NEEDHAM PLANNING BOARD
Tuesday, April 20, 2021
7:15 p.m.

Virtual Meeting using Zoom
Meeting ID: **826-5899-3198**
(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: 826-5899-3198

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: 826-5899-3198

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: 826-5899-3198

Direct Link to meeting: https://us02web.zoom.us/s/82658993198

1. Public Hearing:

   7:20 p.m. Major Project Site Plan Special Permit No. 2020-04: WELL LCB Needham Landlord LLC, c/o LCB Senior Living, 3 Edgewater Drive, Suite 101, Norwood, MA, 02062, Petitioner. (Property located at 100-110 West Street, Needham, MA). Regarding redevelopment of the property to include an 83 unit Assisted Living and Alzheimer's/Memory Care facility and 72 Independent Living Apartments.

   7:50 p.m. 390 Grove Street Definitive Subdivision: Elisabeth Schmidt-Scheuber, 390 Grove Street, Needham, MA, Petitioner, (Property located at 390 Grove Street, Needham, MA). *Please note this is a re-noticed hearing that began on February 4, 2020 and is continued from the July 21, 2020, August 11, 2020, September 8, 2020, November 4, 2020, December 15, 2020, January 19, 2021, February 2, 2021 and March 2, 202Planning Board meetings. Please note: The Petitioner has requested that this application be withdrawn.*

2. Vote on determination of which voting threshold (majority or two-thirds) applies to the zoning articles on the Annual Town Meeting Warrant under the Housing Choice Legislation.

3. Minutes.

4. Correspondence.

5. Report from Planning Director and Board members.

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

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, 3.15.3.2 (b), (c), and (d), 5.1.1.5, 5.1.1.7 and 5.1.3, the Needham Planning Board will hold a public hearing on Tuesday, April 20, 2021 at 7:20 p.m. by Zoom Web ID Number 826-5899-3198 (further instructions for accessing are below), regarding the application of WELL LCB Needham Landlord LLC, c/o LCB Senior Living, 3 Edgewater Drive, Suite 101, Norwood, MA, 02062, for a Special Permit under Site Plan Review, Section 7.4 of the Needham Zoning By-Law.

The subject property is located at 100-110 West Street, Needham, MA, located in the Avery Square Business, Single Residence B and Avery Square Overlay Zoning Districts. The property is shown on Assessors Plan No. 63 as Parcel 37 containing a total of 4.298 acres. The requested Major Project Site Plan Special Permit, would, if granted, permit the Petitioner to redevelop the property to include an 83 unit Assisted Living and Alzheimer's/Memory Care facility and 72 Independent Living Apartments. The existing 3 story brick building is proposed to remain. The existing footprint of the building is not proposed to change and a partial fourth story will be added to create 10 of the proposed 72 Independent Living Apartments. The parking lot to the south of the building will remain unchanged except for selected new landscaping and the parking lot west of the building and adjacent to the railroad right of way will be modified slightly, including selected new landscaping

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 alteration of a non-conforming structure. The structure is a legally pre-existing non-conforming as to the requirements of Sections 4.4.8.4 and 4.4.9. In accordance with the Zoning By-Law, Section 3.15.3.2 (b), (c), and (d) of the Zoning By-Law, a Special Permit is required to allow the following uses allowed in the ASOD by Special Permit: (b) Assisted Living and/or Alzheimer's/Memory Loss Facilities; (c) Independent Living Apartments; and (d) Buildings with multiple uses containing, as a primary use, such uses as are allowed by special permit or by right in the Avery Square Overlay District or the Avery Square Business District, as well as accessory uses subordinate to and customarily incidental to the primary uses. In accordance with the Zoning By-Law, Sections 5.1.1.5 and 5.1.1.7, a Special Permit is required to waive strict adherence to the off-street parking requirements of Section 5.1.3 of the Zoning By-Law, with respect to subsections (h) (parking space layout) and (i) (width of maneuvering aisle).

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Direct Link to meeting: https://us02web.zoom.us/s/82658993198

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 Times, March 25, 2021 and April 1, 2021.

TOWN OF NEEDHAM
MASSACHUSETTS

500 Dedham Ave
Needham, MA 02192
781-455-7550

PLANNING BOARD

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2021 MAR 11 AM 9:16

February 23, 2021

APPLICATION FOR SITE PLAN REVIEW
AND SPECIAL PERMITS

Project Determination: [X] 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 pursuant to Section 7.4 of the By-laws.

Location of Property: 100-110 West Street, Needham, MA 02492

Name of Applicant: WELL LCB Needham Landlord LLC

Address: C/O LCB Senior Living: 3 Edgewater Drive, Suite 101, Norwood, MA 02062 Tel.#: (781) 619-9320

Applicant is Owner [ ] Tenant [X]

Property Owner's Name: HCRI Massachusetts Properties Trust II

Address: 4500 Dorr Street, Toledo, Ohio 43615 Tel.#: (419) 247-2800

Characteristics of Property: Lot Area: 4.298 acres Present Use: Vacant Building

Map #: 63 Parcel #: 37 Zoning District: ASB, SRB, and ASOD

Description of Project for Site Plan Review and Special Permits under Sections 1.4.6, 3.15.3.2., 5.1.1.5, 5.1.1.7, 5.1.3, and 7.4. of the Zoning By-law:

See Exhibit A attached hereto.

. Signature of Applicant (or his representative) _____
Roy A. Cramer, Esq.
Evans Huber, Esq.

Address if not Applicant Frieze Cramer Rosen & Huber LLP
60 Walnut Street, Wellesley, MA 02481

Tel. # 781 943 4030

Owner's permission if other than applicant HCRI Massachusetts Properties Trust II

By: _____
Mary Ellen Pisanelli
Authorized Signatory

SUMMARY OF PLANNING BOARD ACTION

Received by Planning Board _____ Date 3/9/21

Hearing Date _____

Decision Required by _____(date)
(90 days after hearing for special permit)

Parties in Interest Notified
of Public Hearing _____(date)

Granted _____(date)

Decision and Notices of the
Decision sent _____(date)

Denied _____(date)

Fee Paid _____

Withdrawn _____(date)

Fee Waived _____

NOTE: Reports on Minor Projects must be issued within 35 days of filing date.

Exhibit A
Application for Site Plan Review
And Special Permits
LCB Senior Living
Property at 100-110 West Street, Needham, MA

RECEIVED TOWN CLERK NEEDHAM, MA 02492
2021 MAR 11 AM 9:43

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

WELL LCB Needham Landlord LLC, is proposing to redevelop the property to include an 83-unit Assisted Living and Alzheimer's/Memory Care facility and 72 Independent Living Apartments. The existing 3 story brick building will remain. The existing footprint of the building will not change. As allowed by Section 3.15 of the Town's Zoning Bylaws, a partial fourth story will be added to create 10 of the proposed 72 Independent Living Apartments. The parking lot to the south of the building will remain unchanged except for selected new landscaping and the parking lot west of the building and adjacent to the railroad right of way will be modified slightly, including selected new landscaping.

All of the foregoing is more particularly shown on the plans filed herewith.

Applicant seeks Site Plan Review pursuant to Section 7.4 of the Bylaw, and Special Permits pursuant to Section 1.4.6 of the Bylaw (alteration of a non-conforming structure, which is nonconforming with respect to the requirements of Sections 4.4.8.4 and 4.4.9); Section 3.15.3.2 (b), (c), and (d) (uses allowed in the ASOD by Special Permit), and Sections 5.1.1.5 and 5.1.1.7, waiving strict compliance with the requirements of Section 5.1.3 (h) and (i) of the Bylaw.

TOWN OF NEEDHAM
MASSACHUSETTS

PLANNING BOARD

500 Dedham Ave
Needham, MA 02192
781-455-7550
February 23, 2021

2021 MAR 11 AM 9:43

APPLICATION FOR SITE PLAN REVIEW
AND SPECIAL PERMITS

Project Determination: [X] 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 pursuant to Section 7.4 of the By-laws.

Location of Property: 100-110 West Street, Needham, MA 02492

Name of Applicant: WELL LCB Needham Landlord LLC

Address: C/O LCB Senior Living: 3 Edgewater Drive, Suite 101, Norwood, MA 02062 Tel.#: (781) 619-9320

Applicant is Owner [ ] Tenant [X]

Property Owner's Name: HCRI Massachusetts Properties Trust II

Address: 4500 Dorr Street, Toledo, Ohio 43615 Tel.#: (419) 247-2800

Characteristics of Property: Lot Area: 4.298 acres Present Use: Vacant Building

Map #: 63 Parcel #: 37 Zoning District: ASB, SRB, and ASOD

Description of Project for Site Plan Review and Special Permits under Sections 1.4.6, 3.15.3.2., 5.1.1.5, 5.1.1.7, 5.1.3, and 7.4. of the Zoning By-law:

See Exhibit A attached hereto.

Signature of Applicant (or his representative)

Roy A. Cramer, Esq.
Evans Huber, Esq.

Address if not Applicant: Frieze Cramer Rosen & Huber LLP
60 Walnut Street, Wellesley, MA 02481

Tel. #: 781 943 4030

Owner's permission if other than applicant: HCRI Massachusetts Properties Trust II

By: Mary Ellen Pisanelli
Authorized Signatory

SUMMARY OF PLANNING BOARD ACTION

Received by Planning Board _____ Date _____

Hearing Date _____

Decision Required by _____ (date)
(90 days after hearing for special permit)

Parties in Interest Notified
of Public Hearing _____ (date)

Granted _____ (date)

Decision and Notices of the
Decision sent _____ (date)

Denied _____ (date)

Fee Paid _____

Withdrawn _____ (date)

Fee Waived _____

NOTE: Reports on Minor Projects must be issued within 35 days of filing date.

Exhibit A
Application for Site Plan Review
And Special Permits
LCB Senior Living
Property at 100-110 West Street, Needham, MA

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

2021 MAR 11 AM 9:43

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All of the foregoing is more particularly shown on the plans filed herewith.

Applicant seeks Site Plan Review pursuant to Section 7.4 of the Bylaw, and Special Permits pursuant to Section 1.4.6 of the Bylaw (alteration of a non-conforming structure, which is nonconforming with respect to the requirements of Sections 4.4.8.4 and 4.4.9); Section 3.15.3.2 (b), (c), and (d) (uses allowed in the ASOD by Special Permit), and Sections 5.1.1.5 and 5.1.1.7, waiving strict compliance with the requirements of Section 5.1.3 (h) and (i) of the Bylaw.

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2021 MAR 11 AM 9:44

SECRETARY'S CERTIFICATE

March 2, 2021

I, MATTHEW G. MCQUEEN, Executive Vice President - General Counsel & Corporate Secretary of Welltower Inc., a Delaware corporation (the "Company"), HEREBY CERTIFY as follows:

1. HCRI Massachusetts Properties Trust II and WELL LCB Needham Landlord LLC (collectively, "Subsidiaries") are a wholly owned direct or indirect subsidiary of the Company.

2. Attached hereto as Exhibit A is a true and correct copy of certain sections of the resolutions of the Board of Directors of the Company, dated April 29, 2020 (the "Resolutions"), regarding the authority of the executive officers to enter into, execute, and deliver, in the name and on behalf of the Company and Subsidiaries, any contract, agreement, conveyance, note, deed, or any other document or instrument that may be deemed by such officer necessary or advisable in connection with the business of the Company and Subsidiaries in the ordinary course and to prescribe duties and powers to other officers of the Company and Subsidiaries.

3. The Resolutions have not been amended, modified, or repealed in any respect and are in full force and effect as of the date hereof.

4. Pursuant to the authority granted in the Resolutions, Mary Ellen Pisanelli, the Senior Vice President – Legal & Administration of the Company, has been delegated authority to enter into, execute, and deliver, in the name of and on behalf of the Company and Subsidiaries, any document or instrument that she deems necessary or advisable in connection with an Application for Site Plan Review and Special Permits to be submitted to the Town of Needham, Massachusetts with respect to that certain property located at 100-110 West Street, Needham, MA 02492.

DocuSign Envelope ID: 9963BF51-2C6B-45ED-A10B-6A65AF64DB5C

IN WITNESS WHEREOF, I have hereunto set my hand as of the date first set forth above.

DocuSigned by:

D477A1206E8C495...

Matthew G. McQueen – Executive Vice President, General Counsel & Corporate Secretary

2021 MAR 11 AM 9:44

DocuSign Envelope ID: 9963BF51-2C6B-45ED-A10B-6A65AF64DB5C

2021 MAR 11 AM 9:44

Exhibit A

Grant of Powers to Certain Executive Officers

RESOLVED, that each of Thomas J. DeRosa, as Chairman of the Board & Chief Executive Officer, Shankh Mitra, as Vice Chair, Chief Operating Officer & Chief Investment Officer, Timothy G. McHugh, as Executive Vice President - Chief Financial Officer, Matthew G. McQueen, as Senior Vice President - General Counsel & Corporate Secretary, and Ayesha Menon as Senior Vice President - Strategic Investments be, and each of them hereby is, authorized to enter into, execute, and deliver, in the name and on behalf of the Company, any contract, agreement, conveyance, note, deed, or any other document or instrument that may be deemed by such officer necessary or advisable in connection with the business of the Company in the ordinary course, without further act or resolution of the Board of Directors of the Company (the "Board").

Delegation of Power to Executive Officers

RESOLVED, that, pursuant to Article IV, Section 11 of the By-Laws and in addition to the delegation to Mr. DeRosa above, the Board hereby delegates to each of Thomas J. DeRosa, as Chairman of the Board & Chief Executive Officer, Shankh Mitra, as Vice Chair, Chief Operating Officer & Chief Investment Officer, as Timothy G. McHugh, as Executive Vice President - Chief Financial Officer, as Matthew G. McQueen, as Senior Vice President - General Counsel & Corporate Secretary, Ayesha Menon as Senior Vice President - Strategic Investments, the power to prescribe duties and powers to other officers of the Company, without further act or resolution of the Board, including, but not limited to, the power to:

(a) appoint or elect the directors, managers, or officers of any current or future direct or indirect subsidiary or affiliate of the Company; and

(b) enter into, execute, and deliver, in the name and on behalf of the Company or any of its subsidiaries and affiliates, any contract, agreement, conveyance, note, deed, or any other document or instrument that may be deemed necessary or advisable in connection with the business of the Company or any of its subsidiaries and affiliates in the ordinary course.

General Authority

RESOLVED, that any specific resolutions that may be required to have been adopted by the Board in connection with the actions contemplated by any of the foregoing resolutions be, and they hereby are, adopted, and the officers of the Company be, and each of them hereby is, authorized to certify as to the adoption of any and all such resolutions and attach such resolutions hereto;

RESOLVED, that all actions heretofore taken by any director or officer of the Company in connection with, or otherwise in contemplation of, the actions contemplated by any of the foregoing resolutions be, and they hereby are, ratified, confirmed, and approved; and

DocuSign Envelope ID: 9963BF51-2C6B-45ED-A10B-6A65AF64DB5C

RESOLVED, that the officers of the Company be, and each of them hereby is, authorized and empowered on behalf of the Company and in its name to take or cause to be taken all actions and to execute and deliver all such agreements, certificates, instruments, and documents that the officers of the Company, or any one or more of them, approve as necessary or desirable in connection with the foregoing resolutions, such approval to be conclusively evidenced by the taking of any such action or the execution and delivery of any such agreement, certificate, instrument, or document by an officer of the Company.

2021 MAR 11 AM 9:44

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

March 3, 2021

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:

Pursuant to Chapter 40A of the Massachusetts General Laws, the Needham Zoning By-Law, the Needham Planning Board Rules, and Sections 3.3 and 4.2 of Major Project Site Plan Special Permit No. 93-4 dated October 12, 1993 (as amended), I hereby submit applications for Further Site Plan Review and Special Permits on behalf of WELL LCB Needham Landlord LLC ("WELL LCB"), of which this letter is a part. WELL LCB, the developer and operator of the property at 100 West Street, is a joint venture between LCB Senior Living, LLC and Welltower, Inc., which owns the property through HCRI Massachusetts Properties Trust II.

The original Planning Board Decision authorizing the former uses at the site (nursing home and assisted living facilities) dated October 12, 1993, was amended on February 8, 1994, February 25, 1995, May 6, 1996, August 20, 1996 and April 20, 2004. Most recently, until 2017, the site was occupied by Avery Crossing, a 60 unit assisted living/memory care facility, Avery Manor, a 142-bed skilled nursing facility, and medical offices comprising approximately 8,308 square feet.

The property is a 4.298 acre parcel (187,219 square feet) located at the corner of Highland Avenue and West Street. The entire building, and the great majority of the property, is located in the Avery Square Business District (ASB) and the Avery Square Overlay District (ASOD), with a portion of the property located in the Single Residence B Zoning District. The property is currently vacant and is improved by a three-story brick building of approximately

186,000 square feet, outdoor parking areas to the south and west of the building and an indoor parking area.

WELL LCB is proposing to redevelop the property to include an 83 unit Assisted Living and Alzheimer's/Memory Care facility and 72 Independent Living Apartments. The existing 3 story brick building will remain. The existing footprint of the building will not change and a partial fourth story will be added to create 10 of the proposed 72 Independent Living Apartments. The parking lot to the south of the building will remain unchanged except for selected new landscaping and the parking lot west of the building and adjacent to the railroad right of way will be modified slightly, including selected new landscaping, all as more particularly shown on the Plans filed with the Application.

The Applicant certifies pursuant to the Zoning By-Law, Section 7.4 that the project can be constructed and/or that the proposed uses thereof can be commenced without need for the issuance of any variance from any provisions of the Zoning By-Law by the Zoning Board of Appeals.

The zoning relief required for the Project is the following:

1. Special Permit for Further Site Plan Review of a Major Project, pursuant to Zoning By-Law Section 7.4, Article 2 of the Planning Board Rules, and Sections 3.3 and 4.2 of Major Project Site Plan Special Permit No. 93-4 dated October 12, 1993, as amended.

2. Special Permit pursuant to Section 1.4.6 of the Zoning By-Law to allow alteration of a non-conforming structure. The structure is a legally pre-existing non-conforming as to the requirements of Sections 4.4.8.4 and 4.4.9.

3. Special Permit pursuant to Section 3.15.3.2 (b), (c), and (d) of the Zoning By-Law to allow uses allowed in the ASOD by Special Permit.

4. Special Permit pursuant to Sections 5.1.1.5 and 5.1.1.7 of the Zoning By-Law to waive strict adherence to the off-street parking requirements of Section 5.1.3 of the Zoning By-Law, with respect to subsections (h) (parking space layout) and (i) (width of maneuvering aisle). Please note that waivers with respect to the particular ways in which the structure does not comply with these requirements have previously been granted by prior decisions of this Board.

This Application for Further Site Plan Review and Special Permits include the following documents:

1. Traffic Impact Study, prepared by McMahon Associates, 120 Water Street, Unit 1, Boston, MA 02109, dated February 2021.

2. Existing Conditions and Proposed Conditions Site Plans, and Zoning and Parking Tables, prepared by Kelly Engineering Group, 0 Campanelli Drive, Braintree, MA 02184.

3. Stormwater management report prepared by Kelly Engineering Group, dated February 25, 2021.

4. Landscaping Plan, prepared by Hawk Design Inc., P.O. Box 1309, Sandwich, MA 02563.

5. Floor plans, roof plan, elevation plans, photographs and renderings (including existing and proposed views of the property from various vantage points), prepared by The Architectural Team, Inc., 50 Commandants Way, Chelsea, MA 02150.

6. Letter from this office dated March 1, 2021, discussing compliance with the criteria for Site Plan Review.

7. Filing fee to the Town of Needham in the amount of $18,922.

Pursuant to the Board's Covid-19 procedures, these documents are being submitted electronically; additionally two (2) hard copies of the application (1 with original signatures) and all supporting materials, including wet-stamped plans, are being mailed to the Planning Department along with the application fee; and, lastly, one hard copy of (a) the Application for Further Site Plan Review and Special Permits, (b) this letter, and the other letter from this office referred to in item 6, above, (c) the Kelly Engineering Stormwater Management Report, and (d) all the plans (no smaller than 11 x 17), is being mailed to each Board member, and to Lee Newman.

The Applicant hereby requests, pursuant to Zoning By-Law Section 7.4.4, that the Planning Board waive the submission by Applicant of any of the required information not submitted herewith.

The Applicant has previously submitted a copy of these plans to the Design Review Board ("DRB"). The Applicant met with the Design Review Board on February 22, 2021, at which time the DRB approved these plans.

I would appreciate your scheduling this matter for hearing at the Board's April 6, 2021 meeting.

Thank you for your cooperation.

Sincerely,

Evans Huber

Cc: Roy A. Cramer, Esq.

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

March 4, 2021

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 - 110 West Street, Needham

Dear Planning Board Members and Ms. Newman:

I am writing on behalf of WELL LCB Needham Landlord LLC, with respect to the Application for Further Site Plan Review and Special Permits for the Project at 100-110 West Street. The purpose of this letter is to provide the Planning Board with additional information in connection with this Project and, in particular, to discuss how the project will conform to the Review Criteria for Site Plan Review, as set forth in Section 7.4.6 of the Zoning By-Law.

The following are the criteria for the Planning Board to consider during the site plan review process pursuant to Section 7.4.6 of the Zoning By-Law, and the description of how the Project meets those criteria.

(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 proposed project has been designed to protect adjoining premises from detrimental impacts by provision for surface water drainage, sound and sight buffers, and preservation of views, light and air, as follows:

The site has been designed to ensure that there will be no off-site drainage impacts. A drainage system exists on site. The drainage system will ensure that peak storm generation levels will remain unchanged. The proposed site layout plans were presented to the Engineering Department and, as set forth more fully in the Stormwater Management Report filed as part of this Application, it was agreed the proposed project is exempt from the Needham Stormwater Bylaw.

An extensive landscape plan has been developed for screening and enhancing the existing site. Noise and visual impacts have been minimized by locating the proposed 4th floor well set back from the north, east, and south sides of the building, which in many places is set back from the façade of the building further than the Bylaw requires and, overall, occupies a smaller percentage of the existing roof area than the Bylaw allows. The neighbors to the west will be protected by means of the existing buffering provided by a combination of existing trees and vegetation, new plantings, and the MBTA rail lines.

The lighting system for the project has been designed to fully comply with the Town of Needham lighting requirements and will consist of decorative cut off fixtures on low poles, as well as bollards to provide illumination for pedestrian walkways on site.

The Design Review Board has reviewed and approved the landscaping plan and the exterior lighting plan.

(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;

Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets, and the proper location of driveway openings in relation to traffic and to adjacent streets, has been assured. As shown on the plans filed with this application, the project has been designed to ensure that there will be safe vehicular and pedestrian circulation throughout the site. The access to and egress from the property will be via existing driveway openings off West St. and Highland Ave. that will remain and provide access to the site. Sidewalks exist on both West St. and Highland Ave. that connect to the sidewalks on the site. This allows for easy pedestrian access to the site.

Sidewalk access has been provided adjacent to the primary exterior parking stalls for pedestrian safety. Bylaw compliant handicap access and parking is provided.

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

Adequacy of the arrangement of parking and loading spaces in relation to the proposed uses of the premises has been achieved. The proposed exterior parking area complies with the Town of Needham Bylaw requirements for number of spaces, illumination, loading, parking space size, location, design and number of handicap spaces, width of maneuvering aisles, setbacks, and landscaping. The parking is distributed throughout the site to provide convenience for employees and visitors. With respect to the interior parking, Special Permits are requested for parking space layout for certain tandem spaces, and for the aisle width in one portion of the garage. Both of these conditions have existed for many years. Please see the Layout and Zoning Plan for additional details of the parking layout.

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

The site has been designed such that adequate methods of disposal of refuse resulting from the uses permitted on the site have been assured. A dumpster enclosure is provided adjacent to the loading area west of the building. The dumpster enclosure will be screened by means of a fence. Refuse will be removed from the site by a licensed hauler.

(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 matters to be considered by this Board in connection with relationship of structures and open spaces to the natural landscape, existing buildings, and other community assets in the area, have been addressed, and with the exception of the special permits requested, the project complies with all other requirements of the Town Bylaw. The existing building is surrounded by existing commercial buildings to the North, East, and West ranging in size from one story to multi-story buildings, and residential homes to the South. The footprint of the existing building will remain unchanged, and the relatively minor façade changes have been designed to maintain the historic character of the existing building. The addition of the fourth floor on a portion of the building is harmonious with the design of this building and the nearby commercial buildings. There is a natural landscape buffer which will be maintained to the South of the site. To the West of the site are a natural landscape buffer, which will be enhanced by the proposed landscaping plan, as well as the existing MBTA railroad Right of Way. The Senior Center for the Town of Needham is within walking distance of the property.

The project has been designed to maximize landscaped area and limit impervious areas. This is accomplished by the site design and by keeping a portion of the existing parking garage that will accommodate 34 parking spaces. The open space will full comply with the requirements of the Bylaw.

The Design Review Board has reviewed and approved all proposed changes to the exterior of the building, as well as the proposed new fourth floor.

(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.

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 has been assured. The proposed use is expected to have minimal impacts on Town resources due to the nature of the use. It is a clean, quiet, low impact use. The project has been designed to limit adverse impacts to the Town resources as follows:

The project will connect to the Town's water system that is located on Highland Ave. We have met with the Engineering Department and there were no concerns raised regarding water pressure and flow for this area of Town. The project will maintain the existing sewer connections to the Town's sewer system by means of the connections to the sewer main located on Highland Ave.

The proposed site layout plans were presented to the Fire Department prior to finalizing the layouts and the Fire Department was satisfied with the proposed circulation.

As shown in the Traffic Impact Analysis submitted with this application, the project is expected to have a minimal impact on vehicle trips and level of service on Highland Avenue and West Street during peak hours, even when compared to no-build conditions, and is expected to generate less traffic than the prior use of the site.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Evans Huber

Cc: Roy A. Cramer, Esq.

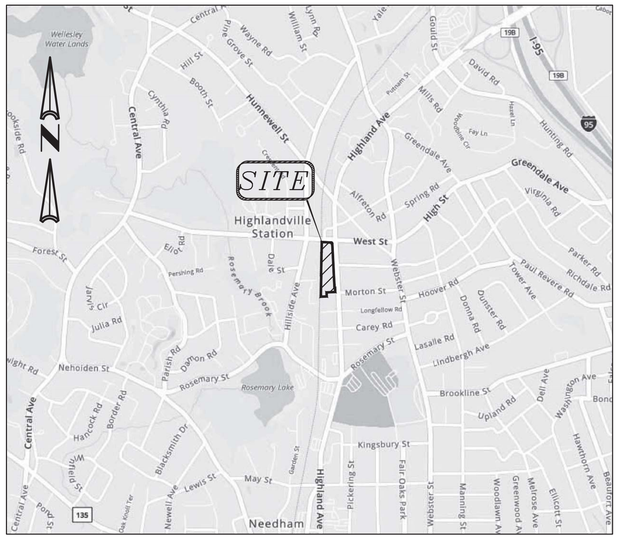
SITE DEVELOPMENT PLANS

FOR

THE RESIDENCE AT CARTER MILL
100 WEST STREET NEEDHAM, MA

JANUARY 29, 2021

SHEET INDEX						
SHEET No.	DESCRIPTION	LATEST REVISED DATE	CONSTRUCTION REVISIONS			
1	COVER SHEET					
2	EXISTING CONDITIONS PLAN					
3	LAYOUT PLAN					
4	GRADING PLAN					
5	DETAIL SHEET					
	PHOTOMETRIC PLAN					



LOCATION MAP

OWNER:
WELLTOWER INC.
4500 DORR ST
TOLEDO, OHIO 43615

OWNER/APPLICANT:
LCB SENIOR LIVING, LLC
3 EDGEWATER DRIVE
NORWOOD, MA 02062

CIVIL ENGINEERS:
KELLY ENGINEERING GROUP, INC.
0 CAMPANELLI DRIVE
BRAINTREE, MA 02184

ARCHITECT:
THE ARCHITECTURAL TEAM
50 COMMANDANT'S WAY AT ADMIRAL'S HILL
CHELSEA, MA 02150

LANDSCAPE ARCHITECT:
HAWK DESIGN, INC
P.O. 1309
SANDWICH, MA 02563

Digitally signed by David Noel Kelly P.E.
DN: cn=David Noel Kelly P.E., o=Kelly Engineering GRoup, Inc., ou, email=dkelly@kellyengineeringgroup.com, c=US
Date: 2021.01.28 14:35:21 -05'00'

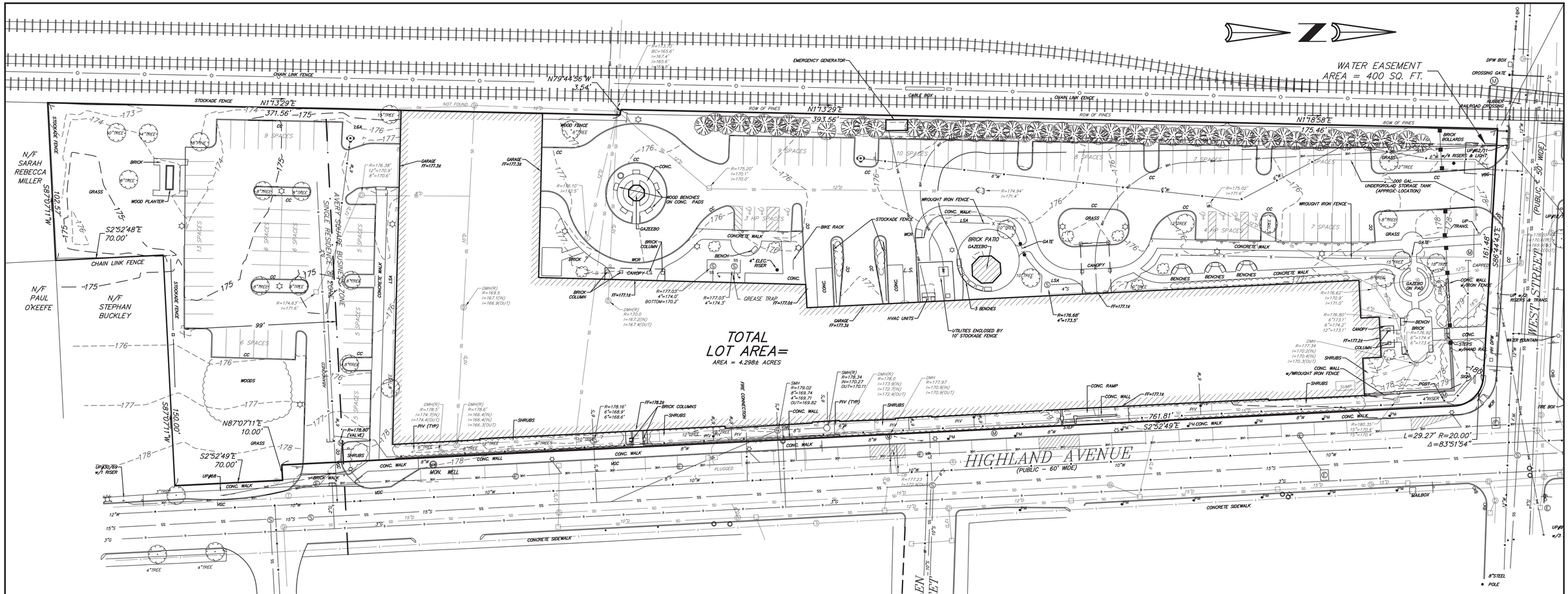
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COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37942
REGISTERED PROFESSIONAL ENGINEER

SCALE NA	JOB # F:\P\2020-030	100 WEST STREET NEEDHAM, MA
DATE 01/29/21	DRAWN BY CJL	
SHEET 1 OF 6	CHKD BY DAM	KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com
FILE # TS01	APPD BY DNK	SHEET NO. 1



LEGEND

CCB	CAPE COD BERM		TRANSFORMER
VGC	VERTICAL GRANITE CURB	OHE	OVERHEAD ELECTRIC LINE
CC	CONCRETE CURB	UGE	UNDERGROUND ELECTRIC LINE
EOP	EDGE OF PAVEMENT		TELEPHONE MANHOLE
	HANDICAP SPACE	T	TELEPHONE LINE
	CURB STOP		BOLLARD
LS	LANDSCAPED AREA	X	FENCE
	CATCH BASIN		STOCKADE FENCE
	DOUBLE CATCH BASIN		CHAIN LINK FENCE
	AREA DRAIN	XXX	CONTOUR LINE (MNR)
	TRENCH DRAIN	XXX	CONTOUR LINE (MJR)
	DRAIN MANHOLE		PROPERTY LINE
	STORM CEPTOR		ZONE LINE
SD	DRAIN LINE		
RD	ROOF DRAIN LINE		
AD	AREA DRAIN LINE		
S	SEWER MANHOLE		
	SEWER CLEAN OUT		
SS	SEWER LINE		
FM	SEWER FORCE MAIN		
GV	GAS VALVE		
G	GAS LINE		
	HYDRANT		
WV	WATER VALVE		
W	WATER LINE		
	UTILITY POLE		
	LIGHT POLE		
	FLOOD LIGHT		
E	ELECTRIC MANHOLE		

NOTES:

1.) UNDERGROUND FEATURES HAVE BEEN COMPILED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. THIS INFORMATION IS TO BE CONSIDERED APPROXIMATE AND KELLY ENGINEERING GROUP, INC. DOES NOT TAKE RESPONSIBILITY FOR SUBSEQUENT ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS PLAN AS A RESULT. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO KELLY ENGINEERING GROUP, INC. THE SIZE, LOCATION, AND EXISTENCE OF ALL SUCH FEATURES MUST BE VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION.

2.) THE LOCATION OF ALL UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED USING ASCE 38-02 (STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA) QUALITY LEVEL C.

3.) THE SITE DETAIL AND SURFACE IMPROVEMENTS DEPICTED HEREON WERE OBTAINED FROM A PLAN PREPARED BY VHB ENTITLED LCB 5+ LIVING, WEST STREET, NEEDHAM, MASSACHUSETTS, EXISTING CONDITIONS PLAN OF LAND, DATED FEBRUARY 18, 2020. KELLY ENGINEERING GROUP HAS CONFIRMED THE CONDITIONS BY PHYSICAL SURVEY AND INSPECTION IN APRIL OF 2020.

4.) ELEVATIONS SHOWN ARE BASED ON THE NORTH AMERICAN DATUM OF 1988 (NAVD88). VERTICAL CONTROL WAS PROVIDED BY GPS RTK SURVEY PERFORMED BY KELLY ENGINEERING GROUP, INC.

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DATE 01/29/21	REV	DATE	REVISION	BY
SHEET 2 of 6				
FILE # EX00				
JOB # F:\P\2020-030				
DRAWN BY SMH				
CHKD BY SMH				
APPD BY SMH				

THE RESIDENCE AT CARTER MILL
100 WEST STREET
NEEDHAM, MA

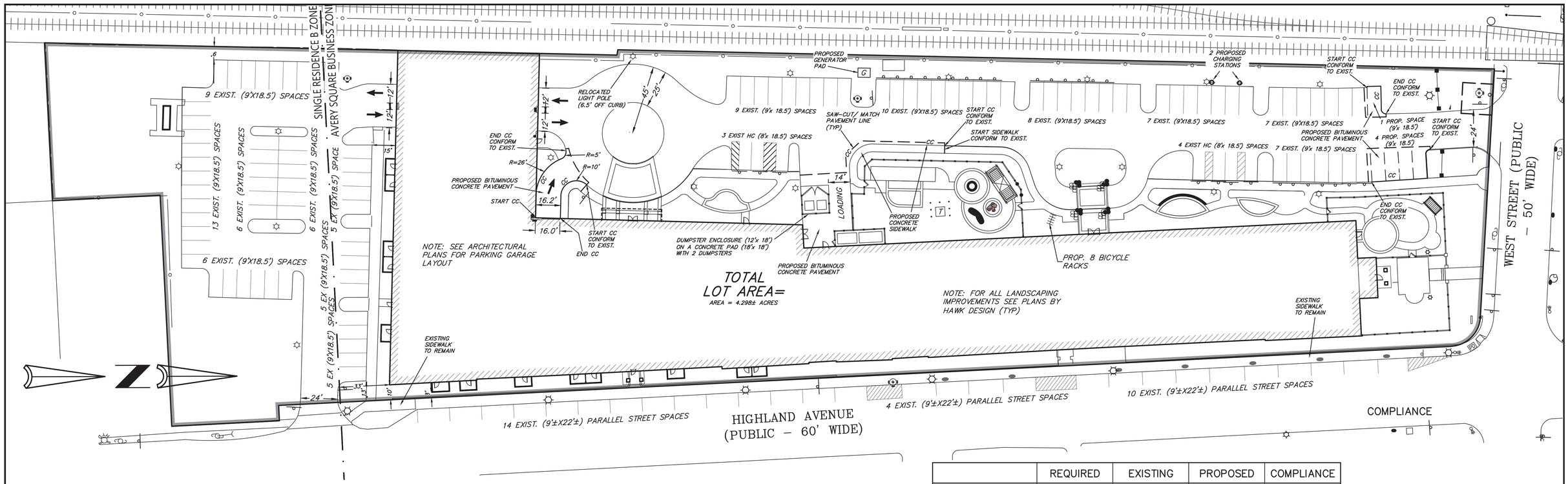
EXISTING CONDITIONS PLAN

COMMONWEALTH OF MASSACHUSETTS
STEVEN M. HORSFALL
No. 41608
PROFESSIONAL LAND SURVEYOR

Steven Horsfall
2021.01.28 14:45:13 -05'00'

KELLY ENGINEERING GROUP
civil engineering consultants
0 Campanelli Drive, Braintree, MA 02184
Phone: 781-843-4333 www.kellyengineeringgroup.com

SHEET NO. 2



ZONING LEGEND

ZONING DISTRICT: AVERY SQUARE BUSINESS DISTRICT/ SINGLE RESIDENCE B/ AVERY SQUARE OVERLAY DISTRICT
(DIMENSIONAL REQUIREMENTS PROVIDED FOR AVERY SQUARE BUSINESS DISTRICT AND ASOD)

	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
MIN. AREA	10,000 S.F.	187,219 S.F. (4.30 AC)	SAME	YES
MIN. FRONTAGE	80'	856'±	SAME	YES
MIN. SETBACK FRONT	10'	10'±	10'	YES (NOTE 1)
MIN. SETBACK SIDE (RESIDENTIAL DISTRICT)	50' (NOTE 1)	33'±	SAME	PRE-EXISTING NONCONFORMING
MIN. SETBACK SIDE	NA	0'±	SAME	YES
MIN. SETBACK REAR	NA	NA	SAME	YES
MAX. STORIES	4	3	4	YES
4TH FL. SETBACKS (NOTE 2)				
EAST FACADE	15'	NA	15' (NOTE 2)	YES
WEST FACADE	0'	NA	0' (NOTE 2)	YES
SOUTH FACADE	35'	NA	35' (NOTE 2)	YES
NORTH FACADE	110'	NA	110' (NOTE 2)	YES
4TH FL. AREA (NOTE 3)	35%	NA	APPROX. 32.9% (NOTE 3)	YES
MAX. HEIGHT	44' – 49' (NOTE 4)	41'–9" (NOTE 4)	44' & 49' (NOTE 4)	YES
LOT COVERAGE	NA (NOTE 5)	0.34	SAME	YES
FLOOR AREA RATIO	1.1 (NOTE 6)	1.00±	1.01	YES
PARKING TOTAL	149 (NOTE 7)	193	149 (NOTE 7)	YES
DRIVEWAY OPENINGS	18'–25' (TWO WAY)	24'	24'	YES

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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NOTE 1. YARD ASSUMPTIONS:
HIGHLAND AVE. AND WEST ST. ARE FRONT YARDS
MBTA RAIL AND SOUTH LOT LINE ARE SIDE YARDS
THERE ARE NO REAR YARDS

EXISTING BUILDING WILL REMAIN 10' FROM HIGHLAND AVE PROPERTY LINE. PROPOSED PATIOS ARE 3' FROM FRONT PROPERTY LINE, BUT ARE NOT CONSIDERED TO BE STRUCTURES.

THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.8.4, 50' SETBACK TO RESIDENTIAL DISTRICT

NOTE 2. SETBACKS ARE MEASURED FROM EXISTING BUILDING FACADE. (BYLAW SECTION 3.15.4.1) AS SHOWN ON THE ARCHITECTURAL PLANS, SETBACK DIMENSIONS VARY. PROPOSED SETBACKS ARE MINIMUMS.

NOTE 3. PER BYLAW SECTION 3.15.4.1 TOTAL FLOOR AREA OF THE 4TH FLOOR MAY NOT EXCEED 35% OF THE TOTAL ROOF AREA OF THE BUILDING. MECHANICAL EQUIPMENT IS NOT INCLUDED IN THE CALCULATION OF MAXIMUM ALLOWABLE FLOOR AREA. THE PROPOSED PERCENTAGE OF ROOF COVERAGE INCLUDES ROOF TERRACES. IF THOSE ARE EXCLUDED, THE PERCENTAGE OF ROOF COVERAGE IS APPROX. 25.3%

NOTE 4. EXISTING BUILDING HEIGHT OF 33±' TO TOP OF ROOF. 41'9" TO TOP OF HIGHEST POINT (MECHANICAL OR ELEVATOR OVERRIDE)

MAX ALLOWABLE BUILDING HEIGHT IS 44' TO TOP OF 4TH STORY AND ALL MECHANICALS OTHER THAN ELEVATOR OVERRIDE; 49' TO TOP OF ELEVATOR OVERRIDE. ACTUAL HEIGHTS ARE PLANNED TO BE SLIGHTLY LESS THAN MAX ALLOWABLE.

BUILDING HEIGHT WAS CALCULATED FROM THE AVERAGE GRADE PLANE OF THE EXISTING BUILDING OF 177.6±.
THE PROPOSED 4TH STORY ELEVATION IS 221.6±
THE PROPOSED ELEVATOR OVERRUN ELEVATION IS 226.6±.

NOTE 5. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.2 (E) THERE IS NO LIMITATION ON LOT COVERAGE IN THE AVERY SQUARE BUSINESS DISTRICT OR THE AVERY SQUARE OVERLAY DISTRICT.

TOTAL BUILDING COVERAGE= 63,700 S.F./ 187,219 S.F.= 0.34

NOTE 6. FLOOR AREA RATIO:
EXISTING FAR = 186,300 S.F./187,219 S.F. = 1.00 FAR
PROPOSED FAR = 189,220 S.F./187,219 S.F. = 1.01 FAR

THE CALCULATION OF PROPOSED FAR DOES NOT INCLUDE UNDERGROUND PARKING, AS ALLOWED IN THE AVERY SQUARE OVERLAY DISTRICT.

THE APPLICABLE BYLAW DEFINITION OF FLOOR AREA EXCLUDES "UNENCLOSED PORCHES AND BALCONIES," THE FAR CALCULATION FOR THIS PROJECT DOES NOT INCLUDE THE AREA OF PROPOSED FIRST FLOOR PATIOS AND ROOF TERRACES, ALL OF WHICH WILL BE UNENCLOSED.

NOTE 7. REQUIRED PARKING:
72 INDEPENDENT LIVING UNITS X 1.0 SPACES/UNIT + 96 ASSISTED LIVING BEDS x 0.5 SPACES/ BEDS
+ 58± EMPLOYEES X 1 SPACE/2 EMPLOYEES ON LARGEST SHIFT
= 149 SPACES REQUIRED
(TOWN OF NEEDHAM ZONING BYLAW SECTION 3.15.5)

PROVIDED:
34 GARAGE SPACES & 115 EXTERIOR PARKING SPACES = 149 SPACES (EXCLUDES 28 PARALLEL PARKING SPACES ON HIGHLAND AVE. ADJACENT TO THE PROPERTY THAT CAN BE COUNTED AS OFF-STREET PARKING PURSUANT TO SECTION 5.1.1.7 OF THE BYLAW FOR A TOTAL PARKING SUPPLY OF 177 SPACES.)

	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
ZONING BYLAW 5.1.3 PARKING PLAN AND DESIGN REQUIREMENTS				
A) PARKING ILLUMINATION	AVG 1 FOOT CANDLE	NA	AVG 2± FC	YES
B) LOADING REQUIREMENTS	1	2	1	YES
C) HANDICAPPED PARKING	6	7±	SAME	YES
D) DRIVEWAY OPENINGS	2	2	SAME	YES
E) MAX. COMPACT CARS	50% (8'X16')	38%	23% (NOTE 8)	YES
F) PARKING SPACE SIZE	9'x18.5'	9'x18.5'	SAME	YES
G) BUMPER OVERHANG	1' OVERHANG	NONE REQUIRED	SAME	YES
H) PARKING SPACE LAYOUT	(NOTE 9)	0	INCL. 5 TANDEM (NOTE 9)	SPECIAL PERMIT
I) AISLE WIDTH EXTERIOR	24' (90 DEG. STALL)	24'	SAME	YES
I) AISLE WIDTH INTERIOR	24' (90 DEG. STALL)	16'–8"	SAME (NOTE 10)	SPECIAL PERMIT
J) PARKING SETBACK				
–FRONT	10'	13'±	SAME	YES
–SIDE	4'	9'±	SAME	YES
–REAR	4'	NA	SAME	YES
–BUILDING	5'	15'±	SAME	YES
K) LANDSCAPED AREAS	10%	>10% (NOTE 11)	11%– 12% (NOTE 11)	YES
L) TREES	1 PER 10 SPACES	(NOTE 12)	(NOTE 12)	YES
M) LOCATION	WITHIN LOT	WITHIN LOT	SAME	YES
N) BICYCLE RACKS	8	0	8	YES

NOTE 8. COMPACT PARKING: 34 PROPOSED COMPACT SPACES IN PARKING GARAGE (23%).

NOTE 9. PARKING SPACE LAYOUT:
5 TANDEM SPACES PROPOSED IN PARKING GARAGE. A SPECIAL PERMIT IS REQUESTED FROM THE PLANNING BOARD.

NOTE 10: INTERIOR AISLE WIDTHS IN THE GARAGE ARE 16'–8". A SPECIAL PERMIT IS REQUESTED FROM THE PLANNING BOARD, BECAUSE THE EXISTING COLUMN TO COLUMN SPACING IS A UNIQUE CIRCUMSTANCE.

NOTE 11. LANDSCAPE AREAS: BETWEEN 11% AND 12% OF THE INTERIOR PORTION OF THE PARKING AREAS IS LANDSCAPED. THE AREAS OUTSIDE THE PERIMETER OF THE PAVED PARKING AREAS ARE NOT INCLUDED IN THIS CALCULATION. THIS SATISFIES THE REQUIREMENT THAT 10% OF THE PARKING AREA BE LANDSCAPED, AS WELL AS THE REQUIREMENT THAT AT LEAST ONE QUARTER OF THE LANDSCAPED AREA BE LOCATED IN THE INTERIOR OF THE PARKING AREA.

NOTE 12. TREES: SEE LANDSCAPE PLAN BY HAWK DESIGN, INC.

SCALE 1"= 30'
DATE 01/29/21
SHEET 3 OF 6
FILE # LA00
JOB # F:\P\2020-030
DRAWN BY CJL
CHKD BY BGL
APPD BY DNK

REV	DATE	REVISION	BY

THE RESIDENCE AT CARTER MILL
100 WEST STREET
NEEDHAM, MA

LAYOUT AND ZONING PLAN

COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37942
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Noel Kelly P.E.
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Date: 2021.07.28 14:20:42 -05'00'

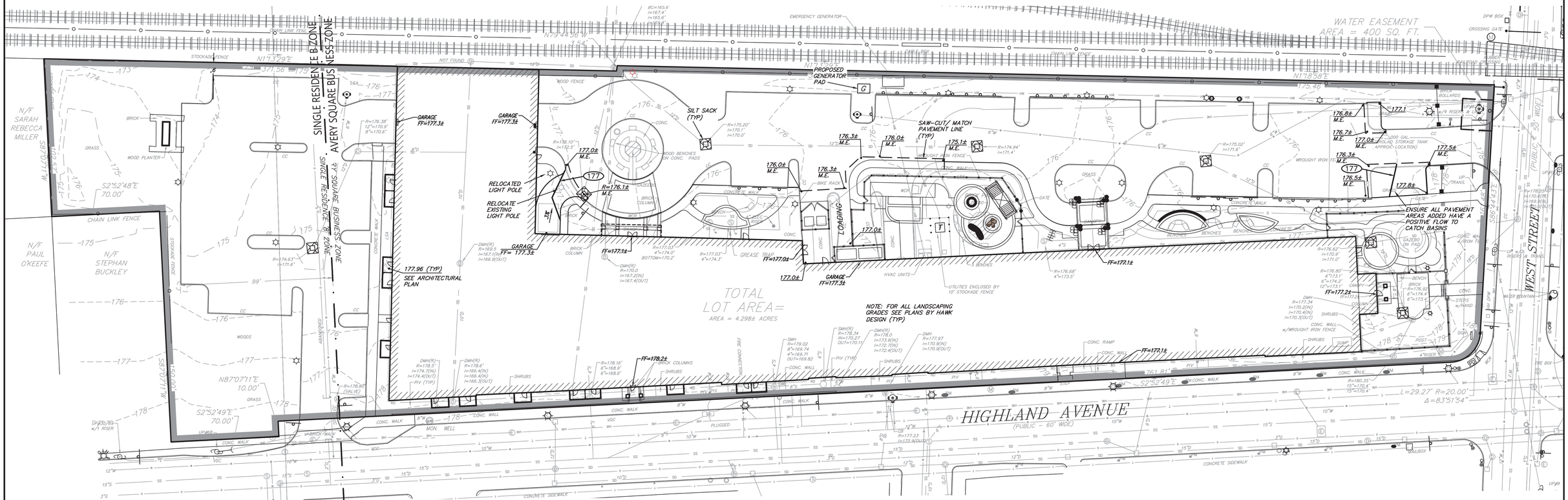
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civil engineering consultants
0 Campanelli Drive, Braintree, MA 02184
Phone: 781-843-4333 www.kellyengineeringgroup.com

SHEET NO. 3

PROPOSED LEGEND

177.0	SPOT GRADE
M.E.	MATCH EXISTING
— — — —	SAW CUT/ MATCH PAVEMENT LINE
⊠	SILT SACK

NOTE: FOR EXISTING SYMBOL LEGEND SEE SHEET 2



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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SHEET 4 of 6				
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APPD BY DNK				

THE RESIDENCE AT CARTER MILL
100 WEST STREET
NEEDHAM, MA

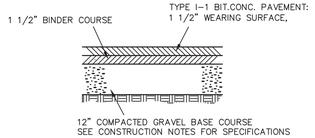
GRADING PLAN

COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37542
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Noel Kelly P.E.
DN: cn=David Noel Kelly P.E., o=Kelly Engineering Group, Inc., ou, email=dkelly@kellyengineering.com, c=US
Date: 2021.01.28 14:36:02 -05'00'

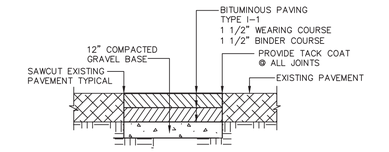
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SHEET NO. 4



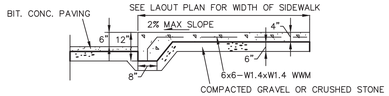
BITUMINOUS CONCRETE PAVEMENT (STANDARD)

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PAVEMENT MATCH/ SAW-CUT DETAIL

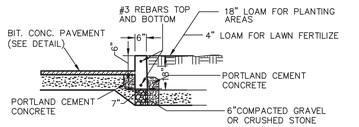
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NOTE: PROVIDE EXPANSION JOINTS AT 25' O.C.

INTEGRAL SIDEWALK/ CURB DETAIL

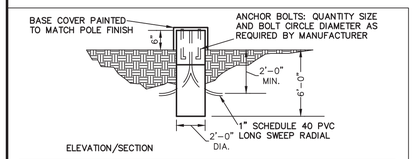
NOT TO SCALE | KELLY ENGINEERING GROUP, INC. ©



NOTE: PROVIDE EXPANSION JOINTS AT 5'-0" O.C. IF CAST IN PLACE.
(PRECAST CONC. CURBS MAY BE SUBSTITUTED)

CONCRETE CURB DETAIL

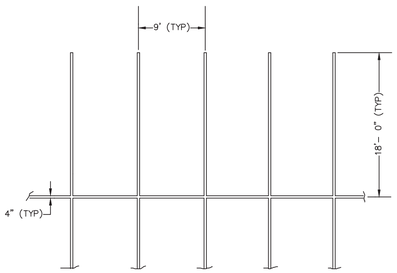
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ELEVATION/SECTION

LIGHT POLE DETAIL (LANDSCAPED AREAS)

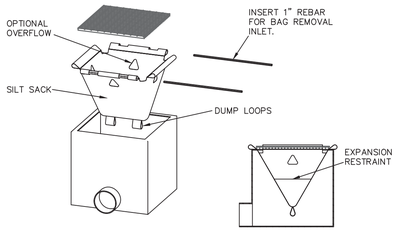
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STRIPING SHALL BE 4" WIDE STRAIGHT LINES
OF WHITE TRAFFIC PAINT, TO BE INSTALLED AS
SHOWN ON LAYOUT AND ZONING PLAN

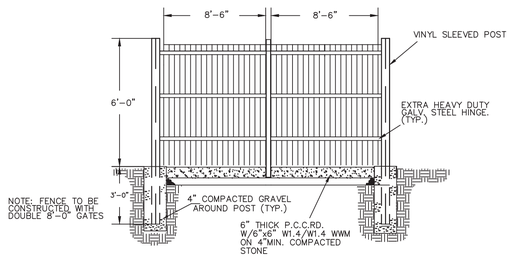
TYPICAL STRIPING DETAIL

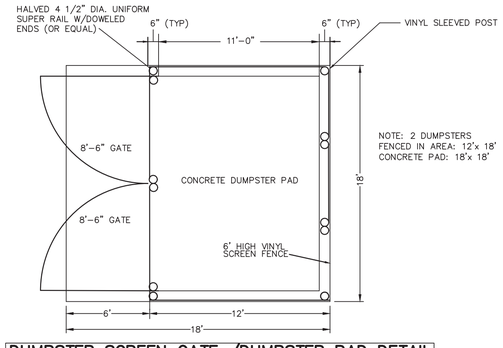
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SILT SACK- TYPE A DETAIL

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DUMPSTER SCREEN GATE /DUMPSTER PAD DETAIL

NOT TO SCALE | (DUMPSTER-DETAIL) | KELLY ENGINEERING GROUP, INC. ©

CONSTRUCTION NOTES

A1. THE CONTRACTOR SHALL REPORT TO THE OWNER AND ENGINEER OF ANY SIGNIFICANT VARIATIONS IN EXISTING SITE CONDITIONS FROM THOSE SHOWN ON THESE PLANS. ANY PROPOSED REVISIONS TO THE WORK, IF REQUIRED BY THESE SITE CONDITIONS, SHALL NOT BE UNDERTAKEN UNTIL REVIEWED AND APPROVED BY THE OWNER AND THE ENGINEER.

A2. THE CONTRACTOR SHALL NOTIFY THE TOWN OF NEEDHAM DEPARTMENT OF PUBLIC WORKS AT LEAST 48 HOURS IN ADVANCE OF ANY REQUIRED INSPECTIONS.

A3. IN ORDER TO PROTECT THE PUBLIC SAFETY DURING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING AT ALL TIMES ALL NECESSARY SAFETY DEVICES AND PERSONNEL, WARNING LIGHTS, BARRICADES, AND POLICE OFFICERS.

A4. ALL WORK SHALL CONFORM TO A SPECIAL PERMIT TO BE ISSUED BY THE TOWN OF NEEDHAM.

A5. THE LOCATION OF UNDERGROUND UTILITIES AS REPRESENTED ON THESE PLANS IS BASED UPON PLANS AND INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES OR MUNICIPAL DEPARTMENTS SUPPLEMENTED BY FIELD IDENTIFICATION WHEREVER POSSIBLE. NO WARRANTY IS MADE AS TO THE ACCURACY OF THESE LOCATIONS OR THAT ALL UNDERGROUND UTILITIES ARE SHOWN. THE CONTRACTOR SHALL CONTRACT DIG SAFE AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. DIG SAFE TELEPHONE NUMBER IS 1-888-344-7233.

A6. THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES PRIOR TO TAPPING INTO, CROSSING OR EXTENDING THEM. IF THE NEW WORK POSES A CONFLICT WITH EXISTING UTILITIES, THE ENGINEER SHALL BE NOTIFIED PRIOR TO THE CONTRACTOR CONTINUING.

A7. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSION AND DOOR LOCATIONS.

A8. ALL PROPOSED SITE GAS, ELECTRIC, TELEPHONE, CATV FEATURES SHOWN ON SITE DEVELOPMENT PLANS ARE INTENDED AS A GUIDE ONLY. FINAL CONFIGURATION TO BE CONFIRMED WITH PROJECT MEP ENGINEER AND UTILITY PROVIDER.

B1. REFER TO PLUMBING PLANS FOR EXACT SIZE AND LOCATION OF SANITARY AND WATER CONNECTIONS.

B2. REFER TO ELECTRICAL PLANS FOR THE LIGHTING CIRCUITS, FIXTURE DETAIL AND BUILDING CONNECTION LOCATION.

B3. ALL H.D.P.E. HIGH DENSITY POLYETHYLENE PIPE SHALL BE ADS N-12 OR APPROVED EQUAL. SEWER SHALL BE SDR 35 WITH RUBBER RING JOINTS. WATER LINES SHALL BE CL 52 D.I.P. (DUCTILE IRON PIPE), REINFORCED CONCRETE PIPE RCP SHALL BE CLASS III.

B4. NO LEDGE, BOULDERS, OR OTHER UNYIELDING MATERIALS ARE TO BE LEFT WITHIN 6" OF THE SEWER IN THE TRENCH, NOR ARE THEY TO BE USED FOR BACKFILL FOR THE FIRST 12" ABOVE THE PIPES.

C1. WALKS SHALL BE 4" THICK AND SHALL BE CONSTRUCTED ON 6" OF COMPACTED BANK GRAVEL. CONCRETE FOR WALKS SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH OF 4,000 PSI. WALKS SHALL BE REINFORCED WITH WWM 6x 6 W1.4/W1.4 CONFORMING TO ASTM A184.

C2. BASE MATERIAL SHALL BE CLEAN BANK RUN GRAVEL, CONFORMING TO M.D.P.W. M1.03.1, WITH NO STONES LARGER THAN THREE (3) INCHES IN DIAMETER AND SHALL BE PLACED AND ROLLED WITH AT LEAST A TEN TON ROLLER. THE SURFACES SHALL BE WET DURING ROLLING TO BIND THE MATERIAL. ALL STONES OF 4" DIAMETER OR LARGER SHALL BE REMOVED FROM THE SUB-BASE PRIOR TO PLACING BASE MATERIAL. PULVERIZED MATERIAL MAY BE USED AS BASE MATERIAL PROVIDING IT MEETS THIS SPECIFICATIONS. AREAS TO BE REPAVED SHALL BE PULVERIZED AND REGRADED TO PROVIDE POSITIVE FLOW TO DRAINAGE AND AWAY FROM BUILDING. PAVE WITH 1 1/2" WEARING COURSE ON 1 1/2" BINDER COURSE. ALL VALVES BOXES, MANHOLES AND OTHER UTILITIES APPURTENANCES SHALL BE ADJUSTED TO CONFORM TO FINAL GRADE

C3. GENORATOR PAD SHALL BE INSTALLED PER MANUFACTURING SPECIFICATIONS.

C4. PAVEMENT AREA SHALL BE PAVED TO A THICKNESS AS SHOWN ON THE PLANS MEASURED AFTER COMPACTION, WITH A BINDER COURSE AND TOP COURSE OF CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1.

C5. THE AGGREGATE SHALL BE COMPOSED, MIXED AND LAID HOT IN TWO COURSES AS SPECIFIED IN THE "COMMONWEALTH OF MASSACHUSETTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGE", 1988 EDITION. SECTION 460 FOR CLASS I BITUMINOUS CONCRETE PAVEMENT, AS SPECIFICALLY SET FORTH IN SECTION 460.20 AND 460.82.

C6. DUMPSTER PAD SHALL BE 8" THICK REINFORCED CONCRETE SLAB WITH CONTROL JOINTS EVERY 10'. THE PAD SHALL BE CONSTRUCTED OVER 6" OF GRAVEL BASE, COMPACT TO 95% REINFORCEMENT SHALL BE WWF 6x6- W1.4 x W1.4 PLACED AT THE CENTER OF THE SLAB. THE FRONT END OF COMPACTOR PAD SHALL HAVE EMBEDDED A 6"x 6"x 3/8" STEEL ANGLE.

C7. ALL EXISTING PAVING TO BE DISTURBED SHALL BE CUT ALONG A STRAIGHT LINE THROUGH ITS ENTIRE THICKNESS, BUTT NEW PAVING INTO THE EXISTING PAVEMENT TO REMAIN AND TACK COAT THE JOINT.

C8. ANY PAVEMENT REMOVED FOR UTILITY TRENCH EXCAVATION OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED WITH A PAVEMENT SECTION CONSISTING OF 1 1/2" WEARING COURSE OVERLAYING A 1 1/2" BINDER COURSE OVERLAYING A 12" COMPACTED GRAVEL BASE COURSE.

D1. ALL AREAS TO BE PLANTED WITH GRASS SHALL BE TREATED WITH 100 POUNDS OF GROUND LIMESTONE PER 1,000 S.F. OF AREA PLANTED. ALL AREAS TO BE PLANTED WITH GRASS SHALL BE FERTILIZED WITH 10-10-10 AT THE RATE OF 1,000 POUNDS PER ACRE OR AS REQUIRED BY SOIL TEST. 40% OF THE NITROGEN SHALL BE ORGANIC FORM.

D2. ALL LANDSCAPED AREAS TO BE LOAMED AND SEEDED SHALL HAVE THE FOLLOWING MIX.

PERENNIAL RYE	25%
KENTUCKY BLUE	25%
CREEPING RED FESCUE OR PENNLAWN FESCUE	50%

SEED AT THE RATE OF 5#/1,000 S.F.

D3. ALL DISTURBED AREAS TO BE LOAMED AND SEEDED SHALL HAVE A MINIMUM OF 4 INCHES OF TOPSOIL SPREAD EVENLY THROUGHOUT. PROVIDE EROSION CONTROL MEASURES AS NECESSARY TO PROVIDE SLOPE STABILITY UNTIL VEGETATION IS ESTABLISHED. (NOTE: IF THERE IS A CONFLICT BETWEEN THESE PLANS AND LANDSCAPE PLANS THE LANDSCAPE PLANS SHALL DICTATE.

E1. THE CONTRACTOR SHALL REGULARLY INSPECT THE PERIMETER OF THE PROPERTY TO CLEANUP AND REMOVE LOOSE CONSTRUCTION DEBRIS BEFORE IT LEAVES THE SITE. ALL DEMOLITION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE TO A LEGAL DUMP SITE. ALL TRUCKS LEAVING THE SITE SHALL BE COVERED.

E2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTITUTE EROSION CONTROL MEASURES ON AN AS NECESSARY BASIS, SUCH THAT EXCESSIVE SOIL EROSION DOES NOT OCCUR. MEASURES SHALL INCLUDE SILT SACKS IN DRAINAGE INLETS, MULCHING AND PLANTING OF DISTURBED AREAS.

E3. PRIOR TO THE COMMENCEMENT OF ANY OTHER WORK A SILT SACK SHALL BE INSTALLED IN EACH EXISTING DRAINAGE INLET.

E4. AFTER INSTALLATION OF EACH DRAINAGE INLET A SILT SACK SHALL BE INSTALLED IN EACH INLET TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM.

E5. AT THE END OF CONSTRUCTION ALL DRAINAGE STRUCTURES ARE TO BE CLEANED OF SILT, STONES AND OTHER DEBRIS.

E6. DURING CONSTRUCTION THE EROSION CONTROL MEASURES SHALL BE INSPECTED ONCE PER WEEK AND WITHIN 24 HOURS OF ANY STORM EVENT GENERATING MORE THAN 1/2" OF RAINFALL. THE EROSION CONTROL MEASURES SHALL BE CLEANED REGULARLY AND ADJUSTED IF NECESSARY TO ENSURE THAT NO SILT OR DEBRIS LEAVES THE SITE.

KELLY ENGINEERING GROUP SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF PUBLIC OR CONTRACTOR'S EMPLOYEES; OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORKING ACCORDANCE WITH THE CONTRACT DOCUMENTS.
THE EXTENT OF KELLY ENGINEERING GROUPS LIABILITY FOR THIS PLAN IS LIMITED TO THE EXTENT OF ITS FEE LESS THIRD PARTY COST.

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THE RESIDENCE AT CARTER MILL
100 WEST STREET
NEEDHAM, MA

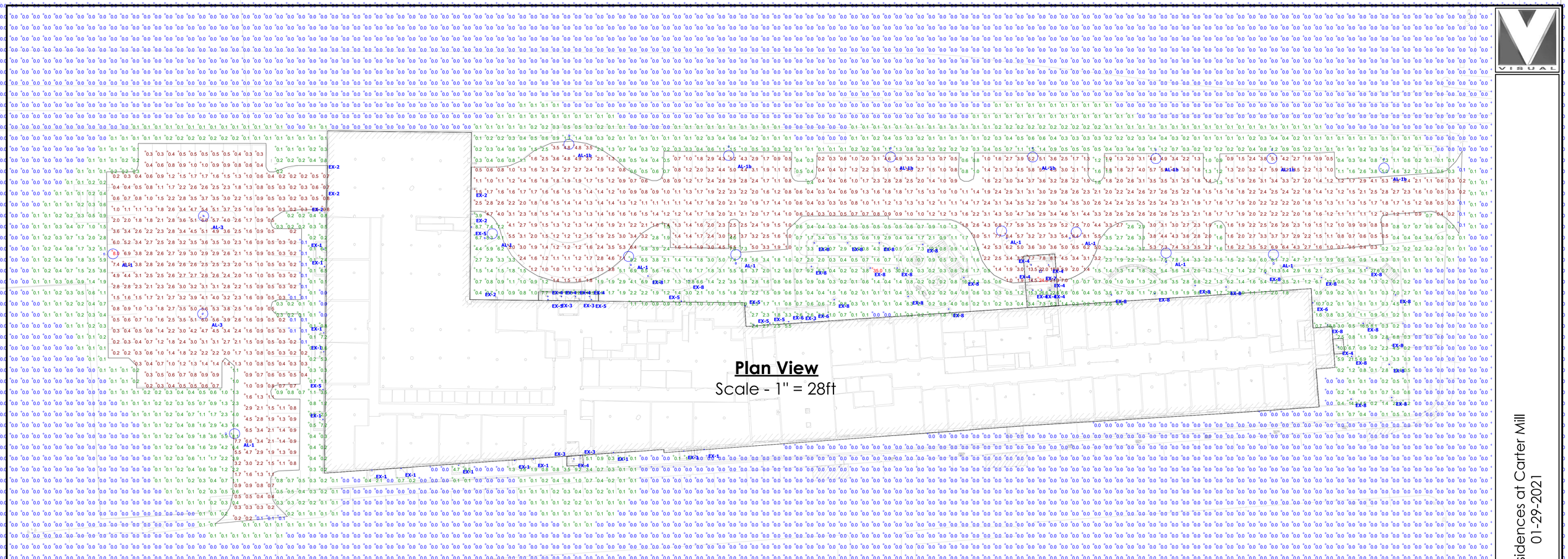
DETAIL SHEET

COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37942
REGISTERED PROFESSIONAL ENGINEER

Digitally signed by David Noel Kelly P.E.
DN: cn=David Noel Kelly P.E., o=Kelly Engineering Group, Inc., ou, email=dkelly@kellyengineering.com, c=US
Date: 2021.01.28 14:36:23 -05'00'

KELLY ENGINEERING GROUP
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Phone: 781-843-4333 www.kellyengineeringgroup.com

SHEET NO.
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Proposed | Aerial View

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REGISTERED ARCHITECT
No. 17
COMMONWEALTH OF MASSACHUSETTS

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FIRST FLOOR PLAN

1/16" = 1'-0"

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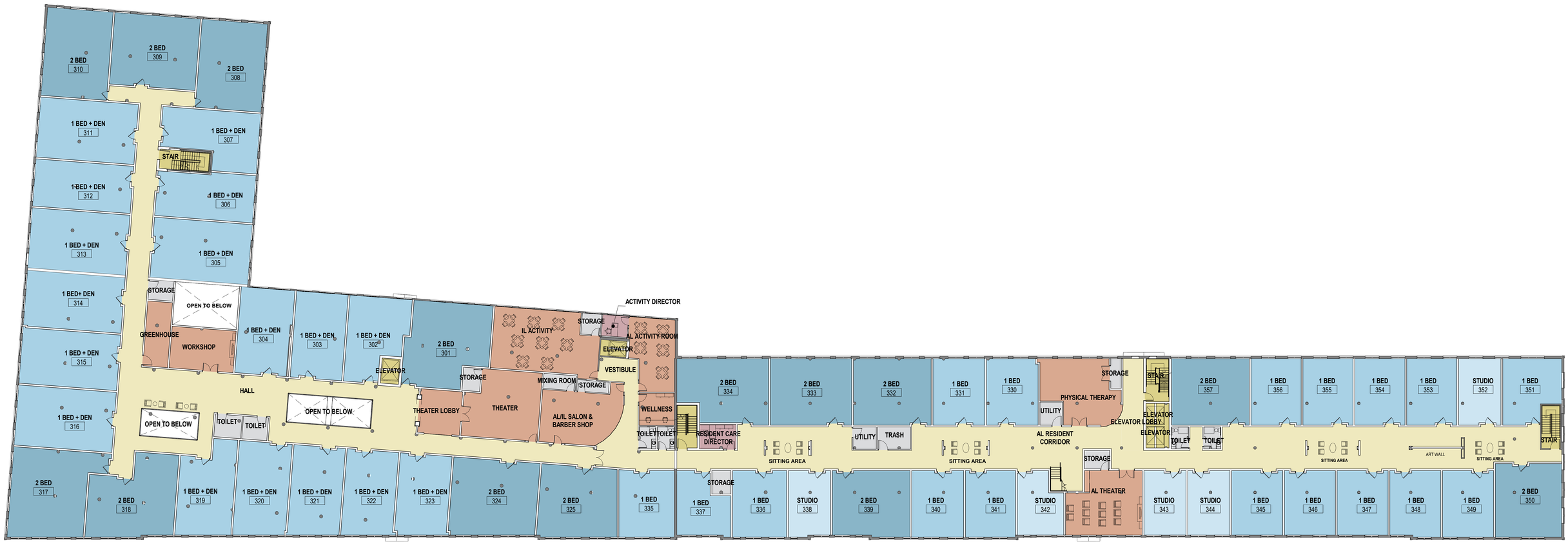
SECOND FLOOR PLAN

1/16" = 1'-0"

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THIRD FLOOR PLAN

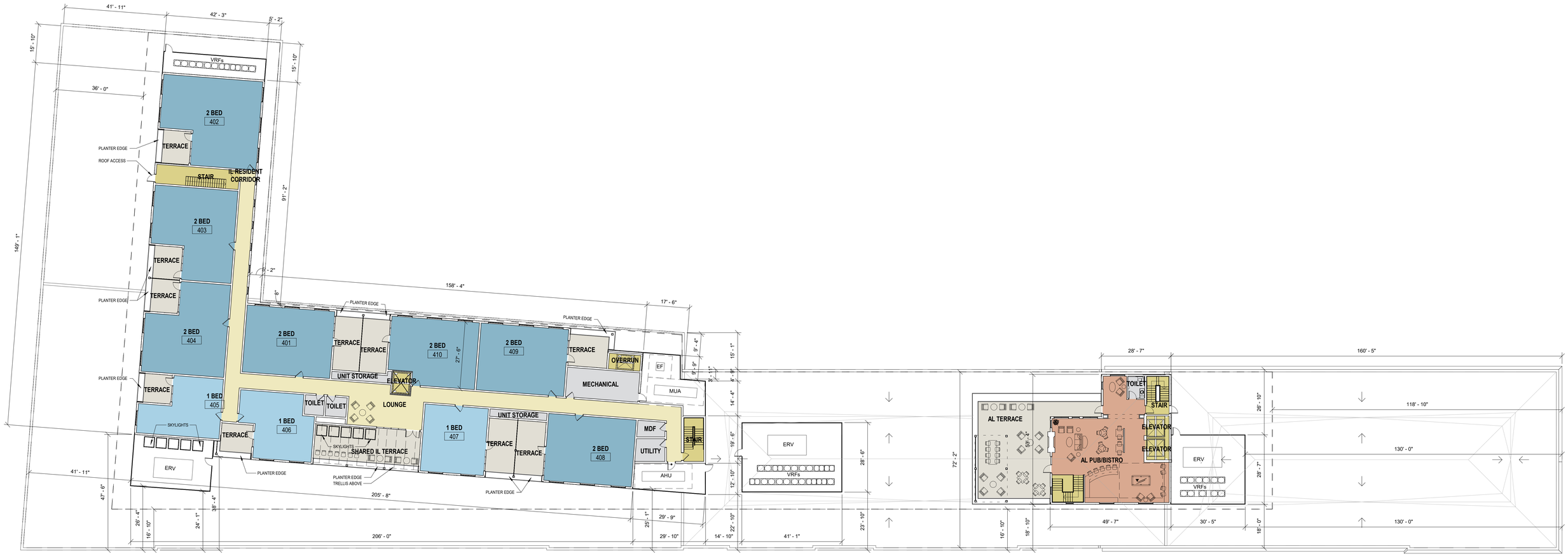
1/16" = 1'-0"

NOT FOR CONSTRUCTION

tat

SQUARE FOOTAGE OF EXISTING ROOF	62,775 SF
SQUARE FOOTAGE OF PROPOSED IL FOURTH FLOOR & AL COMMON SPACE (INCLUDING TERRACES)	20,650 SF
PERCENT OF ROOF COVERED (INCLUDING TERRACES)	32.9%
SQUARE FOOTAGE OF PROPOSED IL FOURTH FLOOR & AL COMMON SPACE (EXCLUDING TERRACES)	15,900 SF
PERCENT OF ROOF COVERED (EXCLUDING TERRACES)	25.3%

ERV - ENERGY RECOVERY VENTILATOR
VRF - VARIABLE REFRIGERANT FLOW
MUA - MAKE UP AIR
AHU - AIR HANDLING UNIT
EF - EXHAUST FAN



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FOURTH FLOOR PLAN

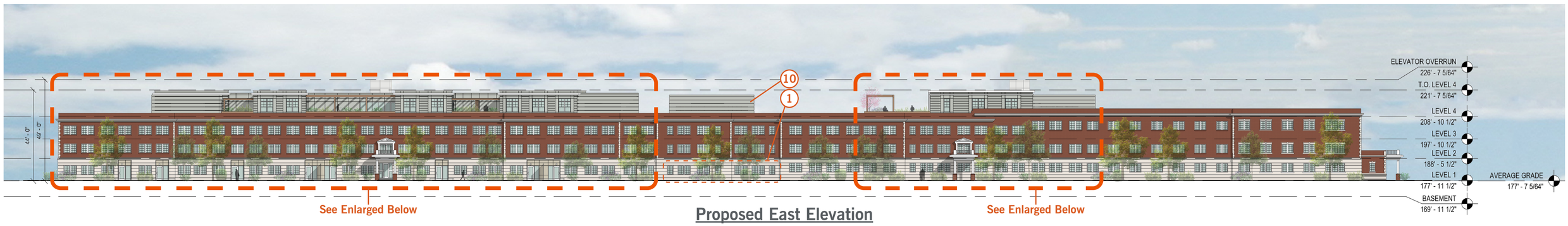
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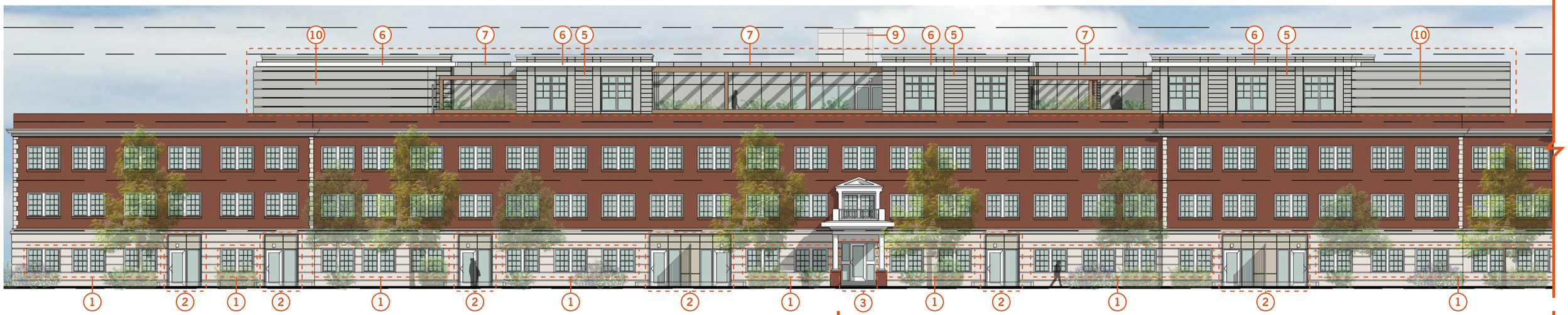
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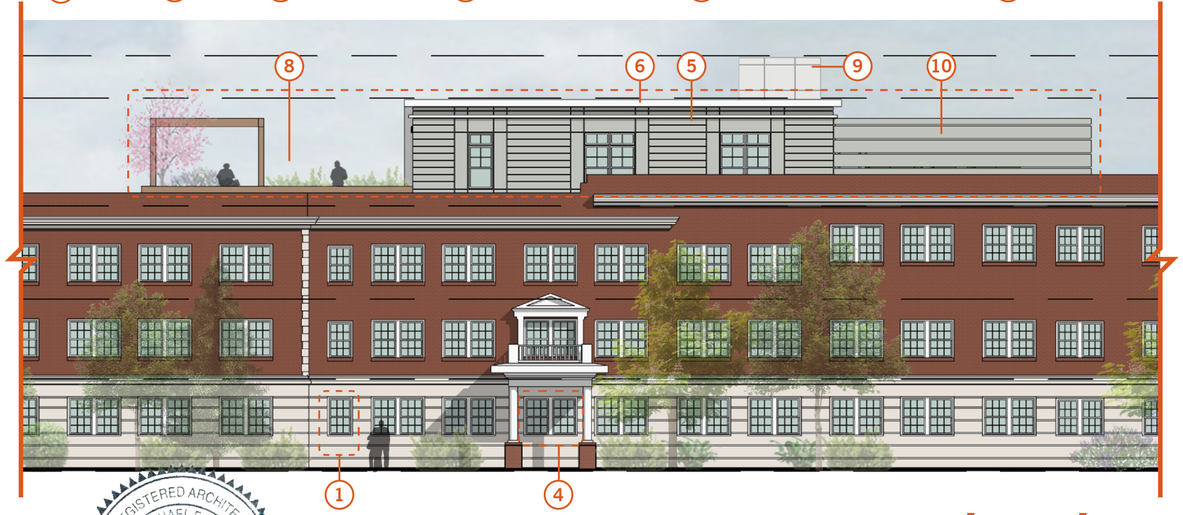


Existing East Elevation



Proposed East Elevation





(Refer to materials page for further information)

1. New window in existing masonry opening to match existing
2. First floor single swing door additions
   - New full glass single swing door with sidelite
   - EIFS to be removed to underside of cornice, smooth fiber cement infill wall
   - PVC privacy screen where required at shared patios
   - New downlight over door (see provided spec)
3. New full glass door with sidelites to replace existing door
4. Remove existing door, replace with window to match existing
5. Fiber cement panel with recessed trim and exposed fasteners
6. Artic white trim banding
7. Independent living patios
   - Smooth fiber cement panel
   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match

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East Elevation (Highland Avenue)

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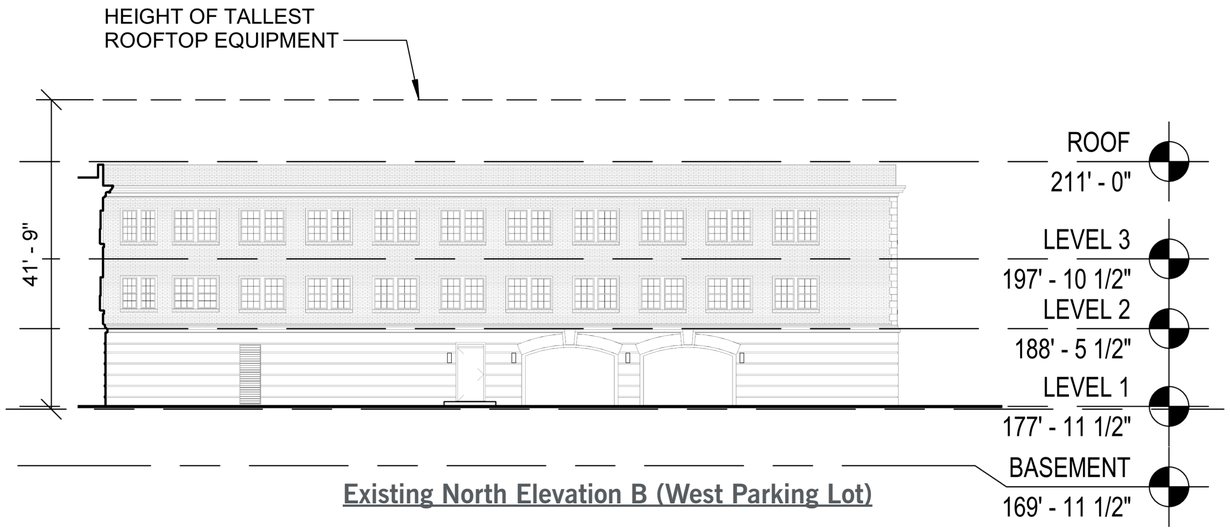
REGISTERED ARCHITECT MICHAEL E. LIU NO. 31,[illegible] COMMONWEALTH OF MASSACHUSETTS

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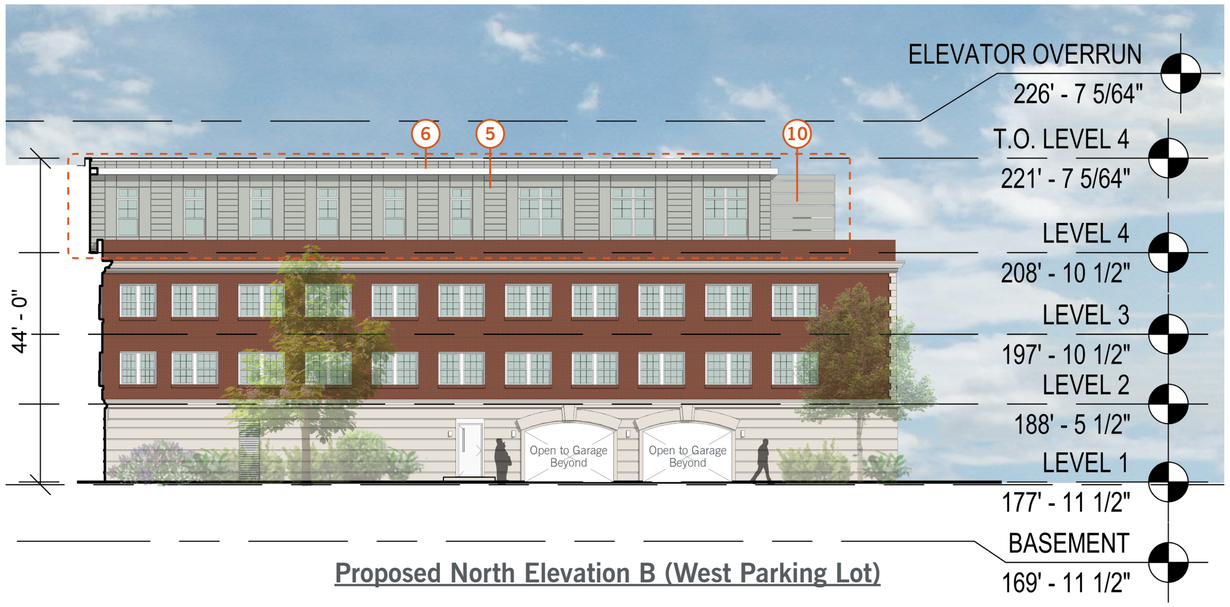
Existing North Elevation A (West Street)



Existing North Elevation B (West Parking Lot)



Proposed North Elevation A (West Street)



Proposed North Elevation B (West Parking Lot)

(Refer to materials page for further information)

(2) First floor single swing door additions
- New full glass single swing door with sidelite
- EIFS to be removed to underside of cornice, smooth fiber cement infill wall
- PVC privacy screen where required at shared patios
- New downlight over door (see provided spec)

(5) Fiber cement panel with recessed trim and exposed fasteners

(6) Artic white trim banding

(9) Elevator overrun, smooth fiber cement panel

(10) Mechanical screening, color to match

(11) Remove awnings from windows

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North Elevation - A & B (West Street & From West Parking Lot)

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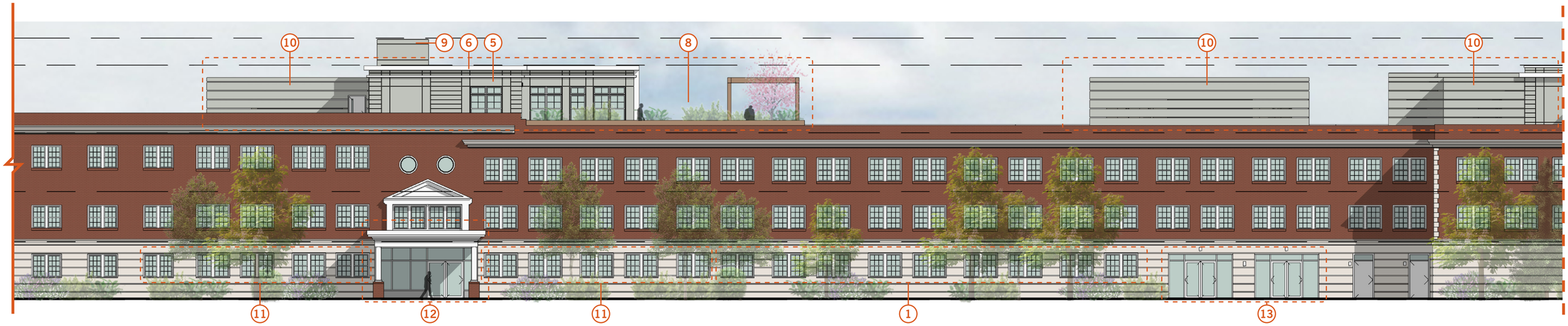
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Existing West Elevation

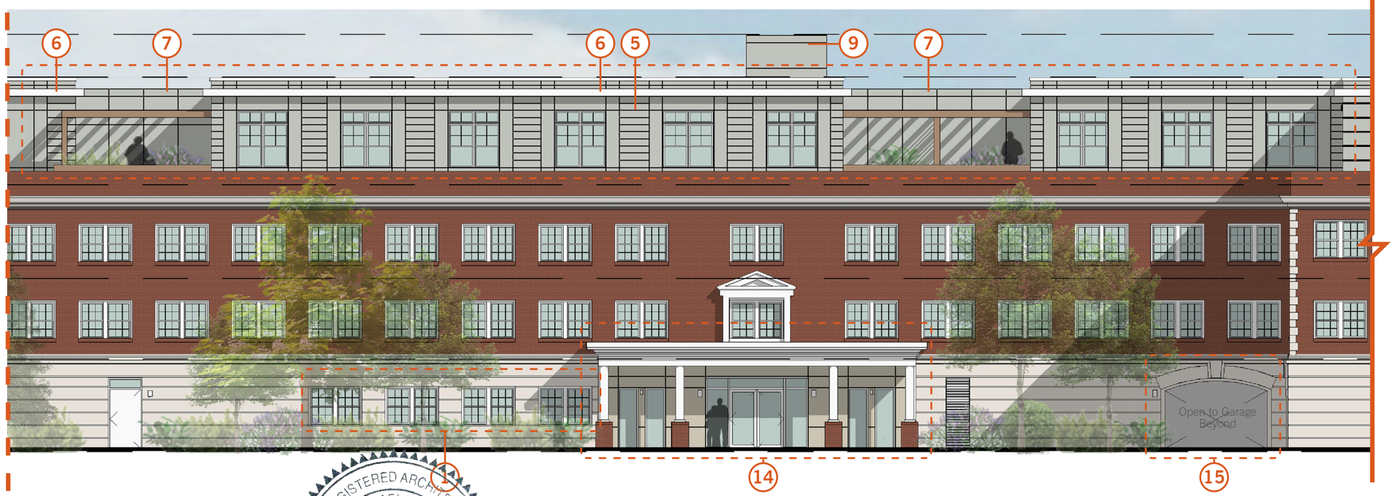


Proposed West Elevation



(Refer to materials page for further information)

1. New window in existing masonry opening to match existing
5. Fiber cement panel with recessed trim and exposed fasteners
6. Artic white trim banding
7. Independent living patios
   - Smooth fiber cement panel
   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match
11. Remove awnings from windows
12. Porte-cochere
    - Remove EIFS to underside of roof
    - New glass entry vestibule with double door
    - Smooth fiber cement infill wall
    - Remove balluster from top of porte-cochere, clean and reface elements as needed
13. Infill existing garage openings with new storefront system to match existing windows
14. Portico
    - Remove ballusters from top of portico
    - Clean and reface trim elements as needed
    - New storefront windows in place of existing french doors
15. New opening into garage to match existing



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West Elevation

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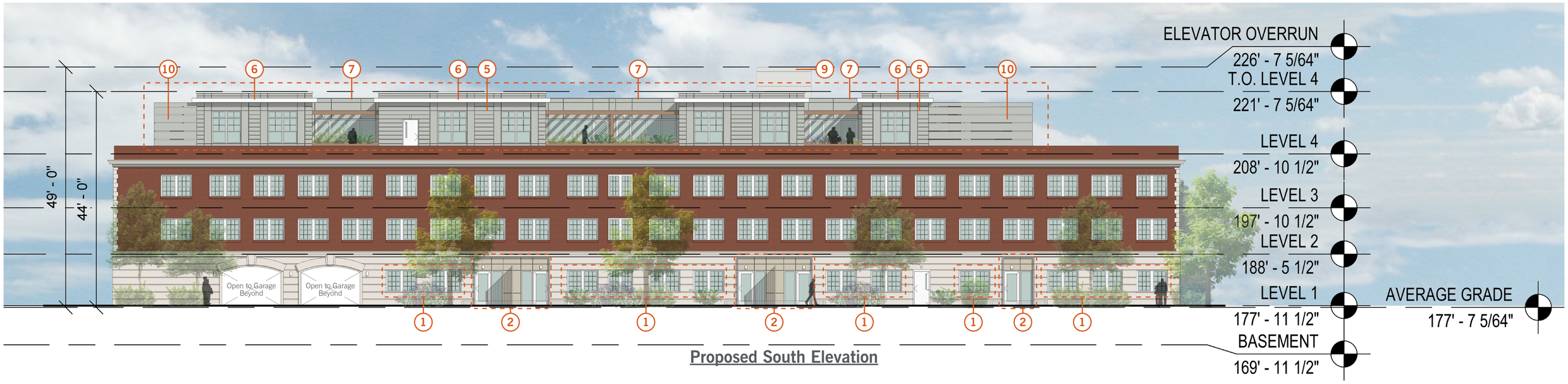
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Existing South Elevation



Proposed South Elevation

(Refer to materials page for further information)

1. New window in existing masonry opening to match existing
2. First floor single swing door additions
   - New full glass single swing door with sidelite
   - EIFS to be removed to underside of cornice, smooth fiber cement infill wall
   - PVC privacy screen where required at shared patios
   - New downlight over door (see provided spec)
3. New full glass door with sidelites to replace existing door
4. Remove existing door, replace with window to match existing
5. Fiber cement panel with recessed trim and exposed fasteners
6. Artic white trim banding
7. Independent living patios
   - Smooth fiber cement panel
   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match

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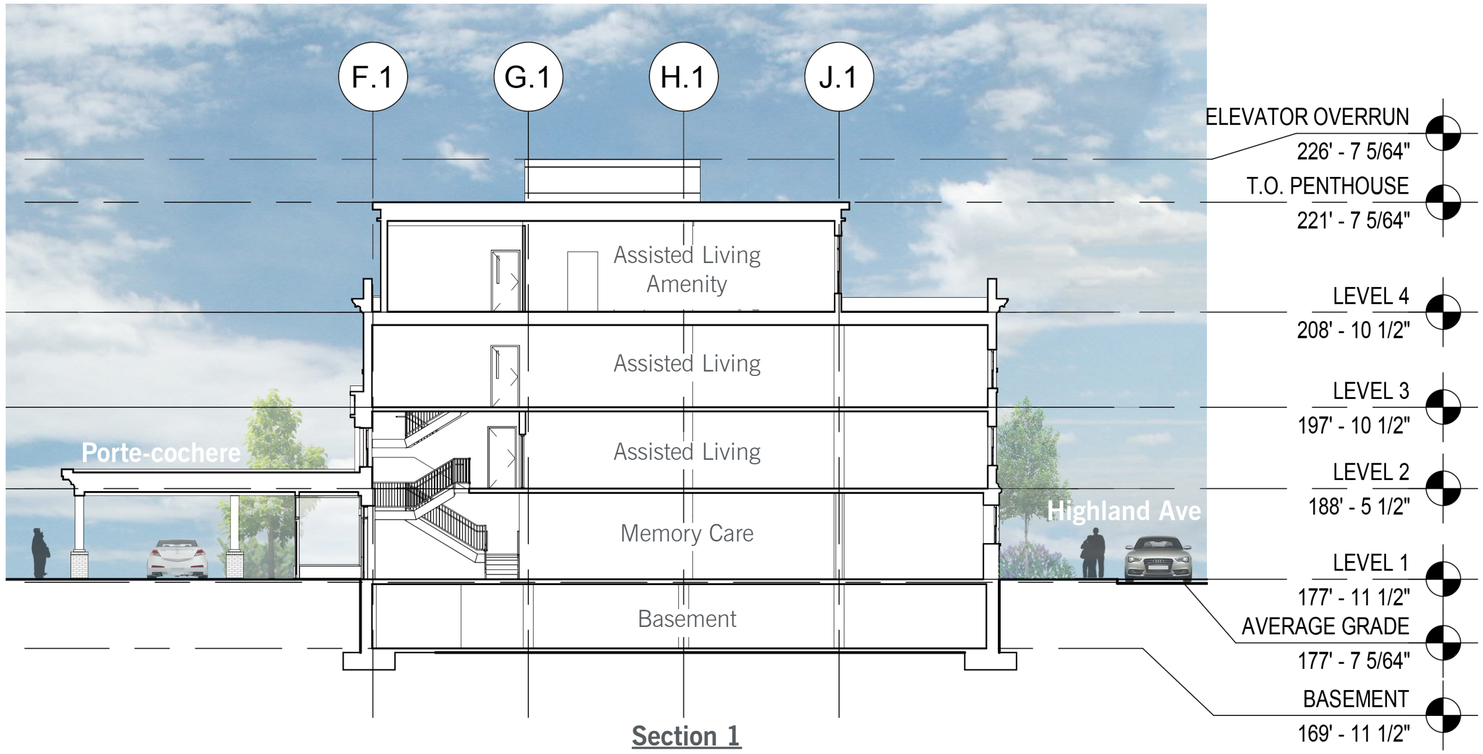
South Elevation

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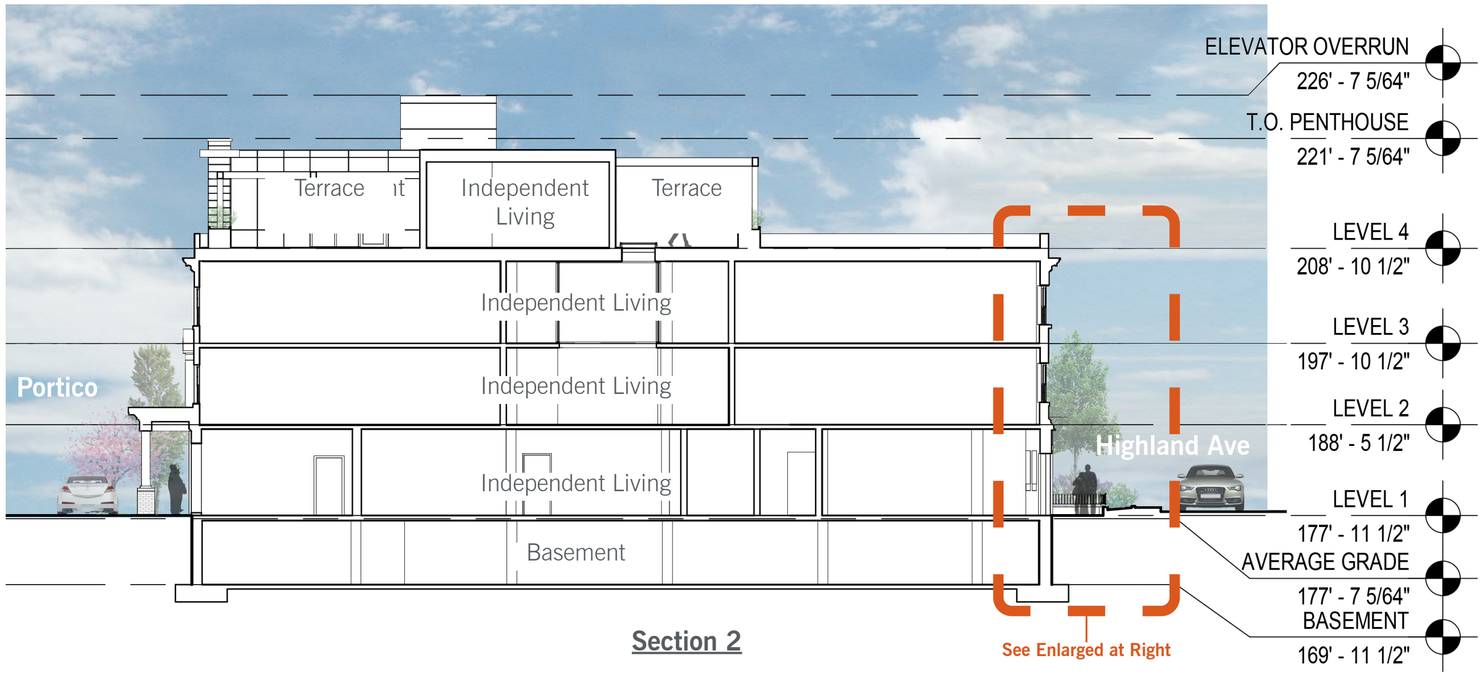
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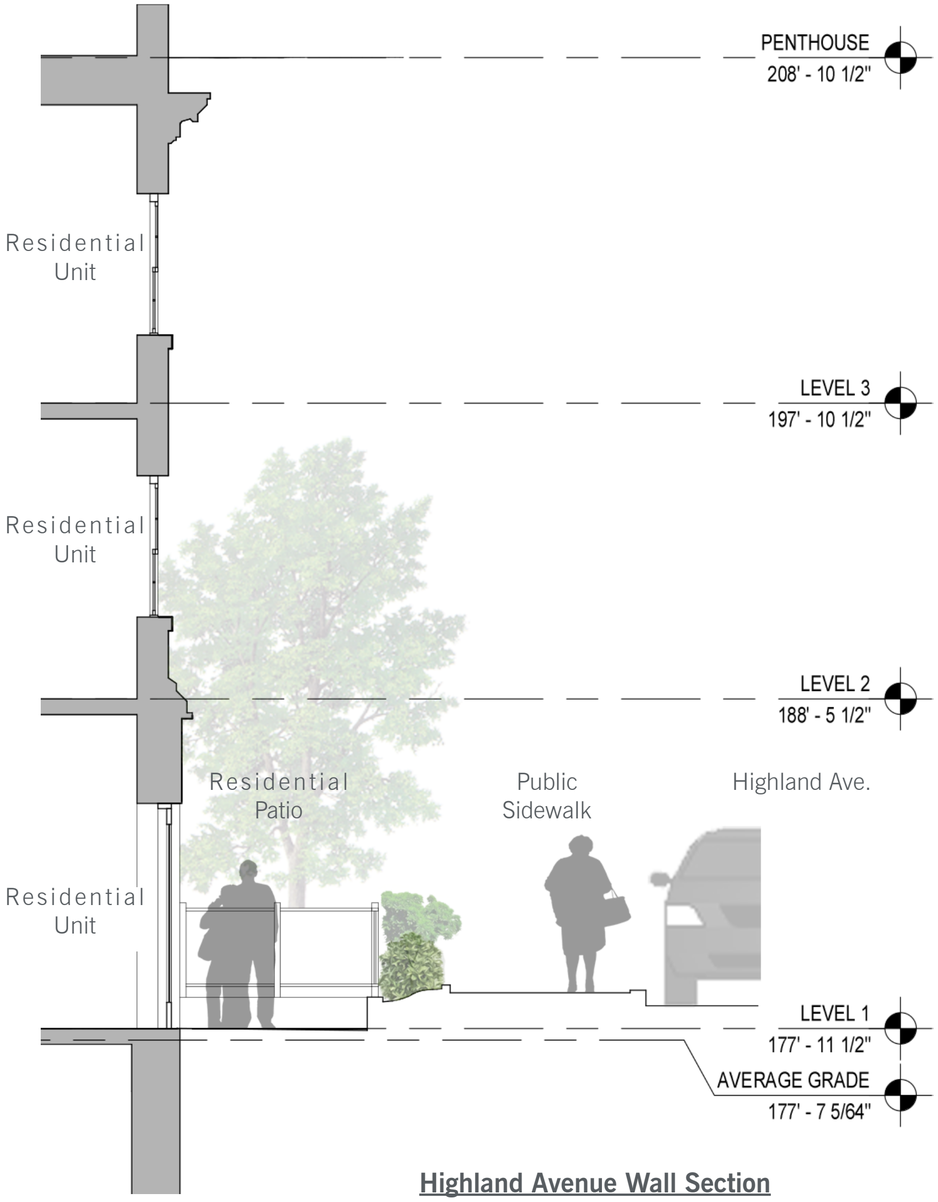


Section 1



Section 2

See Enlarged at Right



Highland Avenue Wall Section

The Residence at Carter Mill

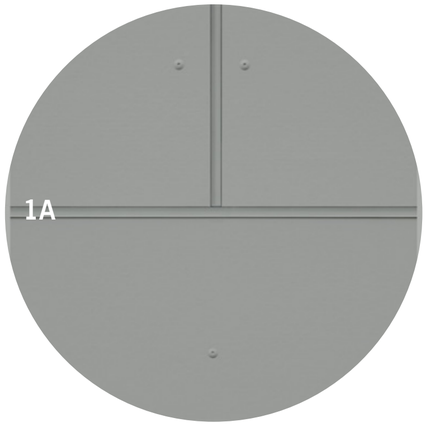
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Building Sections

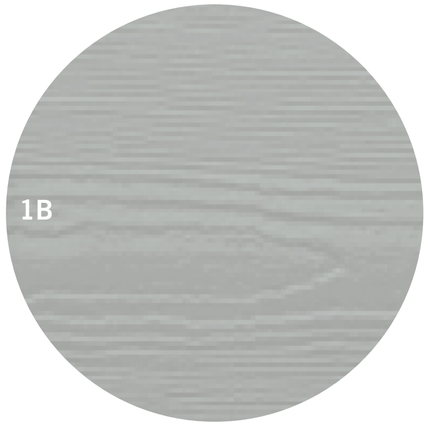
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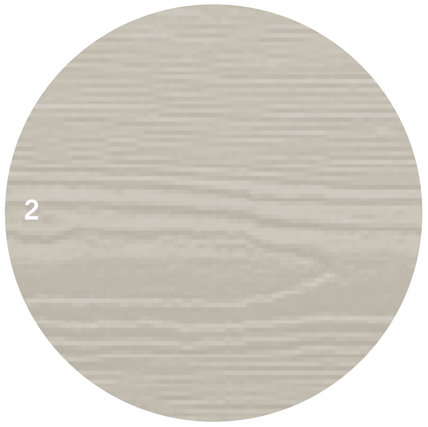
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Fiber Cement - Panel with recess trim & exposed fasteners
Color - Light Mist



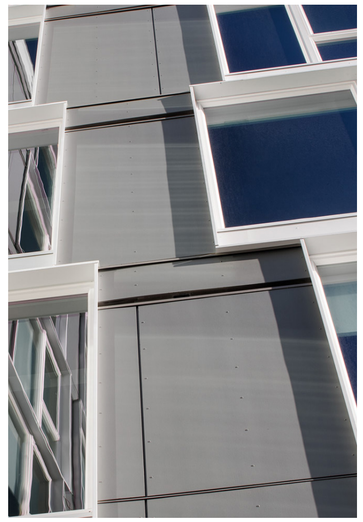
Fiber Cement - Panel with 3/4” reveal
Color - Light Mist

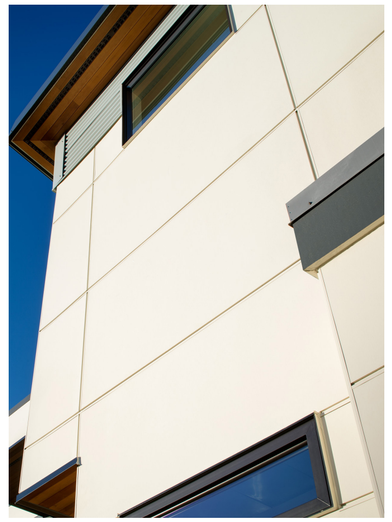


Fiber Cement - Panel with 3/4” reveal
Color - Cobble Stone









Recess reveal examples



Partial South Elevation







Precedent Images

The Residence at Carter Mill

Needham, MA | January 29, 2021 | LCB | 18017 | © The Architectural Team, Inc.

Proposed Elevation Materials
NOT FOR CONSTRUCTION



LCB SENIOR LIVING

tat

The Residence at Carter Mill

100 West Street
Needham, Massachusetts

Landscape Permit Plans

LIST OF DRAWINGS:		Set Date
L1.0	Site Landscape Master Plan	2/24/21
L2.1	North Planting Plan	2/24/21
L2.2	Central Planting Plan	2/24/21
L2.3	South Planting Plan	2/24/21
L2.4	West Buffer Planting Plan	2/24/21
L3.1	North Materials Plan	2/24/21
L3.2	Building Arrival & Resident Courtyard Materials Plan	2/24/21
L3.3	Assisted Living Arrival Materials Plan	2/24/21
LD1	Plant Schedule & Planting Details	2/24/21
LD2	Planting Notes	2/24/21
LD3	Construction Details	2/24/21

Applicant:

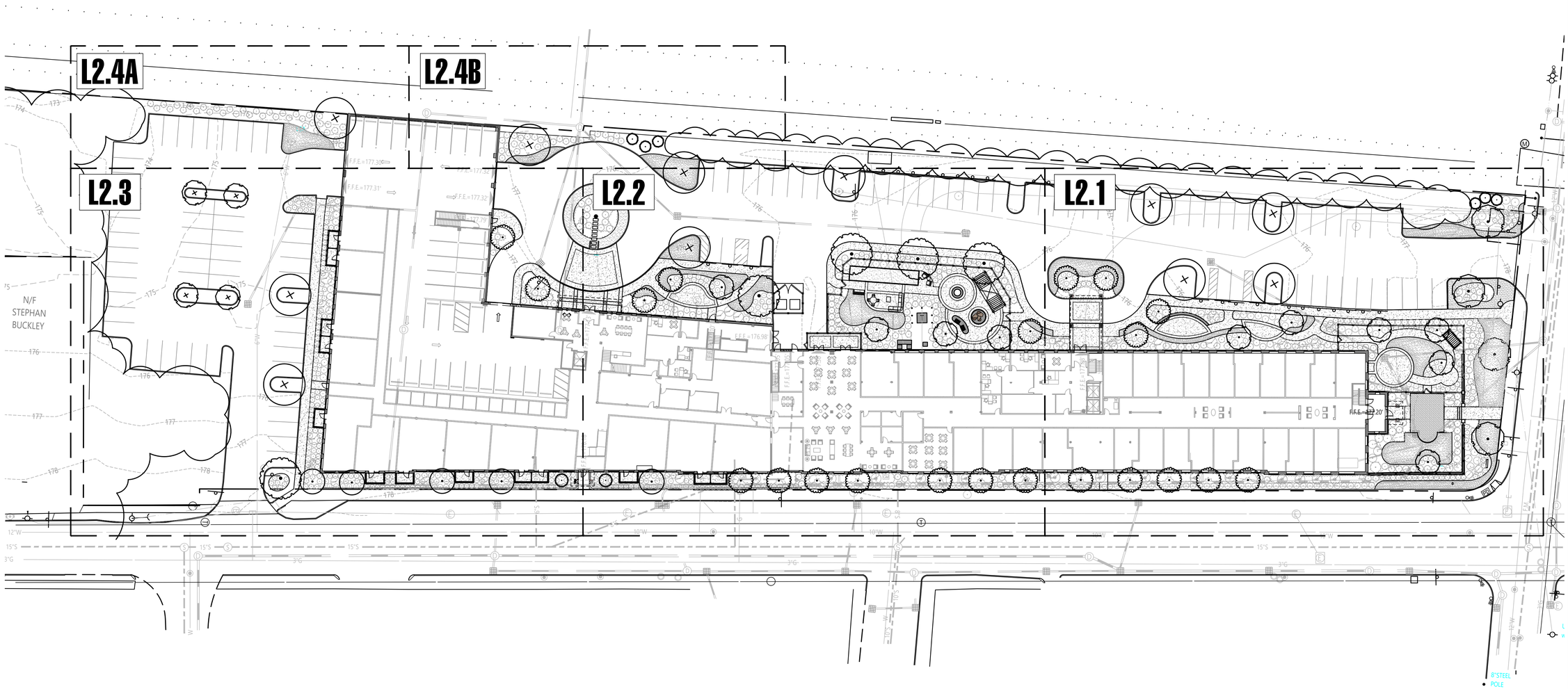
LCB Senior Living, LLC
3 Edgewater Drive
Norwood, MA 02062
Tel: 781-619-9320

Owner:

Welltower, Inc.
4500 Dorr Street
Toledo, OH 43615
Tel: 419-247-2800

Prepared By:

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
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L2.4A
L2.4B
L2.3
L2.2
L2.1
N/F
STEPHAN
BUCKLEY
F.F.E.=177.31'
F.F.E.=177.32'
F.F.E.=176.91'
F.F.E.=177.00'
F.F.E.=177.00'
F.F.E.=177.00

Matchline Sheet L2.2

Property Line

EX. VEGETATED BUFFER AND FENCE ALONG MBTA RAILS TO REMAIN

EX. TREES AND ISLANDS TO REMAIN, TYP.

3-TP-G
12-PA-H
7-IV-RS
30-PER
1-PC-A
6-JH-BH

19-PER
8-SJ-G
LAWN
7-SJ-G
2-PS-C
16-PER
5-B-GM
16-PER
15-PER
38-PER
8-B-GG
16-PER
7-SJ-G
5-PER
1-PS-C
1-SJ-G
13-PER
10-PER
6-SJ-G
1-PS-C
5-WF-MM
1-SV-S
9-HP-BS
1-PS-C
8-HP-BS
6-PA-H
20" HT. STONE SEATING WALL
1-CF-CP
11-WF-MM
1-CF-CP
10-LS-BB
1-VD-AJ
5-SJ-G
1-VD-AJ
4-IG-S
7-HM-ES
9-PV-S
2-SR-IS
19-TM-H
9-PV-S
LAWN
1-PC-A
5-PA-H
6-IC-GL
20-PER
LAWN
4-R-CW
2-PC-A
1-SR-IS
7-PV-S
3-IC-S
6-R-CW
1-TO-EG
5-IG-S
5-R-S
5-IC-GL
6-IC-GL
1-SV-S
6-R-CW
1-SV-S
1-HS-D
3-IC-GL
1-HS-D
4-IC-GL
-IC-GL
CW
F.F.E.=177.08'
UP
3-R-S
10-HP-B
7-IG-S
16-TO-EG
4-IG-S
1-IC-S
1-IM-DL
11-LS-BB
1-SV-S
2-R-S
7-LS-BB
13-PER
2-IC-GL
5-IC-GL
6-IG-S
15-PER
3-R-S
6-LS-BB
1-SV-S
11-LS-BB
1-IM-DL
F.F.E.=177.20'
West Street
1-CF-CP
4-CA-H
3-PO-SW
5-IV-RS
1-IO-JP
9-IC-GL
16-IG-S
7-PO-SW
8-PA-H
4" RISER
5-VD-AJ
12-IG-S
765-PT
3-TO-EG
21-PO-N
5-PS-C
4-VD-AJ
235-PT
3-TO-EG
15-PO-N
EX. SIDEWALK
Highland Avenue
Property Line
Matchline Sheet L2.2

0 10 20 30 feet
SCALE: 1" = 10'

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

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Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS THOMAS E. MINICH REGISTERED LANDSCAPE ARCHITECT 2/24/21

The Residence at Carter Mill

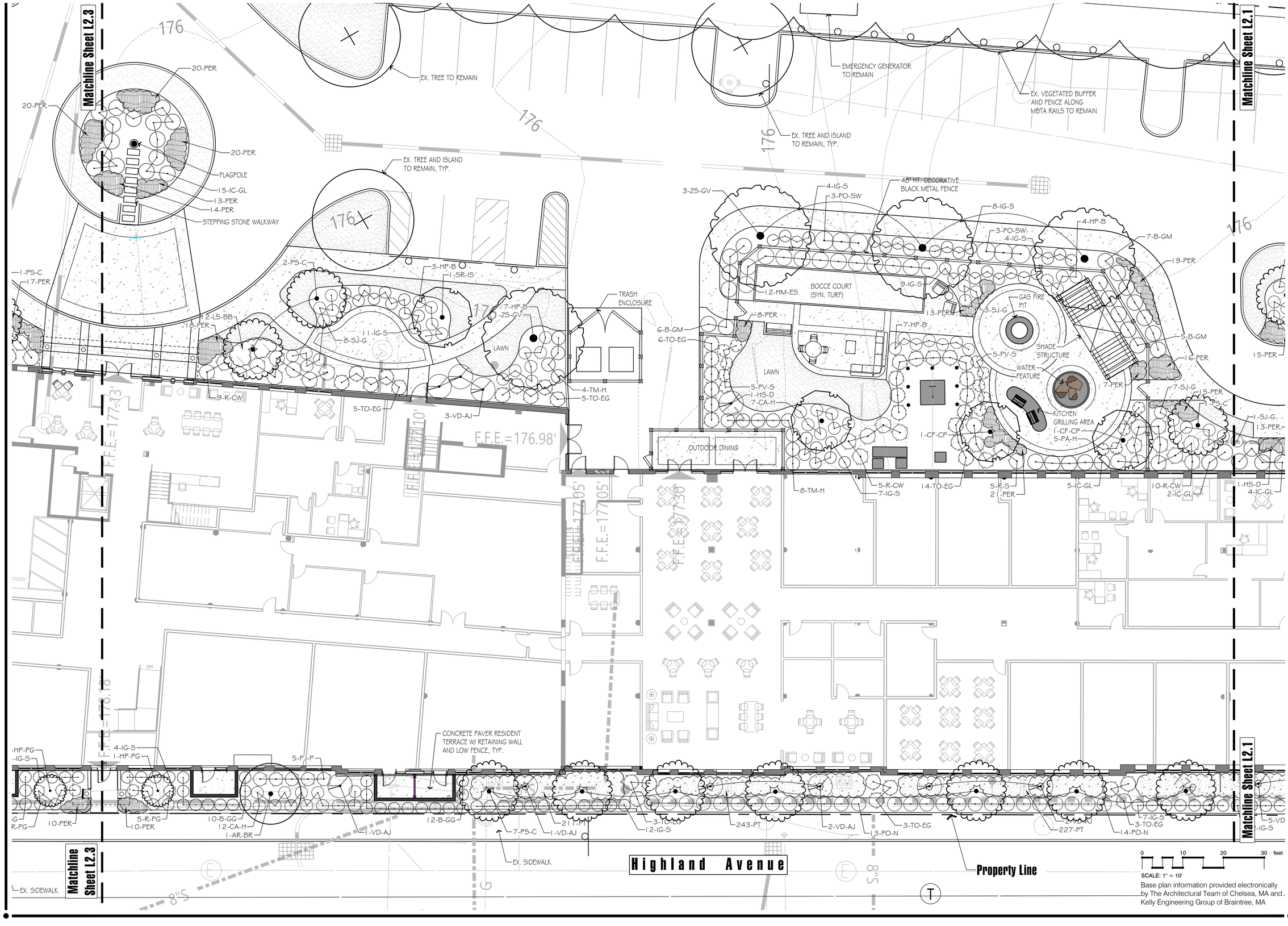
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

North Planting Plan

Scale: 1" = 10'-0"

Sheet: **L2.1**



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Revisions:

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1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS THOMAS E. MINICH No. 49997 REGISTERED LANDSCAPE ARCHITECT 2/24/21

The Residence at Carter Mill

100 West Street Needham, Massachusetts

LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Central Planting Plan

Scale: 1" = 10'-0"

Sheet: L2.2

EX. FLOWERING TREES AND ISLAND TO REMAIN

EX. FLOWERING TREES AND ISLAND TO REMAIN

EX. FENCE AT PROPERTY LINE TO REMAIN

EX. TREES TO REMAIN

Property Line, Typ.

Property Line

EX. TREE AND ISLAND TO REMAIN, TYP.

EX. TREE AND ISLAND TO REMAIN, TYP.

F.F.E.=177.31'

F.F.E.=177.32'

F.F.E.=177.32'

EXIT=177.79'

F.F.E.=177.13'

1-TO-EG
6-PA-H
7-JH-BH
5-PA-H
3-WF-DH
13-B-GG
7-PA-H
2-SV-S
6-WF-DH
12-B-GG
5-PA-H
3-WF-DH
1-TO-EG
5-R-PG
10-B-GG
9-SJ-G
7-IG-S
1-SV-S
9-PA-H
1-ZS-GV
7-PA-H
8-IG-S
1-TO-EG
1-AR-BR
10-CA-H
1-VD-AJ
1-AR-BR
4-R-PG
16-B-GG
9-WF-MM
1-VD-AJ
1-AR-BR
10-B-GG
9-WF-MM
1-VD-AJ
1-AR-BR
2-B-GG
5-R-PG
10-PER
20-PER
17-LS-BB
1-PS-C
5-TM-H
1-PS-C
17-PER
26-LS-BB
5-R-CW
5-TO-EG
4-PJ-P
5-PJ-P
1-HP-PG
4-IG-S

CONCRETE PAVER RESIDENT TERRACE W/ RETAINING WALL AND LOW FENCE, TYP.

EX. SIDEWALK

Property Line

Highland Avenue

Matchline Sheet L2.2

Matchline Sheet L2.2

SCALE: 1" = 10'

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS
THOMAS E. MINICH
No. 52,005
REGISTERED LANDSCAPE ARCHITECT
2/24/21

The Residence at Carter Mill

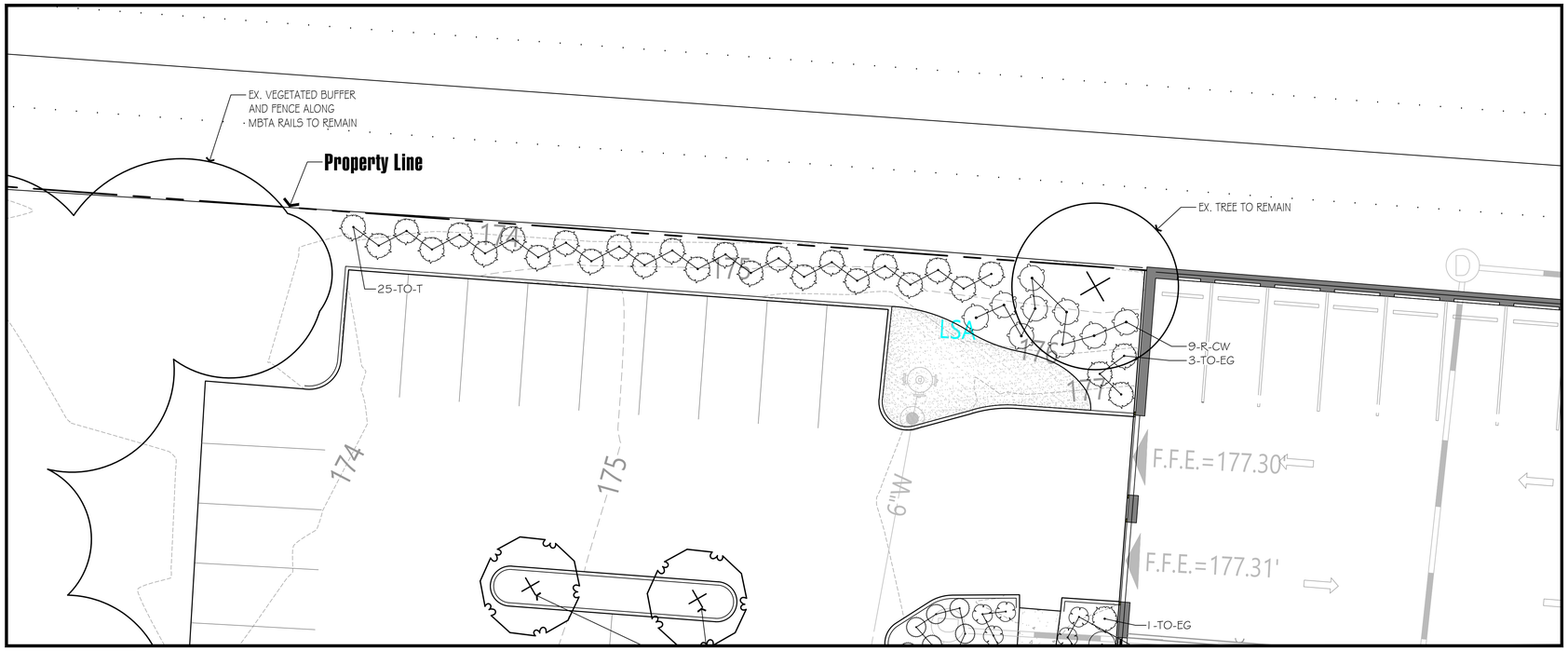
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

South Planting Plan

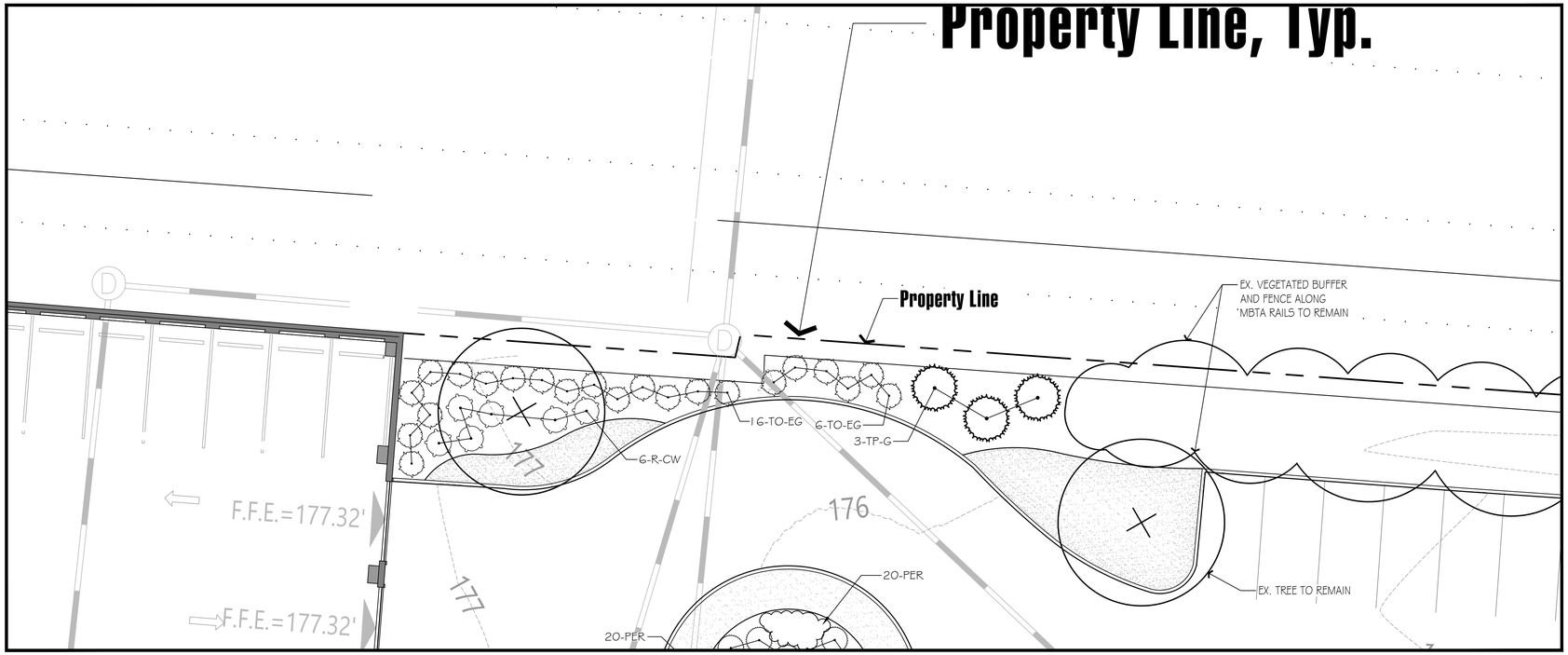
Scale: 1" = 10'-0"

Sheet: L2.3



A Property Line Buffer Planting

Scale: 1" = 10'-0"



B Property Line Buffer Planting

Scale: 1" = 10'-0"

0 10 20 30 feet

SCALE: 1" = 10'

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS
THOMAS E. MINOTT
NO. 52307
REGISTERED LANDSCAPE ARCHITECT
2/24/21

The Residence at Carter Mill

100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

West Buffer Planting Plans

Scale: 1" = 10'-0"

Sheet: L2.4

Matchline Sheet L2.2

20" HT. STONE SEAT WALL

CONCRETE PAVER TERRACE

CONCRETE PAVER TERRACE

SEE ENGINEER'S PLAN FOR STANDARD WALKWAY SPECIFICATIONS

8' HT. PRIVACY FENCE

FENCE GATE

5'-0"

4'-0"

SHADE STRUCTURE

CONCRETE PAVER TERRACE

R 12'-0"

STANDARD BROOM FINISHED CONCRETE

FENCE GATE

PROPOSED BRICK COLUMN TO MATCH EX. BRICK COLUMNS

(2) EX. BRICK COLUMNS TO REMAIN

EX. RETAINING WALL W/ DECORATIVE METAL FENCE TO REMAIN

EX. BRICK TERRACE TO REMAIN (REMOVE ARC AT WEST SIDE TO ALLOW FOR MEMORY CARE COURTYARD ENTRY)

F.F.E.=177.08'

F.F.E.=177.20'

West Street

PD

Highland Avenue

Matchline Sheet L2.2

0 10 20 30 feet

SCALE: 1" = 10'

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Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS THOMAS E. MINICUCCI NO. 52611 REGISTERED LANDSCAPE ARCHITECT 2/24/21

The Residence at Carter Mill

100 West Street Needham, Massachusetts

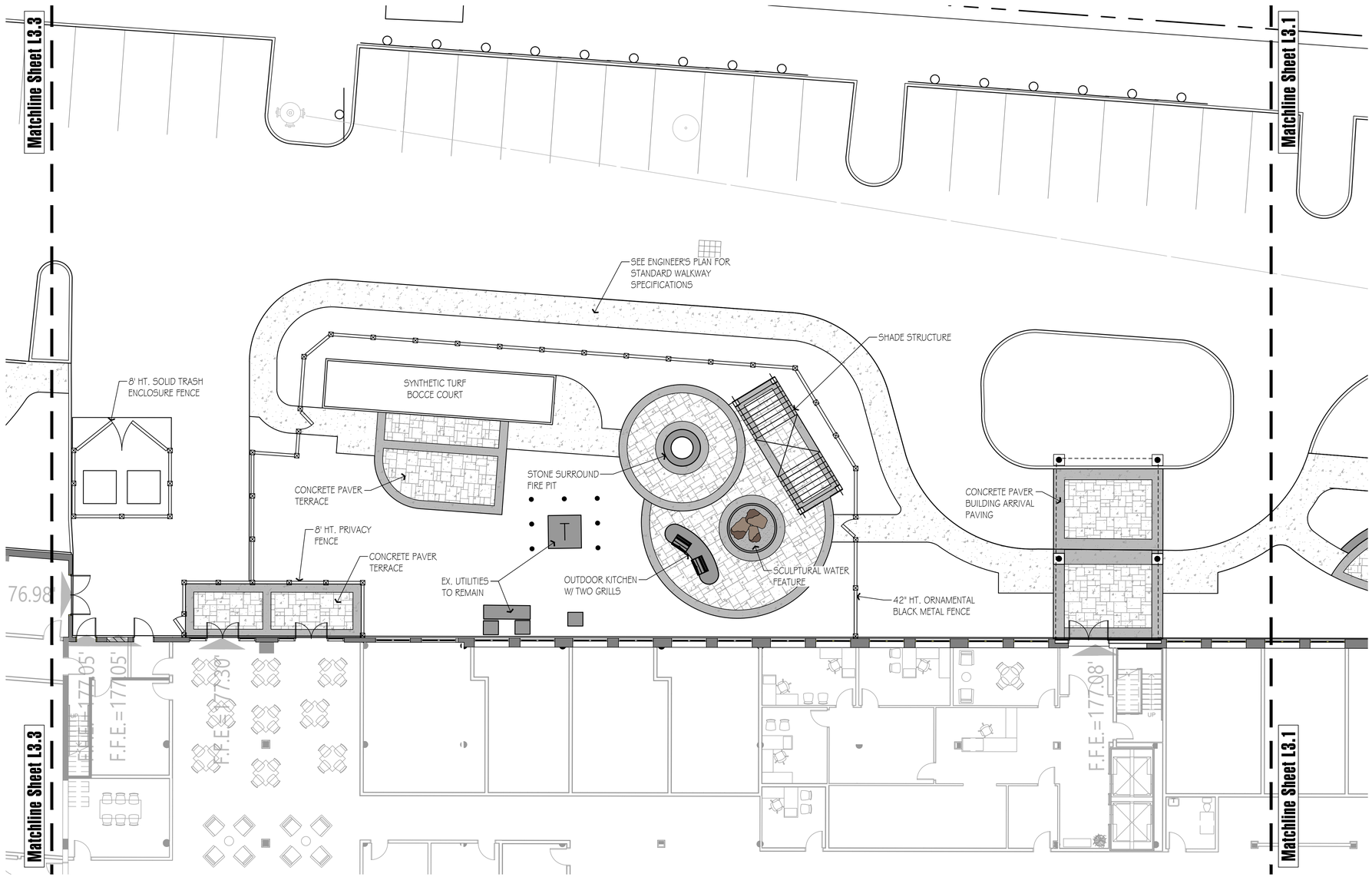
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

North Materials Plan

Scale: 1" = 10'-0"

Sheet: L3.1



0 10 20 30 feet

SCALE: 1" = 10'

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS
THOMAS E. MINICUCCI
NO. 48
REGISTERED LANDSCAPE ARCHITECT
2/24/21

The Residence at Carter Mill

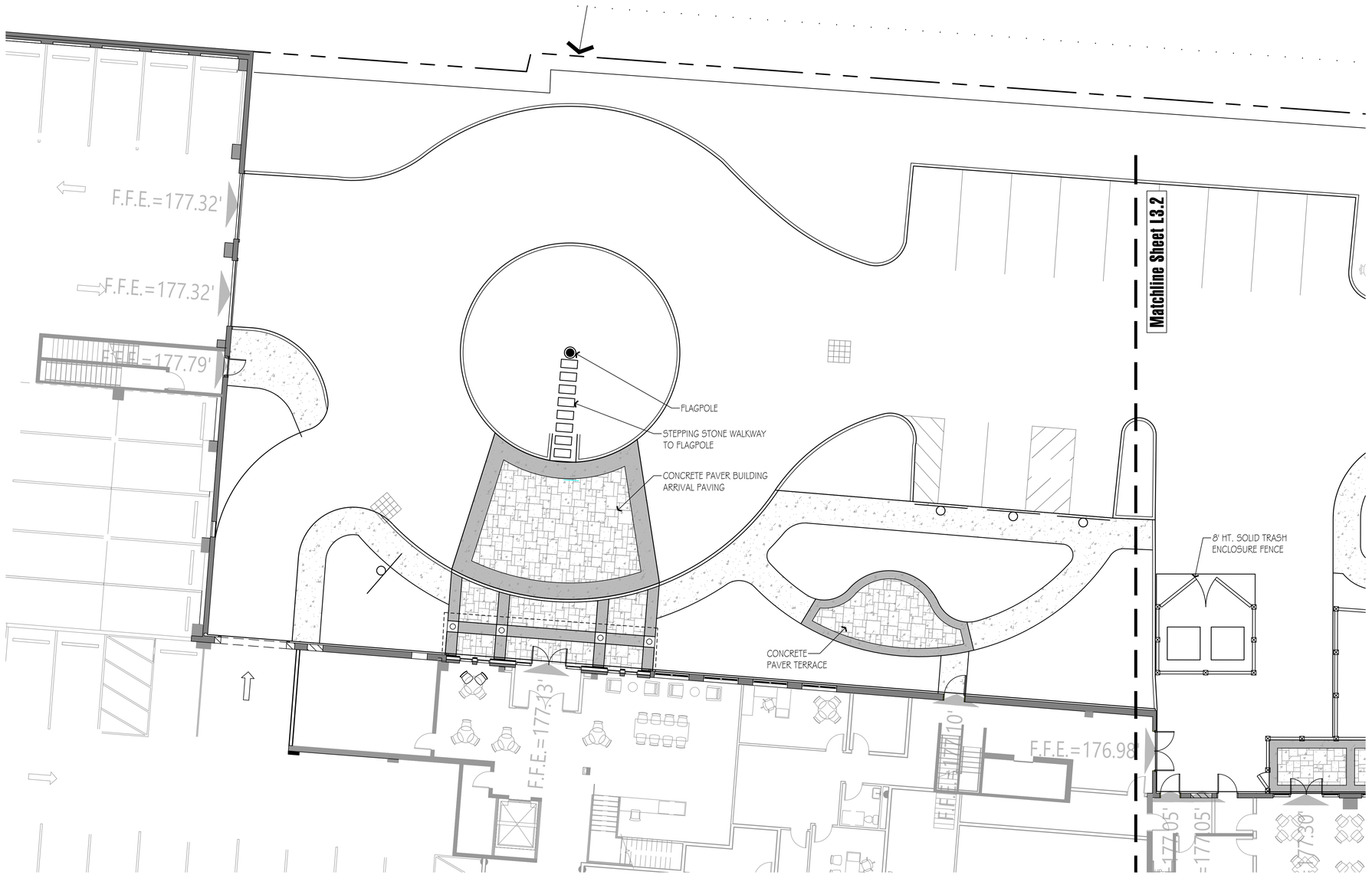
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Building Arrival & Resident Courtyard Materials Plan

Scale: 1" = 10'-0"

Sheet: L3.2



0 10 20 30 feet

SCALE: 1" = 10'

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

COMMONWEALTH OF MASSACHUSETTS
THOMAS E. MINOTT
NO. 49
REGISTERED LANDSCAPE ARCHITECT
2/24/21

The Residence at Carter Mill

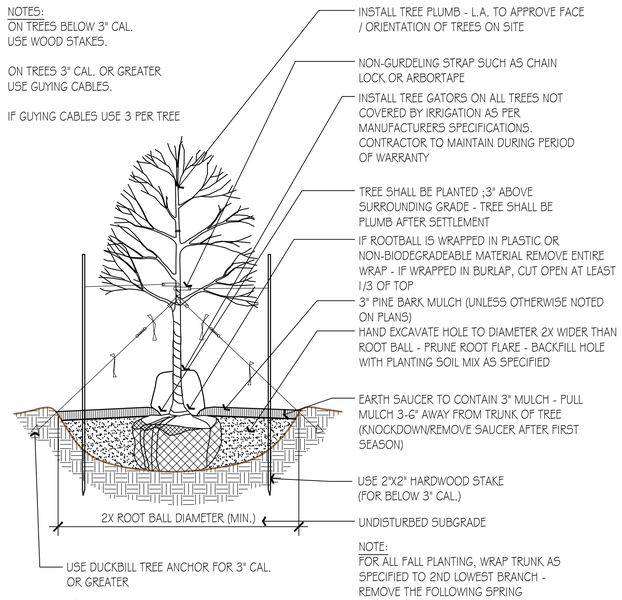
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Assisted Living Entrance Materials Plan

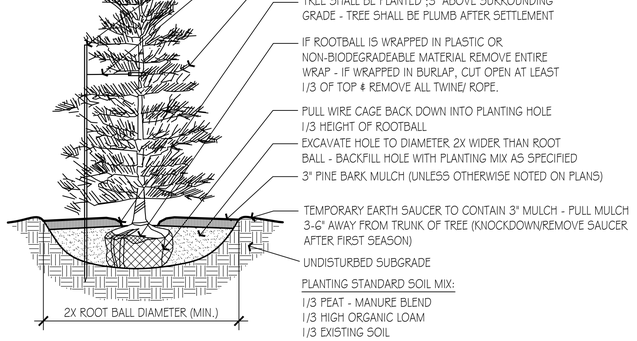
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Sheet: L3.3



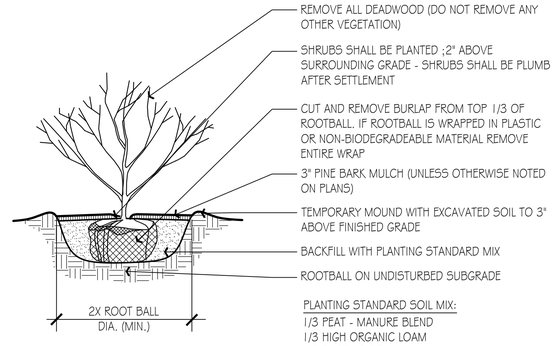
1 Deciduous Tree Planting

Scale: N.T.S.



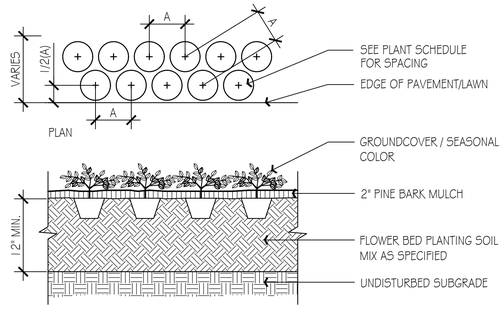
2 Conifer Tree Planting

Scale: N.T.S.



3 Shrub Planting

Scale: N.T.S.



4 Perennial & Groundcover Planting

Scale: N.T.S.

Schedule of Soils

LOCATION	DEPTH	DESCRIPTION
GENERAL PLANTING BEDS	12"	1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL
FLOWER BEDS	12"	SCREENED LOAM 1/3 PEAT - MANURE BLEND LIME - PELATIZED OR GROUND (50 LB. PER 100 SF.) GROUND BONE MEAL (50 LB. PER 100 SF.) 10-10-10 INORGANIC FERTILIZER (50 LB. PER 5000 SF.)
LAWNS - SOD & SEED	6"	6" SCREENED LOAM
PITS/TREE WELLS "STANDARD MIX" FOR BACKFILL	12"	SOIL MIX 'A' - 1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
AR-BR	5	Acer rubrum `Bowhall Red`	Bowhall Columnar Red Maple	B & B	3-3.5" CAL.	
ZS-GV	5	Zelkova serrata `Green Vase`	Green Vase Zelkova	B & B	3-3.5" CAL.	
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
TP-G	6	Thuja plicata `Green Giant`	Green Giant Arborvitae	B & B		8-10` HT.
FLOWERING TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
CF-CP	6	Cornus florida `Cherokee Princess`	Cherokee Princess Dogwood	B & B	3-3.5" CAL.	
HP-PG	2	Hydrangea paniculata `PeeGee Tree`	Tree Form Pee Gee Tree Hydrangea	B & B	2-2.5"-CAL.	
PC-A	4	Pyrus calleryana `Aristocrat`	Aristocrat Flowering Pear	B & B	3-3.5" CAL.	
PS-C	21	Prunus sargentii `Columnaris`	Columnar Sargent Cherry	B & B	3-3.5" CAL.	
SR-IS	4	Syringa reticulata `Ivory Silk`	Ivory Silk Japanese Tree Lilac	B & B	3-3.5" CAL.	
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
B-GG	103	Buxus x `Green Gem`	Green Gem Boxwood	Cont.		2` HT.
B-GM	18	Buxus x `Green Mountain`	Green Mountain Boxwood	B & B		2-2.5` HT.
CA-H	33	Clethra alnifolia `Hummingbird`	Hummingbird Summersweet	B & B		18-24" HT.
HM-ES	19	Hydrangea macrophylla `Endless Summer`	Endless Summer Hydrangea	B & B		2-2.5` HT.
HP-B	33	Hydrangea paniculata `Bobo`	Bobo Panicled Hydrangea	Cont.		18-24" HT.
HP-BS	17	Hydrangea paniculata `Bombshell`	Bombshell Hydrangea	Cont.		2-2.5` HT.
HS-D	3	Hibiscus syriacus `Diana`	Diana Rose of Sharon	B & B		5-6` HT.
IC-GL	62	Ilex crenata `Green Lustre`	Green Luster Japanese Holly	B & B		2-2.5` HT.
IC-S	4	Ilex crenata `Steeds`	Steeds Japanese Holly	B & B		5-6` HT.
IG-S	139	Ilex glabra `Shamrock`	Shamrock Inkberry	B & B		2-2.5` HT.
IM-DL	2	Ilex x meserveae `Dragon Lady`	Dragon Lady Meserve Holly	B & B		5-6` HT.
IO-JP	1	Ilex opaca `Jersey Princess`	Jersey Princess Holly	B & B		5-6` HT.
IV-RS	12	Ilex verticillata `Red Sprite`	Red Sprite Winterberry	B & B		2-2.5` HT.
JH-BH	13	Juniperus horizontalis `Bar Harbor`	Bar Harbor Creeping Juniper	Cont.		18-24" SPD.
PA-H	75	Pennisetum alopecuroides `Hameln`	Hameln Fountain Grass	2 GAL		
PJ-P	15	Pieris japonica `Prelude`	Prelude Andromeda	Cont.		2-2.5` HT.
PO-N	63	Physocarpus opulifolius `Nanus`	Dwarf Ninebark	B & B		2-2.5` HT.
PO-SW	16	Physocarpus opulifolius `Summer Wine`	Summer Wine Ninebark	B & B		3-3.5` HT.
PV-S	35	Panicum virgatum `Shenandoah`	Shenandoah Switch Grass	3 GAL		
R-CW	60	Rhododendron `Cunningham`s White`	Cunningham White Rhododendron	B & B		2-2.5` HT.
R-PG	19	Rhododendron `Purple Gem`	Purple Gem Rhododendron	Cont.		18-24" HT.
R-S	18	Rhododendron `Scintillation`	Scintillation Rhododendron	B & B		2-2.5` HT.
SJ-G	54	Spiraea japonica `Goldflame`	Goldflame Spirea	Cont.		18-24" HT.
SV-S	8	Syringa vulgaris `Sensation`	Sensation Lilac	B & B		5-6` HT.
TM-H	36	Taxus x media `Hicksii`	Hicks Yew	B & B		3-3.5` HT.
TO-EG	95	Thuja occidentalis `Emerald Green`	Emerald Green Arborvitae	B & B		6-7` HT.
TO-T	25	Thuja occidentalis `Techny`	Techny Arborvitae	B & B		6-7` HT.
VD-AJ	24	Viburnum dentatum `Autumn Jazz`	Autumn Jazz Viburnum	B & B		5-6` HT.
WF-DH	12	Weigela florida `Dark Horse`	Dark Horse Weigela	Cont.		2-2.5` HT.
WF-MM	34	Weigela florida `My Monet`	My Monet Weigela	Cont.		15-18" HT.
GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	CONT		
LS-BB	110	Liriope spicata `Big Blue`	Creeping Lily Turf	1 GAL.		
PER	427	Perennials	Assorted Perennials	1 gal		
PT	1,681	Pachysandra terminalis	Japanese Spurge	4"pot		

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments



The Residence at Carter Mill
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Plant Schedule and Planting Details

Scale: As Noted

Sheet: LD 1

General Landscape Notes:

1.1) CONTRACTOR REQUIREMENTS:
A) ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND REGULATIONS, FROM ALL FEDERAL, STATE AND LOCAL AUTHORITIES.

B) THE CONTRACTOR SHALL ARRANGE FOR AND OBTAIN ALL PERMITS AND LICENSES REQUIRED FOR THE COMPLETE WORK SPECIFIED HEREIN AND SHOWN ON ALL THE DRAWINGS. THE CONTRACTOR SHALL PAY FOR ANY FEES NOT WAIVED.

1.2) UTILITIES:
A) LANDSCAPE CONTRACTOR IS REQUIRED TO CONTACT THE RELEVANT UTILITY COMPANIES PRIOR TO DOING ANY EXCAVATION ON THE SITE. IF ANY WORK IS TO BE DONE AROUND UNDERGROUND UTILITIES, THE APPROPRIATE AUTHORITY OF THAT UTILITY MUST BE NOTIFIED OF THE IMPENDING WORK.

B) UTILITIES SHALL BE LOCATED AND MARKED PRIOR TO ANY INSTALLATION. ADJUSTMENTS MAY BE NECESSARY IN THE FIELD TO ACCOMMODATE UTILITY LOCATIONS. REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

C) THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES DONE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF SATISFACTORY REPAIR OF ALL DAMAGE IN KIND RESULTING FROM THEIR FAILURE TO COMPLY.

1.3) PROTECTION OF EXISTING WORK: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL WORK IN A MANNER THAT PROTECTS WORK COMPLETED BY OTHERS, SUCH AS CURBS, UTILITIES, STORM DRAINAGE, FENCES, DRIVEWAY APRONS, DRIVES, VEGETATION, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF SATISFACTORY REPAIR OF ALL DAMAGE IN KIND RESULTING FROM THEIR FAILURE TO COMPLY.

1.4) QUANTITIES: A COMPLETE LIST OF PLANTS INCLUDING A SCHEDULE OF QUANTITIES, SIZES, TYPES, AND NAMES IS INCLUDED IN THIS SET OF DRAWINGS. IN THE EVENT OF DISCREPANCIES BETWEEN QUANTITIES OF PLANT IN THE PLANT LIST AND THE QUANTITIES SHOWN ON THE DRAWINGS, THE PLAN SHALL GOVERN. THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF UNLABELED PLANTS IN PLAN FOR CLARIFICATION. THE LANDSCAPE ARCHITECT SHALL BE ALERTED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO FINAL BID NEGOTIATION.

1.5) APPLICABLE PLANT MATERIALS STANDARDS: ALL PLANT MATERIALS ARE TO COMPLY WITH THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN. PLANTING METHODS WILL BE IN ACCORDANCE WITH SITE-SPECIFIC REQUIREMENTS.

1.6) PLANT HARDINESS: ALL TREES AND SHRUBS SHALL BE NURSERY GROWN WITHIN A USDA PLANT HARDINESS ZONE, WHICH IS THE SAME AS, OR COLDER THAN, THE ZONE IN WHICH THE PROJECT IS LOCATED.

1.7) PLANTING SEASONS: PLANTING SHALL ONLY OCCUR DURING SPECIFIED SEASONS. SPRING SEASON SHALL BE FROM MARCH 1 TO JUNE 15. FALL PLANTING SEASON SHALL BE FROM SEPTEMBER 15 THROUGH NOVEMBER 15. NO PLANTING SHALL OCCUR WHEN THE GROUND IS FROZEN.

1.8) PLANT SUBSTITUTIONS: NO SUBSTITUTIONS OF PRODUCTS, PLANT TYPES OR SIZES SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT. REQUESTS FOR SUBSTITUTION SHALL BE IN WRITING, AND SHALL STATE THE REASON FOR THE SUBSTITUTION REQUEST, THE SUGGESTED ALTERNATIVE AND THE CHANGES IN COST. REQUESTS FOR SUBSTITUTION IN PLANT MATERIALS SHALL STATE THE NAMES OF NURSERIES THAT HAVE BEEN UNABLE TO SUPPLY THE ORIGINALLY SPECIFIED MATERIAL.

1.9) THE LANDSCAPE ARCHITECT SHALL RESERVE THE RIGHT TO INSPECT ALL PLANT MATERIALS AT THE NURSERY, UPON SITE DELIVERY AND DURING INSTALLATION TO INSURE SPECIFICATIONS AND PROCEDURES ARE ADHERED TO.

1.10) MINIMUM SIZES: ALL PLANTS 3' OR GREATER IN HEIGHT OR SPREAD SHALL BE BALLED AND BURLAPPED. SIZES SPECIFIED IN THE PLANT LIST ARE MINIMUMS ON WHICH THE PLANTS ARE TO BE JUDGED.

1.11) DEAD PLANTS: DEAD PLANTS ARE TO BE REMOVED FROM THE SITE IMMEDIATELY, AND REPLACED WITH THE SAME PLANT & SIZE REGARDLESS OF SEASON, WEEKLY FROM THE JOB BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN AN UPDATED COMPREHENSIVE LIST OF ALL DEAD MATERIALS REMOVED AND PRESENT A COPY OF THE LIST TO THE OWNER AND LANDSCAPE ARCHITECT AT THE END OF EVERY MONTH DURING THE CONTRACT PERIOD.

1.12) PLANT MATERIAL REMOVAL: NO EXISTING TREES SHALL BE REMOVED WITHOUT THE WRITTEN AUTHORIZATION FROM THE LANDSCAPE ARCHITECT EXCEPT WHERE NOTED ON THE PLANS. CONTRACTORS WHO REMOVE EXISTING TREES WITHOUT WRITTEN APPROVAL WILL BE REQUIRED TO MAKE REMEDIES DETERMINED BY THE GOVERNING URBAN FORESTER OR EQUIVALENT AUTHORITY. NO GRUBBING SHALL OCCUR WITHIN EXISTING TREE AREAS UNLESS SPECIFICALLY NOTED ON THE PLANS.

1.13) ALL DISTURBED AREAS NOT TO RECEIVE PLANT MATERIALS ARE TO BE LOAMED AND SEEDED AND BLENDED INTO EXISTING GRADE AND CONDITIONS. SEE SECTION 4.0.

1.14) LEDGE BOULDERS: IF DURING SITE EXCAVATION, LEDGE BOULDERS ARE AVAILABLE, THESE ARE TO BE STOCKPILED FOR USE IN EARTH BERMS IF APPLICABLE, WITH HAWK DESIGN, INC. PRIOR TO INSTALLATION. THIS ITEM WILL ONLY APPLY IF SO SPECIFIED ON DRAWINGS. BOULDERS SIZES TO BE STOCKPILED WILL RANGE FROM TWO TO FIVE FEET IN DIAMETER. SEE APPROPRIATE DETAIL FOR INSTALLATION COORDINATION.

1.15) SLEEVES: LANDSCAPE OR SITE CONTRACTOR SHALL PLACE INDIVIDUAL SLEEVES FOR LIGHTING AND IRRIGATION UNDER ANY PROPOSED WALKWAY OR VEHICULAR ROADWAY PRIOR TO INSTALLATION. COORDINATE SLEEVE LOCATIONS WITH IRRIGATION AND LIGHTING CONTRACTORS PRIOR TO INSTALLATION.

1.16) DO NOT CLOSE OR OBSTRUCT ANY STREET, SIDEWALK, ALLEY OR PASSAGEWAY WITHOUT PRIOR NOTIFICATION AND PERMISSION. CONDUCT OPERATIONS AS TO INTERFERE AS LITTLE AS POSSIBLE WITH THE USE ORDINARILY MADE OF ROADS, DRIVEWAYS, ALLEYS, SIDEWALKS OR OTHER FACILITIES NEAR ENOUGH TO THE WORK TO BE EFFECTED THEREBY.

Planting Materials:

2.1 PLANTING MATERIAL ITEMS IN SECTION 2.0 ARE TO BE INCORPORATED DURING PLANT INSTALLATION UNLESS OTHERWISE DEEMED UNNECESSARY IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS. SEE SECTION 3.1.

MULCH - MULCH WILL BE DOUBLE-SHREDDED PINE BARK MULCH.
- TREES AND SHRUBS SHALL RECEIVE AN EVEN 3" MULCH LAYER.
- GROUNDCOVERS, PERENNIALS AND ANNUALS SHALL RECEIVE AN EVEN 2" MULCH LAYER.

MANURE- TO BE WELL ROTTED, ODORLESS, UNLEACHED COW MANURE, CONTAINING NOT MORE THAN 15% BEDDED MATERIALS SUCH AS STRAW, WOOD CHIPS OR SHAVINGS, AGED NOT LESS THAN TWO YEARS OLD.

HERBICIDE- A PRE-EMERGENCE WEED KILLER IS TO BE USED ON ALL LAWN AND PLANTING AREAS PRIOR TO INSTALLATION AS PER MANUFACTURER'S SPECIFICATIONS. *HERBICIDES ARE NOT TO BE APPLIED IN RESTRICTED CONSERVATION AREAS.

FERTILIZER- ALL TREES AND SHRUBS TO HAVE SLOW RELEASE PACKET OR PELLET PLACED INTO THE PLANT PIT WITH A MINIMUM ANALYSIS OF 10-10-10. ALL GROUNDCOVERS, PERENNIALS AND ANNUALS ARE TO RECIEVE A BROADCAST APPLICATION OF A 14-14-14 FERTILZER AT 3 LB PR 100 SQ. FT. APPLY AS PER MANUFACTURER'S INSTRUCTIONS. *FERTILIZERS ARE NOT TO BE APPLIED IN RESTRICTED CONSERVATION AREAS.

TOPSOIL- ACCEPTABLE TOPSOIL SHALL BE FERTILE, FRIABLE NATURAL LOAM, UNIFORM IN COMPOSITION, FREE OF STONES, LIMBS, PLANTS AND THIER ROOTS, DEBRIS AND OTHER EXTRANEOUS MATTER OVER ONE INCH IN DIAMETER. THE SOIL SHALL BE CAPABLE OF SUSTAINED PLANT GROWTH AND HAVE A 5% MINIMUM ORGANIC CONTENT. IN SITUATIONS WHICH REQUIRE A CUSTOM TOPSOIL OR STRUCTURAL SOIL, THE SOIL MIXTURE SPECIFICATION WILL BE PROVIDED BY THE LANDSCAPE ARCHITECT.

SOIL AMENDMENTS: APPLY AS NECESSARY ACCORDING TO SOIL TEST RESULTS, AS PER MANUFACTURES SPECIFICATIONS.

ANTI-DESICCANT- "WILT PRUF" NCF OR EQUAL APPLY AS PER MANUFACTURERS' SPECIFICATIONS.

Plant Installation:

3.1) SOIL TESTING: LANDSCAPE CONTRACTOR SHALL PROVIDE A CERTIFIED SOIL ANALYSIS PRIOR TO ANY PLANT INSTALLATION TO DETERMINE ANY NECESSARY AMENDMENTS TO THE EXISTING SOIL CONDITIONS FOR SEEDING AND PLANTING. THE ANALYSIS WILL ALSO BE REQUIRED FOR ESTABLISHING THE FERTILIZER PROGRAM REQUIRED. COORDINATE RESULTS AND PROVIDE WRITTEN RECOMMENDATIONS TO HAWK DESIGN, INC. 15 DAYS PRIOR TO INSTALLATION.

3.2) ALL PLANTS SHALL BE TRANSPORTED TO THE SITE IN COVERED TRUCKS, TARPAULIN COVERS SHALL BE UTILIZED TO PREVENT WIND DAMAGE OF LOAD.

3.3) DELIVER PLANT MATERIALS IMMEDIATELY PRIOR TO PLACEMENT. KEEP PLANT MATERIALS MOIST. DO NOT STORE PLANT MATERIAL ON PAVED AREAS. ROOTS OR BALLS SHALL BE PROTECTED FROM THE SUN OR DRYING WINDS. AS REQUIRED BY TEMPERATURE OR WIND CONDITIONS, APPLY ANTI-DESICCANT EMULSION TO PREVENT DRYING OUT OF PLANT MATERIALS.

3.4) CONDITIONS FOR PLANT REJECTION:
A) REJECT PLANTS WHEN BALL OF EARTH SURROUNDING ROOTS HAS BEEN CRACKED OR BROKEN PREPARATORY TO OR DURING THE PROCESS OF PLANTING.

B) WHEN BURLAP, STAVES AND ROPES REQUIRED IN CONNECTION WITH TRANSPLANTING HAVE BEEN DISPLACED PRIOR TO ACCEPTANCE.

C) WIND DAMAGED PLANT MATERIAL FROM POOR TARPAULIN COVER PROCEDURES ARE SUBJECT TO REJECTION.

3.5) ALL PLANT MATERIAL, WHICH CANNOT BE PLANTED IMMEDIATELY ON DELIVERY, SHALL BE SET ON THE GROUND IN A SHADED LOCATION AND SHALL BE TEMPORARILY PROTECTED WITH SOIL OR OTHER ACCEPTABLE MATERIAL. TEMPORARY WATERING OR IRRIGATION SHALL BE INCORPORATED AND REGULARLY CONDUCTED ON PLANTINGS IN HOLD AREAS.

3.6) IN CASE OF CONFLICTS DURING CONSTRUCTION WITH UTILITIES, ROCK MATERIALS, TREE ROOTS OR OTHER OBSTRUCTIONS FOR THE EXCAVATION OF SHRUB BEDS AND TREE PITS. CONTACT LANDSCAPE ARCHITECT FOR APPROVED ALTERNATE LOCATIONS.

3.7) SOIL PERMABILITY: TEST DRAINAGE OF PLANTING BEDS AND PITS BY FILLING WITH WATER TWICE IN SUCCESSION. CONDITIONS PERMITTING THE RETENTION OF WATER FOR MORE THAN 24 HOURS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT.

3.8) SOIL EXCAVATIONS:
A) EXCAVATE TREE PITS AND SHRUB BEDS TO DEPTHS REQUIRED BY PLANTING DETAILS. ALL PITS SHALL BE CIRCULAR IN OUTLINE, EXCEPT FOR WHOLE BEDS. SEE APPROPRIATE PLANTNIG DETAILS.

B) SOIL EXCAVATIONS FOR BALLED & BURLAP AND CONTAINER PLANTINGS MUST BE NO LESS THAN 2X ROOT BALL DIAMETER, SEE PLANTING DETAILS. IF QUESTIONABLE SUBSURFACE SOIL CONDITIONS EXIST SUCH AS POOR DRAINAGE CONDITIONS, RUBBLE OR OBSTRUCTIONS, REPORT TO THE LANDSCAPE ARCHITECT AND CONSTRUCTION MANAGER BEFORE PLANTING.

3.9) GRADING:
A) VERIFY GRADES PRIOR TO PLANTING, THE CONTRACTOR SHALL VERIFY THAT CONSTRUCTED GRADES ARE AS INDICATED ON PLANS. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT IF ADJUSTMENTS TO PLANT PLACEMENT MAY BE REQUIRED DUE TO FIELD CONDITIONS AND FINAL GRADING.

B) POSITIVE DRAINAGE SHALL BE MAINTAINED AWAY FROM AND AROUND BUILDINGS (REFER TO ENGINEERS GRADING PLANS). REPORT ANY CONFLICTS TO HAWK DESIGN, INC. PRIOR TO INSTALLATION.

C) FINISH GRADE OF PLANTINGS SHALL BE EQUIVALENT TO FORMER EXISTING GRADE OF PLANT IN THE NURSERY.

3.10) BALLED AND BURLAPED (B&B) MATERIALS:
A) CUT WIRE BASKETS ONCE IN THE PLANT PIT AND PEEL WIRE BACK.

B) TAGS AND TWINE ARE TO BE REMOVED AND BURLAP IS TO BE ROLLED BACK ONE-THIRD ON ALL B&B PLANT MATERIAL. ANY SYNTHETIC BURLAP SHALL BE COMPLETELY REMOVED FROM ANY PLANT MATERIAL

Plant Installation Cont'd

3.11) CONTAINER GROWN STOCK: SHALL BE REMOVED FROM CONTAINER BY CUTTING CONTAINER AWAY TO AVOID ROOT DAMAGE TO PLANT ROOT SYSTEM. IF PLANT ROOT IS BOUND, SLICE ROOT BALLS APPROXIMATELY 2" DEEP WITH KNIFE OR SHARP SPADE.

3.12) DO NOT USE MUDDY OR FROZEN SOIL TO BACKFILL PLANTINGS.

3.13) WATERING: THOROUGHLY WATER UNTIL SOIL IS SATURATED AROUND ALL TREES AND SHRUBS AFTER PLANTING AND THROUGHOUT THE TIME PERIOD UNTIL FINAL ACCEPTANCE FROM CLIENT. DURING DRY CONDITIONS, WATER AS REQUIRED TO MAINTAIN PLANTS IN A WILT-FREE CONDITION.

3.14) PRUNING: TREES SHALL BE PRUNED TO BALANCE TOP GROWTH WITH ROOTS AND TO PRESERVE THEIR NATURAL CHARACTER AND TYPICAL GROWTH HABIT. PRUNING SHALL BE RESTRICTED IN GENERAL TO THE SECONDARY BRANCHES AND SUCKER GROWTH. ALL CUTS TO BE FLUSH WITH TRUNK. DO NOT CUT A LEADER. THE LANDSCAPE ARCHITECT WILL REJECT ALL PLANTS DISFIGURED BY POOR PRUNING PRACTICES. ALL PRUNING CUTS SHALL REMAIN UNPAINTED.

3.15) STAKING AND GUYING: ALL TREES TO BE STAKED AND GUYED WITHIN 48 HOURS OF PLANTING. METHODS AND MATERIALS FOR STAKING AND GUYING ARE ILLUSTRATED IN INDIVIDUAL PLANTING DETAILS. NEATLY FLAG ALL GUY WIRES WITH ROT RESISTANCE YELLOW TREE MARKING RIBBON.

3.16) STAKE OUT PLANT LOCATIONS: PRIOR TO PLANTING THE CONTRACTOR SHALL LAYOUT THE EXTENT OF THE PLANT BEDS AND PROPOSED LOCATIONS FOR B&B PLANTS FOR REVIEW BY THE OWNER AND LANDSCAPE ARCHITECT.

3.17) PLANTING FIELD ADJUSTMENTS:
A) THE CONTACTOR IS TO SLIGHTLY ADJUST PLANT LOCATIONS IN THE FIELD AS NECESSARY TO BE CLEAR OF DRAINAGE SWALES AND UTILITES.

B) LARGE GROWING PLANTS ARE NOT TO BE PLANTED IN FRONT OF WINDOWS OR UNDER BUILDING OVERHANGS. NOTIFY THE LANDSCAPE ARCHITECT OF DISCREPANCIES IN PLANTING PLAN VS. FIELD CONDITIONS.

C) SHRUBS PLANTED NEAR HVAC UNITS ARE TO BE LOCATED SO THAT SHRUBS AT MATURITY WILL MAINTAIN ONE FOOT (1') AIRSPACE BETWEEN THE UNIT AND THE PLANT. ANY PLANTING SHOWN ADJACENT TO CONDENSER UNITS SHALL BE PLANTED TO SCREEN THE UNITS. SHOULD THE CONDENSER UNITS BE INSTALLED IN LOCATIONS DIFFERENT FROM THOSE SHOWN ON THE PLAN, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE LANDSCAPE ARCHITECT AND INSTALL THE MATERIAL AROUND THE CONDENSERS AND ADJUST THE OTHER PLANTING ACCORDINGLY.

3.18) PLANT BED EDGES/LINES: GROUPS OF SHRUBS, PERENNIALS AND GROUNDCOVERS SHALL BE PLACED IN A CONTINUOUS MULCH BED WITH SMOOTH CONTINUOUS LINES. ALL MULCHED BED EDGES SHALL BE CURVILINEAR IN SHAPE, FOLLOWING THE CONTOUR OF THE PLANT MASS. TREES LOCATED WITHIN 4 FEET OF PLANT BEDS SHALL SHARE THE SAME MULCH BEDS.

3.19) A.D.A. - THE AMERICAN WITH DISABILITIES ACT STANDARDS REQUIRE THAT A 7 FOOT VERTICAL CLEARANCE BE MAINTAINED FROM TREE BRANCHES TO FINISHED GRADE WHERE PEDESTRIANS SIDEWALKS AND/OR TRAILS ARE LOCATED. THE CONTRACTOR IS TO ADJUST TREE PLANTINGS IN FIELD TO SLIGHTLY MINIMIZE BRANCH OVERHANG AND COMPLY WITH THE A.D.A. ACT.

3.20) TREE SPACING MINUMUMS: TREES SHALL BE LOCATED A MINIMUM OF 4 FEET FROM RETAINING WALLS AND WALKS WITHIN THE PROJECT. IF A CONFLICT ARISES BETWEEN ACTUAL SIZE OF AREA AND PLANS, THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO LANDSCAPE ARCHITECT WILL RESULT IN CONTRACTORS LIABILITY TO RELOCATE MATERIALS.

Seeding and Sodding:

4.1) SEEDING OF LAWN AREAS: GRASS SEED APPLICATION SHALL BE SPREAD AT THE RATE OF 5 LBS. PER 1,000 SQUARE FEET, SEEDING SHALL BE ACCOMPLISHED BY MEANS OF A HYDRO-SEEDING PROCESS.

4.2) WATERING OF SEEDED AREAS: 24 HOURS AFTER HYDRO SEEDING, THE CONTRACTOR SHALL WATER THE SEEDED AREA LIGHTLY AND SUFFICIENTLY TO A DEPTH OF TWO INCHES (2") 2 TIMES A DAY (BETWEEN THE HOURS OF 7 PM AND 7 AM), UNTIL THE SEEDS ARE ESTABLISHED.

4.3) SEEDED AREA PROTECTION: THE CONTRACTOR SHALL ERECT SUITABLE SIGNS AND BARRICADES NOTIFYING THE PUBLIC TO KEEP OFF THE SEEDED AREAS UNTIL WELL ESTABLISHED. ANY TRAFFIC DAMAGE AND VANDALISM THAT MAY OCCUR PRIOR TO FINAL ACCEPTANCE OF THE WORK SHALL BE REPAIRED AND RESEEDED AT THE OWNERS EXPENSE. ANY DISTURBED OR DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE.

4.4) LAYING OF SOD: A KENTUCKY BLUEGRASS SOD MIX - BY LOCAL SOURCE AS SELECTED BY CONTRACTOR, SHALL BE FRESHLY CUT FROM THE SAME FIELD WITH 1/2 -3/4 INCHES OF SOIL. SOD SHALL BE LAID IMMEDIATELY WITH ANY STORED SOD BEING UNROLLED GRASS SIDE UP AND KEPT WATERED. LAY COURSES TIGHTLY TOGETHER WITHOUT OVERLAPPING WITH THE JOINTS STAGGERED. AFTER SODDING IS COMPLETE, ROLL LIGHTLY. THE CONTRACTOR SHALL WATER THE SODDED AREAS TO A DEPTH OF AT LEAST SIX INCHES AFTER THE SODDING PROCESS. OWNER SHALL THEN BE RESPONSIBLE FOR WATERING. THE FREQUENCY SHALL BE DETERMINED BY RAIN FALL AND WINDS WITH THE UPPER TWO OR THREE INCHES OF SOIL NOT DRYING OUT MARKEDLY.

4.5) SODDED AREA: INSPECTION AND ACCEPTANCE: FOUR WEEKS AFTER CONTRACTOR COMPLETES INSTALLATION, LANDSCAPE ARCHITECT SHALL INSPECT THE LAWN TO DETERMINE THE ACCEPTABILITY OF THE INSTALLATION. SODDED AREAS FAILING TO SHOW ADEQUATE ROOTING INTO THE SUBSOIL, OVERLAPPING, COURSE SEPARATION, UNEVENNESS OF THE SURFACE, UNEVEN COURSE COLOR AND EXCESSIVE BROADLEAF WEED CONTENT SHALL BE REPLACED. THE COST SHALL BE BORNE BY THE CONTRACTOR EXCEPT WHERE VANDALISM OR NEGLECT ON THE PART OF OTHERS NOT UNDER THE CONTRACTORS CONTROL HAS RESULTED IN DAMAGE.

4.6) FINAL APPROVAL: SEEDED AND SODDED AREAS WILL RECEIVE FINAL APPROVAL IF COVERAGE IS FULL AND CONSISTENT, FREE OF BARE SPOTS AND WEED FREE. WHEN GRASS IS CUT AT 2" HEIGHT NO SOIL SHOULD BE VISIBLE. SOD AREAS MUST HAVE RECEIVED A MINIMUM OF TWO MOWINGS. AREAS SODDED AFTER NOVEMBER 1ST WILL BE ACCEPTED THE FOLLOWING SPRING - ONE MONTH AFTER THE START OF THE GROWING SEASON, IF THE ABOVE CRITERIA HAS BEEN MET.

Maintenance:

5.1) MAINTENANCE DURING INSTALLATION: MAINTENANCE OPERATIONS SHALL BEGIN IMMEDIATELY AFTER EACH PLANT IS PLANTED AND SHALL CONTINUE AS REQUIRED UNTIL FINAL ACCEPTANCE AND THEN FOR THE GUARANTEE PERIOD. PLANTS SHALL BE KEPT IN A HEALTHY, GROWING CONDITION BY WATERING, PRUNING, SPRAYING, WEEDING AND ANY OTHER NECESSARY OPERATIONS OF MAINTENANCE. PLANT SAUCERS AND BEDS SHALL BE KEPT FREE OF WEEDS, GRASS AND OTHER UNDESIRED VEGETATION. PLANTS SHALL BE INSPECTED AT LEAST ONCE PER WEEK BY THE CONTRACTOR DURING THE INSTALLATION PERIOD AND ANY NEEDED MAINTENANCE IS TO BE PERFORMED PROMPTLY.

5.2) GRASS AND WEED CONTROL: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MOWING ALL GRASS AROUND LANDSCAPE BEDS AND INDIVIDUAL TREES AND SHRUBS UNTIL FINAL ACCEPTANCE. WEED CONTROL AREAS SHALL INCLUDE ALL LANDSCAPE BEDS AND THE AREA WITHIN 2 FEET OF THE OUTER EDGE OF THE MULCH AREA OR INDIVIDUAL TREE/SHRUBS.

5.3) THE CONTRACTOR SHALL WATER, FERTILIZE, WEED, CULTIVATE, REMULCH, SPRAY TO CONTROL INSECT INFESTATION AND DISEASE AND PERFORM ANY OTHER GOOD HORTICULTURAL PRACTICE NECESSARY TO MAINTAIN THE PLANTS IN A LIVING HEALTHY CONDITION UPON THE TIME FOR TERMINATION OF HIS RESPONSIBILITY FOR CARE AS SET OUT HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLANTS THROUGHOUT LIFE OF THE CONTRACT.

5.4) ALL PLANTS STOLEN, DAMAGED OR DESTROYED BY FIRE, AUTOMOBILES, VANDALISM OR ANY OTHER CAUSE, WITH THE EXCEPTION OF PLANTS DAMAGED OR DESTROYED BY THE OWNERS MAINTENANCE OPERATIONS, SHALL BE REPLACED BY THE OWNER PRIOR TO THE DATE OF FINAL ACCEPTANCE.

5.5) LANDSCAPE CONTRACTOR SHALL PREPARE MAINTENANCE SPECIFICATIONS AND SCHEDULE ANNUAL CARE OF ALL PLANTED AND LAWN AREAS INCLUDING FERTILIZING, WEEDING, MULCHING, BED EDGING, PRUNING AND PEST PREVENTION AND TREATMENT.

Plant Material Guarantee:

*CONTRACTOR SHALL GUARANTEE IN WRITING ALL PLANT MATERIAL AND LANDSCAPE IMPROVEMENTS FOR A PERIOD OF ONE YEAR. THE GUARANTEE IS TO INCLUDE THE FOLLOWING:

6.1) INSPECTIONS: PERFORM PERIODIC INSPECTIONS DURING GUARANTEE PERIOD WITH RESULTING WRITTEN REPORTS TO OWNER, PROJECT ADMINISTRATOR AND LANDSCAPE ARCHITECT STATING CONDITIONS AND RECOMMEND MAINTENANCE MODIFICATIONS. THE CONTRACTOR MUST CONTACT THE OWNER AND LANDSCAPE ARCHITECT AT LEAST 10 DAYS IN ADVANCE TO SCHEDULE ACCEPTANCE INSPECTION(S).

6.2) REMOVAL AND REPLACEMENT OF PLANTS PROVIDED BY CONTRACTOR TO BE DONE WITHIN THIRTY DAYS OF NOTIFICATION BY OWNER OF THEIR UNSATISFACTORY CONDITION DURING GROWING SEASONS. REPLACEMENT MATERIALS MUST BE EQUAL IN TYPE AND SIZE PER THE PROJECT'S PLANT LIST.

6.3) WHEN REPLACEMENT PLANT SPECIES IS EITHER NOT READILY AVAILABLE OR NO LONGER SUITABLE TO EXISTING SITE CONDITIONS WRITTEN NOTICE RECOMMENDATION OF SUBSTITUTION TO BE PROVIDED TO THE OWNER AND LANDSCAPE ARCHITECT WITHIN FIFTEEN DAYS FOR APPROVAL.

6.4) REMOVAL OF TREE'S SUPPORTS AND DEAD LIMBS PRIOR TO END OF GUARANTEE INSPECTION PERIOD.

6.5) CONTINUE WITH MAINTENANCE, SEE SECTION 5.0

6.6) GUARANTEE SHALL BEGIN UPON DATE OF FINAL ACCEPTANCE FROM OWNER AND WILL CONTINUE FOR ONE YEAR.

Site Cleanup:

7.1) SITE WORK CONDITIONS: EXCESS WASTE MATERIAL SHALL BE REMOVED DAILY WHEN PLANTING IN AN AREA HAS BEEN COMPLETED, THE AREA SHALL BE CLEARED OF ALL DEBRIS, SOIL PILES AND CONTAINERS DAILY. WHERE EXISTING GRASS AREAS HAVE BEEN DAMAGED OR SCARRED DURING PLANTING OPERATIONS, THE CONTRACTOR SHALL RESTORE DISTURBED AREAS TO THEIR ORIGINAL CONDITIONS AT HIS EXPENSE.

7.2) CLEAN PAVED AREAS UTILIZED FOR HAULING OR EQUIPMENT STORAGE AT END OF EACH WORKDAY.

7.3) MAINTAIN VEHICLES AND EQUIPMENT IN CLEAN CONDITION TO PREVENT SOILING OF ROADS, WALKS OR OTHER PAVED OR SURFACED AREAS.

7.4) REMOVE PROTECTIVE BARRIERS AND WARNING SIGNS AT TERMINATION OF LAWN ESTABLISHMENT.

Irrigation Notes:

8.1) ALL IRRIGATION SYSTEM COMPONENTS SHALL BE SUPPLIED BY REGIONALLY AUTHORIZED DISTRIBUTORS TO PROVIDE SINGLE SOURCE RESPONSIBILITY FOR WARRANTY SERVICE AND OPERATIONS TO CONFORM TO SPECIFICATIONS IN ALL RESPECTS.

8.2) THE CONTRACTOR IS TO SUBMIT PLANS PREPARED BY A IRRIGATION SPECIALIST TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.

8.3) ALL LINE VOLTAGE TO CONTROLLER AND ASSOCIATED BREAKER, CONDUIT ETC TO BE PERFORMED BY A LICENSED ELECTRICIAN.

8.4) ALL WIRES FOR RAIN SENSOR TO BE RUN IN SCHEDULE 40 PVC CONDUIT FOR APPLICATIONS IN EXPOSED AREAS UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT.

8.5) SLEEVES TO BE COORDINATED, LOCATED AND INSTALLED UNDER ALL HARDSCAPE FEATURES SUCH AS WALKS, WALLS AND DRIVEWAYS. THE CONTRACTOR IS TO IMMEDIATELY NOTIFY THE LANDSCAPE ARCHITECT OF ALL CONFLICT AND DISCREPANCIES.

8.6) CONTRACTOR WILL REVIEW WITH CLIENT ALL IRRIGATION PROCEDURES AND PROCESSES (i.e. TIMERS, ZONES AND ALL OTHER ITEMS INVOLVED W/ THE IRRIGATION SYSTEM) AND PROVIDE NECESSARY DOCUMENTATION FOR OPERATION OF IRRIGATION SYSTEM.

8.7) THE CONTRACTOR IS TO PROVIDE WIRES FOR FUTURE EXPANSION IN 16" DIAMETER VALVE BOX AS DIRECTED BY THE LANDSCAPE ARCHITECT OR CLIENT.

8.8) UNLESS INDICATED OTHERWISE, ALL PLANT BEDS ARE TO BE IRRIGATED WITH DRIP IRRIGATION, ALL LAWN AREAS TO BE IRRIGATED WITH SPRAY HEADS.

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

MASSACHUSETTS
THOMAS E. MINOR
NO. 52611
REGISTERED LANDSCAPE ARCHITECT
2/24/21

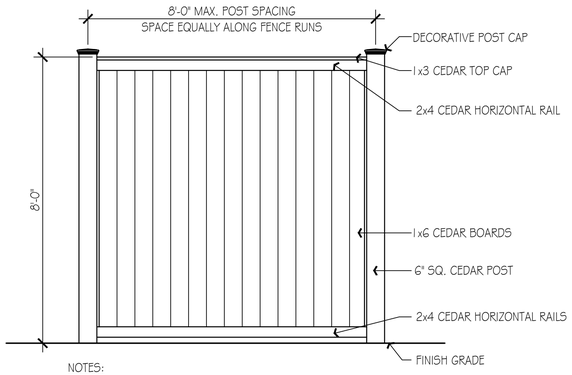
The Residence at Carter Mill
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Planting Notes

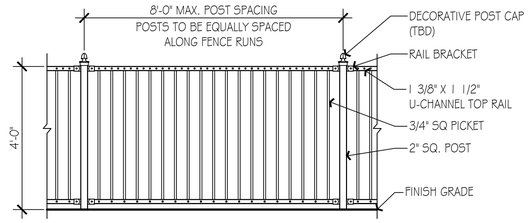
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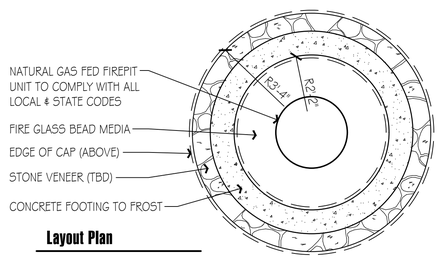
NOTES:
1. TOP CAP TO HAVE 5% WATER SHED
2. ALL SCREWS AND FASTENERS TO BE STAINLESS STEEL
3. ALL FASTENERS AND PLUGS SHOULD BE ALIGNED TO FORM A PATTERN AND SANDED SMOOTH

1 8' Height Privacy Fence
Scale: 1/2" = 1'-0"

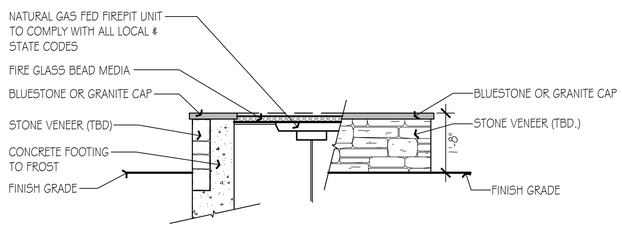


NOTES:
1. ALL FENCE COMPONENTS TO BE POWDER COATED BLACK COLOR

2 48" Height Ornamental Metal Fence
Scale: 1/2" = 1'-0"

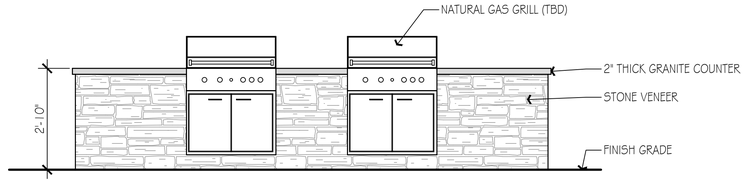


Layout Plan

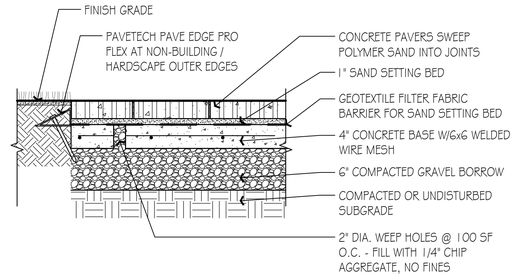


Section - Elevation

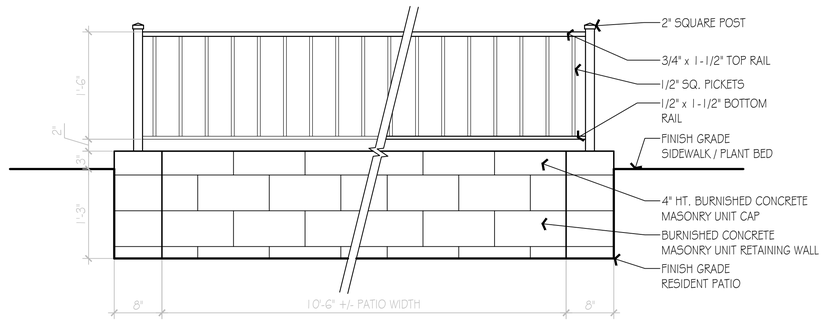
3 Fire Pit (Natural Gas)
Scale: 1/2" = 1'-0"



4 Outdoor Kitchen Area
Scale: 1/2" = 1'-0"



5 Brick Paver
Scale: 1" = 1'-0"



6 Resident Patio Retaining Wall and Fence
Scale: 1" = 1'-0"

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
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MASSACHUSETTS
THOMAS E. MINICUCCI
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REGISTERED LANDSCAPE ARCHITECT
2/24/21

The Residence at Carter Mill
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Construction Details

Scale: As Noted

Sheet: LD 3

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TRANSPORTATION ENGINEERS & PLANNERS

Traffic Impact Study

The Residence at Carter Mill

100-110 West Street
Needham, MA

LCB SENIOR LIVING

Prepared by
McMahon Associates, Inc.
120 Water Street, 4th Floor
Boston, MA 02109
617.556.0020

Prepared for
LCB Senior Living

Updated February 2021

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INTRODUCTION

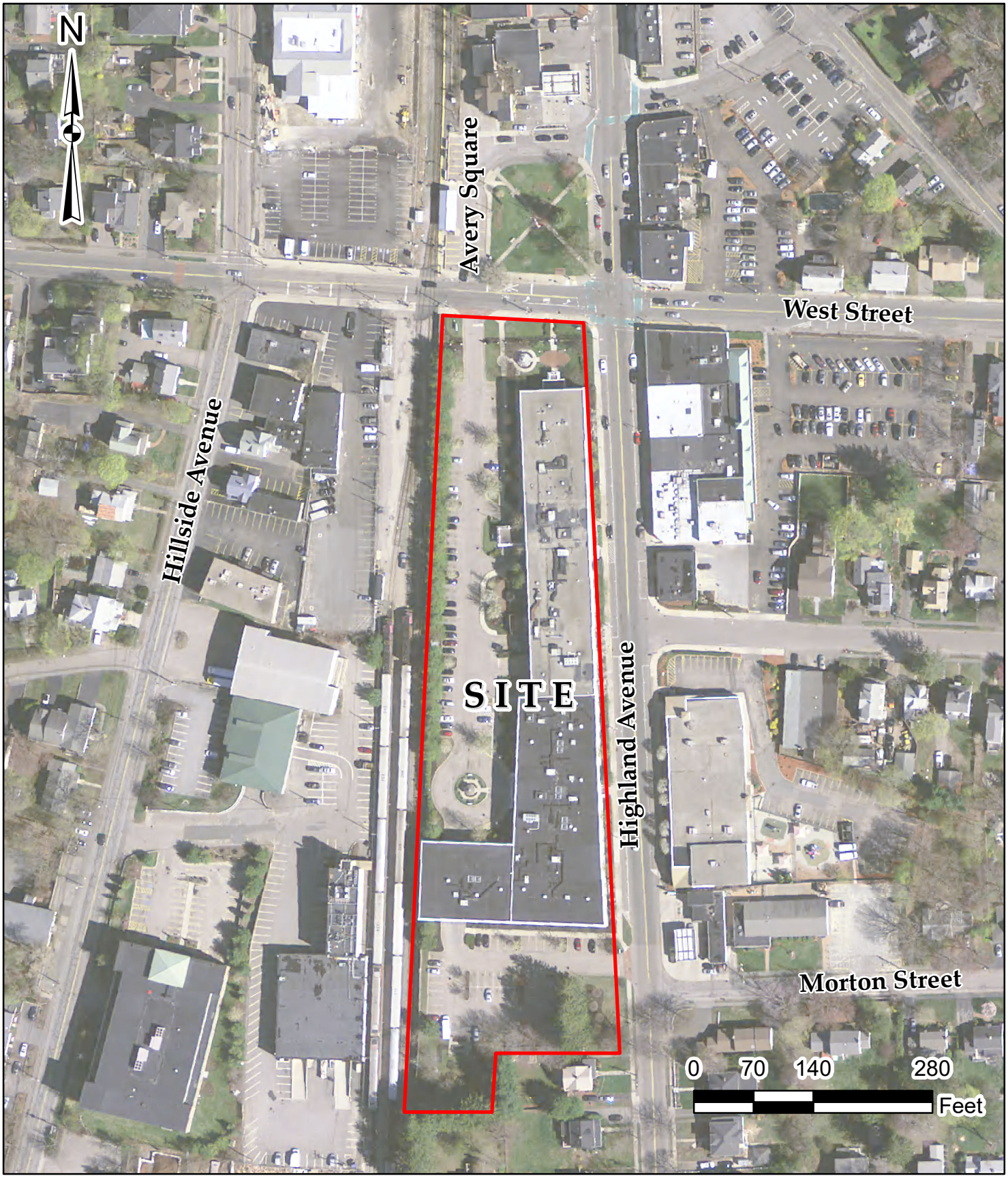
McMahon Associates has completed a review of the existing traffic operations and potential traffic impacts associated with the proposed Residence at Carter Mill redevelopment project at 100-110 West Street in Needham, MA. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the proposed redevelopment within the study area.

The assessment documented in this traffic impact study is based on a review of existing traffic volumes, recent crash data, and the anticipated traffic generating characteristics of the proposed project. The study examines existing and projected traffic operations (both with and without the proposed redevelopment) at key intersections in the vicinity of the project site. The study area was selected based on a review of the surrounding roadway network and estimated trip generating characteristics of the proposed project. This study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the combination of adjacent roadway volumes and project trips would be expected to be the greatest. The study also reviews the previous on-site uses and their impacts to traffic and parking within the study area relative to the proposed project.

Based on the analysis of the proposed project and a review of the previous land use, the proposed project is estimated to have a lesser impact on study area traffic and to require less parking than both the previous land use and the proposed on-site parking supply. The proposed project is shown to have a negligible impact on the area roadways and intersections. The following report documents these findings.

Project Description

The proposed Residence at Carter Mill redevelopment would be located at 100-110 West Street in Needham, MA, as shown in Figure 1. The site currently consists of a vacant building and associated parking that was previously used as an assisted living community, skilled nursing facility, and medical offices. The site is bounded by residential properties to the south, West Street to the north, Highland Avenue to the east, and Massachusetts Bay Transit Authority (MBTA) Commuter Rail tracks to the west. The proposed project would renovate the existing structure to include 83 units of senior assisted living and memory care units (96 beds) and 72 units of independent senior housing. A total of 149 parking spaces would be provided on-site, including 34 interior garage spaces and 115 exterior spaces. Access to the site would continue to be provided via the two existing full-access driveways, one on West Street and one on Highland Avenue.



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Figure 1
Site Location Map
The Residence at Carter Mill
Needham, Massachusetts

Study Methodology

This traffic impact study evaluates existing and projected traffic operations within the study area for the weekday morning and weekday afternoon peak hour traffic conditions when the combination of the adjacent roadway volumes and estimated project trips would be greatest.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the project study area. As part of this inventory, manual turning movement counts were collected at key intersections during the weekday morning and afternoon peak periods. A field visit was also completed to document intersection and roadway geometries and available sight distances at the site driveways. Crash data for the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) to determine if the study area has any existing traffic safety deficiencies.

The second step of the study builds upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with any planned future developments that could influence traffic volumes at the study area intersections were assessed. Consistent with MassDOT traffic study guidelines, Existing traffic volumes were forecasted to the future year 2026 to determine 2026 No Build (without project) conditions and 2026 Build (with project) conditions.

The third step of this study determined if measures are necessary to improve future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the site with the proposed project in place.

Study Area Intersections

Based on a review of the anticipated traffic generating characteristics of the proposed project and a review of the adjacent roadways serving the project site, the following study area intersections were selected for analysis:

- Highland Avenue at West Street
- West Street at Hillside Avenue
- West Street at the Site Driveway/Avery Square
- Highland Avenue at the Site Driveway/Morton Street

The traffic impact study presented in this report documents existing and future traffic conditions for the study area intersections noted above.

EXISTING CONDITIONS

An accurate assessment of the potential traffic impacts associated with the proposed senior living redevelopment requires a comprehensive understanding of the existing traffic conditions within the project study area. The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of peak period traffic volumes, and a review of recent crash data. The existing conditions in the vicinity of the project site are summarized below.

Transportation Network

The project site benefits from excellent access via the local and regional roadway system. A brief description of the principal roadways and public transportation providing access to the project site is presented below.

Highland Avenue

Highland Avenue generally runs in the north-south direction through the Town of Needham and is classified as an urban principal arterial under Town of Needham jurisdiction. Highland Avenue generally provides one travel lane in each direction, each measuring approximately 14 feet in width with 8-foot-wide parking spaces on both sides of the roadway adjacent to the site. A sidewalk is provided on both sides of Highland Avenue and crosswalks are provided across Highland Avenue at its signalized intersection with West Street. No bicycle facilities are provided. South of the site on Highland Avenue, a speed limit of 30 mph is posted for vehicles travelling in the southbound direction, and a speed limit of 25 mph is posted for vehicles travelling in the northbound direction.

West Street

West Street generally runs in the east-west direction through the Town of Needham. West Street is classified as an urban collector under Town of Needham jurisdiction. West of the site, West Street provides one travel lane in each direction, measuring approximately 16.5 feet wide in the eastbound direction and approximately 12.5 feet wide in the westbound direction. Sidewalks are provided on the north and south side of West Street. At the signalized intersection of West Street and Highland Avenue, crosswalks and left turn lanes are provided on the West Street approaches. No bicycle facilities are provided on West Street. An advisory speed limit of 30 miles per hour (mph) is posted west of the site for vehicles travelling westbound, and an advisory speed limit of 25 mph is posted in both directions of travel to the east of the site.

Hillside Avenue

Hillside Avenue generally runs in the north-south direction through the Town of Needham, and is classified as an urban collector under Town of Needham jurisdiction. Hillside Avenue provides one travel lane in each direction, with sidewalks provided on both sides of the roadway north of West Street, and a sidewalk provided on the west side of the roadway

south of West Street. A crosswalk is provided across Hillside Avenue on the north side of its intersection with West Street. An advisory speed limit of 30 miles per hour is posted in the southbound direction south of West Street.

Public Transportation

The MBTA Commuter Rail Needham Heights station is located just north of the intersection of West Street, Avery Square, and the site driveway. The station services the Needham line, which provides commuter rail service between Needham Heights and Boston's South Station between 6:05 AM and 12:00 AM. The MBTA bus route 59 provides stops along Highland Avenue with service between Needham Junction and Watertown Square. Bus stops in the vicinity of the site are located at the intersection of Highland Avenue at Mark Lee Road to the north of the site, and the intersection of Highland Avenue at Dana Place south of the site. Each of the bus and train stops are located within 500 feet of the project site.

Existing Traffic Volumes

Existing Peak Hour Traffic Volumes

To assess peak hour traffic conditions, manual turning movement counts were conducted at the study area intersections during the weekday morning and weekday afternoon peak periods.

Turning movement counts were conducted on Thursday, December 5, 2019 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM at the intersections of Highland Avenue at West Street, West Street at the site driveway/Avery Square, and Highland Avenue at the site driveway/Morton Street. Counts at the intersection of West Street at Hillside Avenue were conducted on Tuesday, January 5, 2021 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix A of this report. The four highest consecutive 15-minute intervals during each of these count periods constitute the peak hours that are the basis of the traffic analysis provided in this report. Based on a review of the peak period traffic data, the weekday morning peak hour at the study area intersections was identified as 7:15 AM to 8:15 AM and the weekday afternoon peak hour was identified as 4:30 PM to 5:30 PM.

A 48-hour Automatic Traffic Recorder (ATR) count was conducted on Highland Avenue north of Morton Street on from Wednesday, December 18 to Thursday, December 19, 2019. The ATR count included hourly vehicle volume and vehicle speed information which is provided in Appendix A of this report and summarized in Table 1 below.

Table 1: ATR Data Summary

Direction	ADT[(1)]	AM Commuter[(2)] Peak Hour	PM Commuter[(3)] Peak Hour	85th Percentile Speed (mph)
Northbound	6,190	492	407	32
Southbound	5,950	320	518	34
Combined	12,140	812	925	33

(1) Average daily traffic volume in vehicles per day.
(2) Weekday morning commuter peak (7:00 AM to 9:00 AM) occurs between 7:30 AM and 8:30 AM.
(3) Weekday afternoon commuter peak (4:00 PM to 6:00 PM) occurs between 4:30 PM and 5:30 PM.

As shown in Table 1, the ATR count on Highland Avenue shows an Average Daily Traffic (ADT) volume of approximately 6,190 vehicles in the northbound direction and approximately 5,950 vehicles in the southbound direction. The 85th percentile speeds in the northbound and southbound directions are 32 mph and 34 mph, respectively.

Seasonal Variation

In order to account for seasonal variation in traffic volumes, continuous count data from a MassDOT count station on I-95 in Newton, MA were reviewed. Based on the seasonal trends of the data, traffic counts collected during the month December are shown to be approximately 4% lower than the average month. Therefore, in order to provide a conservative analysis, the existing peak hour traffic volumes collected in December 2019 were adjusted upward by approximately 4% to represent an average month. The seasonal adjustment data from the continuous count station referenced is provided in Appendix B of this report.

Due to the Covid-19 pandemic, the peak period traffic volumes counted at the intersection of West Street at Hillside Avenue in January of 2021 are considered to be lower than typical conditions. As a result, the peak hour volumes at West Street and Hillside Avenue were adjusted upwards to reflect typical traffic conditions that were present prior to the pandemic. The adjustment was based on a comparison of seasonally adjusted volumes between the December 2019 volume set and the data collected in January 2021 along West Street.

The resulting peak hourly traffic flows for the Existing conditions are depicted in Figure 2 for the weekday morning peak hour and Figure 3 for the weekday afternoon peak hour.

The project site is currently vacant. However, the project site was previously occupied by an assisted living community, skilled nursing facility, and medical offices. The previous site uses are shown to have a higher number of trips and higher parking demand than the currently proposed redevelopment. The traffic associated with the previous land uses were not included in the Existing condition volumes and are discussed in subsequent sections of this report in more detail.

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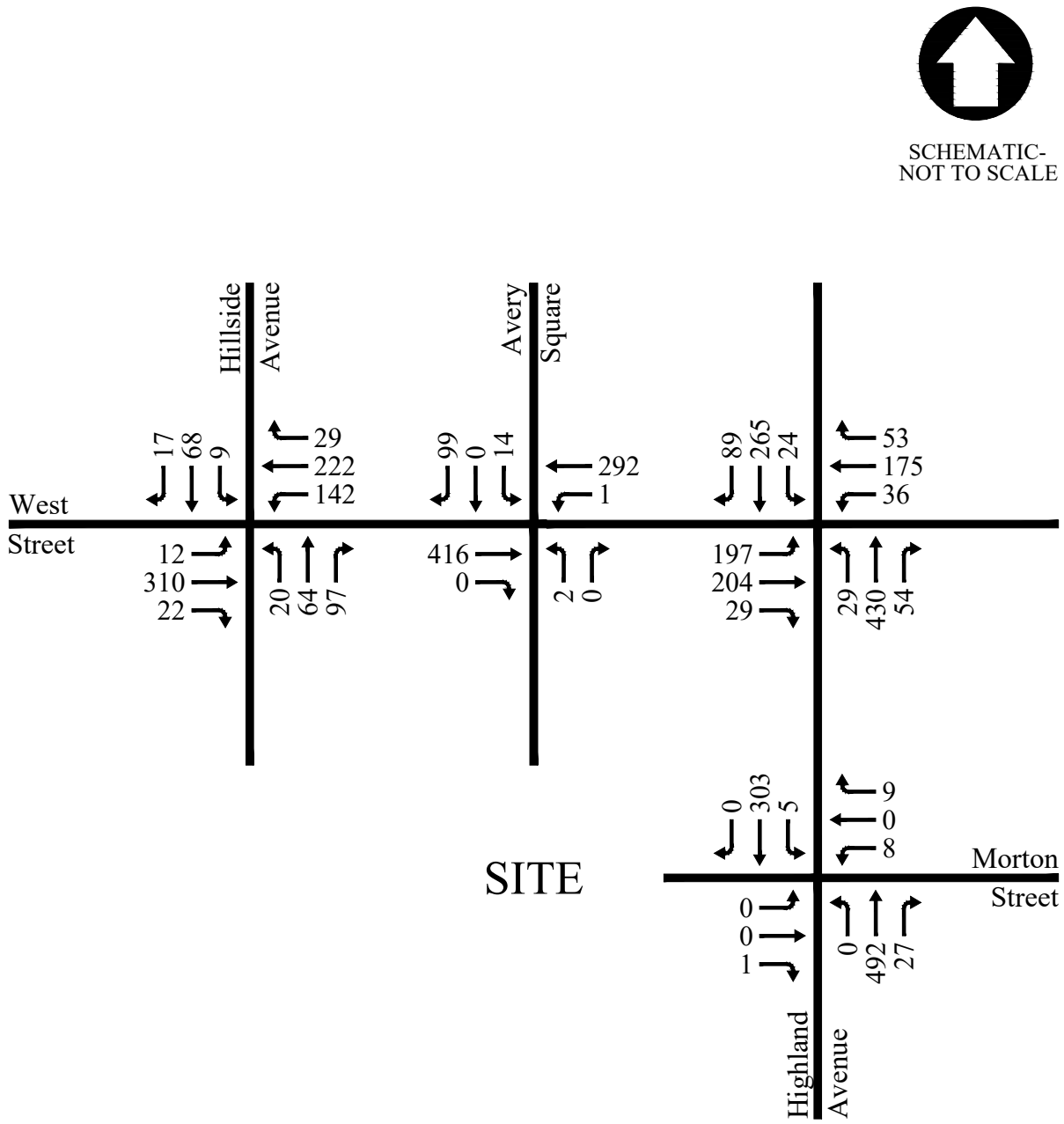
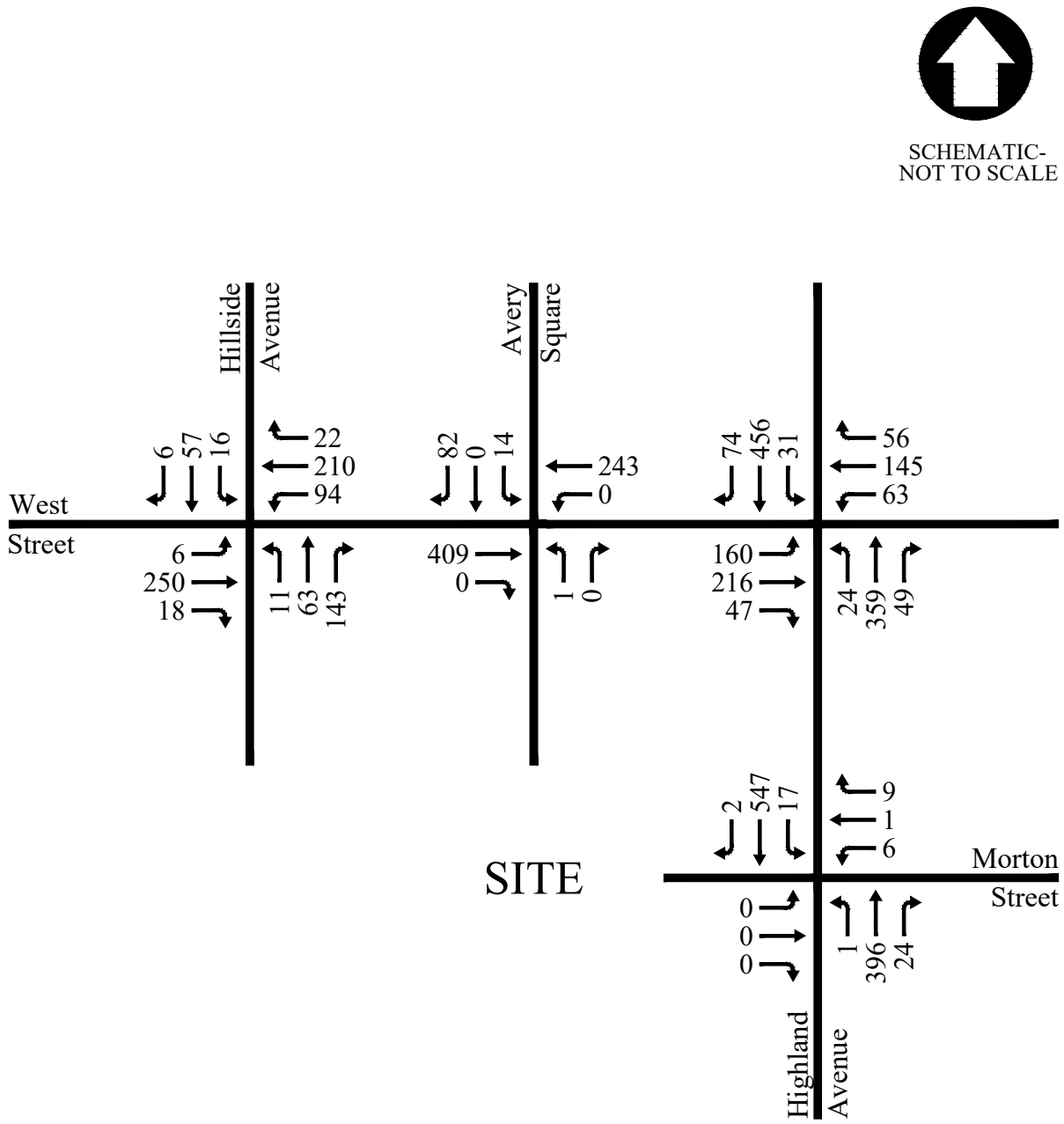


Figure 2
Existing Weekday Morning
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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Figure 3
Existing Weekday Afternoon
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

Crash Summary

Crash data for the study area intersections was obtained from MassDOT for the five-year period from 2013 through 2017. A summary of the crash data is presented in Appendix C.

The MassDOT Crash Rate Worksheet calculations were used to determine whether the crash frequencies at the study area intersections were unusually high given the travel demands at each location. The MassDOT Crash Rate Worksheet calculates a crash rate expressed in crashes per million entering vehicles. The calculated rate is then compared to the average rate for signalized and unsignalized intersections statewide and within MassDOT District 6. For signalized intersections, the statewide average crash rate is 0.78 crashes per million entering vehicles and the MassDOT District 6 crash rate is 0.71 crashes per million entering vehicles. For unsignalized intersections, the statewide average crash rate is 0.57 crashes per million entering vehicles and the MassDOT District 6 crash rate is 0.52 crashes per million entering vehicles.

The signalized intersection of Highland Avenue at West Street is reported to have experienced a total of 30 crashes during the five-year period analyzed, resulting in a crash rate of 0.77 crashes per million entering vehicles, which is below the statewide average crash rate and above the MassDOT District 6 average crash rate. The intersection is not currently identified as a MassDOT Highway Safety Improvement Project (HSIP) high-crash cluster. Of the 30 reported crashes at the intersection of Highland Avenue at West Street, ten were angle collisions, nine were rear-end collisions, and nine were sideswipe collisions. Four of the reported crashes resulted in personal injury, 25 resulted in property damage only, and the severity of one crash was not reported. Based on conversations with the town of Needham, this intersection is anticipated to be reconstructed in the future to improve pedestrian lighting, drainage, and traffic operations which would be expected to have a positive impact safety at the intersection.

The unsignalized intersection of West Street at Hillside Avenue is reported to have experienced a total of 44 crashes from 2013 to 2017, resulting in a crash rate of 2.11 crashes per million entering vehicles, which is higher than both the statewide average crash rate and the MassDOT District 6 crash rate for unsignalized intersections. Of the 44 crashes, 36 were angle collisions, three were rear-end collisions, one was a head-on collision, and three were single vehicle crashes. Of the 44 crashes, 26 crashes resulted in property damage only, while 15 resulted in personal injury and three were of unknown severity. The intersection is listed as a MassDOT HSIP high-crash cluster between the years of 2015 and 2017. The intersection has been identified for pedestrian improvements as part of the MassDOT Complete Streets Funding Program and is discussed in more detail in subsequent sections of this report.

A total of six crashes were reported at the intersection of West Street at the site driveway/Avery Square from 2013 to 2017, resulting in a crash rate of 0.34 crashes per

million entering vehicles. Four of the reported crashes were angle collisions. All of the reported crashes at the intersection resulted in property damage only.

At the intersection of Highland Avenue at the site driveway/Morton Street, five crashes were reported during the five-year study period, resulting in a crash rate of 0.21 crashes per million entering vehicles. Of these crashes, three were rear-end collisions. Three of the five reported crashes resulted in personal injury, and the other two resulted in property damage only.

All of the crashes summarized as part of this analysis occurred during the time that the project site was previously occupied and operating as the assisted living community, skilled nursing facility, and medical offices. With the anticipated reduction in overall vehicle trips and a negligible change in anticipated travel patterns associated with the project site, the proposed redevelopment would not be expected to worsen existing safety concerns at the study area intersections.

FUTURE CONDITIONS

To determine future traffic demands on the study area roadways and intersections, the Existing traffic volumes were projected to the future-year 2026. Traffic volumes on the study area roadways in 2026 are assumed to include all existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the proposed project. The potential background traffic growth, unrelated to the proposed project, was considered in the development of the 2026 No Build (without project) peak hour traffic volumes. The estimated traffic increases associated with the proposed project were then added to the 2026 No Build volumes to reflect the 2026 Build (with project) traffic conditions. A more detailed description of the development of the 2026 No Build and 2026 Build traffic volume networks is presented below.

Future Roadway Improvements

Planned roadway improvement projects can impact travel patterns and future traffic operations. MassDOT project information and the Town of Needham were consulted to develop an understanding of future area roadway improvement projects. Three projects which may affect traffic conditions at the study area intersections were identified.

A MassDOT roadway improvement project on Highland Avenue is currently in the pre-construction phases. This project would construct roadway improvements such as widened sidewalks, separated bicycle facilities, and vehicle turn lanes at intersections along Highland Avenue between its intersections with Route 9 in Newton and Webster Street in Needham, just under 0.4 miles to the north of West Street. This project would alter traffic operations along Highland Avenue within its project limits, but is not expected to significantly affect travel volumes at the study area intersections for the proposed assisted living redevelopment. For this reason, changes associated with the Highland Avenue improvement project are expected to be captured within the overall background growth rate described below.

The Town of Needham is planning an improvement project at the intersection of Highland Avenue at West Street. The project is currently in the design phase and the exact scope of the improvement project is not known at this time, but is expected to include a new southbound exclusive right-turn lane, updated traffic signal phasing and timings as well as new signal equipment, posts and mast arms. The capacity analysis described in this report utilizes the anticipated lane configurations and optimized traffic signal timings and phasing for future 2026 No Build and 2026 Build conditions. Additional improvements include the upgrading of pedestrian lighting and roadway reconstruction to address existing drainage issues along Highland Avenue.

The Town of Needham has identified potential improvements for the intersection of West

Street at Hillside Avenue as part of the MassDOT Complete Streets Funding Program. As part of the program, the Town's prioritization plan has been approved by MassDOT and was accepted as of June 1, 2020. The pedestrian improvement project has been identified as priority #6 in the Town's prioritization plan through the program with a desired construction start date of May 2021. The improvements identified in the Town's prioritization plan include:

- Removal of the brick inlay area located to the west of the intersection.
- Pedestrian refuge islands on each approach of West Street to reduce pedestrian crossing widths and divert vehicles from their straight-line path to reduce vehicle speeds.
- New, high-visibility crosswalk across West Street to the west of the intersection to improve visibility of the crosswalk.
- In-road warning light system, and flashing beacons, such as RRFBs at the West Street crosswalk to alert vehicles to crossing pedestrians especially when solar glare is present.
- Sign warnings of expected solar glare.
- New ADA-compliant wheelchair ramps at all crosswalks as necessary per the DPW Town-wide Handicap Ramp Assessment.

The improvements identified above are intended to improve pedestrian safety at the intersection, particularly for those crossing West Street.

Background Traffic Growth

Traffic growth is generally a function of changes in motor vehicle use and expected land development within the area. In order to predict the rate at which traffic on the study area roadways can be expected to grow during the seven-year forecast period (2019 to 2026), both planned area developments and historic traffic growth were reviewed.

Site-Specific Growth

Based on discussions with the Town of Needham Planning Department, no site-specific developments were identified which would be anticipated to impact traffic volumes within the study area. A proposal for a zoning change in an area approximately 0.6 miles to the north of the site and bounded by Highland Avenue, Gould Street, and I-95 is currently being studied by the Town. This zoning change may allow additional development to occur in this area which could affect vehicle volumes along Highland Avenue, but the extent and exact scale of the impact is unknown at this time.

Historic Traffic Growth

Based on discussions with the Town of Needham Engineering Department, an annual growth rate of one percent per year was identified. The one percent growth rate, compounded annually, was utilized to capture traffic growth associated with general changes in population, other smaller developments, and developments that may not be known at this time.

2026 No Build Traffic Volumes

The Existing peak hour traffic volumes were grown by one percent per year (compounded annually) over the seven-year study horizon (2019 to 2026) to establish the 2026 No Build weekday morning and afternoon peak hour traffic volumes, which are illustrated in Figure 4 and Figure 5, respectively, and are documented in the traffic projection model presented in Appendix D of this report.

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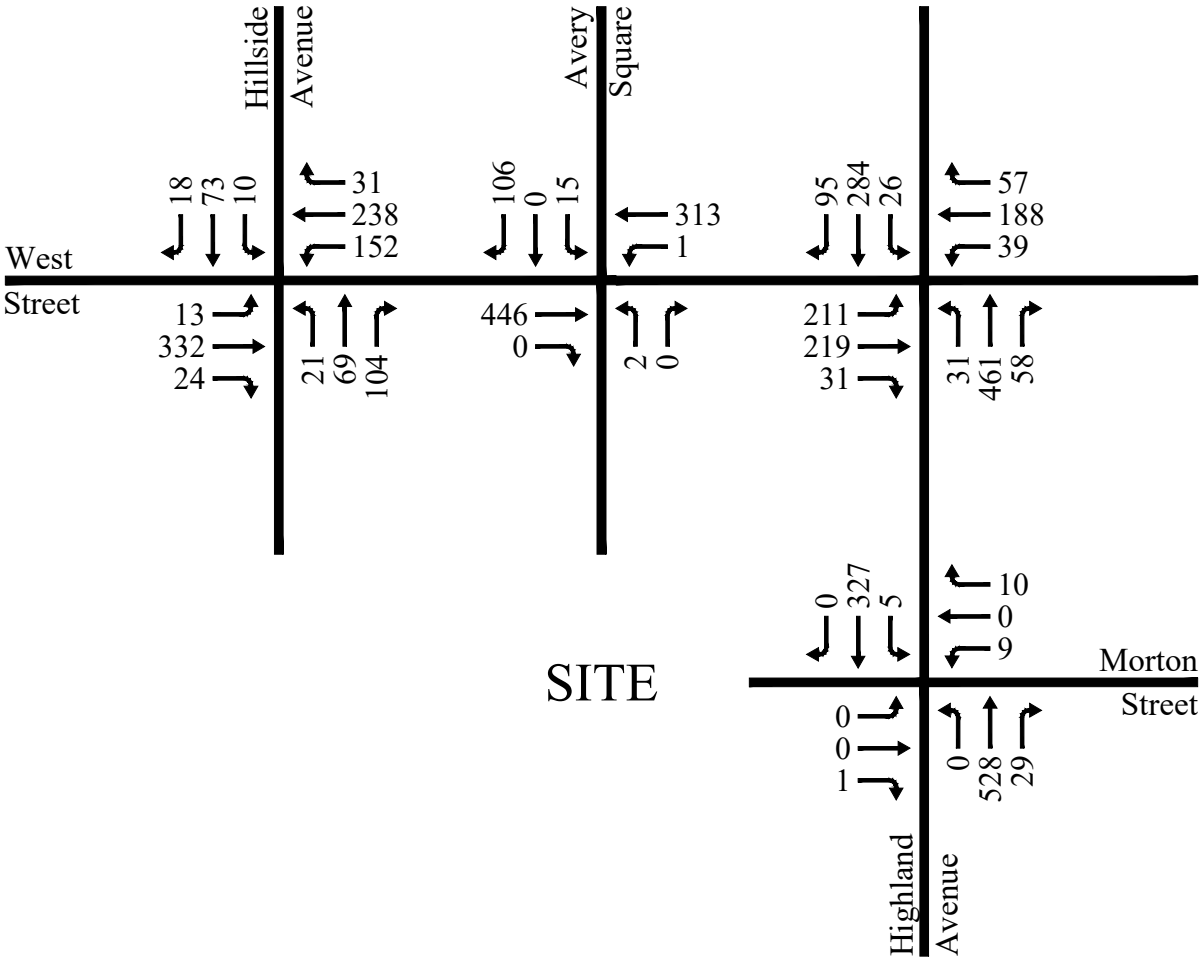


Figure 4
2026 No Build Weekday Morning
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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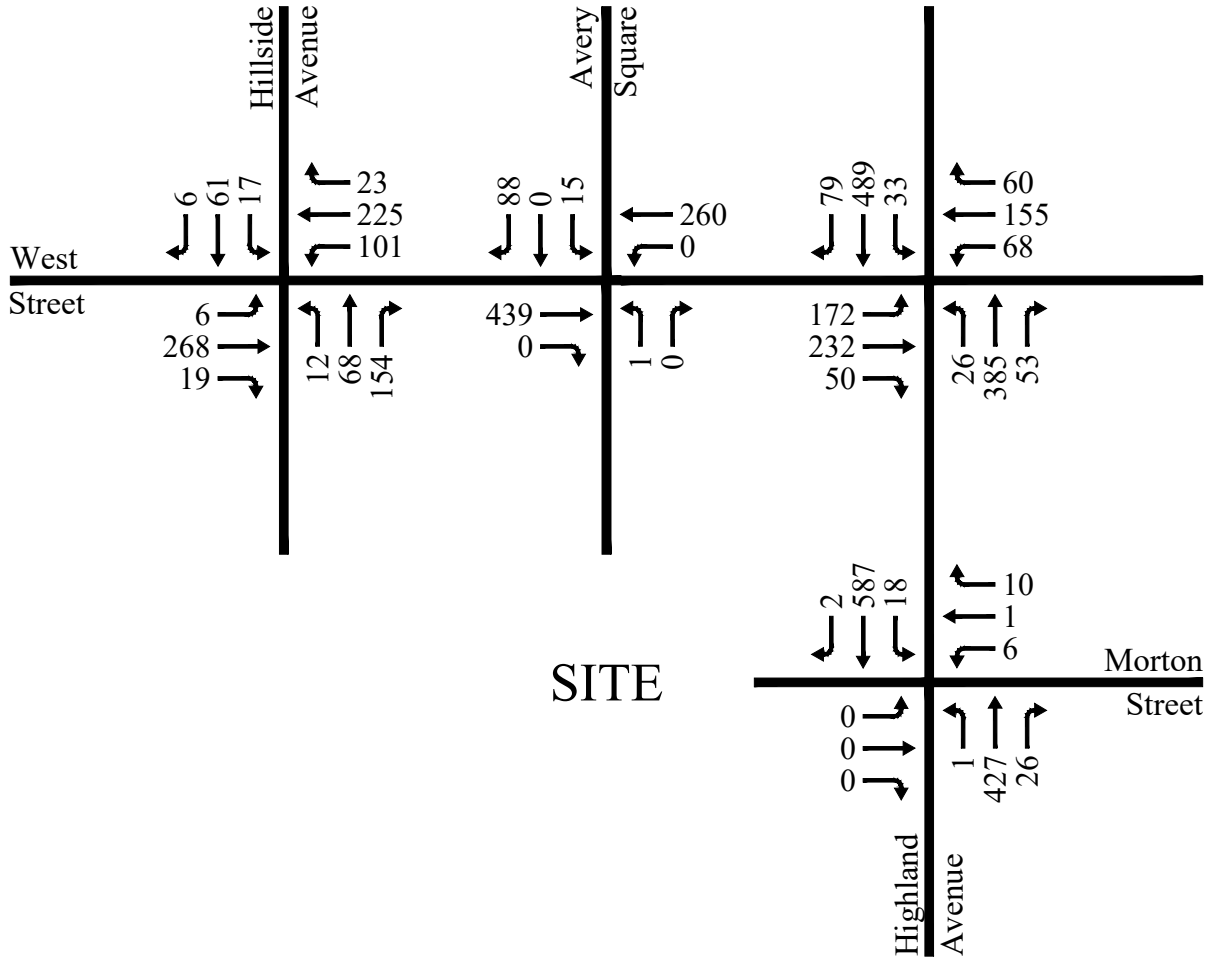


Figure 5
2026 No Build Weekday Afternoon
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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Site-Generated Traffic

In order to estimate the number of vehicle trips associated with the proposed Residence at Carter Mill redevelopment, the Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual, 10th Edition,* was referenced. ITE is a national research organization of transportation professionals, and *Trip Generation Manual, 10th Edition* provides traffic generation information for various land uses compiled from studies conducted by members nationwide. Vehicle trip estimates for the proposed Residence at Carter Mill redevelopment were developed based on data presented in this publication for Land Use Codes 252 (Senior Adult Housing – Attached), and 254 (Assisted Living). This reference establishes vehicle trip rates (in this case expressed in trips per dwelling unit for senior adult housing and number of beds for assisted living) based on actual traffic counts conducted at similar types of existing land uses. Table 2 presents the estimated vehicle trips associated with the proposed Residence at Carter Mill redevelopment.

Table 2: Proposed Project Trips

		Weekday AM Peak Hour			Weekday PM Peak Hour		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Senior Adult Housing [1]	72 Units	5	9	14	11	9	20
Assisted Living[2]	96 Beds	11	7	18	9	15	24
Total Project Trips		16	16	32	20	24	44

(1) ITE Land Use Code 252 (Senior Adult Housing - Attached), based on 72 dwelling units.

(2) ITE Land Use Code 254 (Assisted Living), based on 96 beds (including 30 memory care beds).

As shown in Table 2, the proposed Residence at Carter Mill redevelopment is estimated to result in approximately 32 new vehicle trips (16 entering vehicles and 16 exiting vehicles) during the weekday morning peak hour and approximately 44 new vehicle trips (20 entering vehicles and 24 exiting vehicles) during the weekday afternoon peak hour. The number of estimated peak hour trips would result in approximately one additional vehicle trip on the adjacent roadways every one to two minutes during the weekday morning and afternoon peak hours.

As outlined previously, the project site is served by both bus and rail transit. It can be expected that a portion of the trips to and from the project site would travel utilizing the existing MBTA transit service, reducing the number of overall site trips. Additionally, a number of services and amenities exist in the immediate area around the site which would be expected to reduce the number of vehicle trips by residents and visitors. The Center at the Heights (Needham senior center), a pharmacy, grocery store, USPS post office, the Needham Public Library and a number of doctor's offices and banks are located within an approximately ten-minute walking distance from the site.

Due to the building on site being currently vacant, no trip generation credit was taken as part of the development of the project volumes shown in Table 1. However, for comparison, and to demonstrate the lesser impact of the proposed redevelopment, Table 2 provides a summary of the trip generation associated with the previous assisted living community, nursing facility, and medical office estimated using ITE data.

Table 3: Previous Site Trips

		Weekday AM Peak Hour			Weekday PM Peak Hour		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Assisted Living[1]	60 Beds	7	4	11	6	10	16
Nursing Facility[2]	142 Beds	17	7	24	10	21	31
Medical Office[3]	11,000 sf	24	7	31	11	28	39
Total Previous Use Trips		48	18	66	27	59	86

(1) ITE Land Use Code 254 (Assisted Living), based on 60 beds.

(2) ITE Land Use Code 620 (Nursing Home), based on 142 beds.

(3) ITE Land Use Code 720 (Medical-Dental Office Building) based on 11,000 square feet.

As seen in Table 3, the previous land uses are estimated to have generated nearly twice as many vehicle trips as the proposed Residence at Carter Mill redevelopment during the weekday morning and weekday afternoon peak hours. The skilled nursing facility of the previous land use required far more employees than the proposed assisted living facility and the previous medical offices would have a higher number of employees and patients/visitors than the proposed independent living portion of the redevelopment. Together, the proposed redevelopment is shown to result in a significant decrease in the number of trips entering and exiting the project site, not just during the peak hours, but over the course of an entire typical day.

The proposed Residence at Carter Mills project is estimated to generate approximately 514 vehicle trips daily during a typical weekday while the previous land use is estimated to have generated approximately 926 vehicle trips per typical weekday. This reduced number of vehicle trips accessing the project site would also be expected to reduce the demands on parking and capacity of the adjacent roadways and intersections.

Project Trip Distribution and Assignment

The additional traffic estimated to be generated by the proposed redevelopment was distributed onto the study area roadways and intersections based on the existing travel patterns of the adjacent roadways. Vehicle trips accessing the project site were assigned to the site driveways based on ease of access to and from the roadway network. The resulting

arrival and departure patterns are presented in Figure 6 and are documented in the traffic projection model found in Appendix D.

The project-related traffic was then assigned to the surrounding roadway network based on the project trip distribution patterns presented in Figure 6. The resulting distributed new project trips are shown in Figure 7 and Figure 8 for the weekday morning and weekday afternoon peak hours, respectively.

Due to the proximity to a number of nearby amenities, residents of the proposed project would be expected to walk along study area roadways to access nearby locations. Within a ten-minute walk of the project site are the Center at the Heights, the Needham Public Library, a pharmacy, grocery store, USPS post office, doctor's offices and banks. With the configuration of the proposed project and its proximity to the intersection of Highland Avenue and West Street, many residents and employees would be expected to utilize the crosswalks at the existing signalized intersection. Signalized crossings provide additional comfort and safety over crossings at unsignalized, free flowing approaches. Due to the location of the Center at the Heights, northwest of the project site, some residents may be interested in crossing West Street at Hillside Avenue.

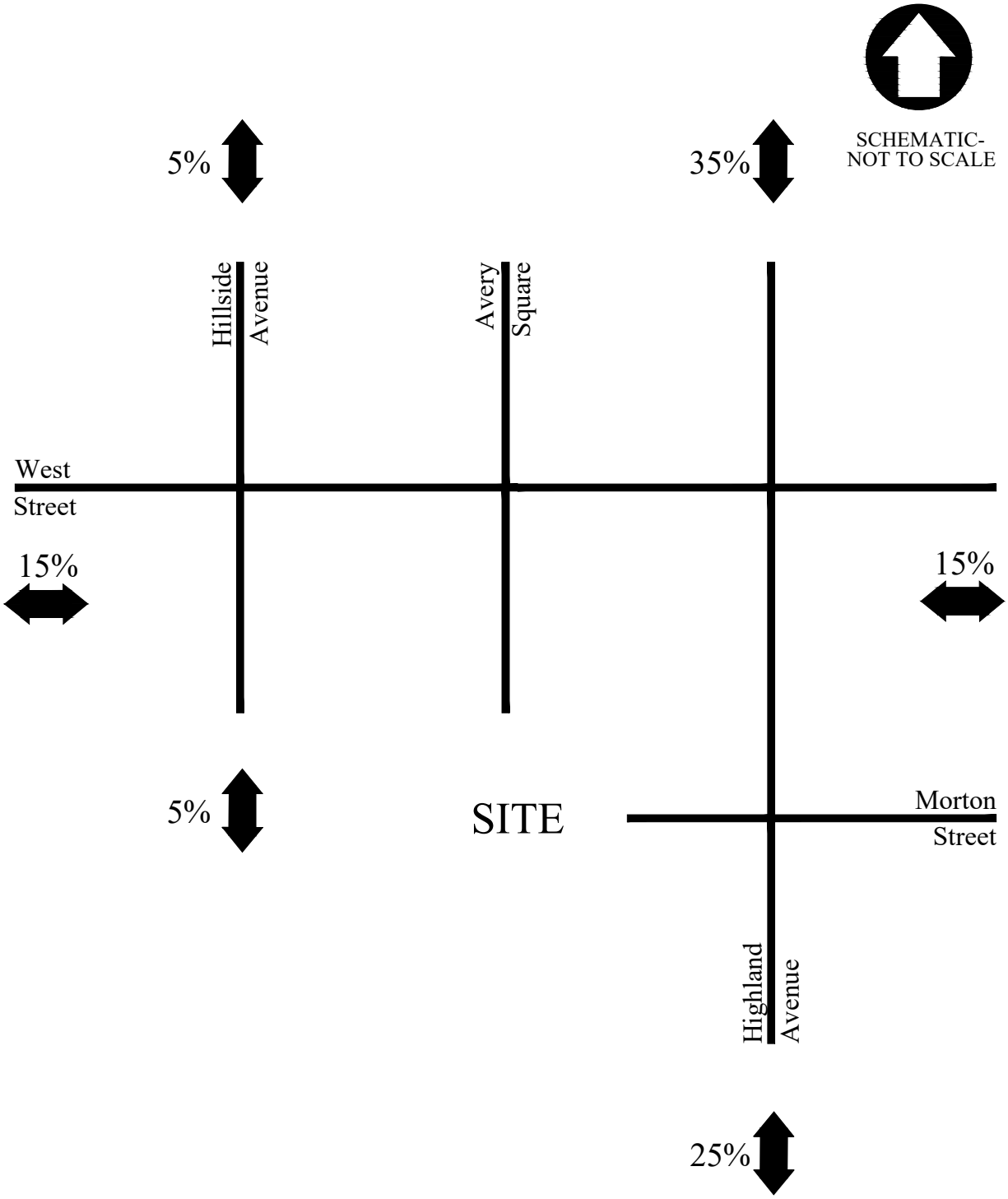
Based on a review of a typical schedule of activities (pre-COVID), the majority of events at the Center at the Heights during the day occur between 9:00 AM and end by 4:00 PM. Some evening events also occur after 6:00PM with a select few events occurring between 4:00PM and 6:00PM two days a week. Based on this schedule, the majority of pedestrian traffic between the project and the Center at the Heights would be expected to travel across West Street during off-peak hours for vehicular traffic. The improvements identified by the Town of Needham as part of MassDOT's Complete Street Funding Program would provide striped crossings across West Street and would enhance the pedestrian amenities offered at the West Street at Hillside Avenue intersection.

The proposed senior living residential project is not shown to generate a substantial amount of vehicular traffic to and from the study area intersections of Highland Avenue with West Street and West Street with Hillside Avenue. The increase in project trips results in a less than a two percent increase over the existing peak hour volumes at each of the nearby study area intersections of Highland Avenue with West Street and West Street with Hillside Avenue. The relatively small increase in project trips is not shown to significantly impact the operations at the study area intersections. It should also be noted that the increase in project trips is a result of the existing building being vacant. When accounting for the previous on-site land uses being in operation, an overall decrease in project trips would have occurred.

2026 Build Traffic Volumes

To establish the 2026 Build peak hour traffic volumes, the distributed new project trips were then added to the 2026 No Build peak hour traffic volumes to reflect the 2026 Build peak

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Figure 6
Directions of Arrival and Departure
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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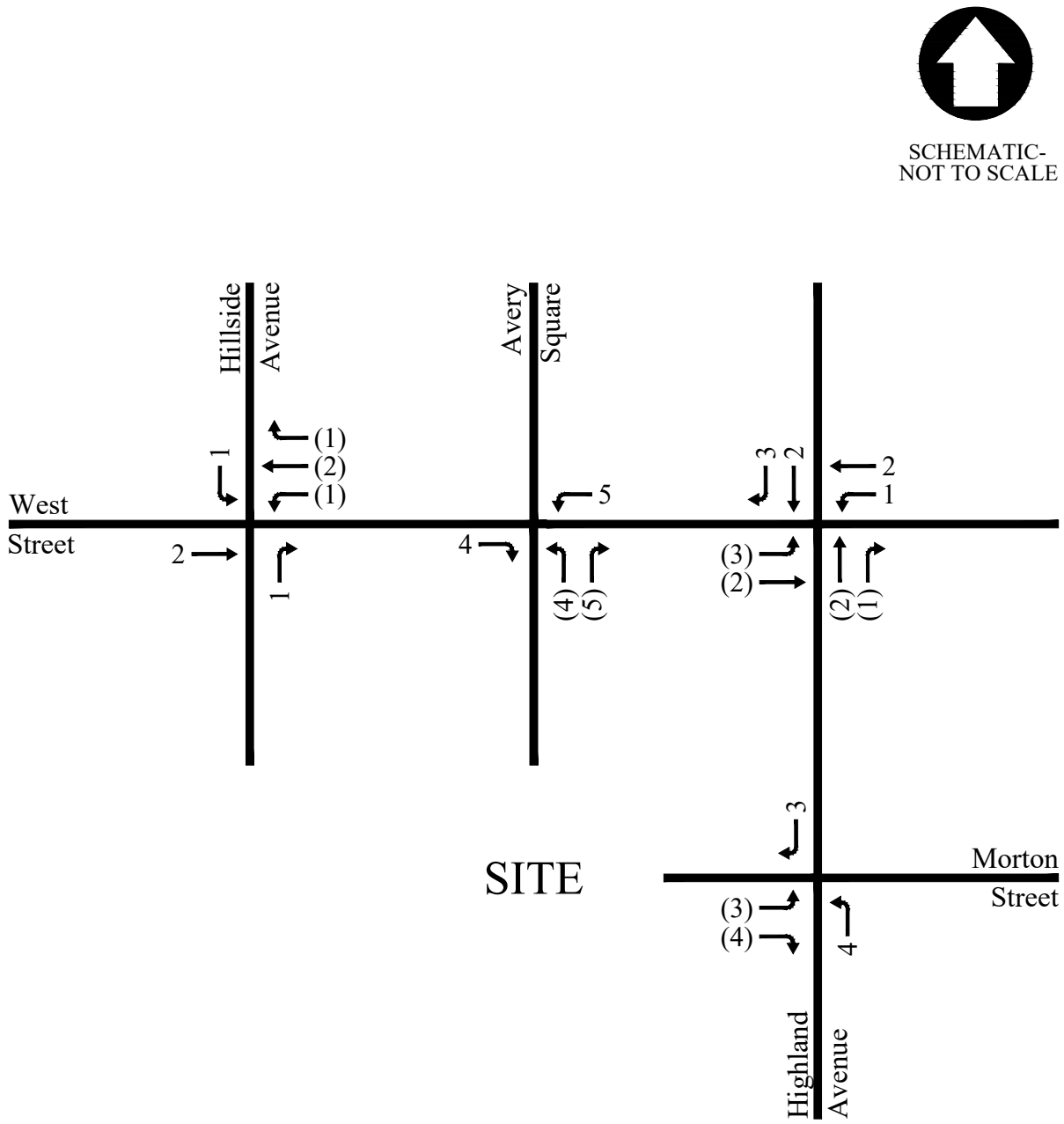


Figure 7
Weekday Morning Peak Hour
New Project Trips
The Residence at Carter Mill
Needham, Massachusetts

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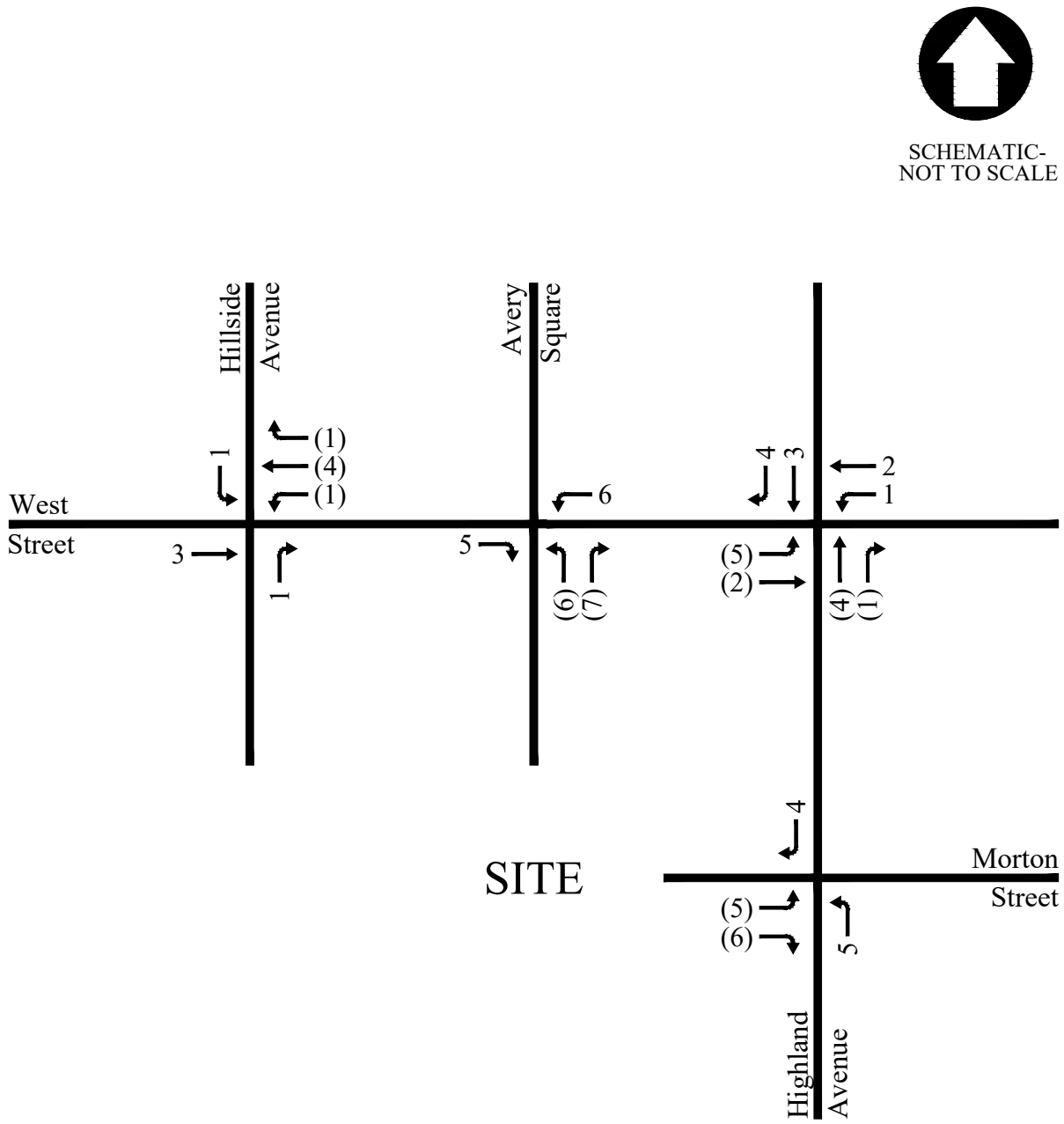


Figure 8
Weekday Afternoon Peak Hour
New Project Trips
The Residence at Carter Mill
Needham, Massachusetts

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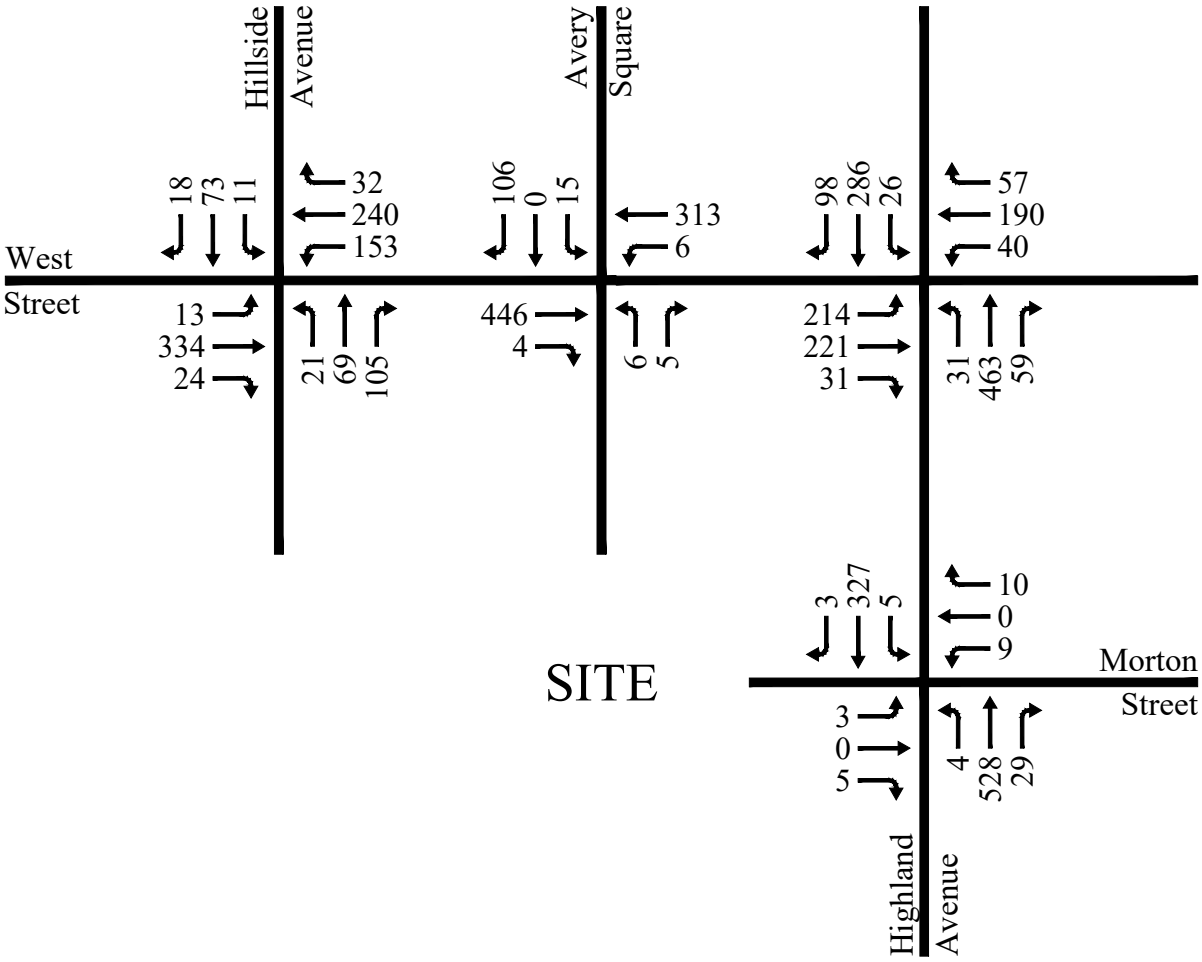


Figure 9
2026 Build Weekday Morning
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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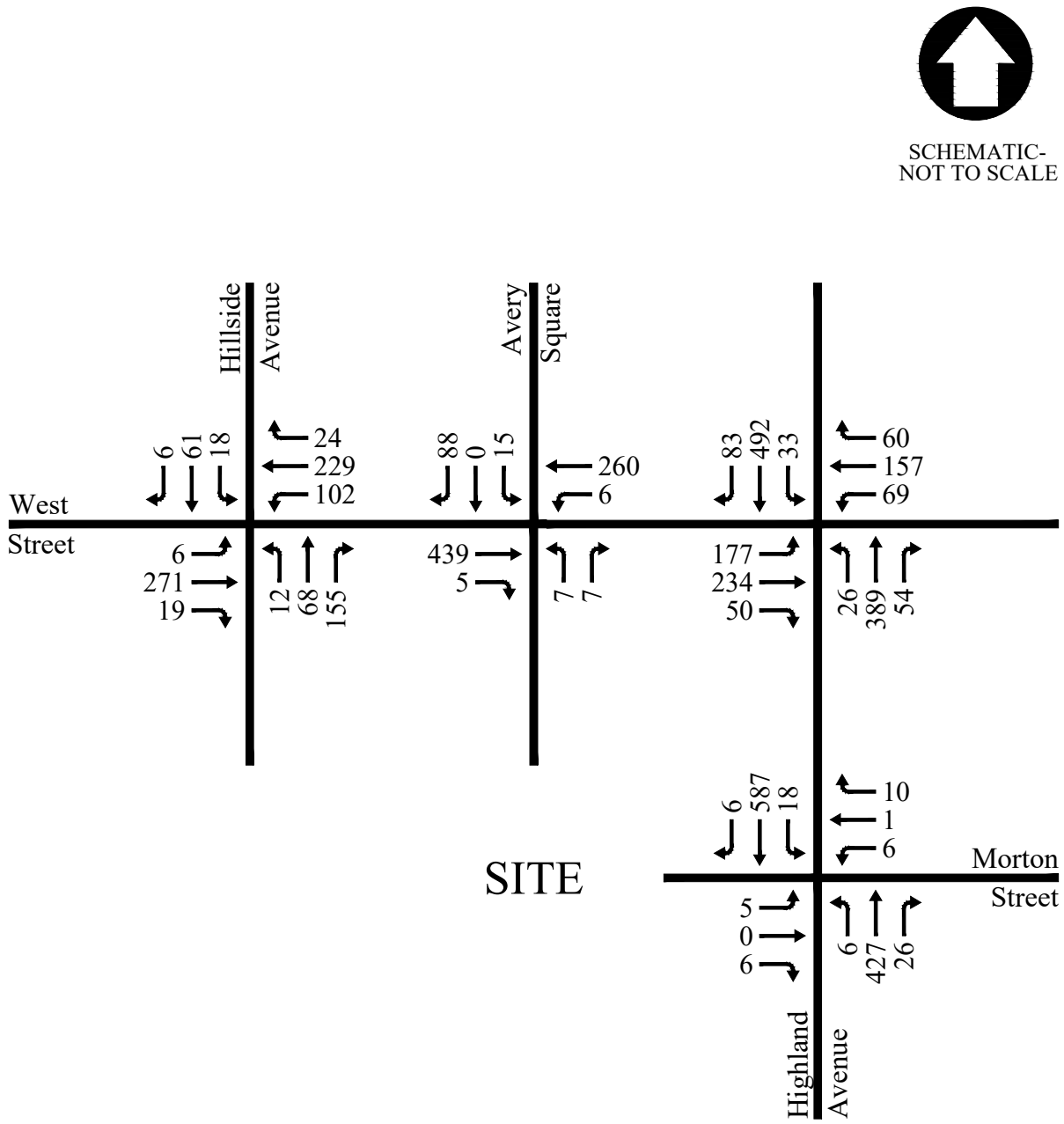


Figure 10
2026 Build Weekday Afternoon
Peak Hour Traffic Volumes
The Residence at Carter Mill
Needham, Massachusetts

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TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analysis was conducted using the Synchro capacity analysis software at the study area intersections under the Existing, 2026 No Build and 2026 Build peak hour traffic conditions. The analysis is based on Synchro capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6th Edition* (HCM), which is summarized in Appendix E. A discussion of the evaluation criteria and a summary of the results of the capacity analysis are presented below.

Level-of-Service Criteria

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds for unsignalized intersections and greater than 80 seconds for signalized intersections. A more detailed description of the LOS criteria is provided in Appendix E.

Capacity Analysis Results

Intersection capacity analysis was conducted using Synchro capacity analysis software for the study area intersections to evaluate the Existing, 2026 No Build and 2026 Build traffic conditions during the weekday morning and weekday afternoon peak hours. As mentioned previously, the peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix D of this report.

The Synchro capacity analysis results for the Existing, 2026 No Build and 2026 Build traffic conditions are presented in Appendix F, Appendix G, and Appendix H, respectively. The overall results of the intersection capacity analysis for the signalized intersection of Highland Avenue at West Street are presented in Table 4 below, and the results for the stop-controlled approaches to each of the unsignalized study area intersections are presented in Table 5. A more detailed summary of the capacity analysis for each study area intersection is provided in Appendix I. The results of the specific capacity analysis at the study area intersections are discussed below.

As stated previously, the study area intersections that were counted and analyzed during the weekday peak hours under the Existing conditions do not include the site in operation under its previous land use. Therefore, the analysis summarized below does not reflect the operations that would have been associated with the previously operational site.

Table 4: Signalized Intersection Capacity Analysis

Intersection	Peak Period	Existing LOS[1]	Existing Delay[2]	Existing V/C[3]	2026 No Build LOS	2026 No Build Delay	2026 No Build V/C	2026 Build LOS	2026 Build Delay	2026 Build V/C
West Street at	AM	D	41.7	0.70	D	42.7	0.88	D	43.1	0.88
Highland Avenue	PM	D	40.3	0.71	D	40.7	0.79	D	41.5	0.80

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

As shown in Table 4, the signalized intersection of Highland Avenue at West Street is shown to currently operate at overall LOS D during the weekday morning and weekday afternoon peak hours. With the proposed lane configuration and signal improvements under the 2026 No Build condition, the intersection is shown to continue to operate at overall LOS D during both peak hours. With the proposed project in place, the intersection is projected to continue to operate at overall LOS D with less than one second increase in average vehicle delay compared to the 2026 No Build conditions, for both morning and afternoon peak hours. All movements at the intersection are projected to operate at the same LOS under 2026 No Build and 2026 Build conditions indicating limited impact on traffic operations due to the proposed redevelopment.

Table 5: Unsignalized Intersection Capacity Analysis

Intersection	Approach	Peak Period	Existing LOS[1]	Existing Delay[2]	Existing V/C[3]	2026 No Build LOS	2026 No Build Delay	2026 No Build V/C	20 LOS
West Street at	NB	AM	E	49.5	0.74	F	>50.0	0.93	F
Hillside Avenue		PM	C	23.3	0.58	D	29.2	0.67	D
	SB	AM	F	>50.0	0.68	F	>50.0	0.84	F
		PM	D	29.5	0.38	E	36.5	0.46	E
West Street at	NB	AM	C	21.7	0.02	C	23.9	0.02	C
Site Driveway/		PM	C	19.5	0.02	C	21.2	0.02	C
Avery Square	SB	AM	B	13.1	0.25	B	13.9	0.29	B
		PM	B	12.2	0.19	B	12.7	0.21	B
Highland Avenue	EB[4]	AM	B	10.2	0.01	B	10.4	0.01	C
at Site Driveway/		PM	A	0.0	0.00	A	0.0	0.00	C
Morton Street	WB	AM	C	18.0	0.08	C	19.7	0.10	C
		PM	C	19.9	0.09	C	21.4	0.10	C

(1) Level-of-Service

(2) Average vehicle delay in seconds

(3) Volume to capacity ratio

(4) Change in LOS from No Build to Build due to the current vacant condition of the project s

As shown in Table 5, the northbound approach at the intersection of West Street at Hillside Avenue is shown to operate at LOS E during the weekday morning peak hour and LOS C during the weekday afternoon peak hour under existing conditions. Under both 2026 No Build and 2026 Build conditions, the northbound approach is projected to operate at LOS F during the weekday morning peak hour and LOS D during the weekday afternoon peak hour. The southbound approach to the intersection of West Street at Hillside Avenue is shown to currently operate at LOS F during the weekday morning peak hour and LOS D during the weekday afternoon peak hour. The southbound approach is expected to continue to operate at LOS F during the weekday morning peak hour under future No Build and Build conditions. During the weekday afternoon peak hour, the southbound approach is projected to operate at LOS E under No Build and Build conditions. Operations along West Street are not shown to be materially impacted by the additional vehicle trips from the proposed development when compared to the 2026 No Build conditions.

The site driveway approach to West Street is shown to currently operate at LOS C during the weekday morning and weekday afternoon peak hours. Under 2026 No Build and 2026 Build conditions, the site driveway approach is projected to continue to operate at LOS C during both peak hours analyzed. The southbound Avery Square approach is shown to currently operate at LOS B during the weekday morning and afternoon peak hours, and is projected to continue to operate at LOS B under future conditions, without and with the proposed project in place.

At the intersection of Highland Avenue at the site driveway and Morton Street, the stop-controlled westbound Morton Street approach is shown to currently operate at LOS C during the weekday morning and weekday afternoon peak hours. Under future conditions both without and with the proposed project in place, the Morton Street approach is projected to continue to operate at LOS C during both peak hours with a negligible amount of additional average vehicle delay. Under 2026 Build conditions, the site driveway on Highland Avenue is projected to operate at LOS C during both the weekday morning and weekday afternoon peak hours.

The analysis described above under the 2026 Build condition is expected to show better traffic operations at the study area intersections than the operations that would have occurred if the previous, more intense on-site uses were still in operation.

Site-Generated Parking Demand

The Residence at Carter Mill redevelopment proposes to include a total of 149 parking spaces on-site, including 34 interior garage spaces and 115 exterior spaces. Ten of the interior garage spaces would be tandem spaces for individuals living in the independent living units that may have two cars.

In order to determine the projected parking demand for the Residence at Carter Mill redevelopment, parking generation data from the ITE publication, *Parking Generation Manual, 5th Edition* was referenced. The *Parking Generation Manual* provides parking generation information for various land uses compiled from studies conducted by members nationwide. Weekday parking demand estimates for the proposed redevelopment were developed based on data presented in this publication for Land Use Codes 252 (Senior Adult Housing – Attached) and 254 (Assisted Living), and are presented in Table 6 below.

Table 6: Proposed Site Parking Generation

Description	Size	Weekday Peak Parking Demand
Senior Adult Housing[(1)]	72 Dwelling Units	44
Assisted Living[(2)]	96 Beds	37
Total Estimated Parking Demand		81

(1) ITE Land Use Code 252 (Senior Adult Housing - Attached), based on 72 dwelling units.

(2) ITE Land Use Code 254 (Assisted Living), based on 96 beds.

As shown in Table 6, the proposed Residence at Carter Mill redevelopment is projected to generate an average peak parking demand of 81 vehicles during a typical weekday based on ITE data. The project proposes to include 149 parking spaces: 34 interior garage spaces and 115 exterior spaces. Comparing the projected parking demand to the proposed parking supply shows that the site would have a peak period utilization rate of approximately 54%.

The *Parking Generation Manual* also provides information indicating how much parking is supplied at each of the studies included in the analysis. For senior adult attached housing, an average parking supply ratio of 0.9 parking spaces per independent senior housing unit was identified. For an assisted living site that is located within a half mile of rail transit, an average parking supply ratio of 0.4 parking spaces per unit was identified. Using these average supply ratios provided by ITE, the number of parking spaces that would be supplied for a project similar in size and type to the proposed site would be approximately 98 parking spaces. The proposed project is providing 51 additional parking spaces than the parking supplies calculated based on ITE.

The zoning for this project would include the following parking supply requirements:

- 0.5 parking spaces per bed for the assisted living community (96 beds proposed)
- 1 parking space for every two employees on the largest shift of the assisted living community (58 employees on the largest shift)
- 1 parking space per unit of independent living (72 units proposed)

Based on a review of the data presented within the *Parking Generation Manual* for independent living, the proposed supply requirement of 1 parking space per independent dwelling unit is considered to be conservative. As identified previously, data from the

Parking Generation Manual for independent senior living suggests that facilities where data was collected provided a parking supply ratio of 0.9 spaces per independent dwelling unit. Within the Town of Needham's Elder Services Zoning District, the parking supply requirement is 0.5 parking spaces per independent living dwelling unit.

Based on the proposed parking supply rates and the proposed build program, the zoning proposal would require 149 parking spaces and the project proposes to include 149 parking spaces.

In addition, while the proposed project is shown to provide more than sufficient on-site parking to meet the anticipated average peak parking demands of the proposed Residence at Carter Mill redevelopment, there is also a variety of on-street parking that could be used by visitors in close proximity to the project site which would further reduce the need for additional parking spaces to be supplied on site.

The previous land uses are shown to require more parking than the proposed project. Table 7, below, provides a summary of the estimated parking demand associated with the previous uses on the site, which included assisted living, a skilled nursing facility, and medical office land uses.

Table 7: Previous Site Parking Demand

Description	Size	Weekday Peak Parking Demand
Assisted Living(1)	60 Beds	26
Nursing Facility(2)	142 Beds	52
Medical Office(3)	11,000 sf	32
Total Estimated Parking Demand		110

(1) ITE Land Use Code 254 (Assisted Living), based on 60 beds.
(2) ITE Land Use Code 620 (Nursing Home), based on 142 beds.
(3) ITE Land Use Code 720 (Medical-Dental Office Building) based on 11,000 square feet.

As shown, the previous land uses are estimated to have had a peak weekday parking demand of approximately 110 vehicles which is 29 more parking spaces than the projected parking demand of the proposed Residence at Carter Mill.

Based on the parking review above, the proposed project is expected to provide a parking supply that exceeds the peak demand of the proposed assisted living and independent living uses on site. The analysis also shows that the proposed project is estimated to have a lesser parking demand than the previous land uses on site. The reduced parking demand of the redevelopment compared to the previous land uses may also reduce the need for on-street parking within the study area.

Site Access and Circulation

Access to the project site is proposed to continue to be provided by two full-access driveways, one located on West Street opposite Avery Square, and one located on Highland Avenue opposite Morton Street. The proposed site driveways would not be significantly modified as part of the project and therefore, the safety and operations at the driveways are not expected to be impacted. The driveways are estimated to experience less traffic volume than the previously occupied site, further reducing potential operational issues associated with the site driveways.

Sight Distance

A field review of the available sight distance was conducted at the site driveways on West Street and Highland Avenue. The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections. The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. According to AASHTO, "If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions."

In order to accurately assess required sight distance on West Street, a speed study of vehicles at free flow speeds was performed on West Street near the project site. The recorded speeds were reviewed and the 85th percentile speeds were determined to be 24 mph in the eastbound direction and 23 mph in the westbound direction. Because the measured speeds are lower than the posted advisory speed limits on West Street, in order to present a conservative analysis, the posted speed limits of 25 mph in the eastbound direction and 30 mph in the westbound direction were utilized to determine the required sight distance at the site driveway on West Street. For the site driveway on Highland Avenue, the 85th percentile speeds measured from the ATR counts were 32 mph in the northbound direction and 34 mph in the southbound direction and were utilized accordingly for the sight distance review.

Table 8 summarizes the AASHTO sight distance standards for the posted speeds on West Street, the 85th percentile speeds on Highland Avenue, and the available sight distance measured at each driveway.

Table 8: Sight Distance Requirements

Site Driveway Location	Looking	Speed Limit (mph)	85th % Speed (mph)	SSD[(1)] Required	Sight Distance Measured	Meets Required SSD?
West Street	Left (West)	25	24	155	210	Yes
	Right (East)	30	23	200	500+	Yes
Highland Avenue	Left (North)	30	34	240	150	No
	Right (South)	25	32	220	500+	Yes

(1) AASHTO stopping sight distance (see AASHTO equations 3-2 and 3-3) equations for the speed limits or 85th percentile speeds.

(2) AASHTO intersection sight distance (see AASHTO equations 9-1 and 9-2) equations for the speed limits or 85th percentile speeds.

As shown in Table 8, the available sight distance for vehicles exiting the site onto West Street looking left towards the west was measured to be approximately 210 feet which exceeds the required AASHTO sight distances for the 30 mph advisory speed limit. At the West Street site driveway looking right towards the east, available sight distance was measured at more than 500 feet down West Street, which exceeds the required and recommended AASHTO sight distances for the 25-mph advisory speed limit. Additional sight lines are available toward vehicles turning from Highland Avenue who would be expected to travel at slower rates of speed.

At the site driveway on Highland, the available sight distance for vehicles exiting the site looking left towards the north was observed to be restricted to approximately 150 feet due to existing on-street parking on the west side of Highland Avenue. The project is not proposing any site changes which would be expected to diminish sight lines more than the existing condition. The available sight distance would not meet the required AASHTO sight distance for the measured 85th percentile speed of 34 mph in the southbound direction. However, it is expected that vehicles exiting the site driveway would exit in two stages, first crossing the sidewalk then turning onto Highland Avenue. As such, sight distance at the site driveway was measured at a point approximately seven feet from the edge of Highland Avenue. The sight distance looking to the left from this point was measured to be approximately 400 feet, which exceeds the AASHTO sight distance for the measured 85th percentile speed of 34 mph in the southbound direction. At the Highland Avenue site driveway looking right towards the south, available sight distance was measured at more than 500 feet, which exceeds the required AASHTO sight distances for the measured 85th percentile speed of 32 mph in the northbound direction.

CONCLUSION

The proposed project includes the redevelopment of the current vacant building at 100-110 West Street in Needham, MA into the Residence at Carter Mill consisting of 83 units of senior assisted living and 72 units of independent senior. Access to the site would continue to be provided via existing full-access driveways on West Street and Highland Avenue.

Based on the analysis presented in this assessment, the proposed project is estimated to generate approximately 32 new vehicle trips (16 entering vehicles and 16 exiting vehicles) during the weekday morning peak hour and approximately 52 new vehicle trips (26 entering vehicles and 26 exiting vehicles) during the weekday afternoon peak hour compared to the existing vacant site. The trip generation of the proposed redevelopment is shown to be significantly less than that of the previous land uses during the weekday peak hours and over the course of a typical work day.

The capacity analysis indicates that the proposed Residence at Carter Mill redevelopment is projected to have a limited impact on the operations of the roadway network adjacent to the site. The signalized intersection of Highland Avenue at West Street is projected to operate at overall LOS D during the weekday morning and weekday afternoon peak hours under 2026 future conditions with or without the proposed project in place. The intersection is shown to experience an increase of less than one second of overall average vehicle delay during the analyzed peak hours as a result of the project.

The northbound and southbound approaches to the intersection of West Street and Hillside Avenue are shown to currently operate at LOS F during the weekday morning peak hour. Based on the capacity analysis completed as part of this study, the proposed project is not shown to have a significant impact on the overall average delay at the intersection. The project is projected to result in a negligible increase in delay on the stop-controlled Avery Square and Morton Street approaches opposite the site driveways. During both the weekday morning and weekday afternoon peak hours, the exiting movements from the site driveway on West Street are projected to operate at LOS B and the exiting movements from the site driveway on Highland Avenue are projected to operate at LOS C.

Available sight distances at the site driveway on West Street exceed required sight distances. Although the project is not proposing changes to the site access, sight distance looking north from the site driveway on Highland Avenue does not currently meet sight distance requirements. However, available sight lines are expected to provide safe access to the site via two-stage exiting, where a driver can assess the safety of turning onto Highland Avenue by moving closer to the roadway before making a turning decision from a distance closer to Highland Avenue than the AASHTO standard distance. With two-stage exiting, available sight distance looking north along Highland Avenue would exceed that required by AASHTO standards.

Based on the parking supply requirements included in the zoning proposal for the project, the proposed project would require 149 parking spaces. A review of estimated parking demand shows that the proposed parking supply requirements and the proposed on-site parking supply of 149 spaces is expected to exceed the typical peak parking demand of 81 spaces associated with the proposed redevelopment. The reduced parking demand of the redevelopment compared to the previous land uses may also reduce the need for on-street parking within the study area.

Based on the evaluation documented within this traffic impact study, the proposed Residence at Carter Mill redevelopment is not shown to have a significant impact on the overall traffic operations of the study area roadways and is not shown to require improvements to mitigate its limited impacts.

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Appendix for Traffic Impact Study

The Residence at Carter Mill

100-110 West Street

Needham, MA

LCB SENIOR LIVING

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Prepared for
LCB Senior Living

Updated February 2021

APPENDIX A

Turning Movement Counts

120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
E/W: Morton Street/Hildreth Place
City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM
Site Code : 12051901
Start Date : 12/5/2019
Page No : 1

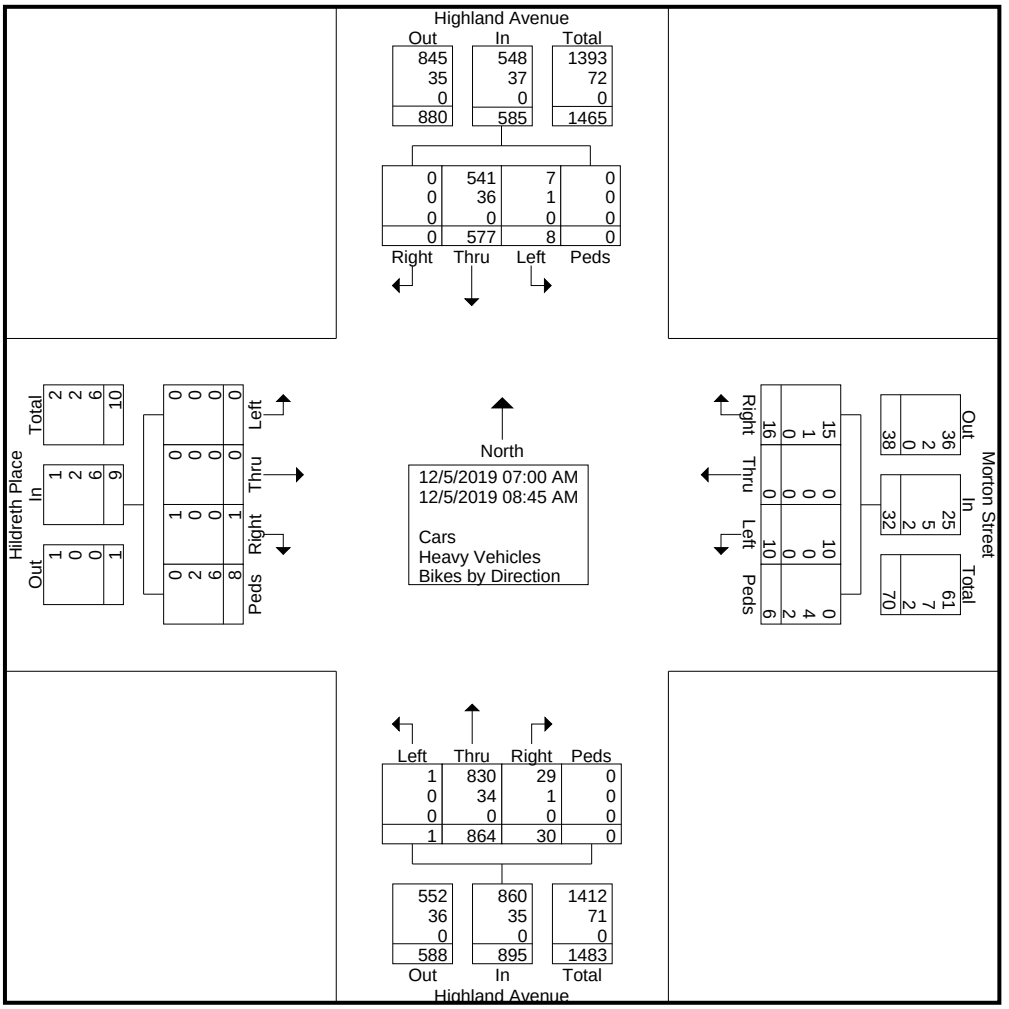
Groups Printed- Cars - Heavy Vehicles - Bikes by Direction

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	50	2	0	52	2	0	0	1	3	0	70	0	0	70	0	0	0	0	0	125
07:15 AM	0	83	0	0	83	1	0	0	1	2	1	90	0	0	91	0	0	0	0	0	176
07:30 AM	0	85	0	0	85	3	0	1	1	5	1	116	0	0	117	0	0	0	4	4	211
07:45 AM	0	71	1	0	72	1	0	5	0	6	10	149	0	0	159	1	0	0	3	4	241
Total	0	289	3	0	292	7	0	6	3	16	12	425	0	0	437	1	0	0	7	8	753
08:00 AM	0	82	1	0	83	3	0	2	0	5	7	122	0	0	129	0	0	0	1	1	218
08:15 AM	0	65	1	0	66	4	0	0	2	6	4	99	0	0	103	0	0	0	0	0	175
08:30 AM	0	73	2	0	75	1	0	1	1	3	5	102	0	0	107	0	0	0	0	0	185
08:45 AM	0	68	1	0	69	1	0	1	0	2	2	116	1	0	119	0	0	0	0	0	190
Total	0	288	5	0	293	9	0	4	3	16	18	439	1	0	458	0	0	0	1	1	768
Grand Total	0	577	8	0	585	16	0	10	6	32	30	864	1	0	895	1	0	0	8	9	1521
Apprch %	0	98.6	1.4	0		50	0	31.2	18.8		3.4	96.5	0.1	0		11.1	0	0	88.9		
Total %	0	37.9	0.5	0	38.5	1.1	0	0.7	0.4	2.1	2	56.8	0.1	0	58.8	0.1	0	0	0.5	0.6	
Cars	0	541	7	0	548	15	0	10	0	25	29	830	1	0	860	1	0	0	0	1	1434
% Cars	0	93.8	87.5	0	93.7	93.8	0	100	0	78.1	96.7	96.1	100	0	96.1	100	0	0	0	11.1	94.3
Heavy Vehicles																					
% Heavy Vehicles	0	6.2	12.5	0	6.3	6.2	0	0	66.7	15.6	3.3	3.9	0	0	3.9	0	0	0	25	22.2	5.2
Bikes by Direction	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
% Bikes by Direction	0	0	0	0	0	0	0	0	33.3	6.2	0	0	0	0	0	0	0	0	75	66.7	0.5

120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
E/W: Morton Street/Hildreth Place
City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM
Site Code : 12051901
Start Date : 12/5/2019
Page No : 2



	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	83	0	0	83	1	0	0	**1**	2	1	90	0	0	91	0	0	0	0	0	176
07:30 AM	0	**85**	0	0	**85**	**3**	0	1	1	5	1	116	0	0	117	0	0	0	**4**	**4**	211
07:45 AM	0	71	**1**					**5**		**6**	**10**	**149**			**159**	**1**					**241**
08:00 AM	0	82	1	0	83	3	0	2	0	5	7	122	0	0	129	0	0	0	1	1	218
Total Volume	0	321	2	0	323	8	0	8	2	18	19	477	0	0	496	1	0	0	8	9	846
% App. Total	0	99.4	0.6	0		44.4	0	44.4	11.1		3.8	96.2	0	0		11.1	0	0	88.9		
PHF	.000	.944	.500	.000	.950	.667	.000	.400	.500	.750	.475	.800	.000	.000	.780	.250	.000	.000	.500	.563	.878

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N/S: Highland Avenue
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City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM
Site Code : 12051901
Start Date : 12/5/2019

Groups Printed- Cars

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	45	1	0	46	2	0	0	0	2	0	65	0	0	65	0	0	0	0	0	113
07:15 AM	0	78	0	0	78	1	0	0	0	1	1	83	0	0	84	0	0	0	0	0	163
07:30 AM	0	77	0	0	77	3	0	1	0	4	1	113	0	0	114	0	0	0	0	0	195
07:45 AM	0	70	1	0	71	1	0	5	0	6	10	145	0	0	155	1	0	0	0	1	233
Total	0	270	2	0	272	7	0	6	0	13	12	406	0	0	418	1	0	0	0	1	704
08:00 AM	0	79	1	0	80	3	0	2	0	5	7	117	0	0	124	0	0	0	0	0	209
08:15 AM	0	62	1	0	63	3	0	0	0	3	4	96	0	0	100	0	0	0	0	0	166
08:30 AM	0	69	2	0	71	1	0	1	0	2	5	98	0	0	103	0	0	0	0	0	176
08:45 AM	0	61	1	0	62	1	0	1	0	2	1	113	1	0	115	0	0	0	0	0	179
Total	0	271	5	0	276	8	0	4	0	12	17	424	1	0	442	0	0	0	0	0	730
Grand Total	0	541	7	0	548	15	0	10	0	25	29	830	1	0	860	1	0	0	0	1	1434
Apprch %	0	98.7	1.3	0		60	0	40	0		3.4	96.5	0.1	0		100	0	0	0		
Total %	0	37.7	0.5	0	38.2	1	0	0.7	0	1.7	2	57.9	0.1	0	60	0.1	0	0	0	0.1	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:30 AM																					
07:30 AM	0	77	0	0	77	**3**	0	1	0	4	1	113	0	0	114	0	0	0	0	0	195
07:45 AM	0	70	**1**					**5**		**6**	**10**	**145**			**155**	**1**				**1**	**233**
08:00 AM	0	**79**	1	0	**80**	3	0	2	0	5	7	117	0	0	124	0	0	0	0	0	209
08:15 AM	0	62	1	0	63	3	0	0	0	3	4	96	0	0	100	0	0	0	0	0	166
Total Volume	0	288	3	0	291	10	0	8	0	18	22	471	0	0	493	1	0	0	0	1	803
% App. Total	0	99	1	0		55.6	0	44.4	0		4.5	95.5	0	0		100	0	0	0		
PHF	.000	.911	.750	.000	.909	.833	.000	.400	.000	.750	.550	.812	.000	.000	.795	.250	.000	.000	.000	.250	.862

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120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
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City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth AM
Site Code : 12051901
Start Date : 12/5/2019
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Groups Printed- Heavy Vehicles

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	5	1	0	6	0	0	0	1	1	0	5	0	0	5	0	0	0	0	0	12
07:15 AM	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	12
07:30 AM	0	8	0	0	8	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	11
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	1	1	6
Total	0	19	1	0	20	0	0	0	1	1	0	19	0	0	19	0	0	0	1	1	41
08:00 AM	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	1	1	9
08:15 AM	0	3	0	0	3	1	0	0	2	3	0	3	0	0	3	0	0	0	0	0	9
08:30 AM	0	4	0	0	4	0	0	0	1	1	0	4	0	0	4	0	0	0	0	0	9
08:45 AM	0	7	0	0	7	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	11
Total	0	17	0	0	17	1	0	0	3	4	1	15	0	0	16	0	0	0	1	1	38
Grand Total	0	36	1	0	37	1	0	0	4	5	1	34	0	0	35	0	0	0	2	2	79
Apprch %	0	97.3	2.7	0		20	0	0	80		2.9	97.1	0	0		0	0	0	100		
Total %	0	45.6	1.3	0	46.8	1.3	0	0	5.1	6.3	1.3	43	0	0	44.3	0	0	0	2.5	2.5	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	5	**1**						**1**	**1**	0	5	0	0	5	0	0	0	0	0	**12**
07:15 AM	0	5	0	0	5	0	0	0	0	0	0	**7**			**7**	0	0	0	0	0	12
07:30 AM	0	**8**	0	0	**8**	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	11
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	**1**	**1**	6
Total Volume	0	19	1	0	20	0	0	0	1	1	0	19	0	0	19	0	0	0	1	1	41
% App. Total	0	95	5	0		0	0	0	100		0	100	0	0		0	0	0	100		
PHF	.000	.594	.250	.000	.625	.000	.000	.000	.250	.250	.000	.679	.000	.000	.679	.000	.000	.000	.250	.250	.854

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Groups Printed- Bikes by Direction

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4	4	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
Apprch %	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
Total %	0	0	0	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0	75	75	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**4**	**4**	**5**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total Volume	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	6	6	8
% App. Total	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.375	.375	.400

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N/S: Highland Avenue
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City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM
Site Code : 12041900
Start Date : 12/4/2019
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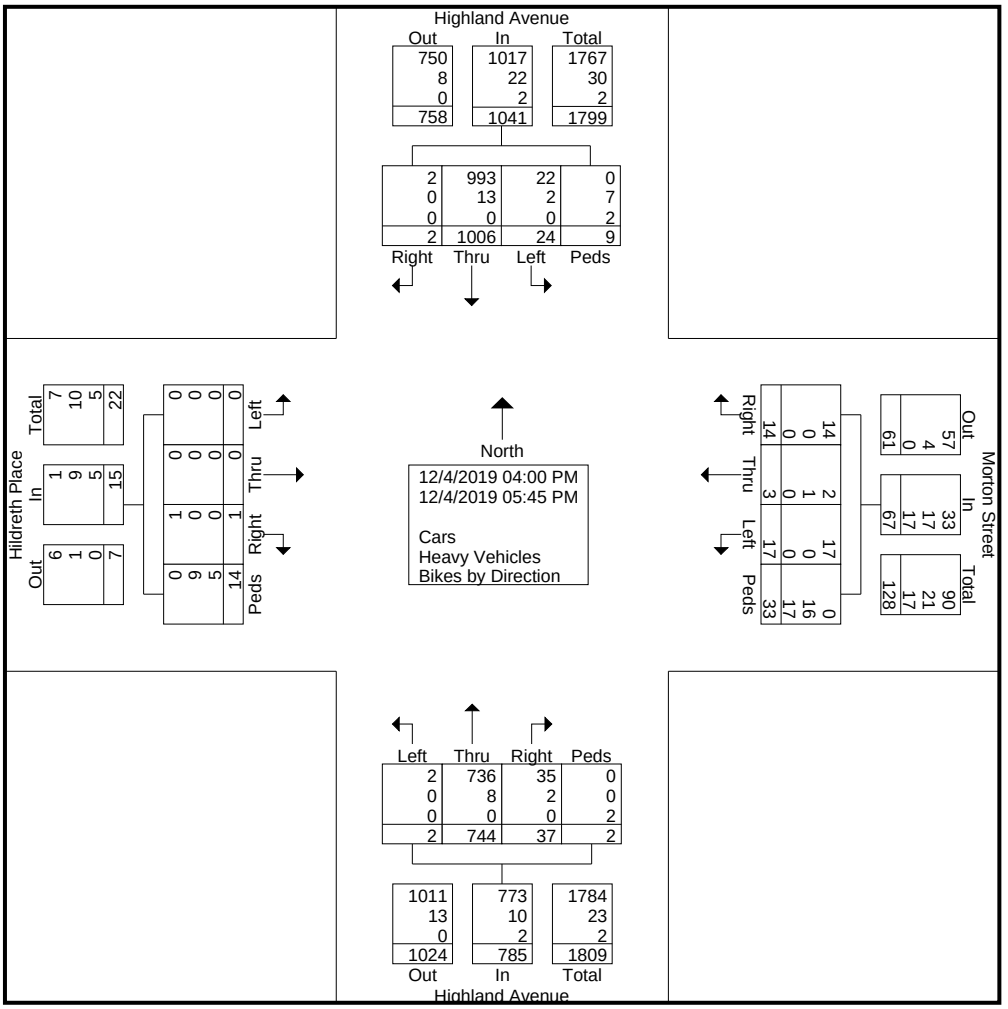
Groups Printed- Cars - Heavy Vehicles - Bikes by Direction

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	109	1	0	110	1	0	2	1	4	0	98	0	0	98	1	0	0	3	4	216
04:15 PM	0	118	1	0	119	3	0	3	13	19	5	97	0	0	102	0	0	0	3	3	243
04:30 PM	1	112	4	0	117	3	0	0	12	15	6	117	0	0	123	0	0	0	1	1	256
04:45 PM	0	139	4	3	146	4	1	2	3	10	5	91	0	0	96	0	0	0	2	2	254
Total	1	478	10	3	492	11	1	7	29	48	16	403	0	0	419	1	0	0	9	10	969
05:00 PM	1	145	7	1	154	1	0	4	0	5	8	85	0	0	93	0	0	0	1	1	253
05:15 PM	0	130	1	0	131	1	0	0	1	2	4	86	1	0	91	0	0	0	1	1	225
05:30 PM	0	137	2	0	139	1	0	3	0	4	4	85	0	0	89	0	0	0	0	0	232
05:45 PM	0	116	4	5	125	0	2	3	3	8	5	85	1	2	93	0	0	0	3	3	229
Total	1	528	14	6	549	3	2	10	4	19	21	341	2	2	366	0	0	0	5	5	939
Grand Total	2	1006	24	9	1041	14	3	17	33	67	37	744	2	2	785	1	0	0	14	15	1908
Apprch %	0.2	96.6	2.3	0.9		20.9	4.5	25.4	49.3		4.7	94.8	0.3	0.3		6.7	0	0	93.3		
Total %	0.1	52.7	1.3	0.5	54.6	0.7	0.2	0.9	1.7	3.5	1.9	39	0.1	0.1	41.1	0.1	0	0	0.7	0.8	
Cars	2	993	22	0	1017	14	2	17	0	33	35	736	2	0	773	1	0	0	0	1	1824
% Cars	100	98.7	91.7	0	97.7	100	66.7	100	0	49.3	94.6	98.9	100	0	98.5	100	0	0	0	6.7	95.6
Heavy Vehicles	0	13	2	7	22	0	1	0	16	17	2	8	0	0	10	0	0	0	9	9	58
% Heavy Vehicles	0	1.3	8.3	77.8	2.1	0	33.3	0	48.5	25.4	5.4	1.1	0	0	1.3	0	0	0	64.3	60	3
Bikes by Direction	0	0	0	2	2	0	0	0	17	17	0	0	0	2	2	0	0	0	5	5	26
% Bikes by Direction	0	0	0	22.2	0.2	0	0	0	51.5	25.4	0	0	0	100	0.3	0	0	0	35.7	33.3	1.4

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File Name : Highland at Morton-Hildreth PM
Site Code : 12041900
Start Date : 12/4/2019



	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	118	1	0	119	3	0	3	**13**	**19**	5	97	0	0	102	0	0	0	**3**	**3**	243
04:30 PM	**1**											**117**			**123**	0	0	0	1	1	**256**
04:45 PM	0	139	4	**3**		**4**	**1**														
05:00 PM	**1**	**145**	**7**	**1**	**154**	1	0	**4**	**0**	**5**	**8**	**85**	**0**	**0**	**93**	**0**	**0**	**0**	**1**	**1**	**253**
Total Volume	2	514	16	4	536	11	1	9	28	49	24	390	0	0	414	0	0	0	7	7	1006
% App. Total	0.4	95.9	3	0.7		22.4	2	18.4	57.1		5.8	94.2	0	0		0	0	0	100		
PHF	.500	.886	.571	.333	.870	.688	.250	.563	.538	.645	.750	.833	.000	.000	.841	.000	.000	.000	.583	.583	.982

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File Name : Highland at Morton-Hildreth PM
Site Code : 12041900
Start Date : 12/4/2019

Groups Printed- Cars

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	107	1	0	108	1	0	2	0	3	0	97	0	0	97	1	0	0	0	1	209
04:15 PM	0	116	1	0	117	3	0	3	0	6	5	95	0	0	100	0	0	0	0	0	223
04:30 PM	1	112	4	0	117	3	0	0	0	3	6	115	0	0	121	0	0	0	0	0	241
04:45 PM	0	138	4	0	142	4	1	2	0	7	5	90	0	0	95	0	0	0	0	0	244
Total	1	473	10	0	484	11	1	7	0	19	16	397	0	0	413	1	0	0	0	1	917
05:00 PM	1	142	6	0	149	1	0	4	0	5	8	85	0	0	93	0	0	0	0	0	247
05:15 PM	0	127	1	0	128	1	0	0	0	1	4	86	1	0	91	0	0	0	0	0	220
05:30 PM	0	137	2	0	139	1	0	3	0	4	4	83	0	0	87	0	0	0	0	0	230
05:45 PM	0	114	3	0	117	0	1	3	0	4	3	85	1	0	89	0	0	0	0	0	210
Total	1	520	12	0	533	3	1	10	0	14	19	339	2	0	360	0	0	0	0	0	907
Grand Total	2	993	22	0	1017	14	2	17	0	33	35	736	2	0	773	1	0	0	0	1	1824
Apprch %	0.2	97.6	2.2	0		42.4	6.1	51.5	0		4.5	95.2	0.3	0		100	0	0	0		
Total %	0.1	54.4	1.2	0	55.8	0.8	0.1	0.9	0	1.8	1.9	40.4	0.1	0	42.4	0.1	0	0	0	0.1	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	116	1	0	117	3	0	3	0	6	5	95	0	0	100	0	0	0	0	0	223
04:30 PM	**1**											**115**			**121**	0	0	0	0	0	241
04:45 PM	0	138	4	0	142	**4**	**1**			**7**	5	90	0	0	95	0	0	0	0	0	244
05:00 PM	1	**142**	**6**		**149**	1	0	**4**			**8**										**247**
Total Volume	2	508	15	0	525	11	1	9	0	21	24	385	0	0	409	0	0	0	0	0	955
% App. Total	0.4	96.8	2.9	0		52.4	4.8	42.9	0		5.9	94.1	0	0		0	0	0	0		
PHF	.500	.894	.625	.000	.881	.688	.250	.563	.000	.750	.750	.837	.000	.000	.845	.000	.000	.000	.000	.000	.967

McMAHON TRANSPORTATION ENGINEERS & PLANNERS
120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
E/W: Morton Street/Hildreth Place
City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM
Site Code : 12041900
Start Date : 12/4/2019
Page No : 1

Groups Printed- Heavy Vehicles

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	5
04:15 PM	0	2	0	0	2	0	0	0	4	4	0	2	0	0	2	0	0	0	3	3	11
04:30 PM	0	0	0	0	0	0	0	0	7	7	0	2	0	0	2	0	0	0	0	0	9
04:45 PM	0	1	0	2	3	0	0	0	2	2	0	1	0	0	1	0	0	0	1	1	7
Total	0	5	0	2	7	0	0	0	13	13	0	6	0	0	6	0	0	0	6	6	32
05:00 PM	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
05:15 PM	0	3	0	0	3	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
05:45 PM	0	2	1	5	8	0	1	0	2	3	2	0	0	0	2	0	0	0	2	2	15
Total	0	8	2	5	15	0	1	0	3	4	2	2	0	0	4	0	0	0	3	3	26
Grand Total	0	13	2	7	22	0	1	0	16	17	2	8	0	0	10	0	0	0	9	9	58
Apprch %	0	59.1	9.1	31.8		0	5.9	0	94.1		20	80	0	0		0	0	0	100		
Total %	0	22.4	3.4	12.1	37.9	0	1.7	0	27.6	29.3	3.4	13.8	0	0	17.2	0	0	0	15.5	15.5	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	**2**	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	5
04:15 PM	0	2	0	0	2	0	0	0	4	4	0	**2**			**2**	0	0	0	**3**	**3**	**11**
04:30 PM	0	0	0	0	0	0	0	0	**7**	**7**	0	2	0	0	2	0	0	0	0	0	9
04:45 PM	0	1	0	**2**	**3**	0	0	0	2	2	0	1	0	0	1	0	0	0	1	1	7
Total Volume	0	5	0	2	7	0	0	0	13	13	0	6	0	0	6	0	0	0	6	6	32
% App. Total	0	71.4	0	28.6		0	0	0	100		0	100	0	0		0	0	0	100		
PHF	.000	.625	.000	.250	.583	.000	.000	.000	.464	.464	.000	.750	.000	.000	.750	.000	.000	.000	.500	.500	.727

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TRANSPORTATION ENGINEERS & PLANNERS
120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
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City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at Morton-Hildreth PM
Site Code : 12041900
Start Date : 12/4/2019
Page No : 1

Groups Printed- Bikes by Direction

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
04:15 PM	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	1	1	6
04:45 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
Total	0	0	0	1	1	0	0	0	16	16	0	0	0	0	0	0	0	0	3	3	20
05:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	0	1	1	4
Total	0	0	0	1	1	0	0	0	1	1	0	0	0	2	2	0	0	0	2	2	6
Grand Total	0	0	0	2	2	0	0	0	17	17	0	0	0	2	2	0	0	0	5	5	26
Apprch %	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
Total %	0	0	0	7.7	7.7	0	0	0	65.4	65.4	0	0	0	7.7	7.7	0	0	0	19.2	19.2	

	Highland Avenue From North					Morton Street From East					Highland Avenue From South					Hildreth Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**1**	**1**	2
04:15 PM	0	0	0	0	0	0	0	0	**9**	**9**	0	0	0	0	0	0	0	0	0	0	**9**
04:30 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	1	1	6
04:45 PM	0	0	0	**1**	**1**	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
Total Volume	0	0	0	1	1	0	0	0	16	16	0	0	0	0	0	0	0	0	3	3	20
% App. Total	0	0	0	100		0	0	0	100		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.444	.444	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.556

120 Water Street, 4th Floor
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File Name : Highland at West AM
Site Code : 12052019
Start Date : 12/5/2019

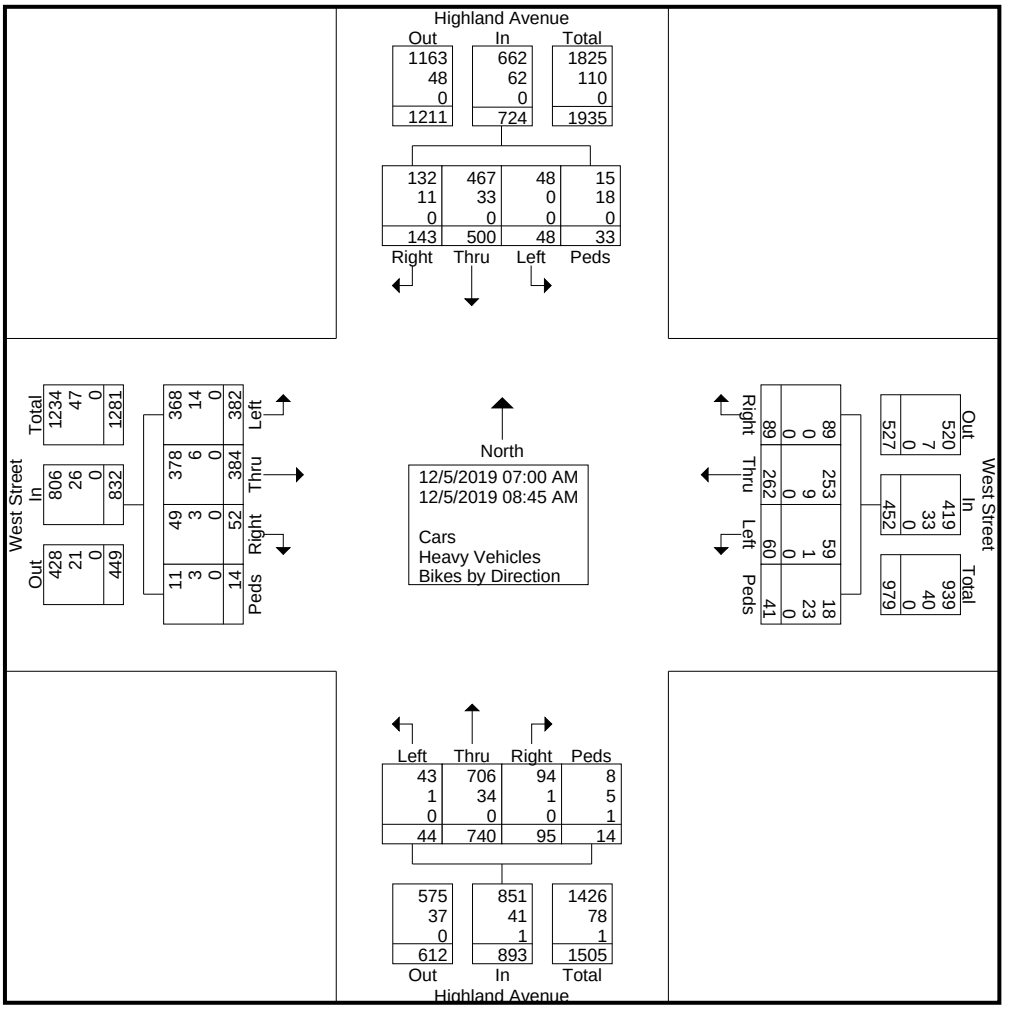
Groups Printed- Cars - Heavy Vehicles - Bikes by Direction

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	14	44	7	3	68	6	15	3	0	24	3	64	3	3	73	5	39	49	1	94	259
07:15 AM	9	75	3	12	99	11	15	6	1	33	8	81	2	1	92	8	48	54	3	113	337
07:30 AM	16	71	5	1	93	8	22	11	8	49	17	87	5	1	110	5	53	48	1	107	359
07:45 AM	21	55	4	3	83	14	36	9	10	69	10	122	8	5	145	8	52	42	5	107	404
Total	60	245	19	19	343	39	88	29	19	175	38	354	18	10	420	26	192	193	10	421	1359
08:00 AM	27	66	3	4	100	8	52	13	10	83	11	117	7	1	136	5	46	46	1	98	417
08:15 AM	21	65	6	5	97	18	37	4	6	65	19	85	5	0	109	8	52	46	1	107	378
08:30 AM	17	69	10	4	100	11	43	9	3	66	12	89	8	3	112	7	46	55	2	110	388
08:45 AM	18	55	10	1	84	13	42	5	3	63	15	95	6	0	116	6	48	42	0	96	359
Total	83	255	29	14	381	50	174	31	22	277	57	386	26	4	473	26	192	189	4	411	1542
Grand Total	143	500	48	33	724	89	262	60	41	452	95	740	44	14	893	52	384	382	14	832	2901
Apprch %	19.8	69.1	6.6	4.6		19.7	58	13.3	9.1		10.6	82.9	4.9	1.6		6.2	46.2	45.9	1.7		
Total %	4.9	17.2	1.7	1.1	25	3.1	9	2.1	1.4	15.6	3.3	25.5	1.5	0.5	30.8	1.8	13.2	13.2	0.5	28.7	
Cars	132	467	48	15	662	89	253	59	18	419	94	706	43	8	851	49	378	368	11	806	2738
% Cars	92.3	93.4	100	45.5	91.4	100	96.6	98.3	43.9	92.7	98.9	95.4	97.7	57.1	95.3	94.2	98.4	96.3	78.6	96.9	94.4
Heavy Vehicles																					
% Heavy Vehicles	7.7	6.6	0	54.5	8.6	0	3.4	1.7	56.1	7.3	1.1	4.6	2.3	35.7	4.6	5.8	1.6	3.7	21.4	3.1	5.6
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	7.1	0.1	0	0	0	0	0	0

120 Water Street, 4th Floor
Boston, MA 02109
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N/S: Highland Avenue
E/W: West Street
City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at West AM
Site Code : 12052019
Start Date : 12/5/2019



	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	21	55	4	3	83	14	36	9	**10**	69	10	**122**	**8**	**5**	**145**	**8**	**52**	42	**5**		
08:00 AM	**27**	**66**	**3**	**4**	**100**	8	**52**	**13**	**10**	**83**	11	117	7	1	136	5	46	46	1	98	**417**
08:15 AM	21	65	6	**5**		**18**	37	4	6	65	**19**										
08:30 AM	**17**	**69**	**10**	**4**	**100**	**11**	**43**	**9**	**3**	**66**	**12**	**89**	**8**	**3**	**112**	**7**	**46**	**55**	**2**	**110**	388
Total Volume	86	255	23	16	380	51	168	35	29	283	52	413	28	9	502	28	196	189	9	422	1587
% App. Total	22.6	67.1	6.1	4.2		18	59.4	12.4	10.2		10.4	82.3	5.6	1.8		6.6	46.4	44.8	2.1		
PHF	.796	.924	.575	.800	.950	.708	.808	.673	.725	.852	.684	.846	.875	.450	.866	.875	.942	.859	.450	.959	.951

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120 Water Street, 4th Floor
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Client: LCB Senior Living

File Name : Highland at West AM
Site Code : 12052019
Start Date : 12/5/2019
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Groups Printed- Cars

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	12	40	7	2	61	6	12	3	0	21	3	59	3	1	66	3	39	45	1	88	236
07:15 AM	7	70	3	6	86	11	13	6	0	30	8	74	2	1	85	8	48	53	3	112	313
07:30 AM	15	64	5	0	84	8	22	10	3	43	16	85	5	0	106	5	53	47	0	105	338
07:45 AM	19	55	4	2	80	14	36	9	3	62	10	118	8	3	139	8	49	42	4	103	384
Total	53	229	19	10	311	39	83	28	6	156	37	336	18	5	396	24	189	187	8	408	1271
08:00 AM	26	63	3	2	94	8	51	13	5	77	11	113	6	1	131	4	45	45	1	95	397
08:15 AM	19	62	6	2	89	18	37	4	4	63	19	81	5	0	105	8	51	43	0	102	359
08:30 AM	17	64	10	0	91	11	42	9	1	63	12	84	8	2	106	7	45	51	2	105	365
08:45 AM	17	49	10	1	77	13	40	5	2	60	15	92	6	0	113	6	48	42	0	96	346
Total	79	238	29	5	351	50	170	31	12	263	57	370	25	3	455	25	189	181	3	398	1467
Grand Total	132	467	48	15	662	89	253	59	18	419	94	706	43	8	851	49	378	368	11	806	2738
Apprch %	19.9	70.5	7.3	2.3		21.2	60.4	14.1	4.3		11	83	5.1	0.9		6.1	46.9	45.7	1.4		
Total %	4.8	17.1	1.8	0.5	24.2	3.3	9.2	2.2	0.7	15.3	3.4	25.8	1.6	0.3	31.1	1.8	13.8	13.4	0.4	29.4	

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	19	55	4	**2**								**118**	**8**	**3**	**139**	**8**			**4**		
08:00 AM	**26**	**63**	**3**	**2**	**94**	8	**51**	**13**	**5**	**77**	11	113	6	1	131	4	45	45	1	95	**397**
08:15 AM	19	62	6	2	89	**18**	37	4	4	63	**19**						**51**	43	0	102	359
08:30 AM	17	**64**	**10**															**51**		**105**	365
Total Volume	81	244	23	6	354	51	166	35	13	265	52	396	27	6	481	27	190	181	7	405	1505
% App. Total	22.9	68.9	6.5	1.7		19.2	62.6	13.2	4.9		10.8	82.3	5.6	1.2		6.7	46.9	44.7	1.7		
PHF	.779	.953	.575	.750	.941	.708	.814	.673	.650	.860	.684	.839	.844	.500	.865	.844	.931	.887	.438	.964	.948

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File Name : Highland at West AM
Site Code : 12052019
Start Date : 12/5/2019
Page No : 1

Groups Printed- Heavy Vehicles

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	4	0	1	7	0	3	0	0	3	0	5	0	2	7	2	0	4	0	6	23
07:15 AM	2	5	0	6	13	0	2	0	1	3	0	7	0	0	7	0	0	1	0	1	24
07:30 AM	1	7	0	1	9	0	0	1	5	6	1	2	0	1	4	0	0	1	1	2	21
07:45 AM	2	0	0	1	3	0	0	0	7	7	0	4	0	1	5	0	3	0	1	4	19
Total	7	16	0	9	32	0	5	1	13	19	1	18	0	4	23	2	3	6	2	13	87
08:00 AM	1	3	0	2	6	0	1	0	5	6	0	4	1	0	5	1	1	1	0	3	20
08:15 AM	2	3	0	3	8	0	0	0	2	2	0	4	0	0	4	0	1	3	1	5	19
08:30 AM	0	5	0	4	9	0	1	0	2	3	0	5	0	1	6	0	1	4	0	5	23
08:45 AM	1	6	0	0	7	0	2	0	1	3	0	3	0	0	3	0	0	0	0	0	13
Total	4	17	0	9	30	0	4	0	10	14	0	16	1	1	18	1	3	8	1	13	75
Grand Total	11	33	0	18	62	0	9	1	23	33	1	34	1	5	41	3	6	14	3	26	162
Apprch %	17.7	53.2	0	29		0	27.3	3	69.7		2.4	82.9	2.4	12.2		11.5	23.1	53.8	11.5		
Total %	6.8	20.4	0	11.1	38.3	0	5.6	0.6	14.2	20.4	0.6	21	0.6	3.1	25.3	1.9	3.7	8.6	1.9	16	

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	**2**						**3**							**2**	**7**	**2**		**4**		**6**	23
07:15 AM	2	5	0	**6**	**13**	0	2	0	1	3	0	**7**									**24**
07:30 AM	1	**7**	0	1	9	0	0	**1**			**1**								**1**		
07:45 AM	**2**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**7**	**7**	0	4	0	1	5	0	**3**	0	1	4	19
Total Volume	7	16	0	9	32	0	5	1	13	19	1	18	0	4	23	2	3	6	2	13	87
% App. Total	21.9	50	0	28.1		0	26.3	5.3	68.4		4.3	78.3	0	17.4		15.4	23.1	46.2	15.4		
PHF	.875	.571	.000	.375	.615	.000	.417	.250	.464	.679	.250	.643	.000	.500	.821	.250	.250	.375	.500	.542	.906

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120 Water Street, 4th Floor
Boston, MA 02109
p. 617-556-0020

N/S: Highland Avenue
E/W: West Street
City, State: Needham, MA
Client: LCB Senior Living

File Name : Highland at West AM
Site Code : 12052019
Start Date : 12/5/2019
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Groups Printed- Bikes by Direction

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Apprch %	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**1**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

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File Name : Highland at West PM
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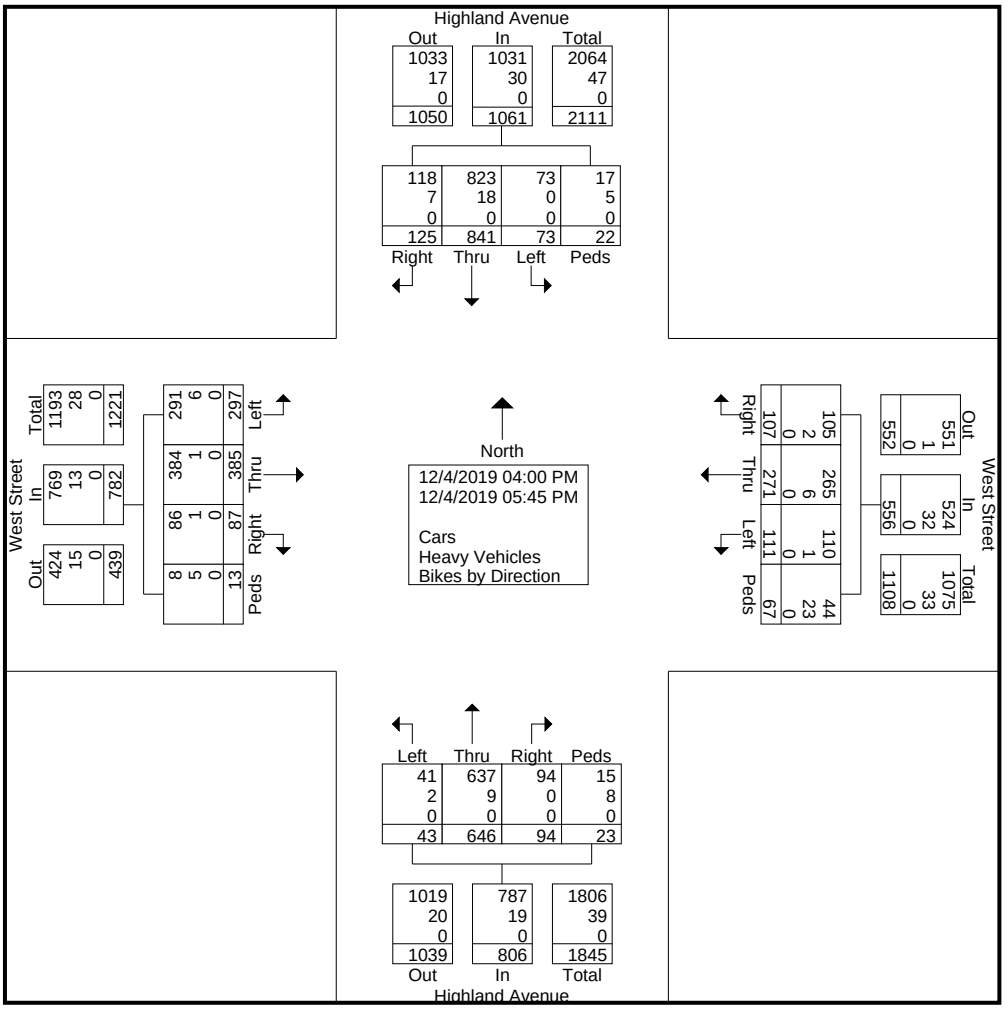
Groups Printed- Cars - Heavy Vehicles - Bikes by Direction

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	11	84	10	1	106	14	38	10	3	65	16	90	2	7	115	11	50	43	4	108	394
04:15 PM	15	105	12	5	137	11	30	14	12	67	13	61	9	6	89	7	37	42	3	89	382
04:30 PM	13	101	5	3	122	12	34	16	21	83	9	101	6	6	122	5	53	36	0	94	421
04:45 PM	12	118	2	2	134	15	26	11	7	59	20	84	4	1	109	12	57	43	1	113	415
Total	51	408	29	11	499	52	128	51	43	274	58	336	21	20	435	35	197	164	8	404	1612
05:00 PM	16	113	14	1	144	13	39	22	5	79	11	71	9	0	91	12	62	43	1	118	432
05:15 PM	30	106	9	1	146	14	40	12	3	69	7	89	4	1	101	16	36	32	2	86	402
05:30 PM	8	116	8	1	133	14	33	8	3	58	10	70	7	0	87	15	38	30	0	83	361
05:45 PM	20	98	13	8	139	14	31	18	13	76	8	80	2	2	92	9	52	28	2	91	398
Total	74	433	44	11	562	55	143	60	24	282	36	310	22	3	371	52	188	133	5	378	1593
Grand Total	125	841	73	22	1061	107	271	111	67	556	94	646	43	23	806	87	385	297	13	782	3205
Apprch %	11.8	79.3	6.9	2.1		19.2	48.7	20	12.1		11.7	80.1	5.3	2.9		11.1	49.2	38	1.7		
Total %	3.9	26.2	2.3	0.7	33.1	3.3	8.5	3.5	2.1	17.3	2.9	20.2	1.3	0.7	25.1	2.7	12	9.3	0.4	24.4	
Cars	118	823	73	17	1031	105	265	110	44	524	94	637	41	15	787	86	384	291	8	769	3111
% Cars	94.4	97.9	100	77.3	97.2	98.1	97.8	99.1	65.7	94.2	100	98.6	95.3	65.2	97.6	98.9	99.7	98	61.5	98.3	97.1
Heavy Vehicles																					
% Heavy Vehicles	5.6	2.1	0	22.7	2.8	1.9	2.2	0.9	34.3	5.8	0	1.4	4.7	34.8	2.4	1.1	0.3	2	38.5	1.7	2.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Site Code : 12042019
Start Date : 12/4/2019



	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:30 PM																					
04:30 PM	13	101	5	**3**					**21**	**83**	9	**101**		**6**	**122**	5	53	36	0	94	421
04:45 PM	12	**118**	2	2	134	**15**	26	11	7	59	**20**							**43**			
05:00 PM	**16**	**113**	**14**	**1**	**144**	**13**	**39**	**22**	**5**	**79**	**11**	**71**	**9**	0	91	12	**62**	43	1	**118**	**432**
05:15 PM	**30**				**146**	14	**40**									**16**			**2**		
Total Volume	71	438	30	7	546	54	139	61	36	290	47	345	23	8	423	45	208	154	4	411	1670
% App. Total	13	80.2	5.5	1.3		18.6	47.9	21	12.4		11.1	81.6	5.4	1.9		10.9	50.6	37.5	1		
PHF	.592	.928	.536	.583	.935	.900	.869	.693	.429	.873	.588	.854	.639	.333	.867	.703	.839	.895	.500	.871	.966

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Groups Printed- Cars

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	11	82	10	1	104	14	37	10	1	62	16	89	2	4	111	11	50	41	3	105	382
04:15 PM	13	104	12	4	133	10	30	13	6	59	13	60	9	5	87	7	36	42	3	88	367
04:30 PM	11	98	5	1	115	12	32	16	11	71	9	97	5	5	116	5	53	34	0	92	394
04:45 PM	11	117	2	2	132	15	25	11	6	57	20	83	3	1	107	12	57	43	1	113	409
Total	46	401	29	8	484	51	124	50	24	249	58	329	19	15	421	35	196	160	7	398	1552
05:00 PM	16	108	14	0	138	13	39	22	4	78	11	71	9	0	91	12	62	41	0	115	422
05:15 PM	29	103	9	1	142	13	40	12	3	68	7	89	4	0	100	16	36	32	1	85	395
05:30 PM	8	116	8	0	132	14	31	8	2	55	10	68	7	0	85	14	38	30	0	82	354
05:45 PM	19	95	13	8	135	14	31	18	11	74	8	80	2	0	90	9	52	28	0	89	388
Total	72	422	44	9	547	54	141	60	20	275	36	308	22	0	366	51	188	131	1	371	1559
Grand Total	118	823	73	17	1031	105	265	110	44	524	94	637	41	15	787	86	384	291	8	769	3111
Apprch %	11.4	79.8	7.1	1.6		20	50.6	21	8.4		11.9	80.9	5.2	1.9		11.2	49.9	37.8	1		
Total %	3.8	26.5	2.3	0.5	33.1	3.4	8.5	3.5	1.4	16.8	3	20.5	1.3	0.5	25.3	2.8	12.3	9.4	0.3	24.7	

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:30 PM																					
04:30 PM	11	98	5	1	115	12	32	16	**11**	71	9	**97**		**5**	**116**	5	53	34	0	92	394
04:45 PM	11	**117**	2	**2**		**15**	25	11	6	57	**20**							**43**	**1**		
05:00 PM	**16**	**108**	**14**	**0**	**138**	**13**	**39**	**22**	**4**	**78**	11	71	**9**	0	91	12	**62**	41	0	**115**	**422**
05:15 PM	**29**				**142**	13	**40**									**16**					
Total Volume	67	426	30	4	527	53	136	61	24	274	47	340	21	6	414	45	208	150	2	405	1620
% App. Total	12.7	80.8	5.7	0.8		19.3	49.6	22.3	8.8		11.4	82.1	5.1	1.4		11.1	51.4	37	0.5		
PHF	.578	.910	.536	.500	.928	.883	.850	.693	.545	.878	.588	.876	.583	.300	.892	.703	.839	.872	.500	.880	.960

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File Name : Highland at West PM
Site Code : 12042019
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Groups Printed- Heavy Vehicles

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	2	0	0	2	0	1	0	2	3	0	1	0	3	4	0	0	2	1	3	12
04:15 PM	2	1	0	1	4	1	0	1	6	8	0	1	0	1	2	0	1	0	0	1	15
04:30 PM	2	3	0	2	7	0	2	0	10	12	0	4	1	1	6	0	0	2	0	2	27
04:45 PM	1	1	0	0	2	0	1	0	1	2	0	1	1	0	2	0	0	0	0	0	6
Total	5	7	0	3	15	1	4	1	19	25	0	7	2	5	14	0	1	4	1	6	60
05:00 PM	0	5	0	1	6	0	0	0	1	1	0	0	0	0	0	0	0	2	1	3	10
05:15 PM	1	3	0	0	4	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	7
05:30 PM	0	0	0	1	1	0	2	0	1	3	0	2	0	0	2	1	0	0	0	1	7
05:45 PM	1	3	0	0	4	0	0	0	2	2	0	0	0	2	2	0	0	0	2	2	10
Total	2	11	0	2	15	1	2	0	4	7	0	2	0	3	5	1	0	2	4	7	34
Grand Total	7	18	0	5	30	2	6	1	23	32	0	9	2	8	19	1	1	6	5	13	94
Apprch %	23.3	60	0	16.7		6.2	18.8	3.1	71.9		0	47.4	10.5	42.1		7.7	7.7	46.2	38.5		
Total %	7.4	19.1	0	5.3	31.9	2.1	6.4	1.1	24.5	34	0	9.6	2.1	8.5	20.2	1.1	1.1	6.4	5.3	13.8	

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	2	0	0	2	0	1	0	2	3	0	1	0	**3**				**2**	**1**	**3**	12
04:15 PM	**2**					**1**	0	**1**									**1**	0	0	1	15
04:30 PM	2	**3**	0	**2**	**7**	0	**2**		**10**	**12**	0	**4**	**1**	1	**6**	0	0	2	0	2	**27**
04:45 PM	1	1	0	0	2	0	1	0	1	2	0	1	1	0	2	0	0	0	0	0	6
Total Volume	5	7	0	3	15	1	4	1	19	25	0	7	2	5	14	0	1	4	1	6	60
% App. Total	33.3	46.7	0	20		4	16	4	76		0	50	14.3	35.7		0	16.7	66.7	16.7		
PHF	.625	.583	.000	.375	.536	.250	.500	.250	.475	.521	.000	.438	.500	.417	.583	.000	.250	.500	.250	.500	.556

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File Name : Highland at West PM
Site Code : 12042019
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Groups Printed- Bikes by Direction

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

	Highland Avenue From North					West Street From East					Highland Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

McMahon Associates

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(508)-823-2245

N/S: Avery Square
E/W: West Street
McMahon Associates
Needham Heights, MA

File Name : West St at Avery Sq_AM
Site Code : 12052019
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Groups Printed- Cars & CW Pedestrians - HV & CCW Pedestrians - Bikes by Direction

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	18	0	2	3	23	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	25
07:15 AM	15	0	3	8	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
07:30 AM	17	0	3	0	20	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	21
07:45 AM	29	0	0	7	36	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	41
Total	79	0	8	18	105	1	0	0	1	2	0	0	0	4	4	0	0	0	2	2	113
08:00 AM	18	0	5	1	24	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	26
08:30 AM	29	0	7	5	41	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	44
08:45 AM	18	0	2	1	21	0	0	1	0	1	1	0	1	1	3	0	0	0	0	0	25
Total	84	0	15	11	110	0	0	2	0	2	1	1	2	2	6	0	0	0	2	2	120
Grand Total	163	0	23	29	215	1	0	2	1	4	1	1	2	6	10	0	0	0	4	4	233
Apprch %	75.8	0	10.7	13.5		25	0	50	25		10	10	20	60		0	0	0	100		
Total %	70	0	9.9	12.4	92.3	0.4	0	0.9	0.4	1.7	0.4	0.4	0.9	2.6	4.3	0	0	0	1.7	1.7	
Cars & CW Pedestrians	163	0	23	29	215	1	0	2	1	4	1	1	2	6	10	0	0	0	4	4	233
% Cars & CW Pedestrians	100	0	100	100	100	100	0	100	100	100	100	100	100	100	100	0	0	0	100	100	100
HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	**29**	0	0	**7**	36	**1**	0	0	0	**1**	0	0	0	**2**	**2**	0	0	0	**2**	**2**	41
08:00 AM	18	0	5	1	24	0	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	**1**	1	2	0	0	0	0	0	26
08:30 AM	29	0	**7**	5	**41**	0	0	0	0	0	0	**1**	0	0	1	0	0	0	2	2	**44**
Total Volume	95	0	13	17	125	1	0	1	0	2	0	1	1	3	5	0	0	0	4	4	136
% App. Total	76	0	10.4	13.6		50	0	50	0		0	20	20	60		0	0	0	100		
PHF	.819	.000	.464	.607	.762	.250	.000	.250	.000	.500	.000	.250	.250	.375	.625	.000	.000	.000	.500	.500	.773

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Groups Printed- Cars & CW Pedestrians

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	18	0	2	3	23	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	25
07:15 AM	15	0	3	8	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
07:30 AM	17	0	3	0	20	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	21
07:45 AM	29	0	0	7	36	1	0	0	0	1	0	0	0	2	2	0	0	0	2	2	41
Total	79	0	8	18	105	1	0	0	1	2	0	0	0	4	4	0	0	0	2	2	113
08:00 AM	18	0	5	1	24	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	26
08:30 AM	29	0	7	5	41	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	44
08:45 AM	18	0	2	1	21	0	0	1	0	1	1	0	1	1	3	0	0	0	0	0	25
Total	84	0	15	11	110	0	0	2	0	2	1	1	2	2	6	0	0	0	2	2	120
Grand Total	163	0	23	29	215	1	0	2	1	4	1	1	2	6	10	0	0	0	4	4	233
Apprch %	75.8	0	10.7	13.5		25	0	50	25		10	10	20	60		0	0	0	100		
Total %	70	0	9.9	12.4	92.3	0.4	0	0.9	0.4	1.7	0.4	0.4	0.9	2.6	4.3	0	0	0	1.7	1.7	

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	**29**	0	0	**7**	36	**1**	0	0	0	**1**	0	0	0	**2**	**2**	0	0	0	**2**	**2**	41
08:00 AM	18	0	5	1	24	0	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	25
08:15 AM	19	0	1	4	24	0	0	0	0	0	0	0	**1**	1	2	0	0	0	0	0	26
08:30 AM	29	0	**7**	5	**41**	0	0	0	0	0	0	**1**	0	0	1	0	0	0	2	2	**44**
Total Volume	95	0	13	17	125	1	0	1	0	2	0	1	1	3	5	0	0	0	4	4	136
% App. Total	76	0	10.4	13.6		50	0	50	0		0	20	20	60		0	0	0	100		
PHF	.819	.000	.464	.607	.762	.250	.000	.250	.000	.500	.000	.250	.250	.375	.625	.000	.000	.000	.500	.500	.773

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Site Code : 12052019
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Groups Printed- HV & CCW Pedestrians

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Site Code : 12052019
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Groups Printed- Bikes by Direction

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Site Code : 12042019
Start Date : 12/4/2019
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Groups Printed- Cars & CW Pedestrians - HV & CCW Pedestrians - Bikes by Direction

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	19	0	1	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
04:15 PM	10	0	2	4	16	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	19
04:30 PM	13	0	3	3	19	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	21
04:45 PM	23	0	5	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
Total	65	0	11	14	90	0	0	0	1	1	0	0	0	4	4	0	0	0	0	0	95
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	26
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	42
Total	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
Grand Total	160	0	21	27	208	0	0	0	1	1	0	0	1	6	7	0	0	0	1	1	217
Apprch %	76.9	0	10.1	13		0	0	0	100		0	0	14.3	85.7		0	0	0	100		
Total %	73.7	0	9.7	12.4	95.9	0	0	0	0.5	0.5	0	0	0.5	2.8	3.2	0	0	0	0.5	0.5	
Cars & CW Pedestrians	160	0	21	27	208	0	0	0	1	1	0	0	1	6	7	0	0	0	1	1	217
% Cars & CW Pedestrians	100	0	100	100	100	0	0	0	100	100	0	0	100	100	100	0	0	0	100	100	100
HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% HV & CCW Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 05:00 PM																					
05:00 PM	24	0	**4**	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	**1**	**1**	**2**	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	26
05:45 PM	**32**	0	2	**7**	**41**	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**42**
Total Volume	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
% App. Total	80.5	0	8.5	11		0	0	0	0		0	0	33.3	66.7		0	0	0	100		
PHF	.742	.000	.625	.464	.720	.000	.000	.000	.000	.000	.000	.000	.250	.500	.375	.000	.000	.000	.250	.250	.726

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Groups Printed- Cars & CW Pedestrians

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	19	0	1	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
04:15 PM	10	0	2	4	16	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	19
04:30 PM	13	0	3	3	19	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	21
04:45 PM	23	0	5	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
Total	65	0	11	14	90	0	0	0	1	1	0	0	0	4	4	0	0	0	0	0	95
05:00 PM	24	0	4	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	26
05:45 PM	32	0	2	7	41	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	42
Total	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
Grand Total	160	0	21	27	208	0	0	0	1	1	0	0	1	6	7	0	0	0	1	1	217
Apprch %	76.9	0	10.1	13		0	0	0	100		0	0	14.3	85.7		0	0	0	100		
Total %	73.7	0	9.7	12.4	95.9	0	0	0	0.5	0.5	0	0	0.5	2.8	3.2	0	0	0	0.5	0.5	

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 05:00 PM																					
05:00 PM	24	0	**4**	3	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
05:15 PM	19	0	1	1	21	0	0	0	0	0	0	0	**1**	**1**	**2**	0	0	0	0	0	23
05:30 PM	20	0	3	2	25	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	26
05:45 PM	**32**	0	2	**7**	**41**	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**42**
Total Volume	95	0	10	13	118	0	0	0	0	0	0	0	1	2	3	0	0	0	1	1	122
% App. Total	80.5	0	8.5	11		0	0	0	0		0	0	33.3	66.7		0	0	0	100		
PHF	.742	.000	.625	.464	.720	.000	.000	.000	.000	.000	.000	.000	.250	.500	.375	.000	.000	.000	.250	.250	.726

McMahon Associates

350 Myles Standish Blvd. Suite 103
Taunton, MA 02780
(508)-823-2245

N/S: Avery Square
E/W: West Street
McMahon Associates
Needham Heights, MA

File Name : West St at Avery Sq_PM
Site Code : 12042019
Start Date : 12/4/2019
Page No : 1

Groups Printed- HV & CCW Pedestrians

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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File Name : West St at Avery Sq_PM
Site Code : 12042019
Start Date : 12/4/2019
Page No : 1

Groups Printed- Bikes by Direction

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					

	Avery Square From North					West Street From East					Avery Square From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

Highland Avenue
north of Morton Street
City, State: Needham, MA
Client: McM/E. Gruber

05293Aspeed
Site Code: Y-19986.11

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
12/18/19	0	0	2	6	18	5	2	0	0	0	0	0	0	0	33	37	40
01:00	0	0	1	3	2	0	0	**2**	0	0	0	0	0	0	8	47	48
02:00	0	0	0	2	1	1	1	0	0	0	0	0	0	0	5	41	43
03:00	0	0	0	0	3	2	1	0	0	0	0	0	0	0	6	40	43
04:00	0	0	0	7	5	7	0	0	0	0	0	0	0	0	19	37	39
05:00	0	0	2	11	24	13	2	1	0	0	0	0	0	0	53	38	40
06:00	1	0	3	50	85	15	1	0	0	0	0	0	0	0	155	34	37
07:00	11	7	35	169	115	**26**	1	0	0	0	0	0	0	0	364	33	36
08:00	17	8	88	**225**	**125**	14	1	0	0	0	0	0	0	0	478	32	34
09:00	17	7	90	187	116	23	**3**	0	0	0	0	0	0	0	443	33	35
10:00	21	27	50	197	125	21	1	0	0	0	0	0	0	0	442	33	34
11:00	**54**	**31**	**134**	185	71	11	0	0	0	0	0	0	0	0	**486**	30	34
12 PM	**29**	17	135	**236**	85	6	1	0	0	0	0	0	0	0	**509**	30	33
13:00	20	8	121	200	**91**	**13**	0	0	0	0	0	0	0	0	453	31	34
14:00	21	**29**	151	211	65	4	**2**	0	0	**1**	0	0	0	0	484	29	33
15:00	29	25	132	198	54	5	0	0	0	0	0	0	0	0	443	29	33
16:00	23	10	129	174	51	4	0	0	0	0	0	0	0	0	391	29	33
17:00	22	15	**158**	176	39	1	0	0	0	0	0	0	0	0	411	29	32
18:00	15	28	123	145	48	1	0	0	0	0	0	0	0	0	360	29	33
19:00	14	9	73	128	47	8	0	0	0	0	0	0	0	0	279	31	34
20:00	6	1	33	107	52	7	0	0	0	0	0	0	0	0	206	32	34
21:00	2	0	24	91	37	3	0	0	0	0	0	0	0	0	157	32	34
22:00	2	1	4	25	25	8	1	**1**	0	0	0	0	0	0	67	34	39
23:00	0	0	3	13	6	3	1	0	0	0	0	0	0	0	26	35	39
Total	304	223	1491	2746	1290	201	18	4	0	1	0	0	0	0	6278		
Percent	4.8%	3.6%	23.7%	43.7%	20.5%	3.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	08:00	08:00	07:00	09:00	01:00							11:00		
Vol.	54	31	134	225	125	26	3	2							486		
PM Peak	12:00	14:00	17:00	12:00	13:00	13:00	14:00	22:00		14:00					12:00		
Vol.	29	29	158	236	91	13	2	1		1					509		

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Highland Avenue
north of Morton Street
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Client: McM/E. Gruber

05293Aspeed
Site Code: Y-19986.11

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
12/19/19	0	0	1	11	10	4	1	0	0	0	0	0	0	0	27	36	39
01:00	0	0	1	7	0	4	1	0	0	0	0	0	0	0	13	38	41
02:00	0	0	0	1	3	0	0	0	0	0	0	0	0	0	4	34	34
03:00	0	0	0	1	5	1	0	0	0	0	0	0	0	0	7	34	38
04:00	0	0	0	2	9	1	1	**2**	0	0	0	0	0	0	15	43	48
05:00	1	0	2	11	25	17	0	0	0	0	0	0	0	0	56	37	39
06:00	3	1	11	66	54	22	1	0	0	0	0	0	0	0	158	34	38
07:00	32	**20**	82	**190**	78	15	0	0	0	0	0	0	0	0	417	31	34
08:00	19	9	**117**	181	125	17	1	0	0	0	0	0	0	0	**469**	32	34
09:00	15	9	72	163	**129**	19	0	0	0	0	0	0	0	0	407	33	34
10:00	15	0	49	179	107	**31**	**2**	0	0	0	0	0	0	0	383	33	37
11:00	**33**	9	82	186	126	17	1	0	0	0	0	0	0	0	454	33	34
12 PM	17	9	103	**204**	93	15	0	0	0	0	0	0	0	0	441	32	34
13:00	17	7	90	186	98	13	0	0	0	0	0	0	0	0	411	32	34
14:00	28	21	**157**	203	85	12	0	0	0	0	0	0	0	0	**506**	31	34
15:00	**32**	20	85	162	**101**	11	**2**	0	0	0	0	0	0	0	413	32	34
16:00	19	10	134	173	62	14	0	0	0	0	0	0	0	0	412	31	34
17:00	23	**27**	121	170	44	5	0	0	0	0	0	0	0	0	390	29	33
18:00	12	12	89	147	43	4	1	0	0	0	0	0	0	0	308	30	33
19:00	11	1	66	141	49	4	0	0	0	0	0	0	0	0	272	31	34
20:00	4	1	50	139	55	3	1	0	0	0	0	0	**1**	0	254	31	34
21:00	4	0	14	91	42	8	0	0	0	0	0	0	0	0	159	33	35
22:00	3	0	8	24	22	**17**	1	0	0	0	0	0	0	0	75	36	39
23:00	1	0	3	14	21	6	0	0	0	0	0	0	0	0	45	34	38
Total	289	156	1337	2652	1386	260	13	2	0	0	0	0	1	0	6096		
Percent	4.7%	2.6%	21.9%	43.5%	22.7%	4.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	07:00	08:00	07:00	09:00	10:00	10:00	04:00							08:00		
Vol.	33	20	117	190	129	31	2	2							469		
PM Peak	15:00	17:00	14:00	12:00	15:00	22:00	15:00						20:00		14:00		
Vol.	32	27	157	204	101	17	2						1		506		
Total	593	379	2828	5398	2676	461	31	6	0	1	0	0	1	0	12374		
Percent	4.8%	3.1%	22.9%	43.6%	21.6%	3.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 21 MPH
50th Percentile : 27 MPH
85th Percentile : 32 MPH
95th Percentile : 34 MPH

Stats

10 MPH Pace Speed : 21-30 MPH
Number in Pace : 8226
Percent in Pace : 66.5%
Number of Vehicles > 30 MPH : 3176
Percent of Vehicles > 30 MPH : 25.7%

Mean Speed(Average) : 27 MPH

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05293Aspeed
Site Code: Y-19986.11

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
12/18/19	0	0	1	8	11	8	2	0	0	0	0	0	0	0	30	38	41
01:00	0	0	0	2	3	2	1	0	0	0	0	0	0	0	8	39	42
02:00	0	0	1	3	1	0	0	0	**1**	0	0	0	0	0	6	50	53
03:00	0	0	0	1	2	3	1	**3**	0	0	0	0	0	0	10	47	49
04:00	0	0	1	1	6	5	0	0	0	0	0	0	0	0	13	38	39
05:00	1	0	2	8	27	17	4	0	1	0	0	0	0	0	60	38	42
06:00	5	0	1	41	87	31	4	1	0	0	0	0	0	0	170	36	39
07:00	9	4	35	102	112	43	6	1	0	0	0	0	0	0	312	35	39
08:00	13	0	20	112	138	37	6	0	0	0	0	0	0	0	326	34	38
09:00	13	1	8	97	**165**	**58**	**7**	0	0	0	0	0	0	0	349	36	39
10:00	15	3	22	130	161	57	5	0	0	0	0	0	0	0	393	35	38
11:00	**24**	**8**	**43**	**133**	142	52	5	1	0	0	0	0	0	0	**408**	34	38
12 PM	17	5	50	172	136	35	1	0	0	0	0	0	0	0	416	34	37
13:00	16	3	35	154	**162**	**42**	3	0	0	0	0	0	0	0	415	34	37
14:00	24	10	44	176	161	40	3	0	0	0	0	0	0	0	458	34	37
15:00	**44**	**17**	76	193	123	19	**4**	0	0	0	0	0	0	0	476	33	34
16:00	30	7	91	241	117	18	0	0	0	0	0	0	0	0	504	32	34
17:00	24	17	**130**	**255**	100	13	0	0	0	0	0	0	0	0	**539**	31	34
18:00	14	14	100	215	86	9	0	0	0	0	0	0	0	0	438	31	34
19:00	8	3	34	126	79	17	2	0	0	0	0	0	0	0	269	33	36
20:00	3	2	13	61	62	13	1	0	0	0	0	0	0	0	155	34	37
21:00	1	1	8	33	30	17	1	0	0	0	0	0	0	0	91	36	38
22:00	2	0	5	25	23	12	3	0	0	0	0	0	0	0	70	36	39
23:00	0	0	0	6	13	4	3	0	0	0	0	0	0	0	26	38	42
Total	263	95	720	2295	1947	552	62	6	2	0	0	0	0	0	5942		
Percent	4.4%	1.6%	12.1%	38.6%	32.8%	9.3%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	09:00	09:00	09:00	03:00	02:00						11:00		
Vol.	24	8	43	133	165	58	7	3	1						408		
PM Peak	15:00	15:00	17:00	17:00	13:00	13:00	15:00								17:00		
Vol.	44	17	130	255	162	42	4								539		

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Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
12/19/19	0	0	0	1	11	4	1	0	0	0	0	0	0	0	17	38	40
01:00	0	0	0	0	2	2	3	**2**	0	0	**1**	0	0	0	10	48	62
02:00	0	0	0	0	2	0	1	0	0	0	0	0	0	0	3	42	44
03:00	0	0	0	1	1	5	2	0	0	0	0	0	0	0	9	41	43
04:00	0	0	0	3	8	8	2	0	0	0	0	0	0	0	21	39	42
05:00	2	0	2	12	32	13	2	2	0	0	0	0	0	0	65	37	41
06:00	4	0	6	31	93	39	2	1	0	0	0	0	0	0	176	36	39
07:00	13	0	19	**120**	110	40	4	0	0	0	0	0	0	0	306	34	38
08:00	12	1	13	82	147	45	3	0	0	0	0	0	0	0	303	35	38
09:00	10	0	6	92	165	51	**9**	1	0	0	0	0	0	0	334	36	39
10:00	**16**	2	26	116	167	**55**	7	1	0	0	0	0	0	0	**390**	35	38
11:00	12	**7**	**30**	117	**172**	41	5	0	0	0	0	0	0	0	384	34	38
12 PM	27	3	39	165	135	40	3	0	0	0	0	0	0	0	412	34	37
13:00	15	2	20	128	176	48	**5**	0	0	0	0	**1**	0	0	395	34	38
14:00	**29**	2	27	147	**180**	**51**	3	0	0	0	0	0	0	0	439	34	38
15:00	20	4	50	226	160	30	4	**1**	0	0	0	0	0	0	495	33	36
16:00	19	**6**	79	235	164	21	1	0	0	0	0	0	0	0	**525**	33	34
17:00	18	2	**101**	**245**	101	5	0	0	0	0	0	0	0	0	472	31	34
18:00	14	5	67	206	134	16	1	0	0	0	0	0	0	0	443	33	34
19:00	9	1	45	140	100	21	0	0	0	0	0	0	0	0	316	33	36
20:00	5	0	17	83	70	15	1	0	0	0	0	0	0	0	191	34	37
21:00	1	2	12	49	48	13	1	0	0	0	0	0	0	0	126	34	37
22:00	0	0	2	24	46	19	1	0	0	0	0	0	0	0	92	36	39
23:00	0	0	0	7	18	13	0	0	0	0	0	0	0	0	38	37	39
Total	226	37	561	2230	2242	595	61	8	0	0	1	1	0	0	5962		
Percent	3.8%	0.6%	9.4%	37.4%	37.6%	10.0%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	07:00	11:00	10:00	09:00	01:00			01:00				10:00		
Vol.	16	7	30	120	172	55	9	2			1				390		
PM Peak	14:00	16:00	17:00	17:00	14:00	14:00	13:00	15:00				13:00			16:00		
Vol.	29	6	101	245	180	51	5	1				1			525		
Total	489	132	1281	4525	4189	1147	123	14	2	0	1	1	0	0	11904		
Percent	4.1%	1.1%	10.8%	38.0%	35.2%	9.6%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 24 MPH
50th Percentile : 29 MPH
85th Percentile : 34 MPH
95th Percentile : 38 MPH

Stats

10 MPH Pace Speed : 26-35 MPH
Number in Pace : 8714
Percent in Pace : 73.2%
Number of Vehicles > 30 MPH : 5477
Percent of Vehicles > 30 MPH : 46.0%

Mean Speed(Average) : 29 MPH

Transportation Data Corporation

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Highland Avenue
north of Morton Street
City, State: Needham, MA
Client: McM/E. Gruber

05293Avolume
Site Code: Y-19986.11

Start Time	18-Dec-19 Wed	NB A.M.	NB P.M.	SB A.M.	SB P.M.	Combined A.M.	Combined P.M.	19-Dec Thu	NB A.M.	NB P.M.	SB A.M.	SB P.M.	Combined A.M.	Combined P.M.
12:00		9	***125***	11	112	20	237		7	119	6	103	13	222
12:15		8	***125***	6	104	14	229		8	115	5	92	13	207
12:30		11	***135***	5	82	16	217		7	111	4	95	11	206
12:45		5	***124***	8	118	13	242		5	96	2	122	7	218
01:00		3	109	1	112	4	221		5	96	3	103	8	199
01:15		1	117	5	106	6	223		2	108	2	93	4	201
01:30		2	112	0	105	2	217		0	109	2	90	2	199
01:45		2	115	2	92	4	207		6	98	3	109	9	207
02:00		4	113	2	110	6	223		1	***122***	2	115	3	237
02:15		0	101	3	122	3	223		1	***109***	0	126	1	***235***
02:30		1	117	0	121	1	238		2	***126***	1	102	3	***228***
02:45		0	153	1	105	1	258		0	***149***	0	96	0	***245***
03:00		4	119	3	118	7	237		2	115	2	123	4	***238***
03:15		1	104	2	114	3	218		3	112	1	116	4	228
03:30		1	112	1	107	2	219		1	93	0	132	1	225
03:45		0	108	4	137	4	245		1	93	6	124	7	217
04:00		5	123	6	136	11	259		3	113	4	***125***	7	238
04:15		2	91	0	128	2	219		5	103	2	***123***	7	226
04:30		6	86	6	106	12	192		2	100	7	***134***	9	234
04:45		6	91	1	***134***	7	***225***		5	96	8	***143***	13	239
05:00		10	120	8	***135***	18	***255***		9	112	8	124	17	236
05:15		10	111	19	***139***	29	***250***		10	98	16	114	26	212
05:30		12	90	11	***137***	23	***227***		20	96	11	110	31	206
05:45		21	90	22	128	43	218		17	84	30	124	47	208
06:00		16	113	36	107	52	220		25	85	37	125	62	210
06:15		33	91	41	129	74	220		36	73	33	117	69	190
06:30		52	74	31	99	83	173		45	69	48	95	93	164
06:45		54	82	62	103	116	185		52	81	58	106	110	187
07:00		64	94	74	82	138	176		69	80	68	95	137	175
07:15		84	50	87	82	171	132		93	73	59	79	152	152
07:30		109	80	66	58	175	138		***128***	71	93	75	***221***	146
07:45		107	55	85	47	192	102		***127***	48	86	67	***213***	115
08:00		124	48	66	38	190	86		***133***	85	74	51	***207***	136
08:15		126	48	80	44	206	92		***130***	67	90	32	***220***	99
08:30		115	66	96	47	211	113		111	58	70	46	181	104
08:45		113	44	84	26	197	70		95	44	69	62	164	106
09:00		113	53	78	25	191	78		114	46	73	39	187	85
09:15		108	37	90	25	198	62		118	45	95	32	213	77
09:30		123	45	83	23	206	68		81	28	84	36	165	64
09:45		99	22	98	18	197	40		94	40	82	19	176	59
10:00		118	24	98	25	216	49		98	25	87	20	185	45
10:15		100	16	94	18	194	34		104	13	***100***	21	204	34
10:30		121	16	105	17	226	33		105	12	***100***	24	205	36
10:45		103	11	96	10	199	21		76	25	***103***	27	179	52
11:00		***116***	12	***98***	9	***214***	21		115	12	***101***	13	216	25
11:15		***131***	6	***98***	7	***229***	13		118	19	96	12	214	31
11:30		***131***	4	***97***	6	***228***	10		122	6	98	9	220	15
11:45		***108***	4	***115***	4	***223***	8		99	8	89	4	188	12
Total		2492	3786	2085	3857	4577	7643		2410	3686	2018	3944	4428	7630
Day Total		6278		5942		12220			6096		5962		12058	
% Total		20.4%	31.0%	17.1%	31.6%				20.0%	30.6%	16.7%	32.7%		
Peak	-	11:00	12:00	11:00	04:45	11:00	04:45	-	07:30	02:00	10:15	04:00	07:30	02:15
Vol.	-	486	509	408	545	894	957	-	518	506	404	525	861	946
P.H.F.		0.927	0.943	0.887	0.980	0.976	0.924		0.974	0.849	0.981	0.918	0.974	0.965

ADT	ADT 12,139	AADT 12,139

Transportation Data Corporation

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Highland Avenue
north of Morton Street
City, State: Needham, MA
Client: McM/E. Gruber

05293Avolume
Site Code: Y-19986.11

Start	18-Dec-19	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		9	125			11	112				
12:15		8	125			6	104				
12:30		11	135			5	82				
12:45		5	124	33	509	8	118	30	416	63	925
01:00		3	109			1	112				
01:15		1	117			5	106				
01:30		2	112			0	105				
01:45		2	115	8	453	2	92	8	415	16	868
02:00		4	113			2	110				
02:15		0	101			3	122				
02:30		1	117			0	121				
02:45		0	153	5	484	1	105	6	458	11	942
03:00		4	119			3	118				
03:15		1	104			2	114				
03:30		1	112			1	107				
03:45		0	108	6	443	4	137	10	476	16	919
04:00		5	123			6	136				
04:15		2	91			0	128				
04:30		6	86			6	106				
04:45		6	91	19	391	1	134	13	504	32	895
05:00		10	120			8	135				
05:15		10	111			19	139				
05:30		12	90			11	137				
05:45		21	90	53	411	22	128	60	539	113	950
06:00		16	113			36	107				
06:15		33	91			41	129				
06:30		52	74			31	99				
06:45		54	82	155	360	62	103	170	438	325	798
07:00		64	94			74	82				
07:15		84	50			87	82				
07:30		109	80			66	58				
07:45		107	55	364	279	85	47	312	269	676	548
08:00		124	48			66	38				
08:15		126	48			80	44				
08:30		115	66			96	47				
08:45		113	44	478	206	84	26	326	155	804	361
09:00		113	53			78	25				
09:15		108	37			90	25				
09:30		123	45			83	23				
09:45		99	22	443	157	98	18	349	91	792	248
10:00		118	24			98	25				
10:15		100	16			94	18				
10:30		121	16			105	17				
10:45		103	11	442	67	96	10	393	70	835	137
11:00		116	12			98	9				
11:15		131	6			98	7				
11:30		131	4			97	6				
11:45		108	4	486	26	115	4	408	26	894	52
Total		2492	3786			2085	3857			4577	7643
Combined Total		6278				5942				12220	
Percentage	0.0%										

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Highland Avenue
north of Morton Street
City, State: Needham, MA
Client: McM/E. Gruber

05293Avolume
Site Code: Y-19986.11

Start Time	19-Dec-19 Thu	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		7	119			6	103				
12:15		8	115			5	92				
12:30		7	111			4	95				
12:45		5	96	27	441	2	122	17	412	44	853
01:00		5	96			3	103				
01:15		2	108			2	93				
01:30		0	109			2	90				
01:45		6	98	13	411	3	109	10	395	23	806
02:00		1	122			2	115				
02:15		1	109			0	126				
02:30		2	126			1	102				
02:45		0	149	4	506	0	96	3	439	7	945
03:00		2	115			2	123				
03:15		3	112			1	116				
03:30		1	93			0	132				
03:45		1	93	7	413	6	124	9	495	16	908
04:00		3	113			4	125				
04:15		5	103			2	123				
04:30		2	100			7	134				
04:45		5	96	15	412	8	143	21	525	36	937
05:00		9	112			8	124				
05:15		10	98			16	114				
05:30		20	96			11	110				
05:45		17	84	56	390	30	124	65	472	121	862
06:00		25	85			37	125				
06:15		36	73			33	117				
06:30		45	69			48	95				
06:45		52	81	158	308	58	106	176	443	334	751
07:00		69	80			68	95				
07:15		93	73			59	79				
07:30		128	71			93	75				
07:45		127	48	417	272	86	67	306	316	723	588
08:00		133	85			74	51				
08:15		130	67			90	32				
08:30		111	58			70	46				
08:45		95	44	469	254	69	62	303	191	772	445
09:00		114	46			73	39				
09:15		118	45			95	32				
09:30		81	28			84	36				
09:45		94	40	407	159	82	19	334	126	741	285
10:00		98	25			87	20				
10:15		104	13			100	21				
10:30		105	12			100	24				
10:45		76	25	383	75	103	27	390	92	773	167
11:00		115	12			101	13				
11:15		118	19			96	12				
11:30		122	6			98	9				
11:45		99	8	454	45	89	4	384	38	838	83
Total		2410	3686			2018	3944			4428	7630
Combined Total		6096				5962				12058	
Percentage	0.0%										
Total		4902	7472			4103	7801			9005	15273
Percent		39.6%	60.4%			34.5%	65.5%			37.1%	62.9%
ADT		ADT 12,139		AADT 12,139							

Transportation Data Corporation

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N/S: Hillside Avenue
E/W: West Street
City, State: Needham, MA
Client: McM/Leina Xu

File Name : 05377A
Site Code : Y1998611
Start Date : 1/5/2021

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	2	3	1	0	0	23	6	0	7	3	0	2	3	31	0	0	81
07:15 AM	2	3	2	0	1	20	12	0	13	1	1	1	4	36	2	1	99
07:30 AM	0	8	2	2	4	32	11	2	13	6	2	0	1	32	3	2	120
07:45 AM	2	6	8	5	4	53	17	0	13	3	2	4	6	49	3	0	175
Total	6	20	13	7	9	128	46	2	46	13	5	7	14	148	8	3	475
08:00 AM	1	12	0	0	5	37	26	0	14	14	3	1	1	49	2	0	165
08:15 AM	1	8	4	0	2	39	16	0	19	8	2	2	6	64	1	2	174
08:30 AM	1	11	1	4	3	43	24	0	16	13	4	1	2	52	2	0	177
08:45 AM	8	15	1	1	9	29	28	0	17	8	4	1	6	46	3	0	176
Total	11	46	6	5	19	148	94	0	66	43	13	5	15	211	8	2	692
Grand Total	17	66	19	12	28	276	140	2	112	56	18	12	29	359	16	5	1167
Apprch %	14.9	57.9	16.7	10.5	6.3	61.9	31.4	0.4	56.6	28.3	9.1	6.1	7.1	87.8	3.9	1.2	
Total %	1.5	5.7	1.6	1	2.4	23.7	12	0.2	9.6	4.8	1.5	1	2.5	30.8	1.4	0.4	
Cars & Peds	16	66	18	12	28	267	139	2	111	56	15	12	28	346	16	5	1137
% Cars & Peds	94.1	100	94.7	100	100	96.7	99.3	100	99.1	100	83.3	100	96.6	96.4	100	100	97.4
Trucks & Buses																	
% Trucks & Buses	5.9	0	5.3	0	0	3.3	0.7	0	0.9	0	16.7	0	3.4	3.6	0	0	2.6
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	12	0	0	13	5	37	26	0	68	14	**14**	3	1	32	1	49	2	0	52	165
08:15 AM	1	8	**4**	0	13	2	39	16	0	57	**19**	8	2	**2**	31	**6**	**64**	1	**2**	**73**	174
08:30 AM	1	11	1	**4**	17	3	**43**	24	0	**70**	16	13	**4**	1	**34**	2	52	2	0	56	**177**
08:45 AM	**8**	**15**	1	1	**25**	**9**	29	**28**	0	66	17	8	4	1	30	6	46	**3**	0	55	176
Total Volume	11	46	6	5	68	19	148	94	0	261	66	43	13	5	127	15	211	8	2	236	692
% App. Total	16.2	67.6	8.8	7.4		7.3	56.7	36	0		52	33.9	10.2	3.9		6.4	89.4	3.4	0.8		
PHF	.344	.767	.375	.313	.680	.528	.860	.839	.000	.932	.868	.768	.813	.625	.934	.625	.824	.667	.250	.808	.977
Cars & Peds	10	46	6	5	67	19	144	94	0	257	66	43	10	5	124	15	203	8	2	228	676
% Cars & Peds	90.9	100	100	100	98.5	100	97.3	100	0	98.5	100	100	76.9	100	97.6	100	96.2	100	100	96.6	97.7
Trucks & Buses	1	0	0	0	1	0	4	0	0	4	0	0	3	0	3	0	8	0	0	8	16
% Trucks & Buses	9.1	0	0	0	1.5	0	2.7	0	0	1.5	0	0	23.1	0	2.4	0	3.8	0	0	3.4	2.3
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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N/S: Hillside Avenue
E/W: West Street
City, State: Needham, MA
Client: McM/Leina Xu

File Name : 05377A
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

Groups Printed- Cars & Peds

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	2	3	1	0	0	22	5	0	6	3	0	2	3	28	0	0	75
07:15 AM	2	3	2	0	1	20	12	0	13	1	1	1	4	35	2	1	98
07:30 AM	0	8	2	2	4	31	11	2	13	6	2	0	1	32	3	2	119
07:45 AM	2	6	7	5	4	50	17	0	13	3	2	4	5	48	3	0	169
Total	6	20	12	7	9	123	45	2	45	13	5	7	13	143	8	3	461
08:00 AM	1	12	0	0	5	37	26	0	14	14	2	1	1	46	2	0	161
08:15 AM	1	8	4	0	2	38	16	0	19	8	2	2	6	61	1	2	170
08:30 AM	1	11	1	4	3	42	24	0	16	13	3	1	2	50	2	0	173
08:45 AM	7	15	1	1	9	27	28	0	17	8	3	1	6	46	3	0	172
Total	10	46	6	5	19	144	94	0	66	43	10	5	15	203	8	2	676
Grand Total	16	66	18	12	28	267	139	2	111	56	15	12	28	346	16	5	1137
Apprch %	14.3	58.9	16.1	10.7	6.4	61.2	31.9	0.5	57.2	28.9	7.7	6.2	7.1	87.6	4.1	1.3	
Total %	1.4	5.8	1.6	1.1	2.5	23.5	12.2	0.2	9.8	4.9	1.3	1.1	2.5	30.4	1.4	0.4	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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	12	0	0	13	5	37	26	0	68	14	**14**	2	1	31	1	46	2	0	49	161
08:15 AM	1	8	**4**	0	13	2	38	16	0	56	**19**	8	2	**2**	31	**6**	**61**	1	**2**	**70**	170
08:30 AM	1	11	1	**4**	17	3	**42**	24	0	**69**	16	13	**3**	1	**33**	2	50	2	0	54	**173**
08:45 AM	**7**	**15**	1	1	**24**	**9**	27	**28**	0	64	17	8	3	1	29	6	46	**3**	0	55	172
Total Volume	10	46	6	5	67	19	144	94	0	257	66	43	10	5	124	15	203	8	2	228	676
% App. Total	14.9	68.7	9	7.5		7.4	56	36.6	0		53.2	34.7	8.1	4		6.6	89	3.5	0.9		
PHF	.357	.767	.375	.313	.698	.528	.857	.839	.000	.931	.868	.768	.833	.625	.939	.625	.832	.667	.250	.814	.977

Transportation Data Corporation

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N/S: Hillside Avenue
E/W: West Street
City, State: Needham, MA
Client: McM/Leina Xu

File Name : 05377A
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

Groups Printed- Trucks & Buses

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	1	1	0	1	0	0	0	0	3	0	0	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	1	0	0	3	0	0	0	0	0	0	1	1	0	0	6
Total	0	0	1	0	0	5	1	0	1	0	0	0	1	5	0	0	14
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	4
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
08:30 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0	0	4
08:45 AM	1	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	4
Total	1	0	0	0	0	4	0	0	0	0	3	0	0	8	0	0	16
Grand Total	1	0	1	0	0	9	1	0	1	0	3	0	1	13	0	0	30
Apprch %	50	0	50	0	0	90	10	0	25	0	75	0	7.1	92.9	0	0	
Total %	3.3	0	3.3	0	0	30	3.3	0	3.3	0	10	0	3.3	43.3	0	0	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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 07:45 AM																					
07:45 AM	0	0	**1**	0	**1**	0	**3**	0	0	**3**	0	0	0	0	0	**1**	1	0	0	2	**6**
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**3**	0	0	**3**	4
08:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
08:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	4
Total Volume	0	0	1	0	1	0	5	0	0	5	0	0	2	0	2	1	9	0	0	10	18
% App. Total	0	0	100	0		0	100	0	0		0	0	100	0		10	90	0	0		
PHF	.000	.000	.250	.000	.250	.000	.417	.000	.000	.417	.000	.000	.500	.000	.500	.250	.750	.000	.000	.833	.750

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File Name : 05377A
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

Groups Printed- Bikes by Direction

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	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	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

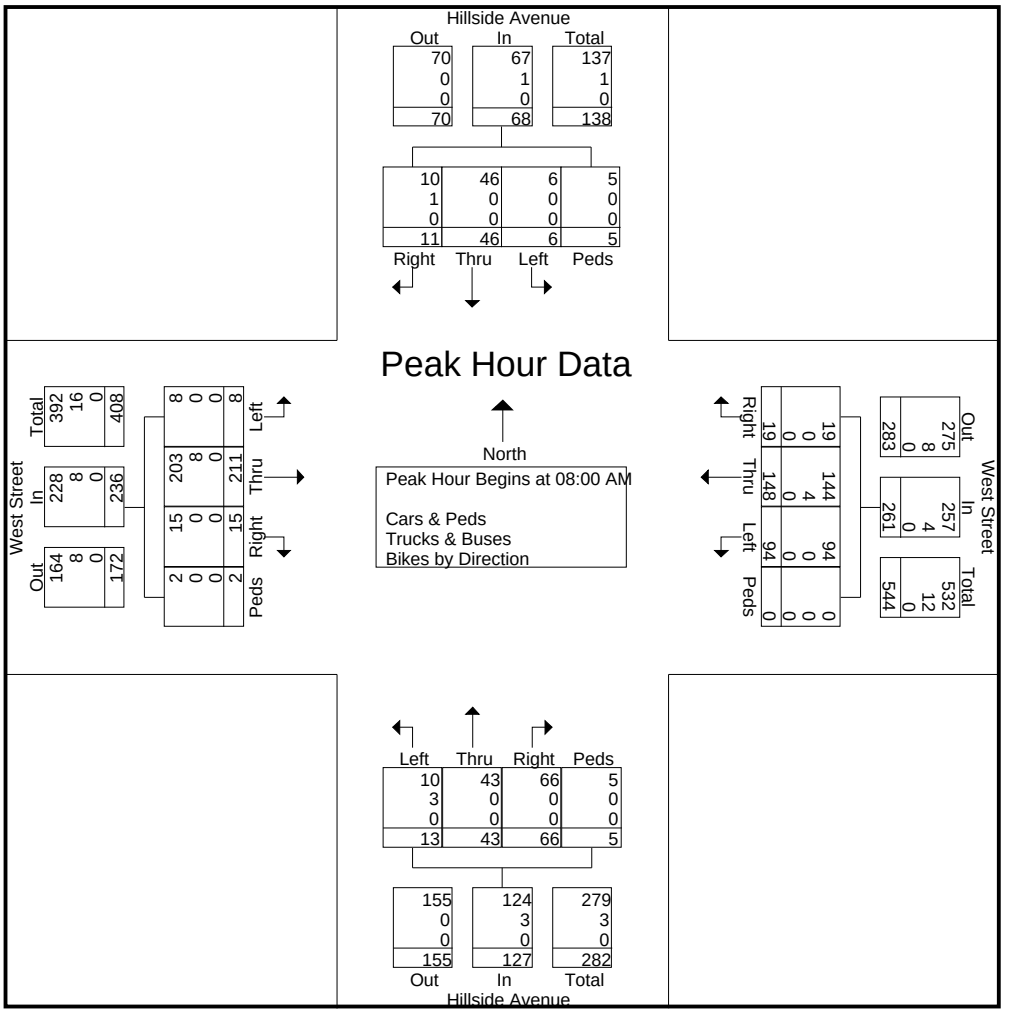
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Client: McM/Leina Xu

File Name : 05377A
Site Code : Y1998611
Start Date : 1/5/2021
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	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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	12	0	0	13	5	37	26	0	68	14	**14**	3	1	32	1	49	2	0	52	165
08:15 AM	1	8	**4**	0	13	2	39	16	0	57	**19**	8	2	**2**	31	**6**	**64**	1	**2**	**73**	174
08:30 AM	1	11	1	**4**	17	3	**43**	24	0	**70**	16	13	**4**	1	**34**	2	52	2	0	56	**177**
08:45 AM	**8**	**15**	1	1	**25**	**9**	29	**28**	0	66	17	8	4	1	30	6	46	**3**	0	55	176
Total Volume	11	46	6	5	68	19	148	94	0	261	66	43	13	5	127	15	211	8	2	236	692
% App. Total	16.2	67.6	8.8	7.4		7.3	56.7	36	0		52	33.9	10.2	3.9		6.4	89.4	3.4	0.8		
PHF	.344	.767	.375	.313	.680	.528	.860	.839	.000	.932	.868	.768	.813	.625	.934	.625	.824	.667	.250	.808	.977
Cars & Peds	10	46	6	5	67	19	144	94	0	257	66	43	10	5	124	15	203	8	2	228	676
% Cars & Peds	90.9	100	100	100	98.5	100	97.3	100	0	98.5	100	100	76.9	100	97.6	100	96.2	100	100	96.6	97.7
Trucks & Buses	1	0	0	0	1	0	4	0	0	4	0	0	3	0	3	0	8	0	0	8	16
% Trucks & Buses	9.1	0	0	0	1.5	0	2.7	0	0	1.5	0	0	23.1	0	2.4	0	3.8	0	0	3.4	2.3
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Hillside Avenue
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City, State: Needham, MA
Client: McM/Leina Xu

File Name : 05377AA
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	1	5	6	4	9	43	18	2	26	12	5	3	5	41	0	2	182
04:15 PM	0	13	2	1	4	43	15	0	16	8	0	0	3	38	2	0	145
04:30 PM	1	11	1	0	1	35	13	0	28	12	1	1	4	53	1	0	162
04:45 PM	2	12	2	0	2	32	22	0	31	13	2	0	1	44	1	0	164
Total	4	41	11	5	16	153	68	2	101	45	8	4	13	176	4	2	653
05:00 PM	2	7	3	1	4	44	19	0	20	7	3	1	2	46	1	0	160
05:15 PM	4	8	3	0	5	46	11	0	15	9	3	0	2	27	3	0	136
05:30 PM	5	13	2	5	2	48	16	1	11	7	3	1	7	33	1	0	155
05:45 PM	2	9	3	1	8	44	13	0	12	11	3	1	4	35	0	2	148
Total	13	37	11	7	19	182	59	1	58	34	12	3	15	141	5	2	599
Grand Total	17	78	22	12	35	335	127	3	159	79	20	7	28	317	9	4	1252
Apprch %	13.2	60.5	17.1	9.3	7	67	25.4	0.6	60	29.8	7.5	2.6	7.8	88.5	2.5	1.1	
Total %	1.4	6.2	1.8	1	2.8	26.8	10.1	0.2	12.7	6.3	1.6	0.6	2.2	25.3	0.7	0.3	
Cars & Peds	17	78	22	12	35	333	127	3	159	79	20	7	28	316	9	4	1249
% Cars & Peds	100	100	100	100	100	99.4	100	100	100	100	100	100	100	99.7	100	100	99.8
Trucks & Buses																	
% Trucks & Buses	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0.3	0	0	0.2
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	1	5	**6**	**4**	**16**	**9**	**43**	18	**2**	**72**	26	12	**5**	**3**	**46**	**5**	41	0	**2**	48	**182**
04:15 PM	0	**13**	2	1	16	4	43	15	0	62	16	8	0	0	24	3	38	**2**	0	43	145
04:30 PM	1	11	1	0	13	1	35	13	0	49	28	12	1	1	42	4	**53**	1	0	**58**	162
04:45 PM	**2**	12	2	0	16	2	32	**22**	0	56	**31**	**13**	2	0	46	1	44	1	0	46	164
Total Volume	4	41	11	5	61	16	153	68	2	239	101	45	8	4	158	13	176	4	2	195	653
% App. Total	6.6	67.2	18	8.2		6.7	64	28.5	0.8		63.9	28.5	5.1	2.5		6.7	90.3	2.1	1		
PHF	.500	.788	.458	.313	.953	.444	.890	.773	.250	.830	.815	.865	.400	.333	.859	.650	.830	.500	.250	.841	.897
Cars & Peds	4	41	11	5	61	16	152	68	2	238	101	45	8	4	158	13	175	4	2	194	651
% Cars & Peds	100	100	100	100	100	100	99.3	100	100	99.6	100	100	100	100	100	100	99.4	100	100	99.5	99.7
Trucks & Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Trucks & Buses	0	0	0	0	0	0	0.7	0	0	0.4	0	0	0	0	0	0	0.6	0	0	0.5	0.3
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : 05377AA
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

Groups Printed- Cars & Peds

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	1	5	6	4	9	43	18	2	26	12	5	3	5	41	0	2	182
04:15 PM	0	13	2	1	4	43	15	0	16	8	0	0	3	37	2	0	144
04:30 PM	1	11	1	0	1	34	13	0	28	12	1	1	4	53	1	0	161
04:45 PM	2	12	2	0	2	32	22	0	31	13	2	0	1	44	1	0	164
Total	4	41	11	5	16	152	68	2	101	45	8	4	13	175	4	2	651
05:00 PM	2	7	3	1	4	43	19	0	20	7	3	1	2	46	1	0	159
05:15 PM	4	8	3	0	5	46	11	0	15	9	3	0	2	27	3	0	136
05:30 PM	5	13	2	5	2	48	16	1	11	7	3	1	7	33	1	0	155
05:45 PM	2	9	3	1	8	44	13	0	12	11	3	1	4	35	0	2	148
Total	13	37	11	7	19	181	59	1	58	34	12	3	15	141	5	2	598
Grand Total	17	78	22	12	35	333	127	3	159	79	20	7	28	316	9	4	1249
Apprch %	13.2	60.5	17.1	9.3	7	66.9	25.5	0.6	60	29.8	7.5	2.6	7.8	88.5	2.5	1.1	
Total %	1.4	6.2	1.8	1	2.8	26.7	10.2	0.2	12.7	6.3	1.6	0.6	2.2	25.3	0.7	0.3	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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 04:00 PM																					
04:00 PM	1	5	**6**	**4**	**16**	**9**	**43**	18	**2**	**72**	26	12	**5**	**3**	**46**	**5**	41	0	**2**	48	**182**
04:15 PM	0	**13**	2	1	16	4	43	15	0	62	16	8	0	0	24	3	37	**2**	0	42	144
04:30 PM	1	11	1	0	13	1	34	13	0	48	28	12	1	1	42	4	**53**	1	0	**58**	161
04:45 PM	**2**	12	2	0	16	2	32	**22**	0	56	**31**	**13**	2	0	46	1	44	1	0	46	164
Total Volume	4	41	11	5	61	16	152	68	2	238	101	45	8	4	158	13	175	4	2	194	651
% App. Total	6.6	67.2	18	8.2		6.7	63.9	28.6	0.8		63.9	28.5	5.1	2.5		6.7	90.2	2.1	1		
PHF	.500	.788	.458	.313	.953	.444	.884	.773	.250	.826	.815	.865	.400	.333	.859	.650	.825	.500	.250	.836	.894

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Groups Printed- Trucks & Buses

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	66.7	0	0	0	0	0	0	0	33.3	0	0	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
04:30 PM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.750

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File Name : 05377AA
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Start Date : 1/5/2021
Page No : 1

Groups Printed- Bikes by Direction

	Hillside Avenue From North				West Street From East				Hillside Avenue From South				West Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	App. Total	Right			Peds	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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

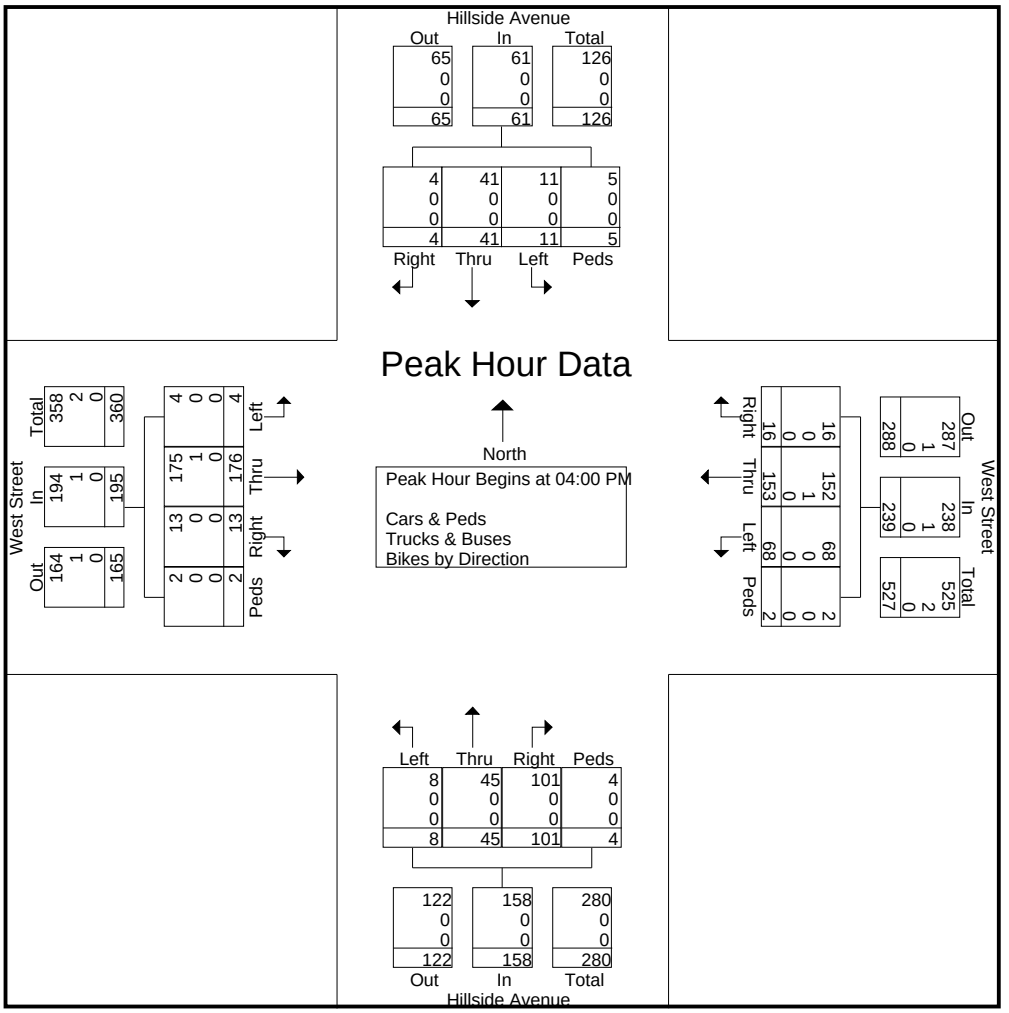
Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Hillside Avenue
E/W: West Street
City, State: Needham, MA
Client: McM/Leina Xu

File Name : 05377AA
Site Code : Y1998611
Start Date : 1/5/2021
Page No : 1

	Hillside Avenue From North					West Street From East					Hillside Avenue From South					West Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:00 PM																					
04:00 PM	1	5	**6**	**4**	**16**	**9**	**43**	18	**2**	**72**	26	12	**5**	**3**	**46**	**5**	41	0	**2**	48	**182**
04:15 PM	0	**13**	2	1	16	4	43	15	0	62	16	8	0	0	24	3	38	**2**	0	43	145
04:30 PM	1	11	1	0	13	1	35	13	0	49	28	12	1	1	42	4	**53**	1	0	**58**	162
04:45 PM	**2**	12	2	0	16	2	32	**22**	0	56	**31**	**13**	2	0	46	1	44	1	0	46	164
Total Volume	4	41	11	5	61	16	153	68	2	239	101	45	8	4	158	13	176	4	2	195	653
% App. Total	6.6	67.2	18	8.2		6.7	64	28.5	0.8		63.9	28.5	5.1	2.5		6.7	90.3	2.1	1		
PHF	.500	.788	.458	.313	.953	.444	.890	.773	.250	.830	.815	.865	.400	.333	.859	.650	.830	.500	.250	.841	.897
Cars & Peds	4	41	11	5	61	16	152	68	2	238	101	45	8	4	158	13	175	4	2	194	651
% Cars & Peds	100	100	100	100	100	100	99.3	100	100	99.6	100	100	100	100	100	100	99.4	100	100	99.5	99.7
Trucks & Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Trucks & Buses	0	0	0	0	0	0	0.7	0	0	0.4	0	0	0	0	0	0	0.6	0	0	0.5	0.3
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



APPENDIX B

Seasonal Adjustment Data

SEASONAL ADJUSTMENT DATA

The Residence at Carter Mill

Needham, MA

MassDOT Continuous Count Station					December	% Above
ID	**Town**	**Roadway**	**Year**	**AADT**	**ADT**	**AADT**
4165	Newton	Yankee Division Highway	2014	145,000	139,000	-4%

APPENDIX C

Crash Summary

CRASH ANALYSIS

The Residence at Carter Mill
Needham, MA

	West Street at Highland Avenue	West Street at Hillside Avenue	West Street at Avery Square/ Site Driveway	Highland Avenue at Morton Street/ Site Driveway
Year				
2013	5	5	2	2
2014	10	8	0	1
2015	7	12	1	0
2016	3	9	1	1
2017	5	10	2	1
Type				
Angle	10	36	4	0
Rear-end	9	3	1	3
Sideswipe	9	0	0	1
Head-on	0	1	0	0
Single Vehicle	2	3	1	1
Unknown	0	1	0	0
Severity				
Property Damage	25	26	6	2
Personal Injury	4	15	0	3
Fatality	0	0	0	0
Unknown	1	3	0	0
Weather				
Clear	24	34	5	4
Cloudy	3	8	0	1
Rain	2	1	1	0
Snow	1	1	0	0
Time				
7:00 AM to 9:00 AM	4	2	0	0
9:00 AM to 4:00 PM	17	32	3	3
4:00 PM to 6:00 PM	4	4	0	0
6:00 PM to 7:00 AM	5	6	3	2
Total	**30**	**44**	**6**	**5**
Crash Rate	0.77	2.11	0.34	0.21
State Average	0.78	0.57	0.57	0.57
District 6 Average	0.71	0.52	0.52	0.52

Source: MassDOT

APPENDIX D

Traffic Projection Model

TRAFFIC PROJECTION MODEL

Weekday Morning Peak Hour
The Residence at Carter Mill
Needham, MA

Intersection	Dir.	Turn	2019 Counted Volumes	2021 Counted Volumes	Seasonal /COVID Adjustment	Existing Volumes	Background Growth 7 yrs (at 1% per year)	2026 No Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2026 Build Volumes
West Street at	EB	L	189		8	197	14	211		0	20%	3	3	214
Highland Avenue		T	196		8	204	15	219		0	10%	2	2	221
		R	28		1	29	2	31		0		0	0	31
	WB	L	35		1	36	3	39	5%	1		0	1	40
		T	168		7	175	13	188	10%	2		0	2	190
		R	51		2	53	4	57		0		0	0	57
	NB	L	28		1	29	2	31		0		0	0	31
		T	413		17	430	31	461		0	15%	2	2	463
		R	52		2	54	4	58		0	5%	1	1	59
	SB	L	23		1	24	2	26		0		0	0	26
		T	255		10	265	19	284	15%	2		0	2	286
		R	86		3	89	6	95	20%	3		0	3	98
West Street at	EB	L		8	4	12	1	13		0		0	0	13
Hillside Avenue		T		211	99	310	22	332	15%	2		0	2	334
(Counted 2021)		R		15	7	22	2	24		0		0	0	24
	WB	L		94	48	142	10	152		0	5%	1	1	153
		T		148	74	222	16	238		0	15%	2	2	240
		R		19	10	29	2	31		0	5%	1	1	32
	NB	L		13	7	20	1	21		0		0	0	21
		T		43	21	64	5	69		0		0	0	69
		R		66	31	97	7	104	5%	1		0	1	105
	SB	L		6	3	9	1	10	5%	1		0	1	11
		T		46	22	68	5	73		0		0	0	73
		R		11	6	17	1	18		0		0	0	18
West Street at	EB	T	400		16	416	30	446		0		0	0	446
Site Driveway/Avery Square		R	0		0	0	0	0	25%	4		0	4	4
	WB	L	1		0	1	0	1	30%	5		0	5	6
		T	281		11	292	21	313		0		0	0	313
	NB	L	2		0	2	0	2		0	25%	4	4	6
		R	0		0	0	0	0		0	30%	5	5	5
	SB	L	13		1	14	1	15		0		0	0	15
		T	0		0	0	0	0		0		0	0	0
		R	95		4	99	7	106		0		0	0	106
Highland Avenue at	EB	L	0		0	0	0	0		0	20%	3	3	3
Site Driveway/Morton Street		T	0		0	0	0	0		0		0	0	0
		R	1		0	1	0	1		0	25%	4	4	5
	WB	L	8		0	8	1	9		0		0	0	9
		T	0		0	0	0	0		0		0	0	0
		R	9		0	9	1	10		0		0	0	10
	NB	L	0		0	0	0	0	25%	4		0	4	4
		T	472		20	492	36	528		0		0	0	528
		R	26		1	27	2	29		0		0	0	29
	SB	L	5		0	5	0	5		0		0	0	5
		T	291		12	303	24	327		0		0	0	327
		R	0		0	0	0	0	20%	3		0	3	3

Peak Hour: 7:45 AM - 8:45 AM

TRAFFIC PROJECTION MODEL

Weekday Afternoon Peak Hour
The Residence at Carter Mill
Needham, MA

Intersection	Dir.	Turn	2019 Counted Volumes	2021 Counted Volumes	Seasonal /COVID Adjustment	Existing Volumes	Background Growth 7 yrs (at 1% per year)	2026 No Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2026 Build Volumes
West Street at	EB	L	154		6	160	12	172		0	20%	5	5	177
Highland Avenue		T	208		8	216	16	232		0	10%	2	2	234
		R	45		2	47	3	50		0		0	0	50
	WB	L	61		2	63	5	68	5%	1		0	1	69
		T	139		6	145	10	155	10%	2		0	2	157
		R	54		2	56	4	60		0		0	0	60
	NB	L	23		1	24	2	26		0		0	0	26
		T	345		14	359	26	385		0	15%	4	4	389
		R	47		2	49	4	53		0	5%	1	1	54
	SB	L	30		1	31	2	33		0		0	0	33
		T	438		18	456	33	489	15%	3		0	3	492
		R	71		3	74	5	79	20%	4		0	4	83
West Street at	EB	L		4	2	6	0	6		0		0	0	6
Hillside Avenue		T		176	74	250	18	268	15%	3		0	3	271
(Counted 2021)		R		13	5	18	1	19		0		0	0	19
	WB	L		68	26	94	7	101		0	5%	1	1	102
		T		153	57	210	15	225		0	15%	4	4	229
		R		16	6	22	1	23		0	5%	1	1	24
	NB	L		8	3	11	1	12		0		0	0	12
		T		45	18	63	5	68		0		0	0	68
		R		101	42	143	11	154	5%	1		0	1	155
	SB	L		11	5	16	1	17	5%	1		0	1	18
		T		41	16	57	4	61		0		0	0	61
		R		4	2	6	0	6		0		0	0	6
West Street at	EB	T	394		15	409	30	439		0		0	0	439
Site Driveway/Avery Square		R	0		0	0	0	0	25%	5		0	5	5
	WB	L	0		0	0	0	0	30%	6		0	6	6
		T	233		10	243	17	260		0		0	0	260
	NB	L	1		0	1	0	1		0	25%	6	6	7
		R	0		0	0	0	0		0	30%	7	7	7
	SB	L	13		1	14	1	15		0		0	0	15
		T	0		0	0	0	0		0		0	0	0
		R	79		3	82	6	88		0		0	0	88
Highland Avenue at	EB	L	0		0	0	0	0		0	20%	5	5	5
Site Driveway/Morton Street		T	0		0	0	0	0		0		0	0	0
		R	0		0	0	0	0		0	25%	6	6	6
	WB	L	6		0	6	0	6		0		0	0	6
		T	1		0	1	0	1		0		0	0	1
		R	9		0	9	1	10		0		0	0	10
	NB	L	1		0	1	0	1	25%	5		0	5	6
		T	379		17	396	31	427		0		0	0	427
		R	23		1	24	2	26		0		0	0	26
	SB	L	16		1	17	1	18		0		0	0	18
		T	526		21	547	40	587		0		0	0	587
		R	2		0	2	0	2	20%	4		0	4	6

Peak Hour: 4:30 PM - 5:30 PM

APPENDIX E

Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.(1) By definition, capacity represents "the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions." The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Such measures include "speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

---

(1) *Transportation Research Board, Highway Capacity Manual, 6th Edition, published by the Transportation Research Board, Washington, DC, 2016.*

Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

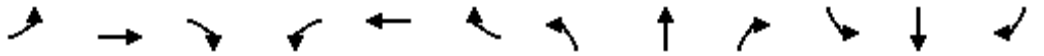
At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	$\leq$ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX F

2019 Existing Capacity/Level-of-Service Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	204	29	36	175	53	29	430	54	24	265	89
Future Volume (vph)	197	204	29	36	175	53	29	430	54	24	265	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1807	0	1805	1820	0	0	1803	0	0	1759	0
Flt Permitted	0.270			0.608				0.963			0.943	
Satd. Flow (perm)	493	1807	0	1155	1820	0	0	1742	0	0	1664	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	243	0	41	262	0	0	583	0	0	398	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	15.0	45.0		30.0	30.0		45.0	45.0		45.0	45.0	
Total Split (%)	13.4%	40.2%		26.8%	26.8%		40.2%	40.2%		40.2%	40.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	35.1	35.1		19.3	19.3			37.1			37.1	
Actuated g/C Ratio	0.36	0.36		0.20	0.20			0.38			0.38	
v/c Ratio	0.67	0.38		0.18	0.74			0.89			0.64	
Control Delay	39.0	28.5		38.2	52.8			49.2			33.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	39.0	28.5		38.2	52.8			49.2			33.2	

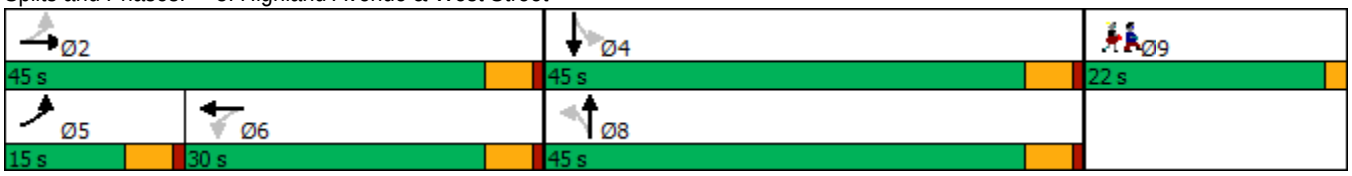
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	D			D			C	
Approach Delay		33.3			50.8			49.2			33.2	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	107	129		24	172			374			223	
Queue Length 95th (ft)	#185	198		54	251			#600			352	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	308	777		310	489			749			715	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.67	0.31		0.13	0.54			0.78			0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 98.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 41.7		Intersection LOS: D	
Intersection Capacity Utilization 70.4%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	15.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	12	310	22	142	222	29	20	64	97	9	68	17
Future Vol, veh/h	12	310	22	142	222	29	20	64	97	9	68	17
Conflicting Peds, #/hr	5	0	5	5	0	5	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	92	92	92	66	66	66
Heavy Vehicles, %	0	4	0	0	3	0	23	0	0	0	0	9
Mvmt Flow	15	378	27	153	239	31	22	70	105	14	103	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	275	0	0	410	0	0	1054	1008	397	1075	1006	262
Stage 1	-	-	-	-	-	-	427	427	-	566	566	-
Stage 2	-	-	-	-	-	-	627	581	-	509	440	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.33	6.5	6.2	7.1	6.5	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.707	4	3.3	3.5	4	3.381
Pot Cap-1 Maneuver	1300	-	-	1160	-	-	186	242	657	199	243	760
Stage 1	-	-	-	-	-	-	566	589	-	513	511	-
Stage 2	-	-	-	-	-	-	438	503	-	550	581	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1294	-	-	1154	-	-	94	199	654	106	200	755
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	199	-	106	200	-
Stage 1	-	-	-	-	-	-	555	577	-	503	429	-
Stage 2	-	-	-	-	-	-	270	422	-	400	569	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.1	49.5	52.1
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	1294	-	-	1154	-	-	210
HCM Lane V/C Ratio	0.742	0.011	-	-	0.132	-	-	0.678
HCM Control Delay (s)	49.5	7.8	0	-	8.6	0	-	52.1
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	5.3	0	-	-	0.5	-	-	4.2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	416	0	1	292	0	2	0	0	14	0	99
Future Vol, veh/h	0	416	0	1	292	0	2	0	0	14	0	99
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	50	50	50	75	75	75
Heavy Vehicles, %	2	4	2	0	3	2	0	2	2	0	2	0
Mvmt Flow	0	438	0	1	356	0	4	0	0	19	0	132

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	441	0	0	869	799	441	796	799	360
Stage 1	-	-	-	-	-	-	441	441	-	358	358	-
Stage 2	-	-	-	-	-	-	428	358	-	438	441	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1130	-	0	274	319	616	307	319	689
Stage 1	0	-	-	-	-	0	599	577	-	664	628	-
Stage 2	0	-	-	-	-	0	609	628	-	601	577	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1127	-	-	220	318	614	307	318	686
Mov Cap-2 Maneuver	-	-	-	-	-	-	220	318	-	307	318	-
Stage 1	-	-	-	-	-	-	599	575	-	664	627	-
Stage 2	-	-	-	-	-	-	489	627	-	601	575	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	21.7	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	220	-	-	1127	-	595
HCM Lane V/C Ratio	0.018	-	-	0.001	-	0.253
HCM Control Delay (s)	21.7	-	-	8.2	0	13.1
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1

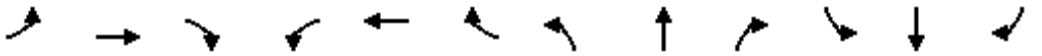
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	1	8	0	9	0	492	27	5	303	0
Future Vol, veh/h	0	0	1	8	0	9	0	492	27	5	303	0
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	0	0	2	11	2	3	0	0	4	2
Mvmt Flow	0	0	4	11	0	13	0	631	35	6	340	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1011	1025	344	1006	1008	652	344	0	0	669	0	0
Stage 1	356	356	-	652	652	-	-	-	-	-	-	-
Stage 2	655	669	-	354	356	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.2	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.3	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	218	235	703	222	240	452	1215	-	-	931	-	-
Stage 1	661	629	-	460	464	-	-	-	-	-	-	-
Stage 2	455	456	-	667	629	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	231	700	219	236	451	1210	-	-	928	-	-
Mov Cap-2 Maneuver	210	231	-	219	236	-	-	-	-	-	-	-
Stage 1	658	621	-	459	463	-	-	-	-	-	-	-
Stage 2	442	455	-	658	621	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	18	0	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1210	-	-	700	301	928	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.08	0.006	-	-
HCM Control Delay (s)	0	-	-	10.2	18	8.9	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	216	47	63	145	56	24	359	49	31	456	74
Future Volume (vph)	160	216	47	63	145	56	24	359	49	31	456	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1849	0	1805	1785	0	0	1841	0	0	1802	0
Flt Permitted	0.307			0.576				0.950			0.959	
Satd. Flow (perm)	566	1849	0	1094	1785	0	0	1755	0	0	1733	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	302	0	73	234	0	0	485	0	0	603	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	
Total Split (s)	13.0	43.0		30.0	30.0		47.0	47.0		47.0	47.0	
Total Split (%)	11.6%	38.4%		26.8%	26.8%		42.0%	42.0%		42.0%	42.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)	32.1	32.1		18.2	18.2			38.4			38.4	
Actuated g/C Ratio	0.33	0.33		0.19	0.19			0.40			0.40	
v/c Ratio	0.63	0.49		0.36	0.70			0.70			0.88	
Control Delay	39.4	32.2		43.0	51.4			33.3			45.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	39.4	32.2		43.0	51.4			33.3			45.7	

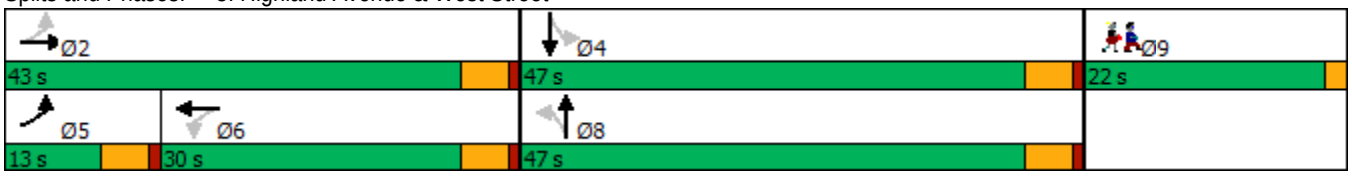
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	D			C			D	
Approach Delay		34.9			49.4			33.3			45.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	97	170		44	152			270			373	
Queue Length 95th (ft)	151	244		84	223			420			#636	
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								
Base Capacity (vph)	291	773		301	491			811			801	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.63	0.39		0.24	0.48			0.60			0.75	

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 97.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 40.3		Intersection LOS: D	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	9.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	250	18	94	210	22	11	63	143	16	57	6
Future Vol, veh/h	6	250	18	94	210	22	11	63	143	16	57	6
Conflicting Peds, #/hr	5	0	4	4	0	5	2	0	2	2	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	301	22	111	247	26	13	75	170	18	65	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	278	0	0	327	0	0	850	830	318	938	828	267
Stage 1	-	-	-	-	-	-	330	330	-	487	487	-
Stage 2	-	-	-	-	-	-	520	500	-	451	341	-
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	1296	-	-	1244	-	-	283	308	727	247	309	777
Stage 1	-	-	-	-	-	-	687	649	-	566	554	-
Stage 2	-	-	-	-	-	-	543	546	-	592	642	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	1239	-	-	209	271	723	135	272	772
Mov Cap-2 Maneuver	-	-	-	-	-	-	209	271	-	135	272	-
Stage 1	-	-	-	-	-	-	679	642	-	559	493	-
Stage 2	-	-	-	-	-	-	417	486	-	396	635	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.4	23.3	29.5
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	449	1290	-	-	1239	-	-	235
HCM Lane V/C Ratio	0.575	0.006	-	-	0.089	-	-	0.382
HCM Control Delay (s)	23.3	7.8	0	-	8.2	0	-	29.5
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	3.5	0	-	-	0.3	-	-	1.7

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	409	0	0	243	0	1	0	0	14	0	82
Future Vol, veh/h	0	409	0	0	243	0	1	0	0	14	0	82
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	25	25	25	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	0	2	2	0	2	0
Mvmt Flow	0	470	0	0	308	0	4	0	0	17	0	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	472	0	0	830	780	473	779	780	308
Stage 1	-	-	-	-	-	-	472	472	-	308	308	-
Stage 2	-	-	-	-	-	-	358	308	-	471	472	-
Critical Hdwy	-	-	-	4.12	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1090	-	0	292	327	591	316	327	737
Stage 1	0	-	-	-	-	0	576	559	-	706	660	-
Stage 2	0	-	-	-	-	0	664	660	-	577	559	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1088	-	-	252	326	589	316	326	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	326	-	316	326	-
Stage 1	-	-	-	-	-	-	576	558	-	706	660	-
Stage 2	-	-	-	-	-	-	574	660	-	576	558	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.5	12.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	252	-	-	1088	-	617
HCM Lane V/C Ratio	0.016	-	-	-	-	0.19
HCM Control Delay (s)	19.5	-	-	0	-	12.2
HCM Lane LOS	C	-	-	A	-	B
HCM 95th %tile Q(veh)	0	-	-	0	-	0.7

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	6	1	9	1	396	24	17	547	2
Future Vol, veh/h	0	0	0	6	1	9	1	396	24	17	547	2
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	0	0	0	1	0	6	1	0
Mvmt Flow	0	0	0	8	1	13	1	508	31	19	615	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1196	1216	621	1196	1202	544	622	0	0	555	0	0
Stage 1	659	659	-	542	542	-	-	-	-	-	-	-
Stage 2	537	557	-	654	660	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	163	181	487	164	186	543	969	-	-	996	-	-
Stage 1	453	461	-	528	523	-	-	-	-	-	-	-
Stage 2	528	512	-	459	463	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	153	172	485	158	177	533	964	-	-	981	-	-
Mov Cap-2 Maneuver	153	172	-	158	177	-	-	-	-	-	-	-
Stage 1	450	445	-	520	515	-	-	-	-	-	-	-
Stage 2	512	504	-	446	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	19.9	0	0.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	964	-	-	-	264	981	-	-
HCM Lane V/C Ratio	0.001	-	-	-	0.085	0.019	-	-
HCM Control Delay (s)	8.7	0	-	0	19.9	8.7	0	-
HCM Lane LOS	A	A	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1	-	-

APPENDIX G

2026 No Build Capacity/Level-of-Service Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	219	31	39	188	57	31	461	58	26	284	95
Future Volume (vph)	211	219	31	39	188	57	31	461	58	26	284	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		130
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1809	0	1805	1820	0	0	1803	0	0	1825	1524
Flt Permitted	0.233			0.599				0.965			0.918	
Satd. Flow (perm)	426	1809	0	1138	1820	0	0	1745	0	0	1682	1524
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	260	0	45	282	0	0	625	0	0	326	100
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	11.0
Total Split (s)	15.0	45.0		30.0	30.0		45.0	45.0		45.0	45.0	15.0
Total Split (%)	13.4%	40.2%		26.8%	26.8%		40.2%	40.2%		40.2%	40.2%	13.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead			Lag	Lag							Lead
Lead-Lag Optimize?	Yes			Yes	Yes							Yes
Recall Mode	None	None		None	None		Min	Min		Min	Min	None
Act Effct Green (s)	35.6	35.6		20.2	20.2			40.0			40.0	51.7
Actuated g/C Ratio	0.35	0.35		0.20	0.20			0.39			0.39	0.51
v/c Ratio	0.79	0.41		0.20	0.79			0.92			0.50	0.13
Control Delay	48.9	29.1		38.4	56.4			52.5			29.5	9.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	48.9	29.1		38.4	56.4			52.5			29.5	9.4

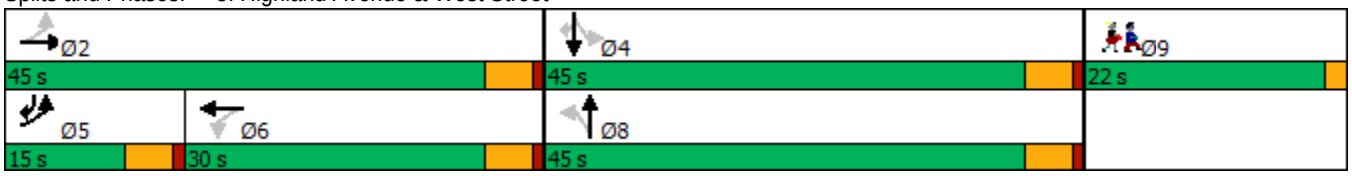
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	E			D			C	A
Approach Delay		38.2			53.9			52.5			24.8	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	116	139		26	188			426			177	19
Queue Length 95th (ft)	#193	213		58	272			#665			278	40
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								130
Base Capacity (vph)	279	726		285	456			700			674	769
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.79	0.36		0.16	0.62			0.89			0.48	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 102.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 42.7		Intersection LOS: D	
Intersection Capacity Utilization 87.6%		ICU Level of Service E	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	26

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	332	24	152	238	31	21	69	104	10	73	18
Future Vol, veh/h	13	332	24	152	238	31	21	69	104	10	73	18
Conflicting Peds, #/hr	5	0	5	5	0	5	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	92	92	92	66	66	66
Heavy Vehicles, %	0	4	0	0	3	0	23	0	0	0	0	9
Mvmt Flow	16	405	29	163	256	33	23	75	113	15	111	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	439	0	0	1127	1077	425	1150	1075	280
Stage 1	-	-	-	-	-	-	457	457	-	604	604	-
Stage 2	-	-	-	-	-	-	670	620	-	546	471	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.33	6.5	6.2	7.1	6.5	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.707	4	3.3	3.5	4	3.381
Pot Cap-1 Maneuver	1279	-	-	1132	-	-	165	221	634	177	221	742
Stage 1	-	-	-	-	-	-	545	571	-	489	491	-
Stage 2	-	-	-	-	-	-	414	483	-	526	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1273	-	-	1127	-	-	69	178	631	84	178	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	178	-	84	178	-
Stage 1	-	-	-	-	-	-	533	558	-	478	404	-
Stage 2	-	-	-	-	-	-	239	398	-	367	551	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.2	89	82.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	226	1273	-	-	1127	-	-	182
HCM Lane V/C Ratio	0.933	0.012	-	-	0.145	-	-	0.841
HCM Control Delay (s)	89	7.9	0	-	8.7	0	-	82.6
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	8	0	-	-	0.5	-	-	6

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	446	0	1	313	0	2	0	0	15	0	106
Future Vol, veh/h	0	446	0	1	313	0	2	0	0	15	0	106
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	50	50	50	75	75	75
Heavy Vehicles, %	2	4	2	0	3	2	0	2	2	0	2	0
Mvmt Flow	0	469	0	1	382	0	4	0	0	20	0	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	472	0	0	931	856	472	853	856	386
Stage 1	-	-	-	-	-	-	472	472	-	384	384	-
Stage 2	-	-	-	-	-	-	459	384	-	469	472	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1100	-	0	249	295	592	281	295	666
Stage 1	0	-	-	-	-	0	576	559	-	643	611	-
Stage 2	0	-	-	-	-	0	586	611	-	579	559	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1097	-	-	194	294	590	281	294	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	294	-	281	294	-
Stage 1	-	-	-	-	-	-	576	557	-	643	610	-
Stage 2	-	-	-	-	-	-	459	610	-	579	557	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	23.9	13.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	194	-	-	1097	-	567
HCM Lane V/C Ratio	0.021	-	-	0.001	-	0.285
HCM Control Delay (s)	23.9	-	-	8.3	0	13.9
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1.2

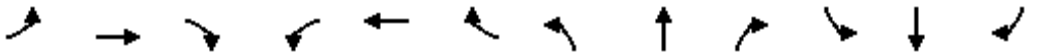
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	9	0	10	0	528	29	5	327	0
Future Vol, veh/h	0	0	1	9	0	10	0	528	29	5	327	0
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	0	0	2	11	2	3	0	0	4	2
Mvmt Flow	0	0	4	13	0	14	0	677	37	6	367	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1086	1100	371	1080	1082	699	371	0	0	717	0	0
Stage 1	383	383	-	699	699	-	-	-	-	-	-	-
Stage 2	703	717	-	381	383	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.2	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.3	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	194	212	679	197	217	425	1188	-	-	893	-	-
Stage 1	640	612	-	434	442	-	-	-	-	-	-	-
Stage 2	428	434	-	645	612	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	186	209	676	194	214	424	1183	-	-	890	-	-
Mov Cap-2 Maneuver	186	209	-	194	214	-	-	-	-	-	-	-
Stage 1	637	605	-	433	441	-	-	-	-	-	-	-
Stage 2	414	433	-	636	605	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	19.7	0	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1183	-	-	676	272	890	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.098	0.006	-	-
HCM Control Delay (s)	0	-	-	10.4	19.7	9.1	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-



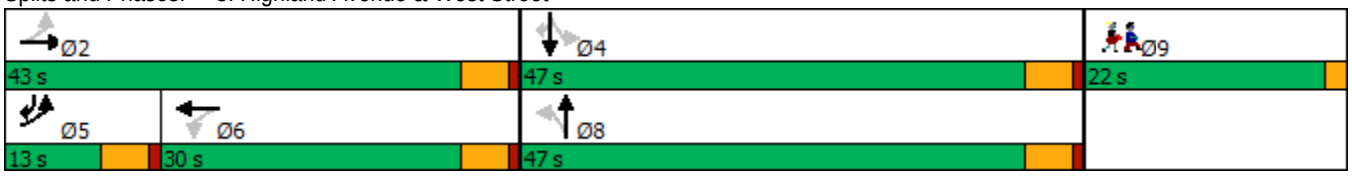
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	232	50	68	155	60	26	385	53	33	489	79
Future Volume (vph)	172	232	50	68	155	60	26	385	53	33	489	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		130
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1851	0	1805	1785	0	0	1840	0	0	1842	1524
Flt Permitted	0.266			0.564				0.805			0.949	
Satd. Flow (perm)	491	1851	0	1072	1785	0	0	1485	0	0	1754	1524
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	324	0	79	250	0	0	522	0	0	561	85
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	11.0
Total Split (s)	13.0	43.0		30.0	30.0		47.0	47.0		47.0	47.0	13.0
Total Split (%)	11.6%	38.4%		26.8%	26.8%		42.0%	42.0%		42.0%	42.0%	11.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead			Lag	Lag							Lead
Lead-Lag Optimize?	Yes			Yes	Yes							Yes
Recall Mode	None	None		None	None		Min	Min		Min	Min	None
Act Effct Green (s)	32.2	32.2		18.9	18.9			42.9			42.9	52.4
Actuated g/C Ratio	0.32	0.32		0.19	0.19			0.42			0.42	0.51
v/c Ratio	0.77	0.55		0.40	0.76			0.84			0.76	0.11
Control Delay	50.9	34.0		44.3	55.2			43.3			36.3	9.0
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	50.9	34.0		44.3	55.2			43.3			36.3	9.0

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	E			D			D	A
Approach Delay		40.4			52.6			43.3			32.7	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	106	186		48	164			330			338	15
Queue Length 95th (ft)	#187	263		90	237			#564			#563	35
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								130
Base Capacity (vph)	256	705		268	447			625			738	783
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.77	0.46		0.29	0.56			0.84			0.76	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 101.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	268	19	101	225	23	12	68	154	17	61	6
Future Vol, veh/h	6	268	19	101	225	23	12	68	154	17	61	6
Conflicting Peds, #/hr	5	0	4	4	0	5	2	0	2	2	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	323	23	119	265	27	14	81	183	19	69	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	297	0	0	350	0	0	910	888	341	1005	886	286
Stage 1	-	-	-	-	-	-	353	353	-	522	522	-
Stage 2	-	-	-	-	-	-	557	535	-	483	364	-
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	1276	-	-	1220	-	-	258	285	706	222	286	758
Stage 1	-	-	-	-	-	-	668	634	-	542	534	-
Stage 2	-	-	-	-	-	-	518	527	-	569	627	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1270	-	-	1215	-	-	182	248	702	111	249	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	248	-	111	249	-
Stage 1	-	-	-	-	-	-	661	627	-	535	469	-
Stage 2	-	-	-	-	-	-	386	463	-	363	620	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.4	29.2	36.5
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	418	1270	-	-	1215	-	-	207
HCM Lane V/C Ratio	0.666	0.006	-	-	0.098	-	-	0.461
HCM Control Delay (s)	29.2	7.9	0	-	8.3	0	-	36.5
HCM Lane LOS	D	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	4.7	0	-	-	0.3	-	-	2.2

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	439	0	0	260	0	1	0	0	15	0	88
Future Vol, veh/h	0	439	0	0	260	0	1	0	0	15	0	88
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	25	25	25	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	0	2	2	0	2	0
Mvmt Flow	0	505	0	0	329	0	4	0	0	18	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	507	0	0	890	836	508	835	836	329
Stage 1	-	-	-	-	-	-	507	507	-	329	329	-
Stage 2	-	-	-	-	-	-	383	329	-	506	507	-
Critical Hdwy	-	-	-	4.12	-	-	7.1	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.5	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1058	-	0	266	303	565	289	303	717
Stage 1	0	-	-	-	-	0	552	539	-	688	646	-
Stage 2	0	-	-	-	-	0	644	646	-	552	539	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1056	-	-	226	302	563	289	302	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	302	-	289	302	-
Stage 1	-	-	-	-	-	-	552	538	-	688	646	-
Stage 2	-	-	-	-	-	-	548	646	-	551	538	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	21.2	12.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	226	-	-	1056	-	590
HCM Lane V/C Ratio	0.018	-	-	-	-	0.213
HCM Control Delay (s)	21.2	-	-	0	-	12.7
HCM Lane LOS	C	-	-	A	-	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0.8

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	6	1	10	1	427	26	18	587	2
Future Vol, veh/h	0	0	0	6	1	10	1	427	26	18	587	2
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	0	0	0	1	0	6	1	0
Mvmt Flow	0	0	0	8	1	14	1	547	33	20	660	2

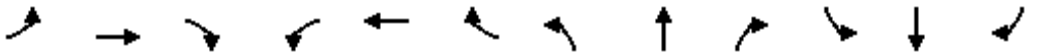
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1283	1304	666	1283	1289	584	667	0	0	596	0	0
Stage 1	706	706	-	582	582	-	-	-	-	-	-	-
Stage 2	577	598	-	701	707	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.5	6.2	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	142	160	459	143	165	515	932	-	-	961	-	-
Stage 1	427	439	-	502	502	-	-	-	-	-	-	-
Stage 2	502	491	-	433	441	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	132	151	457	137	156	505	928	-	-	946	-	-
Mov Cap-2 Maneuver	132	151	-	137	156	-	-	-	-	-	-	-
Stage 1	424	422	-	493	493	-	-	-	-	-	-	-
Stage 2	484	483	-	419	424	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	21.4	0	0.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	928	-	-	-	243	946	-	-
HCM Lane V/C Ratio	0.001	-	-	-	0.099	0.021	-	-
HCM Control Delay (s)	8.9	0	-	0	21.4	8.9	0	-
HCM Lane LOS	A	A	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1	-	-

APPENDIX H

2026 Build Capacity/Level-of-Service Analysis



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	221	31	40	190	57	31	463	59	26	286	98
Future Volume (vph)	214	221	31	40	190	57	31	463	59	26	286	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		130
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1736	1809	0	1805	1820	0	0	1803	0	0	1825	1524
Flt Permitted	0.229			0.597				0.965			0.918	
Satd. Flow (perm)	418	1809	0	1134	1820	0	0	1745	0	0	1682	1524
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.87	0.87	0.87	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	3%	4%	0%	1%	0%	4%	4%	0%	0%	4%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	262	0	46	284	0	0	628	0	0	328	103
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	11.0
Total Split (s)	15.0	45.0		30.0	30.0		45.0	45.0		45.0	45.0	15.0
Total Split (%)	13.4%	40.2%		26.8%	26.8%		40.2%	40.2%		40.2%	40.2%	13.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead			Lag	Lag							Lead
Lead-Lag Optimize?	Yes			Yes	Yes							Yes
Recall Mode	None	None		None	None		Min	Min		Min	Min	None
Act Effct Green (s)	35.6	35.6		20.3	20.3			40.3			40.3	52.0
Actuated g/C Ratio	0.35	0.35		0.20	0.20			0.39			0.39	0.51
v/c Ratio	0.81	0.42		0.21	0.79			0.92			0.50	0.13
Control Delay	51.4	29.2		38.5	56.9			52.6			29.6	9.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	51.4	29.2		38.5	56.9			52.6			29.6	9.4

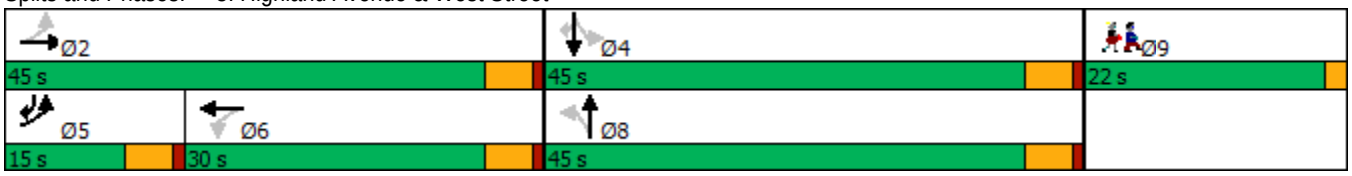
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	E			D			C	A
Approach Delay		39.4			54.4			52.6			24.8	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	117	140		27	189			429			178	20
Queue Length 95th (ft)	#202	215		58	274			#671			279	41
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								130
Base Capacity (vph)	276	722		283	454			696			671	771
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.81	0.36		0.16	0.63			0.90			0.49	0.13

Intersection Summary

Area Type: Other
Cycle Length: 112
Actuated Cycle Length: 102.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 43.1 Intersection LOS: D
Intersection Capacity Utilization 88.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	27.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	334	24	153	240	32	21	69	105	11	73	18
Future Vol, veh/h	13	334	24	153	240	32	21	69	105	11	73	18
Conflicting Peds, #/hr	5	0	5	5	0	5	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	92	92	92	66	66	66
Heavy Vehicles, %	0	4	0	0	3	0	23	0	0	0	0	9
Mvmt Flow	16	407	29	165	258	34	23	75	114	17	111	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	297	0	0	441	0	0	1135	1086	427	1158	1083	282
Stage 1	-	-	-	-	-	-	459	459	-	610	610	-
Stage 2	-	-	-	-	-	-	676	627	-	548	473	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.33	6.5	6.2	7.1	6.5	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.33	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.707	4	3.3	3.5	4	3.381
Pot Cap-1 Maneuver	1276	-	-	1130	-	-	163	218	632	175	219	740
Stage 1	-	-	-	-	-	-	544	570	-	485	488	-
Stage 2	-	-	-	-	-	-	411	479	-	524	562	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1270	-	-	1125	-	-	68	175	629	82	176	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	175	-	82	176	-
Stage 1	-	-	-	-	-	-	532	557	-	474	400	-
Stage 2	-	-	-	-	-	-	235	393	-	365	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.1	92.6	89.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	224	1270	-	-	1125	-	-	178
HCM Lane V/C Ratio	0.946	0.012	-	-	0.146	-	-	0.868
HCM Control Delay (s)	92.6	7.9	0	-	8.7	0	-	89.3
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	8.2	0	-	-	0.5	-	-	6.3

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	446	4	6	313	0	6	0	5	15	0	106
Future Vol, veh/h	0	446	4	6	313	0	6	0	5	15	0	106
Conflicting Peds, #/hr	0	0	3	3	0	0	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	82	82	82	92	92	92	75	75	75
Heavy Vehicles, %	2	4	2	2	3	2	2	2	2	0	2	0
Mvmt Flow	0	469	4	7	382	0	7	0	5	20	0	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	476	0	0	945	870	474	870	872	386
Stage 1	-	-	-	-	-	-	474	474	-	396	396	-
Stage 2	-	-	-	-	-	-	471	396	-	474	476	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1086	-	0	242	290	590	274	289	666
Stage 1	0	-	-	-	-	0	571	558	-	633	604	-
Stage 2	0	-	-	-	-	0	573	604	-	575	557	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1083	-	-	188	287	588	270	286	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	188	287	-	270	286	-
Stage 1	-	-	-	-	-	-	571	556	-	633	599	-
Stage 2	-	-	-	-	-	-	446	599	-	570	555	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	18.8	14
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	272	-	-	1083	-	562
HCM Lane V/C Ratio	0.044	-	-	0.007	-	0.287
HCM Control Delay (s)	18.8	-	-	8.3	0	14
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	1.2

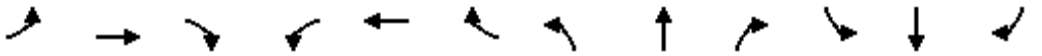
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	0	5	9	0	10	4	528	29	5	327	3
Future Vol, veh/h	3	0	5	9	0	10	4	528	29	5	327	3
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	3	3	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	2	11	2	3	0	0	4	2
Mvmt Flow	3	0	5	13	0	14	5	677	37	6	367	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1098	1112	373	1092	1095	699	374	0	0	717	0	0
Stage 1	385	385	-	709	709	-	-	-	-	-	-	-
Stage 2	713	727	-	383	386	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.31	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.399	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	190	209	673	194	214	425	1184	-	-	893	-	-
Stage 1	638	611	-	428	437	-	-	-	-	-	-	-
Stage 2	423	429	-	644	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	181	204	670	190	209	424	1179	-	-	890	-	-
Mov Cap-2 Maneuver	181	204	-	190	209	-	-	-	-	-	-	-
Stage 1	631	604	-	424	433	-	-	-	-	-	-	-
Stage 2	406	425	-	634	603	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	19.9	0.1	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1179	-	-	333	268	890	-	-
HCM Lane V/C Ratio	0.004	-	-	0.026	0.1	0.006	-	-
HCM Control Delay (s)	8.1	0	-	16.1	19.9	9.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	234	50	69	157	60	26	389	54	33	492	83
Future Volume (vph)	177	234	50	69	157	60	26	389	54	33	492	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	175		0	0		0	0		130
Storage Lanes	1		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1752	1851	0	1805	1785	0	0	1840	0	0	1842	1524
Flt Permitted	0.262			0.563				0.799			0.949	
Satd. Flow (perm)	483	1851	0	1070	1785	0	0	1474	0	0	1754	1524
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		180			604			813			295	
Travel Time (s)		4.1			13.7			18.5			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.89	0.89	0.89	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	0%	0%	2%	2%	9%	1%	0%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	326	0	80	253	0	0	527	0	0	564	89
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		6	6		8	8		4	4	5
Switch Phase												
Minimum Initial (s)	5.0	6.0		6.0	6.0		10.0	10.0		10.0	10.0	5.0
Minimum Split (s)	11.0	11.0		11.0	11.0		15.0	15.0		15.0	15.0	11.0
Total Split (s)	13.0	43.0		30.0	30.0		47.0	47.0		47.0	47.0	13.0
Total Split (%)	11.6%	38.4%		26.8%	26.8%		42.0%	42.0%		42.0%	42.0%	11.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	5.0
Lead/Lag	Lead			Lag	Lag							Lead
Lead-Lag Optimize?	Yes			Yes	Yes							Yes
Recall Mode	None	None		None	None		Min	Min		Min	Min	None
Act Effct Green (s)	32.3	32.3		19.1	19.1			42.9			42.9	52.4
Actuated g/C Ratio	0.32	0.32		0.19	0.19			0.42			0.42	0.51
v/c Ratio	0.80	0.56		0.40	0.76			0.85			0.77	0.11
Control Delay	53.6	34.0		44.4	55.5			44.9			36.7	9.1
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	53.6	34.0		44.4	55.5			44.9			36.7	9.1

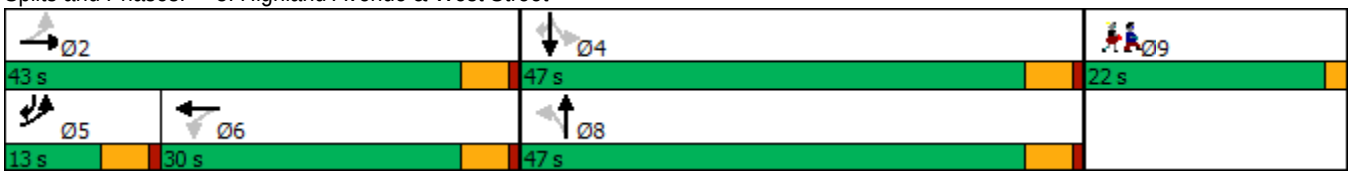
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	20%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	C		D	E			D			D	A
Approach Delay		41.5			52.8			44.9			32.9	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	109	187		49	166			337			342	16
Queue Length 95th (ft)	#198	264		91	241			#574			#568	36
Internal Link Dist (ft)		100			524			733			215	
Turn Bay Length (ft)				175								130
Base Capacity (vph)	254	704		267	446			619			737	782
Starvation Cap Reductn	0	0		0	0			0			0	0
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.80	0.46		0.30	0.57			0.85			0.77	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 102			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 41.5		Intersection LOS: D	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Highland Avenue & West Street



Lane Group	Ø9
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Intersection	
Int Delay, s/veh	11.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	271	19	102	229	24	12	68	155	18	61	6
Future Vol, veh/h	6	271	19	102	229	24	12	68	155	18	61	6
Conflicting Peds, #/hr	5	0	4	4	0	5	2	0	2	2	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	85	85	85	84	84	84	88	88	88
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	327	23	120	269	28	14	81	185	20	69	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	302	0	0	354	0	0	920	899	345	1016	896	290
Stage 1	-	-	-	-	-	-	357	357	-	528	528	-
Stage 2	-	-	-	-	-	-	563	542	-	488	368	-
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	1270	-	-	1216	-	-	254	281	702	218	282	754
Stage 1	-	-	-	-	-	-	665	632	-	538	531	-
Stage 2	-	-	-	-	-	-	514	523	-	565	625	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1264	-	-	1211	-	-	178	244	698	108	244	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	178	244	-	108	244	-
Stage 1	-	-	-	-	-	-	658	625	-	532	466	-
Stage 2	-	-	-	-	-	-	381	459	-	359	618	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.4	30	38.7
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	414	1264	-	-	1211	-	-	200
HCM Lane V/C Ratio	0.676	0.006	-	-	0.099	-	-	0.483
HCM Control Delay (s)	30	7.9	0	-	8.3	0	-	38.7
HCM Lane LOS	D	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	4.8	0	-	-	0.3	-	-	2.4

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	439	5	6	260	0	7	0	7	15	0	88
Future Vol, veh/h	0	439	5	6	260	0	7	0	7	15	0	88
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	79	79	79	92	92	92	82	82	82
Heavy Vehicles, %	2	1	2	2	4	2	2	2	2	0	2	0
Mvmt Flow	0	505	6	8	329	0	8	0	8	18	0	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	513	0	0	909	855	511	858	858	329
Stage 1	-	-	-	-	-	-	510	510	-	345	345	-
Stage 2	-	-	-	-	-	-	399	345	-	513	513	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.3
Pot Cap-1 Maneuver	0	-	-	1052	-	0	256	296	563	279	294	717
Stage 1	0	-	-	-	-	0	546	538	-	675	636	-
Stage 2	0	-	-	-	-	0	627	636	-	548	536	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1050	-	-	216	293	561	273	291	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	293	-	273	291	-
Stage 1	-	-	-	-	-	-	546	537	-	675	630	-
Stage 2	-	-	-	-	-	-	528	630	-	540	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	17.1	12.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	312	-	-	1050	-	580
HCM Lane V/C Ratio	0.049	-	-	0.007	-	0.217
HCM Control Delay (s)	17.1	-	-	8.5	0	12.9
HCM Lane LOS	C	-	-	A	A	B
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0.8

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	6	6	1	10	6	427	26	18	587	6
Future Vol, veh/h	5	0	6	6	1	10	6	427	26	18	587	6
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	16	16	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	71	71	78	78	78	89	89	89
Heavy Vehicles, %	2	2	2	0	2	0	2	1	0	6	1	2
Mvmt Flow	5	0	7	8	1	14	8	547	33	20	660	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1300	1321	669	1303	1308	584	672	0	0	596	0	0
Stage 1	709	709	-	596	596	-	-	-	-	-	-	-
Stage 2	591	612	-	707	712	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.16	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.254	-	-
Pot Cap-1 Maneuver	138	157	458	139	159	515	919	-	-	961	-	-
Stage 1	425	437	-	494	492	-	-	-	-	-	-	-
Stage 2	493	484	-	429	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	127	147	456	130	149	505	915	-	-	946	-	-
Mov Cap-2 Maneuver	127	147	-	130	149	-	-	-	-	-	-	-
Stage 1	417	420	-	480	478	-	-	-	-	-	-	-
Stage 2	470	470	-	408	419	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.3	22.1	0.1	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	915	-	-	209	234	946	-	-
HCM Lane V/C Ratio	0.008	-	-	0.057	0.102	0.021	-	-
HCM Control Delay (s)	9	0	-	23.3	22.1	8.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

APPENDIX I

Capacity/Level-of-Service Analysis Summary

CAPACITY ANALYSIS SUMMARY

Weekday Morning Peak Hour
The Residence at Carter Mill
Needham, MA

			Existing			2026 No Build			2026 Build		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
West Street at	EB	L	D	39.0	0.67	D	48.9	0.79	D	51.4	0.81
Highland Avenue		TR	C	28.5	0.38	C	29.1	0.41	C	29.2	0.42
	WB	L	D	38.2	0.18	D	38.4	0.20	D	38.5	0.21
		TR	D	52.8	0.74	E	56.4	0.79	E	56.9	0.79
	NB	LTR	D	49.2	0.89	D	52.5	0.92	D	52.6	0.92
	SB	LT/R	C	33.2	0.64	C	29.5	0.50	C	29.6	0.50
		R	n/a	n/a	n/a	A	9.4	0.13	A	9.4	0.13
	Overall		*D*	*41.7*	*0.70*	*D*	*42.7*	*0.88*	*D*	*43.1*	*0.88*
West Street at	EB	LTR	A	0.3	0.01	A	0.3	0.01	A	0.3	0.01
Hillside Avenue	WB	LTR	A	3.1	0.13	A	3.2	0.15	A	3.1	0.15
	NB	LTR	E	49.5	0.74	F	89.0	0.93	F	92.6	0.95
	SB	LTR	F	52.1	0.68	F	82.6	0.84	F	89.3	0.87
West Street at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway/Avery Square	WB	LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01
	NB	LTR	C	21.7	0.02	C	23.9	0.02	C	18.8	0.04
	SB	LTR	B	13.1	0.25	B	13.9	0.29	B	14.0	0.29
Highland Avenue at	EB	LTR	B	10.2	0.01	B	10.4	0.01	C	16.1	0.03
Site Driveway/Morton Street	WB	LTR	C	18.0	0.08	C	19.7	0.10	C	19.9	0.10
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.00
	SB	LTR	A	0.1	0.01	A	0.1	0.01	A	0.1	0.01

(1) Level-of-Service
(2) Average vehicle delay in seconds
(3) Volume to capacity ratio
n/a Not Applicable

QUEUE SUMMARY

Weekday Morning Peak Hour
The Residence at Carter Mill
Needham, MA

			Existing		2026 No Build		2026 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
West Street at	EB	L	107	185	116	193	117	202
Highland Avenue		TR	129	198	139	213	140	215
	WB	L	24	54	26	58	27	58
		TR	172	251	188	272	189	274
	NB	LTR	374	600	426	665	429	671
	SB	LT/R	223	352	177	278	178	279
		R	n/a	n/a	19	40	20	41
West Street at	EB	LTR	n/a	0	n/a	0	n/a	0
Hillside Avenue	WB	LTR	n/a	13	n/a	13	n/a	13
	NB	LTR	n/a	133	n/a	200	n/a	205
	SB	LTR	n/a	105	n/a	150	n/a	158
West Street at	EB	TR	n/a	0	n/a	0	n/a	0
Site Driveway/Avery Square	WB	LT	n/a	0	n/a	0	n/a	0
	NB	LR	n/a	3	n/a	3	n/a	3
	SB	LTR	n/a	25	n/a	30	n/a	30
Highland Avenue at	EB	LTR	n/a	0	n/a	0	n/a	3
Site Driveway/Morton Street	WB	LTR	n/a	8	n/a	8	n/a	8
	NB	LTR	n/a	0	n/a	0	n/a	0
	SB	LTR	n/a	0	n/a	0	n/a	0

(1) 50th Percentile Queue Length (ft)
(2) 95th Percentile Queue Length (ft)
n/a Not Applicable

CAPACITY ANALYSIS SUMMARY

Weekday Afternoon Peak Hour
The Residence at Carter Mill
Needham, MA

			Existing			2026 No Build			2026 Build	
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
West Street at	EB	L	D	39.4	0.63	D	50.9	0.77	D	53.6	0.80
Highland Avenue		TR	C	32.2	0.49	C	34.0	0.55	C	34.0	0.56
	WB	L	D	43.0	0.36	D	44.3	0.40	D	44.4	0.40
		TR	D	51.4	0.70	E	55.2	0.76	E	55.5	0.76
	NB	LTR	C	33.3	0.70	D	43.3	0.84	D	44.9	0.85
	SB	LT/R	D	45.7	0.88	D	36.3	0.76	D	36.7	0.77
		R	n/a	n/a	n/a	A	9.0	0.11	A	9.1	0.11
	Overall		*D*	*40.3*	*0.71*	*D*	*40.7*	*0.79*	*D*	*41.5*	*0.80*
West Street at	EB	LTR	A	0.2	0.01	A	0.2	0.01	A	0.2	0.01
Hillside Avenue	WB	LTR	A	2.4	0.09	A	2.4	0.10	A	2.4	0.10
	NB	LTR	C	23.3	0.58	D	29.2	0.67	D	30.0	0.68
	SB	LTR	D	29.5	0.38	E	36.5	0.46	E	38.7	0.48
West Street at	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway/Avery Square	WB	LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01
	NB	LR	C	19.5	0.02	C	21.2	0.02	C	17.1	0.05
	SB	LTR	B	12.2	0.19	B	12.7	0.21	B	12.9	0.22
Highland Avenue at	EB	LTR	A	0.0	0.00	A	0.0	0.00	C	23.3	0.06
Site Driveway/Morton Street	WB	LTR	C	19.9	0.09	C	21.4	0.10	C	22.1	0.10
	NB	LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.01
	SB	LTR	A	0.3	0.02	A	0.3	0.02	A	0.3	0.02

(1) Level-of-Service
(2) Average vehicle delay in seconds
(3) Volume to capacity ratio
n/a Not Applicable

QUEUE SUMMARY

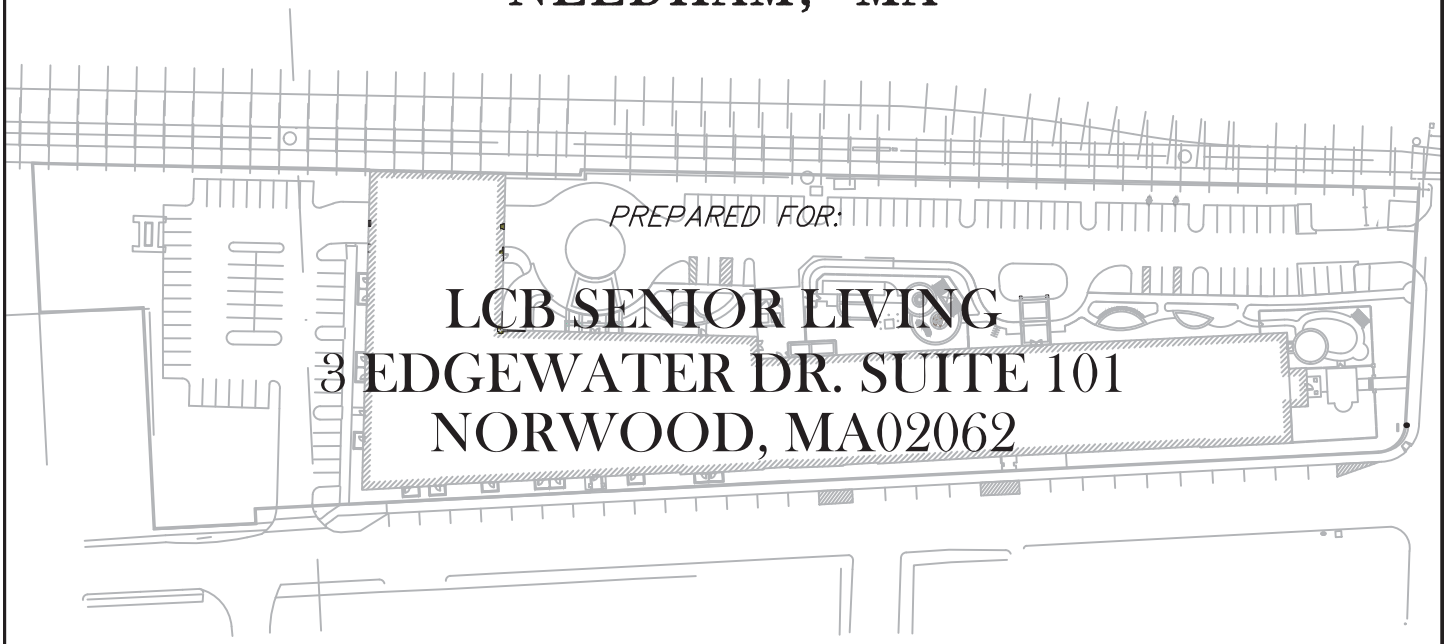
Weekday Afternoon Peak Hour
The Residence at Carter Mill
Needham, MA

			Existing		2026 No Build		2026 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
West Street at	EB	L	97	151	106	187	109	198
Highland Avenue		TR	170	244	186	263	187	264
	WB	L	44	84	48	90	49	91
		TR	152	223	164	237	166	241
	NB	LTR	270	420	330	564	337	574
	SB	LT/R	373	636	338	563	342	568
		R	n/a	n/a	15	35	16	36
West Street at	EB	LTR	n/a	0	n/a	0	n/a	0
Hillside Avenue	WB	LTR	n/a	8	n/a	8	n/a	8
	NB	LTR	n/a	88	n/a	118	n/a	120
	SB	LTR	n/a	43	n/a	55	n/a	60
West Street at	EB	TR	n/a	0	n/a	0	n/a	0
Site Driveway/Avery Square	WB	LT	n/a	0	n/a	0	n/a	0
	NB	LR	n/a	0	n/a	3	n/a	5
	SB	LTR	n/a	18	n/a	20	n/a	20
Highland Avenue at	EB	LTR	n/a	0	n/a	0	n/a	5
Site Driveway/Morton Street	WB	LTR	n/a	8	n/a	8	n/a	8
	NB	LTR	n/a	0	n/a	0	n/a	0
	SB	LTR	n/a	3	n/a	3	n/a	3

(1) 50th Percentile Queue Length (ft)
(2) 95th Percentile Queue Length (ft)
n/a Not Applicable

STORMWATER MANAGEMENT REPORT
02/25/2021

THE RESIDENCE AT CARTER MILL
100-110 WEST STREET
NEEDHAM, MA



PREPARED FOR:

LCB SENIOR LIVING
3 EDGEWATER DR. SUITE 101
NORWOOD, MA02062

PREPARED BY:

KELLY ENGINEERING GROUP
civil engineering consultants
0 Campanelli Drive, Braintree, MA 02184
Phone: 781-843-4333 www.kellyengineeringgroup.com

TABLE OF CONTENTS

Stormwater Letter

Stormwater Maintenance System Operation and Maintenance Plan & Long Term Pollution Prevention Plan

NPDES Requirements for Public Outreach Letter

KELLY ENGINEERING GROUP
civil engineering consultants

February 25, 2021

Town of Needham Planning Board
500 Dedham Ave.
Needham MA 02492
Attn: Lee Newman

Cc: Lee Bloom – LCB Senior Living
Anthony DelGaizo – Department of Public Works

Re: **Stormwater**
Special Permit & Site Plan Review
The Residence at Carter Mill
100-110 West St.
Needham, MA

Dear Members of the Board:

The existing site is serviced by a fully developed storm drainage system as shown on the existing conditions plan provided with this application. We have consulted with site maintenance personnel and town staff and are not aware of any drainage issues on the property. The applicant and our office has met with the Town of Needham Engineering Department and agreed the Needham Stormwater Bylaw Article 7 is not applicable to the proposed project. There is no increase to the existing building footprint. The renovations and floor areas in the garage and penthouse are not increasing the footprint of the building and are not considered an Addition. There is no change in impervious parking areas. The impervious area from the proposed 5 new parking spaces is balanced by removal of the existing garage entrance. There are 2,000 s.f. of additional sidewalks, patios, and other pedestrian areas which are not considered parking areas and therefore exempt from the Needham Stormwater Bylaw. Façade treatments, interior renovations, and less than 1,500 s.f. increase in parking area are exempt under section 7.4.2 of the Stormwater Bylaw.

As part of the Town of Needham DPW NPDES requirements, the applicant will comply with the Public Out Reach & Education and Public Participation & Involvement control measures. Attached is a letter to the DPW identifying the measures selected and dates by which the measures will be completed in order to incorporate it into the Planning Board's decision.

We look forward to presenting this project to you at your next scheduled meeting. If you have any questions or desire any additional information regarding this matter, please do not hesitate to call our office.

Sincerely,

KELLY ENGINEERING GROUP, INC.

Digitally signed by David Noel Kelly P.E.
DN: cn=David Noel Kelly P.E., o=Kelly Engineering GRoup, Inc., ou, email=dkelly@kellyemgoineeringgroup.com, c=US
Date: 2021.03.01 08:30:34 -05'00'

COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37942
REGISTERED PROFESSIONAL ENGINEER

David N. Kelly, P.E. President

0 Campanelli Drive – Braintree – MA 02184
Phone 781 843 4333 www.kellyengineeringgroup.com

THE RESIDENCE AT CARTER MILL
100-110 WEST STREET NEEDHAM, MA

STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN & LONG-TERM POLLUTION PREVENTION PLAN

02/25/2021

Prepared by:

KELLY ENGINEERING GROUP, INC.
Zero Campanelli Drive
Braintree, Massachusetts 02184

OWNER:
Welltower Inc.
4500 Dorr St.
Toldo, OH 43615

APPLICANT AND RESPONSIBLE PARTY:
LCB Senior Living
3 Edgewater Dr. Suite 101
Norwood, MA 02062

_____.
Lee Bloom

Note: If ownership of this property changes then the new owner becomes the responsible party. The Owner may assign responsibility to a tenant on the property.

Introduction

The stormwater management system consists of a number of Best Management Practices (BMP's). These BMP's combine to ensure that storm runoff from the site will not damage the sensitive environmental resources surrounding the site. In order to ensure that these BMP's operate as designed it is very important that the procedures in this operation and maintenance plan be followed. Most of these operation procedures require observation and measurement; however, at certain times more extensive maintenance measures may be needed. The following is an itemization of each of these BMP's and their maintenance needs.

The party responsible for maintenance should contract with a maintenance organization capable of performing the more extensive measures such as pumping of catch basin sumps, etc.

BMP No. 1 – Paved Road Surface:

- Regularly pick up and remove litter from the paved road surface and landscaped areas.
- The paved area is to be swept on a quarterly average, with sweeping scheduled primarily in spring and fall with a high efficiency vacuum sweeper or a regenerative air sweeper. If a mechanical sweeper is used, the paved area is to be swept on a monthly average.

BMP No. 2 - Deep Sump Catch Basins:

- Basins are to be inspected 4 times per year.

    1. Verify that tees are secure and free-flowing.
    2. Measure depth of sediment below water line.

- Basins are to be cleaned whenever sediment and hydrocarbons are observed. Basins are to be cleaned a minimum of twice per year. One of these cleanings shall occur before April 15th of each year and one shall occur before September 15th of each year. Basins may be cleaned either using a clamshell or a vacuum pump.
- All liquid shall be pumped from the sump of each basin at least once per year.
- All sediments and hydrocarbons should be properly handled and disposed of, in accordance with local, state and federal guidelines and regulations.

Note: See catch basin detail for explanation of terms.

Snow Removal:

- Road salts and de-icing materials shall be stored on impervious pads and covered to protect from wind and precipitation.
- There shall be no plowing or stock piling of snow within any resource areas and any area subject to the jurisdiction of local and state regulations without the prior written permission from state or local approving authority.
- No de-icing materials shall be stored nor used within all resource areas and any area subject to the jurisdiction of local and state regulations without the prior written permission from state or local approving authority.

Storage and Use of Chemicals:

- No pesticides, herbicides, nor insecticides shall be stored nor used within all resource areas and any area subject to the jurisdiction of local and state regulations without the prior written permission from state or local approving authority.

- Chemical storage on site shall be limited. Any chemicals that must be stored shall be stored in a secure area in accordance with Local and State regulations.

Hazardous Waste:

- Containment – In the event of a discharge or spill of oil or another hazardous material, outlets to stormwater management ponds shall be plugged so that hazardous material do not enter resource areas.

- Reporting - In the event of a discharge or spill of oil or another hazardous material, responsible facility personnel, oil spill and/or hazardous material removal organizations, federal, state, and local regulatory agencies, the Town of Needham Department of Public Works, and the EPA National Response Center 1-800-424-8802 shall be rapidly notified.

- Hazardous Waste – All hazardous waste materials will be disposed of in the manner specified by local, state and/or federal regulations and by the manufacturer of such products.

- There shall be no illicit discharges to the stormwater management system.

Training for Long Term Pollution Prevention Plan:

- All staff or personnel involved and responsible for implementing the Stormwater Management System Operations and Maintenance Plan and the Long-Term Pollution Prevention Plan shall be properly trained as required under the DEP Stormwater Management Regulations. Training shall be documented with records kept with other stormwater maintenance records.

Pet Waste Management:

- Pooper-scooper laws for pets shall be followed.

- Never dump pet waste into storm drains, catch basins, or the drainage system.

- Pet waste shall be scooped up and disposed of properly in the garbage.

Lawn and Garden activities:

- No pesticides, herbicides, nor insecticides shall be stored nor used within any resource areas its buffers, and any area subject to the jurisdiction of local and state regulations without the prior written permission from state or local approving authority.

- Fertilizers and pesticides shall be applied properly, sparingly, and outside any resource areas and its buffers.

  To reduce the impact of fertilizers, consider the following tips;

- Don't fertilize before a rain storm.

- Consider using organic fertilizers. They release nutrients more slowly.

- Test soils before applying fertilizers. Some soils may not need fertilizers. A standard soil test costs $9.00. (Call the UMass Extension Soil Testing Lab at 413-545-2311 or download a soil test order form at http://www.umass.edu/plsoils/soiltest/.)

February 25, 2021

Needham Planning Board
Needham Town Hall
500 Dedham Avenue
Needham, MA 02492
Attention: Lee Newman

RE: NPDES requirements
The Residence at Carter Mill
100-110 West St.
Needham, MA

Dear Members of the Board,

As part of the NPDES requirement for Control Measure #1: Public Education and Outreach, the applicant will place an advertisement in the local newspaper to encourage environmental awareness. This advertisement will be published prior to occupancy of the building.

As part of the NPDES requirement for Control Measure #2: Public Participation and Involvement, the catch basins will include a plaque with the words “NO DUMPING - DRAINS TO RIVER” by Almetek. These plaques will be installed at prior to occupancy of the building.

If you have any questions, please contact me.

Sincerely,

_____
Lee Bloom

Copy: Anthony DelGaizo, Town Engineer

TOWN OF NEEDHAM

DESIGN REVIEW BOARD

Public Service Administration Building
500 Dedham Avenue
Needham, MA 02492
Application and Report

Property Location: 100-110 West Street, Needham, MA *Date:* 1/29/21

Owner: Welltower Inc.

Address: 4500 Dorr Street (*Street*) Toledo (*City*) Ohio (*State*) 43615 (*Zip*)

Telephone: (419) 247-2800

Applicant: LCB Senior Living

Address: 3 Edgewater Drive, Suite 101 (*Street*) Norwood (*City*) MA (*State*) 02062 (*Zip*)

Telephone: (781) 619-9320

Designer/Installer: The Architectural Team, Inc.

Address: 50 Commandants Way (*Street*) Chelsea (*City*) MA (*State*) 02150 (*Zip*)

Telephone: (617) 889-4402

Type of Application
☐ Sign
☐ Minor Project
☐ Exterior Alterations
Major Project (Site Plan Review)
☐ - preliminary
☒ - final
☐ Flexible Subdivision
☐ Planned Residential Development
☐ Residential Compound

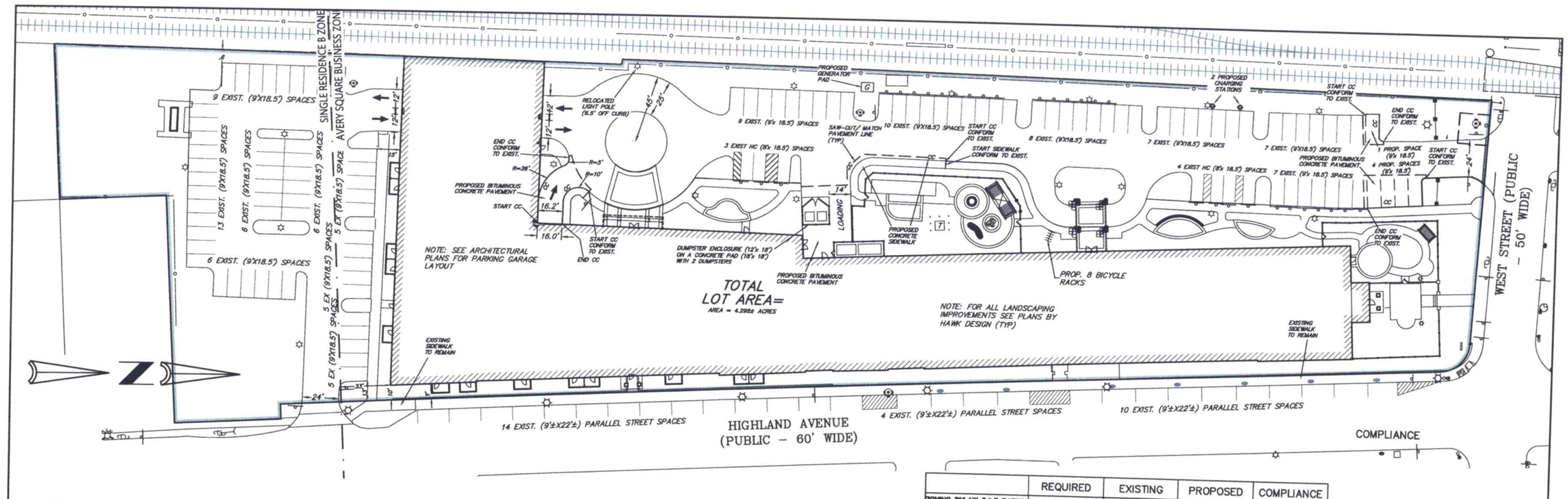
Brief description of sign or project:
See Exhibit A attached hereto.

Please email completed application to elitchman@needhamma.gov

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: M Gutterman
APPROVAL WITH CONDITIONS:

DISAPPROVAL:
DATE: 2.22.21

Revised 2/2020



ZONING LEGEND

ZONING DISTRICT: AVERY SQUARE BUSINESS DISTRICT/ SINGLE RESIDENCE B/ AVERY SQUARE OVERLAY DISTRICT
(DIMENSIONAL REQUIREMENTS PROVIDED FOR AVERY SQUARE BUSINESS DISTRICT AND ASOD)

	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
MIN. AREA	10,000 S.F.	187,219 S.F. (4.30 AC)	SAME	YES
MIN. FRONTAGE	80'	856'±	SAME	YES
MIN. SETBACK FRONT	10'	10'±	10'	YES (NOTE 1)
MIN. SETBACK SIDE (RESIDENTIAL DISTRICT)	50' (NOTE 1)	33'±	SAME	PRE-EXISTING NONCONFORMING
MIN. SETBACK SIDE	NA	0'±	SAME	YES
MIN. SETBACK REAR	NA	NA	SAME	YES
MAX. STORIES	4	3	4	YES
4TH FL. SETBACKS (NOTE 2)				
EAST FACADE	15'	NA	15' (NOTE 2)	YES
WEST FACADE	0'	NA	0' (NOTE 2)	YES
SOUTH FACADE	35'	NA	35' (NOTE 2)	YES
NORTH FACADE	110'	NA	110' (NOTE 2)	YES
4TH FL. AREA (NOTE 3)	35%	NA	APPROX. 32.9% (NOTE 3)	YES
MAX. HEIGHT	44' – 49' (NOTE 4)	41'–9" (NOTE 4)	44' & 49' (NOTE 4)	YES
LOT COVERAGE	NA (NOTE 5)	0.34	SAME	YES
FLOOR AREA RATIO	1.1 (NOTE 6)	1.00±	1.01	YES
PARKING TOTAL	149 (NOTE 7)	193	149 (NOTE 7)	YES
DRIVEWAY OPENINGS	18'–25' (TWO WAY)	24'	24'	YES

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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NOTE 1. YARD ASSUMPTIONS:
HIGHLAND AVE. AND WEST ST. ARE FRONT YARDS
MBTA RAIL AND SOUTH LOT LINE ARE SIDE YARDS
THERE ARE NO REAR YARDS

EXISTING BUILDING WILL REMAIN 10' FROM HIGHLAND AVE PROPERTY LINE. PROPOSED PATIOS ARE 3' FROM FRONT PROPERTY LINE, BUT ARE NOT CONSIDERED TO BE STRUCTURES.

THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.8.4, 50' SETBACK TO RESIDENTIAL DISTRICT

NOTE 2. SETBACKS ARE MEASURED FROM EXISTING BUILDING FACADE. (BYLAW SECTION 3.15.4.1) AS SHOWN ON THE ARCHITECTURAL PLANS, SETBACK DIMENSIONS VARY. PROPOSED SETBACKS ARE MINIMUMS.

NOTE 3. PER BYLAW SECTION 3.15.4.1 TOTAL FLOOR AREA OF THE 4TH FLOOR MAY NOT EXCEED 35% OF THE TOTAL ROOF AREA OF THE BUILDING. MECHANICAL EQUIPMENT IS NOT INCLUDED IN THE CALCULATION OF MAXIMUM ALLOWABLE FLOOR AREA. THE PROPOSED PERCENTAGE OF ROOF COVERAGE INCLUDES ROOF TERRACES. IF THOSE ARE EXCLUDED, THE PERCENTAGE OF ROOF COVERAGE IS APPROX. 25.3%

NOTE 4. EXISTING BUILDING HEIGHT OF 33±' TO TOP OF ROOF. 41'9" TO TOP OF HIGHEST POINT (MECHANICAL OR ELEVATOR OVERRIDE)

MAX ALLOWABLE BUILDING HEIGHT IS 44' TO TOP OF 4TH STORY AND ALL MECHANICALS OTHER THAN ELEVATOR OVERRIDE; 49' TO TOP OF ELEVATOR OVERRIDE. ACTUAL HEIGHTS ARE PLANNED TO BE SLIGHTLY LESS THAN MAX ALLOWABLE.

BUILDING HEIGHT WAS CALCULATED FROM THE AVERAGE GRADE PLANE OF THE EXISTING BUILDING OF 177.6±. THE PROPOSED 4TH STORY ELEVATION IS 221.6± THE PROPOSED ELEVATOR OVERRUN ELEVATION IS 226.6±.

NOTE 5. THE TOWN OF NEEDHAM ZONING BYLAW SECTION 4.4.2 (E) THERE IS NO LIMITATION ON LOT COVERAGE IN THE AVERY SQUARE BUSINESS DISTRICT OR THE AVERY SQUARE OVERLAY DISTRICT.

TOTAL BUILDING COVERAGE= 63,700 S.F./ 187,219 S.F.= 0.34

NOTE 6. FLOOR AREA RATIO:
EXISTING FAR = 186,300 S.F./187,219 S.F. = 1.00 FAR
PROPOSED FAR = 189,220 S.F./187,219 S.F. = 1.01 FAR

THE CALCULATION OF PROPOSED FAR DOES NOT INCLUDE UNDERGROUND PARKING, AS ALLOWED IN THE AVERY SQUARE OVERLAY DISTRICT.

THE APPLICABLE BYLAW DEFINITION OF FLOOR AREA EXCLUDES "UNENCLOSED PORCHES AND BALCONIES." THE FAR CALCULATION FOR THIS PROJECT DOES NOT INCLUDE THE AREA OF PROPOSED FIRST FLOOR PATIOS AND ROOF TERRACES, ALL OF WHICH WILL BE UNENCLOSED.

NOTE 7. REQUIRED PARKING:
72 INDEPENDENT LIVING UNITS X 1.0 SPACES/UNIT + 96 ASSISTED LIVING BEDS x 0.5 SPACES/ BEDS + 58± EMPLOYEES X 1 SPACE/2 EMPLOYEES ON LARGEST SHIFT
= 149 SPACES REQUIRED
(TOWN OF NEEDHAM ZONING BYLAW SECTION 3.15.5)

PROVIDED:
34 GARAGE SPACES & 115 EXTERIOR PARKING SPACES = 149 SPACES (EXCLUDES 28 PARALLEL PARKING SPACES ON HIGHLAND AVE. ADJACENT TO THE PROPERTY THAT CAN BE COUNTED AS OFF-STREET PARKING PURSUANT TO SECTION 5.1.1.7 OF THE BYLAW FOR A TOTAL PARKING SUPPLY OF 177 SPACES.)

	REQUIRED	EXISTING	PROPOSED	COMPLIANCE
ZONING BYLAW 5.1.3 PARKING PLAN AND DESIGN REQUIREMENTS				
A) PARKING ILLUMINATION	AVG 1 FOOT CANDLE	NA	AVG 2± FC	YES
B) LOADING REQUIREMENTS	1	2	1	YES
C) HANDICAPPED PARKING	6	7±	SAME	YES
D) DRIVEWAY OPENINGS	2	2	SAME	YES
E) MAX. COMPACT CARS	50% (8'X16')	38%	23% (NOTE 8)	YES
F) PARKING SPACE SIZE	9'x18.5'	9'x18.5'	SAME	YES
G) BUMPER OVERHANG	1' OVERHANG	NONE REQUIRED	SAME	YES
H) PARKING SPACE LAYOUT	(NOTE 9)	0	INCL. 5 TANDEM (NOTE 9)	SPECIAL PERMIT
I) AISLE WIDTH EXTERIOR	24' (90 DEG. STALL)	24'	SAME	YES
I) AISLE WIDTH INTERIOR	24' (90 DEG. STALL)	16'–8"	SAME (NOTE 10)	SPECIAL PERMIT
J) PARKING SETBACK				
–FRONT	10'	13'±	SAME	YES
–SIDE	4'	9'±	SAME	YES
–REAR	4'	NA	SAME	YES
–BUILDING	5'	15'±	SAME	YES
K) LANDSCAPED AREAS	10%	>10% (NOTE 11)	11%– 12% (NOTE 11)	YES
L) TREES	1 PER 10 SPACES	(NOTE 12)	(NOTE 12)	YES
M) LOCATION	WITHIN LOT	WITHIN LOT	SAME	YES
N) BICYCLE RACKS	8	0	8	YES

NOTE 8. COMPACT PARKING: 34 PROPOSED COMPACT SPACES IN PARKING GARAGE (23%).

NOTE 9. PARKING SPACE LAYOUT:
5 TANDEM SPACES PROPOSED IN PARKING GARAGE. A SPECIAL PERMIT IS REQUESTED FROM THE PLANNING BOARD.

NOTE 10. INTERIOR AISLE WIDTHS IN THE GARAGE ARE 16'–8". A SPECIAL PERMIT IS REQUESTED FROM THE PLANNING BOARD, BECAUSE THE EXISTING COLUMN TO COLUMN SPACING IS A UNIQUE CIRCUMSTANCE.

NOTE 11. LANDSCAPE AREAS: BETWEEN 11% AND 12% OF THE INTERIOR PORTION OF THE PARKING AREAS IS LANDSCAPED. THE AREAS OUTSIDE THE PERIMETER OF THE PAVED PARKING AREAS ARE NOT INCLUDED IN THIS CALCULATION. THIS SATISFIES THE REQUIREMENT THAT 10% OF THE PARKING AREA BE LANDSCAPED, AS WELL AS THE REQUIREMENT THAT AT LEAST ONE QUARTER OF THE LANDSCAPED AREA BE LOCATED IN THE INTERIOR OF THE PARKING AREA.

NOTE 12. TREES: SEE LANDSCAPE PLAN BY HAWK DESIGN, INC.

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: MCDowney
APPROVAL WITH CONDITIONS: _____
DISAPPROVAL: _____
DATE: 2.22.21

SCALE			
1"= 30'			
DATE			
01/29/21	REV	DATE	REVISION BY
SHEET			
3 OF 6			
FILE #			
LA00			
JOB #			
F:\P\2020-030			
DRAWN BY			
CJL			
CHKD BY			
BGL			
APPD BY			
DMK			

THE RESIDENCE AT CARTER MILL
100 WEST STREET
NEEDHAM, MA
LAYOUT AND ZONING PLAN

COMMONWEALTH OF MASSACHUSETTS
DAVID NOEL KELLY
CIVIL
NO. 37942
REGISTERED PROFESSIONAL ENGINEER

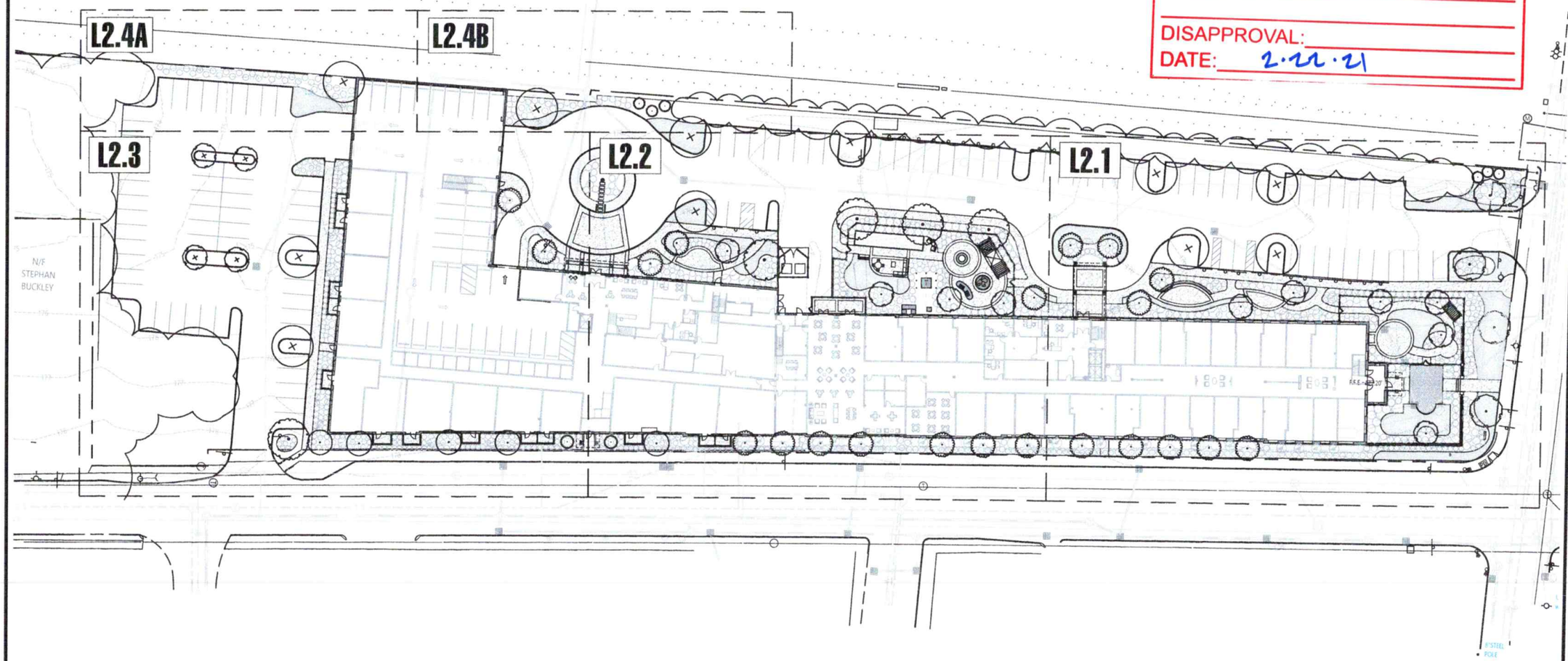
Digitally signed by David N. Kelly, PE
DN: cn=David N. Kelly, PE, o=Kelly Engineering Group, Inc., ou=dkelly@kellyengcorp.com, email=dkelly@kellyengcorp.com, c=US
Date: 2021.01.28 14:53:43 -05'00'

KELLY ENGINEERING GROUP
civil engineering consultants
0 Campanelli Drive, Braintree, MA 02184
Phone: 781-843-4333 www.kellyengineeringgroup.com

SHEET NO.
3

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: M Gwarry
APPROVAL WITH CONDITIONS:

DISAPPROVAL:
DATE: 2.22.21



0 30 60 90 feet
SCALE: 1" = 30'

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

The Residence at Carter Mill

100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Landscape Master Plan

Scale: 1" = 30'-0"

Sheet: L1.0

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: MC Weering
APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21

Matchline Sheet L2.2

Property Line

EX. TREES AND ISLANDS TO REMAIN, TYP.

EX. VEGETATED BUFFER AND FENCE ALONG PERIMETER TO REMAIN

20' HT. STONE SEATING WALL

West Street

Highland Avenue

Property Line

EX. SIDEWALK

F.F.E. = 177.20'

SCALE: 1" = 10'

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

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Landscape Architecture
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The Residence at Carter Mill

100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

North Planting Plan

Scale: 1" = 10'-0"

Sheet: L2.1

Matchline Sheet L2.3

Matchline Sheet L2.1

20-PER
20-PER
20-PER
FLAGPOLE
15-IC-GL
13-PER
14-PER
STEPPING STONE WALKWAY
EX. TREE TO REMAIN
EMERGENCY GENERATOR TO REMAIN
EX. VEGETATED BUFFER AND FENCE ALONG MBTA RAILS TO REMAIN
EX. TREE AND ISLAND TO REMAIN, TYP.
EX. TREE AND ISLAND TO REMAIN, TYP.
1-PS-C
17-PER
2-PS-C
5-HP-B
1-SR-IS
2-LS-BB
14-PER
11-IG-S
8-SJ-G
LAWN
7-HP-B
3-ZS-GV
TRASH ENCLOSURE
9-R-CW
5-TO-EG
3-VD-AJ
4-TM-H
5-TO-EG
6-B-GM
6-TO-EG
3-ZS-GV
4-IG-S
3-PO-SW
48" HT. DECORATIVE BLACK METAL FENCE
8-IG-S
3-PO-SW
4-IG-S
4-HP-B
7-B-GM
19-PER
12-HM-ES
BOCCE COURT (SYN. TURF)
9-IG-S
13-PER
8-PER
3-SJ-G
GAS FIRE PIT
7-HP-B
5-B-GM
5-PV-S
SHADE STRUCTURE
16-PER
WATER FEATURE
LAWN
5-PV-S
1-HS-D
7-CA-H
7-PER
7-SJ-G
5-PER
1-PS-C
KITCHEN GRILLING AREA
1-CF-CP
5-PA-H
1-CF-CP
1-SJ-G
13-PER
OUTDOOR DINING
8-TM-H
5-R-CW
7-IG-S
14-TO-EG
5-R-S
21-PER
5-IC-GL
10-R-CW
2-IC-GL
1-HS-D
4-IC-GL
15-PER

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: MGweeney
APPROVAL WITH CONDITIONS:

DISAPPROVAL:
DATE: 2.22.21

CONCRETE PAVER RESIDENT TERRACE W/ RETAINING WALL AND LOW FENCE, TYP.
-HP-PG
-IG-S
4-IG-S
1-HP-PG
5-PJ-P
G
R-PG
10-PER
5-R-PG
10-PER
10-B-GG
12-CA-H
1-AR-BR
1-VD-AJ
12-B-GG
7-PS-C
1-VD-AJ
211-PT
12-IG-S
3-TO-EG
243-PT
2-VD-AJ
13-PO-N
3-TO-EG
227-PT
7-IG-S
3-TO-EG
14-PO-N
5-VD
1-IG-S
Matchline Sheet L2.3
Matchline Sheet L2.1
EX. SIDEWALK
EX. SIDEWALK
Highland Avenue
Property Line
0 10 20 30 feet
SCALE: 1" = 10'

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

Hawk Design, Inc.
Landscape Architecture
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508-833-9800
info@hawkdesigninc.com

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

The Residence at Carter Mill

100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Central Planting Plan

Scale: 1" = 10'-0"

Sheet: **L2.2**

EX. FLOWERING TREES AND ISLAND TO REMAIN

EX. FLOWERING TREES AND ISLAND TO REMAIN

EX. FENCE AT PROPERTY LINE TO REMAIN

EX. TREE AND ISLAND TO REMAIN, TYP.

Property Line, Typ.

EX. TREES TO REMAIN

EX. TREE AND ISLAND TO REMAIN, TYP.

Property Line

Property Line

Highland Avenue

EX. SIDEWALK

7-JH-BH
5-PA-H
1-TO-EG
6-PA-H
3-WF-DH
3-B-GG
7-PA-H
2-SV-S
6-WF-DH
2-B-GG
5-PA-H
3-WF-DH
1-TO-EG
5-R-PG
10-B-GG
9-SJ-G
7-IG-S
1-SV-S
9-PA-H
1-ZS-GV
7-PA-H
1-AR-BR
10-CA-H
1-VD-AJ
1-AR-BR
6-IG-S
1-TO-EG
CONCRETE PAVER RESIDENT TERRACE W/ RETAINING WALL AND LOW FENCE, TYP.
4-PJ-P
4-R-PG
16-B-GG
9-WF-MM
1-VD-AJ
1-AR-BR
5-PJ-P
10-B-GG
9-WF-MM
1-VD-AJ
1-AR-BR
1-HP-PG
4-IG-S
12-B-GG
5-R-PG
10-PER

20-PER
7-LS-BB
1-PS-C
5-TM-H
1-PS-C
7-PER
26-LS-BB
5-R-CW
5-TO-EG

Matchline Sheet L2.2

Matchline Sheet L2.2

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: M Sweeney
APPROVAL WITH CONDITIONS:

DISAPPROVAL:
DATE: 2.22.21

SCALE: 1" = 10'
Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

Hawk Design, Inc.
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Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

The Residence at Carter Mill

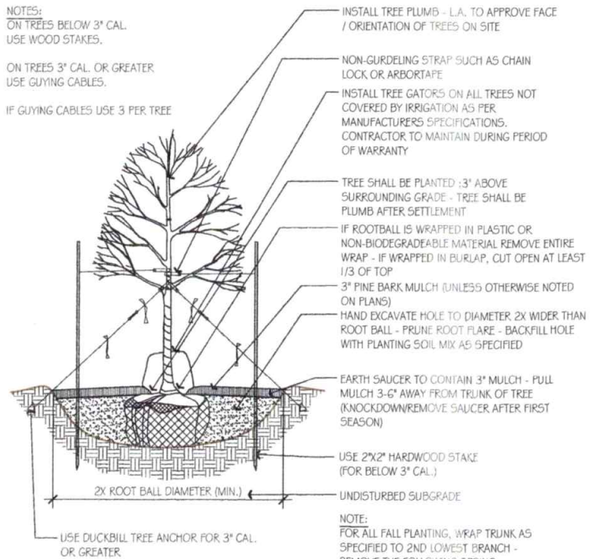
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

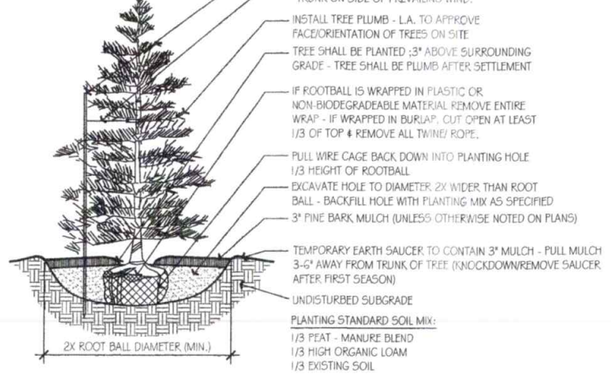
South Planting Plan

Scale: 1" = 10'-0"

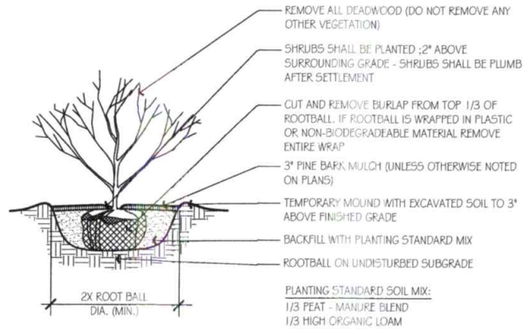
Sheet: **L2.3**



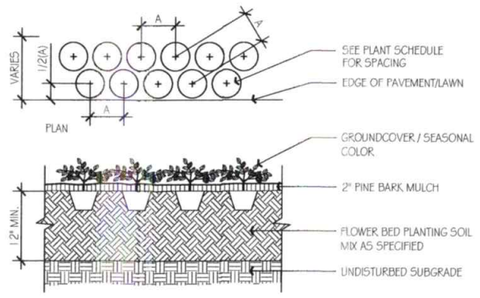
1 Deciduous Tree Planting
Scale: N.T.S.



2 Conifer Tree Planting
Scale: N.T.S.



3 Shrub Planting
Scale: N.T.S.



4 Perennial & Groundcover Planting
Scale: N.T.S.

Schedule of Soils

LOCATION	DEPTH	DESCRIPTION
GENERAL PLANTING BEDS	12"	1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL
FLOWER BEDS	12"	SCREENED LOAM 1/3 PEAT - MANURE BLEND LIME - PELATIZED OR GROUND (50 LB. PER 100 SF.) GROUND BONE MEAL (50 LB. PER 100 SF.) 10-10-10 INORGANIC FERTILIZER (50 LB. PER 5000 SF.)
LAWNS - SOD & SEED	6"	6" SCREENED LOAM
PITS/TREE WELLS "STANDARD MIX" FOR BACKFILL	12"	SOIL MIX 'A' - 1/3 PEAT - MANURE BLEND 1/3 HIGH ORGANIC LOAM 1/3 EXISTING SOIL

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
AR-BR	5	Acer rubrum `Bowhall Red`	Bowhall Columnar Red Maple	B & B	3-3.5" CAL.	
ZS-GV	5	Zelkova serrata `Green Vase`	Green Vase Zelkova	B & B	3-3.5" CAL.	
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
TP-G	6	Thuja plicata `Green Giant`	Green Giant Arborvitae	B & B		8-10` HT.
FLOWERING TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
CF-CP	6	Cornus florida `Cherokee Princess`	Cherokee Princess Dogwood	B & B	3-3.5" CAL.	
HP-PG	2	Hydrangea paniculata `PeeGee Tree`	Tree Form Pee Gee Tree Hydrangea	B & B	2-2.5"-CAL.	
PC-A	4	Pyrus calleryana `Aristocrat`	Aristocrat Flowering Pear	B & B	3-3.5" CAL.	
PS-C	21	Prunus sargentii `Columnaris`	Columnar Sargent Cherry	B & B	3-3.5" CAL.	
SR-IS	4	Syringa reticulata `Ivory Silk`	Ivory Silk Japanese Tree Lilac	B & B	3-3.5" CAL.	
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
B-GG	103	Buxus x `Green Gem`	Green Gem Boxwood	Cont.		2` HT.
B-GM	18	Buxus x `Green Mountain`	Green Mountain Boxwood	B & B		2-2.5` HT.
CA-H	33	Clethra alnifolia `Hummingbird`	Hummingbird Summersweet	B & B		18-24" HT.
HM-ES	19	Hydrangea macrophylla `Endless Summer`	Endless Summer Hydrangea	B & B		2-2.5` HT.
HP-B	33	Hydrangea paniculata `Bobo`	Bobo Panicled Hydrangea	Cont.		18-24" HT.
HP-BS	17	Hydrangea paniculata `Bombshell`	Bombshell Hydrangea	Cont.		2-2.5` HT.
HS-D	3	Hibiscus syriacus `Diana`	Diana Rose of Sharon	B & B		5-6` HT.
IC-GL	62	Ilex crenata `Green Lustre`	Green Luster Japanese Holly	B & B		2-2.5` HT.
IC-S	4	Ilex crenata `Steeds`	Steeds Japanese Holly	B & B		5-6` HT.
IG-S	139	Ilex glabra `Shamrock`	Shamrock Inkberry	B & B		2-2.5` HT.
IM-DL	2	Ilex x meserveae `Dragon Lady`	Dragon Lady Meserve Holly	B & B		5-6` HT.
IO-JP	1	Ilex opaca `Jersey Princess`	Jersey Princess Holly	B & B		5-6` HT.
IV-RS	12	Ilex verticillata `Red Sprite`	Red Sprite Winterberry	B & B		2-2.5` HT.
JH-BH	13	Juniperus horizontalis `Bar Harbor`	Bar Harbor Creeping Juniper	Cont.		18-24" SPD.
PA-H	75	Pennisetum alopecuroides `Hameln`	Hameln Fountain Grass	2 GAL		
PJ-P	15	Pieris japonica `Prelude`	Prelude Andromeda	Cont.		2-2.5` HT.
PO-N	63	Physocarpus opulifolius `Nanus`	Dwarf Ninebark	B & B		2-2.5` HT.
PO-SW	16	Physocarpus opulifolius `Summer Wine`	Summer Wine Ninebark	B & B		3-3.5` HT.
PV-S	35	Panicum virgatum `Shenandoah`	Shenandoah Switch Grass	3 GAL		
R-CW	60	Rhododendron `Cunningham`s White`	Cunningham White Rhododendron	B & B		2-2.5` HT.
R-PG	19	Rhododendron `Purple Gem`	Purple Gem Rhododendron	Cont.		18-24" HT.
R-S	18	Rhododendron `Scintillation`	Scintillation Rhododendron	B & B		2-2.5` HT.
SJ-G	54	Spiraea japonica `Goldflame`	Goldflame Spirea	Cont.		18-24" HT.
SV-S	8	Syringa vulgaris `Sensation`	Sensation Lilac	B & B		5-6` HT.
TM-H	36	Taxus x media `Hicksii`	Hicks Yew	B & B		3-3.5` HT.
TO-EG	95	Thuja occidentalis `Emerald Green`	Emerald Green Arborvitae	B & B		6-7` HT.
TO-T	25	Thuja occidentalis `Techny`	Techny Arborvitae	B & B		6-7` HT.
VD-AJ	24	Viburnum dentatum `Autumn Jazz`	Autumn Jazz Viburnum	B & B		5-6` HT.
WF-DH	12	Weigela florida `Dark Horse`	Dark Horse Weigela	Cont.		2-2.5` HT.
WF-MM	34	Weigela florida `My Monet`	My Monet Weigela	Cont.		15-18" HT.
GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	CONT		
LS-BB	110	Liriope spicata `Big Blue`	Creeping Lily Turf	1 GAL.		
PER	427	Perennials	Assorted Perennials	1 gal		
PT	1,681	Pachysandra terminalis	Japanese Spurge	4"pot		

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: MGweeney
APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21

Base plan information provided electronically by The Architectural Team of Chelsea, MA and Kelly Engineering Group of Braintree, MA

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
Info@hawkdesigninc.com

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Date: 1/29/21

Revisions:

Num.	Date	Description
1.	2/24/21	Per Design Review Board comments

The Residence at Carter Mill
100 West Street Needham, Massachusetts
LCB Senior Living, 3 Edgewater Drive, Norwood, MA

Drawn By: BNL | Checked By: TEM

Plant Schedule and Planting Details

Scale: As Noted

Sheet: **LD 1**

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: MGwozdz
APPROVAL WITH CONDITIONS:

DISAPPROVAL:
DATE: 2.22.21



THE RESIDENCE AT CARTER MILL

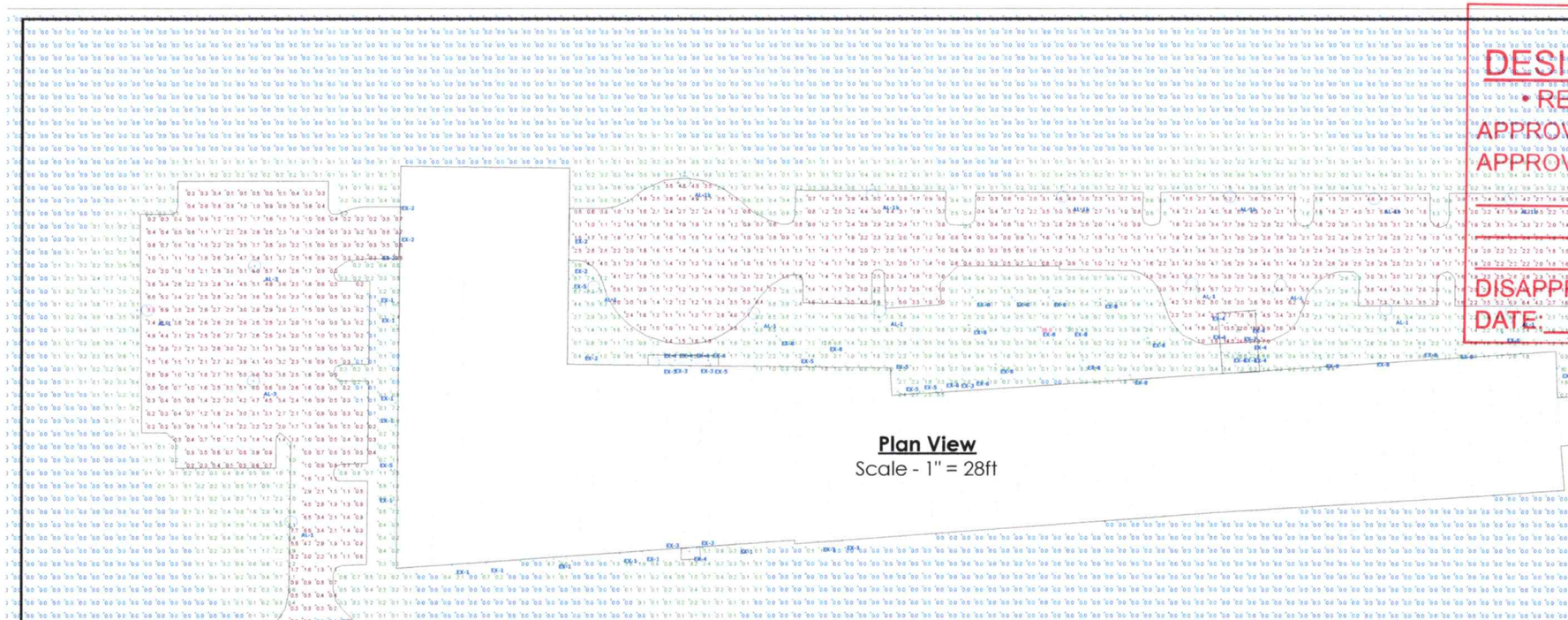
NEEDHAM, MA | January 29, 2021 | LCB | 18017 | © The Architectural Team, Inc.

FIRST FLOOR PLAN

1/16" = 1'-0"

tat

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: M Gwarry
APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21



Plan View
Scale - 1" = 28ft

SCHEDULE

SYMBOL	LABEL	QUANTITY	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	LAMP	# OF LAMPS	LLF	WATTAGE
	AL-1	9	Lumenpulse	ALG72XX VOLT CSL M150 30K CRI70 4 FINISH DIM XX ST	Allegra Bell Shaped Area Light w/ Type 4 Distribution	LED	1	0.9	132
	AL-1b	7	Lumenpulse	ALG72XX VOLT CSL M150 30K CRI70 4BLS FINISH DIM XX ST	Allegra Bell Shaped Area Light w/ Type 4 Back Light Sheild Distribution	LED	1	0.9	132
	AL-3	2	Lumenpulse	ALG72XX VOLT CSL M150 30K CRI70 5S FINISH DIM XX TM	Allegra Bell Shaped Area Light w/ Type 5 Square Distribution	LED	1	0.9	132
	EX-1	13	Lightology	TLG482514	Bowman 4	LED	1	0.35	39
	EX-2	6	Brownlee Lighting Inc	7176 18 AS H08 30K XX	BEAM 7176 Exterior Luminous Cylinder Wall Sconce - 18" Body	LED	1	0.9	7.88131
	EX-3	5	Brownlee Lighting Inc	7176 34 AS H21 30K XX	BEAM 7176 Exterior Luminous Cylinder Wall Sconce - 34" Body	LED	1	0.9	20.83
	EX-4	13	Spectrum Lighting	SP4ES 20L 30K DX // AR4LED SG MF XX	Estimator Series Recessed 4" Downlight	LED	1	0.9	19.5
	EX-5	8	Lightology	TLG749332	Pitch Wall Sconce	LED	6	0.9	11.99
	EX-6	3	Lightology	TLG482515	Bowman 6	LED	1	0.45	24
	EX-7	1	Lightology	TLG748574	Roton 18	LED	1	0.9	71
	EX-8	28	Lithonia Lighting	RADB LED P4 30K SYM DDBXD	Radean Bollard	LED	1	0.9	18.59

NOTES:

-REFLECTANCES ASSUMED:
- SURFACE: 50

- MOUNTING HEIGHTS: 16'-0" AFG
- RECESSED LIGHTS IN CANOPY @ 12'-0" AFG
- WALL SCONCES @ 6'-0" & 8'-0" AFG

- TASK HEIGHT: AT SURFACE

- CALCULATION POINT SPACING: 7'X7' OC

DISCLAIMER:

-THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION. VALUES REPRESENTED ARE AN APPROXIMATION GENERATED FROM MANUFACTURERS PHOTOMETRIC IN-HOUSE OR INDEPENDANT LAB TEST WITH DATA SUPPLIED BY LAMP MANUFACTURERS.

STATISTICS

DESCRIPTION	SYMBOL	AVG.	MAX	MIN.	MAX/MIN	AVG/MIN
Outer Perimeter	+	0.3 fc	35.0 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.7 fc	8.0 fc	0.1 fc	80.0:1	17.0:1
Parking Lot	+	2.5 fc	24.0 fc	0.1 fc	240.0:1	25.0:1

The Residences at Carter Mill
01-29-2021

Designer
Robert J. Lindstrom
Date
1/12/2021
Scale
Not to Scale
Drawing No.
Summary
1 of 1

Specification Sheet

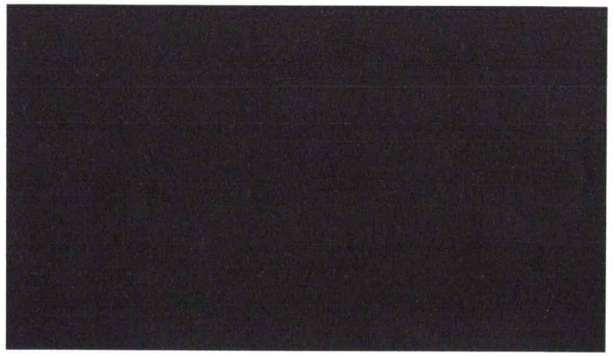
allegra
Allegra Medium

Project Name _____ **Qty** _____

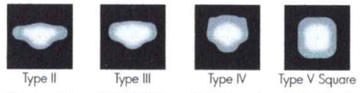
Type _____ **Catalog / Part Number** _____

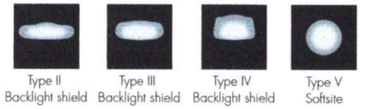






Distributions





Colors and Color Temperatures



Controls

ON/OFF 0-10V

Rating

IP66 (optical chamber)

Certifications

5 YEARS lumenpulse

Description

The Allegra Medium is a durable, stylish luminaire for urban lighting applications, including pedestrian plazas, residential streets and collector roads. Offering a choice of outputs, color temperatures, and distributions, the Allegra Medium is elegance personified.

Features

Color and Color Temperature	2200K, 2700K, 3000K, 3500K, 4000K, 5700K
Distributions	Type II, Type III or Type IV (with or without backlight shield), Type 5 square and Type V Softsite
Options	Corrosion-resistant coating for hostile environments, Surge protector
Mounting Options	Top mounted, Side top mounted
Warranty	5-year limited warranty

Performance

Output (nominal lumens)	Minimum 3000lm / Maximum 17000lm
Color Rendering	3 SDCM for CRI 70+ and 2 SDCM for CRI 80+
Lumen Maintenance	TM-21 L70 527,000 hrs (projected, Ta 77 °F), 36,000 hrs (reported, Ta 77 °F)
Dark Sky	Dark sky compliant (2200K, 2700K and 3000K color temperatures, BUG rating of U0)

Physical

Housing Material	Die cast low copper 360 aluminum alloy
Lens Material	Optical tempered clear glass (Clearsite lens), Optical tempered opal glass (Softsite lens)
Weight	Up to 35 lbs
EPA	Up to 1.13 sq ft

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1220 Marie-Victorin Blvd., Longueuil, QC J4G 2H9 CA
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MS - R13

Lightology

NEEDHAM
DESIGN REVIEW BOARD
RECOMMENDED APPROVAL •
APPROVAL: _____
APPROVAL WITH CONDITIONS: _____
_____
_____
_____
DISAPPROVAL: _____
DATE: 2.22.21

BRAND Tech Lighting

DESCRIPTION

The Bowman Outdoor Wall Light with its soft silhouette of classic table lamp shades is referenced and transformed into a sleek LED wall sconce fixture suitable for both indoor and outdoor applications. Body made of die-cast aluminum in a marine-grade powder coat finish available in Antique Bronze, Black, Silver, Charcoal or White. Houses a powerful LED light source for plentiful illumination on even the darkest of nights. Features a UV stabilized frosted acrylic lens which diffuses the LED light to create an even glow. Available in two sizes. Mounts down only. 5 year warranty. NOTE: Limited finish options in 2700K color temperature.

Bowman Outdoor Wall Light

ITEM NUMBER TLG482514

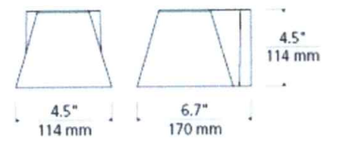


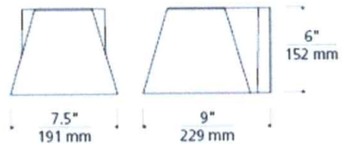
Shown in: Charcoal

SHADE COLOR	N/A
BODY FINISH	Charcoal
WATTAGE	17.8W
DIMMER	Low Voltage Electronic
DIMENSIONS	4.5"W x 4.5"H x 6.7"D
LAMP	1 x LED/17.8W/120V LED

Technical Information

LUMINOUS FLUX	697 lumens
LUMENS/WATT	39.16
LAMP COLOR	3000 K
COLOR RENDERING	80 CRI



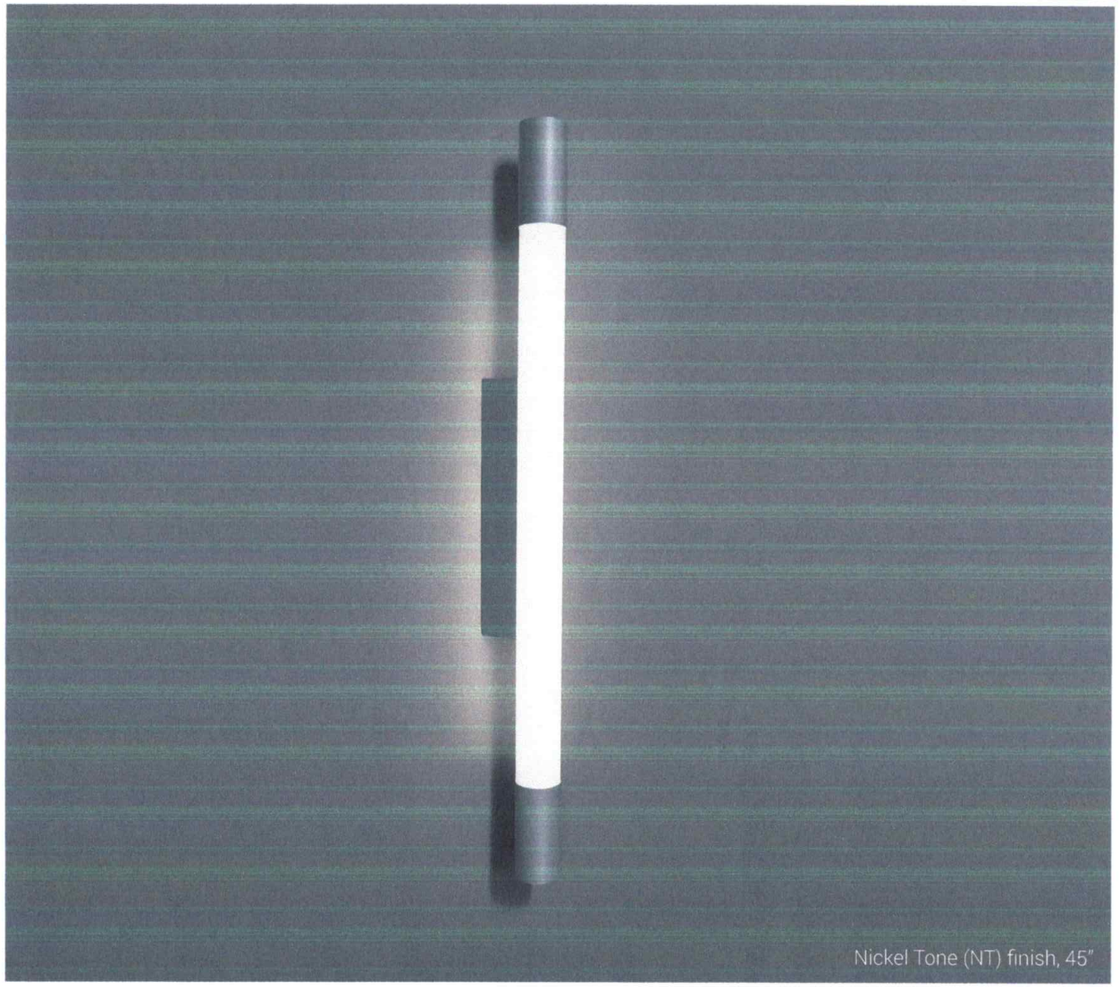


ITEM NUMBER TLG482514

COMPANY PROJECT FIXTURE TYPE APPROVED BY DATE

BEAM

BROWNLEE



Nickel Tone (NT) finish, 45"



7176 LED

The 7176 BEAM LED is a wet location rated product featuring a modern, architectural aesthetic. With four sizes available, this product is ideal for decorative exterior facades, breezeways, commercial interiors, bathrooms, healthcare and even stairwells (battery options available). Constructed of heavy duty aluminum with a stout, perfectly illuminated white acrylic diffuser. Refer to model 7177 LED for an ADA compliant version of this product.

FINISHES

BL | BZ | AS | GM | NT | PL | AG | DB | MB | WH

ESTIMATOR
CONTRACTOR SERIES

4" ROUND DOWNLIGHT



PERFORMANCE DATA				
MODEL NUMBER	SOURCE LUMENS[1]	DELIVERED LUMENS[2]	SYSTEM WATTS	LPW
AR4ES11L	1100	909	11	83
AR4ES15L	1500	1240	15	83
AR4ES20L	2000	1653	20	85

FEATURES
4" downlight and wall wash series with deep regress for visual comfort providing 50° source cutoff. Optional downlight lens for wet location applications. Zhaga international standard LED module for ease of maintenance and future replacement. Tool-less LED module and J-Box access. Expandable 14.2"-26", bar hangers included. Quick connect LED module and trim attachment.

TRIM FINISH
Variety of powdercoat and anodized finishes available.
Specify finish and flange finish.

ELECTRONICS
120V-277V universal input with standard 0-10V 1% Dimming. LED system features high efficacy LEDs backed by standard softening lens. Standard CRI is 80+. Drivers are overload and short circuit protected as well as thermally regulated. Sound rating A. Auto dim thermal protector for long term reliability.

CONSTRUCTION
Housing/frame constructed of #22 GA galvanized steel. Self-flanged one piece trim spun from 0.063" thick high purity aluminum and finished to specification. Passive internal aluminum heatsink.

CODE COMPLIANCE
ENERGY STAR® Certified when used with AR4ES and SG or MW trims only. BAA Compliant. Non-IC rated. ETL certified to meet US and Canadian standards. Suitable for dry or damp locations. Manufactured and tested to UL standards No. 1598/8750.

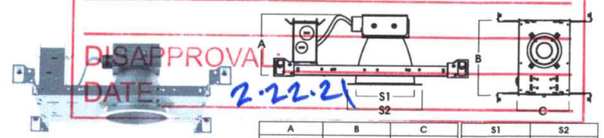
RATED LIFE
Rated for 50,000 Hours at 70% lumen maintenance. (L70)

PROJECT:
TYPE:

NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL:
APPROVAL WITH CONDITIONS:
DISAPPROVAL
DATE: 2.22.21

HOUSING DIMENSIONS

SP4ES - 4" NEW CONSTRUCTION



A	B	C	S1	S2
4.7 119.4 mm	12.7 322.6 mm	8.6 218.4 mm	4.5 114.3 mm	5.8 147.3 mm

Ceiling Cutout: Ø 4.8

TRIM OPTIONS

AR4ES - 4" DOWNLIGHT



AR4WES - 4" WALL WASH



AR4LES - 4" LENSED WET LOCATION



FIXTURE HOUSING SPECIFICATION

SERIES	LUMENS[1]		CCT		DRIVER / VOLTAGE	
SP4ES	11L	1100 Lm	30K	3000K	DX	1%, 0-10V, 120V/277V
	15L	1500 Lm	35K	3500K		
	20L	2000 Lm	40K	4000K		

TRIM / MODULE SPECIFICATION

TRIM		FINISH		FLANGE FINISH	
AR4ES	Downlight	SG	Semi-Diffuse	MF[4]	Matching Flange
AR4WES	Wall Wash	MW	Matte White	WF[5]	White Flange
AR4LES	Lensed Wet Location	AN	Anodic Natural		
		AC	Anodic Champagne		
		MB	Matte Black		
		PT	Platinum Silver		
		CC[3]	Custom Finish		

ACCESSORIES	
GRES4	Goof Ring

EXAMPLE: SP4ES11L30KDX/AR4ESMWMF

NOTES:
1 Nominal Source Lumens at 35K 2 Nominal Delivered Lumens 80 CRI at 35K with AR4ES-SG, with Any Flange Finish
3 Contact Factory for Special Finishes 4 Flange Same Color as Inside of Trim 5 For Use with Non-White Trim

Dimensions and values shown are nominal. Spectrum Lighting continually works to improve products and reserves the right to make changes which may alter the performance or appearance of products.

SPECTRUM LIGHTING INC.

WWW.SPECLIGHT.COM • 994 JEFFERSON STREET, FALL RIVER, MA 02721 • 508.678.2303 FAX 508.678.2260

Lightology

Roton Outdoor Pendant Light

ITEM NUMBER TLG748574

BRAND Tech Lighting

DESCRIPTION

The Roton Outdoor Pendant makes an impressive design statement in the simplicity and scale of its cylindrical geometry. Features a spun aluminum body in marine-grade powder coat finishes and subtle impact-resistant, UV stabilized diffuser. Offered in two sizes and three color temperature options. Supplied with adjustable 3, 6 and 12 inch stem lengths and integrated ball joint that accommodates a sloped ceiling up to 45 degrees. Universal 120-277V. 5 year warranty. Dimmable with a low voltage electronic, 0-10V or Triac dimmer, sold separately.

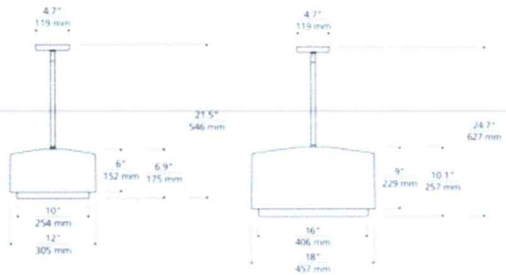


Shown in: Charcoal

SHADE COLOR	N/A
BODY FINISH	Charcoal
WATTAGE	36W
DIMMER	Low Voltage Electronic
DIMENSIONS	34.8"L x 18"W x 10.1"H
LAMP	1 x LED/36W/120V LED

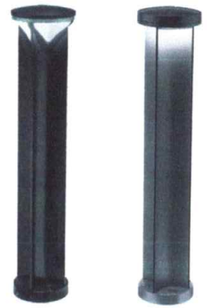
Technical Information

LUMINOUS FLUX	2556 lumens
LUMENS/WATT	71.00
LAMP COLOR	3000 K
COLOR RENDERING	90 CRI



ITEM NUMBER TLG748574

COMPANY | PROJECT | FIXTURE TYPE | APPROVED BY | DATE



RADEAN Bollard

LED Site Luminaire

Catalog Number

Notes

Type

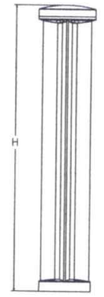
NEEDHAM
DESIGN REVIEW BOARD
• RECOMMENDED ACTION •
APPROVAL: M Gray
APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21

Introduction

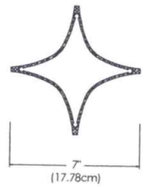
The Radean LED Bollard is an award-winning, energy-saving, long-life solution designed to perform the way a bollard should.

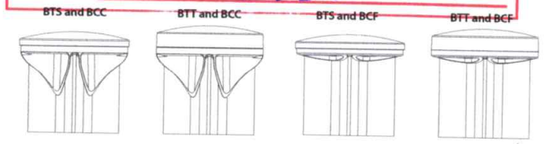
The Radean LED Bollard's rugged construction, durable finish and long-lasting LEDs will provide years of maintenance-free service.





Cross section of shaft





Specifications

Diameter:	D = 8.25" (20.96cm)
Height:	H = 41.5" Standard (105.41cm)
Weight (max):	20lbs (9.07Kg)

Ordering Information

EXAMPLE: RADB LED P4 30K SYM MVOLT BTS BCCDNATXD DBLXD

RADB LED

Series	Performance Package	Color temperature	Distribution	Voltage	Control options	Bollard top *(required)*
RADB LED	P1	27K 2700 K	ASY Asymmetric [2]	MVOLT [3]	**Shipped installed**	**Slim Top**
	P2	30K 3000 K	SYM Symmetric [1]	120	PE Photoelectric cell, button type [4,5]	BTS Slim top, painted to match shaft [5,8]
	P3	35K 3500 K		208 [3]	DMG 0-10V dimming driver (no controls)	BTSDWHXD Slim top, white [5,8]
	P4	40K 4000 K		240 [3]	E7WH Emergency battery backup,Certified in CA Title 20 MAEDBS1 [4,7]	BTSDBLBXD Slim top, black texture [5,8]
	P5 [1]	50K 5000 K		277	FAO Field adjustable output [9]	BTSDBLXD Slim top, black [5,8]
				347	PIR Motion sensor Bi-level [3,5,6,7]	BTSDDBTXD Slim top, dark bronze textured [5,8]
				480		BTSDDBXD Slim top, dark bronze [5,8]
						BTSDNATXD Slim top, natural aluminum textured [5,8]
						BTSDNAXD Slim top, natural aluminum [5,8]
						BTSDWHGXD Slim top, white textured [8]

Tall Top

BTT	Tall top painted to match shaft [8]
BTTDBLBXD	Tall top, black textured [8]
BTTDBLXD	Tall top, black [8]
BTTDDBTXD	Tall top, dark bronze textured [8]
BTTDDBXD	Tall top, dark bronze [8]
BTTDNATXD	Tall top, natural aluminum textured [8]
BTTDNAXD	Tall top, natural aluminum
BTTDWHGXD	Tall top, white textured [8]
BTTDWHXD	Tall top, white [8]

Bollard crown *(required)*

Deep Crown

BCC	Deep crown, painted to match shaft [8]
BCCDWHXD	Deep crown, white [8]
BCCDBLXD	Deep crown, black [8]
BCCDBLBXD	Deep crown, black textured [8]
BCCDDBTXD	Deep crown, dark bronze textured [8]
BCCDDBXD	Deep crown, dark bronze [8]
BCCDNATXD	Deep crown, natural aluminum textured [8]
BCCDNAXD	Deep crown, natural aluminum [8]
BCCDWHGXD	Deep crown, white textured [8]

Flat Crown

BCF	Flat crown, painted to match shaft [8]
BCFDBLBXD	Flat crown, black textured [8]
BCFDBLXD	Flat crown, black [8]
BCFDDBTXD	Flat crown, dark bronze textured [8]
BCFDDBXD	Flat crown, dark bronze [8]
BCFDNATXD	Flat crown, natural aluminum textured [8]
BCFDNAXD	Flat crown, natural aluminum [8]
BCFDWHGXD	Flat crown, white textured [8]
BCFDWHXD	Flat crown, white [8]

Other options

H24 [6,9]	24" overall height
H30 [6,9]	30" overall height
H36 [6,9]	36" overall height
L/AB	Without anchor bolts

Finish *(required)*

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white

Accessories

Ordered and shipped separately.

RADBAB U	Anchor bolts (4)	RK1RADB BCKIT (FINISH) U	Base cover with bolt caps
RADBABC DDBXD U	Replacement anchor bolt covers (specify finish) (4)	RK1RADB EMTESTMAG U	Emergency test stylus

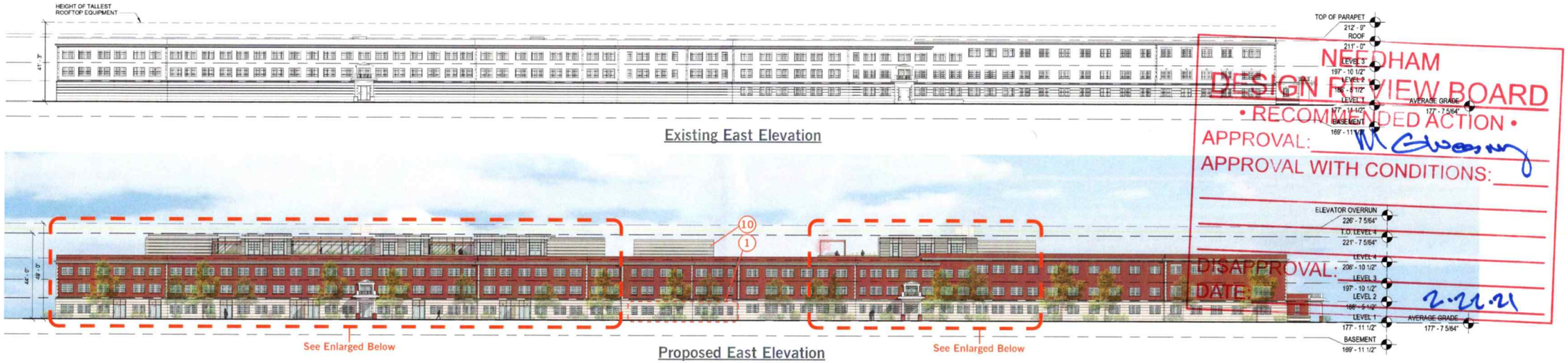
NOTES

1. P5 only available in SYM distribution.
2. ASY has only two illuminated quadrants driven at higher drive currents to generate similar output as the SYM-4-quadrant product.
3. PIR not available with 208V or 240V.
4. PE only available with ASY.
5. PE, PIR and FAO not available with BTS.
6. E7WH and PIR only available in full height. Not available with H24, H30 or H36.
7. PIR not available with E7WH.
8. Architectural and custom colors available (additional leadtimes and cost may apply).
9. 42" Height is standard. H24, H30 and H36 have longer leadtimes.

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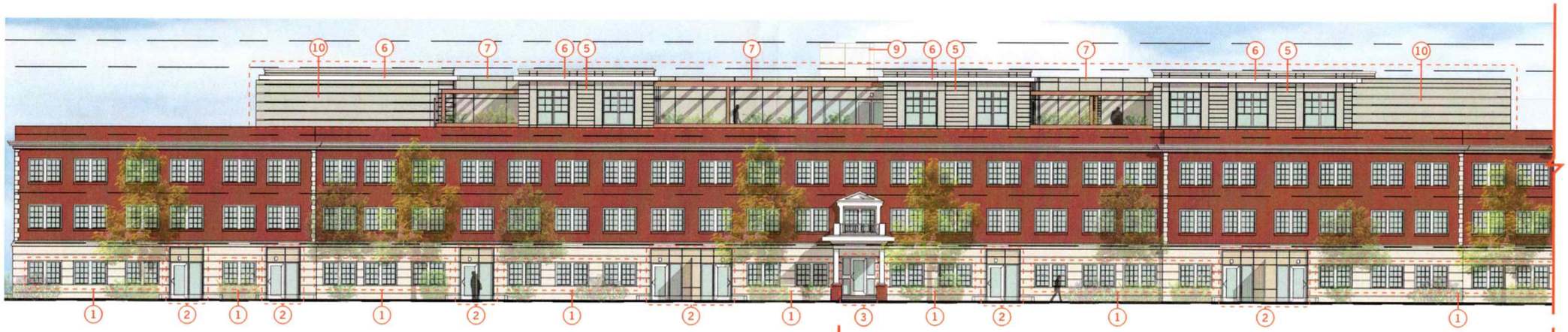
© 2012-2021 Acuity Brands Lighting, Inc. All rights reserved.

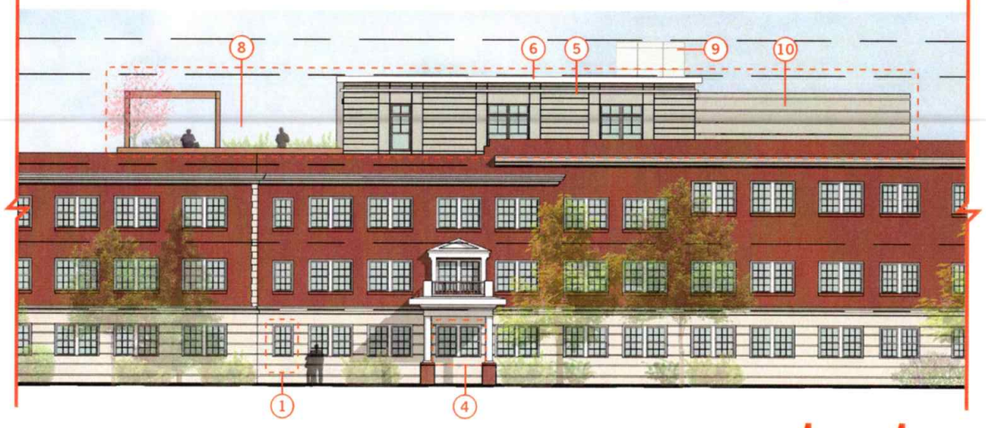


Existing East Elevation

Proposed East Elevation

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APPROVAL:
APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21





(Refer to materials page for further information)

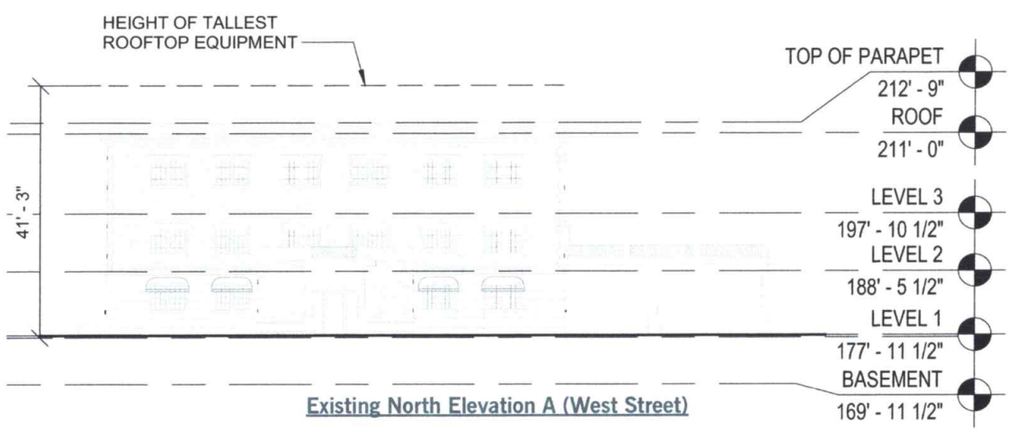
1. New window in existing masonry opening to match existing
2. First floor single swing door additions
   - New full glass single swing door with sidelite
   - EIFS to be removed to underside of cornice, smooth fiber cement infill wall
   - PVC privacy screen where required at shared patios
   - New downlight over door (see provided spec)
3. New full glass door with sidelites to replace existing door
4. Remove existing door, replace with window to match existing
5. Fiber cement panel with recessed trim and exposed fasteners
6. Artic white trim banding
7. Independent living patios
   - Smooth fiber cement panel
   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match

The Residence at Carter Mill

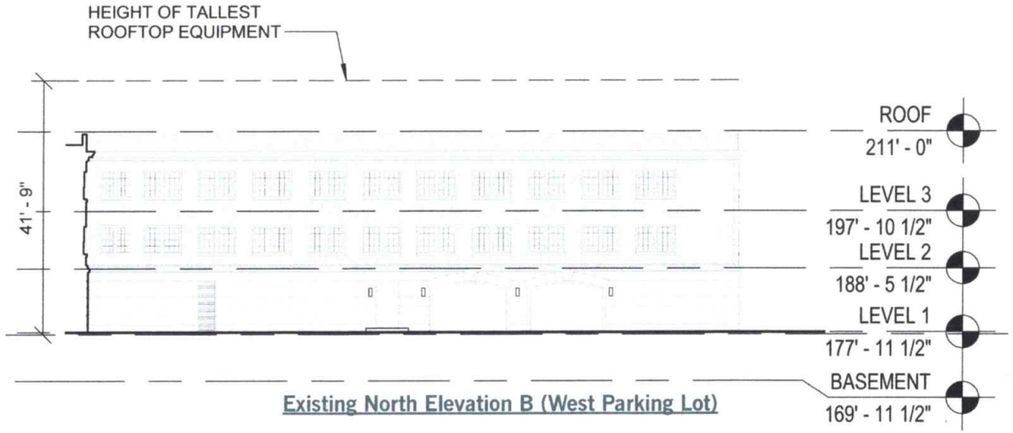
Needham, MA | January 29, 2021 | LCB | 18017 | © The Architectural Team, Inc.

East Elevation (Highland Avenue)

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Existing North Elevation A (West Street)



Existing North Elevation B (West Parking Lot)



Proposed North Elevation A (West Street)



Proposed North Elevation B (West Parking Lot)

(Refer to materials page for further information)

(2) First floor single swing door additions
- New full glass single swing door with sidelite
- EIFS to be removed to underside of cornice, smooth fiber cement infill wall
- PVC privacy screen where required at shared patios
- New downlight over door (see provided spec)

(5) Fiber cement panel with recessed trim and exposed fasteners

(6) Artic white trim banding

(9) Elevator overrun, smooth fiber cement panel

(10) Mechanical screening, color to match

(11) Remove awnings from windows

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DISAPPROVAL:
DATE: 2.22.21

The Residence at Carter Mill

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North Elevation - A & B (West Street & From West Parking Lot)

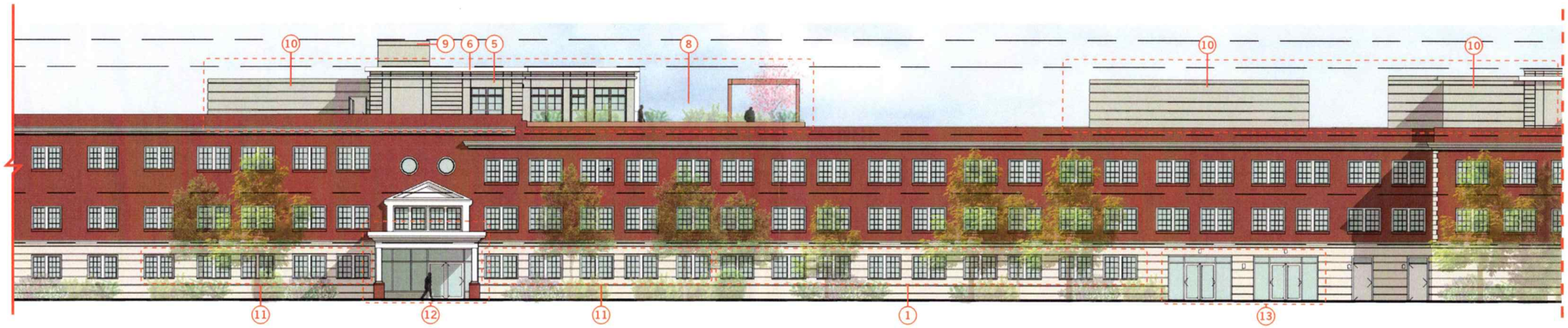
tat



Existing West Elevation

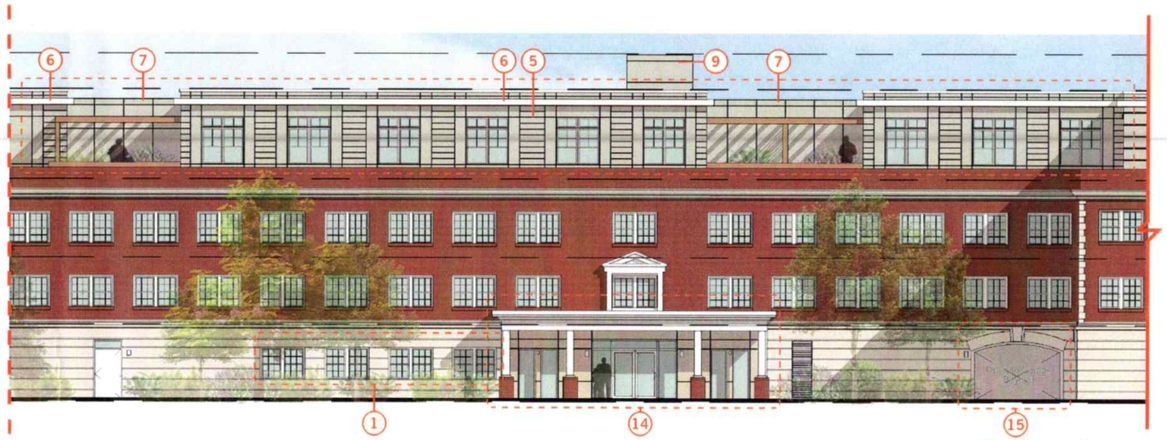


Proposed West Elevation



(Refer to materials page for further information)

1. New window in existing masonry opening to match existing
5. Fiber cement panel with recessed trim and exposed fasteners
6. Artic white trim banding
7. Independent living patios
   - Smooth fiber cement panel
   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match
11. Remove awnings from windows
12. Porte-cochere
    - Remove EIFS to underside of roof
    - New glass entry vestibule with double door
    - Smooth fiber cement infill wall
    - Remove balluster from top of porte-cochere, clean and reface elements as needed
13. Infill existing garage openings with new storefront system to match existing windows
14. Portico
    - Remove ballusters from top of portico
    - Clean and reface trim elements as needed
    - New storefront windows in place of existing french doors
15. New opening into garage to match existing



West Elevation

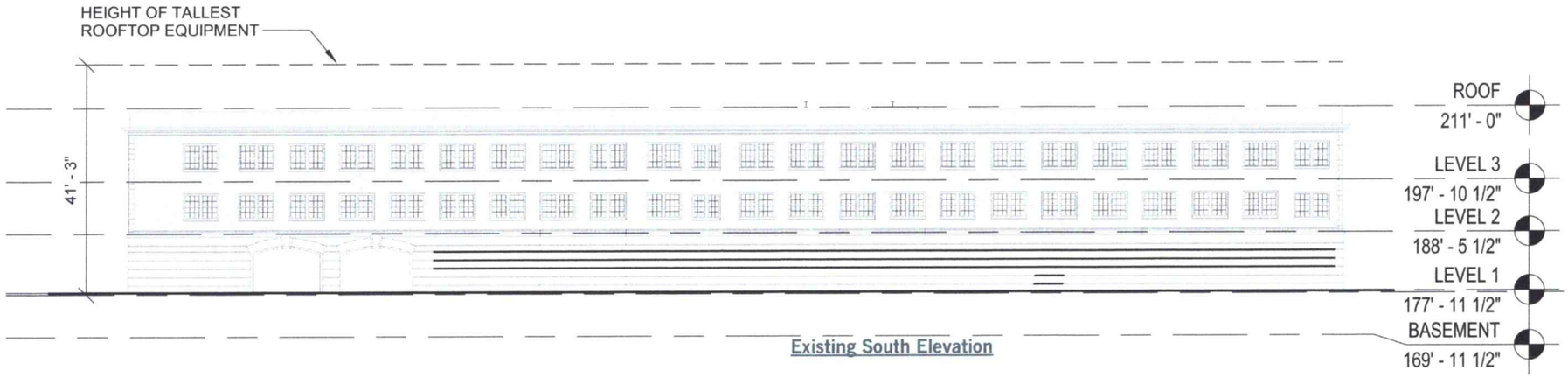
The Residence at Carter Mill

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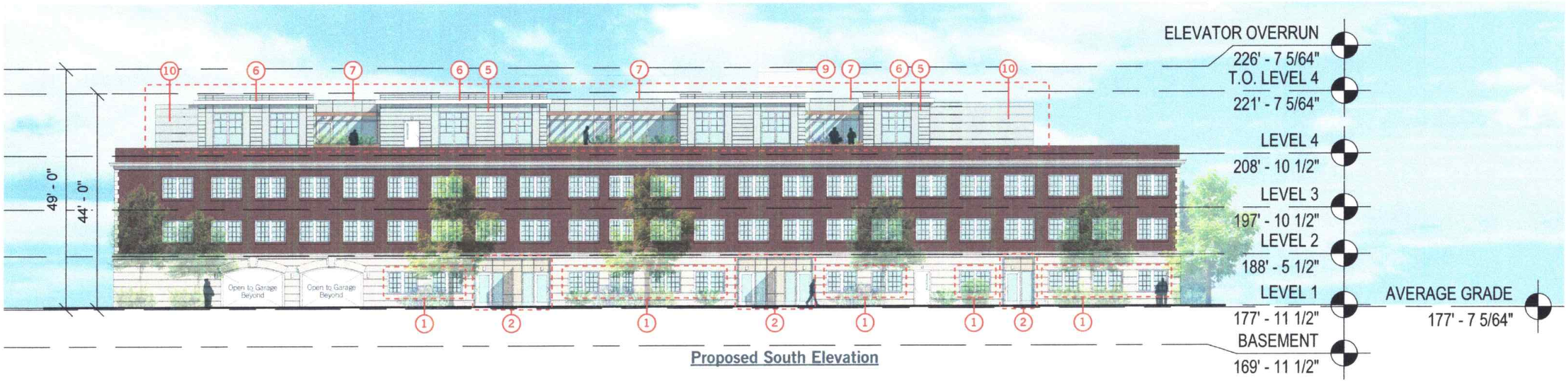
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Existing South Elevation



Proposed South Elevation

(Refer to materials page for further information)

1. New window in existing masonry opening to match existing
2. First floor single swing door additions
   - New full glass single swing door with sidelite
   - EIFS to be removed to underside of cornice, smooth fiber cement infill wall
   - PVC privacy screen where required at shared patios
   - New downlight over door (see provided spec)
3. New full glass door with sidelites to replace existing door
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   - Natural stain wood trellis and planter
8. Assisted Living shared terrace
9. Elevator overrun, smooth fiber cement panel
10. Mechanical screening, color to match

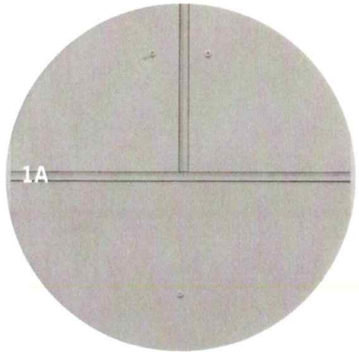
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APPROVAL WITH CONDITIONS:
DISAPPROVAL:
DATE: 2.22.21

The Residence at Carter Mill

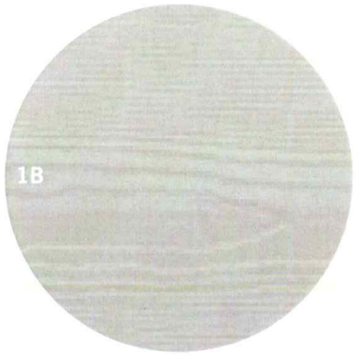
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South Elevation

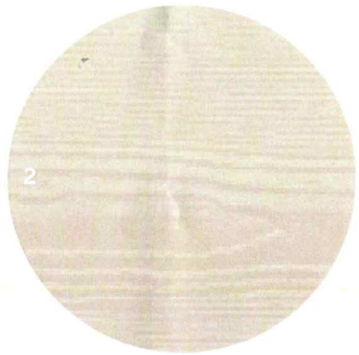
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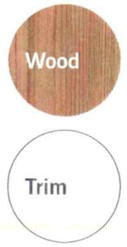
Fiber Cement - Panel with recess trim & exposed fasteners
Color - Light Mist



Fiber Cement - Panel with 3/4" reveal
Color - Light Mist



Fiber Cement - Panel with 3/4" reveal
Color - Cobble Stone



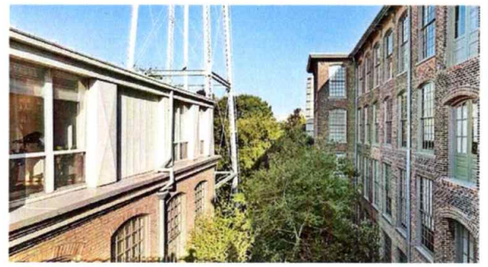


Recess reveal examples



Partial South Elevation







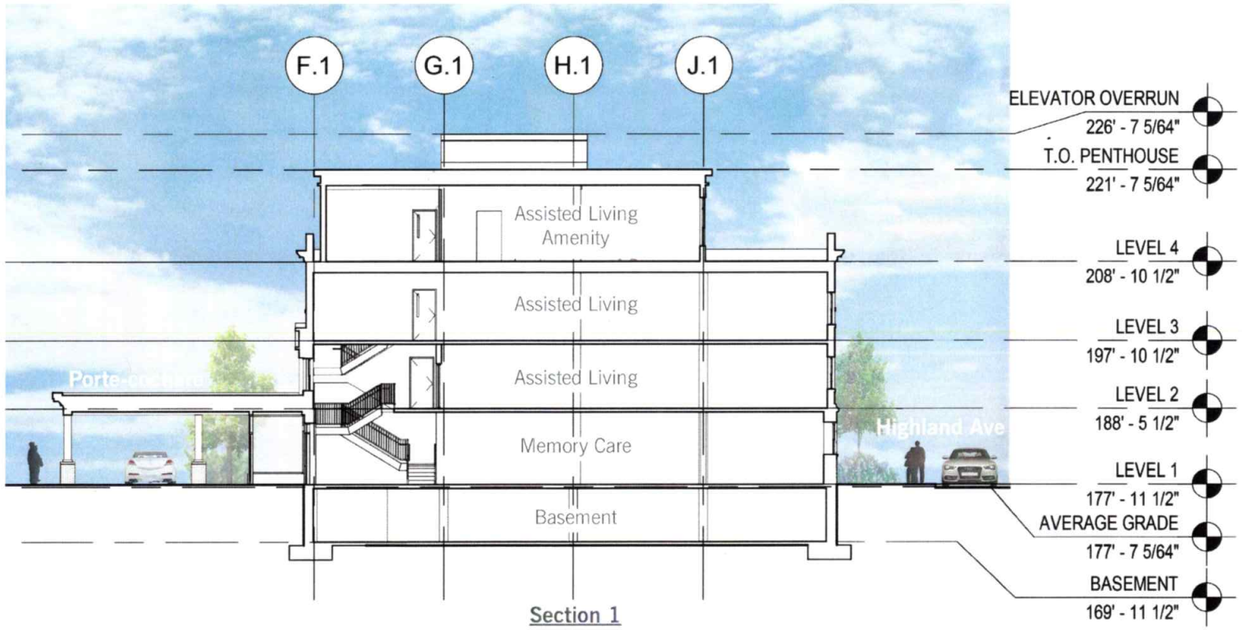
Precedent Images

The Residence at Carter Mill

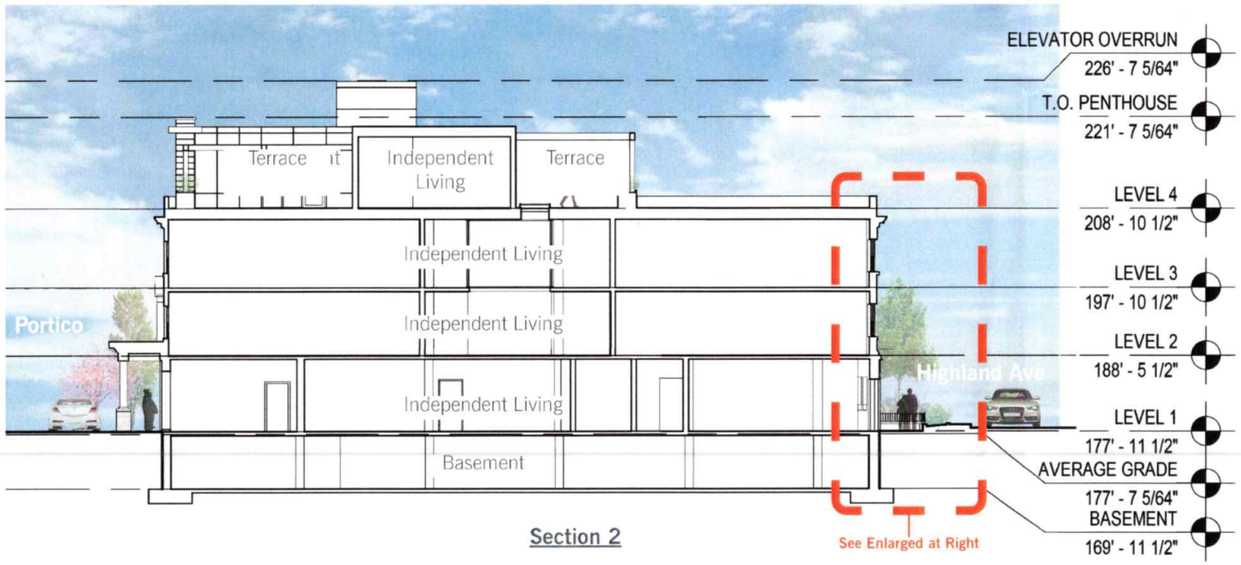
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Proposed Elevation Materials

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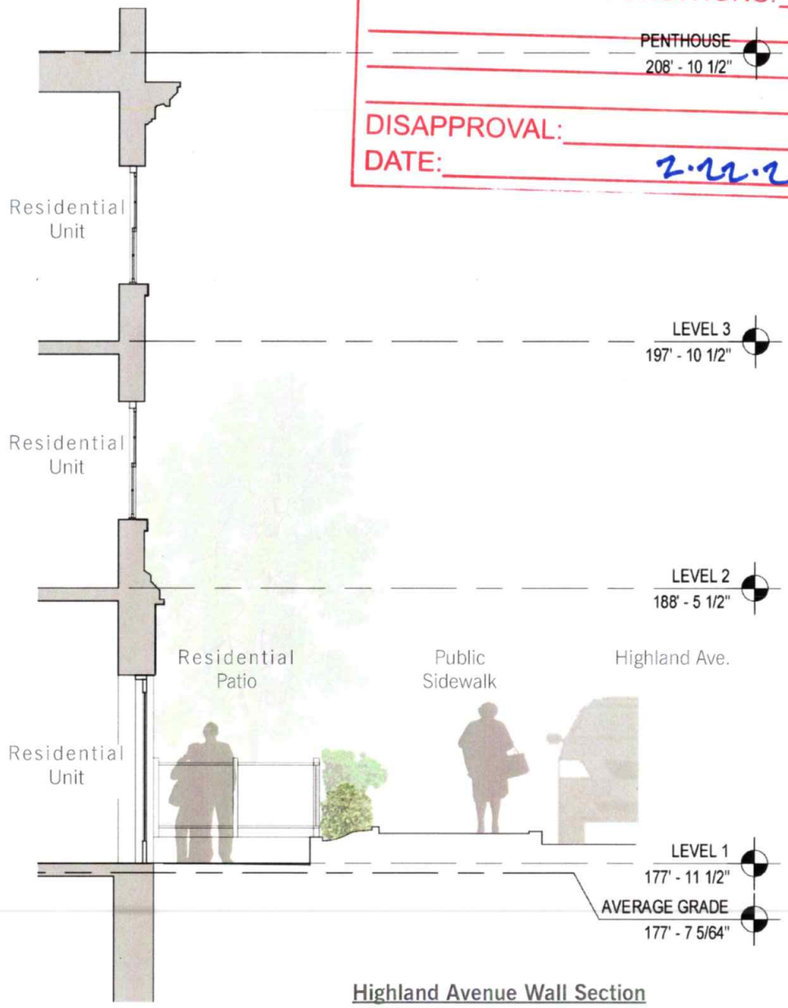


Section 1



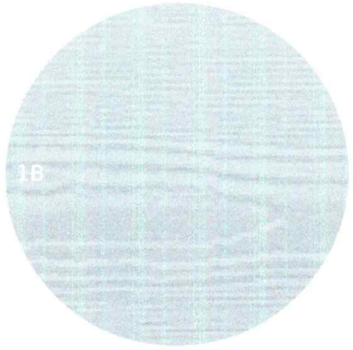
Section 2

See Enlarged at Right



Highland Avenue Wall Section

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Fiber Cement - Panel with recess trim & exposed fasteners
Color - Light Mist

Fiber Cement - Panel with 3/4" reveal
Color - Light Mist



Fiber Cement - Panel with 3/4" reveal
Color - Cobble Stone

Recess reveal examples

DESIGN REVIEW BOARD
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APPROVAL WITH STIPULATIONS
DISAPPROVAL:
DATE: 2.22.21

Partial South Elevation

The Residence at Carter Mill

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Proposed Elevation Materials

Precedent Images

tat

From:	Tara Gurge
To:	Alexandra Clee
Cc:	Lee Newman
Subject:	RE: Public Health reply for your Request for comment - 100-110 West Street
Date:	Monday, March 22, 2021 2:17:15 PM
Attachments:	image002.png image003.png

Alex –

We are replying back to you with the Public Health Division comments for the Major Project Site Plan Special Permit proposal at 100-110 West Street. Here are the comments noted below:

- If there are plans to re-open both kitchens/cafeterias at these locations then proper food permits will need to be acquired. These food establishment permits will need to be applied for through the Public Health Division via the Town's ViewPoint Cloud online permitting system, which will require a review of the proposed kitchen layout plans, one for each kitchen, along with a proposed seating layout plans.
- Sufficient Trash and separate Recycling dumpster accommodations must be provided for BOTH kitchens and independent living/housing areas. The designated kitchen dumpster enclosure(s) must also accommodate separate grease barrel(s), if applicable, if grease is found be generated on site.
- Due to these buildings being vacant for an extended period of time, a certified pest control company must be contracted prior to renovations to inspect and treat both structures AND on-going pest control must be conducted throughout construction. (Weekly reports must be submitted if pest activity is observed.)
- No public health nuisance issues (i.e. odors, noise, light migration, standing water/improper on site drainage, etc.), to neighboring properties, shall develop on site during or after construction. We are in support of an extensive landscaping plan be developed on site to screen and enhance the site, and to ensure that noise and visual impacts are minimized. Additional buffering, by the addition of new vegetation, along with new plantings, is strongly encouraged on the West of the site. Maintaining of these natural buffers to the South is also strongly encouraged.

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.
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 <aclee@needhamma.gov>
Sent: Monday, March 8, 2021 3:29 PM
To: David Roche <droche@needhamma.gov>; Anthony DelGaizo <ADelgaizo@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>
Subject: Request for comment - 100-110 West Street

Dear all,

The Planning Board will be holding a hearing on proposal for a Major Project Site Plan Special Permit at 100-110 West Street. More information is included in the submitted documents, detailed below, which can be found at this location K:\Planning Board Applications\Planning_100_110_West. Some of the application documents are attached, as noted, but not all, as the files were too large to include all.
(some of you will receive a hard copy in the inter-office mail as well).

The documents attached for your review are:

1. Application submitted by WELL LCB Needham Landlord, LLC with Exhibit A. *attached*
2. Secretary's Certificate. *Attached*
3. Letter from Evans Huber Attorney, dated March 3, 2021. *Attached*
4. Letter from Evans Huber Attorney, dated March 4, 2021. *attached*
5. Traffic Impact Study, dated February, 2021. *Attached*

6. Appendix for Traffic Impact Study, dated February, 2021.

7. Plan set entitled "Site Development Plan for The Residence at Carter Mill," prepared by Kelley Engineering Group, consisting of 6 sheets: Sheet 1, Cover Sheet, dated January 29, 2021; Sheet 2, entitled "Existing Conditions Plan," dated January 29, 2021; Sheet 3, entitled "Layout and Zoning Plan," dated January 29, 2021; Sheet 4, entitled "Grading Plan," dated January 29, 2021; Sheet 5, entitled "Detail Sheet," dated January 29, 2021; Sheet 6, no title, showing photometrics, dated January 29, 2021. *Attached.*

8. Plan set entitled "The Residence at Carter Mill," prepared by The Architectural Team, consisting of 11 sheets: Sheet 1, entitled "Proposed Aerial View," dated January 29, 2021; Sheet 2, entitled "First Floor Plan," dated January 29, 2021; Sheet 3, entitled "Second Floor Plan," dated January 29, 2021; Sheet 4, entitled "Third Floor Plan," dated January 29, 2021; Sheet 5, entitled "Fourth Floor Plan," dated January 29, 2021; Sheet 6, entitled "East Elevation (Highland Ave)," dated January 29, 2021; Sheet 7, entitled "North Elevation A & B (West Street and from West Street Parking Lot)," dated January 29, 2021; Sheet 8, entitled "West Elevation," dated January 29, 2021; Sheet 9, entitled "South Elevation," dated January 29, 2021; Sheet 10, entitled "Building Sections," dated January 29, 2021; Sheet 11, entitled "Proposed Elevation Materials," dated January 29, 2021.

9. Plan set entitled "The Residence at Carter Mill, Landscape Permit Plans," prepared by the Hawk Design Inc., consisting of 12 sheets: Sheet 1, Cover Sheet; Sheet 2, Sheet L1.0, entitled "Landscape Master Plan," dated January 29, 2021, revised February 24, 2021; Sheet 3, Sheet L2.1, entitled "North Planting Plan," dated January 29, 2021, revised February 24, 2021; Sheet 4, Sheet L2.2, entitled "Central Planting Plan," dated January 29, 2021, revised February 24, 2021; Sheet 5, Sheet L2.3, entitled "South Planting Plan," dated January 29, 2021, revised February 24, 2021; Sheet 6, Sheet L2.4, entitled "West Buffer Planting Plans," dated January 29, 2021, revised February 24, 2021; Sheet 7, Sheet L3.1, entitled "North Materials Plan," dated January 29, 2021, revised February 24, 2021; Sheet 8, Sheet L3.2, entitled "Building Arrival & Resident Courtyard Materials Plan," dated January 29, 2021, revised February 24, 2021; Sheet 9, Sheet L3.3, entitled "Assisted Living Entrance Materials Plan," dated January 29, 2021, revised February 24, 2021; Sheet 10, Sheet LD 1, entitled "Plan Schedule and Planting Details," dated January 29, 2021, revised February 24, 2021; Sheet 11, Sheet LD 2, entitled "Planting Notes," dated January 29, 2021, revised February 24, 2021; Sheet 12, Sheet LD 3, entitled "Construction Details," dated January 29, 2021, revised February 24, 2021.

10. Stormwater Management Report, dated February 25, 2021.

The hearing is scheduled for April 6, 2021. If you wish to comment, please submit your comment by Wednesday March 31, 2021, so that the Petitioner has time to address any concerns or questions in advance of the hearing.

Thanks, alex.

_____
Alexandra Clee
Assistant Town Planner
Town of Needham
500 Dedham Avenue
Needham, MA 02492
781-455-7550 Ext 271
Needhamma.gov

From:	Dennis Condon
To:	Alexandra Clee; David Roche; Anthony DelGaizo; Timothy McDonald; John Schlittler; Carys Lustig
Cc:	Lee Newman; Elisa Litchman; Thomas Ryder; Tara Gurge
Subject:	RE: Request for comment - 100-110 West Street
Date:	Wednesday, March 10, 2021 2:20:46 PM

Hi Alex,
The Fire Department has discussed the plans with the developers and made comments, which have been addressed. We do not have any issues with the project at this time.
Thanks,
Dennis

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Monday, March 8, 2021 3:29 PM
To: David Roche <droche@needhamma.gov>; Anthony DelGaizo <ADelgaizo@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>
Subject: Request for comment - 100-110 West Street

Dear all,

The Planning Board will be holding a hearing on proposal for a Major Project Site Plan Special Permit at 100-110 West Street. More information is included in the submitted documents, detailed below, which can be found at this location K:\Planning Board Applications\Planning_100_110_West. Some of the application documents are attached, as noted, but not all, as the files were too large to include all.
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10. Stormwater Management Report, dated February 25, 2021.

The hearing is scheduled for April 6, 2021. If you wish to comment, please submit your comment by Wednesday March 31, 2021, so that the Petitioner has time to address any concerns or questions in advance of the hearing.

Thanks, alex.

_____

Alexandra Clee

Assistant Town Planner
Town of Needham
500 Dedham Avenue
Needham, MA 02492
781-455-7550 Ext 271
Needhamma.gov

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

April 14, 2021

Needham Planning Board
Public Service Administration Building
Needham, MA 02492

RE: Major Project Site Plan Special Permit No. 2020-04
Residence at Carter Mill-100-110 West Street

Dear Members of the Board,

The Department of Public Works has completed its review of the above referenced site plan. The proposed Major Project Site Plan Special Permit at the corner of Highland Ave and West Street will redevelop the previous 60-unit assisted living/memory care facility, and 142-bed skilled nursing facility and medical offices. The proposed redevelopment will modify the building to provide 83-unit Assisted Living and Alzheimer's/Memory Care, and 72 Independent Living Apartments. The existing building footprint will remain and well as the parking lot with exception of landscape features.

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 submitted by WELL LCB Needham Landlord, LLC with Exhibit A.

2. Secretary's Certificate.

3. Letter from Evans Huber Attorney, dated March 3, 2021.

4. Letter from Evans Huber Attorney, dated March 4, 2021.

5. Traffic Impact Study, dated February, 2021.

6. Appendix for Traffic Impact Study, dated February, 2021.

7. Plan set entitled "Site Development Plan for The Residence at Carter Mill," prepared by Kelley Engineering Group, consisting of 6 sheets: Sheet 1, Cover Sheet, dated January 29, 2021; Sheet 2, entitled "Existing Conditions Plan," dated January 29, 2021; Sheet 3, entitled "Layout and Zoning Plan," dated January 29, 2021; Sheet 4, entitled "Grading Plan," dated January 29, 2021; Sheet 5, entitled "Detail Sheet," dated January 29, 2021; Sheet 6, no title, showing photometrics, dated January 29, 2021.

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10. Stormwater Management Report, dated February 25, 2021.

Our comments and recommendations are as follows:

- As part of the NPDES requirements, the applicant has submitted a letter proposing Public Out Reach & Education and Public Participation & Involvement control measures to be incorporated into the Planning Board's Decision to be completed prior to Certificate of Occupancy.
- The Engineering Division suggests that the applicant provide some stormwater recharge onsite in order to minimize future disruptions if EPA subjects properties greater 1-acre in size of this requirement. A stormwater recharge proposal is not a requirement at this time as the project does not trigger new construction standards. However, it may be advantageous to add while the site is under construction.
- The DPW has a proposed drainage improvement project in front of this facility at Highland Ave and West Street that is scheduled for this Summer and Fall. The project includes relief drains and repaving. Coordination of this construction project(s) is anticipated with property owners in this vicinity. The existing facility may have an existing sump pump connected to town's drain system which may need to be renewed during construction.

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

Truly yours,

Thomas Ryder
Assistant Town Engineer

From: John Schlittler
To: Alexandra Clee
Subject: RE: Request for comment - 100-110 West Street
Date: Wednesday, April 14, 2021 2:21:56 PM

The police department does not have any concern with this project. The only ask would be to make sure site workers park on site and do not take up any public parking spots or use side streets to park.

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Tuesday, April 13, 2021 1:29 PM
To: Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>
Cc: Anthony DelGaizo <ADelgaizo@needhamma.gov>; Lee Newman <LNewman@needhamma.gov>
Subject: FW: Request for comment - 100-110 West Street

Hi there,

The hearing for this is scheduled for Tuesday April 20 (my original email below stated it was April 6, but it ended up being 4/20). With Monday being a holiday, I am going to try to send out the packets a tad early. If you could get me comments today or tomorrow, that would be great.

Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
Sent: Monday, March 8, 2021 3:29 PM
To: David Roche <droche@needhamma.gov>; Anthony DelGaizo <ADelgaizo@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>
Subject: Request for comment - 100-110 West Street

Dear all,

The Planning Board will be holding a hearing on proposal for a Major Project Site Plan Special Permit at 100-110 West Street. More information is included in the submitted documents, detailed below, which can be found at this location K:\Planning Board Applications\Planning_100_110_West. Some of the application documents are attached, as noted, but not all, as the files were too large to include all.

(some of you will receive a hard copy in the inter-office mail as well).

The documents attached for your review are:

1. Application submitted by WELL LCB Needham Landlord, LLC with Exhibit A. *attached*

2. Secretary's Certificate. *Attached*

3. Letter from Evans Huber Attorney, dated March 3, 2021. *Attached*

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10. Stormwater Management Report, dated February 25, 2021.

The hearing is scheduled for April 6, 2021. If you wish to comment, please submit your comment by Wednesday March 31, 2021, so that the Petitioner has time to address any concerns or questions in advance of the hearing.

Thanks, alex.

_____
Alexandra Clee
Assistant Town Planner
Town of Needham
500 Dedham Avenue
Needham, MA 02492
781-455-7550 Ext 271
Needhamma.gov

From: The Village Club
To: Planning
Subject: LCB Senior Living - 110 West St.
Date: Thursday, April 15, 2021 8:23:24 AM

Good Morning,

As you will be meeting next Tuesday (4/20) with the LCB Senior Living project at 110 West St (or Highland Ave may be an official address) on your agenda, the Board of Directors at The Village Club on 83 Morton Street just wanted to send a note of approval for this project moving forward. The Development team has been very forthcoming with us and as an abutter we believe this project will be a great addition to the community.

Thanks for your time and consideration

Village Club
Board of Directors

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2021 MAR -3 PM 3:49

PLANNING AND COMMUNITY
DEVELOPMENT DEPARTMENT

Theodora K. Eaton
Town Clerk
1471 Highland Avenue
Needham, MA 02492

March 3, 2021

RE: Application for Approval of Definitive Subdivision
Map No. 221, Parcel 9
390 Grove Street

Dear Ms. Eaton:

At its March 2, 2021 meeting, the Planning Board voted to accept the applicant's request to extend the action deadline for the 390 Grove Street Subdivision to May 31, 2021.

A copy of the applicant's request as outlined in a letter from George Giunta Jr. to Lee Newman and dated March 2, 2021 is attached to this memo.

Should you have any questions regarding this matter, please feel free to contact me directly.

Very truly yours,

NEEDHAM PLANNING BOARD

Lee Newman

Lee Newman
Director of Planning and Community Development

cc: George Giunta Jr. *via email*

RECEIVED TOWN CLERK
NEEDHAM, MA 02492

2021 MAR -3 PM 3:49

George Giunta, Jr.
ATTORNEY AT LAW*
281 Chestnut Street
Needham, MASSACHUSETTS 02492
*Also admitted in Maryland

TELEPHONE (781) 449-4520 FAX (781) 449-8475

March 2, 2021

Lee Newman
Planning Director
Town of Needham
1471 Highland Avenue
Needham, MA 02492

VIA EMAIL: LNewman@needhamma.gov

Re: Definitive Subdivision Application
Elisabeth Schmidt-Scheuber
390 Grove Street

Dear Lee,

In connection with the above referenced definitive subdivision application, please be advised that as of last night, the applicant / owner and the neighbors have come to an agreement concerning the property. In order to effectuate such agreement, the parties have agreed to temporarily suspend the pending subdivision proceedings. Therefore, please accept this letter as a joint request to further continue the hearing, and the vote, on the Definitive Subdivision Application for 390 Grove Street until the April 20, 2021 meeting of the Board.

In connection with the foregoing, please also further extend the applicable action deadline until May 31, 2021.

Sincerely,

George Giunta, Jr

Agreed and assented
Bernkopf Goodman LLP

By: Gary P. Lilienthal, of counsel

George Giunta, Jr.
ATTORNEY AT LAW*
281 Chestnut Street
Needham, MASSACHUSETTS 02492
*Also admitted in Maryland
TELEPHONE (781) 449-4520 FAX (781) 449-8475

April 15, 2021

Lee Newman
Planning Director
Town of Needham
1471 Highland Avenue
Needham, MA 02492

VIA EMAIL: LNewman@needhamma.gov

Re: Definitive Subdivision Application
Elisabeth Schmidt-Scheuber
390 Grove Street

Dear Lee,

In connection with the above referenced definitive subdivision application, and in furtherance of the recent agreement between the applicant / owner and the neighbors, please accept this letter as a request to withdraw the Definitive Subdivision Application for 390 Grove Street, without prejudice.

Sincerely,

George Giunta, Jr

Commonwealth of Massachusetts
EXECUTIVE OFFICE OF
HOUSING & ECONOMIC DEVELOPMENT
ONE ASHBURTON PLACE, ROOM 2101
BOSTON, MA 02108
www.mass.gov/eohed

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

MIKE KENNEALY
SECRETARY

TELEPHONE
(617) 788-3610

FACSIMILE
(617) 788-3605

GUIDANCE FOR LOCAL OFFICIALS ON DETERMINING VOTING THRESHOLDS FOR ZONING ORDINANCES AND BYLAWS

Chapter 358 of the Acts of 2020 (sometimes referred to as the economic development legislation of 2020) made several amendments to Chapter 40A of the General Laws, commonly known as the Zoning Act. Among these amendments are (1) changes to section 5 of the Zoning Act, which reduce the number of votes required to enact certain kinds of zoning ordinances and bylaws from a ⅔ supermajority to a simple majority; and (2) changes to section 9 of the Zoning Act, making similar changes to the voting thresholds for the issuance of certain kinds of special permits.

Section 100 of said chapter 358 directs "[t]he executive office of housing and economic development [to] issue guidance to assist local officials in determining the voting thresholds for various zoning amendments. Such guidance shall be assembled in consultation with the department of housing and community development, the Massachusetts attorney general's municipal law unit, and Massachusetts Housing Partnership." This guidance is intended to comply with that directive.

1. Where does the Zoning Act apply?

The Zoning Act applies to all cities and towns in Massachusetts except the City of Boston, which has its own zoning enabling act.

2. What kinds of zoning ordinance or bylaw can be enacted with a simple majority vote?

Under the newly amended section 5 of the Zoning Act, a zoning ordinance or bylaw can be enacted by a simple majority vote, rather than the ⅔ supermajority that applies to other zoning amendments, if that ordinance or bylaw does any of the following:

a. Allows for multi-family housing or mixed-use developments "as of right" in an eligible location.

b. Allows for open space residential development as of right.

c. Allows accessory dwelling units, either within the principal dwelling or within a detached structure on the same lot, as-of-right.

d. Allows by special permit accessory dwelling units in a detached structure on the same lot.

e. Reduces the parking requirements for residential or mixed-use development under a special permit.

f. Permits an increase in the permissible density of population or intensity of a particular use in a proposed multi-family or mixed-use development that requires a special permit.

g. Changes dimensional standards such as lot coverage or floor area ratio, height, setbacks, minimum open space coverage, parking, building coverage to allow for the construction of additional residential units on a particular parcel or parcels of land.

h. Provides for transfer of development rights zoning or natural resource protection zoning in instances where the adoption of such zoning promotes concentration of development in areas that the municipality deems most appropriate for such development, but will not result in a diminution in the maximum number of housing units that could be developed within the municipality.

i. Adopts a smart growth or starter home district in accordance with section 3 of Chapter 40R of the General Laws.

Key terms such as "multi-family housing," "mixed-use development," "accessory dwelling unit," "transfer of development rights zoning," "natural resource protection zoning," and "eligible location" are now defined in section 1A of the Zoning Act.

3. Who decides which voting threshold applies to a particular zoning proposal?

Section 5 does not specify who determines whether a proposed zoning ordinance or bylaw is the kind that can be approved by a simple majority vote. The proponent of a zoning ordinance or bylaw that allows or facilitates the development of new housing should include in the petition a statement explaining if it meets any of the criteria for being approved by a simple majority vote. The Zoning Act provides that no vote on a proposed zoning amendment may occur until after the planning board in a city or town, and the city council (or a committee designated or appointed by the council) each has held a public hearing on the proposal. Additionally, no vote to adopt a zoning ordinance or bylaw may be taken until the planning board has submitted a report and recommendations to the town meeting or city council, or 21 days have elapsed after the hearing without submission of such report. It is recommended that the planning board, after consultation with municipal legal counsel, include in this report a determination of which voting threshold applies to the zoning proposal. The legislative body's vote consistent with that recommendation will affirm the voting threshold.

Under section 32 of chapter 40 of the General Laws, all zoning bylaws adopted by a town must be submitted to the Attorney General for review and approval. A request for approval must

include adequate proof that the town has complied with all of the procedural requirements for the adoption of the bylaw. If the Attorney General finds an inconsistency between the proposed bylaw and state law, the bylaw or portions of it may be disapproved.

4. How do I know if a particular land area qualifies as an eligible location?

Section 1A of the Zoning Act defines "eligible locations" as areas that by virtue of their infrastructure, transportation access, existing underutilized facilities or location make highly suitable locations for residential or mixed use smart growth zoning districts or starter home zoning districts, including without limitation: (i) areas near transit stations, including rapid transit, commuter rail and bus and ferry terminals; or (ii) areas of concentrated development, including town and city centers, other existing commercial districts in cities and towns and existing rural village districts.

Section 5 does not specify who determines whether the land area subject to a proposed zoning ordinance or bylaw is an eligible location. The proponent of a zoning ordinance or bylaw that allows or facilitates the development of new housing should include in the petition explaining if the land area affected meets any of the criteria for an eligible location. As noted above, no vote to adopt a zoning ordinance or bylaw may be taken until the proposal has received a public hearing and the planning board has submitted a report with recommendations to the town meeting or city council, or 21 days have elapsed after the hearing without submission of such report. It is recommended that the planning board, after consultation with municipal counsel, include in this report a determination of whether the affected land area is an eligible location, when such a determination is relevant to the voting threshold.

5. Is there any additional guidance for determining eligible locations?

The same definition of "eligible location" that appears in section 1A of Chapter 40A also appears in section 2 of Chapter 40R. The regulations implementing Chapter 40R (760 CMR 59) set forth detailed criteria that the Department of Housing and Community Development (DHCD) applies when it determines if a land area is an eligible location under that statute. Although 760 CMR 59 does not apply to Chapter 40A, municipalities may reasonably look to those regulations for additional guidance on what areas should be deemed eligible locations under Chapter 40A.

Under the statutory definition, a land area qualifies as an eligible location if it is located "near" a transit station, including rapid transit, commuter rail or bus or ferry terminals. Any parcel that is at least partially within 0.5 miles of the kind of transit station listed should be deemed to be an eligible location.

In addition, the statute includes within the definition of "eligible location" parcels that are within "an area of concentrated development, including a town or city enter, or other existing commercial districts, or existing rural village district."

All other land areas may be determined to be "eligible locations" if, in the judgment of the planning board, the land area is a highly suitable location for residential or mixed-use development based on its infrastructure, transportation access, or existing underutilized facilities.

If there is uncertainty about whether a zoning proposal affects an eligible location, the municipality may request an advisory opinion from the Executive Office of Housing and Economic Development. Such a request must be made by the mayor, city council, board of aldermen, or planning board (when the zoning amendment is proposed in a city); or by the select board or planning board (when the zoning amendment is proposed in a town). A request may not be made by an individual member of the council or board. Communities are encouraged to submit their request for an advisory opinion as early as possible in the zoning amendment process. The request should be made by completing the application at the following website: www.mass.gov/forms/request-an-advisory-opinion-on-ch40a-eligible-locations. EOHED will endeavor to provide a written advisory opinion within 30 days of receipt of a complete request.

6. What happens if a proposed zoning ordinance or bylaw includes some changes that can be adopted with simple majority vote, and other changes that require a ⅔ supermajority?

Section 5 as amended provides that "any amendment that requires a simple majority vote shall not be combined with amendments that require a two-thirds majority vote." A proposed zoning amendment cannot be adopted by a simple majority vote if it is combined with an amendment that requires a ⅔ supermajority. Drafters of new zoning proposals should take care not to combine provisions that require different voting thresholds, so that proposals that will encourage new housing production will get the benefit of the simple majority threshold. If a municipality desires to combine proposals with different voting thresholds, the municipality should first confer with municipal counsel, and review the guidance issued by EOHED. In the case of a zoning bylaw amendment being considered at town meeting, the Town Moderator has authority to "preside and regulate the proceedings, and decide all questions of order"—potentially including the required quantum of vote—pursuant to G.L. c. 39, § 15. If the town meeting approves the amendment, will be subject to the review and approval of the Attorney General pursuant to G.L. c. 40, § 32. *(Updated: April 9, 2021)*

7. What is a special permit and what are the required thresholds for special permit votes?

Section 9 of the Zoning Act provides that zoning ordinances or bylaws can provide for specific types of uses which shall only be permitted in specified districts upon the issuance of a special permit. Zoning ordinances or bylaws may also provide for special permits authorizing increases in density or intensity of a particular use in a proposed development if the petitioner or applicant agrees to conditions that serve the public interest. Special permits may also issue for other purposes set forth in section 9.

A special permit can be granted a ⅔ vote of boards with more than 5 members, a vote of at least 4 members of a 5-member board, and a unanimous vote of a 3-member board. But, the recent amendments to section 9 provide that a special permit may be issued by a simple majority vote if the special permit does any of the following:

- Permits multi-family housing that is located within ½ mile of a commuter rail station, subway station, ferry terminal or bus station; provided that not less than 10% of the housing is affordable to and occupied by households whose annual income is less than 80% of the area median income and affordability is assured for a period of not less than 30 years through the use of an affordable housing restriction as defined in section 31 of chapter 184.

- Permits mixed-use development in centers of commercial activity within a municipality, including town and city centers, other commercial districts in cities and towns and rural village districts; provided, that not less than 10% of the housing meets the same standard of affordability as noted above.

- Permits a reduced parking space to residential unit ratio requirement, provided such reduction in the parking requirement will result in the production of additional housing units.

8. Where can I find additional guidance about the voting thresholds for zoning ordinances and bylaws?

Answers to frequently asked questions (FAQs) will be posted at www.mass.gov/info-details/housing-choice-and-mbta-communities-legislation. Questions about zoning thresholds that are not answered in the FAQs can be directed to the Executive Office of Housing and Economic Development at housingchoice@mass.gov.

9. My town is planning a comprehensive update of our zoning bylaws to eliminate inconsistencies and make the bylaws easier to use (for example, by consolidating all definition in a new section). Can this be done by a vote on a single article that amends and restates the entire zoning code, as originally planned? Or should we delay the vote so that the existing provisions that qualify for a simple majority vote can be presented as separate articles?

You may proceed with a vote as planned, consistent with the following guidance. Section 5 of the Zoning Act now provides that "any amendment that requires a simple majority vote shall not be combined with amendments that require a two-thirds majority vote." The intent of this language is to ensure that certain zoning changes that make it easier to build new housing will have the benefit of the simple majority threshold. If a city or town is considering an existing proposal to amend and restate its entire zoning code with a single vote, and there is not enough time to separate amendments that have different voting thresholds, it may proceed as planned rather than starting over or delaying the vote. Although the statute does not say so expressly, in the view of EOHED, the combined article may be approved by a ⅔ vote. The Attorney General has not yet taken a position on this question. The city or town alternatively may elect to delay the vote and separate out the zoning provisions that have different approval thresholds. Going forward it is the recommendation of EOHED that proposals to amend and restate an entire zoning code should be drafted so that housing-friendly provisions that qualify for approval by a simple majority approval are considered separately, if possible. In all cases, the municipality should consult with municipal counsel regarding the appropriate quantum of vote. In the case of

a zoning bylaw amendment being considered at town meeting, the Town Moderator has authority to "preside and regulate the proceedings, and decide all questions of order"—potentially including the required quantum of vote—pursuant to G.L. c. 39, § 15. If the town meeting approves the amendment, will be subject to the review and approval of the Attorney General pursuant to G.L. c. 40, § 32. *(Added: April 9, 2021)*

10. My town is considering a new overlay district in which a mixture of retail, hospitality, recreational, entertainment, commercial and other uses will be allowed by right. Multifamily and mixed-use developments are among many types of uses that will be allowed in the new zone, along with things like retail, hotels, commercial recreational facilities, and entertainment uses. The new overlay district does not requires a proposed project to include a residential component. Does this overlay district qualify for the simple majority?

Section 5 of the Zoning Act now provides that "any amendment that requires a simple majority vote shall not be combined with amendments that require a two-thirds majority vote." The intent of this language is to ensure that certain zoning changes that make it easier to build new housing will have the benefit of the simple majority threshold. It also is intended to ensure that zoning proposals that otherwise would require a ⅔ vote are not approved by a simple majority simply because a multifamily use or other residential use has been added to the mix of allowed uses. This overlay district appears to conflict with the statute's prohibition on combined articles, since it combines uses that require a ⅔ vote with uses that may potentially qualify for a simple majority vote. In all cases, the municipality should consult with municipal counsel regarding the appropriate quantum of vote. In the case of a zoning bylaw amendment being considered at town meeting, the Town Moderator has authority to "preside and regulate the proceedings, and decide all questions of order"—potentially including the required quantum of vote—pursuant to G.L. c. 39, § 15. If the town meeting approves the amendment, will be subject to the review and approval of the Attorney General pursuant to G.L. c. 40, § 32. *(Added: April 9, 2021)*

Issue date: February 26, 2021
Update date: April 9, 2021

Chapters 40, 40A, 40R, 40S
Redline of Amendments Contained in H.5250
Changes shown as ~~strikethrough~~ and underline for Sections that were amended

Chapter 40

G.L. c. 40, § 4A: Governmental units; joint operation of public activities; termination of agreement; "governmental unit" defined; financial safeguards

Section 4A. The chief executive officer of a city or town, or a board, committee or officer authorized by law to execute a contract in the name of a governmental unit may, on behalf of the unit, enter into an agreement with another governmental unit to perform jointly or for that unit's services, activities or undertakings which any of the contracting units is authorized by law to perform, if the agreement is authorized by the parties thereto, in a city by the city council with the approval of the mayor, in a town by the board of selectmen and in a district by the prudential committee; provided, however, that when the agreement involves the expenditure of funds for establishing supplementary education centers and innovative educational programs, the agreement and its termination shall be authorized by the school committee. Any such agreement shall be for such maximum term, not exceeding twenty-five years, and shall establish such maximum financial liability of the parties, as may be specified in the authorizing votes of the parties thereto. A governmental unit, when duly authorized to do so in accordance with the provisions of law applicable to it, may raise money by any lawful means, including the incurring of debt for purposes for which it may legally incur debt, to meet its obligations under such agreement. Notwithstanding any provisions of law or charter to the contrary, no governmental unit shall be exempt from liability for its obligations under an agreement lawfully entered into in accordance with this section. For the purposes of this section, a "governmental unit" shall mean a city, town or a regional school district, a district as defined in section 1A, a regional planning commission, however constituted, a regional transit authority established under chapter 161B, a water and sewer commission established under chapter 40N or by special law, a county, or a state agency as defined in section 1 of chapter 6A.

All agreements put into effect under this section shall provide sufficient financial safeguards for all participants, including, but not limited to: accurate and comprehensive records of services performed, costs incurred, and reimbursements and contributions received; the performance of regular audits of such records; and provisions for officers responsible for the agreement to give appropriate performance bonds. The agreement shall also require that periodic financial statements be issued to all participants. Nothing in this section shall prohibit any agreement entered into between governmental units from containing procedures for withdrawal of a governmental unit from said agreement. A decision to enter into an intermunicipal agreement under this section, or to join a regional entity, shall be solely subject to the approval process of the towns' elected bodies.

All bills and payrolls submitted for work done under any such agreement shall be plainly marked to indicate that the work was done under authority thereof. Any reimbursement for or

contribution toward the cost of such work shall be made at such intervals as the agreement provides. The amount of reimbursement received under any such agreement by any governmental unit shall be credited on its books to the account of estimated receipts, but any funds received under the provisions of section fifty-three A of chapter forty-four for contribution toward the cost of such work may be expended in accordance with the said provisions. The equipment and employees of a governmental unit while engaged in performing any such service, activity or undertaking under such an agreement shall be deemed to be engaged in the service and employment of such unit, notwithstanding such service, activity or undertaking is being performed in or for another governmental unit or units.

By a majority vote of their legislative bodies, and with the approval of the mayor, board of selectmen or other chief executive officer, any contiguous cities and towns may enter into an agreement to allocate public infrastructure costs, municipal service costs and local tax revenue associated with the development of an identified parcel or parcels or development within the contiguous communities generally; provided, that the agreement shall be approved by the department of revenue.

Chapter 40A

Section 1A: Definitions

Section 1A. As used in this chapter the following words shall have the following meanings:

"Accessory dwelling unit", a self-contained housing unit, inclusive of sleeping, cooking and sanitary facilities on the same lot as a principal dwelling, subject to otherwise applicable dimensional and parking requirements, that: (i) maintains a separate entrance, either directly from the outside or through an entry hall or corridor shared with the principal dwelling sufficient to meet the requirements of the state building code for safe egress; (ii) is not larger in floor area than 1/2 the floor area of the principal dwelling or 900 square feet, whichever is smaller; and (iii) is subject to such additional restrictions as may be imposed by a municipality, including but not limited to additional size restrictions, owner-occupancy requirements and restrictions or prohibitions on short-term rental of accessory dwelling units.

"As of right", development that may proceed under a zoning ordinance or by-law without the need for a special permit, variance, zoning amendment, waiver or other discretionary zoning approval.

"Eligible locations", areas that by virtue of their infrastructure, transportation access, existing underutilized facilities or location make highly suitable locations for residential or mixed-use smart growth zoning districts or starter home zoning districts, including without limitation: (i) areas near transit stations, including rapid transit, commuter rail and bus and ferry terminals; or (ii) areas of concentrated development, including town and city centers, other existing commercial districts in cities and towns and existing rural village districts.

"Gross density", a units-per-acre density measurement that includes land occupied by public rights-of-way and any recreational, civic, commercial and other nonresidential uses.

"Lot", an area of land with definite boundaries that is used or available for use as the site of a building or buildings.

"MBTA community", a city or town that is: (i) one of the 51 cities and towns as defined in section 1 of chapter 161A; (ii) one of the 14 cities and towns as defined in said section 1 of said chapter 161A; (iii) other served communities as defined in said section 1 of said chapter 161A; or (iv) a municipality that has been added to the Massachusetts Bay Transportation Authority under section 6 of chapter 161A or in accordance with any special law relative to the area constituting the authority.

"Mixed-use development", development containing a mix of residential uses and non-residential uses, including, without limitation, commercial, institutional, industrial or other uses;

"Multi-family housing", a building 3 or more residential dwelling units or 2 or more buildings on the same lot with more than 1 residential dwelling unit in each building.

"Natural resource protection zoning", zoning ordinances or by-laws enacted principally to protect natural resources by promoting compact patterns of development and concentrating

development within a portion of a parcel of land so that a significant majority of the land remains permanently undeveloped and available for agriculture, forestry, recreation, watershed management, carbon sequestration, wildlife habitat or other natural resource values.

“Open space residential development”, a residential development in which the buildings and accessory uses are clustered together into 1 or more groups separated from adjacent property and other groups within the development by intervening open land. An open space residential development shall be permitted only on a plot of land of such minimum size as a zoning ordinance or by-law may specify which is divided into building lots with dimensional control, density and use restrictions for such building lots varying from those otherwise permitted by the ordinance or by-law and open land. The open land may be situated to promote and protect maximum solar access within the development. The open land shall either be conveyed to the city or town and accepted by said city or town for park or open space use, or be made subject to a recorded use restriction enforceable by said city or town or a nonprofit organization the principal purpose of which is the conservation of open space, providing that such land shall be kept in an open or natural state and not be built for residential use or developed for accessory uses such as parking or roadway.

"Solar access", the access of a solar energy system to direct sunlight.

"Solar energy system", a device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generating, or water heating.

"Special permit granting authority", shall include the board of selectmen, city council, board of appeals, planning board, or zoning administrators as designated by zoning ordinance or by-law for the issuance of special permits.

~~"Transfer of development rights", the process by which the owner of a parcel may convey development rights, extinguishing those rights on the first parcel and where the owner of another parcel may obtain and exercise those rights in addition to the development rights already existing on that second parcel.~~

“Transfer of development rights”, the regulatory procedure whereby the owner of a parcel may convey development rights, extinguishing those rights on the first parcel, and where the owner of another parcel may obtain and exercise those rights in addition to the development rights already existing on that second parcel.

"Zoning", ordinances and by-laws, adopted by cities and towns to regulate the use of land, buildings and structures to the full extent of the independent constitutional powers of cities and towns to protect the health, safety and general welfare of their present and future inhabitants.

"Zoning administrator", a person designated by the board of appeals pursuant to section thirteen to assume certain duties of said board.

Section 3A:

Section 3A. (a) (1) An MBTA community shall have a zoning ordinance or by-law that

provides for at least 1 district of reasonable size in which multi-family housing is permitted as of right; provided, however, that such multi-family housing shall be without age restrictions and shall be suitable for families with children. For the purposes of this section, a district of reasonable size shall: (i) have a minimum gross density of 15 units per acre, subject to any further limitations imposed by section 40 of chapter 131 and title 5 of the state environmental code established pursuant to section 13 of chapter 21A; and (ii) be located not more than 0.5 miles from a commuter rail station, subway station, ferry terminal or bus station, if applicable.

(b) An MBTA community that fails to comply with this section shall not be eligible for funds from: (i) the Housing Choice Initiative as described by the governor in a message to the general court dated December 11, 2017; (ii) the Local Capital Projects Fund established in section 2EEEE of chapter 29; or (iii) the MassWorks infrastructure program established in section 63 of chapter 23A.

(c) The department, in consultation with the Massachusetts Bay Transportation Authority and the Massachusetts Department of Transportation, shall promulgate guidelines to determine if an MBTA community is in compliance with this section.

Section 5: Adoption or change of zoning ordinances or by-laws; procedure

Section 5. Zoning ordinances or by-laws may be adopted and from time to time changed by amendment, addition or repeal, but only in the manner hereinafter provided. Adoption or change of zoning ordinances or by-laws may be initiated by the submission to the city council or board of selectmen of a proposed zoning ordinance or by-law by a city council, a board of selectmen, a board of appeals, by an individual owning land to be affected by change or adoption, by request of registered voters of a town pursuant to section ten of chapter thirty-nine, by ten registered voters in a city, by a planning board, by a regional planning agency or by other methods provided by municipal charter. The board of selectmen or city council shall within fourteen days of receipt of such zoning ordinance or by-law submit it to the planning board for review.

No zoning ordinance or by-law or amendment thereto shall be adopted until after the planning board in a city or town, and the city council or a committee designated or appointed for the purpose by said council has each held a public hearing thereon, together or separately, at which interested persons shall be given an opportunity to be heard. Said public hearing shall be held within sixty-five days after the proposed zoning ordinance or by-law is submitted to the planning board by the city council or selectmen or if there is none, within sixty-five days after the proposed zoning ordinance or by-law is submitted to the city council or selectmen. Notice of the time and place of such public hearing, of the subject matter, sufficient for identification, and of the place where texts and maps thereof may be inspected shall be published in a newspaper of general circulation in the city or town once in each of two successive weeks, the first publication to be not less than fourteen days before the day of said hearing, and by posting such notice in a conspicuous place in the city or town hall for a period of not less than fourteen days before the day of said hearing. Notice of said hearing shall also be sent by mail, postage prepaid to the department of housing and community development, the regional planning agency, if any, and to

the planning board of each abutting city and town. The department of housing and community development, the regional planning agency, the planning boards of all abutting cities and towns and nonresident property owners who may not have received notice by mail as specified in this section may grant a waiver of notice or submit an affidavit of actual notice to the city or town clerk prior to town meeting or city council action on a proposed zoning ordinance, by-law or change thereto. Zoning ordinances or by-laws may provide that a separate, conspicuous statement shall be included with property tax bills sent to nonresident property owners, stating that notice of such hearings under this chapter shall be sent by mail, postage prepaid, to any such owner who files an annual request for such notice with the city or town clerk no later than January first, and pays a reasonable fee established by such ordinance or by-law. In cases involving boundary, density or use changes within a district, notice shall be sent to any such nonresident property owner who has filed such a request with the city or town clerk and whose property lies in the district where the change is sought. No defect in the form of any notice under this chapter shall invalidate any zoning ordinances or by-laws unless such defect is found to be misleading.

Prior to the adoption of any zoning ordinance or by-law or amendment thereto which seeks to further regulate matters established by section forty of chapter one hundred and thirty-one or regulations authorized thereunder relative to agricultural and aquacultural practices, the city or town clerk shall, no later than seven days prior to the city council's or town meeting's public hearing relative to the adoption of said new or amended zoning ordinances or by-laws, give notice of the said proposed zoning ordinances or by-laws to the farmland advisory board established pursuant to section forty of chapter one hundred and thirty-one.

No vote to adopt any such proposed ordinance or by-law or amendment thereto shall be taken until a report with recommendations by a planning board has been submitted to the town meeting or city council, or twenty-one days after said hearing has elapsed without submission of such report. After such notice, hearing and report, or after twenty-one days shall have elapsed after such hearing without submission of such report, a city council or town meeting may adopt, reject, or amend and adopt any such proposed ordinance or by-law. If a city council fails to vote to adopt any proposed ordinance within ninety days after the city council hearing or if a town meeting fails to vote to adopt any proposed by-law within six months after the planning board hearing, no action shall be taken thereon until after a subsequent public hearing is held with notice and report as provided.

~~No zoning ordinance or by-law or amendment thereto shall be adopted or changed except by a two-thirds vote of all the members of the town council, or of the city council where there is a commission form of government or a single branch, or of each branch where there are two branches, or by a two-thirds vote of a town meeting; provided, however, that if in a city or town with a council of fewer than twenty-five members there is filed with the clerk prior to final action by the council a written protest against such change, stating the reasons duly signed by owners of twenty per cent or more of the area of the land proposed to be included in such change or of the area of the land immediately adjacent extending three hundred feet therefrom, no such change of any such ordinance shall be adopted except by a three-fourths vote of all members.~~

Except as provided herein, no zoning ordinance or by-law or amendment thereto shall be adopted or changed except by a two-thirds vote of all the members of the town council, or of the city council where there is a commission form of government or a single branch, or of each branch where there are 2 branches, or by a two-thirds vote of a town meeting; provided, however, that a the following shall be adopted by a vote of a simple majority of all members of the town council or of the city council where there is a commission form of government or a single branch or of each branch where there are 2 branches or by a vote of a simple majority of town meeting:

(1) an amendment to a zoning ordinance or by-law to allow any of the following as of right: (a) multifamily housing or mixed-use development in an eligible location; (b) accessory dwelling units, whether within the principal dwelling or a detached structure on the same lot; or (c) open-space residential development;

(2) an amendment to a zoning ordinance or by-law to allow by special permit: (a) multi-family housing or mixed-use development in an eligible location; (b) an increase in the permissible density of population or intensity of a particular use in a proposed multi-family or mixed use development pursuant to section 9; (c) accessory dwelling units in a detached structure on the same lot; or (d) a diminution in the amount of parking required for residential or mixed-use development pursuant to section 9;

(3) zoning ordinances or by-laws or amendments thereto that: (a) provide for TDR zoning or natural resource protection zoning in instances where the adoption of such zoning promotes concentration of development in areas that the municipality deems most appropriate for such development, but will not result in a diminution in the maximum number of housing units that could be developed within the municipality; or (b) modify regulations concerning the bulk and height of structures, yard sizes, lot area, setbacks, open space, parking and building coverage requirements to allow for additional housing units beyond what would otherwise be permitted under the existing zoning ordinance or by-law; and

(4) the adoption of a smart growth zoning district or starter home zoning district in accordance with section 3 of chapter 40R. Any amendment that requires a simple majority vote shall not be combined with an amendment that requires a two-thirds majority vote. If, in a city or town with a council of fewer than 25 members, there is filed with the clerk prior to final action by the council a written protest against a zoning change under this section, stating the reasons duly signed by owners of 50 per cent or more of the area of the land proposed to be included in such change or of the area of the land immediately adjacent extending 300 feet therefrom, no change of any such ordinance shall be adopted except by a two-thirds vote of all members.

No proposed zoning ordinance or by-law which has been unfavorably acted upon by a city council or town meeting shall be considered by the city council or town meeting within two years after the date of such unfavorable action unless the adoption of such proposed ordinance or by-law is recommended in the final report of the planning board.

When zoning by-laws or amendments thereto are submitted to the attorney general for approval as required by section thirty-two of chapter forty, he shall also be furnished with a statement

which may be prepared by the planning board explaining the by-laws or amendments proposed, which statement may be accompanied by explanatory maps or plans.

The effective date of the adoption or amendment of any zoning ordinance or by-law shall be the date on which such adoption or amendment was voted upon by a city council or town meeting; if in towns, publication in a town bulletin or pamphlet and posting is subsequently made or publication in a newspaper pursuant to section thirty-two of chapter forty. If, in a town, said by-law is subsequently disapproved, in whole or in part, by the attorney general, the previous zoning by-law, to the extent that such previous zoning by-law was changed by the disapproved by-law or portion thereof, shall be deemed to have been in effect from the date of such vote. In a municipality which is not required to submit zoning ordinances to the attorney general for approval pursuant to section thirty-two of chapter forty, the effective date of such ordinance or amendment shall be the date passed by the city council and signed by the mayor or, as otherwise provided by ordinance or charter; provided, however, that such ordinance or amendment shall subsequently be forwarded by the city clerk to the office of the attorney general.

A true copy of the zoning ordinance or by-law with any amendments thereto shall be kept on file available for inspection in the office of the clerk of such city or town.

No claim of invalidity of any zoning ordinance or by-law arising out of any possible defect in the procedure of adoption or amendment shall be made in any legal proceedings and no state, regional, county or municipal officer shall refuse, deny or revoke any permit, approval or certificate because of any such claim of invalidity unless legal action is commenced within the time period specified in sections thirty-two and thirty-two A of chapter forty and notice specifying the court, parties, invalidity claimed, and date of filing is filed together with a copy of the petition with the town or city clerk within seven days after commencement of the action.

Section 9: Special permits

Section 9. Zoning ordinances or by-laws shall provide for specific types of uses which shall only be permitted in specified districts upon the issuance of a special permit. Special permits may be issued only for uses which are in harmony with the general purpose and intent of the ordinance or by-law, and shall be subject to general or specific provisions set forth therein; and such permits may also impose conditions, safeguards and limitations on time or use.

Zoning ordinances or by-laws may also provide for special permits authorizing increases in the permissible density of population or intensity of a particular use in a proposed development; provided that the petitioner or applicant shall, as a condition for the grant of said permit, provide certain open space, housing for persons of low or moderate income, traffic or pedestrian improvements, installation of solar energy systems, protection for solar access, or other amenities. Such zoning ordinances or by-laws shall state the specific improvements or amenities or locations of proposed uses for which the special permits shall be granted, and the maximum increases in density of population or intensity of use which may be authorized by such special permits.

Zoning ordinances or by-laws may provide that special permits may be granted for multi-family residential use in nonresidentially zoned areas where the public good would be served and after a finding by the special permit granting authority, that such nonresidentially zoned area would not be adversely affected by such a residential use, and that permitted uses in such a zone are not noxious to a multi-family use.

Zoning ordinances or by-laws may provide for special permits authorizing the transfer of development rights of land within or between districts. These zoning ordinances or by-laws shall include incentives such as increases in density of population, intensity of use, amount of floor space or percentage of lot coverage, that encourage the transfer of development rights in a manner that protect open space, preserve farmland, promote housing for persons of low and moderate income or further other community interests; provided, however, that nothing herein shall prohibit a zoning ordinance or by-law from allowing transfer of development rights to be permitted as of right, without the need for a special permit or other discretionary zoning approval.

Zoning ordinances or by-laws may also provide that ~~cluster~~open space residential developments or planned unit developments shall be permitted upon the issuance of a special permit.

Notwithstanding any provision of this section to the contrary, zoning ordinances or by-laws may provide that ~~cluster~~open space residential developments shall be permitted upon review and approval by a planning board pursuant to the applicable provisions of sections 81K to 81GG, inclusive, of chapter 41 and in accordance with its rules and regulations governing subdivision control; provided, however, that nothing herein shall prohibit a zoning ordinance or by-law from allowing open space residential developments to be permitted as of right, without the need for a special permit or other discretionary zoning approval.

~~"Cluster development" means a residential development in which the buildings and accessory uses are clustered together into one or more groups separated from adjacent property and other groups within the development by intervening open land. A cluster development shall be permitted only on a plot of land of such minimum size as a zoning ordinance or by-law may specify which is divided into building lots with dimensional control, density and use restrictions of such building lots varying from those otherwise permitted by the ordinance or by-law and open land. Such open land when added to the building lots shall be at least equal in area to the land area required by the ordinance or by-law for the total number of units or buildings contemplated in the development. Such open land may be situated to promote and protect maximum solar access within the development. Such open land shall either be conveyed to the city or town and accepted by it for park or open space use, or be conveyed to a non-profit organization the principal purpose of which is the conservation of open space, or to be conveyed to a corporation or trust owned or to be owned by the owners of lots or residential units within the plot. If such a corporation or trust is utilized, ownership thereof shall pass with conveyances of the lots or residential units. In any case where such land is not conveyed to the city or town, a restriction enforceable by the city or town shall be recorded providing that such land shall be kept in an open or natural state and not be built for residential use or developed for accessory uses such as parking or roadway.~~

Zoning ordinances or by-laws may also provide that special permits may be granted for reduced parking space to residential unit ratio requirements after a finding by the special permit granting authority that the public good would be served and that the area in which the development is located would not suffer a substantial adverse effect from such diminution in parking.

"Planned unit development" means a mixed use development on a plot of land containing a minimum of the lesser of sixty thousand square feet or five times the minimum lot size of the zoning district, but of such larger size as an ordinance or by-law may specify, in which a mixture of residential, open space, commercial, industrial or other uses and a variety of building types are determined to be sufficiently advantageous to render it appropriate to grant special permission to depart from the normal requirements of the district to the extent authorized by the ordinance or by-law. Such open space, if any, may be situated to promote and protect maximum solar access within the development.

Zoning ordinances or by-laws may also provide for the use of structures as shared elderly housing upon the issuance of a special permit. Such zoning ordinances or by-laws shall specify the maximum number of elderly occupants allowed, not to exceed a total number of six, any age requirements and any other conditions deemed necessary for the special permits to be granted.

Zoning ordinances or by-laws may provide that certain classes of special permits shall be issued by one special permit granting authority and others by another special permit granting authority as provided in the ordinance or by-law. Such special permit granting authority shall adopt and from time to time amend rules relative to the issuance of such permits, and shall file a copy of said rules in the office of the city or town clerk. Such rules shall prescribe a size, form, contents, style and number of copies of plans and specifications and the procedure for a submission and approval of such permits.

Zoning ordinances or by-laws may provide for associate members of a planning board when a planning board has been designated as a special permit granting authority. One associate member may be authorized when the planning board consists of five members, and two associate members may be authorized when the planning board consists of more than five members. A city or town which establishes the position of associate member shall determine the procedure for filling such position. If provision for filling the position of associate member has been made, the chairman of the planning board may designate an associate member to sit on the board for the purposes of acting on a special permit application, in the case of absence, inability to act, or conflict of interest, on the part of any member of the planning board or in the event of a vacancy on the board.

Each application for a special permit shall be filed by the petitioner with the city or town clerk and a copy of said application, including the date and time of filing certified by the city or town clerk, shall be filed forthwith by the petitioner with the special permit granting authority. The special permit granting authority shall hold a public hearing, for which notice has been given as provided in section eleven, on any application for a special permit within sixty-five days from the date of filing of such application; provided, however, that a city council having more than five members designated to act upon such application may appoint a committee of such council

to hold the public hearing. The decision of the special permit granting authority shall be made within ninety days following the date of such public hearing. The required time limits for a public hearing and said action, may be extended by written agreement between the petitioner and the special permit granting authority. A copy of such agreement shall be filed in the office of the city or town clerk. A special permit issued by a special permit granting authority shall require a two-thirds vote of boards with more than five members, a vote of at least four members of a five member board, and a unanimous vote of a three member board.

A special permit issued by a special permit granting authority shall require a simple majority vote for any of the following: (a) multi-family housing that is located within 1/2 mile of a commuter rail station, subway station, ferry terminal or bus station; provided that not less than 10 per cent of the housing shall be affordable to and to be occupied by households whose annual income is less than 80 per cent of the area wide median income as determined by the United States Department of Housing and Urban Development and affordability is assured for a period of not less than 30 years through the use of an affordable housing restriction as defined in section 31 of chapter 184; (b) mixed-use development in centers of commercial activity within a municipality, including town and city centers, other commercial districts in cities and towns and rural village districts; provided, that not less than 10 per cent of the housing shall be affordable to and occupied by households whose annual income is less than 80 per cent of the area wide median income as determined by the United States Department of Housing and Urban Development and affordability is assured for a period of not less than 30 years through the use of an affordable housing restriction as defined in said section 31 of said chapter 184; or (c) a reduced parking space to residential unit ratio requirement pursuant to this section; provided that a reduction in the parking requirement will result in the production of additional housing units.

Failure by the special permit granting authority to take final action within said ninety days or extended time, if applicable, shall be deemed to be a grant of the special permit. The petitioner who seeks such approval by reason of the failure of the special permit granting authority to act within such time prescribed, shall notify the city or town clerk, in writing within fourteen days from the expiration of said ninety days or extended time, if applicable, of such approval and that notice has been sent by the petitioner to parties in interest. The petitioner shall send such notice to parties in interest by mail and each such notice shall specify that appeals, if any, shall be made pursuant to section seventeen and shall be filed within twenty days after the date the city or town clerk received such written notice from the petitioner that the special permit granting authority failed to act within the time prescribed. After the expiration of twenty days without notice of appeal pursuant to section seventeen, or, if appeal has been taken, after receipt of certified records of the court in which such appeal is adjudicated, indicating that such approval has become final, the city or town clerk shall issue a certificate stating the date of approval, the fact that the special permit granting authority failed to take final action and that the approval resulting from such failure has become final, and such certificate shall be forwarded to the petitioner. The special permit granting authority shall cause to be made a detailed record of its proceedings, indicating the vote of each member upon each question, or if absent or failing to vote, indicating such fact, and setting forth clearly the reason for its decision and of its official actions, copies of all of which shall be filed within fourteen days in the office of the city or town clerk and shall be

deemed a public record, and notice of the decision shall be mailed forthwith to the petitioner, applicant or appellant, to the parties in interest designated in section eleven, and to every person present at the hearing who requested that notice be sent to him and stated the address to which such notice was to be sent. Each such notice shall specify that appeals, if any, shall be made pursuant to section seventeen and shall be filed within twenty days after the date of filing of such notice in the office of the city or town clerk.

Zoning ordinances or by-laws shall provide that a special permit granted under this section shall lapse within a specified period of time, not more than 3 years, which shall not include such time required to pursue or await the determination of an appeal referred to in section seventeen, from the grant thereof, if a substantial use thereof has not sooner commenced except for good cause or, in the case of permit for construction, if construction has not begun by such date except for good cause.

Zoning ordinances or by-laws shall also provide that uses, whether or not on the same parcel as activities permitted as a matter of right, accessory to activities permitted as a matter of right, which activities are necessary in connection with scientific research or scientific development or related production, may be permitted upon the issuance of a special permit provided the granting authority finds that the proposed accessory use does not substantially derogate from the public good.

In any city or town that accepts this paragraph, zoning ordinances or by-laws may provide that research and development uses, whether or not the uses are currently permitted as a matter of right, may be permitted as a permitted use in any non-residential zoning district which is not a residential, agricultural or open space district upon the issuance of a special permit provided the special permit granting authority finds that the uses do not substantially derogate from the public good.

"Research and development uses" shall include any 1 or more of investigation, development, laboratory and similar research uses and any related office and, subject to the following limitations, limited manufacturing uses and uses accessory to any of the foregoing.

"Limited manufacturing" shall, subject to the issuance of the special permit, be an allowed use, if the following requirements are satisfied: (1) the manufacturing activity is related to research uses; (2) no manufacturing activity customarily occurs within 50 feet of a residential district; and (3) substantially all manufacturing activity customarily occurs inside of buildings with any manufacturing activities customarily occurring outside of buildings subject to conditions imposed in the special permit.

A hazardous waste facility as defined in section two of chapter twenty-one D shall be permitted to be constructed as of right on any locus presently zoned for industrial use pursuant to the ordinances and by-laws of any city or town provided that all permits and licenses required by law have been issued to the developer and a siting agreement has been established pursuant to sections twelve and thirteen of chapter twenty-one D, provided however, that following the submission of a notice of intent, pursuant to section seven of chapter twenty-one D, a city or town may not adopt any zoning change which would exclude the facility from the locus specified

in said notice of intent. This section shall not prevent any city or town from adopting a zoning change relative to the proposed locus for the facility following the final disapproval and exhaustion of appeals for permits and licenses required by law and by chapter twenty-one D.

A facility, as defined in section one hundred and fifty A of chapter one hundred and eleven, which has received a site assignment pursuant to said section one hundred and fifty A, shall be permitted to be constructed or expanded on any locus zoned for industrial use unless specifically prohibited by the ordinances and by-laws of the city or town in which such facility is proposed to be constructed or expanded, in effect as of July first, nineteen hundred and eighty-seven; provided, however, that all permits and licenses required by law have been issued to the proposed operator. A city or town shall not adopt an ordinance or by-law prohibiting the siting of such a facility or the expansion of an existing facility on any locus zoned for industrial use, or require a license or permit granted by said city or town, except a special permit imposing reasonable conditions on the construction or operation of the facility, unless such prohibition, license or permit was in effect on or before July first, nineteen hundred and eighty-seven; provided, however, that a city or town may adopt and enforce a zoning or non-zoning ordinance or by-law of general application that has the effect of prohibiting the siting or expansion of a facility in the following areas: recharge areas of surface drinking water supplies as shall be reasonably defined by rules and regulations of the department of environmental protection, areas subject to section forty of chapter one hundred and thirty-one, and the regulations promulgated thereunder; and areas within the zone of contribution of existing or potential public supply wells as defined by said department. No special permit authorized by this section may be denied for any such facility by any city or town; provided, however, that a special permit granting authority may impose reasonable conditions on the construction or operation of the facility, which shall be enforceable pursuant to the provisions of section seven.

Section 17: Judicial review

Section 17. Any person aggrieved by a decision of the board of appeals or any special permit granting authority or by the failure of the board of appeals to take final action concerning any appeal, application or petition within the required time or by the failure of any special permit granting authority to take final action concerning any application for a special permit within the required time, whether or not previously a party to the proceeding, or any municipal officer or board may appeal to the land court department, the superior court department in which the land concerned is situated or, if the land is situated in Hampden county, either to said land court or, superior court department or to the division of the housing court department for said county, or if the land is situated in a county, region or area served by a division of the housing court department either to said land court or superior court department or to the division of said housing court department for said county, region or area, or to the division of the district court department within whose jurisdiction the land is situated except in Hampden county, by bringing an action within twenty days after the decision has been filed in the office of the city or town clerk. If said appeal is made to said division of the district court department, any party shall have the right to file a claim for trial of said appeal in the superior court department within twenty-five days after service on the appeal is completed, subject to such rules as the supreme judicial court

may prescribe. Notice of the action with a copy of the complaint shall be given to such city or town clerk so as to be received within such twenty days. The complaint shall allege that the decision exceeds the authority of the board or authority, and any facts pertinent to the issue, and shall contain a prayer that the decision be annulled. There shall be attached to the complaint a copy of the decision appealed from, bearing the date of filing thereof, certified by the city or town clerk with whom the decision was filed.

If the complaint is filed by someone other than the original applicant, appellant or petitioner, such original applicant, appellant, or petitioner and all members of the board of appeals or special permit granting authority shall be named as parties defendant with their addresses. To avoid delay in the proceedings, instead of the usual service of process, the plaintiff shall within fourteen days after the filing of the complaint, send written notice thereof, with a copy of the complaint, by delivery or certified mail to all defendants, including the members of the board of appeals or special permit granting authority and shall within twenty-one days after the entry of the complaint file with the clerk of the court an affidavit that such notice has been given. If no such affidavit is filed within such time the complaint shall be dismissed. No answer shall be required but an answer may be filed and notice of such filing with a copy of the answer and an affidavit of such notice given to all parties as provided above within seven days after the filing of the answer. Other persons may be permitted to intervene, upon motion. The clerk of the court shall give notice of the hearing as in other cases without jury, to all parties whether or not they have appeared. The court shall hear all evidence pertinent to the authority of the board or special permit granting authority and determine the facts, and, upon the facts as so determined, annul such decision if found to exceed the authority of such board or special permit granting authority or make such other decree as justice and equity may require. The foregoing remedy shall be exclusive, notwithstanding any defect of procedure or of notice other than notice by publication, mailing or posting as required by this chapter, and the validity of any action shall not be questioned for matters relating to defects in procedure or of notice in any other proceedings except with respect to such publication, mailing or posting and then only by a proceeding commenced within ninety days after the decision has been filed in the office of the city or town clerk, but the parties shall have all rights of appeal and exception as in other equity cases.

<u>The court, in its discretion, may require a plaintiff in an action under this section appealing a decision to approve a special permit, variance or site plan to post a surety or cash bond in an amount of not more than $50,000 to secure the payment of costs if the court finds that the harm to the defendant or to the public interest resulting from delays caused by the appeal outweighs the financial burden of the surety or cash bond on the plaintiffs. The court shall consider the relative merits of the appeal and the relative financial means of the plaintiff and the defendant.</u>

A city or town may provide any officer or board of such city or town with independent legal counsel for appealing, as provided in this section, a decision of a board of appeals or special permit granting authority and for taking such other subsequent action as parties are authorized to take.

Costs shall not be allowed against the board or special permit granting authority unless it shall appear to the court that the board or special permit granting authority in making the decision appealed from acted with gross negligence, in bad faith or with malice.

Costs shall not be allowed against the party appealing from the decision of the board or special permit granting authority unless it shall appear to the court that said appellant or appellants acted in bad faith or with malice in making the appeal to the court.

The court shall require nonmunicipal plaintiffs to post a surety or cash bond in a sum of not less than two thousand nor more than fifteen thousand dollars to secure the payment of such costs in appeals of decisions approving subdivision plans.

All issues in any proceeding under this section shall have precedence over all other civil actions and proceedings.

Chapter 40R

Section 3: Smart growth zoning districts and starter home zoning districts

Section 3. In its zoning ordinance or by-law, a city or town may adopt a smart growth zoning district or starter home zoning district in an eligible location and may include adjacent areas that are served by existing infrastructure and utilities, and that have pedestrian access to at least 1 destination of frequent use, such as schools, civic facilities, places of commercial or business use, places of employment, recreation or transit stations. A smart growth zoning district or starter home zoning district ordinance or by-law, or any amendment to or repeal of such ordinance or by-law, shall be adopted in accordance with section 5 of chapter 40A.

In creating such a district, a city or town may include qualifying areas within development districts approved by the economic assistance coordinating council pursuant to chapter 40Q or any area approved by a city or town as an urban center housing tax-increment financing zone pursuant to section 60 of chapter 40. In smart growth zoning districts or starter home zoning districts, a city or town shall zone for primary residential use as of right and may also permit business, commercial or other uses consistent with primary residential use; provided, however, that a smart growth zoning district or starter home zoning district ordinance or by-law shall be adopted by a simple majority vote of all the members of the town council, or of the city council where there is a commission form of government or a single branch, or of each branch where there are 2 branches, or by a simple majority vote of a town meeting.

Chapter 40S

Section 1: Definitions

Section 1. As used in this chapter, the following words shall have the following meanings:—

"Additional chapter 70 aid", for each municipality, an amount calculated by the department of education equal to the actual increase in chapter 70 aid payments, including, but not limited to, foundation aid increases and minimum aid increases, that is attributable to the number of each municipality's eligible students from the school district. In the case of a regional school district, the amount of additional chapter 70 aid in the region shall be apportioned among member communities proportionally based upon the number of eligible students from each member municipality. For any municipality with eligible students from more than 1 school district, additional chapter 70 aid shall be the sum of the additional chapter 70 aid at the municipal school district plus the municipality's share of additional chapter 70 aid at each district of which the municipality is a member.

"Average actual net school spending per student", for each school district, the actual net school spending per pupil, as defined by and reported to the department of education, for the immediately preceding fiscal year.

"Division", the division of local services within the department of revenue.

"Education percentage", the average across all communities in the commonwealth of total education expenditures in relation to total municipal expenditures as certified at the end of the preceding fiscal year by the department of revenue. This percentage shall be the total actual net school spending of all districts as defined by the department of education divided by the sum of total General Fund municipal spending and regional school district aid.

"Eligible student", a child living in a new smart growth development that is enrolled as of the prior year in a district or charter school in kindergarten through grade 12, attends a residential or other school pursuant to special education requirements, attends pre-kindergarten or post 12th grade sessions pursuant to special education requirements, or attends a school district through the so-called school choice program, established under section 12B of chapter 76, or a similar program.

"Local smart growth excise tax revenues", for each municipality the total excise taxes for the subject year on vehicles garaged at a new smart growth development, as calculated by the division.

"Local smart growth property tax revenues", for each municipality, the product of the local levy rate times the amount of assessed valuation due to new smart growth development as certified by the commissioner of revenue, as calculated by the division.

"Local smart growth revenues for education", for each municipality, the product of the education percentage times the sum of local smart growth property tax revenues plus local smart growth excise tax revenues, each for the preceding fiscal year.

"New smart growth development", any new residential or commercial development, including the substantial redevelopment of existing ~~properties~~buildings, subject to the payment of local property taxes that: (a) occurs in a smart growth zoning district after the adoption of such zoning by the community, and (b) is permitted under the provisions of the smart growth zoning district. A redevelopment shall be considered substantial if its cost exceeds 50 per cent of the building's pre-renovation assessed value or if it constitutes a change in use from nonresidential to residential.

"Smart growth zoning district", a zoning district adopted by a community and approved by the department of housing and community development which is eligible, and which remains eligible for density bonus payments under chapter 40R, including without limitation smart growth zoning districts or starter home zoning districts as defined in section 1 of said chapter 40R.

"Total education cost for eligible students", for each municipality, the product of the total number of eligible students in the prior fiscal year times the average actual net school spending per student as calculated by the department of education. This calculation shall first be made separately for each school district attended by eligible students, and the results of such calculations shall then be summed.

ARTICLE 5

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING

ARTICLE 5: AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT

To see if the Town will vote to amend the Needham Zoning By-Law as follows:

1. Amend Section 2.1, Classes of Districts, by adding the following term and abbreviation under the subsection Industrial:

   "HC-1 -- Highway Commercial 1"

2. Amend Section 3.2, Schedule of Use Regulations, by adding a new Section 3.2.7 as follows:

   "3.2.7 Uses in the Highway Commercial 1 District

   3.2.7.1 Permitted Uses

   The following uses are permitted within the Highway Commercial 1 District as a matter of right:

   (a) Uses exempt from local zoning control pursuant to M.G.L. Chapter 40A, Section 3.

   (b) Public parks and playgrounds, municipal buildings or uses.

   (c) Retail establishment (not including grocery stores) or combination of retail establishments serving the general public where each establishment contains 5,750 square feet or less of floor area and where all items for sale or rent are kept inside a building.

   (d) Manufacturing clearly incidental and accessory to a retail use on the same premises and the product is customarily sold on the premises.

   (e) Craft, consumer or commercial service establishment dealing directly with the general public.

   (f) Laundry or dry-cleaning pick-up station with processing done elsewhere.

   (g) Professional, business or administrative office, but not including any of the following: a medical clinic or Medical Services Building or medical, surgical, psychiatric, dental, orthodontic, or psychologist group practices comprised of three or more such professionals (hereinafter "Group Practices") or physical therapy, alternative medicine practices, wellness treatments, including but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. "Professional" shall include professional medical, surgical, psychiatric, dental, orthodontic or psychologist practice by a group of two or fewer such professionals ("Non-group Practice").

(h) Bank or Credit Union.

(i) Medical Laboratory or laboratory engaged in scientific research and development and/or experimental and testing activities including, but not limited to, the fields of biology, genetics, chemistry, electronics, engineering, geology, medicine and physics, which may include the development of mock-ups and prototypes.

(j) Radio or television studio.

(k) Light non-nuisance manufacturing, including, but not limited to, the manufacture of electronics, pharmaceutical, bio-pharmaceutical, medical, robotic, and micro-biotic products, provided that all resulting cinders, dust, flashing, fuses, gases, odors, smoke, noise, vibration, refuse matter, vapor, and heat are effectively confined in a building or are disposed of in a manner so as not to create a nuisance or hazard to safety or health.

(l) Telecommunications facility housed within a building.

(m) Other customary and proper accessory uses incidental to lawful principal uses. Further provided, accessory uses for seasonal temporary outdoor seating for restaurants serving meals for consumption on the premises and at tables with service provided by waitress or waiter shall be allowed upon minor project site plan review with waiver of all requirements of Section 7.4.4 and 7.4.6 except as are necessary to demonstrate compliance with Section 6.9 by the Planning Board or Select Board in accordance with Section 6.9.

(n) More than one building on a lot.

(o) More than one use on a lot.

3.2.7.2 Uses Permitted by Special Permit

The following uses are permitted within the Highway Commercial 1 District upon the issuance of a Special Permit by the Special Permit Granting Authority under such conditions as it may require:

(a) Light-rail train station.

(b) Adult day care facility.

(c) Private school, nursery, or kindergarten not otherwise classified under Section 3.2.7.1 (a).

(d) Retail establishment (not including grocery stores) or combination of retail establishments serving the general public where any establishment contains more than 5,750 but less than 10,000 square feet of floor area and where all items for sale or rent are kept inside a building.

(e) Equipment rental service but not including any business that uses outside storage.

(f) Grocery store provided it does not exceed 10,000 square feet of floor area.

(g) Eat-in or take-out restaurant or other eating establishment except that a lunch counter incidental to a primary use shall be permissible by right.

(h) Veterinary office and/or treatment facility and/or animal care facility, including but not limited to, the care, training, sitting and/or boarding of animals.

(i) Indoor athletic or exercise facility or personal fitness service establishment, which may include outdoor pool(s) associated with such facilities.

(j) External automatic teller machine, drive-up window or auto-oriented branch bank accessory to a bank or credit union permitted under Section 3.2.7.1(h) hereof.

(k) Group Practices as defined in Section 3.2.7.1(g) and alternative medicine practices, physical therapy, and wellness treatments facilities including, but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. Such uses may have customary and proper accessory uses incidental to the lawful principal uses, including but not limited to, pharmacies.

(l) Live performance theater, bowling alley, skating rink, billiard room, and similar commercial amusement or entertainment places.

(m) Apartment or multi-family dwelling provided that (1) 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, (2) no more than 240 dwelling units shall be permitted in the Highway Commercial 1 District, (3) at least 40% but not more than 70% of all dwelling units within any project shall be one-bedroom units, and (4) at least 12.5% of all dwelling units shall be Affordable Units as regulated in Section 6.12."

3. Amend Section 4.7.1, Specific Front Setbacks, by deleting the following provisions:

"(b) On the easterly side of Gould Street from Highland Avenue northerly to land of the New York, New Haven and Hartford Railroad Company, there shall be a fifty (50) foot building setback line;

(c) On the northerly side of Highland Avenue from Gould Street northeasterly to the property of the Commonwealth of Massachusetts, there shall be a fifty (50) foot building setback line."

4. Amend Section 4.10, Dimensional Regulations for Industrial-1 District, by deleting Section 4.10.4, which refers to Section 4.7.1 (b) and (c).

5. Amend Section 4, Dimensional Regulations, by adding a new Section 4.11 Dimensional Regulations for Highway Commercial Districts as follows:

"4.11 Dimensional Regulations for Highway Commercial Districts

4.11.1 Highway Commercial 1

Minimum Lot Area (Sq. Ft.)	Minimum Lot Frontage (Ft.)	Front Setback (Ft.) (1)	Side Setback (Ft.) (1) (3)	Rear Setback (Ft.) (1) (3)	Maximum Height (Ft.) (1)	Maximum Stories (1)	Maximum Lot Coverage (2) (4)	Floor Area Ratio (5) (6)
20,000	100	5	10	10	56	4	65%	0.70

(1) a. All buildings shall be limited to a height of 56 feet and four stories, except that buildings within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and buildings within 200 feet of Gould Street shall be limited to a height of 35 feet and 2 ½ stories as-of-right. If the height of a building is increased above the height of 35 feet, the front setback shall be increased to 15 feet and the side and rear setbacks to 20 feet except that, along the MBTA right-of-way the side and rear yard setbacks shall be 10 feet.

b. By Special Permit from the Planning Board, the maximum height of a building may be increased to 3 stories and 42 feet within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and within 200 feet of Gould Street. By Special Permit from the Board, the maximum height of a building may be further increased to the following limits: 5 stories and 70 feet provided the building is not located within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. or within 200 feet of Gould Street.

c. (i) The line from which the 200-foot setback from Highland Avenue referred to in paragraphs a. and b. above shall be measured is that line which starts at the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and runs northeasterly N63º56'51"E by the Highland Avenue 1980 State Highway Alteration 361.46 feet to a stone bond/drill hole, then continues on the same northeasterly course an additional 330.54 feet for a total distance from the first mentioned bound of 700 feet. Reference is made to a plan entitled "Plan of Land Gould Street, Needham, MA", prepared by Andover Engineering, Inc., dated July 27, 2000, last revised September 20, 2001, recorded in the Norfolk County Registry of Deeds as Plan No. 564 of 2001, Plan Book 489. (ii) The line from which the 50-foot landscaped setback from Highland Avenue referred to in paragraph d. below shall be measured is that line which starts at the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and runs northeasterly N63º56'51"E by the Highland Avenue 1980 State Highway Alteration 361.46 feet to a stone bound/drill hole. If the 1980 State Highway Alteration along Highland Avenue is superseded by a subsequent State Highway Alteration, the 50-foot landscaped setback from Highland Avenue shall be measured from the newly-established street line.

d. Buildings and structures abutting Highland Avenue for the distance described in subsection (1) c. (ii) above and/or abutting Highland Avenue as it continues southwesterly to the intersection with Gould Street and/or abutting Gould Street shall be set back at least 50 feet from said streets. Buildings and structures abutting the layout of Route 128/95 beyond said Highland Avenue distance from stone bound to stone bound shall be set back at least 20 feet from said Route 128/95 layout. Notwithstanding the location or height of any building and structures, the required 50-foot or 20-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.

e. Structures erected on a building and not used for human occupancy, such as chimneys, heating-ventilating or air conditioning equipment, solar or photovoltaic panels, elevator housings, skylights, cupolas, spires and the like may exceed the maximum building height provided that no part of such structure shall project more than 15 feet above the

maximum allowable building height, the total horizontal coverage of all of such structures on the building does not exceed 25 percent, and all of such structures are set back from the roof edge by a distance no less than their height. The Planning Board may require screening for such structures as it deems necessary. Notwithstanding the above height limitations, cornices and parapets may exceed the maximum building height provided they do not extend more than 5 feet above the highest point of the roof.

f. For purposes of clarity, the required building setbacks and allowed envelopes (including setbacks) for allowance of additional height above 35 feet for the as-of right circumstance and 42 feet for the special permit circumstance are shown on figures 1 and 2 below.

Figure 1:

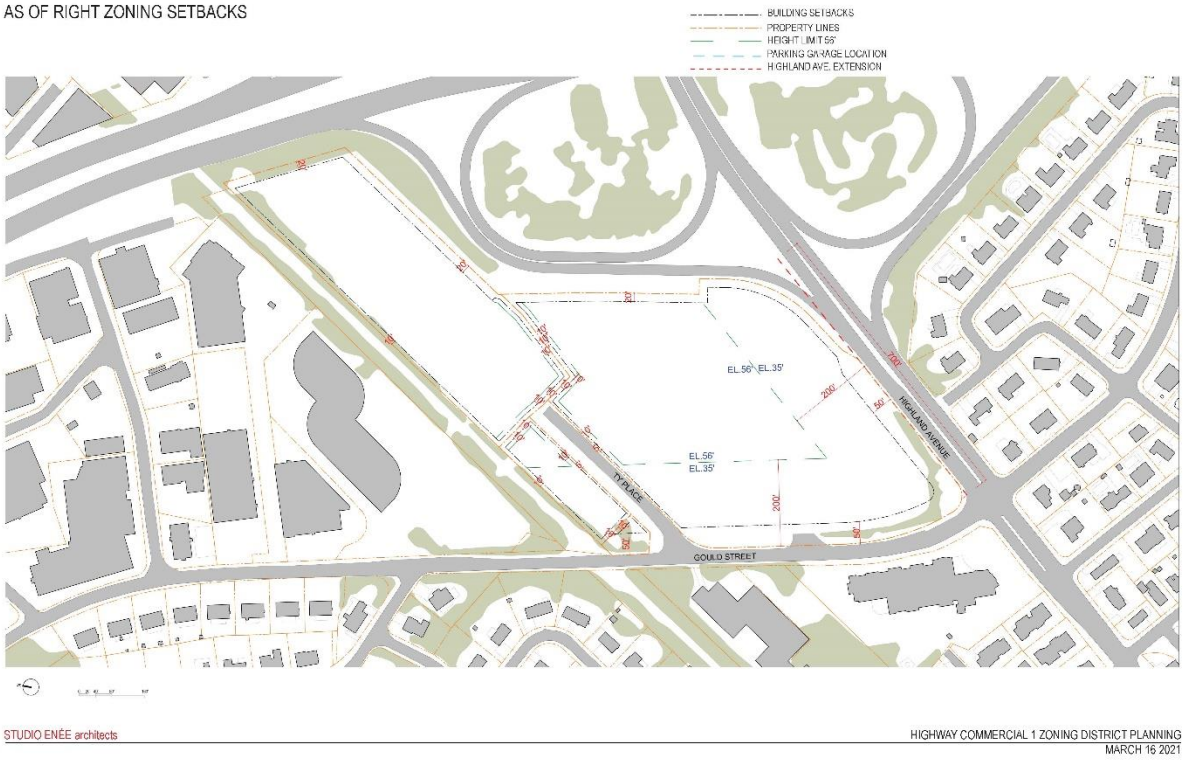
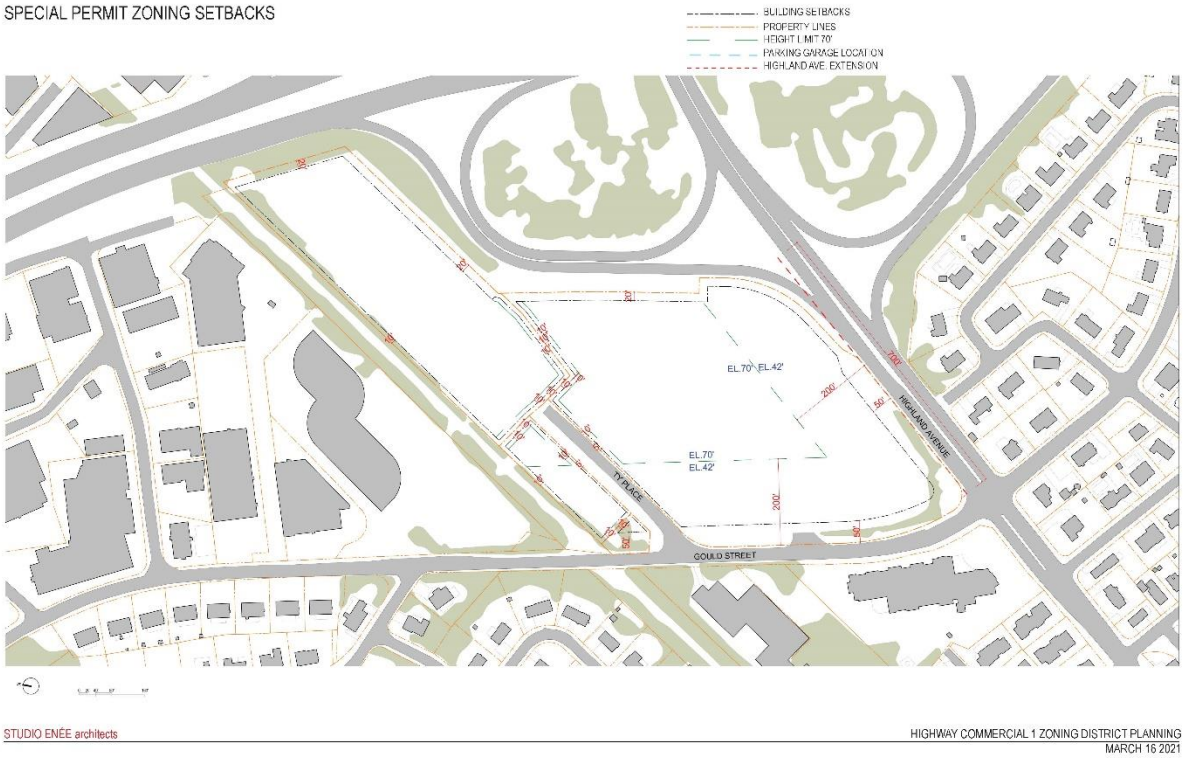


Figure 2:



(2) Maximum lot coverage shall be 65% for all projects. However, if a project is designed such that at least 65% of the required landscaped area immediately abuts at least 65% of the required landscaped area of an adjoining project for a distance of at least 50 feet, the maximum lot coverage may be increased to 75%.

(3) No side or rear yard setback is required for shared parking structures between adjoining properties, but only on one side of each lot, leaving the other side or rear yards open to provide access to the interior of the lot.

(4) A minimum of 25% of total lot area must be open space. The open space area shall be landscaped and may not be covered with buildings or structures of any kind, access streets, ways, parking areas, driveways, aisles, walkways, or other constructed approaches or service areas. Notwithstanding the preceding sentence, open space may include pervious surfaces used for walkways and patios. (Pervious surfaces shall not preclude porous pavement, porous concrete, and/or other permeable pavers.)

(5) A floor area ratio of up to 1.35 may be allowed by a special permit from the Planning Board. In granting such special permit, the Planning Board shall consider the following factors: 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; 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; the environmental impacts of the proposal; and the fiscal implications of the proposal to the Town. 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.

(6) The calculation of floor area in determining floor area ratio shall not include parking areas or structures but shall include such active ground floor uses, such as retail, office, institutional, or display as are allowed by Section 4.11.2 (2).

4.11.2 Supplemental Dimensional Regulations

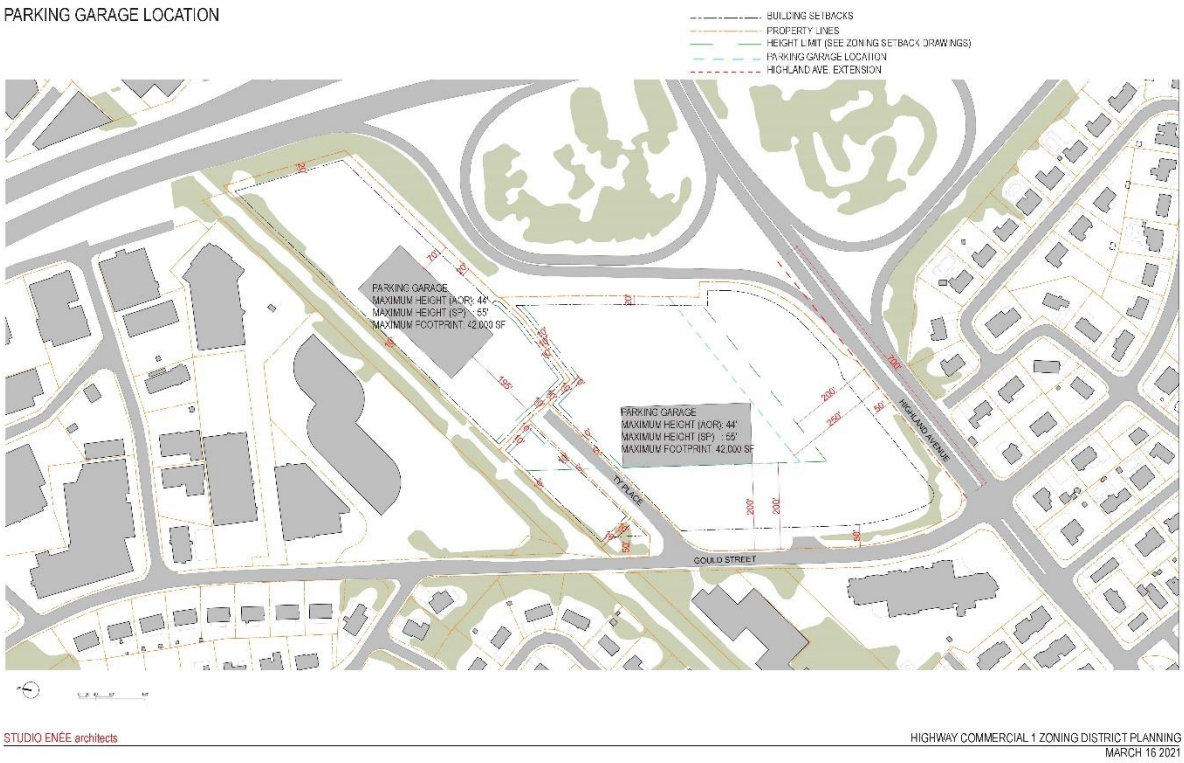
(1) Notwithstanding Section 3.2.7.1(m) and any other provision of this Section 4.11 to the contrary, a parking garage, even if it is for an as-of-right development, may not exceed 44 feet in height, may not have a building footprint in excess of 42,000 square feet and may not be located within 250 feet of Highland Avenue or the extension of the right-of-way line described in Section 4.11.1 (1) c. (i) or within 200 feet of Gould Street. Notwithstanding the above, the maximum height of a parking garage may be increased to 55 feet by Special Permit from the Planning Board. For purposes of clarity the height, coverage and location requirements for the as-of-right and special permit parking garage circumstance are shown on figure 3 below.

(2) Parking structures may have an active ground floor use, such as retail, office, institutional, or display. Structured parking must be located at least 20 feet from adjacent buildings but may be attached to the building it is servicing if all fire and safety requirements are met.

(3) Maximum uninterrupted facade length shall be 200 feet.

(4) All setback, height, and bulk requirements applicable to this Section 4.11 are contained in this Section and no additional requirements occasioned by this district abutting Route 128/95's SRB district shall apply.

Figure 3



4.11.3 Special Permit Requirements

In approving any special permit under Section 3.2.7.2 and/or Section 4.11, or for any project proceeding under the Highway Commercial 1 district provisions which constitute a Major Project under Section 7.4.2, the Planning Board shall consider the following design guidelines for development: (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; (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; (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; (d) The proposed development should promote site features and a layout which is conducive to the uses proposed; (e) The proposed development should incorporate as many green building standards as practical, given the type of building and proposed uses; (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 (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."

6. Amend Section 5.1.3, Parking Plan and Design Requirements, by adding at the end of the second sentence of subsection (j) which reads "Such parking setback shall also be twenty (20) feet in an Industrial-1 District" the words "and Highway Commercial 1 District unless a deeper parking setback is required by Section 4.11."

7. Amend Section 6.5.1 of Section 6.5 Limited Heliports, by adding after the words "Industrial Districts," in the first sentence, the words "and in the Highway Commercial 1 District,".

8. Amend Section 6.12, Affordable Housing, by revising the first paragraph to read as follows:
"Any mixed-use building in the Neighborhood Business District (NB) with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. Any building in the Highway Commercial 1 District with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. The requirements detailed in paragraphs (a) thru (i) below shall apply to a development that includes affordable units in the Neighborhood Business District. The requirements detailed in paragraphs (a), (c), (d), (e), (f), (g), and (h) below shall apply to a development that includes affordable units in the Highway Commercial 1 District."

9. Amend Section 7.2.5 of Section 7.2 Building or Use Permit, by adding after the words "Industrial-1 District," in the first sentence, the words "Highway Commercial 1 District,".

10. Amend Section 7.4.2 of Section 7.4 Site Plan Review, by adding in the first sentence of the last paragraph, the words "Highway Commercial 1 District," after the words "Highland Commercial-128,".

11. Amend Section 7.7.2.2, Authority and Specific Powers (of Design Review Board) by adding after the words "Industrial-1 District," in the first sentence of the second paragraph, the words "Highway Commercial 1 District,".

ARTICLE 5 RECOMMENDATIONS:

The required public hearing was held on Tuesday March 16, 2021.

At the regular meeting of the Planning Board on Tuesday April 6, 2021, upon a motion by Paul S. Alpert and seconded by Adam Block, it was by all of the five members present at the April 6, 2021 meeting

VOTED: The Planning Board recommends adoption of Article 5 at the Annual Town Meeting as shown above.

_____
Jeanne S. McKnight, Chair

_____
Paul S. Alpert, Vice-Chair

_____
Martin Jacobs

_____
Ted Owens

_____
Adam Block

After consultation with municipal counsel, the Planning Board has determined that Article 5 requires a two-thirds vote of Town Meeting for adoption.

ARTICLE 5

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING LEGAL NOTICE

Needham Times
February 25, 2021 and
March 4, 2021

LEGAL NOTICE

LEGAL NOTICE
Planning Board,
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of M.G.L., Chapter 40A, S.5, the Needham Planning Board will hold a public hearing on Tuesday, March 16, 2021 at 7:30 p.m. regarding certain proposed amendments to the Needham Zoning By-Law to be considered by the Spring 2021 Annual Town Meeting.

Pursuant to Governor Baker's March 12, 2020 Order Suspending Certain Provisions of the Open Meeting Law, G.L. c. 30A, Section 18, and the Governor's March 15, 2020 Order imposing strict limitations on the number of people that may gather in one place, this public hearing of the Needham Planning Board is being conducted via remote participation. No in-person attendance of members of the public will be permitted, but the public can view and participate in this meeting while in progress by remote access following the instructions detailed below.

To view and participate in the virtual hearing 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: 878-8275-9890

To view and participate in the virtual hearing on your computer, at the above date and time, go to www.zoom.us click "Join a Meeting" and enter the following ID: 878-8275-9890

Members of the public attending this meeting virtually will be allowed to make comments if they wish to do so, during the portion of the hearing designated for public comment through the zoom app.

Persons interested are encouraged to call the Planning Board office (781-455-7550) for more information. A copy of the complete text of the proposed article is detailed below. The article designation given has been assigned by the Planning Board for identification purposes only. An article number will subsequently be established by the Select Board for the Warrant.

ARTICLE 1: AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT

To see if the Town will vote to amend the Needham Zoning By-Law as follows:

1. Amend Section 3.1, Classes of Districts, by adding the following term and abbreviation under the subsection Industrial:
   "HC1 – Highway Commercial 1"
2. Amend Section 3.2, Schedule of Use Regulations, by adding a new Section 3.2.7 as follows:
   "3.2.7 Uses in the Highway Commercial 1 District
   3.2.7.1 Permitted Uses
   The following uses are permitted within the Highway Commercial 1 District as a matter of right:
   (a) Uses exempt from local zoning control pursuant to M.G.L. Chapter 40A, Section 3.
   (b) Public parks and playgrounds, municipal buildings or uses.
   (c) Retail establishment (not including grocery stores) or combination of retail establishments serving the general public where each establishment contains less than 5,750 square feet of floor area and where all items for sale or rent are kept inside a building.
   (d) Manufacturing clearly incidental and accessory to a retail use on the same premises and the product is customarily sold on the premises.
   (e) Craft, consumer or commercial service establishment dealing directly with the general public.
   (f) Laundry or dry cleaning pick-up station with processing done elsewhere.
   (g) Professional, business or administrative office, but not including any of the following: a medical clinic or Medical Services Building or medical, surgical, psychiatric, dental, orthodontic, or psychologic group practices comprised of three or more such professionals (hereinafter "Group Practices") or physical therapy, alternative medicine practices, wellness treatments, including but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. "Professional" shall include professional medical, surgical, psychiatric, dental, orthodontic or psychologist practice by a group of two or fewer such professionals ("Non-group Practice").
   (h) Bank or Credit Union.
   (i) Medical Laboratory or laboratory engaged in scientific research and development and/or experimental and testing activities including, but not limited to, the fields of biology, genetics, chemistry, electronics, engineering, geology, medicine and physics, which may include the development of mock-ups and prototypes.
   (j) Radio or television studio.
   (k) Light non-nuisance manufacturing, including, but not limited to, the manufacture of electronics, pharmaceutical, bio-pharmaceutical, medical, robotic, and micro-biotic products, provided that all resulting sinders, dust, flashing, fume, gases, odors, smoke, noise, vibration, refuse matter, vapor, and heat are effectively confined in a building or are disposed of in a manner so as not to create a nuisance or hazard to safety or health.
   (l) Telecommunications facility housed within a building.
   (m) Other customary and proper accessory uses incidental to lawful principal uses. Further provided, accessory uses for seasonal temporary outdoor seating for restaurants serving meals for consumption on the premises and at tables with service provided by waitress or waiter shall be allowed upon minor project site plan review with waiver of all requirements of Section 7.4.4 and 7.4.6 except as are necessary to demonstrate compliance with Section 6.9 by the Planning Board or Select Board in accordance with Section 6.9.
   (n) More than one building on a lot.
   (o) More than one use on a lot.
   3.2.7.2 Uses Permitted By Special Permit
   The following uses are permitted within the Highway Commercial 1 District upon the issuance of a Special Permit by the Special Permit Granting Authority under such conditions as it may require:
   (a) Light-rail train station.
   (b) Adult day care facility.
   (c) Private school, nursery, or kindergarten not otherwise classified under Section 3.2.7.1 (a).
   (d) Retail establishment (not including grocery stores) or combination of retail establishments serving the general public where any establishment contains more than 5,750 but less than 10,000 square feet of floor area and where all items for sale or rent are kept inside a building.
   (e) Equipment rental service but not including any business that uses outside storage.
   (f) Grocery store provided it does not exceed 10,000 sq. ft. of floor area.
   (g) Eat-in or take-out restaurant or other eating establishment except that a lunch counter incidental to a primary use shall be permissible by right.
   (h) Veterinary office and/or treatment facility and/or animal care facility, including but not limited to, the care, training, sitting and/or boarding of animals.
   (i) Indoor athletic or exercise facility or personal fitness service establishment, which may include outdoor pool(s) associated with such facilities.
   (j) External automatic teller machine, drive-up window or auto-oriented branch bank accessory to a bank or credit union permitted under Section 3.2.7.1(b) hereof.
   (k) Group Practices as defined in Section 3.2.7.1(g) and alternative medicine practices, physical therapy, and wellness treatments facilities including, but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. Such uses may have customary and proper accessory uses incidental to the lawful principal uses, including but not limited to, pharmacies.
   (l) Live performance theater, bowling alley, skating rink, billiard room, and similar commercial amusement or entertainment places."
3. Amend Section 4.7.1., Specific Front Setbacks, by deleting the following provisions:
   "(b) On the easterly side of Gould Street from Highland Avenue northerly to land of the New York, New Haven and Hartford Railroad Company, there shall be a fifty (50) foot building setback line;
   (c) On the northerly side of Highland Avenue from Gould Street northeasterly to the property of the Commonwealth of Massachusetts, there shall be a fifty (50) foot building setback line."
4. Amend Section 4, Dimensional Regulations, by adding a new Section 4.11 Dimensional Regulations for Highway Commercial Districts as follows:
   "4.11 Dimensional Regulations for Highway Commercial Districts
   4.11.1 Highway Commercial 1

Minimum Lot Area (Sq. Ft.)	Minimum Lot Frontage (Ft.) (1)	Front Setback (Ft.) (1) (3)	Side Setback (Ft.) (1) (3)	Rear Setback (Ft.) (1) (3)	Maximum Height (Ft.) (1)	Maximum Stories (1)	Maximum Lot Coverage (2) (4)	Floor Area Ratio (5) (6)
20,000	100	5	10	10	56	4	65%	1.00

(1) a. All buildings shall be limited to a height of 56 feet and four stories, except that buildings within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and buildings within 200 feet of Gould Street shall be limited to a height of 72 feet and 5 ½ stories as-of-right. If the height of a building is increased above the height of 35 feet, the front setback shall be increased to 15 feet and the side and rear setbacks to 20 feet except that, along the MBTA right-of-way the side and rear yard setbacks shall be 10 feet.

b. By Special Permit from the Planning Board, the maximum height of a building may be increased to the following limits within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and within 200 feet of Gould Street: 3 stories and 45 feet or 3 stories and 60 feet, provided the additional height is contained under a pitched roof or recessed from the face of the building in a manner approved by the Planning Board. By Special Permit from the Board, the maximum height of a building may be further increased to the following limits: 4 stories and 70 feet provided the building is not located within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. or within 200 feet of Gould Street. If the height of a building is increased above the height of 42 feet, or 48 feet if under a pitched roof or recessed as aforesaid, the front setback shall be increased to 15 feet and the side and rear setbacks to 20 feet except that, along the MBTA right-of-way the side and rear yard setbacks shall be 10 feet.

c. The line from which the setbacks from Highland Avenue shall be measured is that line which starts at the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole [SBO#2] said rata northeasterly N63°56'51"E by the Highland Avenue 1980 State Highway Alteration 361.46 feet to a stone bound/drill hole, then continues on the same northeasterly course an additional 150.54 feet for a total distance from the first mentioned bound of 700 feet. Reference is made to a plan entitled "Plan of Land Gould Street, Needham, MA", prepared by Andover Engineering, Inc., dated July 27, 2000, last revised September 20, 2001, recorded in the Norfolk County Registry of Deeds as Plan No. 564 of 2001, Plan Book 489.

d. Buildings and structures abutting Highland Avenue, Gould Street and/or the layout of Route 128/95 shall be set back at least 20 feet from said streets and said layout. Notwithstanding the location of any building and/or structure, a 20 foot landscaped, vegetative buffer area 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.

e. Structures erected on a building and not used for human occupancy, such as chimneys, heating-ventilating or air conditioning equipment, solar or photovoltaic panels, elevator housings, skylights, cupolas, spires and the like may exceed the maximum building height provided that no part of such structure shall project more than 15 feet above the maximum allowable building height, the total horizontal coverage of all of such structures on the building does not exceed 25 percent, and all of such structures are set back from the roof edge by a distance no less than their height. The Planning Board may require screening for such structures as it deems necessary. Notwithstanding the above height limitations, cornices and parapets may extend the maximum building height provided they do not extend more than 5 feet above the highest point of the roof.

f. For purposes of clarity, the required building setbacks and allowed envelopes (including setbacks) for allowance of additional height above 55' for the as-of right circumstance and 45'/48' for the special permit circumstance are shown on figures 1 and 2 below.

Figure 1:

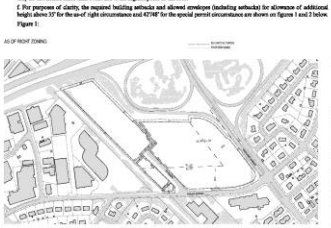
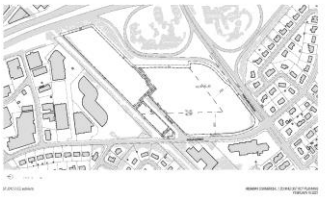


Figure 2:



(2) Maximum lot coverage shall be 65% for all projects. However, if a project is designed such that at least 65% of the required landscaped area immediately abuts at least 65% of the required landscaped area of an adjoining project for a distance of at least 50 feet, the maximum lot coverage may be increased to 75%.

(3) No side or rear yard setback is required for shared parking structures between adjoining properties, but only on one side of each lot, leaving the other side or rear yards open to provide access to the interior of the lot.

(4) A minimum of 20% of total lot area must be open space. The open space area shall be landscaped and may not be covered with buildings or structures of any kind, access streets, ways, parking areas, driveways, aisles, walkways, or other constructed approaches or service areas. Notwithstanding the preceding sentence, open space shall include pervious surfaces used for walkways and patios. (Pervious surfaces shall not preclude porous pavement, porous concrete, and/or other permeable pavers.)

(5) A floor area ratio of up to 1.35 may be allowed by a special permit from the Planning Board. In granting such special permit, the Planning Board shall consider the following factors: 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; 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; the environmental impacts of the proposal; and the fiscal implications of the proposal to the Town. 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.

(6) The calculation of floor area in determining floor area ratio shall not include parking areas or structures.

4.11.2 Supplemental Dimensional Regulations

(1) Parking structures shall be set back at least 100 feet from Highland Avenue and/or Gould Street.

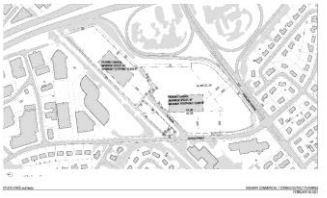
(2) Parking structures may have an active ground floor use, such as retail, office, institutional, or display. Structured parking must be located at least 20 feet from adjacent buildings, but may be attached to the building it is servicing if all fire and safety requirements are met.

(3) Buildings abutting Highland Avenue and/or Gould Street must have a public entrance facing one street on which the building fronts. This requirement may be waived by special permit from the Planning Board for buildings abutting the 20-foot landscaped setback on Gould Street and Highland Avenue where the arrangements for pedestrian access are such that entrances facing those streets are not the best design option.

(4) Maximum uninterrupted facade length shall be 200 feet.

(5) Notwithstanding Section 3.2.7.1(m) and any other provision of this Section 4.11 to the contrary, a parking garage, even if it is for an as-of-right development, may not exceed 44 feet in height, may not have a building footprint in excess of 42,000 square feet and may not be located within 250 feet of Highland Avenue or the extension of the right-of-way line described in Section 4.11.1 (1) (c) or within 200 feet of Gould Street without the issuance of a special permit by the Planning Board. A parking garage for an as-of-right development may, however, be located within the area beyond said setbacks as of right if the parking garage is located easterly or northeasterly of said 200-feet or 250-feet setbacks. For purposes of clarity the height, coverage and location requirements for the as-of-right circumstance are shown on figure 3 below.

Figure 3



(6) All setback, height, and bulk requirements applicable to this Section 4.11 are contained in this Section and no additional requirements contained by this district, including Route 128/95's SRB district shall apply.

4.11.3 Special Permit Provisions

The Planning Board may, by special permit, waive any or all dimensional requirements set forth above in this Section 4.11 (including Section 4.11.1 and 4.11.2), by relating each by up to a maximum percentage of 25% if it finds that, given the particular location and/ or configuration of a project in relation to the surrounding neighborhood, such waivers are consistent with the public good, and that to grant such waiver(s) does not substantially derogate from the intent and purposes of the By-Law. This section does not authorize the Planning Board to waive the maximum height regulations, maximum story regulations, reduce the 20 foot landscaped buffer area requirement along Gould Street, Highland Avenue and the layout of Route 128/95, reduce the 100 foot garage setback requirement along Gould Street and Highland Avenue, or reduce the 20% open space requirement of Section 4.11.1(4), except as specifically provided in Section 4.11.1(1) for pitched or recessed roofs. (By way of example, a 10' front yard setback could be waived to 11.25' or the 20,000 sq. ft. minimum lot area could be waived to 15,000 sq. ft.)

4.11.4 Special Permit Requirements

In approving any special permit under this Section 4.11, the Planning Board shall consider the following design guidelines for development: (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; (b) Any parking structures 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; (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 facade treatments, continuous design, integrated physical design, and/or other elements deemed appropriate by the Planning Board; (d) The proposed development should promote development and a layout which is conducive to the uses proposed; (e) the proposed development should incorporate as many green building standards as practical, given the type of building and proposed uses; and (f) 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."

5. Amend Section 5.1.3, Parking Plan and Design Requirements, by adding at the end of the second sentence of subsection (j) which reads "Such parking setback shall also be twenty (20) feet in an Industrial-1 District" the words "and Highway Commercial 1 District."
6. Amend Section 7.2.5 of Section 7.2 Building or Use Permit, by adding after the words "Industrial-1 District," in the first sentence, the words "Highway Commercial 1 District,"
7. Amend Section 7.4.2 of Section 7.4 Site Plan Review, by adding in the first sentence of the last paragraph, the words "Highway Commercial 1 District," after the words "Highland Commercial-128."
8. Amend Section 7.5.2.1, Authority and Specific Powers (of Design Review Board) by adding after the words "Industrial-1 District," in the first sentence of the second paragraph, the words "Highway Commercial 1 District,"

ARTICLE 2: AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT
SCHEDULE OF PERMITTED EPECIAL PERMIT USES

To see if the Town will vote to amend the Needham Zoning By-Law as follows:

1. Amend Section 3.2.7.2 Uses in the Highway Commercial 1 District, Subsection 3.2.7.2 Uses Permitted By Special Permit, by adding a new paragraph (m) to read as follows:
   "(m) Apartment or multi-family dwelling provided that (1) 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, (2) no more than 240 dwelling units shall be permitted in the Highway Commercial 1 District, (3) at least 40% but not more than 70% of all dwelling units within any project shall be one-bedroom units, and (4) at least 12.5% of all dwelling units shall be Affordable Units as defined in Section 6.12."
2. Amend Section 6.12, Affordable Housing, by revising the first paragraph to read as follows:
   "Any mixed-use building in the Neighborhood Business District (NB) with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. Any building in the Highway Commercial 1 District with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. The requirements detailed in paragraphs (a) thru (j) below shall apply to a development that includes affordable units in the Neighborhood Business District. The requirements detailed in paragraphs (a), (c), (d), (e), (f), (g), and (h) below shall apply to a development that includes affordable units in the Highway Commercial 1 District."

ARTICLE 3: AMEND ZONING BY-LAW – MAP CHANGE TO HIGHWAY COMMERCIAL 1

To see if the Town will vote to amend the Needham Zoning By-Law by amending the Zoning Map as follows:

Place in the Highway Commercial 1 District all that land now zoned Industrial-1 and lying between the Crossubmittal Highway, known as Route 128/95 and Gould Street and between the Massachusetts Bay Transit Authority (M.B.T.A.) right-of-way and Highland Avenue. Said land is bounded and described as follows:

Beginning at a stone bound on the northerly layout line of Highland Avenue at the intersection of Gould Street as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489; thence turning and running southwesterly, westerly and northwesterly along a radius of 44.00 feet a distance of 80.36 feet to a stone bound on the easterly sideline of Gould Street; thence running northwesterly, northerly, and northeasterly along a curve of radius of 305.00 feet of said sideline of Gould Street a distance of 294.17 feet to a point on the said easterly sideline of Gould Street; thence running N10°49'50"E a distance of 284.29 feet to a point on the said easterly sideline of Gould Street at the intersection of TY Place, a privately owned Right of Way; thence continuing N10°49'50"E a distance of 160.00 feet more or less to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184380; thence continuing N10°49'50"E a distance of 84.02 feet to a stone bound located at the intersection of the easterly sideline of Gould Street and the southerly sideline of the M.B.T.A. Right of Way as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184430; thence turning and running along said southerly M.B.T.A. Right of Way line northeasterly a distance of 1,219.55 feet as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184361, 184362 and 184380 to a point at the intersection of the westerly sideline of the Route 128 Right of Way and said southerly sideline of the M.B.T.A. Right of Way; thence turning and running S47°24'50"E a distance of 292.00 feet to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184380; then turning and running southwesterly along the Route 128 Right of Way a distance of 484.61 feet to a point; thence turning and running S13°39'50"W a distance of 451.03 feet as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489 to a point; thence turning and running S76°24'41"E a distance of 35.56 feet to a point; thence turning and running S13°54'58"W a distance of 67.36 feet to a point; thence running southwesterly along a curve of radius 245.40 feet a distance of 138.59 feet to a point; thence running southwesterly along a curve of radius 260.02 feet a distance of 38.04 feet to a point; thence running southwesterly along a curve of radius 1180.00 feet a distance of 140.09 feet to a point; thence turning and running S42°41'47"W a distance of 42.20 feet to a stone bound located in the westerly sideline of the Route 128 Right of Way; thence turning and running S65°56'51"W a distance of 161.66 feet to the point of beginning.

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/).

ARTICLE 6

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING

ARTICLE 6: AMEND ZONING BY-LAW – MAP CHANGE TO HIGHWAY COMMERCIAL 1

To see if the Town will vote to amend the Needham Zoning By-Law by amending the Zoning Map as follows:

Place in the Highway Commercial 1 District all that land now zoned Industrial-1 and lying between the Circumferential Highway, known as Route 128/95 and Gould Street and between the Massachusetts Bay Transit Authority (M.B.T.A.) right-of-way and Highland Avenue. Said land is bounded and described as follows:

Beginning at a stone bound on the northerly layout line of Highland Avenue at the intersection of Gould Street as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489; thence turning and running southwesterly, westerly and northwesterly along a radius of 44.00 feet a distance of 80.06 feet to a stone bound on the easterly sideline of Gould Street; thence running northwesterly, northerly, and northeasterly along a curve of radius of 505.00 feet of said sideline of Gould Street a distance of 254.17 feet to a point on the said easterly sideline of Gould Street; thence running N10º49'50"E a distance of 284.29 feet to a point on the said easterly sideline of Gould Street at the intersection of TV Place, a privately owned Right of Way; thence continuing N10º49'50"E a distance of 160.00 feet more or less to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 18430I; thence continuing N10º49'50"E a distance of 84.82 feet to a stone bound located at the intersection of the easterly sideline of Gould Street and the southerly sideline of the M.B.T.A. Right of Way as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 18430I; thence turning and running along said southerly M.B.T.A. Right of Way line northeasterly a distance of 1,219.55 feet as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 18430I, 18430J and 18430H to a point at the intersection of the westerly sideline of the Route 128 Right of Way and said southerly sideline of the M.B.T.A. Right of Way; thence turning and running S4º25'46"E a distance of 292.00 feet to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 18430H; then turning and running southwesterly along the Route 128 Right of Way a distance of 484.61 feet to a point; thence turning and running S13º34'58"W a distance of 451.02 feet as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489 to a point; thence turning and running S76º26'41"E a distance of 35.56 feet to a point; thence turning and running S13º34'58"W a distance of 67.34 feet to a point; thence running southwesterly along a curve of radius 245.45 feet a distance of 136.59 feet to a point; thence running southwesterly along a curve of radius 248.02 feet a distance of 38.04 feet to a point; thence running southwesterly along a curve of radius 1180.00 feet a distance of 140.09 feet to a point; thence turning and running S42º43'47"W a distance of 42.52 feet to a stone bound located in the westerly sideline of the Route 128 Right of Way; thence turning and running S63º56'51"W a distance of 361.46 feet to the point of beginning.

ARTICLE 6 RECOMMENDATIONS:

The required public hearing was held on Tuesday March 16, 2021.

At the regular meeting of the Planning Board on Tuesday April 6, 2021, upon a motion by Paul S. Alpert and seconded by Adam Block, it was by all of the five members present at the April 6, 2021 meeting

VOTED: The Planning Board recommends adoption of Article 6 at the Annual Town Meeting as shown above.

_____
Jeanne S. McKnight, Chair

_____
Paul S. Alpert, Vice-Chair

_____
Martin Jacobs

_____
Ted Owens

_____
Adam Block

After consultation with municipal counsel, the Planning Board has determined that Article 6 requires a two-thirds vote of Town Meeting for adoption.

ARTICLE 6

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING LEGAL NOTICE

LEGAL NOTICE

LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of M.G.L., Chapter 40A, S.5, the Needham Planning Board will hold a public hearing on Tuesday, March 16, 2021 at 7:30 p.m. regarding certain proposed amendments to the Needham Zoning By-Law to be considered by the Spring 2021 Annual Town Meeting.

Pursuant to Governor Baker's March 12, 2020 Order Suspending Certain Provisions of the Open Meeting Law, G.L. c. 30A, Section 18, and the Governor's March 15, 2020 Order imposing strict limitations on the number of people that may gather in one place, this public hearing of the Needham Planning Board is being conducted via remote participation. No in-person attendance of members of the public will be permitted, but the public can view and participate in this meeting while in progress by remote access following the instructions detailed below.

To view and participate in this virtual hearing 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: 878-8270-9890

To view and participate in this virtual hearing on your computer, at the above date and time, go to www.zoom.us click "Join a Meeting" and enter the following ID: 878-8270-9890

Members of the public attending this meeting virtually will be allowed to make comments if they wish to do so, during the portion of the hearing designated for public comment through the zoom app.

Persons interested are encouraged to call the Planning Board office (781-455-7550) for more information. A copy of the complete text of the proposed article is detailed below. The article designation given has been assigned by the Planning Board for identification purposes only. An article number will subsequently be established by the Select Board for the Warrant.

ARTICLE 1: AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT

To see if the Town will vote to amend the Needham Zoning By-Law as follows:

1. Amend Section 2.1, Classes of Districts, by adding the following term and abbreviation under the subsection Industrial:
"HC-1 – Highway Commercial 1"
2. Amend Section 3.3, Schedule of Use Regulations, by adding a new Section 3.2.7 as follows:
"3.2.7 Uses in the Highway Commercial 1 District
3.2.7.1 Permitted Uses
The following uses are permitted within the Highway Commercial 1 District as a matter of right:
(a) Uses exempt from local zoning control pursuant to M.G.L. Chapter 40A, Section 3.
(b) Public parks and playgrounds, municipal buildings or uses.
(c) Retail establishment (not including grocery stores) or combination of retail establishments serving the general public where each establishment contains less than 5,750 square feet of floor area and where all items for sale or rent are kept inside a building.
(d) Manufacturing clearly incidental and accessory to a retail use on the same premises and the product is customarily sold on the premises.
(e) Craft, consumer or commercial service establishment dealing directly with the general public.
(f) Laundry or dry cleaning pick-up station with processing done elsewhere.
(g) Professional, business or administrative office, but not including any of the following: a medical clinic or Medical Services Building or medical, surgical, psychiatric, dental, orthodontic, or psychologist group practices comprised of three or more such professionals (hereinafter "Group Practices") or physical therapy, alternative medicine practices, wellness treatments, including but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. "Professional" shall include professional medical, surgical, psychiatric, dental, orthodontic or psychologist practice by a group of two or fewer such professionals ("Non-group Practice").
(h) Bank or Credit Union.
(i) Medical Laboratory or laboratory engaged in scientific research and development and/or experimental and testing activities including, but not limited to, the fields of biology, genetics, chemistry, electronics, engineering, geology, medicine and physics, which may include the development of mock-ups and prototypes.
(j) Radio or television studio.
(k) Light non-nuisance manufacturing, including, but not limited to, the manufacture of electronics, pharmaceutical, bio-pharmaceutical, medical, robotic, and micro-biotic products, provided that all resulting cinders, dust, flashing, fume, gases, odors, smoke, noise, vibration, refuse matter, vapor, and heat are effectively confined in a building or are disposed of in a manner so as not to create a nuisance or hazard to safety or health.
(l) Telecommunications facility housed within a building.
(m) Other customary and proper accessory uses incidental to lawful principal uses. Further provided, accessory uses for seasonal temporary outdoor seating for restaurants serving meals for consumption on the premises and at tables with service provided by waitstaff or waiter shall be allowed upon minor project site plan review with waiver of all requirements of Section 7.4.4 and 7.4.6 except as are necessary to demonstrate compliance with Section 6.9 by the Planning Board or Select Board in accordance with Section 6.9.
(n) More than one building on a lot.
(o) More than one use on a lot.
3.2.7.2 Uses Permitted By Special Permit
The following uses are permitted within the Highway Commercial 1 District upon the issuance of a Special Permit by the Special Permit Granting Authority under such conditions as it may require:
(a) Light-rail trans station.
(b) Adult day care facility.
(c) Private school, nursery, or kindergarten not otherwise classified under Section 3.2.7.1 (a).
(d) Retail establishment (not including grocery store) or combination of retail establishments serving the general public where any establishment contains more than 5,750 but less than 10,000 square feet of floor area and where all items for sale or rent are kept inside a building.
(e) Equipment rental service but not including any business that uses outside storage.
(f) Grocery store provided it does not exceed 10,000 sq. ft. of floor area.
(g) Eat-in or take-out restaurant or other eating establishment except that a lunch counter incidental to a primary use shall be permissible by right.
(h) Veterinary office and/or treatment facility and/or animal care facility, including but not limited to, the care, training, sitting and/or boarding of animals.
(i) Indoor athletic or exercise facility or personal fitness service establishment, which may include outdoor pool(s) associated with such facilities.
(j) External automatic teller machine, drive-up window or auto-oriented branch bank accessory to a bank or credit union permitted under Section 3.2.7.1(b) hereof.
(k) Group Practices as defined in Section 3.2.7.1(g) and alternative medicine practices, physical therapy, and wellness treatments facilities including, but not limited to, acupuncture, yoga, chiropractic and/or nutrition services. Such uses may have customary and proper accessory uses incidental to the lawful principal uses, including but not limited to, pharmacies.
(l) Live performance theater, bowling alley, skating rink, billiard room, and similar commercial amusement or entertainment places."
3. Amend Section 4.7.1., Specific Front Setbacks, by deleting the following provisions:
"(b) On the easterly side of Gould Street from Highland Avenue northerly to land of the New York, New Haven and Hartford Railroad Company, there shall be a fifty (50) foot building setback line;
(c) On the northerly side of Highland Avenue from Gould Street northeasterly to the property of the Commonwealth of Massachusetts, there shall be a fifty (50) foot building setback line."
4. Amend Section 4, Dimensional Regulations, by adding a new Section 4.11 Dimensional Regulations for Highway Commercial Districts as follows:
"4.11 Dimensional Regulations for Highway Commercial Districts
4.11.1 Highway Commercial 1

Minimum Lot Area (Sq. Ft.)	Minimum Lot Frontage (Ft.)	Front Setback (Ft.) (1)	Side Setback (Ft.) (1) (3)	Rear Setback (Ft.) (1) (3)	Maximum Height (Ft.) (1)	Maximum Stories (1)	Maximum Lot Coverage (2) (4)	Floor Area Ratio (5) (6)
20,000	100	5	10	10	56	4	65%	1.00

(1) a. All buildings shall be limited to a height of 56 feet and four stories, except that buildings within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and buildings within 200 feet of Gould Street shall be limited to a height of 35 feet and 2 ½ stories as-of-right. If the height of a building is increased above the height of 35 feet, the front setback shall be increased to 15 feet and the side and rear setbacks to 20 feet except that, along the MBTA right-of-way the side and rear yard setbacks shall be 10 feet.

b. By Special Permit from the Planning Board, the maximum height of a building may be increased to the following limits within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. and within 200 feet of Gould Street: 3 stories and 42 feet or 3 stories and 48 feet, provided the additional height is contained under a pitched roof or mansard form the face of the building in a manner approved by the Planning Board. By Special Permit from the Board, the maximum height of a building may be further increased to the following limits: 4 stories and 70 feet provided the building is not located within 200 feet of Highland Avenue or the extension of the right-of-way line as described below in paragraph c. or within 200 feet of Gould Street. If the height of a building is increased above the height of 42 feet, or 48 feet if under a pitched roof or mansard as aforesaid, the front setback shall be increased to 15 feet and the side and rear setbacks to 20 feet except that, along the MBTA right-of-way the side and rear yard setbacks shall be 10 feet.

c. The line from which the setbacks from Highland Avenue shall be measured is that line which starts at the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SBDH) and runs northeasterly N63°56'51"E by the Highland Avenue 1980 State Highway Alteration 561.46 feet to a stone bound/drill hole, then continues on the same northeasterly course an additional 330.54 feet for a total distance from the first mentioned bound of 700 feet. Reference is made to a plan entitled "Plan of Land Gould Street, Needham, MA", prepared by Andover Engineering, Inc., dated July 27, 2000, last revised September 20, 2001, recorded in the Norfolk County Registry of Deeds as Plan No. 564 of 2001, Plan Book 489.

d. Buildings and structures abutting Highland Avenue, Gould Street and/or the layout of Route 128/95 shall be set back at least 20 feet from said streets and said layout. Notwithstanding the location of any building and structures, a 20-foot landscaped, vegetative buffer area 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.

e. Structures erected on a building and not used for human occupancy, such as chimneys, heating-ventilating or air conditioning equipment, solar or photovoltaic panels, elevator housings, skylights, cupolas, spires and the like may exceed the maximum building height, provided that no part of such structure shall project more than 15 feet above the maximum allowable building height, the total horizontal coverage of all of such structures on the building does not exceed 25 percent, and all of such structures are set back from the roof edge by a distance no less than their height. The Planning Board may require screening for such structures as it deems necessary. Notwithstanding the above height limitations, cornices and parapets may exceed the maximum building height provided they do not extend more than 5 feet above the highest point of the roof.

f. For purposes of clarity, the required building setbacks and allowed envelope (including setbacks) for allowance of additional height above 35' for the as-of right circumstance and 42'/48' for the special permit circumstance are shown on figures 1 and 2 below.

Figure 1:

AS OF RIGHT ZONING

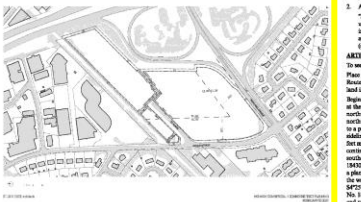
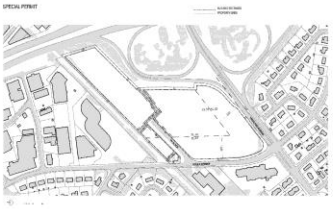


Figure 2:

SPECIAL PERMIT



(2) Maximum lot coverage shall be 65% for all projects. However, if a project is designed such that at least 65% of the required landscaped area immediately abuts at least 65% of the required landscaped area of an adjoining project for a distance of at least 50 feet, the maximum lot coverage may be increased to 75%.

(3) No side or rear yard setback is required for shared parking structures between adjoining properties, but only on one side of each lot, leaving the other side or rear yards open to provide access to the interior of the lot.

(4) A minimum of 20% of total lot area must be open space. The open space area shall be landscaped and may not be covered with buildings or structures of any kind, access streets, ways, parking areas, driveways, aisles, walkways, or other constructed approaches or service areas. Notwithstanding the preceding sentence, open space shall include pervious surfaces used for walkways and patios. (Pervious surfaces shall not preclude porous pavement, porous concrete, and/or other permeable pavers.)

(5) A floor area ratio of up to 1.35 may be allowed by a special permit from the Planning Board. In granting such special permit, the Planning Board shall consider the following factors: 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; 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; the environmental impacts of the proposal; and the fiscal implications of the proposal to the Town. 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.

(6) The calculation of floor area in determining floor area ratio shall not include parking areas or structures.

4.11.2 Supplemental Dimensional Regulations

(1) Parking structures shall be set back at least 100 feet from Highland Avenue and/or Gould Street.

(2) Parking structures may have an active ground floor use, such as retail, office, institutional, or display. Structured parking must be located at least 30 feet from adjacent buildings, but may be attached to the building it is servicing if all fire and safety requirements are met.

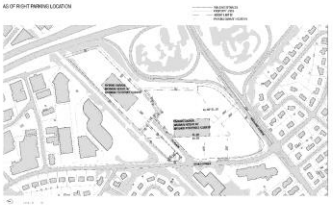
(3) Buildings abutting Highland Avenue and/or Gould Street must have a public entrance facing one street on which the building fronts. This requirement may be waived by special permit from the Planning Board for buildings abutting the 20-foot landscaped setback on Gould Street and Highland Avenue where the arrangements for pedestrian access are such that entrances facing these streets are not the best design option.

(4) Maximum uninterrupted facade length shall be 200 feet.

(5) Notwithstanding Section 3.2.7.1(m) and any other provision of this Section 4.11 to the contrary, a parking garage, even if it is for an as-of-right development, may not exceed 44 feet in height, may not have a building footprint in excess of 42,000 square feet and may not be located within 250 feet of Highland Avenue or the extension of the right-of-way line described in Section 4.11.1 (1) (c) or within 200 feet of Gould Street without the issuance of a special permit by the Planning Board. A parking garage for an as-of-right development may, however, be located within the area beyond said setbacks as-of-right if the parking garage is located easterly or northeasterly of said 200-feet or 250-feet setbacks. For purposes of clarity the height, coverage and location requirements for the as-of-right circumstances are shown on figure 3 below.

Figure 3

AS OF RIGHT PARKING LOCATION



(6) All setback, height, and bulk requirements applicable to this Section 4.11 are contained in this Section and no additional requirements contained by this district abutting Route 128/95's IROD district shall apply.

4.11.3 Special Permit Provision

The Planning Board may, by special permit, waive any or all dimensional requirements set forth above in this Section 4.11 (including sections 4.11.1 and 4.11.2), by finding each by up to a maximum percentage of 25% if it finds that, given the particular location and/or configuration of a project in relation to the surrounding neighborhood, such waivers are consistent with the public good, and that to grant such waiver(s) does not substantially derogate from the intent and purpose of the By-Law. This section does not authorize the Planning Board to waive the maximum height regulations, maximum story regulations, reduce the 20 foot landscaped buffer area requirement along Gould Street, Highland Avenue and the layout of Route 128/95, reduce the 100-foot garage setback requirement along Gould Street and Highland Avenue, or reduce the 20% open space requirement of Section 4.11.1(4), except as specifically provided in Section 4.11.1(2) that the pitched or mansard roofs, (by way of example, a 10' front yard setback could be waived to 11.25' or the 20,000 sq. ft. minimum lot area could be waived to 15,000 sq. ft.)

4.11.4 Special Permit Requirements

In approving any special permit under this Section 4.11, the Planning Board shall consider the following design guidelines for development: (a) The proposed development should provide or contribute to providing pedestrian and neighborhood connections to surrounding properties, e.g., by creating inviting buildings or access edge, by creating planned publicly accessible green spaces, and/or by any other methods deemed appropriate by the Planning Board; (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; (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 facade treatments, mixed-use design, integrated physical design, and/or other elements deemed appropriate by the Planning Board; (d) The proposed development should promote site features and a layout which is conducive to the uses proposed; (e) the proposed development should incorporate as many green building standards as practical, given the type of building and proposed uses; and (f) 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."

5. Amend Section 5.1.3, Parking Plan and Design Requirements, by adding at the end of the second sentence of subsection (j) which reads "Such parking setback shall also be twenty (20) feet in an Industrial-1 District" the words "and Highway Commercial 1 District."
6. Amend Section 7.2.3 of Section 7.2 Building or Use Permit, by adding after the words "Industrial-1 District," in the first sentence, the words "Highway Commercial 1 District,".
7. Amend Section 7.4.2 of Section 7.4 Site Plan Review, by adding in the first sentence of the last paragraph, the words "Highway Commercial 1 District," after the words "Highland Commercial-128,".
8. Amend Section 7.7.2.2, Authority and Specific Powers (of Design Review Board) by adding after the words "Industrial-1 District," in the

ARTICLE 2: AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT SCHEDULE OF PERMITTED SPECIAL PERMIT USES

To see if the Town will vote to amend the Needham Zoning By-Law as follows:

1. Amend Section 3.2.7 Uses in the Highway Commercial 1 District, Subsection 3.2.7.2 Uses Permitted By Special Permit, by adding a new paragraph (m) to read as follows:
"(m) Apartment or multi-family dwelling provided that (1) 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, (2) no more than 240 dwelling units shall be permitted in the Highway Commercial 1 District, (3) at least 40% but not more than 70% of all dwelling units within any project shall be one-bedroom units, and (4) at least 12.5% of all dwelling units shall be Affordable Units as defined in Section 6.12."
2. Amend Section 6.12, Affordable Housing, by revising the first paragraph to read as follows:
"Any mixed-use building in the Neighborhood Business District (NB) with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. Any building in the Highway Commercial 1 District with six or more dwelling units shall include affordable housing units as defined in Section 1.3 of this By-law. The requirements detailed in paragraphs (a) thru (f) below shall apply to a development that includes affordable units in the Neighborhood Business District. The requirements detailed in paragraphs (a), (c), (d), (e), (f), (g), and (h) below shall apply to a development that includes affordable units in the Highway Commercial 1 District."

ARTICLE 3: AMEND ZONING BY-LAW – MAP CHANGE TO HIGHWAY COMMERCIAL 1

To see if the Town will vote to amend the Needham Zoning By-Law by amending the Zoning Map as follows:

Place in the Highway Commercial 1 District all that land now zoned Industrial-1 and lying between the Circumferential Highway, known as Route 128/95 and Gould Street and between the Massachusetts Bay Transit Authority (M.B.T.A.) right-of-way and Highland Avenue. Said land is bounded and described as follows:

Beginning at a stone bound on the northerly layout line of Highland Avenue at the intersection of Gould Street as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489, thence turning and running southwesterly, westerly and northwesterly along a radius of 64.00 feet a distance of 80.06 feet to a stone bound on the easterly sideline of Gould Street; thence running northwesterly, northerly, and northeasterly along a curve of radius of 765.00 feet of said sideline of Gould Street a distance of 254.17 feet to a point on the said easterly sideline of Gould Street; thence running N10°49'30"E a distance of 394.29 feet to a point on the said easterly sideline of Gould Street at the intersection of TV Place, a privately owned Right of Way; thence continuing N10°49'30"E a distance of 160.00 feet more or less to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184302; thence continuing N10°49'30"E a distance of 84.82 feet to a stone bound located at the intersection of the easterly sideline of Gould Street and the southerly sideline of the M.B.T.A. Right of Way as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184302; thence turning and running along said southerly M.B.T.A. Right of Way line northeasterly a distance of 1,219.55 feet as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184301, 184302 and 184303 to a point at the intersection of the westerly sideline of the Route 128 Right of Way and said southerly sideline of the M.B.T.A. Right of Way; thence turning and running S47°25'40"E a distance of 292.00 feet to a stone bound as shown on a plan recorded at the Norfolk County Registry of Deeds Land Court Case No. 184303; then turning and running southwesterly along the Route 128 Right of Way a distance of 404.41 feet to a point; thence turning and running S13°54'58"W a distance of 451.02 feet as shown on a plan recorded at the Norfolk County Registry of Deeds, Plan No. 564 of 2001, Plan Book 489 to a point; thence turning and running S76°26'43"E a distance of 35.56 feet to a point; thence turning and running S13°54'58"W a distance of 67.34 feet to a point; thence running southwesterly along a curve of radius 245.45 feet a distance of 136.59 feet to a point; thence running southwesterly along a curve of radius 248.02 feet a distance of 38.04 feet to a point; thence running southwesterly along a curve of radius 1180.00 feet a distance of 140.09 feet to a point; thence turning and running S67°45'47"W a distance of 42.52 feet to a stone bound located in the westerly sideline of the Route 128 Right of Way; thence turning and running S63°56'51"W a distance of 385.46 feet to the point of beginning.

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 Times
February 25, 2021 and
March 4, 2021

ARTICLE 7

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING

ARTICLE 7: MAP CHANGE TO SINGLE RESIDENCE B ZONING DISTRICT

To see if the Town will vote to amend the Needham Zoning Bylaw by amending the Zoning Map as follows:

Place in the Single Residence B Zoning District (i) all that land now zoned Single Residence A bounded generally to the northwest by a point at the northwesterly end of Parcel 73 on Needham Assessor's Map No. 66, to the northeast by the State Circumferential Highway, to the southeast by Kendrick Street, and to the northwest by Hunting Road; said land comprising Parcels 65, 66, 67, 68, 69, 70, 71, 72 and 73 on said Map No. 66 and Parcels 25, 26 and 27 on Needham Assessor's Map No. 58; as well as (ii) all that land now zoned Single Residence A bounded generally to the northwest by Kendrick Street, to the northeast by the State Circumferential Highway, to the southeast by Cheney Street, and to the southwest by Hunting Road, said land comprising Parcels 1, 2, 3, 4, 18, 19, 20, 21, 22, 23 and 24 on said Map No. 58.

So much of said land comprising Parcels 65, 66, 67, 68, 69, 70, 71, 72 and 73 on said Map No. 66 and Parcels 25, 26 and 27 on Needham Assessor's Map No. 58 being bounded and described as follows: Beginning at a point on the northeasterly side of Hunting Road at the northwesterly end of Parcel 73 on Needham Assessor's Map No. 66; thence running southeasterly along the southwesterly side of the State Circumferential Highway a distance of 1,792.15 feet to Kendrick Street; thence running westerly and northwesterly along the northerly side of Kendrick Street, 328.72 feet to Hunting Road; thence running northwesterly along the northeasterly line of Hunting Road, 1,359.60 feet, to the point of beginning.

And so much of said land comprising Parcels 1, 2, 3, 4, 18, 19, 20, 21, 22, 23 and 24 on Needham Assessor's Map No. 58 being bounded and described as follows: Beginning at a point on the southerly side of Kendrick Street, at the intersection with Hunting Road, thence running westerly 250.08 feet to the southwesterly side of the State Circumferential Highway; thence running generally southeasterly along the southwesterly side of the State Circumferential Highway a distance of 224.63 feet to Cheney Street; thence running southerly along the westerly line of Cheney Street a distance of 371.7 feet to the intersection with Hunting Road; thence running northwesterly along Hunting Road, a distance of 14.19 feet; thence running southerly by Hunting Road, along a curved line, a distance of 68.91 feet; thence running northwesterly along the northeasterly side of Hunting Road 444.24 feet; thence running along a curved line at the intersection of Hunting Road and Kendrick Street a distance of 95.20 to the point of beginning.

Be any or all of said measurements, more or less.

ARTICLE 7 RECOMMENDATIONS:

The required public hearing was held on Tuesday April 6, 2021.

At the regular meeting of the Planning Board on Tuesday April 6, 2021, upon a motion by Martin Jacobs and seconded by Paul S. Alpert, it was by all of the five members present at the April 6, 2021 meeting

VOTED: The Planning Board recommends adoption of Article 7 at the Annual Town Meeting as shown above.

_____
Jeanne S. McKnight, Chair

_____
Paul S. Alpert, Vice-Chair

_____
Martin Jacobs

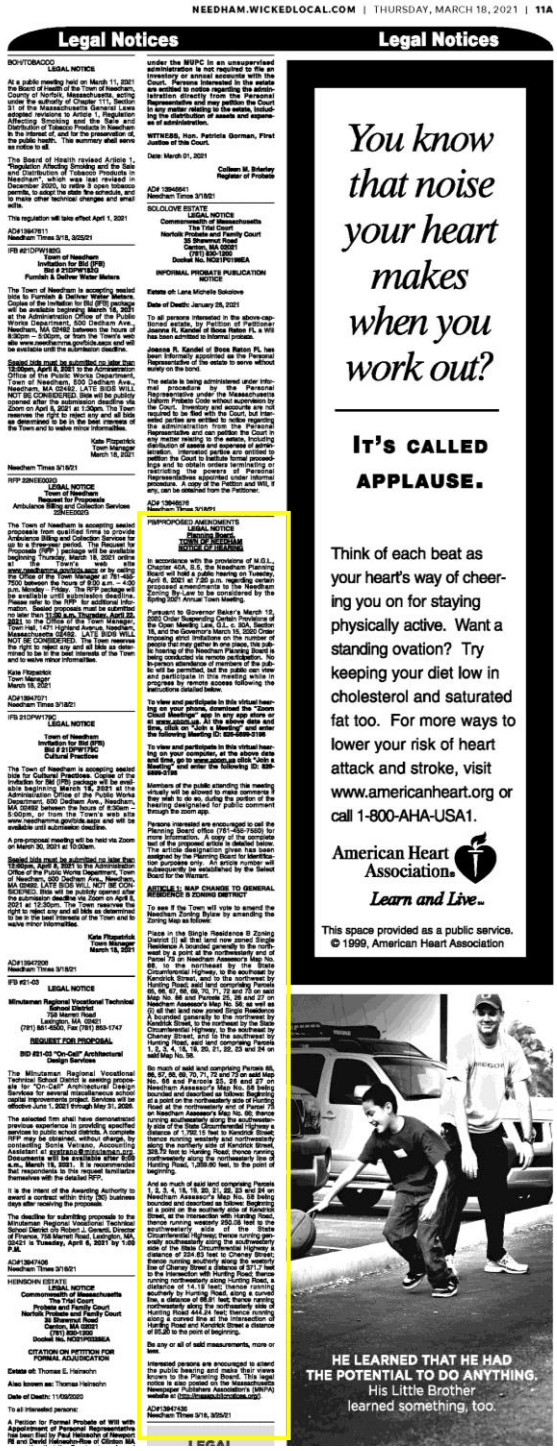
_____
Ted Owens

_____
Adam Block

After consultation with municipal counsel, the Planning Board has determined that Article 7 requires only a majority vote for adoption because the article, if adopted, would modify regulations concerning the bulk and height of structures, yard sizes, lot area, setbacks, open space, parking and building coverage requirements to allow for additional housing units beyond what would otherwise be permitted under the existing zoning by-law.

ARTICLE 7

REPORT WITH RECOMMENDATIONS OF THE TOWN PLANNING BOARD ON THE 2021 ANNUAL TOWN MEETING LEGAL NOTICE



NEEDHAM.WICKEDLOCAL.COM | THURSDAY, MARCH 18, 2021 | 11A

Legal Notices

Legal Notices

BOH/TOBACCO
LEGAL NOTICE

At a public meeting held on March 11, 2021 the Board of Health of the Town of Needham, County of Norfolk, Massachusetts, acting under the authority of Chapter 111, Section 31 of the Massachusetts General Laws adopted revisions to Article 1, Regulation Affecting Smoking and the Sale and Distribution of Tobacco Products in Needham in the interest of, and for the preservation of, the public health. This summary shall serve as notice to all.

The Board of Health revised Article 1, "Regulation Affecting Smoking and the Sale and Distribution of Tobacco Products in Needham", which was last revised in December 2020, to retire 3 open tobacco permits, to adopt the state fee schedule, and to make other technical changes and small edits.

This regulation will take effect April 1, 2021

AD#13947611
Needham Times 3/18, 3/25/21

IFB #21DPW180S
Town of Needham
Invitation for Bid (IFB)
Bid # 21DPW180S
Furnish & Deliver Water Meters

The Town of Needham is accepting sealed bids to Furnish & Deliver Water Meters. Copies of the Invitation for Bid (IFB) package will be available beginning March 18, 2021 at the Administration Office of the Public Works Department, 500 Dedham Ave., Needham, MA 02492 between the hours of 8:30am – 5:00pm, or from the Town's web site www.needhamma.gov/bids.aspx and will be available until the submission deadline.

Sealed bids must be submitted no later than 12:00pm, April 6, 2021 to the Administration Office of the Public Works Department, Town of Needham, 500 Dedham Ave., Needham, MA 02492. LATE BIDS WILL NOT BE CONSIDERED. Bids will be publicly opened after the submission deadline via Zoom on April 6, 2021 at 1:30pm. The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

Kate Fitzpatrick
Town Manager
March 18, 2021

Needham Times 3/18/21

RFP 22NEE002G
LEGAL NOTICE
Town of Needham
Request for Proposals
Ambulance Billing and Collection Services
22NEE002G

The Town of Needham is accepting sealed proposals from qualified firms to provide Ambulance Billing and Collection Services for up to a three-year period. The Request for Proposals (RFP) package will be available beginning Thursday, March 18, 2021 online at the Town's web site www.needhamma.gov/bids.aspx or by calling the Office of the Town Manager at 781-455-7500 between the hours of 8:30 a.m. – 4:00 p.m. Monday - Friday. The RFP package will be available until the proposal deadline. Please refer to the RFP for additional information. A pre-proposal meeting will be held via Zoom on March 30, 2021 at 10:00am.

Sealed proposals must be submitted no later than 11:00 A.M. Thursday, April 15, 2021 to the Office of the Town Manager, Town Hall, 1471 Highland Avenue, Needham, Massachusetts 02492. LATE BIDS WILL NOT BE CONSIDERED. The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

Kate Fitzpatrick
Town Manager
March 18, 2021

AD#13947071
Needham Times 3/18/21

IFB 21CPW179C
LEGAL NOTICE
Town of Needham
Invitation for Bid (IFB)
Bid # 21CPW179C
Cultural Practices

The Town of Needham is accepting sealed bids for Cultural Practices. Copies of the Invitation for Bid (IFB) package will be available beginning March 18, 2021 at the Administration Office of the Public Works Department, 500 Dedham Ave., Needham, MA 02492 between the hours of 8:30am – 5:00pm, or from the Town's web site www.needhamma.gov/bids.aspx and will be available until submission deadline.

A pre-proposal meeting will be held via Zoom on March 30, 2021 at 10:30am.

Sealed bids must be submitted no later than 12:00pm, April 8, 2021 to the Administration Office of the Public Works Department, Town of Needham, 500 Dedham Ave., Needham, MA 02492. LATE BIDS WILL NOT BE CONSIDERED. Bids will be publicly opened after the submission deadline via Zoom on April 8, 2021 at 12:30pm. The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

Kate Fitzpatrick
Town Manager
March 18, 2021

AD#13947006
Needham Times 3/18/21

IFB #21-03
LEGAL NOTICE
Minuteman Regional Vocational Technical School District
758 Marrett Road
Lexington, MA 02421
(781) 861-6500, Fax (781) 863-1747
REQUEST FOR PROPOSAL
BID #21-03 "On-Call" Architectural Design Services

The Minuteman Regional Vocational Technical School District is seeking proposals for "On-Call" Architectural Design Services for several miscellaneous school capital improvements project. Services will be effective June 1, 2021 through May 31, 2026.

The selected firm shall have demonstrated previous experience in providing specified services to public school districts. A complete RFP may be obtained, without charge, by contacting Sonia Versaw, Accounting Assistant at sversaw@minuteman.org. Documents will be available after 9:00 a.m., March 19, 2021. It is recommended that respondents to this request familiarize themselves with the detailed RFP.

It is the intent of the Awarding Authority to award a contract within thirty (30) business days after receiving the proposals.

The deadline for submitting proposals to the Minuteman Regional Vocational Technical School District c/o Robert J. Gerardi, Director of Finance, 758 Marrett Road, Lexington, MA 02421 is Tuesday, April 6, 2021 by 1:00 P.M.

AD#13947406
Needham Times 3/18/21

HEINSOHN ESTATE
LEGAL NOTICE
Commonwealth of Massachusetts
The Trial Court
Probate and Family Court
Norfolk Probate and Family Court
35 Shawmut Road
Canton, MA 02021
(781) 830-1200
Docket No. NO21P0933EA
CITATION ON PETITION FOR FORMAL ADJUDICATION

Estate of: Thomas E. Heinsohn
Also known as: Thomas Heinsohn
Date of Death: 11/09/2020

To all interested persons:

A Petition for Formal Probate of Will with Appointment of Personal Representative has been filed by Paul Galbraith of Needham MA and David Heinsohn of Clinton MA

under the MUPC in an unsupervised administration is not required to file an inventory or annual accounts with the Court. Persons interested in the estate are entitled to notice regarding the administration directly from the Personal Representative and may petition the Court in any matter relating to the estate, including the distribution of assets and expenses of administration.

WITNESS, Hon. Patricia Gorman, First Justice of this Court.

Date: March 01, 2021

Colleen M. Brierley
Register of Probate

AD# 13945641
Needham Times 3/18/21

SOLOLOVE ESTATE
LEGAL NOTICE
Commonwealth of Massachusetts
The Trial Court
Norfolk Probate and Family Court
35 Shawmut Road
Canton, MA 02021
(781) 830-1200
Docket No. NO21P1196EA
INFORMAL PROBATE PUBLICATION NOTICE

Estate of: Lena Michelle Sololove

Date of Death: January 25, 2021

To all persons interested in the above-captioned estate, by Petition of Petitioner Joanna R. Kandel of Boca Raton FL a will has been admitted to informal probate.

Joanna R. Kandel of Boca Raton FL has been informally appointed as the Personal Representative of the estate to serve without surety on the bond.

The estate is being administered under informal procedure by the Personal Representative under the Massachusetts Uniform Probate Code without supervision by the Court. Inventory and accounts are not required to be filed with the Court, but interested persons are entitled to notice regarding the administration from the Personal Representative and can petition the Court in any matter relating to the estate, including distribution of assets and expenses of administration. Interested parties are entitled to petition the Court to institute formal proceedings and to obtain orders terminating or restricting the powers of Personal Representatives appointed under informal procedure. A copy of the Petition and Will, if any, can be obtained from the Petitioner.

AD# 13946216
Needham Times 3/18/21

PRPROPOSED AMENDMENTS
LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of M.G.L. Chapter 40A, Section 5, the Needham Planning Board will hold a public hearing on Tuesday, April 6, 2021 at 7:20 p.m. regarding certain proposed amendments to the Needham Zoning By-Law to be considered by the Spring 2021 Annual Town Meeting.

Pursuant to Governor Baker's March 10, 2020 Order Suspending Certain Provisions of the Open Meeting Law, G.L. c. 30A, Section 18, and the Governor's March 15, 2020 Order imposing strict limitations on the number of people that may gather in one place, this public hearing will be conducted via remote means. Due to in-person attendance of members of the public will be permitted, but the public can view and participate in this meeting while in progress by remote access following the instructions detailed below.

To view and participate in this virtual hearing, 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: 885-8809-2186

To view and participate in this virtual hearing, on your computer, at the above date and time, go to www.zoom.us click "Join a Meeting" and enter the following ID: 885-8809-2186

Members of the public attending this meeting virtually will be allowed to make comments if they wish to do so, during the portion of the hearing designated for public comment through the zoom app.

Persons interested are encouraged to call the Planning Board office (781-455-7550) for more information. A copy of the complete text of the proposed article is detailed below. The article designation given has been assigned by the Planning Board for identification purposes only. An article number will subsequently be established by the Select Board for the Warrant.

ARTICLE 1: MAP CHANGE TO GENERAL RESIDENCE B ZONING DISTRICT

To see if the Town will vote to amend the Needham Zoning Bylaw by amending the Zoning Map as follows:

Place in the Single Residence B Zoning District (i) all that land now zoned Single Residence A bounded generally to the northwest by a point at the northeasterly end of Hunting Road, said point being the end of the RB to the northeast by the State Circumferential Highway, to the southeast by Kendrick Street, and to the northwest by Hunting Road; said land comprising Parcels 65, 66, 67, 68, 69, 70, 71, 72 and 73 on said Map No. 66 and Parcels 25, 26 and 27 on Needham Assessor's Map No. 56; as well as (i) all that land now zoned Single Residence A bounded generally to the northwest by Kendrick Street, to the northeast by the State Circumferential Highway, to the southeast by Charles Street, and to the southwest by Central Avenue; said land comprising Parcels 1, 2, 3, 4, 15, 16, 18, 20, 21, 22, 23 and 24 on said Map No. 56

So much of said land comprising Parcels 65, 66, 67, 68, 69, 70, 71, 72 and 73 on said Map No. 66 and Parcels 25, 26 and 27 on Needham Assessor's Map No. 56 being bounded and described as follows: Beginning at a point on the northeasterly side of Hunting Road at the northwesterly end of Parcel 73 on said Needham Assessor's Map No. 66, thence running southeasterly along the said Hunting Road by a distance of 1,702.15 feet to Kendrick Street, thence running westerly and northwesterly along the northerly side of Kendrick Street, 326.72 feet to Hunting Road, thence running northwesterly along the northeasterly line of Hunting Road, 1,259.00 feet, to the point of beginning.

And so much of said land comprising Parcels 1, 2, 3, 4, 15, 16, 18, 20, 21, 22, 23 and 24 on Needham Assessor's Map No. 56 being bounded and described as follows: Beginning at a point on the southerly side of Kendrick Street, at the intersection with Harding Road, thence running westerly 252.08 feet to the southwesterly side of the State Circumferential Highway, thence running generally southeasterly along the southwesterly side of the State Circumferential Highway a distance of 224.63 feet to Charles Street, thence running southerly along the westerly side of Charles Street a distance of 57.17 feet to the intersection with Harding Road, thence running northeasterly along Hunting Road, a distance of 14.19 feet, thence running southerly by Hunting Road, along a curved line, a distance of 26.21 feet, thence running northeasterly along the northeasterly side of Hunting Road 444.24 feet thence running along a curved line at the intersection of Harding Road and Kendrick Street a distance of 85.26 to the point of beginning.

Be any or all of said measurements, more or less.

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/).

AD#13947430
Needham Times 3/18, 3/25/21

LEGAL

You know that noise your heart makes when you work out?

IT'S CALLED APPLAUSE.

Think of each beat as your heart's way of cheering you on for staying physically active. Want a standing ovation? Try keeping your diet low in cholesterol and saturated fat too. For more ways to lower your risk of heart attack and stroke, visit www.americanheart.org or call 1-800-AHA-USA1.

American Heart Association.
Learn and Live.

This space provided as a public service.
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Needham Times
March 18, 2021 and
March 25, 2021

NEEDHAM PLANNING BOARD MINUTES

January 19, 2021

The Needham Planning Board Virtual Meeting using Zoom was remotely called to order by Jeanne McKnight, Chairman, on Tuesday, January 19, 2021, at 7:30 p.m. with Messrs. Jacobs, Alpert, Owens and Block, as well as Planning Director, Ms. Newman.

Ms. McKnight took a roll call attendance of people expected to be on the agenda. She noted this is an open meeting that is being held remotely because of Governor Baker's executive order on March 12, 2020 due to the COVID Virus. All attendees are present by video conference. She reviewed the rules of conduct for zoom meetings. She noted this meeting includes public hearings and will allow for public comment. If any votes are taken at the meeting the vote will be conducted by roll call.

Upon a motion made by Mr. Alpert, and seconded by Mr. Block, it was by a roll call vote of the five members present unanimously:
VOTED: to automatically continue the meeting to 2/2/21 at 7:15 p.m. with the same zoom ID number if any technical difficulties arise that keep the Planning Board from continuing this meeting tonight and authorize the Vice-Chairman to continue the meeting if the Chairman has technical difficulties.

Public Hearing:

7:30 p.m. – 390 Grove Street Definitive Subdivision: Elisabeth Schmidt-Scheuber, 390 Grove Street, Needham, MA, Petitioner (Property located at 390 Grove Street, Needham, MA). *Please note this is a re-noticed hearing that began on February 4, 2020 and is continued from the July 21, 2020, August 11, 2020, September 8, 2020, November 4, 2020 and December 15, 2020 Planning Board meetings and will be further continued to February 2, 2021.*

Ms. McKnight noted a request was received from Attorney George Giunta Jr. to continue the hearing to the 2/2/21 meeting.

Upon a motion made by Mr. Alpert, and seconded by Mr. Block, it was by a roll call vote of the five members present unanimously:
VOTED: to continue the hearing to 2/2/21 at 7:20 p.m.

Upon a motion made by Mr. Jacobs, and seconded by Mr. Block, it was by a roll call vote of the five members present unanimously:
VOTED: to extend the applicable action deadline to 3/31/21.

Request to Release Performance Surety: Belle Lane Definitive Subdivision, Richard J. Gaffey, Trustee, 634 Charles River Street Realty Trust, 420 Lakeside Ave. Marlborough, MA, Petitioner (Property located at Map 305, Lot 23, off of Charles River Street, Needham, MA).

Ms. McKnight noted a letter from Annmarie von der Goltz, Trustee of the Belle Lane Realty Trust, dated 12/9/20, requesting release of surety. Under a Tripartite Agreement between the Bank and the Planning Board, $123,500 in surety was held in escrow for the completion of work. The applicant has completed most of the requirements and is requesting release of 95,500 for roadway completion leaving $28,000 for off-street drainage. There is a memo from Assistant Town Engineer Thomas Ryder, dated 1/13/21, noting work still needing to be completed. He calculated it would cost $20,000 for this work to be completed and requested a total of $48,000 be retained.

Upon a motion made by Mr. Alpert, and seconded by Mr. Jacobs, it was by a roll call vote of the five members present unanimously:

VOTED: to approve a reduction in the bond for the subdivision at Belle Lane by $75,000 so remaining bond will be a total of $48,000.

Request to Extend Temporary occupancy permit: Amendment to Major Project Site Plan Review No. 2013-02: Town of Needham, 1471 Highland Avenue, Needham, Petitioner, (Property located at 1407 Central Avenue, Needham, MA.

Ms. McKnight noted a letter by Town Counsel Christopher Heep, dated 1/13/21, regarding number of available parking spaces on the property as requested by the Planning Board. He noted there is sufficient area to accommodate a total of 16 parking spaces. Ms. McKnight noted a letter was received from Stephen Gentile, Project Manager, dated 1/7/21. Due to Covid 19 the required 81X Plan is going through the land court and is taking longer than thought. He is requesting an extension of the temporary Certificate of Occupancy from 1/13/21 through 3/8/21. Mr. Jacobs feels there should be a longer extension.

Upon a motion made by Mr. Alpert, and seconded by Mr. Jacobs, it was by a roll call vote of the five members present unanimously:

VOTED: to extend the temporary Occupancy Permit on 1407 Central Avenue until 5/31/21.

Highway Commercial 1 Rezoning and Planning Study: Review of Urban Design Plan, Discussion of Next Steps and Project Schedule.

Ms. Newman updated the Board on the 2/3/21 Community Meeting preparation process. There is a Planning Board meeting on Thursday at 8:30 a.m. to review the updated presentation. Ms. Newman, Mr. Block and Select Board member Marianne Cooley met with Greenman-Pedersen, Inc. (GPI) to discuss what they would like to see presented. They came up with key strategic slides to hit key issues. GPI will be at the meeting on Thursday and will present for about 10 minutes on traffic.

Mr. Block noted there will be about 45 minutes of content from consultants and about 45 minutes of questions. He is hoping GPI can present in less than 15 minutes. [Ms. Newman stated there are no cost estimates.?] Mr. Block noted Natasha Espada, of Studio ENEE, will have 12 to 15 minutes for her presentation on the urban design plan. Ms. Cooley may speak on the fiscal impact. Mr. Block stated he will give the introduction and overview. He will highlight some key dimensional and use changes. Mr. Jacobs noted he will not be able to attend Thursday's meeting.

Ms. Newman stated she will not able to get materials to members until late Wednesday. The members will see the presentation on Thursday. The Board may want to look at this in a more formal way to create incentives to encourage the creation of a build along Gould Street and Highland Avenue and to actually create a framework to encourage multiple buildings on site and to create a street edge. She asked if this was something the Board wants to see happen. If so, does the Board want to see this in the Special Permit or as of right? Mr. Owens suggested thinking about this for the meeting on Thursday morning. He noted, as a Board, they have talked about this for 5 years. They need to put down their pencils. They should not be talking about changing the proposed zoning at this point. He would strongly advise to make a final decision and stop tinkering with it.

Ms. McKnight noted a vision has been developed and that will be presented to the public. She wants to make sure the language of the proposed By-Law carries out the vision. Mr. Block asked what the actual status of the By-Law amendment is. Ms. Newman noted the foundation~~this~~ is the 2019?~~last~~ Town Meeting's version. She decided to use that foundation and make revisions on FAR and setbacks. There [would have been?] minor changes to the framework. It would require some additional thought if there are multiple buildings. Mr. Block noted significant changes have been made. He would agree with Mr. Owens. He does not want to further complicate it. He would like to move on the proposed By-Law amendment expeditiously. He feels they need 2 versions – one with residential included and one without residential.

Mr. Alpert stated he agrees with Ms. Espada that a streetscape is important. If a developer does not want to useput a streetscape concept, he would like to see a large green space buffer. He agrees with Mr. Owens and Mr. Block. The Board does not have the time now to make changes. He sees it as a major drafting problem. Mr. Block stated he thought there was some discussion regarding reducing height as of right to incentivize the developer to go for a Special Permit. The Board would have some control. Mr. Jacobs stated he believes Mr. Owens had left the meeting when the discussion regarding a streetscape occurred. He wanted to make sure Mr. Owens knew this was discussed after he left the last meeting. Mr. Owens feels the vision sketched out last week is fine. He has no objection to reducing height as of right.

8:15 p.m. – Major Project Site Plan Special Permit No. 2020-03: Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA 02025, Petitioner (Property located at 400 Hunnewell Street, Needham, MA). Regarding request to build new residential building with 8 units (see legal notice for more info). *Please note: this hearing is a continuation from the December 15, 2020 and January 4, 2021 meetings of the Planning Board.*

Ms. McKnight noted this is a continued hearing. George Giunta Jr., representative for the applicant, gave a recap of the project. It is a 20,123 square foot property in the Hillside Avenue Business District. Currently there is an 8.520 square foot commercial office building. The applicant is proposing an 8-unit residential buildingcomplex. The numbers are very close to the condo development next door;. It is very similar isin size and dimensions. He described 4 projects that have been done in the area. He noted there was a lot of discussion around shading on the property next door. They looked at the shading and how to address it. The heights of the parapets have been reduced by 2 feet after he met with the neighbors. The applicant is willing to eliminate the parapets on thatthe neighbors' side of the building except the middle parapet. That is to break up the roof line and it is set back 5 feet. The thought is to reduce the shade. The actual height of the building is 27 feet, which is 8 feet less than the 35-foot maximum height allowed. He also noted a typo which says "attic floor." There is no attic.

Ms. McKnight asked what the height of the existing building is. Mr. Giunta Jr. noted it is 22 to 23 feet high. There is about a 5-foot increase in height over the existing. He has submitted revised drawings. The landscape plans have been made formal and are part of the plan set. The dumpster area in back shows as enclosed and they have added arborvitae and evergreens. He has also added photos so the Board could see there is not a substantial change. He took photos for shadowing and showed the results. The project has tried to limit the shading onto neighboring property. He feels it is reasonable as it is 8-feet less than the maximum allowed. He spoke with the abutters. A fence is proposed and the abutters want an 8-foot fence along that side. The fence will be 6-feet by the street and 18 inches of lattice along the top.

Ms. McKnight noted a letter from Assistant Town Engineer Thomas Ryder, dated 1/12/21, regarding a tree being removed per the Town's request and other comments regarding drainage. The letter from the abutters was noted at the last meeting. There was an email from Martin Raffol, owner since 1981 and former Trustee of 210 Hillside Avenue. He stated 8 units is excessive. There are visibility issues at the drive and he objects to a 7:00 a.m. construction start time. He would like an 8:00 a.m. start on weekdays and 9:00 a.m. on Saturdays. He is concerned with construction close to their building. He wants photos taken pre-construction and wants funds set aside by the developer for cleaning of adjacent properties such as windows and drives. There was also an email from Inga Puzikov, Trustee of 210 Hillside Avenue, dated 1/19/21, with the same issues as Mr. Raffol. She feels 8 units is too much and is concerned with the construction start time and the demolition noise.

Mr. Giunta Jr. stated Mr. Raffol and Ms. Puzikov are not immediate abutters. They are across Hunnewell Street. He is not sure there will be an effect. He noted the project is at the bottom of the density scale and noted 210 Hillside Avenue has a density of 57 units per acre. His density is 17 units per acre and he feels 8 units is appropriate for this site. He noted the corner lot has a density of 27 units per acre. The FAR is half of the building across the street. He noted [this? FAR?] is not an appropriate issue as the project is in keeping with the Zoning By-Law. Mr. Giunta Jr. noted, with regards to start time, the Town has a General By-Laws in place to address construction start and noise. This is already regulated. The General By-Law should apply to this project just like everyone else and he noted the project could stretch into a longer period if they are forced to work shorter work days. There will not

be any blasting, dynamiting or ramhoe as this is ordinary construction. He feels a pre-blast survey is not warranted for the building across the street with their parking lot in front.

Mr. Owens has no questions. Mr. Jacobs stated the abutters across the street commented on the driveways being across the street from each other, but. Police and Fire did not have concerns. Mr. Giunta Jr. noted the driveways across from each other are existing conditions. This project will not change the drive and the curb cut will remain the same. This is currently an office building and requires 28 parking spaces. There will be less traffic with 8 units. He feels the likelihood of 2 cars coming out and having an accident will be reduced. [Paul Beaulieu? Who is he – LLC Manager?] noted the Town has a By-Law withregulating streets coming into other streets. He feels the opposing driveways lining up make it safer just like roads are lined up.

Mr. Block has no questions. Mr. Alpert noted he has some concerns. He appreciates the applicant doing the presentation on the shadowing on the condos next door. The shadowing was concerning. An extra 5 feet of shadow on the building next door caused them to lose a considerable amount of light across the entire building. He is not sure if the Board has a right to do anything about that, but he wants the neighbors to know he is thinking about it. He stated he was opposed to the hours of construction when the General By-Law was passed. He felt it should be an 8:00 a.m. start. He feels the Board can put in a condition that noise cannot start until 8:00 a.m. Construction can begin at 7:00 a.m. but not noise. He is also concerned with the construction regarding soil testing and how much blasting. This is a legitimate concern for the abutters. He wants more explanation if the project will need to do blasting and mitigation. They need to document existing conditions. He feels that is a legitimate request on the abutters' side.

Ms. McKnight stated she is concerned with shade. She went to the site and took photos. At 10:30 a.m. the sun line was about the same as shown by Mr. Giunta Jr. At 8:00 a.m. the sun went to the middle of the center windows on the condos next door so they only got sun on the upper part of the windows. Adding 5 feet would mean in the early morning the upper rooms would get no sun. She had an idea whether the second story could be moved 4 or 5 feet toward the driveway and cantilevered out over the driveway. One advantage would be it would give a roof over the frontmain entrance. She noted in the corner behind the building in the left rear there were proposed parking spaces. She suggested they are not needed and should be landscaped but Mr. Giunta Jr. stated there needs to be a place for snow. There is landscaping that is hardy and people could sit out there. She agrees with the start--time comments. For the driveway, she noted the building is on the sameabuts a site that is used as a day care center. Parking spaces are painted in the rear. The dividing line between the 2 properties is not clear. She asked if different surfaces could be used for the drive to make clear it is the applicant's property.

Mr. Giunta Jr. noted there was a full GO eoTtechnical survey done. There is no evidence of rock or ledge being found. If blasting or hammering is necessary, if anything is found, a pre-blasting survey will be done but he does not feel this will be necessary. The applicant has no issue doing the survey in that event. He stated they looked at moving the building out but there is an elevator that services the basement, first and second floors so it gets tricky. There would need to be a wholesale redesign of the building, which is not realistic. The parking spaces are in a recessed area and is set down 4 feet below the adjacent property and would not impact them. He feels more spaces at a building is a good thing. He questions if there is more value with spaces or hardscape. He feels there is more value having 5 spaces there.

Mr. Giunta Jr. noted the dividing line between the 2 properties. The line goes right down the middle of the property and has a shared driveway between the 2 properties. He does not feel it is feasible to have different materials for the drive. For the shading issue, the property is in thea Ccommercial Zzone, which has no side yard setbacks. A building could be put right on the property line and be 35 feet in height. He feels there is a conflict addressing concerns with the residential and commercial zones. He feels the question is if it is fair for this property to redesign when they have made concessions. They do not intend to do a pre-construction survey of conditions. If they run into ledge they will do it then. He noted 210 Hillside Avenue raised this issue. The building next door was knocked down and did not have to do a pre-blast survey. It is not required for others and this applicant should not be compelled to do it. Mr. Alpert stated he objects to a pre-permitting condition. If they encounter ledge then a pre-construction survey will be done. Mr. Giunta Jr. stated he has no issue with that.

Mr. Raffol noted, regarding density, all was good and clear in the explanations. He thinks this is a good idea but he has a few concerns. The applicant has a right to build the building. He would like them to consider looking at the hours of work. He is concerned about noise and particularly on Saturday. He would like an 8:00 a.m. start on weekdays and a 9:00 a.m. start on Saturdays. There are about 50 people in his building of all ages. The applicant is well within his rights but he would like to request a later start. Project Developer Dennis Cronin stated they are prepared not to have any major noise or vibrations on Saturday. He noted it is difficult to get people to start at 8:00 a.m. but major noise will be postponed until 8:00 a.m.

Mr. Raffol stated, if there is blasting, he would like something in writing regarding noise. He is supportive of the project and does not want to interfere with the developer. He is concerned about trucks going in and out. There will be dirt and mud on the street and it will be dragged into their parking lot. There will be dirt on the windows and awnings. He would appreciate a letter regarding the start time and noise. He would also like it to include blasting with a pre-blasting survey and assurance if the parking lot and building gets mud and dirt they will get assistance in cleaning if needed. The real hope is we want to be in the same position as we are now. He would like a letter to the Association. Ms. McKnight stated the Town would not write a letter of assurance. The Board puts conditions in the decision to ~~ensure~~address these issues.

Ms. Puzikov asked if there will be lighting on top or sides of the building that will shine onto their property. Mr. Giunta Jr. noted the landscape plans includes a lot of lighting information. The lighting is mostly ground based and subdued. There will be a series of bollards that line the walkway and fixtures mounted into retaining walls and steps. The lights are not high on the building. There are lights on the canopies in the front and rear. The lights in the rear will be on timers but motion activated. The lights in front could be done the same if needed. Mr. Owens stated in a non-residential zone where the height limit is 35 feet, it seems the abutters complaining about sun ~~is~~should not be a concern. The Board does not have in the Zoning By-Law that they will regulate sun. The building heights are set at 35 feet. He does not find that a persuasive argument. If Town Meeting has set a General By-Law with hourly construction limits he does not feel he can change that. The developer is making a good faith effort. He would not be in favor of any condition that makes the developer conform to these conditions.

Kent Duckham, project architect, arrived at the meeting and was available for questions. Ms. McKnight asked about doing a cantilever on the second floor. Mr. Duckham stated he went up on the roof at 10:00 a.m. in September to project where the sun hit. Then they lowered some parapets to the roof line. Ms. McKnight asked if the hearing needs to be continued. Ms. Newman stated she has all the information needed and nothing warrants continuing this hearing.

Upon a motion made by Mr. Jacobs, and seconded by Mr. Block, it was by a roll call vote of the five members present unanimously:
VOTED: to close the hearing.

Minutes

Upon a motion made by Mr. Jacobs, and seconded by Mr. Alpert, it was by a roll call vote of the five members present unanimously:
VOTED: to accept the minutes of 11/4/20.

Upon a motion made by Mr. Jacobs, and seconded by Mr. Block, it was by a roll call vote of the five members present unanimously:
VOTED: to accept the minutes of 11/17/20 with the changes noted.

Correspondence

Ms. Newman stated she received a letter from Town Counsel Christopher Heep regarding the Cogswell Building. The Board had asked for a parking plan with the maximum number of cars that could be parked there. They have done that and it will be 16 parking spaces.

Report from Planning Director and Board members.

Mr. Jacobs noted the Board members also received the Select Board goals. Ms. McKnight stated some of the goals may pertain to Planning Board work. Mr. Block stated there are a couple of the goals the Board may want to discuss. Time should be found at another meeting to discuss this. Mr. Owens noted he does not intend to run for re-election to the Planning Board.

Upon a motion made by Mr. Block, and seconded by Mr. Alpert, it was by a roll call vote of the five members present unanimously:
VOTED: to adjourn the meeting at 9:50 p.m.

Respectfully submitted,
Donna J. Kalinowski, Notetaker

_____
Paul Alpert, Vice-Chairman and Clerk

Memorandum

To: Carol Smith-Fachetti, Chair, Needham Finance Committee

From: Lee Newman, Director of Planning and Community Development

cc: Kate Fitzpatrick, Town Manager
Katie King, Assistant Town Manager
Dave Davison, Assistant Town Manager
Needham Planning Board

Date: April 13, 2021

Re: 2021 Fiscal Impact Analysis, Highway Commercial 1 Rezoning

This memorandum is submitted as a supplement to the 2021 Fiscal Impact Analysis of the Highway Commercial 1 rezoning prepared by Judi Barrett, Barrett Planning Group LLC, dated March 20, 2021. The purpose of this memorandum is to address questions raised at the Finance Committee meeting of March 31 as to the maximum build-out that could be accomplished at the proposed rezoning site under existing Industrial 1 zoning rules, the highest and best use obtainable under those rules, and the fiscal impact that best use scenario would yield. Additionally, the memorandum addresses questions raised at the meeting as to the fiscal impact of a commercial development option at a maximum floor area ratio (FAR) of 0.70 and a mixed-use option at the same FAR both under the proposed rezoning scheme. To that end we have conducted a site analysis to determine the maximum build-out potential under existing zoning, have identified those marketable land uses which would yield the highest value, and have updated the fiscal impact report prepared by the Barrett Planning Group to show the fiscal impact of the revised land use and density profile. We have also updated the proportional valuation model developed by the Town's fiscal consultant to reflect the above noted development options retaining the underlying assumptions of the model to assure consistency across all studied land use scenarios. The three questions noted above are now answered briefly below followed by a technical appendix of tables which provides the supporting documentation.

1. What is the fiscal outcome to the Town of a nonresidential project with an FAR of 0.50 under the current Industrial 1 zoning district rules?

   Answer: A potential mix of lab space and retail space with a combined FAR of 0.5 and the existing television studio would provide $2,699,726 in gross tax revenue per year and would create demands on municipal services of approximately $152,766 per year. For development at this level, the net revenue would be $2,546,960, for a cost-revenue ratio of 0.056. The details of this proportional valuation are presented below in Table II.A of the technical appendix.

   The build out analysis for the highest and best use of the property revealed that the maximum FAR by special permit at 0.75 under existing zoning, is not achievable because of parking and other restrictions embedded within the outdated zoning. The maximum achievable density and highest and best use under existing zoning is an FAR of 0.5.

2. What is the fiscal outcome to the Town of a nonresidential project with an FAR of 0.70 by right under the proposed new zoning?

   Answer: At maximum buildout with a floor area ratio (FAR) of 0.70 by right, commercial development in the new district under this option would provide $4,713,181 in gross tax revenue per year and would put demands on municipal services of approximately $266,700 per year. For development at this level, the net revenue would be $4,446,481, for a cost-revenue ratio of 0.056. The details of this proportional valuation are presented in Table II.B of the technical appendix below.

3. What is the fiscal outcome to the Town of a project comprised of multiple nonresidential uses (retail, lab space, and offices) and 120 apartments, with a combined total FAR of 0.7 by right under the proposed new zoning?

   Answer: A mixed-use development option with a combined total FAR of 0.7 by right, would generate $4,005,451 in gross taxes per year and would create demands on municipal and school services of approximately $813,094. The net revenue would be $3,192,357 for a cost-revenue ratio of 0.20. The details of this proportional valuation are presented below in Table II.C of the technical appendix below.

It is important to point out that under existing conditions, the parcels generate $490,500 in taxes to the Town per year. As a result, the gain in tax revenue from the new nonresidential options or the mixed-use development options at the 0.70 FAR will be anywhere from 8 to 9.6 times what the Town receives today. Redevelopment of the property under the current Industrial 1 zoning results in a tax gain of 5.5 times current tax revenue.

TECHNICAL APPENDIX

Build-out Analysis: Industrial 1 District

To determine the maximum FAR build-out that could be achieved under the existing zoning framework we assessed the current zoning rules as relates FAR, building height and setback requirements, and parking standards within the Industrial-1 zoning district. The results of that analysis are presented in Table 1 below and show a maximum build-out at the property of 205,625 square feet with surface parking for 685 cars. This build-out to be allocated in a two-story building having a building footprint of 102,813 square feet.

It should be noted however, that although the current zoning provides for an increased FAR of up to 0.75 by special permit where structured parking is provided, this increased density does not lead to an increase in leasable space. This is due to the concurrent zoning requirement that the structured parking itself count toward the FAR requirement.

The current zoning establishes a maximum FAR of 0.5 as-of-right and a FAR of 0.625 or 0.75 by special permit under conditions described as follows: (1) FAR of 0.625, if at least twice the minimum front setback is provided, and if at least one-half of the required parking is provided in or under a building or structure, and if 15 percent of the parking area is maintained as landscaped area; and (2) FAR of 0.75, if at least twice the minimum front setback is provided, and if all of the required parking is provided in or under a building or structure, and if 20 percent of the parking area is maintained as landscaped area. Parking garages, interior portions of buildings devoted to off-street parking, and deck or roof top parking is considered floor area and is included in the FAR calculation.

At the subject property a FAR of 0.625 (257,031 sq. ft.) provides for 171,183 square feet of gross leasable space and 85,877 square feet of structured parking. This is about 34,400 square feet less leasable space than the base as-of-right zoning with a cost of about 3-times more for the structured parking over surface parking. The case for a FAR at 0.75 is even more pronounced, where a FAR of 0.75 (308,438 sq. ft.) provides for 154,219 square feet of gross leasable space and 154,219 square feet of structured parking. This is about 51,000 square feet less leasable space than the base as-of-right zoning where all parking is constructed at grade. Accordingly, recognizing the disincentives implicit in the FAR special permit requirements, the fiscal impact analysis is being modeled at a FAR of 0.5 (205,625 square feet) with surface parking for 685 cars.

Table 1. Industricial-1 Zoning District: Build-out Analysis

Existing Zoning		
Existing Zoning	Industrial -1	
Existing Area	411,250 sf	
FAR	0.5	
Height	30 ft (2 stories)	
Front setback	20ft (50ft on Gould St. & Highland Ave)	
Side Setback	20 ft	
Rear Setback	10 ft	
Min. Lot Area	20,000 sf	
Min. Lot Frontage	100 ft	
Max. Lot Coverage	No requirement	
Min. Open Space	No requirement	
Parking Garage setback	No requirement	
Max. Façade length	No requirement	
Traffic Mitigation	No requirement	

Proposed Maximum Buildout Under Existing Zoning		
Maximum Built area (sf)	205,625	at FAR =0.5
Bldg Footprint at 2-stories (sf)	102,813	sf
Bldg Height -14.5ft / floor = 29ft	2 stories	Under 30ft max.
Parking req'd	685	cars at 1 car / 300sf
Land area at 320sf / space +/-	219,333	sf
Site Analysis		
Total Existing Site Area	9.441	Acres
Site Area devoted to setbacks	2.052	Acres
% of site for setbacks	*21.7%*	
Site Area devoted to Buildings	2.36	Acres
% of site for building	*25%*	
Site Area devoted to parking	5.04	Acres
%of site for parking	*53.3%*	

Analysis of Special Permit allowing FAR of 0.625

Special Permit allows for increase in FAR to 0.625	257,031
Gross leasable area for Office / Retail (about 2/3's)	**171,183**
Total Number of cars required	571
50% of cars must be in structured parking garage	285
Gross area for 50% structured parking at 301sf / car	**85,877**
Note #1 - Therefore since 50% of the parking must be in a garage and the garage parking is included as FAR, the total leasable building area for office / retail is about 34,000sf less than the base zoning allows where all parking is constructed at grade.	
Note #2 - Structured parking is about 3-times as expensive to construct compared to grade parking. Typically, suburban parking is free of charge. Therefore, there is a natural disincentive for a developer to utilize this Special Permit option.	

Analysis of Special Permit allowing FAR of 0.75

Special permit allows for increase in built area to (sf)	308,438
Gross leasable area for Office / Retail (about 1/2)	**154,219**
Total Number of cars required at 1 car /300sf	514
100% of cars must be in structured parking garage	514
Gross area for 50% structured parking at 300sf / car	**154,219**
Note #1 - Therefore since 100% of the parking must be in a garage and the garage parking is included as FAR, the total leasable building area for office / retail is about 51,000sf less than the base zoning allows where all parking is constructed at grade.	
Note #2 - Structured parking is about 3-times as expensive to construct compared to grade parking. Typically, suburban parking is free of charge. Therefore, there is a natural disincentive for a developer to utilize this Special Permit option.	

Land Use Model and Fiscal Impact Report

The Greater Boston market is home to the top life science real estate market across the United States. The COVID-19 pandemic has magnified the focus on healthcare and the need for life science, which has accelerated growth in the sector. This growth has spurred demand and as a result, the Greater Boston suburban lab market recorded 415,643 sq. ft. of positive absorption in the last quarter of 2020, the most

growth recorded in a single quarter since 2003. The suburban lab market was led by Metro West with 393,914 sq. ft. of positive absorption. Rents remain historically high and the Metro West market finished the fourth quarter with an average asking rent of $48.80 per square foot. Vacancy and availability also remain near historical lows, finishing the fourth quarter at 7.1% and 13.6% respectively. The Route 128 West submarket had the most active quarter of the Metro West markets, recording 268,512 sq. ft. of positive absorption. Vacancy decreased to 4.9% while availability finished the quarter at 13.7%. Average asking rents increased to $68.90 per square foot.[1]

We view lab space with ancillary retail as the highest and best use for the subject site for the reasons noted above and have established the framework for the fiscal impact analysis as follows:

R**esearch center/retail facility and television studio mix as of right:**

- Research Center/Lab: 174,775 sq. ft.
- Retail: 30,850 sq. ft.
- TV studio: 90,002
- Total: 295,627 sq. ft.

Accordingly, we have updated the proportional valuation model developed by the Town's fiscal consultant to reflect the above noted development options retaining the underlying assumptions of the model to assure consistency across all studied land use scenarios.

At buildout, a potential mix of lab space and retail space with a combined FAR of 0.5 and the existing television studio would provide $2,699,726 in gross tax revenue per year and would create demands on municipal services of approximately $152,766 per year. For development at this level, the net revenue would be $2,546,960, for a cost-revenue ratio of 0.056. The details of this proportional valuation are presented below in Table II.A below.

[1] CBRE, Boston Suburban Office/Lab, Q4 2020 "Life Science Strengthens as Office Market Weakens"

Table 2. Est. Fiscal Impact of Development Scenarios

II.A. Research Center/ Retail Mix @ .50 FAR and TV Studio

	NEW PROJECT VALUE (AB)	$104,884,485	NOTES
A	New Value / Total Nonresidential Value	0.09	
B	Refinement Coefficient	.321	
C	New Nonresidential Service Costs	$152,766	*(A*B*NonResTot)*
D	Est. Nonresidential Tax Revenue	$2,699,726	*Value/1000/*$25.74*
E	New Residential Service Costs	N/A	
F	Est. Residential Tax Revenue	N/A	
G	Net Revenue	$2,546,960	*D-C*
H	Cost/Revenue Ratio	0.056	*C/D*
	Project Use(s)		
I	Total Sq. Ft.	0	*From Town*
J	Office	0	*From Town*
K	Research Center	174,775	*From Town*
L	Retail	30,850	*From Town*
M	Warehouse	0	*From Town*
M.1	TV Studio (No Change)	90,002	*From Town*
N	Residential (Units)	0	*From Town*
	Rent		
O	Office	$42.00	*CoStar*
P	Research Center	$60.00	*CoStar*
Q	Retail	$36.80	*CoStar*
R	Warehouse	$19.61	*Loopnet*
S	Residential (Units)	$2,637	*CoStar*
	Income & Value		
T	Gross Nonresidential Income	$11,621,780	*Research/Retail only*
U	Nonresidential Exp. Ratio 39.2%	$5,019,444	*CoStar for exp. ratio*
V	Nonresidential NOI	$6,602,336	*T-U*
W	Residential Income	$0	*Units * rents*
X	Residential Exp. Ratio 38%	$0	*CoStar for exp. ratio*
Y	Residential NOI	$0	W-X
Z	Submarket NonRes. Cap Rate 7.0%	$104,884,485	*Research/Retqil + TV Studio*
AA	Submarket Res. Cap Rate 4.50%	$0	*CoStar for cap rate*
AB	Total Value	$104,884,485	*Z+AA*

Fiscal Impact Model Update

Finally, we have updated the proportional valuation model developed by the Town's fiscal consultant to be consistent with the now revised zoning proposal. This update includes two new development scenarios, namely a commercial development option at a maximum by right FAR of 0.70 and a mixed-use option at the same by right FAR. The development options are detailed below with a summary of their fiscal impacts.

1. A nonresidential project with a maximum floor area ratio (FAR) of .70, comprised of:

- Office: 196,212 sq. ft.
- Research Center/Lab: 196,212 sq. ft.
- Retail: 69,251 sq. ft.
- Total: 461,675 sq. ft.

At maximum buildout with a floor area ratio (FAR) of .70 by right, development in the new district under this option would provide $4,713,181 in gross tax revenue per year and would create demands on municipal services of approximately $266,700 per year. For development at this level, the net revenue would be $4,446,481, for a cost-revenue ratio of 0.056. The details of this proportional valuation are presented in the Table II.B below.

2. A mixed-use project with a maximum floor area ratio (FAR) of .70, comprised of:

- Office: 138,500 sq. ft.
- Research Center/Lab: 138,500 sq. ft.
- Retail: 48,475 sq. ft.
- Apartments: 120
- Total: 461,675 sq. ft.

As for the mixed-use development options, a project comprised of multiple nonresidential uses (retail, lab space, and offices) and 120 apartments, with a combined total FAR of 0.7 by right, would generate $4,005,451 in gross taxes per year and would create demands on municipal and school services of approximately $813,094. The net revenue would be $3,192,357 for a cost-revenue ratio of 0.20. The details of this proportional valuation are presented below in Table II.C below.

Table 2. Est. Fiscal Impact of Development Scenarios
II.B. Office/Research/Retail Mix @ .70 FAR

	NEW PROJECT VALUE (Z)	$183,107,300	NOTES
A	New Value / Total Nonresidential Value	0.16	
B	Refinement Coefficient	.321	
C	New Nonresidential Service Costs	$266,700	*(A*B*NonResTot)*
D	Est. Nonresidential Tax Revenue	$4,713,181	*Value/1000/*$25.74*
E	New Residential Service Costs		
F	Est. Residential Tax Revenue		
G	Net Revenue	$4,446,481	*D-C*
H	Cost/Revenue Ratio	0.056	*C/D*
	Project Use(s)		
I	Total Sq. Ft.	461,675	*From Town*
J	Office	196,212	*From Town*
K	Research Center	196,212	*From Town*
L	Retail	69,251	*From Town*
M	Warehouse	0	*From Town*
N	Residential (Units)	0	*From Town*
	Rent		
O	Office	$42.00	*CoStar*
P	Research Center	$60.00	*CoStar*
Q	Retail	$36.80	*CoStar*
R	Warehouse	$19.61	*Loopnet*
S	Residential (Units)	$2,637	*CoStar*
	Income & Value		
T	Gross Nonresidential Income	$22,562,060	*Sq. ft.*rents*
U	Nonresidential Exp. Ratio 39.2%	$ 9,744,549	*CoStar*
V	Nonresidential NOI	$12,817,511	*T-U*
W	Residential Income	$0	
X	Residential Exp. Ratio 38%	$0	
Y	Residential NOI	$0	
Z	Submarket NonRes. Cap Rate 7%	$183,107,300	*Town; consultant modified*
AA	Submarket Res. Cap Rate 4.50%	$0	
AB	Total Value	$183,107,300	

Part II. Est. Fiscal Impact of Development Scenario
II.C. Office/Research/Retail/Residential Mix @ .70 FAR

	NEW PROJECT VALUE (Z)	$181,445,816	NOTES
A	New Value / Total Nonresidential Value	0.16	
B	Refinement Coefficient	0.289	
C	New Nonresidential Service Costs	$237,934	*(A*B*NonResTot)*
D	Est. Nonresidential Tax Revenue	$3,323,747	*Value/1000/*$25.74*
E	New Residential Service Costs[2]	$575,160	*See Assumptions*
F	Est. Residential Tax Revenue	$681,704	*Value/1000/*$13.03*
G	Net Revenue	$3,192,357	*(D+F)-(C+E)*
H	Cost/Revenue Ratio	.20	*(C+E)/(D+F)*
	Project Use(s)		
I	Total Sq. Ft.*	461,675	*From Town*
J	Office	138,500	*From Town*
K	Research Center	138,500	*From Town*
L	Retail	48,475	*From Town*
M	Warehouse	0	*From Town*
N	Residential (Units)	120	*From Town*
	Rent		
O	Office	$42.00	*CoStar*
P	Research Center	$60.00	*CoStar*
Q	Retail	$36.80	*CoStar*
R	Warehouse	$19.61	*Loopnet*
S	Residential (Units)	$2,637	*CoStar*
	Income & Value		
T	Gross Nonresidential Income	$15,910,880	*Sq. ft.*rents*
U	Nonresidential Exp. Ratio 39.2%	$6,871,939	*CoStar for exp. ratio*
V	Nonresidential NOI	$9,038,941	*T-U*
W	Residential Income	$3,797,280	*Units * rents*
X	Residential Exp. Ratio 38%	$1,442,966	*CoStar for exp. ratio*
Y	Residential NOI	$2,354,314	W-X
Z	Submarket NonRes. Cap Rate 7%	$129,127,728	*CoStar for cap rate*
AA	Submarket Res. Cap Rate 4.50%	$52,318,088	*CoStar for cap rate*
AB	Total Value	$181,445,816	*Z+AA*

[2] 234 residents, 20 students

Draft Motion to Amend offered by Barry Pollack:

TOWN OF NEEDHAM

2021 ANNUAL TOWN MEETING

The following motion to amend is offered by _____
Signature of Town Meeting Member

ARTICLE 5:

MOVED: that the main motion under Article 5 be amended by:

1. Deleting the number "25%" in Paragraph 5, specifically in the first sentence of 4.11.1(4) and inserting in its place the number "30%."
2. Deleting the number "1.35" in Paragraph 5, in the first sentence of 4.11.1(5) and inserting in place thereof the number "0.95," and inserting at the end of the paragraph two new sentences stating: "To encourage mixed-use development, by special permit the Planning Board may allow an increase in the floor area ratio of an additional 0.35, totaling 1.3, with the additional 0.35 floor area ratio comprised solely of up to 0.2 floor area ratio devoted to dwelling units consistent with the minimum amount of Affordable Housing set forth in Section 6.12, and up to 0.15 floor area ratio devoted to indoor athletic, exercise, fitness, or skating rink uses. In granting a special permit for such latter uses, the Planning Board shall consider as a primary factor whether a substantial portion of such uses will benefit Needham students and support or supplement school programs."

From:	Lee Newman
To:	Alexandra Clee
Subject:	FW: Town Meeting - 210404 motion to amend-CH edit copy copy.docx
Date:	Tuesday, April 20, 2021 11:06:38 AM
Attachments:	210404 motion to amend-CH edit copy copy.docx

From: Barry Pollack <bpollack@psdfirm.com>
Sent: Tuesday, April 20, 2021 7:17:26 AM
To: Christopher Heep <cheep@miyares-harrington.com>
Subject: Town Meeting - 210404 motion to amend-CH edit copy copy.docx

Chris,
Other town meeting members and I have been working on and planning an amendment to the Muzi rezoning proposal.
As you know, the Finance Committee voted unanimously to reject the Planning Board's present proposal as based on unreliable projections and causing too much burden on the town.
Please pass this along to the Planning Board.
Here are the highlights:

1) Green space is increased from 25 to 30%. The Petition with more than 800 signatories objected to the original 20% green space in PB's February preliminary numbers. When the Planning Board increased that number to 25%, they were literally kicking 25 or 30 around when Adam Block said to go with 25 to give a developer flexibility. 30 is better.
2) office space FAR with a special permit is reduced from 1.35 to .8. The 1.35 produced in the PB's schematics 870K square feet of office space. This still produces over a half million square feet of office space at .8. Rush hours will suffer far less traffic impact. This way, our Town remains more of a town than those city-like portions of Newton, Cambridge or Somerville.
3) this change also incentivizes a developer who wants to build more into including housing and athletic facilities. For those uses, a developer can go to 1.1 FAR by ensuring they have at least .15 FAR of housing (which elsewhere in the amendment must include an affordable component) and .15 athletic center. For those concerned that housing drains schools, I beside the typical counter-arguments, this amendment gives favorable

consideration to an athletic facility that supports schools by substantially benefitting students.
4) this amendment would still get rid of warehouse and industrial uses that the town and The Newton-Needham-Wellesley Chamber of Commerce keep raising as a motivating force
5) according to PB estimates, this amendment should raise tax revenue substantially from its existing level based on special permit development projections
Barry

TOWN OF NEEDHAM

2021 ANNUAL TOWN MEETING

The following motion to amend is offered by _____

Signature of Town Meeting Member

ARTICLE 5:

MOVED: that the main motion under Article 5 be amended by:

1. Deleting the number “25%” in Paragraph 5, specifically in the first sentence of 4.11.1(4) and inserting in its place the number “30%.”
2. Deleting the number “1.35” in Paragraph 5, in the first sentence of 4.11.1(5) and inserting in place thereof the number “0.8,” and inserting at the end of the paragraph two new sentences stating: “To encourage mixed-use development, by special permit the Planning Board may allow an increase in the floor area ratio of an additional 0.3, totaling 1.1, with the additional 0.3 floor area ratio comprised solely of up to 0.15 floor area ratio devoted to dwelling units and up to 0.15 floor area ratio devoted to indoor athletic, exercise, fitness, or skating rink uses. In granting a special permit for indoor athletic, exercise, fitness, or skating rink uses, the Planning Board shall consider whether a substantial portion of such uses will benefit Needham students and support or supplement school programs.”

EJN Statement supporting our Zoning Amendments

Dear Town Meeting Members,

In pursuit of greater housing choice and opportunity in Needham, Equal Justice in Needham is proposing two amendments to Article 5: removing the 240-unit cap and lowering the threshold of affordability currently proposed in the article. We believe the Muzi site, given its size and location, offers Needham a unique and important opportunity to provide more affordable units for current and future residents. In a town with few large sites available for redevelopment, the proposed zoning presents a critical moment for Needham to add to the region's stock of much-needed affordable housing.

Background and Rationale for the Proposed Amendments

The Greater Boston region is in the midst of an affordable housing crisis. Needham is facing its own housing crisis as teardowns are replaced by larger homes, leading to rising home values and a reduction in options for families with children and seniors who wish to downsize. We can reverse this trend if we approach the challenge and look for solutions. It is the obligation of the town's governing bodies to affirmatively further fair housing and identify opportunities for affordable housing where it is appropriate and balanced with other needs of our community. It is also our community's responsibility to take meaningful steps to reverse the historic racial exclusion that has taken place for hundreds of years in suburban communities like Needham.

Why We Propose to Remove the 240-Unit Cap

Article 5 currently specifies a 240-unit cap on the number of units a developer may propose. We believe this is an unnecessary restriction that may impact the financial feasibility of a potential development. In addition, it sends a message to developers that Needham lacks the willingness to consider creative development proposals. Removing the 240-unit cap would not change the need for developers to present their proposals to the town through the Special Permit process and address citizens' concerns through careful analysis and mitigation. The removal of this cap would, however, indicate to the development community that Needham is ready to consider solutions that prioritize the creation of affordable housing in our town.

Why We Propose to Lower the Threshold of Affordability for Rental Projects

The current zoning requires 12.5% of residential units to be affordable to households with annual incomes at or below 80% of the average median income (AMI). However, we believe the affordability threshold established for this site for rental projects must be lowered to meet the growing demand region-wide for housing opportunities at even lower income levels. Additionally, while the town has seen the construction of over 200 affordable units in the last few years as part of Chapter 40B mixed-income developments, these units are set at the 80% AMI level. The lack of production of new rental units at deeper levels of affordability creates a significant barrier

for a large portion of our diverse regional community struggling to find safe, affordable, and decent housing. Needham, as one of the affluent suburban communities of greater Boston, must do its part to contribute to a regional solution for affordable housing at all income levels, helping to make the town more accessible and diverse.

Density Allows for Affordability

While multifamily housing may result in an increase in density from a site's previous use, this density is often the key to providing more housing choice at greater levels of affordability. The town's increase in housing costs is directly connected to the overwhelming proportion of single-family zoning across Needham, as is true in many other suburban communities. The replacement of smaller single-family homes with larger homes drives up the average home price at a rate that far exceeds the economic capacity of potential buyers. It is this trend, coupled with low rates of production of new affordable rental and ownership units, that has led Needham and most of the Boston region to be completely out of reach for so many lower income individuals and families. This economic bifurcation has only helped to perpetuate the racial segregation that has plagued our region, and country, for so long. Allowing higher levels of housing density in appropriate areas is a clear way to alleviate this trend.

Concerns about Schools and Traffic

Discussions about affordable and multifamily housing often include concerns about the impact of more school-age children on our schools and the increase in traffic generated by a site's development potential. While we agree that the impacts on schools and traffic should be addressed during the development review process, along with other stakeholder concerns, we do not believe these issues are impossible to mitigate. Thoughtful mitigations to these concerns are often presented during the review process, resulting in not only a stronger project, but also positive solutions to the issues raised. Neither of EJN's amendments change the process by which developers seek approval from the town for their project and address citizen concerns along the way.

Potential to Address Historic Inequity

Historically, suburban single-family zoning has led to a lack of racial and economic diversity in Needham and the surrounding suburbs. One of Needham's values is being welcoming to all, but our current zoning policy limits us from fulfilling this goal. By thoughtfully reforming our current zoning and affordable housing policies, we can reverse this trend and implement solutions so Needham does not become increasingly less affordable with diminishing economic and racial diversity. This is an opportunity to shift town consciousness to racial equity, and we urge you to focus on this critical issue. Equal Justice in Needham believes these two amendments present an opportunity to live up to the higher standard of being a regional trailblazer in affordable housing and addressing the crises of housing and equity. It is very fitting that April is Fair Housing Month, when we recommit ourselves to the goal of eliminating racial segregation and ending housing discrimination. We hope you will support these amendments with these larger and very important goals in mind.

Benefits of the amendments

- Allow for as many affordable units as possible.
- Meet the needs of individuals and families with incomes lower than 80% AMI.
- Signal to developers that we are a town that is open to as much affordable housing as possible.
- Make progress toward addressing the larger housing crisis in the region and in our town.
- Stem the tide of rising home values that shrink the economic and racial diversity of those who can afford to live in Needham, and that force other residents to leave.
- Take advantage of our well-equipped and capable school system to accommodate and welcome children from more racially and economically diverse households.
- Open up the narrative to the whole town that racial justice and housing reform are a priority.
- Use the opportunity of MUZI to begin a larger shift in town consciousness towards racial and housing equity.

EQUAL JUSTICE NEEDHAM – HOUSING GROUP

PROPOSED AMENDMENT TO MOTION UNDER ARTICLE 5 TO AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT (to change regulation for Affordable Housing Units)

[Name of Town Meeting Member] I move to amend the motion under Article 5 Amend Zoning By-law – Highway Commercial 1 Zoning District, Item 8 Amend Section 6.12, Affordable Housing, by rewording the fourth sentence of the proposed revision of the first paragraph of Section 6.12 to read as follows: "The requirements detailed in paragraphs (a), (d), (e), (f), (g), (h) and (j) below shall apply to a development that includes affordable units in the Highway Commercial 1 District" and by adding to Section 6.12 new subsection (j) as follows:

"(i) In a homeownership project, the affordable unit(s) must be made available to households with annual gross incomes at or below 80% of the area median income (AMI). These units must be priced for affordability to households having annual gross incomes of not more than 70% of AMI at the time of marketing. The monthly housing costs, inclusive of mortgage principal and interest, private mortgage insurance, property taxes, condominium and/or homeowner's association fees, hazard insurance, and parking must not exceed 30% of the 70% AMI limit for that unit.

(ii) In a rental project, the affordable units must be made available to households with annual gross incomes at or below 80% of the area median income (AMI), such that the AMI used for establishing rent and income limits for all the affordable units must average no more than 65% of AMI. Alternatively, at least 50% of such units may have income limits at 50% of AMI and the remaining affordable units may have income limits at 80% AMI.

(iii) Affordable rental units are to be priced to be affordable to a household having a gross annual income at the household income limit for that affordable unit. Monthly housing costs, inclusive of rent, utility costs for heat, water, hot water, and electricity, parking, and including access to all amenities that are offered to tenants in the building, must not exceed 30% of the applicable household income limit for the affordable unit. If the utilities are separately metered, they may be paid by the tenant and the maximum allowable rent will be reduced to reflect the tenant's payment of utilities, based on the area's utility allowance for the specific unit size and type, to be secured from the Needham Housing Authority. For a household with a Section 8 voucher, the rent and income are to be established by the Needham Housing Authority with the approval of HUD."

[Name of Town Meeting Member] I second that motion.

EQUAL JUSTICE NEEDHAM – HOUSING GROUP

PROPOSED AMENDMENT TO MOTION UNDER ARTICLE 5 TO AMEND ZONING BY-LAW – HIGHWAY COMMERCIAL 1 ZONING DISTRICT (to delete 240-unit housing cap)

[Name of Town Meeting Member] I move to amend the motion under Article 5 Amend Zoning By-law – Highway Commercial 1 Zoning District by deleting subsection (2) of Section 3.2.7.2 (m) under Item 2, which subsection (2) provides that no more than 240 dwelling units shall be permitted in the Highway Commercial 1 District, and by renumbering the subsequent subsections from (3) and (4) to (2) and (3).

[Name of Town Meeting Member] I second that motion.

T O W N O F N E E D H A M
TOWN HALL
Needham, MA 02492-2669

TEL: (781) 455-7500

Office of the
SELECT BOARD

FAX: (781) 449-4569

TO:	Boards, Committees, Commissions
FROM:	Select Board
CC:	Kate Fitzpatrick Town Manager, Katie King, Assistant Town Manager/Director of Operations, David Davison, Assistant Town Manger/Director of Finance, Department and Division Managers
DATE:	April 1, 2021
RE:	A Racial Equity Statement for the Town of Needham

In July 2020, the Select Board began the Needham Unite Against Racism Initiative to foster a dialogue about racism in Needham, and to produce actionable strategies to ensure that Needham is a welcoming and inclusive community.

During the past six months, the NUARI Working Group has developed a Racial Equity Statement for the Town of Needham, along with Guiding Principles and a set of Intentional Practices to help Needham realize the vision for racial equity.

The Select Board has voted to adopt these recommendations and will seek approval of NUARI's work in a non-binding resolution at Town Meeting this Spring.

The Select Board asks that your Board, Committee or Commission consider adopting the vision and principles, and integrating these concepts in your work plans, programs, and goals. We are interested in your perspectives and input going forward and would appreciate your letting us know what approaches and actions you plan to take.

The Select Board expects to host periodic summits to assess progress in this work and asks for the help of all the Town's elected and appointed policy makers. It is important that we work together to identify barriers to racial equity, and solutions, opportunities, and resources, to overcome them.

The support of all Boards, Committees, and Commissions, and that of the broader community, is required to assure that the Town of Needham is a welcoming and inclusive place.

NUARI Vision Statement, Guiding Principles, and Intentional Practices
Created & Approved by the NUARI Working Group, March 22, 2021
Adopted by the Needham Select Board, March 23, 2021

A RACIAL EQUITY STATEMENT FOR THE TOWN OF NEEDHAM…

Needham will be a community free of racism, racial bias, prejudice and discrimination. Our residents, schools, businesses, organizations and government will work together to identify barriers to racial equity and create solutions, opportunities, resources and support for removing them.

- We will work collaboratively and democratically toward a just, equitable, antiracist community.
- We will work to identify and change current policies, procedures, practices, and cultural norms in Needham that prevent meaningful access to opportunities because of race.
- We will create opportunities for the community to confront unpleasant truths and seek solutions that always amplify values of racial equity.
- We will intentionally create spaces for respectful dialogue and difficult conversations toward racial amity.
- We will actively engage with those who feel the impact of racism most directly, seeking their input, guidance, and honoring the wisdom of their experience.
- We will commit as individuals to be intentional in our efforts to learn and practice anti-bias and antiracism, transforming our thinking, attitudes and behaviors.

NUARI Vision Statement, Guiding Principles, and Intentional Practices
Created & Approved by the NUARI Working Group, March 22, 2021
Adopted by the Needham Select Board, March 23, 2021

GUIDING PRINCIPLES…

1. Racial equity in Needham means that the experiences of people of color are the same as those of the white majority – from day to day interactions, housing opportunities, interactions with the police and other first responders, employment, and educational opportunities, etc. On the path to racial equity…
    a. People of color will see others of color in leadership roles in government, business, the school system, and civic groups.
    b. Our community will have opportunities to learn a more complete version of American history and its relevance to today's challenges.
    c. Students in schools will experience equity with regard to all aspects of their education (e.g. placement. acknowledgement, recognition, engagement, discipline, curriculum and co-curricular involvement).
    d. People of color will feel safe, validated and treated equitably with respect to public safety (e.g. arrests, use of force, motor vehicle stops, traffic infractions, handcuffing, and criminal applications).
    e. People of color will feel safe, validated, included and treated equitably in all Town-related activities (e.g. town meeting/government, services and events).
    f. In the decision making process, the voices and experiences of people of color will be honored and respected as valid (e.g. equity in hiring, engagement and promotion, programs and events are inclusive and equity minded, intentional anti-bias efforts are employed in all considerations).
    g. All races will want to live here – Needham will be a desirable community for everyone. The town will take proactive measures to support a more racially and economically diverse and inclusive population (e.g. housing access, mixed income and diversity of housing stock).

2. A healthy and equitable community recognizes the harm created by implicit bias, intolerance and racism and strives to embrace diversity and inclusion by using a racial equity lens to promote anti-racist behaviors and attitudes in all aspects of civic and inter-personal living.

3. We value lifelong/ongoing self and group learning and critical social analysis to acknowledge and to further understand the dominance of white culture and privilege throughout US history, and the importance of disrupting racial structures that perpetuate it.

4. Becoming anti-racist means that we must tackle our own implicit bias, intolerance and discriminatory lenses - thus, bringing about restorative justice, healing and reconciliation to truly bring together the community we live in.

5. All members of the community commit to engaging with good will and respect in order to repair and build healthy relationships.

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SUPPORTING THE FOLLOWING INTENTIONAL PRACTICES WILL HELP NEEDHAM REALIZE THE VISION FOR RACIAL EQUITY…

- Seek to increase interactions and create/cultivate friendships across and among the various groups
- Commit to self-education to have a better understanding of and be more informed about race, racism, racial equity, race amity, and race relations.
- Foster safe environments for, and listen to residents who are, directly affected by racism and racial inequities.
- Engage in meaningful and productive conversations on racial issues with town/community members.
- Support those services, materials, expertise, scholarships, and organizations that advocate for racial equity.
- Stand up, speak out, and act against racism and racial injustice.
- Encourage vision, transformation and advocacy anchored in democratic action.
- Encourage and build public understanding of the need to eliminate racial injustice.

NEEDHAM PLANNING BOARD
2021 MEETING SCHEDULE

MEETING DATE	LOCATION
April 20, 2021 (school vacation week)	VIA ZOOM
No May 3, 2021 Due to ATM	
May 18, 2021	VIA ZOOM
June 1, 2021	VIA ZOOM
June 15, 2021	VIA ZOOM
July 2021 - TBD	VIA ZOOM
August 2021 - TBD	VIA ZOOM
Wednesday, September 8, 2021 (Mon. 9/6 Labor Day & Tues. 9/7, 2nd day Rosh Hashanah)	VIA ZOOM
September 21, 2021 (no alex)	VIA ZOOM
October 5, 2021	VIA ZOOM
October 19, 2021	VIA ZOOM
November 2, 2021	VIA ZOOM
November 16, 2021	VIA ZOOM
December 7, 2021	VIA ZOOM
December 21, 2021	VIA ZOOM

All Planning Board meetings begin at 7:15 p.m. unless otherwise noted.

Updated April 2021

TOWN OF DEDHAM
COMMONWEALTH OF MASSACHUSETTS

PLANNING BOARD
John R. Bethoney, Chair
Michael A. Podolski, Esq., Vice Chair
James E. O'Brien IV, Clerk
Jessica L. Porter
James F. McGrail, Esq.
Andrew Pepoli, Associate

Dedham Town Hall
450 Washington Street
Dedham, MA 02026
Phone: 781-751-9240

Jeremy Rosenberger
Planning Director

PLANNING BOARD

FYI

NOTICE OF PUBLIC HEARING
80 BRIDGE STREET, DEDHAM, MA

Notice is hereby given that the Town of Dedham Planning Board will hold a public hearing pursuant to M.G.L. 40A, Section 11, on Thursday, April 29, 2021, at 8:00 p.m., on the application of Petruzziello Properties, LLC, 21 Eastbrook Road, Dedham, MA, requesting a Special Permit for a Mixed Use Development Project, Special Permit for work within a Flood Plain Overlay District, Major Site Plan Review, and any associated waivers to construct a four (4) story, 41 dwelling unit Mixed Use Development and 66 off-street parking spaces. The subject property is located at 80 Bridge Street, Dedham MA, Assessors Map/Lot 14-54, and is located within General Business (GB) and Local Business (LB) Zoning Districts and Flood Plain Overlay District (FPOD). *Dedham Zoning By-Law Section 3.1, 4.1, 4.2, 5.1, 5.2, 7.4, 8.1, 9.2, 9.3, 9.5, Table 1, Table 2 and Table 3*

Pursuant to Governor Baker's March 12,2020 Order Suspending Certain Provisions of the Open Meeting Law, G.L. c. 30A, §18, and the Governor's March 15, 2020 Order imposing strict limitations on the number of people that may gather in one place, this hearing will be conducted via remote participation. To attend and participate in this public hearing via computer/tablet/smartphone, visit www.zoom.com, click Join a Meeting, and enter Webinar ID: 936 9581 5911

To participate via telephone, dial 1-646-558-8656 and enter the following Meeting ID: 936 9581 5911. If you are unable to participate by those means, but would like to comment or have questions, or would like to request plans, please email jdoherty@dedham-ma.gov or call 781-751-9240. Applications and plans are available to review via Dropbox: https://bit.ly/80BridgeStreet