

NEEDHAM PLANNING BOARD

Tuesday, February 16, 2021

7:00 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**

1. Zoning Articles for May 2021 Annual Town Meeting, Review and Vote to Transmit for Hearing: Highway Commercial 1.
2. Decision: 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, Needham, Massachusetts). Regarding request to build new residential building with 8 units (see legal notice for more info).
3. Public Hearing:

7:30 p.m. Amendment to Major Project Site Plan Special Permit No. 1991-3: North Hill Needham, Inc. (formerly known as Living Care Villages of Massachusetts, Inc.), 865 Central Avenue, Needham, MA 02492, Petitioner (Property located at 865 Central Avenue, Needham, MA 02492). *Regarding: proposal to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane.*
4. De Minimus Change: Heather Lane Definitive Subdivision: William John Piersiak, William John Piersiak, Trustee of the 768B Chestnut Street Realty Trust, Evelyn Soule Maloomian, and Koby Kemple, Manager of the 766 Chestnut LLC, Petitioners, (Property located at 764, 766, 768-768A, and 768B Chestnut Street, Needham, Norfolk County, Massachusetts).
5. De Minimus Change: Heather Lane Extension Definitive Subdivision and Residential Compound: William John Piersiak, Petitioner, (Property located at 768-768A Chestnut Street, Needham, Norfolk County, Massachusetts).
6. Board of Appeals – February 18, 2021.
7. Minutes.
8. Correspondence.
9. Report from Planning Director and Board members.

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

Zoning articles
Drafts Feb 12, 2021

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:

“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 a grocery stores) or combination of retail establishments serving the general public where each establishment contains less than 10,000 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, 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 10,000 but less than 25,000 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 25,000 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(h) hereof.

(k) Group Practices as defined in Section 3.2.7.1 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% of all dwelling units shall be Affordable Units as defined 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, 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

<u>Minimum Lot Area (Sq. Ft.)</u>	<u>Minimum Lot Frontage (Ft.)</u>	<u>Front Setback (Ft.)</u>	<u>Side Setback (Ft.)</u>	<u>Rear Setback (Ft.)</u>	<u>Maximum Height (Ft.)</u>	<u>Maximum Stories</u>	<u>Maximum Lot Coverage</u>	<u>Floor Area Ratio</u>
		(1)	(1) (3)	(1) (3)	(1)	(1)	(2) (4)	(5) (6)
<u>20,000</u>	<u>100</u>	<u>5</u>	<u>10</u>	<u>10</u>	<u>56</u>	<u>4</u>	<u>65%</u>	<u>1.00</u>

<u>Minimum Lot Area (Sq. Ft.)</u>	<u>Minimum Lot Frontage (Ft.)</u>	<u>Front Setback (Ft.)</u>	<u>Side Setbacks (Ft.)</u>	<u>Rear Setback (Ft.)</u>	<u>Maximum Height (Ft.)</u>	<u>Maximum Lot Coverage</u>	<u>Floor Area Ratio</u>
		(1)	(1) (3)	(1) (3)	(1)	(2) (4)	(5) (6)
<u>20,000</u>	<u>100</u>	<u>5</u>	<u>10</u>	<u>10</u>	<u>70</u>	<u>65%</u>	<u>1.00</u>

- (1) ~~(1)~~ All buildings shall be limited to a height of ~~56~~70 feet and four stories, except that buildings within ~~200~~50 feet of Highland Avenue or the extension of the right-of-way line as described below 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.

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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 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 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: 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 or within 200 feet of Gould Street. 42 feet unless 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 but not to exceed 48 feet in height. Notwithstanding the

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~~foregoing, the Planning Board may allow by special permit a maximum height of up to 84 feet except within 150 feet of Highland Avenue and 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.

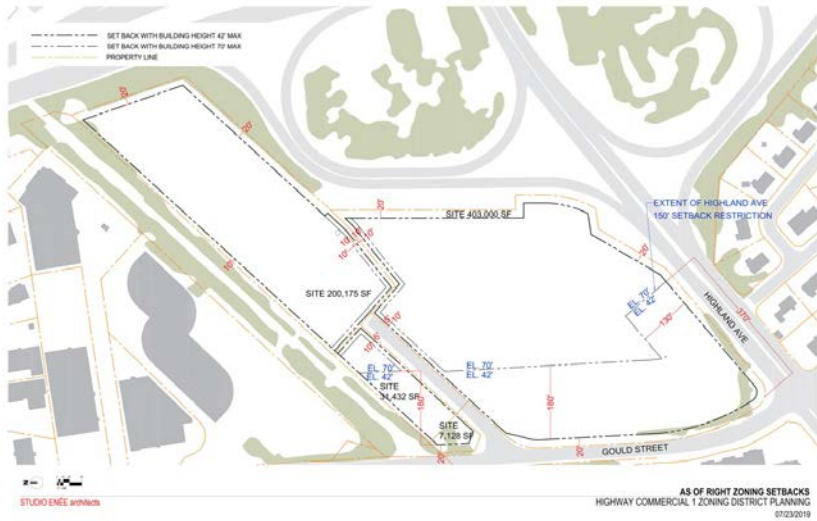
Buildings and structures abutting Highland Avenue, Gould Street and/or the layout of Route 128/95 shall be set back at least 20 feet from said streets and said layout. Notwithstanding the location of any building and structures, a 20 foot landscaped, vegetative buffer area shall be required along the 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.

Structures erected on a building ~~having a height of 72 feet or less~~ 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.

For purposes of clarity, the required building setbacks and allowed envelopes (including setbacks) for allowance of additional height above ~~35'42' for the as-of right circumstance and 42'/48' for the special permit circumstance~~ are shown on the drawings below. The ~~700 feet, being an extension of the existing property line measuring 361.46 feet shown on the drawings below shall extend a distance of 700 feet measured from the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and extending to a point 700 feet easterly at the same bearing 370 feet shown on the drawings below shall extend a distance of 370 feet measured along the centerline of Highland Avenue from a point opposite the midpoint rounding at the intersection of Highland Avenue and Gould Street to a point 370 feet easterly~~ as shown on 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.

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Figure 1:



AS OF RIGHT ZONING

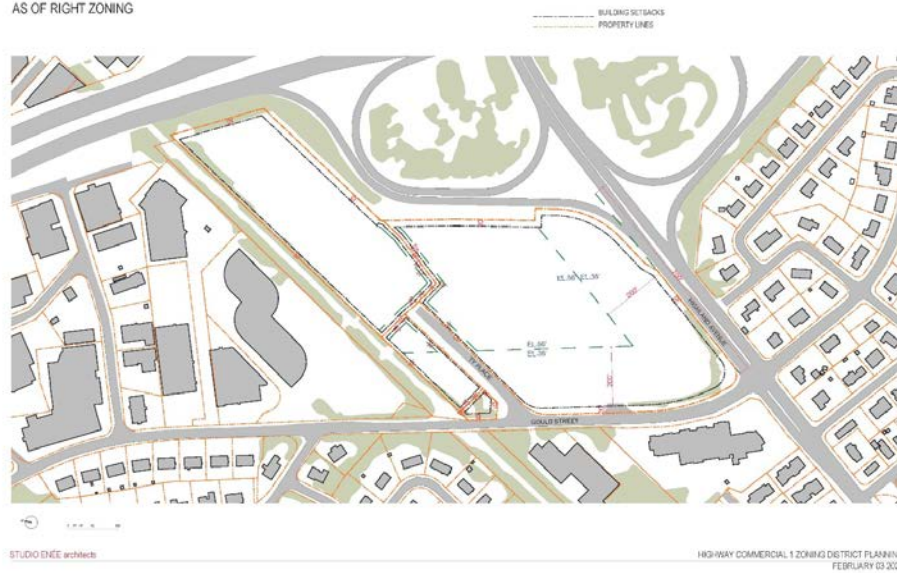
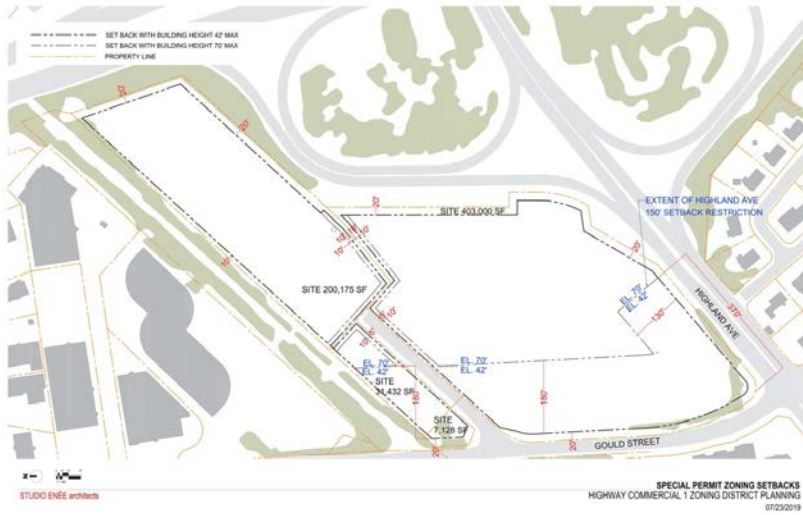
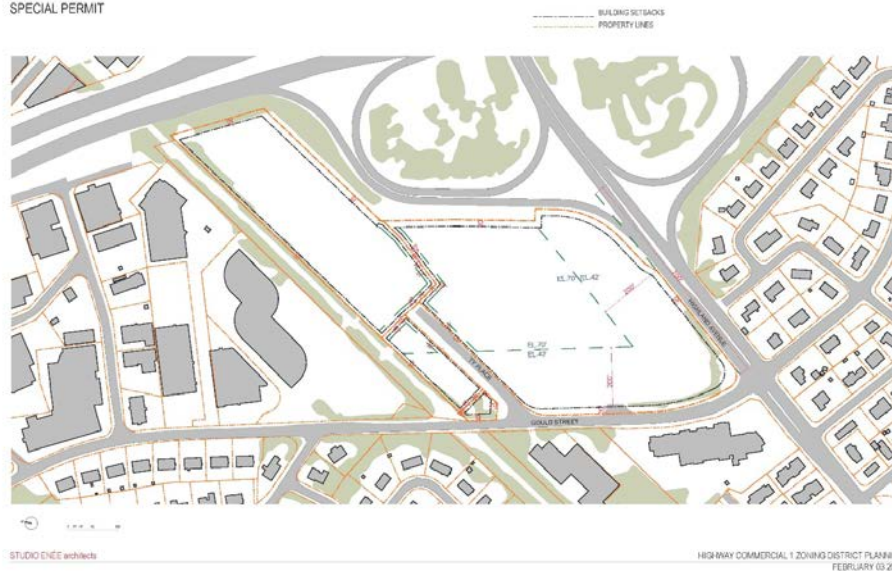


Figure 2:



SPECIAL PERMIT



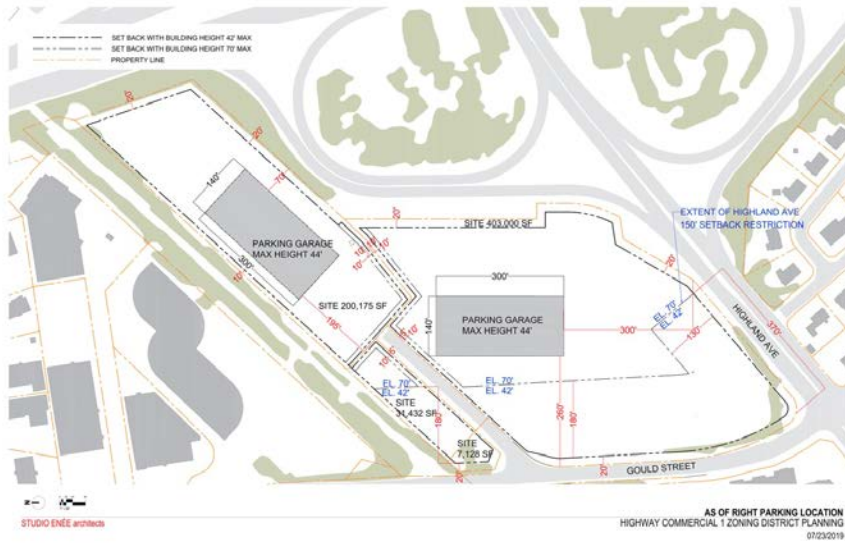
- (2) Maximum lot coverage shall be 65% for all projects. However, if a project is designed such that at least 65% of the required landscaped area immediately abuts at least 65% of the required landscaped area of an adjoining project for a distance of at least 50 feet, the maximum lot coverage may be 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 ~~32~~30% 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 ~~1.37~~1.5 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.

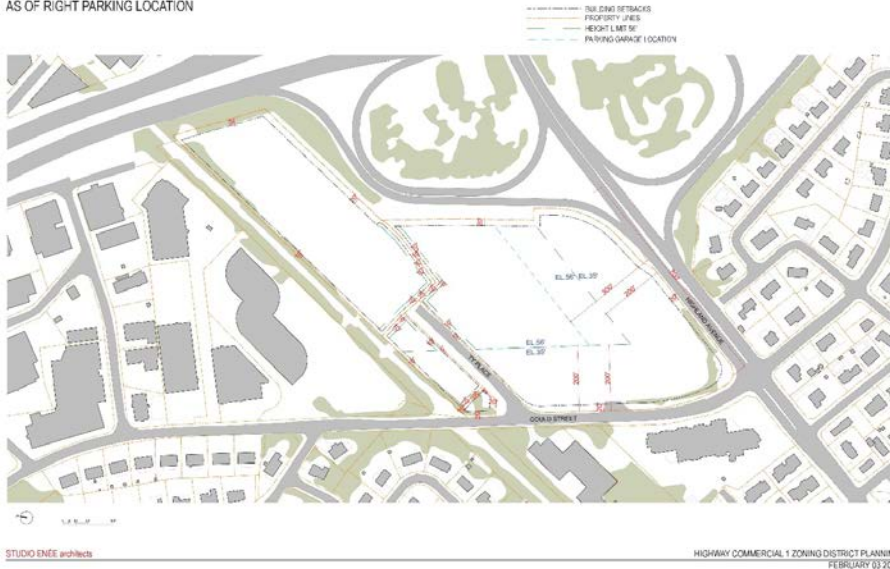
4.11.2 Supplemental Dimensional Regulations

- (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 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.
- (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 the parameters, bulk, and location requirements without the issuance of special permit by the Planning Board as shown on the following drawing.

Figure 3



AS OF RIGHT PARKING LOCATION



The location may, however, be modified as of right if the parking garage is moved easterly or northeasterly towards Route 128/95.

- (6) 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.

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 relaxing 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 320 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 15' 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 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; and (fe) 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 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."

5.—

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~~6-7.~~ 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,”.

~~7-8.~~ 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,”.

~~8-9.~~ 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,”.

Or take any other action relative thereto.

INSERTED BY: Planning Board
FINANCE COMMITTEE RECOMMENDS THAT:

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(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:

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4.11.1 Highway Commercial 1

Minimum Lot Area (Sq. Ft.)	Minimum Lot Frontage (Ft.)	Front Setback (Ft.)	Side Setback (Ft.)	Rear Setback (Ft.)	Maximum Height (Ft.)	Maximum Stories	Maximum Lot Coverage	Floor Area Ratio
		(1)	(1) (3)	(1) (3)	(1)	(1)	(2) (4)	(5) (6)
20,000	100	5	10	10	56	4	65%	1.00

- (1) 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 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.

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 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 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: 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 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.

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.

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.

For purposes of clarity, the required building setbacks and allowed envelopes (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 the drawings below. The 700 feet, being an extension of the existing property line measuring 361.46 feet shown on the drawings below shall extend a distance of 700 feet measured from the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and extending to a point 700 feet easterly at the same bearing as shown on 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.

Figure 1:

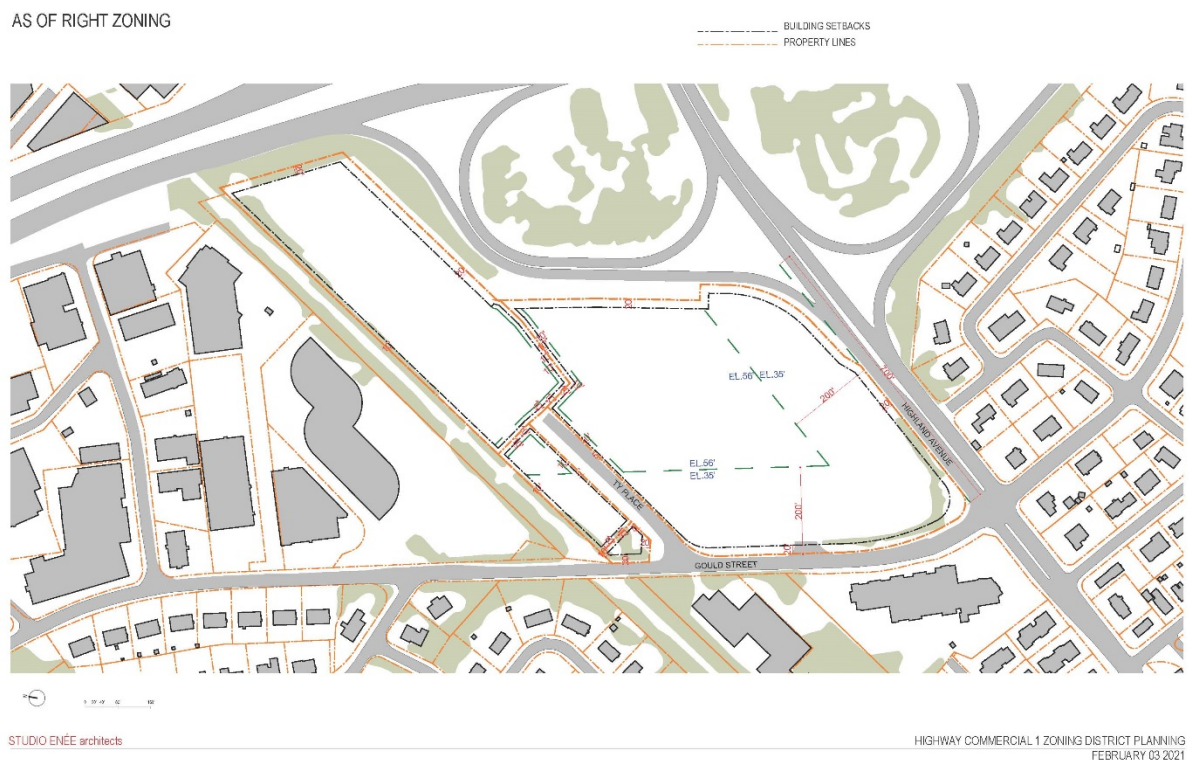
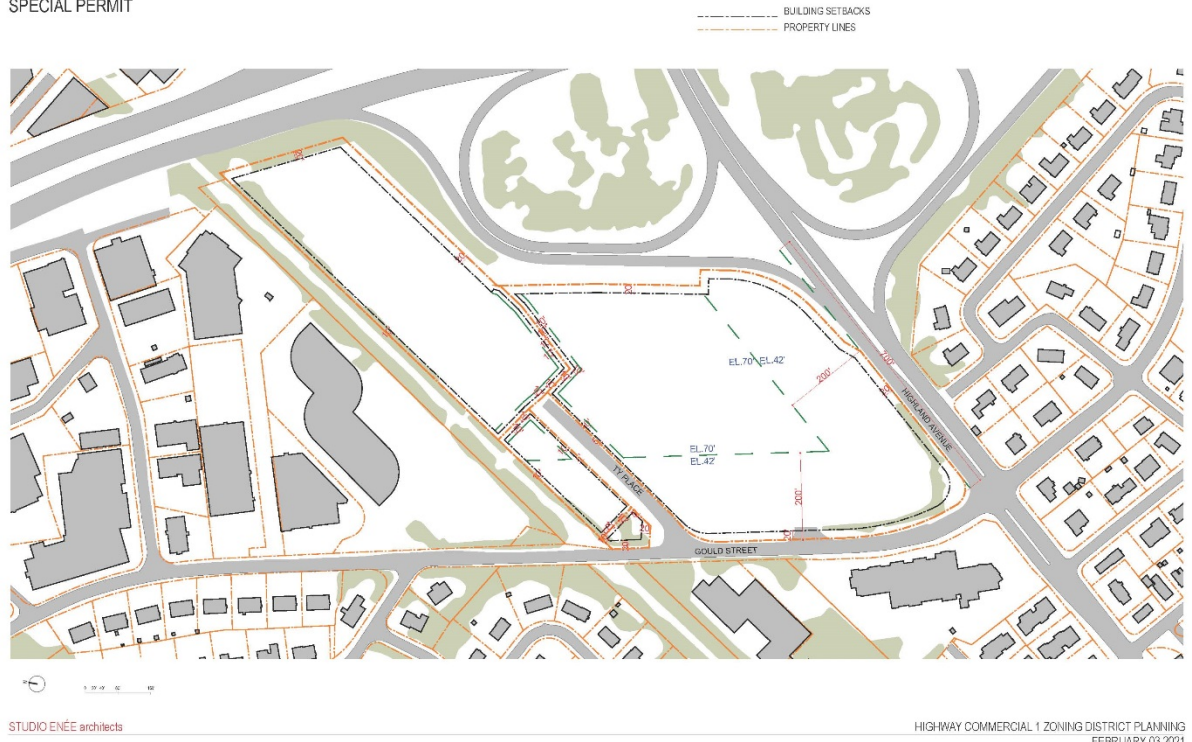


Figure 2:



- (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 30% 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.

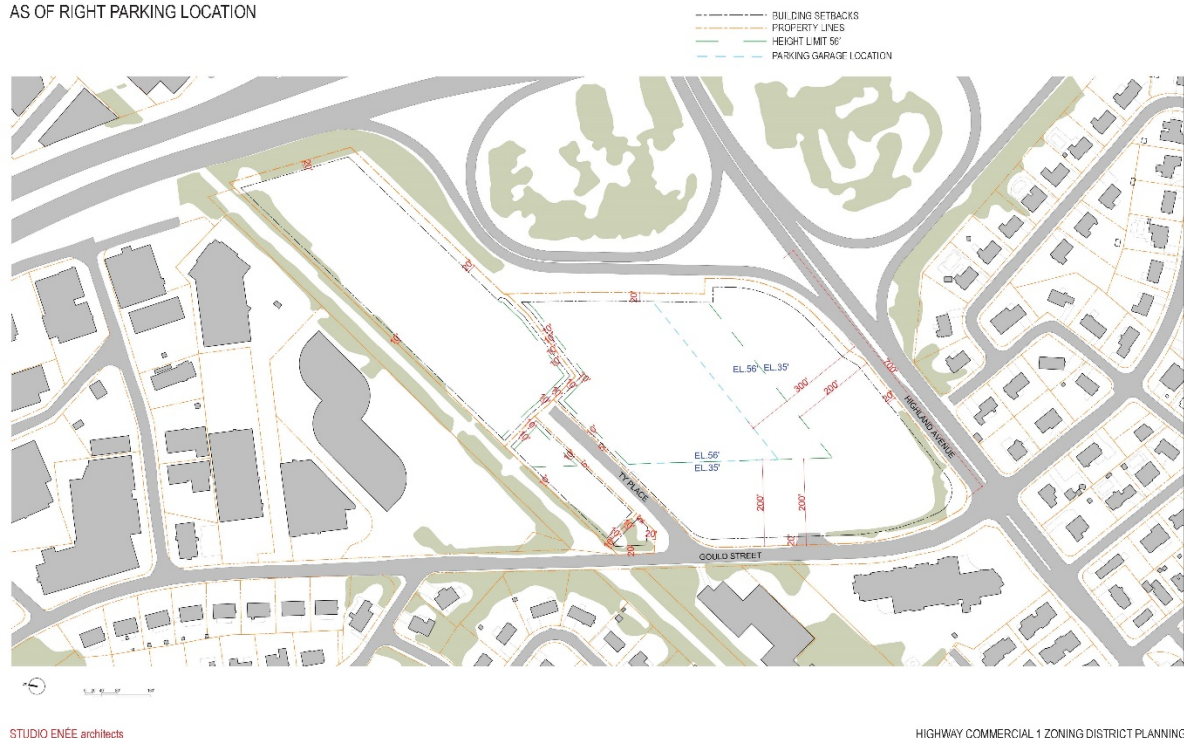
- (6) The calculation of floor area in determining floor area ratio shall not include parking areas or structures.

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.
- (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 the parameters, bulk, and location requirements without the issuance of special permit by the Planning Board as shown on the following drawing.

Figure 3

AS OF RIGHT PARKING LOCATION



The location may, however, be modified as of right if the parking garage is moved easterly or northeasterly towards Route 128/95.

- (6) 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.

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 relaxing 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 30 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 15' 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 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; 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 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."

7. 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,”.
8. 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,”.
9. 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,”.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

ARTICLE 2: 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 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 TV 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. 18430I; thence continuing N10°49'50"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 S4°25'46"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 S13°34'58"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°26'41"E a distance of 35.56 feet to a point; thence turning and running S13°34'58"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 S42°43'47"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 361.46 feet to the point of beginning.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

Article Information: Article 2 describes the geographical area proposed to be placed in the new Highway Commercial 1 zoning district. The affected area is generally bounded on the north by the Massachusetts Bay Transit Authority (M.B.T.A.) commuter railroad right-of-way, on the east by the Circumferential Highway, known as Route 128/95, on the south by Highland Avenue and on the west by Gould Street. The subject land is currently located in the Industrial-1 zoning district.

Zoning articles
Drafts Feb 16, 2021

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:

“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 a-grocery stores) or combination of retail establishments serving the general public where each establishment contains less than 10,000 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, 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 10,000 but less than 25,000 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 25,000 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(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% of all dwelling units shall be Affordable Units as defined 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, 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.)	Side Setback (Ft.)	Rear Setback (Ft.)	Maximum Height (Ft.)	Maximum Stories	Maximum Lot Coverage	Floor Area Ratio
		(1)	(1) (3)	(1) (3)	(1)	(1)	(2) (4)	(5) (6)
20,000	100	5	10	10	56	4	65%	1.00

- (1) All buildings shall be limited to a height of 56 feet and four stories, except that buildings within 3200 feet of Highland Avenue or the extension of the right-of-way line as described below 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.

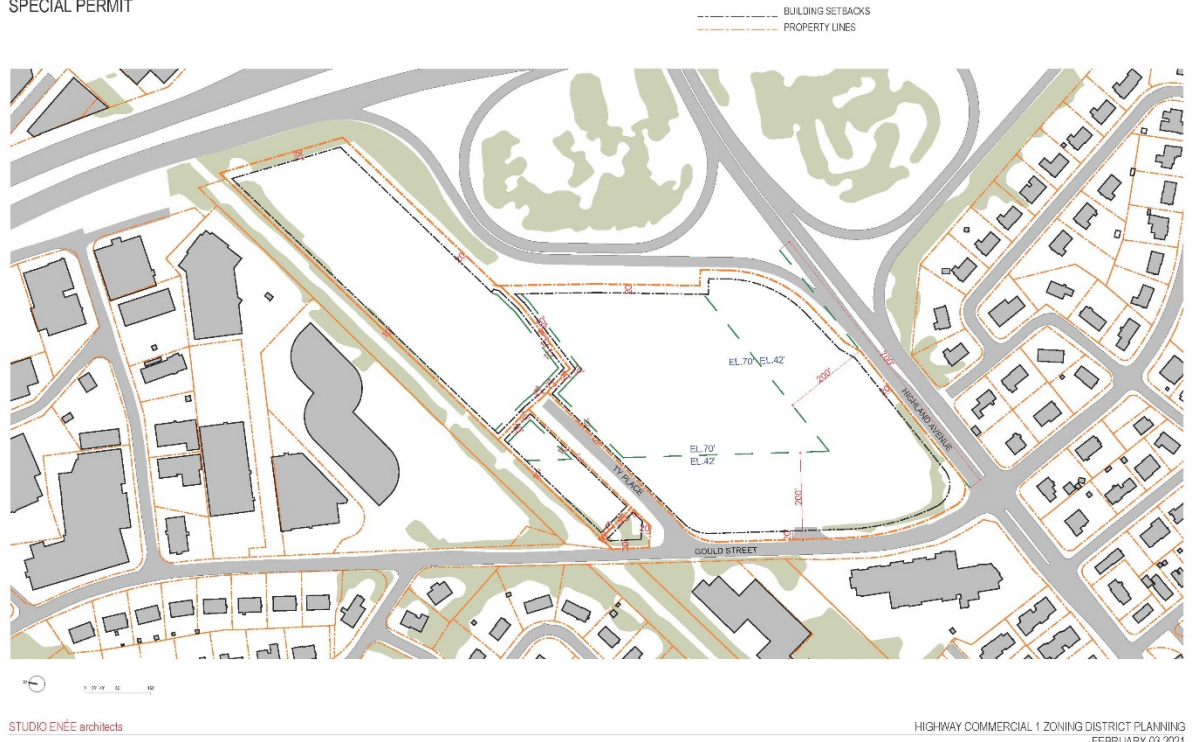
By Special Permit from the Planning Board, the maximum height of a building may be increased to the following limits within 3200 feet of Highland Avenue or the extension of the right-of-way line as described below and within 200 feet of Gould Street: 3 stories and 42 feet or 3 stories and 48 feet, provided the additional height is contained under a pitched roof or 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: 5 stories and 70 feet provided the building is not located within 3200 feet of Highland Avenue or the extension of the right-of-way line as described below 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.

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.

~~For purposes of clarity, the required building setbacks and allowed envelopes (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 the drawings below~~_. The 700 feet, being an extension of the existing property line measuring 361.46 feet shown on the drawings below shall extend a distance of 700 feet measured from the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and extending to a point 700 feet easterly at the same bearing S63°56'51"W -as shown on 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.

Figure 1:





- (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 30% 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.

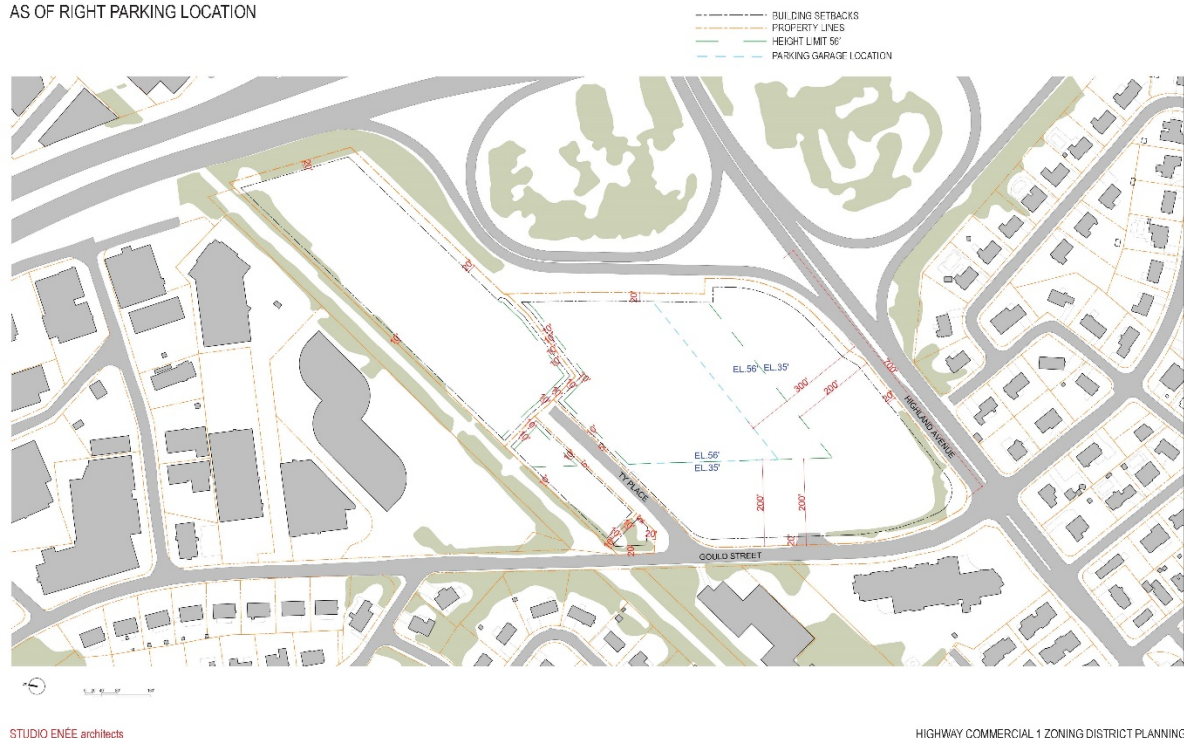
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4.11.2 Supplemental Dimensional Regulations

- (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.
- (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 the parameters, bulk, and location requirements without the issuance of special permit by the Planning Board as shown on the following drawing.

Figure 3

AS OF RIGHT PARKING LOCATION



STUDIO ENEE architects

HIGHWAY COMMERCIAL 1 ZONING DISTRICT PLANNING
FEBRUARY 03 2021

The location may, however, be modified as of right if the parking garage is moved easterly or northeasterly towards Route 128/95.

- (6) 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.

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 relaxing 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 30% 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 15' 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 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; 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 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."~~

~~7.6.~~ 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,”.

~~8.7.~~ 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,”.

~~9.8.~~ Amend Section 7.7.2.2, Authority and Specific Powers (of Design Review Board) by adding after the words “Industrial-1 District,” in the first sentence of the second paragraph, the words “Highway Commercial 1 District,”.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

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:

“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 10,000 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, 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 10,000 but less than 25,000 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 25,000 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(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.”

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.)	Side Setback (Ft.)	Rear Setback (Ft.)	Maximum Height (Ft.)	Maximum Stories	Maximum Lot Coverage	Floor Area Ratio
		(1)	(1) (3)	(1) (3)	(1)	(1)	(2) (4)	(5) (6)
20,000	100	5	10	10	56	4	65%	1.00

- (1) All buildings shall be limited to a height of 56 feet and four stories, except that buildings within 300 feet of Highland Avenue or the extension of the right-of-way line as described below 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.

By Special Permit from the Planning Board, the maximum height of a building may be increased to the following limits within 300 feet of Highland Avenue or the extension of the right-of-way line as described below 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 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: 5 stories and 70 feet provided the building is not located within 300 feet of Highland Avenue or the extension of the right-of-way line as described below 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.

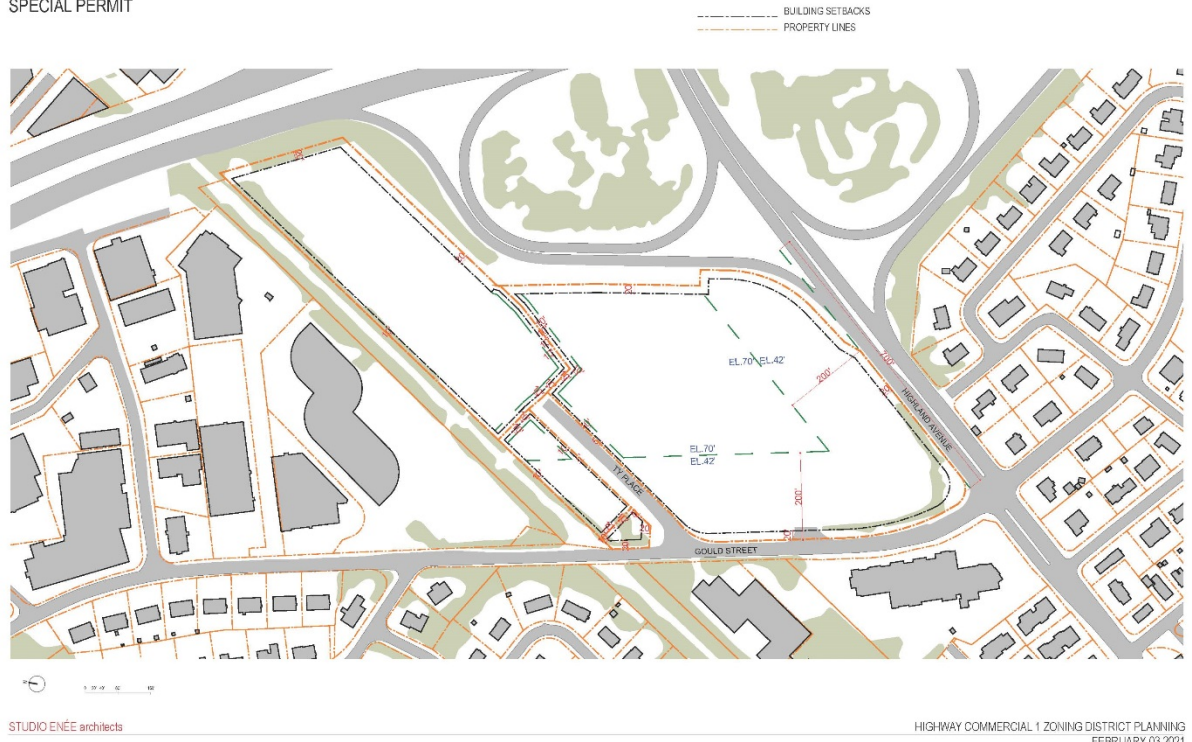
Buildings and structures abutting Highland Avenue, Gould Street and/or the layout of Route 128/95 shall be set back at least 20 feet from said streets and said layout. Notwithstanding the location of any building and structures, a 20 foot landscaped, vegetative buffer area shall be required along the 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.

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

The 700 feet, being an extension of the existing property line measuring 361.46 feet shown on the drawings below shall extend a distance of 700 feet measured from the point of curvature on Highland Avenue at Gould Street marked by a stone bound/drill hole (SB/DH) and extending to a point 700 feet easterly at the same bearing S63°56'51"W as shown on 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.

Figure 1:





- (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 30% 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.

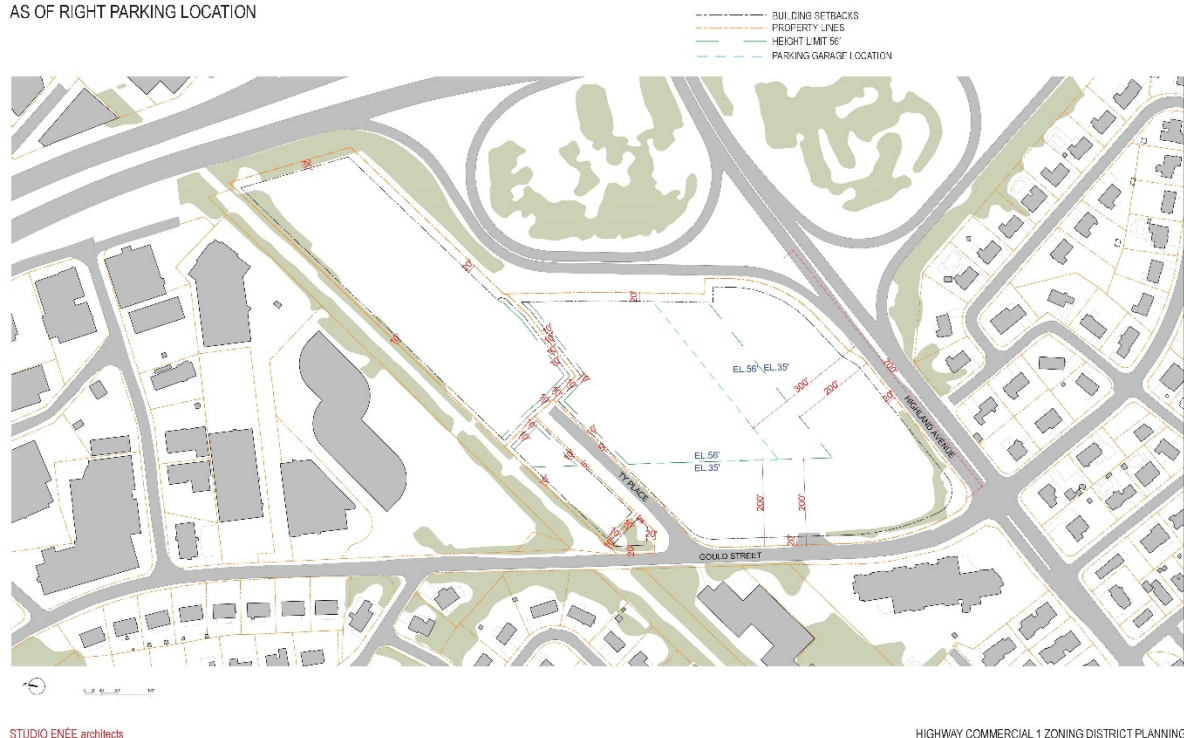
- (6) The calculation of floor area in determining floor area ratio shall not include parking areas or structures.

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.
- (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 the parameters, bulk, and location requirements without the issuance of special permit by the Planning Board as shown on the following drawing.

Figure 3

AS OF RIGHT PARKING LOCATION



The location may, however, be modified as of right if the parking garage is moved easterly or northeasterly towards Route 128/95.

- (6) 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.

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 relaxing 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 30% 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 15' 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 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; 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 7.7.2.2, 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,".

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

**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 4.3, (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% 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 (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.”

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

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 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 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 TV 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. 18430I; thence continuing N10°49'50"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 S4°25'46"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 S13°34'58"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°26'41"E a distance of 35.56 feet to a point; thence turning and running S13°34'58"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 S42°43'47"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 361.46 feet to the point of beginning.

Or take any other action relative thereto.

INSERTED BY: Planning Board

FINANCE COMMITTEE RECOMMENDS THAT:

Article Information: Article 3 describes the geographical area proposed to be placed in the new Highway Commercial 1 zoning district. The affected area is generally bounded on the north by the Massachusetts Bay Transit Authority (M.B.T.A.) commuter railroad right-of-way, on the east by the Circumferential Highway, known as Route 128/95, on the south by Highland Avenue and on the west by Gould Street. The subject land is currently located in the Industrial-1 zoning district.

Tentative Schedule for Highway Commercial-1 May Annual Town Meeting

Friday January 8, 2021 – Drawings from Natasha

Thursday January 14, 2021 – special Planning Board meeting to discuss drawings received

Thursday January 14, 2021 – send notice of Community Meeting to newspaper to run Jan 21 and 28

Week of January 18, 2021 - send out community meeting invitation (2 weeks in advance of mtg). To include email invitation to Town Meeting Members and direct mailing to abutters.

Wednesday February 3, 2021 – Community Meeting

Tuesday February 16, 2021 – Planning Board to finalize language to include in legal notice

Vote to send language to Select Board

Friday February 19, 2021 – Send legal notice to the newspaper

Tuesday February 23, 2021 – Select Board refer back zoning article to Planning Board

Thursday February 25, 2021 – Post notice with Town Clerk, first run in newspaper

Thursday March 4, 2021 – second run in paper

Tuesday March 16, 2021 – Hearing date

Tuesday March 23, 2021 **extra meeting** – Discuss hearing and finalize language

From: noreply@civicplus.com
To: [Alexandra Cleg](#); [Lee Newman](#); [Elisa Litchman](#)
Subject: Online Form Submittal: Contact Planning Board
Date: Wednesday, February 3, 2021 8:46:44 PM

The following form was submitted via your website: Contact Planning Board

Full Name:: Lisa Cherbuliez

Email Address:: Lisa.cherbuliez@gmail.com

Address:: 17 Lindbergh Ave

City/Town:: Needham

State:: MA

Zip Code:: 02494

Telephone Number:: 781-400-3608

Comments / Questions: Wonderful presentation and discussion about zoning and development of the Muzi Ford location. I am attending the zoom meeting but there was too many people to fit all questions. I write in support of this with 2 questions/comments. How do we factor in the likely long term impact of covid and likely sustained work from home (maybe decreased traffic?) And for the health of our residents, community and environment, I would like to see a strong focus on making this area walkable with sidewalks, green space, and buses into town (Needham) including train stop and across 128. Thanks for your consideration.

Additional Information:

Form submitted on: 2/3/2021 8:46:40 PM

Submitted from IP Address: 108.7.77.94

Referrer Page: <https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.needhamma.gov%2f1114%2fPlanning-Board&c=E.1.RtjTAfSSiO6iBgjRaaf7p6Jf2w-0L7PEET6MEwkJSofGOUgV5EAVD0nFRDgT3YreLDLkFIJ8ScXeB1BLKe7Tr5bJDo-yst8miCLbRdF8fFSYUvvt7OA7mY.&typo=1>

Form Address: https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fwww.needhamma.gov%2fForms.aspx%3fFID%3d229&c=E.1.865DzAIQSGB3P8GBw8ZBXCLw3x3BsA3g0auGDVxCv1Vsofr2mXMvCm3-_nPvZ_yosOhnW7CiD28TxsqMzsUz8QjQzMb5MfMIJjJK6cVdWdEb-psVXI.&typo=1

From: [Ganesh Rao](#)
To: [Planning](#)
Subject: Highway commercial 1 zoning
Date: Wednesday, February 3, 2021 8:47:50 PM

Hello,

I have a few questions from the zoning meeting this evening. If there is a FAQ, please point me to it.

1. What mechanisms do you have to control the types of businesses that would occupy the site? What's if the developer is renting out the space? I.e. can you or will you be able to prevent this from becoming a destination like Legacy Place?
2. Can you prevent a hazardous chemical or harmful pathogen lab from occupying the R & D space?
3. What is the impact of this development on neighboring commercially zoned sites? If they redeveloped "by right", how much could they grow and contribute to traffic?

Thank you,
Ganesh Rao
Elder Road

Sent from my iPhone

From: [Monty Krieger](#)
To: [Planning](#)
Subject: Regarding Highway commercial 1 zoning district planning - concern about traffic
Date: Wednesday, February 3, 2021 9:12:10 PM

Feb. 3, 2021

Dear Planning Board,
Rebecca Brown's approach in describing the influence of altered zoning on traffic generally sounded like she was spinning the results to minimize the consequences of development on traffic. That may not be the case, but it seemed such to me and undercuts the credibility of her conclusions.

I am very worried about the traffic issues, and unless more convincing analysis were presented, I would oppose the new regulations.

I also want to thank all of those on the planning board for your hard work for Needham and for your willingness to listen to Needham residents.

Best,

Monty Krieger
33 Woodbine Circle, Needham

From: [Leigh Doukas](#)
To: [Planning](#)
Subject: Proposed Zoning for Business 1/Muzi Site
Date: Wednesday, February 3, 2021 9:12:20 PM

Hi Lee:

Thank you for answering my question. I do think this proposal is much improved from the original. I would have 2 additional comments.

1 - The 1.0 FAR is large enough. The traffic predictions, even with significant developer improvements are not that good.

2 - Maybe there could be incentives under the special permit that would allow for the increased volume with the addition of green space/buffer zone.

My final comment is that the meeting seemed to be hijacked at the end by an organized group, who did not ask questions, or really comment on the proposal, but just wanted a platform for their group. They took up a lot of time from others who may have had questions. Perhaps there should be a time limit/number of questions people can ask.

Thank you.

Leigh

Leigh Rossi Doukas, ABR, CIAS
International President's Circle 2018, 2019
Hall of Fame 2016, 100% Club 2012 - 2017
Coldwell Banker Realty
1498 Highland Ave, Needham MA 02492

Your Needham/Metrowest Real Estate Expert
Cell: 617-966-1245
Website: www.LRDHOMES.com

Your referrals are much appreciated!

From: [Nathanson, Larry \(HMFP - Emerg Med ISClinical RaD\)](#)
To: [Planning](#)
Subject: Needham Heights Meeting 2/3
Date: Wednesday, February 3, 2021 9:30:19 PM

- 1) I'd like to thank Adam Block and the panelists for a very informative meeting.
- 2) A question was asked regarding overflow traffic impacting residential streets such as Noanett, Lee and Gary. I am also very concerned about this.
Adam's answer stated that a traffic study would be done as part of a developer's proposal and the town would peer review that developers study.
However if these proposed zoning changes are approved and a developer then chose to build-by right what recourse would the town have against a very negative traffic study?
I would therefore advocate for a much lower by-right density in the proposal.
I would like to hear more about this impact from the planning board,
- 3) I would support the multiple comments regarding the inclusion of green space and promotion of recreational and similar uses that directly benefit Needham residents as opposed to developers.
- 4) The meeting was very long and clearly tiring toward the end. However a number of excellent questions were asked in the last portion of the meeting without even an attempt at answering. I would like to see the planning board publicly answer those questions that were raised at the end.

Thank you,

Larry Nathanson
52 Noanett Rd

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From: [Nathanson, Larry \(HMFP - Emerg Med ISClinical RaD\)](#)
To: [Planning](#)
Subject: Fwd: Needham Heights Meeting 2/3
Date: Wednesday, February 3, 2021 9:37:52 PM

I would add that a quick review of the Traffic Impact study shows the existing/future scenarios portion of the document does not even show Noanett Rd (but does include an unnamed driveway with minimal traffic?!?!)

This definitely does not leave me with the impression that the impact on the surrounding neighborhood is being considered.

--L

Begin forwarded message:

From: Larry Nathanson <lnathans@bidmc.harvard.edu>
Subject: Needham Heights Meeting 2/3
Date: February 3, 2021 at 9:30:12 PM EST
To: planning@needhamma.gov

- 1) I'd like to thank Adam Block and the panelists for a very informative meeting.
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Larry Nathanson
52 Noanett Rd

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From: [Leigh Doukas](#)
To: [Planning](#); [adam block](#)
Subject: Re: Proposed Zoning for Business 1/Muzi Site
Date: Thursday, February 4, 2021 7:04:28 AM

Hi Alex:

I have some additional questions:

- 1 - If a developer decides to use the the by right 1.0 FAR, can the town compel them to do the traffic remediations, which look costly.
- 2 - What is the projected cost to the town in terms of services with a full build out at the 1.0 FAR and the 1.3 special permit FAR. Is the 1.5 million dollars in taxes based on a full build out using the special permit function,
- 3 - The traffic remediation where the developer does a taking of their own land - in this scenario would there still be a requirement for 20/25% green space on the lot, or would the taking then remove much of the green space.
- 4 - What is the current FAR at full buildout with the current zoning, if the warehouse and other undesirable uses, were removed? What type of traffic would this generate?
- 5 - What if an overlay district was used to increase building height at the highway, allowing for the 70' height as of right, but preserving more green space along Gould Street and put the lower profile retail/restaurants etc, similar to the street in Chestnut Hill.
- 6 - 4X more traffic at the intersection of Highland/Gould/Hunting is not going to be a plus for the residential communitiy, no matter how it is looked at. If the traffice remediation can not be forced upon the developer, this is going to be a costly fix for the town.

With a current budget/expenditures over \$203,000,000 for the town, the additional \$1.5 million in taxes is not going to make a significant difference in the quality of life in Needham. A strangulated traffic entry into the town wil.

Thank you.

Leigh

Leigh Rossi Doukas, ABR, CIAS
International President's Circle 2018, 2019
Hall of Fame 2016, 100% Club 2012 - 2017
Coldwell Banker Realty
1498 Highland Ave, Needham MA 02492

Your Needham/Metrowest Real Estate Expert
Cell: 617-966-1245
Website: www.LRDHOMES.com

Your referrals are much appreciated!

On Wed, Feb 3, 2021 at 9:17 PM Planning <planning@needhamma.gov> wrote:

Thank you for following up with your written comments; I have received them and will share them with the Planning Board.

Thanks, alex.

Alexandra Clee

Assistant Town Planner

Needham, MA

www.needhamma.gov

From: Leigh Doukas <lrdhomes@gmail.com>

Sent: Wednesday, February 3, 2021 9:12 PM

To: Planning <planning@needhamma.gov>

Subject: Proposed Zoning for Business 1/Muzi Site

Hi Lee:

Thank you for answering my question. I do think this proposal is much improved from the original. I would have 2 additional comments.

1 - The 1.0 FAR is large enough. The traffic predictions, even with significant developer improvements are not that good.

2 - Maybe there could be incentives under the special permit that would allow for the increased volume with the addition of green space/buffer zone.

My final comment is that the meeting seemed to be hijacked at the end by an organized group, who did not ask questions, or really comment on the proposal, but just wanted a platform for their group.

They took up a lot of time from others who may have had questions. Perhaps there should be a time limit/number of questions people can ask.

Thank you.

Leigh

Leigh Rossi Doukas, ABR, CIAS

International President's Circle 2018, 2019

Hall of Fame 2016, 100% Club 2012 - 2017

Coldwell Banker Realty

1498 Highland Ave, Needham MA 02492

Your Needham/Metrowest Real Estate Expert

Cell: 617-966-1245

Website: www.LRDHOMES.com

Your referrals are much appreciated!

From: noreply@civicplus.com
To: [Alexandra Cies](#); [Lee Newman](#); [Elisa Litchman](#)
Subject: Online Form Submittal: Contact Planning Board
Date: Thursday, February 4, 2021 10:39:43 AM

The following form was submitted via your website: Contact Planning Board

Full Name:: Oscar Mertz

Email Address:: ocreate@verizon.net

Address:: 67 Rybury Hillway

City/Town:: Needham

State:: MA

Zip Code:: 02492

Telephone Number:: 3392250843

Comments / Questions: Dear Planning Board and Needham staff and consultant - This email is a follow up to last night's public hearing on the Muzi re-zoning presentation and comment session. I want to thank the planning board, staff and the consultant team again for the effort to continue to explore, and seek community involvement in, the appropriate strategy for rezoning this significant site.

I do feel that Needham is facing a serious crisis by not being able to offer a range of housing choices to more economically and racially diverse community. Housing should be highly recommended and a key program in this development. Although the zoning cannot make this mandatory it would be interesting to find ways to incentivise this for developers through added height or density. I think the issue of building scale and setback can be addressed with thoughtful zoning dimensioning guidelines to be able to address the concerns of the community. Some of the local community stated a clear interest in reducing density and height and in providing commercial (retail) choices, green space and possibly a community / sports element. However, density is actually our friend because it allows the buildings to be more efficient and it can allow for more green space so developers can meet their development and open space goals. Reducing height and density too much can make it harder to restore more open space and likely force more surface parking. This would be a less desirable experience i think for the site. Taller buildings appropriately set back can allow for more open space. Greater density can make it more economical to build structured parking that would replace some of the surface parking and allow more open space. There is a balancnig act to allow enough development with incentives to provide the right setbacks and open space so the scale fits appropriately with the surrounding context. For this site the majority of project frontage is facing highway or commercial and the only residential frontage on Gould is facing Wingate which is 2-3 stories. I consider Highland a major thoroughfare where an appropriate scale (3 st) building with landscape buffer would be possible and desirable, given the large ROW for Highland Avenue.

I was also interested in the idea that the town reconsider what a broader vision for the site might be - maybe through a working group planning effort that engaged a range of community viewpoints.

I remain confident that there is a solution for this site to reach it's maximum potential and be developed thoughtfully as a model for what a Needham aspires to be, a welcoming community responding to the challenges of affordability, equity and climate, facing greater Boston.

A final note is that the traffic will always be a big concern so everything we can do to leverage alternative transit should be pursued. This can include public bus service rerouting (mentioned by Studio Enee report), public shuttle service to Hts T station (3/4 mi), ride share incentive (for commercial) and general parking and traffic impact reduction through mixing uses and increasing housing unit limits which ultimately reduces total car trips for the development.

Thank you and I look forward to the pursuit of the appropriate zoning approach.

Oscar Mertz
67 Rybury Hillway
Precinct I
.

Additional Information:

Form submitted on: 2/4/2021 10:39:38 AM

Submitted from IP Address: 108.7.75.70

Referrer Page: No Referrer - Direct Link

Form Address: <https://linkprotect.cudasvc.com/url? a=http%3a%2f%2fwwww.needhamma.gov%2fForms.aspx%3d229&c=E.1.U0CwDZl2H7VxBNcCt7iHvVvk4fDNcOx7EQd2fyvCjketJl0T7l5vcITQIoNmpRNKsedC1aM2gpZuOJxefceF-p48nGzhpMAEq-4yNsEUhf9F32rLXqEnmQw..&typo=1>

From: [Paula Dickerman](#)
To: [Planning](#)
Subject: Muzi Site zoning
Date: Thursday, February 4, 2021 3:17:58 PM

Good morning,

I would like to thank you for the informative presentation of the updated zoning proposal for the Muzi site last night.

Also, I would like to request that you consider 1. making residential units part of the By Right process also, not just the Special Permit process, and 2. increasing the number of residential units allowed to 275 (or another number higher than 240). Let's at least give developers the opportunity to build more residential units.

The presentation made clear that more residential units, and therefore less space devoted to commercial use, would help reduce the traffic issues plainly revealed in the worst-case scenario.

My requests come from a desire to see Needham do whatever it can to increase housing availability in the region and the Commonwealth. There is a housing shortage crisis, and we must do our part to alleviate it. Needham is full of individuals and non-profit organizations that have shown by their actions that they value compassion for people. It's that kind of town.

Last, I was glad to see that there will be an affordable unit requirement of 12.5% and am encouraged to hear that the Town is reconsidering its inclusionary zoning policies.

Thank you for your work and your time.

Paula Dickerman
20 Burnside Road
Needham, MA 02494

From: [bruceeisenhut8](#)
To: [Planning](#)
Subject: Zoom webinar comments
Date: Thursday, February 4, 2021 3:27:02 PM

I wish to thank the Planning Board for a well organized and moderated Zoom meeting regarding the "Muzi rezoning" . As a long time member of the Planning Board, TM member for precinct D and citizen, I have followed the process and the Northland development just accross the river in Newton. The developable area of that project is seven acres larger and there is a known developer Nevertheless, there are ideas and conditions that should be incorporated into the Needham proposal.

First, there has been a consistent expressed interest in open space and community opportunities in that space. The minimal open space required in Northland is 40%. The developer agreed to this in recognition of the value of the location. Further , the developer agreed to a litany of public amenities in the open space (that would count toward meeting the open space minimum). I agree that 40% may be too draconian for Needham, but 20% is too meager. I believe 30% would enhance aesthetics, be better for the environment and would not have a chilling effect on responsibe development. You could word it so that certain public amenities would count toward the 30% such as uncovered outdoor recreation, community gardens, unpaved walkways, etc. Northland is building a community kids wading pool for example.

I strongly oppose a limit on the number of housing units in a special permit process. First, you have to appreciate that historically in many communities the stated fear of impacting the school budget has been a pretext for racial or low income bias. It is difficult for many good people to accept a moral equivalency between providing housing opportunities for low income persons, or couples on fixed incomes against a modest increase in the school budget, especially in a well off community like Needham. Also, there is more of a perception of bias when the school population is leveling off or decreasing as appears the case in Needham. See the MAPC's population projections for Needham out to 2030.

Having a limit on housing units has the potential to derail the TM discusion to broader social issues and take away from the merits and work of the PB. I know some TM members who will take issue with a limit. There is no need for a limit, at least with respect to a special permit process where the PB may discuss and even negotiate with an applicant over the number and mix of housing units. The BOS needs to trust the PB in its expertise and experience doing this.

The question was raised at the Zoom meeting where did the limit of 240 come from. There was no specific answer, just an unsatisfactory vague response of a need to balance. I don't believe there is a good answer. A good developer like Northland could put foward a fabulous housing project or set of projects exceeding that number. The limit may foreclose creativity.

Moving on; although I think Mr. Crocker was confused as to diminsional requirements in his presentation, his point regarding neighborhood aesthetics is shared and should not be ignored. Kudos to the PB in decreasing the FAR and height. However, IMO a slight increase in the side setbacks along Gould and Highland a bit would go a long way in alleviating those concerns, concerns raised at the last TM.

Finally, there has been a cosistent interest and comments arguing the need to bake into the

zoning some environmental protections. Gold Leed certification is required in Northland for, as best I understand, all buildings. Needham could at least bake into the proposed bylaw a silver Leed standard, if not certification, for all commercial buildings over a specified size. At this point in time, the silver standard is fairly minimal. I would not require a certificate from Leed but an engineer's certification that the standard has been met. Again, I submit that an environmental standard baked into the zoning would be favorable to TM., even a minimal one.

Please be so kind as to share these thoughts to the PB members and the BOS. I sincerely appreciate your efforts since the last TM.

Bruce T. Eisenhut
Janis M. Soma
106 Marked Tree Rd.

Sent from my Verizon, Samsung Galaxy smartphone

From: [Alexa](#)
To: [Planning](#)
Subject: Muzi lot: request for green space
Date: Friday, February 5, 2021 6:11:08 AM

Hi,

I'm a resident of Needham and am very much against any type of new buildings on the Muzi lot. The traffic in Needham is already too heavy and unpleasant as it is, and the quality of life and desirability of the town will decrease substantially with any more traffic. Increased traffic is also a noise and pollution issue, as well as a safety issue for our kids. Please consider these values above and beyond all others.

My hope is to make Muzi into green space to attempt to make what is very ugly as an entrance into the town more visually appealing. Lots of trees would be ideal.

Please vote no to develop land where Muzi is and do right by Needham residents who do not want continued development in our town to the detriment of residents.

Thanks,
Alexa Mukherjee

Sent from my iPhone

From: [Lee Newman](#)
To: [Alexandra Clee](#)
Subject: FW: Muzi Site
Date: Monday, February 8, 2021 10:21:24 AM

From: Jeanne McKnight <jeannemcknight@comcast.net>
Sent: Sunday, February 7, 2021 9:00 PM
To: Lee Newman <LNewman@needhamma.gov>
Subject: FW: Muzi Site

Forwarding this comment.

Jeanne

From: J Leghorn <jleghorn@needhamfarm.org>
Sent: Wednesday, February 3, 2021 6:40 PM
To: Jeanne McKnight <jeannemcknight@comcast.net>
Subject: Re: Muzi Site

Jeanne,

While I am concerned with number of vehicles, we also need to consider the mix. If a significant component are heavy or long trucks, that affects intersections. Also, size of vehicles, tons on the road at any given time, the bumps that can intensify the forces on the road bed, can affect the breakdown of the road and the need for rebuild or replacement. What I would like to know are studies about what the current road bed can sustain, what load will cause it to break down, what will it cost to build a road bed that can withstand what the developer's use will impose on the road bed. The Planning Board needs an engineer on it. That's not me, although my undergraduate training math and physics.

Talk to you soon.

Stay healthy,

Joe

On Feb 3, 2021, at 5:20 PM, Jeanne McKnight <jeannemcknight@comcast.net> wrote:

Joe:

The Planning Board's expectation, whether we are dealing with a development allowed by right but requiring site plan approval, or a larger development requiring a special permit, is that we will be able, in accordance with the site plan review criteria or the special permit criteria, to demand funds, as a condition of permit approval, for whatever traffic mitigation is determined to be necessary depending on the likely traffic to be generated by the proposed project.

Jeanne

From: J Leghorn <jleghorn@needhamfarm.org>
Sent: Wednesday, February 3, 2021 4:32 PM
To: Jeanne McKnight <jeannemcknight@comcast.net>
Subject: Re: Muzi Site

Thanks, Jeanne. I like to do a little preparation before making comments. I did find the updated traffic analysis. What I am particularly interested in is an infrastructure analysis. If Gould Street is going to start getting heavy truck traffic, is it built for it? If not developer should have to pay most, if not all of the costs for upgrade. If I can't make the meeting, I will watch, read and then comment. I think we have had a enough of the commons supporting developers, time for them to pay a fair share. If taxes go up, but any increase is spent on improving infrastructure to the benefit of the developer, the people lose again and the developer laughs all the way to the bank.

On Feb 3, 2021, at 4:09 PM, Jeanne McKnight
<jeannemcknight@comcast.net> wrote:

Joe:

The purpose of tonight's community meeting is to get input that will inform our final drafting of what will be then advertised for a public hearing. The attached use and dimensions spreadsheet shows proposed changes from the existing zoning by-law, the proposed amendment presented to Town Meeting 2 years ago, and what is to be presented tonight as proposed use and dimensional requirements. I hope it is readable and helpful. You will learn more if you're able to attend tonight's Zoom community meeting – see Town website for link.

Jeanne

From: Joe Leghorn <jleghorn@needhamfarm.org>
Sent: Wednesday, February 3, 2021 11:32 AM

To: Jeanne McKnight <jeannemcknight@comcast.net>

Subject: Muzi Site

Jean,

Is there a draft zoning proposal for Muzi site that is publicly available? I could not find one on the Town's website.

Thanks.

Best wishes,

Joe

<HC1 Zoning Comparison w footnotes Lee 1.29.2021.xlsx>

February 10, 2021

Dear Needham Planning Board,

Thank you for the recent presentation about the rezoning of the Muzi area near 128.

We are writing to express support for the inclusion of as many affordable housing units within the zone as possible. The mix of units should include a significant portion with three and four bedrooms to accommodate extended families and families with children. The goal is to increase the economic and racial diversity of our schools and community. We support increasing the cap from 240 units to 500 units, with an inclusionary zoning percentage of 15% or even 17.5%, to match our neighbor Newton's inclusionary zoning percentage.

We noted that the estimated \$4 million in increased tax revenue could support about 100 new student enrollments assuming half the new revenue goes to the school system and Needham spends about \$19,000 per student per year.

Sincerely,

Equal Justice Needham

Peter Olive	Jill Olive	Wendy Blom	Si Si Nyunt Goneconto
Paula Dickerman	Smriti Rao	Kristin Casasanto	Rachel Green
Oscar Mertz	John Kirk	Susan Kirk	Heidi Schwartz
Jan Soma	Sarah Keselman	Noah Mertz	Robert Vecchi
Paula Kahn	Andrea Wizer		

From: [Richard Putprush](#)
To: [Planning](#)
Subject: Proposed re-zoning of Industrial-1
Date: Monday, February 15, 2021 5:14:21 PM

Members of the Needham Planning Board,

My name is Rick Putprush and I am writing to you as a concerned Needham resident (97 Manning Street), Needham business owner (Partner at Fulcrum Real Estate Partners, LLC, 935 Great Plain Avenue), and long-time member of Needham's Council of Economic Advisors (CEA). Over the past several years, I have had opportunities to voice my opinions on various matters of the Town, including the on-going discussions regarding the potential re-zoning of the current "Industrial -1" zoned area bordered by Gould Street, Highland Ave and Rt 128 (for sake of simplicity, hereinafter referred to as the "Muzi site") which is the topic of my concerns.

First, I applaud the inclusive process the Select Board has undertaken, and its desire to reach the required consensus in this matter. The goal has always been to convert the zoning of one of the last remaining major development sites along Rt 128 to its "highest and best" use, greatly increasing the tax revenues from the site to the relief of our residents, creating additional high paying jobs for our residents and others, as well as creating an architecturally pleasing entrance to Needham. The public concerns, in general, have always revolved around the increased traffic, particularly on Highland Ave, Gould Street, and Central Ave, fears of creating a "monolithic canyon" down Gould Street, and whether or not a less intensive "recreational" use might be better.

My concern is that the public does not realize or understand, especially considering their issues, that the current Industrial-1 zoning could allow the very situation they are hoping to avoid. Under the current zoning, if I'm not mistaken, approximately 300,000 square feet of 40' high warehouse/distribution space could be developed. Five years ago, this would be an unlikely scenario because such a development would not generate a "market value" for the site. However, things have changed...the trend of internet shopping, e-commerce, has taken hold, ever more pronounced by the COVID-19 pandemic, with no signs of stopping, prompting the Amazons, Walmarts, etc., in this space to find new site locations meeting demographic and major highway access criteria for modern (1,000,000 SF) distribution hubs, and smaller satellite "fulfillment center" distribution centers. My company, Fulcrum Real Estate Partners, specializes in investment in industrial properties, and consultation services for various types of users for site selection. In our recent experience, we are learning that for the right location, price (whether it is for the site for their own development or for leasing a property built for their own specification on the site) is becoming a less important and influential criteria than others. Access to major highways, workforce, customers...and the ability to occupy relatively quickly without the risk of having to spend an inordinate amount of time and money for approvals and permits to operate their business with no guarantee of success...have become the major drivers. In short, the e-commerce giants will compete on price for a well-located site where they can develop a fulfillment center by right, with minimal oversight by the Town.

Again, having watched and participated in the public process of the proposed re-zoning for almost 5 years, I am concerned that the public still does not recognize or understand the potential problems that the continuous delay and revisiting of the merits of the rezoning may

bring. The point here is that a 40' high, 300,000 SF "monolith" warehouse/distribution "fulfillment center" on the Muzi site, bringing 24/7 tractor trailer, box truck and van traffic on Gould Street and Highland Ave is not as far from a potential reality under the current zoning as the Planning Board, or the residents who are fighting what I personally believe to be a reasonable and well-thought out zoning change, might think it is. If it were to happen, it would be an incredible missed opportunity for Needham, in my opinion.

I support the Highway Commercial 1 rezoning effort and thank the Board for its consideration of my concerns.

Sincerely,
Rick Putprush

--

Rick Putprush
Fulcrum Real Estate Partners, LLC / REP Realty Advisors, LLC
935 Great Plain Avenue, #123
Needham, MA 02492-3030
617.697.9750
rick.putprush@gmail.com

From: [Adam Block](#)
To: [Jeanne McKnight](#); [Paul S. Alpert](#); [Ted Owens](#); [Marty Jacobs Esq \(mj@jacobs-thomas.com\)](#)
Cc: [Lee Newman](#); [Alexandra Clee](#)
Subject: HC1 - zoning revisions
Date: Friday, February 12, 2021 9:19:15 PM

Dear Colleagues,

I reviewed the work plan which followed the January 2020 Needham Heights Neighborhood Association's community meeting. That work plan specifically excluded residential uses, grocery stores and other destination retail.

Meanwhile, at our PB community meeting on Feb 3, I presented residential uses, in addition to grocery and other retail upto 25,000 sf.

Fortunately, we seemed to garner support for residential use at the Feb 3 meeting and not a loud chorus of opposition to retail up to 10,000 sf by right and 25,000 sf by special permit.

Retail was intended to be ancillary to the main development. However, 10,000 sf - 25,000 sf retail is not regarded as ancillary nor incidental. This size retail is regarded as 'destination' retail and will further frustrate traffic concerns.

Finally, the medical marijuana use currently allowed by special permit under the existing by-law never carried over to the proposed new bylaw by special permit. Perhaps this was an oversight?

Upon review of community feedback from our Feb 3 meeting, I strongly recommend the following final changes to our proposed zoning regime:

- limit retail by right to 7500 sf;
- limit retail by special permit to 10,000 sf
- limit grocery uses by size up to 10,000 sf
- restore medical marijuana treatment as allowed by special permit

I believe these uses align more with our policy aims and community support.

Regards,
Adam

Adam Block, Realtor®
Keller Williams Chestnut Hill Market Center
C.617.731.9454
adamjblock@kw.com

This email is privileged, confidential and intended only for the named party. Any dissemination is strictly prohibited. If you received this message is error, please delete. All rights reserved.

Major Project Site Plan Special Permit No. 2020-03
February 16, 2021
Hunnewell Needham, LLC
400 Hunnewell Street

(Filed during the Municipal Relief Legislation, Chapter 53 of the Acts of 2020)

DECISION of the Planning Board (hereinafter referred to as the Board) on the petition of Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025, for property located at 400 Hunnewell Street, Needham, MA. Said property is located in the Hillside Avenue Business District. The property is shown on Assessors Plan No. 99 as Parcel 3 containing a total of 20,123 square feet.

This decision is in response to an application submitted to the Board on November 24, 2020, by the Petitioner for: (1) a Major Project Site Plan Special Permit under Section 7.4 of the Needham Zoning By-Law (hereinafter the By-Law); (2) a Special Permit under Section 1.4.6 of the By-Law for a change and extension of a lawful, pre-existing, non-conforming use, and the alteration and enlargement and reconstruction of a lawful, pre-existing, non-conforming structure; (3) a Special Permit under Section 3.2.2 of the By-Law for an apartment or multifamily dwelling in the Hillside Avenue Business District; (4) a Special Permit under Section 4.4.2 of the By-Law to exempt the basement level underground parking from inclusion in the Floor Area Ratio calculation; and (5) a Special Permit under Section 5.1.1.5 of the By-Law to waive strict adherence with the requirements of Section 5.1.3 (Parking Plan and Design Requirements) of the By-Law.

The requested Major Project Site Plan Special Permit, would, if granted, permit the Petitioner to demolish the existing commercial building and replace it with a new residential building containing a total of eight units. The new building would be two stories high, plus a basement level, to be used for underground parking. The first and second floor together would contain a total of 12,915 square feet of floor area. The area to the left of the building, looking from the front, is proposed to be completely landscaped, as will the area in front of the building. Additional landscaping would be provided in the rear corner of the Premises as well. The rest of the Premises is proposed to be occupied by an access driveway and 7 surface parking spaces.

After causing notice of the time and place of the public hearing and of the subject matter thereof to be published, posted and mailed to the Petitioner, abutters and other parties in interest as required by law, the hearing was called to order by the Chairperson, Jeanne S. McKnight on Tuesday, December 15, 2020 at 7:20 p.m. via remote meeting using Zoom ID [826-5899-3198](#). The hearing was continued to Monday, January 4, 2021 at 7:30 p.m., using Zoom ID [826-5899-3198](#). The hearing was further continued to Tuesday, January 19, 2021 at 8:15 p.m., using Zoom ID [826-5899-3198](#). The hearing was further opened on Tuesday, February 2, 2021, to accept the correspondence detailed under Exhibit 11 below. Board members Jeanne S. McKnight, Paul S. Alpert, Martin Jacobs, Adam Block and Ted Owens were present throughout the proceedings.

The record of the proceedings and the submission upon which this decision is based may be referred to in the office of the Town Clerk or the office of the Board.

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

- Exhibit 1 - Application submitted by Hunnewell Needham, LLC, dated November 24, 2020 with Addendum A.
- Exhibit 2 - Two letters from George Giunta Jr. Attorney, dated November 5, 2020 and January 6, 2021.
- Exhibit 3 - Letter from Elisha Long, Manager, Hunnewell Needham, LLC, dated November 5, 2020.
- Exhibit 4 - Plan set prepared by Field Resources, 281 Chestnut Street, Needham, MA, J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, consisting of 8 sheets: Sheet 1, Cover Sheet, dated November 2, 2020; Sheet 2, entitled "Existing Conditions Plan of Land," dated March 5, 2020, revised April 6, 2020 and November 5, 2020; Sheet 3, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020 and November 5, 2020; Sheet 4, entitled "Grading and Drainage Plan," dated November 2, 2020; Sheet 5, entitled "Utility Plan," dated November 2, 2020; Sheet 6, entitled "Erosion and Sediment Control Plan," dated November 2, 2020; Sheet 7, entitled "Details 1/2," dated November 2, 2020; Sheet 8, entitled "Details 2/2," dated November 2, 2020.
- Exhibit 5 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Cover Sheet, dated November 5, 2020; Sheet 2, Sheet A.B.1, entitled "Lower Level Garage Plan," dated November 5, 2020; Sheet 3, Sheet A.1.1, entitled "1st Floor Plan," dated November 5, 2020; Sheet 4, Sheet A.1.2, entitled "2nd Floor Plan," dated November 5, 2020; Sheet 5, Sheet A.1.3, entitled "Roof Plan," dated November 5, 2020; Sheet 6, Sheet A201, entitled "Proposed Elevations," dated November 5, 2020; Sheet 7, Sheet A202, entitled "Proposed Elevations," dated November 5, 2020.
- Exhibit 6 - Stormwater Management Report, prepared by J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, dated November 2, 2020.
- Exhibit 7 - Plan prepared by Field Resources, 281 Chestnut Street, Needham, MA, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and November 20, 2020.
- Exhibit 8 - Plan prepared by Verdant Landscape Architecture, entitled "Landscape Plan, 400 Hunnewell Street, Needham MA," dated December, 2020.
- Exhibit 9 - Letter from Bette Vogel, Rushit Kamani and Annie Atlas, dated December 4, 2020.
- Exhibit 10 - Memorandum from Design Review Board, dated December 7, 2020.

- Exhibit 11 - Letter from Bette Vogel, Rhonda Altman, Rushit Kamani, Mary Bronski, Noah Atlas, Karina Dodor, Elizabeth Hayden, Sam Hart, residents from 154, 156 and 160 Hillside Avenue, dated December 21, 2020, with attached photographs.
- Exhibit 12 - Email from Jeanne McKnight, Planning Board Chair, dated December 29, 2020, with attached photographs.
- Exhibit 13 - Email from Inga Puzikov, dated January 19, 2021.
- Exhibit 14 - Email from Martin Raffol, dated January 19, 2021.
- Exhibit 15 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Cover Sheet, dated January 4, 2021; Sheet 2, Sheet A.B.1, entitled "Lower Level Garage Plan," dated January 4, 2021; Sheet 3, Sheet A.1.1, entitled "1st Floor Plan," dated January 4, 2021; Sheet 4, Sheet A.1.2, entitled "2nd Floor Plan," dated January 4, 2021; Sheet 5, Sheet A.1.3, entitled "Roof Plan," dated January 4, 2021; Sheet 6, Sheet A201, entitled "Proposed Elevations," dated January 4, 2021; Sheet 7, Sheet A202, entitled "Proposed Elevations," dated January 4, 2021.
- Exhibit 16 - Plan set prepared by Field Resources, 281 Chestnut Street, Needham, MA, J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, consisting of 8 sheets: Sheet 1, Cover Sheet, dated November 2, 2020; Sheet 2, entitled "Existing Conditions Plan of Land," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and December 30, 2020; Sheet 3, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and December 30, 2020; Sheet 4, entitled "Grading and Drainage Plan," dated November 2, 2020; Sheet 5, entitled "Utility Plan," dated November 2, 2020; Sheet 6, entitled "Erosion and Sediment Control Plan," dated November 2, 2020; Sheet 7, entitled "Details 1/2," dated November 2, 2020; Sheet 8, entitled "Details 2/2," dated November 2, 2020.
- Exhibit 17 - Plan set prepared by Verdant Landscape Architecture, consisting of 3 sheets: Sheet 1, Sheet L1, entitled "Landscape Plan, 400 Hunnewell Street," dated December 14, 2020; Sheet 2, Sheet L2, entitled "Lighting Plan, 400 Hunnewell Street," dated December 14, 2020; Sheet 3, Sheet L3, entitled "Materials, 400 Hunnewell Street," dated December 14, 2020.
- Exhibit 18 - Plan consisting of 2 sheets, each showing March 19, 2020 Sun Path.
- Exhibit 19 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Sheet A.0.1, entitled "Existing Site Photos," dated January 4, 2021; Sheet 2, Sheet A.0.2, entitled "Existing Site Photos," dated January 4, 2021; Sheet 3, Sheet A.0.3, entitled "Existing Site Photos, View of Tracks & Train," dated January 4, 2021; Sheet 4, Sheet A.0.4, entitled "Existing Shadow Photos," dated January 4, 2021; Sheet 5, Sheet A.0.5, entitled "Existing Roof Height Photos," dated January 4, 2021; Sheet 6, Sheet A.0.6, entitled "Existing Site Photos, View from Office Building," dated January 4, 2021; Sheet 7, Sheet A.0.7, entitled "Site Sections," dated January 4, 2021.

Exhibit 20 - Interdepartmental Communication (IDC) to the Board from Chief John Schlittler, Needham Police Department, dated December 4, 2020 and January 6, 2021; IDC to the Board from Thomas Ryder, Assistant Town Engineer, dated December 14, 2020 and January 12, 2021; and IDC to the Board from Tara Gurge, Health Department, dated December 10, 2020.

Exhibits 1, 2, 3, 6, 15, 16, 17, 18, and 19 are referred to hereinafter as the Plan.

FINDINGS AND CONCLUSIONS

Based upon its review of the exhibits and the record of the proceedings, the Board found and concluded that:

- 1.1 The subject property is located in the Hillside Avenue Business District at 400 Hunnewell Street, Needham, MA. The said property is shown on Needham Town Assessors Plan No. 99 as Parcel 3 and contains approximately 20,123 square feet. The property is owned by Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025.
- 1.2 The site is presently fully developed, occupied by a two-story commercial building, associated parking areas and limited landscaping. Based on the records of the Assessor's Department, the building, which is made of concrete block, was constructed in or around 1975. It contains approximately 8,520 square feet of area divided over two floors, both of which are used for office purposes.
- 1.3 The Petitioner proposes to demolish the existing commercial building and replace it with a new residential building containing a total of eight units. The new building would be two stories high, plus a basement level, to be used for 16 underground parking spaces. The first and second floor together would contain a total of 12,915 square feet of floor area. The area to the left of the building, looking from the front, is proposed to be completely landscaped, as is the area in front of the building. Additional landscaping is proposed in the rear corner of the premises as well. The rest of the premises is proposed to be occupied by an access driveway and 7 surface parking spaces. Access to the surface parking lot and the underground garage will be provided off of Hunnewell Street. As a part of the site improvements, the Petitioner is proposing to install a stormwater infiltration system on site.
- 1.4 As indicated above, the proposed new building will be used entirely for residential purposes. Pursuant to Section 3.2.2 of the Zoning By-Law, use of property in the Hillside Avenue Business District for "apartment or multifamily dwelling" is allowed by special permit. Therefore, provided the Board approves the requested special permit, the proposed use of the premises will comply with the By-Law.
- 1.5 The By-Law, Section 4.4.1 requires that the minimum lot area be 10,000 square feet and the minimum lot frontage be 80 feet. The proposed development, having a lot with an area of approximately 20,123 square feet and 104.31 feet of frontage on Hunnewell Street, complies with the minimum frontage and the minimum area requirements.

- 1.6 The By-Law, Section 4.4.4 requires a minimum front setback of 20 feet. The proposed building is to have a front setback of 20 feet from Hunnewell Street at its closest point. Therefore, the proposed new building complies with the applicable setback requirements.
- 1.7 The By-Law, Section 4.4.2 (e) allows a maximum floor area ratio (FAR) of 0.7 or 14,086.1 square feet in the subject case. The proposed new building will contain a total of 14,076 square feet; 10 square feet less than the maximum permitted. In addition, the basement level will be occupied by a parking garage. Provided the Planning Board issues a special permit waiving inclusion of the underground parking garage in the FAR calculation, the floor area will remain less than the maximum allowed by the By-Law, and the proposed new building will comply with the applicable FAR requirement.
- 1.8 Pursuant to Section 4.4.3 the maximum height allowed as of right in the Hillside Avenue Business District is two and one-half (2 ½) stories, not to exceed 35 feet; with all use except storage prohibited above the second floor. Whereas the proposed new building is two stories with a height of 29 feet, the proposed new building will comply with the height limitations of the By-Law.
- 1.9 The By-Law, Section 4.4.5, further requires that no more than two driveways be permitted for every 150 feet of frontage, and two-way driveways of the kind proposed for the premises must be no less than 18 feet wide and no more than 25 feet wide. Whereas only one driveway is proposed, and whereas the driveway is 25 feet wide, same complies with the applicable driveway opening conditions of Section 4.4.5.¹
- 1.10 The By-Law, Section 4.4.8.4, requires that:

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

A small portion of the Premises directly abuts the Single Residence B Zoning District, at the rear corner, with a larger portion located adjacent to the MBTA railroad right-of-way. Because the HAB district boundary ends at the edge of the railroad right-of-way, and whereas the opposite side of the right-of-way is located in the SRB District, the property line likely constitutes a residential district boundary, as contemplated by Section 4.4.8.4.

However, whereas the proposed new building is an apartment or multi-family dwelling, used for residential purposes, and whereas apartments and multifamily structures and residential use are allowed in a residential district, the provisions of Section 4.4.8.4 do not apply by their own terms.

- 1.11 Under the By-Law, Section 5.1.4, 1.5 parking spaces per each residential unit is required for the eight residential units, for a total of 12 spaces. The Petitioner is proposing to install a total of 23 spaces: 16 underground parking spaces and an additional 7 surface

¹ The Board notes that technically only 12.5 feet of the driveway opening is on the Premises, as the proposed driveway utilizes a common right of way, shared with the adjacent Premises, as set forth in Deed recorded with Norfolk County Registry of Deeds in Book 5115, Page 175, and shown on “Plan of Land in Needham, Mass.”, dated January 28, 1975, prepared by Apex Associates, endorsed by the Needham Planning Board and recorded therewith.

spaces; two to the right of the new building and 5 to the rear. As a result, more than sufficient parking is provided, and the redevelopment complies with the off-street parking requirements of the By-Law relative to the number of spaces.

- 1.12 The spaces as designed comply with all aspects of the Parking Plan and Design Requirements set forth at Section 5.1.3 of the By-Law except the following three, for which waivers are required and requested by the Petitioner under this Section: (1) The illumination proposed is limited to the lights mounted on the building, short bollards and decorative ground mounted lighting, which are all expected to produce an average illumination level of less than one foot candle in the parking area, instead of the requirement of an illumination level of an average of one foot candle required pursuant to Section 5.1.3(a); (2) The By-Law Section 5.1.3(k) requires that ten (10) percent or more of the parking area shall be maintained as landscaped area. Whereas the majority of the parking provided is in an underground structure, and due to the configuration of the site, a waiver from such provision has been requested; (3) As applied to the Premises, the By-Law Section 5.1.3(l) requires two trees, located within or around the parking area, with not less than 40 square feet of unpaved soil or other permeable surface area per tree, in planting beds at least 4 feet wide. While the Petitioner is proposing landscaping at the front and rear corner of the Premises, same does not meet the tree requirement and a waiver has been requested.
- 1.13 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 has been assured. The Board finds that the use of the premises for residential purposes does not constitute a “seriously detrimental use.” The premise is to be connected to the municipal storm drain system. Surface water drainage will be improved over the existing conditions and adequate provision has been made for same. Considering that the premises is bounded to the rear by the MBTA railroad right of way, to one side by a commercial use and to the other side by a multifamily / apartment development, no additional sound and sight buffers are required, and with the redevelopment of the site, views, light and air have been adequately mitigated with height adjustments made in the course of this approval to mitigate shadowing on adjacent properties.
- 1.14 Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets has been assured. The driveway serving the parking area is of adequate width and in an appropriate location, and the building is accessed by a walkway.
- 1.15 The arrangement of parking and loading spaces is adequate, based on the layout and use of the site. Parking is arranged both around and below the building and is readily accessible. The proposed residential use of the building is not expected to require any special or dedicated loading spaces.
- 1.16 Adequate methods of disposal of refuse and other wastes resulting from the uses of the site have been provided. The proposed residential use of the premises is not anticipated to generate any significant wastes or trash. Nevertheless, it will be a requirement for the occupants of the building that all trash, waste and debris be removed on a regular basis, as necessary and appropriate, consistent with customary residential use.
- 1.17 The relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area are in compliance with other requirements of this By-law and have been adequately addressed by this project. The property is bounded on one side by an existing commercial activity on another by a multifamily development,

and on the third side by the MBTA railroad right of way. As a result, the proposed development for residential purposes is not anticipated to have any significant negative effect on any community asset or any adjacent landscape.

- 1.18 The Project will not have an adverse effect on the Town's resources, including the Town's water supply and distribution system, sewer collection and treatment, fire protection and streets. The use of the Premises for residential purposes is consistent with both other current uses in the Hillside Avenue Business District and the uses allowed pursuant to the By-Law. The building will not generate large numbers of motor vehicles and the project has been designed to accommodate fire and other emergency services. The project will connect to the Town's water system that is located in Hunnewell Street. The project will connect to the Town's sewer system by means of connecting to the sewer main located in Hunnewell Street.
- 1.19 Under Section 7.4 of the By-Law, a Major Project Site Plan Review Special Permit may be granted in the Hillside Avenue Business District, if the Board finds that the proposed development complies with the standards and criteria set forth in the provisions of the By-Law. On the basis of the above findings and conclusions, the Board finds that the proposed development Plan, as conditioned and limited herein for the site plan review, to be in harmony with the purposes and intent of the By-Law, to comply with all applicable By-Law requirements, to have minimal adverse impact and to have promoted a development which is harmonious with the surrounding area.
- 1.20 Under Section 3.2.2 of the By-Law, a Special Permit may be granted for apartment or multifamily dwelling use in the Hillside Avenue Business District . On the basis of the above findings and conclusions, the Board finds the proposed development Plan, as conditioned and limited herein, to be in harmony with the general purposes and intent of the By-Law, to comply with all applicable By-Law requirements, and to not increase the detriment to the Town's and neighborhood's inherent use.
- 1.21 Under Section 5.1.1.5 of the By-Law, a Special Permit to waive strict adherence with the requirements of Section 5.1.3 of the By-Law (Off-Street Parking Requirements) more specifically, in Sections 5.1.3(a), 5.1.3(k) and 5.1.3(l), as further described in Section 1.1 above, may be granted provided the Board finds that owing to special and unique circumstances, the particular use, structure or lot does not warrant the application of certain design requirements. On the basis of the above findings and conclusions, the Board finds that there are special and unique circumstances justifying the waiver of the above-noted requirements, as conditioned and limited herein, which will also be consistent with the intent of the By-Law and which will not increase the detriment to the Town's and neighborhood's inherent use.
- 1.22 Under Section 4.4 of the By-Law, a Special Permit may be granted to exempt the floor area of underground parking devoted in whole or in part to the parking of automobiles from being counted as floor area for purposes of determining maximum floor area ratio. On the basis of the above findings and conclusions, the Board finds that there are special and unique circumstances justifying the waiver of the above-noted requirements, as conditioned and limited herein, which will also be consistent with the intent of the By-Law and which will not increase the detriment to the Town's and neighborhood's inherent use.

THEREFORE, the Board voted 5-0 to GRANT: (1) the requested Major Project Site Plan Special Permit under Section 7.4 of the Needham Zoning By-law; (2) the requested Special Permit under

Section 3.2.2 of the By-Law for apartment or multifamily dwelling in the Hillside Avenue Business District; (3) the requested Special Permit under Section 4.4.2 of the By-Law to exempt the basement level underground parking from inclusion in the Floor Area Ratio calculation; and (4) the requested Special Permit under Section 5.1.1.5 of the By-Law to waive strict adherence with the requirements of Section 5.1.3 (Parking Plan and Design Requirements) of the By-Law, as modified by this decision; subject to and with the benefit of the following Plan modifications, conditions and limitations.

PLAN MODIFICATIONS

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

- 2.0 The Plans shall be modified to include the requirements and recommendations of the Board as set forth below. The modified plans shall be submitted to the Board for approval and endorsement.
 - a) The “Parking Plan and Design Requirements” compliance table shall be added to the site plan and be consistent with the waivers requested under the Section 5.1.3 requirement.

CONDITIONS

- 3.0 The following conditions of this approval shall be strictly adhered to. Failure to adhere to these conditions or to comply with all applicable laws and permit conditions shall give the Board the rights and remedies set forth in Section 3.30 hereof.
- 3.1 The building, parking areas, driveways, walkways, landscape areas, and other site and off-site features shall be constructed in accordance with the Plan, as modified by this decision. Any changes, revisions or modifications to the Plan, as modified by this decision, shall require approval by the Board.
- 3.2 The proposed building and support services shall contain the dimensions and shall be located on that portion of the locus exactly as shown on the Plan, as modified by this decision, and in accordance with the applicable dimensional requirements of the By-Law.
- 3.3 The building shall be used exclusively for residential purposes. The basement level shall contain parking spaces for 16 automobiles. Any changes, revisions or modifications to the Plan, as modified by this decision, shall require approval by the Board.
- 3.4 Except in the event that the property is condominiumized, all buildings and land constituting the property shall remain under a single ownership.

- 3.5 Sufficient parking shall be provided on the locus at all times in accordance with the Plan, as modified by this decision, and that there shall be no parking of motor vehicles off the locus at any time except in designated legal on-street parking areas. The sales/leasing plan shall not allow the allocation of parking spaces to tenants in excess of the available number.
- 3.6 Sixteen (16) underground parking spaces shall be provided on the site at all times in accordance with the Plan, as modified by this decision. While the Petitioner proposed and the Board approves seven (7) surface spaces, notwithstanding any provision of this Decision to the contrary, the Board notes that the 5 surface spaces in the rear of the Building may be eliminated without the need to return to the Board. All off-street parking shall comply with the requirements of Section 5.1.3 of the By-Law, except as otherwise waived by this decision.
- 3.7 All required handicapped parking spaces shall be provided including above-grade signs at each space that include the international symbol of accessibility on a blue background with the words "Handicapped Parking Special Plate Required Unauthorized Vehicles May Be Removed At Owners Expense". The quantity & design of spaces, as well as the required signage shall comply with the M.S.B.C. 521 CMR Architectural Access Board Regulation and the Town of Needham General By-Laws, both as may be amended from time to time.
- 3.8 The Petitioner shall secure from the Needham Department of Public Works a Sewer Connection Permit or impact fee, if and to the extent applicable.
- 3.9 The Petitioner shall secure from the Needham Department of Public Works a Street Opening Permit, if and to the extent applicable.
- 3.10 The Petitioner shall seal all abandoned drainage connections and other drainage connections where the developer cannot identify the sources of the discharges. The Petitioner shall connect the sanitary sewer line only to known sources. All sources that cannot be identified shall be disconnected and properly sealed.
- 3.11 The construction, operation and maintenance of the subsurface infiltration facility, on-site catch basins and pavement areas, shall conform to the requirements outlined in the EPA's Memorandum of Understanding signed by the Needham Board of Selectmen.
- 3.12 The Storm Water Management Policy form shall be submitted to the Town of Needham signed and stamped and shall include construction mitigation and an operation and maintenance plan as described in the policy.
- 3.13 The Petitioner shall comply with the Public Outreach & Education and Public Participation & Involvement control measures required under NPDES. The Petitioner shall submit a letter to the DPW identifying the measures selected and dates by which the measures will be completed.
- 3.14 The Petitioner shall provide wooden privacy fence with lattice as well as trees, along the northeastern edge of the property, as shown on the plan.
- 3.15 All solid waste shall be removed from the site by a private contractor, as and when necessary. Snow shall also be removed or plowed by private contractor, as and when necessary.

necessary. All snow shall be removed or plowed such that the total number and size of parking spaces are not reduced.

- 3.16 All commercial deliveries and trash pick-up shall occur only between the hours of 8:30 a.m. and 6:00 p.m., Monday through Saturday, not at all on Sundays and holidays. Trash shall be removed from the building as necessary and shall not be stored in dumpsters or external containers.
- 3.17 All lights shall be shielded and adjusted during the evening hours to prevent any annoyance to the neighbors. The Petitioner shall utilize the exterior lighting located on the exterior of the building to shine down and provide basic and adequate security. There are bollard and railing lights proposed in the handicapped parking area as well the handicapped ramp and the walkway at the rear of the building.
- 3.18 The maintenance of landscaping, as shown on the Plan, as modified by this decision, shall be the responsibility of the Petitioner.
- 3.19 Any portions of the sidewalks located on Hunnewell Street shall be built to Town of Needham Specifications.
- 3.20 In constructing and operating the proposed building on the locus pursuant to this Special Permit, due diligence be exercised and reasonable efforts be made at all times to avoid damage to the surrounding areas or adverse impact on the environment.
- 3.21 Excavation material and debris, other than rock used for walls and ornamental purposes and fill suitable for placement elsewhere on the site, shall be removed from the site.
- 3.22 All construction staging shall be on-site. No construction parking shall be on public streets. Construction parking shall be all on site or a combination of on-site and off-site parking at locations in which the Petitioner can make suitable arrangements. Construction staging plans shall be included in the final construction documents prior to the filing of a Building Permit and shall be subject to the review and approval of the Building Inspector.
- 3.23 The following interim safeguards shall be implemented during construction:
 - a. The hours of construction shall be 7:00 a.m. to 5:00 p.m. Monday through Saturday.
 - b. The Petitioner's contractor shall provide temporary security chain-link or similar type fencing around the portions of the project site, which require excavation or otherwise pose a danger to public safety.
 - c. The Petitioner's contractor shall designate a person who shall be responsible for the construction process. That person shall be identified to the Police Department, the Department of Public Works, the Building Inspector and the abutters and shall be contacted if problems arise during the construction process. The designee shall also be responsible for assuring that truck traffic and the delivery of construction material does not interfere with or endanger traffic flow on Hunnewell Street.
 - d. The Petitioner shall take appropriate steps to minimize, to the maximum extent feasible, dust generated by the construction including, but not limited to, requiring subcontractors to place covers over open trucks transporting construction debris and

keeping Hunnewell Street clean of dirt and debris and watering appropriate portions of the construction site from time to time as may be required.

3.24 No building permit shall be issued in pursuance of the Special Permit and Site Plan Approval until:

a. The final plans shall be in conformity with those approved by the Board, and a statement certifying such approval shall have been filed by this Board with the Building Inspector.

b. A construction management and staging plan shall have been submitted to the Police Chief and Building Inspector for their review and approval.

c. The Petitioner shall have submitted a letter to the DPW identifying the measures selected and dates by which the NPDES requirements outlined in Section 3.13 of this decision will be completed.

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

3.25 No building or structure, or portion thereof, subject to this Special Permit and Site Plan Approval shall be occupied until:

a. An as-built plan, supplied by the engineer of record certifying that the on-site and off-site project improvements were built according to the approved documents, has been submitted to the Board and Department of Public Works. The as-built plan shall show the building, all finished grades and final construction details of the driveways, parking areas, drainage systems, utility installations, and sidewalk and curbing improvements on-site and off-site, in their true relationship to the lot lines. In addition to the engineer of record, said plan shall be certified by a Massachusetts Registered Land Surveyor.

b. There shall be filed with the Building Inspector and Board a statement by the Department of Public Works certifying that the finished grades and final construction details of the driveways, parking areas, drainage systems, utility installations, and sidewalks and curbing improvements on-site and off-site, have been constructed to the standards of the Town of Needham Department of Public Works and in accordance with the approved Plan.

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

d. There shall be filed with the Board and Building Inspector an as-built Landscaping Plan and As-Built Lighting Plan showing the final location, number and type of plant material, final landscape features, parking areas, and lighting installations. Said plan shall be prepared by the landscape architect of record and shall include a certification that such improvements were completed according to the approved documents.

e. There shall be filed with the Board a statement by the Engineering Division of DPW that the Petitioner has met the NPDES requirement as detailed in Section 3.13.

- f. Notwithstanding the provisions of Sections a, b, and d hereof, the Building Inspector may issue one or more certificates for temporary occupancy of all or portions of the buildings prior to the installation of final landscaping and other site features, provided that the Petitioner shall have first filed with the Board surety in an amount not less than 135% of the value of the aforementioned remaining landscaping or other work to secure installation of such landscaping and other site and construction features.
- 3.26 In addition to the provisions of this approval, the Petitioner must comply with all requirements of all state, federal, and local boards, commissions or other agencies, including, but not limited to, the Board of Selectmen, Building Inspector, Fire Department, Department of Public Works, Conservation Commission, Police Department, and Board of Health.
- 3.27 The building or structure authorized for construction by this permit shall not be occupied or used, and no activity except the construction activity authorized by this permit shall be conducted within said area until a Certificate of Occupancy and Use or a Certificate of Temporary Occupancy and Use has been issued by the Building Inspector.
- 3.28 The Petitioner, by accepting this permit decision, warrants that the Petitioner has included all relevant documentation, reports, and information available to the Petitioner in the application submitted, that this information is true and valid to the best of the Petitioner's knowledge.
- 3.29 The Petitioner shall implement the following maintenance plan:
- a. Parking lot sweeping - sweep twice per year; once in spring after snowmelt, and early fall.
 - b. Catch basin cleaning - inspect basins twice per year; in late spring and fall. Clean basins in spring.
 - c. Oil/grit separators - inspect bi-monthly and clean four times per year of all oil and grit.
- 3.30 Violation of any of the conditions of this decision shall be grounds for revocation of any building permit or certificate of occupancy granted hereunder as follows: In the case of violation of any conditions of this decision, the Town will notify the owner of such violation and give the owner reasonable time, not to exceed thirty (30) days, to cure the violation. If, at the end of said thirty (30) day period, the Petitioner has not cured the violation, or in the case of violations requiring more than thirty (30) days to cure, has not commenced the cure and prosecuted the cure continuously, the permit granting authority may, after notice to the Petitioner, conduct a hearing in order to determine whether the failure to abide by the conditions contained herein should result in a recommendation to the Building Inspector to revoke any building permit or certificate of occupancy granted hereunder. This provision is not intended to limit or curtail the Town's other remedies to enforce compliance with the conditions of this decision including, without limitation, by an action for injunctive relief before any court of competent jurisdiction. The Petitioner agrees to reimburse the Town for its reasonable costs in connection with the enforcement of the conditions of this decision if the Town prevails in such enforcement action.

LIMITATIONS

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

- 4.1 This permit applies only to the site and off-site improvements, which are the subject of this petition. All construction to be conducted on-site and off-site shall be conducted in accordance with the terms of this permit and shall be limited to the improvements on the Plan, as modified by this decision.
- 4.2 There shall be no further development of this site without further site plan approval as required under Section 7.4 of the By-Law. The Board, in accordance with M.G.L., Ch. 40A, S.9 and said Section 7.4, hereby retains jurisdiction to (after hearing) modify and/or amend the conditions to, or otherwise modify, amend or supplement, this decision and to take other action necessary to determine and ensure compliance with the decision.
- 4.3 This decision applies only to the requested Special Permits and Site Plan Review. Other permits or approvals required by the By-Law, other governmental boards, agencies or bodies having jurisdiction shall not be assumed or implied by this decision.
- 4.4 The conditions contained within this decision are limited to this specific application and are made without prejudice for any further modification or amendment.
- 4.5 No approval of any indicated signs or advertising devices is implied by this decision.
- 4.6 The foregoing restrictions are stated for the purpose of emphasizing their importance but are not intended to be all-inclusive or to negate the remainder of the By-Law.
- 4.7 This Site Plan Special Permit shall lapse on February 16, 2023, if substantial use thereof has not sooner commenced, except for good cause. Any requests for an extension of the time limits set forth herein must be in writing to the Board at least 30 days prior to February 16, 2023. The Board herein reserves its rights and powers to grant or deny such extension without a public hearing. The Board, however, shall not grant an extension as herein provided except for good cause.
- 4.8 This decision shall be recorded in the Norfolk District Registry of Deeds and shall not become effective until the Petitioner has delivered a certified copy of the document to the Board. In accordance with G.L. Chapter 40A, Section 11, this Major Site Plan Special Permit shall not take effect until a copy of this decision bearing the certification of the Town Clerk that twenty (20) days have elapsed after the decision has been filed in the office of the Town Clerk and either that no appeal has been filed or the appeal has been filed within such time is recorded in the Norfolk District Registry of Deeds and is indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The person exercising rights under a duly appealed Special Permit does so at the risk that a court will reverse the permit and that any construction performed under the permit may be ordered undone.

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

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

Witness our hands this 16th day of February, 2021

NEEDHAM PLANNING BOARD

Jeanne S. McKnight, Chairman

Paul S. Alpert

Martin Jacobs

Adam Block

Ted Owens

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss _____ 2021

On this _____ day of _____, 2021, before me, the undersigned notary public, personally appeared _____, one of the members of the Planning Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

Notary Public

My Commission Expires: _____

TO WHOM IT MAY CONCERN: This is to certify that the 20-day appeal period on the approval of the Project proposed by Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025, for Property located at 400 Hunnewell Street, Needham, Massachusetts, has passed,

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

Date

Theodora K. Eaton, Town Clerk

Copy sent to:

Petitioner-Certified Mail # _____
Town Clerk
Building Inspector
Conservation Commission
Parties in Interest

Board of Selectmen
Engineering
Fire Department
Police Department

Board of Health
Director, PWD
Design Review Board
George Giunta, Jr.

Major Project Site Plan Special Permit No. 2020-03
February 16, 2021
Hunnewell Needham, LLC
400 Hunnewell Street

(Filed during the Municipal Relief Legislation, Chapter 53 of the Acts of 2020)

DECISION of the Planning Board (hereinafter referred to as the Board) on the petition of Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025, for property located at 400 Hunnewell Street, Needham, MA. Said property is located in the Hillside Avenue Business District. The property is shown on Assessors Plan No. 99 as Parcel 3 containing a total of 20,123 square feet.

This decision is in response to an application submitted to the Board on November 24, 2020, by the Petitioner for: (1) a Major Project Site Plan Special Permit under Section 7.4 of the Needham Zoning By-Law (hereinafter the By-Law); (2) a Special Permit under Section 1.4.6 of the By-Law for a change and extension of a lawful, pre-existing, non-conforming use, and the alteration and enlargement and reconstruction of a lawful, pre-existing, non-conforming structure; (3) a Special Permit under Section 3.2.2 of the By-Law for an apartment or multifamily dwelling in the Hillside Avenue Business District; (4) a Special Permit under Section 4.4.2 of the By-Law to exempt the basement level underground parking from inclusion in the Floor Area Ratio calculation; and (5) a Special Permit under Section 5.1.1.5 of the By-Law to waive strict adherence with the requirements of Section 5.1.3 (Parking Plan and Design Requirements) of the By-Law.

The requested Major Project Site Plan Special Permit, would, if granted, permit the Petitioner to demolish the existing commercial building and replace it with a new residential building containing a total of eight units. The new building would be two stories high, plus a basement level, to be used for underground parking. The first and second floor together would contain a total of 12,915 square feet of floor area. The area to the left of the building, looking from the front, is proposed to be completely landscaped, as will the area in front of the building. Additional landscaping would be provided in the rear corner of the Premises as well. The rest of the Premises is proposed to be occupied by an access driveway and 7 surface parking spaces.

After causing notice of the time and place of the public hearing and of the subject matter thereof to be published, posted and mailed to the Petitioner, abutters and other parties in interest as required by law, the hearing was called to order by the Chairperson, Jeanne S. McKnight on Tuesday, December 15, 2020 at 7:20 p.m. via remote meeting using Zoom ID [826-5899-3198](#). The hearing was continued to Monday, January 4, 2021 at 7:30 p.m., using Zoom ID [826-5899-3198](#). The hearing was further continued to Tuesday, January 19, 2021 at 8:15 p.m., using Zoom ID [826-5899-3198](#). The hearing was further opened on Tuesday, February 2, 2021, to accept the correspondence detailed under Exhibit 11 below. Board members Jeanne S. McKnight, Paul S. Alpert, Martin Jacobs, Adam Block and Ted Owens were present throughout the proceedings.

The record of the proceedings and the submission upon which this decision is based may be referred to in the office of the Town Clerk or the office of the Board.

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

- Exhibit 1 - Application submitted by Hunnewell Needham, LLC, dated November 24, 2020 with Addendum A.
- Exhibit 2 - Two letters from George Giunta Jr. Attorney, dated November 5, 2020 and January 6, 2021.
- Exhibit 3 - Letter from Elisha Long, Manager, Hunnewell Needham, LLC, dated November 5, 2020.
- Exhibit 4 - Plan set prepared by Field Resources, 281 Chestnut Street, Needham, MA, J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, consisting of 8 sheets: Sheet 1, Cover Sheet, dated November 2, 2020; Sheet 2, entitled "Existing Conditions Plan of Land," dated March 5, 2020, revised April 6, 2020 and November 5, 2020; Sheet 3, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020 and November 5, 2020; Sheet 4, entitled "Grading and Drainage Plan," dated November 2, 2020; Sheet 5, entitled "Utility Plan," dated November 2, 2020; Sheet 6, entitled "Erosion and Sediment Control Plan," dated November 2, 2020; Sheet 7, entitled "Details ½," dated November 2, 2020; Sheet 8, entitled "Details 2/2," dated November 2, 2020.
- Exhibit 5 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Cover Sheet, dated November 5, 2020; Sheet 2, Sheet A.B.1, entitled "Lower Level Garage Plan," dated November 5, 2020; Sheet 3, Sheet A.1.1, entitled "1st Floor Plan," dated November 5, 2020; Sheet 4, Sheet A.1.2, entitled "2nd Floor Plan," dated November 5, 2020; Sheet 5, Sheet A.1.3, entitled "Roof Plan," dated November 5, 2020; Sheet 6, Sheet A201, entitled "Proposed Elevations," dated November 5, 2020; Sheet 7, Sheet A202, entitled "Proposed Elevations," dated November 5, 2020.
- Exhibit 6 - Stormwater Management Report, prepared by J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, dated November 2, 2020.
- Exhibit 7 - Plan prepared by Field Resources, 281 Chestnut Street, Needham, MA, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and November 20, 2020.
- Exhibit 8 - Plan prepared by Verdant Landscape Architecture, entitled "Landscape Plan, 400 Hunnewell Street, Needham MA," dated December, 2020.
- Exhibit 9 - Letter from Bette Vogel, Rushit Kamani and Annie Atlas, dated December 4, 2020.
- Exhibit 10 - Memorandum from Design Review Board, dated December 7, 2020.

- Exhibit 11 - Letter from Bette Vogel, Rhonda Altman, Rushit Kamani, Mary Bronski, Noah Atlas, Karina Dodor, Elizabeth Hayden, Sam Hart, residents from 154, 156 and 160 Hillside Avenue, dated December 21, 2020, with attached photographs.
- Exhibit 12 - Email from Jeanne McKnight, Planning Board Chair, dated December 29, 2020, with attached photographs.
- Exhibit 13 - Email from Inga Puzikov, dated January 19, 2021.
- Exhibit 14 - Email from Martin Raffol, dated January 19, 2021.
- Exhibit 15 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Cover Sheet, dated January 4, 2021; Sheet 2, Sheet A.B.1, entitled "Lower Level Garage Plan," dated January 4, 2021; Sheet 3, Sheet A.1.1, entitled "1st Floor Plan," dated January 4, 2021; Sheet 4, Sheet A.1.2, entitled "2nd Floor Plan," dated January 4, 2021; Sheet 5, Sheet A.1.3, entitled "Roof Plan," dated January 4, 2021; Sheet 6, Sheet A201, entitled "Proposed Elevations," dated January 4, 2021; Sheet 7, Sheet A202, entitled "Proposed Elevations," dated January 4, 2021.
- Exhibit 16 - Plan set prepared by Field Resources, 281 Chestnut Street, Needham, MA, J.M. Grenier Associates, Inc., 325 Donald Lynch Blvd., Suite 100, Marlborough, MA, 01752, consisting of 8 sheets: Sheet 1, Cover Sheet, dated November 2, 2020; Sheet 2, entitled "Existing Conditions Plan of Land," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and December 30, 2020; Sheet 3, entitled "Layout Plan showing proposed Structure," dated March 5, 2020, revised April 6, 2020, November 5, 2020 and December 30, 2020; Sheet 4, entitled "Grading and Drainage Plan," dated November 2, 2020; Sheet 5, entitled "Utility Plan," dated November 2, 2020; Sheet 6, entitled "Erosion and Sediment Control Plan," dated November 2, 2020; Sheet 7, entitled "Details 1/2," dated November 2, 2020; Sheet 8, entitled "Details 2/2," dated November 2, 2020.
- Exhibit 17 - Plan set prepared by Verdant Landscape Architecture, consisting of 3 sheets: Sheet 1, Sheet L1, entitled "Landscape Plan, 400 Hunnewell Street," dated December 14, 2020; Sheet 2, Sheet L2, entitled "Lighting Plan, 400 Hunnewell Street," dated December 14, 2020; Sheet 3, Sheet L3, entitled "Materials, 400 Hunnewell Street," dated December 14, 2020.
- Exhibit 18 - Plan consisting of 2 sheets, each showing March 19, 2020 Sun Path.
- Exhibit 19 - Plan set prepared by Duckham Architecture and Interiors, 53 Central Avenue, Needham, MA, consisting of 7 sheets: Sheet 1, Sheet A.0.1, entitled "Existing Site Photos," dated January 4, 2021; Sheet 2, Sheet A.0.2, entitled "Existing Site Photos," dated January 4, 2021; Sheet 3, Sheet A.0.3, entitled "Existing Site Photos, View of Tracks & Train," dated January 4, 2021; Sheet 4, Sheet A.0.4, entitled "Existing Shadow Photos," dated January 4, 2021; Sheet 5, Sheet A.0.5, entitled "Existing Roof Height Photos," dated January 4, 2021; Sheet 6, Sheet A.0.6, entitled "Existing Site Photos, View from Office Building," dated January 4, 2021; Sheet 7, Sheet A.0.7, entitled "Site Sections," dated January 4, 2021.

Exhibit 20 - Interdepartmental Communication (IDC) to the Board from Chief John Schlittler, Needham Police Department, dated December 4, 2020 and January 6, 2021; IDC to the Board from Thomas Ryder, Assistant Town Engineer, dated December 14, 2020 and January 12, 2021; and IDC to the Board from Tara Gurge, Health Department, dated December 10, 2020.

Exhibits 1, 2, 3, 6, 15, 16, 17, 18, and 19 are referred to hereinafter as the Plan.

FINDINGS AND CONCLUSIONS

Based upon its review of the exhibits and the record of the proceedings, the Board found and concluded that:

- 1.1 The subject property is located in the Hillside Avenue Business District at 400 Hunnewell Street, Needham, MA. The said property is shown on Needham Town Assessors Plan No. 99 as Parcel 3 and contains approximately 20,123 square feet. The property is owned by Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025.
- 1.2 The site is presently fully developed, occupied by a two-story commercial building, associated parking areas and limited landscaping. Based on the records of the Assessor's Department, the building, which is made of concrete block, was constructed in or around 1975. It contains approximately 8,520 square feet of area divided over two floors, both of which are used for office purposes.
- 1.3 The Petitioner proposes to demolish the existing commercial building and replace it with a new residential building containing a total of eight units. The new building would be two stories high, plus a basement level, to be used for 16 underground parking spaces. The first and second floor together would contain a total of 12,915 square feet of floor area. The area to the left of the building, looking from the front, is proposed to be completely landscaped, as is the area in front of the building. Additional landscaping is proposed in the rear corner of the premises as well. The rest of the premises is proposed to be occupied by an access driveway and 7 surface parking spaces. Access to the surface parking lot and the underground garage will be provided off of Hunnewell Street. As a part of the site improvements, the Petitioner is proposing to install a stormwater infiltration system on site.
- 1.4 As indicated above, the proposed new building will be used entirely for residential purposes. Pursuant to Section 3.2.2 of the Zoning By-Law, use of property in the Hillside Avenue Business District for "apartment or multifamily dwelling" is allowed by special permit. Therefore, provided the Board approves the requested special permit, the proposed use of the premises will comply with the By-Law.
- 1.5 The By-Law, Section 4.4.1 requires that the minimum lot area be 10,000 square feet and the minimum lot frontage be 80 feet. The proposed development, having a lot with an area of approximately 20,123 square feet and 104.31 feet of frontage on Hunnewell Street, complies with the minimum frontage and the minimum area requirements.

- 1.6 The By-Law, Section 4.4.4 requires a minimum front setback of 20 feet. The proposed building is to have a front setback of 20 feet from Hunnewell Street at its closest point. Therefore, the proposed new building complies with the applicable setback requirements.
- 1.7 The By-Law, Section 4.4.2 (e) allows a maximum floor area ratio (FAR) of 0.7 or 14,086.1 square feet in the subject case. The proposed new building will contain a total of 14,076 square feet; 10 square feet less than the maximum permitted. In addition, the basement level will be occupied by a parking garage. Provided the Planning Board issues a special permit waiving inclusion of the underground parking garage in the FAR calculation, the floor area will remain less than the maximum allowed by the By-Law, and the proposed new building will comply with the applicable FAR requirement.
- 1.8 Pursuant to Section 4.4.3 the maximum height allowed as of right in the Hillside Avenue Business District is two and one-half (2 ½) stories, not to exceed 35 feet; with all use except storage prohibited above the second floor. Whereas the proposed new building is two stories with a height of 29 feet, the proposed new building will comply with the height limitations of the By-Law.
- 1.9 The By-Law, Section 4.4.5, further requires that no more than two driveways be permitted for every 150 feet of frontage, and two-way driveways of the kind proposed for the premises must be no less than 18 feet wide and no more than 25 feet wide. Whereas only one driveway is proposed, and whereas the driveway is 25 feet wide, same complies with the applicable driveway opening conditions of Section 4.4.5.¹
- 1.10 The By-Law, Section 4.4.8.4, requires that:

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

A small portion of the Premises directly abuts the Single Residence B Zoning District, at the rear corner, with a larger portion located adjacent to the MBTA railroad right-of-way. Because the HAB district boundary ends at the edge of the railroad right-of-way, and whereas the opposite side of the right-of-way is located in the SRB District, the property line likely constitutes a residential district boundary, as contemplated by Section 4.4.8.4.

However, whereas the proposed new building is an apartment or multi-family dwelling, used for residential purposes, and whereas apartments and multifamily structures and residential use are allowed in a residential district, the provisions of Section 4.4.8.4 do not apply by their own terms.

- 1.11 Under the By-Law, Section 5.1.4, 1.5 parking spaces per each residential unit is required for the eight residential units, for a total of 12 spaces. The Petitioner is proposing to install a total of 23 spaces: 16 underground parking spaces and an additional 7 surface

¹ The Board notes that technically only 12.5 feet of the driveway opening is on the Premises, as the proposed driveway utilizes a common right of way, shared with the adjacent Premises, as set forth in Deed recorded with Norfolk County Registry of Deeds in Book 5115, Page 175, and shown on “Plan of Land in Needham, Mass.”, dated January 28, 1975, prepared by Apex Associates, endorsed by the Needham Planning Board and recorded therewith.

spaces; two to the right of the new building and 5 to the rear. As a result, more than sufficient parking is provided, and the redevelopment complies with the off-street parking requirements of the By-Law relative to the number of spaces.

- 1.12 The spaces as designed comply with all aspects of the Parking Plan and Design Requirements set forth at Section 5.1.3 of the By-Law except the following three, for which waivers are required and requested by the Petitioner under this Section: (1) The illumination proposed is limited to the lights mounted on the building, short bollards and decorative ground mounted lighting, which are all expected to produce an average illumination level of less than one foot candle in the parking area, instead of the requirement of an illumination level of an average of one foot candle required pursuant to Section 5.1.3(a); (2) The By-Law Section 5.1.3(k) requires that ten (10) percent or more of the parking area shall be maintained as landscaped area. Whereas the majority of the parking provided is in an underground structure, and due to the configuration of the site, a waiver from such provision has been requested; (3) As applied to the Premises, the By-Law Section 5.1.3(l) requires two trees, located within or around the parking area, with not less than 40 square feet of unpaved soil or other permeable surface area per tree, in planting beds at least 4 feet wide. While the Petitioner is proposing landscaping at the front and rear corner of the Premises, same does not meet the tree requirement and a waiver has been requested.
- 1.13 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 has been assured. The Board finds that the use of the premises for residential purposes does not constitute a “seriously detrimental use.” The premise is to be connected to the municipal storm drain system. Surface water drainage will be improved over the existing conditions and adequate provision has been made for same. Considering that the premises is bounded to the rear by the MBTA railroad right of way, to one side by a commercial use and to the other side by a multifamily / apartment development, no additional sound and sight buffers are required, and with the redevelopment of the site, views, light and air have been adequately mitigated with height adjustments made in the course of this approval to mitigate shadowing on adjacent properties.
- 1.14 Convenience and safety of vehicular and pedestrian movement within the site and on adjacent streets has been assured. The driveway serving the parking area is of adequate width and in an appropriate location, and the building is accessed by a walkway.
- 1.15 The arrangement of parking and loading spaces is adequate, based on the layout and use of the site. Parking is arranged both around and below the building and is readily accessible. The proposed residential use of the building is not expected to require any special or dedicated loading spaces.
- 1.16 Adequate methods of disposal of refuse and other wastes resulting from the uses of the site have been provided. The proposed residential use of the premises is not anticipated to generate any significant wastes or trash. Nevertheless, it will be a requirement for the occupants of the building that all trash, waste and debris be removed on a regular basis, as necessary and appropriate, consistent with customary residential use.
- 1.17 The relationship of structures and open spaces to the natural landscape, existing buildings and other community assets in the area are in compliance with other requirements of this By-law and have been adequately addressed by this project. The property is bounded on one side by an existing commercial activity on another by a multifamily development,

and on the third side by the MBTA railroad right of way. As a result, the proposed development for residential purposes is not anticipated to have any significant negative effect on any community asset or any adjacent landscape.

- 1.18 The Project will not have an adverse effect on the Town's resources, including the Town's water supply and distribution system, sewer collection and treatment, fire protection and streets. The use of the Premises for residential purposes is consistent with both other current uses in the Hillside Avenue Business District and the uses allowed pursuant to the By-Law. The building will not generate large numbers of motor vehicles and the project has been designed to accommodate fire and other emergency services. The project will connect to the Town's water system that is located in Hunnewell Street. The project will connect to the Town's sewer system by means of connecting to the sewer main located in Hunnewell Street.
- 1.19 Under Section 7.4 of the By-Law, a Major Project Site Plan Review Special Permit may be granted in the Hillside Avenue Business District, if the Board finds that the proposed development complies with the standards and criteria set forth in the provisions of the By-Law. On the basis of the above findings and conclusions, the Board finds that the proposed development Plan, as conditioned and limited herein for the site plan review, to be in harmony with the purposes and intent of the By-Law, to comply with all applicable By-Law requirements, to have minimal adverse impact and to have promoted a development which is harmonious with the surrounding area.
- 1.20 Under Section 3.2.2 of the By-Law, a Special Permit may be granted for apartment or multifamily dwelling use in the Hillside Avenue Business District . On the basis of the above findings and conclusions, the Board finds the proposed development Plan, as conditioned and limited herein, to be in harmony with the general purposes and intent of the By-Law, to comply with all applicable By-Law requirements, and to not increase the detriment to the Town's and neighborhood's inherent use.
- 1.21 Under Section 5.1.1.5 of the By-Law, a Special Permit to waive strict adherence with the requirements of Section 5.1.3 of the By-Law (Off-Street Parking Requirements) more specifically, in Sections 5.1.3(a), 5.1.3(k) and 5.1.3(l), as further described in Section 1.12 above, may be granted provided the Board finds that owing to special and unique circumstances, the particular use, structure or lot does not warrant the application of certain design requirements. On the basis of the above findings and conclusions, the Board finds that there are special and unique circumstances justifying the waiver of the above-noted requirements, as conditioned and limited herein, which will also be consistent with the intent of the By-Law and which will not increase the detriment to the Town's and neighborhood's inherent use.
- 1.22 Under Section 4.4 of the By-Law, a Special Permit may be granted to exempt the floor area of underground parking devoted in whole or in part to the parking of automobiles from being counted as floor area for purposes of determining maximum floor area ratio. On the basis of the above findings and conclusions, the Board finds that there are special and unique circumstances justifying the waiver of the above-noted requirements, as conditioned and limited herein, which will also be consistent with the intent of the By-Law and which will not increase the detriment to the Town's and neighborhood's inherent use.

THEREFORE, the Board voted 5-0 to GRANT: (1) the requested Major Project Site Plan Special Permit under Section 7.4 of the Needham Zoning By-law; (2) the requested Special Permit under

Section 3.2.2 of the By-Law for apartment or multifamily dwelling in the Hillside Avenue Business District; (3) the requested Special Permit under Section 4.4.2 of the By-Law to exempt the basement level underground parking from inclusion in the Floor Area Ratio calculation; and (4) the requested Special Permit under Section 5.1.1.5 of the By-Law to waive strict adherence with the requirements of Section 5.1.3 (Parking Plan and Design Requirements) of the By-Law, as modified by this decision; subject to and with the benefit of the following Plan modifications, conditions and limitations.

PLAN MODIFICATIONS

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

- 2.0 The Plans shall be modified to include the requirements and recommendations of the Board as set forth below. The modified plans shall be submitted to the Board for approval and endorsement.
 - a) The “Parking Plan and Design Requirements” compliance table shall be added to the site plan and be consistent with the waivers requested under the Section 5.1.3 requirement.

CONDITIONS

- 3.0 The following conditions of this approval shall be strictly adhered to. Failure to adhere to these conditions or to comply with all applicable laws and permit conditions shall give the Board the rights and remedies set forth in Section 3.319 hereof.
- 3.1 The building, parking areas, driveways, walkways, landscape areas, and other site and off-site features shall be constructed in accordance with the Plan, as modified by this decision. Any changes, revisions or modifications to the Plan, as modified by this decision, shall require approval by the Board.
- 3.2 The proposed building and support services shall contain the dimensions and shall be located on that portion of the locus exactly as shown on the Plan, as modified by this decision, and in accordance with the applicable dimensional requirements of the By-Law.
- 3.3 The building shall be used exclusively for residential purposes. The basement level shall contain parking spaces for 16 automobiles. Any changes, revisions or modifications to the Plan, as modified by this decision, shall require approval by the Board.
- 3.4 Except in the event that the property is condominiumized, all buildings and land constituting the property shall remain under a single ownership.

- 3.5 Sufficient parking shall be provided on the locus at all times in accordance with the Plan, as modified by this decision, and that there shall be no parking of motor vehicles off the locus at any time except in designated legal on-street parking areas. The sales/leasing plan shall not allow the allocation of parking spaces to tenants or unit owners in excess of the available number.
- 3.6 Sixteen (16) underground parking spaces shall be provided on the site at all times in accordance with the Plan, as modified by this decision. While the Petitioner proposed and the Board approves seven (7) surface spaces, notwithstanding any provision of this Decision to the contrary, the Board notes that the 5 surface spaces in the rear of the Building may be eliminated without the need to return to the Board. All off-street parking shall comply with the requirements of Section 5.1.3 of the By-Law, except as otherwise waived by this decision.
- 3.7 All required handicapped parking spaces shall be provided including above-grade signs at each space that include the international symbol of accessibility on a blue background with the words "Handicapped Parking Special Plate Required Unauthorized Vehicles May Be Removed At Owners Expense". The quantity & design of spaces, as well as the required signage shall comply with the M.S.B.C. 521 CMR Architectural Access Board Regulation and the Town of Needham General By-Laws, both as may be amended from time to time.
- 3.8 The Petitioner shall secure from the Needham Department of Public Works a Sewer Connection Permit or impact fee, if and to the extent applicable.
- 3.9 The Petitioner shall secure from the Needham Department of Public Works a Street Opening Permit, if and to the extent applicable.
- 3.10 The Petitioner shall seal all abandoned drainage connections and other drainage connections where the developer cannot identify the sources of the discharges. The Petitioner shall connect the sanitary sewer line only to known sources. All sources that cannot be identified shall be disconnected and properly sealed.
- 3.11 The construction, operation and maintenance of the subsurface infiltration facility, on-site catch basins and pavement areas, shall conform to the requirements outlined in the EPA's Memorandum of Understanding signed by the Needham Board of Selectmen.
- 3.12 The Storm Water Management Policy form shall be submitted to the Town of Needham signed and stamped and shall include construction mitigation and an operation and maintenance plan as described in the policy.
- 3.13 The Petitioner shall comply with the Public Outreach & Education and Public Participation & Involvement control measures required under NPDES. The Petitioner shall submit a letter to the DPW identifying the measures selected and dates by which the measures will be completed.
- 3.14 The Petitioner shall provide wooden privacy fence with lattice as well as trees, along the northeastern edge of the property, as shown on the plan.
- 3.15 All solid waste shall be removed from the site by a private contractor, as and when necessary. Snow shall also be removed or plowed by private contractor, as and when

necessary. All snow shall be removed or plowed such that the total number and size of parking spaces are not reduced.

- 3.16 All commercial deliveries and trash pick-up shall occur only between the hours of 8:30 a.m. and 6:00 p.m., Monday through Saturday, not at all on Sundays and holidays. Trash shall be removed from the building as necessary and shall not be stored in dumpsters or external containers.

- 3.17 ~~3.17~~ All lights shall be shielded and adjusted during the evening hours to prevent any annoyance to the neighbors. The Petitioner shall utilize the exterior lighting located on the exterior of the building to shine down and provide basic and adequate security. There are bollard and railing lights proposed in the handicapped parking area as well the handicapped ramp and the walkway at the rear of the building.

Lighting shall be adjusted during the evening hours to prevent any annoyance to the neighbors. The Petitioner shall reduce its exterior building and site lighting during the night with that reduction remaining in effect until the following morning. Between the hours of 9:00 p.m. and 10:00 p.m. all site lighting shall be turned off and converted to a motion detection system except as specifically noted: a) the lights embedded in the stair risers may stay on overnight for safety, given their location and low level, b) the light above the front entry (on the daycare side) may stay on from sunset to sunrise for safety and c) the lights above the garage door may be turned on when the garage door is activated.

- 3.18 The maintenance of landscaping, as shown on the Plan, as modified by this decision, shall be the responsibility of the Petitioner.
- 3.19 Any portions of the sidewalks located on Hunnewell Street shall be built to Town of Needham Specifications.
- 3.20 In constructing and operating the proposed building on the locus pursuant to this Special Permit, due diligence be exercised and reasonable efforts be made at all times to avoid damage to the surrounding areas or adverse impact on the environment.
- 3.21 Excavation material and debris, other than rock used for walls and ornamental purposes and fill suitable for placement elsewhere on the site, shall be removed from the site.
- 3.22 All construction staging shall be on-site. No construction parking shall be on public streets. Construction parking shall be all on site or a combination of on-site and off-site parking at locations in which the Petitioner can make suitable arrangements. Construction staging plans shall be included in the final construction documents prior to the filing of a Building Permit and shall be subject to the review and approval of the Building Inspector.
- 3.23 The following interim safeguards shall be implemented during construction:
- a. The hours of construction shall be 7:00 a.m. to 5:00 p.m. Monday through Saturday.
 - b. The Petitioner's contractor shall provide temporary security chain-link or similar type fencing around the portions of the project site, which require excavation or otherwise pose a danger to public safety.

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

d. The Petitioner shall take appropriate steps to minimize, to the maximum extent feasible, dust generated by the construction including, but not limited to, requiring subcontractors to place covers over open trucks transporting construction debris and keeping Hunnewell Street clean of dirt and debris and watering appropriate portions of the construction site from time to time as may be required.

3.24 No building permit shall be issued in pursuance of the Special Permit and Site Plan Approval until:

a. The final plans shall be in conformity with those approved by the Board, and a statement certifying such approval shall have been filed by this Board with the Building Inspector.

b. A construction management and staging plan shall have been submitted to the Police Chief and Building Inspector for their review and approval.

c. The Petitioner shall have submitted a letter to the DPW identifying the measures selected and dates by which the NPDES requirements outlined in Section 3.13 of this decision will be completed.

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

3.25 No building or structure, or portion thereof, subject to this Special Permit and Site Plan Approval shall be occupied until:

a. An as-built plan, supplied by the engineer of record certifying that the on-site and off-site project improvements were built according to the approved documents, has been submitted to the Board and Department of Public Works. The as-built plan shall show the building, all finished grades and final construction details of the driveways, parking areas, drainage systems, utility installations, and sidewalk and curbing improvements on-site and off-site, in their true relationship to the lot lines. In addition to the engineer of record, said plan shall be certified by a Massachusetts Registered Land Surveyor.

b. There shall be filed with the Building Inspector and Board a statement by the Department of Public Works certifying that the finished grades and final construction details of the driveways, parking areas, drainage systems, utility installations, and sidewalks and curbing improvements on-site and off-site, have been constructed to the standards of the Town of Needham Department of Public Works and in accordance with the approved Plan.

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

d. There shall be filed with the Board and Building Inspector an as-built Landscaping Plan and As-Built Lighting Plan showing the final location, number and type of plant material, final landscape features, parking areas, and lighting installations. Said plan shall be prepared by the landscape architect of record and shall include a certification that such improvements were completed according to the approved documents.

e. There shall be filed with the Board a statement by the Engineering Division of DPW that the Petitioner has met the NPDES requirement as detailed in Section 3.13.

f. Notwithstanding the provisions of Sections a, b, and d hereof, the Building Inspector may issue one or more certificates for temporary occupancy of all or portions of the buildings prior to the installation of final landscaping and other site features, provided that the Petitioner shall have first filed with the Board surety in an amount not less than 135% of the value of the aforementioned remaining landscaping or other work to secure installation of such landscaping and other site and construction features.

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

3.27 Any blasting conducted at the property shall require approval by the Needham Fire Department in accordance with Massachusetts Comprehensive Fire Safety Code, 527 CMR 1.00.

3.28 The building or structure authorized for construction by this permit shall not be occupied or used, and no activity except the construction activity authorized by this permit shall be conducted within said area until a Certificate of Occupancy and Use or a Certificate of Temporary Occupancy and Use has been issued by the Building Inspector.

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

3.30 The Petitioner shall implement the following maintenance plan:

a. Parking lot sweeping - sweep twice per year; once in spring after snowmelt, and early fall.

b. Catch basin cleaning - inspect basins twice per year; in late spring and fall. Clean basins in spring.

c. Oil/grit separators - inspect bi-monthly and clean four times per year of all oil and grit.

3.31 Violation of any of the conditions of this decision shall be grounds for revocation of any building permit or certificate of occupancy granted hereunder as follows: In the case of

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

LIMITATIONS

- 4.0 The authority granted to the Petitioner by this permit is limited as follows:
- 4.1 This permit applies only to the site and off-site improvements, which are the subject of this petition. All construction to be conducted on-site and off-site shall be conducted in accordance with the terms of this permit and shall be limited to the improvements on the Plan, as modified by this decision.
- 4.2 There shall be no further development of this site without further site plan approval as required under Section 7.4 of the By-Law. The Board, in accordance with M.G.L., Ch. 40A, S.9 and said Section 7.4, hereby retains jurisdiction to (after hearing) modify and/or amend the conditions to, or otherwise modify, amend or supplement, this decision and to take other action necessary to determine and ensure compliance with the decision.
- 4.3 This decision applies only to the requested Special Permits and Site Plan Review. Other permits or approvals required by the By-Law, other governmental boards, agencies or bodies having jurisdiction shall not be assumed or implied by this decision.
- 4.4 The conditions contained within this decision are limited to this specific application and are made without prejudice for any further modification or amendment.
- 4.5 No approval of any indicated signs or advertising devices is implied by this decision.
- 4.6 The foregoing restrictions are stated for the purpose of emphasizing their importance but are not intended to be all-inclusive or to negate the remainder of the By-Law.
- 4.7 This Site Plan Special Permit shall lapse on February 16, 2023, if substantial use thereof has not sooner commenced, except for good cause. Any requests for an extension of the time limits set forth herein must be in writing to the Board at least 30 days prior to February 16, 2023. The Board herein reserves its rights and powers to grant or deny such extension without a public hearing. The Board, however, shall not grant an extension as herein provided except for good cause.
- 4.8 This decision shall be recorded in the Norfolk District Registry of Deeds and shall not become effective until the Petitioner has delivered a certified copy of the document to the Board. In accordance with G.L. Chapter 40A, Section 11, this Major Site Plan Special Permit shall not take effect until a copy of this decision bearing the certification of the

Town Clerk that twenty (20) days have elapsed after the decision has been filed in the office of the Town Clerk and either that no appeal has been filed or the appeal has been filed within such time is recorded in the Norfolk District Registry of Deeds and is indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The person exercising rights under a duly appealed Special Permit does so at the risk that a court will reverse the permit and that any construction performed under the permit may be ordered undone.

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

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

Witness our hands this 16th day of February, 2021

NEEDHAM PLANNING BOARD

Jeanne S. McKnight, Chairman

Paul S. Alpert

Martin Jacobs

Adam Block

Ted Owens

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss _____ 2021

On this _____ day of _____, 2021, before me, the undersigned notary public, personally appeared _____, one of the members of the Planning Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

Notary Public
My Commission Expires: _____

TO WHOM IT MAY CONCERN: This is to certify that the 20-day appeal period on the approval of the Project proposed by Hunnewell Needham, LLC, 393 South Main Street, Cohasset, MA, 02025, for Property located at 400 Hunnewell Street, Needham, Massachusetts, has passed,

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

Date

Theodora K. Eaton, Town Clerk

Copy sent to:

Petitioner-Certified Mail # _____
Town Clerk
Building Inspector
Conservation Commission
Parties in Interest

Board of Selectmen
Engineering
Fire Department
Police Department

Board of Health
Director, PWD
Design Review Board
George Giunta, Jr.



LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of M.G.L. Chapter 40A, S.11, and the Needham Zoning By-Laws, Sections 5.1.1.5, 5.1.1.7, 5.1.3 and 7.4; and Special Permit No. 1991-3, Section 4.2, the Needham Planning Board will hold a public hearing on Tuesday, February 16, 2021 at 7:30 p.m. by Zoom Web ID Number 826-5899-3198 (further instructions for accessing are below), regarding the application of the North Hill Needham, Inc. (formerly known as Living Care Villages of Massachusetts, Inc.), 865 Central Avenue, Needham, MA 02492, for Special Permits under Site Plan Review, Section 7.4 of the Needham Zoning By-Law.

The subject property is located at 865 Central Avenue, Needham, MA 02492. The property is shown on Needham Town Assessors Plan No.309 as Parcel No. 25 containing approximately 59.54 acres in the Apartment-2 and Single Residence A Zoning Districts. The property is the subject of Needham Board of Appeals decisions dated June 12, 1979, March 9, 1982, May 17, 1983, April 18, 1984 and August 20, 1985 and Needham Planning Board Major Project Site Plan Special Permit No. 91-3 dated May 28, 1991 as amended by Amendments dated July 1, 1997, October 7, 1997, August 10, 1999, June 16, 2009, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, and August 11, 2015, respectively. In addition, certain changes were approved by memo dated August 25, 2016 pursuant to the Planning Board's insignificant modifications policy.

The requested Major Project Site Plan Special Permit, would, if granted, permit the Petitioner to make modifications to the Plans approved in connection with Major Project Site Plan Special Permit Amendment No. 91-3, dated May 28, 1991 as amended by Amendments dated July 1, 1997, October 7, 1997, August 10, 1999, June 16, 2009, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, and August 11, 2015, respectively. The proposed modifications would allow the Petitioner to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane, and undertake associated sitework and landscaping.

The Petitioner has further noted in its application that the existing cooling tower shown on the plans for purposes of illustration is in need of replacement and that the proposed location of the cooling tower (also shown on the plans) is slightly different from the current location. The replacement of the existing cooling tower is part of a continuous process of maintenance, repair, and replacement of elements of a large facility such as North Hill, and Petitioner requests that the Board make a determination that said cooling tower replacement is not part of the site plan review process and will be permitted and overseen, as required, by the Building Department.

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 with the requirements of Section 5.1.3 (Parking Plan Design Requirements) of the Zoning By-Law, more specifically, in Section 5.1.3(f), to waive the parking space size requirement of six existing parking spaces; and in Section 5.1.3(n), to waive the requirement to install bicycle racks. In accordance with the Zoning By-Law, Section 7.4, a Major Project Site Plan Review is required. In accordance with Special Permit No. 1991-3, Section 4.2, further site plan approval is required.

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: 826-5899-3198

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: 826-5899-3198

The application may be viewed at this link:

<https://www.needhamma.gov/Archive.aspx?ADID=8484> 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, January 28, 2021 and February 4, 2021.

TOWN OF NEEDHAM
MASSACHUSETTS

500 Dedham Ave
Needham, MA 02192
781-455-7550
January 13, 2021

PLANNING BOARD

APPLICATION FOR FURTHER SITE PLAN REVIEW
AND SPECIAL PERMITS

Project Determination:

☒	Major Project
☐	Minor Project

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

Location of Property: 865 Central Avenue, Needham, MA 02492

Name of Applicant: North Hill Needham, Inc.

Address: 865 Central Avenue, Needham, MA 02492 Tel.#: 781 433 6204

Applicant is Owner ☐ Tenant ☒

Property Owner's Name: Babson College

Address: 1 College Drive, Babson Park, MA 02152 Tel.#: 781 235 1200

Characteristics of Property: Lot Area: 59.54 acres Present Use: Senior Living Apartments and nursing home

Map #: 309 Parcel #: 25 Zoning District: A-2 and SRA

Description of Project for Site Plan Review under Section 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

BABSON COLLEGE

By: _____

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 _____
Fee Waived _____

Withdrawn _____ (date)

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

Received by the Planning Board. Date: 1/22/2021
Hearing Date: February 16, 2021 Daphne M. Cullen

2021 JAN 25 AM 10:34
RECEIVED
NEEDHAM, MA 02492

Exhibit A
Application for Further Site Plan Review
North Hill Needham, Inc.
Property at 865 Central Avenue, Needham, MA

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

Reference is made to Site Plan Special Permit No. 91-3 dated May 28, 1991 and amendments thereto dated July 1, 1997, October 7, 1997, August 10, 1999, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, and August 11, 2015, respectively. In addition, certain changes were approved by memo dated August 25, 2016 pursuant to the Planning Board's insignificant modifications policy.

The Applicant proposes to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane, and undertake associated sitework and landscaping, all as more particularly shown on the plans filed herewith.

Applicant seeks further site plan review pursuant to Section 7.4 of the Bylaw, and a Special Permit waiving strict compliance with the requirements of Sections 5.1.1.5, 5.1.1.7, and 5.1.3 of the Bylaw.

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NEEDHAM, MA 02452
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TOWN OF NEEDHAM
MASSACHUSETTS

PLANNING BOARD

500 Dedham Ave
Needham, MA 02192
781-455-7550
January 13, 2021

APPLICATION FOR FURTHER SITE PLAN REVIEW
AND SPECIAL PERMITS

Project Determination: ☒ Major Project
☐ Minor Project

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

Location of Property: 865 Central Avenue, Needham, MA 02492

Name of Applicant: North Hill Needham, Inc.

Address: 865 Central Avenue, Needham, MA 02492 Tel.#: 781 433 6204

Applicant is Owner ☐ Tenant ☒

Property Owner's Name: Babson College

Address: 1 College Drive, Babson Park, MA 02152 Tel.#: 781 235 1200

Characteristics of Property: Lot Area: 59.54 acres Present Use: Senior Living Apartments and nursing home

Map #: 309 Parcel #: 25 Zoning District: A-2 and SRA

Description of Project for Site Plan Review under Section 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

BABSON COLLEGE

By: _____

SUMMARY OF PLANNING BOARD ACTION

Received by Planning Board [Signature]

Date 2/4/21

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)

Withdrawn _____ (date)

Fee Paid _____

Fee Waived _____

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

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PLANNING BOARD
NEEDHAM, MA 02192

TOWN OF NEEDHAM
MASSACHUSETTS

Room 20, Town Hall
Needham, MA 02192
617-455-7526
February, 2021

PLANNING BOARD

APPLICATION FOR FURTHER SITE PLAN REVIEW
AND SPECIAL PERMIT

Project Determination: ☒ Major Project
☐ Minor Project

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

Location of Property: 865 Central Avenue, Needham, MA 02492

Name of Applicant: North Hill Needham, Inc.

Address: 865 Central Avenue, Needham, MA 02492 Tel.#: 781 433 6204

Applicant is Owner ☐ Tenant ☒

Property Owner's Name: Babson College

Address: 1 College Drive, Babson Park, MA 02152 Tel.#: 781 235 1200

Characteristics of Property: Lot Area: 59.54 acres Present Use: Apartments and nursing home

Map #: 309 Parcel #: 25 Zoning District: A-2 and SRA

Description of Project for Site Plan Review under Section 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 BABSON COLLEGE

* only to make application and no other purpose By: [Signature]

SUMMARY OF PLANNING BOARD ACTION

Received by Planning Board [Signature] Date 2/4/21

Hearing Date _____

Decision Required by _____ (date) Parties in Interest Notified
(90 days after hearing for special permit) of Public Hearing _____ (date)

Granted _____ (date) Decision and Notices of the
Decision sent _____ (date)

Denied _____ (date)

Withdrawn _____ (date) Fee Paid _____
Fee Waived _____

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

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TOWN OF NEEDHAM
PLANNING BOARD

CLERK'S CERTIFICATE

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2021 FEB -4 AM 10:49

The undersigned, the duly elected and acting Secretary & Clerk of Babson College (the "Corporation"), a Massachusetts non-profit corporation, hereby certifies that Patricia Lyons is the College's Vice President for Facilities Management & Construction and is authorized under the College's Contract Signature Authority Policy (the "Policy") to execute documents on behalf of the Corporation, including the attached *Application for Further Site Plan Review and Special Permit* submitted by North Hill Needham, Inc. to the Town of Needham Massachusetts Planning Board.

I further certify that the Policy has not been altered, amended or rescinded but remains in full force and effect as of the date hereof.

WITNESS my hand and the seal of said Corporation.



Michael D. Layish
Secretary & Clerk

February 2, 2021



Exhibit A
Application for Further Site Plan Review
North Hill Needham, Inc.
Property at 865 Central Avenue, Needham, MA

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

Reference is made to Site Plan Special Permit No. 91-3 dated May 28, 1991 and amendments thereto dated July 1, 1997, October 7, 1997, August 10, 1999, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, and August 11, 2015, respectively. In addition, certain changes were approved by memo dated August 25, 2016 pursuant to the Planning Board's insignificant modifications policy.

The Applicant proposes to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane, and undertake associated sitework and landscaping, all as more particularly shown on the plans filed herewith.

Applicant seeks further site plan review pursuant to Section 7.4 of the Bylaw, and a Special Permit waiving strict compliance with the requirements of Sections 5.1.1.5, 5.1.1.7, and 5.1.3 of the Bylaw.

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NEEDHAM, MA 02462

FRIEZE CRAMER ROSEN & HUBER LLP
C O U N S E L L O R S A T L A W

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

EVANS HUBER
781-943-4043
EH@I28LAW.COM

January 14, 2021

By Electronic Mail and Hand Delivery

Planning Board
Town of Needham
500 Dedham Avenue
Needham, Massachusetts 02492

Re: North Hill Needham, Inc.
 865 Central Avenue, Needham, MA 02492
 Application for Further Site Plan Review and Special Permit

Dear Planning Board Members:

Pursuant to Chapter 40A of the Massachusetts General Laws, the Needham Zoning By-Law, the Needham Planning Board Rules, and Section 4.2 of Site Plan Special Permit Amendment No. 91-3 dated July 8, 2014, I hereby submit applications for Further Site Plan Review and Special Permits on behalf of my client, North Hill Needham, Inc., of which this letter is a part. The Board will recall that on September 8, 2011, it issued a Major Project Site Plan Review Permit (the “Original Decision”) that permitted certain renovations and expansions to the North Hill campus. Certain components of the Petitioner’s Master Plan were deferred until Town Meeting approved an amendment to the Zoning By-Law on November 7, 2011. On March 19, 2013, the Board issued a Site Plan Special Permit Amendment approving the balance of the components of the work. Thereafter, certain amendments were approved by decisions of this Board dated July 8, 2014, and August 11, 2015, respectively. In addition, certain changes were approved by memo dated August 25, 2016 pursuant to the Planning Board’s insignificant modifications policy.

The work approved by the Original Decision and the various amendments comprise the “Project.”¹ The current application addresses certain minor modifications that the Applicant wishes to make to the Project, including the following:

- (a) Widening the existing fire lane to 20 feet;

¹ Reference is made to Site Plan Special Permit No. 91-3 dated May 28, 1991 and amendments thereto dated July 1, 1997, October 7, 1997, August 10, 1999, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, August 11, 2015, and August 25, 2016, respectively.

Planning Board
January 14, 2021
Page 2

- (b) Creation of 75 new parking spaces adjacent to the widened fire lane;
- (c) Associated sitework, such as adding handrails to the existing walkway adjacent to Building G, and reconstructing a portion of the existing walkway adjacent to Building I; and
- (d) Landscaping;

all as more particularly shown on the Plans filed with the Application.

A list of the proposed changes to the Approved Plans is included in the Vanasse Hangen Brustlin, Inc. ("VHB") memorandum dated January 4, 2021, and filed with the Board as part of this application.

As the Planning Board is aware, North Hill has expanded and modernized its facility over the past several years, much of it pursuant to the Planning Board special permit/site plan review process. There presently exists a 12-foot wide fire lane that parallels the rear of the main building. During the construction process a number of residents and staff parked adjacent to the fire lane. Since in many instances those parking spaces were closer to residents' units or staff offices than the parking areas that were formerly utilized, a number of residents and staff continued to park adjacent to the fire lane. In addition to the benefit that proximity of spaces brings, particularly to many senior citizens who have some difficulty walking longer distances (much of it outside), many of our residents find comfort in being able to see their motor vehicle from their unit, or at least know that they are closer to their vehicles.

As a response to these concerns, as well as the desire of North Hill to widen the fire lane to 20 feet in accordance with updated fire regulations, (for increased safety) North Hill is proposing to construct 75 new parking spaces along a portion of the fire lane, as more particularly shown on the plans filed with the application. The proposed new parking area has been designed to comply with the parking area design criteria set forth in Section 5.1.3 of the Zoning By-law.

The Petitioner notes that while the existing Decision provides that at the conclusion of the Project the number of parking spaces will be 512, the Project, as proposed by this Application for an amendment, will increase the total number of parking spaces at the conclusion of the Project to 587 parking spaces.² All of the additional spaces will be compliant with the requirements of the Zoning By-Law. The only spaces not compliant in all respects with the provisions of Section 5.1.3 are the six existing spaces located along the southeasterly corner of the existing Farley Building. Waivers have been previously granted by the Board for those spaces in prior decisions. Moreover, the requirements of Section 5.1.3(n) (Bicycle Racks) has been waived.

² A Parking Summary Chart is included in Sheet C-3 of the VHB drawings filed herewith. In order to minimize the changes between the current, revised drawings and the previously submitted and approved drawings, a chart using the same rows and columns as were on the prior drawings is included, with the increased number of parking spaces "bubbled." The planned 75 new spaces are part of the numbers that appear in the final column of the revised chart.

Planning Board
January 14, 2021
Page 3

The Applicant certifies pursuant to the Zoning By-Law, Section 4.4 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 modifications to 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 Section 4.2 of Special Permit No. 91-3, dated July 8, 2014.
2. 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, if applicable. As described above, the total number of parking spaces after completion of the Project will increase from 512 to 587. A waiver is requested from Section 5.1.3(n)(Bicycle Racks) because no bicycle racks are provided. Parking Waivers have already been granted with respect to the necessity of providing bicycle racks, but the petitioner requests the relief again if the Board determines that the provisions of section 5.1.1.7 are applicable. In addition, a waiver is requested from the requirements of Section 5.1.3(f) (Parking Space Size) with respect to the six existing spaces located along the southeasterly corner of the existing Farley building. The spaces are non-compliant in that they are of varying lengths (between 14-16 feet). A parking waiver has already been granted with respect to these parking spaces, but the Petitioner requests this relief again, if the Board determines that the provisions of Section 5.1.1.7 are applicable. (With respect to said parking waivers granted in prior decisions, see, for example, sections 1.9 and 1.24, and the relief granting clause of the March 19, 2013 decision, and sections 1.7 and 1.25, and the relief granting section of the July 8, 2014 decision).

These Applications for Site Plan Review and Special Permits include the following documents:

1. Application for Further Site Plan Review and Special Permits.
2. Site, Architectural and Landscape Plans entitled "North Hill Life Care Facility, 865 Central Avenue, Needham, Massachusetts 02492" (dated, or last rev. date, 12/23/20).
3. Summary of changes from approved plans prepared by by Vanasse Hangen Brustlin, Inc., 101 Walnut Street, Watertown, Massachusetts 02471-9151 dated January 4, 2021.
4. Supplemental Stormwater Memo prepared by Vanasse Hangen Brustlin, Inc., 101 Walnut Street, Watertown, Massachusetts 02471-9151 dated December 23, 2020.
5. Check payable to the Town of Needham in the amount of \$1000.00 representing the filing fee for Major Site Plan Review.

Planning Board
January 14, 2021
Page 4

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, (c) the VHB memorandum, and (d) all the plans (no smaller than 11 x 17), is being mailed to each Board member, and to Lee Newman.

The Applicant notes that the existing cooling tower shown on the plans for purposes of illustration is in need of replacement and the proposed location of the cooling tower (also shown on the plans) is slightly different from the current location. The replacement of the existing cooling tower is part of a continuous process of maintenance, repair, and replacement of elements of a large facility such as North Hill, and Applicant requests that the Board make a determination that said cooling tower replacement is not part of the site plan review process and will be permitted and overseen, as required, by the Building Department. Since the cooling tower is in the same location as the other work proposed herein, it is much more efficient to do both projects at the same time.

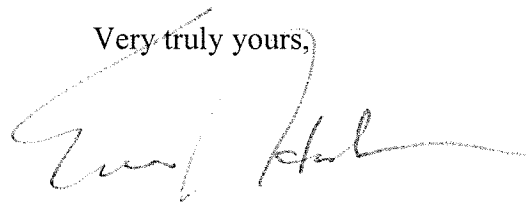
The Applicant hereby requests, pursuant to Zoning By-Law Section 7.4.4, that the Planning Board waive the submission by Applicant of any of the required information not submitted herewith.

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 January 11, 2021, at which time the DRB approved these plans.

I would appreciate your scheduling this matter for hearing at the Board's February 16, 2021 meeting.

Thank you for your cooperation.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'Evans Huber', written over a horizontal line.

Evans Huber

Enclosures
cc: Roy A Cramer, Esq.

**TOWN OF NEEDHAM
MASSACHUSETTS**

PLANNING BOARD

500 Dedham Ave
Needham, MA 02192
781-455-7550
January 13, 2021

**APPLICATION FOR FURTHER SITE PLAN REVIEW
AND SPECIAL PERMITS**

Project Determination:

☒

Major Project

☐

Minor Project

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

Location of Property: 865 Central Avenue, Needham, MA 02492

Name of Applicant: North Hill Needham, Inc.

Address: 865 Central Avenue, Needham, MA 02492 Tel.#: 781 433 6204

Applicant is Owner

☐

Tenant

☒

Property Owner's Name: Babson College

Address: 1 College Drive, Babson Park, MA 02152 Tel.#: 781 235 1200

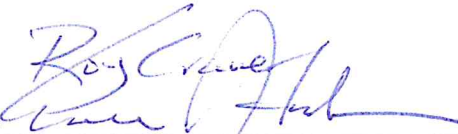
Characteristics of Property: Lot Area: 59.54 acres Present Use: Senior Living Apartments and nursing home

Map #: 309 Parcel #: 25 Zoning District: A-2 and SRA

Description of Project for Site Plan Review under Section 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 BABSON COLLEGE

By: _____

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)

Withdrawn _____ (date)

Fee Paid _____
Fee Waived _____

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

Exhibit A
Application for Further Site Plan Review
North Hill Needham, Inc.
Property at 865 Central Avenue, Needham, MA

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

Reference is made to Site Plan Special Permit No. 91-3 dated May 28, 1991 and amendments thereto dated July 1, 1997, October 7, 1997, August 10, 1999, September 8, 2011, March 20, 2012, July 10, 2012, September 28, 2012, March 19, 2013, July 8, 2014, and August 11, 2015, respectively. In addition, certain changes were approved by memo dated August 25, 2016 pursuant to the Planning Board's insignificant modifications policy.

The Applicant proposes to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane, and undertake associated sitework and landscaping, all as more particularly shown on the plans filed herewith.

Applicant seeks further site plan review pursuant to Section 7.4 of the Bylaw, and a Special Permit waiving strict compliance with the requirements of Sections 5.1.1.5, 5.1.1.7, and 5.1.3 of the Bylaw.



Memorandum

To: Roy A. Cramer
Frieze Cramer Rosen & Huber, LLP
60 Walnut Street
Wellesley, MA 02481

Date: January 4, 2021

Project #: 11369.01

From: Dan Keches, P.E.
Justin Mosca, P.E.

Re: North Hill Life Care Facility -
Plan Changes for Site Plan Special Permit Modification

The following is a list of changes to the North Hill Life Care Facility permitting plans of record that have been made to date subsequent to the latest SUP approval. All revisions are clouded and numbered on the plans according to the following line items:

#1: Added "Bayview Road" improvements (reconstruction/widening of existing fire lane)

- Civil Changes
 - Widening of fire lane to current code requirements
 - 75 parking space addition
 - Cooling tower and access path relocation
 - Adjacent slope regrading
 - Retaining walls, reconstruction and addition
 - Granite curb and guard rail addition
 - Signage additions
 - Bioretention basins and connections to existing closed-drainage addition
 - Cooling tower sanitary sewer connection addition
- Landscape Architecture Changes
 - Bioretention basin planting addition
 - Concrete steps reconstruction
 - Handrail additions
- Electrical Changes
 - Site lighting replacement
 - Cooling tower maintenance lighting addition
 - Associated electrical connections, handholes, and routing

101 Walnut Street
PO Box 9151
Watertown, MA 02472-4026
P 617.924.1770

Site Plans

Issued for: **Permitting**

Date Issued: June 17, 2011

Revised: 7/28/11, 12/3/12, 4/1/13, 5/28/14, 7/8/14, 7/30/15, 8/9/16, 1/4/21

Sheet Index

Number	Drawing Title	Latest Issue
C1	Legend and General Notes	6/17/2011
* C2	Key Plan	1/4/2021
* C3	Overall Site Master Plan	1/4/2021
* C3.1	Phasing Site Plan	1/4/2021
C4.1.1	Permitting Layout and Materials Plan	5/28/2014
+ C4.1.2	Bayview Road Layout and Materials Plan	1/4/2021
C4.2.1	Permitting Layout and Materials Plan	12/3/2012
+ C4.2.2	Bayview Road Layout and Materials Plan	1/4/2021
C4.3.1	Permitting Layout and Materials Plan	7/14/2016
+ C4.3.2	Bayview Road Layout and Materials Plan	1/4/2021
C4.4.1	Permitting Layout and Materials Plan	7/30/2014
C4.5.1	Permitting Layout and Materials Plan	12/3/2012
C5.1.1	Permitting Grading and Drainage Plan	5/28/2014
+ C5.1.2	Bayview Road Grading and Drainage Plan	1/4/2021
C5.2.1	Permitting Grading and Drainage Plan	12/3/2012
+ C5.2.2	Bayview Road Grading and Drainage Plan	1/4/2021
C5.3.1	Permitting Grading and Drainage Plan	8/9/2016
+ C5.3.2	Bayview Road Grading and Drainage Plan	1/4/2021
C5.4.1	Permitting Grading and Drainage Plan	7/30/2014
C5.5.1	Permitting Grading and Drainage Plan	5/28/2014
C6.1.1	Permitting Utilities Plan	5/28/2014
+ C6.1.2	Bayview Road Utilities Plan	1/4/2021
C6.2.1	Permitting Utilities Plan	12/3/2012
+ C6.2.2	Bayview Road Utilities Plan	1/4/2021
C6.3.1	Permitting Utilities Plan	8/9/2016
+ C6.3.2	Bayview Road Utilities Plan	1/4/2021
C6.4.1	Permitting Utilities Plan	7/30/2014
C6.5.1	Permitting Utilities Plan	5/28/2014
* C7	Emergency Vehicle Access Plan	1/4/2021
C8.1	Site Details	12/3/2012
C8.2	Site Details	7/14/2016
C8.3	Site Details	8/9/2016
C8.4	Site Details	5/28/2014
+ C8.5	Bayview Road Site Details	1/4/2021

Reference Drawings

Number	Drawing Title	Latest Issue
SV-1-5	Existing Conditions Plan of Land	6/17/2011
L1	Key Plan	7/30/2014
L2.1	Materials Plan	12/3/2012
L2.2	Materials Plan	12/3/2012
L2.3	Materials Plan	7/30/2014
L2.3.1	Materials and Grading Plan (New IL)	7/14/2016
L2.4	Materials Plan	10/15/2014
L3.1	Planting and Irrigation	12/3/2012
L3.2	Planting and Irrigation	12/3/2012
L3.3	Planting and Irrigation	7/30/2014
L3.3.1	Planting Plan (New IL)	7/14/2016
L3.4	Planting and Irrigation	7/30/2014
L3.5	Main Entry Modifications	12/3/2012
L3.6	Main Entry Modifications	12/3/2012
+ L3.7	Bayview Road Stairway & Path Improvements	1/4/2021
+ L3.8	Bayview Road Bioretention Basin Planting Plans	1/4/2021
L4.1	Site Details	12/3/2012
L4.2	Site Details	12/3/2012
L4.3	Site Details	12/3/2012
L4.4	Site Details	12/3/2012

Reference Drawings (continued)

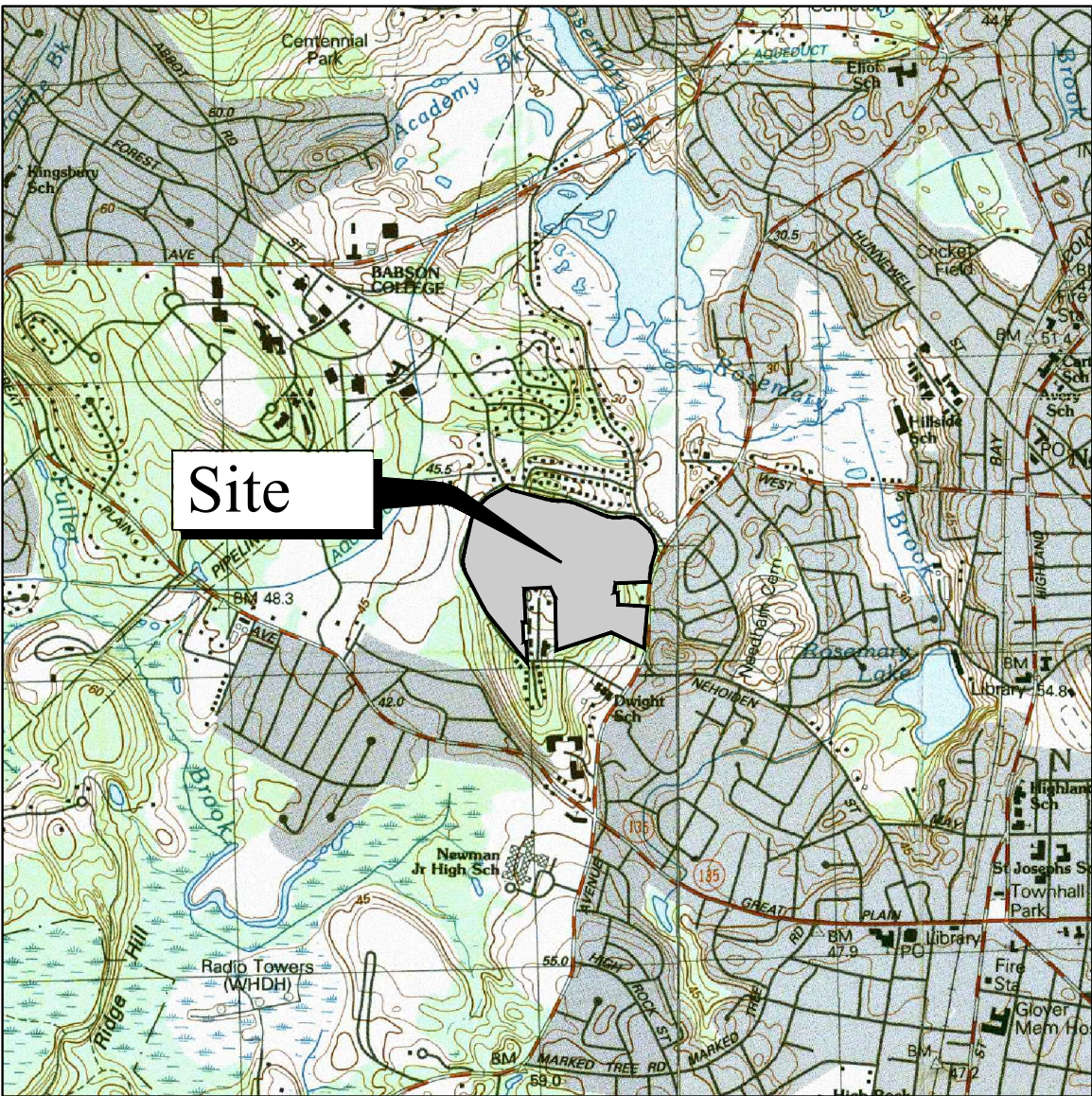
Number	Drawing Title	Latest Issue
L4.5	Site Details	12/3/2012
L4.6	Site Details	12/3/2012
PH1.01	Photometric Lighting Plan	5/28/2014
+ PH1.02	Bayview Road Lighting Photometric Plan	1/4/2021
ES1.01A	Site Distribution Plan - Part "A"	7/12/2012
ES1.01B	Site Distribution Plan - Part "B"	7/12/2012
+ ES1.02	Bayview Road Site Distribution Plan	1/4/2021
A-1	Entry Addition (IL Commons)	6/6/2011
A-2	Canyon Addition (IL Commons)	6/6/2011
A-3	Green House Addition & Repurposing Facade (IL Commons)	12/3/2012
A-4	C & E Wing Entry Elevation	5/11/2012
A-5	Lower Floor (IL Commons)	6/17/2011
A-6	First Floor (IL Commons)	6/17/2011
A-7	Second Floor (IL Commons)	6/17/2011
A-8	Third Floor (IL Commons)	6/17/2011
A-9	Fourth Floor (IL Commons)	6/17/2011
A-10	Fifth Floor (IL Commons)	6/17/2011
A-11.1	Level 1 Floor Plan (New IL)	5/28/2014
A-12.1	Level 2 Floor Plan (New IL)	5/28/2014
A-13.1	Level 3 Floor Plan (New IL)	5/28/2014
A-14.1	Level 4 Floor Plan (New IL)	5/28/2014
A-15.1	Level 5 Floor Plan (New IL)	5/28/2014
A-16.1	Exterior Elevations (New IL)	5/28/2014
A-17	Plan & Elevations (Maintenance Building)	12/3/2012
A-18	Level One Floor Plan (SNF)	12/3/2012
A-19	Level Two Floor Plan (SNF)	12/3/2012
A-20	Level Three Floor Plan (SNF)	12/3/2012
A-21	Level Four Floor Plan (SNF)	12/3/2012
A-22	Exterior Elevations (SNF)	5/8/2014
A-23	Level Three Floor Plan (EIL)	12/3/2012
A-24	Level Four Floor Plan (EIL)	12/3/2012
A-25	Exterior Elevations (EIL)	12/3/2012
A26	Floor and Roof Plan (Farley)	12/3/2012
A27	Exterior Elevations (Farley)	12/3/2012
A-5	Lower Floor (Commons Interior Phasing)	6/27/2011
A-6	First Floor (Commons Interior Phasing)	6/27/2011
A-7	Second Floor (Commons Interior Phasing)	6/27/2011
A-8	Third Floor (Commons Interior Phasing)	6/27/2011
A-9	Fourth Floor (Commons Interior Phasing)	6/27/2011
A-10	Fifth Floor (Commons Interior Phasing)	6/27/2011
A1.05	Sitework and Canopy Detail	10/5/2011
9 Sheets	6'-0" x 8'-0" Aluminum Building	2/29/2012 (Unchanged, Not Submitted)

NOTE:

- * DENOTES PLAN REVISED IN PLANSET
- + DENOTES PLAN ADDED TO PLANSET

North Hill Life Care Facility

865 Central Avenue
Needham, Massachusetts 02492



Site Location Map



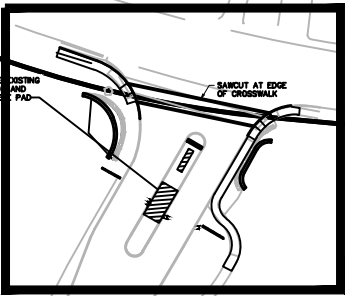
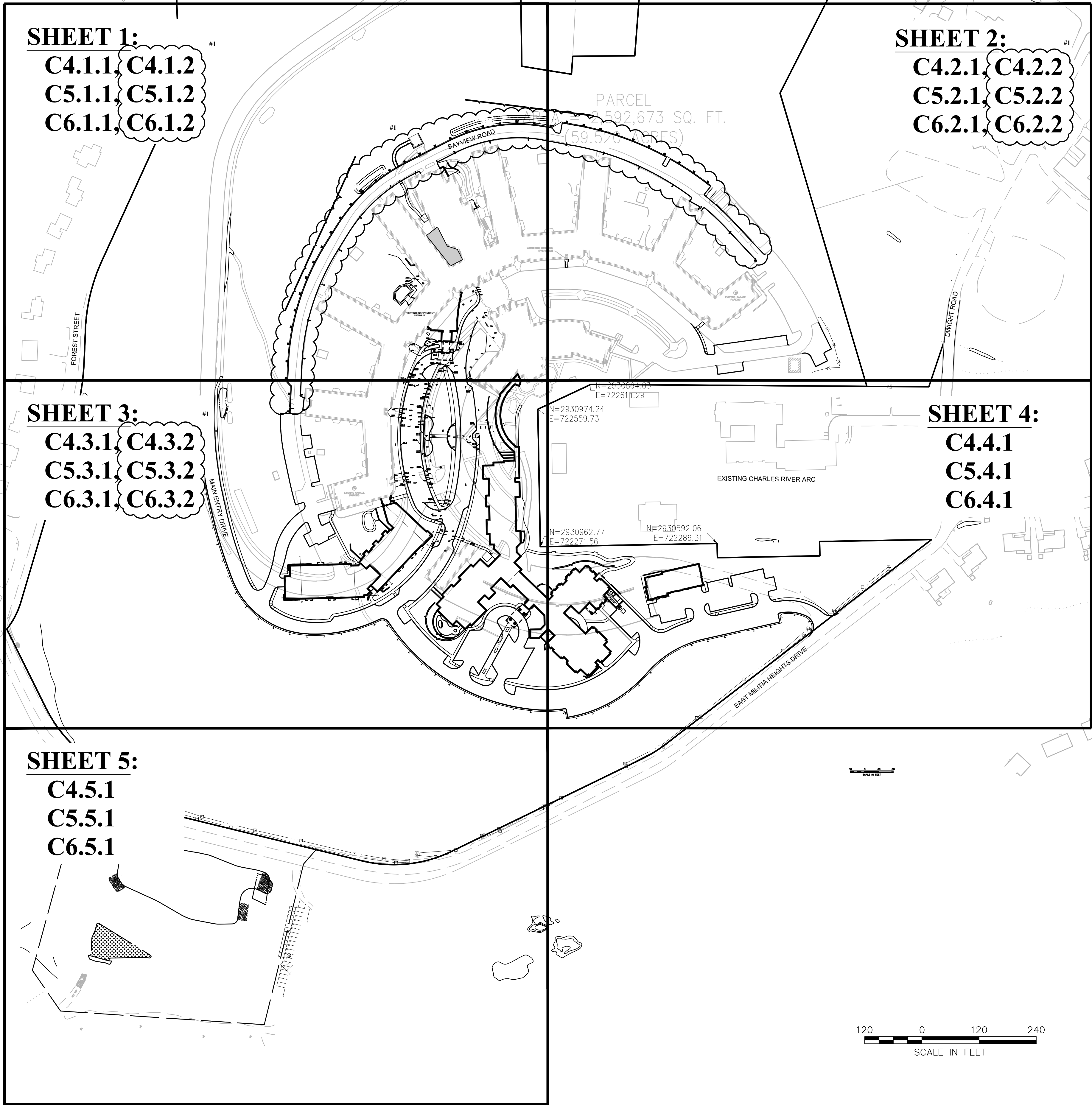
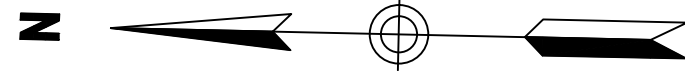
Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services

101 Walnut Street, P.O. Box 9151
Watertown, Massachusetts 02471
617.924.1770 • FAX 617.924.2286



Applicant:
North Hill Needham, Inc.
865 Central Avenue
Needham, MA 02492

VHB Project No. 11369.00
865 Central Avenue, Needham, MA
Issued for: Permitting - 1/4/21



Inset 1A:
C4.1.1
C5.1.1
C6.1.1

SHEET 1:
C4.1.1, C4.1.2
C5.1.1, C5.1.2
C6.1.1, C6.1.2

SHEET 2:
C4.2.1, C4.2.2
C5.2.1, C5.2.2
C6.2.1, C6.2.2

SHEET 3:
C4.3.1, C4.3.2
C5.3.1, C5.3.2
C6.3.1, C6.3.2

SHEET 4:
C4.4.1
C5.4.1
C6.4.1

SHEET 5:
C4.5.1
C5.5.1
C6.5.1

Bayview Road Improvements Project Team:

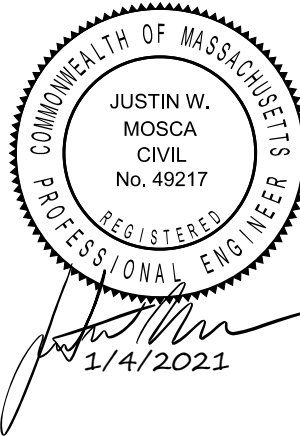
Landscape Architect
Hammer + Walsh Design Inc 617.439.0125
Electrical
Bard, Rao & Athanas Consulting, Inc. 617.254.0016

New 45 IL Residences Project Team:

Architect
DiMella Shaffer 617.426.5004
Structural
L.A. Fuess Partners, Inc. 617.948.5700
MEP/Code
R.W. Sullivan Engineering 617.523.8227
Landscape Architect
Hammer + Walsh Design Inc 617.439.0125
Interiors
Wellesley Design Consultants, Inc. 978.965.8185

Commons / SNF / EIL / Maint. Bldg. Project Team:

Architect
JSA 603.436.2551
Structural
Engineers Design Group 781.396.9007
Mechanical/Plumbing/Fire
R.W. Sullivan Engineering 617.523.8227
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VAD, Inc. 781.255.9754
Landscape Architect
Copley Wolff Design Group 617.654.9000
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Food Service and Laundry
Crabtree McGrath Associates 978.352.8500



1/4/21	Bayview Road Improvements
7/14/16	Permitting Modifications
5/28/14	Permitting Modifications
12/3/12	Permitting Modifications
7/28/11	Parking Revisions

Revisions:

Scale: 1" = 120'
Date: June 17, 2011
Drawn By: **Checked By:** **Reviewed By:**

North Hill
Life Care Facility
865 Central Avenue
Needham, MA 02492

Permitting
Not Issued for Construction

Key Plan

C2

Zoning Summary Chart

Zoning District(S):	Apartment A-2				
Overlay District(S):	N/A				
Zoning Regulation Requirements	Required	Provided			
		New Independent Living	Maintenance Building	Enhanced Independent Living	Skilled Nursing Facility
MINIMUM LOT AREA	43,560 SF	2,592,674± SF (59.5± ACRES)			
FRONTAGE	150 FT	>> 150 FT			
FRONT YARD SETBACK	40 FT	515 FT	216 FT	406 FT	205 FT
SIDE YARD SETBACK	40 FT	492 FT	41 FT	41 FT	41 FT
REAR YARD SETBACK	40 FT	226 FT	41 FT	41 FT	41 FT
MAXIMUM FLOOR AREA RATIO	0.30	0.29			
MAXIMUM BUILDING HEIGHT	3 STORIES/40 FT*	3 STORIES/<40 FT**	1 STORY/20 FT	2 STORIES/29 FT	3-4 STORIES/47 FT**
MINIMUM PARKING AREA LANDSCAPING PERCENTAGE	10%	>> 10%			
MINIMUM INTERIOR PARKING AREA LANDSCAPING PERCENTAGE	2.5%	>> 2.5%			

* 4 STORIES/50-FT. IF UTILIZED AS A CONVALESCENT OR NURSING HOME W/ RESTRICTIONS, PER SECTION 4.3.1 OF THE ZONING BY-LAW
** SNF BUILDING HEIGHT (46.9') = ROOF ELEVATION (271.7') - AVERAGE ADJOINING GRADE (224.8)
*** REFER TO ARCHITECTURAL PLANS

Parking Summary Chart

Description	Size		Spaces		
	Required	Provided	Existing	Required	Provided
PROPOSED RELOCATED STANDARD 90° SPACES (SITE)	9 x 18.5	9 x 18.5	--	--	276
PROPOSED RELOCATED STANDARD PARALLEL SPACES (SITE)	9 x 22	9 x 22	--	--	64
PROPOSED RELOCATED STANDARD ACCESSIBLE SPACES (SITE)	8 x 18*	9 x 18.5	--	--	4
PROPOSED RELOCATED VAN ACCESSIBLE SPACES (SITE)	8 x 18*	9 x 18.5	--	--	5
PROPOSED RELOCATED GARAGE SPACES**			--	--	49
TOTAL PROPOSED RELOCATED SPACES					398
TOTAL SPACES			478***	478***	587****
LOADING BAYS			N/A	N/A	2

* ADA/AA8 REQUIREMENTS
** PROPOSED RELOCATED GARAGE SPACES INCLUDE 2 STANDARD ACCESSIBLE SPACES
*** INCLUDES 6 EXISTING NON-CONFORMING SPACES
**** PER SPECIAL PERMIT
***** TOTAL SPACES INCLUDES 189 EXISTING SPACES WHICH ARE TO REMAIN, 6 OF WHICH ARE NON-CONFORMING SPACES, 12 OF WHICH ARE ACCESSIBLE SPACES AND 80 OF WHICH ARE EXISTING GARAGE PARKING SPACES, AND 398 PROPOSED/RELOCATED SPACES

Key Plan

- ① - EXISTING PARKING SPACES TO REMAIN (189 TOTAL)
- ② - PROPOSED PARKING SPACES (398 TOTAL) #1
- ③ - AREA OF GREENROOF (SEE ARCHITECTURAL PLANS)

Notes

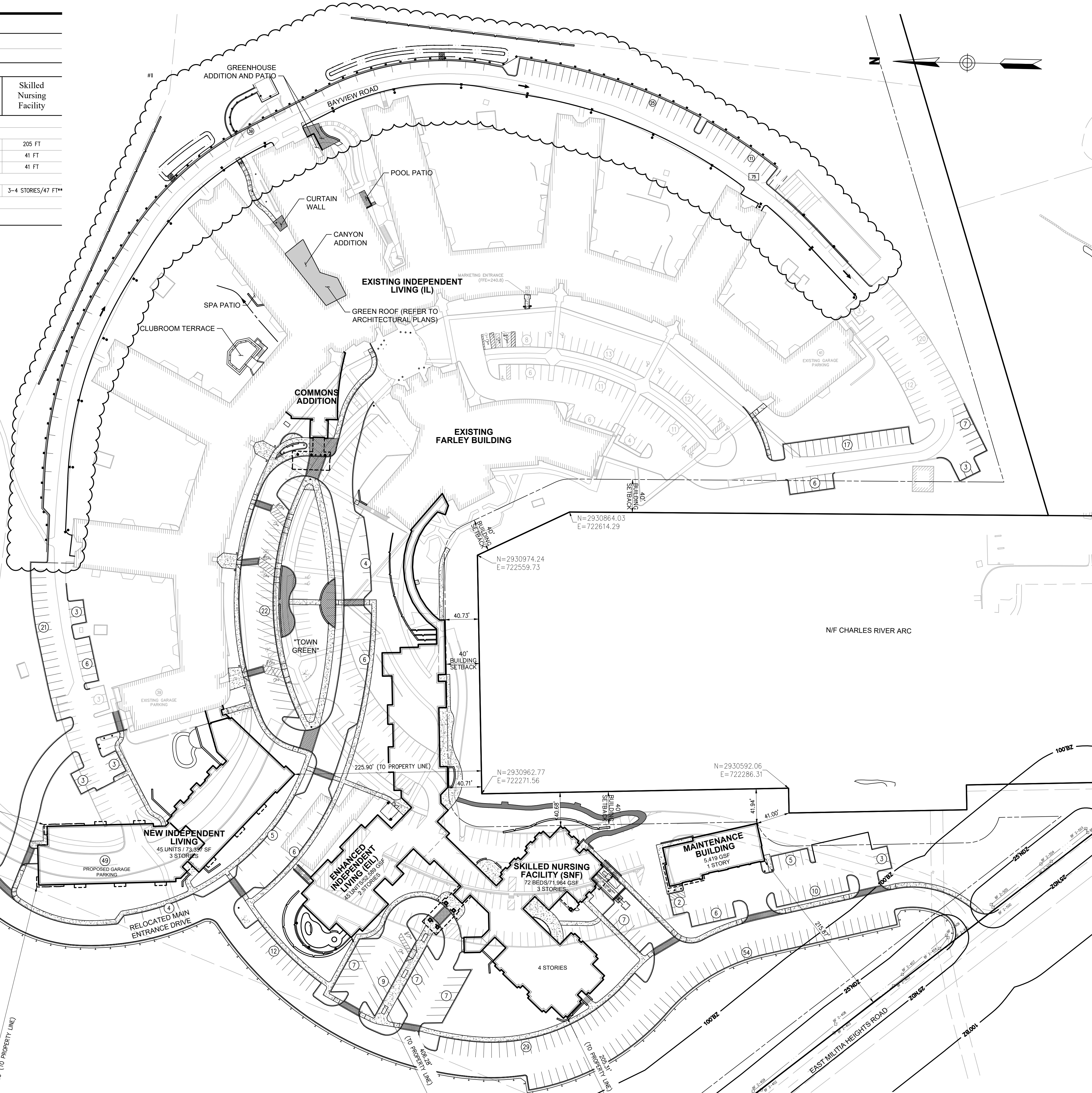
1. PARKING AREAS WILL COMPLY WITH ALL PARKING PLAN AND DESIGN REQUIREMENTS SET FORTH IN SECTION 5.1.3 OF THE NEEDHAM ZONING BYLAWS EXCEPT THAT A WAIVER IS REQUESTED FROM THE PROVISIONS OF SECTION 5.1.3(g) ("PARKING LOT ILLUMINATION"), SO THAT EACH PARKING AREA SHALL PROVIDE AN AVERAGE ILLUMINATION LEVEL OF AT LEAST ONE FOOTCANDLE.

Sign Summary

M.U.T.C.D.	Specification		Desc.
Number	Width	Height	
R1-1	30"	30"	
R6-1R	12"	18"	
R6-1L	12"	18"	
R5-1	30"	30"	
R7-1	12"	18"	
R7-8 (REVISED)	12"	18"	
R7-8A	12"	6"	

Sign Summary

M.U.T.C.D.	Specification		Desc.
Number	Width	Height	
SP-1	12"	18"	CAUTION WATCH FOR EXISTING VEHICLES
SP-2	12"	18"	NO LOADING OR DELIVERIES



Civil:



101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

North Hill

877.736.4371

Bayview Road Improvements Project Team:

Landscape Architect
Hammer + Walsh Design Inc 617.439.0125

Electrical
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New 45 IL Residences Project Team:

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Food Service and Laundry
Crabtree McGrath Associates 978.352.8500



1/4/21 Bayview Road Improvements
7/14/16 Permitting Modifications
5/28/14 Permitting Modifications
12/3/12 Permitting Modifications
7/28/11 Parking Revisions

Revisions:

Scale: 1" = 60'
Date: June 17, 2011

Drawn By: **Checked By:** **Reviewed By:**

North Hill Life Care Facility

865 Central Avenue
Needham, MA 02492

Permitting

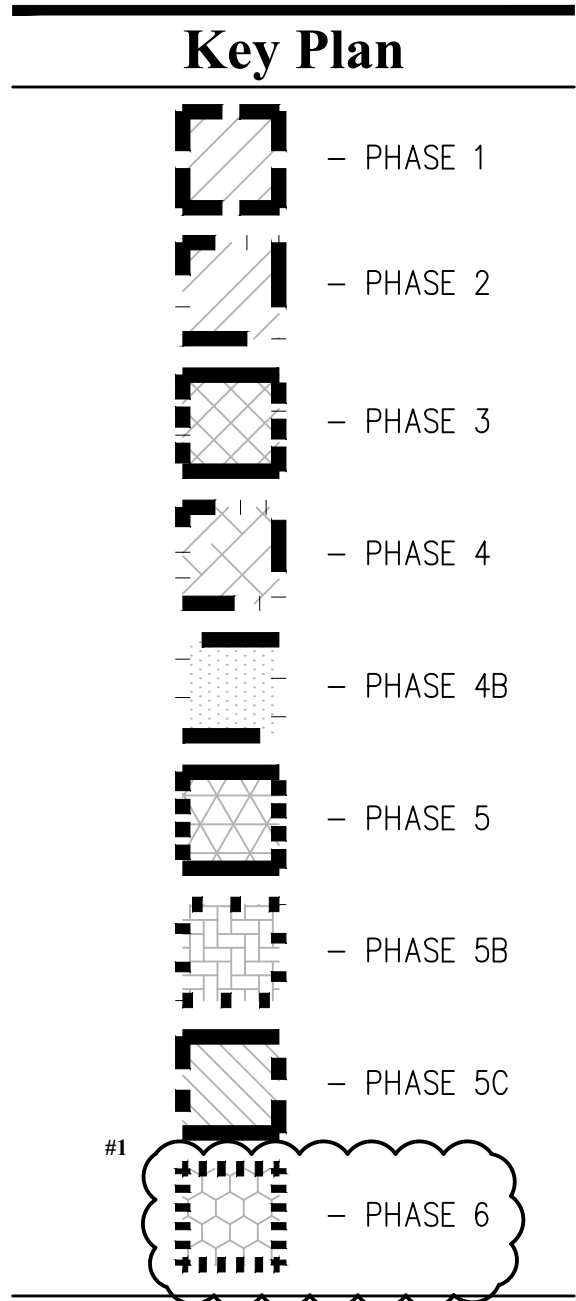
Not Issued for Construction

Overall Site Master Plan

C3

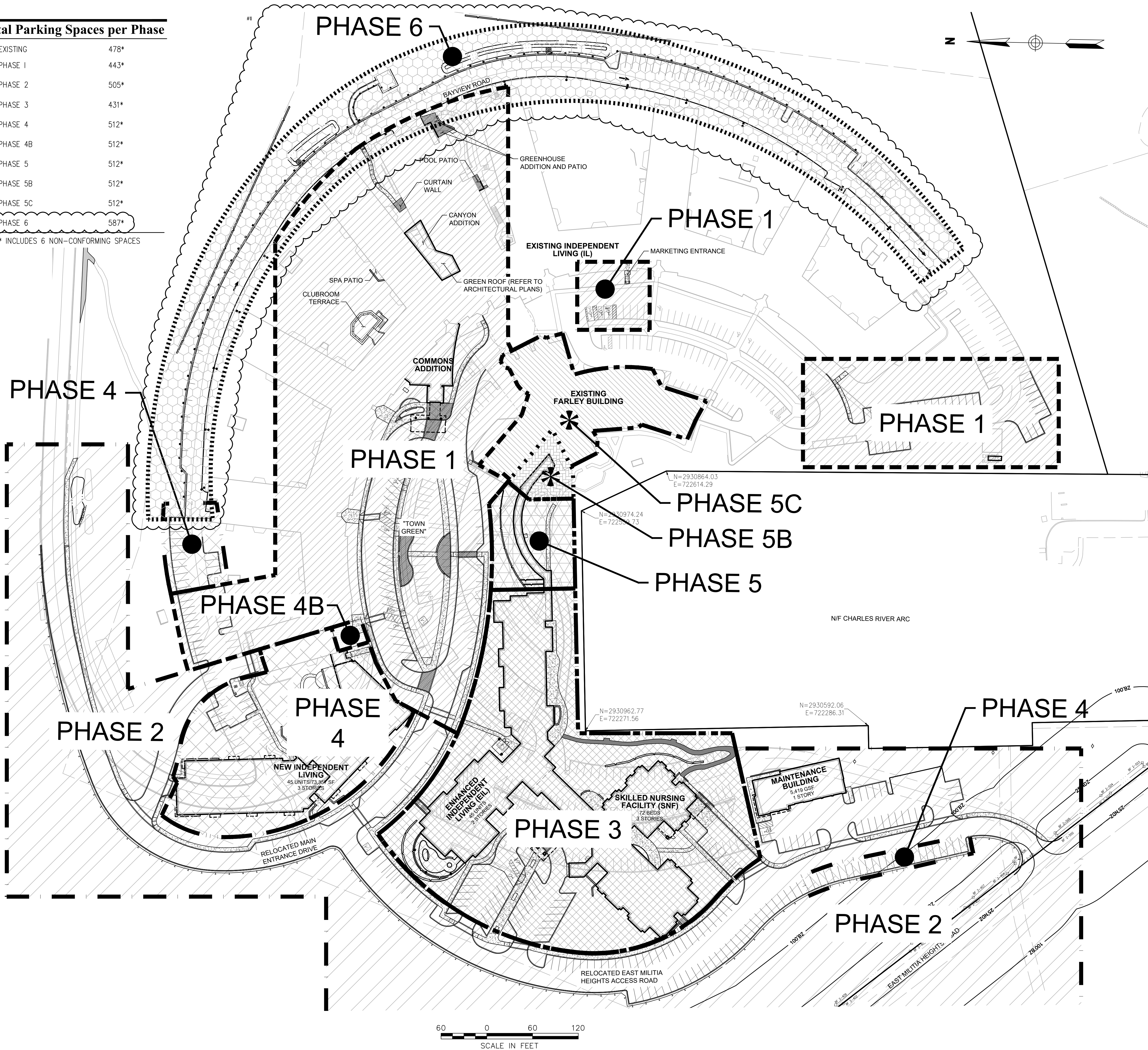
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Total Parking Spaces per Phase		
EXISTING	478*	
PHASE 1	443*	
PHASE 2	505*	
PHASE 3	431*	
PHASE 4	512*	
PHASE 4B	512*	
PHASE 5	512*	
PHASE 5B	512*	
PHASE 5C	512*	
PHASE 6	587*	

* INCLUDES 6 NON-CONFORMING SPACES



Civil:

vhb

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

North Hill

877.736.4371

Bayview Road Improvements Project Team:

Landscape Architect Hammer + Walsh Design Inc	617.439.0125
Electrical Bard, Rao & Athanas Consulting, Inc.	617.254.0016

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1/4/21	Bayview Road Improvements
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Revisions:

Scale: 1" = 60'	Date: June 17, 2011
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North Hill

Life Care Facility

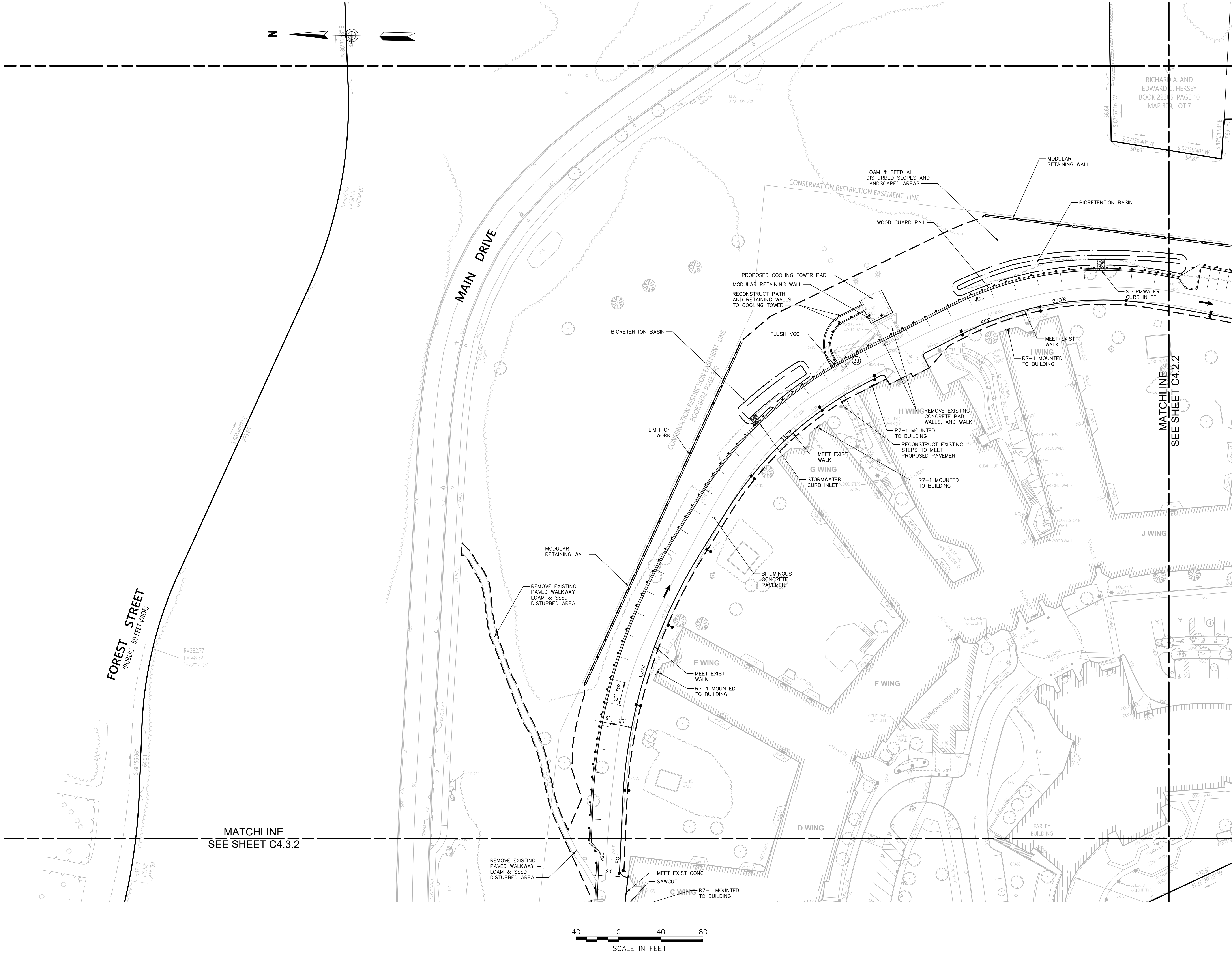
865 Central Avenue
Needham, MA 02492

Permitting

Not Issued for Construction

Phasing Site Plan

C3.1



Civil: **vhb**
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

North Hill 877.736.4371

Bayview Road Improvements Project Team:

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Site Key



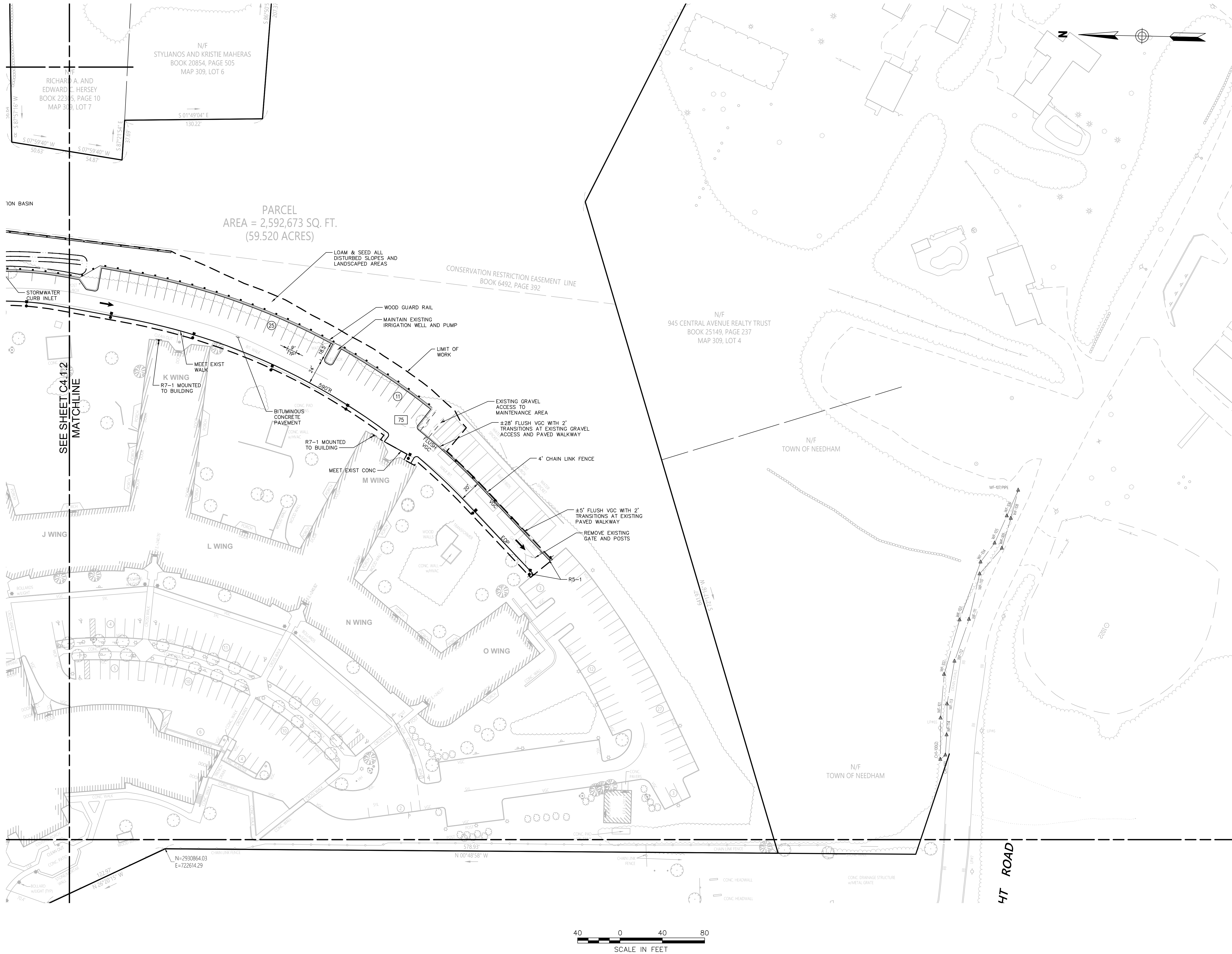
Revisions:
Scale: 1" = 40'
Date: January 4, 2021
Drawn By: **Checked By:** **Reviewed By:**

North Hill
Life Care Facility
865 Central Avenue
Needham, MA 02492

Permitting
Not Issued for Construction

Bayview Road
Layout & Materials Plan

#1 **C4.1.2**



Bayview Road Improvements Project Team:

Landscape Architect Hammer + Walsh Design Inc	617.439.0125
Electrical Bard, Rao & Athanas Consulting, Inc.	617.254.0016

New 45 IL Residences Project Team:

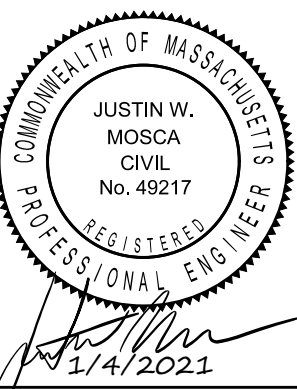
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MEP/Code R.W. Sullivan Engineering	617.523.8227
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Interiors Wellesley Design Consultants, Inc.	978.965.8185

Commons / SNF / EIL / Maint. Bldg. Project Team:

Architect JSA	603.436.2551
Structural Engineers Design Group	781.396.9007
Mechanical/Plumbing/Fire R.W. Sullivan Engineering	617.523.8227
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Food Service and Laundry Crabtree McGrath Associates	978.352.8500



Site Key



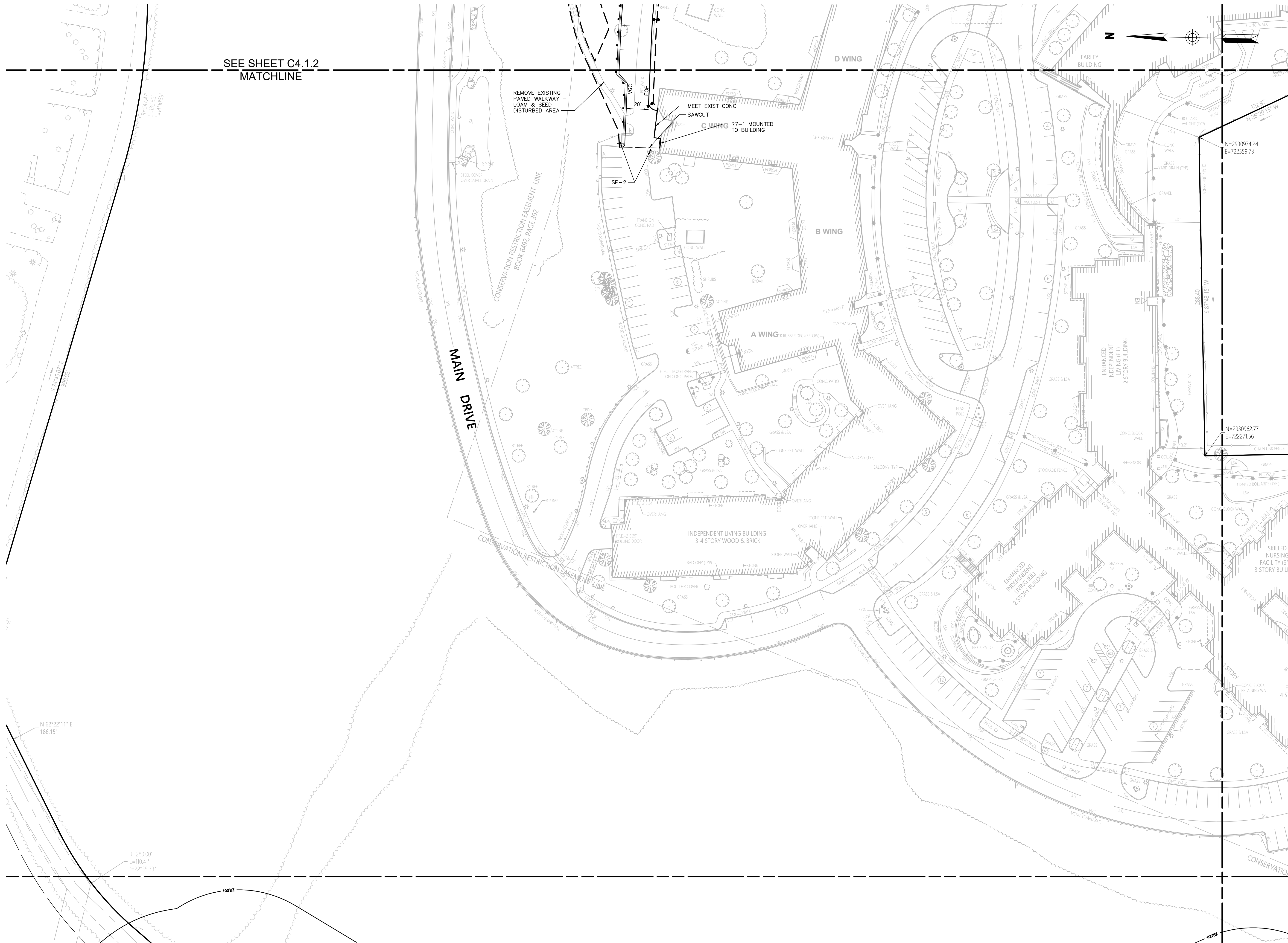
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Scale: 1" = 40'	Date: January 4, 2021		
Drawn By:	Checked By:	Reviewed By:	

**North Hill
Life Care Facility**
865 Central Avenue
Needham, MA 02492

Permitting
Not Issued for Construction

Bayview Road
Layout & Materials Plan

#1 **C4.2.2**



Civil: 
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

North  Hill 877.736.4371

Bayview Road Improvements Project Team:

Landscape Architect
Hammer + Walsh Design Inc 617.439.0125
Electrical
Bard, Rao & Athanas Consulting, Inc. 617.254.0016

New 45 IL Residences Project Team:

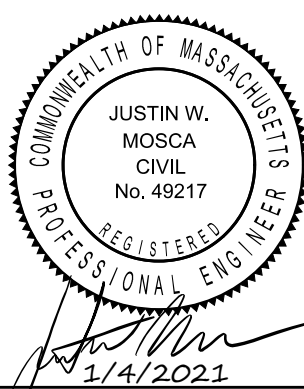
Architect
DiMella Shaffer 617.426.5004
Structural
L.A. Fuess Partners, Inc. 617.948.5700
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Site Key

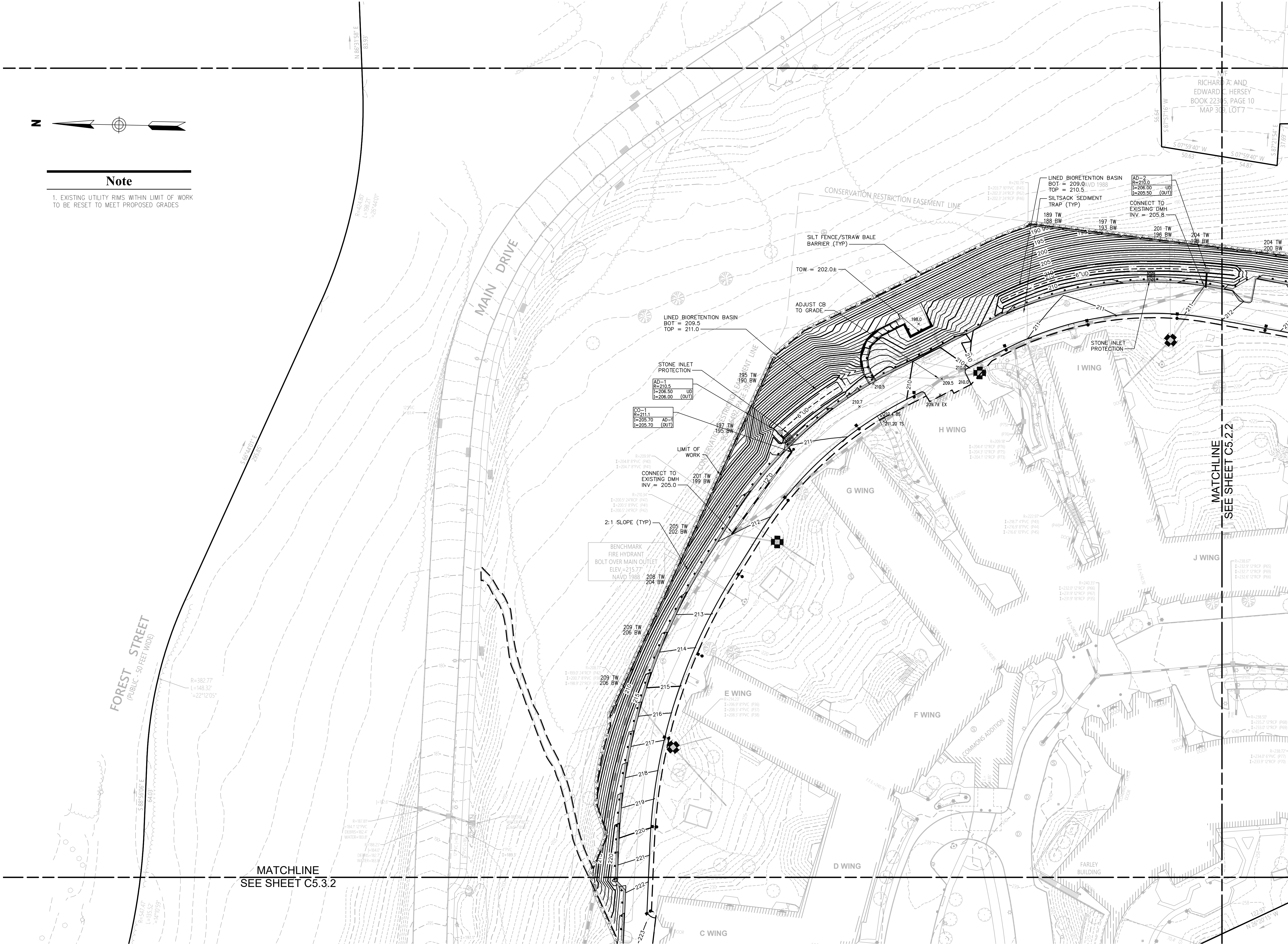


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#1 **C4.3.2**



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Site Key

JUSTIN W. MOYSA
CIVIL
No. 49217
REGISTERED PROFESSIONAL ENGINEER
1/4/2021

Revisions:

Scale: 1" = 40'

Date: January 4, 2021

Drawn By: **Checked By:** **Reviewed By:**

North Hill
Life Care Facility

865 Central Avenue
Needham, MA 02492

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Bayview Road
Grading & Drainage Plan

#1

C5.1.2





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617.924.1770

NorthHill

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Landscape Architect Hammer + Walsh Design Inc	617.439.0125
Electrical Bard, Rao & Athanas Consulting, Inc.	617.254.0016

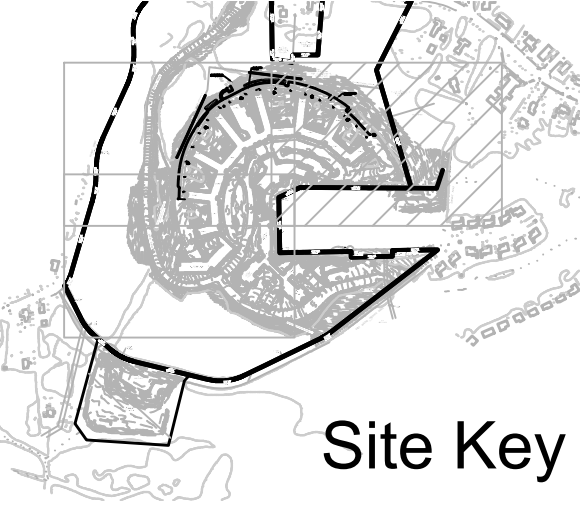
New 45 IL Residences Project Team:

Architect DiMella Shaffer	617.426.5004
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Site Key



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Life Care Facility**

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Grading & Drainage Plan

C5.2.2



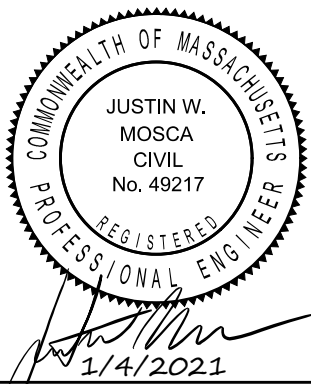
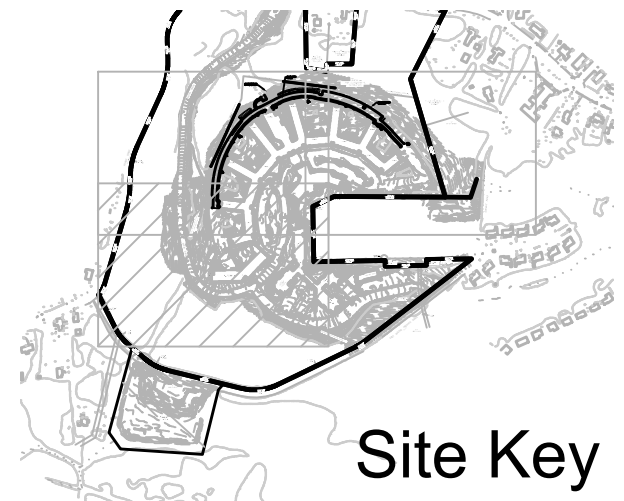
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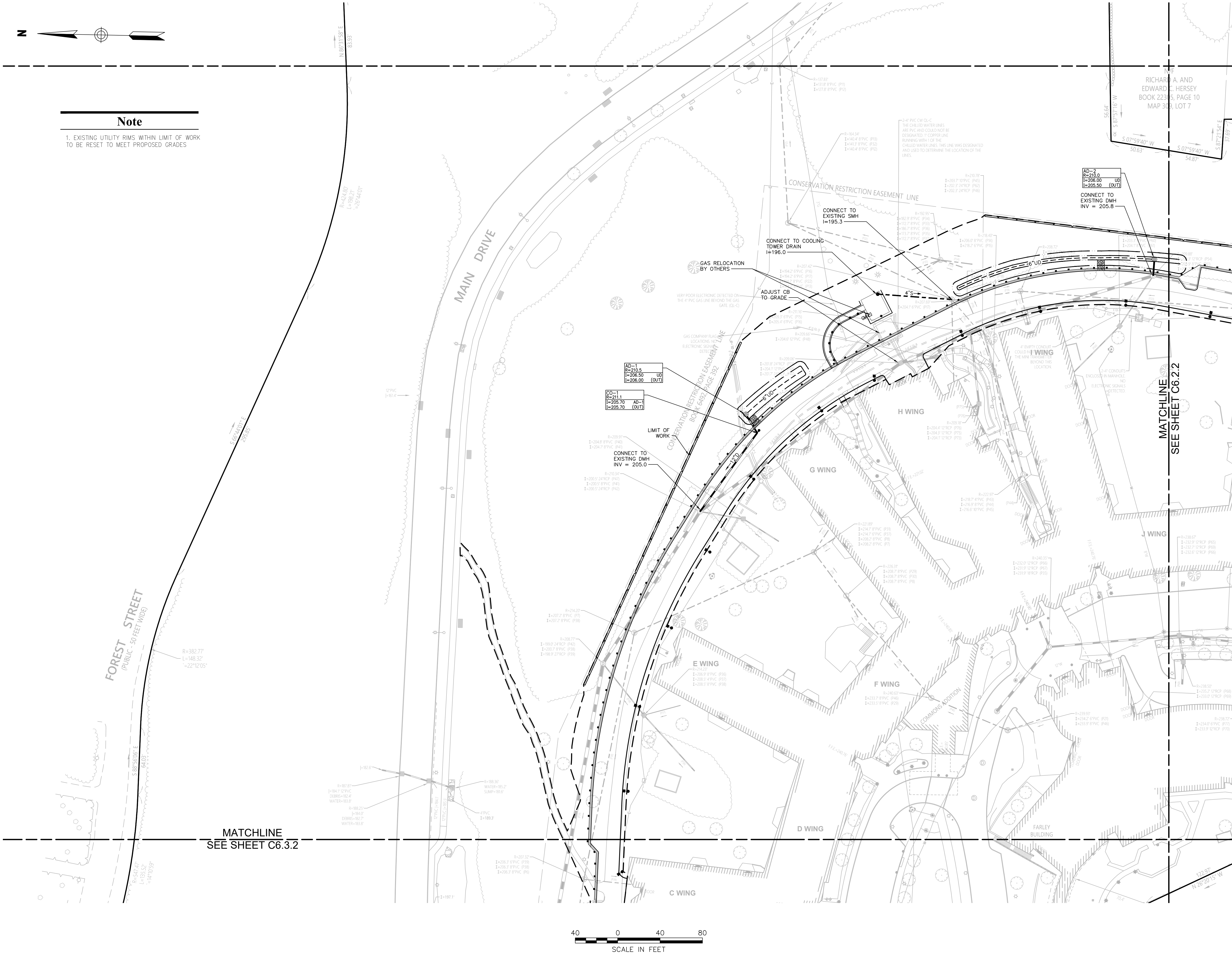
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Drawn By: **Checked By:** **Reviewed By:**

North Hill
Life Care Facility
865 Central Avenue
Needham, MA 02492

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Bayview Road
Grading & Drainage Plan

#1 **C5.3.2**





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101 Walnut Street
PO Box 9151
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North Hill 877.736.4371

Bayview Road Improvements Project Team:

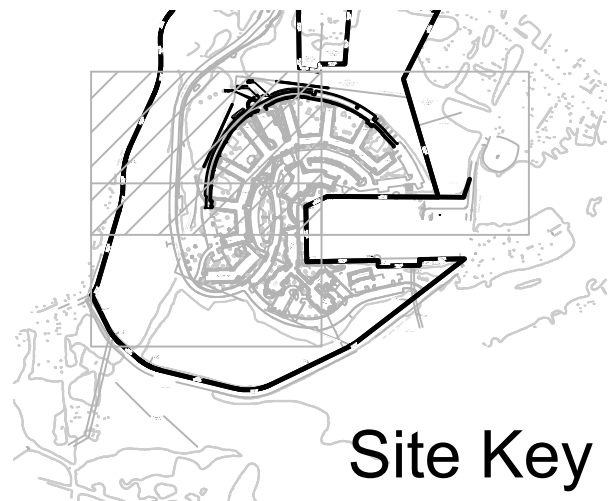
Landscape Architect
Hammer + Walsh Design Inc 617.439.0125
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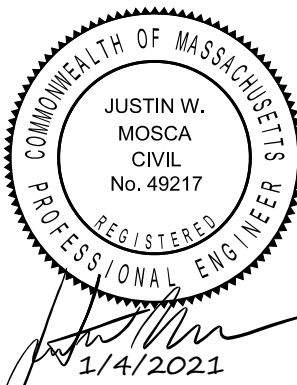
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Site Key



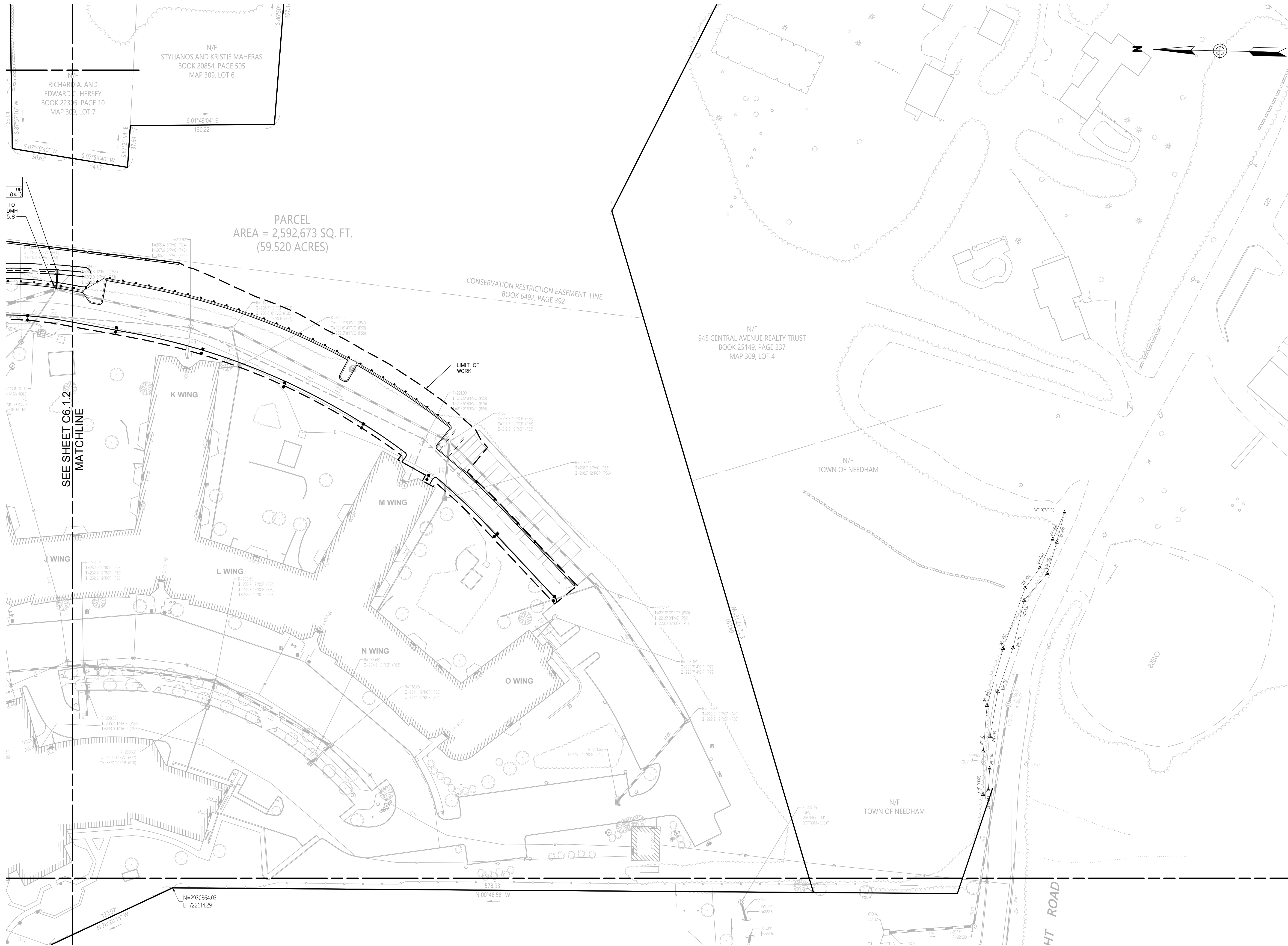
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Life Care Facility
865 Central Avenue
Needham, MA 02492

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Bayview Road
Utilities Plan

C6.1.2



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101 Walnut Street
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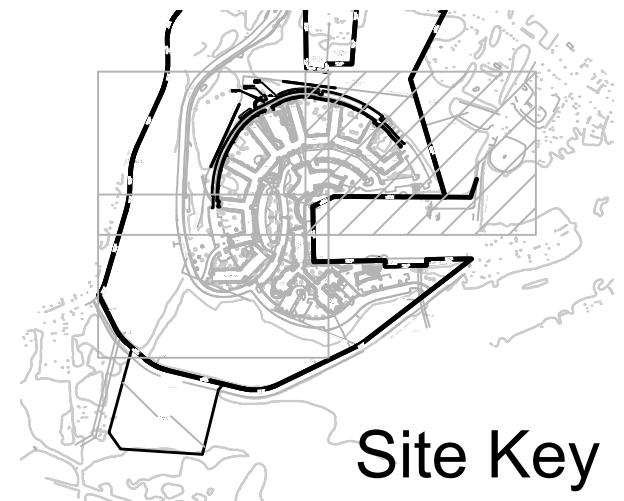
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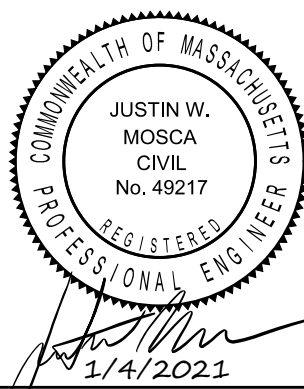
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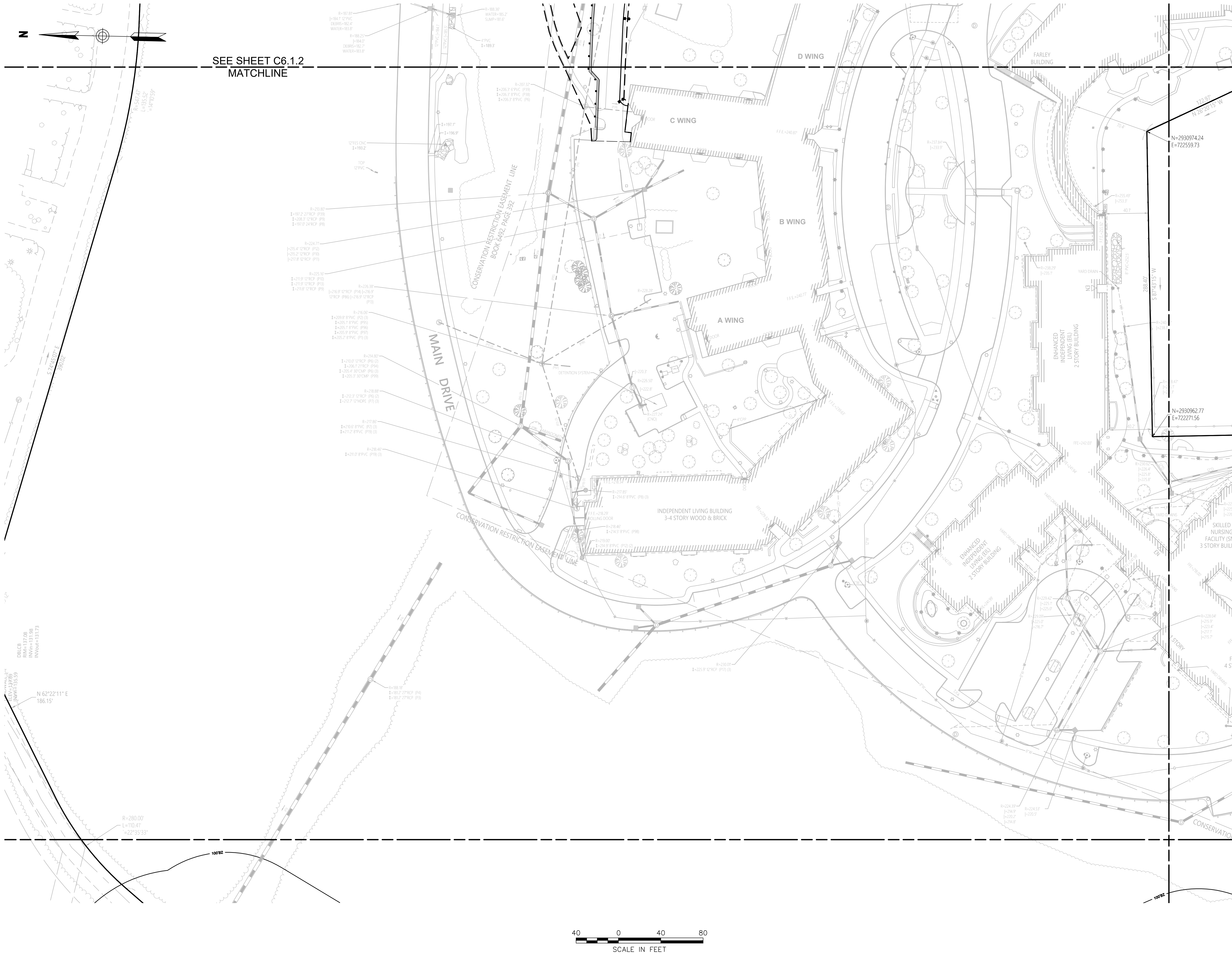
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865 Central Avenue
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Utilities Plan

C6.2.2



vhb

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Bayview Road Improvements Project Team:

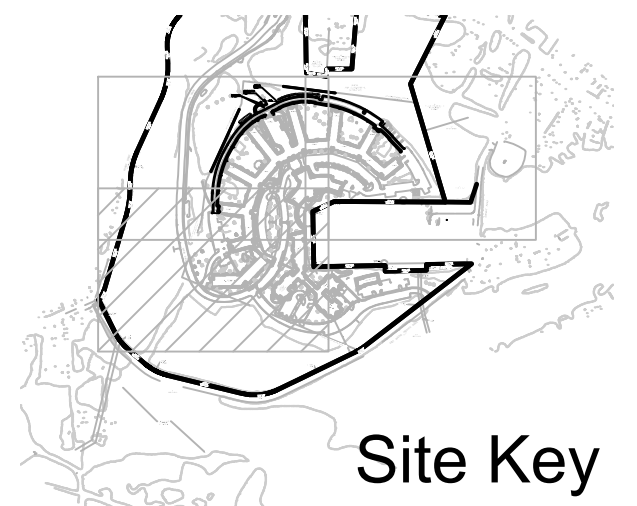
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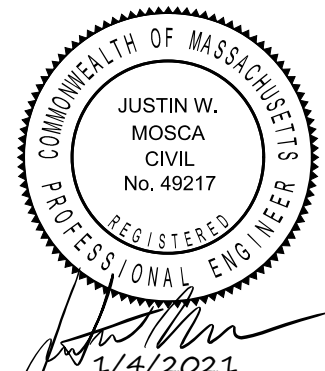
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Site Key



Revisions:

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Drawn By:	Checked By:	

**North Hill
Life Care Facility**

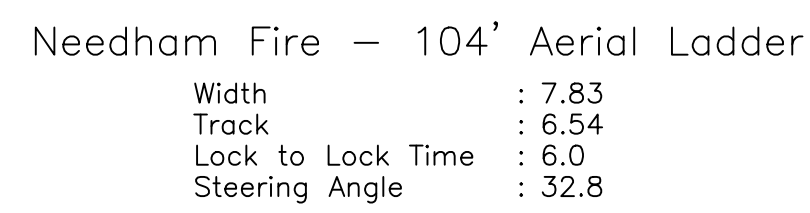
865 Central Avenue
Needham, MA 02492

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Not Issued for Construction

Bayview Road
Utilities Plan

#1

C6.3.2

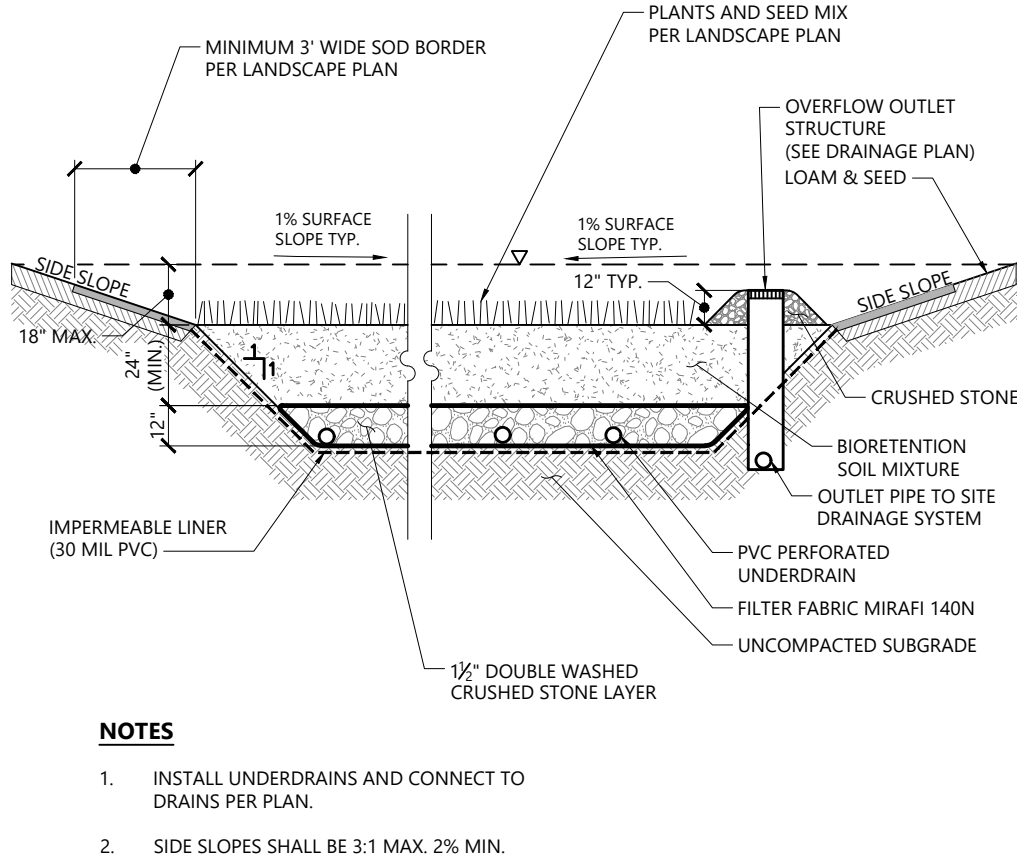


North Hill
Life Care Facility
865 Central Avenue
Needham, MA 02492

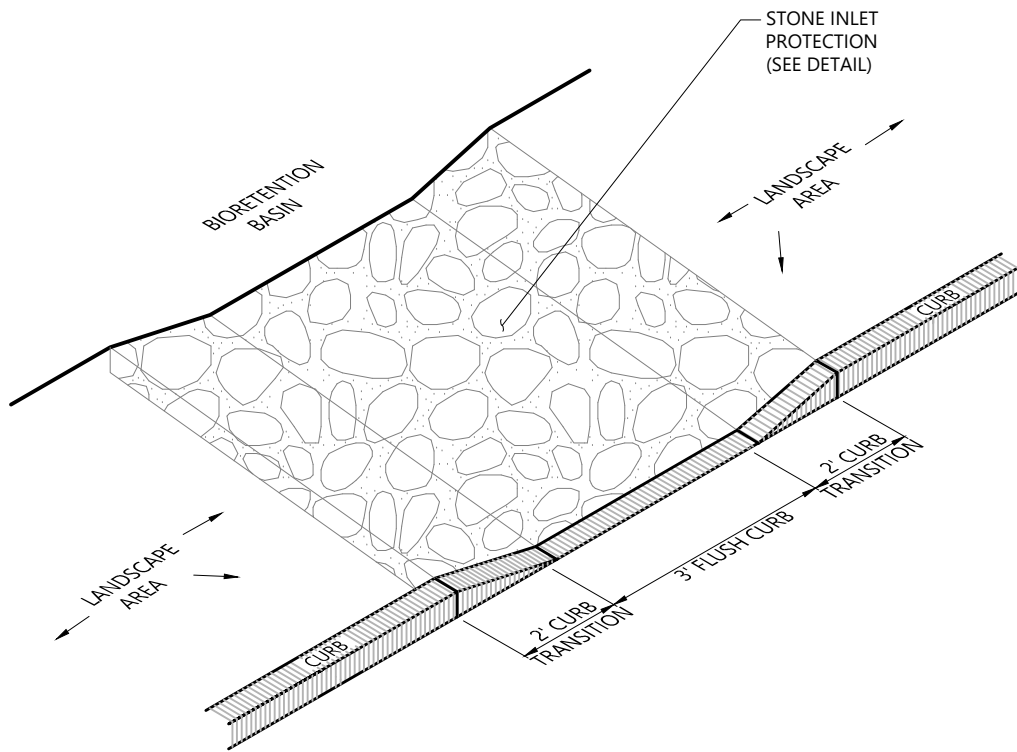
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Emergency Vehicle
Access Plan

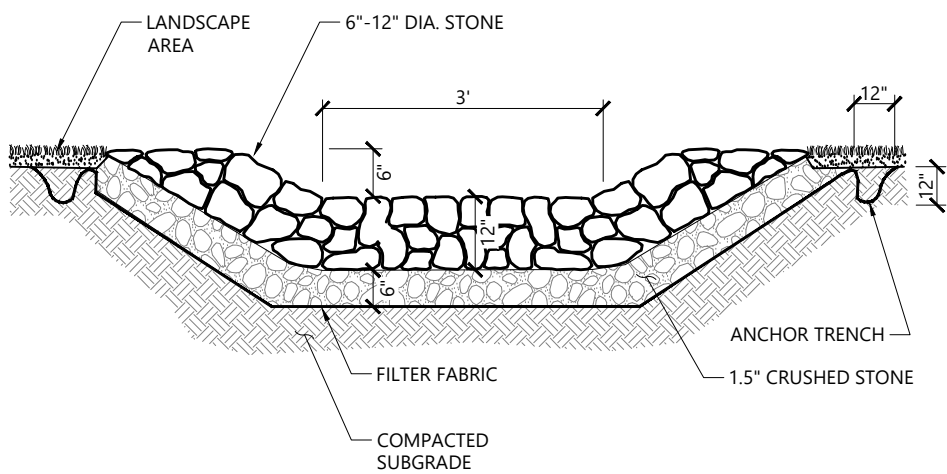
C7



Bioretention Basin 3/20
N.T.S. Source: VHB REV LD_199



Stormwater Curb Inlet 1/16
N.T.S. Source: VHB REV LD_512



Stone Inlet Protection 1/16
N.T.S. Source: VHB REV LD_170

Civil:

vhb

101 Walnut Street

PO Box 9151

Watertown, MA 02471

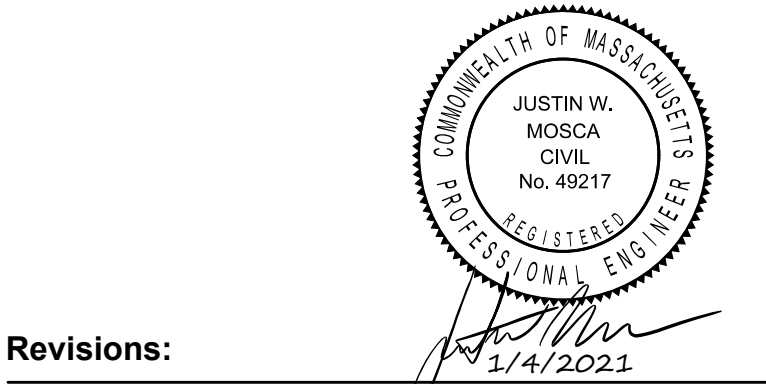
617.924.1770

NorthHill

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Bayview Road Improvements Project Team:		
Landscape Architect		
Hammer + Walsh Design Inc	617.439.0125	
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New 45 IL Residences Project Team:		
Architect		
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Life Care Facility

865 Central Avenue

Needham, MA 02492

Permitting

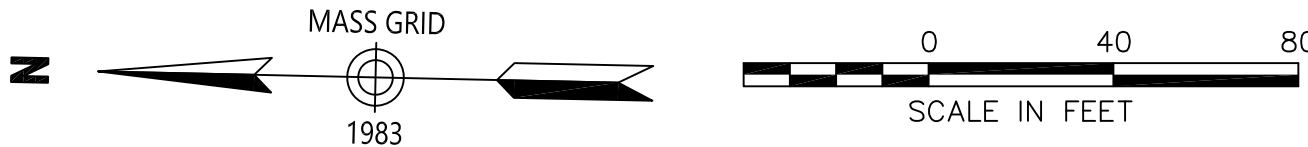
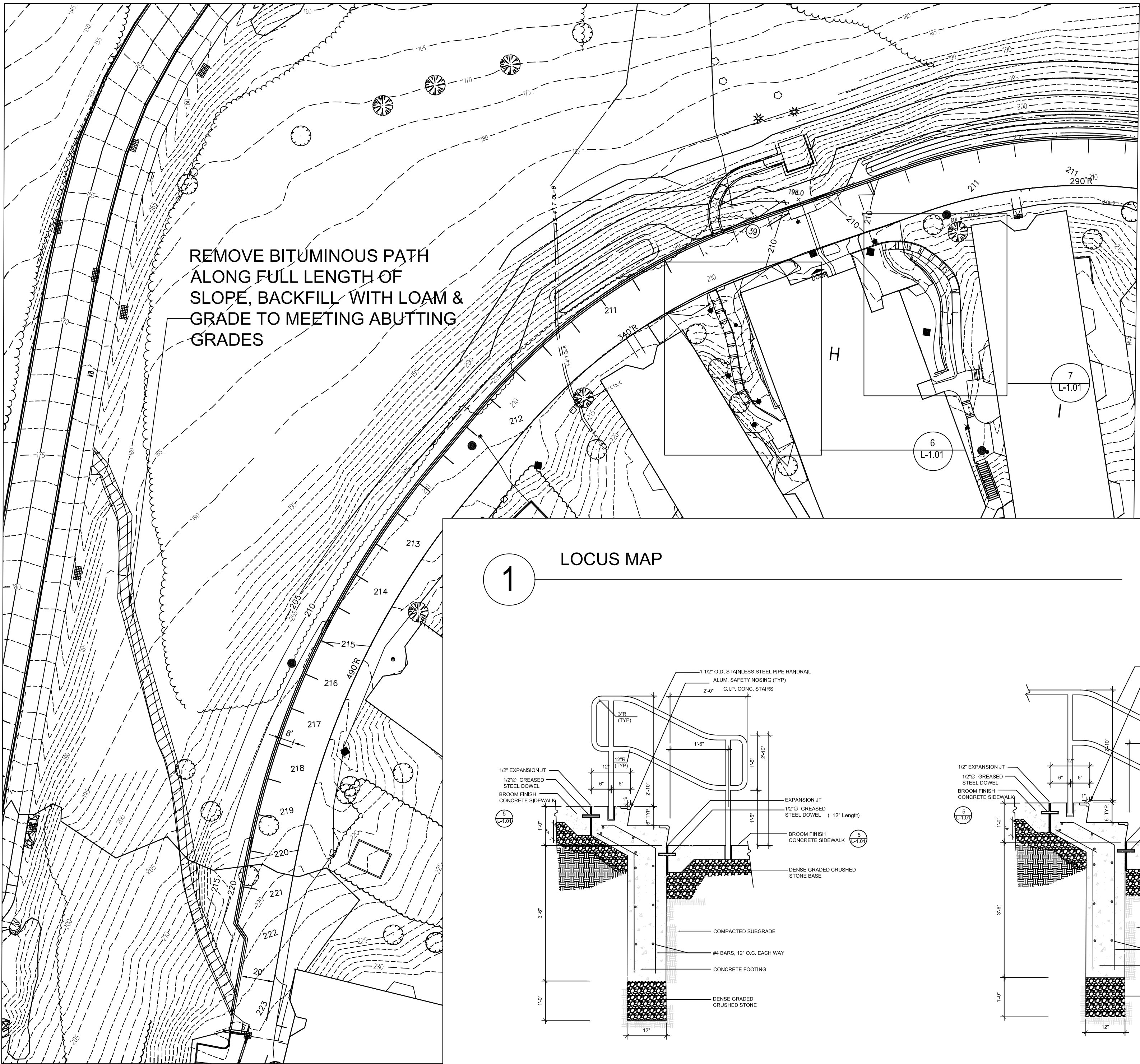
Not Issued for Construction

Bayview Road

Site Details

#1

C8.5



GENERAL NOTES

Concrete Paving Notes:

- Concrete shall be 4,000 psi compressive strength, 5-7% air entrained.
- Extend the depth of the concrete slab to accommodate handrail post footings as detailed.
- Expansion joints shall be spaced a maximum of 25' O.C. and shall be radial to the curves of the walk.
- Install steel dowels at all expansion joints to prevent differential settling between pours. Provide 3 dowels per expansion joint.
- Tool joints shall be equidistantly spaced between tool joints, between 5' and 6' O.C., typ.
- Finish shall be a medium broom finish swept perpendicular to the direction of the walkway.

Handrail notes:

- Handrails shall be Grade 304 stainless steel pipe, 1 1/2" O.D., as detailed.
- For both existing and new concrete walkways, core holes in the concrete as detailed.
- Place handrails in center of coring and support in a plumb position.
- Fill voids with exterior grade non-shrink grout such as Super Por-Rok.
- Maintain plumb support until grout has cured.
- Remove excess grout from the base of each post.

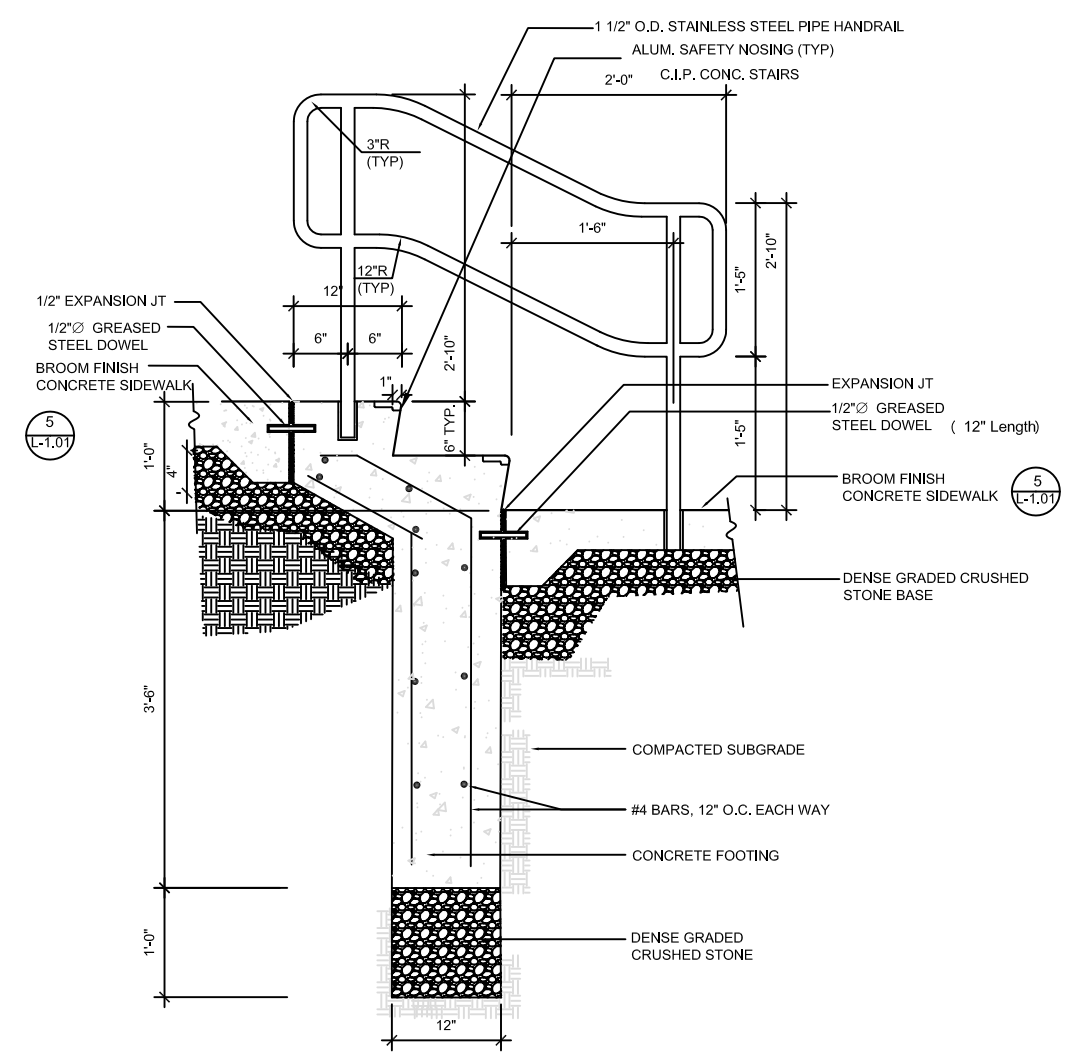
Sodding notes:

- Prior to topsoiling, the existing finish grade shall be cultivated to a depth of 6" to 8"
- Topsoil for sod shall have a pH of between 5.8 and 7.0 and shall contain not less than 4% nor more than 20% organic matter. Topsoil shall be provided to a depth of 6".
- Sod shall be provided by a recognized supplier/distributor and shall be machine cut at a uniform thickness of 1 1/2" (1 1/4" - 1 3/4") at the time of cutting.
- Immediately before sod is installed, the ground shall be scarified, harrowed, raked and broomed until the surface is smooth, friable, and of uniformly fine texture.
- Soil moistening: After all grading has been completed, the soil shall be irrigated 12-24 hours prior to laying the sod. Sod should not be laid on soil that is dry and powdery.
- Starter strip: The first row of sod shall be laid in a straight line, with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to ensure that the sod is not stretched or overlapped and that all joints are butted tightly to prevent voids that would cause drying of the roots.

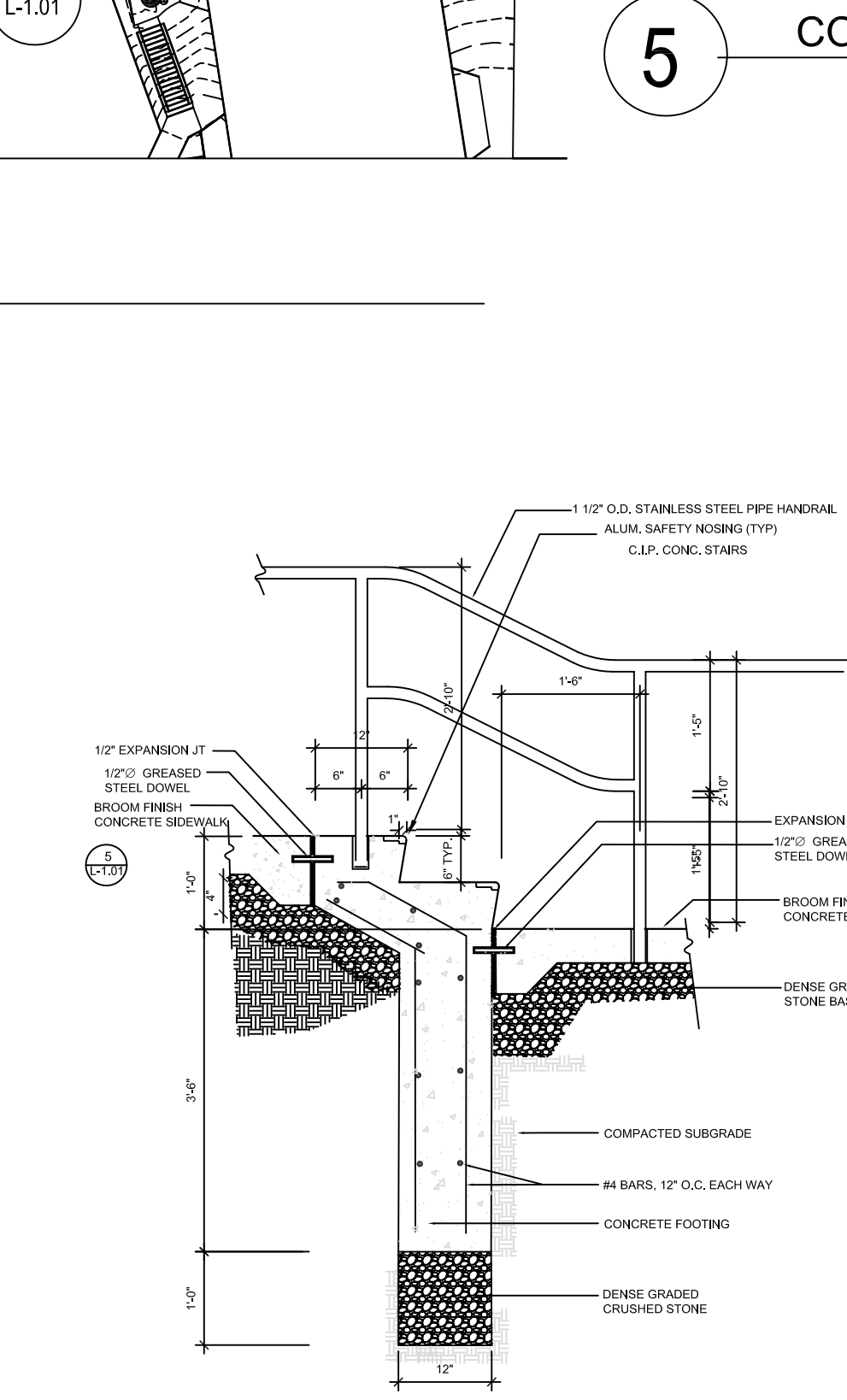
Planting notes:

- In the event of a discrepancy between the planting plan and the plant list, the planting plan shall take precedence.
- In the event of a discrepancy on the planting plan between the number of circles representing plants and the number of plants identified in a plant call-out, the number of circles on the plan shall take precedence.
- Substitutions: In the event the specified species cannot be found prior to the required planting schedule, substitutions shall be allowed, provided they are reviewed and approved by the Landscape Architect prior to purchase, and can be provided in the specified size (one gallon) and quantities.

1 LOCUS MAP

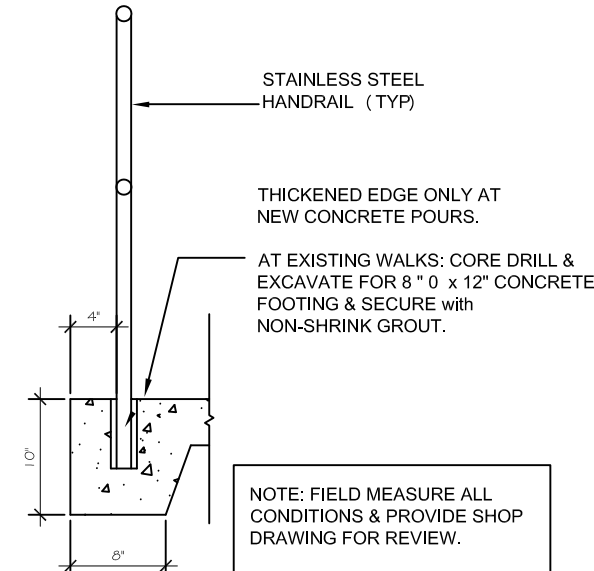


2 STAND ALONE HANDRAIL

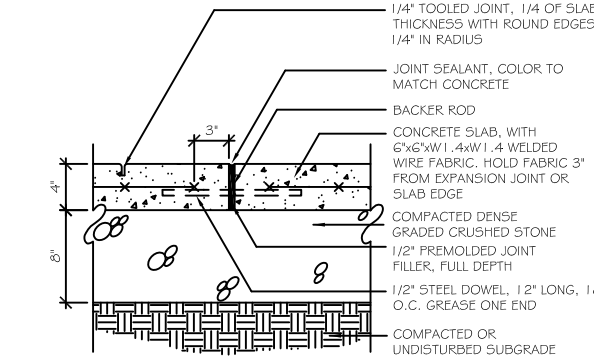


3 CONTINUOUS HANDRAIL

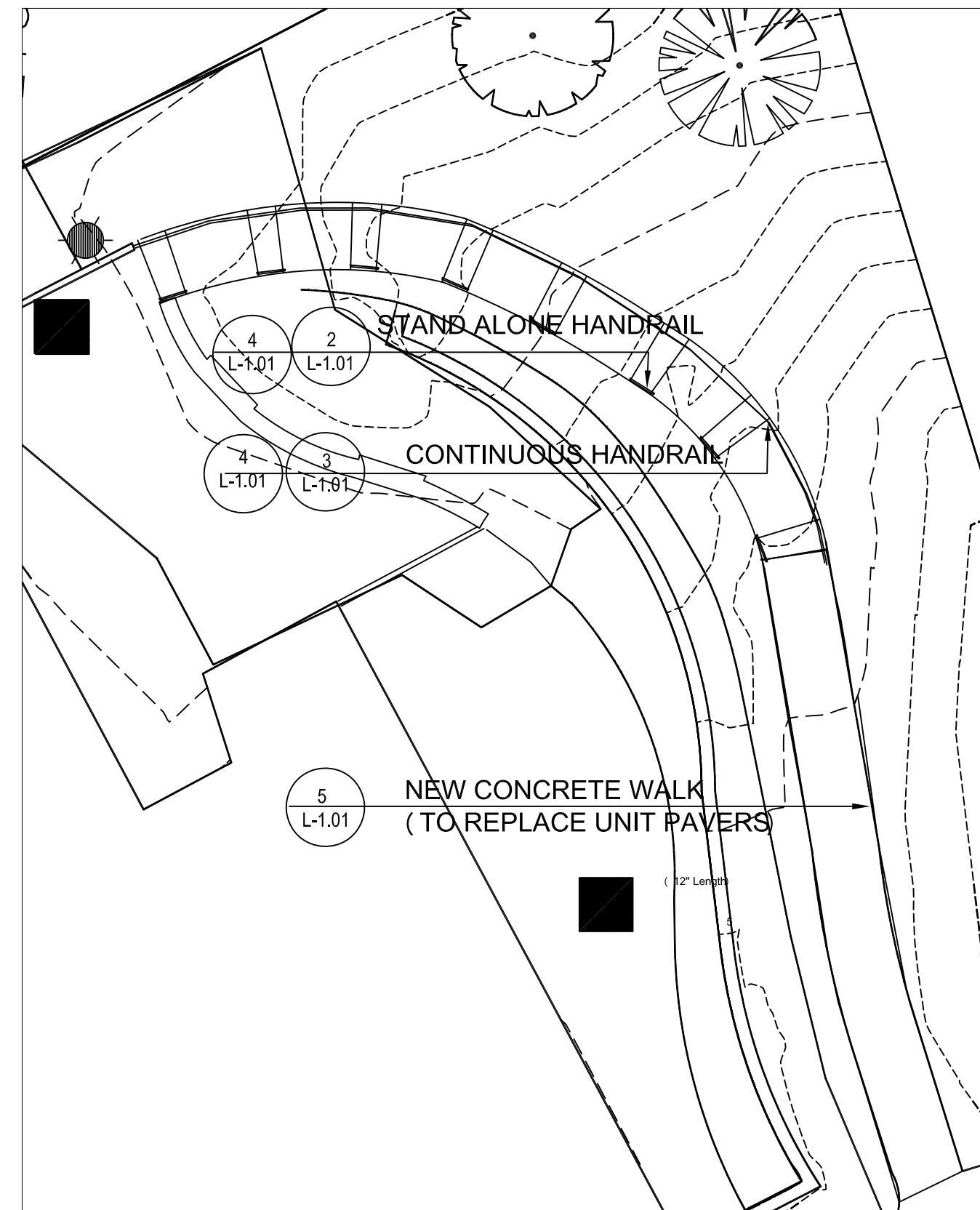
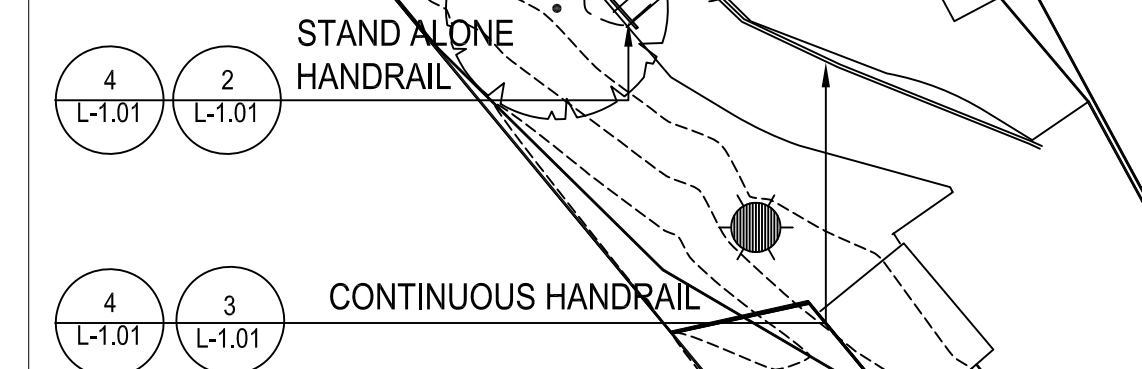
4 POST OFFSET AT CONCRETE EDGE



5 CONCRETE WALK



6 EXISTING WALKWAY NORTH OF BLDG "H"



7 REBUILT WALKWAY SOUTH OF BLDG "H"

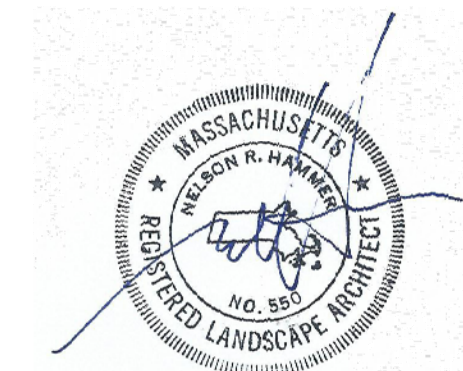
Bayview Road Improvements Project Team:

Electrical
Bard, Rao & Athanas Consulting, Inc. 617.254.0016

Landscape Architect

**Hammer
+ Walsh
Design Inc.**

24 Farnsworth Street, 4th Floor
Boston, MA 02210
(617) 439-0125
www.hammerwalsh.com



Revisions:

Scale: Date: **January 4, 2021**

Drawn By: Checked By: Reviewed By:

North Hill Life Care Facility

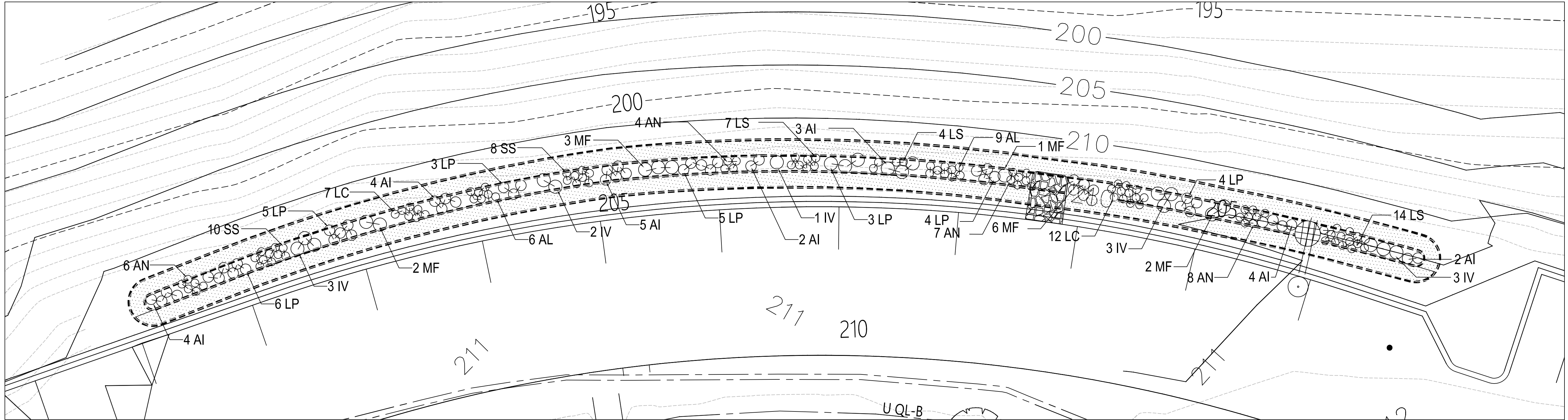
865 Central Avenue
Needham, MA 02492

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Bayview Road
Stairway & Path Improvements

#1
L 3.7

D:\2 SHARED DRIVE (TS5200DS64-2)\ACTIVE PROJECTS\NORTH HILL- BAY VIEW ROAD\DRAWINGS\CURRENT\1 3.8 12-31-20.dwg

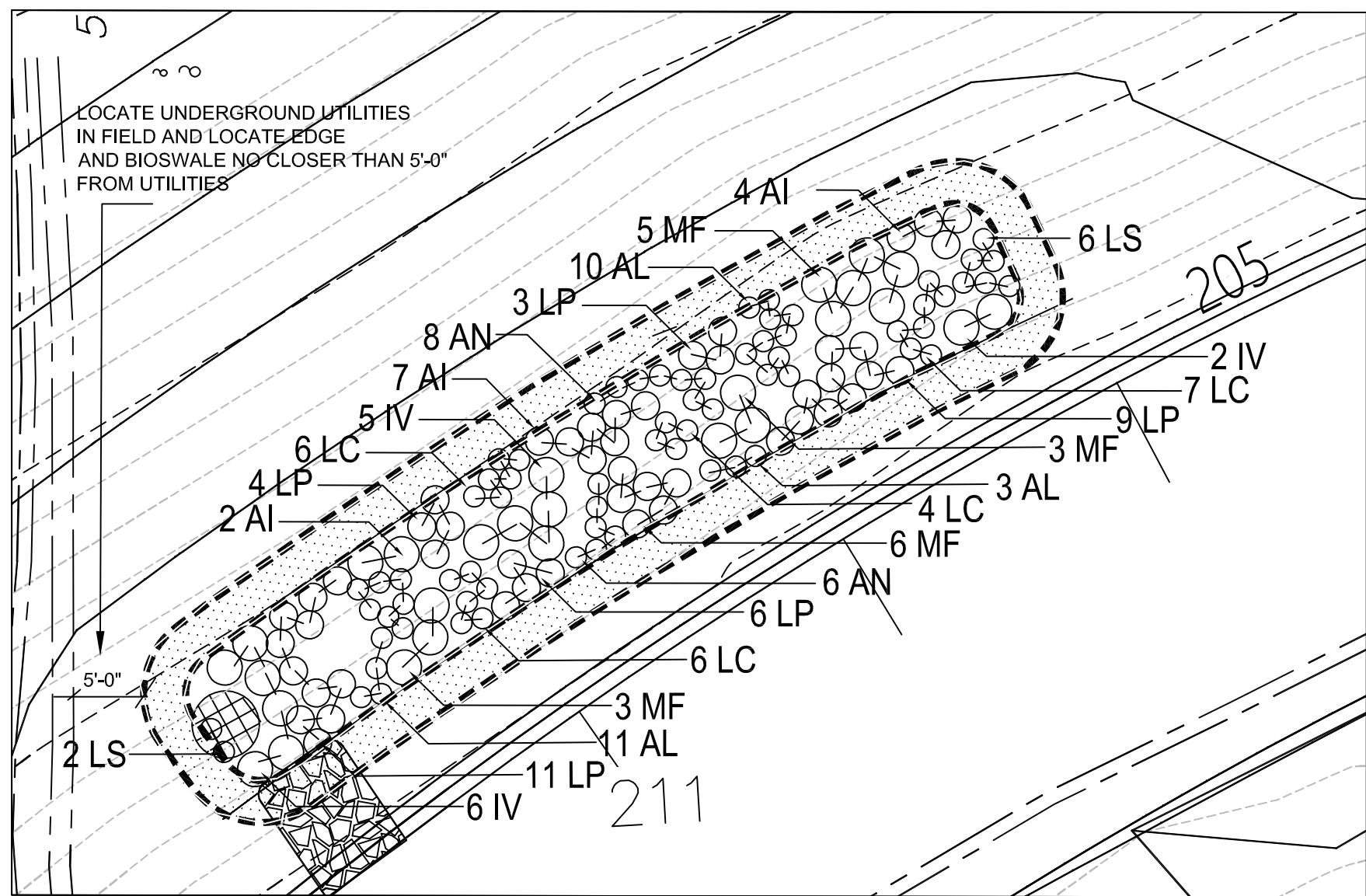


1 SOUTH BIOSWALE

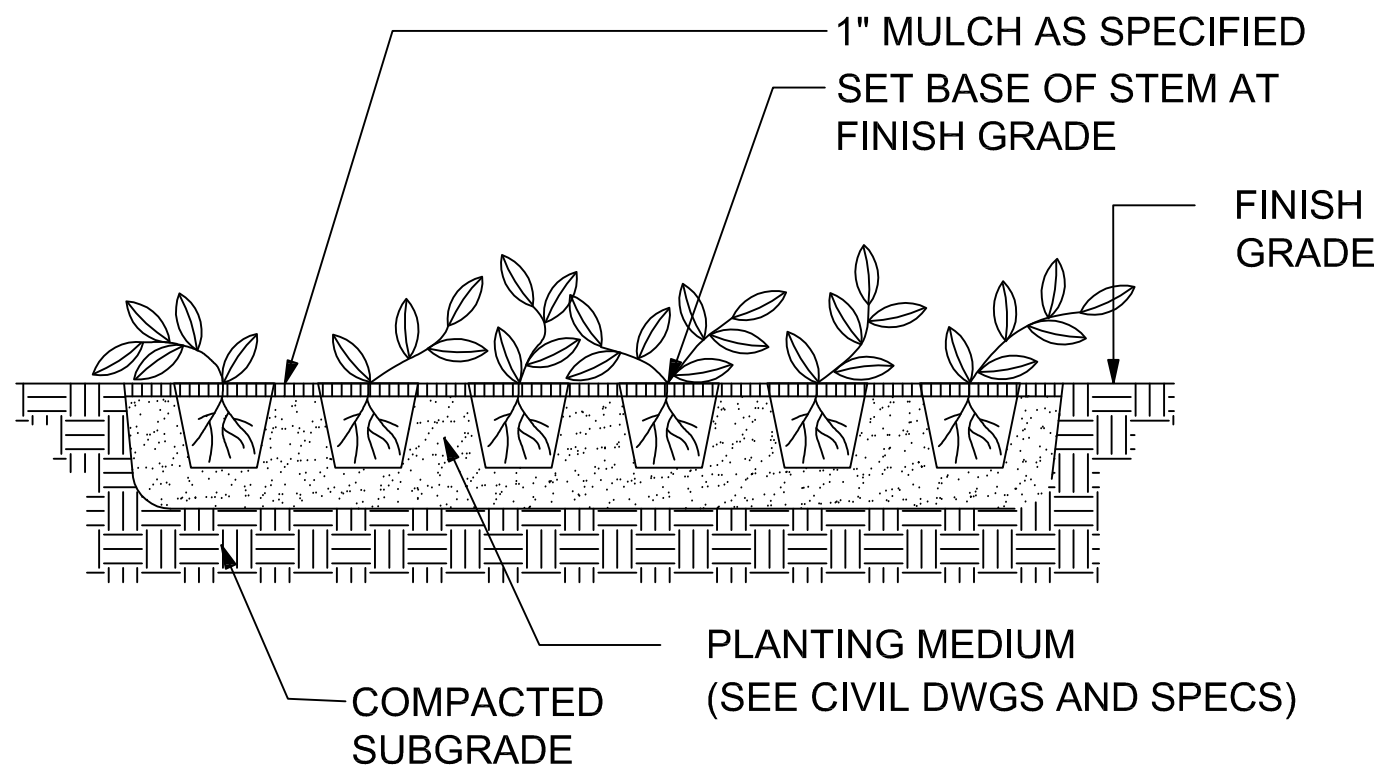
NORTH HILL RETIREMENT COMMUNITY
BAY VIEW ROAD IMPROVEMENTS

BIOSWALE PLANT LIST

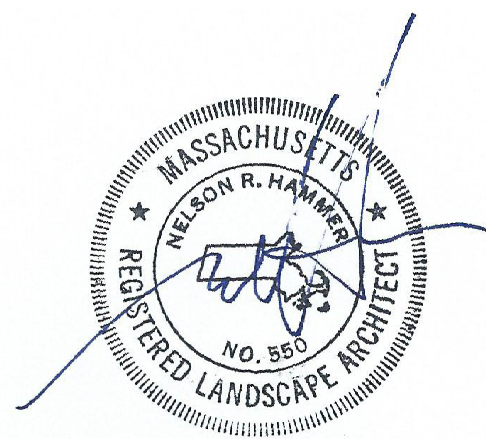
QUANTITIES			KEY	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	SPACING	SIZE
NORTH	SOUTH	TOTAL						
13	20	33	AI	Asclepias incarnata	Swamp Milkweed	36"-48"	24"	4" PLUGS
24	19	43	AL	Aster laevis	Bluebird	36"-48"	18"	4" PLUGS
14	25	39	AN	Aster novae-angliae	New England Aster	up to 48"	18"	4" PLUGS
13	26	39	IV	Iris versicolor	Blue Flag Iris	24"-36"	30"	4" PLUGS
28	58	86	LP	Liatris spicata	Blazing Star	up to 24"	24"	4" PLUGS
23	42	65	LC	Lobelia cardinalis	Cardinal Flower	12"-72"	18"	4" PLUGS
6	29	35	LS	Lobelia siphilitica	Great Blue Lobelia	24"-36"	18"	4" PLUGS
17	31	48	MF	Monarda fistulosa	Wild Bergamot	48"-50"	30"	4" PLUGS
	18	18	SS	Schizyachyrium scoparium	Little Bluestem	24"-48"	18"	4" PLUGS



2 NORTH BIOSWALE



3 PLANTING DETAIL



Revisions:
Scale: Date: **January 4, 2021**
Drawn By: Checked By: Reviewed By:

**North Hill
Life Care Facility**
865 Central Avenue
Needham, MA 02492

Permitting
Not Issued For Construction

Bayview Road
Bioretention Basin Planting Plans

#1
L 3.8

8/19/2020 2:07:42 PM

K:\Jobs\3029900.D5\LELEC\D5-Lighting Plan.dwg

8/19/2020 2:07:42 PM



Calculation Summary	
Label	Units
Red	2 Fc
Green	1 Fc
Blue	0.5 Fc
Light Blue	0.1 Fc

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
Path	Fc	0.58	1	0.3	1.93	3.33
Street	Fc	1.08	1.9	0.2	5.40	9.50
Equipment Bay	Fc	5.87	10.5	2.2	2.67	4.77

Civil:

vhb

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Watertown, MA 02471
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North Hill

877.736.4371

Bayview Road Improvements Project Team:

Landscape Architect
Hammer + Walsh Design Inc

617.439.0125

Electrical
Bard, Rao & Athanas Consulting, Inc.

617.254.0016

Revisions:		
Scale:	Date: January 04, 2021	
Drawn By:	Checked By:	Reviewed By:

North Hill

Life Care Facility

865 Central Avenue
Needham, MA 02492

Permitting

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Bayview Road
Lighting Photometric Plan

#1

PH1.02

LIGHTING FIXTURE SCHEDULE							
TYPE	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LAMP DATA			NOTES
				NB	WATTS	TYPE	
P1	POLE	BEACON	URB-CAP-21-24L-55-4K7-UNV-2-PCU	1	27	LED	UNV
S1	STEP LIGHT	KIM LIGHTING	EL807/3L3KUV	1	3.6	LED	UNV
W1	WALLPACK	BEACON	TRV-3-241-27-4K7-4V-UNV-MDB-PCU-BLT	1	27	LED	UNV
B1	BOLLARD	BEACON	BRP42-AC-24N8-55-3K-UNV-INDS-AB-CES-BLT	1	55	LED	UNV REPLACE EXISTING WALKWAY BOLLARDS

ABBREVIATIONS (LIGHTING PLANS)

CU	COPPER
DCR	DEPARTMENT OF CONSERVATION AND RECREATION
FC	FOOTCANDLES
HH	HANDHOLE
LED	LIGHT EMITTING DIODE
LM	LUMEN
MH	MOUNTING HEIGHT
PB	PULLBOX
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
RMC	RIGID METAL CONDUIT
RMC/V	RIGID METAL CONDUIT, PVC COATED

LINE LEGENDS

UES	UNDERGROUND ELECTRICAL SERVICE FEEDER, ONE (1) 3" RIGID STEEL CONDUIT (120/240V, SINGLE PHASE)
	UNDERGROUND ELECTRICAL CONDUIT, ONE (1) 2" PVC SCH 80, UON, WIRING AS INDICATED.
	SURFACE MOUNTED ELECTRICAL CONDUIT, 3/4" PV COATED RIGID STEEL WITH 2#10 AWG, 1#10 AWG GROUND. CONDUCTORS SHALL BE TYPE XHHW-2 WITH XLP JACKET.
HH	LIGHTING HANDHOLE
	LED WALLPACK FIXTURE WITH FACTORY BACKBOX, BLACK.
	LED STEP LIGHT FIXTURE WITH FACTORY BACKBOX, BLACK.
	JUNCTION BOX, NEMA 3R GALVANIZED STEEL, WITH THREADED, SEALED HUBS.
	DISCONNECT SWITCH, NEMA 3R GALVANIZED STEEL, WITH THREADED, SEALED HUBS.
TC	TIME CLOCK WITH CONTACTORS

ABBREVIATIONS

ETR	EXISTING TO REMAIN
ETD	EXISTING TO BE DEMOLISHED
ETRL	EXISTING TO BE RELOCATED
ENL	EXISTING NEW LOCATION

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Electrical
Bard, Rao & Athanas Consulting, Inc. 617.254.0016



GENERAL NOTES

1. REFER TO LEGEND SHEET E-000 FOR LEGEND, SYMBOLS, AND NOTES

KEY NOTES

- 1 PROVIDE EMPTY BACK BOX AND 1" CONDUIT FOR WANDERGUARD SYSTEM FURNISHED BY VENDOR AND PER MANUFACTURER'S DRAWINGS
- 2 FEED (2) EXTERIOR LIGHTING CIRCUITS BACK TO EXISTING PANEL LL VIA HANDHOLE
- 3 COORDINATE STEP LIGHT MOUNTING WITH APPROVED WALL MANUFACTURER

Revisions:

Scale: Date: January 04, 2021
Drawn By: Checked By: Reviewed By:

North Hill
Life Care Facility

865 Central Avenue
Needham, MA 02492

Permitting
Not Issued for Construction

Bayview Road
Site Distribution Plan

#1

ES1.02



Memorandum

To: Roy A. Cramer
Frieze Cramer Rosen & Huber, LLP
60 Walnut Street
Wellesley, MA 02481

Date: January 4, 2021

Project #: 11369.04

From: Dan Keches, P.E.
Justin Mosca, P.E.

Re: North Hill Life Care Facility -
Bayview Road Stormwater Revisions

Project Description

Vanasse Hangen Brustlin, Inc. (VHB) has prepared this memorandum as a supplement to the June 2011 Stormwater Report for the master plan and associated improvements at the North Hill campus (Project) at 865 Central Avenue, Needham, MA (Site), as amended through the Project's Certificate of Compliance issued September 19, 2017, which documents the existing and proposed drainage conditions associated with the redevelopment.

The Project has been under construction since 2011. During this time, the constructed phases of the Project have remained consistent with the June 2011 overall program and design intent. The changes described herein consist of a new phase of work which includes improvement of Bayview Road, an existing fire access lane around the rear (north and east sides) of the existing Independent Living Building (IL Building). Work proposed under this new phase of the Project includes reconstructing the fire lane to a 20-foot width around the entire IL Building for improved emergency vehicle access, adding 75 parking spaces on the outside of the fire lane, and constructing stormwater management features, ancillary area lighting and landscape improvements. An existing cooling tower will also be replaced, including associated utility routing. This memorandum is intended to give an accounting of those changes from a stormwater perspective and to demonstrate that they do not negatively impact the Project's stormwater management system. The associated improvements are detailed on the project plans dated January 4, 2021.

Existing Conditions

Through the various phases of site development and associated design changes during that time, the Stormwater Management Report has undergone several updates since 2011. As such, the term "existing conditions" can vary in meaning depending on the point in time being referenced. For the purposes of this memorandum, the following terminology will be used to clearly identify design reference points:

- "Pre-Project Existing Condition(s)": Refers to the onsite conditions existing at the time of the original Stormwater Management Report dated June 2011. This is the primary point of comparison for peak rate and volumes to off-site areas.
- "Previously Approved Condition(s)": Refers to the onsite conditions as they exist at the time of this filing, through all phases of installed improvements to date. Comparison against this point in time is a relative reference to what was previously approved under the Project's Special Permit and environmental filings.
- "Currently Proposed Condition(s)": Refers to the future site conditions following installation of the improvements proposed under this revision to the Special Permit plans.

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Memorandum

Under both Pre-Project Existing Conditions and Previously Approved Conditions, the area of proposed work consists of a 12-foot wide paved drive and gravel shoulder extending from "C" to "O" Wings of the existing IL Building. Stormwater runoff from the driveway and shoulder flows overland down primarily vegetated slopes to the North and East towards the Main Entry Drive and Central Avenue. Any runoff that makes it beyond the vegetated slope is ultimately collected in the closed-drainage networks along those roadways. Runoff from this area is not collected in the Site's closed-drainage system and is not tributary to the East Militia Height Drive Basin (DP-1). As this portion of the Site is located beyond the limits of work completed under previous phases of site improvements, it was not included in the original stormwater model or analysis. Accordingly, it has now been added to the stormwater model as Subcatchment 30. A new Design Point 3 (DP-3) has also been added for the offsite closed-drainage networks in Central Avenue to which this area is eventually tributary. Refer to the enclosed, Figure 2 for updated drainage areas for the Pre-Project Existing Conditions.

Proposed Conditions

In the Currently Proposed Condition, the majority of the existing access drive in the area of work will be replaced with a 20-foot wide paved driveway conforming to access requirements for fire lanes, and paved parallel parking will be added to the outer perimeter. For the remaining portion of the drive at the east end, the driveway width will be increased to 24 feet to accommodate "head in" parking where adjacent topography allows. Curbing will be provided along the outer edge of the new pavement to route stormwater from the reconstructed drive into the onsite stormwater management system and prevent runoff down the adjacent slopes. Stormwater will flow overland to one of two proposed lined, filtering bioretention basins located on the outside of the new driveway near "G" and "I" Wings of the IL Building. Outlets from these basins will connect back to the existing closed-drainage system within Bayview Road, ultimately routing this stormwater to the existing stormwater infiltration/detention basin at East Militia Heights Drive and DP-1. Refer to the enclosed, updated Figure 3 for Currently Proposed Conditions drainage areas.

Stormwater Management

Hydrologic Analysis

As proposed, the Bayview Road improvements divert stormwater from the newly added Design Point 3 under the Pre-Project Existing Conditions to Design Point 1 under the Currently Proposed Conditions. As such, they represent an increase in tributary area and stormwater runoff routed to the existing East Militia basin and Design Point 1 compared to the Previously Approved Condition; however, the improvements will result in no net increase in the rate of stormwater runoff as compared to the Pre-Project Existing Conditions outlined in the original Stormwater Report. The proposed changes will result in a net increase in impervious area over the Previously Approved Condition of approximately 24,500 square feet (sf), which represents approximately 1.6% of the tributary area to DP-1.

The following tables present a summary of the stormwater characteristics and analysis of the Pre-Project Existing Conditions, the Previously Approved Conditions, and the Currently Proposed Conditions for comparison. Refer to Attachment 2 for full hydrologic calculations. These tables are a modification to those originally presented in the



Memorandum

Stormwater Report and subsequent amendments referenced above and, as such, only include information applicable to the proposed modification that has been added or revised. As a conservative approach, the volumes of the newly proposed bioretention basins have not been included in the hydrologic model as detention, since the proposed bioretention basins have been sized for water quality (refer to "Water Quality" section herein) and are anticipated to have negligible impacts on runoff rates and volumes, which are managed in the downstream East Militia Basin.

As shown in the Table 3 updated values, while the proposed Bayview Road improvements result in a slight increase from some of the Previously Approved Conditions peak runoff rates, they maintain peak runoff at or below the Pre-Project Existing Conditions rates. Please refer to the Project's Stormwater Report for the hydrologic analysis of areas unaffected by the currently proposed modifications.

Table 2 Updated Values
Pre-Project Existing Conditions Hydrologic Data (EX-30)

Drainage Area	Discharge Location	Design Point	Area (acres)	Curve Number	Time of Concentration (min)
EX-30 (added)	Central Ave. Drainage	3	3.8	78	5.0

Table 3 Updated Values
Proposed Conditions Hydrologic Data (PR-14 and PR-30)

Drainage Area	Discharge Location	Design Point	Area (acres)	Curve Number	Time of Concentration (min)
PR-14 (updated)	E. Militia Basin	1	1.1	96	6.5
PR-30 (added)	Central Ave Drainage	3	2.7	76	5.0

Table 4 Updated Values
Peak Discharge Rates (cubic feet per second) (DP-1 and DP-3)

Design Point	2-year	10-year	25-year	100-year
<u>Design Point 1: East Militia Basin</u>				
Pre-Project Existing Conditions	1.9	3.1	6.1	8.4
Previously Approved Conditions	1.8	2.2	5.3	8.4
Currently Proposed Conditions	1.8	2.6	6.1	8.2
<u>Design Point 3: Central Ave. Drainage</u>				
Pre-Project Existing Conditions	5.7	11.2	14.4	19.1
Previously Approved Conditions	-	-	-	-
Currently Proposed Conditions	3.6	7.4	9.6	12.9



Memorandum

Infiltration

The newly proposed Bayview Road phase of the Project represents a net increase in impervious cover over the Previously Approved Condition. Test borings were performed in coordination with the Project's geotechnical engineer to determine soil conditions and feasibility for infiltration to meet both MassDEP's required recharge volume and the Town of Needham's Stormwater Bylaw. Those requirements are 0.25 inches over the impervious area (for hydraulic soil group C soils) and 1.0 inches over the impervious area, respectively.

Existing soils consist of glacial till material comprised of 30-40% silt and clay. According to the Geotechnical Engineer's findings, "The natural glacial till soil deposits at the site are typically dense to very dense and contain high percentages of silt and clay sized particles. As a result, these soils are considered poorly drained and typically have very slow hydraulic conductivity rates." These findings are consistent with soils exposed and observed elsewhere onsite, where stormwater facilities constructed in previous phases of the Project have been found to retain stormwater for extended periods and drawdown very slowly, if at all. Although gradation suggests HSG "B" soils, stormwater infiltration is not anticipated to be feasible in the area of proposed work for Bayview Road due to the highly dense existing soil conditions. Accordingly, infiltration measures are not proposed. Bioretention basins have been designed with impermeable liners and underdrains to collect treated stormwater and route it to the closed-drainage system, thereby protecting adjacent slopes from lateral breakout due to poor soil conditions underlying the basins. Refer to Attachment 3 for the results of the onsite subsurface soil investigation effort.

Water Quality

The proposed Bayview Road phase of the Project will improve the water quality of stormwater runoff within the work area. Under Pre-Project Existing Conditions and the Previously Approved Conditions, stormwater runoff from the paved driveway flows untreated to the north and east, down the adjacent slope, and is collected in the closed-drainage system along the Main Entry Driveway/Central Avenue. Under the proposed condition, vertical curbing will be provided along the outer edge of the expanded driveway/parking, allowing stormwater runoff to be collected and routed to one of two new filtering bioretention basins. These basins have been designed to provide improved water quality by removing Total Suspended Solids (TSS) and Total Phosphorus through organic media and filtration. Due to poor underlying soils and proximity to the adjacent slope, the basins will be provided with an impermeable liner and underdrain system. Treated stormwater will be collected in the underdrains and routed to the existing closed drainage system following treatment. The proposed bioretention basin soil profile, combined with a pretreatment inlet filter strip, provides 90% TSS removal in accordance with MassDEP methodology. The proposed basin volumes provide treatment of a volume exceeding the required half-inch of runoff over the tributary impervious area per MassDEP requirements for TSS. Refer to Attachment 4 for TSS removal calculations.

The project site is located within the watershed of the Charles River, which is regulated under Total Maximum Daily Loads (TMDLs) for Nutrients and Pathogens. Under the Town of Needham's MS4 requirements and associated local regulations, the Project is required to remove 55% of the annual phosphorous load from the current area of proposed work. The proposed bioretention basins have been sized to treat a volume equal to 0.62 inches over the proposed impervious area within the limit of work (See Attachment 5), which in turn provides 65% removal of Total Phosphorus



Memorandum

in accordance with the US EPA Stormwater Best Management Practices Analysis (Attachment 6). This removal meets the requirements of the EPA's TMDL for high-density residential land use, as well as the Town of Needham's stormwater bylaw and associated phosphorous removal target.

Regarding pathogens, the main source of degradation to nearby waterways are sanitary sewers (illicit connections, combined sewer overflows, and aging infrastructure) and stormwater runoff. There are no known illicit sanitary connections to North Hill's stormwater management system. Furthermore, North Hill has an existing animal waste policy in place to control waste from any pets on campus, which helps to reduce pathogens entering the storm system. Per US EPA guidance for mitigation measured to address pathogen pollution in surface waters, bioretention basins provide good mitigation of pathogens in stormwater. The proposed bioretention basins will provide pathogen removal within the tributary area of Bayview Road.

Summary

The currently proposed "Bayview Road" phase of the Project will provide stormwater improvements compared to both the Pre-Project Existing Condition and the Previously Approved Condition. Stormwater runoff from the paved area of the fire lane that previously flowed untreated toward Central Avenue will now be collected in an onsite stormwater management system designed to provide greater than the requisite water quality through the use of bioretention basins providing removal of suspended solids, phosphorus, and pathogens. While total impervious area is expected to increase over the Previously Approved Condition, post-construction peak runoff rates will continue to be managed in the East Militia Basin and will be maintained at or below the Pre-Project Existing Condition. Subsurface soil conditions have been studied in detail, and infiltration has been deemed not feasible due to dense glacial till soils. The proposed improvements have otherwise been designed to meet all applicable design criteria of both state and local stormwater regulations. As such, the Project will result in a net benefit to onsite stormwater management and water quality.



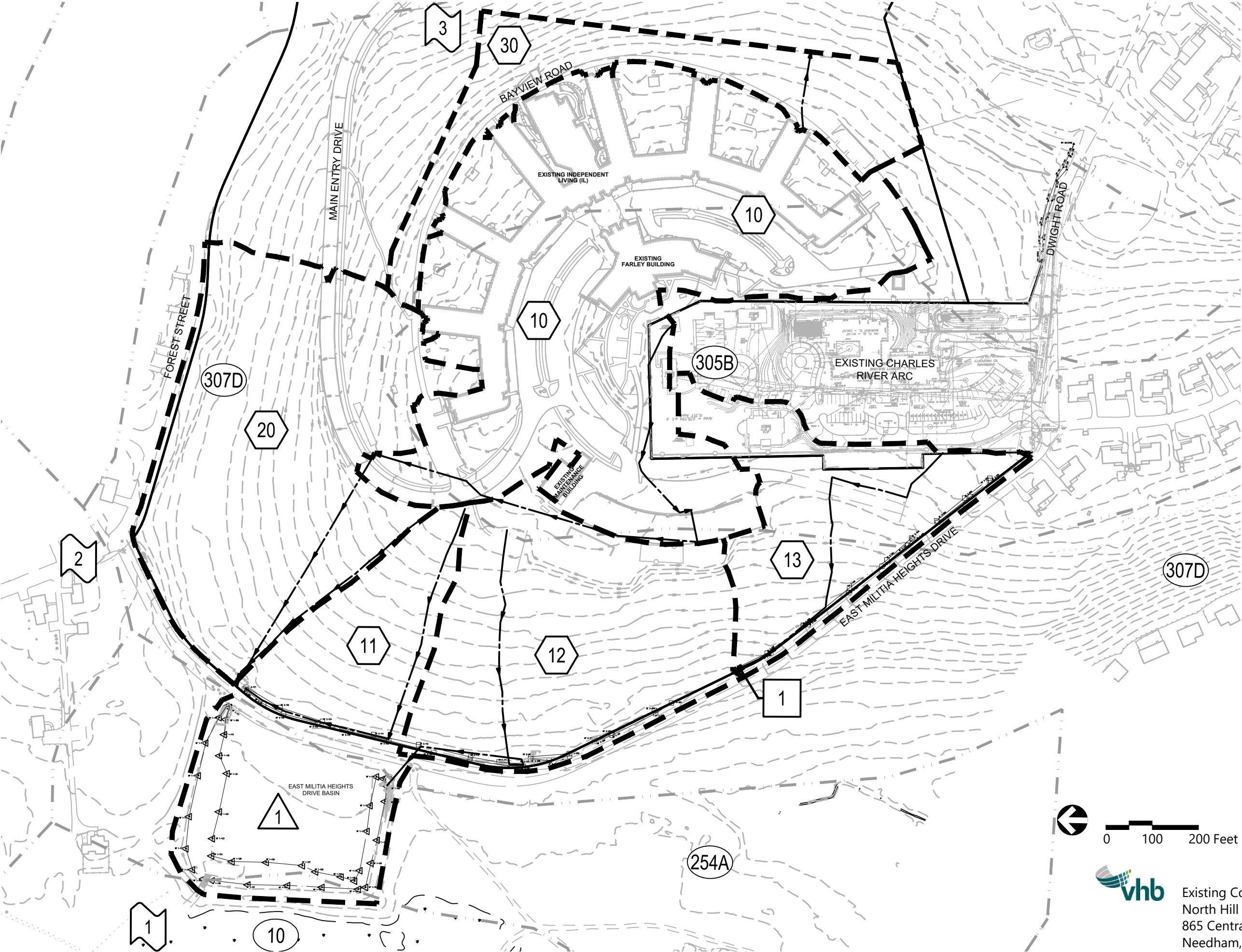
Memorandum

Attachments

1. Updated Stormwater Report Figures
 - a. Figure 2 – Existing Conditions Drainage Areas
 - b. Figure 3 – Proposed Conditions Drainage Areas
2. Updated Hydrologic Analyses
 - a. Existing Conditions Hydrologic Analysis
 - b. Proposed Conditions Hydrologic Analysis
3. Soil Boring Logs
4. TSS Removal Calculations
5. Water Quality Volume Calculations
6. US EPA BMP Performance Analysis – Bioretention



Attachment 1 – Updated Stormwater Report Figures



LEGEND

1

SUBCATCHMENT DRAINAGE AREA DESIGNATION

1

POND

1

DESIGN POINT

1

REACH

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

SOIL TYPE BOUNDARY

2-101 2-102

WETLAND BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

307D

PAXTON FINE SANDY LOAM (HSG C)

305B

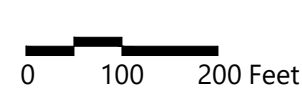
PAXTON FINE SANDY LOAM (HSG C)

254A

MERRIMAC FINE SANDY LOAM (HSG A)

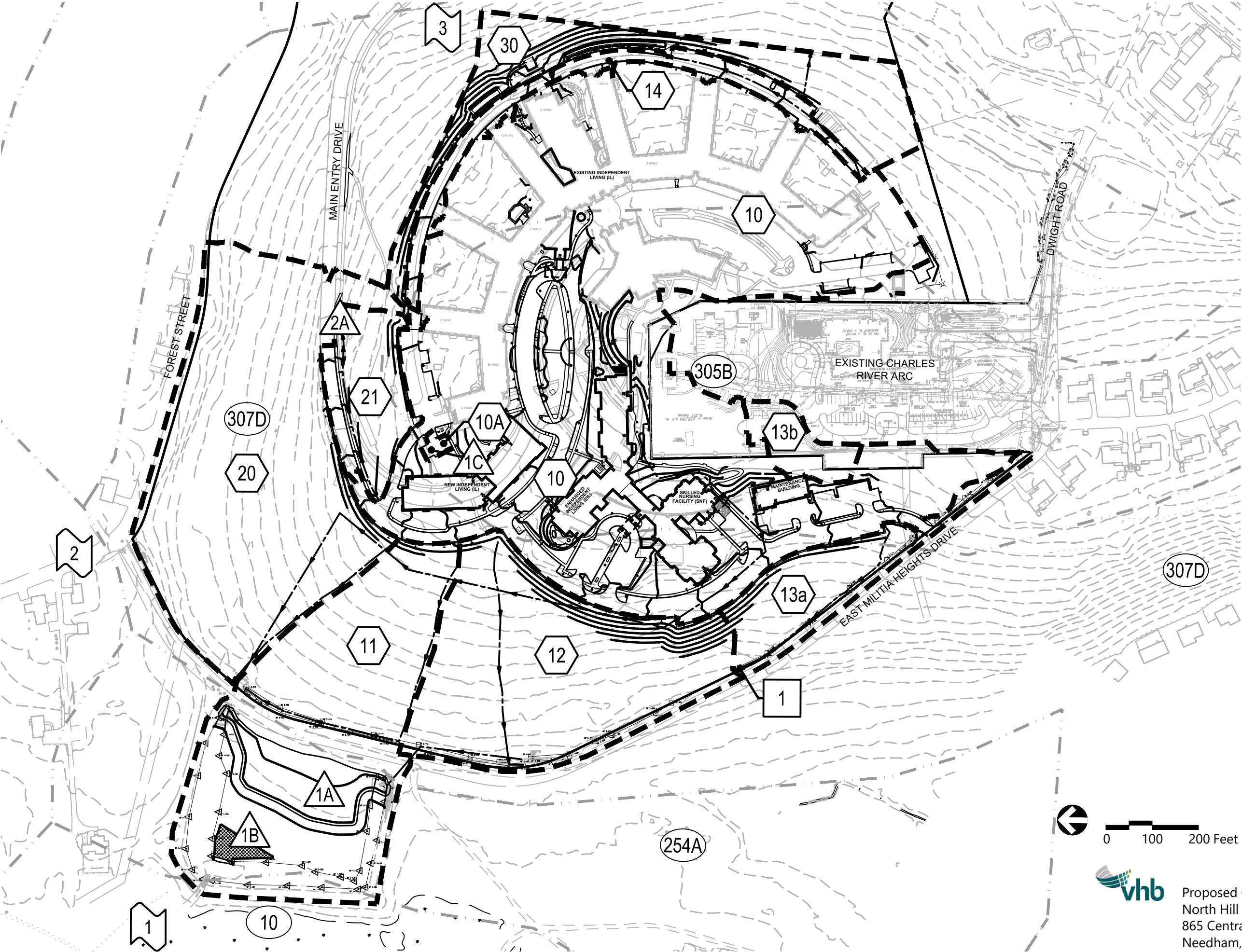
10

SCARBORO AND BIRDSALL SOILS (HSG D)



Existing Conditions Drainage Areas
North Hill Life Care Facility
865 Central Avenue
Needham, Massachusetts

Figure 2
June 2011
Rev Dec 2020



LEGEND

1

SUBCATCHMENT DRAINAGE AREA DESIGNATION

1

POND

1

DESIGN POINT

1

REACH

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

SOIL TYPE BOUNDARY

WETLAND BOUNDARY

NRCS SOIL CLASSIFICATIONS (HSG)

307D

PAXTON FINE SANDY LOAM (HSG C)

305B

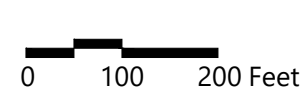
PAXTON FINE SANDY LOAM (HSG C)

254A

MERRIMAC FINE SANDY LOAM (HSG A)

10

SCARBORO AND BIRDSALL SOILS (HSG D)

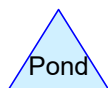
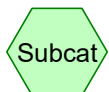
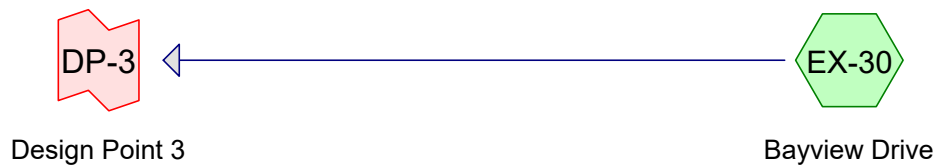
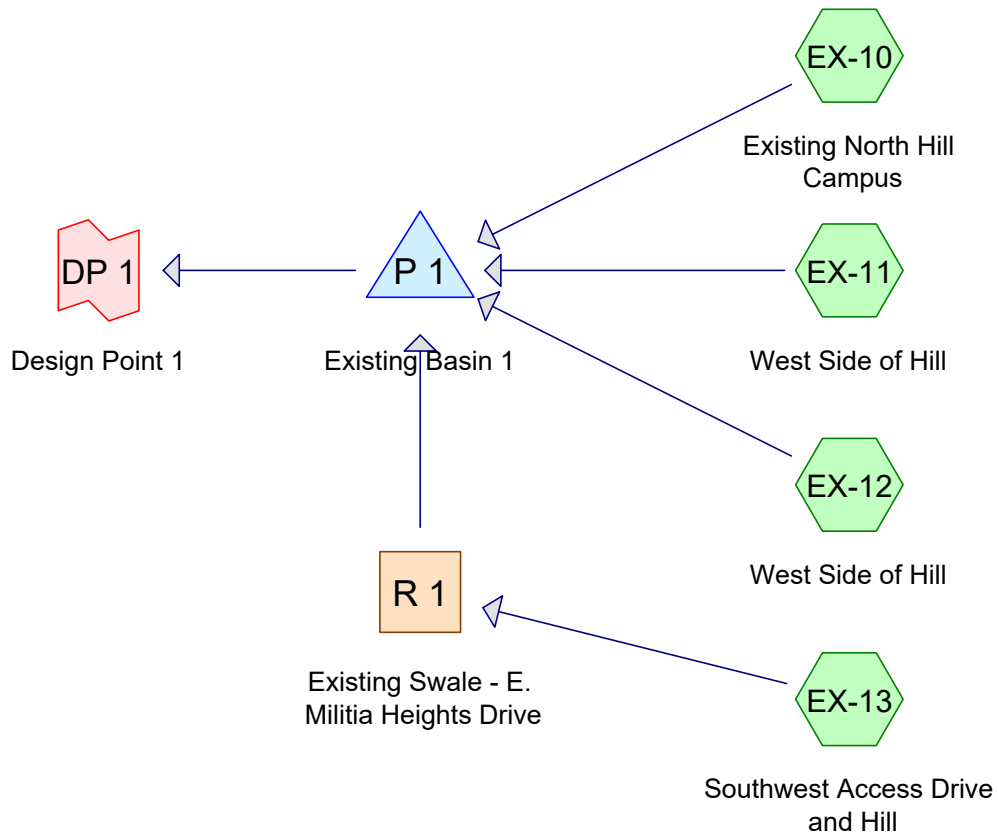


Proposed Conditions Drainage Areas
North Hill Life Care Facility
865 Central Avenue
Needham, Massachusetts

Figure 3
June 2011
Rev Dec 2020



Attachment 2 – Updated Hydrologic Analyses



11369.04-NorthHill_HydroCAD-EX

Prepared by VHB

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.062	49	50-75% Grass cover, Fair, HSG A (EX-11)
11.559	79	50-75% Grass cover, Fair, HSG C (EX-10, EX-11, EX-12, EX-13, EX-20, EX-30)
0.370	84	50-75% Grass cover, Fair, HSG D (EX-11)
11.316	98	Impervious (EX-10, EX-11, EX-12, EX-13, EX-20, EX-30)
0.185	36	Woods, Fair, HSG A (EX-11)
21.293	73	Woods, Fair, HSG C (EX-10, EX-11, EX-12, EX-13, EX-20, EX-30)
47.784	79	TOTAL AREA

11369.04-NorthHill_HydroCAD-EX*Type III 24-hr 2 year Rainfall=3.20"*

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Page 3

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentEX-10: Existing North Hill Runoff Area=699,160 sf 59.28% Impervious Runoff Depth=2.17"
Flow Length=1,860' Tc=15.8 min CN=90 Runoff=30.0 cfs 2.901 af

SubcatchmentEX-11: West Side of Hill Runoff Area=300,305 sf 2.40% Impervious Runoff Depth=0.52"
Flow Length=850' Tc=13.1 min CN=63 Runoff=2.3 cfs 0.298 af

SubcatchmentEX-12: West Side of Hill Runoff Area=311,390 sf 2.71% Impervious Runoff Depth=1.09"
Flow Length=875' Tc=11.2 min CN=75 Runoff=7.3 cfs 0.652 af

SubcatchmentEX-13: Southwest Access Runoff Area=198,695 sf 12.31% Impervious Runoff Depth=1.21"
Flow Length=810' Tc=14.2 min CN=77 Runoff=4.8 cfs 0.461 af

SubcatchmentEX-20: Northwest Portion Runoff Area=408,120 sf 4.33% Impervious Runoff Depth=1.15"
Flow Length=525' Slope=0.1100 '/' Tc=11.0 min CN=76 Runoff=10.3 cfs 0.899 af

SubcatchmentEX-30: Bayview Drive Runoff Area=163,800 sf 12.61% Impervious Runoff Depth=1.27"
Flow Length=169' Tc=5.0 min CN=78 Runoff=5.7 cfs 0.399 af

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=4.8 cfs 0.461 af
Outflow=4.8 cfs 0.461 af

Pond P 1: Existing Basin 1 Peak Elev=149.17' Storage=121,584 cf Inflow=44.2 cfs 4.311 af
Outflow=1.9 cfs 4.224 af

Link DP 1: Design Point 1 Inflow=1.9 cfs 4.224 af
Primary=1.9 cfs 4.224 af

Link DP 2: Design Point 2 Inflow=10.3 cfs 0.899 af
Primary=10.3 cfs 0.899 af

Link DP-3: Design Point 3 Inflow=5.7 cfs 0.399 af
Primary=5.7 cfs 0.399 af

Total Runoff Area = 47.784 ac Runoff Volume = 5.610 af Average Runoff Depth = 1.41"
76.32% Pervious = 36.468 ac 23.68% Impervious = 11.316 ac

Summary for Subcatchment EX-10: Existing North Hill Campus

Runoff = 30.0 cfs @ 12.21 hrs, Volume= 2.901 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
414,480	98	Impervious
61,415	73	Woods, Fair, HSG C
223,265	79	50-75% Grass cover, Fair, HSG C
699,160	90	Weighted Average
284,680		40.72% Pervious Area
414,480		59.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.8	205	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.5	130	0.0380	3.96		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
0.8	240	0.0110	4.76	3.74	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
1.4	350	0.0050	4.20	7.43	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, straight & clean
0.2	210	0.0400	14.40	45.24	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, straight & clean
0.4	570	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	1,860	Total			

Summary for Subcatchment EX-11: West Side of Hill

Runoff = 2.3 cfs @ 12.23 hrs, Volume= 0.298 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

11369.04-NorthHill_HydroCAD-EX

Type III 24-hr 2 year Rainfall=3.20"

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Area (sf)	CN	Description
7,215	98	Impervious
8,040	36	Woods, Fair, HSG A
124,230	73	Woods, Fair, HSG C
133,360	49	50-75% Grass cover, Fair, HSG A
11,360	79	50-75% Grass cover, Fair, HSG C
16,100	84	50-75% Grass cover, Fair, HSG D
300,305	63	Weighted Average
293,090		97.60% Pervious Area
7,215		2.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	30	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.8	440	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.3	330	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
13.1	850	Total			

Summary for Subcatchment EX-12: West Side of Hill

Runoff = 7.3 cfs @ 12.16 hrs, Volume= 0.652 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
* 8,445	98	Impervious
221,385	73	Woods, Fair, HSG C
81,560	79	50-75% Grass cover, Fair, HSG C
311,390	75	Weighted Average
302,945		97.29% Pervious Area
8,445		2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
4.3	465	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.0	330	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
11.2	875	Total			

Summary for Subcatchment EX-13: Southwest Access Drive and Hill

Runoff = 4.8 cfs @ 12.20 hrs, Volume= 0.461 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
*	24,450	98	Impervious
	131,500	73	Woods, Fair, HSG C
	42,745	79	50-75% Grass cover, Fair, HSG C
	198,695	77	Weighted Average
	174,245		87.69% Pervious Area
	24,450		12.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	45	0.0780	1.40		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	30	0.2000	2.24		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.7	165	0.0120	1.64		Shallow Concentrated Flow, Access Drive Swale Grassed Waterway Kv= 15.0 fps
0.1	45	0.0670	11.74	9.22	Pipe Channel, Culvert below Access Drive 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.4	235	0.1110	1.67		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.8	240	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
14.2	810	Total			

Summary for Subcatchment EX-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 10.3 cfs @ 12.16 hrs, Volume= 0.899 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
*	17,670	98	Impervious
	290,810	73	Woods, Fair, HSG C
	99,640	79	50-75% Grass cover, Fair, HSG C
	408,120	76	Weighted Average
	390,450		95.67% Pervious Area
	17,670		4.33% Impervious Area

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Type III 24-hr 2 year Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	475	0.1100	1.66		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
11.0	525	Total			

Summary for Subcatchment EX-30: Bayview Drive

Runoff = 5.7 cfs @ 12.08 hrs, Volume= 0.399 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
20,650	98	Impervious
98,200	73	Woods, Fair, HSG C
44,950	79	50-75% Grass cover, Fair, HSG C
163,800	78	Weighted Average
143,150		87.39% Pervious Area
20,650		12.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	32	0.0410	4.11		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
0.3	33	0.0910	2.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.9	104	0.1440	1.90		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	169	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.561 ac, 12.31% Impervious, Inflow Depth = 1.21" for 2 year event
 Inflow = 4.8 cfs @ 12.20 hrs, Volume= 0.461 af
 Outflow = 4.8 cfs @ 12.20 hrs, Volume= 0.461 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1: Existing Basin 1

[44] Hint: Outlet device #2 is below defined storage

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Type III 24-hr 2 year Rainfall=3.20"

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Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth = 1.49" for 2 year event
 Inflow = 44.2 cfs @ 12.20 hrs, Volume= 4.311 af
 Outflow = 1.9 cfs @ 16.70 hrs, Volume= 4.224 af, Atten= 96%, Lag= 269.8 min
 Primary = 1.9 cfs @ 16.70 hrs, Volume= 4.224 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 149.17' @ 16.70 hrs Surf.Area= 74,192 sf Storage= 121,584 cf

Plug-Flow detention time= 720.8 min calculated for 4.223 af (98% of inflow)
 Center-of-Mass det. time= 709.0 min (1,543.5 - 834.5)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	702,453 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	2,525	0	0
146.00	9,550	6,038	6,038
147.00	21,235	15,393	21,430
148.00	42,190	31,713	53,143
149.00	69,605	55,898	109,040
150.00	95,895	82,750	191,790
151.00	120,320	108,108	299,898
152.00	132,780	126,550	426,448
153.00	138,220	135,500	561,948
154.00	142,790	140,505	702,453

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.9 cfs @ 16.70 hrs HW=149.17' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 1.9 cfs of 6.9 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.2 cfs @ 10.09 fps)
 3=Orifice (Orifice Controls 1.7 cfs @ 8.61 fps)
 4=Weir/Orifice (Controls 0.0 cfs)
 5=Orifice (Controls 0.0 cfs)
 6=Broad-Crested Rectangular Weir(Controls 0.0 cfs)

Summary for Link DP 1: Design Point 1

Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth > 1.46" for 2 year event
Inflow = 1.9 cfs @ 16.70 hrs, Volume= 4.224 af
Primary = 1.9 cfs @ 16.70 hrs, Volume= 4.224 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 9.369 ac, 4.33% Impervious, Inflow Depth = 1.15" for 2 year event
Inflow = 10.3 cfs @ 12.16 hrs, Volume= 0.899 af
Primary = 10.3 cfs @ 12.16 hrs, Volume= 0.899 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 3.760 ac, 12.61% Impervious, Inflow Depth = 1.27" for 2 year event
Inflow = 5.7 cfs @ 12.08 hrs, Volume= 0.399 af
Primary = 5.7 cfs @ 12.08 hrs, Volume= 0.399 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentEX-10: Existing North Hill Runoff Area=699,160 sf 59.28% Impervious Runoff Depth=3.59"
Flow Length=1,860' Tc=15.8 min CN=90 Runoff=48.8 cfs 4.799 af

SubcatchmentEX-11: West Side of Hill Runoff Area=300,305 sf 2.40% Impervious Runoff Depth=1.32"
Flow Length=850' Tc=13.1 min CN=63 Runoff=7.7 cfs 0.760 af

SubcatchmentEX-12: West Side of Hill Runoff Area=311,390 sf 2.71% Impervious Runoff Depth=2.21"
Flow Length=875' Tc=11.2 min CN=75 Runoff=15.5 cfs 1.316 af

SubcatchmentEX-13: Southwest Access Runoff Area=198,695 sf 12.31% Impervious Runoff Depth=2.37"
Flow Length=810' Tc=14.2 min CN=77 Runoff=9.8 cfs 0.902 af

SubcatchmentEX-20: Northwest Portion Runoff Area=408,120 sf 4.33% Impervious Runoff Depth=2.29"
Flow Length=525' Slope=0.1100 '/' Tc=11.0 min CN=76 Runoff=21.2 cfs 1.788 af

SubcatchmentEX-30: Bayview Drive Runoff Area=163,800 sf 12.61% Impervious Runoff Depth=2.46"
Flow Length=169' Tc=5.0 min CN=78 Runoff=11.2 cfs 0.771 af

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=9.8 cfs 0.902 af
Outflow=9.8 cfs 0.902 af

Pond P 1: Existing Basin 1 Peak Elev=150.43' Storage=235,783 cf Inflow=80.8 cfs 7.776 af
Outflow=3.1 cfs 6.600 af

Link DP 1: Design Point 1 Inflow=3.1 cfs 6.600 af
Primary=3.1 cfs 6.600 af

Link DP 2: Design Point 2 Inflow=21.2 cfs 1.788 af
Primary=21.2 cfs 1.788 af

Link DP-3: Design Point 3 Inflow=11.2 cfs 0.771 af
Primary=11.2 cfs 0.771 af

Total Runoff Area = 47.784 ac Runoff Volume = 10.335 af Average Runoff Depth = 2.60"
76.32% Pervious = 36.468 ac 23.68% Impervious = 11.316 ac

Summary for Subcatchment EX-10: Existing North Hill Campus

Runoff = 48.8 cfs @ 12.21 hrs, Volume= 4.799 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
414,480	98	Impervious
61,415	73	Woods, Fair, HSG C
223,265	79	50-75% Grass cover, Fair, HSG C
699,160	90	Weighted Average
284,680		40.72% Pervious Area
414,480		59.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.8	205	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.5	130	0.0380	3.96		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
0.8	240	0.0110	4.76	3.74	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
1.4	350	0.0050	4.20	7.43	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, straight & clean
0.2	210	0.0400	14.40	45.24	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, straight & clean
0.4	570	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	1,860	Total			

Summary for Subcatchment EX-11: West Side of Hill

Runoff = 7.7 cfs @ 12.20 hrs, Volume= 0.760 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

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Type III 24-hr 10 year Rainfall=4.70"

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Area (sf)	CN	Description
7,215	98	Impervious
8,040	36	Woods, Fair, HSG A
124,230	73	Woods, Fair, HSG C
133,360	49	50-75% Grass cover, Fair, HSG A
11,360	79	50-75% Grass cover, Fair, HSG C
16,100	84	50-75% Grass cover, Fair, HSG D
300,305	63	Weighted Average
293,090		97.60% Pervious Area
7,215		2.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	30	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.8	440	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.3	330	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
13.1	850	Total			

Summary for Subcatchment EX-12: West Side of Hill

Runoff = 15.5 cfs @ 12.16 hrs, Volume= 1.316 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
* 8,445	98	Impervious
221,385	73	Woods, Fair, HSG C
81,560	79	50-75% Grass cover, Fair, HSG C
311,390	75	Weighted Average
302,945		97.29% Pervious Area
8,445		2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
4.3	465	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.0	330	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
11.2	875	Total			

Summary for Subcatchment EX-13: Southwest Access Drive and Hill

Runoff = 9.8 cfs @ 12.20 hrs, Volume= 0.902 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	24,450	98	Impervious
	131,500	73	Woods, Fair, HSG C
	42,745	79	50-75% Grass cover, Fair, HSG C
	198,695	77	Weighted Average
	174,245		87.69% Pervious Area
	24,450		12.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	45	0.0780	1.40		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	30	0.2000	2.24		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.7	165	0.0120	1.64		Shallow Concentrated Flow, Access Drive Swale Grassed Waterway Kv= 15.0 fps
0.1	45	0.0670	11.74	9.22	Pipe Channel, Culvert below Access Drive 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.4	235	0.1110	1.67		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.8	240	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
14.2	810	Total			

Summary for Subcatchment EX-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 21.2 cfs @ 12.16 hrs, Volume= 1.788 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	17,670	98	Impervious
	290,810	73	Woods, Fair, HSG C
	99,640	79	50-75% Grass cover, Fair, HSG C
	408,120	76	Weighted Average
	390,450		95.67% Pervious Area
	17,670		4.33% Impervious Area

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Type III 24-hr 10 year Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	475	0.1100	1.66		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
11.0	525	Total			

Summary for Subcatchment EX-30: Bayview Drive

Runoff = 11.2 cfs @ 12.08 hrs, Volume= 0.771 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
20,650	98	Impervious
98,200	73	Woods, Fair, HSG C
44,950	79	50-75% Grass cover, Fair, HSG C
163,800	78	Weighted Average
143,150		87.39% Pervious Area
20,650		12.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	32	0.0410	4.11		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
0.3	33	0.0910	2.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.9	104	0.1440	1.90		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	169	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.561 ac, 12.31% Impervious, Inflow Depth = 2.37" for 10 year event
 Inflow = 9.8 cfs @ 12.20 hrs, Volume= 0.902 af
 Outflow = 9.8 cfs @ 12.20 hrs, Volume= 0.902 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1: Existing Basin 1

[44] Hint: Outlet device #2 is below defined storage

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Type III 24-hr 10 year Rainfall=4.70"

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Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth = 2.69" for 10 year event
 Inflow = 80.8 cfs @ 12.20 hrs, Volume= 7.776 af
 Outflow = 3.1 cfs @ 16.74 hrs, Volume= 6.600 af, Atten= 96%, Lag= 272.9 min
 Primary = 3.1 cfs @ 16.74 hrs, Volume= 6.600 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 150.43' @ 16.74 hrs Surf.Area= 106,512 sf Storage= 235,783 cf

Plug-Flow detention time= 904.1 min calculated for 6.600 af (85% of inflow)
 Center-of-Mass det. time= 838.4 min (1,659.0 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	702,453 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	2,525	0	0
146.00	9,550	6,038	6,038
147.00	21,235	15,393	21,430
148.00	42,190	31,713	53,143
149.00	69,605	55,898	109,040
150.00	95,895	82,750	191,790
151.00	120,320	108,108	299,898
152.00	132,780	126,550	426,448
153.00	138,220	135,500	561,948
154.00	142,790	140,505	702,453

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.1 cfs @ 16.74 hrs HW=150.43' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 3.1 cfs of 7.8 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.2 cfs @ 11.45 fps)
 3=Orifice (Orifice Controls 2.0 cfs @ 10.16 fps)
 4=Weir/Orifice (Orifice Controls 0.9 cfs @ 1.45 fps)
 5=Orifice (Controls 0.0 cfs)
 6=Broad-Crested Rectangular Weir(Controls 0.0 cfs)

Summary for Link DP 1: Design Point 1

Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth > 2.29" for 10 year event
Inflow = 3.1 cfs @ 16.74 hrs, Volume= 6.600 af
Primary = 3.1 cfs @ 16.74 hrs, Volume= 6.600 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 9.369 ac, 4.33% Impervious, Inflow Depth = 2.29" for 10 year event
Inflow = 21.2 cfs @ 12.16 hrs, Volume= 1.788 af
Primary = 21.2 cfs @ 12.16 hrs, Volume= 1.788 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 3.760 ac, 12.61% Impervious, Inflow Depth = 2.46" for 10 year event
Inflow = 11.2 cfs @ 12.08 hrs, Volume= 0.771 af
Primary = 11.2 cfs @ 12.08 hrs, Volume= 0.771 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentEX-10: Existing North Hill Runoff Area=699,160 sf 59.28% Impervious Runoff Depth=4.36"
Flow Length=1,860' Tc=15.8 min CN=90 Runoff=58.8 cfs 5.832 af

SubcatchmentEX-11: West Side of Hill Runoff Area=300,305 sf 2.40% Impervious Runoff Depth=1.83"
Flow Length=850' Tc=13.1 min CN=63 Runoff=11.2 cfs 1.054 af

SubcatchmentEX-12: West Side of Hill Runoff Area=311,390 sf 2.71% Impervious Runoff Depth=2.86"
Flow Length=875' Tc=11.2 min CN=75 Runoff=20.2 cfs 1.704 af

SubcatchmentEX-13: Southwest Access Runoff Area=198,695 sf 12.31% Impervious Runoff Depth=3.05"
Flow Length=810' Tc=14.2 min CN=77 Runoff=12.6 cfs 1.158 af

SubcatchmentEX-20: Northwest Portion Runoff Area=408,120 sf 4.33% Impervious Runoff Depth=2.95"
Flow Length=525' Slope=0.1100 '/' Tc=11.0 min CN=76 Runoff=27.5 cfs 2.306 af

SubcatchmentEX-30: Bayview Drive Runoff Area=163,800 sf 12.61% Impervious Runoff Depth=3.14"
Flow Length=169' Tc=5.0 min CN=78 Runoff=14.4 cfs 0.984 af

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=12.6 cfs 1.158 af
Outflow=12.6 cfs 1.158 af

Pond P 1: Existing Basin 1 Peak Elev=150.77' Storage=272,377 cf Inflow=101.4 cfs 9.748 af
Outflow=6.1 cfs 8.401 af

Link DP 1: Design Point 1 Inflow=6.1 cfs 8.401 af
Primary=6.1 cfs 8.401 af

Link DP 2: Design Point 2 Inflow=27.5 cfs 2.306 af
Primary=27.5 cfs 2.306 af

Link DP-3: Design Point 3 Inflow=14.4 cfs 0.984 af
Primary=14.4 cfs 0.984 af

Total Runoff Area = 47.784 ac Runoff Volume = 13.037 af Average Runoff Depth = 3.27"
76.32% Pervious = 36.468 ac 23.68% Impervious = 11.316 ac

Summary for Subcatchment EX-10: Existing North Hill Campus

Runoff = 58.8 cfs @ 12.20 hrs, Volume= 5.832 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
414,480	98	Impervious
61,415	73	Woods, Fair, HSG C
223,265	79	50-75% Grass cover, Fair, HSG C
699,160	90	Weighted Average
284,680		40.72% Pervious Area
414,480		59.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.8	205	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.5	130	0.0380	3.96		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
0.8	240	0.0110	4.76	3.74	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
1.4	350	0.0050	4.20	7.43	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, straight & clean
0.2	210	0.0400	14.40	45.24	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, straight & clean
0.4	570	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	1,860	Total			

Summary for Subcatchment EX-11: West Side of Hill

Runoff = 11.2 cfs @ 12.19 hrs, Volume= 1.054 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

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Type III 24-hr 25 year Rainfall=5.50"

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Area (sf)	CN	Description
7,215	98	Impervious
8,040	36	Woods, Fair, HSG A
124,230	73	Woods, Fair, HSG C
133,360	49	50-75% Grass cover, Fair, HSG A
11,360	79	50-75% Grass cover, Fair, HSG C
16,100	84	50-75% Grass cover, Fair, HSG D
300,305	63	Weighted Average
293,090		97.60% Pervious Area
7,215		2.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	30	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.8	440	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.3	330	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
13.1	850	Total			

Summary for Subcatchment EX-12: West Side of Hill

Runoff = 20.2 cfs @ 12.16 hrs, Volume= 1.704 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
* 8,445	98	Impervious
221,385	73	Woods, Fair, HSG C
81,560	79	50-75% Grass cover, Fair, HSG C
311,390	75	Weighted Average
302,945		97.29% Pervious Area
8,445		2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
4.3	465	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.0	330	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
11.2	875	Total			

Summary for Subcatchment EX-13: Southwest Access Drive and Hill

Runoff = 12.6 cfs @ 12.20 hrs, Volume= 1.158 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
*	24,450	98	Impervious
	131,500	73	Woods, Fair, HSG C
	42,745	79	50-75% Grass cover, Fair, HSG C
	198,695	77	Weighted Average
	174,245		87.69% Pervious Area
	24,450		12.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	45	0.0780	1.40		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	30	0.2000	2.24		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.7	165	0.0120	1.64		Shallow Concentrated Flow, Access Drive Swale Grassed Waterway Kv= 15.0 fps
0.1	45	0.0670	11.74	9.22	Pipe Channel, Culvert below Access Drive 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.4	235	0.1110	1.67		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.8	240	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
14.2	810	Total			

Summary for Subcatchment EX-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 27.5 cfs @ 12.16 hrs, Volume= 2.306 af, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
*	17,670	98	Impervious
	290,810	73	Woods, Fair, HSG C
	99,640	79	50-75% Grass cover, Fair, HSG C
	408,120	76	Weighted Average
	390,450		95.67% Pervious Area
	17,670		4.33% Impervious Area

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Type III 24-hr 25 year Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	475	0.1100	1.66		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
11.0	525	Total			

Summary for Subcatchment EX-30: Bayview Drive

Runoff = 14.4 cfs @ 12.07 hrs, Volume= 0.984 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
20,650	98	Impervious
98,200	73	Woods, Fair, HSG C
44,950	79	50-75% Grass cover, Fair, HSG C
163,800	78	Weighted Average
143,150		87.39% Pervious Area
20,650		12.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	32	0.0410	4.11		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
0.3	33	0.0910	2.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.9	104	0.1440	1.90		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	169	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.561 ac, 12.31% Impervious, Inflow Depth = 3.05" for 25 year event
Inflow = 12.6 cfs @ 12.20 hrs, Volume= 1.158 af
Outflow = 12.6 cfs @ 12.20 hrs, Volume= 1.158 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1: Existing Basin 1

[44] Hint: Outlet device #2 is below defined storage

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Type III 24-hr 25 year Rainfall=5.50"

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Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth = 3.38" for 25 year event
 Inflow = 101.4 cfs @ 12.20 hrs, Volume= 9.748 af
 Outflow = 6.1 cfs @ 15.19 hrs, Volume= 8.401 af, Atten= 94%, Lag= 179.6 min
 Primary = 6.1 cfs @ 15.19 hrs, Volume= 8.401 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 150.77' @ 15.19 hrs Surf.Area= 114,597 sf Storage= 272,377 cf

Plug-Flow detention time= 772.5 min calculated for 8.400 af (86% of inflow)
 Center-of-Mass det. time= 711.0 min (1,526.3 - 815.3)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	702,453 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	2,525	0	0
146.00	9,550	6,038	6,038
147.00	21,235	15,393	21,430
148.00	42,190	31,713	53,143
149.00	69,605	55,898	109,040
150.00	95,895	82,750	191,790
151.00	120,320	108,108	299,898
152.00	132,780	126,550	426,448
153.00	138,220	135,500	561,948
154.00	142,790	140,505	702,453

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.1 cfs @ 15.19 hrs HW=150.77' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 6.1 cfs of 8.0 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.3 cfs @ 11.78 fps)
 3=Orifice (Orifice Controls 2.1 cfs @ 10.53 fps)
 4=Weir/Orifice (Orifice Controls 3.8 cfs @ 2.35 fps)
 5=Orifice (Controls 0.0 cfs)
 6=Broad-Crested Rectangular Weir(Controls 0.0 cfs)

Summary for Link DP 1: Design Point 1

Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth > 2.91" for 25 year event
Inflow = 6.1 cfs @ 15.19 hrs, Volume= 8.401 af
Primary = 6.1 cfs @ 15.19 hrs, Volume= 8.401 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 9.369 ac, 4.33% Impervious, Inflow Depth = 2.95" for 25 year event
Inflow = 27.5 cfs @ 12.16 hrs, Volume= 2.306 af
Primary = 27.5 cfs @ 12.16 hrs, Volume= 2.306 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 3.760 ac, 12.61% Impervious, Inflow Depth = 3.14" for 25 year event
Inflow = 14.4 cfs @ 12.07 hrs, Volume= 0.984 af
Primary = 14.4 cfs @ 12.07 hrs, Volume= 0.984 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 100 year Rainfall=6.70"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentEX-10: Existing North Hill Runoff Area=699,160 sf 59.28% Impervious Runoff Depth=5.53"
Flow Length=1,860' Tc=15.8 min CN=90 Runoff=73.6 cfs 7.396 af

SubcatchmentEX-11: West Side of Hill Runoff Area=300,305 sf 2.40% Impervious Runoff Depth=2.68"
Flow Length=850' Tc=13.1 min CN=63 Runoff=16.8 cfs 1.539 af

SubcatchmentEX-12: West Side of Hill Runoff Area=311,390 sf 2.71% Impervious Runoff Depth=3.89"
Flow Length=875' Tc=11.2 min CN=75 Runoff=27.4 cfs 2.315 af

SubcatchmentEX-13: Southwest Access Runoff Area=198,695 sf 12.31% Impervious Runoff Depth=4.10"
Flow Length=810' Tc=14.2 min CN=77 Runoff=16.9 cfs 1.557 af

SubcatchmentEX-20: Northwest Portion Runoff Area=408,120 sf 4.33% Impervious Runoff Depth=3.99"
Flow Length=525' Slope=0.1100 '/' Tc=11.0 min CN=76 Runoff=37.1 cfs 3.116 af

SubcatchmentEX-30: Bayview Drive Runoff Area=163,800 sf 12.61% Impervious Runoff Depth=4.20"
Flow Length=169' Tc=5.0 min CN=78 Runoff=19.1 cfs 1.317 af

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=16.9 cfs 1.557 af
Outflow=16.9 cfs 1.557 af

Pond P 1: Existing Basin 1 Peak Elev=151.36' Storage=344,420 cf Inflow=132.9 cfs 12.807 af
Outflow=8.4 cfs 11.270 af

Link DP 1: Design Point 1 Inflow=8.4 cfs 11.270 af
Primary=8.4 cfs 11.270 af

Link DP 2: Design Point 2 Inflow=37.1 cfs 3.116 af
Primary=37.1 cfs 3.116 af

Link DP-3: Design Point 3 Inflow=19.1 cfs 1.317 af
Primary=19.1 cfs 1.317 af

Total Runoff Area = 47.784 ac Runoff Volume = 17.241 af Average Runoff Depth = 4.33"
76.32% Pervious = 36.468 ac 23.68% Impervious = 11.316 ac

Summary for Subcatchment EX-10: Existing North Hill Campus

Runoff = 73.6 cfs @ 12.20 hrs, Volume= 7.396 af, Depth= 5.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
414,480	98	Impervious
61,415	73	Woods, Fair, HSG C
223,265	79	50-75% Grass cover, Fair, HSG C
699,160	90	Weighted Average
284,680		40.72% Pervious Area
414,480		59.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
2.8	205	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.5	130	0.0380	3.96		Shallow Concentrated Flow, Pavement Paved Kv= 20.3 fps
0.8	240	0.0110	4.76	3.74	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
1.4	350	0.0050	4.20	7.43	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, straight & clean
0.2	210	0.0400	14.40	45.24	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, straight & clean
0.4	570	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	1,860	Total			

Summary for Subcatchment EX-11: West Side of Hill

Runoff = 16.8 cfs @ 12.19 hrs, Volume= 1.539 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

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Type III 24-hr 100 year Rainfall=6.70"

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Area (sf)	CN	Description
7,215	98	Impervious
8,040	36	Woods, Fair, HSG A
124,230	73	Woods, Fair, HSG C
133,360	49	50-75% Grass cover, Fair, HSG A
11,360	79	50-75% Grass cover, Fair, HSG C
16,100	84	50-75% Grass cover, Fair, HSG D
300,305	63	Weighted Average
293,090		97.60% Pervious Area
7,215		2.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	30	0.1000	2.21		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
3.8	440	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.3	330	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
13.1	850	Total			

Summary for Subcatchment EX-12: West Side of Hill

Runoff = 27.4 cfs @ 12.16 hrs, Volume= 2.315 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
* 8,445	98	Impervious
221,385	73	Woods, Fair, HSG C
81,560	79	50-75% Grass cover, Fair, HSG C
311,390	75	Weighted Average
302,945		97.29% Pervious Area
8,445		2.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
4.3	465	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.0	330	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
11.2	875	Total			

Summary for Subcatchment EX-13: Southwest Access Drive and Hill

Runoff = 16.9 cfs @ 12.19 hrs, Volume= 1.557 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
*	24,450	98	Impervious
	131,500	73	Woods, Fair, HSG C
	42,745	79	50-75% Grass cover, Fair, HSG C
	198,695	77	Weighted Average
	174,245		87.69% Pervious Area
	24,450		12.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	45	0.0780	1.40		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.2	30	0.2000	2.24		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.7	165	0.0120	1.64		Shallow Concentrated Flow, Access Drive Swale Grassed Waterway Kv= 15.0 fps
0.1	45	0.0670	11.74	9.22	Pipe Channel, Culvert below Access Drive 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
2.4	235	0.1110	1.67		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.8	240	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
14.2	810	Total			

Summary for Subcatchment EX-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 37.1 cfs @ 12.15 hrs, Volume= 3.116 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
*	17,670	98	Impervious
	290,810	73	Woods, Fair, HSG C
	99,640	79	50-75% Grass cover, Fair, HSG C
	408,120	76	Weighted Average
	390,450		95.67% Pervious Area
	17,670		4.33% Impervious Area

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Type III 24-hr 100 year Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
4.8	475	0.1100	1.66		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
11.0	525	Total			

Summary for Subcatchment EX-30: Bayview Drive

Runoff = 19.1 cfs @ 12.07 hrs, Volume= 1.317 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
20,650	98	Impervious
98,200	73	Woods, Fair, HSG C
44,950	79	50-75% Grass cover, Fair, HSG C
163,800	78	Weighted Average
143,150		87.39% Pervious Area
20,650		12.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	32	0.0410	4.11		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
0.3	33	0.0910	2.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.9	104	0.1440	1.90		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	169	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.561 ac, 12.31% Impervious, Inflow Depth = 4.10" for 100 year event
 Inflow = 16.9 cfs @ 12.19 hrs, Volume= 1.557 af
 Outflow = 16.9 cfs @ 12.19 hrs, Volume= 1.557 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1: Existing Basin 1

[44] Hint: Outlet device #2 is below defined storage

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Type III 24-hr 100 year Rainfall=6.70"

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Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth = 4.43" for 100 year event
 Inflow = 132.9 cfs @ 12.19 hrs, Volume= 12.807 af
 Outflow = 8.4 cfs @ 14.89 hrs, Volume= 11.270 af, Atten= 94%, Lag= 161.8 min
 Primary = 8.4 cfs @ 14.89 hrs, Volume= 11.270 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 151.36' @ 14.89 hrs Surf.Area= 124,846 sf Storage= 344,420 cf

Plug-Flow detention time= 657.2 min calculated for 11.268 af (88% of inflow)
 Center-of-Mass det. time= 601.6 min (1,410.4 - 808.8)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	702,453 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	2,525	0	0
146.00	9,550	6,038	6,038
147.00	21,235	15,393	21,430
148.00	42,190	31,713	53,143
149.00	69,605	55,898	109,040
150.00	95,895	82,750	191,790
151.00	120,320	108,108	299,898
152.00	132,780	126,550	426,448
153.00	138,220	135,500	561,948
154.00	142,790	140,505	702,453

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.4 cfs @ 14.89 hrs HW=151.36' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 8.4 cfs @ 10.72 fps)
 2=Low Flow Orifice (Passes < 0.3 cfs potential flow)
 3=Orifice (Passes < 2.2 cfs potential flow)
 4=Weir/Orifice (Passes < 11.1 cfs potential flow)
 5=Orifice (Passes < 1.7 cfs potential flow)
 6=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Link DP 1: Design Point 1

Inflow Area = 34.654 ac, 30.11% Impervious, Inflow Depth > 3.90" for 100 year event
Inflow = 8.4 cfs @ 14.89 hrs, Volume= 11.270 af
Primary = 8.4 cfs @ 14.89 hrs, Volume= 11.270 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 9.369 ac, 4.33% Impervious, Inflow Depth = 3.99" for 100 year event
Inflow = 37.1 cfs @ 12.15 hrs, Volume= 3.116 af
Primary = 37.1 cfs @ 12.15 hrs, Volume= 3.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 3.760 ac, 12.61% Impervious, Inflow Depth = 4.20" for 100 year event
Inflow = 19.1 cfs @ 12.07 hrs, Volume= 1.317 af
Primary = 19.1 cfs @ 12.07 hrs, Volume= 1.317 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
503,994	79	50-75% Grass cover, Fair, HSG C (PR-10, PR-11, PR-12, PR-13A, PR-13B, PR-14, PR-20, PR-21, PR-30)
141,619	30	Brush, Good, HSG A (PR-11)
7,201	65	Brush, Good, HSG C (PR-11)
16,102	73	Brush, Good, HSG D (PR-11)
611,287	98	Impervious (PR-10, PR-10A, PR-11, PR-12, PR-13A, PR-13B, PR-14, PR-20, PR-21, PR-30)
801,298	73	Woods, Fair, HSG C (PR-10, PR-11, PR-12, PR-13A, PR-13B, PR-20, PR-21, PR-30)
2,081,501	79	TOTAL AREA

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPR-10: Proposed North Runoff Area=917,489 sf 56.53% Impervious Runoff Depth=2.08"
Flow Length=2,324' Tc=15.8 min CN=89 Runoff=37.9 cfs 159,149 cf

SubcatchmentPR-10A: Added Parking Runoff Area=2,400 sf 100.00% Impervious Runoff Depth=2.97"
Tc=5.0 min CN=98 Runoff=0.2 cfs 593 cf

SubcatchmentPR-11: West Side of Hill Runoff Area=292,366 sf 2.47% Impervious Runoff Depth=0.20"
Flow Length=805' Tc=12.9 min CN=53 Runoff=0.4 cfs 4,815 cf

SubcatchmentPR-12: West Side of Hill Runoff Area=222,032 sf 3.42% Impervious Runoff Depth=1.09"
Flow Length=870' Tc=10.8 min CN=75 Runoff=5.3 cfs 20,241 cf

SubcatchmentPR-13A: Southwest Side of Runoff Area=68,701 sf 11.70% Impervious Runoff Depth=1.21"
Flow Length=515' Tc=8.4 min CN=77 Runoff=2.0 cfs 6,938 cf

SubcatchmentPR-13B: Portion of Existing Runoff Area=25,070 sf 25.21% Impervious Runoff Depth=1.47"
Tc=5.0 min CN=81 Runoff=1.0 cfs 3,069 cf

SubcatchmentPR-14: Bayview Drive Runoff Area=47,450 sf 91.46% Impervious Runoff Depth=2.75"
Flow Length=2,236' Tc=6.5 min CN=96 Runoff=3.2 cfs 10,871 cf

SubcatchmentPR-20: Northwest Portion Runoff Area=327,503 sf 1.84% Impervious Runoff Depth=1.04"
Flow Length=450' Slope=0.1100 '/' Tc=10.2 min CN=74 Runoff=7.5 cfs 28,317 cf

SubcatchmentPR-21: Northwest Access Runoff Area=62,140 sf 15.82% Impervious Runoff Depth=1.47"
Flow Length=370' Tc=5.3 min CN=81 Runoff=2.5 cfs 7,607 cf

SubcatchmentPR-30: Perimeter Access Runoff Area=116,350 sf 1.55% Impervious Runoff Depth=1.15"
Flow Length=101' Tc=5.0 min CN=76 Runoff=3.6 cfs 11,170 cf

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=2.9 cfs 10,007 cf
Outflow=2.9 cfs 10,007 cf

Pond P 1AA: Wet Basin - Upper Levels Peak Elev=152.71' Storage=75,581 cf Inflow=47.0 cfs 205,337 cf
Outflow=22.5 cfs 205,339 cf

Pond P 1B: Existing Expanded Basin Peak Elev=148.88' Storage=102,138 cf Inflow=22.5 cfs 205,339 cf
Outflow=1.8 cfs 197,436 cf

Pond P 2A: Rain Garden 1 Peak Elev=194.25' Storage=614 cf Inflow=2.5 cfs 7,607 cf
Outflow=2.5 cfs 7,172 cf

Pond P-1C: Subsurface Infiltration Peak Elev=223.93' Storage=344 cf Inflow=0.2 cfs 593 cf
Discarded=0.0 cfs 0 cf Primary=0.1 cfs 254 cf Outflow=0.1 cfs 254 cf

Link DP 1: Design Point 1 Inflow=1.8 cfs 197,436 cf
Primary=1.8 cfs 197,436 cf

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Type III 24-hr 2 year Rainfall=3.20"

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Link DP 2: Design Point 2

Inflow=9.6 cfs 35,489 cf

Primary=9.6 cfs 35,489 cf

Link DP-3: Design Point 3

Inflow=3.6 cfs 11,170 cf

Primary=3.6 cfs 11,170 cf

Total Runoff Area = 2,081,501 sf Runoff Volume = 252,770 cf Average Runoff Depth = 1.46"
70.63% Pervious = 1,470,214 sf 29.37% Impervious = 611,287 sf

Summary for Subcatchment PR-10: Proposed North Hill Campus

Runoff = 37.9 cfs @ 12.21 hrs, Volume= 159,149 cf, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
*	518,662	98	Impervious
	93,214	73	Woods, Fair, HSG C
	305,613	79	50-75% Grass cover, Fair, HSG C
	917,489	89	Weighted Average
	398,827		43.47% Pervious Area
	518,662		56.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	125	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	15	0.3300	4.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.2	80	0.0250	1.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	456	0.0500	10.14	7.97	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	132	0.0150	7.28	12.87	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.1	928	0.0100	7.20	22.62	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.4	483	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	2,324	Total			

Summary for Subcatchment PR-10A: Added Parking

Runoff = 0.2 cfs @ 12.07 hrs, Volume= 593 cf, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

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Type III 24-hr 2 year Rainfall=3.20"

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	Area (sf)	CN	Description
*	2,400	98	Impervious
	2,400		100.00% Impervious Area

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

Summary for Subcatchment PR-11: West Side of Hill

Runoff = 0.4 cfs @ 12.49 hrs, Volume= 4,815 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
	7,216	98	Impervious
	8,259	30	Brush, Good, HSG A
	111,905	73	Woods, Fair, HSG C
*	133,360	30	Brush, Good, HSG A
	8,323	79	50-75% Grass cover, Fair, HSG C
	16,102	73	Brush, Good, HSG D
	7,201	65	Brush, Good, HSG C
	292,366	53	Weighted Average
	285,150		97.53% Pervious Area
	7,216		2.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.5	400	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.6	355	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
12.9	805	Total			

Summary for Subcatchment PR-12: West Side of Hill

Runoff = 5.3 cfs @ 12.16 hrs, Volume= 20,241 cf, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

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Type III 24-hr 2 year Rainfall=3.20"

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Area (sf)	CN	Description
* 7,600	98	Impervious
190,538	73	Woods, Fair, HSG C
23,894	79	50-75% Grass cover, Fair, HSG C
222,032	75	Weighted Average
214,432		96.58% Pervious Area
7,600		3.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	15	0.0200	0.12		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
0.9	15	0.1750	0.28		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
2.5	20	0.1750	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.9	430	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.1	360	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
10.8	870	Total			

Summary for Subcatchment PR-13A: Southwest Side of Hill

Runoff = 2.0 cfs @ 12.13 hrs, Volume= 6,938 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
* 8,039	98	Impervious
48,481	73	Woods, Fair, HSG C
12,181	79	50-75% Grass cover, Fair, HSG C
68,701	77	Weighted Average
60,662		88.30% Pervious Area
8,039		11.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.13		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
3.8	30	0.1400	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	85	0.1400	1.87		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	380	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
8.4	515	Total			

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Type III 24-hr 2 year Rainfall=3.20"

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Summary for Subcatchment PR-13B: Portion of Existing CR ARC & Proposed Pervious Area (Prior to Cu

Runoff = 1.0 cfs @ 12.08 hrs, Volume= 3,069 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
*	6,320	98	Impervious
	9,870	73	Woods, Fair, HSG C
	8,880	79	50-75% Grass cover, Fair, HSG C
	25,070	81	Weighted Average
	18,750		74.79% Pervious Area
	6,320		25.21% Impervious Area

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

Summary for Subcatchment PR-14: Bayview Drive

Runoff = 3.2 cfs @ 12.09 hrs, Volume= 10,871 cf, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

	Area (sf)	CN	Description
	43,400	98	Impervious
	0	73	Woods, Fair, HSG C
	4,050	79	50-75% Grass cover, Fair, HSG C
	47,450	96	Weighted Average
	4,050		8.54% Pervious Area
	43,400		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0220	1.14		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.20"
2.7	573	0.0300	3.52		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
2.8	1,000	0.0070	6.02	18.93	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.4	571	0.0790	21.89	87.05	Pipe Channel, RCP_Round 27" 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013
0.1	60	0.0150	11.56	81.69	Pipe Channel, RCP_Round 36" 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013
6.5	2,236	Total			

Summary for Subcatchment PR-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 7.5 cfs @ 12.15 hrs, Volume= 28,317 cf, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
* 6,020	98	Impervious
275,940	73	Woods, Fair, HSG C
45,543	79	50-75% Grass cover, Fair, HSG C
327,503	74	Weighted Average
321,483		98.16% Pervious Area
6,020		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	400	0.1100	1.66		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
10.2	450	Total			

Summary for Subcatchment PR-21: Northwest Access Drive and Hill

Runoff = 2.5 cfs @ 12.08 hrs, Volume= 7,607 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
* 9,830	98	Impervious
10,850	73	Woods, Fair, HSG C
41,460	79	50-75% Grass cover, Fair, HSG C
62,140	81	Weighted Average
52,310		84.18% Pervious Area
9,830		15.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0588	0.23		Sheet Flow, Grass
					Grass: Short n= 0.150 P2= 3.20"
1.6	320	0.0500	3.35		Shallow Concentrated Flow, Swale
					Grassed Waterway Kv= 15.0 fps
5.3	370	Total			

Summary for Subcatchment PR-30: Perimeter Access Drive and Slope

Runoff = 3.6 cfs @ 12.08 hrs, Volume= 11,170 cf, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
1,800	98	Impervious
60,500	73	Woods, Fair, HSG C
54,050	79	50-75% Grass cover, Fair, HSG C
116,350	76	Weighted Average
114,550		98.45% Pervious Area
1,800		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	16	0.3440	4.11		Shallow Concentrated Flow, Grass
					Short Grass Pasture Kv= 7.0 fps
0.7	85	0.1530	1.96		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
0.8	101	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 93,771 sf, 15.31% Impervious, Inflow Depth = 1.28" for 2 year event
Inflow = 2.9 cfs @ 12.11 hrs, Volume= 10,007 cf
Outflow = 2.9 cfs @ 12.11 hrs, Volume= 10,007 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1AA: Wet Basin - Upper Levels Only

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 1.56" for 2 year event
Inflow = 47.0 cfs @ 12.20 hrs, Volume= 205,337 cf
Outflow = 22.5 cfs @ 12.52 hrs, Volume= 205,339 cf, Atten= 52%, Lag= 19.5 min
Primary = 22.5 cfs @ 12.52 hrs, Volume= 205,339 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 152.71' @ 12.52 hrs Surf.Area= 31,230 sf Storage= 75,581 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 204.8 min (1,032.1 - 827.3)

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Type III 24-hr 2 year Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description
#1	149.70'	101,744 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
149.70	20,236	0	0
150.00	20,347	6,087	6,087
151.00	24,116	22,232	28,319
152.00	28,073	26,095	54,413
153.00	32,496	30,285	84,698
153.50	35,688	17,046	101,744

Device	Routing	Invert	Outlet Devices
#1	Primary	152.25'	20.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	152.59'	24.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#3	Primary	149.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=22.5 cfs @ 12.52 hrs HW=152.71' TW=146.99' (Dynamic Tailwater)

- 1=Broad-Crested Rectangular Weir (Weir Controls 16.8 cfs @ 1.81 fps)
- 2=Broad-Crested Rectangular Weir (Weir Controls 2.7 cfs @ 0.91 fps)
- 3=Orifice/Grate (Orifice Controls 3.0 cfs @ 8.63 fps)

Summary for Pond P 1B: Existing Expanded Basin

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 1.56" for 2 year event
 Inflow = 22.5 cfs @ 12.52 hrs, Volume= 205,339 cf
 Outflow = 1.8 cfs @ 25.03 hrs, Volume= 197,436 cf, Atten= 92%, Lag= 750.7 min
 Primary = 1.8 cfs @ 25.03 hrs, Volume= 197,436 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 148.88' @ 25.03 hrs Surf.Area= 62,722 sf Storage= 102,138 cf

Plug-Flow detention time= 671.9 min calculated for 197,395 cf (96% of inflow)
 Center-of-Mass det. time= 645.4 min (1,677.5 - 1,032.1)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	527,911 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.50	0	0	0
145.00	2,609	652	652
146.00	10,587	6,598	7,250
147.00	22,591	16,589	23,839
148.00	41,981	32,286	56,125
149.00	65,579	53,780	109,905
150.00	76,289	70,934	180,839
151.00	81,609	78,949	259,788
152.00	86,811	84,210	343,998
153.00	92,120	89,466	433,464
154.00	96,775	94,448	527,911

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.014, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Weir - Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.8 cfs @ 25.03 hrs HW=148.88' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.8 cfs of 6.4 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.2 cfs @ 9.74 fps)
 3=Orifice (Orifice Controls 1.6 cfs @ 8.20 fps)
 4=Weir/Orifice (Controls 0.0 cfs)
 5=Orifice (Controls 0.0 cfs)
 6=Weir - Rip Rap Spillway (Controls 0.0 cfs)

Summary for Pond P 2A: Rain Garden 1

Inflow Area = 62,140 sf, 15.82% Impervious, Inflow Depth = 1.47" for 2 year event
 Inflow = 2.5 cfs @ 12.08 hrs, Volume= 7,607 cf
 Outflow = 2.5 cfs @ 12.10 hrs, Volume= 7,172 cf, Atten= 2%, Lag= 0.8 min
 Primary = 2.5 cfs @ 12.10 hrs, Volume= 7,172 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 194.25' @ 12.10 hrs Surf.Area= 748 sf Storage= 614 cf

Plug-Flow detention time= 44.1 min calculated for 7,172 cf (94% of inflow)
 Center-of-Mass det. time= 13.5 min (852.4 - 838.9)

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Volume	Invert	Avail.Storage	Storage Description
#1	193.25'	1,258 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.25	490	0	0
194.00	670	435	435
194.50	825	374	809
195.00	970	449	1,258

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.5 cfs @ 12.10 hrs HW=194.25' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir**(Weir Controls 2.5 cfs @ 1.22 fps)

Summary for Pond P-1C: Subsurface Infiltration

Inflow Area = 2,400 sf, 100.00% Impervious, Inflow Depth = 2.97" for 2 year event
 Inflow = 0.2 cfs @ 12.07 hrs, Volume= 593 cf
 Outflow = 0.1 cfs @ 12.24 hrs, Volume= 254 cf, Atten= 58%, Lag= 10.2 min
 Discarded = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.1 cfs @ 12.24 hrs, Volume= 254 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 223.93' @ 12.24 hrs Surf.Area= 243 sf Storage= 344 cf

Flood Elev= 227.10' Surf.Area= 243 sf Storage= 384 cf

Plug-Flow detention time= 299.4 min calculated for 254 cf (43% of inflow)

Center-of-Mass det. time= 158.9 min (914.4 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	221.00'	237 cf	6.83'W x 33.68'L x 2.83'H Field A
			652 cf Overall - 59 cf Embedded = 593 cf x 40.0% Voids
#2A	222.00'	59 cf	ADS_StormTech SC-310 +Cap x 4 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3	220.10'	88 cf	4.00'D x 7.00'H Catch Basin
		384 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	220.10'	0.170 in/hr Exfiltration X 0.00 over Surface area Conductivity to Groundwater Elevation = 216.00' Phase-In= 0.10'
#2	Primary	223.80'	12.0" Round Culvert L= 15.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 223.80' / 222.90' S= 0.0600 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.0 cfs @ 0.00 hrs HW=220.10' (Free Discharge)

↑**1=Exfiltration** (Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 12.24 hrs HW=223.93' TW=152.00' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.1 cfs @ 1.23 fps)

Summary for Link DP 1: Design Point 1

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth > 1.50" for 2 year event
Inflow = 1.8 cfs @ 25.03 hrs, Volume= 197,436 cf
Primary = 1.8 cfs @ 25.03 hrs, Volume= 197,436 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 389,643 sf, 4.07% Impervious, Inflow Depth = 1.09" for 2 year event
Inflow = 9.6 cfs @ 12.14 hrs, Volume= 35,489 cf
Primary = 9.6 cfs @ 12.14 hrs, Volume= 35,489 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 116,350 sf, 1.55% Impervious, Inflow Depth = 1.15" for 2 year event
Inflow = 3.6 cfs @ 12.08 hrs, Volume= 11,170 cf
Primary = 3.6 cfs @ 12.08 hrs, Volume= 11,170 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPR-10: Proposed North Runoff Area=917,489 sf 56.53% Impervious Runoff Depth=3.49"
Flow Length=2,324' Tc=15.8 min CN=89 Runoff=62.5 cfs 266,483 cf

SubcatchmentPR-10A: Added Parking Runoff Area=2,400 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.3 cfs 893 cf

SubcatchmentPR-11: West Side of Hill Runoff Area=292,366 sf 2.47% Impervious Runoff Depth=0.73"
Flow Length=805' Tc=12.9 min CN=53 Runoff=3.1 cfs 17,691 cf

SubcatchmentPR-12: West Side of Hill Runoff Area=222,032 sf 3.42% Impervious Runoff Depth=2.21"
Flow Length=870' Tc=10.8 min CN=75 Runoff=11.2 cfs 40,859 cf

SubcatchmentPR-13A: Southwest Side of Runoff Area=68,701 sf 11.70% Impervious Runoff Depth=2.37"
Flow Length=515' Tc=8.4 min CN=77 Runoff=4.0 cfs 13,592 cf

SubcatchmentPR-13B: Portion of Existing Runoff Area=25,070 sf 25.21% Impervious Runoff Depth=2.72"
Tc=5.0 min CN=81 Runoff=1.9 cfs 5,686 cf

SubcatchmentPR-14: Bayview Drive Runoff Area=47,450 sf 91.46% Impervious Runoff Depth=4.23"
Flow Length=2,236' Tc=6.5 min CN=96 Runoff=4.8 cfs 16,744 cf

SubcatchmentPR-20: Northwest Portion Runoff Area=327,503 sf 1.84% Impervious Runoff Depth=2.13"
Flow Length=450' Slope=0.1100 '/' Tc=10.2 min CN=74 Runoff=16.1 cfs 58,060 cf

SubcatchmentPR-21: Northwest Access Runoff Area=62,140 sf 15.82% Impervious Runoff Depth=2.72"
Flow Length=370' Tc=5.3 min CN=81 Runoff=4.7 cfs 14,095 cf

SubcatchmentPR-30: Perimeter Access Runoff Area=116,350 sf 1.55% Impervious Runoff Depth=2.29"
Flow Length=101' Tc=5.0 min CN=76 Runoff=7.4 cfs 22,209 cf

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=5.7 cfs 19,278 cf
Outflow=5.7 cfs 19,278 cf

Pond P 1AA: Wet Basin - Upper Levels Peak Elev=153.13' Storage=88,991 cf Inflow=83.0 cfs 361,608 cf
Outflow=72.8 cfs 361,610 cf

Pond P 1B: Existing Expanded Basin Peak Elev=150.34' Storage=207,119 cf Inflow=72.8 cfs 361,610 cf
Outflow=2.6 cfs 282,332 cf

Pond P 2A: Rain Garden 1 Peak Elev=194.37' Storage=708 cf Inflow=4.7 cfs 14,095 cf
Outflow=4.6 cfs 13,660 cf

Pond P-1C: Subsurface Infiltration Peak Elev=224.05' Storage=346 cf Inflow=0.3 cfs 893 cf
Discarded=0.0 cfs 0 cf Primary=0.3 cfs 553 cf Outflow=0.3 cfs 553 cf

Link DP 1: Design Point 1 Inflow=2.6 cfs 282,332 cf
Primary=2.6 cfs 282,332 cf

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Link DP 2: Design Point 2

Inflow=20.0 cfs 71,720 cf

Primary=20.0 cfs 71,720 cf

Link DP-3: Design Point 3

Inflow=7.4 cfs 22,209 cf

Primary=7.4 cfs 22,209 cf

Total Runoff Area = 2,081,501 sf Runoff Volume = 456,311 cf Average Runoff Depth = 2.63"
70.63% Pervious = 1,470,214 sf 29.37% Impervious = 611,287 sf

Summary for Subcatchment PR-10: Proposed North Hill Campus

Runoff = 62.5 cfs @ 12.21 hrs, Volume= 266,483 cf, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	518,662	98	Impervious
	93,214	73	Woods, Fair, HSG C
	305,613	79	50-75% Grass cover, Fair, HSG C
	917,489	89	Weighted Average
	398,827		43.47% Pervious Area
	518,662		56.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	125	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	15	0.3300	4.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.2	80	0.0250	1.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	456	0.0500	10.14	7.97	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	132	0.0150	7.28	12.87	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.1	928	0.0100	7.20	22.62	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.4	483	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	2,324	Total			

Summary for Subcatchment PR-10A: Added Parking

Runoff = 0.3 cfs @ 12.07 hrs, Volume= 893 cf, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

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	Area (sf)	CN	Description
*	2,400	98	Impervious
	2,400		100.00% Impervious Area

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

Summary for Subcatchment PR-11: West Side of Hill

Runoff = 3.1 cfs @ 12.23 hrs, Volume= 17,691 cf, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
	7,216	98	Impervious
	8,259	30	Brush, Good, HSG A
	111,905	73	Woods, Fair, HSG C
*	133,360	30	Brush, Good, HSG A
	8,323	79	50-75% Grass cover, Fair, HSG C
	16,102	73	Brush, Good, HSG D
	7,201	65	Brush, Good, HSG C
	292,366	53	Weighted Average
	285,150		97.53% Pervious Area
	7,216		2.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.5	400	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.6	355	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
12.9	805	Total			

Summary for Subcatchment PR-12: West Side of Hill

Runoff = 11.2 cfs @ 12.15 hrs, Volume= 40,859 cf, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

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Type III 24-hr 10 year Rainfall=4.70"

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Area (sf)	CN	Description
* 7,600	98	Impervious
190,538	73	Woods, Fair, HSG C
23,894	79	50-75% Grass cover, Fair, HSG C
222,032	75	Weighted Average
214,432		96.58% Pervious Area
7,600		3.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	15	0.0200	0.12		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
0.9	15	0.1750	0.28		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
2.5	20	0.1750	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.9	430	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.1	360	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
10.8	870	Total			

Summary for Subcatchment PR-13A: Southwest Side of Hill

Runoff = 4.0 cfs @ 12.12 hrs, Volume= 13,592 cf, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
* 8,039	98	Impervious
48,481	73	Woods, Fair, HSG C
12,181	79	50-75% Grass cover, Fair, HSG C
68,701	77	Weighted Average
60,662		88.30% Pervious Area
8,039		11.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.13		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
3.8	30	0.1400	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	85	0.1400	1.87		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	380	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
8.4	515	Total			

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Type III 24-hr 10 year Rainfall=4.70"

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Summary for Subcatchment PR-13B: Portion of Existing CR ARC & Proposed Pervious Area (Prior to Cu

Runoff = 1.9 cfs @ 12.07 hrs, Volume= 5,686 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	6,320	98	Impervious
	9,870	73	Woods, Fair, HSG C
	8,880	79	50-75% Grass cover, Fair, HSG C
	25,070	81	Weighted Average
	18,750		74.79% Pervious Area
	6,320		25.21% Impervious Area

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

Summary for Subcatchment PR-14: Bayview Drive

Runoff = 4.8 cfs @ 12.09 hrs, Volume= 16,744 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
	43,400	98	Impervious
	0	73	Woods, Fair, HSG C
	4,050	79	50-75% Grass cover, Fair, HSG C
	47,450	96	Weighted Average
	4,050		8.54% Pervious Area
	43,400		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0220	1.14		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.20"
2.7	573	0.0300	3.52		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
2.8	1,000	0.0070	6.02	18.93	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.4	571	0.0790	21.89	87.05	Pipe Channel, RCP_Round 27" 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013
0.1	60	0.0150	11.56	81.69	Pipe Channel, RCP_Round 36" 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013
6.5	2,236	Total			

Summary for Subcatchment PR-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 16.1 cfs @ 12.14 hrs, Volume= 58,060 cf, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	6,020	98	Impervious
	275,940	73	Woods, Fair, HSG C
	45,543	79	50-75% Grass cover, Fair, HSG C
	327,503	74	Weighted Average
	321,483		98.16% Pervious Area
	6,020		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	400	0.1100	1.66		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
10.2	450	Total			

Summary for Subcatchment PR-21: Northwest Access Drive and Hill

Runoff = 4.7 cfs @ 12.08 hrs, Volume= 14,095 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	9,830	98	Impervious
	10,850	73	Woods, Fair, HSG C
	41,460	79	50-75% Grass cover, Fair, HSG C
	62,140	81	Weighted Average
	52,310		84.18% Pervious Area
	9,830		15.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0588	0.23		Sheet Flow, Grass
					Grass: Short n= 0.150 P2= 3.20"
1.6	320	0.0500	3.35		Shallow Concentrated Flow, Swale
					Grassed Waterway Kv= 15.0 fps
5.3	370	Total			

Summary for Subcatchment PR-30: Perimeter Access Drive and Slope

Runoff = 7.4 cfs @ 12.08 hrs, Volume= 22,209 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
1,800	98	Impervious
60,500	73	Woods, Fair, HSG C
54,050	79	50-75% Grass cover, Fair, HSG C
116,350	76	Weighted Average
114,550		98.45% Pervious Area
1,800		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	16	0.3440	4.11		Shallow Concentrated Flow, Grass
					Short Grass Pasture Kv= 7.0 fps
0.7	85	0.1530	1.96		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
0.8	101	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 93,771 sf, 15.31% Impervious, Inflow Depth = 2.47" for 10 year event
Inflow = 5.7 cfs @ 12.10 hrs, Volume= 19,278 cf
Outflow = 5.7 cfs @ 12.10 hrs, Volume= 19,278 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1AA: Wet Basin - Upper Levels Only

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 2.75" for 10 year event
Inflow = 83.0 cfs @ 12.20 hrs, Volume= 361,608 cf
Outflow = 72.8 cfs @ 12.28 hrs, Volume= 361,610 cf, Atten= 12%, Lag= 5.3 min
Primary = 72.8 cfs @ 12.28 hrs, Volume= 361,610 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 153.13' @ 12.28 hrs Surf.Area= 33,329 sf Storage= 88,991 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 173.3 min (987.9 - 814.6)

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Type III 24-hr 10 year Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	149.70'	101,744 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
149.70	20,236	0	0
150.00	20,347	6,087	6,087
151.00	24,116	22,232	28,319
152.00	28,073	26,095	54,413
153.00	32,496	30,285	84,698
153.50	35,688	17,046	101,744

Device	Routing	Invert	Outlet Devices
#1	Primary	152.25'	20.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	152.59'	24.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#3	Primary	149.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=72.8 cfs @ 12.28 hrs HW=153.13' TW=147.84' (Dynamic Tailwater)

- 1=Broad-Crested Rectangular Weir (Weir Controls 44.0 cfs @ 2.50 fps)
- 2=Broad-Crested Rectangular Weir (Weir Controls 25.5 cfs @ 1.97 fps)
- 3=Orifice/Grate (Orifice Controls 3.2 cfs @ 9.17 fps)

Summary for Pond P 1B: Existing Expanded Basin

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 2.75" for 10 year event
 Inflow = 72.8 cfs @ 12.28 hrs, Volume= 361,610 cf
 Outflow = 2.6 cfs @ 18.21 hrs, Volume= 282,332 cf, Atten= 96%, Lag= 355.8 min
 Primary = 2.6 cfs @ 18.21 hrs, Volume= 282,332 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 150.34' @ 18.21 hrs Surf.Area= 78,100 sf Storage= 207,119 cf

Plug-Flow detention time= 906.2 min calculated for 282,332 cf (78% of inflow)
 Center-of-Mass det. time= 737.0 min (1,725.0 - 987.9)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	527,911 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Type III 24-hr 10 year Rainfall=4.70"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.50	0	0	0
145.00	2,609	652	652
146.00	10,587	6,598	7,250
147.00	22,591	16,589	23,839
148.00	41,981	32,286	56,125
149.00	65,579	53,780	109,905
150.00	76,289	70,934	180,839
151.00	81,609	78,949	259,788
152.00	86,811	84,210	343,998
153.00	92,120	89,466	433,464
154.00	96,775	94,448	527,911

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.014, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Weir - Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.6 cfs @ 18.21 hrs HW=150.34' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 2.6 cfs of 7.4 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.2 cfs @ 11.35 fps)
 3=Orifice (Orifice Controls 2.0 cfs @ 10.05 fps)
 4=Weir/Orifice (Orifice Controls 0.4 cfs @ 1.07 fps)
 5=Orifice (Controls 0.0 cfs)
 6=Weir - Rip Rap Spillway (Controls 0.0 cfs)

Summary for Pond P 2A: Rain Garden 1

Inflow Area = 62,140 sf, 15.82% Impervious, Inflow Depth = 2.72" for 10 year event
 Inflow = 4.7 cfs @ 12.08 hrs, Volume= 14,095 cf
 Outflow = 4.6 cfs @ 12.09 hrs, Volume= 13,660 cf, Atten= 1%, Lag= 0.7 min
 Primary = 4.6 cfs @ 12.09 hrs, Volume= 13,660 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 194.37' @ 12.09 hrs Surf.Area= 786 sf Storage= 708 cf

Plug-Flow detention time= 27.7 min calculated for 13,657 cf (97% of inflow)
 Center-of-Mass det. time= 9.9 min (831.0 - 821.1)

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Volume	Invert	Avail.Storage	Storage Description
#1	193.25'	1,258 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.25	490	0	0
194.00	670	435	435
194.50	825	374	809
195.00	970	449	1,258

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.6 cfs @ 12.09 hrs HW=194.37' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir**(Weir Controls 4.6 cfs @ 1.54 fps)**Summary for Pond P-1C: Subsurface Infiltration**

Inflow Area = 2,400 sf, 100.00% Impervious, Inflow Depth = 4.46" for 10 year event
 Inflow = 0.3 cfs @ 12.07 hrs, Volume= 893 cf
 Outflow = 0.3 cfs @ 12.07 hrs, Volume= 553 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.3 cfs @ 12.07 hrs, Volume= 553 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 224.05' @ 12.07 hrs Surf.Area= 243 sf Storage= 346 cf

Flood Elev= 227.10' Surf.Area= 243 sf Storage= 384 cf

Plug-Flow detention time= 210.7 min calculated for 553 cf (62% of inflow)

Center-of-Mass det. time= 103.6 min (851.8 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	221.00'	237 cf	6.83'W x 33.68'L x 2.83'H Field A 652 cf Overall - 59 cf Embedded = 593 cf x 40.0% Voids
#2A	222.00'	59 cf	ADS_StormTech SC-310 +Cap x 4 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3	220.10'	88 cf	4.00'D x 7.00'H Catch Basin
		384 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	220.10'	0.170 in/hr Exfiltration X 0.00 over Surface area Conductivity to Groundwater Elevation = 216.00' Phase-In= 0.10'
#2	Primary	223.80'	12.0" Round Culvert L= 15.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 223.80' / 222.90' S= 0.0600 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.0 cfs @ 0.00 hrs HW=220.10' (Free Discharge)

↑**1=Exfiltration** (Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.07 hrs HW=224.05' TW=152.36' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.3 cfs @ 1.70 fps)

Summary for Link DP 1: Design Point 1

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth > 2.15" for 10 year event
Inflow = 2.6 cfs @ 18.21 hrs, Volume= 282,332 cf
Primary = 2.6 cfs @ 18.21 hrs, Volume= 282,332 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 389,643 sf, 4.07% Impervious, Inflow Depth = 2.21" for 10 year event
Inflow = 20.0 cfs @ 12.13 hrs, Volume= 71,720 cf
Primary = 20.0 cfs @ 12.13 hrs, Volume= 71,720 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 116,350 sf, 1.55% Impervious, Inflow Depth = 2.29" for 10 year event
Inflow = 7.4 cfs @ 12.08 hrs, Volume= 22,209 cf
Primary = 7.4 cfs @ 12.08 hrs, Volume= 22,209 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPR-10: Proposed North Runoff Area=917,489 sf 56.53% Impervious Runoff Depth=4.25"
Flow Length=2,324' Tc=15.8 min CN=89 Runoff=75.6 cfs 325,118 cf

SubcatchmentPR-10A: Added Parking Runoff Area=2,400 sf 100.00% Impervious Runoff Depth=5.26"
Tc=5.0 min CN=98 Runoff=0.3 cfs 1,052 cf

SubcatchmentPR-11: West Side of Hill Runoff Area=292,366 sf 2.47% Impervious Runoff Depth=1.10"
Flow Length=805' Tc=12.9 min CN=53 Runoff=5.5 cfs 26,863 cf

SubcatchmentPR-12: West Side of Hill Runoff Area=222,032 sf 3.42% Impervious Runoff Depth=2.86"
Flow Length=870' Tc=10.8 min CN=75 Runoff=14.5 cfs 52,928 cf

SubcatchmentPR-13A: Southwest Side of Runoff Area=68,701 sf 11.70% Impervious Runoff Depth=3.05"
Flow Length=515' Tc=8.4 min CN=77 Runoff=5.2 cfs 17,441 cf

SubcatchmentPR-13B: Portion of Existing Runoff Area=25,070 sf 25.21% Impervious Runoff Depth=3.43"
Tc=5.0 min CN=81 Runoff=2.4 cfs 7,168 cf

SubcatchmentPR-14: Bayview Drive Runoff Area=47,450 sf 91.46% Impervious Runoff Depth=5.03"
Flow Length=2,236' Tc=6.5 min CN=96 Runoff=5.7 cfs 19,889 cf

SubcatchmentPR-20: Northwest Portion Runoff Area=327,503 sf 1.84% Impervious Runoff Depth=2.77"
Flow Length=450' Slope=0.1100 '/' Tc=10.2 min CN=74 Runoff=21.1 cfs 75,576 cf

SubcatchmentPR-21: Northwest Access Runoff Area=62,140 sf 15.82% Impervious Runoff Depth=3.43"
Flow Length=370' Tc=5.3 min CN=81 Runoff=5.9 cfs 17,767 cf

SubcatchmentPR-30: Perimeter Access Runoff Area=116,350 sf 1.55% Impervious Runoff Depth=2.95"
Flow Length=101' Tc=5.0 min CN=76 Runoff=9.6 cfs 28,632 cf

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=7.3 cfs 24,609 cf
Outflow=7.3 cfs 24,609 cf

Pond P 1AA: Wet Basin - Upper Levels Peak Elev=153.28' Storage=94,084 cf Inflow=103.4 cfs 450,119 cf
Outflow=96.0 cfs 450,121 cf

Pond P 1B: Existing Expanded Basin Peak Elev=150.77' Storage=241,012 cf Inflow=96.0 cfs 450,121 cf
Outflow=6.1 cfs 364,023 cf

Pond P 2A: Rain Garden 1 Peak Elev=194.43' Storage=753 cf Inflow=5.9 cfs 17,767 cf
Outflow=5.8 cfs 17,332 cf

Pond P-1C: Subsurface Infiltration Peak Elev=224.07' Storage=346 cf Inflow=0.3 cfs 1,052 cf
Discarded=0.0 cfs 0 cf Primary=0.3 cfs 713 cf Outflow=0.3 cfs 713 cf

Link DP 1: Design Point 1 Inflow=6.1 cfs 364,023 cf
Primary=6.1 cfs 364,023 cf

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Link DP 2: Design Point 2

Inflow=26.1 cfs 92,908 cf

Primary=26.1 cfs 92,908 cf

Link DP-3: Design Point 3

Inflow=9.6 cfs 28,632 cf

Primary=9.6 cfs 28,632 cf

Total Runoff Area = 2,081,501 sf Runoff Volume = 572,434 cf Average Runoff Depth = 3.30"
70.63% Pervious = 1,470,214 sf 29.37% Impervious = 611,287 sf

Summary for Subcatchment PR-10: Proposed North Hill Campus

Runoff = 75.6 cfs @ 12.21 hrs, Volume= 325,118 cf, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
*	518,662	98	Impervious
	93,214	73	Woods, Fair, HSG C
	305,613	79	50-75% Grass cover, Fair, HSG C
	917,489	89	Weighted Average
	398,827		43.47% Pervious Area
	518,662		56.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	125	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	15	0.3300	4.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.2	80	0.0250	1.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	456	0.0500	10.14	7.97	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	132	0.0150	7.28	12.87	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.1	928	0.0100	7.20	22.62	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.4	483	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	2,324	Total			

Summary for Subcatchment PR-10A: Added Parking

Runoff = 0.3 cfs @ 12.07 hrs, Volume= 1,052 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

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Type III 24-hr 25 year Rainfall=5.50"

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	Area (sf)	CN	Description
*	2,400	98	Impervious
	2,400		100.00% Impervious Area

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

Summary for Subcatchment PR-11: West Side of Hill

Runoff = 5.5 cfs @ 12.21 hrs, Volume= 26,863 cf, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
	7,216	98	Impervious
	8,259	30	Brush, Good, HSG A
	111,905	73	Woods, Fair, HSG C
*	133,360	30	Brush, Good, HSG A
	8,323	79	50-75% Grass cover, Fair, HSG C
	16,102	73	Brush, Good, HSG D
	7,201	65	Brush, Good, HSG C
	292,366	53	Weighted Average
	285,150		97.53% Pervious Area
	7,216		2.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.5	400	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.6	355	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
12.9	805	Total			

Summary for Subcatchment PR-12: West Side of Hill

Runoff = 14.5 cfs @ 12.15 hrs, Volume= 52,928 cf, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

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Type III 24-hr 25 year Rainfall=5.50"

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Area (sf)	CN	Description
* 7,600	98	Impervious
190,538	73	Woods, Fair, HSG C
23,894	79	50-75% Grass cover, Fair, HSG C
222,032	75	Weighted Average
214,432		96.58% Pervious Area
7,600		3.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	15	0.0200	0.12		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
0.9	15	0.1750	0.28		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
2.5	20	0.1750	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.9	430	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.1	360	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
10.8	870	Total			

Summary for Subcatchment PR-13A: Southwest Side of Hill

Runoff = 5.2 cfs @ 12.12 hrs, Volume= 17,441 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
* 8,039	98	Impervious
48,481	73	Woods, Fair, HSG C
12,181	79	50-75% Grass cover, Fair, HSG C
68,701	77	Weighted Average
60,662		88.30% Pervious Area
8,039		11.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.13		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
3.8	30	0.1400	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	85	0.1400	1.87		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	380	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
8.4	515	Total			

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Type III 24-hr 25 year Rainfall=5.50"

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Summary for Subcatchment PR-13B: Portion of Existing CR ARC & Proposed Pervious Area (Prior to Cu

Runoff = 2.4 cfs @ 12.07 hrs, Volume= 7,168 cf, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
*	6,320	98	Impervious
	9,870	73	Woods, Fair, HSG C
	8,880	79	50-75% Grass cover, Fair, HSG C
	25,070	81	Weighted Average
	18,750		74.79% Pervious Area
	6,320		25.21% Impervious Area

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

Summary for Subcatchment PR-14: Bayview Drive

Runoff = 5.7 cfs @ 12.09 hrs, Volume= 19,889 cf, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

	Area (sf)	CN	Description
	43,400	98	Impervious
	0	73	Woods, Fair, HSG C
	4,050	79	50-75% Grass cover, Fair, HSG C
	47,450	96	Weighted Average
	4,050		8.54% Pervious Area
	43,400		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0220	1.14		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.20"
2.7	573	0.0300	3.52		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
2.8	1,000	0.0070	6.02	18.93	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.4	571	0.0790	21.89	87.05	Pipe Channel, RCP_Round 27" 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013
0.1	60	0.0150	11.56	81.69	Pipe Channel, RCP_Round 36" 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013
6.5	2,236	Total			

Summary for Subcatchment PR-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 21.1 cfs @ 12.14 hrs, Volume= 75,576 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
* 6,020	98	Impervious
275,940	73	Woods, Fair, HSG C
45,543	79	50-75% Grass cover, Fair, HSG C
327,503	74	Weighted Average
321,483		98.16% Pervious Area
6,020		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	400	0.1100	1.66		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
10.2	450	Total			

Summary for Subcatchment PR-21: Northwest Access Drive and Hill

Runoff = 5.9 cfs @ 12.08 hrs, Volume= 17,767 cf, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
* 9,830	98	Impervious
10,850	73	Woods, Fair, HSG C
41,460	79	50-75% Grass cover, Fair, HSG C
62,140	81	Weighted Average
52,310		84.18% Pervious Area
9,830		15.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0588	0.23		Sheet Flow, Grass
					Grass: Short n= 0.150 P2= 3.20"
1.6	320	0.0500	3.35		Shallow Concentrated Flow, Swale
					Grassed Waterway Kv= 15.0 fps
5.3	370	Total			

Summary for Subcatchment PR-30: Perimeter Access Drive and Slope

Runoff = 9.6 cfs @ 12.08 hrs, Volume= 28,632 cf, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
1,800	98	Impervious
60,500	73	Woods, Fair, HSG C
54,050	79	50-75% Grass cover, Fair, HSG C
116,350	76	Weighted Average
114,550		98.45% Pervious Area
1,800		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	16	0.3440	4.11		Shallow Concentrated Flow, Grass
					Short Grass Pasture Kv= 7.0 fps
0.7	85	0.1530	1.96		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
0.8	101	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 93,771 sf, 15.31% Impervious, Inflow Depth = 3.15" for 25 year event
Inflow = 7.3 cfs @ 12.10 hrs, Volume= 24,609 cf
Outflow = 7.3 cfs @ 12.10 hrs, Volume= 24,609 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1AA: Wet Basin - Upper Levels Only

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 3.43" for 25 year event
Inflow = 103.4 cfs @ 12.19 hrs, Volume= 450,119 cf
Outflow = 96.0 cfs @ 12.25 hrs, Volume= 450,121 cf, Atten= 7%, Lag= 3.8 min
Primary = 96.0 cfs @ 12.25 hrs, Volume= 450,121 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 153.28' @ 12.25 hrs Surf.Area= 34,290 sf Storage= 94,084 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 152.7 min (962.4 - 809.7)

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Type III 24-hr 25 year Rainfall=5.50"

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Volume	Invert	Avail.Storage	Storage Description
#1	149.70'	101,744 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
149.70	20,236	0	0
150.00	20,347	6,087	6,087
151.00	24,116	22,232	28,319
152.00	28,073	26,095	54,413
153.00	32,496	30,285	84,698
153.50	35,688	17,046	101,744

Device	Routing	Invert	Outlet Devices
#1	Primary	152.25'	20.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	152.59'	24.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#3	Primary	149.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=96.0 cfs @ 12.25 hrs HW=153.28' TW=148.39' (Dynamic Tailwater)

- 1=Broad-Crested Rectangular Weir (Weir Controls 55.7 cfs @ 2.70 fps)
- 2=Broad-Crested Rectangular Weir (Weir Controls 37.0 cfs @ 2.23 fps)
- 3=Orifice/Grate (Orifice Controls 3.3 cfs @ 9.36 fps)

Summary for Pond P 1B: Existing Expanded Basin

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 3.43" for 25 year event
 Inflow = 96.0 cfs @ 12.25 hrs, Volume= 450,121 cf
 Outflow = 6.1 cfs @ 15.51 hrs, Volume= 364,023 cf, Atten= 94%, Lag= 195.5 min
 Primary = 6.1 cfs @ 15.51 hrs, Volume= 364,023 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 150.77' @ 15.51 hrs Surf.Area= 80,376 sf Storage= 241,012 cf

Plug-Flow detention time= 764.8 min calculated for 364,023 cf (81% of inflow)
 Center-of-Mass det. time= 611.3 min (1,573.7 - 962.4)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	527,911 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Type III 24-hr 25 year Rainfall=5.50"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.50	0	0	0
145.00	2,609	652	652
146.00	10,587	6,598	7,250
147.00	22,591	16,589	23,839
148.00	41,981	32,286	56,125
149.00	65,579	53,780	109,905
150.00	76,289	70,934	180,839
151.00	81,609	78,949	259,788
152.00	86,811	84,210	343,998
153.00	92,120	89,466	433,464
154.00	96,775	94,448	527,911

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.014, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Weir - Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.1 cfs @ 15.51 hrs HW=150.77' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 6.1 cfs of 7.7 cfs potential flow)
 2=Low Flow Orifice (Orifice Controls 0.3 cfs @ 11.78 fps)
 3=Orifice (Orifice Controls 2.1 cfs @ 10.54 fps)
 4=Weir/Orifice (Orifice Controls 3.8 cfs @ 2.35 fps)
 5=Orifice (Controls 0.0 cfs)
 6=Weir - Rip Rap Spillway (Controls 0.0 cfs)

Summary for Pond P 2A: Rain Garden 1

Inflow Area = 62,140 sf, 15.82% Impervious, Inflow Depth = 3.43" for 25 year event
 Inflow = 5.9 cfs @ 12.08 hrs, Volume= 17,767 cf
 Outflow = 5.8 cfs @ 12.09 hrs, Volume= 17,332 cf, Atten= 1%, Lag= 0.6 min
 Primary = 5.8 cfs @ 12.09 hrs, Volume= 17,332 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 194.43' @ 12.09 hrs Surf.Area= 804 sf Storage= 753 cf

Plug-Flow detention time= 23.4 min calculated for 17,332 cf (98% of inflow)
 Center-of-Mass det. time= 8.9 min (823.3 - 814.4)

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Type III 24-hr 25 year Rainfall=5.50"

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Volume	Invert	Avail.Storage	Storage Description
#1	193.25'	1,258 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.25	490	0	0
194.00	670	435	435
194.50	825	374	809
195.00	970	449	1,258

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=5.8 cfs @ 12.09 hrs HW=194.43' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir**(Weir Controls 5.8 cfs @ 1.68 fps)

Summary for Pond P-1C: Subsurface Infiltration

Inflow Area = 2,400 sf, 100.00% Impervious, Inflow Depth = 5.26" for 25 year event
 Inflow = 0.3 cfs @ 12.07 hrs, Volume= 1,052 cf
 Outflow = 0.3 cfs @ 12.07 hrs, Volume= 713 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.3 cfs @ 12.07 hrs, Volume= 713 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 224.07' @ 12.07 hrs Surf.Area= 243 sf Storage= 346 cf

Flood Elev= 227.10' Surf.Area= 243 sf Storage= 384 cf

Plug-Flow detention time= 192.0 min calculated for 713 cf (68% of inflow)

Center-of-Mass det. time= 93.2 min (838.7 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	221.00'	237 cf	6.83'W x 33.68'L x 2.83'H Field A
			652 cf Overall - 59 cf Embedded = 593 cf x 40.0% Voids
#2A	222.00'	59 cf	ADS_StormTech SC-310 +Cap x 4 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3	220.10'	88 cf	4.00'D x 7.00'H Catch Basin
		384 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	220.10'	0.170 in/hr Exfiltration X 0.00 over Surface area Conductivity to Groundwater Elevation = 216.00' Phase-In= 0.10'
#2	Primary	223.80'	12.0" Round Culvert L= 15.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 223.80' / 222.90' S= 0.0600 ' / ' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.0 cfs @ 0.00 hrs HW=220.10' (Free Discharge)

↑**1=Exfiltration** (Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.07 hrs HW=224.07' TW=152.87' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.3 cfs @ 1.78 fps)

Summary for Link DP 1: Design Point 1

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth > 2.77" for 25 year event
Inflow = 6.1 cfs @ 15.51 hrs, Volume= 364,023 cf
Primary = 6.1 cfs @ 15.51 hrs, Volume= 364,023 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 389,643 sf, 4.07% Impervious, Inflow Depth = 2.86" for 25 year event
Inflow = 26.1 cfs @ 12.13 hrs, Volume= 92,908 cf
Primary = 26.1 cfs @ 12.13 hrs, Volume= 92,908 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP-3: Design Point 3

Inflow Area = 116,350 sf, 1.55% Impervious, Inflow Depth = 2.95" for 25 year event
Inflow = 9.6 cfs @ 12.08 hrs, Volume= 28,632 cf
Primary = 9.6 cfs @ 12.08 hrs, Volume= 28,632 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

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Type III 24-hr 100 year Rainfall=6.70"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPR-10: Proposed North Runoff Area=917,489 sf 56.53% Impervious Runoff Depth=5.42"
Flow Length=2,324' Tc=15.8 min CN=89 Runoff=95.2 cfs 414,058 cf

SubcatchmentPR-10A: Added Parking Runoff Area=2,400 sf 100.00% Impervious Runoff Depth=6.46"
Tc=5.0 min CN=98 Runoff=0.4 cfs 1,292 cf

SubcatchmentPR-11: West Side of Hill Runoff Area=292,366 sf 2.47% Impervious Runoff Depth=1.76"
Flow Length=805' Tc=12.9 min CN=53 Runoff=9.9 cfs 42,865 cf

SubcatchmentPR-12: West Side of Hill Runoff Area=222,032 sf 3.42% Impervious Runoff Depth=3.89"
Flow Length=870' Tc=10.8 min CN=75 Runoff=19.8 cfs 71,906 cf

SubcatchmentPR-13A: Southwest Side of Runoff Area=68,701 sf 11.70% Impervious Runoff Depth=4.10"
Flow Length=515' Tc=8.4 min CN=77 Runoff=7.0 cfs 23,457 cf

SubcatchmentPR-13B: Portion of Existing Runoff Area=25,070 sf 25.21% Impervious Runoff Depth=4.53"
Tc=5.0 min CN=81 Runoff=3.1 cfs 9,457 cf

SubcatchmentPR-14: Bayview Drive Runoff Area=47,450 sf 91.46% Impervious Runoff Depth=6.22"
Flow Length=2,236' Tc=6.5 min CN=96 Runoff=7.0 cfs 24,613 cf

SubcatchmentPR-20: Northwest Portion Runoff Area=327,503 sf 1.84% Impervious Runoff Depth=3.78"
Flow Length=450' Slope=0.1100 '/' Tc=10.2 min CN=74 Runoff=29.0 cfs 103,211 cf

SubcatchmentPR-21: Northwest Access Runoff Area=62,140 sf 15.82% Impervious Runoff Depth=4.53"
Flow Length=370' Tc=5.3 min CN=81 Runoff=7.7 cfs 23,441 cf

SubcatchmentPR-30: Perimeter Access Runoff Area=116,350 sf 1.55% Impervious Runoff Depth=3.99"
Flow Length=101' Tc=5.0 min CN=76 Runoff=12.9 cfs 38,700 cf

Reach R 1: Existing Swale - E. Militia Heights Drive Inflow=9.8 cfs 32,914 cf
Outflow=9.8 cfs 32,914 cf

Pond P 1AA: Wet Basin - Upper Levels Peak Elev=153.46' Storage=100,492 cf Inflow=134.7 cfs 587,308 cf
Outflow=127.2 cfs 587,311 cf

Pond P 1B: Existing Expanded Basin Peak Elev=151.63' Storage=312,462 cf Inflow=127.2 cfs 587,311 cf
Outflow=8.2 cfs 495,217 cf

Pond P 2A: Rain Garden 1 Peak Elev=194.51' Storage=816 cf Inflow=7.7 cfs 23,441 cf
Outflow=7.6 cfs 23,006 cf

Pond P-1C: Subsurface Infiltration Peak Elev=224.10' Storage=347 cf Inflow=0.4 cfs 1,292 cf
Discarded=0.0 cfs 0 cf Primary=0.4 cfs 953 cf Outflow=0.4 cfs 953 cf

Link DP 1: Design Point 1 Inflow=8.2 cfs 495,217 cf
Primary=8.2 cfs 495,217 cf

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Link DP 2: Design Point 2Inflow=35.4 cfs 126,217 cf
Primary=35.4 cfs 126,217 cf**Link DP-3: Design Point 3**Inflow=12.9 cfs 38,700 cf
Primary=12.9 cfs 38,700 cf**Total Runoff Area = 2,081,501 sf Runoff Volume = 753,000 cf Average Runoff Depth = 4.34"**
70.63% Pervious = 1,470,214 sf 29.37% Impervious = 611,287 sf

Summary for Subcatchment PR-10: Proposed North Hill Campus

Runoff = 95.2 cfs @ 12.20 hrs, Volume= 414,058 cf, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
*	518,662	98	Impervious
	93,214	73	Woods, Fair, HSG C
	305,613	79	50-75% Grass cover, Fair, HSG C
	917,489	89	Weighted Average
	398,827		43.47% Pervious Area
	518,662		56.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	20	0.0250	0.06		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	30	0.2500	0.17		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	55	0.0200	0.99		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.7	125	0.0590	1.21		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.1	15	0.3300	4.02		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
1.2	80	0.0250	1.11		Shallow Concentrated Flow, Grass Short Grass Pasture Kv= 7.0 fps
0.7	456	0.0500	10.14	7.97	Pipe Channel, Drain Network 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, bends & connections
0.3	132	0.0150	7.28	12.87	Pipe Channel, Drain Network 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
2.1	928	0.0100	7.20	22.62	Pipe Channel, Drain Network 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013 Concrete pipe, bends & connections
0.4	483	0.0800	22.03	87.60	Pipe Channel, Drain Network 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013 Concrete pipe, bends & connections
15.8	2,324	Total			

Summary for Subcatchment PR-10A: Added Parking

Runoff = 0.4 cfs @ 12.07 hrs, Volume= 1,292 cf, Depth= 6.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

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Type III 24-hr 100 year Rainfall=6.70"

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	Area (sf)	CN	Description
*	2,400	98	Impervious
	2,400		100.00% Impervious Area

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

Summary for Subcatchment PR-11: West Side of Hill

Runoff = 9.9 cfs @ 12.20 hrs, Volume= 42,865 cf, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
	7,216	98	Impervious
	8,259	30	Brush, Good, HSG A
	111,905	73	Woods, Fair, HSG C
*	133,360	30	Brush, Good, HSG A
	8,323	79	50-75% Grass cover, Fair, HSG C
	16,102	73	Brush, Good, HSG D
	7,201	65	Brush, Good, HSG C
	292,366	53	Weighted Average
	285,150		97.53% Pervious Area
	7,216		2.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.5	400	0.1480	1.92		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
3.6	355	0.0120	1.64		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
12.9	805	Total			

Summary for Subcatchment PR-12: West Side of Hill

Runoff = 19.8 cfs @ 12.15 hrs, Volume= 71,906 cf, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

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Type III 24-hr 100 year Rainfall=6.70"

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Area (sf)	CN	Description
* 7,600	98	Impervious
190,538	73	Woods, Fair, HSG C
23,894	79	50-75% Grass cover, Fair, HSG C
222,032	75	Weighted Average
214,432		96.58% Pervious Area
7,600		3.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	15	0.0200	0.12		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
0.9	15	0.1750	0.28		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
2.5	20	0.1750	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
3.9	430	0.1330	1.82		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
0.3	30	0.0100	1.50		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
1.1	360	0.0080	5.58	17.54	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Corrugated PE, smooth interior
10.8	870	Total			

Summary for Subcatchment PR-13A: Southwest Side of Hill

Runoff = 7.0 cfs @ 12.12 hrs, Volume= 23,457 cf, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
* 8,039	98	Impervious
48,481	73	Woods, Fair, HSG C
12,181	79	50-75% Grass cover, Fair, HSG C
68,701	77	Weighted Average
60,662		88.30% Pervious Area
8,039		11.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0250	0.13		Sheet Flow, Grass Grass: Short n= 0.150 P2= 3.20"
3.8	30	0.1400	0.13		Sheet Flow, Woods Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	85	0.1400	1.87		Shallow Concentrated Flow, Woods Woodland Kv= 5.0 fps
1.3	380	0.1040	4.84		Shallow Concentrated Flow, E. Militia - Swale Grassed Waterway Kv= 15.0 fps
8.4	515	Total			

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Type III 24-hr 100 year Rainfall=6.70"

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Summary for Subcatchment PR-13B: Portion of Existing CR ARC & Proposed Pervious Area (Prior to Cu

Runoff = 3.1 cfs @ 12.07 hrs, Volume= 9,457 cf, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
*	6,320	98	Impervious
	9,870	73	Woods, Fair, HSG C
	8,880	79	50-75% Grass cover, Fair, HSG C
	25,070	81	Weighted Average
	18,750		74.79% Pervious Area
	6,320		25.21% Impervious Area

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

Summary for Subcatchment PR-14: Bayview Drive

Runoff = 7.0 cfs @ 12.09 hrs, Volume= 24,613 cf, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

	Area (sf)	CN	Description
	43,400	98	Impervious
	0	73	Woods, Fair, HSG C
	4,050	79	50-75% Grass cover, Fair, HSG C
	47,450	96	Weighted Average
	4,050		8.54% Pervious Area
	43,400		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	32	0.0220	1.14		Sheet Flow, Paved Smooth surfaces n= 0.011 P2= 3.20"
2.7	573	0.0300	3.52		Shallow Concentrated Flow, Paved Paved Kv= 20.3 fps
2.8	1,000	0.0070	6.02	18.93	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.4	571	0.0790	21.89	87.05	Pipe Channel, RCP_Round 27" 27.0" Round Area= 4.0 sf Perim= 7.1' r= 0.56' n= 0.013
0.1	60	0.0150	11.56	81.69	Pipe Channel, RCP_Round 36" 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.013
6.5	2,236	Total			

Summary for Subcatchment PR-20: Northwest Portion of Main Entry Drive and Hill

Runoff = 29.0 cfs @ 12.14 hrs, Volume= 103,211 cf, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
* 6,020	98	Impervious
275,940	73	Woods, Fair, HSG C
45,543	79	50-75% Grass cover, Fair, HSG C
327,503	74	Weighted Average
321,483		98.16% Pervious Area
6,020		1.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		Sheet Flow, Woods
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	400	0.1100	1.66		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
10.2	450	Total			

Summary for Subcatchment PR-21: Northwest Access Drive and Hill

Runoff = 7.7 cfs @ 12.08 hrs, Volume= 23,441 cf, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
* 9,830	98	Impervious
10,850	73	Woods, Fair, HSG C
41,460	79	50-75% Grass cover, Fair, HSG C
62,140	81	Weighted Average
52,310		84.18% Pervious Area
9,830		15.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0588	0.23		Sheet Flow, Grass
					Grass: Short n= 0.150 P2= 3.20"
1.6	320	0.0500	3.35		Shallow Concentrated Flow, Swale
					Grassed Waterway Kv= 15.0 fps
5.3	370	Total			

Summary for Subcatchment PR-30: Perimeter Access Drive and Slope

Runoff = 12.9 cfs @ 12.07 hrs, Volume= 38,700 cf, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=6.70"

Area (sf)	CN	Description
1,800	98	Impervious
60,500	73	Woods, Fair, HSG C
54,050	79	50-75% Grass cover, Fair, HSG C
116,350	76	Weighted Average
114,550		98.45% Pervious Area
1,800		1.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	16	0.3440	4.11		Shallow Concentrated Flow, Grass
					Short Grass Pasture Kv= 7.0 fps
0.7	85	0.1530	1.96		Shallow Concentrated Flow, Woods
					Woodland Kv= 5.0 fps
0.8	101	Total, Increased to minimum Tc = 5.0 min			

Summary for Reach R 1: Existing Swale - E. Militia Heights Drive

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 93,771 sf, 15.31% Impervious, Inflow Depth = 4.21" for 100 year event
Inflow = 9.8 cfs @ 12.10 hrs, Volume= 32,914 cf
Outflow = 9.8 cfs @ 12.10 hrs, Volume= 32,914 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond P 1AA: Wet Basin - Upper Levels Only

[44] Hint: Outlet device #3 is below defined storage

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 4.47" for 100 year event
Inflow = 134.7 cfs @ 12.19 hrs, Volume= 587,308 cf
Outflow = 127.2 cfs @ 12.24 hrs, Volume= 587,311 cf, Atten= 6%, Lag= 3.4 min
Primary = 127.2 cfs @ 12.24 hrs, Volume= 587,311 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 153.46' @ 12.24 hrs Surf.Area= 35,463 sf Storage= 100,492 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 128.1 min (931.8 - 803.7)

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Volume	Invert	Avail.Storage	Storage Description
#1	149.70'	101,744 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
149.70	20,236	0	0
150.00	20,347	6,087	6,087
151.00	24,116	22,232	28,319
152.00	28,073	26,095	54,413
153.00	32,496	30,285	84,698
153.50	35,688	17,046	101,744

Device	Routing	Invert	Outlet Devices
#1	Primary	152.25'	20.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	152.59'	24.0' long x 12.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#3	Primary	149.50'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=127.1 cfs @ 12.24 hrs HW=153.46' TW=149.19' (Dynamic Tailwater)

- 1=Broad-Crested Rectangular Weir (Weir Controls 71.5 cfs @ 2.94 fps)
- 2=Broad-Crested Rectangular Weir (Weir Controls 52.3 cfs @ 2.49 fps)
- 3=Orifice/Grate (Orifice Controls 3.3 cfs @ 9.59 fps)

Summary for Pond P 1B: Existing Expanded Basin

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth = 4.47" for 100 year event
 Inflow = 127.2 cfs @ 12.24 hrs, Volume= 587,311 cf
 Outflow = 8.2 cfs @ 15.28 hrs, Volume= 495,217 cf, Atten= 94%, Lag= 182.4 min
 Primary = 8.2 cfs @ 15.28 hrs, Volume= 495,217 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 151.63' @ 15.28 hrs Surf.Area= 84,900 sf Storage= 312,462 cf

Plug-Flow detention time= 639.9 min calculated for 495,114 cf (84% of inflow)
 Center-of-Mass det. time= 510.8 min (1,442.6 - 931.8)

Volume	Invert	Avail.Storage	Storage Description
#1	144.50'	527,911 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Type III 24-hr 100 year Rainfall=6.70"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
144.50	0	0	0
145.00	2,609	652	652
146.00	10,587	6,598	7,250
147.00	22,591	16,589	23,839
148.00	41,981	32,286	56,125
149.00	65,579	53,780	109,905
150.00	76,289	70,934	180,839
151.00	81,609	78,949	259,788
152.00	86,811	84,210	343,998
153.00	92,120	89,466	433,464
154.00	96,775	94,448	527,911

Device	Routing	Invert	Outlet Devices
#1	Primary	143.90'	12.0" Round Culvert L= 70.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 143.90' / 143.76' S= 0.0020 ' S= 0.0020 ' Cc= 0.900 n= 0.014, Flow Area= 0.79 sf
#2	Device 1	144.70'	2.0" Vert. Low Flow Orifice C= 0.600
#3	Device 1	145.73'	6.0" Vert. Orifice C= 0.600
#4	Device 1	150.23'	36.0" W x 12.0" H Vert. Weir/Orifice C= 0.600
#5	Device 1	151.24'	36.0" x 36.0" Horiz. Orifice C= 0.600 Limited to weir flow at low heads
#6	Primary	153.00'	13.0' long x 20.0' breadth Weir - Rip Rap Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.2 cfs @ 15.28 hrs HW=151.63' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Barrel Controls 8.2 cfs @ 10.46 fps)
 2=Low Flow Orifice (Passes < 0.3 cfs potential flow)
 3=Orifice (Passes < 2.2 cfs potential flow)
 4=Weir/Orifice (Passes < 13.5 cfs potential flow)
 5=Orifice (Passes < 9.7 cfs potential flow)
 6=Weir - Rip Rap Spillway (Controls 0.0 cfs)

Summary for Pond P 2A: Rain Garden 1

Inflow Area = 62,140 sf, 15.82% Impervious, Inflow Depth = 4.53" for 100 year event
 Inflow = 7.7 cfs @ 12.08 hrs, Volume= 23,441 cf
 Outflow = 7.6 cfs @ 12.09 hrs, Volume= 23,006 cf, Atten= 1%, Lag= 0.6 min
 Primary = 7.6 cfs @ 12.09 hrs, Volume= 23,006 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 194.51' @ 12.09 hrs Surf.Area= 828 sf Storage= 816 cf

Plug-Flow detention time= 19.0 min calculated for 23,001 cf (98% of inflow)
 Center-of-Mass det. time= 7.8 min (814.4 - 806.6)

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Volume	Invert	Avail.Storage	Storage Description
#1	193.25'	1,258 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
193.25	490	0	0
194.00	670	435	435
194.50	825	374	809
195.00	970	449	1,258

Device	Routing	Invert	Outlet Devices
#1	Primary	194.00'	8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=7.6 cfs @ 12.09 hrs HW=194.51' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir**(Weir Controls 7.6 cfs @ 1.87 fps)

Summary for Pond P-1C: Subsurface Infiltration

Inflow Area = 2,400 sf, 100.00% Impervious, Inflow Depth = 6.46" for 100 year event
 Inflow = 0.4 cfs @ 12.07 hrs, Volume= 1,292 cf
 Outflow = 0.4 cfs @ 12.07 hrs, Volume= 953 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.4 cfs @ 12.07 hrs, Volume= 953 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Peak Elev= 224.10' @ 12.07 hrs Surf.Area= 243 sf Storage= 347 cf

Flood Elev= 227.10' Surf.Area= 243 sf Storage= 384 cf

Plug-Flow detention time= 173.3 min calculated for 952 cf (74% of inflow)

Center-of-Mass det. time= 83.6 min (826.2 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	221.00'	237 cf	6.83'W x 33.68'L x 2.83'H Field A
			652 cf Overall - 59 cf Embedded = 593 cf x 40.0% Voids
#2A	222.00'	59 cf	ADS_StormTech SC-310 +Cap x 4 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
#3	220.10'	88 cf	4.00'D x 7.00'H Catch Basin
		384 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	220.10'	0.170 in/hr Exfiltration X 0.00 over Surface area Conductivity to Groundwater Elevation = 216.00' Phase-In= 0.10'
#2	Primary	223.80'	12.0" Round Culvert L= 15.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 223.80' / 222.90' S= 0.0600 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.0 cfs @ 0.00 hrs HW=220.10' (Free Discharge)

↑**1=Exfiltration** (Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.07 hrs HW=224.10' TW=153.13' (Dynamic Tailwater)

↑**2=Culvert** (Inlet Controls 0.4 cfs @ 1.87 fps)

Summary for Link DP 1: Design Point 1

Inflow Area = 1,575,508 sf, 37.68% Impervious, Inflow Depth > 3.77" for 100 year event
Inflow = 8.2 cfs @ 15.28 hrs, Volume= 495,217 cf
Primary = 8.2 cfs @ 15.28 hrs, Volume= 495,217 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Link DP 2: Design Point 2

Inflow Area = 389,643 sf, 4.07% Impervious, Inflow Depth = 3.89" for 100 year event
Inflow = 35.4 cfs @ 12.13 hrs, Volume= 126,217 cf
Primary = 35.4 cfs @ 12.13 hrs, Volume= 126,217 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

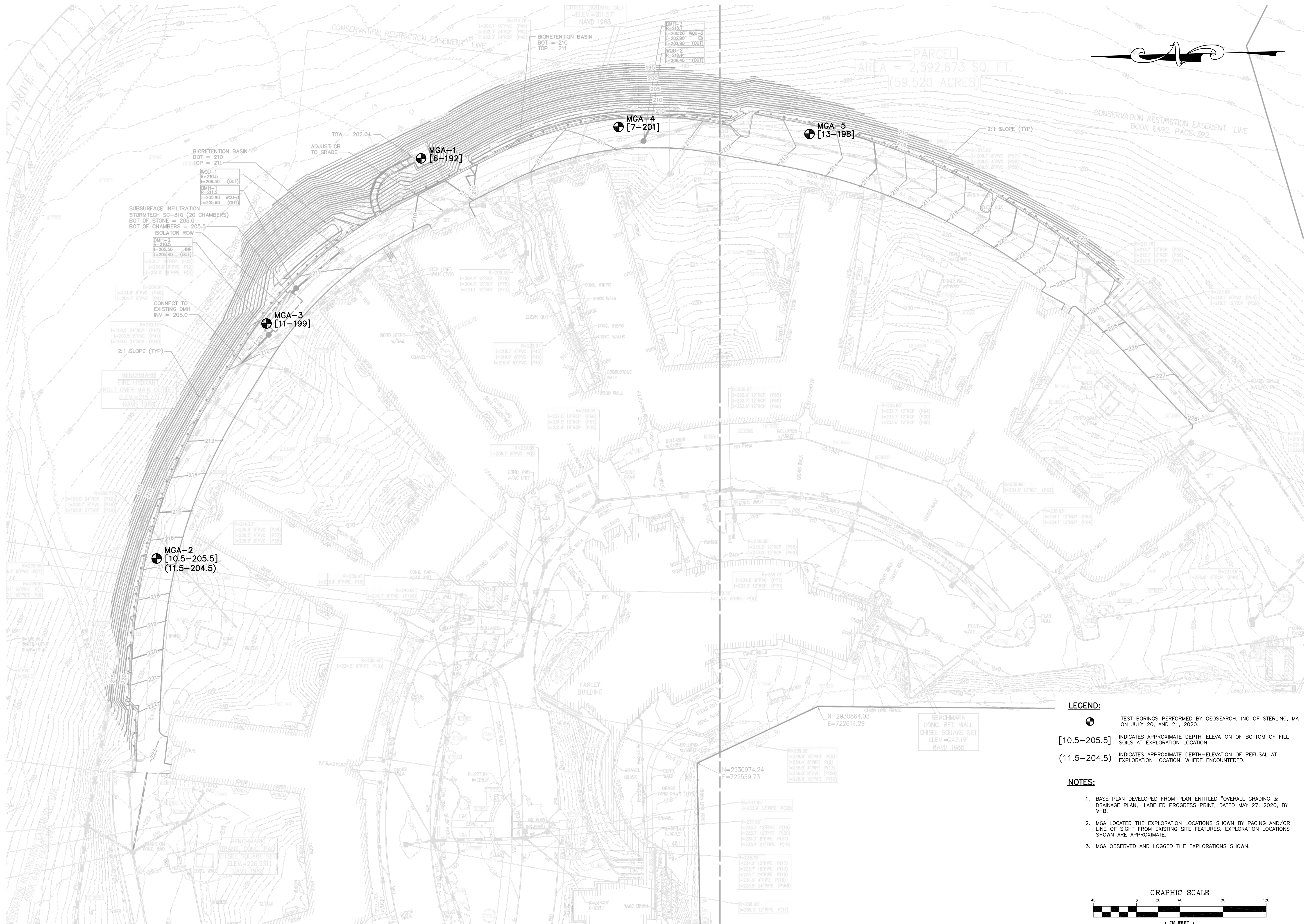
Summary for Link DP-3: Design Point 3

Inflow Area = 116,350 sf, 1.55% Impervious, Inflow Depth = 3.99" for 100 year event
Inflow = 12.9 cfs @ 12.07 hrs, Volume= 38,700 cf
Primary = 12.9 cfs @ 12.07 hrs, Volume= 38,700 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs



Attachment 3 – Soil Boring Logs

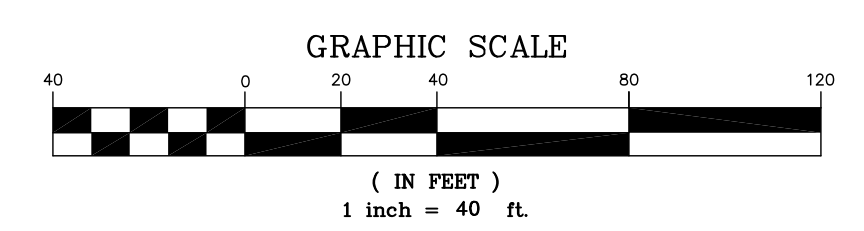


LEGEND:

- TEST BORINGS PERFORMED BY GEOSearch, INC. OF STERLING, MA ON JULY 20, AND 21, 2020.
- [10.5-205.5] INDICATES APPROXIMATE DEPTH-ELEVATION OF BOTTOM OF FILL SOILS AT EXPLORATION LOCATION.
- (11.5-204.5) INDICATES APPROXIMATE DEPTH-ELEVATION OF REFUSAL AT EXPLORATION LOCATION, WHERE ENCOUNTERED.

NOTES:

- BASE PLAN DEVELOPED FROM PLAN ENTITLED "OVERALL GRADING & DRAINAGE PLAN," LABELED PROGRESS PRINT, DATED MAY 27, 2020, BY VHB.
- MGA LOCATED THE EXPLORATION LOCATIONS SHOWN BY PACING AND/OR LINE OF SIGHT FROM EXISTING SITE FEATURES. EXPLORATION LOCATIONS SHOWN ARE APPROXIMATE.
- MGA OBSERVED AND LOGGED THE EXPLORATIONS SHOWN.



REVISIONS

DRAWN BY: RED

DESIGNED BY: RED

CHECKED BY: SLH

McArdle Gannon Associates, Inc.
Engineers & Consultants
300 Oak Street, Suite 460
Pembroke, MA 02359
781.826.0040 phone
781.735.0418 fax

EXPLORATION LOCATION PLAN

NORTH HILL EXPANSION

865 CENTRAL AVENUE, NEEDHAM, MASSACHUSETTS

SEPTEMBER 2020

SCALE: 1" = 40'

JOB No. G0809

FIG No. 2

SHEET 1 OF 1



**McCardle Gannon
Associates, Inc.**

TEST BORING LOG

BORING MGA-1

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

CONTRACTOR: Geosearch

MGA NO. : G0809
SHEET NO. : 1 of 1
LOCATION N : See Plan

E :
ELEVATION : 198'±

DATE START : 7/20/20

END : 7/20/20

DRILLER : Ken Bylund

ENGINEER : Robert Drown

GROUNDWATER		DEPTH (ft) OF:			EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Casing	Hole	Type	HSA	Split Spoon	----
7/20/20	3:15pm	NE (4)	17.5	17.5	Size I.D.	4-1/4"	1-3/8"	----
					Hammer Wt.	----	140#	----
					Hammer Fall	----	30"	----

Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/Type	Sample Depth Range (ft)	Sample Recovery (in)	Elevation/Depth (ft)	FIELD CLASSIFICATION AND REMARKS
0			3	S-1	0.0	16	197.5	Dark brown, fine to medium SAND, some Silt, little Roots/Organic Matter.
			15		2.0		0.5	-FOREST MAT/TOPSOIL FILL-
			19					Dense, brown, fine to coarse SAND and SILT, little (+) fine to coarse Gravel.
			12					Very dense, brown to dark gray, fine to coarse SAND, some Silt, little (+) fine to coarse Gravel, trace (-) Roots.
4			15	S-2	2.0	14		-FILL-
			30		4.0			Brown, fine to coarse SAND, some Silt, little (+) fine to coarse Gravel.
			29					
			22					
			7	S-3	5.0	6	192.0	Olive-brown, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel.
			15		6.0	12	6.0	Dense, olive-brown, fine to coarse SAND and SILT, trace (+) fine Gravel.
			22	S-3A	6.0			
			35		7.0	20		
8			20	S-4	7.0			Very dense, olive-brown, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel.
			22		9.0			
			22					
			21					
			18	S-5	10.0	16		
			39		12.0			
12			37					
			27					
			15	S-6	15.0	20		Dense, olive-brown to gray, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel.
16			15		17.0			
			21					
			28					
							180.5	[Drive box broke on drill rig while attempting to auger to 20 feet. Boring terminated at 17.5 feet]
							17.5	BOTTOM OF BORING AT 17.5 FEET.
20								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0 - 4	Very Loose	0 - 2	Very Soft	- S - Split Spoon	Station: Rock: Samples:
4 - 10	Loose	2 - 4	Soft	- T - Thin Wall Tube	
10 - 30	Medium Dense	4 - 8	Medium Stiff	- U - Undisturbed Piston	BORING MGA-1
30 - 50	Dense	8 - 15	Stiff	- C - Diamond Core	
50 +	Very Dense	15 - 30	Very Stiff	- B - Bulk/Grab Sample	
		30+	Hard		



McCardle Gannon
Associates, Inc.

TEST BORING LOG

BORING MGA-2

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

CONTRACTOR: Geosearch

MGA NO. : G0809
SHEET NO. : 1 of 1
LOCATION N : See Plan

E :
ELEVATION : 216'±

DATE START : 7/20/20

END : 7/20/20

DRILLER : Ken Bylund

ENGINEER : Robert Drown

GROUNDWATER		DEPTH (ft) OF:			EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Casing	Hole	Type	HSA	Split Spoon	----
7/20/20	10:00am	NE (4)	11.5	11.5	Size I.D.	4-1/4"	1-3/8"	----
					Hammer Wt.	----	140#	----
					Hammer Fall	----	30"	----

Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/Type	Sample Depth Range (ft)	Sample Recovery (in)	Elevation/Depth (ft)	FIELD CLASSIFICATION AND REMARKS
0			19	S-1	0.0	20		Dense, brown, fine to coarse SAND, some fine to coarse Gravel, little Silt.
			22		2.0			
			18					
			32					
			48	S-2	2.0	24		Very dense, olive-brown, fine to coarse SAND, some Silt, little fine Gravel.
			64		4.0			
4			61					-FILL-
			58					
			4	S-3	5.0	12		Loose, olive-brown, fine to coarse SAND and SILT, trace fine Gravel.
			3		7.0			
			2					
			3					
			2	S-4	7.0	6		Very loose to loose, olive-brown, fine to coarse SAND and SILT, trace fine Gravel.
8			3		9.0			
			1					
			2					
			9	S-5	10.0	6	205.5	Olive-brown, fine to coarse SAND and SILT, little (-) fine Gravel, trace (-) Roots.
			13	S-5A	10.5	8	10.5	
			50/22"		10.5		204.5	Olive-brown, fine to coarse SAND, some (+) Silt, little (+) fine to coarse Gravel.
12					11.2		11.5	-GLACIAL TILL- AUGUER REFUSAL AT 11.5 FEET.
16								
20								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0 - 4	Very Loose	0 - 2	Very Soft	- S - Split Spoon	Station: Rock: Samples:
4 - 10	Loose	2 - 4	Soft	- T - Thin Wall Tube	
10 - 30	Medium Dense	4 - 8	Medium Stiff	- U - Undisturbed Piston	BORING MGA-2
30 - 50	Dense	8 - 15	Stiff	- C - Diamond Core	
50 +	Very Dense	15 - 30	Very Stiff	- B - Bulk/Grab Sample	
		30+	Hard		



McCardle Gannon
Associates, Inc.

TEST BORING LOG

BORING MGA-3

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

CONTRACTOR: Geosearch

MGA NO. : G0809

SHEET NO. : 1 of 1

LOCATION N : See Plan

E :

ELEVATION : 210'±

DATE START : 7/20/20

END : 7/20/20

DRILLER : Ken Bylund

ENGINEER : Robert Drown

GROUNDWATER		DEPTH (ft) OF:			EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Casing	Hole	Type	HSA	Split Spoon	----
7/20/20	12:30pm	NE (4)	20	22	Size I.D.	4-1/4"	1-3/8"	----
					Hammer Wt.	----	140#	----
					Hammer Fall	----	30"	----

Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/Type	Sample Depth Range (ft)	Sample Recovery (in)	Elevation/Depth (ft)	FIELD CLASSIFICATION AND REMARKS
0			13	S-1	0.0	12	199.0 11.0	Medium dense, brown to black, fine to coarse SAND, some fine to coarse Gravel, little (+) Silt, trace (-) Roots.
			8		2.0			
			11					
			21	S-2				
			24		2.0	6		Very dense, brown, fine to coarse GRAVEL, little fine to coarse Sand, little Silt.
			24		4.0			
			29					
4			17					-FILL-
			6	S-3	5.0	16		Dense, olive-brown, fine to coarse SAND, some Silt, some fine to coarse Gravel.
			21		7.0			
			16					
			29	S-4				
			35		7.0	14		Dense, olive-brown, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel.
			27		9.0			
			21					
			17	S-5				
			15		10.0	12		Gray-brown, fine to coarse SAND, some (+) Silt, some (-) fine to coarse Gravel, trace (-) Roots.
			8	S-5A	11.0	12		Olive-brown, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel.
			27		11.0			
			34	S-6	12.0	20		Very dense, olive-brown, fine to coarse SAND, some (+) Silt, little (-) fine Gravel.
			29		12.0			
			33		14.0			
			47					
			36	S-7				
			25		15.0	18		Very dense, olive-brown, fine to coarse SAND and SILT, some fine to coarse Gravel.
			28		17.0			
			114					
			63	S-8				
			24		20.0	24		Very dense, olive-brown, fine to coarse SAND, some (+) fine to coarse Gravel, some Silt.
			28		22.0			
			34					
			42					
							188.0 22.0	BOTTOM OF BORING AT 22 FEET.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0 - 4	Very Loose	0 - 2	Very Soft	- S - Split Spoon	Station: Rock: Samples:
4 - 10	Loose	2 - 4	Soft	- T - Thin Wall Tube	
10 - 30	Medium Dense	4 - 8	Medium Stiff	- U - Undisturbed Piston	BORING MGA-3
30 - 50	Dense	8 - 15	Stiff	- C - Diamond Core	
50 +	Very Dense	15 - 30	Very Stiff	- B - Bulk/Grab Sample	
		30+	Hard		



**McCardle Gannon
Associates, Inc.**

TEST BORING LOG

BORING MGA-4

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

CONTRACTOR: Geosearch

MGA NO. : G0809

SHEET NO. : 1 of 2

LOCATION N : See Plan

E :

ELEVATION : 208'±

DATE START : 7/21/20

END : 7/21/20

DRILLER : Ken Bylund

ENGINEER : Robert Drown

GROUNDWATER		DEPTH (ft) OF:			EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Casing	Hole	Type	HSA	Split Spoon	----
7/21/20	10:00am	NE (4)	25	25.3	Size I.D.	4-1/4"	1-3/8"	----
					Hammer Wt.	----	140#	----
					Hammer Fall	----	30"	----

Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/ Type	Sample Depth Range (ft)	Sample Recov- ery (in)	Elev- ation/ Depth (ft)	FIELD CLASSIFICATION AND REMARKS
0			11	S-1	0.0	20	201.0 7.0	Medium dense, dark brown to brown, fine to coarse SAND, some fine to coarse Gravel, little Silt.
			12		2.0			
			9					
			3					
			7	S-2	2.0	16		Dense, dark brown, fine to coarse SAND and fine to coarse GRAVEL, little (+) Silt.
			12		4.0			
			22					
			21					-FILL-
4								
			8	S-3	5.0	12		Dense, brown, fine to coarse SAND, some Silt, little (+) fine Gravel.
			8		7.0			
			36					
			40					
			28	S-4	7.0	16		Medium dense to dense, gray-brown, fine to coarse SAND, some Silt, some (-) fine to coarse Gravel, trace (-) Roots.
8			13		9.0			
			17					
			16					
			21	S-5	10.0	14		Very dense, olive-brown, fine to coarse SAND, some (+) fine to coarse Gravel, some (-) Silt.
			28		12.0			
			25					
			27					-GLACIAL TILL-
12								
			17	S-6	15.0	24		Dense, olive-brown, fine to coarse SAND, some (+) fine to coarse Gravel, some (-) Silt.
			25		17.0			
			23					
			33					
			31	S-7	20.0	22		Very dense, olive-brown, fine to coarse SAND, some fine to coarse Gravel, some (-) Silt.
20			33		22.0			
			41					
			47					
								[Difficult augering from 20-25± feet]

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0 - 4	Very Loose	0 - 2	Very Soft	- S - Split Spoon - T - Thin Wall Tube - U - Undisturbed Piston - C - Diamond Core - B - Bulk/Grab Sample	Station:
4 - 10	Loose	2 - 4	Soft		Rock:
10 - 30	Medium Dense	4 - 8	Medium Stiff		Samples:
30 - 50	Dense	8 - 15	Stiff		BORING MGA-4
50 +	Very Dense	15 - 30	Very Stiff		
		30+	Hard		

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

MGA NO. : G0809

SHEET NO. : 2 of 2

Depth in Feet		Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/Type	Sample Depth Range (ft)	Sample Recovery (in)	Elevation/Depth (ft)	FIELD CLASSIFICATION AND REMARKS
24									-GLACIAL TILL- Olive-brown, fine to coarse SAND, some Silt, little (+) fine to coarse Gravel. BOTTOM OF BORING AT 25.3 FEET.
			50/4"	S-8	25.0 25.3	4	182.7 25.3		
28									
32									
36									
40									
44									
48									

BLOWS/FT.		DENSITY		BLOWS/FT.		CONSISTENCY		SAMPLE IDENTIFICATION		SUMMARY	
0 - 4		Very Loose		0 - 2		Very Soft		- S - Split Spoon - T - Thin Wall Tube - U - Undisturbed Piston - C - Diamond Core - B - Bulk/Grab Sample		Station:	
4 - 10		Loose		2 - 4		Soft				Rock:	
10 - 30		Medium Dense		4 - 8		Medium Stiff				Samples:	
30 - 50		Dense		8 - 15		Stiff				BORING MGA-4	
50 +		Very Dense		15 - 30		Very Stiff					
				30+		Hard					



McCardle Gannon
Associates, Inc.

TEST BORING LOG

BORING MGA-5

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

CONTRACTOR: Geosearch

MGA NO. : G0809

SHEET NO. : 1 of 2

LOCATION N : See Plan

E :

ELEVATION : 211'±

DATE START : 7/21/20

END : 7/21/20

DRILLER : Ken Bylund

ENGINEER : Robert Drown

GROUNDWATER		DEPTH (ft) OF:			EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Casing	Hole	Type	HSA	Split Spoon	----
7/21/20	12:30pm	NE (4)	25	27	Size I.D.	4-1/4"	1-3/8"	----
					Hammer Wt.	----	140#	----
					Hammer Fall	----	30"	----

Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/Type	Sample Depth Range (ft)	Sample Recovery (in)	Elevation/Depth (ft)	FIELD CLASSIFICATION AND REMARKS
0			11 18 5 5	S-1	0.0 2.0	12	198.0 13.0	Medium dense, dark brown, fine to coarse SAND, some fine to coarse Gravel, little Silt.
			8 8 7 6	S-2	2.0 4.0	16		Medium dense, brown, fine to coarse SAND, some Silt, little fine to coarse Gravel.
4								-FILL-
			4 3 3 2	S-3	5.0 7.0	18		Loose, dark brown, fine to coarse SAND and SILT, little (-) Roots/Organic Matter, trace (-) fine Gravel.
8			2 2 5 8	S-4	7.0 9.0	10		Loose, dark brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, trace (-) Roots.
			4 6 8 7	S-5	10.0 12.0	13		Medium dense, brown, fine to coarse SAND, some fine to coarse Gravel, some Silt, trace (-) Roots.
12			6 8	S-6	12.0 13.0	6		Brown, fine to coarse SAND, some fine to coarse Gravel, some Silt.
			10 12	S-6A	13.0 14.0	12		Gray, fine to coarse SAND, some Silt, some fine to coarse Gravel.
16			12 12 15 26	S-7	15.0 17.0	12		Medium dense, gray, fine to coarse SAND, some (+) fine to coarse Gravel, some (-) Silt.
								-GLACIAL TILL-
20			16 75 50/0"	S-8	20.0 21.0	6		Very dense, gray, fine to coarse GRAVEL, some fine to coarse SAND, little (+) Silt.
								[Difficult augering from 20-25± feet]

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0 - 4	Very Loose	0 - 2	Very Soft		Station:
4 - 10	Loose	2 - 4	Soft		Rock:
10 - 30	Medium Dense	4 - 8	Medium Stiff		Samples:
30 - 50	Dense	8 - 15	Stiff		BORING MGA-5
50 +	Very Dense	15 - 30	Very Stiff		
		30+	Hard		

PROJECT: North Hill Expansion, 865 Central Avenue, Needham, MA

CLIENT: North Hill, CCRC

MGA NO. : G0809

SHEET NO. : 2 of 2

FIELD CLASSIFICATION AND REMARKS							
Depth in Feet	Strata Change	Case BPF (Drill) (min/ft)	Sampler Blows Per 6" (RQD%)	Sample Number/ Type	Sample Depth Range (ft)	Sample Recov- ery (in)	Elev- ation/ Depth (ft)
24							
			51	S-9	25.0	16	
			62		27.0		
			68				
			84				184.0
28							27.0
32							
36							
40							
44							
48							
Very dense, gray, fien to coarse SAND, some fine to coarse Gravel, some Silt.							
BOTTOM OF BORING AT 27 FEET.							

KEY TO SYMBOLS

Symbol Description

Strata symbols



Forest Mat/Topsoil Fill



Fill



Glacial Till

Soil Samplers



Split Spoon

Notes:

1. Geosearch, Inc. of Sterling, Massachusetts performed the test borings on July 20 and 21, 2020 using all-terrain vehicle (ATV) (MGA-1 through MGA-3) and truck mounted (MGA-4 and MGA-5) drill rigs equipped with a 140-pound automatic hammer.
2. Test boring elevations were estimated from ground surface contours on shown on a plan entitled "Overall Grading & Drainage Plan", dated May 20, 2019 by VHB. Elevations should be considered approximate.
3. MGA observed and logged the test borings.
4. NE = Not Encountered



Attachment 4 – TSS Removal Calculations



VHB, Inc..
101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
(617) 924-1770

TSS Removal Calculation Worksheet

Project Name: **North Hill**
Project Number: **11369.04**
Location: **Needham, MA**
Discharge Point: **DP-1**
Drainage Area(s): **14**

Sheet: **1 of 1**
Date: **September 2020**
Computed by: **DMK**
Checked by: **JWM**

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D E)
Bioretention Area	90%	1.00	0.90	0.10

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1.

** Equals remaining load from previous BMP (E)

**Treatment Train
TSS Removal =**

90%



Attachment 5 – Water Quality Volume Calculations



Water Quality Volume Calculations

Project Name: North Hill
Project Location: Needham, MA
Proj. No.: 11369.04
Date: September 2020
Calculated by: DMK
Checked by: JWM

Bioretention Basin #1

Water Quality Storm Runoff Depth (inches) = **0.62**
Total Impervious Area (sq.ft.) = **16,550**

Required*:

Runoff Depth to be Treated (in.) Required
Volume (cu.ft.)
0.62 **855**

Provided:

Elevation	Area (s.f.)	Cumulative Volume (cu.ft.)
209.5	700	0
210.5	1200	950

* Per US EPA Stormwater Best Management Practices Analysis for 65% Phosphorus Removal

Bioretention Basin #2

Water Quality Storm Runoff Depth (inches) = **0.62**
Total Impervious Area (sq.ft.) = **26,850**

Required*:

Runoff Depth to
be Treated (in.) Required
Volume (cu.ft.)
0.62 **1387**

Provided:

Elevation	Area (s.f.)	Cumulative Volume (cu.ft.)
210	850	0
211	2200	1525

* Per US EPA Stormwater Best Management Practices Analysis for 65% Phosphorus Removal



Attachment 6 – EPA Bioretention Performance Analysis

BMP Performance Curve: Bioretention

BMP Performance Table

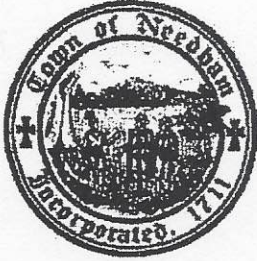
BMP Name: Bioretention

Land Use	Pollutant	Depth of Runoff Treated (inches) *							
		0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Commercial	TSS	44%	69%	91%	97%	98%	99%	100%	100%
	TP	19%	33%	53%	64%	71%	76%	84%	89%
	Zn	68%	88%	95%	96%	96%	97%	98%	99%
Industrial	TSS	45%	70%	91%	97%	98%	99%	100%	100%
	TP	20%	34%	53%	64%	71%	76%	84%	89%
	Zn	46%	72%	94%	96%	96%	96%	98%	99%
High-Density Residential	TSS	46%	70%	92%	97%	99%	99%	100%	100%
	TP	19%	34%	53%	64%	71%	76%	84%	89%
	Zn	53%	79%	95%	96%	96%	97%	98%	99%
Medium-Density Residential	TSS	54%	78%	94%	98%	99%	99%	100%	100%
	TP	20%	34%	53%	63%	70%	75%	83%	88%
	Zn	23%	41%	68%	83%	92%	95%	97%	97%
Low-Density Residential	TSS	52%	73%	91%	96%	98%	99%	99%	100%
	TP	21%	35%	52%	62%	68%	73%	81%	86%
	Zn	17%	33%	59%	76%	88%	93%	97%	97%

* 0.62 inches treated = 65% removal efficiency

Annual Pollutant Loading Rates

Land use	Pollutant load (lbs/acre-year)		
	TSS	TP	Zn
Commercial	1117.77	1.66	2.33
Industrial	745.22	1.43	0.45
High-Density Residential	465.08	1.10	0.79
Medium-Density Residential	274.63	0.55	0.11
Low-Density Residential	72.11	0.042	0.043



TOWN OF NEEDHAM

DESIGN REVIEW BOARD

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

Property Location: 865 Central Avenue **Date:** 12/28/2020

Owner: North Hill Needham, Inc.

Address: 865 Central Avenue Needham MA 02492
Street City State Zip

Telephone: 781-454-5197

Applicant: North Hill Needham, Inc.

Address: 865 Central Avenue Needham MA 02492
Street City State Zip

Telephone: 781-454-5197

Designer/Installer: VHB

Address: 101 Walnut Street Watertown MA 02471
Street City State Zip

Telephone: 617-924-1770

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

NEEDHAM	
DESIGN REVIEW BOARD	
APPROVAL	<u>M. Glavin</u>
APPROVAL WITH CONDITIONS:	
DISAPPROVAL:	
DATE:	<u>1.11.21</u>

Brief description of sign or project:

Applicant proposes to construct 75 new parking spaces along a portion of the existing fire lane, widen the fire lane, and

Undertake associated sitework, all as more particularly shown on the plans filed herewith.

Please email completed application to elitchman@needhamma.gov

From: [Dennis Condon](#)
To: [Lee Newman](#); [Alexandra Clee](#); [Anthony DelGaizo](#); [David Roche](#); [John Schlittler](#); [Timothy McDonald](#); [Carys Lustig](#)
Cc: [Elisa Litchman](#); [Tara Gurge](#); [Thomas Ryder](#)
Subject: RE: Request for comment - North Hill
Date: Wednesday, January 20, 2021 2:51:01 PM
Attachments: [image001.png](#)
[image002.png](#)

Hi Lee,

Yes, we are satisfied with the plan. We were just interested in some signage to keep people from parking in the fire lane itself.

Thanks,
Dennis

Dennis Condon
Chief of Department
Needham Fire Department
Town of Needham
(W) 781-455-7580
(C) 508-813-5107
Dcondon@needhamma.gov



Follow on Twitter: Chief Condon@NeedhamFire



Watch Needham Fire Related Videos on YouTube @ Chief Condon



From: Lee Newman <LNewman@needhamma.gov>
Sent: Wednesday, January 20, 2021 1:11 PM
To: Dennis Condon <DCondon@needhamma.gov>; Alexandra Clee <aclee@needhamma.gov>; Anthony DelGaizo <ADelgaizo@needhamma.gov>; David Roche <droche@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Elisa Litchman <elitchman@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>
Subject: RE: Request for comment - North Hill

Dennis,

I am following up on your email below. Were the changes you require reflected on the plan set we provided for your review. If not can you clarify the changes you require so we can be sure there are

reflected in the final plan set which the Planning Board approves.

Thank you,

Lee

From: Dennis Condon <DCondon@needhamma.gov>

Sent: Tuesday, January 19, 2021 10:35 AM

To: Alexandra Clee <aclee@needhamma.gov>; Anthony DelGaizo <ADelgaizo@needhamma.gov>; David Roche <droche@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>

Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>

Subject: RE: Request for comment - North Hill

Hi Alex,

The FD has met with the developers and have informed them of any concerns we had and they are to be addressed. We have no further issues with this project.

Thanks,
Dennis

Dennis Condon
Chief of Department
Needham Fire Department
Town of Needham
(W) 781-455-7580
(C) 508-813-5107
Dcondon@needhamma.gov



Follow on Twitter: Chief Condon@NeedhamFire



Watch Needham Fire Related Videos on YouTube @ Chief Condon



From: Alexandra Clee <aclee@needhamma.gov>

Sent: Monday, January 18, 2021 8:21 PM

To: Anthony DelGaizo <ADelgaizo@needhamma.gov>; David Roche <droche@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>

Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>;

Tara Gurge <TGurge@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>

Subject: Request for comment - North Hill

Dear all,

The Planning Board will be holding a hearing on an Amendment to the 91-3 Special permit issued for 865 Central. More information is included in the submitted documents, detailed below, which can be found here: [K:\Planning_865Central_NorthHill_2021Amend](#). (some of you may receive a hard copy in the inter-office mail as well).

The documents included on the Common Drive for your review are:

1. Application submitted by North Hill Needham, Inc. *(also attached to this email)*
2. Letter from Evans Huber, Attorney, dated January 14, 2021 *(also attached to this email)*
3. Memo from vhb dated January 4, 2021, re: site plan changes.
4. Memo from vhb dated January 4, 2021, re: stormwater revisions, with attached calculations.
5. Plan set consisting of 19 sheets, most recent date of January 4, 2021.

The hearing is scheduled for February 16, 2021. If you wish to comment, please submit your comment by Tuesday February 9, 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

**** Please note: I will not be in the office on Mondays. I will reply to you on Tuesdays, Wednesdays, Thursdays and Fridays.**

From: [Alexandra Clee](#)
To: [Tara Gurge](#)
Cc: [Lee Newman](#)
Subject: Re: Public Health Comments - North Hill
Date: Thursday, January 21, 2021 4:51:39 PM
Attachments: [image002.png](#)
[image003.png](#)

Received, thank you.

From: Tara Gurge <TGurge@needhamma.gov>
Sent: Thursday, January 21, 2021 4:14:47 PM
To: Alexandra Clee <aclee@needhamma.gov>
Subject: RE: Public Health Comments - North Hill

Alex –

The Public Health Division reviewed the proposed Amendment to the 91-3 Special permit issued for 865 Central Ave, North Hill, and have the following comments, see below:

- In reference to the cooling tower, we'd like to remind the applicant to ensure that the potential noise does not pose as a public health nuisance with the noise produced not exceeding more than the maximum dB level of more than 10 dB above background noise. **Please Note:** If nuisance noise complaints are received and a violation is determined, the owner will be required to properly buffer the area and/or the equipment to ensure it meets proper MA Dept. of Environmental Protection noise ordinance requirements.
- The proposed lighting installed by the cooling tower on site shall not cause a public health nuisance, with lighting being allowed to migrate on to other abutting properties (if applicable). If complaints are received, this lighting may need to be adjusted so it will not cause a public health nuisance.

Feel free to have the applicant reach out if they have any questions on those comments.

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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From: Alexandra Clee <aclee@needhamma.gov>

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Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>

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

February 10, 2021

Needham Planning Board
Public Service Administration Building
Needham, MA 02492

RE: Major Project Site Plan Special Permit Amendment No. 1991-03
North Hill-Further site Plan Review

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 Further Review will permit the applicant to make certain renovations and expansions to the North Campus. Specifically, increasing drive width to 24-feet, providing fire lanes, landscaping, bio-retention basins, and addition of parking and curbing.

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- Completed Application for Further Site Plan Review, with Exhibit A.
- 2- A letter from Attorney Evans Huber to members of the Needham Planning Board dated January 14, 2021.
- 3- Memo to Roy Cramer, from Dan Keches and Justin Mosca, Vanasse Hangen Brustlin, Inc., dated January 4, 2021.
- 4- Plans entitled "North Hill Life Care Facility, 865 Central Avenue, Needham, Massachusetts 02492" prepared by Vanasse Hangen Brustlin, Inc., 101 Walnut Street, P.O. Box, 9151, Watertown, MA, 02471, Copley Wolff Design Group, 160 Boylston Street, 3rd Floor, Boston, MA, issued on June 17, 2011, revised January 4, 2021, and consisting of 19 sheets.
- 5- Stormwater Report Update-Memo and Report Dated January 4, 2021, provided by VHB consisting of 106-pages

Our comments and recommendations are as follows:

- We have no comment or objection to the proposed modifications

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

Truly yours,

Thomas Ryder
Assistant Town Engineer

From: [Tara Gurge](#)
To: [Alexandra Clee](#)
Cc: [Lee Newman](#)
Subject: RE: Public Health Comments - North Hill
Date: Tuesday, February 16, 2021 10:09:47 AM
Attachments: [Control-Toolkit-Cooling-Towers.pdf](#)
[image002.png](#)
[image003.png](#)
Importance: High

Alex –

Sorry I got my dates mixed up on my previous email I just sent to you. I sent you our previous comments re: North Hill back on 1/21. But at our recent BOH meeting last Friday (2/12), one of our Board members wanted to add the following additions to our comments. Here are the amended comments, with BOH member comments added, below. (I understand that it may be too late to add these additional BOH comments, but sending to you just in case.) And they also wanted us to provide the attached CDC Cooling Tower guidance document as well.

The Public Health Division reviewed the proposed Amendment to the 91-3 Special permit issued for 865 Central Ave, North Hill, and have the following comments, **see below**:

- In reference to the relocated cooling tower, it must be located far from any building intakes and not be able to discharge near outdoor recreation or seating areas. Inadequately maintained cooling towers can create aerosols (droplets of water in the air) that contain *Legionella* bacteria. The heat-rejection fans in cooling towers then spread these bacteria.
- This cooling tower must be properly maintained and be placed on at least monthly maintenance plan during the season, checking chemical levels, water flows, etc., which should include routine testing of the water for legionella in the late spring. (See attached guidance document from CDC on proper maintenance of Cooling Towers.)
- In reference to the cooling tower, we'd like to remind the applicant to ensure that the potential noise does not pose as a public health nuisance with the noise produced not exceeding more than the maximum dB level of more than 10 dB above background noise. **Please Note:** If nuisance noise complaints are received and a violation is determined, the owner will be required to properly buffer the area and/or the equipment to ensure it meets proper MA Dept. of Environmental Protection noise ordinance requirements.
- The proposed lighting installed by the cooling tower on site shall not cause a public health nuisance, with lighting being allowed to migrate on to other abutting properties (if applicable). If complaints are received, this lighting may need to be adjusted so it will not cause a public health nuisance.

Feel free to have the applicant reach out if they have any questions on those comments.

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
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From: Alexandra Clee <aclee@needhamma.gov>
Sent: Thursday, January 21, 2021 4:52 PM
To: Tara Gurge <TGurge@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>
Subject: Re: Public Health Comments - North Hill

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To: Alexandra Clee <aclee@needhamma.gov>
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From: Alexandra Clee <aclee@needhamma.gov>
Sent: Monday, January 18, 2021 8:21 PM
To: Anthony DelGaizo <ADelgaizo@needhamma.gov>; David Roche <droche@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Dennis Condon <DCondon@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>
Subject: Request for comment - North Hill

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Thanks, alex.

Alexandra Clee
Assistant Town Planner
Town of Needham
500 Dedham Avenue
Needham, MA 02492
781-455-7550 Ext 271
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Controlling *Legionella* in Cooling Towers

Purpose

Use this document to:

1. Help evaluate hazardous conditions associated with all types of cooling towers and evaporative condensers
2. Implement *Legionella* control measures for cooling towers per ASHRAE Guideline 12-2020
3. Complement existing resources for water management programs
4. Support environmental assessments conducted during public health investigations

Key Points

- Scale, corrosion, sediment controls, and system cleaning are critical for cooling tower operations and Legionnaires' disease prevention.
- Disinfectant residual should be monitored and adjusted by an automated system.
- *Legionella* risks are similar for open and closed-circuit cooling tower systems.

Sediment and biofilm, temperature, water age, and disinfectant residual are the key factors that affect *Legionella* growth in cooling towers.

Design

Open- vs. Closed-Circuit Cooling Towers

All cooling towers use the evaporation of water to remove heat and release it into the atmosphere. Cooling towers use circulating water to cool chillers, heat pumps, compressors, condensers, heat exchangers, and other process devices. Both kinds of cooling towers, open- and closed-circuit, require the same basic operation and maintenance protocols. Both types of cooling towers can release aerosolized water to the atmosphere. If *Legionella* is present, the aerosolized water can spread the bacteria over miles. However, closed-circuit cooling towers have an additional, closed loop that can keep the fluid used in the cooling processes from being exposed to the atmosphere. Closed-circuit cooling towers can operate in cool temperatures in a “dry” mode that does not use water or generate aerosols.

Design Recommendations

Understanding cooling tower design components is critical for *Legionella* control.

- Use high-efficiency drift eliminators.
- Locate cooling towers at least 25 feet from building air intakes to ensure that the cooling tower's drift plume is not drawn into a ventilation system.
- Ensure system piping is designed to avoid stagnation or dead legs.
- Recirculate water during intermittent operation.
- Design and install an automated water treatment system.



Operation, Maintenance, and Control Limits

Safe operation and regular cooling tower maintenance protect building operators, staff, visitors, and the adjacent community from exposure to *Legionella*. The necessary frequency of these activities depends on the cooling load, the environmental conditions present in the area where the cooling tower is located, and the cooling tower's design. Use a water management program to establish, track, and improve operation and maintenance activities. Operate and maintain cooling towers with the following guidelines in mind:

- Follow manufacturer recommendations for cleaning and disinfection prior to commissioning, before startup, when idling, and after shutdown.
- Operate cooling tower systems at the lowest possible water temperature, and below the most favorable *Legionella* growth range (77–113°F, 25–45°C), if possible.
- Automate anti-corrosion, anti-scale, and disinfectant addition and monitoring.
- Monitor water parameters, like disinfectant residual and pH, on a regular basis. Measurement frequency should be based on performance of the water management program or *Legionella* performance indicators for control. Adjust frequency according to the stability of performance indicator values. For example, the measurement frequency should be increased if there is a high degree of measurement variability.
- Flush low-flow pipe runs and dead legs at least weekly.
- Balance operating times among cooling towers to prevent stagnation when multiple cooling towers or cells exist.
- Implement automated blowdown (intentional discharge of system water and replacement with supply water) to maintain system water quality.
- Consider filtration to reduce the level of suspended solids in the cooling water based on system factors (e.g., cooling tower location, particle load).
- Perform an off-line disinfection and cleaning at least annually.
- Monitor cooling towers for water service disruptions and develop plans to respond accordingly.
- Consider testing for *Legionella* in accordance with Routine Testing for *Legionella* (Page F1).
- Maintain site-specific log sheets, test procedures, service reports, and test results on-site.

Remediation

If an outbreak or illness is suspected, test in conjunction with public health in order to:

- Confirm the presence of *Legionella* before performing remediation.
- Confirm elimination of *Legionella* after remediation activities.

Cleaning, disinfecting, and remediating cooling towers involves a hierarchy of protocols. Determine how the following response protocols fit into your water management program. The protocols are listed in order of increasing intensity from routine treatment to offline emergency disinfection. Consult ASHRAE Guideline 12-2020 for instructions for each response. These steps may require customization based on system components, operating conditions, or other factors.

- Online remedial treatment
- Online disinfection
- Offline cleaning and disinfection
- Offline emergency cleaning and disinfection

If an associated outbreak or illness is suspected by the public health authority having jurisdiction (AHJ), perform an offline emergency cleaning and disinfection using the procedures below. Note: The public health AHJ determines whether there are associated illness(es) or an outbreak.

Consult a water treatment professional for guidance on applying these procedures.

1. **Review** the current water treatment program (e.g., cleanliness, maintenance, disinfectant program).
2. **Remove** heat load from the cooling system. Shut off fans associated with the cooling tower. Disengage all automated chemical feed and control equipment.
3. **Shut off** system blowdown and keep make-up water valves open and operating.
4. **Close** building air intake vents near the cooling tower, especially those downwind, until after the cleaning procedure is complete.
5. **Circulate** water through all system equipment, including any bypass or standby components.
6. **Add** an oxidizing disinfectant sufficient to achieve a disinfectant residual of at least 20 ppm as free available oxidant.
7. **Add** an appropriate dispersant and apply antifoam, if needed. Apply appropriate corrosion inhibitors.
8. **Reduce** the cycles of concentration (if necessary) to achieve and maintain a pH of less than 8.0 for chlorine-based disinfectants or less than 8.5 for bromine-based disinfectants.
9. **Maintain** a free available oxidant residual of 10 ppm for a minimum of 24 hours. Shorter contact times can be effective at higher concentrations.
10. **Drain** the system after the disinfection period to the sanitary sewer, following all applicable rules, regulations, and permits that may be required.
11. **Physically clean** all accessible system equipment. Consideration should be given to all cooling tower equipment, including fill pack, drift eliminators, equalizer lines, remote sumps, basins, strainers, chillers, free cooling heat exchangers, and any bypass or standby components.
12. **Refill** the system and circulate water through all system equipment including any bypass or standby components.
13. **Add** an oxidizing disinfectant and maintain a free available oxidant residual of at least 10 ppm for one hour.
14. **Drain** the system after the disinfection period to the sanitary sewer following all applicable rules, regulations, and permits that may be required.
15. **Refill** the system and return all chemical feed and control equipment to normal operation.

Table 1. *Legionella* Control Measures for Cooling Towers

Water Parameter	Control Measure	Recommendations
Sediment and Biofilm	Cleaning frequency, scale and corrosion inhibitors	• Cleaning frequency varies based on operational factors. • Remove from service, clean, and disinfect at least annually. • Monitor scale and corrosion inhibitor levels frequently as indicated by water quality measurements.
Temperature	Control limits	• Operate at the lowest possible water temperature outside the favorable growth range for <i>Legionella</i> (77–113°F, 25–45°C).
Water Age	Make-up water quality and turnover frequency	• Flush low-flow pipe runs and dead legs at least weekly. • During wet system standby (water remains in system and shutdown for less than 5 days), maintain water treatment program and circulate water 3 times a week through the open loop of a closed-circuit cooling tower and entire open-circuit cooling system. Ensure system water quality is managed through automated system blow down. • Use potable water for system make-up water or ensure reclaimed or condensate sources are appropriately managed.
Disinfectant Residual	Control limits	• pH: Maintain based on type of disinfectant used and manufacturer recommendations to prevent corrosion. • Oxidizing disinfectants (e.g., chlorine & bromine): Maintain measurable residuals throughout each day. Consult manufacturer recommendations. • Non-oxidizing disinfectants: Maintain based on product label concentration and contact time.

Resources

- Toolkit for Controlling *Legionella* in Common Sources of Exposure: <https://www.cdc.gov/legionella/wmp/control-toolkit/index.html>
- Toolkit: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings: <https://www.cdc.gov/legionella/wmp/toolkit/index.html>
- *Legionella* Environmental Assessment Form: <https://www.cdc.gov/legionella/downloads/legionella-environmental-assessment.pdf>
- PreventLD Training: <https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html>
- ASHRAE Guideline 12-2020: <https://www.ashrae.org/technical-resources/standards-and-guidelines/guidance-on-reducing-the-risk-of-legionella>
- Cooling Technology Institute Guideline 159(20): <https://www.coolingtechnology.org/shop>

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

TEL (781) 444-9344 FAX (781) 449-0242

E-MAIL bob@robertsmart.net WEBSITE www.robertsmart.net

By Hand and E-Mail
February 4, 2021

Needham Planning Board
Public Services Administration Building
500 Dedham Avenue
Needham, Ma. 02492

Re: Heather Lane, Heather Lane Extension and Residential Compound Proposed
Amendments

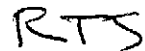
Dear Members of the Board:

Enclosed herewith are three separate but related applications for amendment to three Decisions: Heather Lane Subdivision, Heather Lane Extension Subdivision, and Residential Compound.

Notice of the three applications have been given to 770 Chestnut Street LLC by certified and regular mail. Copies of my letters are enclosed.

It is requested that all three be heard at the Board's February 16, 2021 meeting.

Very truly yours,



Robert T. Smart, Jr.

cc: William John Piersiak



**TOWN OF NEEDHAM, MA
PLANNING AND COMMUNITY
DEVELOPMENT DEPARTMENT**

500 Dodham Avenue
Needham, MA 02492
781-455-7550

**AMENDMENT TO
APPLICATION FOR APPROVAL
OF A DEFINITIVE SUBDIVISION PLAN**

Date: 1/28/21

The undersigned, on behalf of William John Piersiak et al (owner's name or self) of 764, 766, 768, 768A, 768B Chestnut Street (address), owner of land in Needham, the description of said land being submitted herewith, desiring to make a subdivision of said land hereby submits the following required plans and documents:

- a) the original tracings and eight full sized copies and six reduced sized copies of each of the following plans -
- i. a key location map
 - ii. a lot plan
 - iii. a profile plan
 - iv. a municipal services and utility plan
 - v. a topographic plan
 - vi. any detail plans required

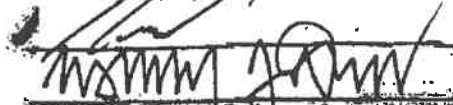
Each plan bearing title, endorsements and imprints required.

- b) a filing fee of \$500 plus \$250 per lot for each lot in the subdivision.
- c) a description of the boundaries of the entire area to be subdivided; and
- d) a list of names and addresses of all abutters as they appear on the most recent Needham Assessors' records
- e) _____
(specify any additional material or information submitted)

and petitions the Planning Board to consider and approve such subdivision plans under the provisions of the Subdivision Control Law (M.G.L. Chapter 41, Sections 81-A through 81-G inclusive, as amended) and in accordance with the Rules and Regulations of the Needham Planning Board and the applicable By-Laws of the Town of Needham.

The undersigned certifies that the applicant(s) is/are the sole owner(s) of the entire land proposed to be subdivided and that the subdivision plans and the description submitted indicate the true boundaries of said land and the correct names of all abutters as shown on the most recent records of the Needham Assessors.

(If the applicant is not the owner, written authorization to act as agent must be attached)

 (owners)
By William J. Piersiak and Kirby Kempel (agent)

This application is accepted by the Needham Planning Board in accordance with Sections 81-G and 81-T of the Subdivision Control Law.

ATTACHMENT TO APPLICATION FOR APPROVAL
OF A DEFINITIVE SUBDIVISION PLAN

2021 FEB -4 AM 10:55
JENNIFER L. BROWN
JENNIFER L. BROWN, PA #275

Owners	Property Addresses	Book and Page
William John Piersiak	768-768A Chestnut St (Lot 4A 8/22/00 Cheney Eng Plan, Plan 511 of 2000 Book 478)	36756/532
William J. Piersiak, Trustee Of The 768B Chestnut Street Realty Trust	768B Chestnut Street (Parcel A and Lot 1 8/22/00 Cheney Eng. Plan)	26628/469
William J. Piersiak, Trustee Of The 768B Chestnut Street Realty Trust	764 Chestnut Street	38112/280 and 38112/577
Koby Kempel, Manager 766 Chestnut LLC	766 Chestnut Street Lot G1, Giunta plan 4/7/82 Plan No. 712, Plan Bk 298	36038/67

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

TEL (781) 444-9344 FAX (781) 449-0242

E-MAIL bob@robertsmart.net WEBSITE www.robertsmart.net

2021 FEB -4 AM 10:56
RECEIVED
PLANNING BOARD
NEEDHAM, MA 02492

By Hand and E-Mail
February 4, 2021

Needham Planning Board
Public Services Administration Building
500 Dedham Avenue
Needham, Ma. 02492

Re: Proposed Amendment to Definitive Subdivision Decision, August 11, 2020, Heather Lane, 764, 766, 768-768A, and 768B Chestnut Street

Dear Members of the Board:

Enclosed for filing please find:

1. Application for Amendment to Approval of a Definitive Subdivision Plan, seeking a "de minimus" amendment of the Definitive Subdivision Decision, August 11, 2020, Heather Lane, 764, 766, 768-768A, and 768B Chestnut Street (Decision).
2. Check of \$50.00 for the filing fee.

The Petitioners, William John Piersiak, William J. Piersiak, Trustee of the 768B Chestnut Street Realty Trust, and Koby Kempel, Manager of the 766 Chestnut LLC (Petitioners), have realized that the existing house on Lot 3 (764 Chestnut Street) is old, and that they may want to replace it in the future. Accordingly, they want to amend the Decision, by replacing the first four sentences of numbered Section 19, which read:

"Off-street drainage surety in the amount of \$10,500.00 shall be posted (\$3,500.00 per lot) for Lots 1, 5 and 6. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lots 2 and 3 under this subdivision approval. The off-street drainage surety requirement for the Residential Compound lots to be created out of Lot 4 will be stated in the Board's Decision regarding the proposed Heather Lane Extension Subdivision and Residential Compound Plan. Said \$10,500.00 surety shall be posted prior to the release of said Lots 1, 5 and 6 as shown on the Plan for purposes of building or conveyance." with the following:

"Off-street drainage surety in the amount of \$3,500.00 per Lot shall be posted for each Lot on which new construction will take place. Currently, Petitioners intend new construction on Lots 1, 5 and 6, but not Lots 2 and 3, for a total off street drainage surety requirement of \$10,500.00. If Petitioners decide on new construction for Lot 3, drainage surety of an additional \$3,500.00 for said Lot will be posted. The off-street drainage surety requirement for the Residential Compound lots to be created out of Lot 4 will be stated in the Board's Decision regarding the proposed Heather Lane Extension Subdivision and Residential Compound Plan. Said \$3,500.00 surety for each Lot on which new construction is intended shall be posted prior to the release of each such Lot for purposes of building or conveyance."

This amendment will not have any adverse effects. If the Petitioners choose to replace the existing house on Lot 3, they will post a \$3,500.00 drainage bond prior to release of the Lot for building or conveyance.

It is requested that this matter be placed on the agenda for the next available Planning Board meeting, as a "de minimus" amendment.

If further documentation is required, please let me know.

Very truly yours,



Robert T. Smart, Jr.

cc: William John Piersiak

contains wetland areas, including bordering vegetated wetlands, bank and a riverfront area. The protected area borders the Charles River and will protect the water quality of the Charles River and Priority Habitat for Rare Species and Estimated Habitat, as identified by the Natural Heritage Endangered Species Program, including, but not limited to, the Umber Shadowdragon (*Neurocordulia obsoleta*). The Petitioner shall deliver to the Board a copy of the recorded Conservation Restriction prior to the release of Lot 4 for purposes of building or conveyance.

15. Street lighting shall be provided in the subdivision in accordance with the Plan. The light sources shall be on posts at least 10 feet high and shall be controlled by photovoltaic switches. Post lighting shall be supplied as shown on the Plan. The lighting system shall be maintained, and the electricity shall be supplied through the Heather Lane Homeowners Trust Agreement.

16. The island in the center of the Heather Lane cul-de-sac shall be landscaped. A cul-de-sac landscaping plan shall be submitted to the Board and the Department of Public Works for review and approval prior to endorsement of the subdivision Plan. The island landscaping shall be maintained by the record owners of Lots 1 through 6 through the Heather Lane Homeowners Trust Agreement.

17. In any sale or transfer by the record owner of title to Lots 1 through 6, as shown on the Plan, or any successor record owner of title to Lots 1 through 6, as shown on the Plan, the deed or other instrument shall refer to and incorporate condition 15 of this decision. In any sale or transfer by the record owner of title to Lot 4, as shown on the Plan, or any successor record owner of title to Lot 4, as shown on the Plan, the deed or other instrument shall refer to and incorporate condition 14 of this decision. Any deed or other instrument purporting to transfer or convey any interest in Lot 1, Lot 2, Lot 3, Lot 4, Lot 5, and Lot 6 which does not expressly refer to and incorporate these conditions shall, nevertheless, be deemed to contain the same and all events shall be subject thereto.

18. In general, the cutting of trees and removal of vegetation shall be kept to a minimum in the construction and development of the Subdivision. All trees having a caliber of 6 inches as measured three feet off the ground bordering "Heather Lane" and on the site shall be retained and not disturbed or destroyed during construction of the subdivision except for those trees which must be removed for the construction of the proposed way, driveways, utilities, and dwellings and uses accessory thereto.

19. Off-street drainage surety in the amount of \$10,500.00 shall be posted (\$3,500.00 per lot) for Lots 1, 5 and 6. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lots 2 and 3 under this subdivision approval. The off-street drainage surety requirement for the Residential Compound lots to be created out of Lot 4 will be stated in the Board's Decision regarding the proposed Heather Lane Extension Subdivision and Residential Compound Plan. Said \$10,500.00 surety shall be posted prior to the release of said Lots 1, 5 and 6 as shown on the Plan for purposes of building or conveyance. As recommended in the memo of the Board of Health dated July 29, 2020, all lots shall be graded to the limits of construction so as to have no standing water and/or otherwise create a public health nuisance. Grading shall not improperly shed or illegally increase drainage onto adjacent properties. All subsequent developers or builders shall be notified of the off-street drainage bond and the specific off-street drainage requirements. If required by the Board of Health, an as-built certified grading plan(s) of all or any of the lots shall be submitted prior to release of the drainage surety.

20. The existing and proposed houses within the six-lot subdivision are each required to have dry wells. The dry wells for each house shall have volumetric capacity sufficient to store 1 inch of roof runoff. Each record owner, whether one or more persons or entities, of title to Lots 1 through 6, as shown on the Plan, shall maintain and keep operational their respective roof



PLANNING

**TOWN OF NEEDHAM, MA
PLANNING AND COMMUNITY
DEVELOPMENT DEPARTMENT**

500 Dedham Avenue
Needham, MA 02492
781-455-7550

AMENDMENT ^{*} TO

**APPLICATION FOR APPROVAL
OF A DEFINITIVE SUBDIVISION PLAN**

Date: 1/29 20 21

The undersigned, on behalf of William John Piersiak (owner's name or self) of
768-768A Chestnut Street (address), owner of land in Needham, the description of
said land being submitted herewith, desiring to make a subdivision of said land hereby submits the following required plans
and documents:

- a) the original tracings and eight full sized copies and six reduced sized copies of each of the
following plans -

- i. a key location map
- ii. a lot plan
- iii. a profile plan
- iv. a municipal services and utility plan
- v. a topographic plan
- vi. any detail plans required

Each plan bearing titles, endorsements and imprints required.

- b) a filing fee of \$500 plus \$250 per lot for each lot in the subdivision.
- c) a description of the boundaries of the entire area to be subdivided; and
- d) a list of names and addresses of all abutters as they appear on the most recent Needham Assessors' records
- e) _____
(specify any additional material or information submitted)

and petitions the Planning Board to consider and approve such subdivision plans under the provisions of the Subdivision Control Law (M.G.L. Chapter 41, Sections 81-A through 81-G inclusive, as amended) and in accordance with the Rules and Regulations of the Needham Planning Board and the applicable By-Laws of the Town of Needham.

The undersigned certifies that the applicant(s) is/are the sole owner(s) of the entire land proposed to be subdivided and that the subdivision plans and the description submitted indicate the true boundaries of said land and the correct names of all abutters as shown on the most recent records of the Needham Assessors.

(If the applicant is not the owner, written authorization to act as agent must be attached)

William John Piersiak (owners)
William John Piersiak

By _____ (agent)

This application is accepted by the Needham Planning Board in accordance with Sections 81-Q and 81-T of the Subdivision Control Law.

214 20 21

By Alinda

* This amendment will require the Petitioner to post an additional drainage surety of \$3,500.00 if he moves or replaces the existing house on Residential Compound Lot 1

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

TEL (781) 444-9344 FAX (781) 449-0242

E-MAIL bob@robertsmart.net WEBSITE www.robertsmart.net

By Hand and E-Mail
February 4, 2021

Needham Planning Board
Public Services Administration Building
500 Dedham Avenue
Needham, Ma. 02492

Re: Proposed Amendment to Definitive Subdivision Decision, August 11, 2020, Heather Lane Extension, 768-768A Chestnut Street

Dear Members of the Board:

Enclosed for filing please find:

1. Application for Amendment to Approval of a Definitive Subdivision Plan, seeking a "de minimus" amendment of the Definitive Subdivision Decision, August 11, 2020, Heather Lane Extension, 768-768A Chestnut Street (Decision).
2. Check of \$50.00 for the filing fee.

The Petitioner, William John Piersiak, may want to move or replace the existing house on Lot 1. Accordingly, he wants to amend the Decision, by replacing the first two sentences of numbered Section 17 (copy attached), which read:

"Off-street drainage surety in the amount of \$14,000.00 shall be posted (\$3,500.00 per lot) for Lots 2, 3, 4 and 5. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lot 1 under this subdivision approval."

The Petitioner proposes that these first two sentences be replaced with the following:

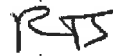
"Off-street drainage surety in the amount of \$14,000.00 shall be posted (\$3,500.00 per lot) for Lots 2, 3, 4 and 5. If the existing house on Lot 1 is moved or replaced, the surety amount will be increased to \$17,500.00."

This amendment will not have any adverse effects. If the Petitioner chooses to replace the existing house on Lot 1, he will post a \$3,500.00 drainage bond prior to release of the Lot for building or conveyance.

It is requested that this matter be placed on the agenda for the Planning Board's February 16, 2021 meeting, as a "de minimus" amendment.

If further documentation is required, please let me know.

Very truly yours,

A handwritten signature in black ink, appearing to read "R. T. Smart".

Robert T. Smart, Jr.

cc: William John Piersiak

trees which must be removed for the construction of the proposed way, driveways, utilities, and dwellings and uses accessory thereto.

17. Off-street drainage surety in the amount of \$14,000.00 shall be posted (\$3,500.00 per lot) for Lots 2, 3, 4 and 5. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lot 1 under this subdivision approval. Said surety shall be posted prior to the release of said Lots as shown on the Plan for purposes of building or conveyance. As recommended in the memo of the Board of Health dated July 29, 2020, all lots shall be graded to the limits of construction so as to have no standing water and/or otherwise create a public health nuisance. Grading shall not improperly shed or illegally increase drainage onto adjacent properties. All subsequent developers or builders shall be notified of the off-street drainage bond and the specific off-street drainage requirements. If required by the Board of Health, an as-built certified grading plan(s) of all or any of the lots shall be submitted prior to release of the drainage surety.

18. The existing and proposed houses within the five-lot subdivision are each required to have dry wells. The dry wells for each house shall have volumetric capacity sufficient to store 1 inch of roof runoff. Each record owner, whether one or more persons or entities, of title to Lots 1 through 5, as shown on the Plan, shall maintain and keep operational their respective roof drainage system in accordance with the Plan and the above-noted standard. Prior to the release of Lots 1 and 3, which contain existing structures which are proposed to remain, proof of compliance with this condition shall be provided to the Board for review and approval.

19. Prior to Plan endorsement and in keeping with Phase II NPDES, Town of Needham as filed July 30, 2003, the Petitioner shall submit a letter indicating they are committed to providing a response under the NPDES requirement: Control Measure #1- "Public Education and Outreach" and Control Measure #2, "Public Participation/Involvement" and shall implement said measures prior to the release of the subdivision lots.

20. A Department of Environmental Protection sewer extension permit may be required to service the subdivision and abutting lots. If required, approval of this subdivision is subject to the granting by the Board of Selectmen and the Department of Environmental Protection of a Sewer Extension and Connection Permit.

21. Any and all special permits required by the Massachusetts Water Resources Authority, if applicable, shall be obtained at the expense of the applicant.

22. A special sewer connection permit program fee, if applicable, shall be provided for all lots within the subdivision.

23. Grade adjustment rings are not permitted to adjust gate boxes and/or other castings. The Petitioner shall use appropriately sized castings.

24. All catch basins shall remain functional at all times. Rims shall be set at binder elevation and shall be adjusted to finish course elevation prior to placement of the top course of pavement.

25. If the binder course of pavement is exposed to one winter season, it shall be chipsealed prior to September 1 of the following winter season. If the roadway work is not completed prior to the third winter season, road reconstruction may be required by the Highway Superintendent.

26. During initial construction, no openings to the chipseal shall be made between the months of November 30 and April 1 prior to the placement of the top course of pavement.



TOWN OF NEEDHAM
MASSACHUSETTS

Room 20, Town Hall
Needham, MA 02192
617-444-5100

PLANNING BOARD

AMENDMENT TO

APPLICATION FOR SPECIAL PERMIT
for

~~PLANNED RESIDENTIAL DEVELOPMENT~~
RESIDENTIAL COMPOUND
~~FLEXIBLE DEVELOPMENT~~

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.

Location of Property 768-768A Chestnut Street

Name of Applicant William John Piersiak Address 768 Chestnut St. Tel. # 617-759-9820

Applicant is Owner ☒ Tenant ☐ Agent/Attorney ☐ Purchaser ☐

Property Owner's Name _____ Address _____ Tel. # _____
(if not Applicant)

Characteristics of Property: Lot Area 13.28 acres Present Use Residential
204 Parcel # 004-001 Zoning District RRC

Nature and justification of request for a special permit under the Zoning By-law,
Section 4.2.5. Planned Residential Development; Section 4.2.6. Residential Compound;
~~or Section 4.2.4. Flexible Development;~~

To amend the existing Special Permit for Residential Compound, by adding language allowing the existing single-family house on Lot 1 to be moved or replaced, and substituting language calling for retention of the barn structure on Lot 3 and its conversion to a single-family dwelling with language stating that Lot 3 will have a new single-family house constructed on it.

I hereby request a hearing before the Planning Board with reference to the above application.

Signature of Applicant (or his representative) William John Piersiak

Address if not Applicant _____

Tel. # 617-759-9820

Owner's permission if other than applicant _____

Findings

- 1.0 On the basis of the evidence and after open deliberations, the Board makes the following findings:
- 1.1 The "Heather Lane Extension Residential Compound" is comprised of 13.26 acres of land with approximately 232 feet of frontage on Heather Lane, a private way. Frontage on Heather Lane is derived through Lot 4 shown on the Definitive Subdivision Plan for Heather Lane, 764, 766, 768-768A & 768B Chestnut Street, Needham, MA. Said plan received approval by the Needham Planning Board under Definitive Subdivision Decision, Heather Lane, 764, 766, 768-768A, and 768B Chestnut Street, Needham, MA, dated August 11, 2020. (Exhibit 24).
- 1.2 The "Heather Lane Extension Definitive Subdivision Plan" and accompanying deed restrictions and covenants provide for legal access to Heather Lane for all lots within the "Heather Lane Extension Residential Compound" having frontage on Heather Lane Extension.
- 1.3 The "Heather Lane Extension Residential Compound" contains five lots, all of which are restricted from further subdivision. Lot 1 will retain the existing single-family dwelling. Lots 2 and 4 are proposed for new single-family house construction. Lot 3 will retain the existing barn structure which will be converted to a single-family dwelling. Lot 5 proposes the relocation of the existing single-family dwelling to a location southerly on the lot. The five buildings lots are restricted to single-family dwellings, all of which are detached.
- 1.4 The lots within the "Heather Lane Extension Residential Compound" share a private 20-foot wide paved driveway (known as Heather Lane Extension) with frontage and access on Heather Lane.
- 1.5 Adequate provision has been made for the maintenance of the private driveway by the owners of the lots.
- 1.6 The "Heather Lane Extension Residential Compound", as approved, meets the dimensional, density, frontage, and access requirements of Section 4.2.12 of the Needham Zoning By-Law, as well as all requirements of Section 9 of Chapter 40A, M.G.L. The Residential Compound contains 13.26 acres and 2.65 acres per dwelling unit. No proposed structure is located closer than 30 feet from any other structure, nor 20 feet from any tract boundary line.
- 1.7 The proposed "Heather Lane Extension Residential Compound", is in harmony with the general purpose and intent of Section 4.2.12 of the Zoning By-Law; it is designed in such a manner to make it sufficiently advantageous to the Town and to the residential district in which it is proposed to be located, with the primary benefits being the retention of the rural feeling in the area, the conservation of open space along the Charles river, consistent with high quality residential development.

Decision

- 2.0 On the basis of the foregoing, this Board finds the proposed "Heather Lane Extension Residential Compound", to be in conformance with the provisions, standards, general purpose and intent of Section 4.2.12 Residential Compound of the Zoning By-Law.

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

TEL (781) 444-9344 FAX (781) 449-0242

E-MAIL bob@robertsmart.net WEBSITE www.robertsmart.net

By Hand and E-Mail
February 4, 2021

Needham Planning Board
Public Services Administration Building
500 Dedham Avenue
Needham, Ma. 02492

Re: Proposed Amendment to Residential Compound Special Permit, August 11, 2020, Heather Lane Extension, 768-768A Chestnut Street

Dear Members of the Board:

Enclosed for filing please find:

1. Application for Amendment to Special Permit for Residential Compound, seeking a "de minimus" amendment of the Residential Compound Special Permit Decision for Heather Lane Extension, 768-768A Chestnut Street (Decision).
2. A check of \$500.00 for the filing fee. The fee normally required for a change to a residential compound special permit is \$500.00, plus \$250.00 per unit. It is requested that the Board waive the \$250.00 per unit charge, as suggested in Lee Newman's January 27, 2021 e-mail to me.

The applicant, William John Piersiak, may want to replace the existing house on Residential Compound Lot 1, as it is old and deteriorating. In addition, he has learned that a prospective buyer of Residential Compound Lot 3 does not want to retain the existing barn structure on the lot. Accordingly, he proposes to replace Finding 1.3 in the Decision, in its entirety. Finding 1.3 (copy attached) currently reads as follows:

"The "Heather Lane Extension Residential Compound" contains five lots, all of which are restricted from further subdivision. Lot 1 will retain the existing single-family dwelling. Lots 2 and 4 are proposed for new single-family house construction. Lot 3 will retain the existing barn structure which will be converted to a single-family dwelling. Lot 5 proposes the relocation of the existing single-family dwelling to a location southerly on the lot. The five buildings lots are restricted to single-family dwellings, all of which are detached."

The applicant proposes a replacement Finding 1.3, to read as follows:

“The “Heather Lane Extension Residential Compound” contains five lots, all of which are restricted from further subdivision. Lot 1 may retain, or may move or replace, the existing single-family dwelling. Lots 2, 3 and 4 are proposed for new single-family house construction. Lot 5 proposes the relocation of the existing single-family dwelling to a location southerly on the lot. The five buildings lots are restricted to single-family dwellings, all of which are detached.”

This amendment will not have any adverse effects. The Special Permit Decision did not impose a condition requiring the retention of the existing single-family dwelling on Lot 1, nor a condition that the barn be retained on Lot 3.

Section 17 of the Heather Lane Extension Subdivision Decision already calls for posting a drainage surety on Lot 3. The Applicant is filing herewith a proposed amendment requiring an additional \$3,500.00 drainage surety if he moves or replaces the existing house on Lot 1.

Please confirm that this matter is on the agenda for the February 16, 2021 Planning Board meeting, as a “de minimus” amendment.

If further documentation is required, please let me know.

Very truly yours,



Robert T. Smart, Jr.

cc: William John Piersiak

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

TEL (781) 444-9344 FAX (781) 449-0242

E-MAIL bob@robertsmart.net WEBSITE www.robertsmart.net

Certified Mail, RRR
7016 1370 0000 9211 7382
February 4, 2021

770 Chestnut Street LLC
130 Prospect Street
Cambridge, MA 02139

Re: Heather Lane Subdivision, Heather Lane Extension Subdivision, Residential Compound
764, 766, 768-768A, and 768B Chestnut Street, Needham

Dear Sir/Madam:

Bill Piersiak has filed three applications with the Planning Board. He proposes to amend the Board's Decisions on the Heather Lane Subdivision, the Heather Lane Extension Subdivision, and the Residential Compound. The purpose of the proposed amendments is to allow him to remove, or move, the existing houses on three lots. Copies of the documents filed with the Planning Board are enclosed.

The applications are to be heard at the Planning Board's meeting on February 16, 2021. I do not yet have a copy of the agenda for the meeting, but I will mail a copy to you once I have it. If you want it emailed to you, please provide an email address. If you want further information about the meeting, you may want to contact the Planning Board staff.

If you have questions, please contact me.

Very truly yours,



Robert T. Smart, Jr.

Cc: William Piersiak

ROBERT T. SMART, JR., ESQ.

ATTORNEY AT LAW

399 CHESTNUT STREET

NEEDHAM, MASSACHUSETTS 02492

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February 4, 2021

770 Chestnut Street LLC
130 Prospect Street
Cambridge, MA 02139

Re: Heather Lane Subdivision, Heather Lane Extension Subdivision, Residential Compound
764, 766, 768-768A, and 768B Chestnut Street, Needham

Dear Sir/Madam:

Bill Piersiak has filed three applications with the Planning Board. He proposes to amend the Board's Decisions on the Heather Lane Subdivision, the Heather Lane Extension Subdivision, and the Residential Compound. The purpose of the proposed amendments is to allow him to remove, or move, the existing houses on three lots. Copies of the documents filed with the Planning Board are enclosed.

The applications are to be heard at the Planning Board's meeting on February 16, 2021. I do not yet have a copy of the agenda for the meeting, but I will mail a copy to you once I have it. If you want it emailed to you, please provide an email address. If you want further information about the meeting, you may want to contact the Planning Board staff.

If you have questions, please contact me.

Very truly yours,



Robert T. Smart, Jr.

Cc: William Piersiak



Needham Public Health Division

178 Rosemary St., Needham, MA 02494
www.needhamma.gov/health

781-455-7940 ext. 504
781-455-7922 (fax)



MEMO

To: Lee Newman, Planning Department

From: Tara Gurge, Public Health Division

Date: 2/8/2021

Re: Definitive Subdivision Plan Comments for Heather Lane - #764, #766, #768-768A and #768B Chestnut St.- Revised Comments with addition of Lot 3.

This memo is in reference to the Public Health Division comments on the Definitive Subdivision for Heather Lane- #764, #766, #768-768A and #768B Chestnut St., in Needham. This subdivision creates 4 new buildable lots namely Lots 1, 3, 5 and 6.

This proposed subdivision would create three (4) individual house lots that conform to current zoning, with lots located on new road off of Chestnut St., known as Heather Lane. These lots would be serviced by municipal water and sewer.

The following is a list of Public Health Division comments regarding this proposal:

- Need to ensure that owners/builders of all structures to be razed each fill out the Building Department's Demolition Form, through town's online permitting system ViewPoint Cloud, which must be submitted along with supplemental documents for our review and approval prior to the issuance of the Building demolition permit.

The following additional off-street drainage requirements are indicated:

- 1) All lots should be graded to the limits of construction as to have no standing water or otherwise create a public health nuisance.
- 2) Grading shall not improperly shed or illegally increase drainage onto adjacent properties.
- 3) All subsequent developers or builders should be notified of the off-street drainage requirements.
- 4) If there are difficult or unusual conditions as determined in the field from the approved grading plan, or other circumstances or objections received from abutters, the Board of Health may require an as-built grading plan for further evaluation.
- 5) Following the Board of Health off-street drainage guidelines for a subdivision, a drainage surety of \$3,500.00 will be required for each buildable lot, or \$14,000.00 for the four-lot subdivision.

Please feel free to contact the Public Health Division office if you have any additional questions on those requirements.

cc: Timothy McDonald, HHS Director

ChestnutStHeatherLnDefSubdivRevMemo-20

**AMENDMENT DECISION
HEATHER LANE DEFINITIVE SUBDIVISION
February 16, 2021**

Heather Lane
764, 766, 768-768A and 768B Chestnut Street, Needham MA
(Original Decision dated August 11, 2020, Amendment Decision dated February 16, 2021)

(Filed during the Municipal Relief Legislation, Chapter 53 of the Acts of 2020)

DECISION of the Planning Board (hereinafter referred to as the Board) on an Application for an Amendment to the Heather Lane Definitive Subdivision Decision dated August 11, 2020, said Amendment filed by William John Piersiak, of 768 Chestnut Street, Needham, Massachusetts, William J. Piersiak, Trustee of the 768B Chestnut Street Realty Trust, and Koby Kempel, Manager of the 766 Chestnut LLC (collectively to be referred to hereinafter as the “Applicant”) for that certain property located at 764, 766, 768-768A and 768B Chestnut Street, Needham, Massachusetts (hereinafter referred to as the Property). Said Property contains 26.904 acres, more or less, and is located in the Rural Residence Conservation District.

This Decision is in response to a written request, contained in the February 4, 2021 letter from the Applicant’s attorney, Robert T. Smart, Jr., Esq., to amend the August 11, 2020 Decision, for approval of a “de minimus” Amendment which would allow the Applicant to replace the existing house on Lot 3, and in such event to increase the off-street drainage surety by \$3,500.00.

The change requested is deemed minor in nature and extent, and it does not require public notice or public hearing. Testimony and documentary evidence were presented to the Board on February 16, 2021 at a public meeting conducted via zoom. Board members Jeanne S. McKnight, Paul Alpert, Martin Jacobs, Ted Owens, and Adam Block were present throughout the February 16, 2021 proceedings. All five members deliberated on the matter.

FINDINGS AND CONCLUSIONS

The findings and conclusions made in the Definitive Subdivision Decision dated August 11, 2020 are ratified and confirmed except as follows:

1. The first four sentences of numbered Section 19 are replaced in their entirety. These existing sentences read as follows:

“Off-street drainage surety in the amount of \$10,500.00 shall be posted (\$3,500.00 per lot) for

Lots 1, 5 and 6. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lots 2 and 3 under this subdivision approval. The off-street drainage surety requirement for the Residential Compound lots to be created out of Lot 4 will be stated in the Board's Decision regarding the proposed Heather Lane Extension Subdivision and Residential Compound Plan. Said \$10,500.00 surety shall be posted prior to the release of said Lots 1, 5 and 6 as shown on the Plan for purposes of building or conveyance."

2. The replacement for the first four sentences of numbered Section 19 shall read as follows:

"Off-street drainage surety in the amount of \$3,500.00 per Lot shall be posted for each Lot on which new construction will take place. Currently, Petitioners intend new construction on Lots 1, 5 and 6, but not Lots 2 and 3, for a total off street drainage surety requirement of \$10,500.00. If Petitioners decide on new construction for Lot 3, drainage surety of an additional \$3,500.00 for said Lot will be posted. The off-street drainage surety requirement for the Residential Compound lots to be created out of Lot 4 will be stated in the Board's Decision regarding the proposed Heather Lane Extension Subdivision and Residential Compound Plan. Said \$3,500.00 surety for each Lot on which new construction is intended shall be posted prior to the release of each such Lot for purposes of building or conveyance."

3. This amendment will not have any adverse effects. If the Petitioner chooses to replace the existing house on Lot 3, he will post a \$3,500.00 drainage bond prior to release of that Lot for building or conveyance.

4. The proposed change is minor in nature and does not require public notice or hearing.

DECISION

Therefore the Board voted 5-0 to GRANT the requested amendment to the Heather Lane Definitive Subdivision Decision dated August 11, 2021, as set forth in Findings and Conclusions set forth above.

No Plan Modifications are required.

LIMITATIONS

The provisions contained in the Heather Lane Definitive Subdivision Decision dated August 11, 2020, except as modified by this Amendment Decision, are ratified and confirmed.

The provisions of this Heather Lane Definitive Subdivision Decision Amendment shall be binding upon every owner or owners of the lots and the executors, administrators, heirs, successors and assigns of such owners, and the obligations and restrictions herein set forth shall run with the land in accordance with their terms, in full force and effect for the benefit of and enforceable by the Town of Needham.

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

This approval shall be recorded in the Norfolk District Registry of Deeds. This Amendment Decision shall not take effect until the Applicant has delivered written evidence of recording to the Board.

Witness our hands this 16th day of February, 2021.

NEEDHAM PLANNING BOARD

Jeanne S. McKnight, Chairperson

Paul Alpert

Martin Jacobs

Ted Owens

Adam Block

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss _____, 2021

On this _____ day of _____, 2021, before me, the undersigned notary public, personally appeared _____, one of the members of the Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was in the form of a state issued driver's license, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

Notary Public

My commission expires: _____

Copy sent to:

Applicant - Certified Mail #
Town Clerk
Building Inspector
Director, DPWD
Board of Health
Conservation Commission
Board of Selectmen
Engineering
Fire Department
Police Department
Design Review Board

**AMENDMENT DECISION
HEATHER LANE EXTENSION DEFINITIVE SUBDIVISION
February 16, 2021**

Heather Lane Extension
768-768A Chestnut Street, Needham MA
(Original Decision dated August 11, 2020, Amendment Decision dated February 16, 2021)

(Filed during the Municipal Relief Legislation, Chapter 53 of the Acts of 2020)

DECISION of the Planning Board (hereinafter referred to as the Board) on an Application for an Amendment to the Heather Lane Extension Definitive Subdivision Decision dated August 11, 2020, said Amendment filed by William John Piersiak, of 768 Chestnut Street, Needham, Massachusetts (to be referred to hereinafter as the “Applicant”) for that certain property located at 768-768A Chestnut Street, Needham, Massachusetts (hereinafter referred to as the Property). Said Property contains 13.26 acres, more or less, and is located in the Rural Residence Conservation District.

This Decision is in response to a written request, contained in the February 4, 2021 letter from the Applicant’s attorney, Robert T. Smart, Jr., Esq., to amend the August 11, 2020 Decision, for approval of a “de minimus” Amendment which would allow the Applicant to move or replace the existing house on Residential Compound Lot 1, and in such event to increase the off-street drainage surety by \$3,500.00.

The change requested is deemed minor in nature and extent, and it does not require public notice or public hearing. Testimony and documentary evidence were presented to the Board on February 16, 2021 at a public meeting conducted via zoom. Board members Jeanne S. McKnight, Paul Alpert, Martin Jacobs, Ted Owens, and Adam Block were present throughout the February 16, 2021 proceedings. All five members deliberated on the matter.

FINDINGS AND CONCLUSIONS

The findings and conclusions made in the Definitive Subdivision Decision dated August 11, 2020 are ratified and confirmed except as follows:

1. The first two sentences of numbered Section 17 are replaced in their entirety. These existing sentences read as follows:

“Off-street drainage surety in the amount of \$14,000.00 shall be posted (\$3,500.00 per lot) for

Lots 2, 3, 4 and 5. Said surety amount is predicated on the Petitioner's representation that no new construction will occur on Lot 1 under this subdivision approval."

2. The replacement for the first two sentences of numbered Section 17 shall read as follows:

"Off-street drainage surety in the amount of \$14,000.00 shall be posted (\$3,500.00 per lot) for Lots 2, 3, 4 and 5. If the existing house on Lot 1 is moved or replaced, the surety amount will be increased to \$17,500.00."

3. This amendment will not have any adverse effects. If the Petitioner chooses to replace the existing house on Lot 1, he will post a \$3,500.00 drainage bond prior to release of the Lot for building or conveyance.

4. The proposed change is minor in nature and does not require public notice or hearing.

DECISION

Therefore the Board voted 5-0 to GRANT the requested amendment to the Heather Lane Extension Definitive Subdivision Decision dated August 11, 2021, as set forth in Findings and Conclusions set forth above.

No Plan Modifications are required.

LIMITATIONS

The provisions contained in the Heather Lane Extension Definitive Subdivision Decision dated August 11, 2020, except as modified by this Amendment Decision, are ratified and confirmed.

The provisions of this Heather Lane Extension Definitive Subdivision Decision Amendment shall be binding upon every owner or owners of the lots and the executors, administrators, heirs, successors and assigns of such owners, and the obligations and restrictions herein set forth shall run with the land in accordance with their terms, in full force and effect for the benefit of and enforceable by the Town of Needham.

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

This approval shall be recorded in the Norfolk District Registry of Deeds. This Amendment Decision shall not take effect until the Applicant has delivered written evidence of recording to the Board.

Witness our hands this ____ day of February, 2021.

NEEDHAM PLANNING BOARD

Jeanne S. McKnight, Chairperson

Paul Alpert

Martin Jacobs

Ted Owens

Adam Block

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss _____, 2021

On this _____ day of _____, 2021, before me, the undersigned notary public, personally appeared _____, one of the members of the Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was in the form of a state issued driver's license, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

Notary Public

My commission expires: _____

Copy sent to:

Applicant - Certified Mail #
Town Clerk
Building Inspector
Director, DPWD
Board of Health
Conservation Commission
Board of Selectmen

Engineering
Fire Department
Police Department
Design Review Board

**AMENDMENT DECISION
RESIDENTIAL COMPOUND SPECIAL PERMIT
February 16, 2021**

Heather Lane Extension
768-768A Chestnut Street, Needham MA
(Original Decision dated August 11, 2020, Amendment Decision dated February 16, 2021)

(Filed during the Municipal Relief Legislation, Chapter 53 of the Acts of 2020)

DECISION of the Planning Board (hereinafter referred to as the Board) on an Application for an Amendment to a Residential Compound Special Permit dated August 11, 2020, said Amendment filed by William John Piersiak, of 768 Chestnut Street, Needham, Massachusetts (to be referred to hereinafter as the “Applicant”) for that certain property located at 768-768A Chestnut Street, Needham, Massachusetts (hereinafter referred to as the Property). Said Property contains 13.26 acres, more or less, and is located in the Rural Residence Conservation District.

This Decision is in response to a written request, contained in the February 4, 2021 letter from the Applicant’s attorney, Robert T. Smart, Jr., Esq., to amend the August 11, 2020 Decision, for approval of a “de minimus” Amendment which would allow the Applicant to retain, move or replace the existing structure on Residential Compound Lot 1, and to remove or replace the existing barn structure on Residential Compound Lot 3.

The change requested is deemed minor in nature and extent, and it does not require public notice or public hearing. Testimony and documentary evidence were presented to the Board on February 16, 2021 at a public meeting conducted via zoom. Board members Jeanne S. McKnight, Paul Alpert, Martin Jacobs, Ted Owens, and Adam Block were present throughout the February 16, 2021 proceedings. All five members deliberated on the matter.

On February 4, 2021, the Applicant’s attorney Robert T. Smart, Jr. by letter requested that the Board accept a \$500.00 filing fee while waiving an additional \$250.00 per unit filing fee charge for the Application.

FINDINGS AND CONCLUSIONS

The findings and conclusions made in the Residential Compound Special Permit dated August 11, 2020 were ratified and confirmed except as follows:

1. Finding 1.3 in the Decision is replaced in its entirety. Said finding currently reads as follows:

“The “Heather Lane Extension Residential Compound” contains five lots, all of which are restricted from further subdivision. Lot 1 will retain the existing single-family dwelling. Lots 2 and 4 are proposed for new single-family house construction. Lot 3 will retain the existing barn structure which will be converted to a single-family dwelling. Lot 5 proposes the relocation of the existing single-family dwelling to a location southerly on the lot. The five buildings lots are restricted to single-family dwellings, all of which are detached.”

2. The replacement Finding 1.3 in the Decision shall read as follows:

“The “Heather Lane Extension Residential Compound” contains five lots, all of which are restricted from further subdivision. Lot 1 may retain, or may move or replace, the existing single-family dwelling. Lots 2, 3, and 4 are proposed for new single-family house construction. Lot 5 proposes the relocation of the existing single-family dwelling to a location southerly on the lot. The five buildings lots are restricted to single-family dwellings, all of which are detached.”

3. This amendment will not have any adverse effects. The Special Permit Decision did not impose a condition requiring the retention of the existing single-family dwelling on Lot 1, nor a condition that the barn be retained on Lot 3.

4. The proposed change is minor in nature and does not require public notice or hearing.

5. The requested waiver of filing fees is allowed.

DECISION

Therefore the Board voted 5-0 to GRANT the requested amendment to the Residential Compound Special Permit Decision dated August 11, 2021, as set forth in Findings and Conclusions set forth above.

No Plan Modifications are required.

LIMITATIONS

The provisions contained in the Residential Compound Special Permit dated August 11, 2020, except as modified by this Amendment Decision, are ratified and confirmed.

The provisions of this Residential Compound Special Permit Amendment shall be binding upon every owner or owners of the lots and the executors, administrators, heirs, successors and assigns of such owners, and the obligations and restrictions herein set forth shall run with the land in

accordance with their terms, in full force and effect for the benefit of and enforceable by the Town of Needham.

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

This approval shall be recorded in the Norfolk District Registry of Deeds. This Major Site Plan Special Permit Amendment Decision shall not take effect until the Applicant has delivered written evidence of recording to the Board.

Witness our hands this 16th day of February, 2021.

NEEDHAM PLANNING BOARD

Jeanne S. McKnight, Chairperson

Paul Alpert

Martin Jacobs

Ted Owens

Adam Block

COMMONWEALTH OF MASSACHUSETTS

Norfolk, ss _____, 2021

On this _____ day of _____, 2021, before me, the undersigned notary public, personally appeared _____, one of the members of the Board of the Town of Needham, Massachusetts, proved to me through satisfactory evidence of identification, which was in the form of a state issued driver's license, to be the person whose name is signed on the proceeding or attached document, and acknowledged the foregoing to be the free act and deed of said Board before me.

Notary Public
My commission expires: _____

Copy sent to:

Applicant - Certified Mail #
Town Clerk
Building Inspector
Director, DPWD
Board of Health
Conservation Commission
Board of Selectmen
Engineering
Fire Department
Police Department
Design Review Board



**NEEDHAM
ZONING BOARD OF APPEALS
AGENDA**

THURSDAY, February 25, 2021 - 7:30PM

Zoom Meeting ID Number: 82078898989

This Agenda is PB usage only

The link to join the meeting is <https://us02web.zoom.us/j/82078898989>

- | | |
|-------------------|--|
| Minutes | Review and approve Minutes from January 21, 2021 meeting. |
| Case #1 – 7:30 PM | 16 Edwardel Road - Nader and Rhonda Sidhom, applicants, have made application to the Board of Appeals for a Special Permit under Sections 3.15, 7.5.2 and any other applicable Sections of the Zoning By-Law to allow the addition of an Accessory Dwelling Unit. The property is located at 16 Edwardel Road , Needham, MA in the Single Residential B District. |
| Case #2 – 7:30 PM | 1625 Great Plain Avenue - Joseph Dinneen and Cindy McGowan, applicants, have made application to the Board of Appeals for a Special Permit under Sections 3.15, 7.5.2 and any other applicable Sections of the Zoning By-Law to allow the addition of an Accessory Dwelling Unit. The property is located at 1625 Great Plain Avenue , Needham, MA in the Single Residential B District. |
| Case #3 – 7:45PM | 86 Plymouth Road - Lakshmi Balachandra and Patrick Stern, applicants, have made application to the Board of Appeals for a Special Permit under Sections 3.15, 7.5.2 and any other applicable Sections of the Zoning By-Law to allow the addition of an Accessory Dwelling Unit. The property is located at 86 Plymouth Road, Needham, MA in the Single Residential B District. |

Next Meeting: **Thursday, March 18, 2021, 7:30pm**



TOWN OF NEEDHAM
MASSACHUSETTS
BOARD OF APPEALS

RECEIVED TOWN CLERK
NEEDHAM, MA 02469

2021 FEB -5 PM 12:24

APPLICATION FOR HEARING

IT IS STRONGLY RECOMMENDED THAT APPLICANTS CONSULT WITH THE BUILDING INSPECTOR PRIOR TO FILING THIS APPLICATION.

Note: Application must be complete, with certified plot plan attached, and application fee included, or application will not be accepted.

Date: 1/23/2021

Name of Applicant or Appellant: ~~Paul Hermond~~ Cindy Margowan + Joseph Hermond

Address: 1625 Great Plain Ave Needham

E-mail address: Cmargowan@cff.org

Daytime telephone: 774-230-6486

Cell phone: Same

Additional contact information, (ie: contractor ☒, architect ☐, builder ☐, attorney ☐):
Paul Hermond 617 981 9960

Address/Location of Property 1625 Great Plain Ave

American map/parcel number F 721097 2929489

Zone of property: SRB

Is property within 100 feet of wetlands, 200 ft. of stream or in flood plain? ☐ Yes ☒ No

Applicant is: ☐ owner ☐ tenant ☐ prospective tenant ☒ licensee ☐ prospective purchaser

Type of Permit requested: ☒ residential or ☐ commercial

If residential renovation, will renovation constitute "new construction"? ☒ yes ☐ no

If commercial, please consult with building inspector regarding parking issues

Select one: ☒ Special Permit ☐ Variance ☐ Comprehensive Permit, M.G.L. Ch. 40B
☐ Amendment ☐ Appeal Building Inspector Decision*

*(For an appeal from decision of Building Inspector, attach copy of the decision or other written notice received from the Building Inspector.)

Existing Conditions: Single family resident

Statement of relief sought: Build New Adu Addition on left side of house

Applicable Section(s) of Zoning By-Law: Section 3.15 ADU

If application under Zoning Section 1.4, listed immediately above:

List nonconformities related to lot/structure(s) in application: _____

Date structure(s) on lot constructed (including any additions): 1926

Date lot created: _____

A certified plot plan, prepared by a registered surveyor, must be attached to this application at time of filing. An application will be returned if a copy of the plot plan is not attached to the application.

•Applications for Comprehensive permits under M.G.L. Ch. 40B require a copy of plot plan.

Please feel free to attach any additional information/photos relative to the application.

Additional information may be requested by the Board at any time during the application or hearing process.

A hearing before the Board of Appeals, with reference to the above noted application or appeal, is requested by

Signed Joseph F. Dwyer III
Title Owner

An application must be submitted to the Town Clerk's Office at townclerk@needhamma.gov and to the ZBA Office at dcollins@needhamma.gov



ADU – ZBA Special Permit Application

Owner's Name	Cindy Macgowan + Joseph Dinnien			
Address	1625 Great Plain Ave Needham			
Phone	774-230-0486	E-mail	Cmacgowan@eff.org	
ADU's Resident Name	Doris Bachard			
Phone	860-583-2609	E-mail		
ADU Resident Relationship to Owner (Select one)	☐ spouse ☒ parent ☐ sibling ☐ child ☐ grandchild	Spouse of: ☐ parent ☐ sibling ☐ child ☐ grandchild	Child of: ☐ parent ☐ sibling ☐ child ☐ grandchild	☐ Caregiver. If caregiver, select type of caregiver: ☐ Elderly ☐ Chronically ill ☐ Disable Owner
Total Occupants in Principal Dwelling Unit and ADU	4	Total Occupants not related to Owner (not to exceed five)	0	Owner to occupy: ☒ Principal Unit ☐ ADU

ADU Information

Map & Page ID	Book 25114 P 557 F 721097 2929489	Zoning District	SRB
Size of ADU (not to exceed 850 sq. feet)	760 sq ft	Location of ADU: ☐ basement, ☐ attic, ☒ 1 st floor, ☐ 2 nd floor	

Does ADU have separate provisions for (ADU limited to one bedroom):

Living ☒ Yes ☐ No; Sleeping ☒ Yes ☐ No; Cooking ☒ Yes ☐ No; Eating ☒ Yes ☐ No

Number and location of Means of Egress:

basement door, 1st floor windows, back door, access through main

Describe where the interior door access between ADU and Principal Dwelling Unit is?

8.5 ft opening in middle of existing house connecting to middle living area in new

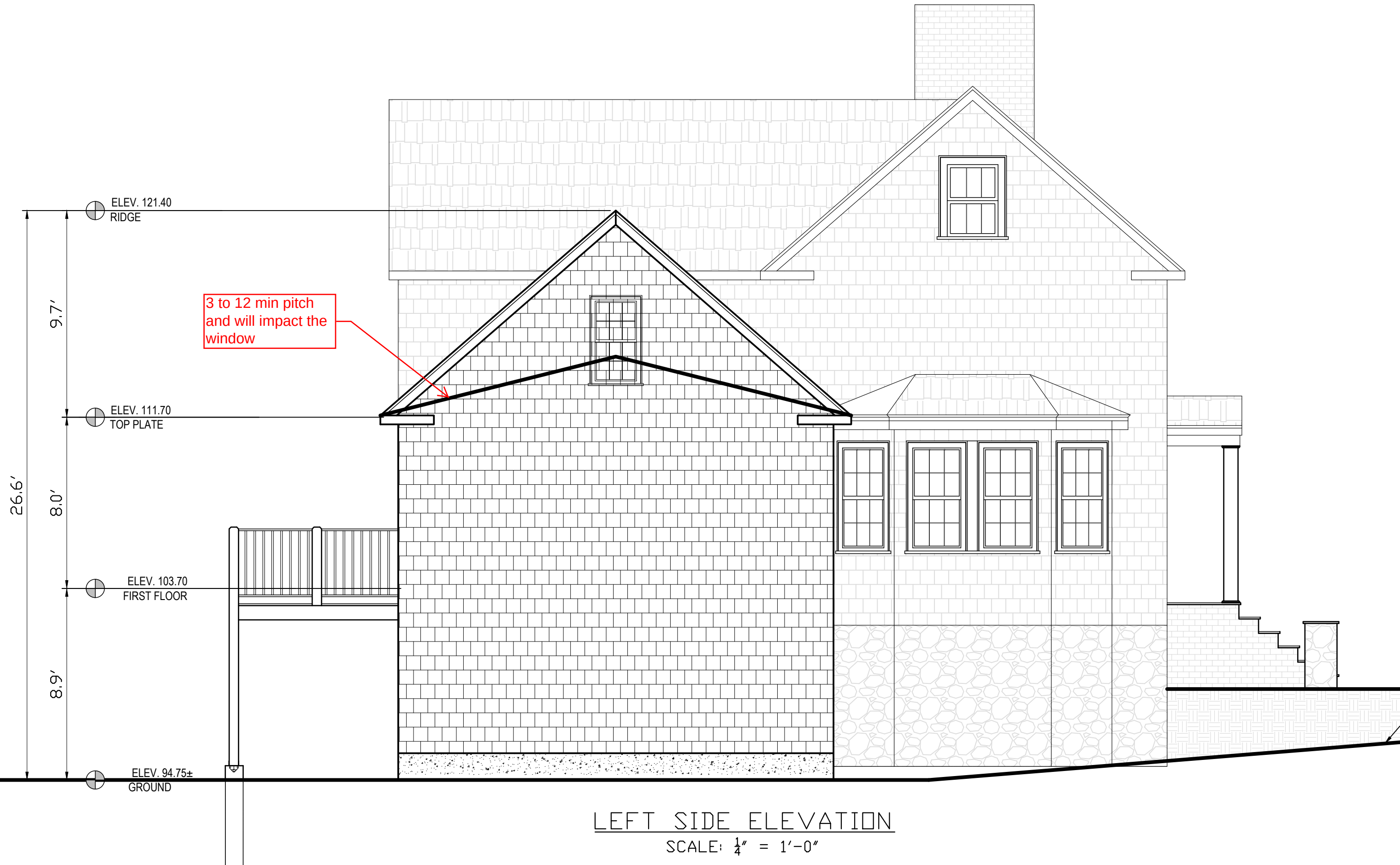
Total number of off-street parking for Principal Dwelling Unit and ADU:

2

I attest that the information in this application is true and accurate to the best of my knowledge and understanding:

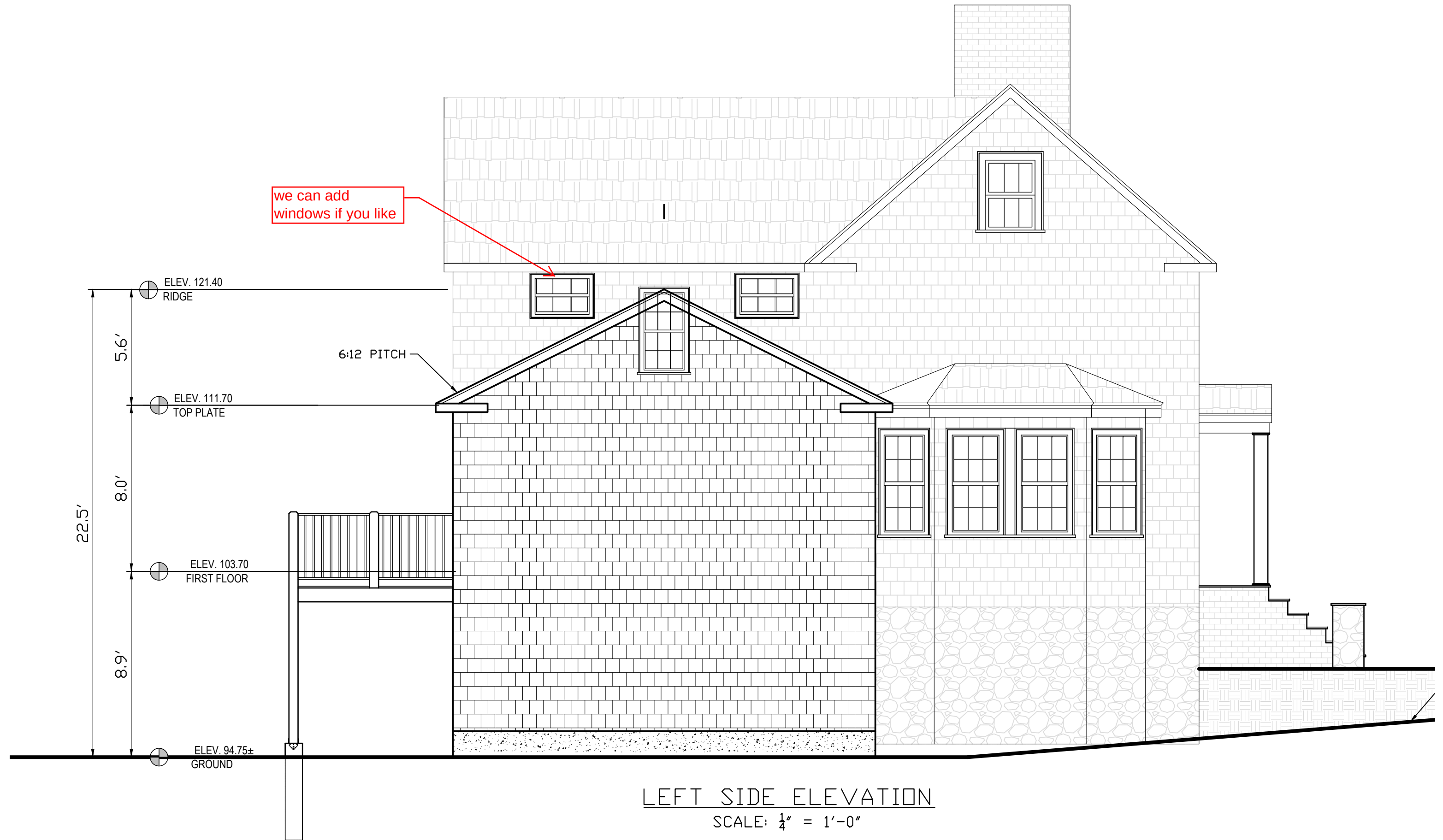
Joseph Dinnien III

Owner's Signature/Date



LEFT SIDE ELEVATION

SCALE: $\frac{1}{4}" = 1'-0"$





FRONT ELEVATION
SCALE: 1/4" = 1'-0"

FLOOR AREA SUMMARY			
	EXISITNG	ADDITION	TOTAL
FIRST FLOOR	1040 SF	753 SF	1793 SF
SECOND FLOOR	1020 SF	0 SF	1020 SF
TOTAL	2060 SF	753 SF	2813 SF

DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 1 OF 6

PROJECT TYPE
IN-LAW ADDITION RESIDENTIAL

PROJECT LOCATION
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

ISSUED FOR
ZONING REVIEW

PLANS PREPARED BY	DESIGN BY SAMI LLC.
	81 Oceanside Drive Scituate, MA 02066 617-460-1041 - Sami@designbysami.com
	.\\pe signed blue.tiff



BACK ELEVATION
SCALE: $\frac{1}{4}" = 1'-0"$

DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 2 OF 6

PROJECT TYPE
IN-LAW ADDITION RESIDENTIAL

PROJECT LOCATION
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

ISSUED FOR
ZONING REVIEW

PLANS PREPARED BY	
DESIGN BY SAMI LLC.	
81 Oceanside Drive Scituate, MA 02066 617-460-1041 — Sami@designbysami.com	
	.\\pe signed blue.tiff



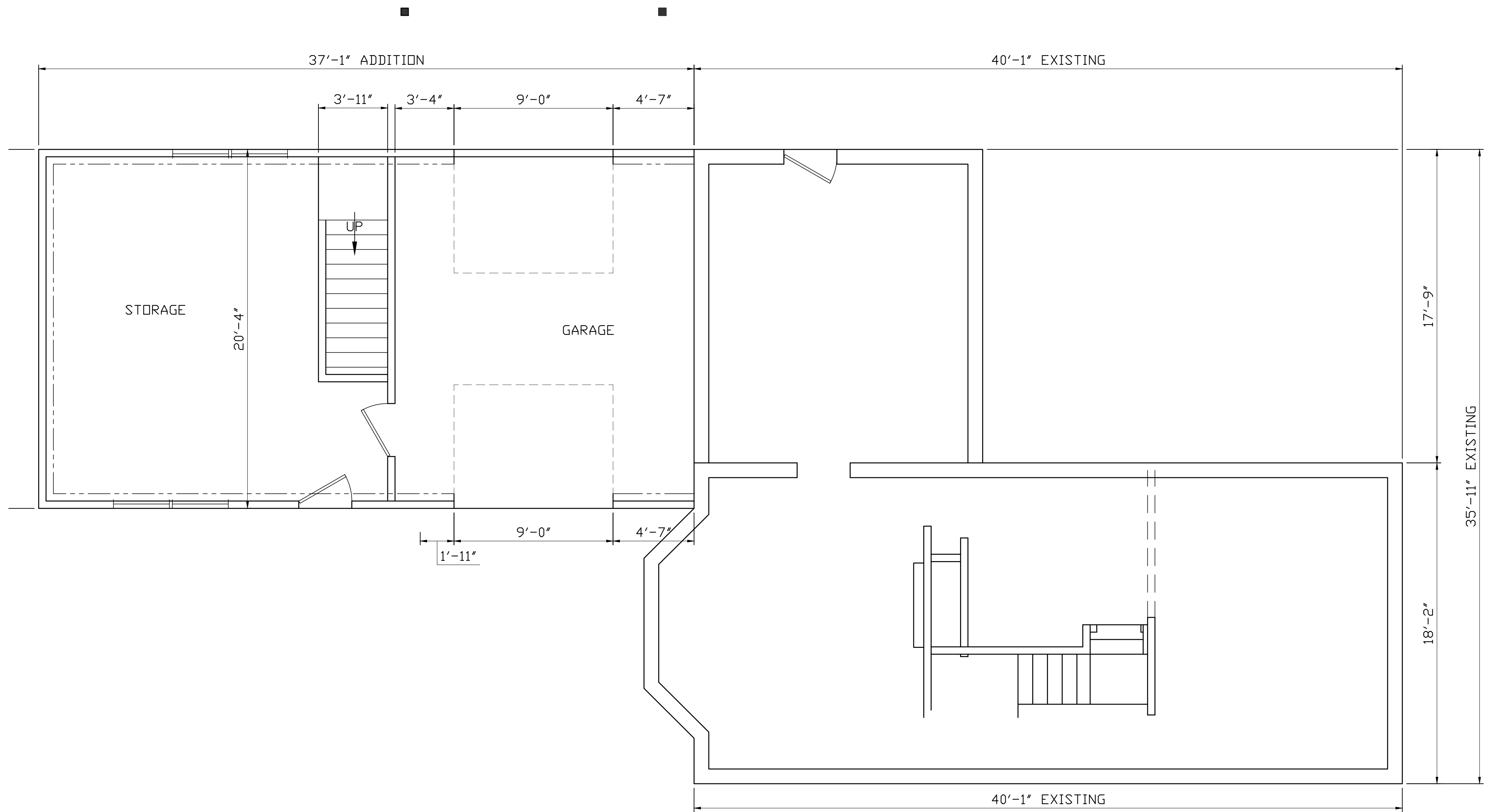
DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 3 OF 6

<u>PROJECT TYPE</u>
IN-LAW ADDITION RESIDENTIAL

<u>PROJECT LOCATION</u>
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

<u>ISSUED FOR</u>
ZONING REVIEW

PLANS PREPARED BY	
DESIGN BY SAMI LLC.	
81 Oceanside Drive Scituate, MA 02066 617-460-1041 – Sami@designbysami.com	
	.\\pe signed blue.tiff



BASEMENT PLAN
SCALE: $\frac{1}{4}" = 1'-0"$

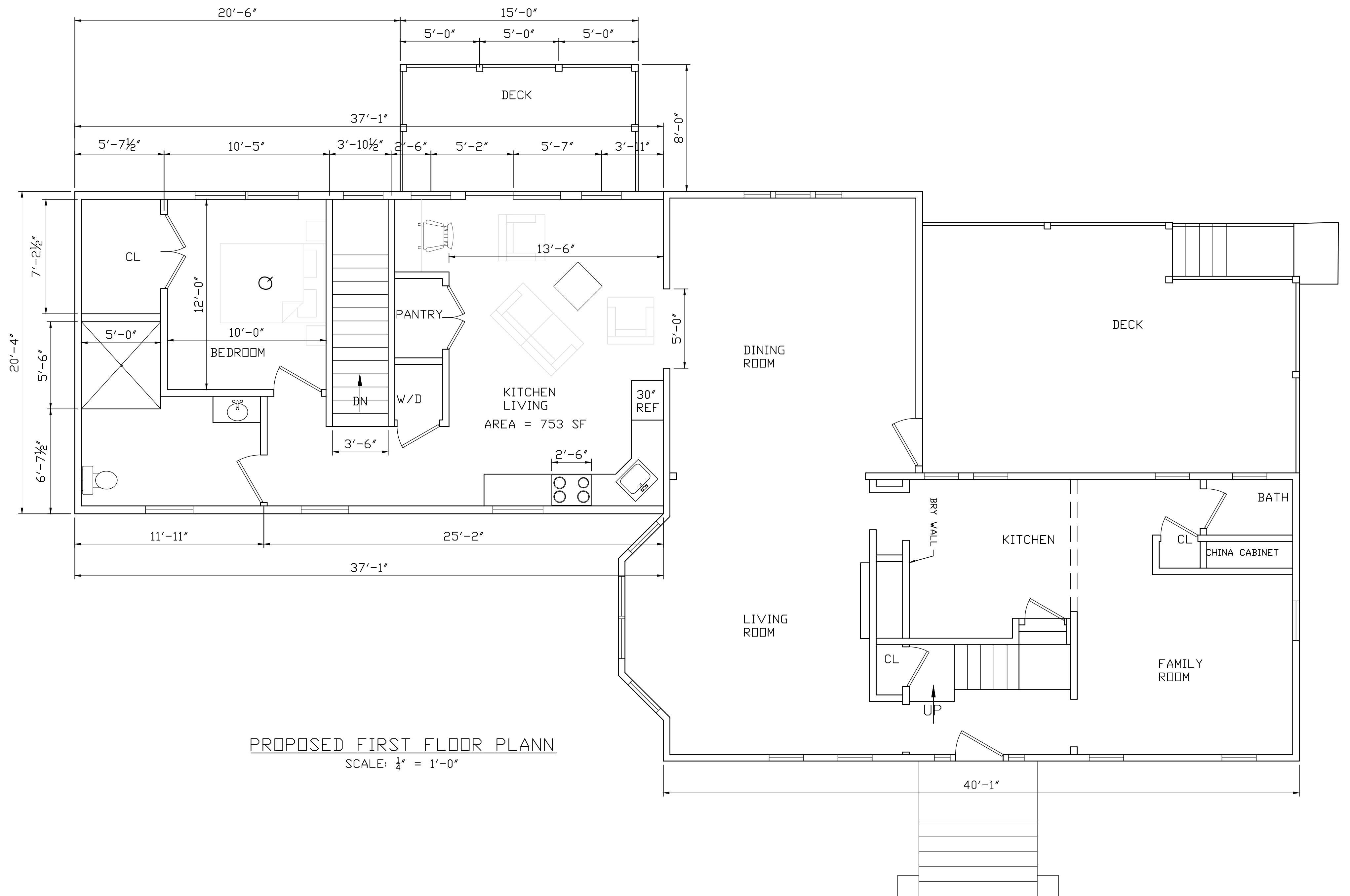
DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 4 OF 6

PROJECT TYPE
IN-LAW ADDITION RESIDENTIAL

PROJECT LOCATION
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

ISSUED FOR
ZONING REVIEW

<u>PLANS PREPARED BY</u> DESIGN BY SAMI LLC. 81 Oceanside Drive Scituate, MA 02066 617-460-1041 — Sami@designbysami.com	.tpe signed blue.tiff
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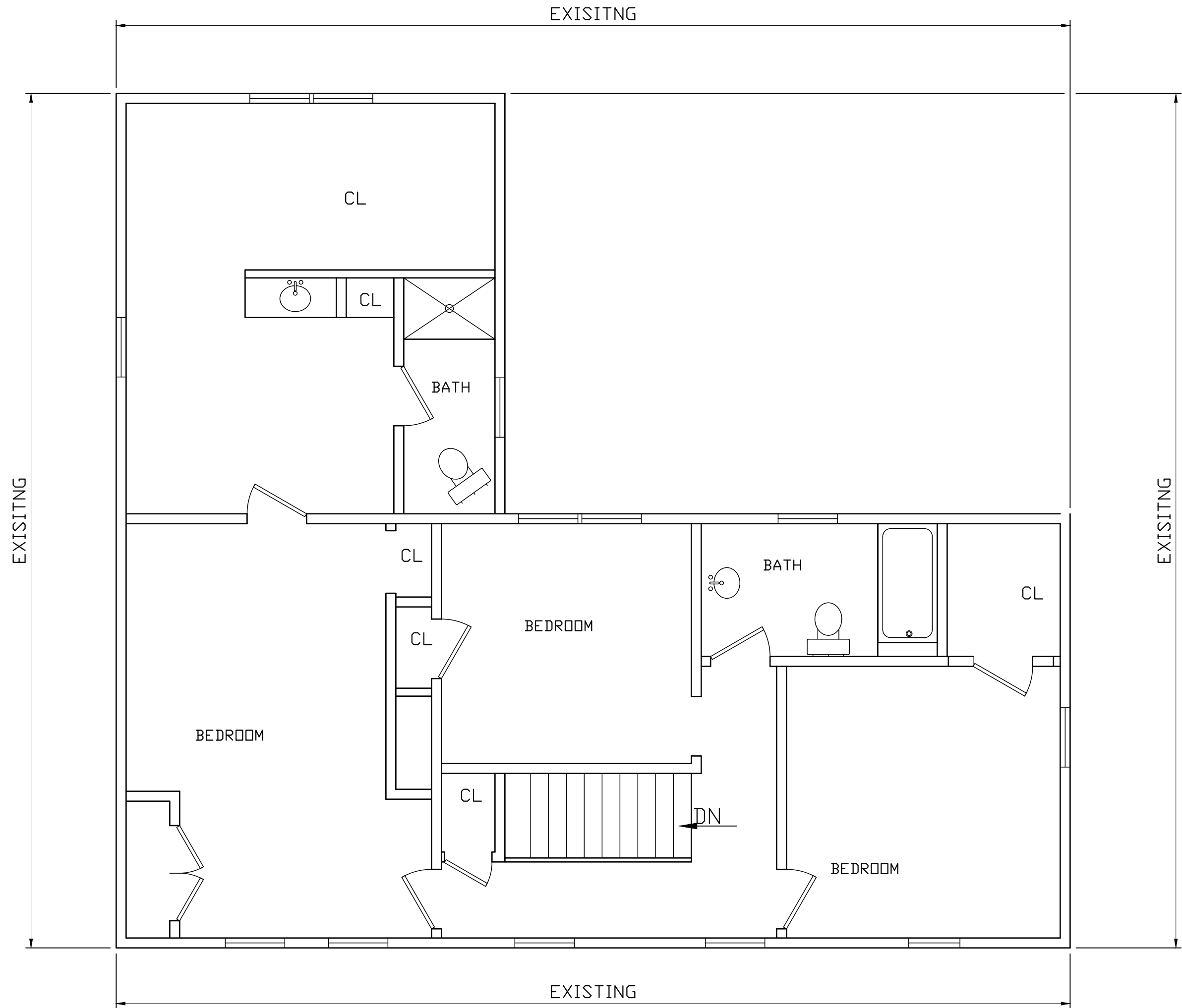
DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 5 OF 6

PROJECT TYPE
IN-LAW ADDITION RESIDENTIAL

PROJECT LOCATION
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

ISSUED FOR
ZONING REVIEW

PLANS PREPARED BY	
DESIGN BY SAMI LLC.	
81 Oceanside Drive Scituate, MA 02066 617-460-1041 - Sami@designbysami.com	
	.tpe signed blue.tiff



EXISTING SECOND FLOOR
(NO WORK PROPOSED)
SCALE: 1/4" = 1'-0"

DRAWN BY: SK
CHECKED: SK
DECEMBER 15, 2020
SHEET 6 OF 6

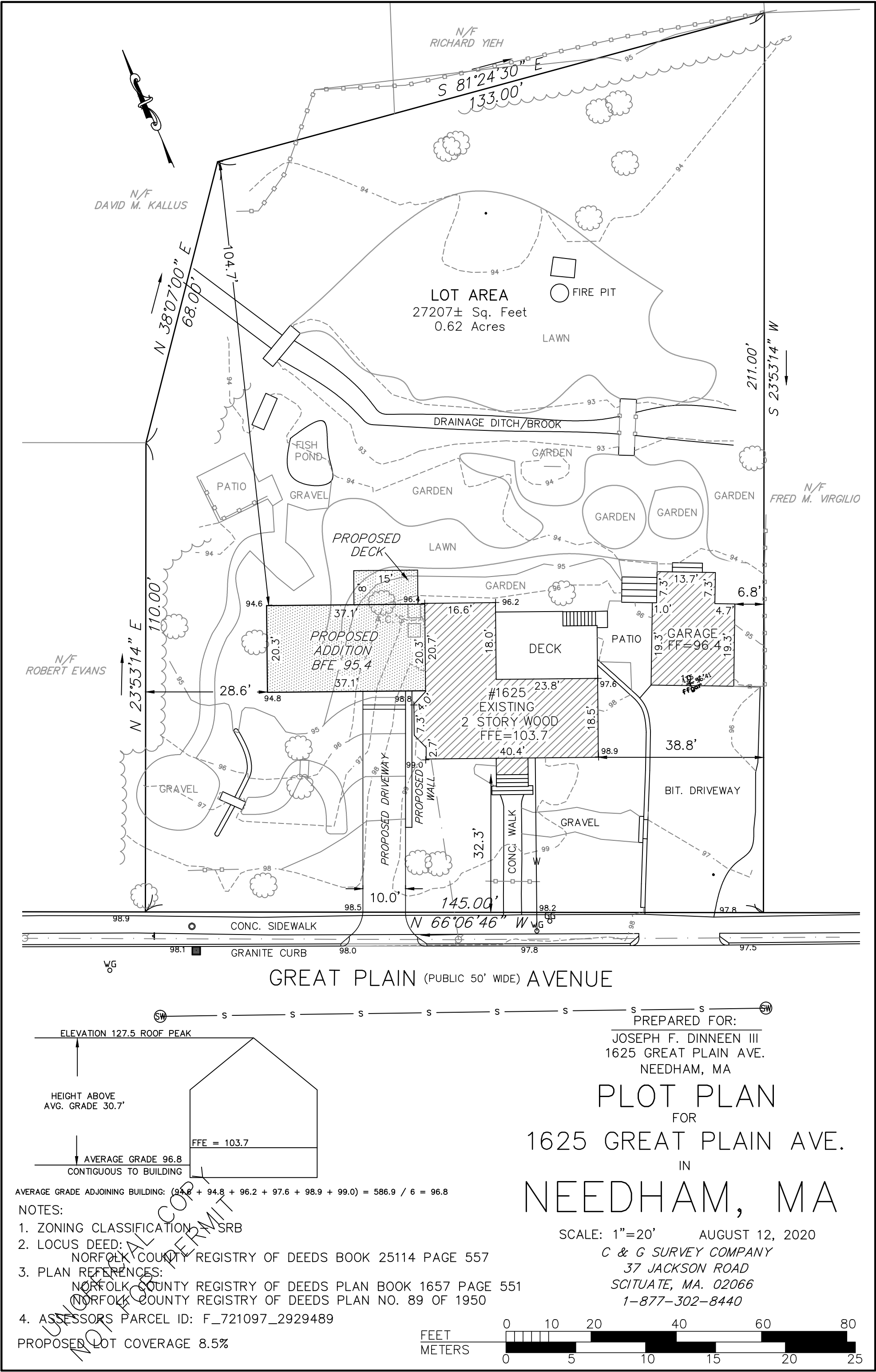
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PROJECT TYPE
IN-LAW ADDITION RESIDENTIAL

PROJECT LOCATION
1625 GREAT PLAIN AVENUE NEEDHAM, MA 02492

ISSUED FOR
ZONING REVIEW

PLANS PREPARED BY	
DESIGN BY SAMI LLC.	
81 Oceanside Drive Scituate, MA 02066 617-460-1041 - Sami@designbysami.com	
	.\\pe signed blue.tiff



AVERAGE GRADE ADJOINING BUILDING: $(94.6 + 94.8 + 96.2 + 97.6 + 98.9 + 99.0) = 586.9 / 6 = 96.8$

NOTES:

1. ZONING CLASSIFICATION: SRB
2. LOCUS DEED:
NORFOLK COUNTY REGISTRY OF DEEDS BOOK 25114 PAGE 557
3. PLAN REFERENCES:
NORFOLK COUNTY REGISTRY OF DEEDS PLAN BOOK 1657 PAGE 551
NORFOLK COUNTY REGISTRY OF DEEDS PLAN NO. 89 OF 1950
4. ASSESSORS PARCEL ID: F_721097_2929489

PROPOSED LOT COVERAGE 8.5%

SCALE: 1"=20' AUGUST 12, 2020

C & G SURVEY COMPANY
37 JACKSON ROAD
SCITUATE, MA. 02066
1-877-302-8440

FEET
METERS





TOWN OF NEEDHAM
MASSACHUSETTS
BOARD OF APPEALS

RECEIVED 16 JAN 01 PM
NEEDHAM, MA 02492
2021 FEB -5 PM 12:24

APPLICATION FOR HEARING

IT IS STRONGLY RECOMMENDED THAT APPLICANTS CONSULT WITH THE BUILDING INSPECTOR PRIOR TO FILING THIS APPLICATION.

Note: Application must be complete, with certified plot plan attached, and application fee included, or application will not be accepted.

Date: 1/12/21

Name of Applicant or Appellant: LAKSHMI BALACHANDRA + PATRICK STERN

Address: 86 PLYMOUTH RD
NEEDHAM, MA 02492

E-mail address: pstern42@gmail.com

Daytime telephone: 617 921 2143

Cell phone: ↑

Additional contact information, (ie: contractor ☐, architect ☐, builder ☐, attorney ☐):

Address/Location of Property 86 PLYMOUTH RD

Assessor map/parcel number Deed book 3/714 pg 452, Block 0006 on Map 31

Zone of property: SRB

Is property within 100 feet of wetlands, 200 ft. of stream or in flood plain? ☐ Yes ☒ No

Applicant is: ☒ owner ☐ tenant ☐ prospective tenant ☐ licensee ☐ prospective purchaser

Type of Permit requested: ☒ residential or ☐ commercial

If residential renovation, will renovation constitute "new construction"? ☒ yes ☐ no

If commercial, please consult with building inspector regarding parking issues

Select one: ☒ Special Permit ☐ Variance ☐ Comprehensive Permit, M.G. L Ch. 40B
☐ Amendment ☐ Appeal Building Inspector Decision*

*(For an appeal from decision of Building Inspector, attach copy of the decision or other written notice received from the Building Inspector.)

Existing Conditions: N/A New construction

Statement of relief sought: Requesting a Special Permit to allow for the inclusion of an ADA under all applicable use regulations stated in Zoning By-law 3.15.3

Applicable Section(s) of Zoning By-Law: Section 3.15 - the regulations: Accessory Dwelling Units (ADUs)

If application under Zoning Section 1.4, listed immediately above:

List nonconformities related to lot/structure(s) in application: N/A

Date structure(s) on lot constructed (including any additions): N/A

Date lot created:

N/A

A certified plot plan, prepared by a registered surveyor, must be attached to each of the thirteen (13) copies of this application at time of filing. Application will be returned if a copy of the plot plan is not attached to each application.

•Applications for Comprehensive permits under M.G.L. Ch. 40B require thirteen (13) copies of plot plan (two reduced to 8 ½ by 11), plus additional submissions.

Please feel free to attach any additional information/photos relative to the application.

Additional information may be requested by the Board at any time during the application or hearing process.

A hearing before the Board of Appeals, with reference to the above noted application or appeal, is requested by

Signed 

Title owner

Application Packets must be delivered to the Town Clerk's Office.



ADU – ZBA Special Permit Application

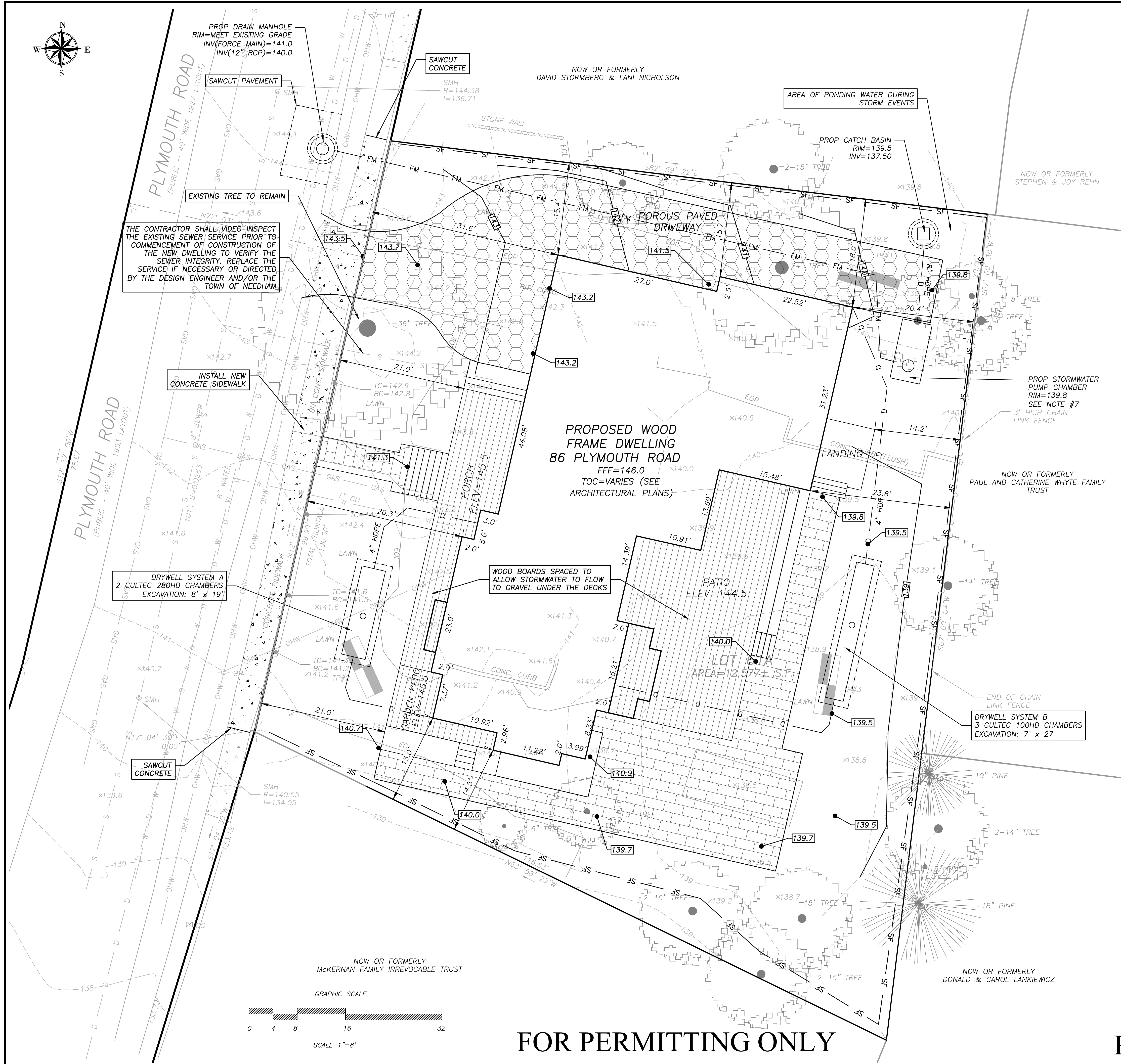
Owner's Name	LAKSHMI BALACHANDRA + PATRICK STERN			
Address	86 PLYMOUTH RD			
Phone	617.921.2143	E-mail	pstern42@gmail.com	
ADU's Resident Name	R. + SHARADA BALACHANDRA			
Phone	617 733 8834	E-mail	rbala184@gmail.com	
ADU Resident Relationship to Owner (Select one)	☐ spouse ☒ parent ☐ sibling ☐ child ☐ grandchild	Spouse of: ☐ parent ☐ sibling ☐ child ☐ grandchild	Child of: ☐ parent ☐ sibling ☐ child ☐ grandchild	☐ Caregiver. If caregiver, select type of caregiver: ☐ Elderly ☐ Chronically Ill ☐ Disable Owner
Total Occupants in Principal Dwelling Unit and ADU	7	Total Occupants not related to Owner (not to exceed five)	0	Owner to occupy: ☒ Principal Unit ☐ ADU

ADU Information

Map & Page ID	Deed Book 31714 Pg 452 Block 006 on Map 31	Zoning District	SRB
Size of ADU (not to exceed 850 sq. feet)	848 sq ft	Location of ADU: ☐ basement, ☐ attic, ☒ 1 st floor, ☐ 2 nd floor	
Does ADU have separate provisions for (ADU limited to one bedroom): Living ☒ Yes ☐ No; Sleeping ☒ Yes ☐ No; Cooking ☒ Yes ☐ No; Eating ☒ Yes ☐ No			
Number and location of Means of Egress: 1) exterior door to backyard 2) door to garage 3) door to 1 st dwelling			
Describe where the interior door access between ADU and Principal Dwelling Unit is? Door to ADU is off Main Stair Hallway between Entry Foyer and Garage Access			
Total number of off-street parking for Principal Dwelling Unit and ADU: 3			

I attest that the information in this application is true and accurate to the best of my knowledge and understanding:

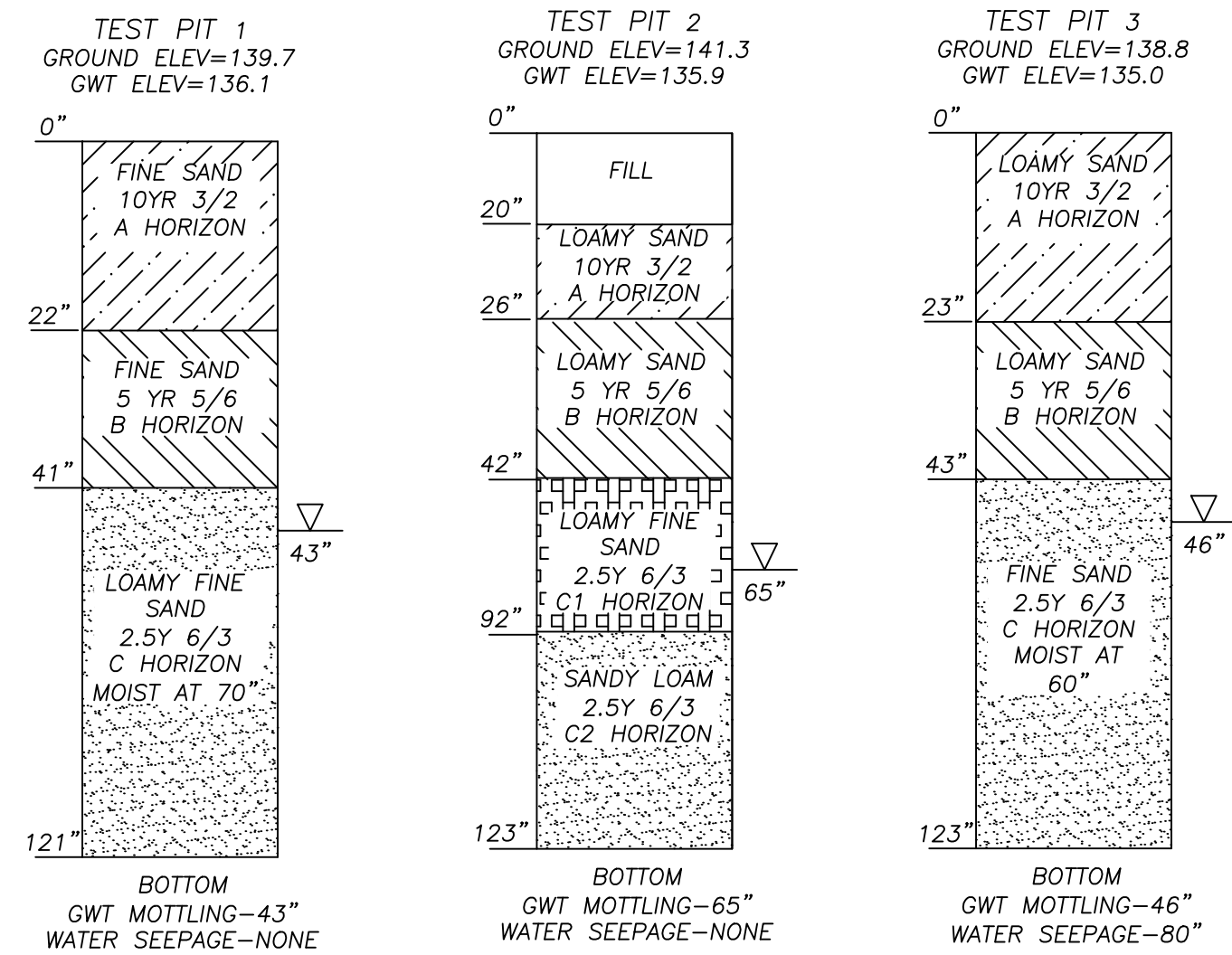
Owner's Signature/Date



- NOTES:**
- THE SOIL TESTING WAS PERFORMED BY EAGLEBROOK ENGINEERING & SURVEY, LLC ON SEPTEMBER 24, 2020, BY BENJAMIN MINNIX, A LICENSED SOIL EVALUATOR.
 - THE VERTICAL DATUM IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 19688 (NAVD88). THE DATUM WAS ESTABLISHED BY GPS OBSERVATIONS ON AUGUST 7, 2020 WITH A LEICA GS14 ANTENNA USING THE LEICA SMARTNET RTK NETWORK.
 - THE RECORD OWNER IS LAKSHMI BALACHANDRA AND PATRICK STERN. THE PROPERTY IS DESCRIBED IN DEED BOOK 31714, PAGE 452 AS RECORDED AT THE NORFOLK REGISTRY OF DEEDS.
 - THE PROPERTY IS DESCRIBED BY THE NEEDHAM ASSESSOR AS BLOCK 0006 ON MAP 31. THE PROPERTY IS LOCATED IN THE SINGLE RESIDENCE B (SRB) ZONING DISTRICT.
 - ALL OF THE ROOF RUNOFF WILL BE COLLECTED AND DISCHARGED TO THE DRYWELLS.
 - THE DESIGN OF THE STORMWATER SYSTEM AND THE PROPOSED DRAIN CONNECTION TO THE STORM DRAIN PIPE WITHIN PLYMOUTH ROAD MUST BE APPROVED BY THE NEEDHAM DEPARTMENT OF PUBLIC WORKS.
 - A GENERATOR SHOULD BE INSTALLED TO SUPPLY POWER TO THE PUMPS DURING ANY POWER OUTAGES.

LEGEND:

EXISTING	PROPOSED	
D	D	DRAIN LINE
W	FM	FORCE MAIN
S	SF	SILT FENCE
GAS		
OHV		
X142.5		SPOT ELEVATION
141		CONTOUR
TC		TOP CURB
BC		BOTTOM CURB
EOP		EDGE OF PAVEMENT
EOL		EDGE OF LAWN
BIT CONC		BITUMINOUS CONCRETE



STORMWATER CALCULATIONS:

ROOF AREA TO DRYWELL A:	1,472 SQUARE FEET
RUNOFF VOLUME (1" RAINFALL):	122.7 CUBIC FEET
ROOF AREA TO DRYWELL B:	2,205 SQUARE FEET
RUNOFF VOLUME (1" RAINFALL):	183.8 CUBIC FEET

I DECLARE TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION, AND BELIEF, TO THE NEEDHAM BUILDING INSPECTOR THAT THE PROPOSED DWELLING IS LOCATED ON THE PROPERTY AS DEPICTED ON THIS PLAN.



FOR EAGLEBROOK ENGINEERING & SURVEY, LLC DATE 11/24/20

EAGLEBROOK
EAGLEBROOK ENGINEERING & SURVEY, LLC
491 MAPLE STREET, SUITE 304
DANVERS, MASS. 01923
TEL: (978) 777-0494

86 PLYMOUTH ROAD
LOCATED IN
NEEDHAM, MASSACHUSETTS
PREPARED FOR
BECHTEL FRANK ERICKSON
1840 MASSACHUSETTS AVENUE
LEXINGTON, MA.

STAMP:

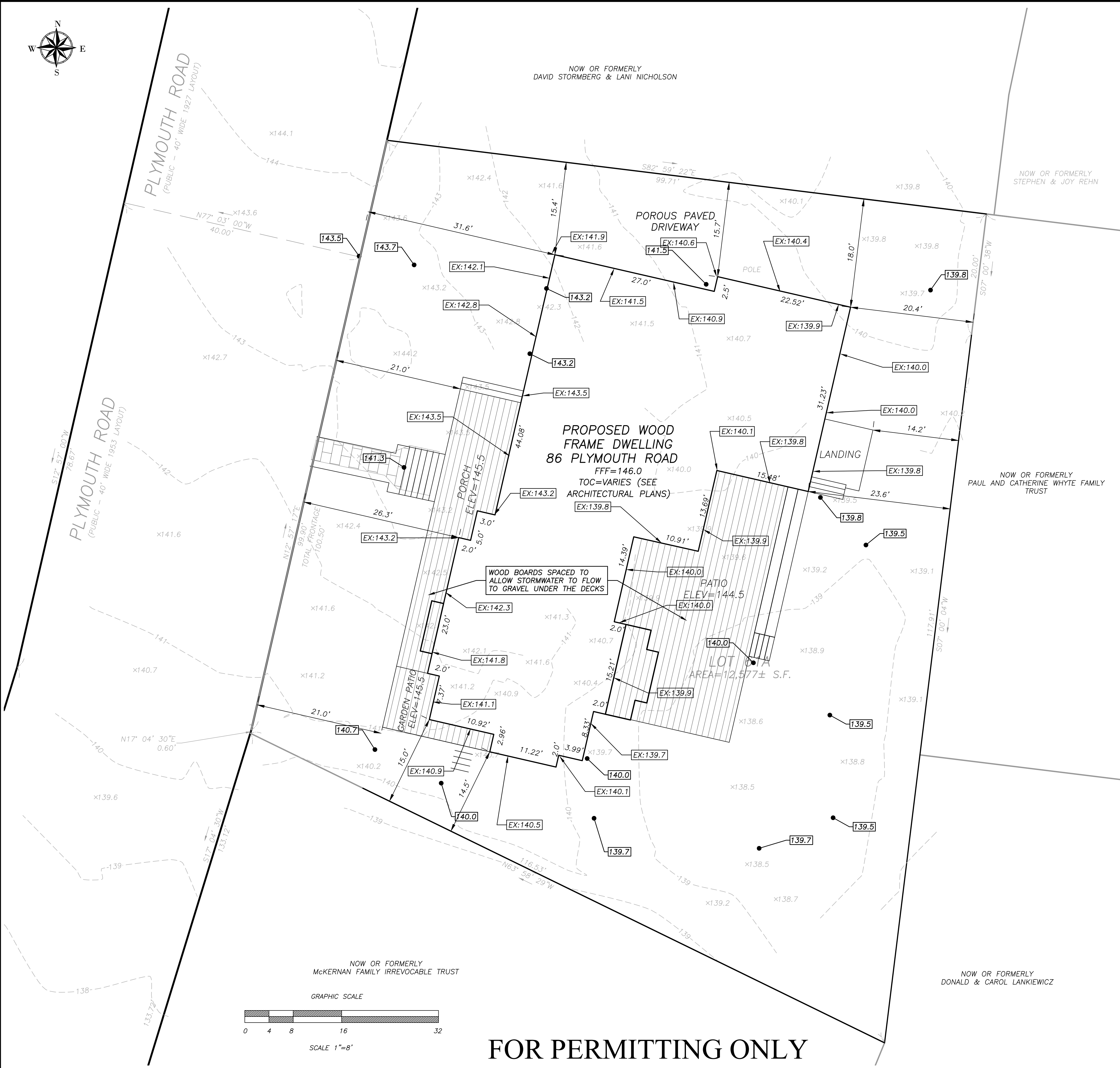
DATE:
OCTOBER 19, 2020

REVISIONS:			
3:	REMOVE POOL	1/15/21	DATE:
2:	POOL & DECK CHANGES	1/11/21	
1:	BUILDING PERMIT	11/24/20	
NO:	DESCRIPTION:		

DRAWN BY: MJJ
CHECKED BY: KCK
SCALE: AS NOTED

PROJECT NO. 20-024

TITLE:
SITE PLAN
C-2



AVERAGE GRADE PLAN
FLOOR AREA RATIO
LOT COVERAGE

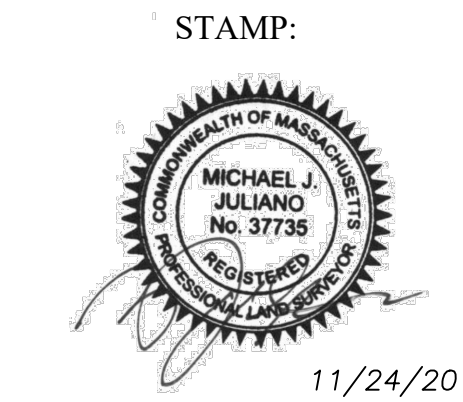


EAGLEBROOK

EAGLEBROOK ENGINEERING
& SURVEY, LLC

491 MAPLE STREET, SUITE 304
DANVERS, MASS. 01923
TEL: (978) 777-0494

86 PLYMOUTH ROAD
LOCATED IN
NEEDHAM, MASSACHUSETTS
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DATE:
OCTOBER 19, 2020

REVISIONS:

NO.	DESCRIPTION:	DATE:
3:	REMOVE POOL	11/15/21
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1:	BUILDING PERMIT	11/24/20
NO.		

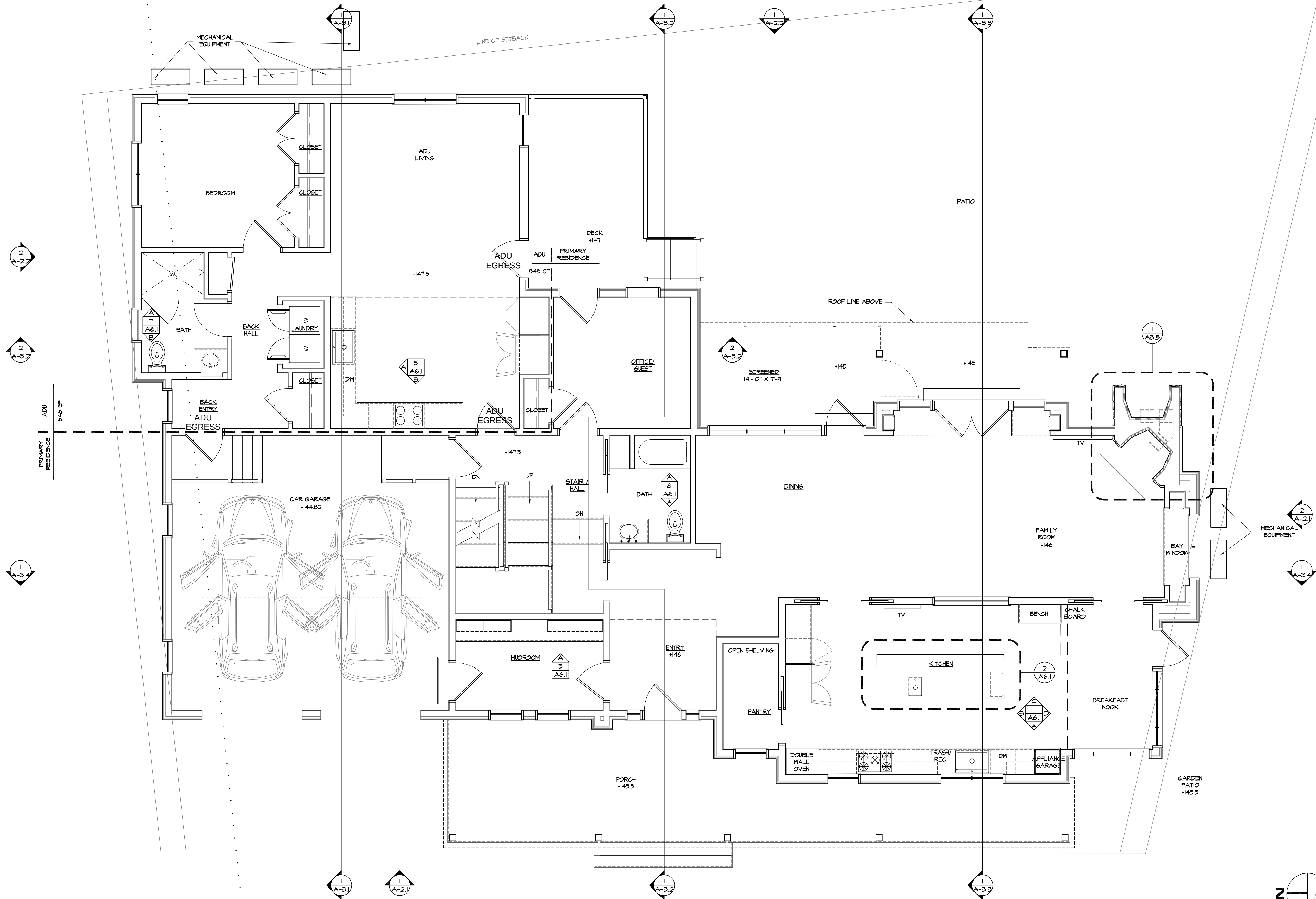
DRAWN BY: MJJ
CHECKED BY: KCK
SCALE: AS NOTED

PROJECT NO. 20-024

TITLE:
**PERMIT
PLAN**
C-5

SHEET No. 5 OF 5

S:\projects\2025\00_86_Plymouth_Rd_Needham\21_Drawing\Working Folder - CAD\A1- First & ADU.dwg - Sat 28/02/25 3:33 PM



1 FIRST FLOOR PLAN
1/4" = 1'-0"

86 PLYMOUTH RD.
NEEDHAM, MA

BECHTEL FRANK ERICKSON
ARCHITECTS, INC.
1840 MASSACHUSETTS AVE
LEXINGTON, MA 02420
(781) 662-3313
www.bfearc.com

1/15/21	ZBA HEARING - ADU
1/6/21	REVISED PERMIT SET
12/15/20	2 BULLETIN 2
11/16/20	PERMIT SET
11/4/20	1 BULLETIN 1
9/25/20	BID SET
8/28/20	INITIAL PRICING SET

ISSUANCES

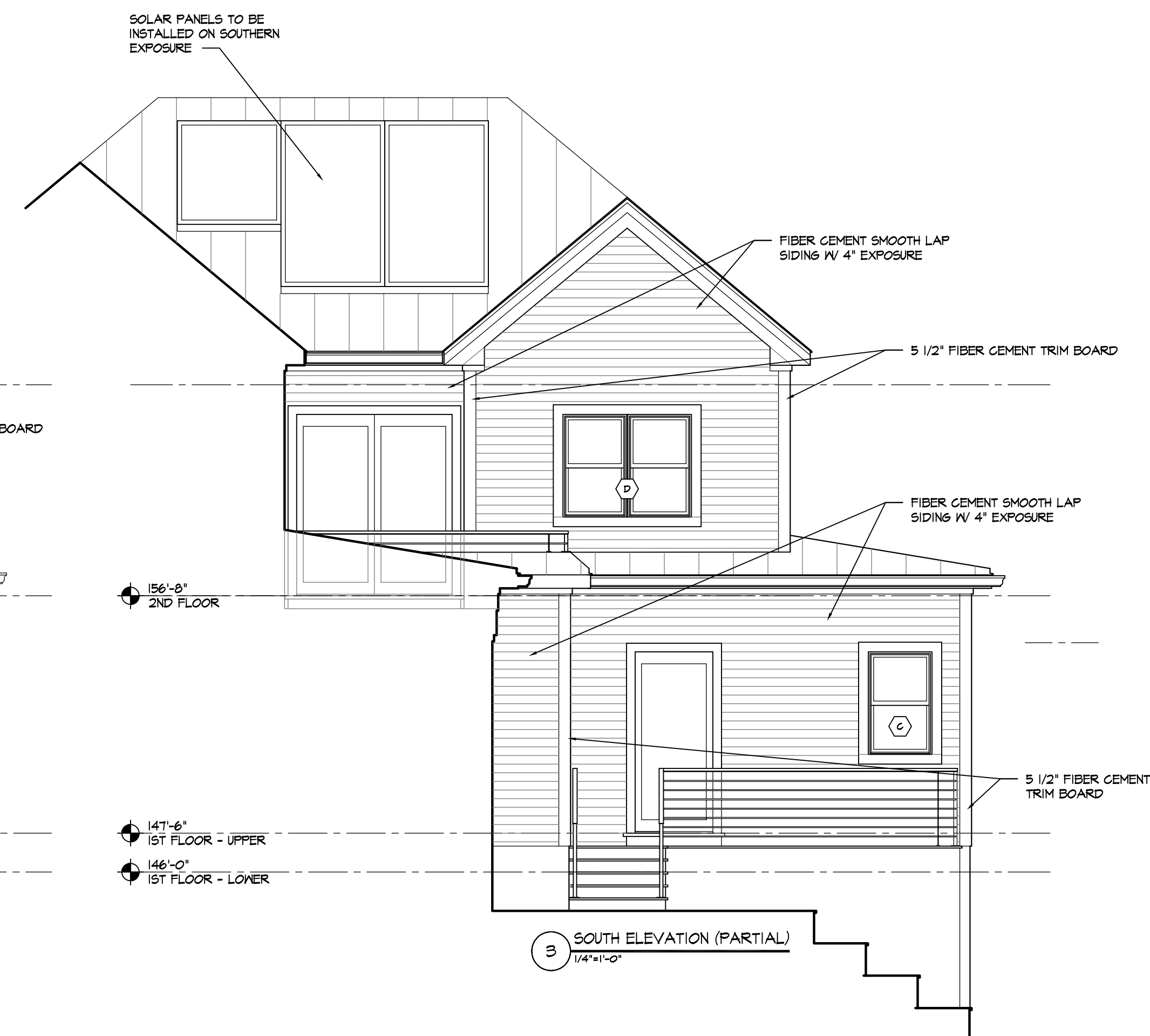
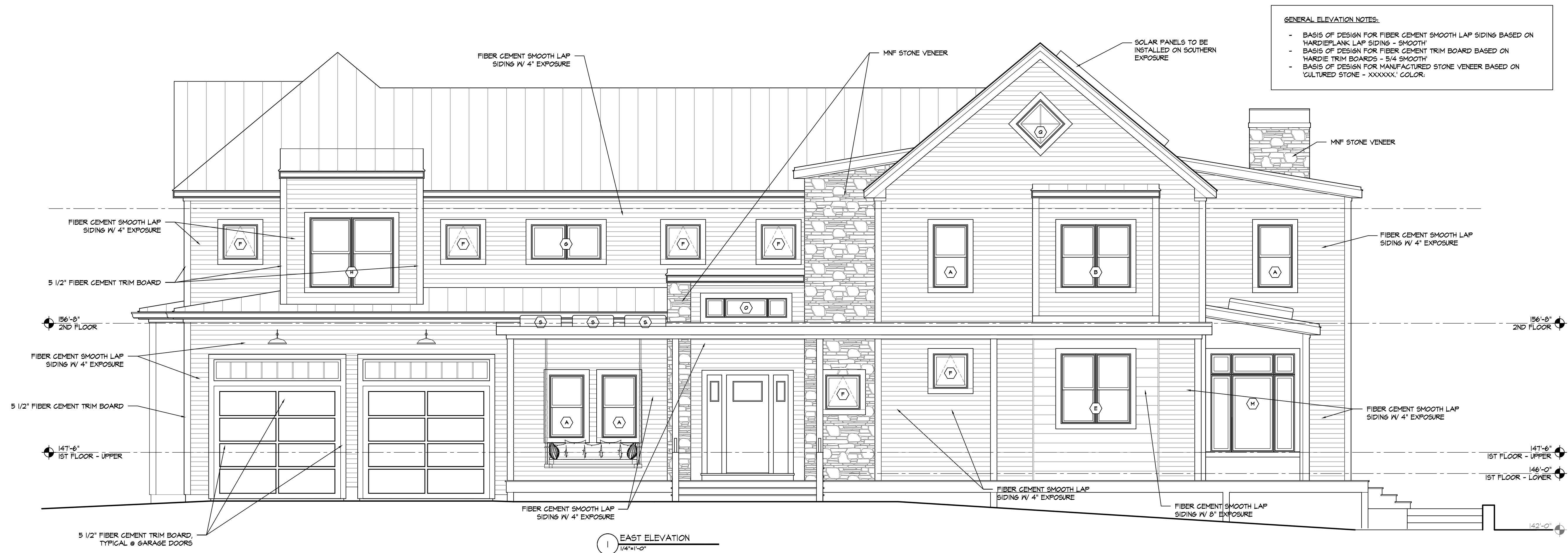
DRAWING TITLE
FIRST FLOOR
PLAN

DATE 04-25-2020

SCALE 1/4"=1'-0"

BFE PROJ No. 2005.00

A-1.1

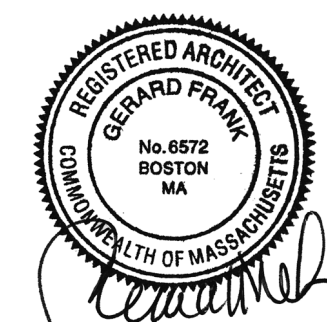


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1/28/21	CONSTRUCTION SET
1/6/21	REVISED PERMIT SET
12/15/20	 BULLETIN 2
11/16/20	PERMIT SET
11/4/20	BULLETIN 1
9/25/20	BID SET
8/28/20	INITIAL PRICING SET

ISSUANCES



DRAWING TITLE

EXTERIOR
ELEVATIONS

DATE 09-25-2020

SCALE 1/4"=1'-0"

BFE PROJ No. 2005.00

A-2.1

s:\projects\2025\00_86_Plymouth_Rd_Needham\2_Drawing\Working Folder - CAD\A-2 Elevations.dwg - Jan 28, 2021, 10:21 AM



1 WEST ELEVATION
1/4"=1'-0"



2 NORTH ELEVATION
1/4"=1'-0"

GENERAL ELEVATION NOTES:

- BASIS OF DESIGN FOR FIBER CEMENT SMOOTH LAP SIDING BASED ON 'HARDIEPLANK LAP SIDING - SMOOTH'
- BASIS OF DESIGN FOR FIBER CEMENT TRIM BOARD BASED ON 'HARDIE TRIM BOARDS - 5/4 SMOOTH'
- BASIS OF DESIGN FOR MANUFACTURED STONE VENEER BASED ON 'CULTURED STONE - XXXXXX', COLOR:

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1/28/21	CONSTRUCTION SET
1/6/21	REVISED PERMIT SET
12/15/20	2 BULLETIN 2
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ISSUANCES



DRAWING TITLE

EXTERIOR
ELEVATIONS

DATE 04-25-2020

SCALE 1/4"=1'-0"

BFE PROJ No. 2005.00

A-2.2

NEEDHAM PLANNING BOARD MINUTES

December 15, 2020

The Needham Planning Board Virtual Meeting using Zoom was remotely called to order by Jeanne McKnight, Chairman, on Tuesday, December 15, 2020, at 7:15 p.m. with Messrs. Jacobs, Alpert, Owens and Block, as well as Planning Director, Ms. Newman and Assistant Planner, Ms. Clee.

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 does include public hearings and will allow for public comment. If any votes are taken at the meeting the vote will be conducted by roll call.

De Minimus Change: Major Project Site Plan Special Permit No. 95-2: Zucchini Gold, LLC d/b/a The Rice Barn, 172 N. Main Street #9, Mansfield, MA 02048, Petitioner (Property located at 1037 Great Plain Avenue, Needham, MA).

Charles Intha, owner, stated his cash flow has been adversely impacted by the pandemic so he has looked at ways to generate more cash flow. He has decided to open in the morning. The business is close to the train station. He is not sure it would work but would like to try. In the morning he will have food like a coffee shop but will cook differently from the other coffee shops around. Ms. McKnight asked his current opening time. Mr. Intha stated he can open at 11:00 a.m. but opens at 11:30 a.m. Ms. McKnight noted this is a de minimus change and Mr. Intha is requesting a waiver of the \$250 application fee. There were no comments from members.

Mr. Intha stated he would like to change his application opening time from 7:00 a.m. to 6:00 a.m. Ms. Newman noted the town By-Laws allow a 6:00 a.m. opening time. Bakers Best and French Press both open at 6:00 a.m. Ms. Newman noted special permits are not needed for hours.

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 treat the application as a de minimus change and approve the application to amend the special permit to allow for opening at The Rice Barn at 6:00 a.m. for the same number of days allowed to open and to waive the \$250 filing fee.

A motion was made to approve the draft of the amendment to the decision to Site Plan Special Permit 95-2 with the single change to allow opening at 6:00 a.m. rather than 7:00 a.m. Mr. Alpert noted there was one typo. It should be Mr. Block rather than Mr. Eisenhut.

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 approve the draft of the amendment to the decision to Site Plan Special Permit 95-2 with the change to allow opening at 6:00 a.m. rather than 7:00 a.m. and the change from Mr. Eisenhut to Mr. Block.

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 automatically continue the meeting to 1/4/21 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:

7:20 p.m. – Major Project Site Plan Special Permit No. 2020-03: Hunnewell Street, 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).

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 waive the reading of the public hearing notice.

Ms. McKnight noted this is a request to build residential units and demolish the existing building. George Giunta Jr. noted this is in the Hillside Avenue Business District. It is mixed use with commercial and residential uses. The property is 20,123 square feet with 104 feet of frontage. There is currently a 2-story commercial building with parking and limited landscaping. The building is a 1975 concrete block building, 22 to 23 feet in height with 8,520 square feet of floor space. The property is just over the railroad bridge from Highland Avenue on the right side of Hunnewell Street. The building is 8 feet from the left property line and 20 feet from the street. The entire site will be razed. The proposal is to build a 2-story residential building, approximately 27 feet high from grade, with a lower-level garage accessed from the back. There will be 8 units with 2 bedrooms and 2 baths. Each unit will have a patio/balcony. The basement will have 16 parking spaces with small mechanical areas. ~~It is accessed by the back.~~ There will be lush landscaping all around the property.

Mr. Giunta Jr. noted this went before the Design Review Board (DRB) and was given the thumbs up. This is a similar project to next door at 154-156-160 Hillside Avenue that was built in approximately 2000-2001. That project demolished 2 residential structures and constructed 3 buildings with 8 units totaling 22,984 square feet. This project will be one building. This minimizes the impact and can be built on the existing footprint. He showed renderings and existing conditions. There is a shared right of way easement in the middle of 2 properties. The proposal maintains the right of way. He described the site. There will be 5 parking spots in the rear of the lot with 2 handicap spaces in ~~the front of the building's main entrance~~. The new building follows the footprint of the old building and all new development is on the inside of the property to almost square the building. There will be 16 parking spaces in the basement with 4 housing units on each level. The 2 levels will be mirror images with balconies and patios on the front and back. There are no balconies or patios on the sides. There is a handicap ramp on the ~~backside of~~ the main entrance, which is on the right side of the building.

Mr. Giunta Jr. noted a walkway runs along the building from the back to the right-side entry. He reviewed the landscaping. A lot of landscaping is being added especially along the front and side. There is also a proposed fence along the sideline. Mr. Alpert asked what the new waiver requests are. Mr. Giunta Jr. reviewed the special permit and waiver requests – special permit site plan review, apartment or multi-family use, underground parking not included in FAR and a parking waiver regarding design requirements. He noted accent lighting is being proposed. There will be provisions for refuse removal with dumpsters in the back corner that will be fenced in. There is a request for a waiver of a traffic study and with parking under the building there are some requirements that cannot be met. There are also waivers for illumination, landscaping and trees. Mr. Alpert asked him to explain the landscaping waiver. Mr. Giunta Jr. noted it relates to parking. There can be no landscaping inside the building and there are only 5 parking spaces outside with 2 handicap spaces. The project may meet the requirements if all landscaping counts.

Ms. McKnight asked for clarification as to whether the area in the abutting railroad right of way is zoned or unzoned. Ms. Newman will check and get back to the members. Ms. McKnight stated she does not think parking design requirements apply to underground parking. Ms. Newman stated the Board has not applied design requirements to parking inside buildings – just exterior parking. Mr. Alpert stated on the zoning map the railroad right of way is in the Residence B District. He asked whether, if a setback rule ~~it~~ applies, it can ~~it~~ be waived. Ms. Newman stated it cannot be waived. Mr. Alpert noted the request for lighting waiver in the underground garage. He is concerned with safety and asked if there needs to be better lighting at night. Mr. Giunta Jr. stated there are 5 parking spots outside with low level lighting. The request is for a waiver for a photometric plan being needed. He does not feel this warrants a full plan. The 16 spaces are entirely within the building and will have lighting. Mr. Alpert wants to make sure the illumination supplied is adequate at night for the safety of those using the parking. Mr. Giunta Jr. stated the lighting is adequate and it is the same waiver as was requested for underground parking on Oak Street.

Kent Duckham, Project Architect, noted the lighting plan has been sent. This came up during design review and it was sent to Mr. Giunta Jr. yesterday. There will be illuminated bollards right down to the ground from Hunnewell Street to the front (right-side) entry which has a small canopy. There are slip lights going back recessed into the

walls. The back (left-side) entry is also illuminated with 3-foot bollards. Blair Hines, Landscape Architect, noted the pathway in back has cast in place concrete steps and each step has a surface mounted light fixture on the tread. The whole path has a series of bollards on the fence side. The bollards follow the stepping stones out to the sidewalk. There is inset recessed lighting that goes along the wall to the garage entrance. The handicap ramp has a railing with bottom mounted LED fixtures that create a zig zag on the ramp. The handicap spaces have bollards that line the steps out to the sidewalk and soffit mounted lights over the doorways.

Mr. Block asked if all the lights are on all the time or if they are motion sensed. **Mr. Hines is not sure and will check on that.** Mr. Duckham stated all lights are lighting downward and will not glare. It is subtle lighting. Mr. Hines stated all lights are below the elevation of the fence. The fence will step down and will go from 6 feet to 4 feet. Mr. Alpert asked if there ~~will be~~ was too much parking. The requirement is for 1.5 spaces per unit for 12 spaces. The proposal is for 23 spaces. This is encouraging 2 or more cars per unit rather than trying to discourage cars. He asked if 7 spaces ~~are were~~ really needed outside. He noted landscaping could be added ~~where the parking spaces are now shown~~. He asked if there was space for a bicycle rack somewhere. Mr. Giunta Jr. stated the standard is usually 2 parking spaces per unit. These are 2-bed~~room~~ units so there would probably not be large families. The expectation is 2 cars per unit and there will need to be several guest spaces. There is no parking on Hunnewell Street. ~~Mr. Giunta~~He feels it makes sense to have extra spaces but he will defer to the applicants if they want to eliminate 2 spaces and maybe put in a bike rack. Mr. Duckham stated next door has a large parking area. He wants to deter people from using their parking. He stated there are really only 2 parking spaces that can be seen from any vantage point and there needs to be a place to put snow so the back spaces may be used for snow at times. The applicant is mindful of that.

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Mr. Jacobs stated he would like to get the information on whether the lights are on sensors or will be on all the time. He asked if Tara Gurge had any issues in her 12/10/20 letter and noted a 12/4 letter from 3 abutters at 160 Hillside Avenue. He asked if there was any response. Mr. Giunta Jr. stated he did not recall Ms. Gurge having any concerns. He noted the abutters are in the project next door in the building closest to this building. He noted that FAR is .7 and this is .69. The height of the building next door is 31 feet and this project is 27 feet, which is 8 feet lower than the 35 feet maximum height allowed in this district. This building is in keeping with the building there now and is well below the threshold allowed and lower than the neighboring building. He stated a shading study was done. Ms. McKnight would like that ~~formally~~ ~~eeet~~ submitted. Mr. Giunta Jr. showed the shading study. He noted the shade is not much more than the existing. He does not feel there is a significant impact and, if there is, it is relatively minor.

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Ms. McKnight noted the following correspondence for the record: a letter from Police Chief John Schlittler regarding a traffic-safety concern as to the proposed maple tree on the front corner and a letter from Tara Gurge, of the Health Department, dated 12/10/20 with comments and noting trash dumpsters and recycling. It was noted the maple tree will not be planted. Mr. Duckham stated the dumpster area could accommodate 2 small dumpsters. Mr. Jacobs noted the abutters' comment about the drainage being filled with debris. John Grenier, Project Engineer, stated the drainage structure was filled with leaves and debris. That is a current condition. It will be cleaned out so it functions properly if it is kept. Ms. McKnight noted the DRB letter, dated 12/7/20, with issues, including the slope of the driveway and entry to the garage and the lighting plan. The project was approved by the DRB in total as presented. There is also a letter from Assistant Town Engineer Thomas Ryder, dated 12/14/20, with comments, and a letter from the abutters. Mr. Block and Mr. Owens had no comments or questions.

Evelyn Adlerstein, of 210 Hillside Avenue, asked if the units were for sale or rentals. Dennis Cronin, Project Developer, stated the units will be sold as condos. Inga Puzikov, of 210 Hillside Avenue, stated she is a Trustee and owns a unit there. She does not live there. She feels this is very squishy. ~~It is not a Brighton area.~~—It gets unbearable. People use their parking lot now. She feels the Board should not encourage more traffic with more spots. There will be tons of cars. This is a mixed-use area and ~~the~~ 20,000 square feet ~~lot at 10,000~~—would allow one house. Special permits and reviews need to be taken into consideration. The Board should let people know who they can contact with concerns. No one has mentioned construction here. They have the train idling day and night behind them. A lot of elderly live there and they are tired. This will be very disruptive. There needs to be a traffic study. She warned the Board to be careful of what they grant and take into consideration the people who live nearby. A clean slate needs to be by the rules. A couple of bushes and a couple of trees do not make up for it. She noted their driveway is directly across from the project. If cars try to go out at the same time there will be accidents.

Mr. Giunta Jr. showed both buildings and a google map of the driveways. He noted construction hours are limited per the Town By-Laws. Noah Atlas, of 160 Hillside Avenue, noted the fence is 6 feet high. He asked how high

are the trees and bushes. He is concerned with lighting but more importantly the units would look right into each other. He asked if the developers have looked at that and if anything can be done to mitigate that. Rushit Kamani, of 160 Hillside Avenue, Unit 6, is concerned with the height. There are chimneys on top of the building and he asked if that was factored into the study. Bette Vogel, of 160 Hillside Avenue, Unit 8, stated there are major concerns. She disagrees with Mr. Giunta Jr. regarding shadow and light. She gets full light in the upstairs and into the rear. It is not shadowed currently. She is concerned with the height and patios and balconies. There is less area between the property line and the proposed building, and she will not get sun. She asked if the building could be moved 4 feet so they can get sun-shine. She noted her utilities will go up because there will be no sun to heat the unit during the day. She would like someone from the Planning Board or DRB to come to see them to see the current sunlighting.

Mark Lane, of 312 Webster Street, stated he is the property manager for the Hillside Avenue condos. They had an annual meeting last week regarding fencing, lighting, landscaping and dumpsters. These are the big issues. He needs more details. He would prefer not to see dumpsters and would prefer Toters trash carts inside. There are some good points such as there is not a sea of asphalt, less outdoor parking and more modern lighting. Mr. Giunta Jr. clarified the height of the building is 27 feet which is only about 4 or 5 feet higher than the existing building and lower than conventional designs. Mr. Duckham noted the building is 8 feet off the property line which is the same as the current building. The proposed buildings and the building at 160 Hillside Avenue are 16 feet away from each other. The current building is office and the new building is similar in use to the abutters. The shade study was done from an app. It does not take into account the height of the buildings. The shade is showing at ground level. The height is 27 feet and the balconies are in front and back. They are not on the sides. The balconies will be glass and steel and will not cast any shade. He noted the building cannot be moved due to the 20 foot setback limit. The building meets all requirements for driveway width and other requirements. The left side is exactly where the current building is. The landscape plan shows lush plantings. It is a very decorative planting scheme and the plan shows the plants and heights.

Mr. Hines stated there are examples of the fence, trees and plantings on the plan. Ms. McKnight suggested the applicant take time to meet with the abutters. Rhonda Altman, of 156 Hillside Avenue, Unit 4, stated she did not see any information on water flow. Is the ground level being raised in a way to impact them? Ms. McKnight stated there is a utility plan. Ms. Newman noted the storm water report. Mr. Giunta Jr. stated the storm water analysis went through Town Engineering Department review. It does not increase water flow off the property. Water will be captured into catch basins to the town system. Engineering had no concerns. Ms. McKnight confirmed that ~~noted~~ the report was reviewed by the Town Engineer and he had no issues.

Upon a motion made by Mr. Block, and seconded by Mr. Jacobs, it was by a roll call vote of the five members present unanimously:

VOTED: to continue the hearing to 1/4/21 at 7:30 p.m. and invite people to submit comments or questions to the Planning Director so the Board can review them and also invite them to attend the next meeting.

Mr. Owens left the meeting at 9:40 p.m.

7:40 pm. – 390 Grove Street Definitive Subdivision: Elisabeth Schmidt-Scheubr, 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 and November 4, 2020 Planning Board meetings.

Ms. McKnight noted this is a continued hearing. There are revised plans and a Stormwater Analysis and Calculation Report. She noted the following correspondence for the record: 2 letters, dated 11/23/20 and 12/8/20, from Attorney Gary Lilienthal, of Bernkopf Goodman LLP, representative for the abutters; a letter from Assistant Town Engineer Thomas Ryder, dated 12/14/20, with a request for more time to review and an engineering report from Robert Stetson of Bernkopf Goodman for the abutters.

Mr. Giunta Jr., representative for the applicant, noted the applicant provided this is an as-of-right plan that establishes how many lots could be created by a subdivision plan requiring no waivers by right. The roadway has changed a bit and now has a conforming rounding. Parcel A is expanded to include the storm water infiltration system. Additional soil testing has been done and the lotting plan keeps the curve coming in a 20 foot radius rounding. Waivers are no longer needed. Parcel A is the same. David Kelly, Project Engineer, noted the infiltration system is completely in Parcel A. Soil test pits were done to establish ground water levels and the system was done

accordingly. The cul-del-sac was modified slightly to accommodate the changes. Utilities have been relabeled and modified.

Mr. Giunta Jr. stated some notes were put on the plan. Instead of a roadway, a driveway will serve the house in back. He addressed the concerns of the abutters. The abutters claim Parcel A cannot be created. There is no evidence it cannot be done. The ~~abutter's~~ attorney gave irrelevant cases. Nothing in the law says you cannot create a non-buildable parcel. In fact you can. The Board has authorized this type of thing including a 10 foot strip for Heather Lane and the creation of a 10 foot strip of land with the Woodworth Road subdivision. The Board should continue to apply past policy and process as long as ~~the parcels~~ they are clearly identified and labeled on the plan. The abutters' attorney stated that the curve violates Section 3.3.4. That is a gross misreading of the application and does not apply at all. Section 3.3.3 applies and the curve follows the rules. The sidewalk ~~on the as-of-right plan~~ would be right up against the ~~neighbors~~ neighbor's property ~~a waiver~~ but does not apply. Needham Engineering has not completed their review. He would hold off at this point addressing the other concerns if the meeting is to be continued.

Mr. Lilienthal stated they will wait. He disagrees with Mr. Giunta Jr.'s summary regarding the parcel. There is well-verified law on this. The parcel serves ~~no~~ no distinct purpose other than to separate Lot 1 from Grove Street to keep it from being a corner lot. The Heather Lane reference is faulty. There are things yet to be resolved with this plan. He feels a decision should deny this. ~~Mr. Giunta Jr. notes a slippery slope but they have put together a very cultured document.~~ Karlis Skulte, of Civil & Environmental Consultants, Inc. CEC, speaking on behalf of the ~~abutters~~, read the criteria regarding corner lots and street jogs. This refers to street jogs less than 30 feet. A number of items came up with discrepancies, and additional work needs to be done on the engineering side. Ms. Newman noted the action deadline is at the end of January. This should be continued to the end of February and continue the hearing to 1/4/21 or 1/19/21. Mr. Giunta Jr. stated he has no objection to extending the action deadline. He would like the hearing sooner than the 19th if possible. Mr. Lilienthal asked if it would be the first item on the agenda and was informed it would be at 7:30 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 continue the hearing to 1/19/21 at 7:30 p.m. and accept Mr. Giunta Jr.'s request to extend the action deadline to the end of February.

Ms. Newman noted she will need the written request for the extension this week to record with the Town Clerk.

8:00 p.m. – Amendment to Major Project Site Plan Special Permit No. 2012-07: The Children's Hospital Corporation c/o Boston Children's Hospital, 300 Longwood Avenue, Boston, MA, Petitioner (Property located at 66 B Street, 360 First Avenue, 410 First Avenue and 37 A Street, Needham, MA). Regarding request of to building out development for Children's Hospital (see legal notice for more info). Please note: this hearing is a continuation from November 17, 2020.

Ms. McKnight noted this is a continued hearing. There is a slight concern that Assistant Planner Alexandra Clee discovered. The legal notice references a Special Permit needed under Site Plan Review under a Major Project. The notice did not say a Special Permit for use. The notice did refer to the application for people to see and ~~the use issue that~~ was clear. Her opinion is the discrepancy does not render the notice deficient. She wanted all to know the issue. She stated there is additional information regarding the traffic review.

~~Applicant's attorney~~ Timothy Sullivan, of Goulston & Storrs, stated a lot was covered last time. They are left with traffic and the questions that BETA raised. Ms. Newman stated the waste-water needs to be determined - whether this will be done themselves or with a contribution to the Town fund. Jaklyn Centracchio, of BETA, responded to the outstanding comments. Comment 1 was why the remaining intersection volumes were not included in future volume diagrams. The response is the data was collected for trip generation of the existing ~~office~~ park. A post-occupancy study will be conducted.

Comment 2 was consideration should be given to a raised crosswalk between Garage B to 360 First Avenue. This is currently under study and will be included into the design if feasible, or other safety measures will be looked into. Comment 10 was the full build plans do not show a 3-way stop at the New Way/Founders Drive intersection. The applicant has agreed to do that and it will be included in the design plans. Comment 23 was the signal timing and phasing adjustment. The applicant has agreed to retain a signal contractor to make an appropriate one-time

adjustment to the signal timing and phasing at Kendrick Street and Third Avenue within 6 months after the Building Permit issuance.

Comment 26 is the intersection improvements at Third and Kendrick to mitigate the impact to the intersection. The applicant has offered \$30,000 and the question was how the contribution was determined. They feel the amount is sufficient to implement Audible Pedestrian Signals (APS) at the intersection. Comment 28 was to consider realigning the overhead signal head to improve safety at Kendrick and Third Avenue. The hospital will make a one-time signal head adjustment within 6 months after Building Permit issuance. Sean Manning, of VHB, noted the traffic mitigation. At Kendrick and Third they plan to adjust the timing and phasing. There are currently 2 lanes and right turn indicators can be added. The signal head adjustment will make it easier to see and will improve pedestrian safety. The applicant is committed to a full Traffic Signal Warrant Analysis and Road Safety Audit at Kendrick and Fourth. They will meet with Mass. DOT and the Town to determine what would be best for the intersection over the long run. That would be considered down the road with no impact on the 380 First Avenue project.

Mr. Manning stated an ~~annual~~ parking monitoring program will be conducted annually one year after the Certificate of Occupancy for 380 First Avenue. Transportation Demand Program (TDP) Measures are continuing and ongoing. The applicant will provide a shuttle service, 50% transit pass subsidy, emergency rides home and bicycle and walking amenities among other measures. Mr. Jacobs stated he is quite satisfied with the mitigations. Mr. Alpert agreed. Ms. McKnight noted the following correspondence for the record: a letter, dated 12/14/20, from Assistant Town Engineer Thomas Ryder regarding the Traffic Peer Review and Sewage Flow Comparison, with comments, and the Transportation Impact agreement with findings from BETA and VHB. Mr. Sullivan stated this project was previously approved. There are 3 pads left. 380 First Avenue will be built first, then 2 offices. 380 First Avenue will not exceed mitigation already provided. There should be a condition prior to moving forward with the next ~~phase that~~ there either be a payment made or do a sewer inflow mitigation project acceptable to the Town Engineer. Mr. Jacobs asked if that proposal was consistent with what the Town Engineer says. Ms. Newman would need to speak with the Town Engineer to see if this is acceptable. This is the only outstanding issue.

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 with the one exception of getting input from the Town with regard to the proposal on timing of a Sewer Inflow Mitigation payment or work done.

Ms. Newman noted this will be on the 1/4/21 agenda at 7:15 p.m. for the decision.

Highway Commercial 1 Rezoning and Planning Study: Review of Work Program.

Ms. Newman stated she had hoped to have Natasha Espada's proposal tonight but did not get it yet. It is in the form of the framework the Board wanted. She reviewed the framework. There will be site plans with aerial perspectives and street perspectives. She stated she had put together a tentative schedule. Zoning is due to the Selectmen at the end of March. There is the possibility of a community meeting on 2/3/21 but ~~it~~ the schedule will be very tight. Once they get the drawings, there would be a meeting in mid-January, the community meeting on 2/3/21 and zoning in by 3/16/21. The question is how to use the time period from January to the end of February. She has not received confirmation from Ms. Espada yet if she can do this. There would need to be the drawings by 1/8/21, a 1/14/21 Planning Board meeting and a 2/3/21 community meeting.

Mr. Block feels the Needham Heights Neighborhood Association (NHNA) would welcome hosting the community meeting in a ~~zoom~~ model. He will speak with others on the NHNA Board to see if anyone would Chair the meeting. Ms. Newman stated the Planning Board would have to host the meeting if the NHNA cannot do it. She explained the process and asked if there was anything to be gained from a community meeting. Would other issues come up that did not come up at the earlier meeting? Mr. Block asked if the League of Women Voters would consider hosting if he cannot get anyone from the Board to host. Ms. McKnight will check but feels it would be hard to do. Ms. Newman noted the Town Manager told her to plan for a May Town Meeting.

Ms. McKnight noted one question out there that needs to be resolved is if housing is going to be included or not. There needs to be community involvement for that. Mr. Block feels both options should be presented but he tends to favor office and research and development. Residential could be an option but not included in the zoning. Ms.

Newman stated it could be in the zoning but with further information it could be taken out. Mr. Alpert sees the community meeting as a way to let the towns-people know they were heard and the Board has addressed their concerns. There does not need to be a full blown presentation. Just a short presentation to let people know they have heard the concerns, here is what we have come up with, and have a traffic study and summary done with conclusions. It should be 10 minutes tops. The Board needs to make a decision on including residential and needs to have that discussion on 1/14.

Ms. McKnight stated it would seem to be better as a Planning Board sponsored meeting. A discussion ensued. Mr. Alpert asked if the NHNA would be able to help get information out to the neighbors. He is concerned with people who live in that neighborhood. They need to be satisfied the project is something they can be satisfied with. Mr. Block stated there should be support from the Select Board and Finance Committee. Ms. Newman stated she could invite them to the Planning Board meeting along with Ms. Espada so they can hear it. Mr. Jacobs reiterated he feels there should be a community meeting. At ~~athe~~ formal ~~noticed~~ hearing the focus ~~will be~~ is on language. He wants to know if they got it right. He feels there is great value in a community meeting. Ms. McKnight stated if a community meeting ~~is feasible, could be put together~~ there should be one ~~if feasible~~. Three members see value in it, Mr. Block is doubtful and Mr. Owens is against it. She would like a consensus. Mr. Block ~~stated~~ stated if the Board agrees he would go along with it. He will confer with the NHNA to see if someone would open and close the meeting. He will notice their membership and publicize the meeting.

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 adjourn the meeting at 11:31 p.m.

Respectfully submitted,
Donna J. Kalinowski, Notetaker

Paul Alpert, Vice-Chairman and Clerk

NEEDHAM PLANNING BOARD MINUTES

January 4, 2021

The Needham Planning Board Virtual Meeting using Zoom was remotely called to order by Jeanne McKnight, Chairman, on Monday, January 4, 2021, at 7:15 p.m. with Messrs. Jacobs, Alpert, Owens and Block, as well as Planning Director, Ms. Newman and Assistant Planner, Ms. Clee.

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 does include public hearings and will allow for public comment. If any votes are taken at the meeting the vote will be conducted by roll call.

Public Hearing:

7:15 p.m. – Amendment to Major Project Site Plan Special Permit No. 2012-07: The Children's Hospital Corporation c/o Boston Children's Hospital, 300 Longwood Avenue, Boston, MA, Petitioner (Property located at 66 B Street, 360 First Avenue, 410 First Avenue and 37 A Street, Needham, MA). Regarding request of to building out development for Children's Hospital (see legal notice for more info). Please note: this hearing is a continuation from November 17, 2020 and December 15, 2020 meetings of the Planning Board.

Ms. McKnight noted the following correspondence for the record: a letter from Gerald Topping, Sr. Project Manager, to Town Engineer Anthony DelGaizo, dated 12/16/20, proposing additional Inflow and Infiltration of wastewater (I&I) mitigation; a 12/21/20 response from Town Engineer DelGaizo with a response from Planning Director Lee Newman; a 12/29/20 letter from Timothy Sullivan, Attorney for Children's Hospital, stating the hospital proposes to comply with the removal of I&I with a payment of \$132,000. She noted this is what the Board was waiting for. All members are satisfied.

Ms. McKnight asked if what was proposed was ~~an~~ addition to Garage B. Mr. Sullivan stated an addition to Garage B will be completed. When Garage A goes forward an elevator lobby will be added, which changes the façade a bit.

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 close the hearing.

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 automatically continue the meeting to 1/4/21 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.

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 authorize the Vice-Chairman to continue the meeting if the Chairman has technical difficulties.

Ms. Newman asked if Mr. Owens had been able to listen to the tape of the last meeting and was informed he had listened to it.

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 grant the requested amendment to a Special Permit and Major Project Site Plan Review under Section 7.4 of this By-Law; to approve the Plan as described in this Amendment; to approve the

detailed plans of Building 1, together with associated landscaping and other site improvements as shown on the Plan; and to approve the Interim Conditions Site Plan of the Project as shown on the phasing plan described as Sheet 21 of Exhibit 5 of this Amendment; the requested Special Permit under Section 3.2.4.2 (j) and Article II of the Board Rules for a Pediatric Medical Facility Use in the New England Business Center District; the requested Special Permit pursuant to Section 4.8.3 to waive the requirements of Section 4.8.1 (6) to permit the façade of Garage A to exceed 300 feet of uninterrupted façade length by increasing the length of the uninterrupted facade from 315 feet to 337 feet; the requested Amendment to replace the previously governing plan (Exhibit 6 of the January 6, 2015 Decision) with the Plan attached hereto as Exhibit 5; the requested Amendment to reallocate 34,491 square feet from Building 4 to Building 1; the requested Amendment to Section 3.9 of the Existing Special Permit to reflect the change in proposed use and subsequent changes to buildout plans and parking; the requested Amendment to Section 3.11 of the Existing Special Permit to reflect the change in use from office to Pediatric Medical Facility in Building 1; the requested Amendment to Section 3.38 of the Existing Special Permit to reflect the change in proposed use and current design of Building 1; the requested Amendment to Section 4.6 of the Existing Special Permit to extend the date for commencement of construction of the Project and subsequent construction of later phases from November 13, 2022 to December 31, 2029; the requested Amendment to the Existing Special Permit to extend relief previously generated to allow for uninterrupted façade length in excess of 300 feet to apply to the 337 ~~B-fooeet~~ proposed for Garage A; the requested clarification noting that the Existing Special Permit is separate and distinct from the special permit previously granted for Center 128 East, and in granting the relief requested that the Board expressly finds that the amendment of Existing Special Permit shall not be construed as an amendment or modification to the special permit granted previously for Center 128 East; and the request that in the unlikely event the Plan is approved by the Board, but the Petitioner's purchase of the remaining development rights for the Proposed Development does not occur on or before March 31, 2021; that the Existing Special Permit shall, upon the written election of the Property Owner delivered to the Board no later than July 1, 2021, remain in full force and effect without modification, with the following exceptions: 1) the termination date of the Existing Special Permit shall become December 31, 2029, unless further extensions are granted and 2) the requested special permit to grant the uninterrupted façade length of Garage A from 315 feet to 337 feet shall continue to be in force and effect.

Ms. Newman noted several typos, which include on page 2, at the top, it should be 1/4/2021; there should be a “:” after the first paragraph after the findings on page 4; on page 8, in 1.16, last sentence, the word “which” should be inserted; on page 15, Section 3.9, the extra “of” should be deleted; on page 16, under Design Guidelines, Section 3.10, paragraph 3, should say “prior concept plan” for Building 1. It should note the prior concept plan that was approved for Building 1 shall serve as a general template for Buildings 2 and 4, which is about 35% opaque, 60 to 70% precast concrete with the remainder metal, wood, glass fiber and such to be used as part of wall or wall systems. Synthetic stucco EIS is prohibited. These are the principles that were agreed to.

Mr. Alpert stated he is satisfied the comments have been addressed. Mr. Jacobs noted in Section 1.19, 2nd sentence, it seems the sentence ends awkwardly. He suggested it should be “would continue to be so connected.” Ms. McKnight stated the lighting in Garage B was very bright. She complained and then the lighting was changed so it was not as bright and glaring. She wants something regarding the lighting that it would not be any brighter than the current lighting in Garage B. She does not want that to be an issue again. Mr. Alpert stated a requirement was already in the Special Permit and this decision is modifying that Special Permit. Mr. Sullivan noted the applicant intends to light it the same way as now. He will work with Ms. Newman to incorporate the language.

Mr. Alpert noted on page 18, Section 4.1 (b) the original language has since been changed from “the Petitioner shall report to the Board” to “the Petitioner shall, in response to a written request from the Board.” This is shifting the burden of initiating a report onto the Planning Staff. This should stay the obligation of the hospital. He asked if the hospital was ok with 2 years. He would consider lengthening that period if 2 years is too short. Mr. Sullivan

commented the hospital would like the time frame to be larger. It could be 2 years following the permanent issuance of the Certificate of Occupancy. Mr. Alpert is ok with that change.

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 the decision with the red line changes proposed by the Petitioner and further changes discussed at this meeting.

Lisa Hogerty, Sr. Vice President for Real Estate, thanked the Board for all the guidance. The Board is a professional Board supported by professional staff. They look forward to coming to Needham.

7:30 p.m. – Major Project Site Plan Special Permit No. 2020-03: Hunnewell Street, 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 meeting of the Planning Board.

Ms. McKnight noted revised plans were submitted late. She has not seen them yet. The Board has not had a chance to review them. Ms. Newman is in agreement to continue the hearing to 1/19/21 at 8:15 p.m.

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 continue the hearing to 1/19/21 at 8:15 p.m.

Inga Puzikov, Trustee of an abutter, wants to understand the project better. She would like to speak with a Planning Board member to understand. Ms. McKnight suggested she contact George Giunta Jr., representative for the applicant. Ms. Puzikov stated she spoke with Mr. Giunta Jr. and he dismissed her. Ms. Newman stated she would be happy to speak with her. Mr. Alpert suggested Ms. Puzikov send Ms. Newman an email and copy Ms. Clee. If ~~she~~Ms. Puzikov has comments they can be forwarded to the Board members.

De Minimus Change: Amendment to Major Project Site Plan Review No. 2013-02: Town of Needham, 1471 Highland Avenue, Needham, Massachusetts, Petitioner (Property located at 1407 Central Avenue, Needham, MA). (Proposal for staff to report to building during Covid 19 state of emergency).

Town Counsel Christopher Heep noted this is a minor modification of the Jack Cogswell Seasonal Storage Facility on Central Avenue. The building has been completed and is in active use. The building was not to be staffed and is mainly storage for seasonal equipment out of use. It is a special permit condition that it is not to be staffed. Due to Covid 19, the DPW has the need to space out the employees beyond headquarters. This building has been identified as a place staff could report to work and work from on a temporary basis for the duration of the emergency only. Sixteen employees are to report and work from here when the weather is inclement. Most employees work outside during the work day. He noted the request is temporary. The applicant is requesting it expire after the lifting of the state of emergency and the condition will fall back to the original special permit.

Mr. Block stated he supports the effort. He asked, if the building was constructed without the intent to house employees, are any modifications needed such as heating, refrigeration, and meeting rooms. Mr. Heep stated there is enough interior space to accommodate the employees. Carys Lustig, Interim Director of Public Works, stated it was largely maintenance work. The heat is sufficient and there is no need to air-condition the space. Mr. Heep stated the facility will comply with all codes. Mr. Jacobs asked if there will be 16 cars parked there throughout the day and was informed there would be. He asked how many cars were parked there now. Mr. Heep stated there are 3 spaces permitted there. There is a large area that can accommodate a number of cars. Cars can also park across the street at the athletic field.

Mr. Jacobs stated there is a condition that all vehicles would be parked inside. Mr. Heep does not recall anything regarding personal vehicles. That may refer to public vehicles. Mr. Jacobs asked if the site can accommodate 16

cars. Ms. Lustig believes it can. Ms. McKnight noted the decision says Claxton Field will be used if more than 3 cars. Mr. Jacobs is all for it but sees a potential problem. The applicant needs to let people know that if parking is abused they will be asked to come back to the Board. Mr. Alpert stated employees parking at Claxton Field need to know the speed limit is 40 there and should be careful crossing Central Avenue. He noted the expiration date of 30 days after the lifting could be extended. Mr. Heep would like to have it extended to 60 days. All agreed.

Mr. Heep noted the decision as drafted seems to be 3 spaces. He wants to clarify 3 striped spaces plus additional parking area. He would like to modify this to allow additional parking to the extent it can be safely done. Ms. Newman stated it could be done as a plan modification, have Engineering lay out how the parking will be laid out on the site and how people will park in that area. Mr. Jacobs stated he witnessed some town vehicles are out in the open and not under cover. Some spaces now used for these vehicles may be taken up by town employees. Ms. Lustig noted some are under cover and some are out. Mr. Jacobs stated that is a violation of the permit. Mr. Heep will go through the original conditions in the permit. Mr. Alpert noted Section 2.0 under Plan Modifications. Ms. Newman will draft the language but it should say "or plans shall be modified to show use of additional parking on site as approved by the Planning Director." This was agreed.

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 treat the property change as requested as minor in nature not requiring public notice.

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 grant the requested modification to Major Project Site Plan Special Permit No. 2013-02.

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 approve the decision as drafted with the modifications discussed this evening.

Highway Commercial 1 Rezoning and Planning Study: Review of Work Program.

Ms. Newman stated there was a working group meeting this morning which included Ms. McKnight, Mr. Alpert, Mark Gluesing, Select Board Chair Marianne Cooley and Natasha Espada and her staff. Urban design plans have been developed for the zoning proposal with existing conditions showingwith a warehouse and proposed showingwith commercial and residential. There was an opportunity to look at the drawings that Natasha has done so far and review all views from all angles. It was a productive meeting. The Team will put together drawings and there will be another meeting on Wednesday. Mr. Block will be included as he is presenting. The Planning Board will review next week.

Mr. Block asked if there were any suggested changes by people there. Ms. Newman noted Ms. Cooley suggested doing a perspective drawing of what the building would look like getting off the highway. That is not part of the contract and she is working with Natasha on that. The property was shown in a larger ~~retail~~ context this time. It is important to show in a larger context. Natasha has been able to import this into GIS. She thinks the Board will be pleased. Ms. McKnight stated Natasha suggested lowering the height ~~for~~ further along Highland Avenue. Mr. Alpert noted she suggested eliminating higher buildings along Highland Avenue and the exit ramp and moving ~~itthem~~ further into the Muzi parking lot. Mr. Block thinks this is great and takes into account the feedback from the residents. He asked if the timing of the schedule has changed at all. Ms. Newman noted she is trying to keep this on schedule.

Mr. Block discussed the community meeting. The Planning Board will host the meeting and the Needham Heights Neighborhood Association will help market the event. He spoke with most members and all agreed to utilize their platform to help promote the meeting. Ms. Newman asked what the goal of the meeting iswas. Ms. McKnight stated the message to residents is that the Board heard them. There were meetings last year and the Board has responded to the concerns raised. They want to show the changes that have been made. Mr. Block stated one worry

is that it may be fine to set out the residential uses and others ~~uses~~ and not limit it; ~~the~~ the Board should let the market decide that. Ms. McKnight stated they Board should go in proposing all such uses.

Mr. Block stated he heard lower the density and reconfigure the placement of the buildings. He proposes the type of uses be left to the market. Residential may not make sense as there is no public transportation there currently. Ms. Newman stated there is a bus line relatively close that could be rethought. Mr. Alpert asked if there is a cap on the number of units. He assumes a cap of 240 the same as Mixed Use 128. With that cap residential probably would not be built unless it is a mixed use project. Ms. Newman stated 240 units with retail on the first floor could be done. Mr. Alpert stated they need to encourage commercial for town revenue. Ms. Newman stated there will be a fiscal impact study done, and she expects that. ~~The~~ the town would see a revenue loss by adding residential.

Mr. Jacobs agreed with Mr. Block that they should let the market decide. He has heard lab space is in great demand. He asked if something close to 100% lab space should be modeled. Ms. Newman noted office space and lab space are interchangeable. A discussion ensued. Mr. Block proposed the zoning be as flexible as possible. Mr. Alpert noted they should allow research and development, commercial, retail, residential with a possible cap and all mixed uses for all potential uses. Ms. Newman stated the goal is to get the information out Friday or Saturday to members for their meeting on 1/14/21 at 7:15 p.m. The community meeting/workshop will be 2/3/21 at 7:00 p.m.

Board of Appeals – January 21, 2021

Needham Enterprises, LLC – 460 Central Avenue

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: “No comment.”

Nader and Ronda Sidhom – 16 Edwardel Road

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: “No comment.”

Minutes

Ms. McKnight has prepared a red lined version of the 10/20/20 minutes. Mr. Jacobs noted on the bottom of page 2, it speaks about the gate on Dedham Avenue. He asked if there were any updates. Ms. Newman does not have any information but will follow up.

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 accept the minutes of 10/20/20 with the changes suggested by Ms. McKnight.

Ms. McKnight noted on the 11/18/20 minutes, top of page 2, Ms. Browns looked at where people were coming from... and the trip generation came out the same as each. She does not know what “each” is. Ms. Newman suggested adding “each of these categories.”

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 accept the minutes of 11/18/20 with the change suggested by Ms. McKnight.

Correspondence

Ms. Newman stated the only correspondence was on the Highway Commercial 1 and that has already been gone through. Ms. McKnight showed a spreadsheet she had created. She is meeting with a working group called ~~Equi~~Equal Justice Needham. She feels she is a resource for them. Some zones that allow multi-family housing or mixed-use have development have no affordable housing requirement. The overlay districts generally require affordable housing units. She has highlighted in yellow the zones where multi-family is allowed by Special Permit but there is no affordable requirements. She feels something should be put in the Avery Square District and also the Chestnut Street Business District. She feels there should be some affordability in those mixed use districts and also Hillside Avenue. It is a simple fix and she feels it should be made consistent throughout the town. She asked if other members had any thoughts.

Mr. Alpert asked why apartment zones are not included. Ms. McKnight commented these zones~~some~~ are already fully developed with apartment buildings. Mr. Alpert stated if it is a townwide requirement it cannot hurt to put it in and grandfather the existing buildings. Ms. Newman stated some towns are asking that units be created or a donation be made to the town for developments within their single-family residential zones~~developments~~. A discussion ensued. It was decided to work up something along the lines of an amendment to the zoning districts and approach the Select Board to let them know the Planning Board is considering this. Ms. Newman noted the Town did a housing plan years ago and there should be a revision to that housing plan.

Report from Planning Director and Board members

Mr. Block stated he had a question about Grove Street. Ms. Newman stated that has been continued to 1/19/21. She had a meeting with Engineering and the Developers engineers. They went through the list of comments and they will be addressed. There will be revised drawings and responses to the questions raised by abutters.

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 adjourn the meeting at 9:35 p.m.

Respectfully submitted,
Donna J. Kalinowski, Notetaker

Paul Alpert, Vice-Chairman and Clerk

NEEDHAM PLANNING BOARD MINUTES

January 14, 2021

The Needham Planning Board Virtual Meeting using Zoom was remotely called to order by Jeanne McKnight, Chairman, on Thursday, January 14, 2021, at 8:30 a.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 does not include public hearings and will not allow for public comment. If any votes are taken at the meeting the vote will be conducted by roll call.

Highway Commercial 1 Rezoning and Planning Study: Review of Urban Design Plan, Discussion of Next Steps and Project Schedule.

Ms. McKnight noted all information is on the website. Ms. Newman introduced the work that has been done. This is a follow up to the previous Town Meeting where a number of issues and concerns had come up. There have been meetings to come up with issues the community had and they have tried to address those. This is to better understand the visual impact ~~of on~~ the property.

Upon a motion made by Mr. Block, and seconded by Mr. Jacobs, it was by a roll call vote of the five members present unanimously:

VOTED: to automatically continue the meeting to 1/19/21 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.

Natasha Espada, of Studio ENEE, showed the site divided into Site 1 and Site 2. Site 1 is the Channel 5 portion and Site 2 is the Muzi portion. She reviewed the planning effort to date and gave a summary of existing conditions. The existing zoning FAR is .5 with commercial use/warehouse. The ~~proposed~~ as-of-right FAR is 1.0 with 2 options. Option 1 is commercial use and option 2 is mixed use of commercial and residential. The Special Permit zoning has an FAR of 1.35 with 2 options. Option 1 is commercial use and option 2 is mixed use with commercial and residential. She ~~focused on~~ analyzed the overall analysis of Needham and looked at density in town. They looked at the amenities corridor along Chestnut Street and Highland Avenue and at transportation. There is no public transportation ~~serving this site~~ there. They should look at how transportation ~~could~~ can impact the site in a better way.

Ms. Espada stated most buildings in the amenities corridor are 2 story and create an edge. They are intertwined with some houses. ~~The precedent is to have the zone continue into that site.~~ She noted there is an existing By-Law, the previous proposal and the new proposal. The FAR has decreased and the height remains at 70 feet but the setback is decreased. The minimum lot area remains, lot frontage remains and lot coverage will be 65%. Traffic mitigation is to be paid for by the developer. Ms. Newman stated the use profile needs to be added to the chart under the new proposal. Ms. Espada will work with Ms. Newman and Mr. Block to verify the spreadsheet. The amenities corridor disintegrates now as it gets to the site. The Muzi site has 454,150 square feet with 757 parking spaces. The Channel 5 site has 205,375 with 343 required parking spaces.

Mr. Block stated between Sites 1 and 2 is a parcel of land. Ms. Espada noted that is part of the Channel 5 site. Mr. Jacobs asked if the parking requirement can be shown on the table. Ms. Espada stated she will show that and will document what is existing. She looked at a one story warehouse use and how many parking spaces would be needed. At .35, and one story, with 140 spaces this exceeds the size of some buildings across Rte. 128/95 ~~the highway~~. Ms. McKnight asked what the building next to the warehouse on the drawings is ~~was~~. Ms. Espada stated that was ~~is~~ the Muzi Ford building. She wanted to show existing conditions but will pPhoto-shop it out. Mr. Jacobs

feels she should show the warehouse with and without the existing buildings. Mr. Block commented they should consider only showing warehouse use if someone asks; otherwise, -It could be considered a scare tactic. Ms. Espada commented what the gateway could look like under current zoning by right needs to be shown. Ms. Newman stated this shows the scale of a building now allowed by right. Mr. Alpert does not want people to focus on that. He wants them to focus on what the Planning Board vision is.

Ms. Espada suggested saying a warehouse half the size of the site could be built and she will show that if asked. She will move it to the back of the presentation. For the as-of-right proposed zoning plan, she recommends that 200 feet from Gould Street and about the same from Highland Avenue, with should be an FAR of 1.0. There would be 685 parking spaces on the Channel 5 site with 205,000 square feet and 1,513 parking spaces on the Muzi site with 454,000 square feet. She feels there should be 20% open space. Corporate office could be 42%, research and development at 42% and retail at 15%. Ms. Newman stated the depth of the setback along Highland Avenue has been increased from the original proposal. She showed renderings of 42-foot-high and 70-foot-high buildings and different scenarios. A "P" should be added on top of parking. Housing is to be shown going against across from residential neighborhoods and research and development and commercial have been pushed farther into the site. The Special Permit could have an FAR of 1.35 and 866,000 square feet. She stated they are not designing a building but just showing the scale.

Mr. Owens stated he agrees with Mr. Alpert this is excellent work. They are 85% of the way there. There were a variety of comments regarding slides that need to be added. He would suggest going into the 2/3/21 meeting with the final version. The purpose is to present the vision and what the Board feels it should look like. A full hour will be spent going through this. He expects there will be comments. He suggests the Board meet again next Thursday morning and review the next version of this. His personal opinion is this gateway site w should not be used as a gateway site for housing. He is not sure about letting the market decide. The job as the Planning Board is to do the zoning but he would apply flexibility for the developer.

Mr. Alpert stated he disagrees with Mr. Owens. The Board's job is to create not only zoning but zoning with a vision. Mr. Owens agrees they go together. Ms. Newman will see if GPI can be part of the meeting next Thursday. GPI is working on the fiscal impact. The Board spoke of the agenda and timing. It will be a 90-minute meeting with 60 minutes of presentation and 30 minutes for questions. Mr. Owens asked if it was true to include residential would mean less beneficial fiscal impact than commercial and was informed that was true. Ms. McKnight assumes there will be an affordability requirement for multi-family housing. She expects the impact on the schools would not be a terrible impact. A discussion ensued regarding the peak for different uses.

Mr. Jacobs asked what Ms. Espada would like to see different and if there are any flaws she sees. Ms. Espada commented this has come a long way. She would like to see an urban edge created along the front rather than a parking lot with buildings in the back. They should find a way to encourage keeping the corner an urban edge that is of scale and appropriate for Highland Avenue. Mr. Owens left the meeting at 9:30 a.m.

Mr. Block stated he likes the idea of creating an urban edge. It keeps the continuity of what is there now. The Board should make it a mandate if that is what the Board members want. His other comment is that it is uncommon in the for mixed use to have residential and lab or residential and commercial. The Board should give that some thought. The amenities of one use may be different for other uses such as lab space as opposed to seniors. Ms. McKnight stated there would be a cap on the number of residential units. Mr. Alpert agrees with the concept of an urban edge but he is not sure how to mandate it in the Zoning By-Law. It is too much getting into the weeds at this point. Only the scale of the buildings are being shown at this point.

Mr. Jacobs noted Mr. Block raises some good issues but the issues are for the developer and not the Board. He commented the word "edge" should be used rather than "urban." Ms. Newman discussed strategies and FARs. The Board wants people to use the Special Permit process and not the as of right. Mr. Alpert suggested they might want to go to .8 or .85 FAR by special permit. Ms. Espada stated that is a big change. She would need to recalculate everything. Mr. Alpert suggested leaving it at 1.0 but saying at the meeting the Planning Board is considering changing to a lower number. Having a low density takes away their vision. Ms. Espada noted she sent some

examples of sustainable zoning that other towns are doing. Somerville and Cambridge are leaders in sustainable zoning.

Select Board Chair Marianne Cooley stated she was thinking about the notion of a lower by-right FAR. She feels the change should not be made. It creates a lot of artificial work. A discussion ensued. It was decided the slide with the satellite view and the historic sites slides were not needed. Ms. McKnight likes the concept of the amenities slide but it is out of date. Mr. Jacobs likes the amenities slide and it could be said it was out of date. Mr. Block noted the amenities could be pointed out when showing the spine slide. Ms. McKnight feels the total acreage for the parcels should be shown. She summarized the following changes that had been discussed: all the views from Gould Street should make it clear they are toward Highland Avenue; get rid of the black box that is the existing Muzi building; add "P" to parking; and change the green retail color to another color as it conflicts with can't be distinguished from the greenery. Ms. Espada will make the changes by next Thursday. She will emphasize the continuation of the spine and edge.

Minutes

The Board will deal with these at the next meeting.

Ms. Newman stated the as-of-right height could also be dropped to create base conditions. Ms. Espada would recommend changing height rather than FAR. With a change in height you keep some of the density. The heights could be one story less and would require developers to get a Special Permit. Ms. Cooley stated she is in favor of looking at height rather than FAR. Ms. Espada will come down to 2 stories in the front and 4 stories in back. She will see how much she can get done for Thursday. Mr. Block would like to invite Ms. Cooley to the meeting next week. Ms. Cooley asked what is the by-right height in Needham Crossing and was informed it is was 54 feet and 4 stories. Mr. Alpert does not think that is relevant to this site; ~~the~~ the Board has a different vision for this site.

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:

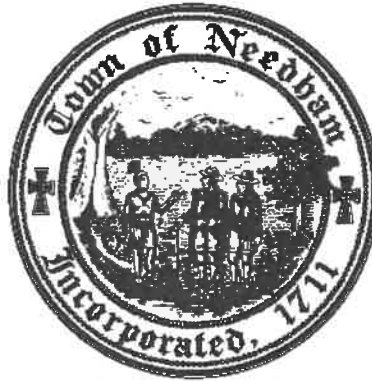
VOTED: to adjourn the meeting at 10:07 a.m.

Respectfully submitted,
Donna J. Kalinowski, Notetaker

Paul Alpert, Vice-Chairman and Clerk

TOWN OF NEEDHAM

Office of the Town Clerk



BY-LAWS

Approved By the Attorney General

Special Town Meeting
October 4, 2020

February 4, 2021



THE COMMONWEALTH OF MASSACHUSETTS
OFFICE OF THE ATTORNEY GENERAL

2021 FEB -4 AM 11:04
CENTRAL MASSACHUSETTS DIVISION
10 MECHANIC STREET, SUITE 301
WORCESTER, MA 01608

MAURA HEALEY
ATTORNEY GENERAL

(508) 792-7600
(508) 795-1991 fax
www.mass.gov/ago

February 4, 2021

Theodora K. Eaton, Town Clerk
Town of Needham
1471 Highland Avenue
Needham, MA 02492

**RE: Needham Special Town Meeting of October 4, 2020 - Case # 9951
Warrant Articles # 6 and 7 (Zoning)**

Dear Ms. Eaton:

Articles 6 and 7 - We approve Articles 6 and 7, and the map amendments adopted under Article 7, from the October 4, 2020, Needham Special Town Meeting. We will send the approved map to you by regular mail.

Note: Pursuant to G.L. c. 40, § 32, neither general nor zoning by-laws take effect unless the Town has first satisfied the posting/publishing requirements of that statute. Once this statutory duty is fulfilled, (1) general by-laws and amendments take effect on the date these posting and publishing requirements are satisfied unless a later effective date is prescribed in the by-law, and (2) zoning by-laws and amendments are deemed to have taken effect from the date they were approved by the Town Meeting, unless a later effective date is prescribed in the by-law.

MAURA HEALEY
ATTORNEY GENERAL

Kelli E. Gunagan

by: Kelli E. Gunagan, Assistant Attorney General
Municipal Law Unit
Office of the Attorney General
Ten Mechanic Street, Suite 301
Worcester, MA 01608
508-792-7600

cc: Town Counsel Christopher H. Heep

Received
2021

TOWN CLERK
February 4, 2021

NEEDHAM
11:04



Theodora K. Eaton, MMC
Town Clerk

TOWN OF NEEDHAM

Office of the Town Clerk

1471 Highland Avenue, Needham, MA 02492-0909

Telephone (781) 455-7500 x216

Fax (781) 449-1246

Email: Teaton@needhamma.gov

AT THE SPECIAL TOWN MEETING

HELD ON SUNDAY, OCTOBER 4, 2020

UNDER ARTICLE 6

It was

VOTED:

That the Town vote to amend the Needham Zoning By-Law, as follows:

- (a) Amend the definition of “Independent Living Apartments” in Section 1.3, Definitions, by (i) adding the words “or Avery Square Overlay District” after the words “Elder Services Zoning District”; (ii) deleting the word “only” before the words “residential uses”; and (iii) adding to the end of the definition the sentence “; provided, however, that within the Avery Square Overlay District, as provided in Section 3.15.3.2(d), below, such Independent Living Apartments may be located in a building that also houses Assisted Living and/or Alzheimer’s/Memory Loss Facilities but need not be part of a Continuing Care Retirement Community.”, so that it reads as follows:

“A building in the Elder Services Zoning District or Avery Square Overlay District containing three or more dwelling units, which building houses residential uses and support services accessory thereto, intended primarily as independent living units for individuals aged 55 years or older, and/or families with at least one family member aged 55 years or older, within a Continuing Care Retirement Community; provided, however that within the Avery Square Overlay District, as provided in Section 3.15.3.2(d), below, such Independent Living Apartments may be located in a building that also houses Assisted Living and/or Alzheimer’s/Memory Loss Facilities, but need not be part of a Continuing Care Retirement Community.”

- (b) Amend Section 2.1 Classes of Districts by adding the following term and abbreviation under the subsection Overlay:

“ASOD — Avery Square Overlay District”

- (c) Amend Section 3, Use Regulations, by adding a new Subsection 3.15, Avery Square Overlay District, to read as follows:

“3.15 Avery Square Overlay District

3.15.1 Purposes of District

The purposes of the Avery Square Overlay District (“ASOD”) are to promote the health, safety, and general welfare of the community by creating opportunities for housing primarily serving individuals 55 years old or older, who wish to live in independent apartments and/or who may need to live in Assisted Living and/or Alzheimer’s/Memory Loss facilities, within walking distance of goods and services, public transportation, and the civic life of the town; to promote a vibrant, walkable area within the ASOD, and to encourage and allow redevelopment of the existing property within the ASOD in a manner that will further these purposes. Toward these ends, development in the Avery Square Overlay District

shall, as set forth in this Section 3.15, be permitted to exceed the density and dimensional requirements that normally apply in the underlying zoning district provided that such development complies with all other requirements of this Section 3.15.

3.15.2 Scope of Authority

In the Avery Square Overlay District, all requirements of the underlying district shall remain in effect except where this Section 3.15 provides an alternative to such requirements, in which case the requirements of this Section 3.15 shall prevail. If the provisions of the Avery Square Overlay District are silent on a requirement that applies in the underlying district, the requirements of the underlying district shall apply.

By filing an application for a Special Permit, site plan review or building permit under this Section 3.15, an applicant shall be deemed to accept and agree to the provisions and requirements of this Section 3.15. If an applicant elects to proceed pursuant to zoning provisions of the underlying district, the provisions and requirements of this bylaw applicable in the underlying district shall control and the provision of the Avery Square Overlay District shall not apply.

3.15.3 Use Regulations

3.15.3.1 Permitted Uses

The following uses are permitted in the Avery Square Overlay District as a matter of right:

- (a) Uses exempt from local zoning control under M.G.L. c.40A, s. 3.
- (b) Public, semi-public and institutional uses permitted as of right in the underlying district.
- (c) Business uses permitted as of right in the underlying district.
- (d) Accessory uses permitted as of right in the underlying district.

3.15.3.2 Special Permit Uses

The following uses are allowed in the Avery Square Overlay District by Special Permit issued by the Planning Board:

- (a) All uses allowed by special permit in the Avery Square Business District as set forth in Section 3.2.2 of this Bylaw, except those uses permitted as a matter of right as set forth in Section 3.15.3.1, above.
- (b) Assisted Living and/or Alzheimer's/Memory Loss Facilities
- (c) Independent Living Apartments.
- (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.

3.15.4 Dimensional Regulations

3.15.4.1 Building Height and Related Requirements

The maximum building height (including mechanical structures such as HVAC equipment) in the Avery Square Overlay District shall be 44 feet. This height limitation shall not apply to elevator shaft overruns, which shall not exceed a maximum height of 49 feet.

A building or structure which is located on property in the Avery Square Overlay District may include, but not exceed, four (4) stories, all of which may be occupied, except in the following circumstances:

- (a) With respect to the existing building, if a different use is proposed for the building that does not include Independent Living Apartments and/or Assisted Living and/or Alzheimer's/ Memory Loss Facilities as the primary use(s), then the proposed use shall be governed by the use regulations of Section 3.15.3, above, but the fourth story cannot be occupied without a special permit.
- (b) If the Special Permit described in subparagraph (a), above is not granted, the fourth story shall remain unoccupied for any use without a Special Permit, but the fourth story, and any associated mechanical equipment, does not need to be demolished.
- (c) In the event the existing building is demolished, if the primary use(s) of the successor building is not one or both of the uses described in Sections 3.15.3.2 (b) or 3.15.3.2 (c), then the successor building shall not be permitted to have a fourth story.

The ability to use and occupy the fourth story, when permitted by a Special Permit granted pursuant to Sections 3.15.3.2 (b) and/or 3.15.3.2 (c), shall continue notwithstanding (i) a shift in the number of units from the use described in Section 3.15.3.2 (b) to the use described in Section 3.15.3.2 (c), or vice-versa; or (ii) the elimination of one of the uses described in Sections 3.15.3.2 (b) or 3.15.3.2 (c), provided such shift or elimination is allowed by such Special Permit or amendment thereto.

For the fourth story, minimum setback requirements, measured from the façade(s) of the building on which such fourth story is located, shall be as follows: from the eastern façade of the building (facing Highland Ave), fifteen (15) feet; from the northern façade of the building (closest to and facing West Street), one hundred and ten (110) feet; from the western façade of the building, zero (0) feet; from the southern façade of the building, thirty-five (35) feet. No fourth story setback from the north-facing building façade is required with respect to any portion of any building that is set back from West Street at least two hundred (200) feet.

The total floor area of any fourth floor addition to the building may not exceed thirty-five percent (35%) of the total roof area of the building. Mechanical equipment, including but not limited to HVAC equipment, whether or not enclosed, shall not be included in the calculation of maximum allowable floor area hereunder.

Buildings developed under the regulations of the Avery Square Overlay District shall not be subject to any other height limitations nor any other limitations contained in Section 4.4.3.

3.15.4.2 Building Bulk and Other Requirements

The maximum floor area ratio in the Avery Square Overlay District shall be 1.1. Property contiguous with and in common ownership with property in the Avery Square Overlay District shall be included in the lot for purposes of calculating floor area ratio. The enclosed area of a building devoted to off-street parking shall not be counted as floor area for purposes of determining the maximum floor area ratio. Buildings developed under the regulations of the Avery Square Overlay District shall not be subject to any other limitations on floor area ratio, lot coverage, or building bulk contained in Sections 4.4.2, 4.4.7 and 4.4.9.

3.15.5 Off-Street Parking

Except as provided below, the off-street parking regulations in Section 5.1 and the regulations for enclosed parking in Section 4.4.6 shall apply in the Avery Square Overlay District.

- (a) The minimum number of off-street parking spaces in Section 5.1.2 shall apply except as follows:

- (1) For Independent Living Apartments, there shall be one space per Apartment.

- (2) For Assisted Living units and Alzheimer's/Memory Loss units, the parking requirement shall be one space for every two beds, plus one space for each two employees on the largest shift.
- (b) Notwithstanding anything to the contrary elsewhere in this Bylaw, including but not limited to Section 4.4.8.4, in the event that land located in the Single Residence B Zoning District

- (1) is adjacent to the Avery Square Overlay District;
- (2) is in common ownership with adjacent land located in the Avery Square Overlay District; and
- (3) prior to approval of this Section 3.15, was improved as a parking area associated with a building located in the Avery Square Overlay District;

then, provided that said land extends into the Single Residence B Zoning District not more than one hundred (100') feet from the boundary line between the Single Residence B Zoning District and the Avery Square Business District, said land may, as a matter of right, be used as a parking area accessory to uses permitted in the Avery Square Overlay District by right or by special permit.

3.15.6 Affordable Housing

Any building with ten or more Independent Living Apartments shall include affordable housing units as defined in Section 1.3 of this By-Law, as may be modified in this Section 3.15.6. The following requirements shall apply to a development that includes ten or more Independent Living Apartments:

- (a) For a development with ten or more Independent Living Apartments, twelve and one-half percent (12.5%) of the Independent Living Apartments shall be affordable units. In the instance of a fraction, the fraction shall be rounded up to the nearest whole number. There shall be no affordable housing requirement for nursing homes, convalescent homes, Assisted Living and Alzheimer's/Memory Loss Facilities, or residential care institutions or facilities.
 - (b) If the Applicant provides at least one-half of the affordable Independent Living Apartments required herein for households with incomes at or below 50% of area median income, the remaining affordable Independent Living Apartments may be rented to households with incomes up to 100% of area median income even if the latter units are therefore not eligible for the Subsidized Housing Inventory, regardless of any requirements to the contrary set forth in Section 1.3.
 - (c) Affordable units shall be dispersed within the building and not concentrated in one area or on one floor. They shall generally be comparable in size, energy efficiency, quality, convenience, and unit-specific real estate-related amenities to the development's market-rate units. Services and other amenities that may be purchased by residents on a voluntary basis are not to be considered unit-specific real estate-related amenities and are excluded from such comparability requirements.
 - (d) The selection of eligible homebuyers or renters for the affordable units shall be in accordance with a marketing plan approved by the Needham Planning Board prior to the issuance of any building permits for the development.
 - (e) The affordable units shall be subject to an affordable housing restriction as defined in Section 1.3 of this By-Law with limitations on use, occupancy, resale prices or rents, as applicable, and which provides for periodic monitoring for compliance with the requirements of said restriction."
- (d) Amend Section 4.4.4 Front Setback, by adding the following paragraph after the fourth paragraph of that section:

"In the Avery Square Overlay District, the front setback, if any, shall be kept open and landscaped with grass, plants, and other non-paving materials such as mulch, and shall be unpaved except for patios, walks, and driveways as defined in section 4.4.5. Walls (including walls serving in part as retaining walls) no higher than 36 inches above the grade of the

patios, as well as fencing and privacy screening, along the front and side edges of the patios, shall be allowed in the Avery Square Overlay District.”

- (e) Amend Section 4.4.6 Enclosed Parking, by adding the phrase “for each square foot” before the words “of parking space (excluding driveways and aisles)” on the fourth line of the first paragraph of that section so that it reads as follows:

“Whenever off-street parking is provided underground and/or within a building itself, the maximum area coverage of the building may be increased up to the limits of the required setback as provided herein. The lot coverage of the building may be increased up to 2 ½ % points above the maximum allowed percentage, by one square foot for each square foot of parking space (excluding driveways and aisles) that is underground and/or within the building itself.”

Parking which is under a building or partially underground shall, except for driveways, be separated from the street line by building space occupied by the principal use, not by parking.

In the Center Business District, enclosed parking shall be entirely below the grade of adjoining streets measured at their respective center lines. Access to enclosed parking shall be from the rear of the building. If provided, enclosed parking shall not be visible from the street. The placement of parking underground shall not raise the first non-parking floor of a structure above grade. Municipal parking facilities in the Center Business District shall be exempt from this provision.”

- (f) Amend Section 7.6.1 Special Permit Granting Authority, by adding the number “3.15” after the number “3.14” on the second line of that Section so that it reads as follows:

“The Planning Board shall act as a Special Permit Granting Authority only where so designated in Sections 3.4, 3.8, 3.9, 3.10, 3.14, 3.15, 4.2.10, 4.2.11, 4.2.12, 4.4.5, 4.4.9, 4.4.10, 5.1.1.6, 6.6, 6.8, and 7.4 of this Bylaw. In all other cases the Board of Appeals shall act as the Special Permit Granting Authority. Procedures and decision criteria for the Planning Board shall be the same as specified in Section 7.5.2 and Section 7.5.3 (second and fourth paragraphs) for special permits acted on by the Board of Appeals, except where alternative or supplemental criteria are specified, such as at Sections 3.4 and 6.6.”

UNANIMOUS VOTE

A true copy

ATTEST:


Theodora K. Eaton, MMC, Town Clerk



Theodora K. Eaton, MMC
Town Clerk

TOWN OF NEEDHAM

Office of the Town Clerk

1471 Highland Avenue, Needham, MA 02492-0909

Telephone (781) 455-7500 x216

Fax (781) 449-1246

Email: Teaton@needhamma.gov

AT THE SPECIAL TOWN MEETING

HELD ON SUNDAY, OCTOBER 4, 2020

UNDER ARTICLE 7

It was

VOTED: That the Town will vote to amend the Needham Zoning By-Law by amending the Zoning Map as follows:

- (a) Place in the Avery Square Overlay District all that land described as follows, and superimposing that District over the existing Avery Square Business District:

Beginning at the point of intersection of the westerly sideline of Highland Avenue and the northerly sideline of what was formerly known as Hildreth Place (said former Hildreth Place as shown on Needham Town Assessors Map 63); thence running northerly by the westerly sideline of Highland Avenue to the point of curvature of a curve having a radius of 20 feet and an arc length of 29.27 feet; said curve being a property rounding of the intersection of the westerly sideline of Highland Avenue and the southerly sideline of West Street; thence running northerly, northwesterly, and westerly by said curve to the point of tangency of said curve located on the southerly sideline of West Street; thence running westerly by the southerly sideline of West Street to the point of intersection of the southerly sideline of West Street and the easterly right of way line of MBTA property; thence running southerly by said easterly right of way line of MBTA property to the intersection of the easterly right of way line of MBTA property and the northerly sideline of what was formerly known as Hildreth Place; thence running easterly by the northern boundary of what was formerly known as Hildreth Place, to the point of beginning.

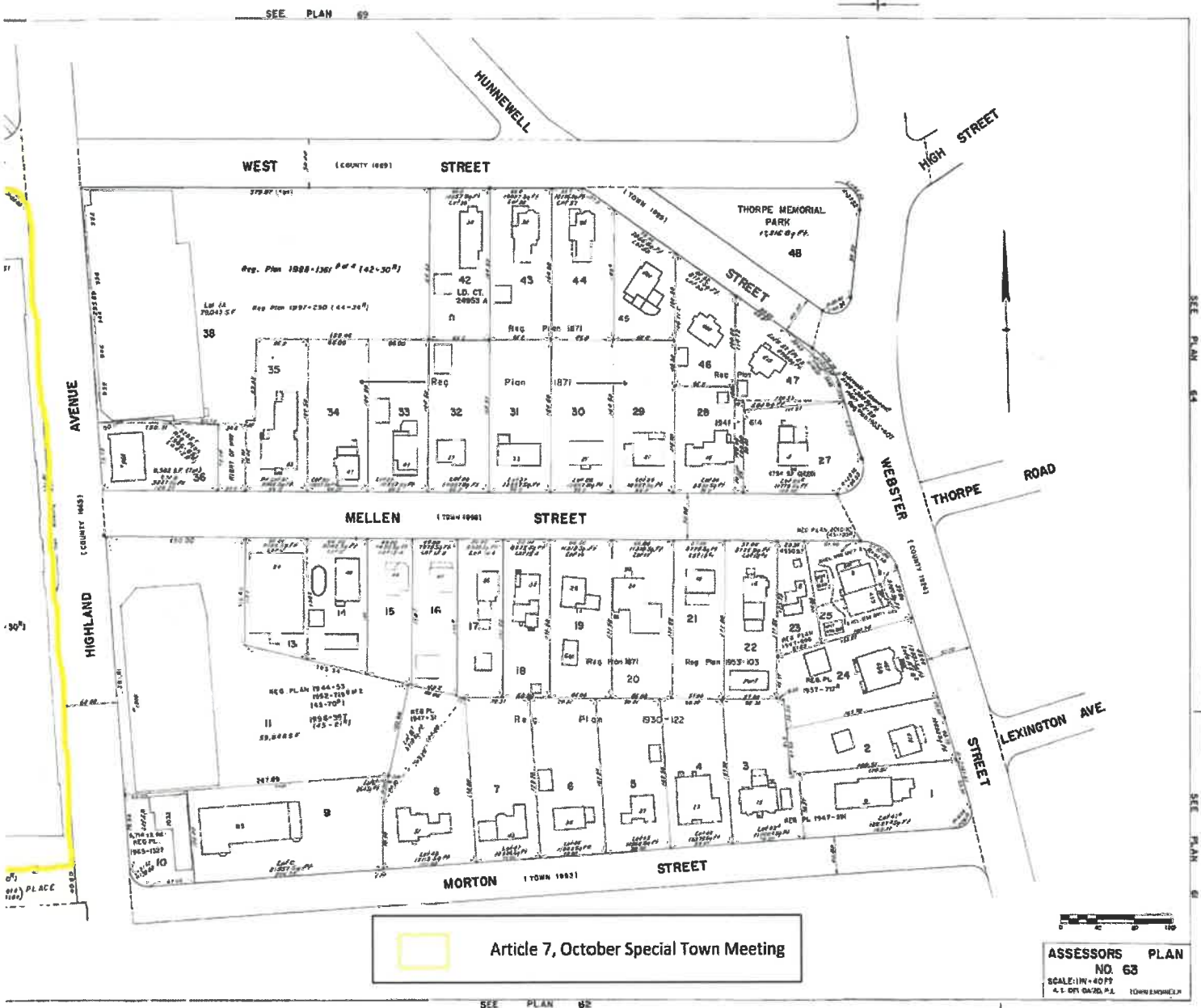
The land is also shown on Needham Town Assessors Map 63, Parcel 37, but excluding any land to the south of the northerly sideline of what was formerly known as Hildreth Place.

**TWO THIRDS VOTE DECLARED BY THE MODERATOR
ON A VOICE VOTE**

A true copy

ATTEST:


Theodora K. Eaton, MMC, Town Clerk



Article 7, October Special Town Meeting

ASSESSORS PLAN
NO. 63
SCALE: 1" = 40'
A.S. ON 04/20/04 TOWN ENGINEER

A True Copy
Attest:

Shirley K. Eaton
Town Clerk of Needham, MA