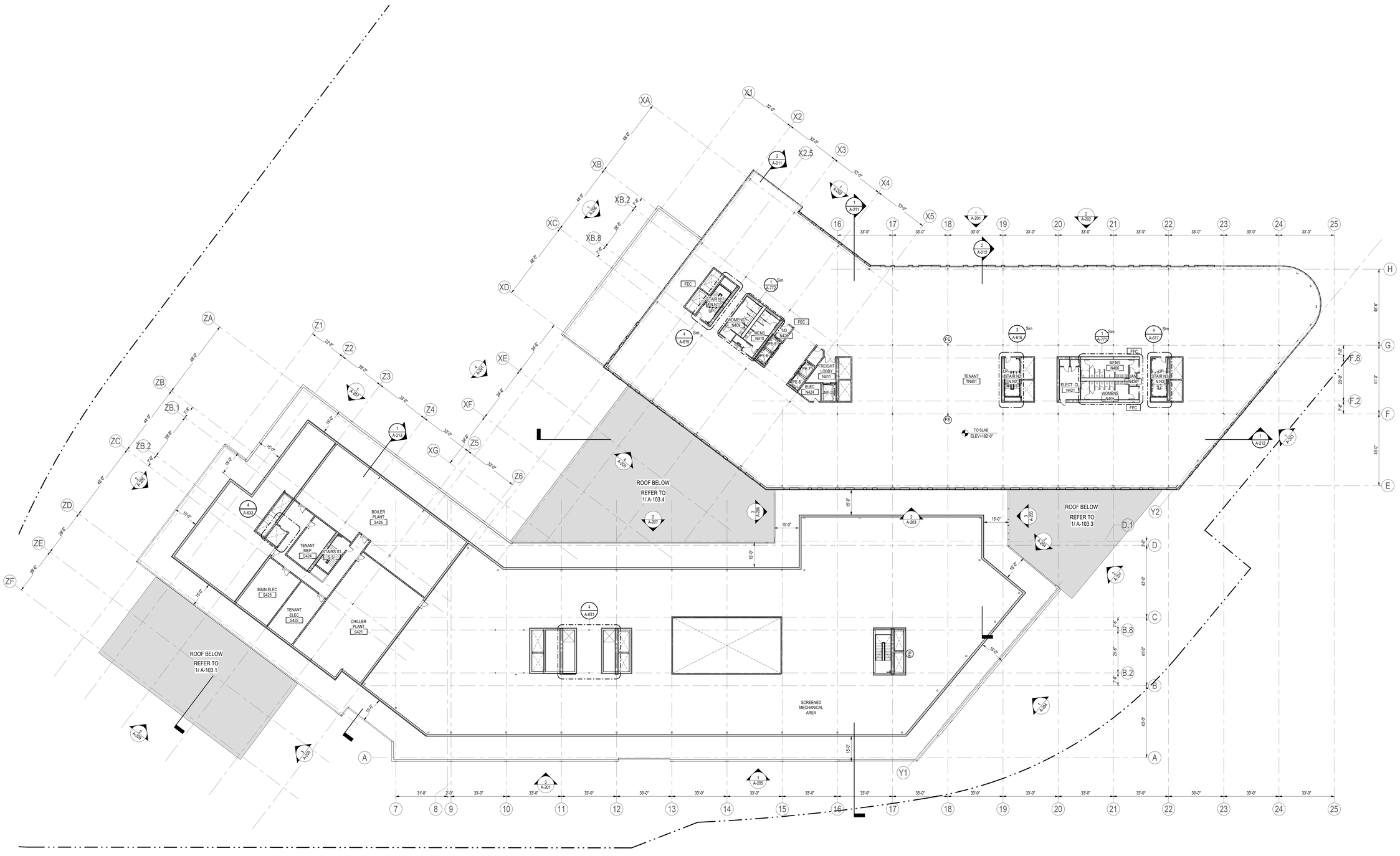
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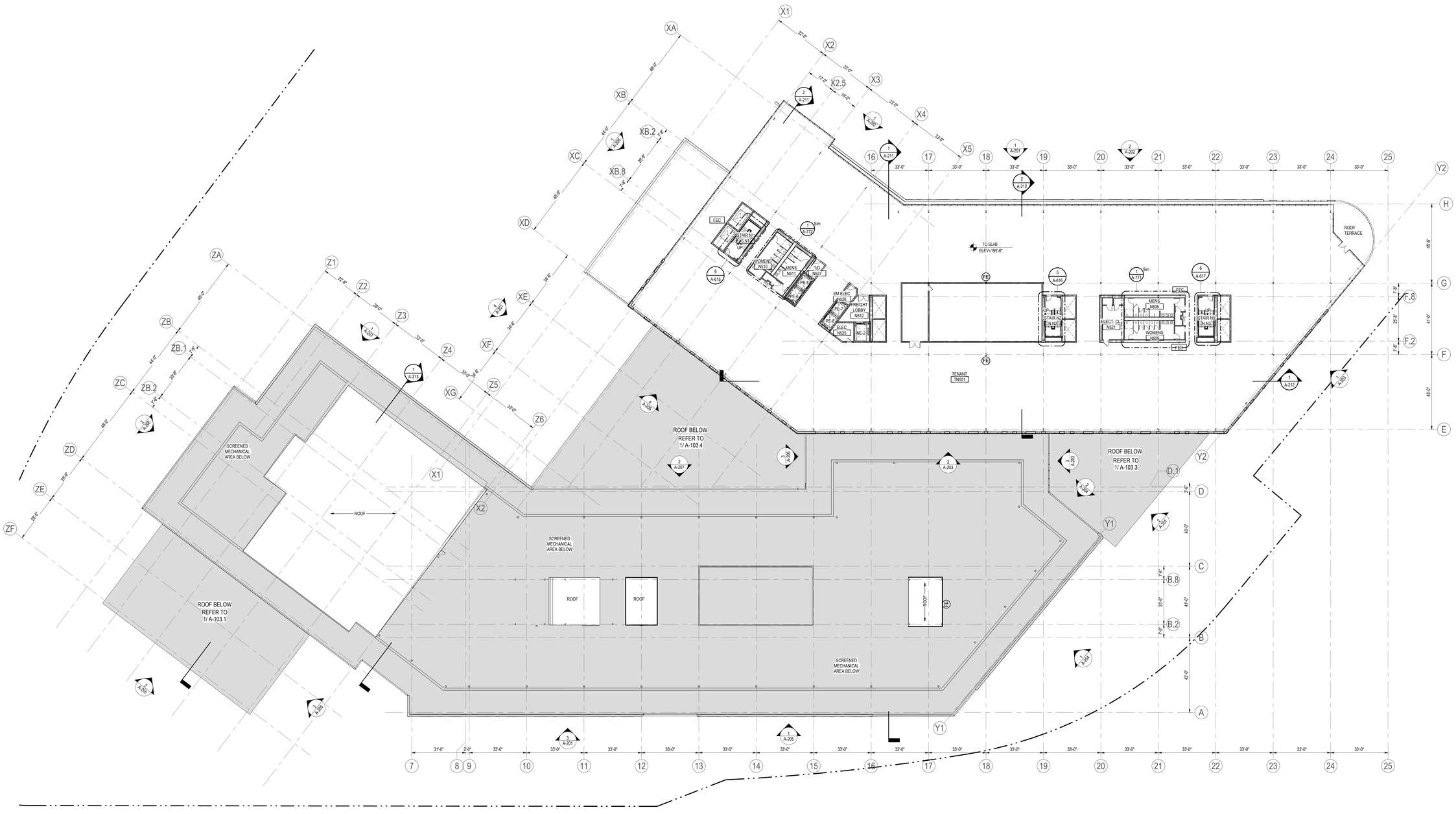
Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
LEVEL 3 - OVERALL PLAN

Revision:
Drawing No.
A-103

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ORIGINAL SHEET - ARCH E


ROOF BELOW
REFER TO
1/ A-103.4
ROOF BELOW
REFER TO
1/ A-103.3
ROOF BELOW
REFER TO
1/ A-103.1
SCREENED
MECHANICAL
AREA
TENANT
TN401
TO SLAB
ELEV=182'-0"
BOILER
PLANT
S425
TENANT
MEP
S424
STAIRS S1
S.N.S1
MAIN ELEC
S423
TENANT
ELEC.
S422
CHILLER
PLANT
S421
FREIGHT
LOBBY
N411
ELEC.
N424
MENS
N410
WOMENS
N409
MENS
N406
WOMENS
N405
ELECT. CL
N421
STAIR N1
S.N.N1
STAIR N2
S.N.N2
STAIR N3
S.N.N3
FEC
TO
TO
TO



1 A-105 **LEVEL 5 / SOUTH BUILDING UPPER ROOF - OVERALL PLAN**
1" = 20'-0"

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Issued/Revision	By	Appd	YYYY.MM.DD
3RD PKG. REMIX PACKAGE #1			2022.08.15
DSR SUBMISSION			2022.07.13
30% DESIGN DEVELOPMENT SET			2022.03.30
60% CONSTRUCTION DOCUMENT SET			2022.05.27

Permit/Seal

KEY PLAN

LEGEND
- WHEELED FIRE EXTINGUISHER
- FIRE EXTINGUISHER BRACKET WALL MTD
- FEC — FIRE EXTINGUISHER CABINET WALL MTD

75'-0" MAX. DISTANCE PER CODE, TYP.

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: As indicated

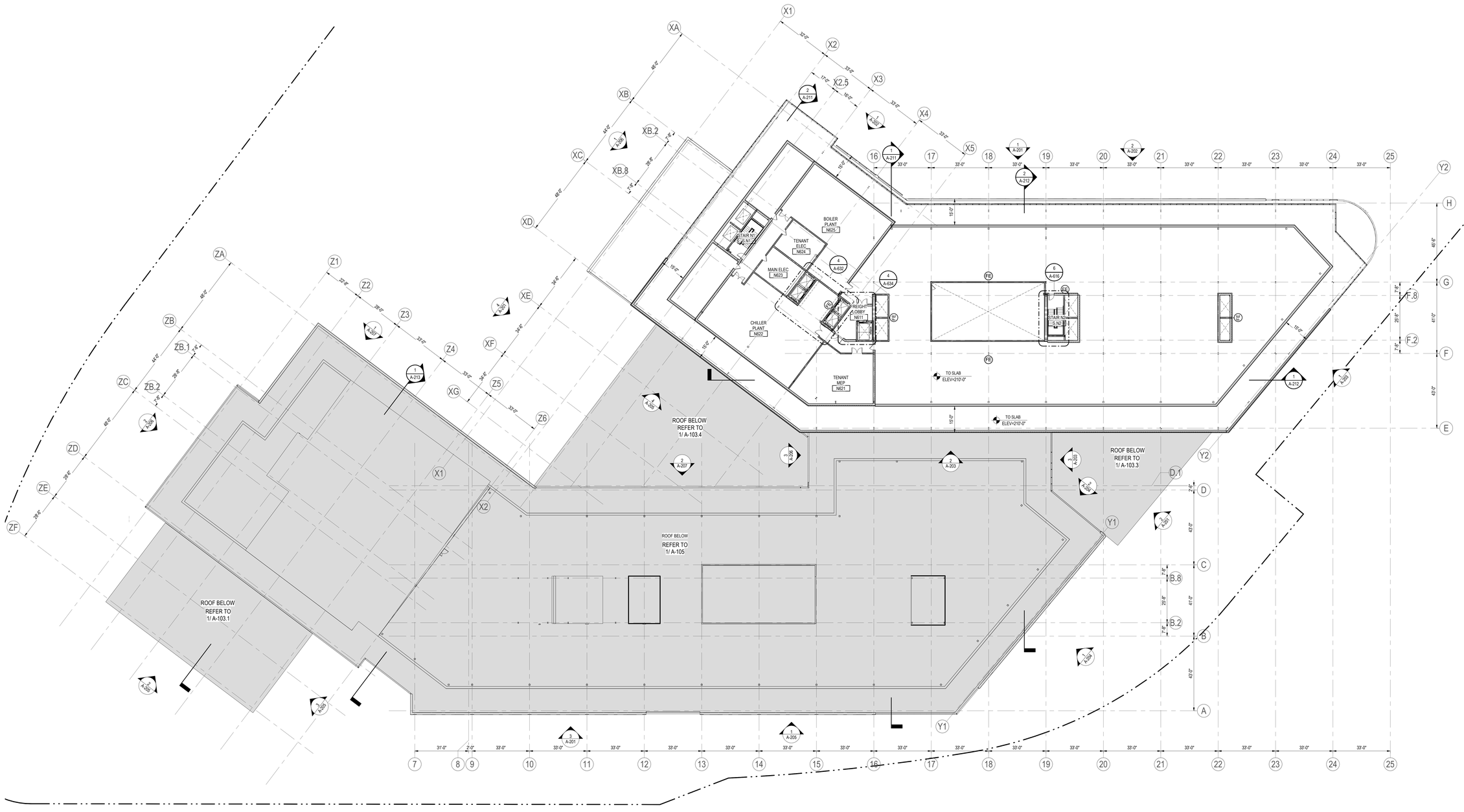
Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
LEVEL 5 / SOUTH BUILDING UPPER ROOF - OVERALL PLAN

Revision:

Drawing No.
A-105

*Plot Number in Project Information
8/15/2022 3:53:38 PM
ORIGINAL SHEET - ARCH E



1 NORTH BUILDING PENTHOUSE - OVERALL PLAN

A-106 1" = 20'-0"

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No.	Issued/Revision	By	Appvd
1	2ND PLANNING BOARD SUBMISSION		2022.08.15
2	DEP SUBMISSION		2022.07.15
3	30% CHECK SET/SCHEME B		2022.03.30
4	30% CHECK SET/SCHEME A		2022.03.21

Permit/Seal



KEY PLAN

LEGEND

WF	WHEELED FIRE EXTINGUISHER
FE	FIRE EXTINGUISHER BRACKET WALL MTD
FEC	FIRE EXTINGUISHER CABINET WALL MTD

75'-0" MAX. DISTANCE PER CODE, TYP.

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.:21842343
File Name: N/A
Scale: As indicated

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

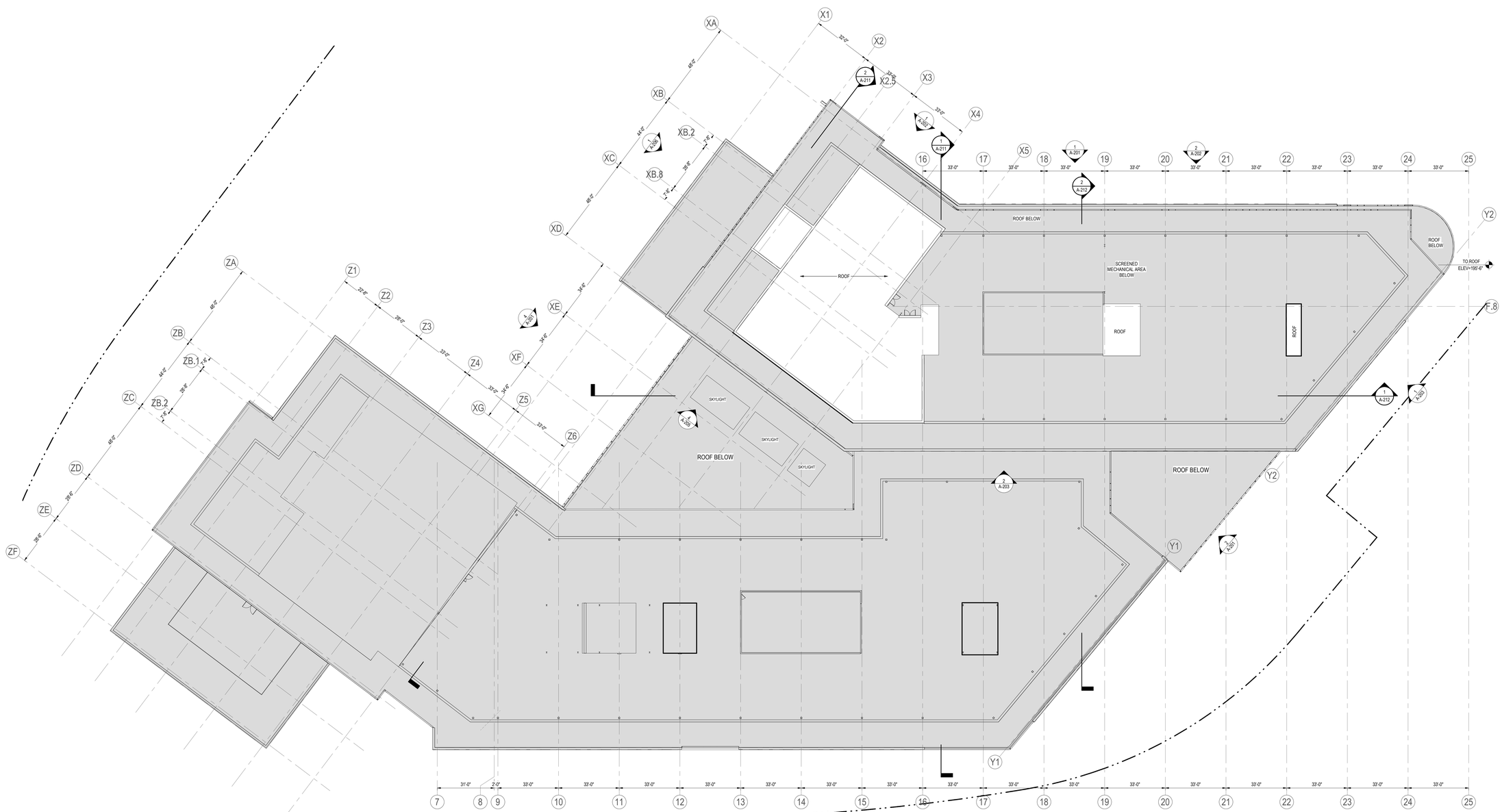
Title
NORTH BUILDING PENTHOUSE - OVERALL PLAN

Revision:

Drawing No.
A-106

File Location & Project Information
8/15/2022 3:53:47 PM

ORIGINAL SHEET - ARCH E



1 ROOF PLAN
A-107 1" = 20'-0"

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Issued/Revision

	By	Appd	YYYY.MM.DD
2ND PH. REMEETING/PLAN			2022.08.15
DEIR SUBMISSION			2022.07.15
30% DESIGN DEVELOPMENT			2022.03.30
30% DESIGN DEVELOPMENT			2022.03.30

Permit/Seal



KEY PLAN

LEGEND

- WF — WHEELED FIRE EXTINGUISHER
- FE — FIRE EXTINGUISHER BRACKET WALL MTD
- FEC — FIRE EXTINGUISHER CABINET WALL MTD

75'-0" MAX. DISTANCE PER CODE, TYP.

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

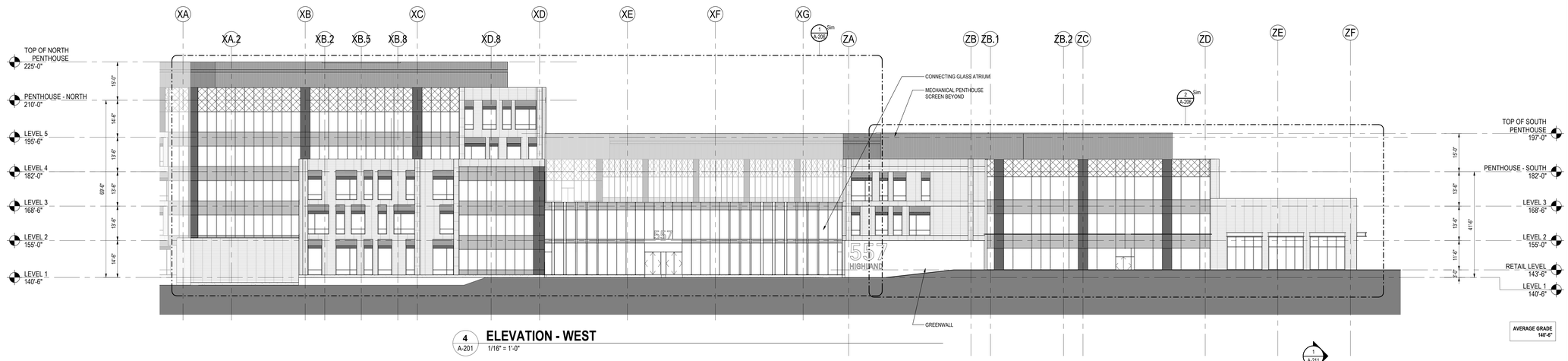
Project No.:218421343
File Name: N/A
Scale: As indicated

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
FULL ROOF PLAN

Revision:
Drawing No.
A-107

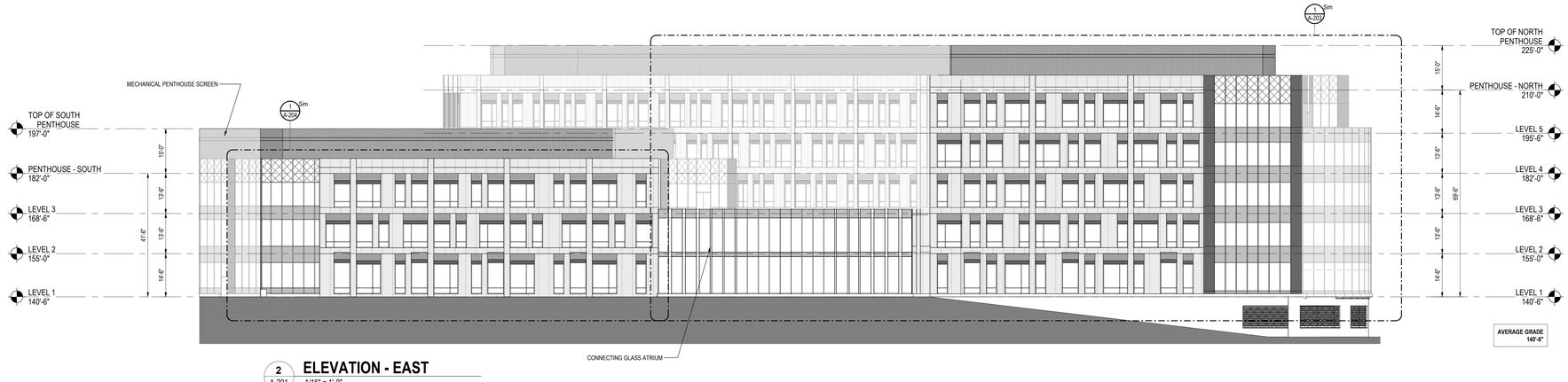
ORIGINAL SHEET - ARCH E



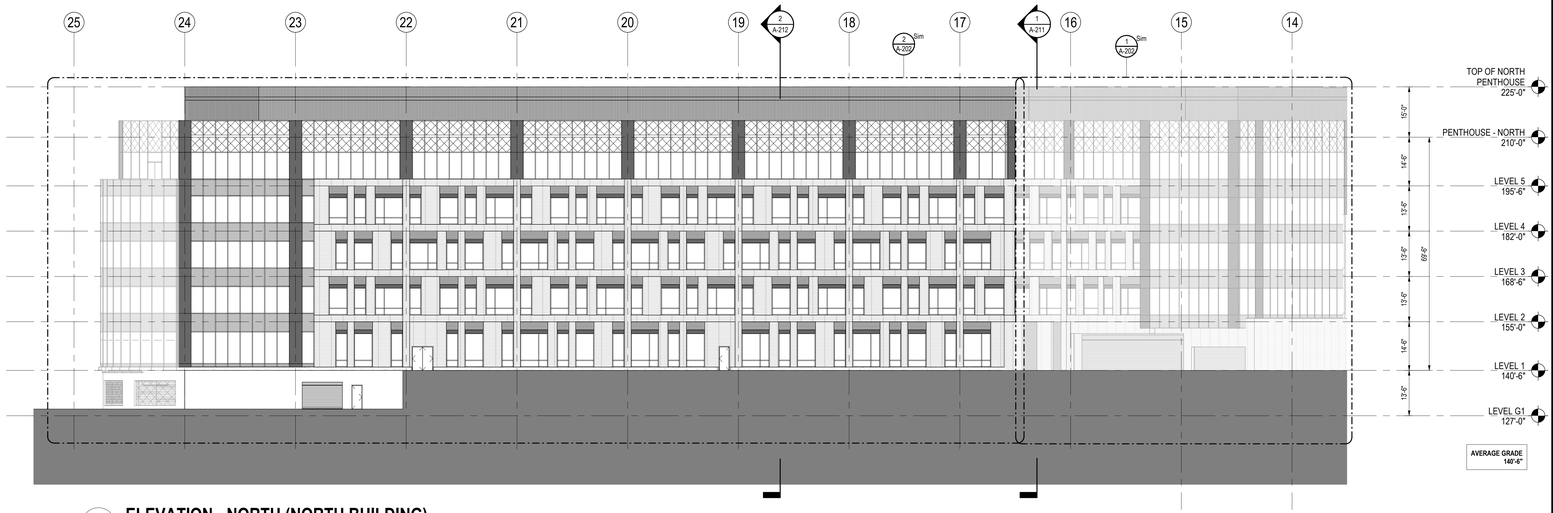
4 A-201 ELEVATION - WEST
1/16" = 1'-0"



3 A-201 ELEVATION - SOUTH (SOUTH BUILDING)
1/16" = 1'-0"



2 A-201 ELEVATION - EAST
1/16" = 1'-0"



1 A-201 ELEVATION - NORTH (NORTH BUILDING)
1/16" = 1'-0"

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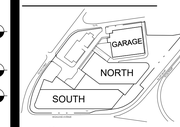
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No.	Issued/Revision	By	Appvd	YYYY.MM.DD
1	ZBA INITIAL RESUBMISSION		ZBA	2022.06.15
2	ZBA SUPPLEMENTAL INFO		ZBA	2022.07.15
3	ZBA SUPPLEMENTAL INFO #2		ZBA	2022.08.01
4	SPECIAL PERMIT PACKAGE R1		ZBA	2022.08.15

Permit/Seal

REGISTERED ARCHITECT
No. 30550
THOMAS M. LISTER
COMMONWEALTH OF MASSACHUSETTS



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/16" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING ELEV - LOCATOR ELEVATIONS

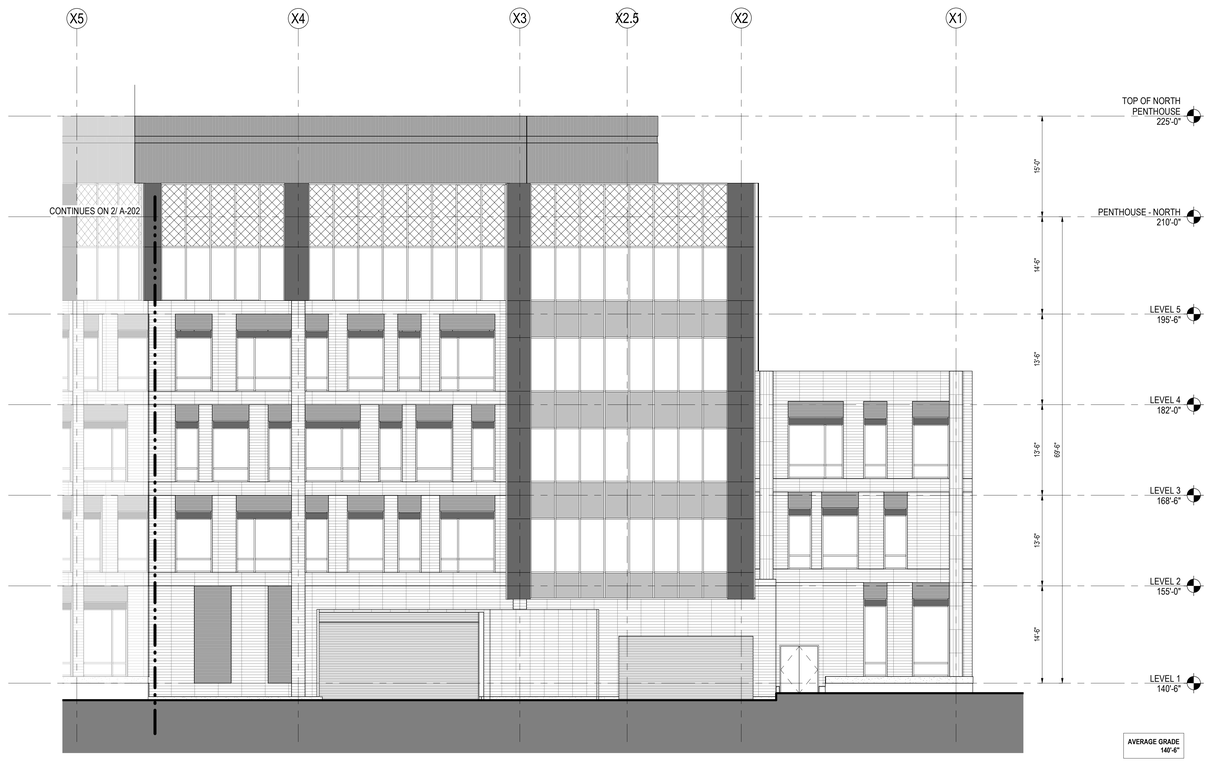
Revision:
Drawing No.
A-201

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1/10/2022 3:44:11 PM

ORIGINAL SHEET - ARCH E



2 A-202 **ENLARGED ELEVATION - NORTH BUILDING - NORTH**
1/8" = 1'-0"



1 A-202 **ENLARGED ELEVATION - NORTH BUILDING - NORTH (ANGLED WALL)**
1/8" = 1'-0"

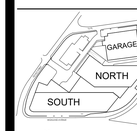
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Issued/Revision	By	Appd	YYYY.MM.DD
30% SCHEMATIC DESIGN			2022.01.31
DEP SUBMISSION			2022.02.25
30% DESIGN DEVELOPMENT			2022.03.31
SPECIAL PERMIT PACKAGE R1			2022.06.15

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

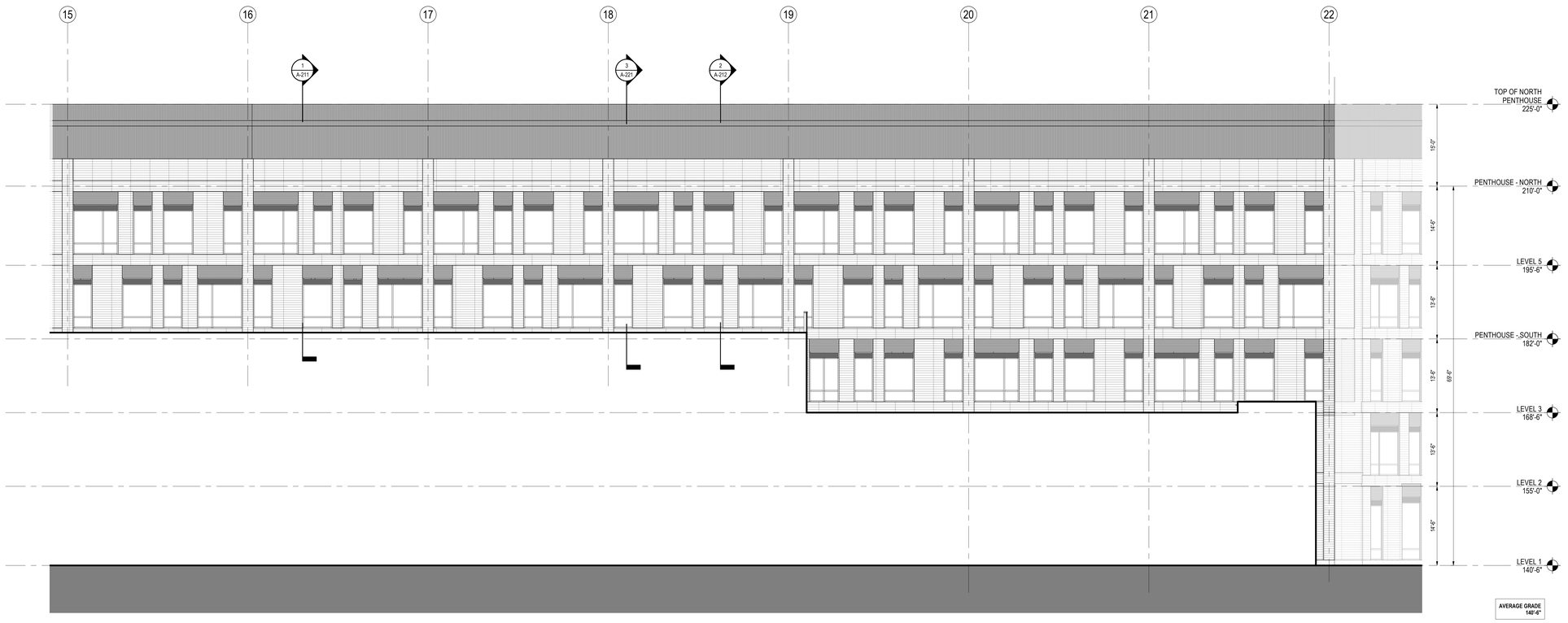
Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING ELEV - NORTH BLDG - NORTH

Revision:
Drawing No.
A-202

<PELOTON>\<Project Information>
8/10/2022 3:54:23 PM
ORIGINAL SHEET - ARCH E



2 A-203 **ENLARGED ELEVATION - NORTH BUILDING - SOUTH**
1/8" = 1'-0"



3 A-203 **ENLARGED ELEVATION - ATRIUM - EAST (HIDDEN) AT GRID 19**
1/8" = 1'-0"

1 A-203 **ENLARGED ELEVATION - NORTH BUILDING & ATRIUM - EAST**
1/8" = 1'-0"

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No.	By	Issued/Revision	YYYY.MM.DD
1		2ND PLANNING BOARD SUBMISSION	2022.08.15
2		3RD PLANNING BOARD SUBMISSION	2022.09.27
3		SPECIAL PERMIT PACKAGE R1	2022.10.31

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

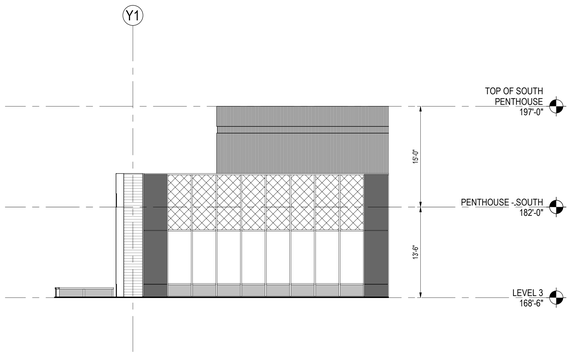
Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.04.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

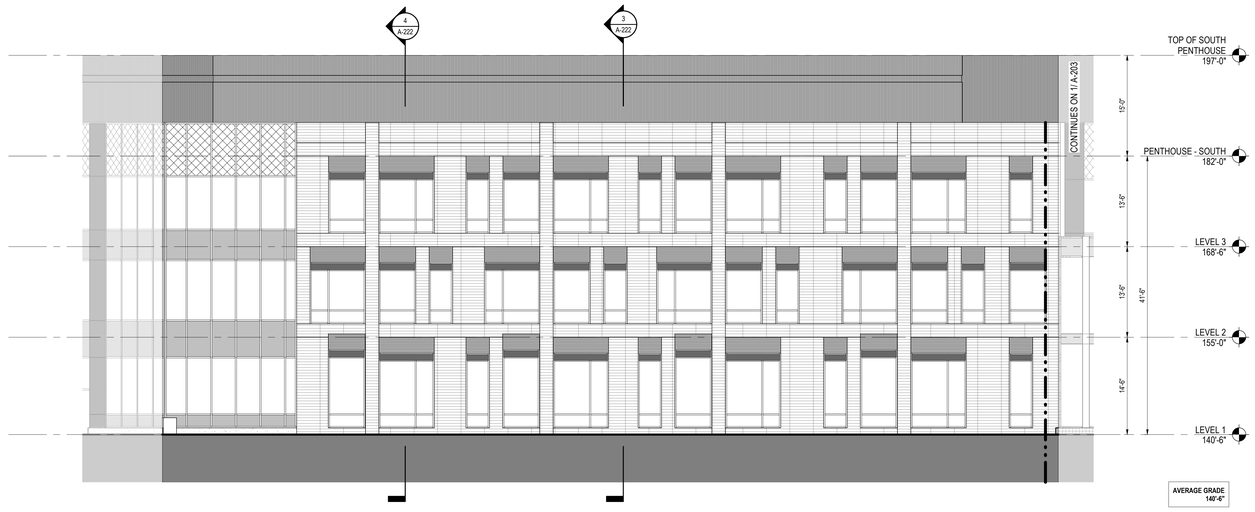
Title
BUILDING ELEV - NORTH BLDG - SOUTH & EAST

Revision:
Drawing No.
A-203

<Work Location & Project Information>
8/10/2022 3:34:52 PM
ORIGINAL SHEET - ARCH E



2 / A-204 **ENLARGED ELEVATION - SOUTH BUILDING - NORTH CORNER**
1/8" = 1'-0"



1 / A-204 **ENLARGED ELEVATION - SOUTH BUILDING - EAST**
1/8" = 1'-0"

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1	SPECIAL PERMIT PACKAGE R1			2022.08.15
0	SPECIAL PERMIT PACKAGE			2022.07.13

Permit/Seal

REGISTERED ARCHITECT — THOMAS M. LISTA — No. 30550 — COMMONWEALTH OF MASSACHUSETTS



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

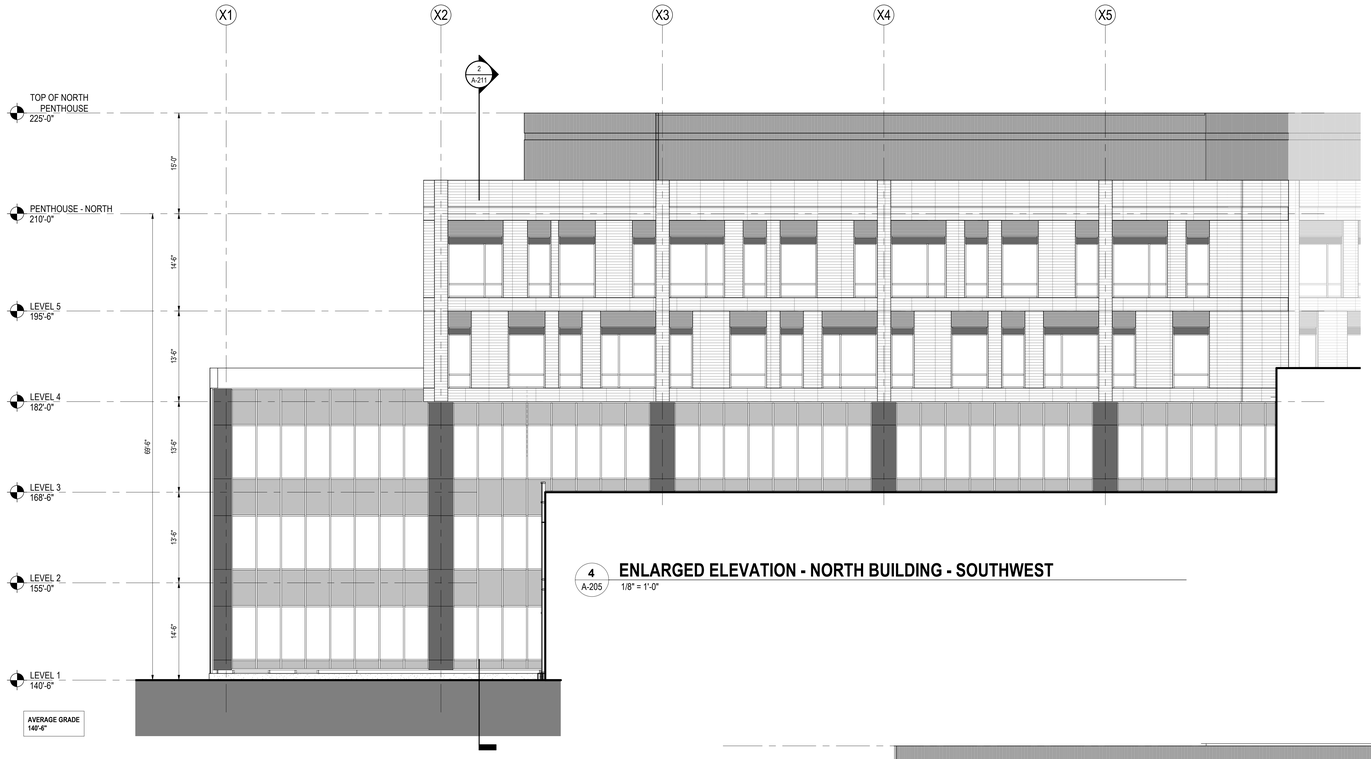
Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

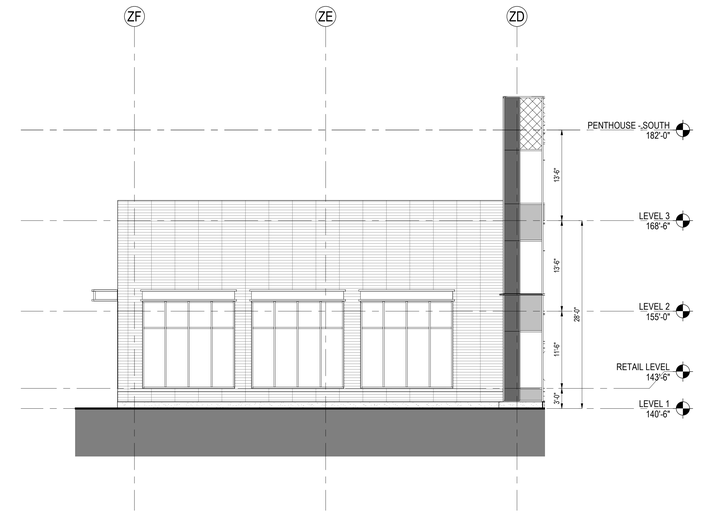
Title
BUILDING ELEV - SOUTH BLDG - SOUTH EAST

Revision:
Drawing No.
A-204

<PELSubSite>\\Project Information\
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ORIGINAL SHEET - ARCH E



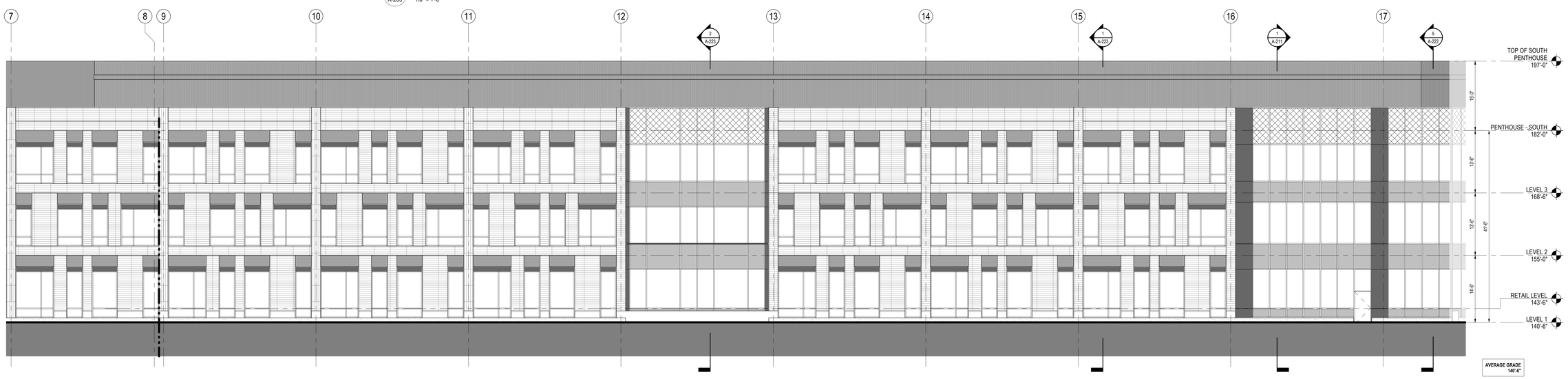
4 A-205 ENLARGED ELEVATION - NORTH BUILDING - SOUTHWEST
1/8" = 1'-0"



3 A-205 ENLARGED ELEVATION - SOUTH BUILDING - RETAIL SOUTHEAST
1/8" = 1'-0"



2 A-205 ENLARGED ELEVATION - SOUTH BUILDING - RETAIL SOUTHWEST
1/8" = 1'-0"



1 A-205 ENLARGED ELEVATION - SOUTH BUILDING - SOUTHEAST
1/8" = 1'-0"

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1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	DEIR SUBMISSION			2022.07.15
3	30% CONCEPT DESIGN SET			2022.03.30
4	SPECIAL PERMIT PACKAGE R0			2022.02.24

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

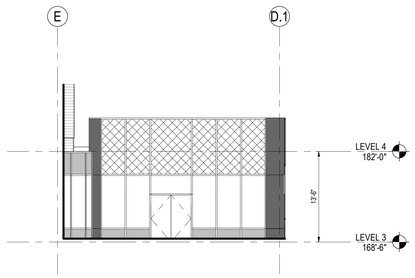
Author	Designer	Checker	2022.04.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING ELEV - NORTH BLDG (SOUTHWEST) & SOUTH BLDG (SOUTH)

Revision:
Drawing No.
A-205

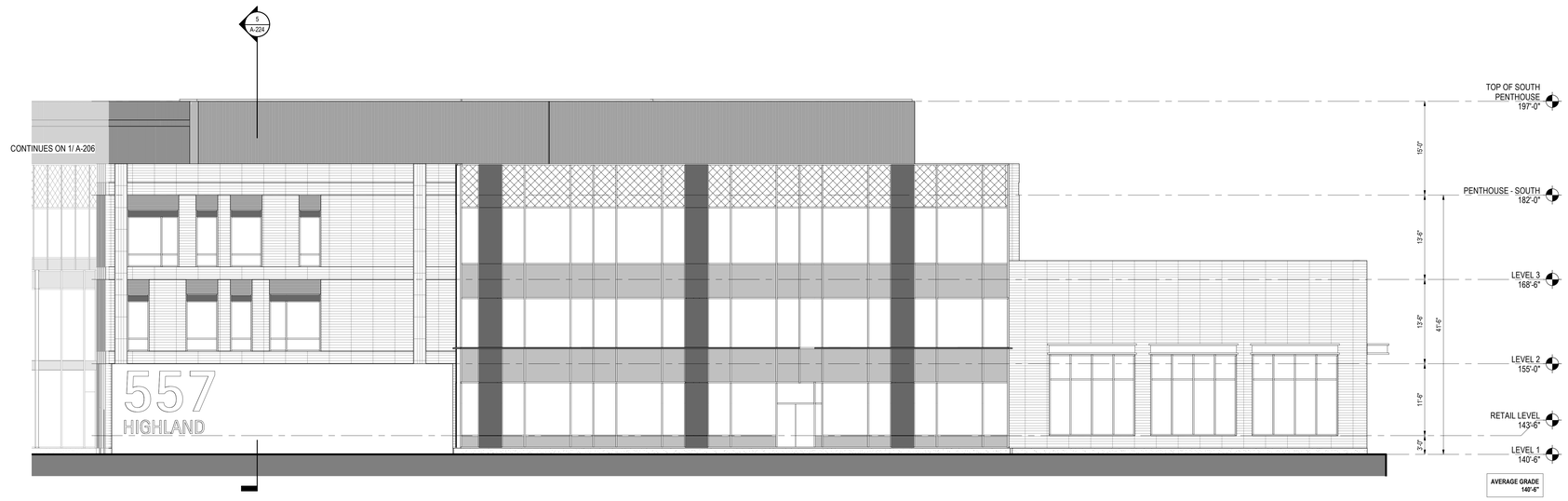
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ORIGINAL SHEET - ARCH E



ENLARGED ELEVATION - ATRIUM - EAST (HIDDEN) AT GRID 15

3 A-206 1/8" = 1'-0"



SOUTH BLGD - ELEVATION - GREENWALL

2 A-206 1/8" = 1'-0"



ENLARGED ELEVATION - NORTH BUILDING - WEST

1 A-206 1/8" = 1'-0"

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Issued/Revision	By	Appvd
2022.08.15		
2022.07.15		
2022.03.30		
2022.03.07		

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
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557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING ELEV - NORTH BLDG (WEST) & SOUTH BLDG (NORTH & WEST)

Revision:

Drawing No.
A-206

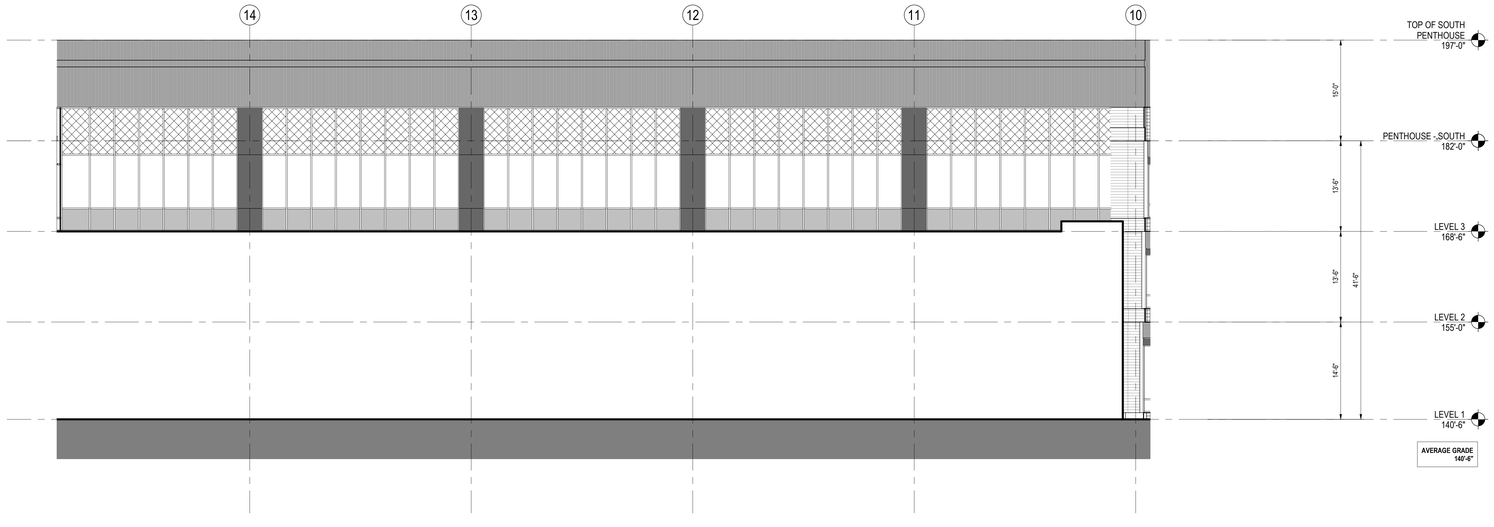
<Pro Location or Project Information>
8/10/2022 3:53:24 PM

ORIGINAL SHEET - ARCH E



1 A-207 **SOUTH BLDG - SOUTH ELEVATION LEVEL 1 - LOADING DOCK**

1/8" = 1'-0"



2 A-207 **ENLARGED ELEVATION - SOUTH BUILDING - NORTHWEST**

1/8" = 1'-0"

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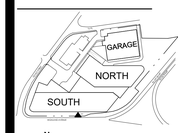
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Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
100% SPECIAL PERMIT PACKAGE			2022.07.13

Permit/Seal

REGISTERED ARCHITECT
No. 30550
THOMAS M. LISS
COMMONWEALTH OF MASSACHUSETTS



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
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Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

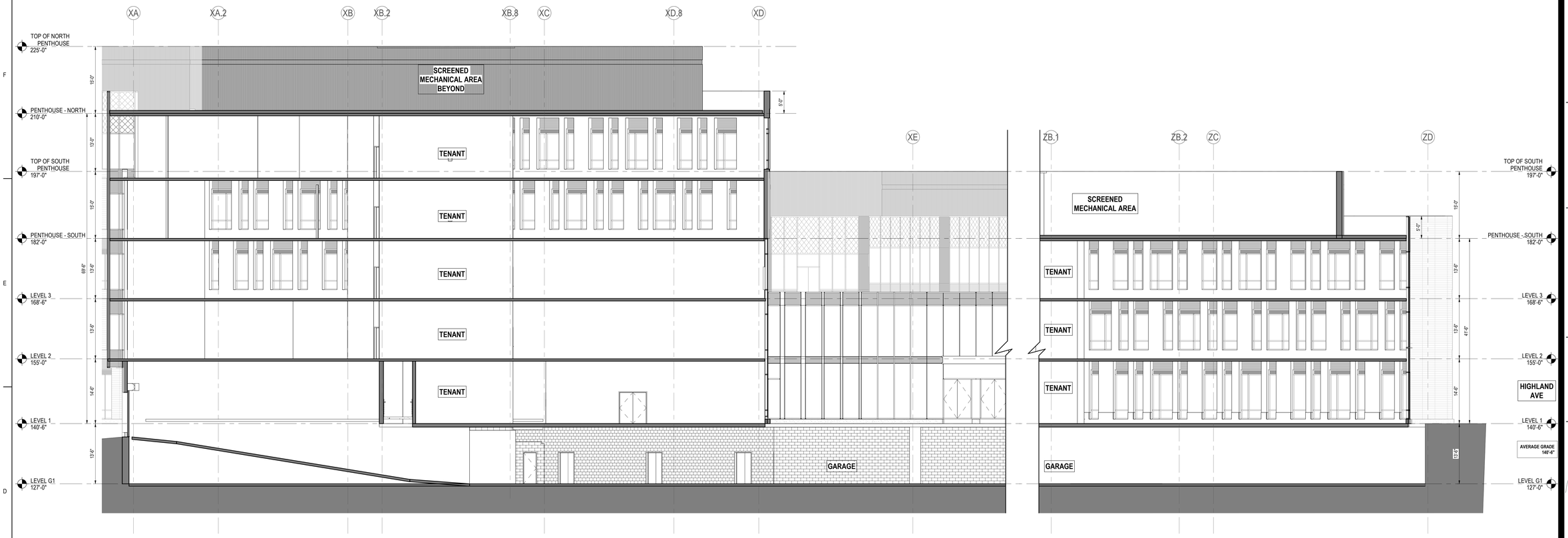
Title
BUILDING ELEV - SOUTH BLDG - NORTH & EAST

Revision:

Drawing No.
A-207

•Plot Scaled to Paper Information•
8/1/2022 3:34:54 PM

ORIGINAL SHEET - ARCH E



2 A-211 **SECTION - N-S NEAR GRID 12**

1/8" = 1'-0"



1 A-211 **SECTION - N-S NEAR GRID 16**

1/8" = 1'-0"

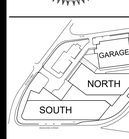
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Issued/Revision	By	Appd	YYYY.MM.DD
30% DESIGN DEVELOPMENT			2022.03.25
30% DESIGN DEVELOPMENT #2			2022.05.27
SPECIAL PERMIT PACKAGE R1			2022.08.15

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KEY PLAN

Client/Project
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557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING SECTIONS - OVERALL

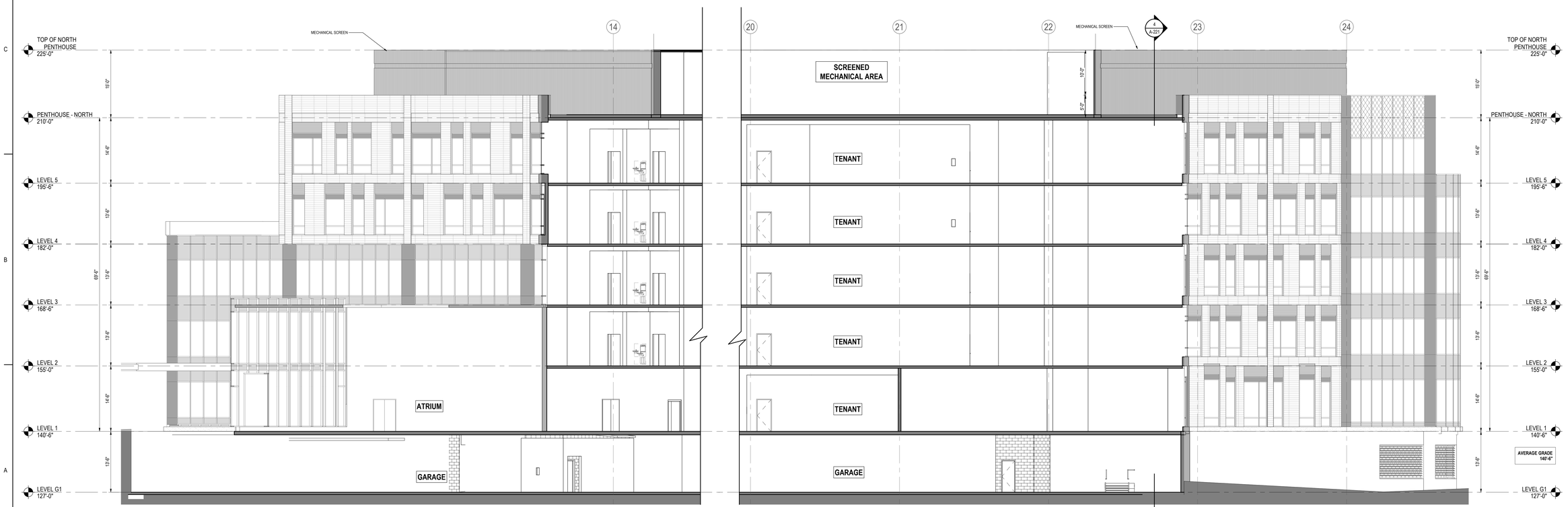
Revision:
Drawing No.
A-211

ORIGINAL SHEET - ARCH E



2 A-212 **SECTION - NORTH BUILDING - SECTION N-S NEAR GRID 20**

1/8" = 1'-0"



1 A-212 **SECTION - NORTH BUILDING - SECTION E-W NEAR GRID F**

1/8" = 1'-0"

Stantec

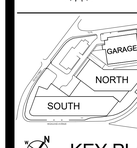
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1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	DEIR SUBMISSION			2022.07.15
3	SPECIAL PERMIT PACKAGE			2022.03.30
4	30% DESIGN SUBMISSION			2021.12.17

Permit/Seal





KEY PLAN

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Client/Project
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557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

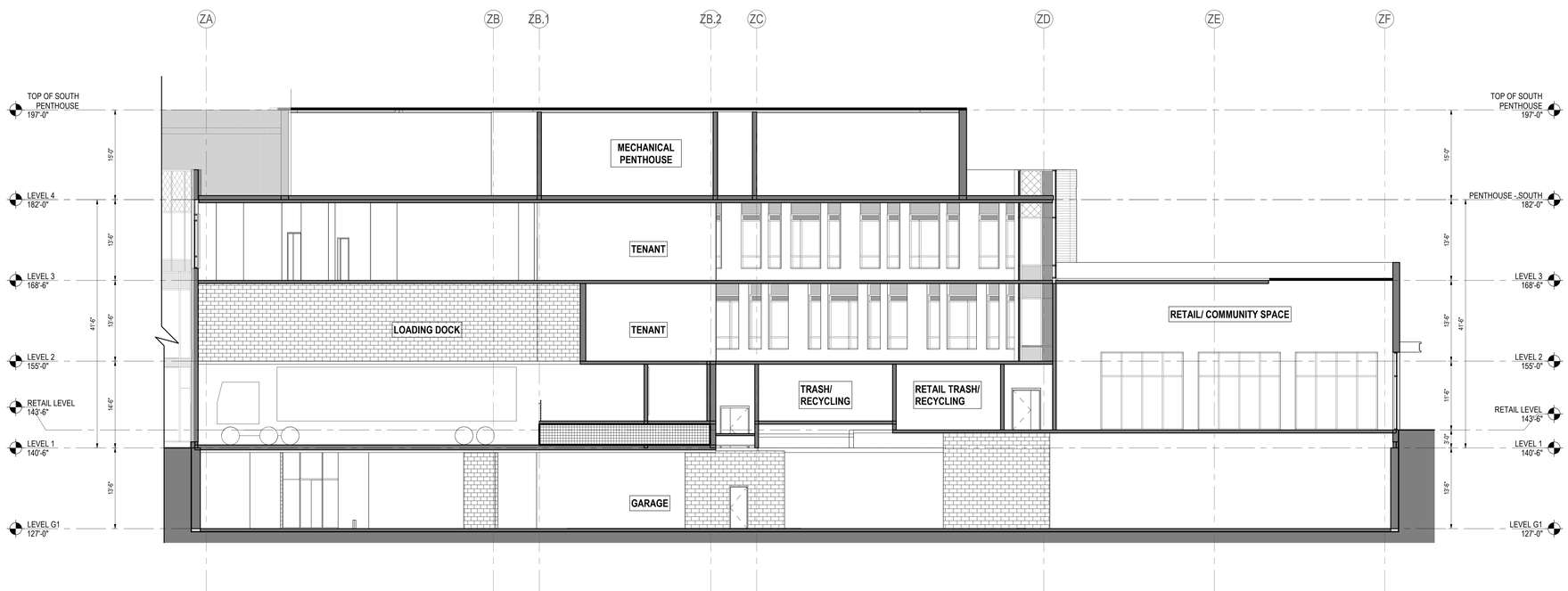
Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING SECTIONS - NORTH BLDG

Revision:

Drawing No.
A-212

<Pc3.ctb>,<Plan>,<Information>
8/30/2022 3:34:18 PM
ORIGINAL SHEET - ARCH E



1 A-213 **SECTION - SOUTH BUILDING - SECTION N-S NEAR GRID 5**

1/8" = 1'-0"

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SPECIAL PERMIT PACKAGE R1			2022.08.15
30% SPECIAL PERMIT SUBMISSION			2022.07.13
30% DESIGN DEVELOPMENT			2022.06.24

Permit/Seal

REGISTERED ARCHITECT THOMAS M. LISTA No. 30550 COMMONWEALTH OF MASSACHUSETTS



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER
557 Highland Ave
Needham, MA 02494

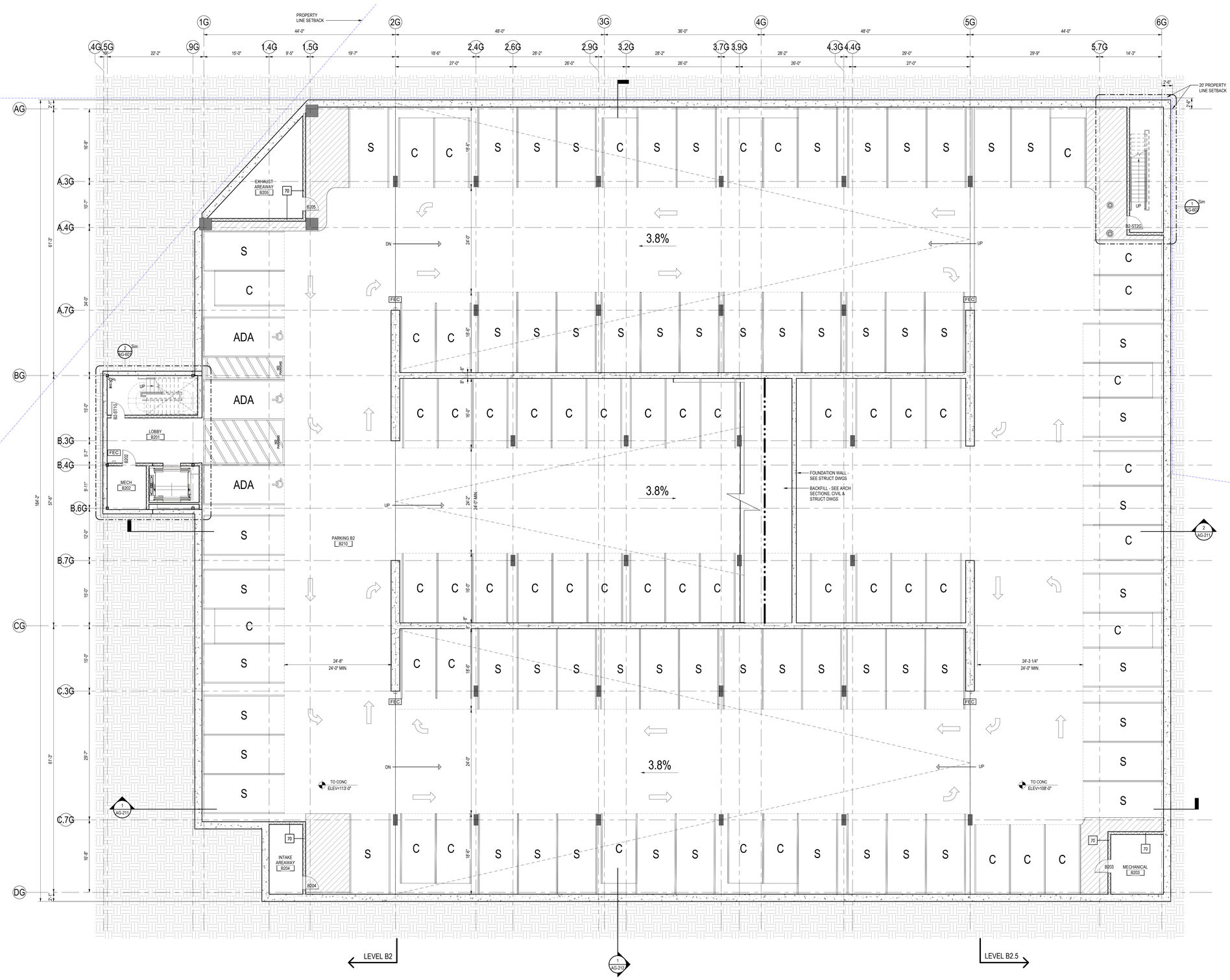
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File Name: N/A
Scale: 1/8" = 1'-0"

Author	Designer	Checker	2022.06.24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
BUILDING SECTIONS - SOUTH BLDG

Revision:
Drawing No.
A-213

ORIGINAL SHEET - ARCH E



1 GARAGE - LEVEL B2
AG-100B2 1/8" = 1'-0"

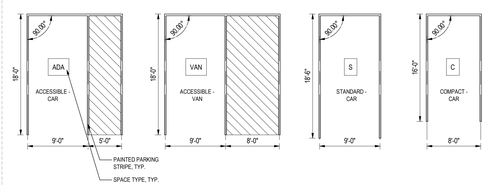
GARAGE PARKING COUNT	
PARKING TYPE	COUNT
GARAGE - LEVEL B2	
ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116
GARAGE - LEVEL B1	
ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119
GARAGE - LEVEL 1	
ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126
GARAGE - LEVEL 2	
ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131
GARAGE - LEVEL 3	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 4	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 5	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 6	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110
TOTAL: 998	998

LEGEND

FEC — SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



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Issued/Revision	By	Appvd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
30% DESIGN SUBMITTAL			2022.05.27
100% DESIGN SUBMITTAL			2022.03.25

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

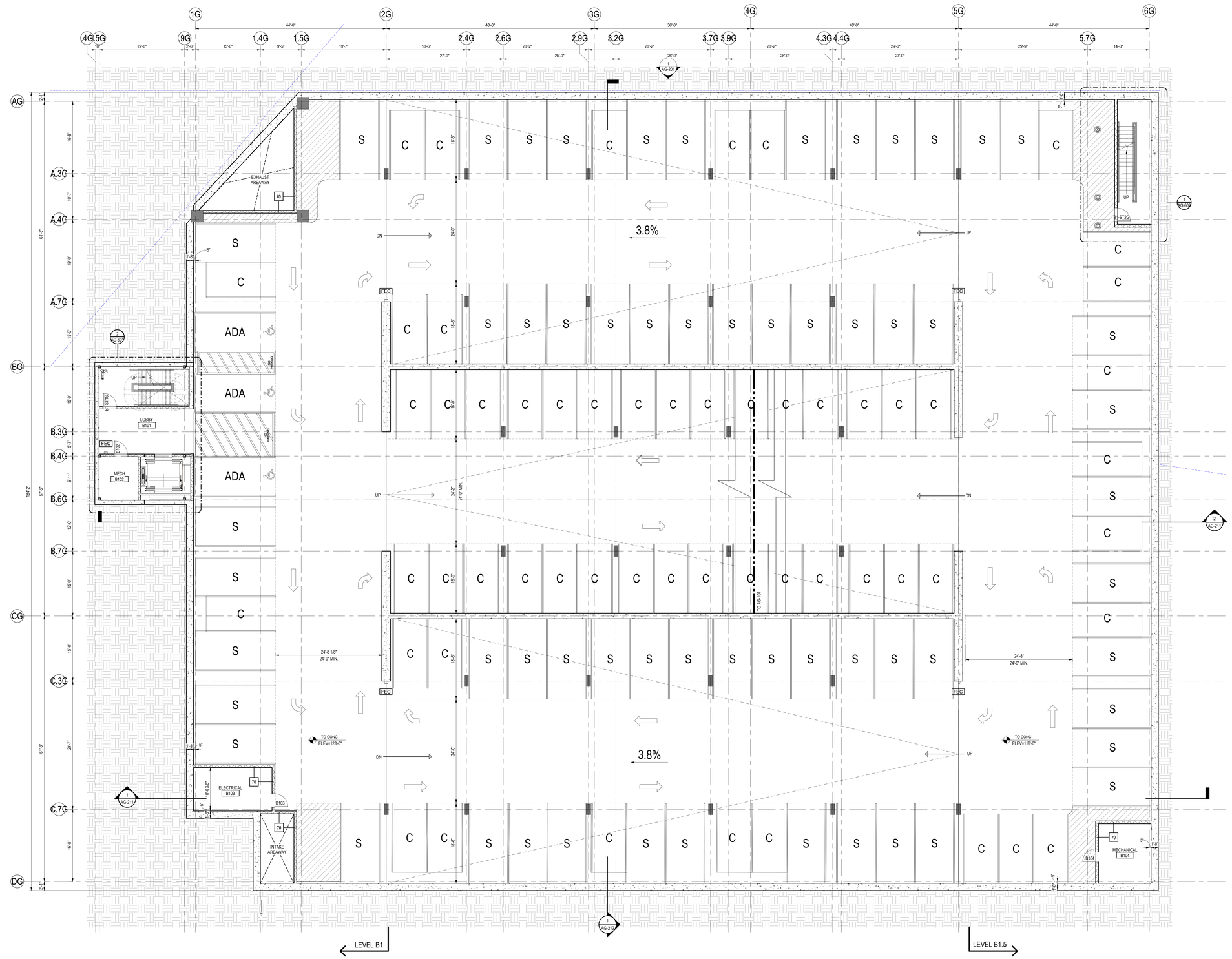
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File Name: N/A
Scale: 1/8" = 1'-0"

RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL B2

Revision:
Drawing No.
AG-100B2
GARAGE

ORIGINAL SHEET - ARCH E



1 GARAGE - LEVEL B1
AG-100B1 1/8" = 1'-0"

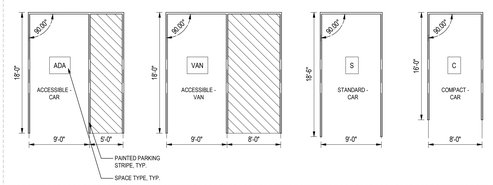
GARAGE PARKING COUNT	
PARKING TYPE	COUNT
GARAGE - LEVEL B2	
ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116
GARAGE - LEVEL B1	
ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119
GARAGE - LEVEL 1	
ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126
GARAGE - LEVEL 2	
ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131
GARAGE - LEVEL 3	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 4	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 5	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 6	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110
TOTAL: 998	998

LEGEND

FEC — SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



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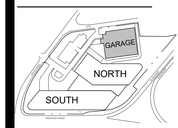
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Issued/Revision	By	Appvd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
30% DESIGN SUBMITTAL			2022.03.31
60% DESIGN SUBMITTAL			2022.05.27

Permit/Seal





KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

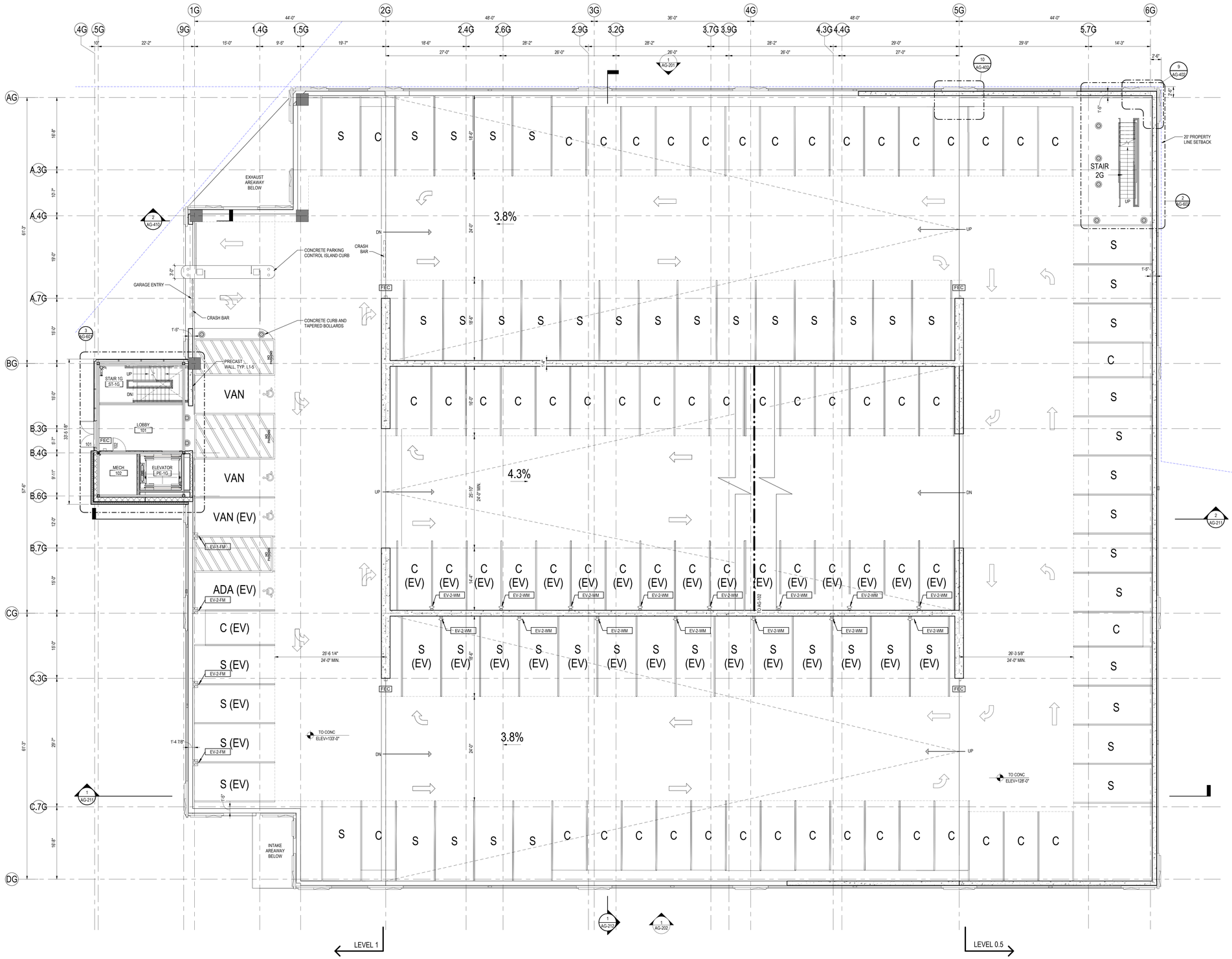
RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL B1

Revision:
Drawing No.
AG-100B1
GARAGE

"P:\Active Projects\Bulfinch\218421343\Revit\Models\218421343_Highland_Garage_Central_R21_Detached_wip_TMU.rvt"
5/25/2022 3:55:12 PM

ORIGINAL SHEET - ARCH E



1 AG-101 GARAGE - LEVEL 1-

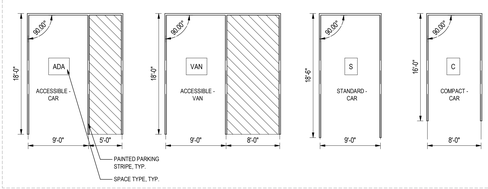
1/8" = 1'-0"

LEGEND

FEC — SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



GARAGE PARKING COUNT	
PARKING TYPE	COUNT

GARAGE - LEVEL B2

ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116

GARAGE - LEVEL B1

ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119

GARAGE - LEVEL 1

ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126

GARAGE - LEVEL 2

ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131

GARAGE - LEVEL 3

ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132

GARAGE - LEVEL 4

ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132

GARAGE - LEVEL 5

ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132

GARAGE - LEVEL 6

ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110

TOTAL: 998 998

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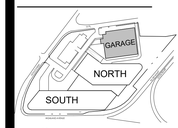
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Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
SITE PLAN SUBMITTAL			2022.03.31
SPECIAL PERMIT PACKAGE R1			2022.08.15

Permit/Seal





KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

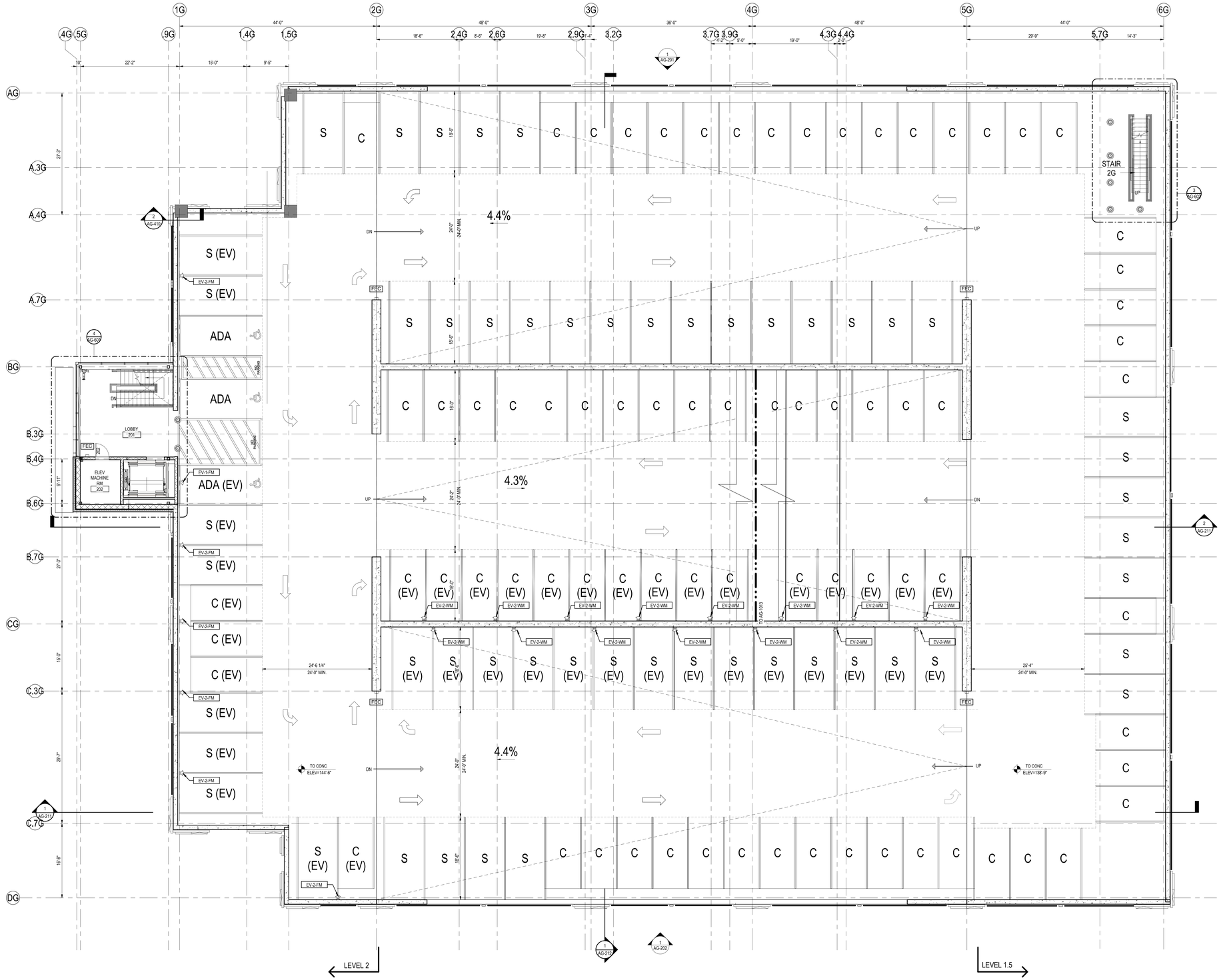
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File Name: N/A
Scale: 1/8" = 1'-0"

RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL 1

Revision:
Drawing No.
AG-101
GARAGE

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ORIGINAL SHEET - ARCH E



1 AG-102 GARAGE - LEVEL 2

1/8" = 1'-0"

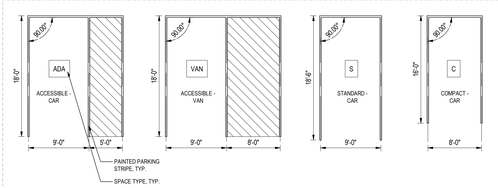
GARAGE PARKING COUNT	
PARKING TYPE	COUNT
GARAGE - LEVEL B2	
ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116
GARAGE - LEVEL B1	
ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119
GARAGE - LEVEL 1	
ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126
GARAGE - LEVEL 2	
ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131
GARAGE - LEVEL 3	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 4	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 5	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 6	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110
TOTAL: 998	998

LEGEND

FEC — SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



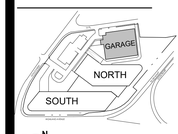
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Issued/Revision	By	Appvd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
30% DESIGN SUBMITTAL			2022.03.30
100% DESIGN SUBMITTAL			2021.12.17

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

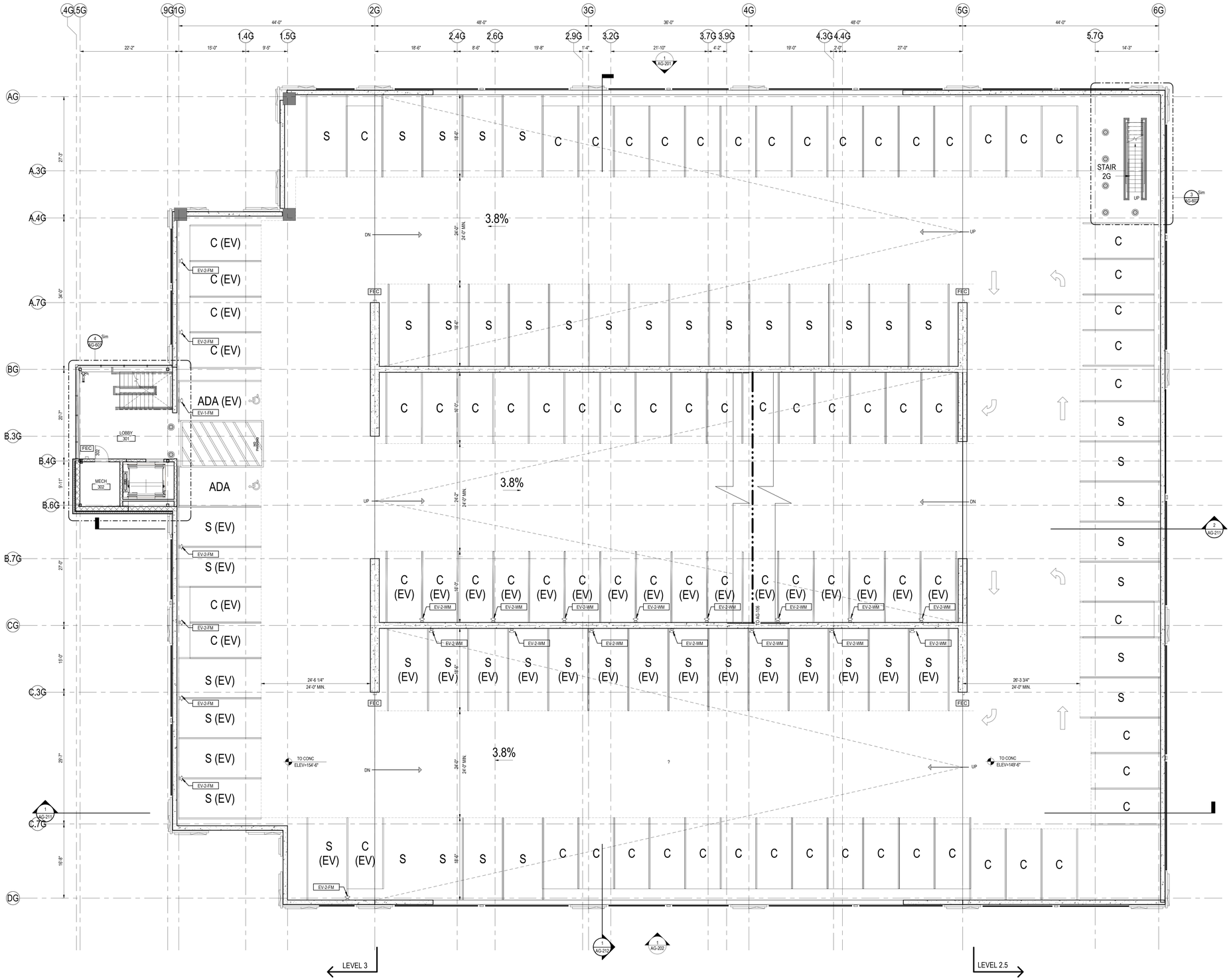
RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL 2

Revision:
Drawing No.
AG-102
GARAGE

<File location>\Project Information>
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ORIGINAL SHEET - ARCH E



1 GARAGE - LEVEL 3 (LEVEL 4-5 SIM.)
AG-103 1/8" = 1'-0"

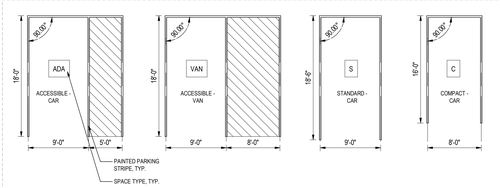
GARAGE PARKING COUNT	
PARKING TYPE	COUNT
GARAGE - LEVEL B2	
ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116
GARAGE - LEVEL B1	
ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119
GARAGE - LEVEL 1	
ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126
GARAGE - LEVEL 2	
ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131
GARAGE - LEVEL 3	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 4	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 5	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 6	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110
TOTAL: 998	998

LEGEND

FEC — SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



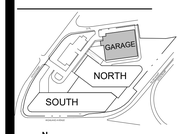
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Issued/Revision	By	Appd	YYYY.MM.DD
SPECIAL PERMIT PACKAGE R1			2022.08.15
30% DESIGN DEVELOPMENT			2022.03.30
100% DESIGN DEVELOPMENT			2022.01.27

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

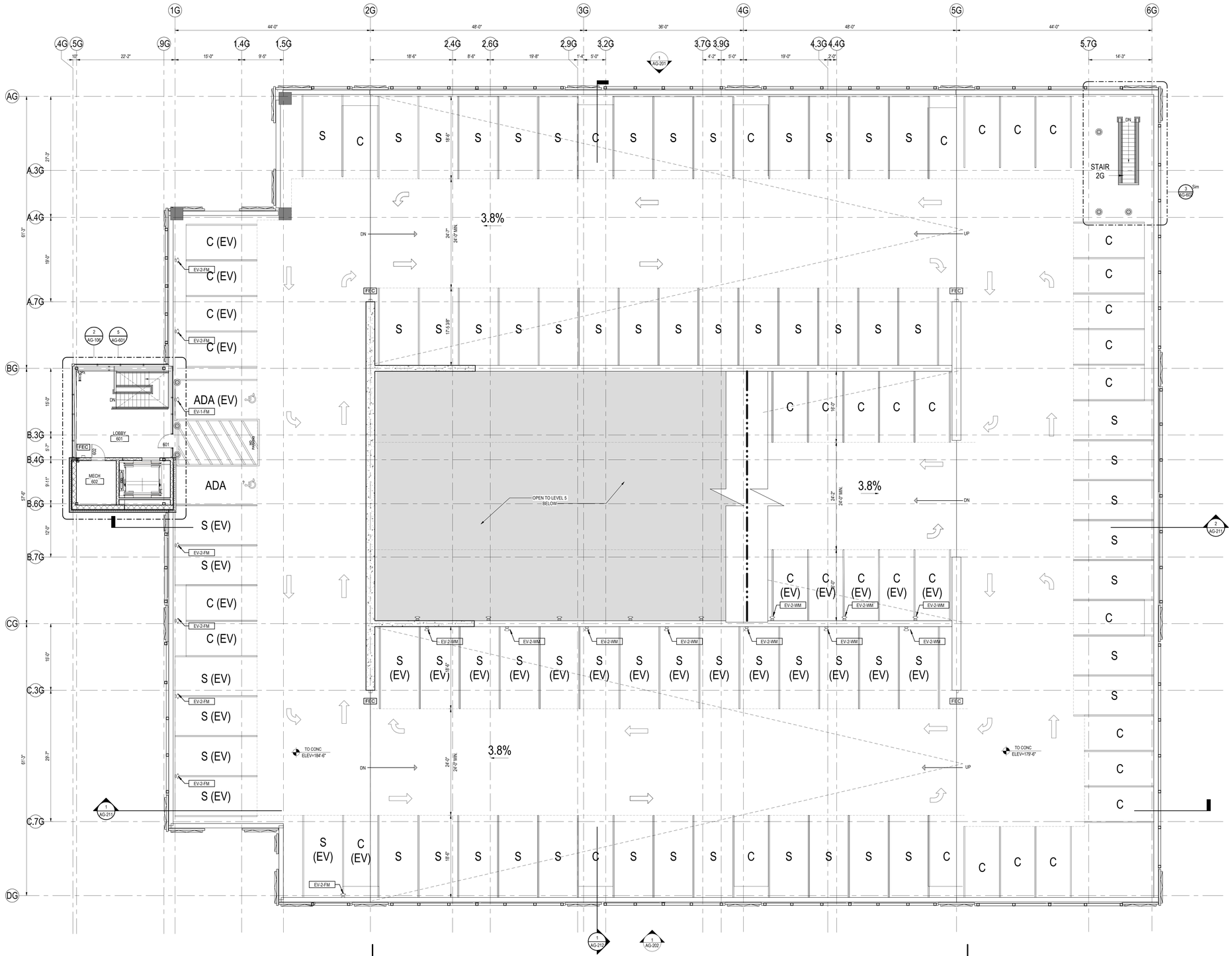
RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL 3 (LEVEL 4-5 SIM.)

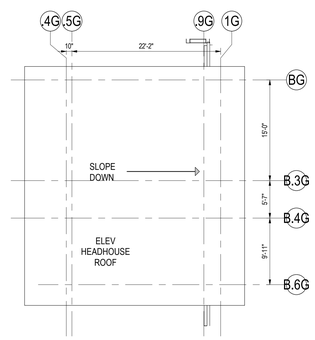
Revision:
Drawing No.
AG-103
GARAGE

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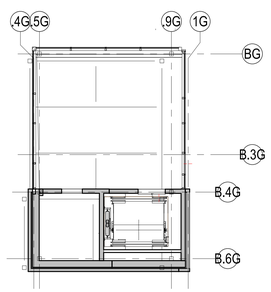
ORIGINAL SHEET - ARCH E



1 AG-106 **GARAGE - LEVEL 6**
1/8" = 1'-0"



2 AG-106 **GARAGE - MAIN ENTRY ROOF**
1/8" = 1'-0"



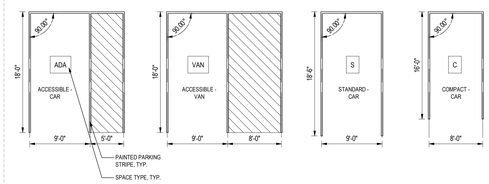
3 AG-106 **GARAGE - LEVEL 6 - RCP**
1/8" = 1'-0"

LEGEND

FEC: SURFACE MOUNTED FIRE EXTINGUISHER CABINET W/ 10lb "ABC" TYPE EXTINGUISHER

75'-0" MAX. DISTANCE PER CODE, TYP.

PARKING LEGEND



GARAGE PARKING COUNT

PARKING TYPE	COUNT
GARAGE - LEVEL B2	
ACCESSIBLE	3
COMPACT	52
STANDARD	61
	116
GARAGE - LEVEL B1	
ACCESSIBLE	3
COMPACT	56
STANDARD	60
	119
GARAGE - LEVEL 1	
ACCESSIBLE - EV SPACE	1
ACCESSIBLE VAN	2
ACCESSIBLE VAN - EV SPACE	1
COMPACT	50
COMPACT - EV SPACE	17
STANDARD	37
STANDARD - EV SPACE	18
	126
GARAGE - LEVEL 2	
ACCESSIBLE	2
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	20
STANDARD	30
STANDARD - EV SPACE	22
	131
GARAGE - LEVEL 3	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 4	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 5	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	56
COMPACT - EV SPACE	23
STANDARD	30
STANDARD - EV SPACE	21
	132
GARAGE - LEVEL 6	
ACCESSIBLE	1
ACCESSIBLE - EV SPACE	1
COMPACT	28
COMPACT - EV SPACE	13
STANDARD	46
STANDARD - EV SPACE	21
	110
TOTAL: 998	998

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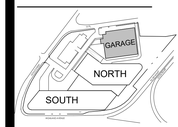
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Consultant

No.	Issued/Revision	By	Appd.	YYYY.MM.DD
1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	SPR SPECIAL PERMIT PACKAGE R2			2022.09.27
3	SPR SPECIAL PERMIT PACKAGE R3			2022.11.17

Permit/Seal





KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: 1/8" = 1'-0"

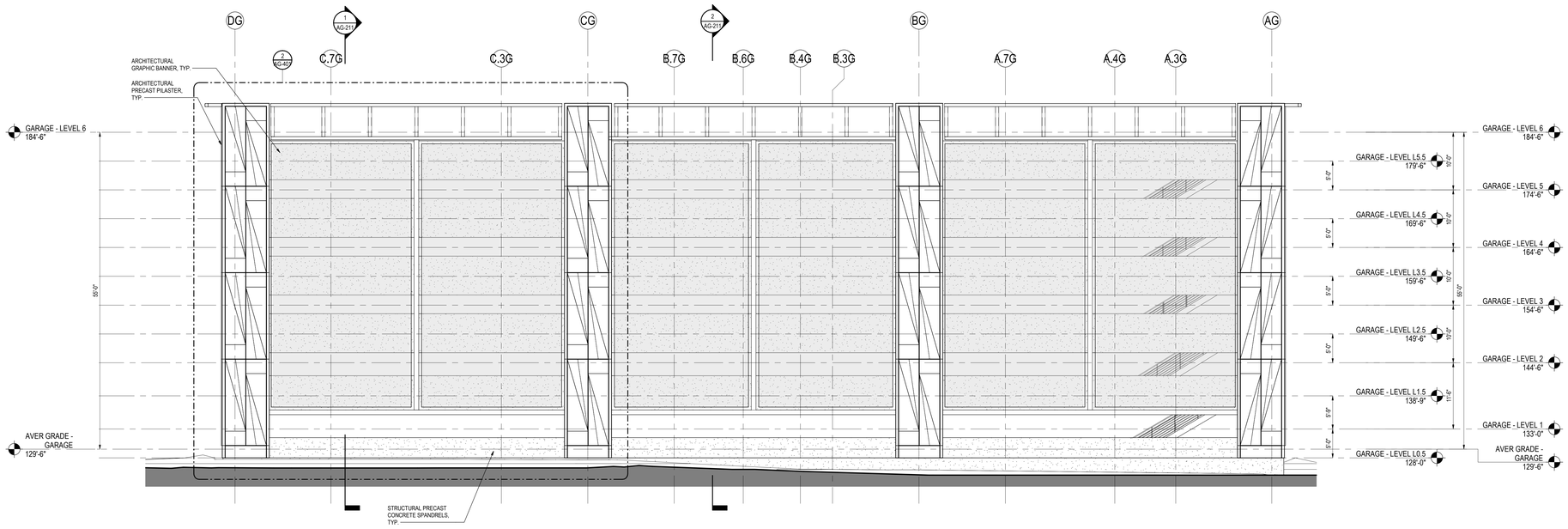
RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE LEVEL 6

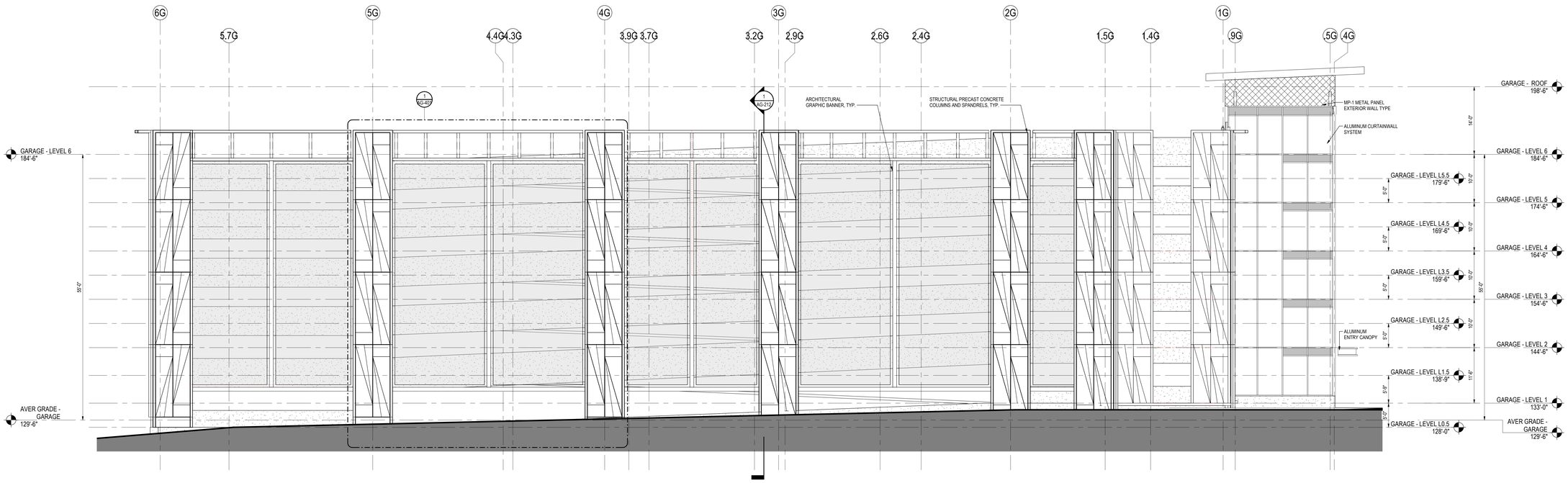
Revision:
Drawing No.
AG-106
GARAGE

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ORIGINAL SHEET - ARCH E



2 AG-201 EAST ELEVATION
1/8" = 1'-0"



1 AG-201 NORTH ELEVATION
1/8" = 1'-0"

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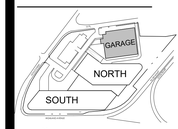
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1	SPECIAL PERMIT PACKAGE R1			2022.08.15
2	SPECIAL PERMIT PACKAGE R2			2022.09.27
3	SPECIAL PERMIT PACKAGE R3			2022.10.27

Permit/Seal





KEY PLAN

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

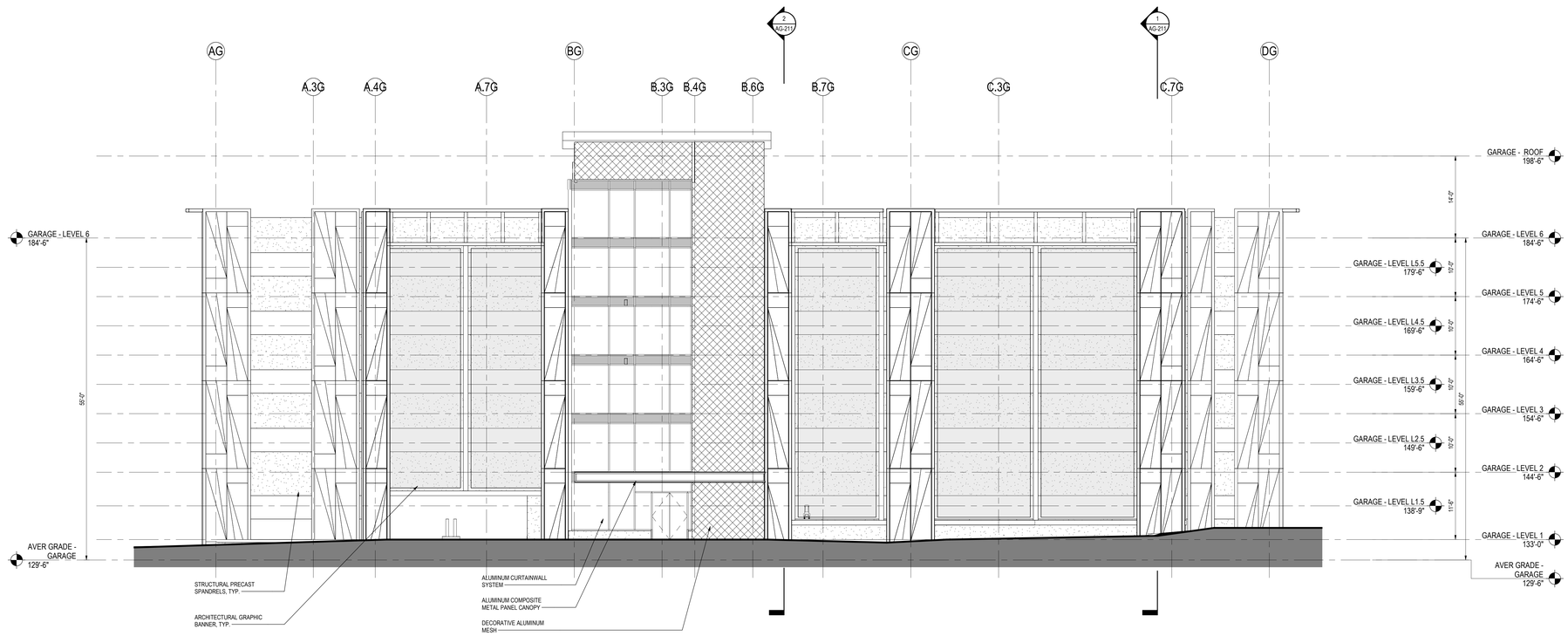
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BS	Designer	TMU	2022.05.27
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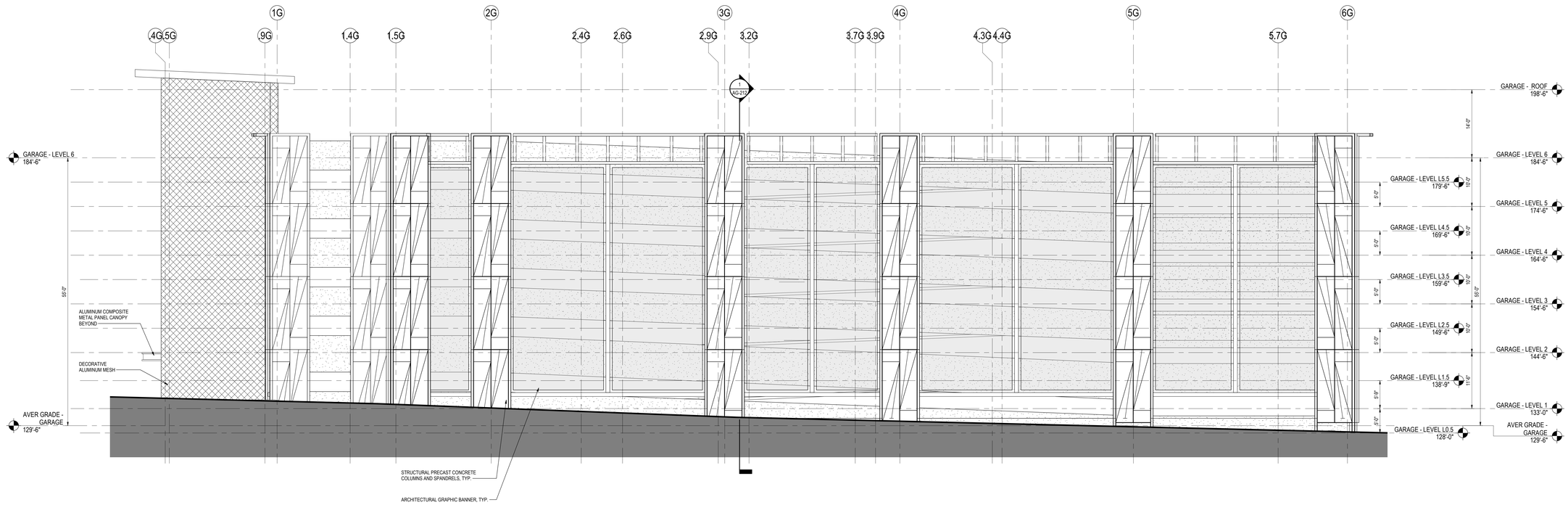
Title
ELEVATIONS - NORTH & EAST

Revision:
Drawing No.
AG-201
GARAGE

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ORIGINAL SHEET - ARCH E



2 AG-202 WEST ELEVATION
1/8" = 1'-0"



1 AG-202 SOUTH ELEVATION
1/8" = 1'-0"

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Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave
Needham, MA 02494

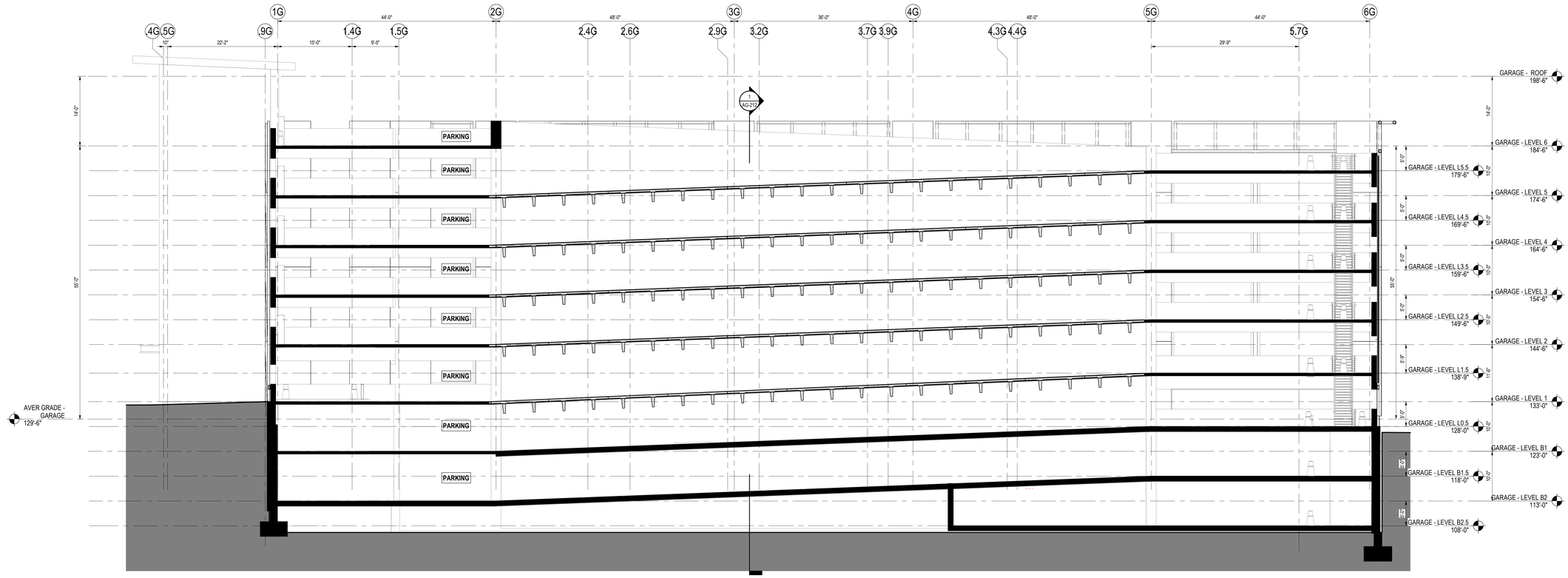
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Title
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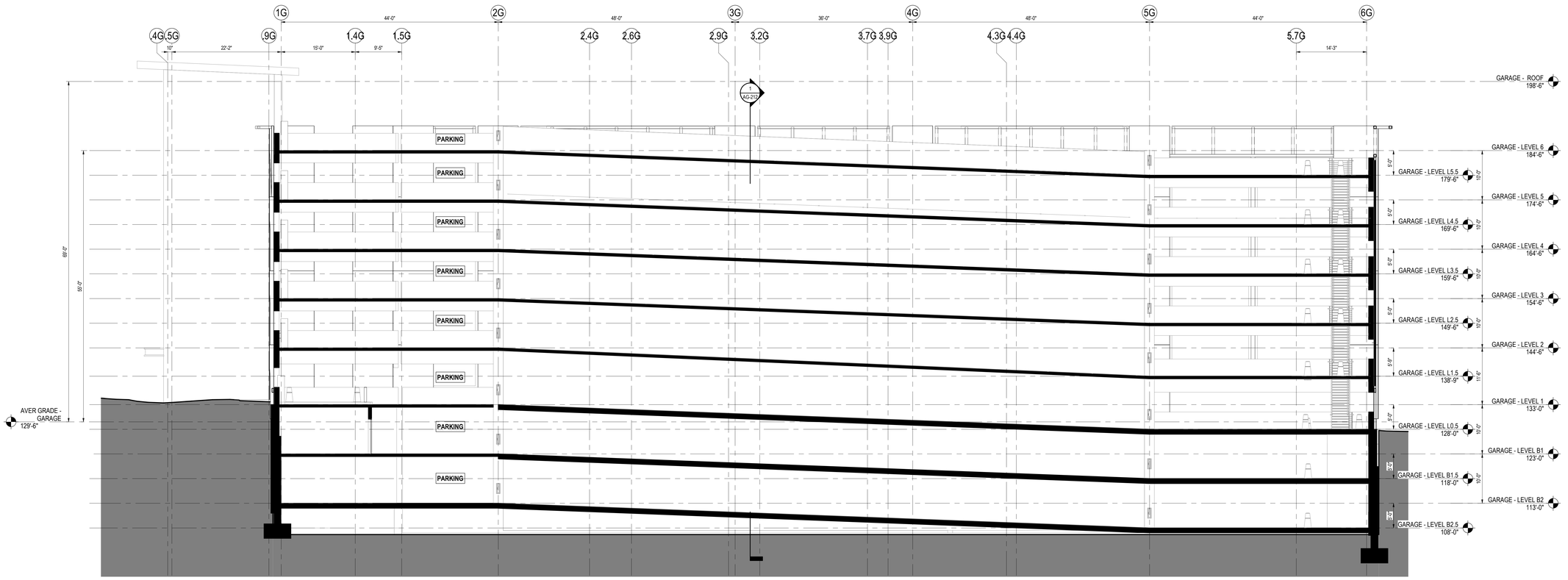
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Drawing No.
AG-202
GARAGE

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ORIGINAL SHEET - ARCH E



2 AG-211 **GARAGE SECTION BB - CENTRAL RAMP**

1/8" = 1'-0"



1 AG-211 **GARAGE SECTION AA - OUTER RAMP**

1/8" = 1'-0"

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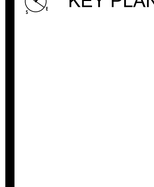
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3	SPECIAL PERMIT PACKAGE R3		2022.10.27	

Permit/Seal





KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave, Needham, MA 02494

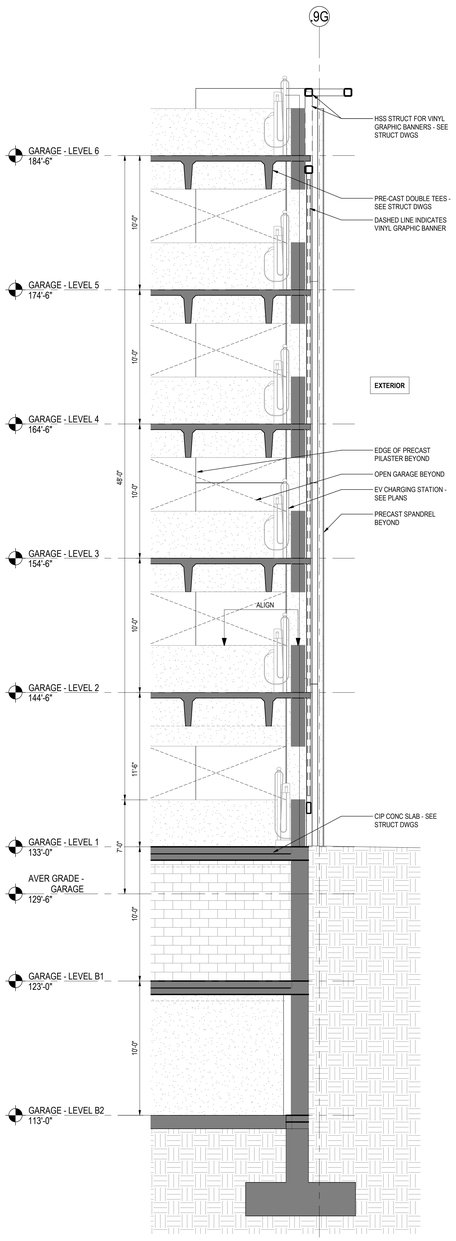
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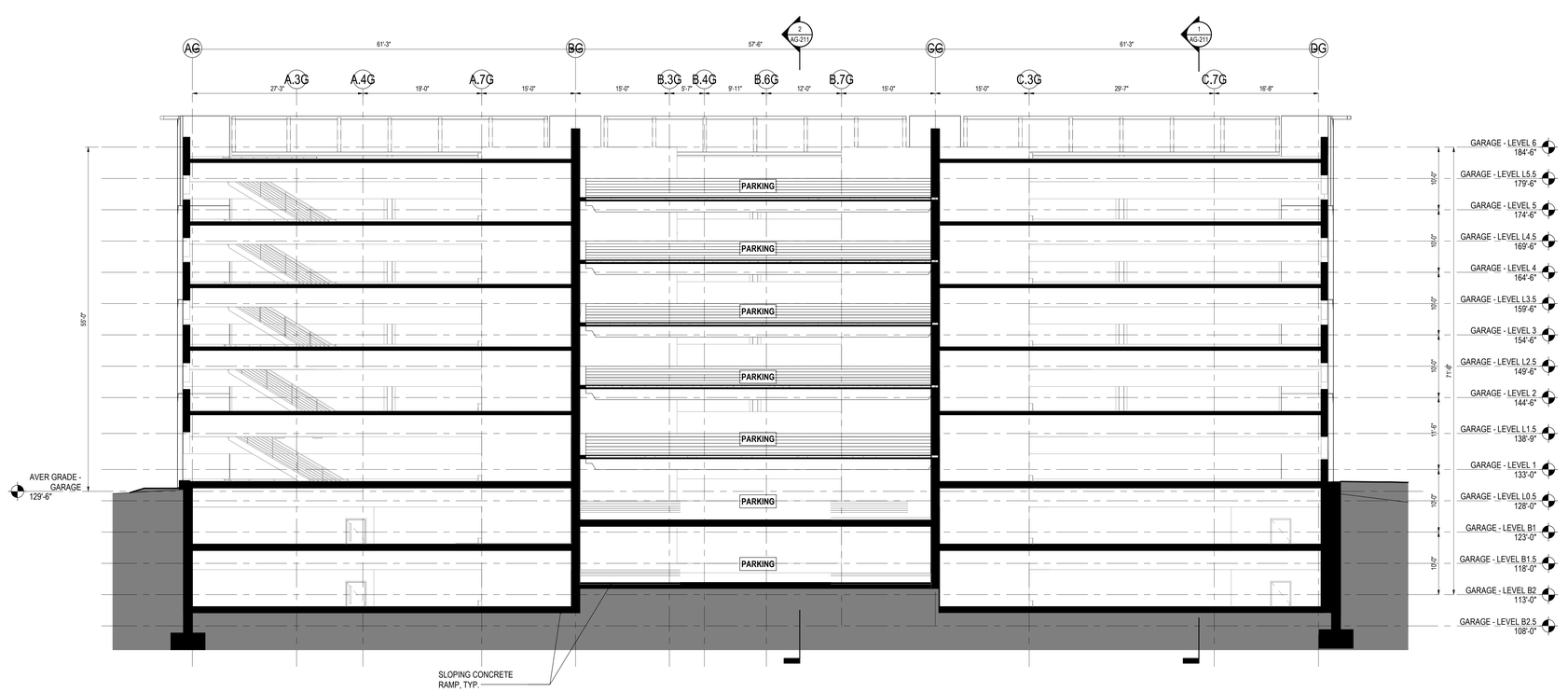
Title
GARAGE SECTIONS

Revision:
Drawing No.
AG-211
GARAGE

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ORIGINAL SHEET - ARCH E



2 AG-212 **TYP. BAY SECTION - FOUNDATION OUTBOARD**
1/4" = 1'-0"



1 AG-212 **GARAGE SECTION CC - Transverse**
1/8" = 1'-0"

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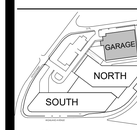
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Consultant

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SPECIAL PERMIT PACKAGE R1			2022.08.15
30% DESIGN SUBMISSION			2022.05.27

Permit/Seal



KEY PLAN

SPECIAL PERMIT PACKAGE R1
08/15/2022
(FOR 09/07/2022 PLANNING BOARD SPECIAL PERMIT PUBLIC HEARING)

Client/Project
Bulfinch
HIGHLAND INNOVATION CENTER - GARAGE
557 Highland Ave.
Needham, MA 02494

Project No.:218421343
File Name: N/A
Scale: As indicated

RS	Designer	TMU	2022.05.27
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GARAGE SECTIONS

Revision:
Drawing No.
AG-212
GARAGE

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ORIGINAL SHEET - ARCH E

REF.: NEX-2200133.00

September 29, 2022

Ms. Lee Newman
Director of Planning and Community Development
Needham Department of Public Works
500 Dedham Avenue
Needham, MA 02492

SUBJECT: Highland Science Center, Gould Street, Needham, MA
Traffic Peer Review – Recommended Conditions of Approval

Dear Ms. Newman:

On behalf of the Town of Needham, ***Greenman-Pedersen Inc.*** (GPI) has conducted a transportation peer review of the proposed Highland Science Center in Needham, Massachusetts, which included an evaluation of the project's traffic impacts, parking provisions, site access and circulation, and safety of the study area intersections. As part of this process, GPI reviewed the following documents provided by the Applicant's consultant team:

- *Transportation Impact and Access Study, Highland Science Center, Needham, Massachusetts*; prepared by Vanasse Hangen Brustlin, Inc. (VHB); March 2022.
- *Environmental Notification Form, Highland Science Center, Needham Heights, Massachusetts;* prepared by VHB; March 2022.
- *Conceptual Design – Offsite Roadway Improvements*; prepared by VHB; June 27, 2022;
- *Response to Transportation Impact and Access Study Traffic Peer Review Comments dated May 27, 2022 by Greenman-Pedersen Inc. (GPI), 557 Highland Avenue, Needham, Massachusetts*; prepared by VHB; June 29, 2022.
- *Revised Site Plan, Highland Science Center, Needham Heights, Massachusetts*; prepared by VHB; July 14, 2022.
- *Draft Environmental Impact Report, Highland Science Center, Needham Heights, Massachusetts;* prepared by VHB; July 2022;
- *Needham Special Permit Package R1, 557 Highland Avenue, Needham, MA;* prepared by Stantec and VHB; August 15, 2022;
- *Highland Innovation Center – 557 Highland Avenue, Needham Heights, Massachusetts – Application for Major Project Site Plan Review and Special Permits – Revisions dated as of September 7, 2022 Planning Board Public Hearing Letter #3;* prepared by Goulston & Storrs; August 15, 2022.
- *Response to MEPA DEIR – Traffic Peer Review by Greenman-Pedersen Inc. (GPI) dated 8/18/2022, 557 Highland Avenue, Needham, Massachusetts;* prepared by VHB; August 29, 2022.

Based on our review of the documents described above, the Applicant has provided a satisfactory assessment of the Project's impacts on the surrounding area roadway network and has identified appropriate measures to mitigate the Project-specific impacts to the study area intersections. Should the Town of Needham Planning Board vote to approve the Special Permit Application for this development, GPI recommends the following conditions of approval be included as part of the decision in order to ensure the Project's impacts are sufficiently mitigated.

A. Pre-Construction Studies

Prior to commencing construction on the site, the Applicant will:

1. Collect existing conditions traffic volume counts along Sachem Road and Noanett Road to establish a baseline condition on these roadways. These will include a minimum of 48-hour automatic traffic recorder (ATR) counts to obtain weekday daily traffic volumes on both roadways. In addition, turning movement counts (TMCs) will be collected during the weekday AM (7:00 AM – 9:00 AM), weekday midday (11:00 AM – 1:00 PM), and weekday PM (3:00 PM – 6:00 PM) peak periods at the following intersections:
    - Central Avenue / Noanett Road
    - Gould Street / Noanett Road
    - Hunting Road / Sachem Road
    - Highland Avenue / Mills Road
    - Highland Avenue / Utica Road

    This traffic count data will be used to create a baseline condition for comparison to post-occupancy traffic counts in order to assess any increase in cut-through traffic generated by the Project on Noanett Road and Sachem Road.

B. Off-Site Roadway Improvements

Prior to the issuance of a Certificate of Occupancy for the site, the Applicant will complete the following off-site improvement measures:

1. Implement signal timing modifications to optimize traffic operations at the following intersections:
    - Highland Avenue / West Street
    - Highland Avenue / Webster Street
    - Highland Avenue / 1st Avenue
    - Hunting Road / Kendrick Street

2. Adjust the yellow and red clearance intervals at the Hunting Road / Kendrick Street intersection consistent with current design standards for the geometry of the intersection to improve safety.

3. Install NO THRU TRAFFIC or LOCAL TRAFFIC ONLY regulatory signage at the following locations:
    - Noanett Road facing Gould Street
    - Noanett Road facing Central Avenue
    - Mills Road facing Highland Avenue
    - Utica Road facing Highland Avenue
    - Sachem Road facing Hunting Road

4. *Central Avenue / Gould Street:*
    a. Install a fully-actuated traffic control signal with video detection and Opticom for emergency vehicle activation;
    b. Restripe Central Avenue to provide a dedicated left-turn lane on Central Avenue westbound and a single through lane in each direction;
    c. Install new crosswalks with ADA-compliant curb ramps and APS pedestrian signals with countdown indications and vibro-tactile push-buttons on all three approaches; and
    d. Provide dedicated signal phases for the two residential driveways within the intersection.

5. *Gould Street / Noanett Road:*
    a. Reconstruct curb ramps on the northwest and southwest corners of the intersection to provide ADA accessibility and stripe a new crosswalk across Noanett Road.

6. *Gould Street Pedestrian and Bicycle Enhancements*
    a. Install a 10-foot two-way bicycle track and 8-foot sidewalk along the easterly side of Gould Street between Highland Avenue and the former railroad track approximately 150 feet north of TV Place;
    b. Provide a 4-foot bicycle accommodating shoulder along the westerly side of Gould Street between TV Place at Highland Avenue;
    c. Install a crosswalk at the northerly end of the bicycle track at the former railroad crossing and install Rectangular Rapid Flash Beacons (RRFBs) with a passive detection system for pedestrians and bicyclists; and
    d. Reconstruct the sidewalk along the westerly side of Gould Street between Highland Avenue and Noanett Road to provide a 6-foot ADA-compliant sidewalk.

7. *Gould Street / TV Place:*
    a. Widen Gould Street to provide a left-turn lane and a through lane on the Gould Street southbound approach and a single lane on the northbound approach; and
    b. Widen TV Place to provide separate left- and right-turn lanes exiting to Gould Street and a single entrance lane with 8-foot sidewalks on either side of TV Place.

8. *Gould Street / Site Driveway / Wingate Driveway*
    a. Widen Gould Street southbound to provide a dedicated left-turn lane, a through lane, and a shared through/right-turn lane;
    b. Widen Gould Street northbound to provide a 50-foot left-turn pocket, a through lane, and a right-turn lane;
    c. Construct the driveway to provide a dedicated left-turn lane and a shared left/through/right-turn lane;
    d. Install a fully-actuated traffic signal with video detection and Opticom for emergency vehicle activation; and
    e. Install cross-ways with ADA-accessible curb ramps and APS pedestrian signals with count-down indications and vibro-tactile push-buttons across all four approaches to the intersection.

9. *Highland Avenue / Gould Street / Hunting Road:*
    a. Widen the Gould Street southbound approach to provide two left-turn lanes and a shared through/right-turn lane with a minimum 4-foot bicycle-accommodating shoulder;
    b. Reconstruct the median island on Highland Avenue eastbound to accommodate the left-turn onto Gould Street;
    c. Reconstruct the median island on Highland Avenue westbound to accommodate the left-turn double left-turn from Gould Street onto Highland Avenue;
    d. Reconstruct crosswalks and curb ramps on the Highland Avenue eastbound and Gould Street southbound approaches consistent with ADA guidelines;
    e. Install new traffic signal equipment as necessary to accommodate the geometric changes to the intersection, including, but not limited to, mast arms, vehicle detection, signal heads, conduit, pull-boxes, signage, etc.;
    f. Replace the existing traffic signal controls with adaptive traffic signal controls to allow for improved optimization of traffic operations; and
    g. Upgrade pedestrian signals to APS signals with countdown indications and vibro-tactile push-buttons.

10. *Hunting Road:*
    a. Fund the installation of two radar-embedded speed limit signs on Hunting Road as locations to be determined in coordination with the Needham Police Department to control speeds.

C. <u>Transportation Demand Management</u>

1. Provide an Employee Transportation Advisor who will coordinate with the local Transportation Management Association;

2. Provide up to 104 secure, covered bicycle parking spaces for Tenant's employees and up to 50 public bicycle spaces for visitors and patrons;

3. Install EV charging stations at a minimum of 25 percent of the parking spaces provided within each parking lot/garage area. Provide free EV charging for all employees for at least the first five years following issuance of a Certificate of Occupancy;

4. Provide a shuttle between the site and nearby public transportation services, including the commuter rail at Needham Heights and the Green Line D Branch at Newton Highlands. The Applicant will allow area residents and employees to utilize the shuttle;

5. Require tenants to provide a 50 percent transit pass subsidy for employees;

6. Implement carpool assistance and incentives for employees;

7. Provide incentives and amenities for bicycling and walking;

8. Provide a guaranteed ride home to all employees using public transit, walking, bicycling, or carpooling to work;

9. Provide on-site locker rooms and showers for employees; and

10. Display transportation-related information and tenant's employees and visitors in the main lobby.

D. <u>Transportation Monitoring Program</u>

Within one year, and at least six months following, initial occupancy of the proposed development, the Applicant will conduct a transportation monitoring program to include the following:

1. Trip Generation:

a. Collect automatic traffic recorder (ATR) or turning movement counts (TMCs) at the site driveway intersections with TV Place and Gould Street to verify the trip generation characteristics of the development during the weekday daily, weekday AM peak hour, and weekday PM peak hour time periods.

b. Should the actual trip generation of the site exceed the trip generation estimates contained in the *Draft Environmental Impact Report*[1] by more than 10 percent, the Applicant will evaluate and implement measures to reduce vehicle trip generation, including implementation of additional Transportation Demand Management (TDM) measures.

c. Should the actual trip generation of the site exceed the trip generation estimates contained in the *Draft Environmental Impact Report*[2] by more than 10 percent, the Applicant will work with MassDOT and the Town of Needham to assess whether the Transportation Monitoring Program should be expanded to assess the Project's impacts on additional intersections.

2. Traffic Operations:

a. Collect turning movement counts (TMCs) during the weekday AM (7:00 AM – 9:00 AM) and weekday PM (3:00 PM – 6:00 PM) peak periods at the following intersections:

[1] *Draft Environmental Impact Report, Highland Science Center, Needham Heights, Massachusetts*; prepared by Vanasse Hangen Brustlin, Inc.; August 2022.
[2] *Draft Environmental Impact Report, Highland Science Center, Needham Heights, Massachusetts*; prepared by Vanasse Hangen Brustlin, Inc.; August 2022.

- Central Avenue / Gould Street
- Gould Street / TV Place
- Gould Street / Site Driveway / Wingate Driveway
- Highland Avenue / Gould Street / Hunting Road

b. Conduct capacity and queue analyses to evaluate the operations of the intersections listed in Item D.2.a during the weekday AM and PM peak hours and compare the results of the traffic operations analysis to the analysis projections contained in the August 29, 2022 *Response to Comments*[3].

c. The Applicant will evaluate and implement additional measures to mitigate project impacts should the results of the capacity and queue analyses indicate any of the following occurs:
   i. Any movement at any of the study area intersections exceeds capacity (volume-to-capacity (V/C) ratio exceeds 1.00);
   ii. Delay increased by more than ten seconds for any movement operating at level-of-service (LOS) E or F;
   iii. Queues in any lane exceed the storage capacity of that lane AND increased over projected queues in the *Response to Comments* by two vehicles (50 feet) or more; or
   iv. Queues in any lane increased over projected queues in the *Response to Comments* by four vehicles (100 feet) or more.

3. Cut-Through Traffic:

a. Collect a minimum of 48-hour automatic traffic recorder (ATR) counts to obtain weekday daily traffic volumes on Noanett Road and Sachem at the same locations as collected as part of the Pre-Construction Study. In addition, turning movement counts (TMCs) will be collected during the weekday AM (7:00 AM – 9:00 AM), weekday midday (11:00 AM – 1:00 PM), and weekday PM (3:00 PM – 6:00 PM) peak periods at the following intersections:
   - Central Avenue / Noanett Road
   - Gould Street / Noanett Road
   - Hunting Road / Sachem Road
   - Highland Avenue / Mills Road
   - Highland Avenue / Utica Road

b. Compare the post-occupancy traffic volumes along Noanett Road and Sachem Road to those collected pre-construction to assess whether any measurable increase in cut-through traffic has resulted from the proposed development. Should traffic volumes on Noanett Road or Sachem Road increase by more than 10 percent over the pre-construction traffic counts, the Applicant will take additional measures to reduce cut-through traffic, including, but not limited to:
   i. Coordination with the Needham Police Department for increase enforcement;
   ii. Installation of radar speed indication signage along the subject roadway;
   iii. Installation of traffic calming devices such as speed tables, chicanes, bump-outs, or other devices; and/or
   iv. Implementing signal timing modifications or other improvements at the Central Avenue / Gould Street and/or Highland Avenue / Gould Street / Hunting Road intersection, as necessary, to reduce the apparent benefit of cut-through behavior in the neighborhoods.

c. Following implementation of any additional cut-through mitigation measures as described in item D.2.b, the Applicant will conduct additional traffic volume counts to ensure that the implemented measure(s) were effective in reducing cut-through traffic.

[3] *Response to MEPA DEIR – Traffic Peer Review by Greenman-Pedersen Inc. (GPI) dated 8/18/2022, 557 Highland Avenue, Needham, Massachusetts;* Prepared by Vanasse Hangen Brustlin, Inc.; August 29, 2022.

3. On-Site Parking Utilization Study

a. Conduct a parking utilization study on weekday between 8:00 AM and 4:00 PM to assess the occupancy of each parking area within the site, including the two garages and the surface lot. This study will include a review of EV charging stations, compact car parking, and any provided carpool or otherwise designated parking spaces to assess the adequacy of these spaces in accommodating the peak parking demand.

b. Should the results of the parking study indicate that more than 90 percent of the EV charging stations are occupied during the peak period, the Applicant will install additional EV charging stations to accommodate additional parking demand.

c. Should the overall parking demand exceed 95 percent of the parking supply, the Applicant will identify and implement measures to reduce parking demand and perform an additional post-implementation assessment to verify the effectiveness of the implemented measures.

The Transportation Monitoring Program will continue on an annual basis for a period of five years following initial occupancy of the development. The findings of the Transportation Monitoring Program will be provided to the Needham Planning Department and Planning Board for review.

With implementation of the mitigation measures described above and completion of the post-occupancy monitoring program, the traffic generated by the proposed Highland Science Center can be safety and efficiently accommodated along the study area roadways and intersections.

Should you have any questions regarding these comments, please contact me directly at 603-766-5223.

Sincerely,

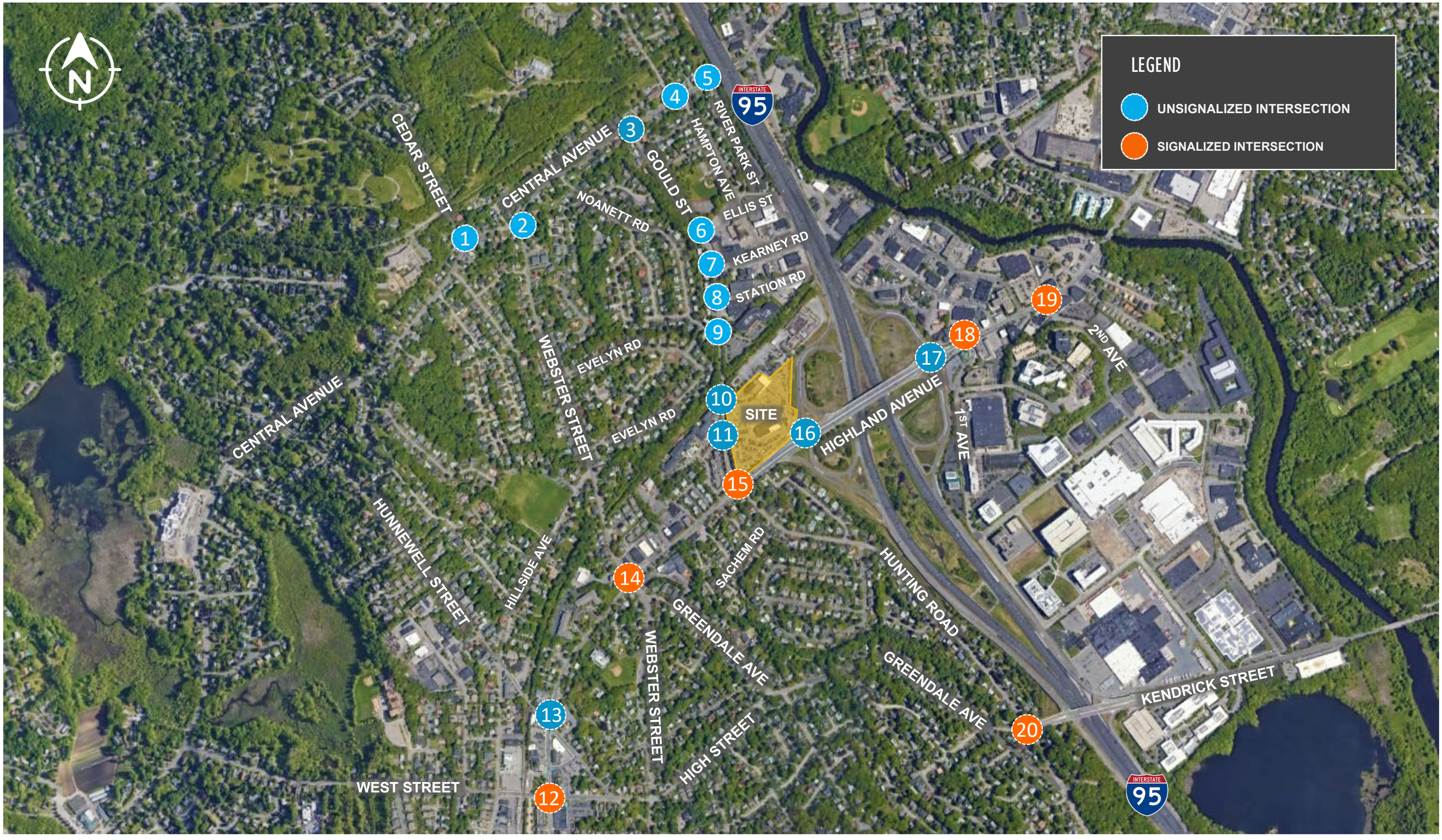
GREENMAN–PEDERSEN, INC.



Rebecca L. Brown, P.E.
Senior Project Manager

Highland Science Center
Needham, Massachusetts

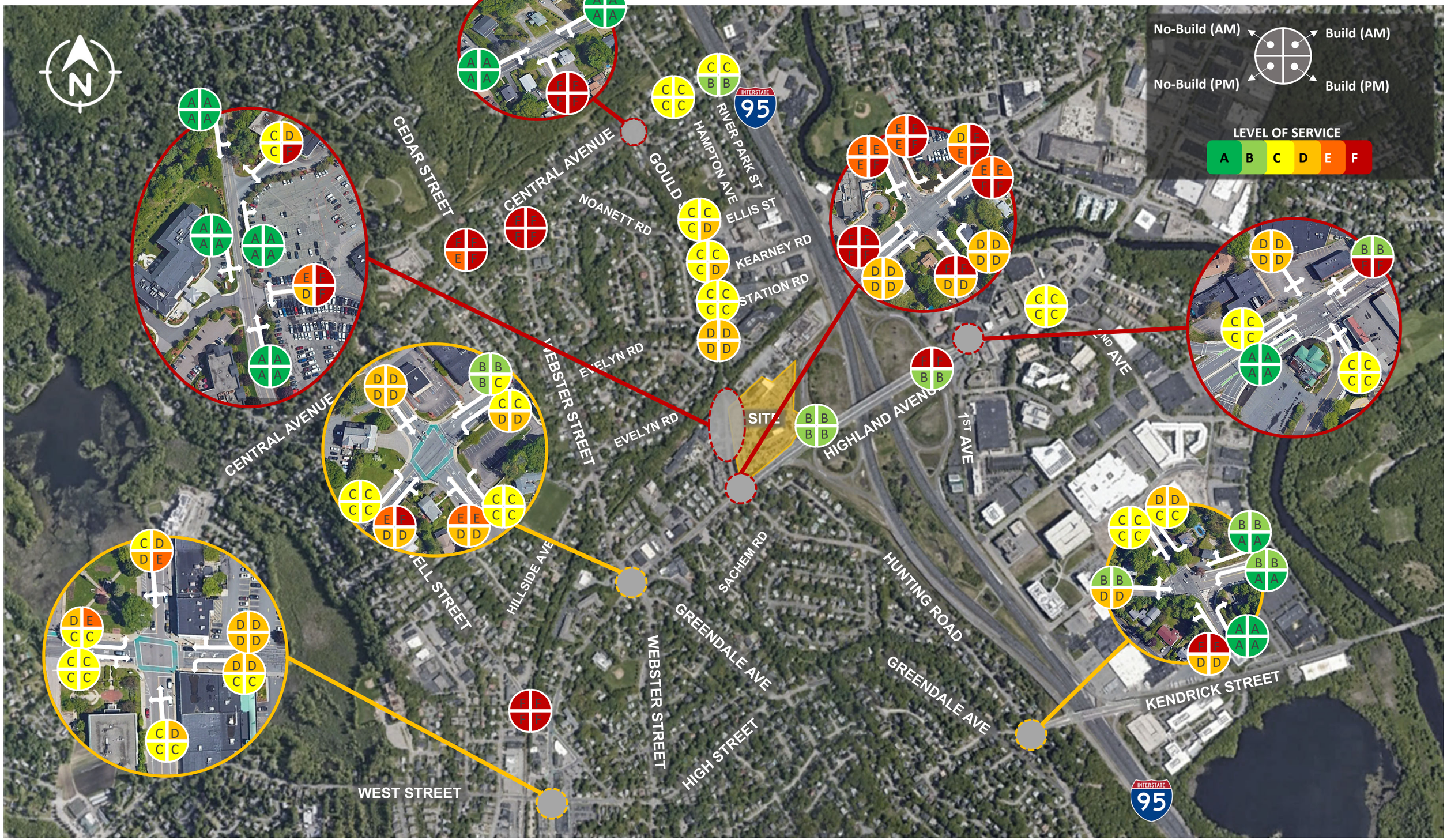
Planning Board Meeting
October 3, 2022



Greenman-Pedersen, Inc. || 181 Ballardvale Street, Suite 202, Wilmington, MA 01887

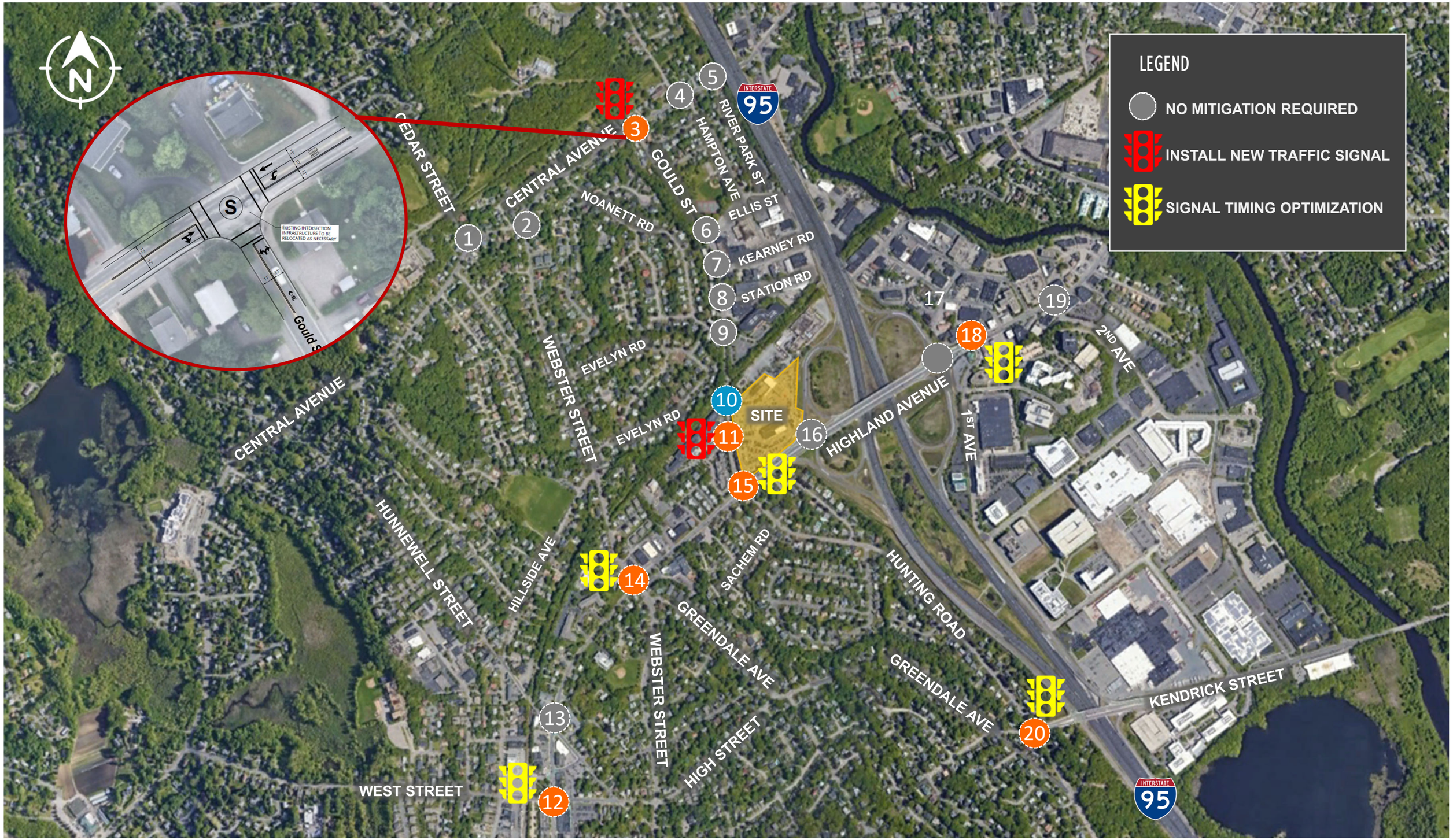
HIGHLAND SCIENCE CENTER – NEEDHAM, MASSACHUSETTS

STUDY AREA



GPI
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HIGHLAND SCIENCE CENTER – NEEDHAM, MASSACHUSETTS

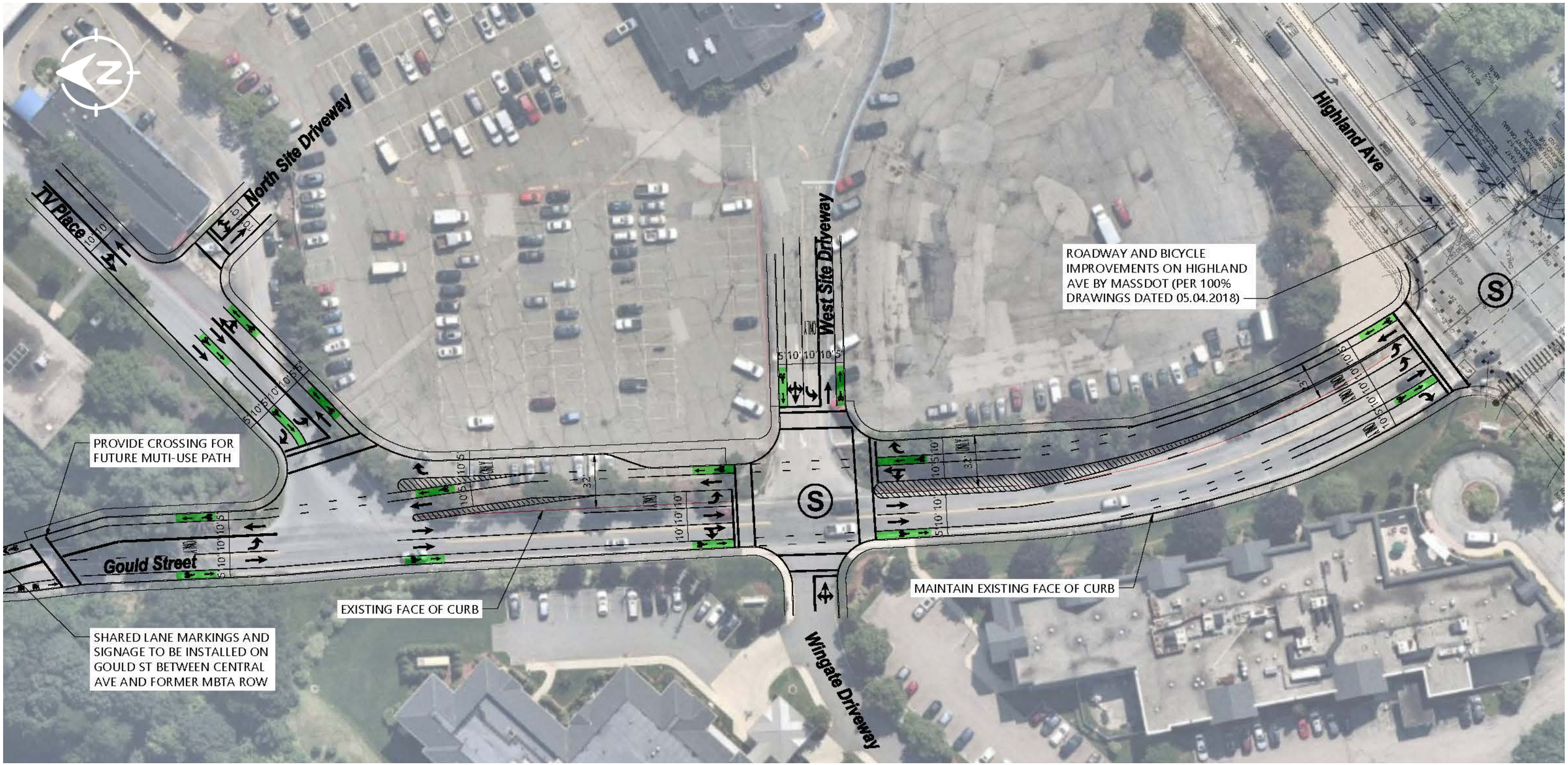
LEVEL-OF-SERVICE (LOS) – 2029 NO-BUILD VS BUILD



Greenman-Pedersen, Inc. || 181 Ballardvale Street, Suite 202, Wilmington, MA 01887

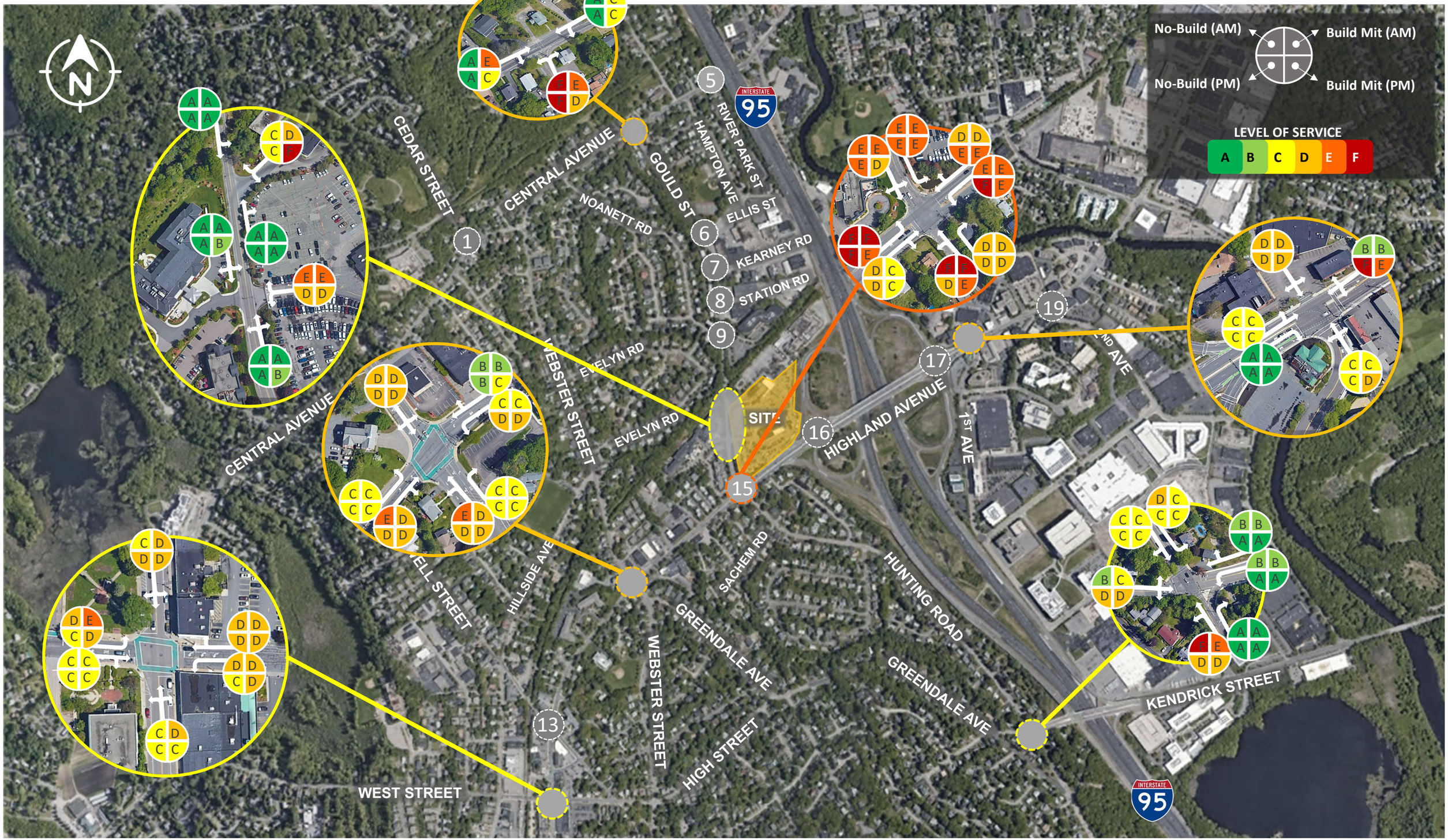
HIGHLAND SCIENCE CENTER – NEEDHAM, MASSACHUSETTS

PROPOSED MITIGATION



GPI
Greenman-Pedersen, Inc. || 181 Ballardvale Street, Suite 202, Wilmington, MA 01887
HIGHWAY COMMERCIAL 1 – NEEDHAM, MASSACHUSETTS

PROPOSED IMPROVEMENTS



GPI
Greenman-Pedersen, Inc. || 181 Ballardvale Street, Suite 202, Wilmington, MA 01887
HIGHLAND SCIENCE CENTER – NEEDHAM, MASSACHUSETTS

LEVEL-OF-SERVICE (LOS) – 2029 NO-BUILD VS BUILD MITIGATED

goulston&storrs
counsellors at law

September 30, 2022

BY HAND DELIVERY, OVERNIGHT DELIVERY & ELECTRONIC MAIL

Town of Needham Planning Board Members
Public Service Administration Building
500 Dedham Avenue
Needham, MA 02492
Attn: Lee Newman, Planning Director

Re: Highland Innovation Center – 557 Highland Avenue, Needham Heights, Massachusetts (the "Property")

Dear Planning Board Members:

As you know, this office is counsel to 557 Highland, LLC, an affiliate of The Bulfinch Companies, Inc. (the "Applicant"), in connection with the redevelopment of the Property with a new, mixed-use development of office, laboratory, research and development, and retail/restaurant uses (the "Project"). On April 5, 2022, the Applicant submitted an application for Major Project Site Plan Review and issuance of Special Permits for the Project, all as described in our letter of that date, as supplemented by letters dated June 30, 2022 and August 15, 2022 (collectively, the "Application"). Under separate cover you should have received materials from the Project architect, Stantec, for review at the upcoming public hearing on October 3, 2022. The Application is under review by the Board and, in connection therewith, the Board has held three (3) public hearings, on June 7, 2022, July 7, 2022, and September 7, 2022 to discuss and evaluate the Project and receive public comment. The Applicant has also held seven (7) community meetings with the general public as part of a robust community engagement process. At the public hearing on September 7, 2022, the Board heard comments from a few community members. The Applicant seeks to clarify responses to a few of those comments and reaffirm the Project's merits and the Town's thoughtful rezoning of the Property that allows for the Project.

* * *

The Planning Board and the Town Have Considered Concerns Regarding Density, Landscaped Buffers, Traffic Impacts, and Environmental Issues During the Re-Zoning of the Property

The HC-1 District was established by an amendment to the Town of Needham Zoning By-Law (as amended, the "By-Law") adopted by a 168-37 super-majority vote of Town Meeting pursuant to Article 5 of the Annual Town Meeting held on May 3, 2021. The creation of the HC-1 District was the result of an extensive, multi-year planning effort by the Town and was based on the results of several studies, including studies related to traffic and fiscal impacts. Details on this process were provided in our April 5, 2022 letter. At the October 2019 Town Meeting, the public expressed concerns about density, traffic impacts, certain uses, and environmental issues related to the creation of the HC-1 District.

In response to those concerns, a Town-wide community meeting was held with stakeholders in January 2020 to discuss overall land use goals for the to-be-established HC-1 District. A working group was formed. That group obtained an updated traffic study of the area, to analyze the ability of the Town's traffic infrastructure to accommodate development at various densities and use profiles, and an updated fiscal impact analysis. Building on these analyses, the Planning Board drafted a revised zoning article to

establish the HC-1 District that was responsive to the discussions held and specific concerns expressed during this planning period.

The Planning Board's revised proposal (a) established a maximum FAR of 1.35, (b) reduced the maximum number of stories by 1 story, (c) increased the building setbacks along Gould Street and Highland Avenue from 20 to 50 feet, (d) increased the required open space from 20% to 25%, and (e) added green building standards to the special permit criteria.

The HC-1 District setbacks, height, and FAR are more restrictive of development than the New England Business Center and Highland Commercial-128 Districts, which also abut Route 128 and residential districts: (a) front setbacks in HC-1 are 50 feet, but in the other two districts are waivable down to 20 feet; (b) maximum height in HC-1 by special permit is 70 feet, but in the NEBC is 84 feet; (c) maximum special permit FAR in HC-1 is 1.35, but in NEBC it is 2.0, and in HC-128 it is 1.5.

Persuaded that the concerns of the public had been properly addressed, Town Meeting approved the revised HC-1 District zoning by a vote of 168-37 on May 3, 2021.

The Project complies with HC-1 District Requirements

The Project meets or otherwise complies with each of the following HC-1 District requirements:

- **Floor Area Ratio ("FAR")** – The HC-1 District allows an FAR of 0.7 as of right and of up to 1.35 by Special Permit. ***The Project's proposed FAR of 1.21 is less than the maximum allowed in the HC-1 District.***
- **Review Process –** The HC-1 District was designed to ensure that projects seeking an FAR in excess of 0.7 undergo a thorough review. ***With more than three nights of public hearings and seven community meetings held to review the Project, and two Design Review Board meetings and eleven Town Department meetings, the zoning is working as intended.***
- **Dimensional Controls** – The HC-1 District was designed to require very specific setbacks to mitigate bulk and density impacts from a redevelopment of the Property. These setbacks determine the location of structures, provide significant vegetative and landscaped areas, limit maximum lot coverage, and ensure specified minimum open space. ***The Project adheres to all of these specific requirements.***
- **Transportation** – A key piece of the adoption of the HC-1 District was the potential traffic and roadway improvements that could result as public benefits from redevelopment, including the widening of Gould Street and associated intersection improvements. ***The Project will provide substantial traffic and roadway improvements as confirmed by the Town's independent traffic consultant, Greenman-Pedersen, Inc ("GPI")***.
- **Fiscal** – The fiscal impact analysis commissioned by the Town in connection with the rezoning found that a full-build out of the Property at 1.35 FAR would yield an annual net financial benefit to the Town of approximately $5,000,000. This is independent of the WCVB Channel 5 site, which is not part of the Project, and which could provide additional financial benefits if and when that site is developed. The Project is proposing less density than was contemplated at the time the HC-1 District was approved by Town Meeting, but still is expected to create an annual net financial benefit of approximately $5,300,000 ***The Project is expected to generate income in excess of the revenue projected for the Project as stated in the Town's fiscal impact analysis. In***

addition, over $1,000,000 in impact fees as well as over $2,000,000 in building permit fees will be generated from the Project.

The nature and scale of the Project is entirely consistent with that which was studied and contemplated at the time the Town Meeting resoundingly adopted the HC-1 District.

Refinements to Project in Response to Community Feedback

The rigorous public review of the Project has encompassed four (4) public hearings (including the upcoming October 3, 2022 hearing) with the Planning Board, two (2) meetings with (and subsequent approval by) the Design Review Board, and a voluntary community engagement process, including seven (7) community meetings and other independent outreach to stakeholders. The Applicant has met with various other Town boards and officials, including the Fire Chief, the Police Chief, and the representatives of the Department of Public Works. The Applicant has also investigated the sewer line issue referenced at the September 7, 2022 hearing and concluded this was due to a maintenance problem rather than an inherent defect in the system.

The Applicant, as an affiliate of The Bulfinch Companies, is a well-recognized local developer that owns and operates a significant number of commercial properties in the Town of Needham and City of Newton, representing the Applicant's commitment to the community.

The Applicant has implemented responsive improvements and refinements that have enhanced the design and made the Project better for the Town and nearby neighborhoods, including:

1. **Reduction in Size**
   (i) On April 8, 2022 the Applicant submitted an Environmental Notification Form ("ENF") to the MEPA Office for a Project of 531,000 square feet (sq. ft.)
   (ii) Upon receiving input from members of the public and prior to submitting the Application, the Project was reduced by approximately 24,306 sq. ft.
   (iii) Following comments from the Board and its traffic peer review consultant, GPI, the North and South Buildings were further reduced by approximately 16,694 sq. ft. and the Garage was reduced by approximately 5,412 sq. ft.
   (iv) Following comments from the Board, the South Building's massing was reduced by 15,000 sq. ft. The Project's reduced size is now 475,000 sq. ft. (FAR 1.21).
   (v) Since April 2022, the Project has been reduced by more than 55,000 sq. ft.
2. **Building Design Improvements**
   (i) In response to public comments, the Applicant redesigned the North Building to include stepped façade to break up the building's scale, and introduced a bend in the footprint of the South Building, creating room for a plaza. The Applicant also redesigned the South Building to bend away from the Gould Street and Highland Avenue intersection and further stepped the massing down to a 1-story "retail pavilion" and south-facing plaza, to support the retail/restaurant uses.
   (ii) In response to comments from the Planning Board, the loading dock areas for the North and South Buildings were relocated to minimize visibility from public ways.
   (iii) In response to comments from the Planning Board, the Applicant pushed back the third-floor massing of the South Building along Highland Avenue, and created a "reveal" to emphasize the two-story massing and create a stronger relationship to the residential scale across

Highland Avenue. In addition, the mechanical penthouse screening was broken down in scale with the use of profiled and perforated metal panels.

3. **Site Design Improvements**
   (i) The community engagement process resulted in the Applicant adding pickleball courts, a winter ice skating area, and public lawn/turf areas.
   (ii) The Applicant reimagined the planting design in order to provide (i) a greater number of street trees to provide more screening and shade along the public walkways; (ii) a greater number of plantings throughout the Property (more than double) with greater diversity to provide more interest for the public and attract more wildlife; and (iii) a reduction in the amount of maintained lawn areas and introduction of low maintenance lawn areas and wildflower areas.
   (iii) The Applicant redesigned the multi-use walkway and landscape buffer along Highland Avenue to provide a wider landscape buffer to enhance screening of the buildings as well as improve the sense of separation from the vehicular traffic along Highland Avenue.
   (iv) The Applicant provided additional crosswalks across the internal drives and redesigned them all to be raised with paver surfacing to improve pedestrian safety.
   (v) The Applicant redesigned the multi-use walkway along Highland Avenue to further remove any potential obstructions to emergency service vehicle access and to locate an access point near the Gould Street intersection with removable bollards and curb cuts to provide improved emergency access.

The Applicant has carefully considered all comments it has received from the Town, Planning Board, and members of the public. This has resulted in a number of refinements to the Project design as described above.

Project's Public Benefits

The Project will provide substantial public benefits, many of which were contemplated at the time Town Meeting adopted the HC-1 District zoning, including:

(i) $5.3MM estimated annual net financial benefit to the Town, which exceeds the $5 MM revenue projection for this Property that was presented to Town Meeting (the financial benefit from the Project is a prorated amount because the Property is only a portion of the total HC-1 District). This revenue will allow the Town to advance important capital projects, fund desirable programs, and reduce the tax burden which would otherwise fall on residential taxpayers;
(ii) $3MM in impact and building permit fees;
(iii) Substantial roadway and transportation improvements to nearby roadways and intersections, which have all been approved by the same peer review consultant (GPI) that the Town engaged to review transportation matters at the time the HC-1 District was adopted, including roadway improvements that will not be needed unless and until the WCVB land is substantially redeveloped;
(iv) A multi-use fitness/access walkway around the Property, with various exercise areas at intervals on the loop, all open to the public;
(v) A new approximately 7,127 sq. ft. park with an interactive exhibit to serve as a connection point to the potential future rail trail (the "North Parcel Park");
(vi) New pickleball courts, open space, and a winter ice skating area for public enjoyment;

(vii) Significant environmental cleanup of the Property from its prior use, and construction of new LEED-certifiable buildings, including state of the art solar and low carbon emissions;
(viii) Over 1,000 new, permanent jobs; and
(ix) New restaurant and retail spaces for the general public.

The Project will provide tremendous financial and other public benefits to the Town as evidenced by the foregoing.

Response to Most Recent Comments

The Applicant has further revised the Project in response to the helpful comments and constructive feedback received during and after the last Planning Board hearing. These updates are shown in the materials received under separate cover from Stantec and will be reviewed review at the October 3, 2022 hearing and are described below:

(i) The screening material for the rooftop mechanical equipment and the garage has been updated to incorporate additional detail.
(ii) The Applicant has revised the design of the multi-use walkway, including widening such walkway from 8 ft. to 20 ft., raising it above the street level, separating it by a vegetative barrier, increasing vegetation along Highland Avenue, and incorporating permeable pavement and pavers, in response to comments from the Fire Department and Department of Public Works.
(iii) The Applicant's traffic engineers have studied the potential for queuing of vehicles at the entry to the Wingate residences and the Project's entrances and have determined that queuing will not pose an issue to traffic flow.
(iv) The Applicant has agreed to add the North Parcel Park, which contains an interactive exhibit for public use, to the Project.
(v) The Applicant has revised the façade design and materials of the South Building, including a new "notch", to break up the massing of the Project's façade along Highland Avenue to address concerns of residents.

The foregoing points and other information in the record demonstrate the public benefits the Project will provide to the Town and the substantial degree to which the Applicant has incorporated public feedback into the Project design during the review process. We look forward to finalizing discussion of the Project at the next public hearing on October 3, 2022.

Very truly yours,

Timothy W. Sullivan
Attorney for Applicant

Enclosures

View From Wingate Entry Drive & Gould St (North)





View From Place & Gould St Intersection





View From TV Place & Gould St Intersection





The following are all staff comments received on this project.

TOWN OF NEEDHAM
TOWN HALL
1471 Highland Avenue
Needham, MA 02492-2669

Design Review Board

Memo: Project review, 557 Highland Avenue

May 16, 2022

The Board reviewed the design drawings for the development at 557 Highland Avenue, the former Muzi Motors site.

The DRB reviewed the project from the perspectives of overall site organization, general landscape concepts and amenities; building massing, materials, fenestration; Parking garage design, and site and building lighting.

The Board approved of the general site organization and building locations. The organization allowed for landscaping amenities at various locations that will be accessible to the public. The Board discussed the main entrance location off of Gould Street. There was some question about the closeness of the site entrance to Highland Ave intersection. The applicant noted the proposed installation of turning lanes, signalization of the entrance intersection and the alignment with the Wingate entrance as key reasons for that entry location. The Board agreed with the decision.

The DRB believed the paved plaza related to the proposed retail area was a good design element. The Board expressed some concern with the required setbacks on Gould and Highland not being utilized well, and the development of the plaza adjacent to the proposed retail area will be a good use of the setback area. The applicant proposes a walking path with fitness stops around the entire site. The path material is not yet determined but is expected to be some sort of pervious surface. Other amenities include using a retention pond in the rear of the site to create a water feature. They also propose a small water feature at the corner of Highland and Gould, a remake of a feature the previous site had at that location. The buffer zone area next to the surface parking area is also planned to have an area for use by the public. The applicant is having discussions with the neighborhood about what exactly it may be. The DRB considers all these elements helpful to integrate the development into the town.

The DRB reviewed the general landscaping concepts illustrated in the presentation. While they did review the plant list with the applicant, there was not a lot of detail shown on the plan. The applicant explained that they are working with the neighborhood on landscaping issues and will have more detail once that work is complete. The development will strive to have plant varieties that will provide seasonal color, not just summer vegetation. The Board asked that they return to the DRB once a more detailed plan is developed. The DRB asked that native species be used as much as possible.

The applicant stated the trees will be 3.5-4” caliper. The Board agrees this will provide more of an impact right from the beginning rather than planting saplings. The exact species and locations are being discussed with the neighborhood at this time.

The plan at this time illustrates large areas of lawn, and the Board recommends more of a mix of different grasses and planting beds rather than simply grass lawn areas.

The Board suggested that plant screening on areas along the walking path would be beneficial. Especially along Highland Avenue where the walk is close to the street. It is a very busy street, and some screening would make pedestrians more comfortable. Screening could also be useful along the plaza space.

Site lighting will be a mix of pedestrian and parking area lighting. Fixtures will be dark sky compliant. The Board asked that information on the final fixture selection be submitted to the DRB. The applicant did not expect much lighting on the building itself. The Board did not review any information on lighting on the building.

The building design and massing was approved by the Board. The design has a mix of precast GFRC finish, which can be colored and textured in a variety of ways, and metal / glass curtain wall. The applicant will supply a sample of the material to the Community Development office and DRB members can see the sample there.

The design does well breaking up long facades with changes in materials and with the insertion of small outdoor spaces on the upper floors. One suggestion was to consider using a lighter colored mechanical screen. A lighter color could help moderate the mass of the building as a transition to the lighter sky.

There was a discussion of the garage doors on the ground level walls each side of the main entrance. They appear to be a large single panel. The Board suggested the applicant could consider something with more detail to break it up.

The Parking Garage is a precast concrete structure. The design proposes a finish look with similar colors to those on the buildings. The columns will not be flush with the panels to break up the horizontal lines. Decorative fabric panels will be added to create visual interest and screen the garage. The elevator/stair tower would be finished in a different color, with a perforated metal panel accent.

The DRB discussed some of the issues they had with a similar structure in the N2 district. They suggested that the screens not simply be rectangles on frames attached to the façade. The frame could be designed as more of an architectural feature, possibly extending beyond the banners, or above the height of the garage. Screening could be more than one layer, of different heights, or of varied shapes. The applicant should pay special attention to the Gould Street side of the building and consider where the banners are placed, not simply the centers of each side of the garage structure.

Garage lighting needs to be carefully considered. The installation should be done in a way that minimizes the lighting being viewed from outside the site. The applicant stated the lights will be installed in the recessed portions of the precast structure, limiting their visibility. The fixtures themselves will have stages of brightness related to the activity level; low for pedestrian, medium for few cars, brightest for the most activity. The Board believes the proposed lighting and installation should help mitigate the amount of visibility the garage lighting will have off the site.

Overall the Board approved of the project design. They asked the applicant to provide an update on the landscape plan at some point during the Planning Board review process, to provide information on site lighting fixtures, and to provide a sample of the exterior finishes.

End of comments

Town of Needham
Building Department
500 Dedham Ave.
Needham, MA 02492

Tel.781-455-7550 x 308

May 25, 2022

Town of Needham
Planning Board
500 Dedham Avenue
Needham, MA. 02492

Re: 557 Highland Ave./ Highland Innovation Center

Dear Board Members,

Please be advised that The Building Department has been part of several meetings between the applicant The Bulfinch Companies and town staff and consultants. Many of the questions that we had during this process have been addressed as far as the site is concerned. The project is still under design and in the early stages for Building, Fire and Mechanical questions currently.

As stated, before site access for pedestrian and vehicle traffic were addressed, fire access around the site was addressed, surface and garage parking were addressed. Water supply and flow for fire protection, and hydrants are under design, locations of hydrants were discussed with the Needham fire consultant.

The site as presented appears to meet the zoning regulations for the site, Special Permits are required for some dimensional requirements based on the design of the structures. The Building Department has no additional questions or comments currently and will continue to work with the applicant on the technical designs of the project.

David A Roche
Building Commissioner
Town of Needham

From: Tara Gurge
To: Alexandra Clee
Cc: Timothy McDonald
Subject: RE: Public Health Division"s comments RE: #577 Highland Ave. proposal
Date: Friday, May 27, 2022 5:45:09 PM
Attachments: image002.png
image003.png

Hello Alex –

Here are the Public Health Division comments for the proposal located at #557 Highland Avenue. See below:

- Any retail/food establishments proposed in the buildings located on this property would need an online Food Permit Plan Review application completed, along with proposed food establishment design plans, which will need to be submitted and reviewed and approved by the Public Health Division prior to start of construction. Here is the direct link to the online Food Establishment Permit Plan Review application - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006516 .
- Please keep in mind, if a food establishment plan review is approved, sufficient space must be made available in the parking lot for both a solid waste (trash) dumpster and a separate recycling dumpster, for each food establishment, along with waste oil/grease containment (if applicable.) These dumpsters must be placed in an easily accessible area outside the facility, close to each food establishment. An exterior grease interceptor may also need to be installed.
- The following info. was previously provided to Robert Schlager, Bulfinch President, back on 4/26/22, re: his inquiry on his wastewater reuse proposal for this project - Here is the Massachusetts Dept. of Environmental Protection's (MassDEP) direct website link to their wastewater reuse program - https://www.mass.gov/service-details/wastewater-reclaimed-water. This proposal would need to meet MassDEP's approval for reclaiming water, specifically for - Cooling tower water, toilet and urinal flushing, boiler feed, industrial process water and irrigation for landscaped areas, etc. All these uses are allowed under 314 CMR 20.00., if approved.
- If a Biotech laboratory is proposed for this site, please ensure that the following online permit application is submitted to the Public Health Division for our review and approval - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006513 . Proper Biohazardous waste containment will need to be provided on site.
- Due to the environmental soil contamination that was discovered on the property during your environmental assessment that was conducted that you informed us about, we advise you to continue working with William Burns, Licensed Site Professional (LSP), LEP with McPHAIL ASSOCIATES, LLC on your ongoing clean-up protocols, and copies of these clean-up reports must continue to be submitted to the Public Health Division for our review for our files. Any updates or changes to your current LSP that is overseeing this clean-up, must be provided for our records.

Please let us know if you need additional information or have any follow-up questions on those requirements.

Thanks,

TARA E. GURGE, R.S., C.E.H.T., M.S. (she/her/hers)
ASSISTANT PUBLIC HEALTH DIRECTOR
Needham Public Health Division
Health and Human Services Department
178 Rosemary Street
Needham, MA 02494
Ph- (781) 455-7940; Ext. 211/Fax- (781) 455-7922
Mobile- (781) 883-0127
Email - tgurge@needhamma.gov
Web- www.needhamma.gov/health

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From: Alexandra Clee <aclee@needhamma.gov>
Sent: Wednesday, May 25, 2022 1:49 PM
To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; David Roche <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: RE: request for comment - 577 Highland Ave

Dear all,

As a reminder, we would appreciate your comments on this application as soon as you are able.

Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271

www.needhamma.gov

From: Alexandra Clee
Sent: Tuesday, April 19, 2022 4:17 PM
To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; 'David Roche (droche@needhamma.gov)' <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: RE: request for comment - 577 Highland Ave

Apologies, one additional application item:

6. Fiscal Impact Analysis, prepared for rezoning, prepared by Barrett Planning Group, Inc., dated March 20, 2021.

Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
Sent: Tuesday, April 19, 2022 4:08 PM
To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; David Roche (droche@needhamma.gov) <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: request for comment - 577 Highland Ave

Dear all,

We have received the application materials for the proposal to redevelop 557 Highland Avenue. the information can be found on the website: https://www.needhamma.gov/Archive.aspx?ADID=9611

Although we operate electronically much of the time lately, I am sending hard copies for this project.

The Planning Board has scheduled this matter for June 7, 2022. Please send your comments by Wednesday May 25, 2022 at the latest.

Please note: These are the same materials that we distributed (electronically) for the Development Review Team meeting to be held April 26. We are also seeking staff comment, which can arrive after the DRT meeting.

The documents attached for your review are as follows:

1. Application for the Major Project Special Permit No. 2022-02, Applicant 557 Highland, LLC, dated April 7, 2022.

2. Letter directed to Planning Board Members, from Timothy Sullivan, dated April 5, 2022.

3. Plan set consisting of 44 pages, dated March 30, 2022.

4. Transportation Impact and Access Study, prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, dated March 2022. (Appendices only sent to Engineering)

5. Stormwater Report, prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, dated March 2022.

Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

From: Dennis Condon
To: Alexandra Clee
Cc: Lee Newman
Subject: RE: request for comment - 577 Highland Ave
Date: Wednesday, June 1, 2022 2:39:14 PM
Attachments: image001.png
image002.png

Hi Alex,

The Fire dept. has met with the development team for this site to express our concerns and made a number of recommendations, which are to be addressed. Of prime concern was circulation for fire apparatus and the ability of fire crews to be able to access various locations of each building from the exterior. This is especially true of the South and North buildings along Highland Avenue and the Rte 128 ramp areas. Initial plans had the fire responding units to stage remotely from the building on Highland Avenue or the off ramp this would create a safety issue for both responding personnel and building occupants and was considered to be inadequate. Since these are State roads MA DOT might have also had objections with this staging plan. A solution was arrived at by incorporating the proposed fitness path to be dual purposed to accommodate fire apparatus. This would include paving wide enough for ladder truck operations. By revising the plan this way will allow responding units sufficient circulation to reach at least three side of each building. While full access around each building is ideal, it is not always practical. We feel the solution arrived at will remedy what might be a significant public safety issue in the event of a major response to this large site. We further requested that this pathway be kept free of snow throughout the winter, so that responding apparatus be able to gain sufficient access regardless of time of year. We will continue to work with the developer throughout the project construction to ensure all code and safety regulations are met.

Thanks,
Dennis

Dennis Condon
Chief of Department
Needham Fire Department
Town of Needham
(W) 781-455-7580
(C) 508-813-5107
Dcondon@needhamma.gov

Follow on Twitter: Chief Condon@NeedhamFire

Watch Needham Fire Related Videos on YouTube @ Chief Condon

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Sent: Wednesday, May 25, 2022 1:49 PM
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Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
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Subject: request for comment - 577 Highland Ave

Dear all,

We have received the application materials for the proposal to redevelop 557 Highland Avenue. the information can be found on the website: https://www.needhamma.gov/Archive.aspx?ADID=9611

Although we operate electronically much of the time lately, I am sending hard copies for this project.

The Planning Board has scheduled this matter for June 7, 2022. Please send your comments by Wednesday May 25, 2022 at the latest.

Please note: These are the same materials that we distributed (electronically) for the Development Review Team meeting to be held April 26. We are also seeking staff comment, which can arrive after the DRT meeting.

The documents attached for your review are as follows:

1. Application for the Major Project Special Permit No. 2022-02, Applicant 557 Highland, LLC, dated April 7, 2022.

2. Letter directed to Planning Board Members, from Timothy Sullivan, dated April 5, 2022.

3. Plan set consisting of 44 pages, dated March 30, 2022.

4. Transportation Impact and Access Study, prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, dated March 2022. (Appendices only sent to Engineering)

5. Stormwater Report, prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, dated March 2022.

Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

TOWN OF NEEDHAM, MASSACHUSETTS
PUBLIC WORKS DEPARTMENT
500 Dedham Avenue, Needham, MA 02492
Telephone (781) 455-7550 FAX (781) 449-9023

June 2, 2022

Needham Planning Board
Needham Public Service Administration Building
Needham, MA 02492

RE: Major Project Special Permit No. 2022-02
557 Highland Avenue- Bullfinch Companies

Dear Members of the Board,

The Department of Public Works has completed its review of the above referenced request for a Special Permit. The applicant requests to redevelop the former Muzi Ford and Chevrolet automotive dealerships and service centers and Muzi car wash.

The proposed project will const 2-buildings of a 497,694 sf office, laboratory, research and development, as well as 10,000 sf for retail uses. A proposed one level parking garage for each building as well as a separate stand alone garage to accommodate the parking needs.

The review was conducted in accordance with the Planning Board's regulations and standard engineering practice. The documents submitted for review are as follows:

1. Application for the Major Project Special Permit No. 2022-02, Applicant 557 Highland, LLC, dated April 7, 2022.

2. Letter directed to Planning Board Members, from Timothy Sullivan, dated April 5, 2022.

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5. Stormwater Report, prepared by VHB, 101 Walnut Street, PO Box 9151, Watertown, MA, dated March 2022.

Our comments and recommendations are as follows:

Water Supply:

- We are seeking clarification for the facility's proposed water use of 129,172 GPD while the wastewater design flow generation is 54,554 GPD.

- We expect to work with the developer on determining the optimum water loop design. The current proposal shows a 10-inch water connection to the site off a 12-inch main on Gould Street and a connection to an existing 8-inch water main on TV place. The additional loop connection may be more optimum if connected from Highland Avenue in front of the development instead of, or an addition to the 8-inch on TV Place connection.

Traffic at the Intersection of Highland and Gould

- We concur with traffic comments/recommendations prepared by GPI in their April 25, 2022 letter to the Planning and Community Development Office.

- The proposed development revises the currently under construction traffic pattern from the MassDOT's Highland Avenue Corridor project. The newly proposed layout for this project shows sidewalks on both sides of the road and consists of one bike lane with 4-vehicle traffic lanes exiting Gould Street onto Highland Avenue, and one bike lane with one vehicle lane entering Gould Street from Highland Avenue.

- This new road design increases the traveled width by approximately 32-feet from intersection of Highland Avenue at Gould to just beyond TV Place. A portion of the design shows the travel lanes located on private property owned by the Development. We expect the Developer to work with the town in providing an alteration/taking plan and recordings for a new Road Right of Way layout on Gould Street and to optimize of the traffic signals at Highland at Gould.

Wastewater:

- According to the ENF filed by the applicant, the proposed project will generate a total of design wastewater flow of 54,554 GPD; this is an increase of 31,501 GPD from the existing facility to the town's sewer system. The applicant has been in contact with Town of Needham representatives and understands the requirements to have a rate of four gallons for every one gallon of sewage added to the system removed through an I/I program (attached regulations).

- For the new facility, four times the increased flow equates to a total of 126,004 GPD I/I removal anticipated from the development. This may be satisfied by either undertaking a construction project or paying a fee to the Town's I&I program at a rate of $8.00 per gallon required to be removed. We are in the process of analyzing the target areas for the inflow/infiltration to be removed and expect to work with the developer through the site plan approval process.

Stormwater Report:

- As part of the NPDES requirements, the applicant must comply with the Public Outreach & Education and Public Participation & Involvement control measures. The applicant shall submit a letter to the town identifying the measures selected and dates by which the measures will be completed in order to incorporate it into the Planning Board's decision.

Other:

- If emergency generators are proposed, they should indicate on the plans with proper screening and noise reduction according to a sound study for the proposed generators.

If you have any questions regarding the above, please contact our office at 781-455-7550.

Truly yours,

Thomas Ryder
Town Engineer

From: John Schlittler
To: Alexandra Clee
Cc: Lee Newman
Subject: RE: request for comment - 577 Highland Ave
Date: Friday, June 3, 2022 3:37:20 PM

I have a couple of concerns regarding traffic.
Gould at Central, looks like one lane getting out to Central. I am concerned that traffic will back up and create a scenario where vehicles will use cut through streets that are off Gould.

I am also concerned that vehicles will use Noanett, Ellis, Kearney, Beech, and Arnold St daily to beat the light at Gould and Central. I think the first step would be to place signage at these locations restricting traffic between commuting hours in the morning and afternoon.

I am also concerned about the impact that this project will have on Hunting/Greendale Ave. Although the RT 128 on/off ramps are very close this stretch of RT 128 tends to be stop and go during peak hours. I often see vehicles getting off RT 128 to use surface streets Hunting/Greendale to bypass traffic delays. What can be done to address impact to those neighborhoods?

If there are going to be walking paths, bike access around the building then there should be enough space for emergency vehicle access around the entire project.

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Tuesday, April 19, 2022 4:17 PM
To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; David Roche <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: RE: request for comment - 577 Highland Ave

Apologies, one additional application item:

6. Fiscal Impact Analysis, prepared for rezoning, prepared by Barrett Planning Group, Inc., dated March 20, 2021.

Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
Sent: Tuesday, April 19, 2022 4:08 PM

To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; David Roche (droche@needhamma.gov) <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
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The Planning Board has scheduled this matter for June 7, 2022. Please send your comments by Wednesday May 25, 2022 at the latest.

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Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA

781-455-7550 ext. 271
www.needhamma.gov

Town of Needham
Building Department
500 Dedham Ave.
Needham, MA 02492

Tel.781-455-7550 x 308

August 23, 2022

Town of Needham Planning Board
Lee Newman / Town Planner
500 Dedham Ave.
Needham, MA. 024902

Re: 557 Highland Ave. / Highland Innovation Center

Dear Planning Board Members,

Please be advised that I have reviewed the proposed plan for the former Muzi site the new Highland Innovation Center and I have the following comments.

Fire Department access: The plan shows a Fitness path / Fire access driveway around the buildings, it does not show the curb cuts or access to this roadway from Gould St. or TV. Place. This roadway / walk should probably be gated at the entry of the roadway to prevent vehicles from driving around the building. This should include some sort of barrier preventing vehicle access between the parking garage and Lab building beyond the loading area. These gates should be approved by the Fire Department and have additional signage installed stating “Fire Department Emergency access only.”

Cross walks: The plan shows cross walks in four locations but there is no direct access from the surface parking to the entrance of the lab building. It appears the pedestrian traffic would have to exit the parking lot walk toward Gould Street then cross at the entry of the complex and walk back to the lab building. I believe that a cross walk should be installed between the open parking area and the entrance to the lab building. There should also be a defined crossing between the parking garage and the lab building, the plan shows a large walk next to the loading dock area with no curb cuts for this area. The plan does show two curb cuts at the entry of the loading area between the buildings, I would suggest this location for the crosswalk.

Pond Bridge: The plan shows a pedestrian walkway over the pond, this pond is proposed to be approximately six feet deep, the bridge does not show any guards or railings crossing over the pond.

Retaining walls: The plan indicates retaining walls in many locations on the plans, no details were provided on the type of walls to be used. Some of the walls are along emergency roadways

and walkways no details are provided for vehicle guard rails, or pedestrian guards, railings or fencing along these areas that need fall protection.

Accessible Entries: The plan indicates a stairway in front of the Lab building it is assumed that there is an accessible ramp along the front of the building providing accessible entry into the building.

Public Community open space: The proposal is to provide public spaces for paddle board courts, pavilion plaza, possible seasonal skating rink. The developer has not identified rest room facilities within 300’ of this area.

Front Setback TV Place: The plan on page L-1.0 indicates a rear setback along TV Place this is a way and would be considered frontage therefore it needs to reflect front setback, the plan on page A-101 shows the setback at 20’

Any Questions please contact my office.

David A Roche
Building Commissioner
Town of Needham

Town of Needham
Fire Department Headquarters
88 Chestnut Street
Needham, MA 02492

(781) 455-7580
(781) 444-2174

Chief of Department
Thomas M. Conroy

Deputy Fire Chief of Operations
Donald E. Anastasi

Deputy Fire Chiefs
Matthew P. Dooher
Matthew B. Bagnell
Peter J. Vigliano

TO: Lee Newman

FROM: Thomas Conroy
Chief of Department

DATE: August 31, 2022

RE: August 30, 2022, 557 Highland Ave Project Meeting (Muzi)

Dave Roche has been working with the landscape architect to address the Fire Departments concerns for the project at 557 Highland Ave. Listed below are our concerns:

- Access and egress points for the fitness/access walkway
- What is the finish material for the path
- What is the finish material on either side of the walkway
- Is this material safe for the stability of a fire truck
- Moving the lighting out of the walkway path for accessibility
- Where are the curb cuts going to be and will there be a driveway or a sloped berm

Chief Thomas M. Conroy
Needham Fire Department
88 Chestnut Street
Needham, MA 02492
(781) 455-7580 tconroy@needhamma.gov

From: Stacey Mulroy
To: Alexandra Clee
Cc: Lee Newman; Thomas Ryder; Carys Lustig
Subject: RE: Request for comment - 577 Highland Ave
Date: Wednesday, August 31, 2022 2:39:54 PM
Attachments: image001.png

HI All,

Sorry for my delayed response.

On a quick overview it looks fine, though I would make suggestions to the contractors about the walking path and the orientation of the pickleball courts. There wasn't a lot of detail on the "recreational" parts, but if you get more details in the next wave, I'd be happy to take a closer look.

Thank you!
Stacey

Stacey Mulroy, CPRP
She/Her/Hers (What's this?)

Director, Needham Park & Recreation
O: 781.455.7930
C: 781.589.0960
E: smulroy@needhamma.gov

Rosemary Recreation Complex
178 Rosemary Street
Needham, MA 02494
www.needhamma.gov/495/Park-Recreation



From: Alexandra Clee <aclee@needhamma.gov>
Sent: Thursday, August 18, 2022 12:05 PM
To: Stacey Mulroy <smulroy@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; Carys

Lustig <clustig@needhamma.gov>
Subject: Request for comment - 577 Highland Ave

Hi Stacey,

The Planning Board does not typically ask you or the Commission for comments; however, in this case your input would be helpful.

If you wouldn't mind reviewing the plans, specifically regarding the amenities provided, such as the walking trail and the pickle ball court.

Links to materials:

- Revised Plans, dated August 15, 2022.

- Cover letter from Attorney Tim Sullivan, dated August 15, 2022 as well as the following documents: a) Boundary Description; b) Revision Letter from Civil; c) Revision Letter re: Transportation; d) Revision Letter re: Landscape; e) Revision Letter re: Architecture; f) Preliminary Exterior/Community Noise Evaluation/Narrative.

Any comments you have would be welcomes by August 30.

Thanks!

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
Sent: Wednesday, August 17, 2022 3:27 PM
To: Carys Lustig <clustig@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Deb Anderson <andersond@needhamma.gov>; David Roche <droche@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>
Subject: ADDITIONAL request for comment - 577 Highland Ave

Dear all,

We received revised plans on the project at 557 Highland. They can be found at the following links:

- Revised Plans, dated August 15, 2022.

- Cover letter from Attorney Tim Sullivan, dated August 15, 2022 as well as the following

documents: a) Boundary Description; b) Revision Letter from Civil; c) Revision Letter re: Transportation; d) Revision Letter re: Landscape; e) Revision Letter re: Architecture; f) Preliminary Exterior/Community Noise Evaluation/Narrative.

Please provide comments by August 30, 2022.

Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov

From: Alexandra Clee
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Subject: RE: request for comment - 577 Highland Ave

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Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

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Thank you, alex.

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500 Dedham Ave.
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Tel.781-455-7550 x 308

August 31, 2022

Town of Needham Planning Board
Lee Newman / Town Planner
500 Dedham Ave.
Needham, MA. 024902

Re: 557 Highland Ave. / Highland Innovation Center / **Revised Letter**

Dear Planning Board Members,

Please be advised that I have reviewed the proposed plan for the former Muzi site the new Highland Innovation Center and I have the following comments. **The applicant has responded to our comments and town staff concerns, I have added my new comments to my previous letter.**

Fire Department access: The plan shows a Fitness path / Fire access driveway around the buildings, it does not show the curb cuts or access to this roadway from Gould St. or TV. Place. This roadway / walk should probably be gated at the entry of the roadway to prevent vehicles from driving around the building. This should include some sort of barrier preventing vehicle access between the parking garage and Lab building beyond the loading area. These gates should be approved by the Fire Department and have additional signage installed stating "Fire Department Emergency access only." **After an additional meeting with Planning staff, Fire Chief, Town Engineer and Building Commissioner, the applicant has provided three plan modifications. The last modification which we have approved answers the gate, curb cut and access pathway questions. The applicant will provide a cross section detail showing a 10' wide permeable pavement with 5' permeable pavers on both sides meeting the Chiefs request for H 20 Loading for the 20' width. Final detail of this walk will be approved on-site before construction by the Town Engineer and Fire Chief.**

Cross walks: The plan shows cross walks in four locations but there is no direct access from the surface parking to the entrance of the lab building. It appears the pedestrian traffic would have to exit the parking lot walk toward Gould Street then cross at the entry of the complex and walk back to the lab building. I believe that a cross walk should be installed between the open parking area and the entrance to the lab building. There should also be a defined crossing between the parking garage and the lab building, the plan shows a large walk next to the loading dock area with no curb cuts for this area. The plan does show two curb cuts at the entry of the loading area

between the buildings, I would suggest this location for the crosswalk. **These corrections have been answered and corrected.**

Pond Bridge: The plan shows a pedestrian walkway over the pond, this pond is proposed to be approximately six feet deep, the bridge does not show any guards or railings crossing over the pond. **These questions have been answered and will be addressed upon issuance of the Building Permit.**

Retaining walls: The plan indicates retaining walls in many locations on the plans, no details were provided on the type of walls to be used. Some of the walls are along emergency roadways and walkways no details are provided for vehicle guard rails, or pedestrian guards, railings or fencing along these areas that need fall protection. **These questions have been answered and will be addressed upon issuance of the building permits and actual site visit.**

Accessible Entries: The plan indicates a stairway in front of the Lab building it is assumed that there is an accessible ramp along the front of the building providing accessible entry into the building. **These questions have been answered.**

Public Community open space: The proposal is to provide public spaces for paddle board courts, pavilion plaza, possible seasonal skating rink. The developer has not identified rest room facilities within 300' of this area. **This question has been answered and will comply with the State Building and Plumbing Code requirements.**

The plan was also corrected to illustrate the front Set-back from TV Place where the previous plan showed it as side set-back.

Many small technical details will need to need to be clarified throughout the permitting process with multiple departments. The applicant has been very responsive to our concerns, and after working with this developer I am confident that the design team for the project and town staff will work out the fine details on this complex development.

Any Questions please contact my office.
781-455-7550 x 308

David A Roche
Building Commissioner
Town of Needham

TOWN OF NEEDHAM
TOWN HALL
1471 Highland Avenue
Needham, MA 02492-2669

Design Review Board

Memo: Site Plan review, 557 Highland Avenue

12 September 2022

The Board reviewed the revised design drawings for the development proposed for this site.

The Board had commented on the design of the project in an earlier review. At the time of that review the landscaping and site lighting had not yet been developed in detail. The applicant presented more detailed site and landscaping designs, as well as modifications to the buildings and parking garage developed after meetings with the Planning Board and residents.

The overall landscaping plan was very well designed. Modifications to the walking path along Highland Avenue, and the new plantings of trees and some screen elements were seen as an improvement by the Board. The plant selection was also seen as well done. There was discussion of the choice of oak tree species along the walking path. There is concern about acorns in the fall season on a walking/biking path. The applicant stated it had been working with the Superintendent of Parks and Forestry on tree selection and that he had suggested this tree. The applicant stated their preference was a mix of trees, not a single sort of allée along the property edge. The DRB agrees with this approach. The applicant will discuss our concerns with the Town and explore all other tree options.

The design includes less mowed lawn area and more landscaping features along the building. The Board noted this in the first review and the new design is well done. The extensive use of native plants is also a very good design element.

The development includes several public amenities. The Board approved of the design of these elements. The fencing at the pickle ball courts will be black vinyl chain link fencing, and planting such as clematis or similar plantings are planned be grown on the fence. There is also bike parking and community open space. Parking in that area is also provided. While the walk is adjacent to a busy road the layout and landscaping will help to protect the activities. The material for the walk was discussed. The difficulty is that it is also emergency fire access, so the usual pervious surfaces may not be suitable. The design is to be a bordered walkway. One suggestion by the Board was Gravel Lok or a similar gravel binder product for the main path with a complementary edging. No final choice was made at this time, but the Board believes the options discussed were all acceptable.

There were changes to the building design. Some of the garage loading doors previously located to the left of the main entrance were moved to the side of the building facing the parking garage. This is an improvement.

The parking garage exterior design was also modified. Changes were made to add more detail to the columns and panels. The screening and its support framing were modified to be less two dimensional. The Board approved of these changes.

A more major change was made to the building at the corner of Gould and Highland. The previous design followed the site shape and had a rounded corner to the building. The Board had previously approved this design, with the thought that it was a good design. It filled the negative space at that corner in a positive way and was a good overall planning solution. The new design angles the main building the other direction and opens up the space at the corner significantly. A large plaza is planned for this space, which will be adjacent to a one-story portion of the building, The one-story section will have greenspace on the roof for use by the tenants of the building. While the Board approves the design of the building changes, there was some concern about how much use that plaza will actually receive. It seems very dependent on the final uses in the one-story retail/restaurant space adjacent to it. The applicant explained the area is also the beginning of the fire truck access so that impacted the design as well. The Board suggested that the treed area proposed in conjunction with the plaza might be enlarged and some larger elements (trees) will start to fill the view at the corner, visually containing the space in a positive way.

The project was approved in total as presented; the Board presents these comments for the Planning Board's consideration.

End of Notes

From:	Tara Gurge
To:	Alexandra Clee
Cc:	Lee Newman
Subject:	RE: Biotech requirements for Public Health
Date:	Tuesday, October 25, 2022 1:38:08 PM
Attachments:	image002.png image003.png ARTICLE 11 - Biotechnology Registration (002).pdf
Importance:	High

Alex -

Sorry for not getting back to you sooner. Here are the Biotech existing requirements, below, for your reference. (See also attached Article 11 BOH ordinance.) We sent you comments re: the Biotch lab requirements, noted in our May 27, 2022 email, which are still relevant. Nothing has changed with these requirements since we are still in the process of updating our existing regulation. (NOTE: As mentioned to you on my recent follow-up email, we have not updated these regulation requirements yet, however, we are in the process of setting up a Biolab regulation committee that Tim recently put together, which is made up of Health Division staff, since these BOH Biotechnology regulation updates will be pretty extensive. Here are the existing requirements noted below, as stated in our previous comments, which we will be expanding in the near future. Feel free to reach back out to me if you have any additional questions!

- Need to fill out an online Biotechnology permit application through the Public Health Division, Easy Permits website. See direct link - - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006513.
- Proper Biohazardous waste containment will need to be provided on site. Need to set up a contract with a permitted medical waste hauler.
- If the company is working with sharps, a Sharps Disposal permit will need to be applied for at the following online permit link - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006511. The Public Health Division will need to issue a permit the company on an annual basis, and conduct annual inspections prior to renewing the Sharps Disposal permit.
- If the company if working with Animals, an Animal Permit application will need to be applied for at the following online permit link - https://needhamma.viewpointcloud.com/categories/1073/record-types/1006509. The Public Health Division will need to issue a permit the company on an annual basis, and conduct annual inspections prior to renewing the Animal permit.
- SEE specific excerpts taken from our BOH Biotech ordinance noted below, for your reference.

So here are the Needham Board of Health Biotech registration requirements as stated in our BOH Article 11 ordinance (See below) – The Health Division will need to verify that all these items are uploaded to the online permit for review.

11.4.2 The institution shall:

(1) Register using a form approved by the Board of Health.
(2) Renew and update the registration annually.

(3) Submit copies of all registration materials to the Building Department, Fire Department, Emergency Management Department and the Planning Board.
(4) Allow inspections, at reasonable times, of both the institution's facilities and records, as related to these regulations.

11.5.1 In order to register, the following information must be submitted, using an application form approved by the board, to the Board of Health:

(1) Name of institution.
(2) Address, telephone, and fax number.
(3) Names and telephone numbers of persons designated to be contacted on a 24-hour a day basis in case of an emergency.
(4) A plot plan showing the proposed location of the facility and a floor plan showing the internal layout of the facility(s).
(5) General statement of the company's intended area of research.
(6) General statement of the types of hazardous, bio hazardous, infectious or radioactive materials expected to be used in the facility.
(7) Evidence of certification, as necessary, from the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health.

11.5.2 In order to register, the following information must be submitted to the Board of Health, on a form which is approved by the Board of Health:

(1) The chief executive officer must certify that the company adheres to the NIH Guidelines for recombinant DNA Research.

Let me know if you have any additional questions, and I have time for a call this afternoon if you still want to touch base.

Thanks,

TARA E. GURGE, R.S., C.E.H.T., M.S. (she/her/hers)
ASSISTANT PUBLIC HEALTH DIRECTOR
Needham Public Health Division
Health and Human Services Department
178 Rosemary Street
Needham, MA 02494
Ph- (781) 455-7940; Ext. 211/Fax- (781) 455-7922
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Board of Health

Edward Cosgrove, PhD
Chair

Stephen Epstein, MD, MPP
Member

Jane Fogg, MD, MPH
Vice Chair

ARTICLE 11 BIOTECHNOLOGY REGISTRATION REGULATION

SECTION 11.1 AUTHORITY

The Needham Board of Health, pursuant to the authority granted under Massachusetts General Laws Chapter 111 section 31 hereby adopts the following regulation to protect the-public health of the communit**y.**

SECTION 11.2 PURPOSE

The Needham Board of Health recognizes that the use of modern biological techniques for industrial purposes do not pose unique risks to public health or the environment when the activities are conducted in accordance with accepted best scientific practice. However, following the recommendations of the Needham Biotechnology Committee, it is the opinion of the Board of Health that the existing regulatory structure in the Town of Needham is not sufficient to ensure that Town officials would be alerted to the presence of biotechnology companies in the Town.

The assessment of potential health risks is one of the primary roles and responsibilities of a public health agency.

Accordingly, the Board of Health declares that the purpose of this regulation is to require registration of biotechnology companies, to enable the Board of Health and other town officials to better assess and monitor potential fire and other hazards posed by flammable chemicals and hazardous materials.

SECTION 11.3 DEFINITIONS

Board: The Board of Health or its agent or designee.

Biotechnology: The use of modern biological techniques for industrial or research purposes. The term Biotechnology shall include any industrial or research activities which use recombinant DNA molecules (rDNA) or organisims and viruses containing rDNA.

Director: The Director for the Needham Board of Health or designee.

Guidelines:
(1) National Institutes of Health (NIH) Guidelines for Research involving Recombinant DNA molecules as published in the Federal Register of April 27, 1995.

(2) Any amendments, revisions or substitutions enacted subsequent to the above-referenced "Guidelines".

Institution: A single individual, group of individuals, association, organization, corporation educational institution, or medical facility conducting rDNA research, rDNA development, rDNA production, or biological material therapies or diagnostics.

Recombinant DNA Molecules (rDNA): As defined in the NIH "Guidelines," as defined above.

Substantive Change: Any change in hazard designation as identified in the NIH Guidelines.

SECTION 11.4 LABORATORY REGISTRATION REQUIRED

11.4.1 All institutions proposing any use of rDNA technology, as defined in and not exempted by the NIH Guidelines, which seeks to operate in the Town of Needham must first register with the Needham Board of Health before engaging in any rDNA activity, including construction or renovation of facilities for rDNA use(s).

11.4.2 The institution shall:

(1) Register using a form approved by the Board of Health.
(2) Renew and update the registration annually.
(3) Submit copies of all registration materials to the Building Department, Fire Department, Emergency Management Department and the Planning Board.
(4) Allow inspections, at reasonable times, of both the institution's facilities and records, as related to these regulations.

11.4.3 Pre-existing Institutions shall have 90 days from adoption of these regulations to register with the Board.

SECTION 11.5 REGISTRATION

11.5.1 In order to register, the following information must be submitted, using an application form approved by the board, to the Board of Health:

(1) Name of institution.
(2) Address, telephone, and fax number.
(3) Names and telephone numbers of persons designated to be contacted on a 24-hour a day basis in case of an emergency.
(4) A plot plan showing the proposed location of the facility and a floor plan showing the internal layout of the facility(s).
(5) General statement of the company's intended area of research.
(6) General statement of the types of hazardous, bio hazardous, infectious or radioactive materials expected to be used in the facility.
(7) Evidence of certification, as necessary, from the Massachusetts Department of Environmental Protection and the Massachusetts Department of Public Health.

11.5.2 In order to register, the following information must be submitted to the Board of Health, on a form which is approved by the Board of Health:

(1) The chief executive officer must certify that the company adheres to the NIH Guidelines for recombinant DNA Research.

11.5.3 Fees:

The fee for registration shall be as designated in Article 17 of the Board of Health Regulations, Permit, License and other Fees.

SECTION 11.6 RENEWAL OF REGISTRATION

11.6.1 The registration shall be valid for one year.

11.6.2 All companies registered with the Board of Health must renew their registration within thirty (30) days of the expiration of the registration.

11.6.3 The Board of Health must be notified of any substantive changes in operation at least thirty (30) prior to the change.

SECTION 11.7 VARIANCES

11.7.1 The Board may vary the application of any provision of these regulations, with respect to any particular case when, its opinion, the enforcement thereof would do manifest injustice or conflict with the spirit of any minimum standard established by these regulations. Any variance shall, while it is in effect, be available to the public at all reasonable hours in the office of the Town Clerk, or in the office of the Board of Health.

SECTION 11.8 ENFORCEMENT AND PENALTIES

11.8.1 Any person who violates the terms of these regulations shall be subject to a fine of five hundred dollars $500 per offense. Each day shall constitute a separate offense.

11.8.2 Violations of this regulation and penalties listed in Section 8.a. may be subject to non-criminal disposition, M.G.L. Chapter 40, Section 21D, and Town of Needham, General By-Laws, July 1996 compilation, Section 9.2.2.6, Board of Health Regulations, and as amended. Each day that the offense continues shall constitute a separate offense.

11.8.3 These regulations may be enforced by the Town of Needham: Board of Health director or his designee, the Fire Chief or his designee, or by the Building Inspector or his designee.

SECTION 11.9 SEVERABILITY

In the event any section, subsection or provision of the regulations are held to be invalid, it shall not effect the validity of any other section, subsection or provision thereof.

SECTION 11.10 EFFECTIVE DATE

This regulation shall take effect after publication of a summary of the regulation in a newspaper published in the Town of Needham. As required by Massachusetts General Laws, Chapter 111, Section 31, an attested copy has been filed with the Department of Environmental Protection. A public hearing regarding this regulation was held on 07/20/93. This regulation was voted by a majority of the board on 07/20/93.

Public Comments on 557 Highland Avenue

Received between June 4, 2022 and October 3, 2022, end of hearing

1. Email from Carlos Agualimpia, Town Meeting Member - Precinct C, dated June 4, 2022.
2. Email from Steven Sussman, 30 Davenport Road, dated June 6, 2022.
3. Email from Henry Ragin, 25 Bennington Street, dated June 6, 2022.
4. Email from Casey Fedde, 16 Mills Rd, dated June 6, 2022.
5. Email from Avery, dated June 6, 2022.
6. Email from Karen Quigley, dated June 6, 2022.
7. Email from Kim Stone, Kim Stone, 45 Greendale Ave, dated June 6, 2022.
8. Email from MaeLynn Patten, 16 Ledge Street, dated June 6, 2022.
9. Email from Valerie Maio, 15 Park Ave., dated June 6, 2022.
10. Email from Maggie Flanagan, dated June 6, 2022.
11. Email from Nicole Nasson, dated June 6, 2022.
12. Email from Brooke Reilly, 41 Pine Grove Street, dated June 6, 2022.
13. Email from Jennie Jonas, 93 Sachem Road, dated June 6, 2022.
14. Email from Shannon Shavor, dated June 6, 2022.
15. Email from Matt Flanagan, 54 Sachem Road, dated June 6, 2022.
16. Email from Holly Charbonnier, 94 Sachem Road, dated June 6, 2022.
17. Email from Joanne Garabedian, dated June 6, 2022.
18. Email from Ali Dabuzhsky, 42 Aletha Road, dated June 6, 2022.
19. Email from Ashly Scheufele, 52 Greendale Avenue, dated June 6, 2022.
20. Letter from the Needham Heights Alliance, dated June 6, 2022.
21. Email from Paul Charbonnier, 94 Sachem Road, dated June 6, 2022.
22. Email from Emily Pick, 12 Mills Road, dated June 6, 2022.
23. Email from Natalie and Eugene Ho, 21 Utica Rd, dated June 26, 2022.

24. Email from Russell Smith, dated June 6, 2022.
25. Email from Julie Tracey, Beech Street, dated June 6, 2022.
26. Email from Ada Lei Chan, dated June 6, 2022.
27. Email from Elizabeth C Rich, 323 West Street, dated June 6, 202.
28. Email from Alanna Burke, dated June 6, 2022.
29. Email from Maureen and Jim DiMeo, 442 Central Avenue, dated June 6, 2022.
30. Email from Larry Tobin, 31 Greendale Ave, dated June 6, 2022.
31. Email from Michael Diener, dated June 7, 2022.
32. Email from Laura Ruch, dated June 7, 2022.
33. Email from Kelly Close, dated June 7, 2022.
34. Email from Robert Deutsch, dated June 7, 2022.
35. Email from Callie Curran Morrell, 2 Central Terrace, dated June 7, 2022.
36. Email from Jackie Boni, 13 Nichols Rd, dated June 7, 2022.
37. Letter from Deb Whitney, dated June 7, 2022.
38. Email from Kate Robey, dated June 7, 2022.
39. Email from Gilad & Rachel Skolnic, 33 Park Avenue, dated June 8, 2022.
40. Email from Kathleen Robey, 150 Warren Street, dated June 7, 2022.
41. Email from Kira Robinson-Kates, dated June 8, 2022.
42. Email from Ryan Ciporkin, 42 Park Avenue, dated June 9, 2022.
43. Email from Alex Boni, 13 Nichols Rd, dated June 9, 2022.
44. Email from Robert Dangel, 28 Hewitt Circle, dated June 11, 2022.
45. Email from Susan B. McGarvey, 66 Upland Road, dated June 11, 2022.
46. Email from Shari Stier, 23 Park Ave, dated June 14, 2022.
47. Email from Christine Dedek, 55 Hunting Road, dated June 28, 2022.
48. Email from Teresa Combs, 7 Utica Road, dated July 5, 2022.

49. Email from Joan E. Feeney, 74 Wayne Road, dated July 6, 2022.
50. Email from David M. Mindlin, 74 Hampton Avenue, dated July 7, 2022.
51. Email from Elizabeth Mercer, dated July 7, 2022.
52. Letter from the Needham Heights Alliance and Community, dated September 12, 2022.
53. Email from Michele Markley, dated September 12, 2022.
54. Email from Peter Schuller, 25 & 27 Mills Rd, dated September 13, 2022.
55. Email from Lauren Schuller, 25 & 27 Mills Rd, dated September 13, 2022.
56. Letter from Eugene Ho, Utica Road, dated September 15, 2022.
57. Email from Carol Richmond, Noanett Road, dated September 17, 2022.
58. Email from Kenneth Phillips, 74 Sachem Rd, dated September 18, 2022.
59. Email from Marjorie Phillips, 74 Sachem Rd, dated September 18, 2022.
60. Email from Verna Gurwitz, dated September 20, 2022.
61. Email from Carol Cohne, dated September 20, 2022.
62. Email from Henry Ragin, 25 Bennington Street, dated September 21, 2022.
63. Email from Lisa Durkin, 15 Avery Street, dated September 23, 2022.
64. Email from Beverly W. Litman, Noanett Road, dated September 25, 2022.
65. Email from Howard Breslau, 199 Evelyn Road, dated September 25, 2022.
66. Email from Fotoula Kopellas, 125 Evelyn Road, dated September 26, 2022.
67. Email from John Kopellas, 125 Evelyn Road, dated September 26, 2022.
68. Email from William Kopellas, 125 Evelyn Road, dated September 26, 2022.
69. Email from Anastasia Kopellas, 125 Evelyn Road, dated September 26, 2022.
70. Email from Judy and Larry Pelletier, 107 Gould Street, dated September 26, 2022.
71. Email from Le Truong, dated September 27, 2022.
72. Two emails from Antoinette Tigges, 122 Webster Street, dated September 27, 2022.
73. Email from Ranen S. Schechner, 50 Spring Road, dated September 29, 2022.

74. Email from : Nancy L. Magier, 112 Woodbine Circle, dated September 29, 2022.

75. Email from Wei Lu, dated September 29, 2022.

76. Email from Yulia Murray, 93 Hillside Avenue, dated September 29, 2022.

77. Email from Brian O'Neill, 149 Charles River Street, dated September 30, 2022.

78. Email from Kathy Zimbone, 10 Woodbury Dr, dated September 30, 2022.

79. Email from Casey Fedde, 16 Mills Rd, dated September 30, 2022.

80. Email from Chrissy Silverman, dated September 30, 2022.

81. Email from Jeffrey D. Drucker, The Atlantic Interests Limited Partnership, 144 Gould Street, Suite 206, Needham, MA 02494, dated September 30, 2022.

82. Email from Matthew S. Ross, 41 Stewart Road, dated September 30, 2022.

83. Email from Jodi Traub, dated September 30, 2022.

84. Email from Bob Rice, dated September 30, 2022.

85. Email from Bob O'Connor, 9 Fuller Road, dated September 30, 2022.

86. Email from Thomas M Totten, 370 Central Avenue, dated September 30, 2022.

87. Email from Steven Sussman, 30 Davenport Road, dated September 30, 2022.

88. Email from Joni and Michael Schockett, 174 Evelyn Road, dated September 30, 2022.

89. Emailed letter form Moe Handel, former Planning Board and Select Board Member and Needham Heights Resident, 3 Rosemary Street, dated October 1, 2022.

90. Email from Cynthia R. Janower, 85 Riverbend Lane, dated October 1, 2022.

91. Email from Larry Tobin, 31 Greendale Ave, dated October 2, 2022.

92. Email from David A. Shaff, MD, 109 Arch Street, dated October 2, 2022.

93. Email from Wujun Qie, 43 Douglas Rd, dated October 2, 2022.

94. Email from Yun Bian, 115 Gould Street, dated October 2, 2022.

95. Email from Marvin Berkowitz, 23 Wayne Road, dated October 2, 2022.

96. Email from Edward & Barbara Shapiro, 276 Bridle Trail Road, dated October 2, 2022.

97. Email from Shari Stier, dated October 2, 2022.

98. Email from Oleg Kerbel, dated October 2, 2022.
99. Email from Dingsong Feng, 45 Plymouth Road, dated October 2, 2022.
100. Email from Jacquelyn Furman, dated October 2, 2022.
101. Email from Ben Daniels, 5 Sachem Rd, dated October 2, 2022.
102. Email from Derek Wade, 41 Riverside St, dated October 2, 2022.
103. Email from Janice Chen, dated October 2, 2022.
104. Email from Tonia Chu, dated October 2, 2022.
105. Email from Donghui Yu, dated October 2, 2022.
106. Email from Brooks Goddard, 59 Otis Street, dated October 2, 2022.
107. Email from Albert Chang, dated October 2, 2022.
108. Email from The Lu family, 90 Norwich Rd, dated October 2, 2022.
109. Email from Hairuo Peng, dated October 2, 2022.
110. Email from Martha Cohen Barrett, 49 Lynn Road, dated October 2, 2022.
111. Email from Dennis Zhang, dated October 2, 2022.
112. Email from Joe Matthews, dated October 3, 2022.
113. Email from Matt Siciliano, dated October 3, 2022.
114. Email from James Segel, 30 Edgewater Drive, dated October 2, 2022.
115. Email from Yi Ding, dated October 3, 2022.
116. Letter from the Charles River Chamber, dated October 3, 2022.
117. Email from Emily Pick, 12 Mills Road, dated October 3, 2022.
118. Email from Natalie T, dated October 3, 2022.
119. Email from Michelle Saipe, 5 Sachem Road, dated October 3, 2022.

From: Jesse Kaddy
To: Planning
Subject: Arnold St. Traffic Study for Special Permit No. 2022-02: 557 Highland
Date: Wednesday, November 2, 2022 8:15:57 AM

During the November 1st planning board meeting, when discussing special permit No. 2022-02 (557 Highland) it was mentioned that there would be pre/post construction traffic study for the streets surrounding 557 Highland.

As a resident of Arnold Street, who often witnesses cars cutting through surrounding streets at a dangerously high rate of speed to avoid traffic build-up at Central and Gould, I'd very much recommend that the pre/post construction traffic study include Arnold St. Beech St, and Hampton Ave.

Best regards,

Jesse Kaddy
8 Arnold St. Needham, MA

From:	Holly Charbonnier
To:	Adam Block
Cc:	Planning; Artie Crocker; jeannemcknight@comcast.net; N. Espada; psa@westonpatrick.com
Subject:	Re: Fitness Path at 577 Highland Avenue
Date:	Monday, November 14, 2022 9:43:20 PM
Attachments:	Permeable Paving.png Presentation Slide.png Access Lane.png

---

Dear Planning Board,
I was recently informed that when Martin Jacobs was on the Planning Board for the 1688 Project, he made a public statement that even though a Hearing was being closed to public comment, the community was always allowed to make submissions about legal points as long as it's not new facts. With that as a precedent, I believe that my below email should also be considered as clarification to the legal zoning requirements for the 557 Highland Avenue project.

This issue that Artie Crocker raised at the Planning Board Deliberation was never discussed in a public forum. Ideally, the Planning Board would reopen the Special Permit for the Town residents to provide comment on this specific issue.

I ask that this email be marked as received and part of the record for the 557 Highland Avenue Project.

Thank you,
Holly Charbonnier
TMM Precinct J

On Saturday, November 5, 2022 at 06:56:13 PM EDT, Adam Block <adam.block@compass.com> wrote:

Hi Holly,

We appreciate your research and thoughtful correspondence.

However, as our public hearing is closed, you are correct that this email and materials are inadmissible and, unfortunately, we cannot engage here in the substance of your research or interpretation though I can say we are all mindful of what is proposed and what is permissible.

My number is below. Should you ever wish to discuss other questions, please feel free to call anytime.

Kindly,
Adam Block
Principal Agent
Compass
adam.block@compass.com
617.731.9454

> On Nov 4, 2022, at 5:42 PM, Holly Charbonnier <hollycharbonnier@yahoo.com> wrote:
>
> Dear Planning Board,
>
> While I understand that you are no longer accepting public comment, after the deliberation this week, I feel it's important to point out some details about the fitness path. A couple of times I heard people reference the path as being grassy and not paved. I do not believe that to be the case in this situation. I have been reviewing their plans for the fitness path (slide detail below) and the grassy part is only acting as a border to

the actual "drivable" path. the 10' path itself is identified as Permeable Paving - Heavy Duty.

As you had read allowed at the PB meeting, Needham's Zoning Law states that "The required 50-foot setback **shall be a landscaped, vegetative buffer area,** which shall be required along the aforementioned street frontages and said layout in order to screen the development. Driveway openings, sidewalks, walkways and screened mechanical equipment shall be permitted in the buffer area."

Their slide presentation is a bit misleading. The image of paving is just the permeable grass block (which is being used as the boarder to the permeable paving. They conveniently do not show a precedent image of the permeable paving. (see the one I have found from a local contractor below).

I understand their reasoning is that the fire department is requiring this paving for emergency purposes. While this is accurate, it still doesn't give them the right to ignore the zoning for the site. Typical sidewalks are 5 feet to 8 feet wide in non-urban areas. The **20 feet they are proposing** as a walking path is triple a typical sidewalk. Shouldn't the developer be required to move the building an additional 10 feet back away from the road to provide the proper amount of landscaped, vegetative setback as required by our zoning?

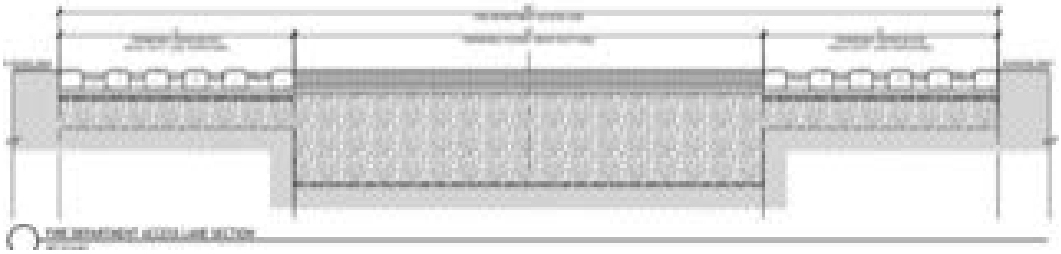
Thank you for your consideration,
Holly Charbonnier
TMM, Precinct J



Heavy-Duty Permeable Paving

Rockpave's heavy-duty permeable paving system bears the heaviest loads over the longest time periods. This product can be used for your small or large residential pavement home jobs and for large- to small-scale commercial or municipal public works projects. The surface is the best, most robust product for areas that require heavy-duty load-bearing: driveways, entranceways, courtyards, and all public works needs. It's ideal for paths bearing heavier loads or with high pedestrian and bike traffic. City municipality managers looking for the highest quality porous paving systems testify that this product is the best, completely customizable solution. We'll be happy to discuss all the metrics and benefits of our heavy-duty permeable paving with you.





Fitness Path Detail

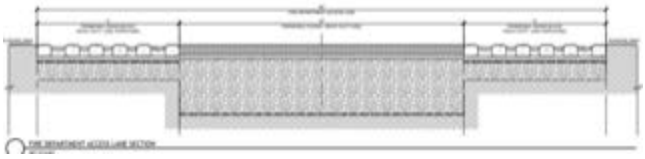




Heavy-Duty Permeable Paving

Rockpave's heavy-duty permeable paving system bears the heaviest loads over the longest time periods. This product can be used for your small or large residential pavement home jobs and for large- to small-scale commercial or municipal public works projects. The surface is the best, most robust product for areas that require heavy-duty load-bearing: driveways, entranceways, courtyards, and all public works needs. It's ideal for paths bearing heavier loads or with high pedestrian and bike traffic. City municipality managers looking for the highest quality porous paving systems testify that this product is the best, completely customizable solution. We'll be happy to discuss all the metrics and benefits of our heavy-duty permeable paving with you.





TOWN OF NEEDHAM
TOWN HALL
Needham, MA 02492-2669

Office of the
SELECT BOARD

TEL: (781) 455-7500
FAX: (781) 449-4569

TO:	Planning Board
FROM:	Kate Fitzpatrick
CC:	Select Board, Dave Davison
	Katie King Lee Newman
DATE:	November 8, 2022
RE:	Select Board Goals Related to Planning Board Interests

At its meeting on September 27, 2022 the Select Board voted to adopt goals for FY2023 and FY2024. Included in that document as goal 7.4 is the following: "Work with the Planning Board to explore zoning options to allow solar canopies on public and private property."

Board members have also expressed interest in exploring whether modifying the definition of a setback for the infrastructure for heat pumps and geothermal would make it easier for homeowners to switch to newer technologies.

The Board is interested in the Planning Board's priorities with respect to future zoning changes related to sustainability and energy and stand ready to assist the Planning Board in this regard.

Finally, the Board's goals also include "Sponsor a Tree Summit" and "Work with the Planning Board on next steps related to the MBTA Community Housing Guidelines and the update to the Town's Affordable Housing Plan. Review updated demographics and impact on anticipated transit-oriented development and schools." The Board looks forward to working with the Planning Board on these items as well.

If you have any questions or need additional assistance, please let me know.