World Dracut, LLC
Broadway Villages
341 Broadway Road, Dracut, Massachusetts

A proposed mixed-use, 300-unit rental community featuring Multi-family Apartment Residences, Open-Space, Recreational Complex, Market, Retail and Restaurant Uses

Town of Dracut Comprehensive Permit Modification Application

Under M.G.L. Chapter 40B, Sections 20-23 and 760 CMR 56, et. sec.

Prepared For World Dracut, LLC By:

The Panos Law Group

246 Andover Street, Suite 301
Peabody, MA 01960
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ANNINO INCORPORATED
ARCHITECTS • PLANNERS

125 North Washington Street
North Attleboro, MA 02760
508.643.4551

Respectfully Submitted To:

TOWN OF DRACUT MASSACHUSETTS

Town Hall
Zoning Board of Appeals
62 Arlington Street
Dracut, Massachusetts 01826

June 17, 2025

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Appendix D – Project Eligibility Letter from MassDevelopment dated December 22, 2004 with Approved Sale of Property and Change of Ownership to World Dracut, LLC

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Appendix T – Filing fee to the Town of Dracut in the amount of $500.00 was included with Application submittal to the Board on October 1, 2024 as evidenced by Check No. 15751 a copy of which is provided herewith.

Town of Dracut Building Department Board of Appeals
Application for Hearing

Name of Applicant: World Dracut, LLC, a Massachusetts limited liability company

Applicant must be the Owner of the property. (If not, a letter from the owner required or the owner must be present at the Board of Appeals hearing.)

Address: c/o Jason A. Panos, Esq., The Panos Law Group, 246 Andover Street Suite 301 Peabody, Massachusetts 01960

Location of property: 341 Broadway Road; 226 & 250 Loon Hill Road, Dracut, Massachusetts

Current owner of land and date of purchase: World Dracut, LLC by virtue of Deed dated March 27, 2021, recorded with the Middlesex North District Registry of Deeds on April 7, 2021 in Book 35591, Page 144.

Nature of Application: Modification of an existing Comprehensive Permit issued by the Zoning Board of Appeals (the "Board") issued to First Dracut Development Company LLC on January 21, 2005 and modified on or around February 6, 2015 evidenced by "Findings and Decision" recorded with said Deeds in Book 28885, Page 231.

(State reason for application)

Attachments Required:

Twenty-four (24) Copies of plot plans, showing locus plan and table of dimensional requirements
Two (2) Applications (original signatures
One (1) Abutters list from Board of Assessors (with 1 set of stamped envelopes from abutters list)
One (1) Deed
One (1) $500 filing fee

I hereby request a hearing before the Board of Appeals with reference to the above nature of application. I further attest that I have been made aware of the "Rules and Regulations for the Board of Appeals of Dracut" and that a copy of it is in the Building Inspector's office. Applicants are strongly urged to obtain and read a copy of the above regulations as well as the Zoning By-Laws for the Town of Dracut and MA General Laws, Chapter 40B.

Signed: _____ **Date:** June 17, 2025

Address: c/o Jason A. Panos, Esq.
246 Andover Street, Suite 301, Peabody,
Massachusetts 01960

Phone: 978-406-6697 x 1

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THE PANOS LAW GROUP
COUNSELORS AT LAW

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June 17, 2025

By E-Mail Delivery To:
shardy@dracutma.gov
amanugian@dracutma.gov
cbewig@dracutma.gov

Jayne Boissonneault,
Town Clerk

Alison Manugian,
Assistant Town Manager,
Community Development Director
Town Hall
62 Arlington Street
Dracut, MA 01826

RE: Re-Application for Modification to Comprehensive Permit
BOA No. 2005-13
Applicant: World Dracut, LLC
Broadway Village/ Property located at 341 Broadway; 226 Loon Hill Road and 150 Loon Hill Road, Dracut, Middlesex County, Massachusetts

Dear Town Clerk Boissonneault, Assistant Town Manager/Director Manugian and Clerk Bewig-

This office represents World Dracut, LLC which is pleased to file with the Town of Dracut Zoning Board Appeals, items and materials referenced in the Town of Dracut Zoning Board of Appeals Procedures for a 40B Application and Application for Hearing included herewith. As indicated in my conversations with Assistant Town Manager/Community Development Director Manugian, this is a re-submittal of that Application filed with your respective offices on October 1, 2024 with very few substantive changes. We greatly appreciate the Town Community Development Department's accommodation to waive the $500 application filing fee and to file these supplemental materials electronically. We confirmed that the materials contained within that October 1, 2024 filing are still maintained in the Town's Community Development Department. The supplemental and substitute materials provided herewith are as follows:

1. A fully completed Town of Dracut "Application for Hearing";

2. Assessor Certified Abutter's List dated June 12, 2025 which was hand delivered to the Community Development Department's office on or about June 13, 2025;

3. Updated resumes and background materials for Civilworks New England, replacing Bohler Engineering, the prior team engineering consultant;

4. A copy of the Decision by the Board of Appeals Extending the Time on Granted Comprehensive Permit pursuant to G.L. c. 40B recorded with the Middlesex North District Registry of Deeds operating to extend the existing Comprehensive Permit through December 18, 2025 (pursuant to the "Mass Leads Act", § 280 of Chapter 238 of the Acts of 2024, that period is automatically extended to December 18, 2027);

5. As referenced above, all other materials required in the Town of Dracut Zoning Board of Appeals Procedures for a 40B Application to the extent those materials are required by the proposed development are the same as those previously filed on October 1, 2024 still maintained in the Town's Planning Office.

Note too, the Dracut Assessor's Office confirmed no changes to the Certified Abutter's List provided with that October 1, 2024 filing and the pre-addressed stamped envelopes previously prepared are still in the possession of the Town Planning Office.

Also, as noted above, Bohler Engineering is no longer the Development engineer. Civilworks New England will act in that capacity to, among other things, present and discuss the civil plans to and with the Zoning Board of Appeals and interface with and coordinate with the Board's peer review consultants on behalf of the Development team. The designated Civilworks Engineers on the Development Team are Stephen Haight, PE, President and Mark Beaudry, PE, Sr. Associate and Sr. Project Manager and their qualifications and experience are detailed in the Team resumes which are included with this correspondence and also included with the new submission package.

As requested, a fully compiled submission is being prepared containing the replacement supplemental, substitute materials noted above and will be transmitted electronically under separate cover.

Please submit this correspondence to the Zoning Board of Appeals for placement on its Hearing Agenda to take place within thirty (30) days from the date hereof which is confirmed for July 17, 2025. Also, kindly provide me with a Town Clerk's date stamped copy of this transmittal letter.

Please do not hesitate to contact me with any questions or comments.

Very truly yours,

/s/ Jason A. Panos

Jason A. Panos

Encl.

CC: Kate Hodges, Town Manager (email)
Cystal Bewig, Clerk of Town of Dracut Zoning Board of Appeals (email)
Daniel McLaughlin, Town of Dracut Building Commissioner (email)
World Dracut, LLC (email)
Michael Busby, 40B Housing Specialist, MassHousing (email)
MassDevelopment (email)

III. INTRODUCTION

Town of Dracut, Massachusetts
ZONING BOARD OF APPEALS

Premises affected: Certain parcels of land situated in the Town of Dracut, Massachusetts, and numbered 341 Broadway Road, 226 Loon Hill Road and 250 Loon Hill Road and are shown on the Town of Dracut Assessor's Maps as Parcels: 4924 (MBLU: 37/86/1), 8012 (MBLU: 51/86/3), and 8011 (MBLU: 37/86/1), inclusive. The premises are more particularly described in the documents, plans, exhibits, and other materials included with this Application.

APPLICATION FOR MODIFICATION OF A COMPREHENSIVE PERMIT
UNDER GENERAL LAWS CHAPTER 40B, Sections 20-23 and 760 CMR 56, et. seq.

World Dracut, LLC, a Massachusetts limited liability company (interchangeably, "World Dracut" or the "Applicant") hereby applies to the Zoning Board of Appeals of the Town of Dracut, Massachusetts (the "Board"), pursuant to Massachusetts General Laws, Chapter 40B, Sections 20 through 23, as amended ("Chapter 40B") and 760 CMR 56.00, *et. seq.* (the "40B Regulations" with Chapter 40B are hereafter, collectively, the "Act") and The Town of Dracut Board of Appeals Procedure for a 40B Application (collectively, the "Dracut Regulations")[1], a completed "Town of Dracut Building Department Board of Appeals Application For Hearing" (with all documents, plans, appendices, exhibits and other materials submitted simultaneously herewith and hereafter which are incorporated herein by reference and made a part hereof, the "Application"), for the modification of a Comprehensive Permit (Case Number 2005-13) issued on or about January 10, 2008 and modified on December 18, 2014 (the "Existing Comprehensive Permit"), attached hereto in Appendix A, authorizing the Applicant to construct, on the above-referenced premises, a 278 rental, apartment multi-family dwelling community for mix-income residents in four (4) buildings with proposed modification to 300 residential, multifamily dwelling units with a mix of uses including, without limitation, market/retail, a recreational complex and restaurant space in seven (7) buildings to be called, "**BROADWAY VILLAGE".** This Application and the documents, plans, exhibits and other materials submitted simultaneously herewith, as may be supplemented

[1] This Application submission is completed in accordance with the Dracut Regulations to the extent they are not inconsistent with the applicable provisions of the Act. (*See* 760 CMR 56.05(1)).

and amended from time to time and all of which are incorporated herein by reference, contain a complete description of the Applicant and the proposed modifications to the Existing Comprehensive, and constitute the complete application package required to be submitted to the Zoning Board of Appeals pursuant to: (a) Chapter 40B; (b) the rules, regulations and guidelines adopted by the Commonwealth of Massachusetts Executive Office of Housing and Livable Communities ("EOHLC") (formerly, the Department of Housing and Community Development) , (c) and the Massachusetts Housing Finance Agency, Inc. or "MassHousing"; (d) MassDevelopment, the current subsidizing agency; and € the Dracut Regulations with respect to Comprehensive Permits under Chapter 40B, including but not limited to the regulations set forth at 760 CMR 56, et. seq.

IV. APPLICANT INFORMATION, DEVELOPMENT TEAM, DEVELOPMENT DESCRIPTION, PERMITTING AND PROPOSED SCHEDULE

I. Brief Description, Applicant Information and Development Team

Brief Development Description

World Dracut proposes construction of 300 units of multifamily, rental, affordable housing with a mix of uses including, without limitation, market/retail, a recreational complex and restaurant space in accordance with the Act and through modification of the Existing Comprehensive Permit. The proposed development, known as "Broadway Village", is proposed on an approximately 46.5 acre +/- parcel situated in the Town of Dracut, Massachusetts (the "Town") at property known and numbered or located at 341 Broadway Road, 226 Loon Hill Road and 250 Loon Hill Road and shown on the Town of Dracut Assessor's Maps as Parcels: 4924 (MBLU: 37/86/1), 8012 (MBLU: 51/86/3), and 8011 (MBLU: 37/86/1), inclusive (interchangeably, the "Property" or the "Site") which is accessed from Broadway Road, a public way which is also Massachusetts Intrastate Route 113.

The "Development" is a 300-unit, multifamily, rental, mixed-use development is proposed in 7 buildings consisting of:

1) a public Market/Retail/Restaurant Building;

2) a public Recreational Building ("Sports Pavilion");

3) Residential Building 1 housing 60 Units (22, 1 Bedroom; 30, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

4) Residential Building 2 housing 67 Units (9, 1 Bedroom; 50, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

5) Residential Building 3 housing 90 units (34, 1 Bedroom; 48, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses and an attached "Pool and Community Center" for the residents;

6) Residential Building 4 housing 61 Units (23, 1 Bedroom; 30, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

7) Residential Building 5 housing 22 units (7, 1 Bedroom; and 15, 2 Bedroom Units) with an attached "Pool and Community Center" exclusively for the residents (also attached to Building 3).

8) 15 Accessible units are proposed and 6 "Hard of Hearing" units are proposed in compliance with applicable requirements of the Architectural Access Board (521 CMR) Code.

A total of 831 parking spaces are proposed for all uses as follows:

1) 468 parking spaces are set aside for the residences for of which 50 parking spaces are covered which are located in Residential Building 2 and 420 parking spaces are located on the ground equaling with an overall parking ratio of 1.56 parking spaces per unit;

2) 35 parking spaces are dedicated to the Market/Retail/Restaurant use in compliance with the parking requirements of the Zoning By-Law;

3) 62 aggregate parking spaces are dedicated to the Market/Retail uses located within each Residential Building in compliance with the parking requirements of the Zoning By-Law;

4) 142 parking spaces are dedicated to the Recreational Building (Commercial Recreation, "Sports Pavilion") use located in compliance with the parking requirements of the Zoning By-Law; and

5) An additional 124 parking spaces are proposed over an easement area controlled by National Grid and is subject to the approval and agreement between the Applicant and National Grid.[2]

6) 19 Accessible parking spaces are provided servicing the residents in excess of applicable code requirements.

7) 31 Accessible parking spaces are provided servicing the commercial uses in compliance with applicable code requirements.

The Site and Development are more particularly described in:

1. That compilation of plans in thirty (31) sheets entitled "Proposed Preliminary Site Plan Documents" for World Dracut, LLC, Broadway Village, dated September 20, 2024, prepared by Bohler Engineering (collectively the "Civil Plans") provided herewith in Appendix B and otherwise described herein this Application; and

2. That compilation of plans in 86 sheets entitled Conceptual Architect Design Drawings, Floor Plans, Elevations, and Development Summary dated September 20, 2024, prepared by Annino Incorporated (collectively the "Design Plans" with the Civil Plans are sometimes referred to herein as the "Plans" when referred to collectively) and are provided herewith in Appendix C and otherwise described herein this Application.

The Design Plans include a "Project Summary" referencing, among other things, a breakdown of Building, unit and commercial square footages, for each Building, market rate and affordable unit information and a summary of parking proposed for each use.

Chapter 40B Jurisdictional Requirements and Applicant Information

MassDevelopment ("MassDevelopment") issued its "Project Eligibility Letter" for the Existing Comprehensive Permit Project Eligibility Letter from MassDevelopment dated December 22,

[2] Note, the National Grid parking area is not counted toward any particular use for purposes of this Application because it is subject to National Grid approval.

2004 with Approved Sale of Property and Change of Ownership to World Dracut, LLC dated May 20, 2021 (the "PEL") which is required under 760 CMR 56.04. (formerly 760 CMR 31.01 pursuant to which the Existing Comprehensive Permit PEL was issued and referencing near identical provisions as those currently in effect) See Appendix D) as a jurisdictional prerequisite to filing the Application.

MassDevelopment has, accordingly determined and found that the prior Development meets all of the criteria established under 760 CMR 56.04(1) and (4) (formerly 760 CMR 31.01) (i.e. that (i) the Applicant has sufficient legal control of the site, (ii) the Applicant is a limited dividend organization (See Appendix D), (iii) the Applicant and the project are generally eligible under the requirements of the MassDevelopment program, (iv) that the Site of the proposed project is generally appropriate for residential development, and (v) that the conceptual project design is generally appropriate for the Site). MassDevelopment, through issuance of the PEL, also found that the Development is financially feasible after review of the Development *proforma* submitted to it.

The Applicant, upon approval of the Application by the Board, for the Development, intends to seek "Final Approval" from MassHousing, a different Subsidizing Agency, pursuant to the requirements of 760 CMR 56.04(7). In such event and upon obtaining Final Approval, MassHousing will have reaffirmed that the Applicant meets the above referenced jurisdictional requirements prescribed by 760 CMR 56.04(1). The Applicant will, accordingly, pursue construction, financing, and rental of the units for the Development required under the Act, pursuant to MassHousing's Rental Program requiring, in part, a minimum of 25% of construction and permanent financing be obtained through the Federal Home Loan Bank of Boston's "New England Fund" (the "NEF").

World Dracut is a "Limited Dividend Organization" in accordance with the requirements of the Act and is the Applicant hereunder this Application. (See Appendix D and Appendix E). World Dracut is also the "Property Owner" of the Site pursuant to a Quitclaim Deed recorded with the Middlesex North District Registry of Deeds at Book 35591, Page 144. (See Appendix F) and therefore World Dracut has site control as required pursuant to 760 CMR 56.04(1)(c).

Development Team

The Applicant has assembled an experienced team in pursuit of this Application and includes:

Applicant
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c/o The Panos Law Group
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Tel: (508) 481-7400
Email: skelly@chappellengineering.com

Marketing/Lottery Agent
To be determined

For Development Team backgrounds and resumes see Appendix G.

Consistency with the Town of Dracut Housing Production Plan/Affordable Housing

The Site is a 45.6 +/- acre parcel and is comprised of undeveloped, vacant land, and is underutilized. Located in Dracut's I-1, Industrial -1 zoning district, the proposed Development is prohibited as more particularly described herein. We believe this proposed Development will provide much needed housing without significant neighborhood or community impacts, including to infrastructure and traffic consistent with the goals established in the Dracut Housing Production Plan adopted in October, 2019 (the "Housing Production Plan"). The Development will also provide much needed amenity and recreation space accessible to both the Development residents and Town residents alike with the proposed market, restaurant and sports recreation facilities.

Through its Housing Production Plan, the Town identified the "…community's local housing needs, while also meeting State requirements, as outlined under Chapter 40B, to produce more affordable housing for residents ..." The Hosing Production Plan identified a strategy to expand housing opportunities "…that is accessible and affordable to people with a range of incomes, household characteristics, and demographic qualities is critical to successful and sustainable

community planning…" and in doing so also identified gaps between existing housing needs and current supplies concluding that the Town is in need of more affordable housing among all demographic populations and income levels.

Further, the Housing Production Plan cites various development constraints and limitations "…that have an impact on the development of new housing opportunities in Dracut. lt includes a land use, zoning and infrastructure analysis…" and identifies the need for proposed residential and mixed-use developments on privately owned land available for such mixed-use development such as that proposed hereunder this Application.

It is therefore easy to conclude that the Development on the Site is consistent with the Town's identified need for new residential, mixed-use development by development of this underutilized and undeveloped 46.5 +/- acre Site.

Also, according to the Subsidized Housing Inventory ("SHI") for the Town of Dracut, dated September 26, 2024 and published by the Massachusetts Executive Office Housing and Livable Communities, 5.34% of 2020 Census Year Round Housing Units are SHI eligible where a total of 1,231 units are required with 657 units in its affordable housing inventory. (See SHI at Appendix H). To meet its 10% mandate, the Town must produce an additional 574 units of "SHI Eligible Housing" as set forth in the Act. In accordance with the Act seventy-five (75) of the three hundred (300) dwelling units (being 25% of the overall unit count) will be designated affordable and available to those residents earning a maximum of eighty (80%) percent of the "Area Median Income" ("AMI") as prescribed by the United States Department of Housing and Urban Development (Lowell, MA HUD Metro FMR Area, 2024). Notwithstanding the foregoing, as a rental development, all 300 units will count towards the Town's SHI, once approved, creating a substantial addition of countable units to the Town's SHI in advance of its mandate to create 10% of year round housing stock as affordable.

The affordable units will include: 23, 1 bedroom units; 44, 2 bedroom and 8, 3 bedroom units for a total of 75 units or 25% of the 300 units proposed. Accordingly, this Development is required to satisfy a critical local and regional housing need consistent with the goals articulated in the Housing Production Plan and in advance of meeting its 10% SHI mandate.

The proposed Development will provide much needed housing for those working in the Town of Dracut and in and around the region. This is achieved by the Applicant's commitment to work with the Town to provide for a 70% "Local Preference" for the "Affordable Units" resulting in 35 affordable Units being first offered for "Local Preference" to:

- Current residents of the city or town: People living in the community at the time of application for the lottery.
- Municipal employees (teachers, fire fighters, police officers, etc.)
- Employees of local businesses (businesses located in the city or town).
- Households with children attending the community's schools, such as METCO students or participants in the "School Choice" program.

The remaining 22 "Affordable Units" will be available to those participating in an open lottery system.

II. Permitting History and Background

The Existing Comprehensive Permit was issued to First Dracut Development Corporation, LLC, the then applicant, by the Board on or around January 10, 2008 which was later modified by "Findings and Decision" issued by the Board on December 19, 2014 (the "Decision") filed with the Town Clerk on February 6, 2015 and recorded with at the Registry of Deeds in Book 28885, Page 281.

The development approved under the Existing Comprehensive Permit is summarized as follows:

1. 278 Residential Rental apartment units approved on the Site within four (4) buildings;
2. 98, 1 bedroom units; and 180, 2 bedroom units were proposed with no accommodation for any 3 bedroom units.
3. The development included provision for a club house/office area;
4. 58 Units were proposed as age restricted (55+) at the request of First Dracut Development Corporation, LLC, the then applicant;
5. By vote of the Board, on September 15, 2016, the age restriction was removed (See Board Minutes dated September 15, 2016 attached hereto in Appendix I);
6. 570 parking spaces were approved for the development under the Existing Comprehensive Permit or a ratio 2.05 parking spaces per unit.
7. 20% of the 278 Units (56 units) were proposed affordable to families earning no more than 50% of AMI.

8. The Existing Comprehensive Permit did not allow for any commercial (non-residential) uses (i.e. Retail/Restaurant/Business Recreation) and was strictly a multi-family, residential rental development.

9. The Existing Comprehensive Permit did not provide for sustainable design elements.

The Existing Comprehensive Permit was duly extended and otherwise amended by the Board and subsequent to issuance the Board granted, at its duly noticed hearing(s):

1. A three year Extension (hearings September 17, 2020 and October 15, 2020) to December 18, 2023 (See attached Appendix J).

2. Approval of "Sale of Property and Change of Ownership" dated May 20, 2021from First Dracut Development Corporation, LLC to World Dracut, LLC finding that World Dracut complies with the requirements of 760 CMR 56.04(1)(a) and (b) as a duly qualified and validly existing "Limited Dividend Organization". (See attached Appendix D).

3. A two year Extension (hearing November 2, 2023) to December 18, 2025. (See attached Appendix K).

Comparison of Development to the Existing Comprehensive Permit Development

The Application proposes a modification of the Existing Comprehensive Permit which Application details are more particularly described below but are summarized as follows:

1. Proposed 300 unit multifamily, rental apartment, mixed-use development (increased from 278 units);

2. Proposed change in affordability criteria from 50% AMI to 80% AMI;

3. Proposed change in Subsidizing Agency from MassDevelopment to MassHousing;

4. A proposed change in affordable unit set aside from 20% of 278 units (56 Units) to 25% of 300 units (75 units);

5. Provision for 468 parking spaces servicing 300 units;

6. Addition of a Retail/Restaurant/Market, added to frontage at Broadway Road at the entry to the Site.

7. Addition of Recreation Building ("Sports Pavilion") for Resident and Town resident use featuring 4 basketball courts, 4 bowling alley lanes, a café, fitness area and fitness studios

added to site adjacent to Residential Buildings 2 and 3. Additional parking has been added below the first-floor level.

8. A lower level is proposed at Residential Building 2 for parking and retail space.
9. Enclosed pool between building 3 and 5 with one story structure with roof top garden/patio for Development Residents.
10. Provide a direct weatherproof connector from the pool to Residential Building 3 and 5 with sitting space and enclosed stairs.
11. Addition of Residential Building 5, 22 unit, 4 story residential building between Residential Buildings 2 and 3.
12. Relocate grilles/picnic area and patios between Residential Building 2 and 3 to allow for better use and more comfortable space for residents.
13. Eliminate underground parking at Residential Building 4.
14. Provide Development Resident storage cubicles in Residential Buildings 1, 3, 4 and 5 at new lower level.
15. Introduce small retail areas in the lower level of Residential Buildings 1, 2, 3 and 4.
16. Revised Building Designs.
17. Design new Building envelopes to conform to the new state Energy Code. Provide enhanced insulation.
18. Generally propose sustainable design elements for each Building proposed on the Site.
19. Eliminate false chimneys at roof level.
20. Incorporate roof elements that break up the façade, tower, panels, metal roofing, etc. all act to break up the façade.
21. Provide carport areas in the surrounding parking areas. The carports protect vehicles and provide solar collectors on the roof to provide the ability to generate electrical power for the development. The is approximately two acres of photovoltaic cells on the roofs of the carports as well as building flat roof areas.
22. Provide EV charging stations scattered around the Site.
23. Provide dog/pet areas that are adjacent to buildings and provide safe opportunities for those living in the community.
24. Provide sitting areas around the site for passive recreation.
25. Provide a playground on site for children living in the community.
26. Because of the new wetland flagging there is a reduction in disturbed areas on Site.
27. Provide separate loading/unloading areas with access to storage cubicles in the lower level of Residential Buildings 1, 3, 4 and 5.

28. There is the potential to expand parking in the easement area pending National Grid approval.

Proposed Modification is a Substantial Change

Accordingly, while it is unclear whether to proposed modifications of the Existing Comprehensive Permit are tantamount to "Substantial Changes to Project" in accordance with 760 CMR 56.07(4)(b), the Applicant submits to the Board that the proposed modifications to the Existing Comprehensive Permit are "substantial" allowing the Board to immediately hear the Application without a 20 day determination period in accordance with the provisions of 760 CMR 56.05(11), "Changes after Issuance of a Permit." Therefore, the Board shall call a hearing within 30 days of filing of this Application to the Board in accordance with 760 CMR 56.05(3).

III. Site and Development Description

The Site and Development are more particularly described in:

1. The Civil Plans. (See Appendix B);
2. The Design Plans. (See Appendix C).

Existing Conditions

The Site consists, in the aggregate, of 46.5+/- acres of unimproved land situated in the Town at 341 Broadway Road, 226 Loon Hill Road and 250 Loon Hill Road and shown on the Town of Dracut Assessor's Maps as Parcels: 4924 (MBLU: 37/86/1), 8012 (MBLU: 51/86/3), and 8011 (MBLU: 37/86/1), inclusive. (See Existing Conditions Plan, Civil Plan no. C-103 at Appendix B). The Site is comprised of 21.2 acres (46%) of unusable open space located in resource areas subject to the provisions of M.G.L. c. 131, §40 and 310 CMR 10.00, et. seq. (collectively the "Wetlands Protection Act").[3] The Development is proposed on portions of the Site located in Flood Zone X and outside of designated special flood hazard areas A, AE, AH, O, AR, A99, V and VE and as such is considered low risk. (See Appendix L).

Existing site conditions are depicted on Sheet C-103 of the Civil Plans (see Appendix B).

The Site is located in a diverse neighborhood consisting of multi-family condominium dwelling homes across Broadway Road, to the north of the Site, single family homes remotely located to its and east (off Loon Hill Road). Industrial and commercial uses and structures are located directly to its west and east including a storage facility and various industrial use.

[3] The proposed Development will require a Notice of Intent filing with the Dracut Conservation Commission solely under the jurisdiction of the Wetlands Protection Act.

The Site is commuter friendly because it is conveniently located and accessible to and from Broadway Road/Route 113 (located on its noth side) and located near and accessible to Routes 110 and Interstate Route 495. Additionally, the Site is located within 1.5 miles of Lowell Regional Transportation Authority Bus Routes and with nearby access to MBTA Commuter Rail stop with access to Boston and other points south to Boston. Additionally, Dracut is located near commercial centers of employment. Supporting local and regional businesses through the provision of expanded housing choices that serves a diverse local workforce is a Housing Production Plan goal served by the development's close proximity to these job opportunities. (See Appendix M, Site Amenity Context Map, see also, Appendix N, Site Transportation Map). The Applicant proposes working with the Town to petition the Lowell Regional Transit Authority to create a bus stop at and within the Development if approved.

The Site is also located in close proximity to shopping opportunities, municipal services, restaurants, schools, and open space. (See Appendix M, Site Amenity Context Map).

In short, the location of the proposed site is well suited for development of multi-family dwellings satisfying a local need as articulate in the Housing Production Plan.

Proposed Development

The "Development" is a 300-unit, multifamily, rental, mixed-use development is proposed in 7 buildings consisting of:

1) a public Market/Retail/Restaurant Building;

2) a public Recreational Building ("Sports Pavilion");

3) Residential Building 1 housing 60 Units (22, 1 Bedroom; 30, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

4) Residential Building 2 housing 67 Units (9, 1 Bedroom; 50, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

5) Residential Building 3 housing 90 units (34, 1 Bedroom; 48, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses and an attached "Pool and Community Center" for the residents;

6) Residential Building 4 housing 61 Units (23, 1 Bedroom; 30, 2 Bedroom; and 8, 3 Bedroom Units) with combined commercial/retail uses;

7) Residential Building 5 housing 22 units (7, 1 Bedroom; and 15, 2 Bedroom Units) with an attached "Pool and Community Center" exclusively for the residents (also attached to Building 3).

8) 15 Accessible units are proposed and 6 "Hard of Hearing" units are proposed in compliance with applicable requirements of the Architectural Access Board (521 CMR) Code.

A total of 831 parking spaces are proposed for all uses as follows:

8) 468 parking spaces are set aside for the residences for of which 50 parking spaces are covered which are located in Residential Building 2 and 420 parking spaces are located on the ground equaling with an overall parking ratio of 1.56 parking spaces per unit;

9) 35 parking spaces are dedicated to the Market/Retail/Restaurant use in compliance with the parking requirements of the Zoning By-Law;

10) 62 aggregate parking spaces are dedicated to the Market/Retail uses located within each Residential Building in compliance with the parking requirements of the Zoning By-Law;

11) 142 parking spaces are dedicated to the Recreational Building (Commercial Recreation, "Sports Pavilion") use located in compliance with the parking requirements of the Zoning By-Law; and

12) An additional 124 parking spaces are proposed over an easement area controlled by National Grid and is subject to the approval and agreement between the Applicant and National Grid.[4]

Provision for 19 accessible parking spaces for the residences is made exceeding compliance with applicable law and design standards and 31 Accessible parking spaces are provided servicing the commercial uses in compliance with applicable code requirements and as depicted on the Civil Plans and Design Plans. (See Appendix B and Appendix C).

Further, the proposed Development features needed open space, recreational and pet friendly amenities which will be available to all Development Residents and Town residents and sustainable design elements as noted below. The proposed amenities include a Market/Restaurant and Recreation Building ("Sports Pavilion") which will complement the existing Town amenities shown on the attached Site Amenity Context Map attached hereto as Appendix N.

Additionally, the Development will be served by municipal water and sewer and an onsite, state of the art stormwater management system designed in compliance with Massachusetts stormwater management standards both of which will be connected to municipal infrastructure from the Development Site.

The Development has proposed direct access from Broadway Road/Route 113 fronting the Site to a gently winding roadway providing access and circulation through the Site. The entry off Broadway Road will be designed as the private development entrance with robust landscaping which will be employed throughout to improve the visual impact of the Development.

Seventy Five (75) of the 300 units (a set side of 25%) are proposed, designated as affordable for those residents earning a maximum of 80-percent (80%) of the "Area Median Income" ("AMI")

[4] Note, the National Grid parking area is not counted toward any particular use for purposes of this Application because it is subject to National Grid approval.

as prescribed by the United States Department of Housing and Urban Development (Lowell, MA HUD Metro FMR Area, 2024).

Design Elements and Approach

This overall mixed-use Development community aligns with the building typology of similar projects in proximity to the existing adjacent neighborhoods, (i.e. medium sized multi-story buildings which work with the sloped site topography). The proposed Development seeks to fit seamlessly as a transitional element between the existing neighborhood and the commercial development on adjacent portions of the Site by taking its cues from the local architectural vernacular in the form of cleanly detailed buildings with ample glazing and private protruding balconies which act to reduce scale and add visual interest. This is additionally achieved by employing a mix of traditional and patterned siding materials and window pattern configurations along with covered entrance porticos, amongst other elements. We expect to employ traditional colors for each of the building's exteriors. The garage, proposed in Residential Building 2, will be completely covered in a podium style and will be built into the topography away from the roadway to reduce visual impact and to be less prominent from the road. The Development also employs a series of landscaped walkways which interconnect the residences. Additional amenities include a proposed courtyard with trellis elements, bocce and recreational courts, play areas, a dog run, a fitness center and an onsite rental and management office. The overall design is intended be more of an organically developed neighborhood rather than single Development.

Design features and elements incorporate the following:

1. Redesign the entire façade of all Buildings. The new design is reflective of the community of Dracut and the physical location of the development on a very natural, wooded site.
2. Total building roof height reduced by incorporating flat roof areas behind the mansard roof. The flat areas allow mechanical equipment to be placed out of the field of vision on the site. This minimizes vandalism as well as unsightly appearance and noise generation adjacent to the residential units.
3. Provide decorative deck areas at each residential unit that are covered and enhanced with a stone base.
4. New porches at units will be covered with standing seam metal roofs.
5. Provide a mixture of different textures and colors on the building façade. The use of Hardi panel and plank will break up the massing and provide for much visual interest.

6. Enlarge and add windows at each unit, bigger areas of unobstructed glass and addition of more double hung units. The residential style window units better reflect the character of the community.
7. Better detailing at Building entry points.
8. Design new Building envelopes to conform to the new state Energy Code. Provide enhanced insulation.
9. Incorporate roof elements that break up the façade, tower, panels, metal roofing, etc. all act to break up the façade.

In addition to the residential component of the Development, the Applicant proposes amenities which will be available to Town residents including, without limitation, a 6,835 s/f +/- Retail/Market/Restaurant and a 64,383 s/f +/- Recreation facility (the "Sports Pavilion") featuring 4 basketball courts, 4 bowling alley lanes, a café, fitness area and fitness studios added to site adjacent to Residential Buildings 2 and 3.

In short, this Development has a consistent "Community Vision" that is important for not only the Dracut community but also its residents. We feel that this proposed Development captures the "Spirit and Vitality of Place" that is needed in any development of this scope and magnitude. It will set a design precedent for large scale future developments in Dracut and will create a vibrant, active, and walkable project in this close-knit Town. The sense of pride in this community is equally shared by the Applicant and this Design Team.

The new unit designs each propose between 747 square feet and 1,324 square feet of living area. They feature open floor plans with ample natural light as well as comfortably sized bedrooms. Each unit will contain either 1 bedroom with 1 full bath, 1 bedrooms with full bath and nook, 2 bedrooms with 2 full baths, 2 bedrooms with a nook with 2 full baths, or 3 three bedrooms, each with and 2 full baths and nook. Each unit will provide for ample storage. Each unit will have covered balcony or private patio area, designed to maximize privacy for the homeowner. Landscaping will be strategically placed to maximize privacy to the extent possible. (See generally, Appendix B).

For a narrative regarding "Design Guidelines" for principles determining design of the Development, please see Appendix O attached.

Sustainable Design

The Development will incorporate several environmentally sustainable features, including being Energy-Star rated. The building envelope will feature high R value insulation within a complete

air and moisture barrier system. Windows will be insulated, low-e glazed with operable sash. Each unit will have individual climate control by utilizing efficient heat pump technology. LED lighting will be used throughout with common area occupancy sensors. All exterior lighting will be dark sky compliant. Low-flow plumbing fixtures, including shower heads, will be used. The large roof surface of the building will be light in color and designed to accommodate a large array of photovoltaic solar panels and minimizing any "heat island" effect.

Exterior parking areas will be covered with approximately 67,800 sq feet of solar panels. Flat roof areas on all 5 buildings are proposed to be covered with approximately 19,893 sq feet of solar panels. The total area covered will be 87,693 sq feet which is approximately 2.013 acres. These panels will furnish electrical energy to all five buildings as well as the Recreation Building ("Sports Pavilion").

The Development further proposes 10 EV charging stations located throughout the Site. In compliance with the applicable energy code requiring a minimum of 20% of the parking on site able to accommodate EV charging stations, the Development proposes conduit for these additional spaces. Total parking spaces on Site not including the parking in the in the National Grid Easement Area is 707 resulting in 10 permanent EV charging stations and 131 parking spaces ready to accommodate a charging station. If we include the easement parking, we will have 831 spaces with 10 permanent and 156 ready to accommodate a charging station.

The development will conform the new Massachusetts Energy Code Standards.

Traffic Impacts

A Traffic Impact and Access Study (TIA) was prepared by Chappell engineering Associates, LLC ("Chappell") dated September, 24, 2024 to analyze project impacts on prevailing traffic conditions. The study area was selected to contain the major roadways providing local access/egress to/from the Site.

Evaluation of the traffic impacts associated with the project requires an examination of existing and projected traffic volumes, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and intersections. The study area scope for this assessment includes locations expected to accommodate the majority of project-related traffic, including the following intersections:

1. Broadway Road at Jones Avenue and Wheeler Road

2. Broadway Road at Loon Hill Road and private driveway

3. Broadway Road at Willard Street

4. Broadway Road at site driveway

This TIA was prepared in accordance with MassDOT guidelines (Appendix P). In the Traffic Impact Assessment, Chappell concludes, *"... the proposed development is expected to result in only minor impacts to area traffic operations as compared to future No-Build conditions. The site access as proposed allows for safe access and egress, with minimal driveway queuing, amounting to only one to two vehicles during peak hours, expected on the site driveway approach to Broadway Road."* (See Appendix P).

Community Impacts

The Development will be served by an municipal water and sewer, Utility Plan Sheets 1-3. (See Appendix B). Adjacent neighborhoods are served by municipal water with existing infrastructure located within Broadway Road and Loon Hill Road and as otherwise depicted on the Civil Plans. Proposed potable water and fire protection supply will be provided by tying in to existing water mains.

Additionally, the Development will be served by an onsite, state of the art stormwater management system designed in compliance with Massachusetts stormwater management standards both of which will be connected to municipal infrastructure from the Development Site. (See Grading and Utility Plans included with the Civil Plans at Appendix B, See also Drainage Report at Appendix Q).

As a result, community impacts to infrastructure are expected to be minimal.

IV. Permitting

General

The Applicant proposes to obtain all local permits and approvals through the Chapter 40B comprehensive permit process established pursuant to 760 CMR 56.00 *et. sec*. Accompanying this Application in Appendix R is a table referencing all requested exceptions and waivers from the applicable provisions of the Town of Dracut By-Laws and Regulations.

Waivers and Exceptions

The Site is located within the Town's "Industrial-1" (I-1) zoning district where the proposed mixed-use multi-family, residential uses are prohibited. Although great care was taken by the Development Team to minimize the need for variances and waivers from the provisions of

applicable Town of Dracut By-Laws and Regulations the Applicant is the waivers and exceptions which are more particularly set forth in Appendix R:

- Use Regulations: Multi-family, residential uses are prohibited in the I-1 Zoning Districts.
- Dimensional Regulations:
    - The proposed Multi-Family Development is compliant with the Zoning Ordinance regarding Lot Size; Frontage; Lot Width; and Lot Coverage.
    - The Applicant seeks zoning relief to allow the proposed Multi-family Development as shown on the Plans. The Development will not comply with the following dimensional requirements:
        - Proposed Setbacks, building height, Floor Area Ratio, and Minimum Lot Area.
        - Parking space dimensions to allow for slightly narrower parking spaces.
- Landscaping Requirements.
- Parking Requirements.
- Site Plan Review Requirements.
- Development Impact Review.
- Removal of Earth Products.
- Signs.
- Town of Dracut Wetlands Regulations.
- Town of Dracut Stormwater Regulations.

Further the non-residential Retail (<5,000 G.S.F.) uses proposed for the "Market/Restaurant" and the Commercial Recreation (Recreation Building/Sports Pavilion) require Special Permits from the Planning Board and the Select Board respectively. The Market/Restaurant Building proposes approximately 4,201 +/- s/f dedicated to the Market/Retail uses and approximately 3,657 +/- s/f for the proposed restaurant use. The recreation Building ("Sports Pavilion") building is proposed to be approximately 87,687 +/- s/f which includes an approximately 23,304 +/- s/f garage. Commercial uses are also interspersed among Residential Buildings 1, 2, 3 and 4 (See Design Plans at Appendix C with Project Summary). Parking for all proposed commercial uses on the Site is in compliance with the provisions of the Zoning By Law.

A Comprehensive Permit may provide all local permits and approvals pursuant to the Act enabling construction of the proposed mixed-use, multi-family Development consistent with local needs including for the non-residential uses pursuant to 760 CMR 56.05(8)(d).2. In that regard, the Zoning Board of Appeals shall, pursuant to the Act, grant all variances, reviews and orders on

behalf of all other Town of Dracut "Local Boards" (including, without limitation, the Planning Board, the Select Board, the Conservation Commission, etc.) to the extent of grant of those local permits and approvals through local By-laws and Regulations.

Portions of the Site are located within designated resource areas (see Existing Conditions Plan and Civil Plans Generally at Appendix B) which will necessitate the filing of a Notice of Intent with the Dracut Conservation Commission subject, only, to the jurisdiction of the G.L. c. 30, §§ 61-62H and 310 CMR 10.00, *et. seq.*, being Massachusetts Wetlands Protection Act ("WPA") and supporting regulations. (See resource areas subject to the WPA depicted in the Civil Plans at Appendix B. There are no other jurisdictional resource areas, or cultural or historic resources, or critical habitat areas at the Site. Public water and electric services are all available at the Site.

MEPA/EPA Construction General Permit/Stormwater Management

A Drainage Report prepared by Bohler, dated September 20, 2024 is provided herewith in Appendix Q. The Development, as proposed, is considered a new development project by the Massachusetts Department of Environmental Protection ("MaDEP") under its Massachusetts Stormwater Handbook and is subject to full compliance with applicable Stormwater Management Standards.

The Development, as proposed, will disturb in excess of one acre in land area and will be required to obtain a Construction General Permit ("CGP") through the United States Environmental Protection Agency ("EPA"). The Applicant will be required to develop a Stormwater Pollution Prevention Plan ("SWPPP") that addressed construction phase erosion and sedimentation controls and best practices. Best management practices employed for the Development include:

- Installation of straw wattles along the limit of work for erosion control;
- A stabilized construction entrance shall be provided to minimize tracking of sediment from vehicle tires;
- A designated Environmental Monitor will inspect all erosion control devices on a weekly basis and after storm events in excess of ½-inch per 24-hour period; and
- Stabilization of exposed areas.

Additionally, the Development and the Site is subject to review under the Massachusetts Environmental Policy Act, M.G.L. c. 30, §§ 61 through 62L ("MEPA") and 301 CMR 11.00 by application to the Massachusetts Executive Office of Energy and Environmental Affairs ("EEA") also requiring the filing of an Environmental Notification Form to EEA and obtaining, from EEA an Environmental Impact Report (draft or final).

Community Outreach and Input

Members of the Development Team met with the Town Planner, Conservation Agent, and Building Commissioner at various times on May 23, 2024 and May 29, 2024 to discuss preparations for the Application and concept plans presented. Constructive comments were given and important questions were asked of the Development Team. The Applicant listened. The Applicant incorporated many of the constructive comments provided by the Town which changes are reflected in this Application, the Civil Plans and the Design Plans and reference additional green and amenity spaces, design of the ingress and egress into and from the Site, enhanced Stormwater Management, and more efficient traffic circulation through, into and from the Site reducing impacts on the surrounding neighborhoods and on Broadway Road.

V. Proposed Development Schedule

The Applicant intends to construct the Development in a single phase although all rights are reserved to construct the Development in phases. The following Development milestones are anticipated:

- March 2026 – All permits granted
- April 2026 – Construction start
- October 2026 – Marketing of affordable units
- November 2026 – Marketing of market rate units
- August 2031 – Construction completion for entire Development
- December 2027 – Initial occupancy (for completed Residential Buildings)

This Development Schedule is only an estimate and will likely change based on a number of factors, including, without limitation, conclusion of the ZBA's hearing on the Application.

VI. General Information

Proof of the Applicant's Site control, as referenced above, is indicated by the attached Deed to the Applicant (See Appendix F) A Certified Abutters list provided by the Town's Assessor on September 16, 2024 is provided herewith (See Appendix S. The filing fee to the Town in the amount of $500.00 is included as evidenced by Check No. 15751 a copy of which is provided herewith (See Appendix T).

VI. Conclusion

The proposed "Broadway Village" modification will provide high quality, multi-family, rental housing, commercial, open space and additional Town recreation amenities in a manner identified by the Town as desirable according to its Housing Production Plan.

In the Housing Production Plan, the Town identified that:

Housing is needed to support Dracut residents and businesses. In order maintain a balanced community Dracut needs to provide housing for residents of all ages and stages in their lives.
The Town further identified:

- several obstacles to the production of affordable housing there focused on zoning issues with particular attention to zoning which precludes residential development in commercial areas due to unbuildable regulations. And failure to diversify residential uses will continue to lend itself to the creation of housing that serves regional needs in terms of price and product (namely affluent seniors), rather than Dracut's local housing needs.
- Outsized minimum lot size, frontage, and setback requirements preclude most innovative forms of residential neighborhood design.
- The need to Provide housing options that attract families and enable older adults to remain in Dracut as their needs change across all income levels; 2. reinforce Dracuts's economic goals by supporting local businesses through the provision of expanded housing choices that serves a diverse local workforce; and Maintain and improve the condition of the Towns' housing stock and encourage high quality new construction.

This Development satisfies and meets all of the Town identified challenges, obstacles, and goals. It is therefore easy to conclude that the Development of the proposed Site is consistent with the Town's identified need for new residential development by development of this underutilized and undeveloped 46.5 +/- acre site.
It also contributes to the Town's Subsidized Housing Inventory adding 300 of the proposed units to the inventory and placing the Town closer to its 10% mandate providing for expanded affordable housing choices to existing residents, Town and local employees and families with school children already in the system though "Local Preference.
In short, the housing proposed under this Application will provide high quality, much needed housing for those working in and around the region meeting a critical need as a catalyst of local and regional economic development. The Development features minimal impacts on the Town's roadways, infrastructure and services by incorporating sustainable features. Additionally, the Development will revitalize and spur future, high-quality development in the surrounding area.

Appendix A –

Existing Comprehensive Permit

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Town of Dracut
Board of Appeals

62 Arlington Street
Dracut, MA 01826
Tel: (978) 454-0603
Fax: (978) 937-9885
email: boardofappeals@dracutma.gov

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TOWN CLERK'S OFFICE
DRACUT, MA

FINDINGS AND DECISION

PETITIONER AND OWNER: First Dracut Development Company, LLC

PROPERTY LOCATION: 341 Broadway Road

RE: Application of First Dracut Development Company, LLC for Comprehensive Permit (the "Application") (BOA No. 2005-13)

DATE: December 18, 2014

I, KATHLEEN GRAHAM, CLERK of the TOWN of DRACUT, MASS., HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE
3/3/2015 Kathleen M. Graham
Date Town Clerk, Dracut, Mass.

PROCEDURAL HISTORY

On or about January 21, 2005, First Dracut Development Company, LLC (the "Applicant"), applied for a comprehensive permit, pursuant to G.L. c.40B, to construct a total of 318 rental units, including 78 units of age-restricted rental units, to be contained within five separate buildings (as further reduced to 278 rental units noted by the Applicant at the February 16, 2006 hearing), on a site containing approximately 47.5 acres, located off Broadway Road, in Dracut, Massachusetts, (the "Property") to be called "Broadway Village" (hereinafter, the "Project"). The Project will be a "rental" Project.

1. A duly advertised public hearing of the Dracut Zoning Board of Appeals (hereinafter "the Board") was advertised on February 24, 2005 and March 3, 2005, opened on March 10, 2005, and continued to the following dates, including: May 12, 2005; June 9, 2005; October 27, 2005; January 19, 2006; February 16, 2006; April 27, 2006; June 22, 2006; September 14, 2006; December 14, 2006; March 8, 2007; April 19, 2007; May 17, 2007; and, June 28, 2007. The "Board" held a working session and deliberations on October 25, 2007, November 20, 2007, January 3, 2008 and January 10, 2008. The public hearing was closed on June 28, 2007. 2. The Board received and deliberated upon the documents and exhibits listed in Exhibit A attached hereto at the above listed hearings and meetings and the "Original Decision" incorporated the testimony received from the public, municipal departments, boards and commissions, and representatives of the Applicant, and set forth the Board's findings, stated the Board's action, and listed the conditions the Board voted to include in its Original Decision at its meetings on September 20, 2007, October 25, 2007, November 20, 2007, January 3, 2008, and January 10, 2008.

3. On July 21, 2011 the Board, at the request of the Applicant, reopened the Comprehensive Permit hearing process, pursuant to M.G.L. c. 40B and the regulations promulgated thereunder, to allow for modifications to the Project to address the fact that the Project site, subsequent to the Original Decision, was mapped by the Department of Environmental Protection's Natural Heritage Endangered Species Program to include habitat

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for Endangered and/or Species of Special Concern. Because of the mapping, the Project as originally approved, could not meet the then applicable NHESP regulations.

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4. Upon request of the applicant to reopen the public hearing on the Project, a duly advertised hearing of the Dracut Zoning Board of Appeals was advertised on July 7, 2011 and July 14, 2011, the hearing was subsequently reopened on July 21, 2011 and continued until September 22, 2011, November 17, 2011, February 16, 2012, April 26, 2012, June 21, 2012, December 20, 2012, March 21, 2013, May 16, 2013, June 27, 2013, September 19, 2013, October 17, 2013, December 19, 2013, February 27, 2014, April 17, 2014, May 15, 2014, June 19, 2014, July 17, 2014 and September 18, 2014. The public hearing was closed on September 18, 2014.

5. Subsequent to the reopening of the public hearing, the Board received and deliberated upon the documents and exhibits listed in Exhibit B attached hereto at the above listed hearings and meetings. The following Decision incorporates the testimony received from the public, municipal departments, boards and commissions, and representatives of the Applicant, and sets forth the Board's findings, states the Board's action, and lists the conditions the Board has voted to include in its Decision at its meetings on October 16, 2014 and December 3, 2014 and December 18, 2014.

6. The minutes, exhibits and other documents contained in the record are available for public inspection in the Board office, and are hereby incorporated by reference in the Decision.

SUMMARY OF DECISION

For the reasons stated below, the Board approves with the conditions set forth below the application of First Dracut Development Company, LLC, for a Comprehensive Permit for the Project consisting of 278 rental units of housing pursuant to the Massachusetts Comprehensive Permit Law (M.G.L., c. 40B, §§20-23, or Chapter 408) (the "Act"), Rules of the Department of Housing and Community Development's ("DHCD's") Housing Appeals Committee, 760 CMR 56.00 (the "Regulations"), and the Rules and Regulations of The Zoning Board of Appeals of Dracut.

I. FINDINGS OF FACT

1. The Applicant, First Dracut Development Company, LLC, is a Massachusetts limited liability company having an address of 224R Andover Street, Andover, MA 01810.

2. The Applicant is qualified to make the Application pursuant to 760 CMR 31.01 in that (a) it is a "limited dividend organization" as that term is used in G.L. c.40B, s. 21 and 760 CMR 31.01(1); (b) the project is fundable by a subsidizing agency under a low and moderate income housing subsidy program, and (c) it has "control of the site".

3. The Applicant proposes to comply with the limited dividend requirement of G.L. c, 40B, § 20, by executing and recording a Tax Regulatory Agreement in accordance with the rules governing the Massachusetts Development Finance Agency's (Mass

Development's) Tax Exempt Bond Program for Rental Housing, and agreeing to restrict the distribution of return to the Applicant or to the members, partners, shareholders, or other owners of the Applicant or the Project to no more than ten percent (10%) of the Applicant's Equity in the Project per year (the "Limited Dividend Requirement"), as determined from financial statements approved by Mass Development ("Allowable Profit"), as described in Mass Development's Equity and Limited Dividend Policy, and as set forth in the proposed Tax Regulatory Agreement to be executed by the Applicant, the Bond Issuer and Mass Development.

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4. The Project is fundable by a subsidizing agency under a low and moderate-income housing subsidy program as evidenced by the site approval letter issued by Mass Development, dated December 22, 2004, pursuant to the Mass Development Tax Exempt Bond Program for Rental Projects.

5. The "Board" finds that the Applicant has shown evidence of its interest in the Property sufficient to qualify as a recipient of a Comprehensive Permit. It maintains "site control" of the Property within the meaning of 760 CMR 56, as evidenced by, among other things, a Deed into the Applicant, dated November 3, 2000, and included within the Comprehensive Permit Application.

6. The Applicant has submitted a complete application and other information as required by, and in accordance with, the requirements of the Act and the Regulations and Town of Dracut Zoning Board of Appeals.

7. The Town of Dracut has not met the statutory minima set forth in G.L. c. 40B §20 or 760 CMR 56 in that: (1) low and moderate-income housing units in Dracut do not exceed 10% of Dracut's total housing units; (2) low and moderate income housing is not located on sites comprising one and one-half percent or more of the total land area zoned for residential, commercial or industrial use, and (3) the development of affordable units consistent with this application will not result in the commencement of construction of such housing units on sites comprising more than three-tenths of one percent of such land area, or ten acres, whichever is larger, in one calendar year.

8. The "Project Site" (or "Property" or "Site") as defined in the Application, and as supplemented by documentation and site plans filed with the ZBA, is that real property consisting of a total of approximately 47.5 +/- acres of land, as further identified on the Town of Dracut Assessors Maps as Map 37/51, Parcels 86-1, 86-2, and 86-3 (341 Broadway Road), and all as shown on the "Site Plans" (as defined below).

9. The Project consists of two-hundred seventy-eight (278) residential rental apartment units on the property to be located within four (4) separate multifamily residential structures, of which ninety-eight (98) of the rental units will have one bedroom, and one-hundred eighty (180) of the rental units will have two bedrooms. The total of 278 residential rental units shall be collectively referred to as the "Units" and each, a "Unit." The Project will also include a clubhouse/office area, as well as other amenities, as shown on the "Site Plans" (as defined below). All units within the 55+ age restricted units (58 units) will be

designed to facilitate handicap accessibility and 5% of the remaining units will be handicap accessible throughout the project.

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10. The buildings containing the Units are shown on a set of architectural plans, entitled "Broadway Village, 341 Broadway Road, Dracut, MA, dated September 18, 2014, Provided by Clockwork 11 Kearney Square, 3rd Floor, Lowell, MA 01852" collectively, the architectural plans listed in Paragraph 10 herein are hereinafter defined as the "Architectural Plans" unless otherwise described herein.

11. The buildings containing the Units, as well as a depiction of other improvements as part of the Project are shown on the following signed and stamped engineering plans entitled "Site Plan in the Town of Dracut Middlesex County Commonwealth of Massachusetts Broadway Village 341 Broadway Road", dated November 4, 2013, last revised October 1, 2014, including Cover Sheet (Sheet 1), Existing Conditions Plan (Sheet 2), Overall Site Plan (Sheet 3), Proposed Site Plans (Sheets 4, 5 and 6), Proposed Utility Plans (Sheets 7, 8 and 9), Proposed Grading and Utility Profiles (Sheets 10, 11, 12, and 13), Detail Sheets (Sheets 14, 15 and 16), Proposed Cross Section Plan, Sheet 17), and Proposed Roadway Widening Plan (Sheet 18). Collectively, the site engineering plans listed in the Paragraph 11 herein are hereafter defined as the "Site Development Plans" unless otherwise described herein.

12. Collectively, the Architectural Plans and the Site Development Plans referenced in Paragraphs 10 and 11 above are hereinafter defined as the "Site Plans" unless otherwise noted herein.

13. The Property is located entirely within the Industrial 1 (I-1) Zoning District, as defined under the Town of Dracut Zoning Bylaws, as amended (the "Zoning Bylaws").

14. The Applicant submitted a comprehensive list of requested waivers and exceptions from the Town of Dracut's local bylaws and regulations, as part of its original application, and as supplemented by the Applicant. (revised December 10, 2014).

15. As required in this Decision, each dwelling Unit will be serviced by a water supply connection to the Dracut Water Supply District, and by a sewer connection issued by the Dracut Sewer Department.

16. The Town of Dracut's Sewer Department and the Dracut Water Supply District have indicated that the existing mains have adequate capacity to serve the dwelling Units and Project.

17. The Applicant proposes to provide a total of 570 parking spaces on the Property, the 55+ building includes a garage with parking under the building and the other units contain surface parking spaces, all as shown on the Site Plans. Each unit will have parking available either in the garage or in an outside space.

18. The Board originally retained Judith Nitsch Engineering, Inc., of Boston, MA as its professional engineering and traffic consultants to assist the Board in the review of the Application. Upon reopening the hearing the Site Plans and related documents were

reviewed by Fay, Spofford & Thorndike. The Board also retained the services of its Town Counsel, Attorney James A. Hall, to review legal aspects of the Application and Decision. Other aspects of the Project were reviewed by the departments of the Town of Dracut.

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19. The Board's traffic and engineering consultants prepared detailed reports indicating that the Project would not endanger public health or safety or the environment. Said reports are included herein by reference. The conditions below reflect any and all recommendations and/or requirements of said consultants.

20. As proposed and approved, twenty percent (20%) of the two-hundred seventy-eight (278) rental dwelling units, or fifty-six (56) units (the "Affordable Units") shall be reserved for rental to families earning no more than fifty (50%) percent of the median household income for the Lowell MA HMFA (HUD Metro FMR Area), as may be adjusted in accordance with Mass Development's Tax Exempt Bond Program for Rental Housing from time to time. The distribution of Affordable Units shall be proportional among all four (4) buildings.

21. The Project is "consistent with local needs" as defined in the Regulations.

22. During the course of the hearings, the Board sought and received comments from Town Boards, Departments, Commissions and other Town staff, as well as, from its peer review consultants. The Applicant has addressed these comments and issues adequately, and there are no outstanding issues, provided that the Project complies with the conditions set forth in this decision.

II. DECISION AND CONDITIONS FOR APPROVAL

For the foregoing reasons, the Board grants approval of the application of the Applicant, First Dracut Development Company, LLC, for a Comprehensive Permit Decision for the Project consisting of 278 rental housing units and other improvements shown on the Site Plans on the Property pursuant to Chapter 40B, subject to each and every one of the following conditions.

The term "Applicant" as set forth herein shall mean the Applicant, its heirs, successors and assigns, including but not limited to the condominium association and Unit owners, but only for such person's or entity's duration of ownership or control.

The term "Board" shall mean the Town of Dracut Zoning Board of Appeals.

A. General Conditions

A.1 Approved Plan. Prior to the commencement of construction, the Applicant shall submit to the Board a final comprehensive permit site plan set for technical review by the Board to ensure that it is consistent with and in conformity with this Decision, which upon such finding shall be approved and endorsed by the Board (the

"Approved Plan") pursuant to its authority under Section 21 of M.G.L. c. 40B, The Board shall render a decision on the Approved Plan within 45 days of its submittal.

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A.2 Endorsement and Recording of Approved Plan. This Decision shall be noted on the endorsed Approved Plan and both this Decision and the Approved Plan shall be recorded at the Middlesex Registry of Deeds. Proof of recording shall be forwarded to the Board prior to issuance of a building permit.

A.3 Compliance with Local Bylaws. The Applicant shall comply with all local bylaws, rules and regulations of the Town of Dracut and its boards and commissions in effect as of the date which the Comprehensive Permit Application was filed with the Board, unless expressly waived herein or as otherwise addressed in these conditions.

A.4 Fees. The Applicant shall pay all fees of the Town of Dracut imposed on construction projects and for the purposes of monitoring compliance of the construction and occupancy of the Project in accordance with this Comprehensive Permit unless otherwise waived in this Decision. Accordingly, the Board does not waive any local fees applicable to the Project.

A.5 Compliance with State Building Code. The Applicant shall comply with The State Building Code. The Applicant shall also comply with any local regulations or fees of the Building Inspector unless otherwise waived in this Decision. The Applicant shall pay all required fees for all such building permits including any fees customarily charged for inspections and permits.

A.6 Inspections. Inspections during the construction phase shall be conducted, at the expense of the Applicant, in accordance with the Rules and Regulations of the Planning Board. The Board may appoint an agent to conduct such inspections. The Board may require the establishment of an escrow account to assure such payment.

A.7 Recordkeeping. The Applicant shall maintain a copy of the Approved Plan and this Decision at the Site during construction.

A.8 Binding Effect. Each condition in this Decision shall run with the Property and shall, in accordance with its terms, be applicable to and binding on the Applicant and the Applicant's successors and assigns.

A.9 Rental Units and Parking. This Decision permits the construction and use of two hundred seventy-eight (278) rental housing units with a mix of garage-under parking, surface parking and other improvements, all as shown on the Site Plans. The construction and use of the Site shall be in substantial conformity with the Site Plans as modified by the Approved Plan, and there shall be no creation of additional housing units or any other structures or infrastructure except that which is shown on the Approved Plan. All Units shall be used, and offered, for rental purposes only. At no time shall any individual Unit be made available for ownership, and no Units shall be converted from rental Units to ownership Units, without further approval of the

Board in the form of an amendment to this Decision if required in accordance with procedures described in Section M below. The Project shall include a total of 570 parking spaces as shown on the Site Plans.

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A.10 Model Unit. A model dwelling unit shall be allowed in the preliminary phase in addition to the 278 dwelling units. This model shall never be occupied as a dwelling unit for rental or any other residential purpose. It may only be used as office space or for display by the rental office.

A.11 Age Restriction – Building No. 4 All Units in Building No. 4 shall be subject to an age restriction described in a deed, deed rider, restrictive covenant, or other document approved by the Board that shall be recorded at the Registry of Deeds. All such documentation shall reference the requirement that the occupied units shall be occupied by at least one person who is fifty-five years of age or older (the "Qualified Occupant") consistent with the "Housing Laws" (as defined below); provided, however, that in the event of death of the Qualified Occupant(s) of a Unit, a two-year exemption shall be allowed to allow for the transfer of the Unit to another Qualified Occupant (the "Age Restriction") so long as the provisions of the "Housing Laws" are not violated by such occupancy. The Age Restriction is intended to be consistent with, and is set forth in order to comply with, the Federal Fair Housing Act, 42 USC Section 3607(b), as amended, the regulations promulgated thereunder at 24 CFR Section 100.300 et seq., Subpart E —Housing For Older Persons, as amended, and MGL c. 151B, Section 4 (collectively, the "Housing Laws"). Moreover, in accordance with amendments to MGL c. 151B identified in Chapter 291 of the Acts of 2006, the housing owner or manager shall register biennially with the Massachusetts Department of Housing and Community Development. No other Units within the Project shall be required to be age-restricted as provided in this Section A.11.

B. Submission Requirements

B.1 Pre-Construction Submissions: Before any building permit is issued by the Building Department, the Applicant shall have filed the following documents, unless otherwise provided below:

a. Obtained, and filed with the Board a copy of any approvals from the Dracut Conservation Commission which may be required under any statute, code, or rule and regulation under its jurisdiction not otherwise preempted by Chapter 40B, to the extent not otherwise expressly covered by this Decision, including a final Order of Conditions or Superseding Order of Conditions under the Wetlands Protection Act as to any portion of the Site subject to the Wetlands Protection Act;

b. Obtained and filed with the Board a copy of a U.S. EPA National Pollutant Discharge Elimination System ("NPDES") stormwater permit issued for the Project;

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c. Delivered to the Board final architectural drawings for each of the four (4) buildings to be constructed, substantially as shown in the Architectural Plans, providing a scaled depiction of the front, rear and side elevations, signed by a registered architect; provided, however, that only the final architectural plans for the first building need to be delivered to the Board prior to the issuance of building permit(s) for the first building to be constructed, and the second set of building permits shall be issued only upon the Board's receipt of the final architectural plans for the second building, and the same shall be required for subsequent phases including new buildings approved in this Decision.

d. Obtained and filed with the Board, a DEP Sewer Extension/ Connection Permit if required.

e. Obtained and filed with the Board, both the Environmental Notification Form (ENF) and Secretary's Certificate, and if applicable, any subsequent filings as well as any additional Certificate as may be required and issued under the Massachusetts Environmental Policy Act and regulations set forth at 301 CMR 11.00 ("MEPA").

f. Filed with the Board, a recorded Regulatory Agreement including a perpetual Affordable Housing Restriction in conformance with the provisions herein, which shall be subject to review and approval by the Board and Town Counsel as to form and consistency with this Decision, said approval to not be unreasonably withheld or delayed.

g. Obtained and filed with the Board, an Assent Agreement or other agreement executed by National Grid which allows the improvement shown on the Site Plans to be constructed and maintained.

h. Obtained and file a Conservation Management Permit issued by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), or a determination of "no take" from the NHESP.

C. Site Development Construction Conditions

C.1 Site Access. The Applicant shall ensure safe and convenient vehicular access to the Site during the entire duration of the Project. The applicant shall also employ generally accepted means of ensuring that soil, rocks, debris, etc. from the Property are not deposited on abutting roadways, to the satisfaction of the DPW Director. The Board representatives shall be permitted access to the Site to observe and inspect the site and construction progress until such time as the Project has been completed.

C.2 Final Architectural Plans. The Applicant shall forward final architectural plans to the Building Inspector at the time of applying for building permits. All construction shall be inspected by the Building Inspector and shall be in compliance

with all Massachusetts State Building Code requirements. The Applicant shall conform with all pertinent requirements of the Americans with Disabilities Act and other similar Town of Dracut written policies or other written requirements pertaining to accessibility.

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C.3 Mailbox Units. The Applicant shall provide one or more centralized mailbox units (CMU) for any Project residents, which shall be approved as to location by the local Postmaster of the United States Post Office.

C.4 Prevention of Nuisance Conditions. The Applicant shall be responsible to ensure that nuisance conditions do not exist in and around the site during the construction operations. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area.

C.5 Hours of Construction. – The hours of operation for any construction activities on-site shall be between 7:00 am and 6:00 pm, Monday through Saturday, and no work shall be allowed on-site on Sundays or on Holidays as recognized by the Commonwealth of Massachusetts and the Town of Dracut.

C.6 Dust Control. – The Applicant shall implement on-Site and off-Site dust control operations whenever directed by the Building Inspector or the Director of the DPW in order to minimize potential impacts to abutting properties.

C.7 Noise Suppression. – The Applicant shall implement measures to ensure that noise from Project construction activities does not exceed acceptable levels, as set forth by Federal and State regulatory agencies and the Town of Dracut Bylaws. The Applicant shall cease any excessively loud activities when directed by the Building Inspector.

C.8 Vibration. – The Applicant shall implement necessary controls to ensure that vibration does not extend beyond the subject site and create a nuisance or hazard for property abutters.

C.9 Traffic Controls. – The Applicant shall implement necessary traffic safety controls to ensure a safe and convenient vehicular access in and around the site. Any traffic problems that occur as a result of site operations and construction shall be mitigated immediately, at the expense of the Applicant.

C.10 Roadway Maintenance. – The Applicant is responsible for the sweeping, removal of snow, and sanding of the internal roadways and driveways permitting access to residents, emergency vehicles, and others during construction.

C. 11 Retaining Walls. Any retaining walls and related appurtenances shall be maintained by the Applicant. In the event that the Applicant fails to maintain the retaining walls and related appurtenances, the Town may conduct such emergency maintenance or repairs and the Applicant shall convey such easement or other rights necessary to

implement such guidelines prior to the issuance of a certificate of occupancy. In the event the Town conducts such maintenance or repairs, the Applicant (or its successors if the Property is conveyed by the Applicant), shall promptly reimburse the Town for all reasonable expenses associated therewith; if the Applicant fails to so reimburse the Town, the Town may place a lien on the Project to secure such payment.

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C.12 Utilities. – Utilities, including but not necessarily limited to electric, cable, gas, and telephone shall be located underground except with respect to any of the so -called "green" electrical transformer boxes, street lights, and related appurtenances, and unless otherwise shown on the Site Plans or approved by the Zoning Board of Appeals.

C.13 Construction Vehicles. – Construction vehicles shall be parked on the Property and off Broadway Road at all times except when work on or adjacent to Broadway Road is required pursuant to the Mass Highway Curb Cut Permit.

C.14 Blasting. In the event that blasting is required to construct the Project, any such blasting activity at the site must be pre-approved and coordinated through the Town of Dracut Fire Department and must to conform to all of the requirements of the Dracut Fire Department, State Fire Marshall's Office and any other appropriate regulatory agency.

C.15 Final Approval of Other Plans. Prior to the issuance of a building Permit, for any dwelling unit, the Applicant shall submit the following information or plans for final site approval by the Board or its agent:

a. Architectural Plans, consistent with Section B.1I;
b. Final Sign Plan for the Project;
c. Drainage Report and Stormwater Management Plan;
d. Off-Site Sewer Line Plan and On-Site Pumping Station Plan; and,
e. Site plan to include lighting (including a photometric plan) and landscaping.

Notwithstanding the foregoing, the Applicant may perform general site work at the developer's risk. This action should not be construed as approval for continuing the entire project.

C.16 Management Documents. The Applicant shall prepare management documents in a form that conforms to this Decision and applicable law for the Board's review. The Management Documents are designed to manage the Project and ensure that the terms and conditions of this Decision are enforced, and the purpose of the Management Documents is to ensure the Applicant has developed a sound and long-term strategy to ensure that the Project remains viable, attractive and safe to tenants living within the Project. The Board requires that the Management Documents identify, at a minimum, which the day-to-day responsible parties will be, in the case of an on-site emergency, and plans for day-to-day and periodic on-site maintenance.

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The Management Documents, which shall be on file with the Board and maintained on the Site prior to the issuance of the first Certificate of Occupancy for the Project, shall, at a minimum, contain the following:

a. A plan for the operation and maintenance of the dwelling units, common areas, and all other improvements shown on the recorded Site Plans;

b. A specific plan (with identified parties) to maintain the drainage facilities, stormwater basins and appurtenances as incorporated into a Stormwater Operation and Maintenance ("O & M") Plan which may be substituted by an equivalent O & M Plan approved by the Conservation Commission;

c A maintenance plan for roads and driveways, including snow removal, spring-cleaning, and repair of road surfaces as needed;

Such Management Documents shall provide for and include a comprehensive set of rules and regulations governing the conduct of tenants, residents, and their invitees upon the Site, without limitation; (i) noise control rules, (ii) prohibition on parking of resident or visitor-owned commercial vehicles, (iii) prohibition on parking or storing of motor vehicles, boats, trailers, or other property on the main roadway or in any other non-designated parking spaces.

C.17 As Built Plans: Prior to the occupancy or use of the final building constituting a part of the Project, the Applicant shall submit to the Board an "As Built Plan" showing all pavement, buildings, stormwater management structures, and other infrastructure as they exist on the Site, above and below grade. The plans shall be signed by a registered land surveyor or civil engineer, certifying that the Project as built conforms and complies with the conditions of this Comprehensive Permit.

C.18 As Built Utilities Plan: An accurate as-built utilities plan and profile, showing actual in-ground installation of all utilities, shall be submitted to the Department of Public Works after completion of construction.

D. Legal Requirements

D.1 Building Permits. Prior to the issuance of a certificate of occupancy for the particular buildings/units, the Applicant shall file with the Board a copy of: (a) a building permit from the Dracut Building Department pursuant to the Massachusetts State Building Code for the number of buildings / Units applied for in the Applicant's sole discretion, recognizing that the construction of the Units will be phased; and, (b) the construction drawings submitted to obtain said building permits(s).

D.2 Conditions Binding. The Applicant and/or subsequent Owner(s) shall be bound by all conditions and requirements set forth in this Comprehensive Permit.

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D.3 Private Maintenance Obligations. The Applicant shall be responsible for the private maintenance obligations and other obligations described as follows:

a. Access to Fire Hydrants shall be maintained free of snow and other debris or obstructions;
b. Maintenance of landscaping and school bus stop in accordance with the Site Plan;
c. Trash and recyclables shall be collected internally within the 55+ building. A roll away dumpster and/or compactor shall be located in the garage area to collect the deposited trash. The dumpster will then be handled on the designated day for trash removal by the managing entity for the Project. Additionally, the proposed outside dumpster areas will be fenced and screened as shown on the Site Plans;
d. Private driveway maintenance to ensure that driveways are maintained to provide year round, safe and adequate passage (i.e. access and egress), and to meet the requirements of the Dracut Fire and Police Departments. ;
e. Private sidewalk maintenance to ensure that sidewalks are maintained to provide year round, safe and adequate pedestrian passage and to meet the safety requirements of the Dracut Fire and Police Departments.;
f. Maintenance of Centralized Mail Delivery Area(s) as approved herein;
g. Maintenance of Project Storm Water Management Facilities. In the event that the Applicant, its successors, or agents fail to maintain the stormwater management system in accordance with such guidelines for operation and maintenance, the Town, in its sole discretion, may conduct such emergency maintenance or repairs. Prior to obtaining building permits for the Project, the Applicant shall convey to the Town an easement, acceptable to the Board, to allow for such maintenance or repair by the Town. In the event the Town conducts such maintenance or repairs, the Applicant (or its successors if the Property is conveyed by the Applicant), shall promptly reimburse the Town for all reasonable expenses associated therewith; if the Applicant fails to so reimburse the Town, the Town may place a lien on the Project to secure such payment.
h. The driveways, roads, utilities, drainage systems, and all other infrastructure shown on the Approved Plans as serving the Project shall remain private and the Town of Dracut shall not have, now or ever, any legal responsibility for the operation or maintenance of the infrastructure, including but not limited to snow removal and landscape maintenance.

D.4 Unapproved Structures. No building, deck, pool or other structural improvement as shown on the Approved Site Plans may be expanded, and all accessory buildings, additions, decks other than those shown on the Site Plans, including sheds, portable buildings, swing sets, tennis courts, swimming pools, and other similar improvements on the Property shall be prohibited unless otherwise approved by the Zoning Board of Appeals.

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E. Traffic and Safety Conditions

E.1 All traffic improvements shall be completed in accordance with the standards set forth in the most recent edition of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD), and as further defined by the applicants traffic consultant and reviewed by the Boards traffic consultant, F S & T and shall be in place prior to project occupancy unless otherwise determined by the Director of Public Works.

E.2 Driveways, sidewalks and curbing, sufficient for the safe separation of pedestrians from moving vehicles, shall be provided throughout the Site substantially as shown on the Site Plans or otherwise to allow safe vehicular and pedestrian access within the site and between all units.

E.3 The Applicant shall install traffic signs within the Project as recommended by the Town's peer review traffic consultant, and the Applicant shall bear the cost of all such signage and installation.

E.4 The following conditions were recommended by the Boards Consulting Engineers and the Board hereby requires compliance therewith:

Site

a. Mitigation for Broadway Road – Route 113 consisting of roadway upgrades as shown on the "Proposed Roadway Widening Plan" of the Site Development Plans.

Traffic

a. Mitigation for traffic volume by analyzing and if required and agreed upon by the Town of Dracut consulting review engineer and the Massachusetts Highway Department, adjusting the signal timing at the Broadway/Arlington/Wheeler Street traffic signal location.

b. Provided an incentive program for alternative transportation modes to be used by residents of the proposed development

c. All other comments on traffic and engineering have been satisfactorily addressed by the Applicant, and as required, have been addressed and noted on the Site Plans.

E.5 The Applicant shall construct all sidewalks and curbs as specified and shown on the Site Plans.

E.6 The following Fire Department recommendations, as outlined in a

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memorandum to the Board from Leo Gaudette, Chief of the Dracut Fire Department, dated August 31, 2011 and as provided in the memorandum to the Board from Glen Edwards dated December 9, 2013, are conditions to Project approval as provided below:

a. Water flow tests indicating the required gallons per minute and acceptable pressure shall be submitted to the Fire Department;
b. Final hydrant locations or changes to be determined by the Fire Department;
c. Per Code a fire hydrant must be located within 100' feet of all fire department sprinkler connections;
d. All buildings will require a fire suppression sprinkler system;
e. A pedestal style Master Box with a Graphic Annuciater showing ALL buildings, to be located at the complex entrance determined by the Fire Department;
f. All Fire Lanes must be 25' feet in width and meet the turning characteristics of a single bus unit (AASHTO);
g. A Fire Alarm Panel, along with a separate Annunciater, will be required per building, location determined by Fire Department;
h. Building numbers at least 12' inches in size;
i. A hallway sign with arrowed direction of the unit numbers per floor;
j. Road entrance must have a curb-cut opening of no less than 50' feet;
k. Access roads per NFPA must be at least 20' feet in width, with a paved surface and NO gates.
l. A Knox Box to store the entry keys on each building.

Additionally, no storage space shall be allowed in the attics of any building.

E.7 The Applicant shall address as applicable any outstanding requirements identified in the September 9, 2011 memorandum of Glen Edwards reflecting comments from the Department review meeting held August 31, 2011 and the December 9, 2013 memorandum of Glen Edwards reflecting comments from the Department Review meeting held on December 5, 2013.

E.8 The Applicant shall construct and maintain a bus stop in the location agreed to by the Applicant and the School Business Administrator for the Dracut Public Schools as described in a letter from Terry L Wiggin, School Business Administrator, to Kenneth M. Lania, dated April 26, 2006.

E.9 The Applicant shall apply for and obtain appropriate curb cut permits from the Department of Public Works and/or Mass Highway.

F. Landscaping and Open Space Conditions

F.1 The Applicant shall prepare a final landscaping plan for review and approval by the Board prior to the Building Commissioner's issuance of building permits.

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F.2. The Applicant shall complete the landscaping improvements located on the Site as depicted on the Site Plans.

F.3 The landscaping shall be maintained by the Applicant. Dead or diseased plantings shall be replaced as soon as possible in accordance with growing and weather conditions but in no event shall replacement occur more than one year from the discovery of the dead or diseased planting

F.4 The open space/recreation areas shown on the Site Plans in the courtyards of Buildings 1, 2, 3 and 4 shall be maintained as open space and passive recreational areas.

G. Affordability Requirements

G.1 Affordable Units. No less than twenty (20%) percent of the Units (56 Units) within the Project shall be reserved for rental to households whose aggregate income is no greater than 50% of the area median income, adjusted for household size, as published by the Department of Housing and Urban Development for the Lowell MA HMFA (HUD Metro FMR Area) as the same may be adjusted pursuant to Mass Development Tax Exempt Bond Program for Rental Housing (the "Affordable Units").

G.2 Affordable Rental Rates: The Affordable Units shall be rented to qualified households at prices deemed affordable to households earning no more than 50% of the area median income, adjusted for household size, using cost and other assumptions developed under Mass Development's Tax Exempt Bond Program for Rental Housing.

G.3 Affordable Housing Restriction: Each Affordable Unit shall be rented pursuant to a restriction ensuring that only income-qualified tenants are occupying the Affordable Unit(s). An affordable housing restriction, enforceable by the Town of Dracut, requiring that the Affordable Units remain affordable in perpetuity and in a form approved by counsel for the Town, shall be recorded senior to any liens on any land or dwelling unit within the limits of the Project to protect the requirement for the Affordable Units in the event of foreclosure, bankruptcy, refinancing or sale as may be approved by Mass Development.

G.4 Selection of Tenants for Affordable Units. The Applicant shall obtain the Monitoring Agent's approval of a Tenant Selection Plan for the rental of the Affordable Units prior to putting the Affordable Units on the market. Tenants for the Affordable Units shall be selected through a fair lottery process (the "Lottery"). To the maximum extent permitted by law, first preference for the rental of 70% of the Affordable Units shall be given to households that meet one or more of the following local preference criteria:

a. Dracut residents;

b. at least one member of the household is either a son, daughter, or parent of a Dracut resident; and,

c. U.S. military veterans residing in Dracut.

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The local preference shall be implemented by a Lottery Agent approved by the Board. Prior to conducting the Lottery, the Lottery Agent shall submit a final Lottery Plan to the Board and Monitoring Agent for its approval. All costs associated with the Lottery shall be exclusively the Applicant's.

G.5 Mix of Affordable and Market Rate Units. The Affordable Units shall not be segregated from the market rate units. The Affordable Units shall not be different in external appearance from the market rate units. The Building Plans shall identify the initial locations of the Affordable Units. The Applicant shall notify the Board of the change in location of any Affordable Units, if and as it occurs, within two (2) weeks of such change.

G.6 Tenant Selection. The selection of tenants, for the Affordable Units, including the administration of the Lottery, shall be performed by a Lottery Agent retained by the Applicant, subject to the Monitoring Agent's approval. The Lottery shall be implemented pursuant to a Lottery Plan developed by the Lottery Agent and approved by the Monitoring Agent. The Monitoring Agent shall oversee the lottery.

G.7 Income Eligibility. The Monitoring Agent shall develop rules and guidelines to carry out the provisions of this Section G, as necessary. Income eligibility shall be governed by the requirements of the Mass Development Tax Exempt Bond Program for Rental Housing, or in default, the rules and standards employed by the Massachusetts Department of Housing and Community Development (DHCD) or the U.S. Department of Housing and Urban Development in the selection of income-eligible tenants for publicly subsidized housing,

G.8 Disputes. Disputes concerning income qualification and local preference qualification shall be resolved in the first instance by the Monitoring Agent. A party aggrieved by qualification-related decision of the Monitoring Agent may appeal the decision to the Department of Housing and Community Development to the extent allowed by law.

G.9 Compliance With Program Requirements. The provisions of this section are intended to complement and not to override or supersede any applicable fair marketing regulations of the Department of Housing and Community Development, the Massachusetts Commission Against Discrimination, or any authority with jurisdiction and like purpose, to provide low and/ or moderate income housing. Moreover, to the extent there is a conflict between the provisions in this Decision and the form of Regulatory Agreement approved by Mass Development, the Regulatory Agreement shall prevail.

G.10 Phasing of Affordable Units. If the Project is phased, then approximately 20% of the Units in each phase will be Affordable Units. The Affordable Units shall be reasonably interspersed within the Project.

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H. Stormwater Management System

H.1 Stormwater shall be managed in accordance with the applicable Massachusetts Stormwater Management Policy and related guidance, the terms and conditions required by the Board's peer review consultants (which terms and conditions are reflected in the Conditions of this Decision), and the Wetlands Order of Conditions issued by the Dracut Conservation Commission.

H.2 All stormwater drainage basins shall be located as to facilitate the maintenance and operation of the basins or drainage utility.

H.3 The Applicant shall maintain and repair the drainage structures and stormwater management system on the Site in accordance with a management plan until such time as the Applicant conveys the Site to a new Applicant/Owner subject to these responsibilities.

H.4 In the event that the Applicant, its successors, or agents fail to maintain the stormwater management system in accordance with such guidelines for operation and maintenance, the Town, in its sole discretion, may conduct such emergency maintenance or repairs. Prior to obtaining building permits for the Project, the Applicant shall convey to the Town an easement, acceptable to the Board, to allow for such maintenance or repair by the Town. In the event the Town conducts such maintenance or repairs, the Applicant (or its successors if the Property is conveyed by the Applicant), shall promptly reimburse the Town for all reasonable expenses associated therewith; if the Applicant fails to so reimburse the Town, the Town may place a lien on the Project to secure such payment.

H.5 The Applicant shall provide stabilization for all slopes greater than 3:1

H.6 Prior to the issuance of a Building Permit for the first Building, the Applicant shall provide as applicable stamped retaining wall designs to the Dracut Building Department for all walls greater than six (6) feet in height.

H.7 The Applicant shall stake the property line in the area of the property line at the entrance to the project, as shown on Site Plans to ensure that no work occurs on the abutting properties.

H.8 The Applicant shall address stormwater requirements as applicable as identified in the July 19, 2014 memorandum from David Glen, P.E., Fay, Spoffard & Thorndike, LLC to the extent that such stormwater requirements require plan changes, they shall be incorporated into the approved Plan in accordance with Condition A.1.

I. Wetlands Resource Areas

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I.1 Wetlands. The Conservation Commission's Order of Conditions, or any order of the Department of Environmental Protection (DEP), if applicable, regarding this Property, shall be made a part of this Comprehensive Permit Decision. If there is any inconsistency between the Site Plans and the plans as may be approved by the Conservation Commission or the DEP, the Applicant shall submit an amended plan to the Zoning Board of Appeals for approval. Said amended plan shall be accompanied by a letter setting forth any and all changes from the submitted plan of record and shall include revised drainage calculations, if applicable.

J. Surety & Covenants

J.1 No certificate of occupancy for any building shall be issued until the improvements specified in this decision and set forth on the plans of record are constructed and installed so as to adequately serve said building, or adequate security has been provided, reasonably acceptable to the Zoning Board of Appeals, to ensure such completion. Any such performance guarantee shall be governed by the subdivision rules and regulations of the Planning Board and shall be approved as to form by the Board legal counsel.

J.2 Unless otherwise approved by the Zoning Board of Appeals, the Project shall follow the Planning Board's Subdivision Rules and Regulations regarding performance guarantees for the installation of municipal services, including but not limited to, the completion of the infrastructure related to the Project as shown on the Approved Plan, including, but not limited to, the sidewalks, parking areas, drainage facilities, utilities, and any other specific infrastructure shown on the Site Plans (the Infrastructure"). In determining the amount of the bond or surety, the Director of Public Works shall be guided by the following formula in setting the sum of the security:

a. The Director's estimate of the cost to complete the work; plus
b. A ten percent margin of error; plus
c. An appropriate rate of inflation over a five-year period.

J.3 All performance bonds shall contain the following provision:

"If the Principal shall fully and satisfactorily observe and perform in accordance with the qualifications and time schedule set forth herein specified, all the covenants, agreements, terms and provisions set forth in the following:

a. The plan of record;
b. This Decision with all exhibits thereto;

Then this obligation shall be void; otherwise, it shall remain in full force and effect and the aforesaid sum shall be paid to the Town as liquidated damages."

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J.4 Performance bonds, if any, shall be released by the Zoning Board of Appeals, in accordance with the Subdivision Rules and Regulations of the Planning Board.

K. Water Supply

K.1 The Applicant shall submit a plan for water line extension, and prior to the issuance of each Building Permit for a Building, the Applicant shall have applied for and obtained a water connection permit for each Building (for which the building permit was sought) from, and pay the applicable water fee to, the Dracut Water Supply District. The District shall also set the required infrastructure conditions to supply potable and fire protection water to the Project.

K.2 The Applicant shall be required to meet with the Board of Water Commissioners and conduct necessary flow tests and submit calculations for water demand.

K.3 As noted in the February 25, 2006 letter from the Dracut Water Supply District, an adequate supply of water and water service is available to the Site for the Project, and that the approval is subject to final review and agreement between the Applicant and the Dracut Water Supply District's Board of Commissioners.

L. Sewer System

L.1 The Applicant will submit the final design of the on-site pump station and force main to the Board, the Director of Department of Public Works, and the Dracut Sewer Superintendent prior to the release of any building permits.

L.2 Prior to the issuance of the first building permit for the Project, the Applicant must obtain a local sewer extension or connection permit and pay the appropriate fee (for each Building for which the building permit was sought) or as otherwise may be required by the Sewer Department.

L.3 The proposed Sewer lines and related appurtenances shall be constructed substantially in accordance with the Site Plans, as may be modified at the request of the Director of the Department of Public Works.

M. Amendments

If, between the date this Decision is filed in the office of the Dracut Town Clerk and the completion of the Project, the Applicant desires to change in a material way and/or to a significant degree the proposed Project as reflected in and approved by this Decision, such changes shall be governed by 760 CMR 56.

N. Expiration Date

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If construction authorized by this Comprehensive Permit Decision has not begun within three years of the date on which the permit becomes final, the permit shall lapse unless extended in accordance with the Rules of the Housing Appeals Committee, 760 CMR 56. The Decision shall become final on the date that the written decision is filed in the office of the Town Clerk if no appeal is filed. Otherwise, it shall become final on the date the last appeal is decided or otherwise disposed of.

O. Miscellaneous.

O.1 The term "Applicant" as set forth herein shall mean the First Dracut Development Company, LLC, its successors and assigns.

O.2 Unless otherwise indicated herein, the Board may designate an agent to review and approve matters noted in the conditions set forth herein,

O.3 The Applicant has requested, and the Board has granted, the approved waivers from local rules set forth in Exhibit C hereto. To the extent that the Approved Plan shows additional waivers at specific locations not expressly set forth above, these waivers are also granted, "The Board" in the subsequent review and approval of final plans may authorize minor deviations from otherwise applicable local rules.

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RECORD OF VOTE

The following members of the Board vote to grant a Comprehensive Permit Decision, subject to the above-stated terms:

John J. Crowley

Stephen Hamilton

R. Scott Mallory

Heather Santiago-Hutchings

Michael Pagones

The following members of the Board are in opposition to the grant of the Comprehensive Permit Decision:

Filed with the Town Clerk: February 6, 2015

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EXHIBIT A—FROM ORIGNAL HEARING
List of Record Documents

1. Comprehensive Permit Application, 341 Broadway Village, Dracut, MA, dated January 21, 2005, as supplemented.
2. Project Eligibility (Site Approval) Letter, dated December 22, 2004, issued to Mr. Sunder K. Ganglani on behalf of the Applicant by Ann E. Howard, Chief Operating Officer, Mass Housing (the "Site Approval Letter").
3. Drainage Calculations for Broadway Village, dated July 14, 2005 (Rev. December 1, 2006), prepared by K & M Land Consultants LLC.
4. Traffic Impact Study, (undated), prepared by Axum Design and Engineering Corporation (ADEC), as updated on June 8, 2007.
5. Letter dated March 26, 2004, to Board of Selectmen from Joseph Tully, Jr., Chairman, Dracut Affordable Housing Committee,
6. List of Requested Exceptions Requested from Local Requirements.
7. Memorandum dated March 27, 2006, from Glen Edwards to Board of Appeals (Departmental Review Meeting Minutes Summary).
8. Letter from Glen Edwards to Diane R. Sullivan, Vice President of Community Development, Mass Housing, dated August 16, 2004.
9. Memorandum from Gary W. McCarthy, Executive Director-Superintendent, Dracut Water Supply District, to Dracut Board of Appeals, dated March 9, 2005 (Confirming adequacy of water supply in area).
10. Appraisal, dated August 16, 2005, prepared by Peter Hatt, Commonwealth Valuation Group.
11. Letter to John J. Crowley from Douglas Prentiss, dated February 15, 2006 (Traffic Peer Review Scope Letter).
12. Letter to John J. Crowley from Douglas Prentiss, dated August 4, 2006 (Traffic Peer Review Letter).
13. Letter to John J. Crowley from Douglas Prentiss, dated March 8, 2007 (Traffic Peer Review Letter).
14. Letter to John J. Crowley from Douglas Prentiss, dated May 17, 2007 (Traffic Peer Review Letter).
15. Letter to John J. Crowley from Douglas Prentiss, dated June 19, 2007 (Traffic Peer Review Letter).
16. Letter to John J. Crowley from Sandra Brock, RE., dated April 7, 2006 (Engineering Peer Review).
17. Letter to John J. Crowley from Kenneth Lania, EIT, dated December 1, 2006 (Response to Engineering Peer Review).
18. Letter to John J. Crowley from Sandra Brock, P.E., dated March 4, 2007 (Engineering Peer Review),
19. Memorandum dated March 16, 2006 from Fire Chief Leo Gaudette to John Crowley, Chairman.
20. Letter to John J. Crowley from Sandra Brock, P.E., dated December 29, 2005 (Engineering Peer Review).

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21. Memorandum to Glen Edwards from Lori Cahill, Conservation Administrator, dated March 22, 2006;
22. Letter to The Board from Michael Buxton, Chairman, Board of Sewer Commissioners, dated March 3, 2005;
23. Letter to The Board from Michael Buxton, Chairman, Board of Sewer Commissioners, dated February 7, 2006;
24. Letter to The Board from Michael Buxton, Chairman, Board of Sewer Commissioners, dated March 20, 2006;
25. Letter to The Board from Michael Buxton, Chairman, Board of Sewer Commissioners, dated January 30, 2007;
26. Letter to The Board from Kevin Richardson, Chief of Police, dated March 4, 2005; from Kevin Richardson, Chief of Police;
27. Letter to Glen Edwards from Kevin Richardson, Chief of Police, dated March 4, 2005, from Kevin Richardson, Chief of Police, dated March 21, 2006;
28. Letter to The Board from Kevin Richardson, Chief of Police, dated February 28, 2007, from Kevin Richardson, Chief of Police;
29. Letter to John J. Crowley from John Turpin, Superintendent, Town of Dracut Sewer Department, dated March 3, 2005;
30. Letter to John J. Crowley from Michael R. Buxton, Chairman, Board of Sewer Commissioners, Town of Dracut Sewer Department, dated February 7, 2006;
31. Letter to Kenneth Lania, K & Land Consultants, LLC from Terry L. Wiggin, School Business Administrator, Dracut Public School, dated April 26, 2006; Letter from Steven R. Towle, National Grid, to Sue Noel, Building Department, dated October 20, 2005;
32. Letter from Steven R. Towle, National Grid, to Kenneth Lania, K & M Land Consultants, LLC, dated September 14, 2006;
33. Area Calculations of the Apartment Complex (undated), Received by Board on March 10, 2005.
34. The minutes, exhibits and other documents that make up the public record are available for public inspection in the Board's offices and are contained in the record.

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EXHIBIT B
List of Documents from Reopened Hearing

1. Prints drawn by Mark O'Hara Jr., professional land surveyor, dated July 14, 2005 revised through June 28, 2011;
2. Plans, Mark O'Hara, dated August 5, 2012;
3. Michael Buxton, Director of Public Works letter dated August 15, 2011;
4. Thomas Bomal, Director of Public Health letter dated August 25, 2011;
5. Leo Gaudette, Dracut Fire Chief letter dated August 31, 2011;
6. Glen Edwards meeting comments dated September 6, 2011;
7. Memo from Glen Edwards to Board of Appeals regarding Broadway Village Chapter 40B dated September 9, 2011;
8. Site Plans by John A. Visniewski, professional land surveyor, dated November 3, 2011, revision date January 20, 2012;
9. Continuance request letter from Ken Lania dated March 21, 2013;
10. Conceptual Layout Plan revision for NHESP dated April 23, 2012;
11. Continuance request letter from Ken Lania dated September 18, 2013;
12. Letter from Attorney Hall dated September 26, 2013;
13. Letter from Attorney Hall dated October 7, 2013;
14. Copy of email from David Paulson of NHESP dated _____ regarding NHESP 11-29532.
15. Site plan from Cornerstone Land Consultants dated October 16, 2013;
16. Priority Habitat plan dated December 19, 2012, revision date of October 17, 2013;
17. Site plan from John A. Visniewski, registered professional engineer, dated November 4, 2013;
18. Memorandum from Glen Edwards to Board of Appeals regarding Department Review Meeting dated December 9, 2013.
19. Site plan Notice of Intent drawing dated February 19, 2014;
20. Letter from Noah Parekh, Manager of First Dracut Development Company, LLC, dated April 13, 2014;
21. Proposal dated April 15, 2014 from Doug Prentiss to provide engineering consulting services;
22. Traffic Impact Peer Review dated May 9, 2014;
23. Memo from David Glenn to John Crowley regarding Stormwater Management System dated May 9, 2014;
24. Sewer review memorandum dated May 12, 2014;
25. Sewer review report dated May 16, 2014;
26. Letter from Attorney Natasha N. Parekh Ramsingh dated May 29, 2014;
27. Supplemental Traffic Impact Peer Review dated June 19, 2014;
28. Storm Water Management System Report dated June 19, 2014;
29. Letter from Glen Edwards dated July 11, 2014;
30. Email from Deputy Chief Rich Patterson dated July 11, 2014;
31. Continuance Request letter from Chester Bartels dated July 17, 2014;
32. Letter from Chief Kevin Richardson dated July 17, 2014.

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33. Letter from Dracut Town Manager, Richard Duggan dated July 21, 2014;
34. Letter from Jay Reynolds, Superintendent of Dracut Sewer Department dated July 22, 2014;
35. Sewer review memorandum dated September 15, 2014;
36. Storm Water Management System document dated September 15, 2014;
37. Supplemental Traffic Impact Peer Review Report dated September 15, 2014;
38. Storm Water Management System Operation & Maintenance Manual dated June 12, 2014, last revised September 18, 2014;

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List of Exceptions
(See Attached)

Chapter 8A, Sections 1 through 17	Streets and Sidewalks	Street opening permit issued, and related fee required, by Sewer Commissioners and/or Highway Surveyor and/or Town Engineer.	Requires street opening permit for the disturbance of the surface of any public way, and for the installation of sewer, water and other utilities under the surface of any public way.	Waived. To be Governed By Comprehensive Permit.
Chapter 9, Sections 10, 11	Building Construction	Construction on Undeveloped Streets	Requires that No Building Permit Shall Issue on Undeveloped Streets Without Planning Board Approval.	Waived. To Be Governed By Comprehensive Permit.
Chapter 13, Section 2	Earth Removal	Earth Removal Permit.	Earth Removal Permit.	Waived. To Be Governed By Comprehensive Permit.

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1.11.00	Administration	Enforcement of Zoning Bylaws.	Provides the Building Inspector with enforcement authority with respect to Zoning Bylaw violations.	Building Inspector to maintain authority to enforce the Comprehensive Permit Decision, as well as portions of the Zoning Bylaw not waived by this Comprehensive Permit Decision. Waived to the extent that Zoning Bylaw is superseded by the Comprehensive Permit Decision and G.L. c. 40B.
1.16.20 - 1.16.23	Site Plan Special Permit	Site Plan Special Permit	Site Plan Special Permit required for certain uses and construction.	Waived. To be governed by Comprehensive Permit.
1.17.10-1.17.20	Other Laws. Minima.	Other Laws. Minima.	Zoning By-Law controls if other regulations impose less restrictions than Zoning Bylaw.	Waived to the extent that Comprehensive Permit Decision grants waivers/exceptions from the applicability of specific provisions of the Zoning Bylaw.
1.17.30-1.17.50	Compliance with Zoning Bylaws.	Compliance with Zoning Bylaws	Uses and buildings and structures are to be governed by applicable use and dimensional requirements within zoning district described in the Zoning Bylaw.	Waived to the extent that use and dimensional requirements are superseded by this Comprehensive Permit Decision.

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2.11.00 - 2.11.50; 4.12.00 – 4.12.30	Use Regulations and Definitions.	Use Regulation Requirements and Schedule for uses within the Industrial 1 Zoning District; Multifamily Development Special Permits.	Prohibits single, two family and multi-family dwellings in I-1 Zoning District and other uses not specifically permitted in the Table of permitted Uses (Section 2.11.30) or Section 2.11.40. Permits no more than one building for dwelling purposes on a lot (Section 2.11.42).	Waived. Permit the use of the Property for 278 residential dwelling units, and related accessory uses, parking (including garage and surface parking), utilities, accessory utility/storage/maintenance facility serving the project, and other appurtenant uses customary to such residential uses, as well as designated open space uses. Also allow the use of up to four (4) temporary construction and/or marketing trailers as Applicant's project office until all units are sold.

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2.12.00-2.12.10	Intensity of Use (Dimensional Requirements)	Dimensional Requirements.	No land can be used or structure constructed except in accordance with 2.12.00 and Table of Dimensional Requirements.	Waived. To be governed by Site Plans as described in the Comprehensive Permit Decision.
2.12.00 -- 2.12.50 (Table of Dimensional Standards)	Dimensional Requirements	General Dimensional Requirements.	Min. Lot Area (90,000 s.f.); Frontage (225 ft.); Lot Width (50 ft); Front Yard (100 ft); Side Yard (15 ft); Rear Yard (40 ft); Max. Height (65 ft. and 5 stories).	Waived except as shown on Site Plans.
2.12.60	Dimensional Relief for Affordable Housing.	Dimensional Relief for Affordable Housing.	Dimensional Relief for Affordable Housing.	Waived. To be governed by Comprehensive Permit.
2.12.80	Principal Structures	Permits More Than One Principal Structure on Lot.	Permits More Than One Principal Structure on Lot, subject to conditions.	Waived. To be governed by Comprehensive Permit, including Site Plans referenced therein.
2.13.00-2.13.70	Floodplain and Floodway Districts			Waived. To Be Governed By Massachusetts Wetlands Protection Act, G.L. c. 131, sec. 40 and Regulations at 310 CMR 10.00.

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2.17.00 - 2.17.70	Wellhead Protection District Bylaw	Wellhead Protection District Bylaw	Wellhead Protection District Bylaw	Waived, if applicable.
3.10.00 -3.10.24, 3.10.40-3.10.49	Parking and Loading Requirements	Parking Requirements	Parking and loading requirements for I-1 Zoning District, including minimum spaces by use, setback, location and landscaping requirements.	Waived to the extent the parking shown on Site Plans is inconsistent with parking requirements. Parking to be provided shall include a total of 516 parking spaces, or an average of 2.1 spaces per unit, all as shown and located on the Site Plans, and shall comply with the rules and regulations of the Massachusetts Architectural Access Board.

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3.11.32, 3.11.41, and 3.11.42	Sign Regulations	Sign Regulations.	Sign Permit required, along with other dimensional requirements, including the allowance in residential districts of: (a) one sign displaying the street number and/or the name of the occupant of the premises; (b) one additional sign (2 s.f.) permitted for specified accessory uses; (c) one unlighted contractor's sign not exceeding 12 s.f. during construction; and, (d) one subdivision identification sign at each entrance not in excess of 12 s.f.; (d) one identification sign not in excess of 12 s.f. at each public entrance to a multifamily development.	Allow the construction of two (2) permanent externally-illuminated ground signs of no more than forty-eight (48) square feet in size and not exceeding eight (8) feet in height to be located as shown on the Site Plans, and one temporary, non-illuminated construction sign of no more than sixty-four (64) square size from the commencement until completion of construction (i.e. issuance of the final occupancy permit) all as may be shown on the Site Plans, along with other signs permitted in Industrial Districts as provided in section 3.11.41.
3.12.00 – 3.12.80	Permit for Soil, Vegetation, Rock and Gravel Removal.	Permit for Soil, Vegetation, Rock and Gravel Removal.	Prohibits Soil, Vegetation, Rock and Gravel Removal unless incidental to construction of ways approved by Planning Board, or in connection with site specific building.	Waived in its entirety. Allow earth removal as provided in the Comprehensive Permit Decision.
3.14.00 – 3.14.73	Buffering, Screening and Grading Requirements.	Standards for Buffering, Screening and Grading Requirements.	Standards for Buffering, Screening and Grading Requirements.	Waived. Buffering, Screening and Grading are to be as shown on the Site Plans.

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TOWN OF DRACUT ZONING BYLAWS (AS AMENDED THROUGH NOVEMBER 4, 2013 ANNUAL TOWN MEETING) (cont.)

BY-LAW/REG.	TITLE	DESCRIPTION	REQUIRED	PROPOSED
4.12.00-4.12.30	Special Permits-Multifamily Development.	Requires special permit for multifamily development based upon specified criteria.	Requires special permit for multifamily development based upon specified criteria.	Waived.
3.15.50	Environmental Solid Waste Storage	Standards for Solid Waste Storage	Requires waste receptacles or structures to be located not less than 10 feet from any structure and fully screened.	Waive allows for waste receptacles as shown on the Site Plans.

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Construction and Engineering Standards	Construction and Engineering Standards.	Construction and Engineering Standards for Multifamily Developments.	Construction and Engineering Standards	Required that the project will Comply with the "Town of Dracut Construction Standards, Engineering Department dated July 1988 and as amended on October 15, 1996" And the "Rules and Regulations Governing the Subdivision of Land in Dracut Massachusetts dated March 1998 Section VI.A. Street and Roadway".
	Town Bond and Security and Related Requirements			Waive all surety requirements except as provided in the Comprehensive Permit.

I, KATHLEEN GRAHAM, CLERK of the TOWN of DRACUT, MASS., HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE

Date

Kathleen M. Graham
Town Clerk, Dracut, Mass.

Town of Dracut
Board of Appeals

62 Arlington Street
Dracut, MA 01826

15 FEB 13 AM 11:4

Tel: (978) 454-0603
Fax: (978) 937-9885
email: boardofappeals@dracutma.gov

BOARD OF APPEALS FOR THE TOWN OF DRACUT
RECORD OF PROCEEDINGS

APPLICATION NO:	**2005-13 Continued**
PETITIONER:	**First Dracut Development, LLC**
PROPERTY LOCATION:	**341 Broadway Road**
DESCRIPTION:	**Comprehensive Permit for 278 rental units with 4 buildings.**
OWNER:	**Parekh**
DATES OF LEGAL NOTICES:	**See Next Page**
DATE OF HEARING (S):	**Hearing 1-7/21/11 Hearing 2-9/22/11** **Hearing 3-11/17/11 Hearing 4-2/16/12** **Hearing 5-4/26/12 Hearing 6-6/21/12** **Hearing 7-12/20/12 Hearing 8-3/21/13** **Hearing 9-5/16/13 Hearing 10-6/27/13** **Hearing 11-9/19/13 Hearing 12-10/17/13** **Hearing 13-12/19/13 Hearing 14-2/27/14** **Hearing 15-4/17/14 Hearing 16-5/15/14** **Hearing 17–6/19/14 Hearing 18-7/17/14** **Hearing 19-9/18/14**
MEMBERS PRESENT:	**See Next Page**

I, Clerk of the Board, hereby certify that the following is a detailed record of all its proceedings relative to the petition of First Dracut Development, LLC for a 40B Comprehensive Permit for a Special Permit and Variance waivers from the Dracut Zoning By-laws.

NOTIFICATION

A notice of public hearing was published, posted and mailed to the "Parties in Interest" as indicated below:

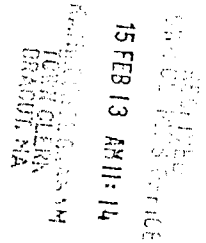
A. Published in The Lowell Sun;
B. Posted in a conspicuous place in the Town Hall not less than 48 hours prior to the date of hearing;
C. Mailed by first class mail, postage prepaid, to the applicant, abutters and owners of land within 300 feet of the property line as named in the certificate from assessors and to the Board of Appeals, Building Inspector and the Planning Board of every abutting city and town.

I HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE

3-10-15 Kathleen M. Lehan
Date Town Clerk, Dracut, Mass.

DATES OF LEGAL NOTICES:

7/7/11 & 7/14/11 – 9/8/11 & 9/15/11
11/3/11 & 11/10/11 – 2/2/12 & 2/9/12
4/12/12 & 4/19/12 – 6/7/12 & 6/14/12
12/6/12 & 12/13/12 – 3/7/13 & 3/14/13
5/2/13 & 5/9/13 – 6/13/13 & 6/20/13
9/5/13 & 9/12/13 – 10/3/13 & 10/10/13
12/5/13 & 12/12/13 – 2/13/14 & 2/20/14
4/3/14 & 4/10/14 – 5/1/14 & 5/8/14
6/5/14 & 6/12/14 – 7/3/14 & 7/10/14
9/4/14 & 9/11/14



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MEMBERS PRESENT:	7/21/11	9/22/11	11/17/11	2/16/12
John J. Crowley, Chairman	Present	Present	Present	Present
Steve Hamilton, Vice Chairman	Present	Present	Present	Present
Scott Mallory, Clerk	Present	Present	Present	Present
Ina Hakkila, Member	Present	Present	Present	Present
David Meli, Member	Present	Present	Absent	Present
Heather Santiago-Hutchings, Alt. Member	Present	Present	Present	Present
Michael Pagones, Alt. Member		Present	Present	Absent

	4/26/12	6/21/12	12/20/12	3/21/13
John J. Crowley, Chairman	Present	Present	Present	Present
Stephen Hamilton, Vice Chairman	Present	Present	Absent	Present
Scott Mallory, Clerk	Absent	Absent	Present	Present
Ina Hakkila, Member	Present	Present	Present	Present
David Meli, Member	Present	Present	Present	Absent
Heather Santiago-Hutchings, Alt. Member	Present	Present	Present	Present
Michael Pagones, Alt. Member	Present	Present	Present	Present

	5/16/13	6/27/13	9/19/13	10/17/13
John J. Crowley, Chairman	Present	Present	Present	Present
Stephen Hamilton, Vice Chairman	Present	Present	Present	Present
Scott Mallory, Clerk	Present	Present	Present	Present
Ina Hakkila, Member	Present	Present		
David Meli, Member	Absent	Present	Absent	Absent
Heather Santiago-Hutchings, Alt. Member	Absent	Present	Absent	Present
Michael Pagones, Alt. Member	Present	Present	Present	Absent

	12/19/13	2/27/14	4/17/14	5/15/14
John J. Crowley, Chairman	Present	Present	Present	Present
Stephen Hamilton, Vice Chairman	Present	Present	Present	Present
Scott Mallory, Clerk	Present	Present	Present	Present
David Meli, Member	Absent	Absent		
Heather Santiago-Hutchings, Member	Present	Present	Present	Present
Michael Pagones, Member	Absent	Present	Present	Present

	6/19/14	7/17/14	9/18/14
John J. Crowley, Chairman	Present	Present	Present
Stephen Hamilton, Vice Chairman	Present	Present	Present
Scott Mallory, Clerk	Present	Present	Present
Heather Santiago-Hutchings, Member	Present	Present	Absent
Michael Pagones, Member	Present	Present	Present

HEARING (S)

As detailed above, hearings were held at Harmony Hall, 1660 Lakeview Avenue, Dracut at which all those interested were given an opportunity to be heard.

FINDINGS:

July 21, 2011 hearing:

Chairman Crowley opened the meeting and signed in a set of prints drawn by Mark O'Hara Jr., Professional Land Surveyor dated July 14, 2005 and revised June 28, 2011.

Attorney Douglas Deschenes will be representing for Mr. Nalin Parekh, First Dracut Development. Attorney Deschenes stated they are here this evening to ask the Board to reopen the public hearing with respect to the new project to allow them to present changes made to the original project.

A motion to allow First Dracut Development to reopen the public hearing on the project at 341 Broadway Road was made by Mr. Stephen Hamilton and seconded by Mr. Scott Mallory. The Board voted unanimously to reopen the public hearing.

Attorney Deschenes gave a brief overview of the revised project. The changes have been driven due to the ledge that has been found on the site. The original project called for five (5) buildings of residential rental units, a public clubhouse/community center and underground parking. The main area of the development turned out to be significantly ledged filled. The costs associated with moving enough ledge to put the parking underground in those buildings is totally cost prohibited so they had to redesign the project. The 55 and over building will remain the same with underground parking.

The new project has been down sized from five (5) to four (4) buildings and clubhouse will be integrated within those buildings. They are eliminating some underground parking so they have to put parking on the outside of the buildings. Because they reduced the number of buildings, they are proposing to add one (1) additional floor to the buildings. Positive impacts to the changes are:

- The total site disturbance is being reduced by over 105,000 sq. ft. or 2 ½ acres of less disturbance by reducing the footprint.
- Even though they are adding outside parking, there will be less paving in the impervious area.
- The wetlands filling are reduced.
- The length of the retaining wall is reduced.
- The roadway length has been reduced from just over 4,000 linear feet to about 3,000 linear feet.
- The 55 and over building will still have underground parking.

Attorney Deschenes stated they have had some preliminary discussions with the Fire Department regarding the changes made. They had a very good meeting this week and the Fire Chief had

some proposed changes to the access roadway around the building. The Fire Chief is comfortable with the additional height as long as they were able to give them some additional access on the ground which they are able to do.

The Sewer Department has approved the extension and is in the process of being completed. The sewer will come from Broadway Road instead of Loon Hill as originally proposed.

Attorney Deschenes presented a schedule of dates from Mr. Lanier, Project Engineer as follows:

- Final drawings no later than Friday, August 5, 2011 to include changes received from the Fire Department.
- Department Head Review Meeting on Tuesday, August 16, 2011.
- Distribution to peer review consultant around August 5th or the following week with comments back in two or three weeks if possible.
- Revised plans by Friday, September 2, 2011 reflecting any comments received from the departments or peer reviewers.

Chairman Crowley will contact Fay, Spofford & Thorndike for a quotation to perform the peer review. The petitioner will provide any additional monies as needed for peer review and administrative costs. Chairman Crowley asked the Board for permission that once an amount is decided upon, have the petitioner submit the check so it can be accepted by the Selectmen. The Board agreed.

It was noted that the original Traffic Study would be used, as there were no changes made to affect that study. Chairman Crowley asked Attorney Deschenes to put together a set of plans and a submittal to be sent to the peer reviewer for a quote.

Ms. Hakkila questioned if the four (4) stories are within the regulations for height. Mr. Parekh stated two years ago the state allowed for 4 story wood construction above the foundation versus 3 stories prior. The building height will be 45 feet. Chairman Crowley noted that under the town's by-law the height is 36 feet, but this is a comprehensive permit so they can ask to waive it. The state building code cannot be waived by either party.

Chairman Crowley suggested that Attorney Deschenes gets verification of the sewer and water fees. Based on discussions to date it would appear that there is some validity, but the Board is waiting for Town Council to respond to a letter sent by Attorney Smolak on this same subject, that there is enough case law and precedent that the fees in effect at the time the proposal was originally submitted are locked in for that project. The water department is not the town, they are a separate legal enterprise and not sure if this applies to them. It would apply to the other fees.

Ms. Hakkila noted that the original project had the trash from the apartments going through the wall to a dumpster in the garage. She asked what would happen with the trash in the buildings with no underground parking. Mr. Parekh stated he would have the architect review this item and appropriate arrangements will be made. The 55 and over (Building 4), will remain the same with the trash going to the garage.

Chairman Crowley noted that this is a rental project and as such all these units count towards the town's count of affordable units.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to September 22, 2011 at 7:00 p.m. was made by Ms. Hakkila and seconded by Mr. Meli. The Board voted unanimously to continue.

September 22, 2011 hearing:

Attorney Deschenes, Mr. Lania and Mr. Parekh here present at the hearing.

Chairman Crowley signed in a set of plans drawn by Mark O'Hara Jr., Professional Engineer dated August 5, 2011.

Attorney Deschenes gave an overview of the project:

- 278 units
- 55 plus has added an outdoor patio and recreational area off the back side of the building with a defined drop off and pick up area at entrance of building
- 3 other buildings will have a recreational area in the courtyard with the clubhouse integrated into one of these building

Chairman Crowley inquired about a revised pro forma. Attorney Deschenes stated they have engaged a consultant Michael Mulcahy who is part of the company funding this project and it should be ready in two (2) weeks.

Chairman Crowley asked if they had a site approval letter. Attorney Deschenes said yes and it is the same as what is on file with the original package. Attorney Deschenes will alert the approval agency as to status of the project and send a letter to the Board with their response.

Attorney Deschenes stated they have been before the Conservation Commission to discuss the proposed changes. All of the changes will ultimately reduce the impact to the site. The site disturbance is now down over 104,000 sq. ft. of area that was previously going to be disturbed that now will be untouched. Mr. Lania has met with the Conservation Agent to review the changes and has received very favorable feedback. They will file for an amendment when the site plan has been finalized. Chairman Crowley will ask the secretary to contact the Conservation Agent for the town for her review of the project as it stands now. He is very interested in her review because some of the buildings are sited in a no build zone. Mr. Lania stated they are filling an area of wetland near Building #1 and the no build is 50 feet from the edge of the wetlands. Chairman Crowley questioned whether they would be allowed to alter the wetlands in order to build on it. Mr. Lania stated it is the same exact location of the wetlands as in the previous approval in their Order of Conditions. Chairman Crowley wants to know from the Conservation Agent after a review of this plan how they are allowed to build in a no build zone. Attorney Deschenes stated that as a 40B project they can be exempted from the local wetlands by-laws, but are not exempt from the State Wetlands Protection Act. The project does

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meet all the performance criteria under this act. They have been before the Conservation Commission and have in hand an approval to build the project as originally proposed and the amended project will result in less impact and more protection of the buffer. He believes that the Conservation Commission Agent has expressed to Mr. Lania that they have approved the first project and if everything being done now is pulling away and making it less, the project should be in good position with the Conservation Commission. The only comment from Conservation at this point was from the Department Review Meeting in which it states "the applicant was advised to monitor the expiration date of their Order of Conditions and that the plans appear to have changed significantly and must apply for an amendment." Chairman Crowley informed Attorney Deschenes that the Board needs to get something in writing from Conservation with their approval of the changes. Attorney Deschenes stated they do not want to formally file for a new approval from the Conservation Commission until the project has been finalized. Chairman Crowley advised Attorney Deschenes that he does not want the Board to approve a plan that goes to Conservation, has to be changed and then come back to this Board. The Board needs to have some indication that everyone is headed in the right direction and on the same page. Chairman Crowley suggests that they file both with the local Conservation Commission and the state. Attorney Deschenes stated that they would not file an ENF until they have a Comprehensive Permit. Chairman Crowley noted that he would not grant a Comprehensive Permit until he has a higher level of certainly that there would not be issues with Conservation. Mr. Lania will get a copy of the Order of Conditions to the Board.

Attorney Deschenes continued his review of the project. The project now has gone to four (4) stories. Mr. Lania stated that the original elevation of the garage was 120 ft., but Broadway Road elevation has changed and is now 164. Based on the height of the previous structure, they are at approximately 129 for a finished floor elevation and total height of 137 feet and above that are three (3) floors and the attic. The project would be approximately 7 feet 8 inches higher than Broadway Road with the finished peak of the roof at an elevation of 131. The peak of the structure would be 24 feet above Broadway with one story and the peak being visible. The first structure is 1400 feet away from Broadway Road. The view from Broadway Road will be incredibly limited. They will cut a 70-foot swath of the wooded area on Broadway Road for the entrance road, but all other wooded area will remain. The entrance road will split into the main road and the emergency access only road. Mr. Lania has reviewed the plans with the Fire Department and they are okay with the extra story as they do have the equipment necessary to provide the fire protection. Attorney Deschenes stated the Fire Department's biggest concern was that the trucks could access around the buildings and the corners to get to the buildings. There are two fire access lanes that have been added in the center of the project on either side of where the tenant courtyard is.

Attorney Deschenes noted the length of the retaining wall would be 730 feet less than the original project. The building footprint has been reduced by nearly 20,000 sq. ft. and the roadway is 1200 feet less of paved road on the site. The total disturbance to this site is dramatically cut.

Attorney Deshenes stated they have run into a very significant environmentally related matter that slowed the project down. The Natural Heritage Endangered Species Program mapped the entire area as a potential habitat for endangered species that led to the denial of the sewer

extension through the property over to Loon Hill Road. The sewer was rerouted, ultimately approved by Natural Heritage and his client gave the town a different set of easements to facilitate the sewer extension. This also impacted the site. Since they last met with the Board, they have been doing a full Habitat and environmental study of the site. The potential resident on site is a turtle. They filed with Natural Heritage a checklist Wild Life report on September 1, 2011. Natural Heritage is now in the process of reviewing the Wild Life Study. The study did not find any of the endangered species and Natural Heritage is cognizant of the fact that this project has been in permitting for a number of years. Attorney Deschenes is comfortable that Natural Heritage is going to allow them to move forward. They have about thirty (30) days remaining in their review and he is expecting to have their written comments by October 15th.

Attorney Deschenes noted that Mr. Parekh did attend a Department Review Meeting and there were a number of issues that need to be addressed. The most prominent comment was that Mr. Hamel has asked them to regenerate the drainage report so that it meets the current 2011 Stormwater Regulations. In designing the changes, Mr. Lania did design it to meet the current Stormwater Management Guidelines so the plan does not need to be changed. The report is in the process of being updated.

Attorney Deschenes reviewed the schedule for information to be submitted as follows:

- Pro forma will be received on October 13th and will file with the Board on October 14th.
- Revised plans will be submitted on or before October 14th.
- Drainage Report will be submitted on or before October 20th.
- Natural Heritage by mid October.

Once the new drainage report is done, the peer review will need to be done and this will take a few weeks. The pro forma peer review will also take a number of weeks. He will put a letter together delineating these dates.

Chairman Crowley read the Department Review letters from the meeting held on August 31, 2011 into the record as follows:

- Glen Edwards meeting comments dated September 6, 2011.
- Thomas Bomil, Director of Public Health dated August 25, 2011.
- Michael Buxton, Public Works Director dated August 15, 2011.
- Leo Gaudette, Dracut Fire Chief dated August 31, 2011.

A new Department Review meeting will be scheduled after Mr. Lania makes all the changes requested.

There was a discussion on how to restrict egress on the emergency access road. The emergency road will have a curbed piece across it with sloped granite curbing. Further review will be needed.

Attorney Deshenes summarized what the Board will be looking for as follows:

- Follow up on the Site Approval letter request.
- Will formally address the Conservation Commission for their review.
- Will discuss the possibility with Mr. Lania of completing the ENF.
- Provide a letter with his schedule of submissions as stated at this hearing.

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- Schedule another Department Review meeting towards the end of October after the information requested has been obtained.

Chairman Crowley suggested $10,000 for peer review from the petitioner. It was agreed that Fay, Spofford & Thorndike would perform the engineering review and Mr. Michael Jacobs would perform the pro forma review. Chairman Crowley will also have Fay, Spofford & Thorndike review the emergency access road as part of their traffic review.

Ms. Hakkila noted that the rubbish collection and the dumpsters are not shown on the plan. The three (3) buildings that have no basement need to have a designated location. She also would like to see recycling be included in this project. Attorney Deschenes stated they are in the process of reviewing this item.

Chairman Crowley questioned the issue with National Grid regarding the distance between the actual roadway surface to the top of the highest fire ladder truck in reference to their power lines. Mr. Lania noted that National Grid would not supply approval until final plans are issued for construction, but as long as they met those integral height requirements and were only perpendicularly traversing that easement, they were fine with it.

Chairman Crowley asked Attorney Deschense to pull any previous letters with comments such as the one from National Grid that are still pertinent to the project so they can be reviewed again.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to November 17, 2011 at 7:00 p.m. was made by Mr. Scott Mallory and seconded by Mr. Stephen Hamilton. The Board voted unanimously to continue.

November 17, 2011 hearing:

Attorney Deschenes presented a letter to the Board dated November 17, 2011 requesting a continuance until the January meeting. Attorney Deschenes apologized for having to ask the Board for its consideration of this, but unfortunately it is a situation that they had no control of. They are in the process of having to switch engineering companies and will need time to come up to speed and complete the work. Cornerstone Land Consultants has agreed to take over the project and will finish the required plans and engineering work.

Chairman Crowley noted that if the Board agrees to continue, they would need to make sure that the Board understands whose engineering stamp will be on the drawings. Attorney Deschenes will get a letter from Mr. Visniewski of Cornerstone acknowledging their contract with his client and the fact that his engineering stamp will be what the Board sees going forward.

After a brief discussion, it was agreed by all parties to continue to the February 2012 meeting. Attorney Deschenes signed an Extension of Time Agreement Form.

Abutters: Who came forward in favor or in opposition?

None.

A motion to continue to February 16, 2012 was made by Ms. Ina Hakkila and seconded by Mr. Scott Mallory. The Board voted unanimously to continue.

February 16, 2012 hearing:

Kenneth Lania of Cornerstone Consultants will be representing the applicant First Dracut Development. Also present are John Visniewski and David DeBay of Cornerstone Consultants and the applicant Nalin Parekh.

Chairman Crowley signed in a set of prints drawn by John A. Visniewski, Professional Land Surveyor dated November 8, 2011 with a revision date of January 20, 2012.

Mr. Lania updated the Board on the status of the project. They are still trying to obtain the National Heritage Endangered Species permit and approval. The National Heritage Tracking Number is 11-29532. In conversations with Mr. Butler this week he believes that currently due to the fact that their reviewer for the project is out on maternity leave, he does not believe the process will be completed for sixty (60) to ninety (90) days. It is not known whether a new reviewer will be assigned to the project. Chairman Crowley is concerned that every time National Heritage gets involves there has been some substantial changes to the layouts. Mr. Lania at this time is not aware as to what they would ask them to do. Mr. Lania reviewed the National Heritage process with the Board. A preliminary application would be filed for the inspection review with National Heritage and would require response from them within thirty (30) days of the application. This would determine if the property is a "take" or "no take". If the property is considered a "take", a Conservation Management Plan Permit would need to be completed and approved through National Heritage. This permit would be a sixty (60) to ninety (90) day process. The project is still in the preliminary process.

Mr. Lania will review the revisions on the plans to give a background as to what they have been working on so the Board would know the process is ongoing on their end. They will also ask for a continuance so they can get to the next stage with National Heritage. After further discussion about National Heritage, Mr. Lania will have Mr. Butler give Chairman Crowley a call to discuss.

Mr. Lania reviewed the following:

- 278 Units
- Reduction in site plan with reduced lineage of roadway and retaining wall.
- Lessen the amount of wetland filling.
- Increased the amount of replication.
- Reduced the number of buildings from six (6) to four (4).
- Added additional parking spaces to the development.
- There will be a sidewalk from Broadway Road to the development.
- The parking area near Broadway Road is for a pick up and drop off area for the school bus with an overhead shelter. It will be 50 feet off the roadway with 10 spaces.

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- The pump station on the property at the bottom of the hill will be maintained by First Dracut Development with an easement to the town.
- Reviewed drainage plans.
- The dumpster location is on the southern portion of Building 1. Each building will have a recycle and trash dumpster.
- They have reviewed the current plans with the Fire Department in regards to fire hydrants and accessibility to the structures. NFPA require that every building that is being proposed have access within 150 feet to every point on every structure.
- Landscape plan will be updated when plans completed.

It was noted that the revised prints have been delivered to all departments by Mr. Lania. The Board will wait for comments back. It will be decided if another Department Review meeting will be needed.

Mr. Lania stated that National Grid will review when the final plans are done. They have had preliminary discussion and preliminary approvals for the access through the easement area, but will not receive anything in writing or easement approvals until the plans are finalized.

After discussion about the time frame for the next meeting, it was decided to continue until the April meeting.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to April 26, 2012 was made by Mr. Mallory and seconded by Ms. Hakkila. The Board voted unanimously to continue.

April 26, 2012 hearing:

Mr. Parekh presented a Conceptual Layout Plan revision for NHESP dated 4/23/12. Chairman Crowley signed in plan.

Mr. Parekh updated the Board in regards to National Heritage. They had a meeting about a month ago with National Heritage to review the project from 2005 until now. The project is not grandfathered in any way to bypass National Heritage. Their recommendation was take out everything to the left of the retention easement in the middle of the property and put it on the right hand side. There is 12 to 13 acres of usable land on the left hand side and on the right hand where they originally had the Community Center there is about 2 ½ to 3 acres of land. They told National Heritage they would try to do the most mitigation so that they could get more upland for the Blandings turtle. National Heritage wants them to do a study. If they do the study it would take about two to three months and if they find one turtle, they are worse off than they are now. They are not going to do the survey. They will be sending National Heritage the revised plan to see if they will accept it within the week.

After further discussion, it was agreed to continue for two (2) months until the June meeting.

A motion to continue to June 21, 2012 was made by Ms. Hakkila and seconded by Mr. Hamilton. The Board voted unanimously to continue.

June 21, 2012 hearing:

Mr. Lania and Mr. Parekh were present. Mr. Lania reviewed the changes they have proposed to date with National Heritage as follows:

- 278 units remain the same
- 4 buildings remain the same
- Reduced the amount of roadway pavement as well as length of roadway into the areas closest to the wetlands on the south side of the parcel. It would include the area beyond easement for National Grid heading towards Loon Hill Road.

Under this design, they will be providing a four (4) acre piece of land that would be preserved on the southern portion of the site and another four (4) acres of land within the National Grid easement area. National Heritage has also asked them to approach any neighboring properties to see if they would also be interested in putting forth a conservation restriction on their properties as well. They are in the process of doing this.

Mr. Lania stated that National Heritage has accepted the revised plan, but does not have any documentation saying this. The letter will not come until they actually make a filing. They are currently in the review process with National Heritage so a filing can be made. They would need another ninety (90) days to continue the process.

Mr. Lania reviewed the preliminary layout that they submitted to National Heritage. The total impervious area is reduced, a reduction in wetland fill, added additional twenty-four (24) parking spaces and reduced the total length of roadway on the property. Impact wise, the project development is getting more condensed on the internal portion of the site so the exterior portion can be left open for habitat.

Under discussion for when the next hearing should be scheduled, Mr. Lania stated that the ninety (90) days would allow them to contact all the abutters and review with National Heritage the findings of these discussions. They would also need an additional sixty (60) days to obtain the National Grid easement approval in addition to the ninety (90) days.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to December 20, 2012 was made by Ms. Hakkila and seconded by Mr. Hamilton. Chairman Crowley noted that he would really like to see some progress by that hearing. The Board voted unanimously to continue.

December 20, 2012 hearing:

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Mr. Lania and Mr. Parekh were present. Mr. Lania stated he has received correspondence from David Paulson of National Heritage dated December 20, 2012 indicating the project is permitable pursuant to MESA. A copy was passed out to all Board Members. He stated that it will take three (3) months to receive the permit. They will approve the plans as shown. Mr. Lania also presented a copy of a proposed Purchase Agreement between First Dracut and Vengren Nominee Trust to allow a Conservation Restriction to be placed on a portion of the adjacent Vengren property to help satisfy the NHESP Requirement imposed on First Dracut.

Mr. Lania will have the revised plans completed by the end of February and get them to Fay, Spofford & Thorndike for peer review.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to March 21, 2013 was made by Mr. Mallory and seconded by Ms. Ina Hakkila. The Board voted unanimously to continue.

March 21, 2013 hearing:

Chairman Crowley read a letter from Kenneth M. Lania dated March 21, 2013 on behalf of the applicant requesting a continuance to the May meeting. The applicant has secured an agreement for the Comcast property along Loon Hill Road and along with a prior agreement with the Vengren property this will allow them to complete the necessary plans for NHESP and finalize the engineering plans for peer review by the Boards engineering consultant. This should take about sixty (60) days.

A motion to continue to May 16, 2013 was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

May 16, 2013 hearing:

Chairman Crowley asked if anyone was present representing the petitioner for this hearing. Nobody came forward. A motion to continue this hearing until later in the evening was made by Mr. Hamilton and seconded by Mr. Pagones. The Board voted unanimously to continue.

Chairman Crowley read the notice again and noted that there is no one present representing the petitioner. He feels the petitioner is not ready; however, it seems to show a distinct lack of interest in their own wellbeing and benefit not to show up for a hearing.

A motion to continue to the June 27, 2013 meeting was made by Mr. Hamilton and seconded by Ms. Hakkila. If it is alright with the Board, Chairman Crowley would like to make it abundantly clear with the property owner and Mr. Lania that failure to appear at the next hearing or serve notice that they are not going to appear, he will step down from the chair and make a motion to deny the Comprehensive Permit. The Board was in agreement. The Board voted unanimously to continue.

June 27, 2013 hearing:

Mr. Lania informed the Board that the petitioner Mr. Parekh had passed away this past weekend. Chairman Crowley expressed the Board's condolences on his passing.

A discussion of how the ownership of the land was going to be handled followed. Mr. Noah Parekh, son and Ms. Tamara Parekh, daughter were introduced by Mr. Lania. They will assume ownership of the LLC along with Mr. Sandy Gangliano, Mr. Parekh's business partner, who was also present. They are planning to continue with the project.

Chairman Crowley requested that prior to the next hearing they send something to James Hall, Town Counsel for his review regarding transfer of names, financing and status of the eligibility letter from Mass Housing. Chairman Crowley will follow up with Attorney Hall prior to the next hearing to verify he has had an opportunity to review all the documentation provided to him and make sure he has all the details needed for him to rule on the acceptability of the proceeding.

Mr. Lania noted they are still working on the land swap, completing the plans for final peer review and are currently before Conservation. Mr. Lania feels he needs a couple of months to complete the paperwork needed to continue.

A motion to continue to the September 19, 2013 meeting was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

September 19, 2013 hearing:

Chairman Crowley noted that paperwork for succession, ownership and rights of the property and a letter from DHCD was to be submitted to Town Counsel for review to see if this is still a legitimate application. Chairman Crowley spoke with Town Counsel last week and he had not received anything. He also spoke with Mr. Lania yesterday and today and the paperwork has not been finalized yet. They have been working on the print and design, but at the Board's request they cannot appear again before the Board unless the information requested has been submitted and reviewed by Town Counsel.

Chairman Crowley read a letter from Mr. Lania dated September 18, 2013 requesting a continuance to the October meeting so that the information regarding the legality of the entity for the projects LLC can be submitted to Attorney Hall's office for his review and opinion so that they can proceed with the project's submissions and reviews.

A motion to continue to the October 17, 2013 meeting was made by Mr. Mallory and seconded by Mr. Pagones. The Board voted unanimously to continue.

October 17, 2013 hearing:

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Chairman Crowley read a letter from Attorney Hall dated October 7, 2013 that had a Certificate of Good Standing from the Commonwealth of Massachusetts relative to First Dracut Development Company. Also received a letter from Attorney Hall dated September 26, 2013 noting that a review of the documents received from Attorney Deschenes related to the Comprehensive Permit for 341 Broadway Road for First Dracut Development Company, LLC establish that the recent death of Nalin Parekh does not jeopardize the viability of the applicant. Attorney Deschenes, Mr. Lania and Mr. Noah Parekh were present. Mr. Deschenes thanked the Board for their patience.

Mr. Lania gave an overview of the current status of the project. He presented an email from David Paulson of National Heritage noting that the Division anticipates a predictable and straight forward permitting process for the Broadway Village-Revised Restriction Plan (NHESP 11-29532). Mr. Lania passed out the final approved Priority Habitat Plan dated December 19, 2012 with a revision date of October 17, 2013 and the Overall Site Plan dated October 16, 2013. He proceeded to review the changes made as required by National Heritage. They have secured conservation restriction easements with two (2) abutting properties owned by Bob Vengren and Comcast. Restriction land can never be used for anything. The two (2) easement areas are attached by a small strip of land at the eastern rear of property so there will be one (1) combined easement. Mr. Lania noted they still have to go to Conservation. National Heritage will not issue a permit until finished with Conservation and the Zoning Board of Appeals.

Mr. Lania will prepare a new package to be distributed to all town departments for review and comments back to the Board. He will also submit a package for peer review by Mr. Prentiss.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to the December 19, 2013 meeting was made by Mr. Hamilton and seconded by Ms. Santiago-Hutchings. The Board voted unanimously to continue.

December 19, 2013 hearing:

Chairman Crowley asked the petitioner to allow the Board to table this hearing to later in the meeting as there is not a full quorum of members present. Mr. Lania agreed.

Chairman Crowley opened the hearing expressing his concern that all the Board Members are not present at this hearing to ensure continuity of membership to move forward with the hearing. He noted a Department Review Meeting was held on December 5, 2013 and the comments will be distributed tonight. Updated drawings have also been distributed to the Board. Also, the Traffic Engineer has not had an opportunity to get comments back to the Board.

Chairman Crowley signed in a set of plans drawn by John A. Visniewski, Registered Professional Engineer dated November 4, 2013.

There was a discussion about moving forward to enter this into testimony tonight and begin discussion or rather take the information presented to review and postpone discussion until the

meeting in February. Chairman Crowley asked the Secretary to work up a list of which Board Members can sign the decision.

Mr. Lania and Mr. Kevin Erickson from Deschenes & Farrell were present. Mr. Lania agreed and feels they can have everything ready, including the Traffic Engineer comments, by the February meeting.

A motion to continue to the February 27, 2014 meeting was made by Mr. Mallory and seconded by Mr. Hamilton. The Board voted unanimously to continue.

February 27, 2014 hearing:

Mr. Lania was present representing the applicant. He updated the Board on the status of the project. Mr. Lania stated that during discussions with the Peer Review Consultant Mr. Prentiss regarding the Traffic Study done in 2007, Mr. Prentiss felt a brand new Traffic Study was going to be required as the data has changed significantly in the past seven (7) years. The applicant has hired Fraser Polyengineering Services to complete the Traffic Study and send to Mr. Prentiss by the end of the first week in March per a letter dated February 11, 2014.

Mr. Lania would like to request an extension to the April meeting for time to complete the Traffic Study, get to Mr. Prentiss for review and comments back to the Board prior to that meeting. He presented a copy of the Sight Plan Notice of Intent drawing dated February 19, 2014 that was submitted to the Conservation Commission showing the two (2) abutting parcels of land that were needed for mitigation by National Heritage with the restricted areas delineated. This plan has been submitted to Mr. David Paulson of National Heritage. Chairman Crowley requested Mr. Lania send a copy to Mr. Prentiss to complete his packet of information. Mr. Lania agreed to forward the drawing.

A motion to continue to the April 17, 2014 meeting was made by Mr. Pagones and seconded by Mr. Hamilton. The Board voted unanimously to continue.

April 17, 2014 hearing:

Mr. Lania was present and introduced Mr. Chester Bartels. Mr. Bartels, Principal with Clockwork Architecture and Design explained they have been retained by First Dracut Development to help matters move forward with the process.

Mr. Lania stated they have completed the updated traffic report. The traffic report, site plan and stormwater report have been forward to Mr. Prentiss of Fay, Spofford & Thorndike so he could prepare a proposal to provide peer review services. Chairman Crowley noted Mr. Prentiss is still waiting for some information on the sewer. Mr. Lania stated he will have the information needed to Mr. Prentiss by Monday, April 21, 2014.

Chairman Crowley read a letter from Noah Parekh as Manager of First Dracut Development Company, LLC dated April 13, 2014 with an update on the Broadway Village 40B project and

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an introduction of Mr. Bartels of Clockwork Architecture and Design who has been hired to spearhead the project moving forward.

Chairman Crowley noted the Board is in receipt of a Proposal dated April 15, 2014 from Mr. Prentiss to Provide Engineering Consulting services in the amount of $19,040. Copies were passed out to the Board and the petitioner for review. The Board and Mr. Parekh agreed to proceed with the peer review. Chairman Crowley will initiate the contract and informed Mr. Parekh he will have to put in the additional deposit of funds to the escrow account to cover the cost.

A motion to continue to the May 15, 2014 meeting was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

May 15, 2014 hearing:

Mr. Lania and Mr. Bartels were present. Mr. Doug Prentiss from Fay, Spofford and Thorndike is also present and is prepared to present to the Board and discuss the traffic and sewer review.

Mr. Prentiss reviewed the Sewer Review dated May 12, 2014. Most of the issues are more house cleaning issues with regards to the site plan as listed under Comments on Plans. They will require additional flow information as noted under Comments on Wastewater Flow Rate Calculations prior to completion.

Mr. Prentiss reviewed the Traffic Impact Peer Review dated May 9, 2014. A number of issues were raised regarding the site plan as listed under Site Plan Review on Page 6. The Site Plan that was included with the documents done by Cornerstone did not really match up with what was identified in the traffic study. On the notes listed under Mitigation on Page 6 and 7, they are suggesting the project proponent develop a detailed conceptual plan at the site drive intersection with Broadway Road (Route 113). The notes listed under Conclusion on Page 7 and 8 were reviewed. It appears based on the intersection operation that there is adequate capacity to accommodate this project and there are no outlining safety issues that are seen presently.

Mr. Lania had some concern regarding the Sewer Review Comments On Wastewater Flow Rate Calculations. The pump station was designed by the Town's Engineer CDM and is out of their control. He asked if the Board could request the Sewer Commissioner and CDM to supply the information regarding Items 1 and 2 on the Sewer Review Comments. After further discussion, Mr. Prentiss will call directly to request the information needed. They are in the process of responding with additional information regarding the plans comments.

The Stormwater Report needs more information and review. Mr. Lania is already in the process of getting the additional information needed for the Stormwater report. Mr. Lania noted the original design of the project started in 2004 with the stormwater regulations at that time, but since that time they have been modified in 2008. Chairman Crowley trusts Mr. Prentiss and his firm to review and make a decision as to whether the regulations in 2004 will suffice or if the 2008 regulations need to be met to provide a safe and viable project for the town.

It was agreed that the information needed will be supplied to Mr. Prentiss by June 16, 2014 or sooner for his review prior to the next meeting.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to the June 19, 2014 meeting was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

June 19, 2014 hearing:

Mr. Bartels and Attorney Deschenes were present. Mr. Prentiss and Mr. Glenn, Peer Reviewers from Fay, Spofford and Thorndike were also present.

Mr. Prentiss reviewed the Supplemental Traffic Impact Peer Review report dated June 19, 2014. Of the eleven (11) issues noted in the May 9, 2014 report, about five (5) have been satisfied. The remaining issues will be reviewed by Mr. Prentiss and their traffic person. After all the issues are satisfied, the traffic study will be put into one completed document. It was noted that a letter from the school department regarding Memorandum #4 for a waiting area or a bus shelter will be provided to the Board. Mr. Prentiss noted that Memorandum #6 for the Broadway Road/site drive intersection should be clarified why a 90-degree type intersection is not proposed.

Mr. Prentiss reviewed the Sewer Review report dated May 16, 2014. A letter dated May 29, 2014 was received from Natasha N. Parekh Ramsingh, Esq. requesting the calculations and capacity of the sewer pump station design done by Camp Dresser McKee (CDM) for the town and a meeting with CDM to discuss the impact on the project. The letter was forward to Mr. Reynolds at Dracut Sewer Department on June 4, 2014. Attorney Deschenes reviewed how the design came to be and that they had worked very closely with CDM. He will facilitate getting CDM to meet with FST to review the design and capacity.

Mr. Glenn reviewed the Stormwater Management System report dated June 19, 2014 noting there were five (5) issues that need to be addressed by the applicant. The applicant's engineer will provide the additional information requested. Mr. Glenn noted they still need to go to Dracut Conservation and the National Heritage report has not been seen yet. Attorney Deschenes reviewed discussions they have had to date with Conservation and National Heritage. He stated they will not file a new Notice of Intent with Conservation until the stormwater issues have been reviewed.

Mr. Bartels inquired if the 90 degree intersection opposed to 65 degrees was a deal breaker. Mr. Prentiss responded no. The MassDOT will ultimately design how the intersection will be designed. Chairman Crowley will ask Mr. Edwards to inquire with the police and fire department for their review and comments on the intersection. Attorney Deschenes noted they need to get from MassDot an answer as to why the intersection was originally approved at 65 degrees when the standard is 90 degrees.

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TOWN CLERK'S OFFICE
2014 FEB 13 AM 11: 14
TOWN CLERK
DRACUT, MA

Chairman Crowley asked what the notification to the public is for MassDEP and the ENF process. Mr. Prentiss noted the hearing is posted in the Land Use Monitor, but not sure if in the local newspaper.

Chairman Crowley informed those present that he is available to help set up any meetings that are needed prior to the next hearing. Prior to the next hearing, he asked all Board Members and Mr. Edwards to review the site plan layout, architectural plans and documents received to make sure all items have been covered. Before the final agreement is signed, the final plans need to be presented to the Board prior to final approval.

It was agreed by the Board that Attorney Deschenes could start developing the Comprehensive Permit for review with Attorney Hall.

Abutters: Who came forward in favor or in opposition?
None.

A motion to continue to the July 17, 2014 meeting was made by Mr. Hamilton and seconded by Mr. Pagones. The Board voted unanimously to continue.

July 17, 2014 hearing:

Mr. Lania was present. Chairman Crowley announced there would be no testimony taken at this hearing. He read a letter from Mr. Bartels dated July 17, 2014 requesting a continuance to the next scheduled meeting.

A motion to continue to the September 18, 2014 meeting was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

September 18, 2014 Hearing:

Mr. Lania, Mr. Bartels and Mr. Prentiss were present. Mr. Lania reviewed the outstanding issues and presented the Stormwater Management System Operation & Maintenance Manual dated June 12, 2014 and last revised September 18, 2014. It was noted that the pump station will be reviewed by Mr. Prentiss at construction.

Mr. Prentiss reviewed the Sewer Review dated September 15, 2014. There was a meeting on July 17, 2014 with the Dracut Town Officials, FST and CDM Smith to discuss the flows allocated to the development during the design of the Broadway II Pump Station and other items relative to the on-site sewer design. Chairman Crowley read a letter from Jay Reynolds, Superintendent of the Sewer Department dated July 22, 2014 noting the Sewer Department will address Item #3 regarding the 8" pipe calculations noted on the comments of the Department Review Meeting held on December 5, 2013. Items #1 and 3 remain and should be addressed by the Builder. Mr. Prentiss noted any remaining issues will be handled by final review.

Mr. Prentiss reviewed the Stormwater Management System dated September 15, 2014. They recommend revisions to the Broadway Village Site/Utility/Grading/Profile Plans; Outlet Control Structure Elevation Summary Table; and the Operation & Maintenance Manual be incorporated in a Final Site Plan Submission to the Board. Mr. Lania noted they were meeting with the Conservation Commission on October 1, 2014.

Mr. Prentiss reviewed the Supplemental Traffic Impact Peer Review dated September 15, 2014. He commended the Traffic Engineer on the comprehensive traffic impact study done. MassDot will have the final say.

Chairman Crowley read the following letters into the record:

- Letter from Glen Edwards dated July 11, 2014 indicating consideration should be given to the comments of the December 5, 2013 Department Review Meeting.
- Email from Deputy Chief Rich Patterson dated July 11, 2014 stating they have no issue with the 90 degree intersection providing the turning radius remains within the requirement listed in the initial letter and the delivery space is also not of major concern.
- Letter from James A. Duggan, Town Manager to Douglas Deschenes dated July 21, 2014 regarding the meeting between CDM Smith and FS&T and Town Staff noting the pump station can accommodate the Project's sewer flow.
- Letter from Chief Kevin Richardson dated July 17, 2014 stating he has no concerns regarding the traffic circulation or delivery points.

Chairman Crowley explained that the Board has to have a vote within forty (40) days after closing the hearing unless both parties agreed to extend. After a vote, the Comprehensive Permit working session would begin to include a set of prints.

After a discussion about the next meeting, the following was agreed to:

- Draft Comprehensive Permit decision no later than October 8, 2014 so the Board can review prior to the next meeting.
- List of waivers to be included.
- Final set of drawings.
- Architectural drawings.

Discussion on the Comprehensive Permit will be at the October 16, 2014 meeting with a signed extension of time agreement for sixty (60) days.

A motion to close was made by Mr. Mallory and seconded by Mr. Pagones. An Extension of Time Agreement Form was signed by Mr. Bartels for sixty (60) days. The Board voted unanimously to close.

The Board closed the hearing on September 18, 2014.

DECISION

The Board voted to approve the Comprehensive Permit on December 18, 2014.

Appeals, if any, shall be made pursuant to G.L.C.40, Subsection 17, and shall be filed within 20 days after the decision filed with the Town Clerk.

Dracut Board of Appeals

Chairman

Vice Chairman

Copies of this record of Proceedings and Decision with all attachments and plans referred to in the Decision, if any, must be filed with the Town Clerk.

Date filed with Town Clerk: February 13, 2015

RECEIVED
TOWN CLERK'S OFFICE
15 FEB 13 AM 11:14
KATHLEEN GRAHAM
TOWN CLERK
DRACUT, MA

I, KATHLEEN GRAHAM, CLERK of the TOWN of DRACUT, MASS., HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE

3-10-15
Date

Town Clerk, Dracut, Mass.

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Appendix B –

"Proposed Preliminary Site Plan Documents" for World Dracut, LLC, Broadway Village, dated September 26, 2024, prepared by Bohler Engineering in 31 sheets (11 x 17)

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REFERENCES

EXISTING CONDITIONS PLAN:
"EXISTING CONDITIONS PLAN - BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY"
BY CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD, SOUTHBOROUGH MA 01772
DATE: 10/27/2023 UPDATED THROUGH 8/23/2024

ARCHITECTURAL PLANS:
"BROADWAY VILLAGE"
BY ANNINO INCORPORATED
125 NORTH WASHINGTON STREET, NORTH ATTLEBOROUGH MA 02760
DATE: 9/20/2024

* THE ABOVE REFERENCED DOCUMENTS ARE INCORPORATED BY REFERENCE AS PART OF THESE PLANS, HOWEVER, BOHLER ENGINEERING DOES NOT CERTIFY THE ACCURACY OF THE WORK REFERENCED OR DERIVED FROM THESE DOCUMENTS, BY OTHERS.

PRELIMINARY SITE PLAN DOCUMENTS

ALL SITE DEVELOPMENT PLANS CONTAINED HEREIN ARE PRELIMINARY IN ACCORDANCE WITH THE PROVISIONS OF M.G.L. c 40B, §§ 20-23 AND 760 CMR 56.00 ET. SEQ.

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

LOCATION OF SITE:
341 BROADWAY ROAD, 226 LOON HILL ROAD &
250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA
PARCEL ID: 4924, 8012 & 8011

APPROVAL UNDER
TOWN OF DRACUT
ZONING BOARD OF APPEALS
COMPREHENSIVE PERMIT REGULATIONS

CHAIRMAN

DATE (APPROVAL)

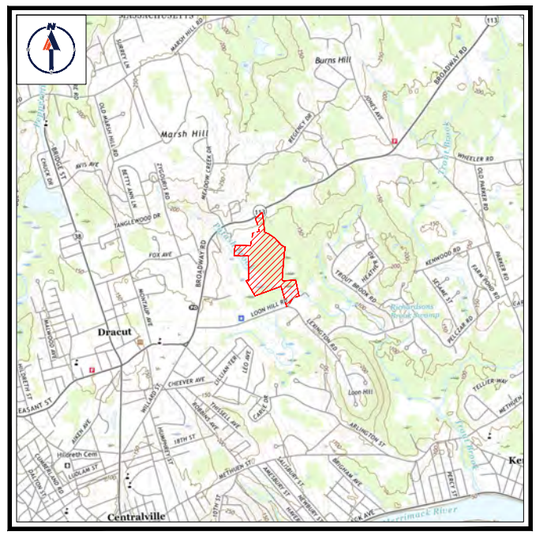
DATE (ENDORSEMENT)

PARKING MATRIX

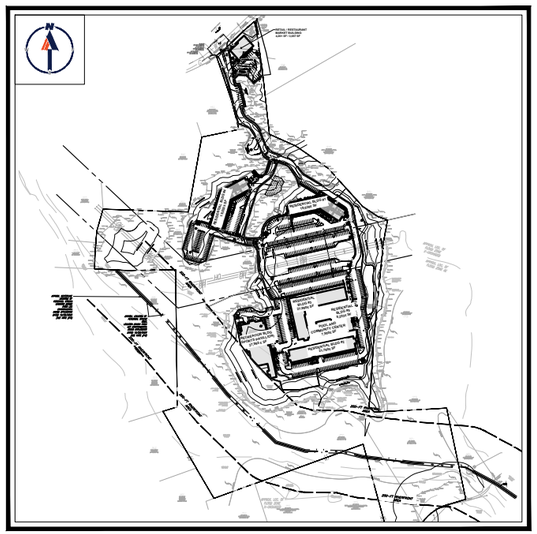
* SPACES AT MARKET/RESTAURANT BUILDING ARE 10'x20'

BUILDING MATRIX (REFER TO ARCHITECTURAL PLANS)

Floor Level	Residential Area (SF)	Commercial Area (SF)	Residential Area (SF)	Garage Area (SF)	Recreational Area (SF)	Building Area (SF)	1 Bed/1 Bath with Nook	1 Bed/1 Bath	2 Bed/2 Bath with Nook	2 Bed/2 Bath	3 Bed/2 Bath with Nook	Total Units
Market/Restaurant Building												
First Floor	2 034	4 201				6 935						
Second Floor	1 003					1 003						
Total	3 037	4 201	0	0	0	7 238						
Building 1												
Basement			2 004	16 069		18 073	0	0	0	0	0	0
First Floor	0	0	19 001	0	0	19 001	4	1	8	0	2	7
Second Floor	0	0	19 006	0	0	19 006	5	1	8	0	2	8
Third Floor	0	0	19 006	0	0	19 006	5	1	8	0	2	8
Fourth Floor	0	0	19 003	0	0	19 003	5	1	8	0	2	8
Total	0	0	82 019	16 069	0	98 088	19	5	32	0	8	40
Building 2												
Basement			3 090	1 709	16 969	21 768	0	0	0	0	0	0
First Floor	0	0	21 768	0	0	21 768	3	1	11	0	2	7
Second Floor	0	0	21 767	0	0	21 767	2	1	13	0	2	8
Third Floor	0	0	21 767	0	0	21 767	2	0	13	0	2	7
Fourth Floor	0	0	21 767	0	0	21 767	2	0	13	0	2	7
Total	0	3 090	86 770	16 969	0	106 831	9	2	62	0	10	37
Building 3												
Basement			4 900	14 006		18 906	0	0	0	0	0	0
First Floor	0	0	27 982	0	0	27 982	4	0	8	1	2	7
Second Floor	0	0	28 288	0	0	28 288	10	0	12	1	2	8
Third Floor	0	0	28 288	0	0	28 288	10	0	12	1	2	8
Fourth Floor	0	0	28 288	0	0	28 288	10	0	12	1	2	8
Total	0	4 900	127 710	0	0	132 700	34	0	44	4	10	39
Building 4												
Basement			2 001	8 969		11 030	0	0	0	0	0	0
First Floor	0	0	19 003	0	0	19 003	4	1	6	0	2	7
Second Floor	0	0	19 001	0	0	19 001	5	1	8	0	2	8
Third Floor	0	0	19 001	0	0	19 001	5	1	8	0	2	8
Fourth Floor	0	0	19 006	0	0	19 006	5	1	8	0	2	8
Total	0	0	96 012	8 969	0	87 041	19	4	30	0	8	39
Building 5												
Basement			5 179			5 179						
First Floor			8 203			8 203	1	1	2	1	0	5
Second Floor			7 660			7 660	0	1	3	1	0	5
Third Floor			7 660			7 660	0	2	3	1	0	6
Fourth Floor			7 660			7 660	0	2	3	1	0	6
Total	0	0	36 362	0	0	36 362	1	6	11	4	0	22
Pool												
First Floor			7 500			7 500						
Second Floor			770			770						
Total	0	0	8 270	0	0	8 270						
Recreation Building (Sports Pavilion)												
Basement					25 304	2 972	25 376					
First Floor					0	27 605	27 605					
Second Floor					0	24 095	24 095					
Third Floor					0	10 041	10 041					
Total	0	0	0	0	25 304	64 713	87 117					
Totals	3 037	15 407	432 100	48 203	64 303	564 810	82	13	183	8	37	396



USGS MAP
SCALE: 1" = 2,000'



SITE MAP
SCALE: 1" = 350'

DRAWING SHEET INDEX

SHEET INDEX	
SHEET TITLE	NUMBER
COVER SHEET	C-101
GENERAL NOTES SHEET	C-102
EXISTING CONDITIONS PLAN	C-103
OVERALL SITE & KEY PLAN	C-300
SITE LAYOUT PLAN SHEET 1	C-301
SITE LAYOUT PLAN SHEET 2	C-302
SITE LAYOUT PLAN SHEET 3	C-303
GRADING AND DRAINAGE PLAN SHEET 1	C-401
GRADING AND DRAINAGE PLAN SHEET 2	C-402
GRADING AND DRAINAGE PLAN SHEET 3	C-403
UTILITY PLAN SHEET 1	C-501
UTILITY PLAN SHEET 2	C-502
UTILITY PLAN SHEET 3	C-503
SOIL EROSION AND SEDIMENT CONTROL PLAN	C-601
SOIL EROSION AND SEDIMENT CONTROL NOTES & DETAILS	C-602
DETAIL SHEET	C-901
DETAIL SHEET	C-902
DETAIL SHEET	C-903
OVERALL LANDSCAPE PLAN	L-101
LANDSCAPE PLAN - ENLARGEMENT A	L-102
LANDSCAPE PLAN - ENLARGEMENT B	L-103
LANDSCAPE PLAN - ENLARGEMENT C	L-104
LIGHTING PLAN	L-105
LANDSCAPE NOTES AND DETAILS	L-200
LANDSCAPE DETAILS	L-201
REFERENCE PLANS	
EXISTING CONDITIONS PLAN (CONTROL POINT ASSOCIATES)	6 SHEETS

PREPARED BY

BOHLER

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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PERMIT SET

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PROJECT NO.: MAB230046.00
DRAWN BY: AP/EA/AH
CHECKED BY: TA/HEA
DATE: 9/20/2024
CAD I.D.: P-CIVL-PROP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

T.A. HAYES
HAYES
NO. 51929
REGISTERED
PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

C-101

ORG. DATE - 9/20/2024

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GENERAL NOTES

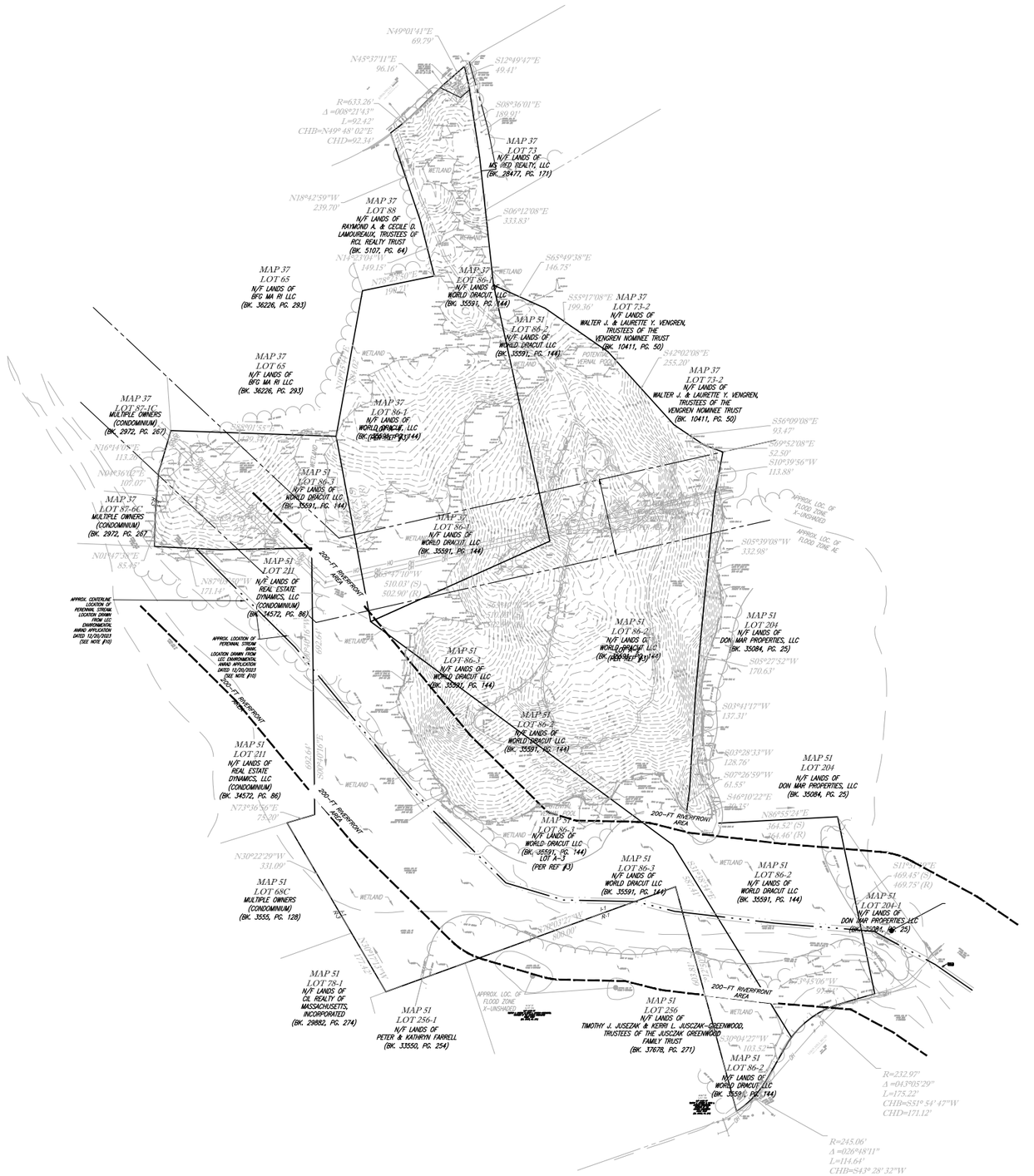
(REV. 1/2023)

1. THESE PLANS ARE SOLELY BASED ON INFORMATION THE OWNER AND OTHERS PROVIDED TO BOHLER ENGINEERING MA, LLC (HEREIN "BOHLER") PRIOR TO THE DATE ON WHICH THE PROFESSIONAL OF RECORD HAS PREPARED THESE PLANS. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND IMMEDIATELY NOTIFY BOHLER , IN WRITING, IF ANY ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON THESE PLANS, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.
2. THE CONTRACTOR MUST STRICTLY COMPLY WITH THESE NOTES AND ALL SPECIFICATIONS/REPORTS CONTAINED HEREIN. THE CONTRACTOR MUST ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS. THESE NOTES, AND THE REQUIREMENTS ARTICULATED IN THE NOTES CONTAINED IN ALL THE OTHER DRAWINGS THAT COMPRISE THE PLAN SET OF DRAWINGS. ADDITIONAL NOTES AND SPECIFIC PLAN NOTES MAY BE FOUND ON THE INDIVIDUAL PLANS. THESE GENERAL NOTES APPLY TO THIS ENTIRE DOCUMENT PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE, PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION.
3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST CONFIRM WITH THE PROFESSIONAL OF RECORD AND BOHLER THAT THE LATEST EDITION OF THE DOCUMENTS AND/OR REPORTS REFERENCED WITHIN THE PLAN REFERENCES ARE BEING USED FOR CONSTRUCTION. THE CONTRACTOR IS SOLE AND COMPLETE RESPONSIBLE.
4. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION SHALL COMMENCE UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE CONDITIONS OF APPROVAL TO ALL PLANS AND OTHER DOCUMENTS REVIEWED AND APPROVED BY THE PERMITTING AUTHORITIES AND HAS ALSO CONFIRMED THAT ALL NECESSARY AND REQUIRED PERMITS HAVE BEEN OBTAINED. THE CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.
5. THE CONTRACTOR MUST ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS/REPORTS AND CONDITIONS OF APPROVAL, AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, REGULATIONS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT, AND ALL PROVISIONS IN AND CONDITIONS OF THE CONSTRUCTION CONTRACT WITH THE OWNER/DEVELOPER INCLUDING ALL EXHIBITS, ATTACHMENTS AND ADDENDA TO SAME.
6. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST CONFIRM THAT THE BUILDING LAYOUT BY CAREFULLY REVIEWING THE MOST CURRENT ARCHITECTURAL, CIVIL AND STRUCTURAL CONSTRUCTION DOCUMENTS (INCLUDING, BUT NOT LIMITED TO, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLANS, WHERE APPLICABLE). THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE OWNER, ARCHITECT AND PROFESSIONAL OF RECORD AND BOHLER, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST BETWEEN THESE PLANS AND/OR ANY OTHER PLANS THAT COMPRISE THE CONSTRUCTION DOCUMENTS.
7. CONTRACTOR MUST REFER TO AND ENSURE COMPLIANCE WITH THE APPROVED ARCHITECTURAL/BUILDING PLANS OF RECORD FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.
8. THE CONTRACTOR MUST FIELD VERIFY ALL DIMENSIONS AND MEASUREMENTS SHOWN ON THESE PLANS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROFESSIONAL OF RECORD AND BOHLER, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST BETWEEN THE ACTUAL CONDITIONS AND THE INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR FOR WORK WHICH HAS TO BE RE-DONE OR REPAIRED DUE TO DIMENSIONS, MEASUREMENTS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO BOTH (A) THE CONTRACTOR GIVING THE PROFESSIONAL OF RECORD AND BOHLER WRITTEN NOTIFICATION OF SAME AND (B) PROFESSIONAL OF RECORD AND CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH REMEDIAL WORK, WILL BE AT NO ADDITIONAL WORK.
9. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND MEASUREMENTS INCLUDED ON DESIGN DOCUMENTS HEREIN AND MUST NOT SCALE OFF THE DRAWINGS DUE TO POTENTIAL PRINTING INACCURACIES. ALL DIMENSIONS AND MEASUREMENTS ARE TO BE CHECKED AND CONFIRMED BY THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION/ORDERING OF PARTS AND MATERIALS. FAILURE TO DO SO MAY RESULT IN MISALIGNMENT OF SITE WORK. SITE PLAN DRAWINGS ARE NOT INTENDED AS SURVEY DOCUMENTS. DIMENSIONS SUPERSEDE GRAPHICAL REPRESENTATIONS. THE CONTRACTOR MUST MAKE CONTRACTOR'S OWN MEASUREMENTS FOR LAYOUT OF IMPROVEMENTS.
10. THE OWNER AND CONTRACTOR ARE RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
11. WHEN INCLUDED AS PART OF THE REFERENCED DOCUMENTS, THE GEOTECHNICAL REPORT, SPECIFICATIONS AND RECOMMENDATIONS SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE STRINGENT REQUIREMENTS AND/OR RECOMMENDATIONS CONTAINED IN (A) THE PLANS; AND (B) THE GEOTECHNICAL REPORT AND RECOMMENDATIONS, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROFESSIONAL OF RECORD AND BOHLER, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORT AND PLANS AND SPECIFICATIONS, PRIOR TO PROCEEDING WITH ANY FURTHER WORK. IF A GEOTECHNICAL REPORT WAS NOT PREPARED, THEN THE CONTRACTOR MUST FOLLOW AND COMPLY WITH ALL OF THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE SPECIFICATIONS WHICH HAVE JURISDICTION OVER THIS PROJECT
12. THE PROFESSIONAL OF RECORD AND BOHLER ARE NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, HAS NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.
13. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN AND WHERE SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES. ALL OF THIS WORK IS TO BE PERFORMED AT CONTRACTOR'S SOLE COST AND EXPENSE.
14. THE CONTRACTOR MUST EXERCISE EXTREME CAUTION WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER ON THE INDIVIDUAL PHASE OF THE PROJECT OR ADJACENT TO IT. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE THAT ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.
15. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION AND CONSTRUCTION WASTES, UNSUITABLE EXCAVATED MATERIAL, EXCESS SOIL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER THE CONTRACTOR.
16. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MAINTAIN RECORDS TO DEMONSTRATE PROPER AND FULLY COMPLIANT DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.
17. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE TO UTILITY LINES, INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION AND/OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS, RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE CONTRACTOR MUST PROMPTLY DOCUMENT AND NOTIFY THE OWNER AND THE CONSTRUCTION MANAGER OF ANY EXISTING DAMAGE AND NOTIFY IN WRITING, THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
18. THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR AND HAVE NO CONTRACTUAL, LEGAL OR OTHER RESPONSIBILITIES FOR JOB SITE SAFETY JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME. THE PROFESSIONAL OF RECORD AND BOHLER HAVE NOT BEEN RETAINED TO PERFORM OR TO BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF THE PROFESSIONAL OF RECORDS AND BOHLER SERVICES AS RELATED TO THE PROJECT. THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES OR ANY JOB SITE CONDITIONS, AT ANY TIME.
19. THE CONTRACTOR MUST IMMEDIATELY IDENTIFY IN WRITING, TO THE PROFESSIONAL OF RECORD AND BOHLER, ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF THE CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING SUCH WRITTEN NOTIFICATION AS DESCRIBED ABOVE, IT WILL BE AT THE CONTRACTOR'S SOLE RISK AND EXPENSE. THE CONTRACTOR MUST INDEMNIFY, DEFEND AND HOLD HARMLESS THE PROFESSIONAL OF RECORD AND BOHLER FOR ANY AND ALL DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM OR ARE IN ANY WAY RELATED TO SAME INCLUDING, BUT NOT LIMITED TO, ANY THIRD PARTY AND FIRST PARTY CLAIMS.
20. THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM THE CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS, AND CURRENT CODES AND THE LIKE. IF THE CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH APPROVED PLANS, RULES, STATUTES, CODES AND THE LIKE, THE CONTRACTOR AND OWNER MUST INDEMNIFY, DEFEND, AND HOLD HARMLESS (ON A FULLY INDEMNIFICATION, SEPARATELY, AND NOT LIMITED TO, BASIS) THE PROFESSIONAL OF RECORD AND HOLD THE PROFESSIONAL OF RECORD AND BOHLER HARMLESS FOR AND FROM ALL INJURIES, CLAIMS AND DAMAGES THAT THE PROFESSIONAL OF RECORD AND BOHLER SUFFER AND ANY AND ALL COSTS THAT THE PROFESSIONAL OF RECORD AND BOHLER INCUR AS RELATED TO SAME.
21. ALL CONTRACTORS MUST CARRY AT LEAST THE MINIMUM AMOUNT OF THE SPECIFIED AND COMMERCIALLY REASONABLE STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND COMMERCIAL GENERAL LIABILITY INSURANCE (GCL) INCLUDING ALSO AN UMBRELLA COVERAGES. ALL CONTRACTORS MUST HAVE THEIR GGL POLICIES ENDORSED TO NAME BOHLER , AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSUREDS AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE (DEFEND, IF APPLICABLE) AND HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED AND AGREED TO BY THE CONTRACTOR HEREIN. ALL CONTRACTORS MUST FURNISH BOHLER WITH CERTIFICATIONS OF INSURANCE OR CERTIFICATES OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE COVERAGES PRIOR TO COMMENCING ANY WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION AND FOR TWO YEARS AFTER THE COMPLETION OF CONSTRUCTION AND AFTER ALL PERMITS ARE ISSUED, WHICHEVER DATE IS LATER. IN ADDITION, ALL CONTRACTORS AGREE THAT THEY WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS FROM AND AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, TORT DAMAGES, STATUTORY CLAIMS, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTOR(S), ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT'S DESIGN, IF ANY. CONTRACTOR MUST NOTIFY THE PROFESSIONAL OF RECORD, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.
22. THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONSTRUCTION MEANS AND METHODS CONTAINED IN ANY SHOP DRAWINGS. THE CONTRACTOR IS EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE MEANS AND METHODS FOR COMPLETION OF THE WORK, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
23. NEITHER THE PROFESSIONAL ACTIVITIES OF BOHLER, NOR THE PRESENCE OF BOHLER AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE (HEREIN "BOHLER PARTIES"), RELIEVES OR WILL RELIEVE THE CONTRACTOR OF ITS OBLIGATION AND RESPONSIBILITY FOR AND FROM CONSTRUCTION MEANS, METHODS, SEQUENCING, PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ALL HEALTH AND SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT, SAFETY AND SECURITY MEASURES, AND ALL OTHER PRECAUTIONS NECESSARY FOR THE SAFE AND PROPER PERFORMANCE OF THE CONTRACT AND ITS RESPONSIBILITY FOR) ANY CONSTRUCTION. THE CONTRACTOR OR ITS EMPLOYEES RELATING TO THEIR WORK AND ANY AND ALL HEALTH AND SAFETY PROGRAMS OR PROCEDURES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND FOR ITS OWN ACTIONS AND INDEMNIFY, DEFEND, PROTECT AND HOLD HARMLESS BOHLER PARTIES FOR AND FROM ANY LIABILITY TO BOHLER PARTIES RESULTING FROM THE CONTRACTOR'S WORK, SERVICES AND/OR VIOLATIONS OF THIS NOTE. THESE NOTES OR ANY NOTES IN THE PLANS SHALL FURTHER, THE CONTRACTOR MUST NAME BOHLER AS AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE.
24. WHEN IT IS CLEARLY AND SPECIFICALLY WITHIN BOHLER'S SCOPE OF SERVICES CONTRACT WITH THE OWNER/DEVELOPER, BOHLER WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF EVALUATING CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME. BOHLER WILL PERFORM ITS REQUIRED DRAWING REVIEW WITH REASONABLE PROMPTNESS, AS CONDITIONS PERMIT. ANY DOCUMENT, DOCUMENTING BOHLER'S REVIEW OF A SPECIFIC ITEM OR LIMITED SCOPE, MUST NOT INDICATE THAT BOHLER HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR MUST, IN WRITING, PROMPTLY AND IMMEDIATELY BRING ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS TO BOHLER'S ATTENTION. BOHLER IS NOT REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.
25. IF THE CONTRACTOR DEVIATES FROM THESE PLANS AND/OR SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE PROFESSIONAL OF RECORD AND BOHLER FOR ALL DEVIATIONS WITHIN THE PROFESSIONAL OF RECORD'S AND BOHLER SCOPE, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK PERFORMED WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, MUST DEFEND, INDEMNIFY, PROTECT, AND HOLD HARMLESS THE PROFESSIONAL OF RECORD AND BOHLER PARTIES TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, AND CLAIMS, INJURIES, PENALTIES AND THE LIKE.
26. THE CONTRACTOR IS RESPONSIBLE FOR A MAINTAINING AND PROTECTING THE TRAFFIC CONTROL PLAN AND ELEMENTS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS. ALL PHYSICAL SITE FEATURES DESIGNED AS TRAFFIC CONTROL PLANS AND RELATED DOCUMENTS IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN, AND, FURTHER, THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES AS DESIGNED AND CONSTRUCTED, OWNER AGREES TO INDEMNIFY AND HOLD THE PROFESSIONAL OF RECORD AND BOHLER PARTIES, HARMLESS FOR ALL INJURIES, DAMAGES AND COSTS THAT THE PROFESSIONAL OF RECORD AND BOHLER INCUR AS A RESULT OF SAID FAILURE OR FAILURE TO PRESERVE.
27. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN, AND, FURTHER, THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES, OWNER AGREES TO INDEMNIFY AND HOLD THE PROFESSIONAL OF RECORD AND BOHLER PARTIES, HARMLESS FOR ALL INJURIES, DAMAGES AND COSTS THAT THE PROFESSIONAL OF RECORD AND BOHLER INCUR AS A RESULT OF SAID FAILURE OR FAILURE TO PRESERVE.
28. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION ACTIVITIES AND MATERIALS COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL RULES AND REGULATIONS, LAWS, ORDINANCES, AND CODES, AND ALL APPLICABLE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 ET SEQ.) AS AMENDED, AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.
29. THE CONTRACTOR MUST STRICTLY COMPLY WITH THE LATEST AND CURRENT OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION OVER EXCAVATION AND TRENCHING PROCEDURES. THE PROFESSIONAL OF RECORD AND BOHLER HAS NO RESPONSIBILITY FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES AND WORK.
30. THE CONTRACTOR AND THE OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF THE CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY, INDEPENDENTLY, SEPARATELY, COLLECTIVELY AND SEVERALLY INDEMNIFY, DEFEND, PROTECT AND HOLD THE PROFESSIONAL OF RECORD AND BOHLER PARTIES HARMLESS FOR ALL INJURIES AND DAMAGES THAT PROFESSIONAL OF RECORD SUFFERS AND COSTS THAT THE PROFESSIONAL OF RECORD INCURS AS A RESULT OF SAID FAILURE.
31. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIREMENTS OR LOCAL GOVERNING AGENCY FOR SITES WHERE ONE (1) ACRE OR MORE IS DISTURBED BY CONSTRUCTION ACTIVITIES (UNLESS THE LOCAL JURISDICTION REQUIRES A DIFFERENT THRESHOLD). THE CONTRACTOR MUST ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF ALL SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE AND FURTHER, THE CONTRACTOR IS SOLELY AND COMPLETELY RESPONSIBLE FOR FAILING TO DO SO.
32. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED DOCUMENTS PREPARED BY THE PROFESSIONAL OF RECORD AND BOHLER, THE USE OF THE WORDS 'CERTIFY' OR 'CERTIFICATION' CONSTITUTES) AN EXPRESSION ONLY OF PROFESSIONAL OPINION REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE PROFESSIONAL OF RECORD'S AND BOHLER KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON AND ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE OF ANY NATURE OR TYPE, EITHER EXPRESSED OR IMPLIED, UNDER ANY CIRCUMSTANCES.

GENERAL DEMOLITION NOTES

(REV. 1/2023)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. THE CONTRACTOR MUST CONDUCT DEMOLITION/REMOVALS ACTIVITIES IN SUCH A MANNER AS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND ALL OTHER ADJACENT FACILITIES. THE CONTRACTOR MUST OBTAIN ALL APPLICABLE PERMITS FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY(IES) PRIOR TO THE COMMENCEMENT OF ANY ROAD OPENING OR DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.
3. WHEN DEMOLITION-RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY, THE CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH THE CURRENT FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS.
4. THE DEMOLITION (AND/OR REMOVALS) PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION AND TO IDENTIFY ONLY CONDITIONS REGARDING ITEMS TO BE DEMOLISHED, REMOVED, AND/OR TO REMAIN.
   4.1. THE CONTRACTOR MUST ALSO REVIEW ALL CONSTRUCTION DOCUMENTS AND INCLUDE WITHIN THE DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
   4.2. THIS PLAN IS NOT INTENDED TO DEFINE METHODOLOGY OR DIRECTION REGARDING THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE EMPLOYED TO ACCOMPLISH THE WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST BE IN STRICT ACCORDANCE AND CONFORMANCE WITH ALL APPLICABLE FEDERAL, STATE, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE FOR THE CONTRACTOR AND THE PUBLIC.
5. THE CONTRACTOR MUST INCLUDE ALL "METHODS AND MEANS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR, AT THE CONTRACTOR'S SOLE COST, SHALL REPAIR ALL DAMAGE TO ALL ITEMS AND FEATURES THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIRS MUST RESTORE ALL ITEMS AND FEATURES REPAIRED TO THEIR PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR MUST PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.
6. THE PROFESSIONAL OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. THE CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, COMPLYING WITH ALL OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY AND SAFETY TO ALL PROPERTY ON THE SITE OR ADJACENT OR NEAR TO THE SAME.
7. THE CONTRACTOR IS RESPONSIBLE FOR, WHICH SHALL INCLUDE, BUT IS NOT LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING, OTHER APPROPRIATE AND/OR NECESSARY SAFETY FEATURES AND ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITIES



SITE AREA = 2,025,794 SQUARE FEET OR 46.506 ACRES

FOR FURTHER DETAIL, SEE CONTROL POINT ASSOCIATE PLANS INCLUDED HEREWITH.

WETLAND LINES SHOWN PER ABBREVIATED NOTICE OF RESOURCE AREA DELINEATION (ANRAD) APPROVED BY THE DRACUT CONSERVATION COMMISSION ON 5/15/2024.

150 75 37.5 0 150

1"=150'

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BOHLER™
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

811 Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

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THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	MAB230046.00
DRAWN BY:	AP/EA/AH
CHECKED BY:	TAH/EA
DATE:	9/20/2024
CAD I.D.:	P-CIVL-PROP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

T.A. HAYES
HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

EXISTING CONDITIONS PLAN

SHEET NUMBER:

C-103

ORG. DATE - 9/20/2024

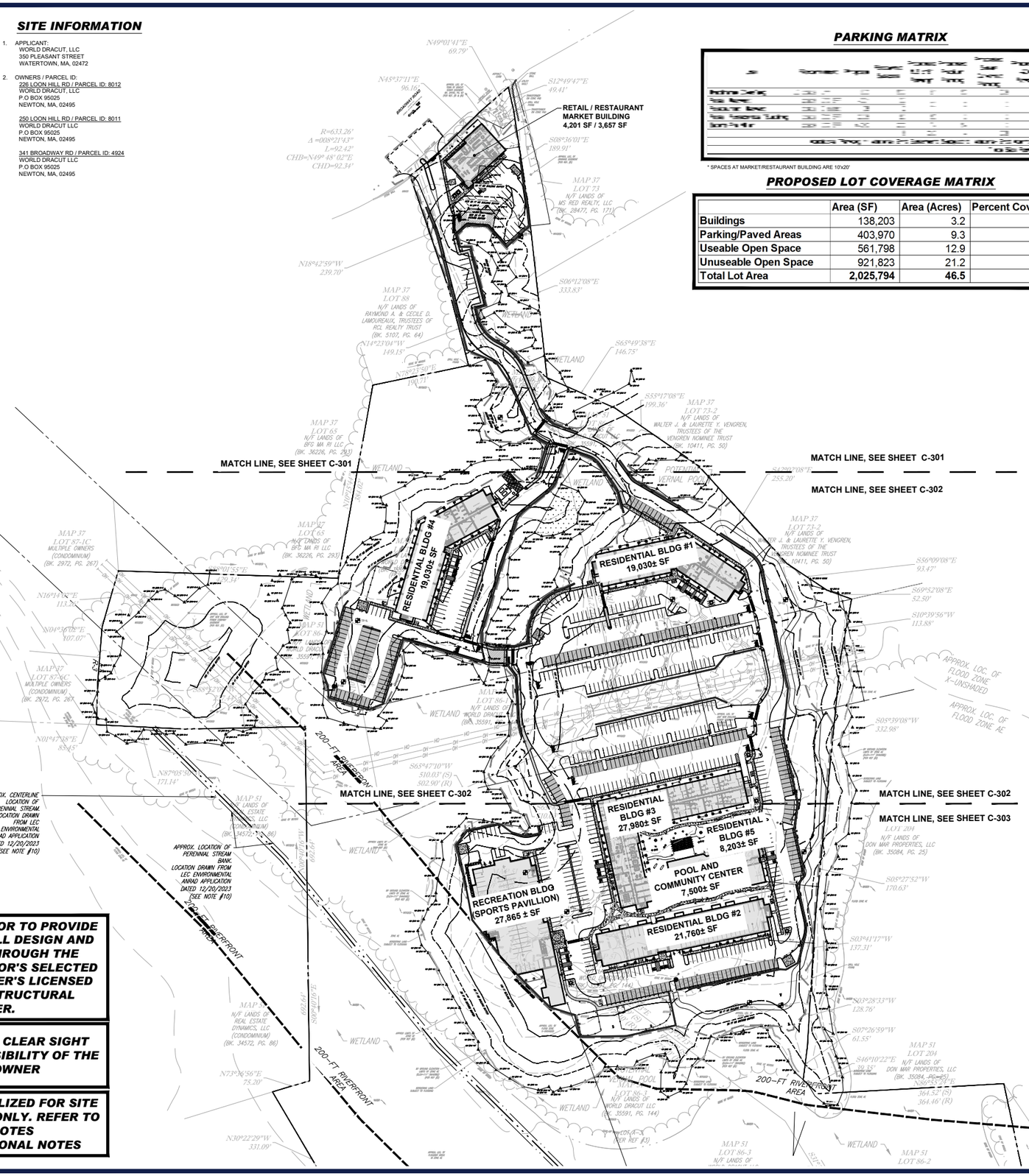
SITE INFORMATION

1. APPLICANT:
   WORLD DRACUT, LLC
   350 PLEASANT STREET
   WATERTOWN, MA, 02472

2. OWNERS / PARCEL ID:
   226 LOON HILL RD / PARCEL ID: 8012
   WORLD DRACUT, LLC
   P.O BOX 95025
   NEWTON, MA, 02495

   250 LOON HILL RD / PARCEL ID: 8011
   WORLD DRACUT LLC
   P.O BOX 95025
   NEWTON, MA, 02495

   341 BROADWAY RD / PARCEL ID: 4924
   WORLD DRACUT LLC
   P.O BOX 95025
   NEWTON, MA, 02495



PARKING MATRIX

[illegible]													
[illegible]													
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[illegible]													
[illegible]													

* SPACES AT MARKET/RESTAURANT BUILDING ARE 10'x20'

PROPOSED LOT COVERAGE MATRIX

	Area (SF)	Area (Acres)	Percent Coverage
Buildings	138,203	3.2	7%
Parking/Paved Areas	403,970	9.3	20%
Useable Open Space	561,798	12.9	28%
Unuseable Open Space	921,823	21.2	46%
Total Lot Area	2,025,794	46.5	100%

ZONING ANALYSIS TABLE

N/A - NOT APPLICABLE
N/S - NOT SPECIFIED
(V) - VARIANCE REQUESTED
(W) - WAIVER REQUESTED
(E) - EXIST. NON-CONFORMANCE

ZONING DISTRICT	INDUSTRIAL (I-1)		
APPLICABLE SPECIAL REGULATIONS	SOIL, VEGETATION, ROCK AND GRAVEL REMOVAL (6.3.1), MAJOR BUSINESS COMPLEX (8.1)		
ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MIN. LOT AREA	90,000 SF (SECT. 4.4)	2,025,794 SF / 46.5 ACRES 1,380,518 SF / 31.7 ACRES (PER SECT. 4.1.2)[1]	NO CHANGE
MIN. FRONTAGE	225 FT (SECT. 4.4)	258 FT	NO CHANGE
MIN. LOT WIDTH	50 FT (SECT. 4.4)	150 FT	NO CHANGE
MIN. SIDE YARDS	30 FT (SECT. 4.4)	N/A	1.0 FT (RETAINING WALL >4 FT) (W)
MIN. FRONT YARD	60 FT (SECT. 4.4)	N/A	17.0 FT (MARKET BUILDING) (W)
MIN. REAR YARD	40 FT (SECT. 4.4)	N/A	472.1 FT (RECREATION BUILDING)
MAX. BUILDING HEIGHT	4 STORIES / 50 FT (SECT. 4.4)	N/A	68'-0" (W)
MIN. SITE LANDSCAPING	20% OF TOTAL IMPERVIOUS SURFACE OF PROJECT (SECT. 2.4.12) = 2.2 ACRES	N/A	1.4± ACRES (W)
MAX. LOT COVERAGE	65%	0.09%	39.3%[2]
TOTAL PARKING SPACES	1,017	N/A	707 (W)
ACCESS. PARKING SPACES	21	N/A	25
RESIDENTIAL PARKING RATIO	2.0	N/A	1.56[3]
PARKING STALL CRITERIA REQUIRED: STANDARD: 10 FT x 20 FT COMPACT: 9 FT x 16 FT (SECT 6.1.8(D)) PROVIDED: 10 FT x 20 FT (MARKET) 8.5 FT x 18 FT (RESIDENTIAL)	USE/CATEGORY: MULTIFAMILY DWELLING REQUIRED PARKING: TWO SPACES PER DWELLING UNIT (SECT 6.1.6) USE/CATEGORY: RESTAURANT[4] REQUIRED PARKING: ONE SPACE PER THREE SEATS (SECT 6.1.6) USE/CATEGORY: STORES, RETAIL BUSINESS AND SERVICES[5] REQUIRED PARKING: 1 SPACE / 200 SF OF GROSS LEASABLE FLOOR AREA (SECT 6.1.6) USE/CATEGORY: RECREATION BUILDING[5]: ANY OTHER NON-RESIDENTIAL USE, OR ANY USE INVOLVING COMBINATIONS OF FUNCTIONS SIMILAR TO OR LISTED HEREIN REQUIRED PARKING: A NUMBER OF SPACES AS DETERMINED BY THE BUILDING INSPECTOR BY APPLICATION SIMILAR TO OR LISTED HEREIN OF THE RATIOS ABOVE OR BY THE SPECIAL PERMIT GRANTING AUTHORITY IF USE REQUIRES SPECIAL PERMIT (SECT 6.1.6)		
ACCESSIBLE PARKING CRITERIA STANDARD: 8 FT x 18 FT STALL (MIN.) 5 FT x 18 FT AISLE (MIN.) VAN: 8 FT x 18 FT STALL (MIN.) 8 FT x 18 FT AISLE (MIN.)	501-1,000 SPACES = MIN. 2% OF TOTAL 1 ACCESSIBLE VAN SPACE PER 6 STANDARD ACCESSIBLE SPACES (MIN.)		

(1) AREA CALCULATED TO EXCLUDE 70% OF WETLAND RESOURCE AREAS PER SECT. 4.1.2
TOTAL LOT AREA = 2,025,794 SF
- WETLAND AREA = 921,823 SF * 70% = 645,276 SF
LAND AREA = 1,380,518 SF
(2) IMPERVIOUS AREA = 138,203 SF BUILDINGS + 403,970 SF PARKING/PAVED AREAS = 542,173 SF
IMPERVIOUS AREA / LAND AREA (EXCLUDING 70% OF WETLAND RESOURCE AREAS PER SECT. 4.1.2) = 542,173 SF / 1,380,518 SF = 39.3%
(3) 468 SPACES / 300 UNITS = 1.57
DOES NOT INCLUDE NATIONAL GRID PARKING EASEMENT SPACES.
(4) SPECIAL PERMIT FROM PLANNING BOARD REQUIRED FOR RETAIL STORE >5,000 SF AND RESTAURANT USES IN I-1 DISTRICT. SPECIAL PERMIT FROM BOARD OF SELECTMEN REQUIRED FOR COMMERCIAL RECREATION USE IN I-1 DISTRICT. ZONING BOARD OF APPEALS WILL BE PERMIT GRANTING AUTHORITY FOR SPECIAL PERMITS IN ACCORDANCE WITH 760 CMR 56.05(7)(D)2.

BUILDING MATRIX
(REFER TO ARCHITECTURAL PLANS)

Floor Level	Residential Area (SF)	Commercial Area (SF)	Residential Area (SF)	Garage Area (SF)	Recreational Area (SF)	Building Area (SF)	1 Bed/1 Bath with Nook	1 Bed/1 Bath	2 Bed/1 Bath with Nook	2 Bed/2 Bath	3 Bed/2 Bath with Nook	Total Units
Market/Restaurant Building												
First Floor	2,624	4,201				6,825						
Second Floor	1,033					1,033						
Total	3,657	4,201	0	0	0	7,858						
Building 1												
Basement			2,063	8,968		11,030	0	0	0	0	0	
First Floor		0	19,030			19,030	4	11	0	0	2	
Second Floor		0	19,000			19,000	5	1	8	0	2	
Third Floor		0	19,000			19,000	5	1	8	0	2	
Fourth Floor		0	19,000			19,000	5	1	8	0	2	
Total	0	0	96,093	8,968	0	105,060	19	14	32	0	8	69
Building 2												
Basement			3,069	1,709	16,659	21,760	0	0	0	0	0	
First Floor		0	21,760	0		21,760	3	11	11	0	2	
Second Floor		0	21,760	0		21,760	3	11	11	0	2	
Third Floor		0	21,760	0		21,760	2	9	13	0	2	
Fourth Floor		0	21,760	0		21,760	2	9	13	0	2	
Total	0	0	90,109	1,709	16,659	108,801	9	9	48	0	8	67
Building 3												
Basement			4,960	14,026		19,650	0	0	0	0	0	
First Floor		0	27,980			27,980	4	9	6	1	2	
Second Floor		0	28,288			28,288	10	11	12	1	2	
Third Floor		0	28,288			28,288	10	11	12	1	2	
Fourth Floor		0	28,288			28,288	10	9	12	1	2	
Total	0	0	117,810	0	0	117,810	34	31	44	4	8	121
Building 4												
Basement			2,063	8,968		11,030	0	0	0	0	0	
First Floor		0	19,030			19,030	4	1	6	0	2	
Second Floor		0	19,000			19,000	5	1	8	0	2	
Third Floor		0	19,000			19,000	5	1	8	0	2	
Fourth Floor		0	19,000			19,000	5	1	8	0	2	
Total	0	0	96,093	8,968	0	107,061	19	4	38	0	8	69
Building 5												
Basement			5,179			5,179						
First Floor			8,203			8,203	1	1	2	1	0	
Second Floor			7,990			7,990	0	1	3	1	0	
Third Floor			7,990			7,990	0	2	3	1	0	
Fourth Floor			7,990			7,990	0	2	3	1	0	
Total	0	0	37,352	0	0	37,352	1	6	11	4	0	22
Pool												
First Floor			7,500			7,500						
Second Floor			770			770						
Total	0	0	8,270	0	0	8,270						
Recreation Building (Sports Pavillion)												
Basement				25,394	2,072	27,376						
First Floor				0	27,865	27,865						
Second Floor				0	24,045	24,045						
Third Floor				0	10,841	10,841						
Total			0	25,394	64,823	90,217						
Totals	3,657	95,407	432,100	49,263	64,389	645,816	82	53	165	8	32	390

100 50 25 0 100
1"= 100'

GENERAL CONTRACTOR TO PROVIDE A SITE SPECIFIC WALL DESIGN AND CALCULATIONS THROUGH THE GENERAL CONTRACTOR'S SELECTED WALL MANUFACTURER'S LICENSED PROFESSIONAL STRUCTURAL ENGINEER.

MAINTENANCE OF A CLEAR SIGHT LINE IS THE RESPONSIBILITY OF THE PROPERTY OWNER

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DRAWN BY: AP/EA/AH
CHECKED BY: TAH/EA
DATE: 9/20/2024
CAD I.D.: P-CIVL-PROP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

T.A. HAYES
HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

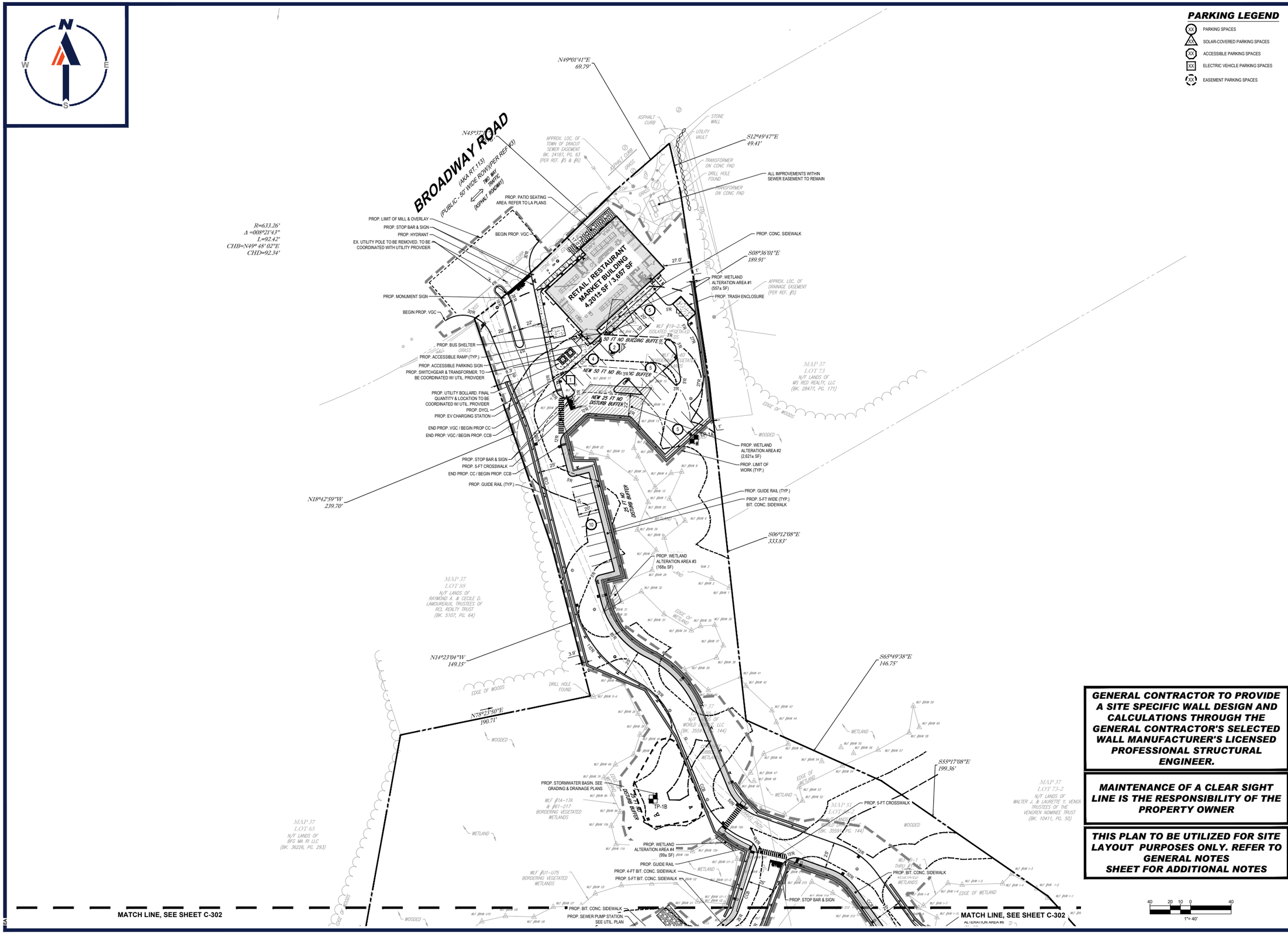
SHEET TITLE:

OVERALL SITE & KEY PLAN

SHEET NUMBER:

C-300

ORG. DATE - 9/20/2024



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DATE:	9/20/2024
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PROJECT:

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PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
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MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
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www.BohlerEngineering.com

COMMONWEALTH OF MASSACHUSETTS
T.A. HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

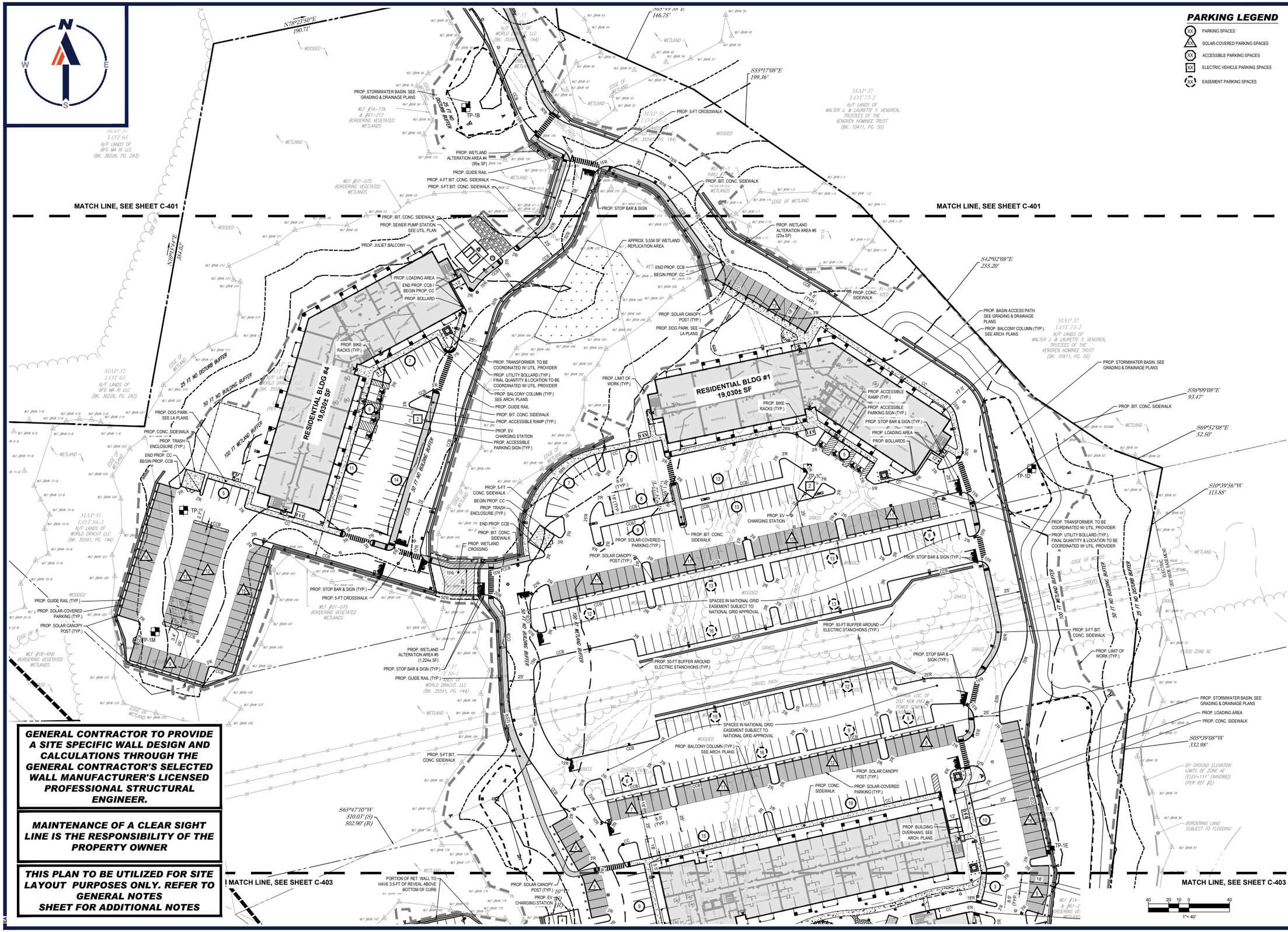
SHEET TITLE:

SITE LAYOUT PLAN

SHEET NUMBER:

C-301

ORG. DATE - 9/20/2024



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CHECKED BY:	TA/HEA
DATE:	9/20/2024
CAD I.D.:	P-CIVL-PROP-MAB230046.00-0A

PROJECT:

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FOR

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T.A. HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

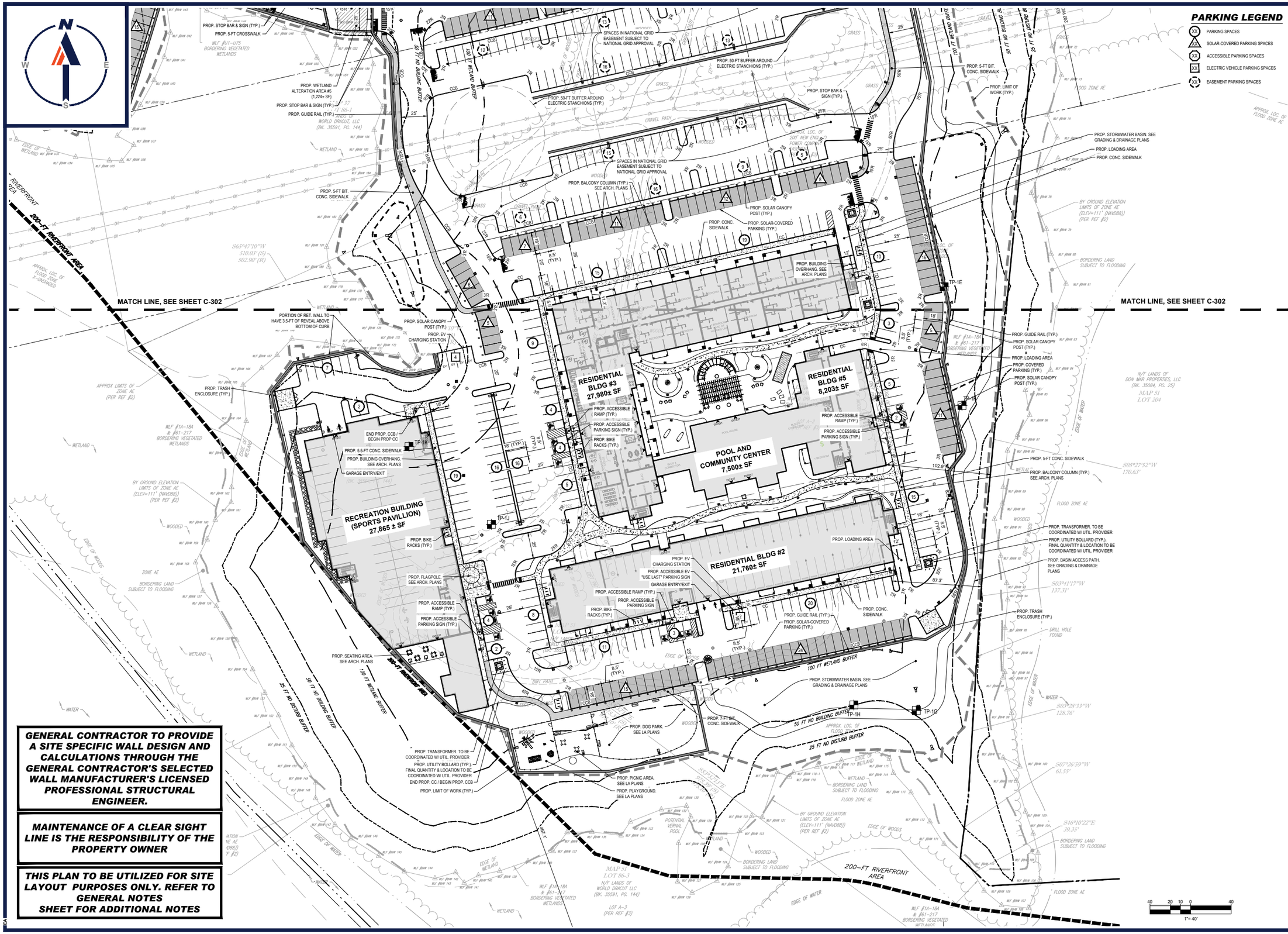
SITE LAYOUT PLAN

SHEET NUMBER:

C-302

ORG. DATE - 9/20/2024

I:\BOLER\ENGINEERING\MAB\PROJECTS\2023\MAB230046.00\CAD\DRAWINGS\PLAN SET\SITE PLAN\SP-CIVIL-PROP-MAB230046.00-0A-----LAYOUT: C-302



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T.A. HAYES
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PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

SITE LAYOUT PLAN

SHEET NUMBER:

C-303

ORG. DATE - 9/20/2024

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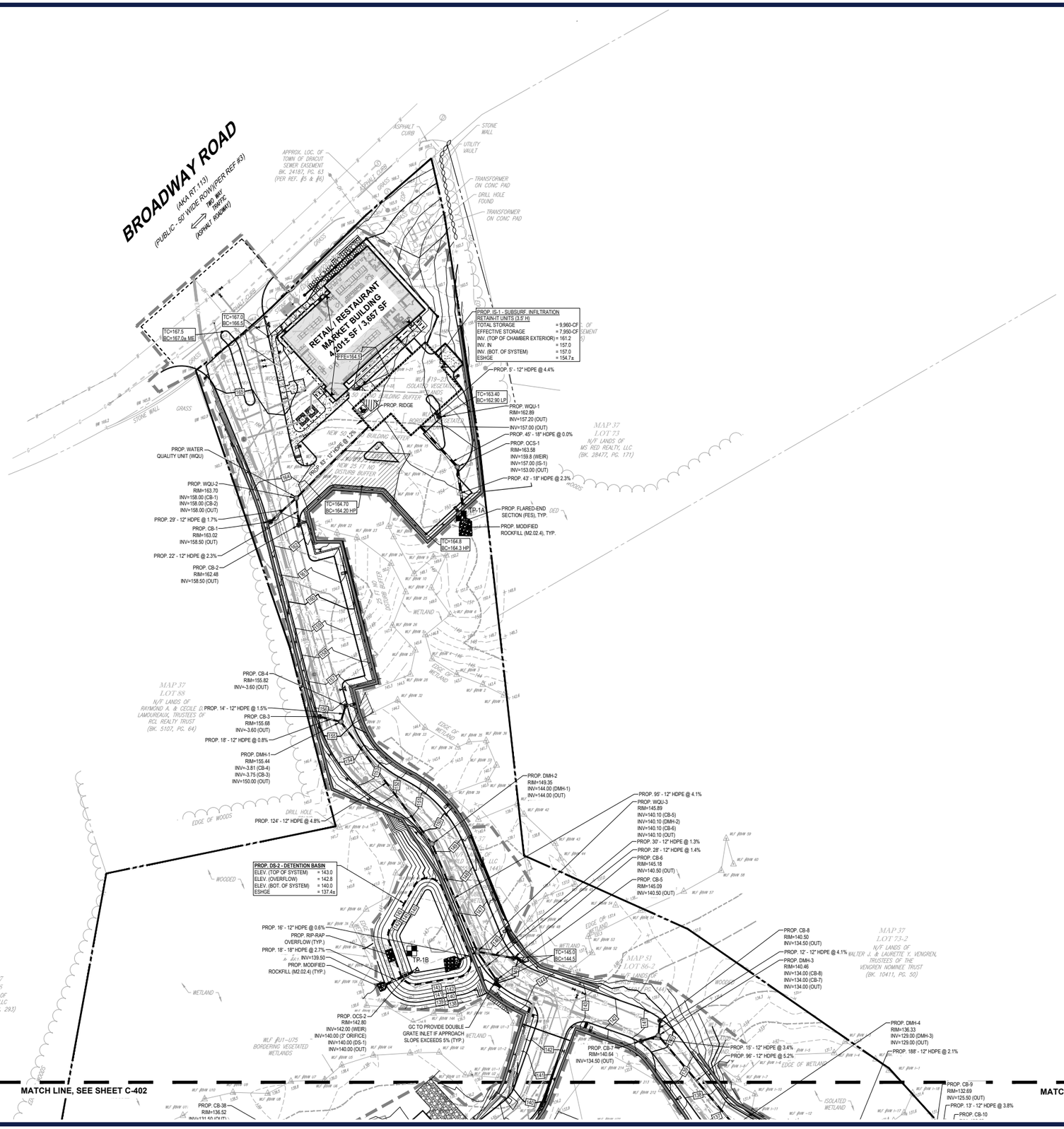

REFER TO DRAINAGE REPORT / STORMWATER OPERATION AND MAINTENANCE PLAN FOR ADDITIONAL DETAIL.

THIS PLAN TO BE UTILIZED FOR SITE GRADING AND DRAINAGE PURPOSES ONLY. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL GRADING & UTILITY NOTES

40 20 10 0 40
1"= 40'

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DATE:	9/20/2024
CAD I.D.:	P-CIVL-PROP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
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COMMONWEALTH OF MASSACHUSETTS
T.A. HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-401

ORG. DATE - 9/20/2024

MATCH LINE, SEE SHEET C-401

MATCH LINE, SEE SHEET C-401

MATCH LINE, SEE SHEET C-403

MATCH LINE, SEE SHEET C-403

RESIDENTIAL BLDG #4
19,030± SF

RESIDENTIAL BLDG #1
19,030± SF

RESIDENTIAL BLDG #3
27,980± SF

RESIDENTIAL BLDG #5
8,203± SF

PROP. IS-8 - SUBSURF. INFILTRATION
STORMTRAP SINGLETRAP UNITS (2.5' H)
TOTAL STORAGE = 5,950-CF
EFFECTIVE STORAGE = 5,440-CF
INV. (TOP OF CHAMBER EXTERIOR) = 133.0
INV. IN = 130.0
INV. (BOT. OF SYSTEM) = 130.0

PROP. IS-4 - SUBSURF. INFILTRATION
STORMTRAP SINGLETRAP UNITS (3.5' H)
TOTAL STORAGE = 28,450-CF
EFFECTIVE STORAGE = 24,370-CF
INV. (TOP OF CHAMBER EXTERIOR) = 130.0
INV. IN = 126.0
INV. (BOT. OF SYSTEM) = 126.0

PROP. IS-3 - INFILTRATION BASIN
ELEV. (TOP OF SYSTEM) = 124.0
ELEV. (OVERFLOW) = 123.8
ELEV. (BOT. OF SYSTEM) = 121.0
ESHGE = 119.0±

PROP. IS-9 - SUBSURF. INFILTRATION
RETAIN-IT UNITS (4.5' H)
TOTAL STORAGE = 18,300-CF
EFFECTIVE STORAGE = 17,080-CF
INV. (TOP OF CHAMBER EXTERIOR) = 131.2
INV. IN = 126.0
INV. (BOT. OF SYSTEM) = 126.0

PROP. IS-12C - SUBSURF. INFILTRATION
STORMTRAP SINGLETRAP UNITS (3.0' H)
TOTAL STORAGE = 7,250-CF
EFFECTIVE STORAGE = 7,250-CF
INV. (TOP OF CHAMBER EXTERIOR) = 127.0
INV. IN = 123.5
INV. (BOT. OF SYSTEM) = 123.5

PROP. DS-10 - DETENTION BASIN
ELEV. (TOP OF SYSTEM) = 125.0
ELEV. (OVERFLOW) = 124.9
ELEV. (BOT. OF SYSTEM) = 121.0

PROP. IS-12A - SUBSURF. INFILTRATION
STORMTRAP SINGLETRAP UNITS (3.0' H)
TOTAL STORAGE = 7,250-CF
EFFECTIVE STORAGE = 7,250-CF
INV. (TOP OF CHAMBER EXTERIOR) = 128.0
INV. IN = 124.5
INV. (BOT. OF SYSTEM) = 124.5

PROP. IS-12B - SUBSURF. INFILTRATION
STORMTRAP SINGLETRAP UNITS (3.0' H)
TOTAL STORAGE = 6,010-CF
EFFECTIVE STORAGE = 6,010-CF
INV. (TOP OF CHAMBER EXTERIOR) = 132.0
INV. IN = 128.5
INV. (BOT. OF SYSTEM) = 128.5

PROP. IS-11 - SUBSURF. INFILTRATION
RETAIN-IT UNITS (3.0' H)
TOTAL STORAGE = 2,710-CF
EFFECTIVE STORAGE = 2,440-CF
INV. (TOP OF CHAMBER EXTERIOR) = 121.7
INV. IN = 118.0
INV. (BOT. OF SYSTEM) = 118.0

REFER TO DRAINAGE REPORT / STORMWATER OPERATION AND MAINTENANCE PLAN FOR ADDITIONAL DETAIL.

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40 20 10 0 40
1"= 40'

200-FT RIVERFRONT AREA

25 FT NO DISTURB BUFFER

50-FT NO BUILDING BUFFER

N/F LANDS DON MAR PROPER. (BK. 35084, PG. MAP 51 LOT 204

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DRAWN BY:	AP/EA/AH
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DATE:	9/20/2024
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PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

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T.A. HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-402

ORG. DATE - 9/20/2024

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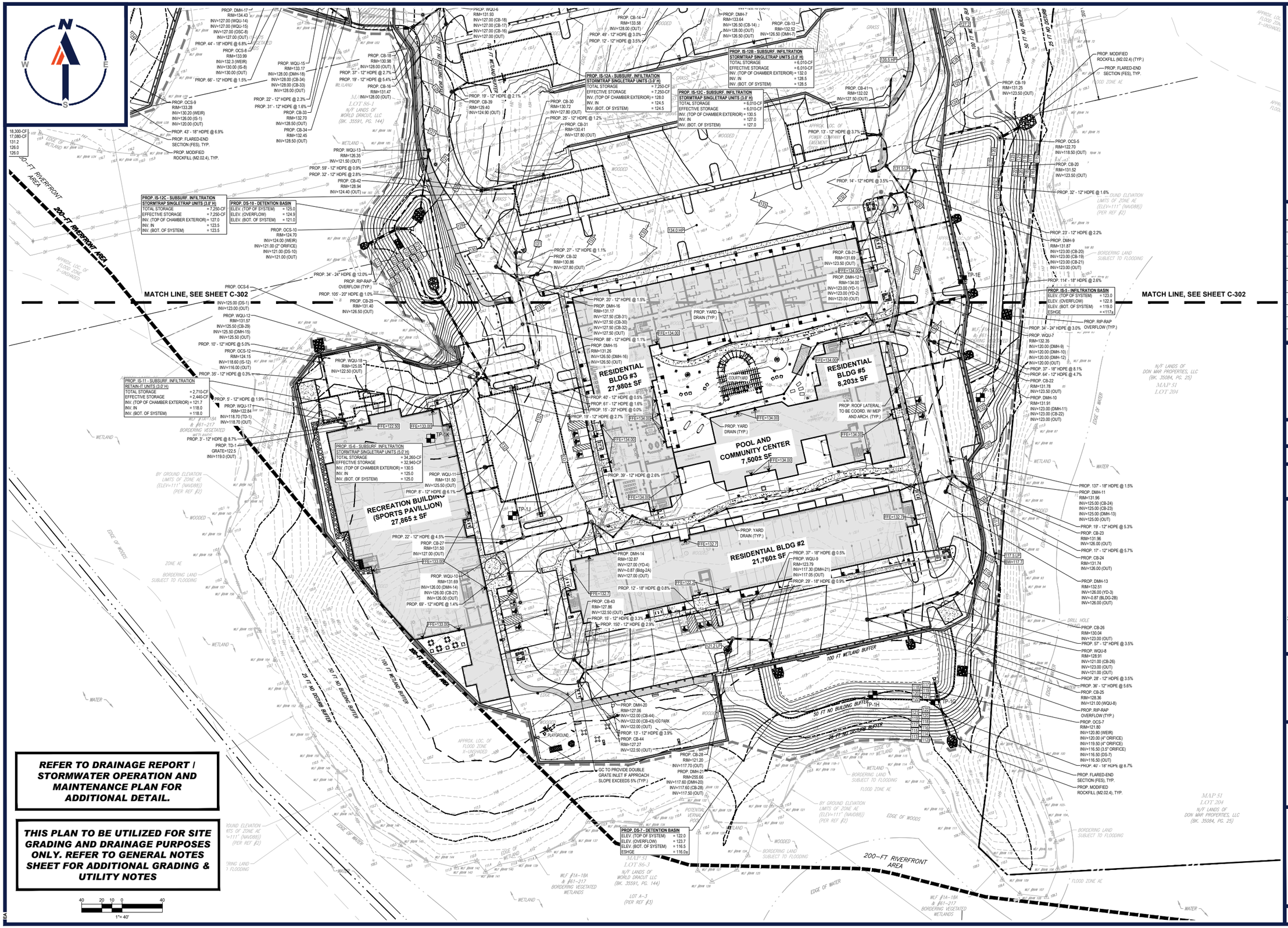
EA 9/20/2024 8:57:26 AM EDT



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40 20 10 0 40
1"= 40'

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PROJECT No.:	MAB230046.00
DRAWN BY:	AP/EA/AH
CHECKED BY:	TAH/EA
DATE:	9/20/2024
CAD I.D.:	P-CIVL-PROP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER

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BOSTON, MA 02110
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T.A. HAYES
HAYES
NO. 51929
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

GRADING & DRAINAGE PLAN

SHEET NUMBER:

C-403

ORG. DATE - 9/20/2024

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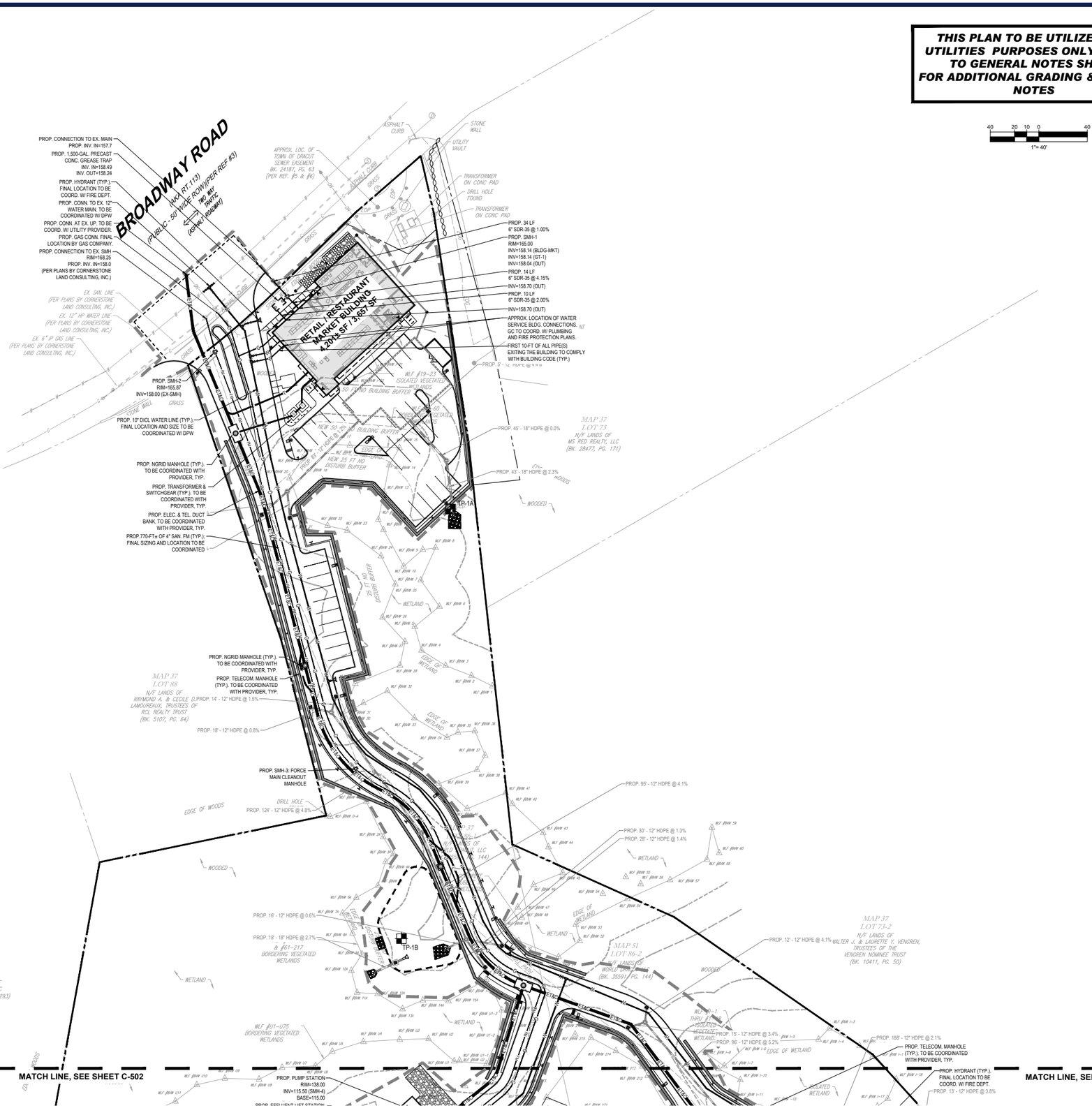

40 20 10 0 40
1"= 40'

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COMMONWEALTH OF MASSACHUSETTS
T.A. HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-501

ORG. DATE - 9/20/2024

THIS PLAN TO BE UTILIZED FOR UTILITIES PURPOSES ONLY. REFER TO GENERAL NOTES SHEET FOR ADDITIONAL GRADING & UTILITY NOTES

MATCH LINE, SEE SHEET C-501

MATCH LINE, SEE SHEET C-501

MATCH LINE, SEE SHEET C-503

MATCH LINE, SEE SHEET C-503

RESIDENTIAL BLDG #4
19,030± SF

RESIDENTIAL BLDG #1
19,030± SF

RESIDENTIAL BLDG #3

RESIDENTIAL BLDG #5

DOG PARK

DOG PARK

200-FT RIVERFRONT AREA

200-FT RIVERFRONT AREA

MAP 37
LOT 65
N/F LANDS OF
BFG MA RI LLC
(BK. 36226, PG. 293)

MAP 51
LOT 86-3
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 37
LOT 86-1
N/F LANDS OF
WORLD DRACUT, LLC
(BK. 35591, PG. 144)

MAP 37
LOT 73-2
N/F LANDS OF
WALTER J. & LAURETTE Y. VENGREN,
TRUSTEES OF THE
VENGREN NOMINEE TRUST
(BK. 10411, PG. 50)

MAP 51
LOT 86-2
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 51
LOT 211
LANDS OF
ESTATE
MCS, LLC
(CONDOMINIUM)
172, PG. 86)

WETLAND

EDGE OF WOODS

EDGE OF WETLAND

25 FT NO DISTURB BUFFER

50 FT NO BUILDING BUFFER

WLF #1A–184 & #61–217 BORDERING VEGETATED WETLANDS

WLF #18–65B BORDERING VEGETATED WETLANDS

WLF #U1–U75 BORDERING VEGETATED WETLANDS

WLF #U1–U16 THRU #1–16 ISOLATED VEGETATED WETLANDS

APPROX LOC. OF 100-FOOT BUFFER TO BORDERING LAND SUBJECT TO FLOODING

APPROX LOC. OF FLOOD ZONE A–EL 111

APPROX LOC. OF 3523 POWER COMPANY EASEMENT (DEED BOOK 1441, PAGE 287)

GRAVEL PATH

GRASS

WOODED

BOUNDARY ELEVATION LIMITS OF ZONE AE (ELEV=111' (NAVD88)) (PER REF #2)

ZONE AE

ZONE X

40 20 10 0 40
1"= 40'

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PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-502

ORG. DATE - 9/20/2024

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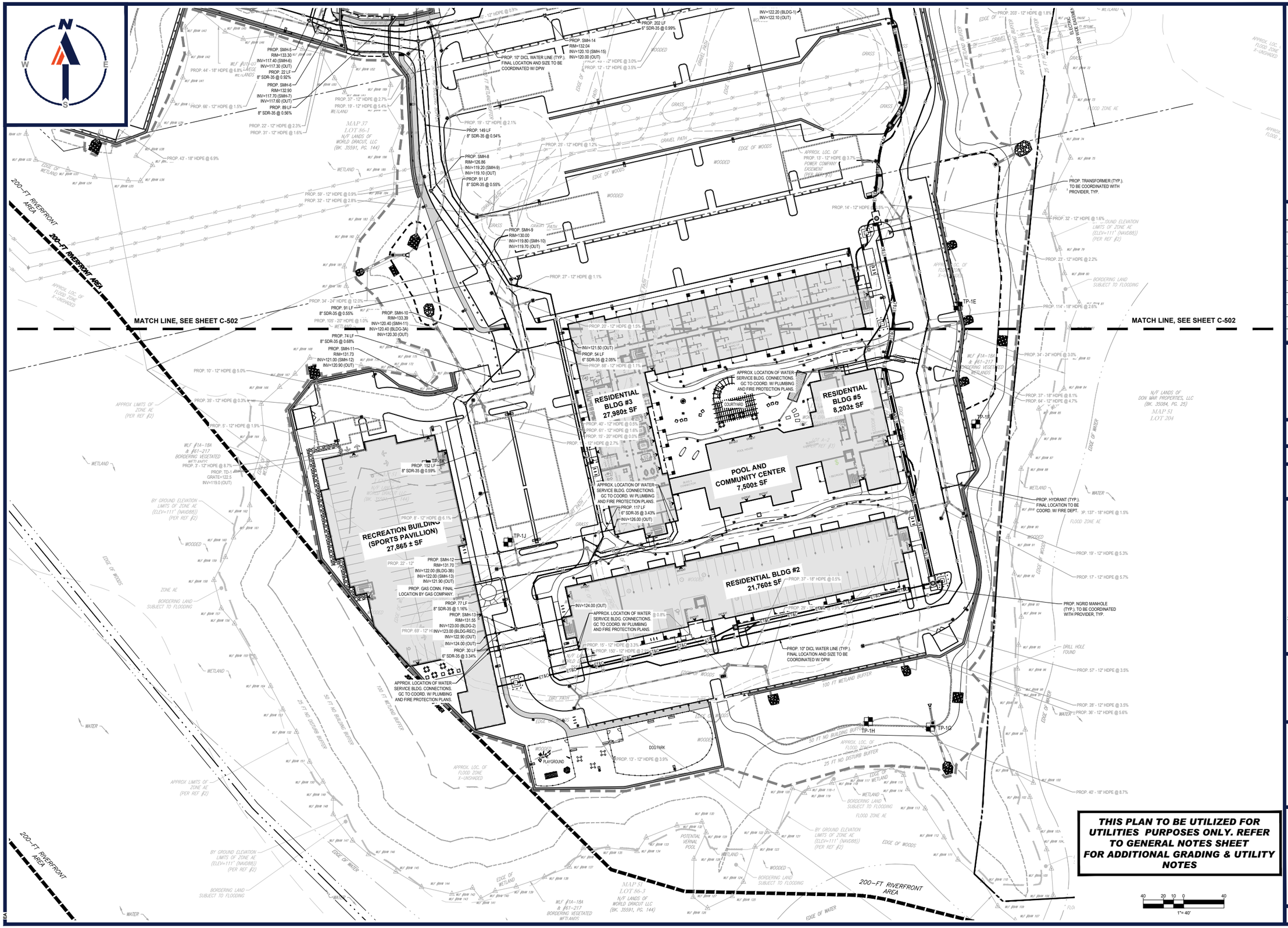

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SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-503

ORG. DATE - 9/20/2024

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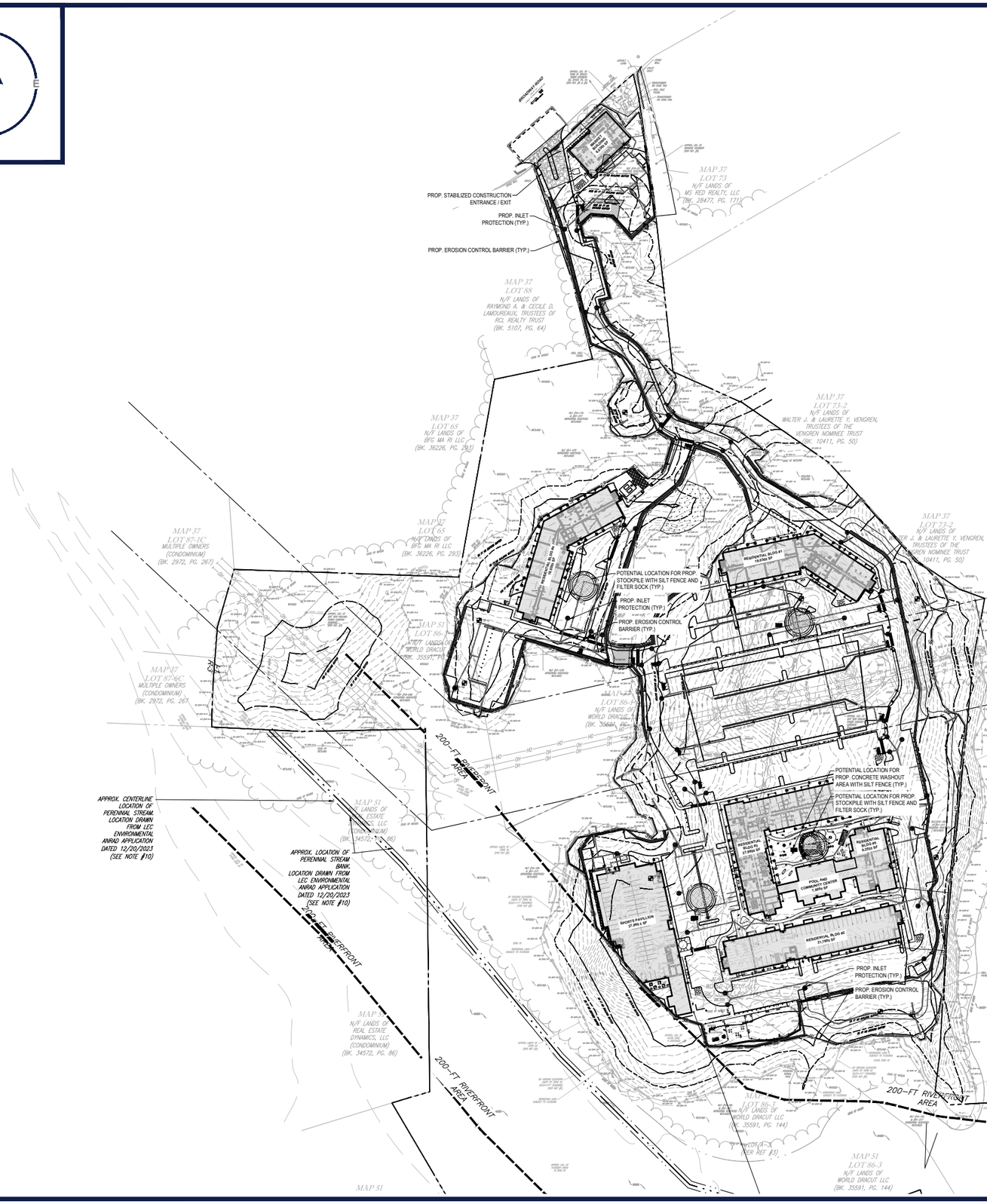

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REFER TO SOIL EROSION CONTROL NOTES & DETAIL SHEET FOR EROSION NOTES AND DETAILS

40 20 10 0 40
1"= 40'

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COMMONWEALTH OF MASSACHUSETTS
T.A. HAYES
HAYES
NO. 51929
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

SOIL EROSION & SEDIMENT CONTROL PLAN

SHEET NUMBER:

C-601

ORG. DATE - 9/20/2024

EROSION AND SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.
2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. AT A MINIMUM, AREAS SHALL BE PERMANENTLY STABILIZED ACCORDING TO THE CURRENT EDITION OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP), OR IN THE ABSENCE OF A SWPPP, THEY SHALL BE PERMANENTLY STABILIZED WITHIN 14 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POND, THE AREA SHALL BE STABILIZED WITHIN 7 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).
3. SEDIMENT BARRIERS (SILT FENCE, STRAW BARRIERS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 8%.
4. INSTALL SILTATION BARRIER AT TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILTATION BARRIER DETAILS FOR PROPER INSTALLATION. SILTATION BARRIER WILL REMAIN IN PLACE PER NOTE #5.
5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED. FOR SEDIMENT CONTROL DEVICES THAT ARE WITHIN AREAS SUBJECT TO CONSERVATION COMMISSION JURISDICTION, THE DEVICES SHALL REMAIN IN PLACE AND BE REMOVED IN ACCORDANCE WITH THE ORDER OF CONDITIONS.
6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1) UNLESS OTHERWISE INDICATED ON THE PLANS. SLOPE PROTECTION FOR SLOPES GREATER THAN 2:1 SHALL BE DESIGNED BY A GEOTECHNICAL ENGINEER.
7. IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCH (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
8. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST TO PROTECT FROM SPRING RUNOFF PROBLEMS.
9. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL STANDARDS.
10. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
    - 10.1. SIX INCHES, OR DEPTH SPECIFIED ON THE LANDSCAPE PLAN, OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
    - 10.2. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 LB PER ACRE OR 18.4 LB PER 1,000 SF USING 10-20-20 OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER1,000 SF).
    - 10.3. FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEEDED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUE-GRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS. SEEDING RATE IS 1.03 LBS PER 1,000 SF LAWN. QUALITY SOD MAY BE SUBSTITUTED FOR SEED WHERE SLOPES DO NOT EXCEED 2:1. SOD ON SLOPES STEEPER THAN 3:1 SHOULD BE PEGGED.
    - 10.4. STRAW MULCH AT THE RATE OF 70-90 LBS PER 1,000 SF. A HYDRO-APPLICATION OF WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE NON-TOXIC BINDER WILL BE USED ON STRAW MULCH FOR WIND CONTROL.
11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS 70% STABILIZED. FOR EROSION CONTROL MEASURES THAT ARE WITHIN AREAS SUBJECT TO CONSERVATION COMMISSION JURISDICTION, THE MEASURES SHALL REMAIN IN PLACE AND BE REMOVED IN ACCORDANCE WITH THE ORDER OF CONDITIONS.
12. WETLANDS WILL BE PROTECTED WITH BARRIERS CONSISTING OF STRAW BALES, COMPOST TUBES, SILT FENCE OR A COMBINATION THEREOF.
13. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL HAVE AN EXPOSURE WINDOW OF NOT MORE THAN 7 DAYS.
14. ALL AREAS WITHIN 100 FEET OF A FLAGGED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED:

LOCATION	MULCH	MULCH RATE (1000 SF)
PROTECTED AREA	STRAW	100 POUNDS
WINDY AREA	SHREDDED OR CHOPPED CORNSTALKS	185-275 POUNDS
	STRAW (ANCHORED)*	100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 3:1	JUTE MESH OR EXCELSIOR MAT	AS REQUIRED
GREATER THAN 3:1	(REFER TO GEOTECHNICAL REPORT FOR FINAL DESIGN REQUIREMENT)	

* A HYDRO-APPLICATION OF WOOD OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE NON-TOXIC BINDER SHALL BE USED TO ADDITIONAL WIND CONTROL.

* MULCH ANCHORING: ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD/BLOCK); MULCH NETTING (AS PER MANUFACTURER); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURER'S SPECIFICATIONS); USE OF A SERRATED STRAIGHT DISK. WETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

15. PROPOSED LOCATIONS OF SURFACE STORMWATER MANAGEMENT BASINS CAN BE UTILIZED AS A TEMPORARY SEDIMENT TRAP DURING CONSTRUCTION.SEDIMENT TRAPS SHALL BE SIZED AND CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS.
    - 15.1. TEMPORARY SEDIMENT TRAPS SHALL BE SIZED PER THE CURRENT EDITION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS" AND PROVIDE A MINIMUM OF 1,800 CF PER ACRE OF TRIBUTARY AREA WITH A MAXIMUM TRIBUTARY AREA OF 5 ACRES, MAINTAIN A 2:1 LENGTH TO WIDTH RATIO, AND NOT EXCEED 5 FT IN HEIGHT. UPON SITE STABILIZATION, ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE TEMPORARY SEDIMENT TRAP EXCAVATED TO 1 FOOT BELOW THE TRAP. THE AREA SHALL THEN BE SCARIFIED TO PREVENT COMPACTION AND PROMOTE INFILTRATION, AND GRADED AND STABILIZED IN ACCORDANCE WITH THE GRADING AND LANDSCAPE PLANS.
16. STOCKPILING OF MATERIALS (DIRT, WOOD, CONSTRUCTION MATERIALS, ETC.) MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY DUST PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PROVIDE MAXIMUM PROTECTION AGAINST EROSION RUNOFF.
17. EXISTING CATCH BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.
18. THE CONTRACTOR MUST PERFORM DEWATERING (IF REQUIRED), IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND PAY FOR THE COSTS ASSOCIATED WITH ANY AND ALL NECESSARY DISCHARGE PERMITS ASSOCIATED WITH SAME.
19. THE CONTRACTOR MUST LOCATE CONSTRUCTION WASTE MATERIAL STORAGE AREAS TO MINIMIZE EXPOSURE TO STORMWATER. THE CONTRACTOR MUST IMMEDIATELY PLACE CONSTRUCTION WASTE IN ON-SITE STORAGE CONTAINERS UNTIL THAT CONSTRUCTION WASTE IS READY FOR OFF-SITE DISPOSAL. THE CONTRACTOR MUST MAINTAIN SPILL PREVENTION AND RESPONSE EQUIPMENT AND MAKE SAME CONTINUOUSLY AVAILABLE ON-SITE FOR USE BY THE CONTRACTOR'S EMPLOYEES WHO MUST BE PROPERLY TRAINED IN THE APPLICATION OF SPILL PREVENTION AND RESPONSE PROCEDURES.
20. EROSION CONTROL NOTES DURING WINTER CONSTRUCTION
21. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.
22. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT THE AMOUNT OF AREA OPEN AT ONE TIME IS MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE AND IN CONFORMANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN SUCH THAT ADEQUATE PROVISIONS ARE EMPLOYED TO CONTROL STORMWATER RUNOFF.
23. CONTINUATION OF EARTHWORK OPERATION ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
24. AN AREA SHALL BE CONSIDERED TO HAVE BEEN TEMPORARILY STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE.
25. FOR AREAS WHERE CONSTRUCTION ACTIVITIES HAVE CEASED FOR A PERIOD EXCEEDING 14 DAYS BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED. IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 200-300% HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED AS APPLICABLE. SLOPES SHALL NOT BE LEFT UNSTABILIZED OVER THE WINTER OR IN AREAS WHERE WORK HAS CEASED FOR MORE THAN 14 DAYS UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF SEDIMENT BARRIERS OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
26. MULCHING REQUIREMENTS:
    - 26.1. BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING OR WOOD CELLULOSE FIBER.
    - 26.2. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPE EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
    - 26.3. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
27. ALL DISTURBED AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE STORMWATER PREVENTION PLAN.
28. DURING THE WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. EROSION CONTROL MEASURES MUST CONFORM TO THE STATE, LOCAL, AND FEDERAL GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL UNLESS OTHERWISE NOTED, OR UNLESS THE PROFESSIONAL OF RECORD CLEARLY AND SPECIFICALLY, IN WRITING, DIRECTS OTHERWISE. INSTALLATION OF EROSION CONTROL, CLEARING, AND SITE WORK MUST BE PERFORMED EXACTLY AS INDICATED IN THE EROSION CONTROL CONSTRUCTION NOTES.
3. THE DISTURBED LAND AREA OF THIS SITE IS APPROXIMATELY 19 ACRES.
4. THE FOLLOWING EROSION CONTROL MEASURES ARE PROPOSED FOR THIS SITE:

A. STABILIZED CONSTRUCTION ENTRANCE/ EXIT - A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT IS TO BE INSTALLED AT THE DESIGNATED LOCATION SHOWN ON THE PLAN. THIS AREA MUST BE GRADED SO THAT RUNOFF WATER WILL BE RETAINED ON-SITE.

B. SEDIMENT FENCE - INSTALL SILT FENCE(S) AND/OR SILT SOCK AROUND ALL OF THE DOWNSLOPE PERIMETERS OF THE SITE, TEMPORARY FILL AND SOIL STOCKPILES.

C. INSTALL FILTER FABRIC DROP INLET PROTECTION AROUND EACH DRAINAGE INLET AS DRAINAGE STRUCTURES ARE INSTALLED TO REDUCE THE QUANTITY OF SEDIMENT. INSTALL TEMPORARY INLET PROTECTION ON INLETS DOWNSLOPE FROM DISTURBANCE, WHICH MAY BE BEYOND THE LIMITS OF DISTURBED AREA.

5. INSTALLATION OF EROSION CONTROL DEVICES MUST BE IN ACCORDANCE WITH ALL OF THE MANUFACTURER'S RECOMMENDATIONS.
6. THE CONTRACTOR MUST INSPECT EROSION CONTROL MEASURES WEEKLY. THE CONTRACTOR MUST REMOVE ANY SILT DEPOSITS GREATER THAN 6 INCHES OR HALF THE EROSION CONTROL BARRIER'S HEIGHT COLLECTED ON THE FILTER FABRIC AND/OR SILT SOCK BARRIERS AND EXCAVATE AND REMOVE ANY SILT FROM DROP INLET PROTECTION.
7. THE CONTRACTOR MUST APPLY TEMPORARY SEED AND MULCH TO ALL DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINISHED GRADE AND VEGETATED WITHIN 7 DAYS. WHEN AREAS ARE DISTURBED AFTER THE GROWING SEASON, THE CONTRACTOR MUST STABILIZE SAME WITH GEOTEXTILE FABRIC AND MAINTAIN SAME IN STRICT ACCORDANCE WITH BEST MANAGEMENT PRACTICES.
8. THE CONTRACTOR MUST INSTALL ADDITIONAL EROSION CONTROL MEASURES IF THE PROFESSIONAL OF RECORD SO REQUIRES, TO PREVENT ANY, INCLUDING THE INCIDENTAL, DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.
9. THE CONTRACTOR MUST BE RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION CONTROL MEASURES ON THE SITE UNTIL PERMANENT PAVING AND TURF/LANDSCAPING IS ESTABLISHED. THE COSTS OF INSTALLING AND MAINTAINING THE EROSION CONTROL MEASURES MUST BE INCLUDED IN THE BID PRICE FOR THE SITE WORK AND THE CONTRACTOR IS RESPONSIBLE FOR ALL SUCH COSTS.
10. THE CONTRACTOR MUST CONTINUE TO MAINTAIN ALL EROSION CONTROL MEASURES UNTIL THE COMPLETION OF CONSTRUCTION AND THE ESTABLISHMENT OF VEGETATION.
11. THE CONTRACTOR MUST REMOVE EROSION CONTROL MEASURES, SILT AND DEBRIS AFTER ESTABLISHING PERMANENT VEGETATION COVER OR OTHER INSTALLING A DIFFERENT, SPECIFIED METHOD OF STABILIZATION.
12. THIS PLAN REPRESENTS THE MINIMUM LEVEL OF IMPLEMENTATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES, MEASURES AND STRUCTURES. ADDITIONAL FACILITIES, MEASURES AND STRUCTURES MUST BE INSTALLED WHERE NECESSARY TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS AND/OR TO PREVENT ANY, INCLUDING THE INCIDENTAL DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.
13. THE CONTRACTOR MUST PROTECT ALL EXISTING TREES AND SHRUBS. THE CONTRACTOR MUST REFER TO THE LANDSCAPE AND/OR DEMOLITION PLAN(S) FOR TREE PROTECTION, FENCE LOCATIONS AND DETAILS.
14. THE CONTRACTOR MUST REFER TO GRADING PLANS FOR ADDITIONAL INFORMATION.
15. THE CONTRACTOR MUST CLEAN EXISTING AND PROPOSED DRAINAGE STRUCTURES AND INTERCONNECTING PIPES ON OR OFF-SITE AS THE JURISDICTIONAL AGENCY REQUIRES, BOTH AT THE TIME OF SITE STABILIZATION AND AT END OF PROJECT.
16. SOIL EROSION CONTROL MEASURES MUST BE ADJUSTED OR RELOCATED BY THE CONTRACTOR AS IDENTIFIED DURING SITE OBSERVATION IN ORDER TO MAINTAIN THE COMPLETE EFFECTIVENESS OF ALL CONTROL MEASURES.
17. THE CONTRACTOR MUST IDENTIFY, ON THE PLAN, THE LOCATION OF WASTE CONTAINERS, FUEL STORAGE TANKS, CONCRETE WASHOUT AREAS AND ANY OTHER LOCATIONS WHERE HAZARDOUS MATERIALS ARE STORED.

RECOMMENDED CONSTRUCTION SEQUENCE

N.T.S.

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

-INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT (AS SHOWN)

-INSTALLATION OF EROSION CONTROL BARRIER (STRAW BALES AND SILT FENCE) (AS SHOWN)

-INSTALLATION OF INLET PROTECTION IN STREET (AS SHOWN)

-DEMOLITION OF EXISTING SITE STRUCTURES (SEE DEMOLITION PLAN)

-DEMOLITION OF EXISTING SITE PAVEMENT AND AMENITIES (SEE DEMOLITION PLAN)

-CLEARING AND GRUBBING

-INSTALLATION OF TEMPORARY SWALES AND SEDIMENT BASINS

-EARTHWORK AND EXCAVATION/FILLING AS NECESSARY

-CONSTRUCTION OF UTILITIES

-STABILIZE PERMANENT LAWN AREAS AND SLOPES WITH TEMPORARY SEEDING

-INSTALLATION OF INLET PROTECTION OF ON-SITE UTILITIES (AS SHOWN)

-CONSTRUCTION OF BUILDINGS

-CONSTRUCTION OF ALL CURBING AND LANDSCAPE ISLANDS AS INDICATED ON THE PLANS

-SPREAD TOPSOIL ON SLOPED AREAS AND SEED AND MULCH

-FINAL GRADING OF ALL SLOPED AREAS

-PLACE 6" TOPSOIL ON SLOPES AFTER FINAL GRADING COMPLETED. FERTILIZE, SEED, AND MULCH SEED MIXTURE TO BE INSTALLED AS REQUIRED.

-REMOVAL OF THE TEMPORARY SEDIMENT BASINS

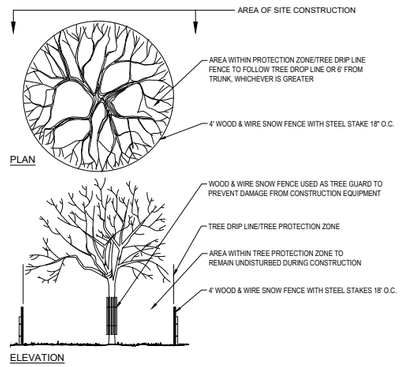
-PAVE PARKING LOT

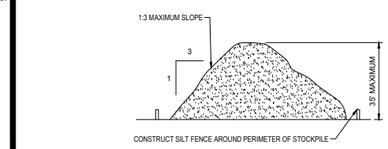
-LANDSCAPING PER LANDSCAPING PLAN

-REMOVE EROSION CONTROLS AS DISTURBED AREAS BECOME STABILIZED TO 70% STABILIZATION OR GREATER

TREE PROTECTION DURING SITE CONSTRUCTION

N.T.S.





TEMPORARY STOCKPILE

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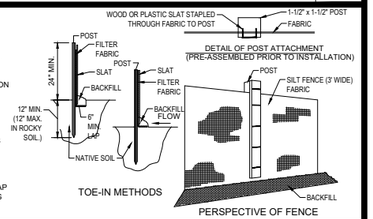
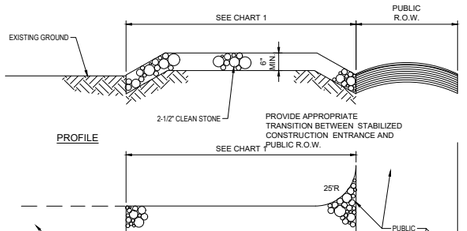
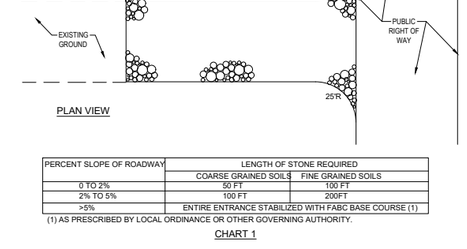


NOTES:
1. EXCAVATE A 6"x6" TRENCH ALONG THE LINE OF EROSION CONTROL OF THE SITE.
2. UNROLL SILTATION FENCE AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM FLOW DIRECTION).
3. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS LAYING ACROSS THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF THE FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL ALSO BE ACCOMPLISHED BY LAYING FABRIC FLAP ON UNDISTURBED GROUND AND PILING & TAMPING FILL AT THE BASE.

TYP. SILTATION FENCE

N.T.S.





PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0 TO 2%	50 FT	100 FT
2% TO 5%	100 FT	200FT
>5%	ENTIRE ENTRANCE STABILIZED WITH FABC BASE COURSE (1)	

(1) AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

CHART 1

STABILIZED CONSTRUCTION ENTRANCE

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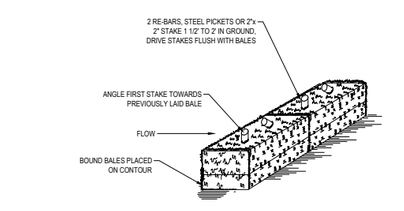

DRAINAGE AREA NO MORE THAN ¼ AC. PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.

NOTES:

1. BALES SHALL BE PLACED AT THE TOP OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.

2. EACH BALE SHALL BE PLACED SO THE BINDINGS ARE HORIZONTAL.

3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.

4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE PROMPTLY AS NEEDED.

5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

STRAW BALE

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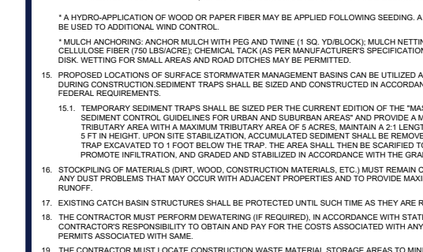
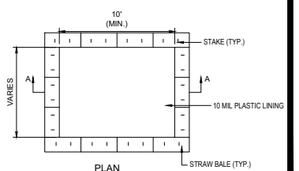


NOTES:
1. TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE LOCATED A MINIMUM OF 50 FT. FROM STORM DRAIN INLETS.
2. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF OFF-SITE. CONTRACTOR TO DISPOSE OF HARDENED CONCRETE ON A REGULAR BASIS.
3. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
4. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.
5. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75% FULL.
6. STRAW BALE AND STAPLES MAY BE SUBSTITUTED WITH ALTERNATE SECURING MEASURES SUCH AS CONCRETE BLOCK.



CONCRETE WASTE MANAGEMENT AREA

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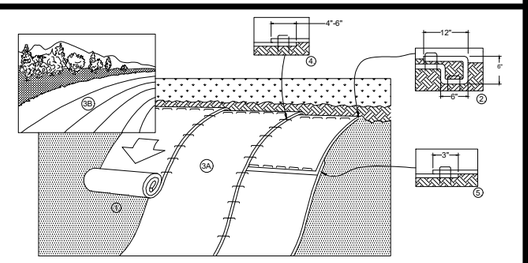
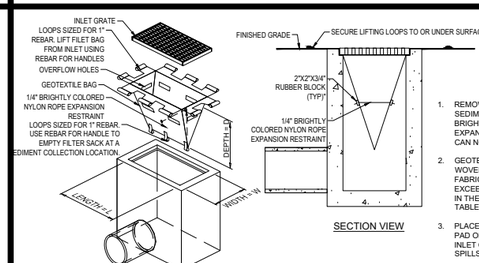


1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH AS SHOWN IN DETAIL 2. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS PER MANUFACTURES RECOMMENDATION.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MINIMUM 6" OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. PLACE STAPLES/STAKES PER MANUFACTURER'S RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

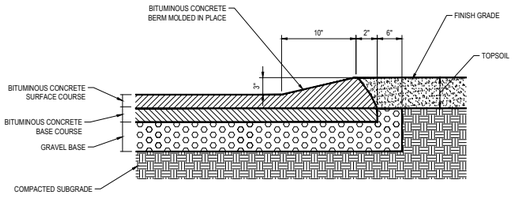
NOTES:
1. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 8" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.
2. FOLLOW EROSION CONTROL TECHNOLOGY COUNCIL SPECIFICATION FOR PRODUCT SELECTION.

EROSION CONTROL BLANKET 2:1 SLOPES (SLOPE INSTALLATION)

N.T.S.

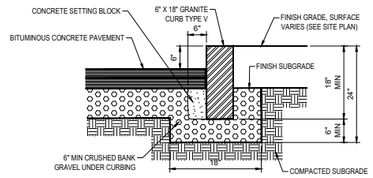


LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20%
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80%
APPARENT OPENING SIZE



CAPE COD BERM

NOT TO SCALE (S300.01xx_07/2022) N.T.S.



NOTE: INSTALL WITHIN ALL PUBLIC WAYS, CORNERS, AND RADIUS SECTIONS

VERTICAL GRANITE CURB

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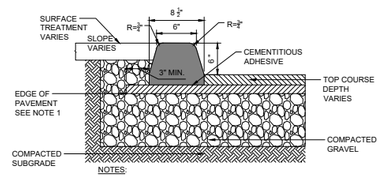

NOTES:

1. CONTRACTOR IS TO DETERMINE THE EXTENDED LAYOUT DIMENSION OF THE BASE COURSE IN ORDER TO ACCOMODATE PLACEMENT OF THE EXTRUDED CONCRETE CURB.

EXTRUDED CONCRETE CURB

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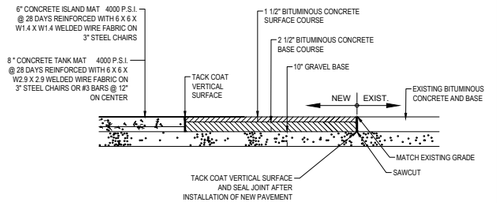

CONCRETE AND BITUMINOUS PAVING

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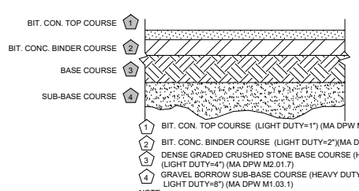

NOTE:

1. PAVEMENT BASE AND SUBBASE COURSES TO CONFORM TO STATE DEPARTMENT OF TRANSPORTATION
2. GC TO REFER TO GEOTECHNICAL REPORT FOR PAVEMENT SPECIFICATIONS.

PAVEMENT SECTION

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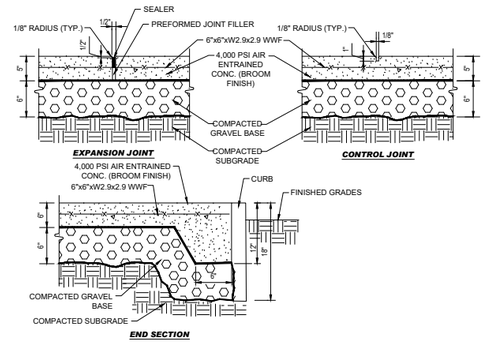

NOTES: TO BE USED FOR BUILDING SURROUND AND OTHER CONCRETE WALKS. USE CHAIRS TO SUPPORT REINFORCING STEEL DURING POUR. VARIES SEE PLAN

1. SEE SITE PLAN FOR WIDTH AND GRADES
2. PROVIDE MINIMUM 1/8"/FT. CROSS-SLOPE
3. PROVIDE CONTROL JOINTS 5'-0" O.C. MIN.
4. PROVIDE EXPANSION JOINTS 20'-0" O.C. MIN.

CONCRETE SIDEWALK

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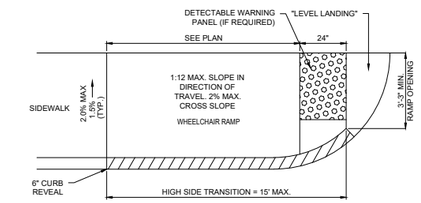

ACCESSIBLE RAMP TYPE C

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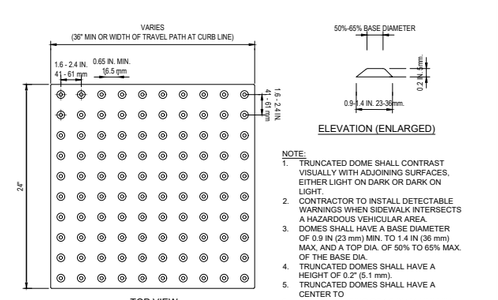


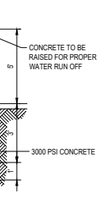
NOTE:

1. TRUNCATED DOME SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT ON DARK OR DARK ON LIGHT.
2. CONTRACTOR TO INSTALL DETECTABLE WARNINGS WHEN SIDEWALK INTERSECTS A HAZARDOUS VEHICULAR AREA.
3. DOMES SHALL HAVE A BASE DIAMETER OF 0.9 IN (23 mm) MIN. TO 1.4 IN (36 mm) MAX. AND A TOP DIA. OF 50% TO 65% MAX. OF THE BASE DIA.
4. TRUNCATED DOMES SHALL HAVE A HEIGHT OF 0.2" (5.1 mm).
5. TRUNCATED DOMES SHALL HAVE A CENTER TO
6. CENTER SPACING OF 1.6 IN (41 MM) MIN. AND 2.4 (61 mm) MAX. AND A BASE TO BASE SPACING OF 0.65 IN. (16.5 mm) MIN., MEASURED BETWEEN THE MOST ADJACENT DOMES ON THE GRID.

NOTE TO DESIGNER:
IF A WALK CROSSES OR ADJOINS A VEHICULAR WAY WHERE THE WALKING SURFACE AND PAVEMENT ARE NOT SEPERATED BY CURBS, RAILING OR OTHER ELEMENTS, THE BOUNDARY BETWEEN THE AREA SHALL BE DEFINED BY A CONTINUOUS DETECTABLE WARNING WHICH IS MIN. 36" WIDE (ADA ACCESSIBLE GUIDELINES PRINTED 11-4-06) AND MIN. 24" DEPTH.

DETECTABLE WARNING

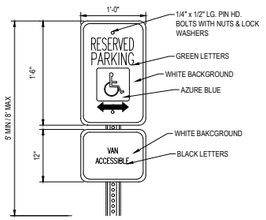
NOT TO SCALE (S300.04xx_07/2022) N.T.S.



NOTE:
BOLLARDS REQ'D AT BLDG. CORNERS. FIRE HYDRANTS, WATER METER, GAS METER, SPRINKLER RISER, SHOWN TRANSFORMER & ALL UTILITIES AT LOCATIONS SHOWN ON THESE DRAWINGS INTERIOR & EXTERIOR.

BOLLARD

NOT TO SCALE (S300.06xx_07/2022) N.T.S.



HANDICAP SIGN

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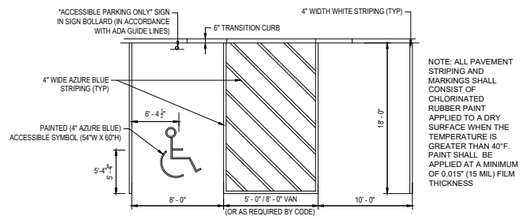

NOTE: ALL PAVEMENT STRIPING AND MARKINGS SHALL CONSIST OF CHLORINATED RUBBER PAINT APPLIED TO A DRY SURFACE WHEN THE TEMPERATURE IS GREATER THAN 40°F. PAINT SHALL BE APPLIED AT A MINIMUM OF 0.015" (15 MIL) FILM THICKNESS

ACCESSIBLE PARKING STALL MARKINGS

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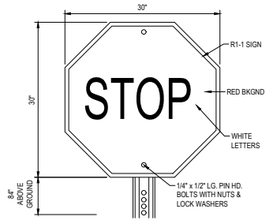

STOP SIGN

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CHECKED BY:	TAH/EA
DATE:	9/20/2024
CAD I.D.:	P-CIVL-DETL-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

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BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
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TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

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REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

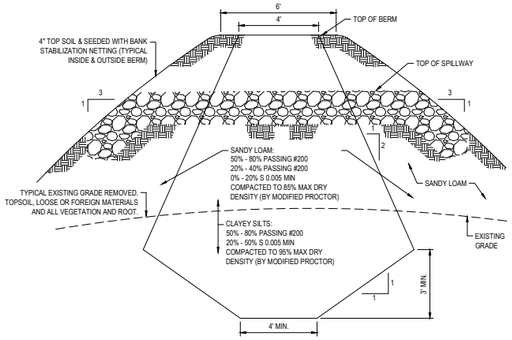
DETAIL SHEET

SHEET NUMBER:

C-901

ORG. DATE - 9/20/2024

I:\BOHLER\ENGINEERING\MAB\MAB-PROJECTS\2023\MAB230046.00\CAD\DRAWINGS\PLAN SET\PLANSET\PLAN SET\PLANSET\C-901_DETAIL SHEET.DWG — Layout: C-901 DETL



DETENTION BASIN BERM

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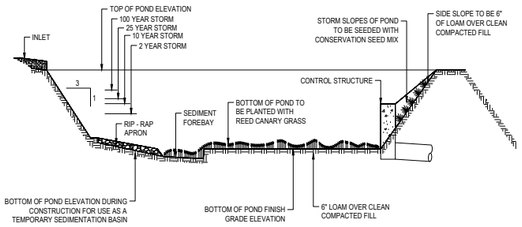

NOTE:
THE SIDE SLOPES OF THE DETENTION POND SHALL BE PLANTED WITH A SEED MIX CONSISTING OF CREEPING RED FESCUE, TALL FESCUE, AND LADINO CLOVER.

DETENTION POND BASIN

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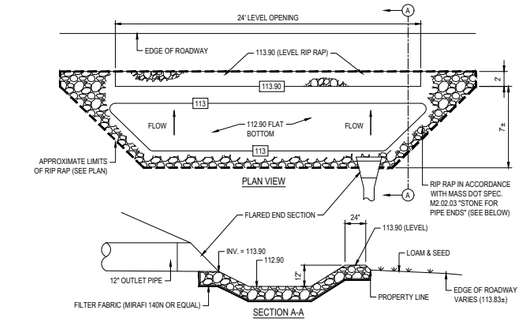

M2.02.3 STONE FOR PIPE ENDS.
STONE FOR PIPE ENDS SHALL BE SOUND, DURABLE ROCK WHICH IS ANGULAR IN SHAPE. ROUNDED STONES, BOULDERS, SANDSTONE OR SIMILAR STONE OR RELATIVELY THIN SLABS WILL NOT BE ACCEPTABLE. EACH STONE SHALL WEIGH NOT LESS THAN 50 POUNDS NOT MORE THAN 125 POUNDS AND AT LEAST 75 % OF THE VOLUME SHALL CONSIST OF STONES WEIGHING NOT LESS THAN 75 POUNDS EACH. THE REMAINDER OF THE STONES SHALL BE SO GRADED THAT WHEN PLACED WITH THE LARGER STONES THE ENTIRE MASS WILL BE COMPACT.

FLARED END SECTION WITH LEVEL SPREADER

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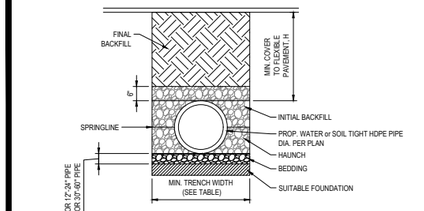

RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRANCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

HDPE STORM DRAINAGE TRENCH

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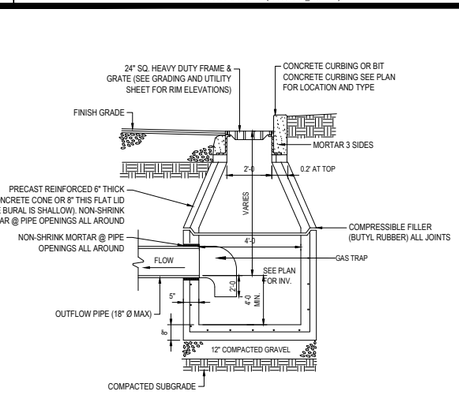

NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.
2. USE PRECAST FLAT SLAB TOP FOR SHALLOW INVERT APPLICATIONS

PRECAST CONCRETE DEEP SUMP CATCH BASIN

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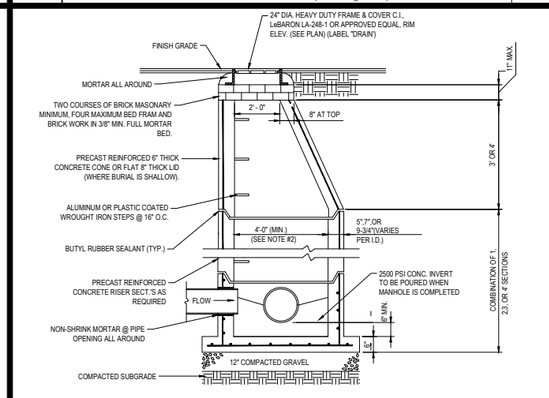

NOTES:
1. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.
2. CONTRACTOR SHALL SIZE MANHOLE AS NECESSARY TO ACCOMMODATE THE PIPE SIZING AND ORIENTATION USING THE GEOMETRY SHOWN ON THE GRADING AND DRAINAGE PLANS.

PRECAST CONCRETE STORM DRAIN MANHOLE

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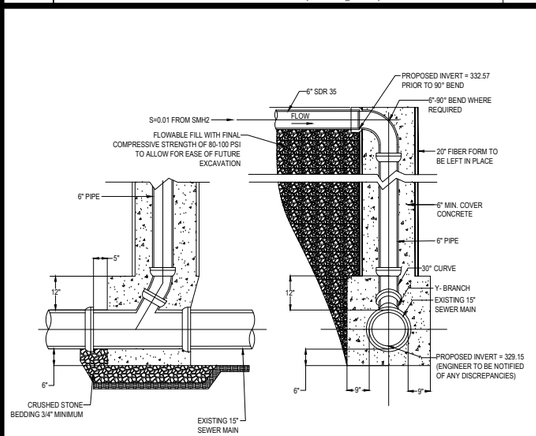

CHIMNEY CONNECTION

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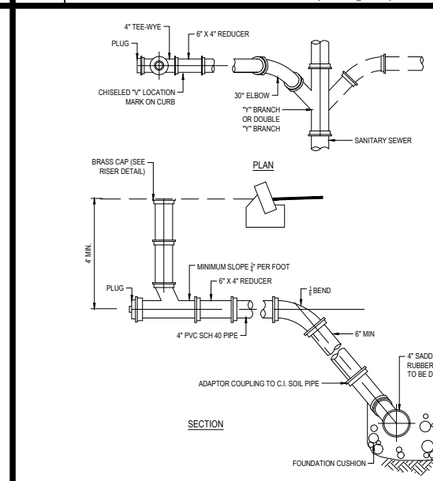

STANDARD SEWER MAIN CONNECTION

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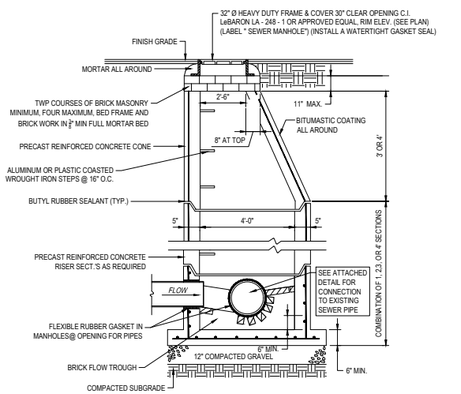
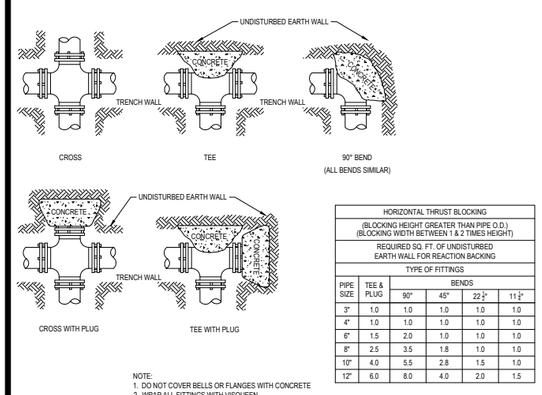


NOTE: ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C478.

TYPICAL PRECAST CONCRETE SANITARY MANHOLE

NOT TO SCALE (S500.02xx_07/2022) N.T.S.



HORIZONTAL THRUST BLOCKING					
(BLOCKING HEIGHT GREATER THAN PIPE O.D.) (BLOCKING WIDTH BETWEEN 1 & 2 TIMES HEIGHT)					
REQUIRED SQ. FT. OF UNDISTURBED EARTH WALL FOR REACTION BACKING					
TYPE OF FITTINGS					
PIPE SIZE	TEE & PLUG	BENDS			
		90°	45°	22½°	11¼°
3"	1.0	1.0	1.0	1.0	1.0
4"	1.0	1.0	1.0	1.0	1.0
6"	1.5	2.0	1.0	1.0	1.0
8"	2.5	3.5	1.8	1.0	1.0
10"	4.0	5.5	2.8	1.5	1.0
12"	6.0	8.0	4.0	2.0	1.5

NOTE:
1. DO NOT COVER BELLS OR FLANGES WITH CONCRETE
2. WRAP ALL FITTINGS WITH VISQUEEN.
3. BACK ALL TEES ACCORDING TO SIZE OF BRANCH.
4. BACKING FUTURE LINE EXTENSIONS SHALL BE SUCH THAT LATER REMOVAL IS POSSIBLE.
5. ALL BENDS WHERE FITTINGS ARE USED, BOTH HORIZONTAL OR VERTICAL SHALL BE BACKED.
6. REACTION BACKING TABLE IS BASED ON 100 P.S.I. AND SOIL BEARING PRESSURE OF 2000 lb./sq.ft. ADDITIONAL BACKING MAY BE REQUIRED IN SOME AREAS AS DIRECTED BY ENGINEERS.
7. ALL CONCRETE SHALL BE 2500 P.S.I.
8. 18" AND LARGER REQUIRES SPECIFIC ANTI-THRUST DESIGN.

HORIZONTAL THRUST BLOCKING

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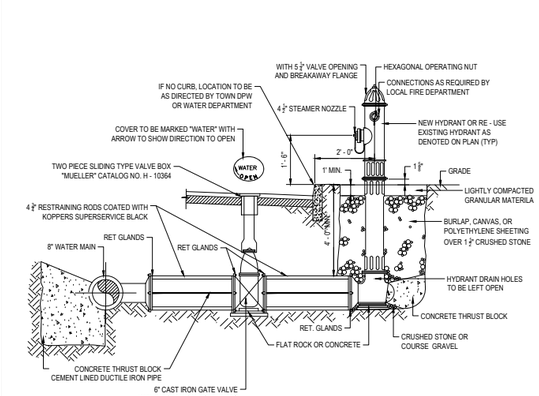

HYDRANT AND VALVE INSTALLATION

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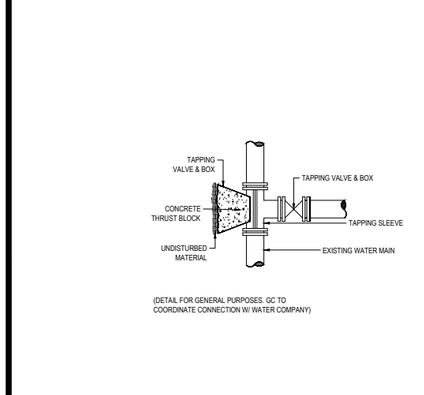

(DETAIL FOR GENERAL PURPOSES. GC TO COORDINATE CONNECTION W/ WATER COMPANY)

TAPPING SLEEVE AND GATE VALVE

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T.A. HAYES
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE NO. 51929

SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

C-902

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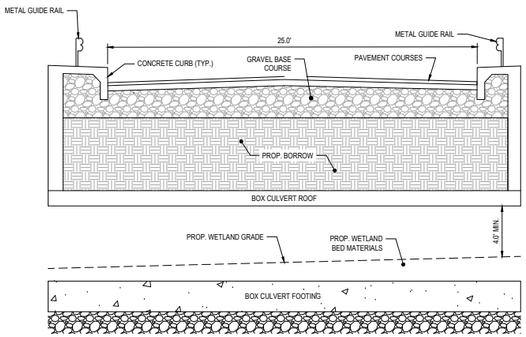
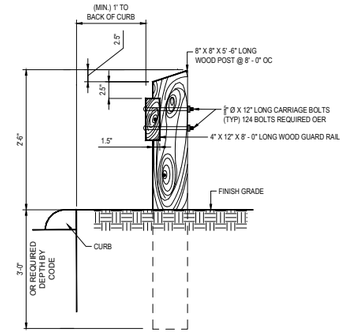


WETLAND CROSSING SECTION A-A

N.T.S.



NOTE: ALL CARRIAGE BOLTS, NUTS & WASHERS TO BE GALVANIZED & ALL WOOD POSTS & RAILS TO BE PRESSURE TREATED.

WOOD GUIDERAIL

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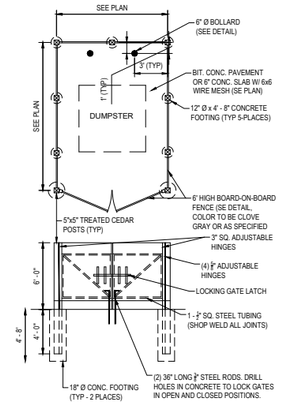

TRASH ENCLOSURE

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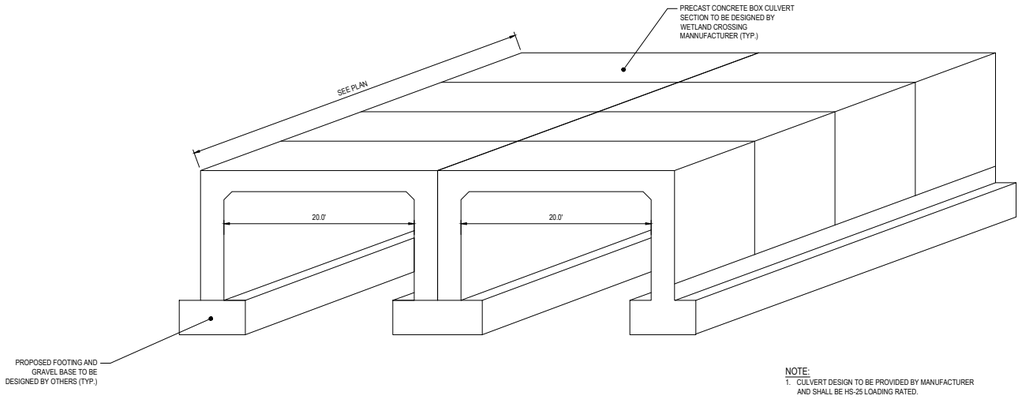
N.T.S.



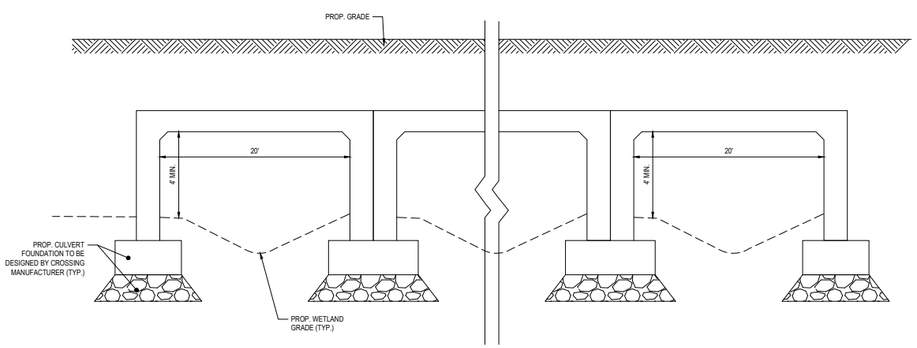
NOTE:
1. CULVERT DESIGN TO BE PROVIDED BY MANUFACTURER AND SHALL BE HS-25 LOADING RATED.

PRECAST BOX CULVERT WETLAND CROSSING - ISOMETRIC VIEW

N.T.S.

N.T.S.

N.T.S.



PRECAST BOX CULVERT SECTION A-A

N.T.S.

N.T.S.

N.T.S.

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LANDSCAPE TABLE

KEY	TYPE	SPECIES OPTIONS	QUANTITY
	DECIDUOUS TREE	QUERCUS PALUSTRIS (PIN OAK), TILIA CORDATA 'GREENSPIRE' (GREENSPIRE LINDEN), LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA' (SEEDLESS SWEETGUM), ACER RUBRUM (RED MAPLE), LIRIODENDRON TULIPIFERA (TULIP TREE)	
	SHRUBS (60%)	ILEX GLABRA "SHAMROCK" (INKBERRY), JUNIPER CHINENSIS (CHINESE JUNIPER), JUNIPERUS HORIZONTALIS (CREEPING JUNIPER), THUJA OCCIDENTALIS 'DEGROOT'S SPIRE' (AMERICAN ARBORVITAE), RHODODENDRON "PJM", RHODODENDRON "PURPLE GEM", RHODODENDRON 'NOVA ZEMBLA', CORNUS ALBA "ELEGANTISSIMA" (VARIEGATED RED TWIG DOGWOOD), ILEX VERTICILLATA 'RED SPRITE' (WINTERBERRY), FOTHERGILLA (DWARF FOTHERGILLA), HYDRANGEA QUERCIFOLIA 'PEE WEE" (OAKLEAF HYDRANGEA), SYRINGA PATULA "MISS KIM" (MISS KIM LILAC), ROSA X "ELLISHING KNOCKOUT" (KNOCKOUT ROSE), ITEA VIRGINICA "LITTLE HENRY" (SWEETSPIRE)	
	GRASSES, PERENNIALS & GROUNDCOVERS (40%)	PENNISETUM ALOPECUROIDES "LITTLE BUNNY" (DWARF FOUNTAIN GRASS), MISCANTHUS SINENSIS "STRICTUS" (PORCUPINE GRASS), MISCANTHUS SINENSIS 'MORNING LIGHT' (FOUNTAIN GRASS), LIRIOPE MUSCARI (LILYTURF), HEMEROCALLIS 'STELLA DE ORO' (REBLOOMING DAYLILY), PEROVSKIA ATRIPLICIFOLIA (RUSSIAN SAGE), ASTILBE + ARENDSII 'FANAL' (ASTILBE), HOSTA 'PATRIOT", LAVANDULA ANGUSTIFOLIA "HIDCOTE' (HIDCOTE LAVENDER), NEPETA X FAASSENII "WALKER'S LOW' (CATMINT), VINCA, ENGLISH IVY, AJUGA	

MATERIALS LEGEND

SITE PAVING

KEY	SYMBOL	DESCRIPTION
		CONCRETE PAVING
		CONCRETE UNIT PAVERS
		POURED IN PLACE RUBBERIZED PLAY SURFACE
		DOG PARK SURFACING
		SODDED LAWN
		SEEDED LAWN
		SYNTHETIC TURF
		SHRUB PLANTING
		DECIDUOUS TREE
		BASIN SEED MIX
		BOCCE COURT SURFACING

SITE ELEMENTS

		BENCH
		BIKE RACK
		DOG FOUNTAIN
		PET WASTE STATION
		TRASH RECEPTACLE
		ALUMINUM PICKET FENCE
		GRILL STATION
		SHADE STRUCTURE
		FIRE TABLE
		VEHICULAR LIGHT POLE
		VEHICULAR LIGHT POLE WITH SHIELD
		VEHICULAR DOUBLE LIGHT POLE
		BOLLARD LIGHT
		TAPE LIGHT AT SEATWALL
		MONUMENT SIGN
FF&E		ADIRONDACK SEATING
FF&E		CORNHOLE
FF&E		SQUARE TABLE
FF&E		OUTDOOR SEATING

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PROJECT No.:	MAB230046.00
DRAWN BY:	MB/JK
CHECKED BY:	JE
DATE:	9/20/2024
CAD I.D.:	P-CIVL-LSCP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

COMMONWEALTH OF MASSACHUSETTS — JOSEPH EDWARD — No. 12,177 — REGISTERED LANDSCAPE ARCHITECT

SHEET TITLE:

OVERALL LANDSCAPE PLAN

SHEET NUMBER:

L-101

ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CADD\LAWN\GSP\LAN SETS\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A-----LAYOUT L-101 OVERALL LANDSCAPE PLAN

MATERIALS LEGEND

KEY	SYMBOL	DESCRIPTION
SITE PAVING		
		CONCRETE PAVING
		CONCRETE UNIT PAVERS
		POURED IN PLACE RUBBERIZED PLAY SURFACE
		DOG PARK SURFACING
		SODDED LAWN
		SEEDED LAWN
		SYNTHETIC TURF
		SHRUB PLANTING
		DECIDUOUS TREE
		BASIN SEED MIX
		BOCCE COURT SURFACING
SITE ELEMENTS		
		BENCH
		BIKE RACK
		DOG FOUNTAIN
		PET WASTE STATION
		TRASH RECEPTACLE
		ALUMINUM PICKET FENCE
		GRILL STATION
		SHADE STRUCTURE
		FIRE TABLE
		VEHICULAR LIGHT POLE
		VEHICULAR LIGHT POLE WITH SHIELD
		VEHICULAR DOUBLE LIGHT POLE
		BOLLARD LIGHT
		TAPE LIGHT AT SEATWALL
		MONUMENT SIGN
FF&E		ADIRONDACK SEATING
FF&E		CORNHOLE
FF&E		SQUARE TABLE
FF&E		OUTDOOR SEATING

THIS PLAN TO BE UTILIZED FOR LANDSCAPE PURPOSES ONLY

40 20 10 0 40
1"= 40'

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COMMONWEALTH OF MASSACHUSETTS — JOSEPH EDWARD — REGISTERED LANDSCAPE ARCHITECT — NO. 12

SHEET TITLE:

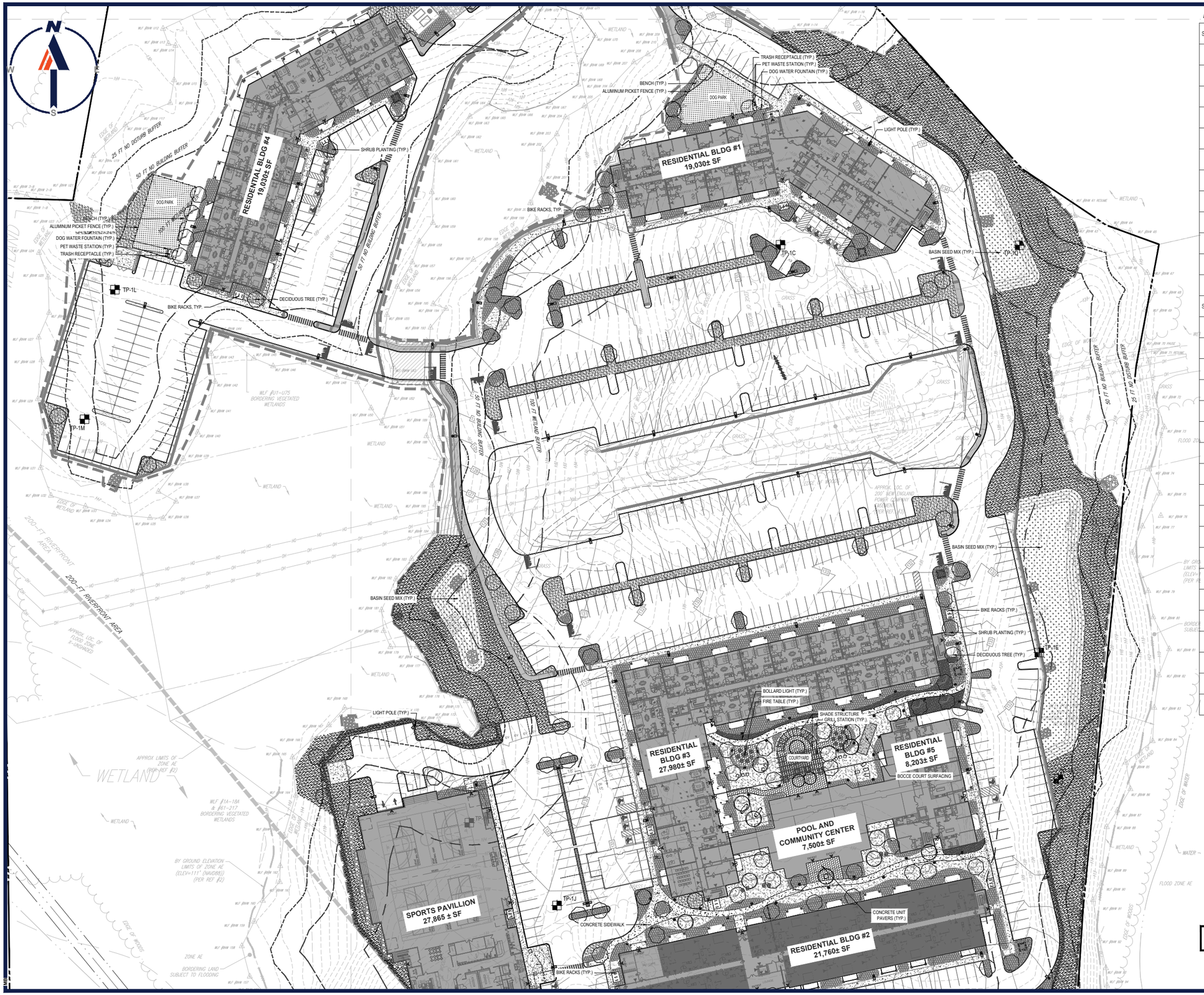
LANDSCAPE PLAN - ENLARGEMENT A

SHEET NUMBER:

L-102

ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A-----LAYOUT: L-102 ENLARGEMENT A



MATERIALS LEGEND

KEY	SYMBOL	DESCRIPTION
SITE PAVING		
		CONCRETE PAVING
		CONCRETE UNIT PAVERS
		POURED IN PLACE RUBBERIZED PLAY SURFACE
		DOG PARK SURFACING
		SODDED LAWN
		SEEDED LAWN
		SYNTHETIC TURF
		SHRUB PLANTING
		DECIDUOUS TREE
		BASIN SEED MIX
		BOCCE COURT SURFACING
SITE ELEMENTS		
		BENCH
		BIKE RACK
		DOG FOUNTAIN
		PET WASTE STATION
		TRASH RECEPTACLE
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		BOLLARD LIGHT
		TAPE LIGHT AT SEATWALL
		MONUMENT SIGN
FF&E		ADIRONDACK SEATING
FF&E		CORNHOLE
FF&E		SQUARE TABLE
FF&E		OUTDOOR SEATING

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40 20 10 0 40
1" = 40'

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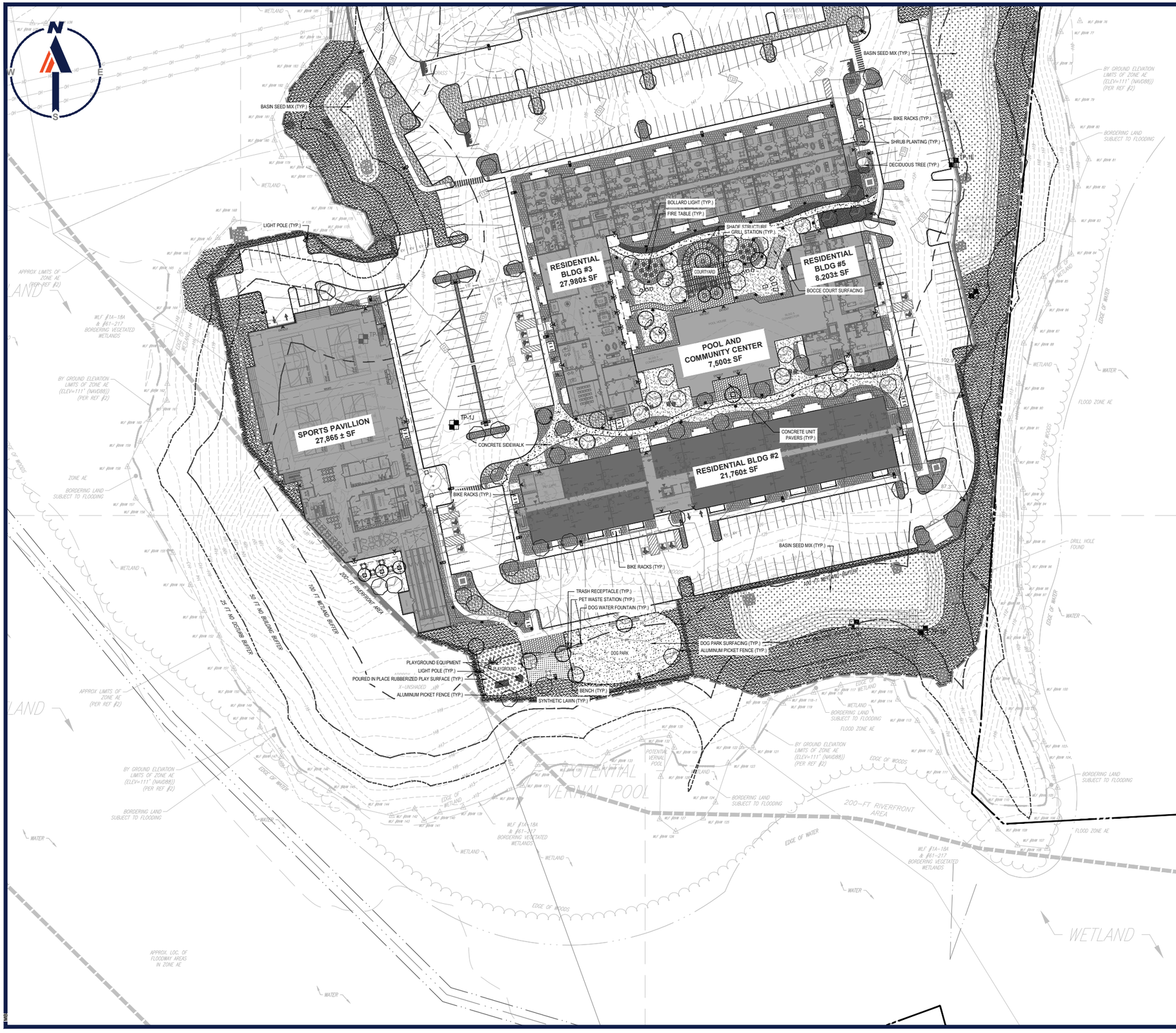
COMMONWEALTH OF MASSACHUSETTS
MATTHEW J. MORAN
No. 12,147
REGISTERED LANDSCAPE ARCHITECT

SHEET TITLE:
LANDSCAPE PLAN - ENLARGEMENT B

SHEET NUMBER:
L-103

ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CAD\DRAWING\PLAN SET\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A-----LAYOUT: L-103 ENLARGEMENT B



MATERIALS LEGEND

KEY	SYMBOL	DESCRIPTION
SITE PAVING		
		CONCRETE PAVING
		CONCRETE UNIT PAVERS
		POURED IN PLACE RUBBERIZED PLAY SURFACE
		DOG PARK SURFACING
		SODDED LAWN
		SEEDED LAWN
		DOG PARK SYNTHETIC TURF
		SHRUB PLANTING
		DECIDUOUS TREE
		BASIN SEED MIX
		BOCCE COURT SURFACING
SITE ELEMENTS		
		BENCH
		BIKE RACK
		GRILL STATION
		SHADE STRUCTURE
		FIRE TABLE
FF&E		ADIRONDACK SEATING
FF&E		CORNHOLE
FF&E		SQUARE TABLE
FF&E		OUTDOOR SEATING

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40 20 10 0 40
1"= 40'

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CAD I.D.:	P-CIVL-LSCP-MAB230046.00-0A

PROJECT:

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Phone: (617) 849-8040
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COMMONWEALTH OF MASSACHUSETTS — TIMOTHY O. MAY — No. 21,167 — REGISTERED PROFESSIONAL ENGINEER

SHEET TITLE:

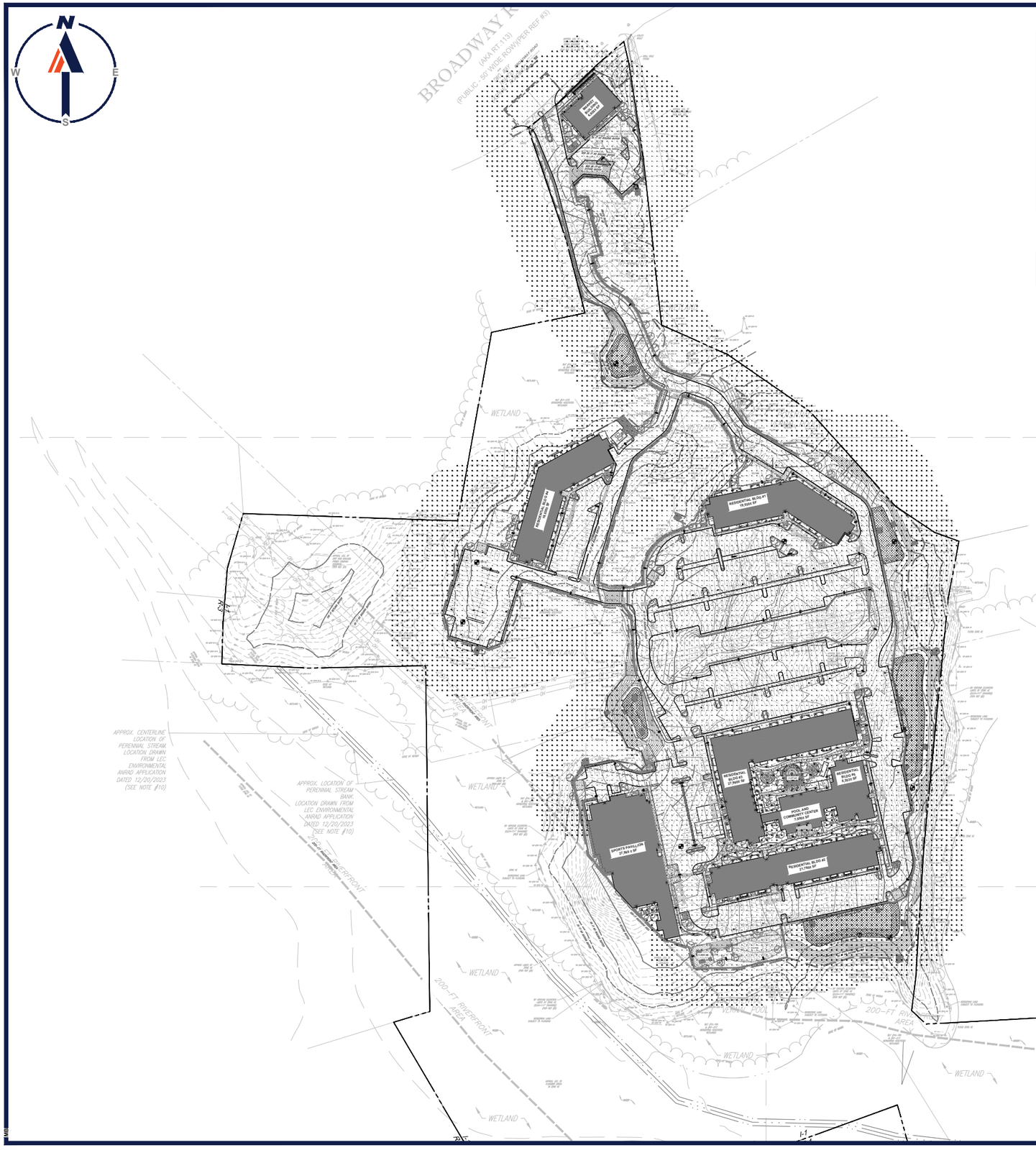
LANDSCAPE PLAN - ENLARGEMENT C

SHEET NUMBER:

L-104

ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CAD\DRAWING\SP\PLAN SET\SC\VIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A ——LAYOUT: L-104 ENLARGEMENT C



Luminaire Schedule					
Qty	Label	Arr. Watts	Arrangement	LLF	Description
7	B1	21.67	SINGLE	0.900	PA7R-NU4-12L-020-3K7
36	B2	21.74	SINGLE	0.900	PA7R-NU2-12L-020-3K7
5	B3	21.68	SINGLE	0.900	PA7R-NU5-12L-020-3K7
42	D1	48.1	SINGLE	0.900	SRT2-50-3K7-5QW
6	F1	16	SINGLE	0.900	77 682_BEGA_IES
7	P1	144	BACK-BACK	0.900	VP-1-160L-75-3K7-4W
16	P2	72	SINGLE	0.900	VP-1-160L-75-3K7-4W
16	P2-BC	72	SINGLE	0.900	VP-1-160L-75-3K7-4-BC
23	P3	72	SINGLE	0.900	VP-1-160L-75-3K7-3
7	P4-BC	72.5	SINGLE	0.900	VP-1-160L-75-3K7-2-BC
3	P5	35	SINGLE	0.900	VP-1-160L-35-3K7-4W
2	P5-BC	52	SINGLE	0.900	VP-1-160L-50-3K7-4-BC
4	S1	21	SINGLE	0.900	66516_BEGA_IES
63	T1	1.45	SINGLE	0.450	RBS224-0.75-30PH 1FT(300mm)

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
Site	Fc	0.66	19.6	0.0	N.A.	N.A.

LIGHTING LEGEND

KEY	SYMBOL	DESCRIPTION
E1		VEHICULAR LIGHT POLE
E2		VEHICULAR LIGHT POLE WITH SHIELD
E3		VEHICULAR DOUBLE LIGHT POLE
E4		BOLLARD LIGHT
E5		LINEAR TAPE LIGHT AT SEATWALL

NOTES:
- PROPOSED LIGHT FIXTURES ARE LED AND DARK SKY COMPLIANT
- PROPOSED LIGHT FIXTURES TO BE AT 20 FEET HIGH ON THE POLES.

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20 10 5 0 20
SCALE: 1" = 20'

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COMMONWEALTH OF MASSACHUSETTS — MATTHEW J. MORIN — No. 12 — REGISTERED LANDSCAPE ARCHITECT

SHEET TITLE:

LIGHTING PLAN

SHEET NUMBER:

L-105

ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A-----LAYOUT: L-105 LIGHTING

LANDSCAPE SPECIFICATIONS

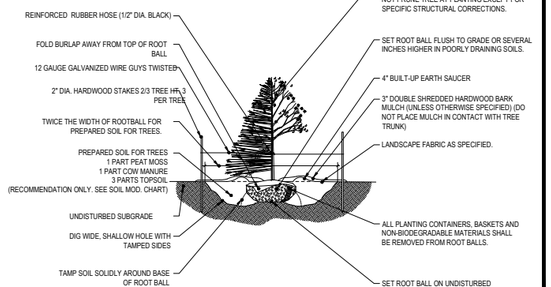
1. SCOPE OF WORK:
   1.1. THE LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.
2. MATERIALS
   2.1. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
   2.2. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 4.5-7.0. IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAY CLODS.
   2.3. LAWN - ALL DISTURBED AREAS ARE TO BE TREATED WITH A MINIMUM 6" THICK LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, AND SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED ON THE LANDSCAPE PLAN
      2.3.1. LAWN SEED MIXTURE SHALL BE FRESH, CLEAN NEW CROP SEED.
      2.3.2. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/PEST FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.
   2.4. MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN AND/OR LANDSCAPE PLAN NOTES /DETAILS.
   2.5. FERTILIZER
      2.5.1. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.
      2.5.2. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.
   2.6. PLANT MATERIAL
      2.6.1. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION (FORMERLY THE AMERICAN ASSOCIATION OF NURSERYMEN).
      2.6.2. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.
      2.6.3. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.
      2.6.4. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1½", WHICH HAVE NOT BEEN COMPLETELY CALLUSED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.
      2.6.5. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH: WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.
      2.6.6. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT 12" ABOVE THE NATURAL GRADE.
      2.6.7. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.
      2.6.8. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.
3. GENERAL WORK PROCEDURES
   3.1. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.
   3.2. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.
4. SITE PREPARATIONS
   4.1. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.
   4.2. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.
   4.3. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.
5. TREE PROTECTION
   5.1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.
   5.2. A FORTY-EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VISI-FENCE', OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.
   5.3. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE LANDSCAPE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.
   5.4. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.
6. SOIL MODIFICATIONS
   6.1. CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.
   6.2. LANDSCAPE CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL, SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE LANDSCAPE CONTRACTOR DEPENDING ON SITE CONDITIONS.
   6.3. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.
      6.3.1. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.
      6.3.2. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.
      6.3.3. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.
7. FINISHED GRADING
   7.1. UNLESS OTHERWISE CONTRACTED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.
   7.2. LANDSCAPE CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1"±).
   7.3. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.
   7.4. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.
8. TOPSOILING
   8.1. CONTRACTOR SHALL PROVIDE A 6" THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.
   8.2. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.
   8.3. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.
   8.4. ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY [SEE SPECIFICATION 6.A.]):
      8.4.1. 20 POUNDS 'GRO-POWER' OR APPROVED SOIL CONDITIONER/FERTILIZER
      8.4.2. 20 POUNDS NITRO-FORM (COURSE) 38-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER
   8.5. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.
9. PLANTING
   9.1. INSOFAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, LANDSCAPE CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.
   9.2. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.
   9.3. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.
   9.4. ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.
   9.5. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.
   9.6. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:
      9.6.1. PLANTS: MARCH 15 TO DECEMBER 15
      9.6.2. LAWN: MARCH 15 TO JUNE 15 OR SEPT. 1 TO DECEMBER 1
      9.6.3. PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.
   9.7. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPECIES BE PLANTED DURING THE FALL PLANTING SEASON:

ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIQUIDAMBAR STYRACIFLUA	TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA	ZELKOVA VARIETIES

   9.8. PLANTING PITS SHALL BE DUG WITH LEVEL BOTTOMS, WITH THE WIDTH TWICE THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:
      9.8.1. 1 PART PEAT MOSS
      9.8.2. 1 PART COMPOSTED COW MANURE BY VOLUME
      9.8.3. 3 PARTS TOPSOIL BY VOLUME
      9.8.4. 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:
         9.8.4.1. 2 TABLETS PER 1 GALLON PLANT
         9.8.4.2. 3 TABLETS PER 5 GALLON PLANT
         9.8.4.3. 4 TABLETS PER 15 GALLON PLANT
         9.8.4.4. LARGER PLANTS: 2 TABLETS PER ½" CALIPER OF TRUNK
   9.9. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.
   9.10. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.
   9.11. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE.
   9.12. GROUND COVER AREAS SHALL RECEIVE A ½" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.
   9.13. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.
   9.14. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.
   9.15. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.
10. TRANSPLANTING (WHEN REQUIRED)
   10.1. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT.
   10.2. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.
   10.3. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10 AND JUNE 30.
   10.4. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.
   10.5. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.
   10.6. F TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES.
11. WATERING
   11.1. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.
   11.2. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.
   11.3. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.
12. GUARANTEE
   12.1. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF 1 YEAR FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
   12.2. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION.
   12.3. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND THROUGHOUT THE 90 DAY MAINTENANCE PERIOD AS SPECIFIED HEREIN. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.
   12.4. LAWNS SHALL BE MAINTAINED THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.
13. CLEANUP
   13.1. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.
   13.2. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.
14. MAINTENANCE (ALTERNATIVE BID):
   14.1. A 90 DAY MAINTENANCE PERIOD SHALL COMMENCE AT THE END OF ALL LANDSCAPE INSTALLATION OPERATIONS. THE 90 DAY MAINTENANCE PERIOD ENSURES TO THE OWNER/OPERATOR THAT THE NEWLY INSTALLED LANDSCAPING HAS BEEN MAINTAINED AS SPECIFIED ON THE APPROVED LANDSCAPE PLAN. ONCE THE INITIAL 90 DAY MAINTENANCE PERIOD HAS EXPIRED, THE OWNER/OPERATOR MAY REQUEST THAT BIDDERS SUBMIT AN ALTERNATE MAINTENANCE BID FOR A MONTHLY MAINTENANCE CONTRACT. THE ALTERNATE MAINTENANCE CONTRACT WILL ENCOMPASS ANY WORK THAT IS CONSIDERED APPROPRIATE TO ENSURE THAT PLANT AND LAWN AREAS ARE HEALTHY AND MANICURED TO THE APPROVAL OF THE OWNER/OPERATOR.

P:\2023\MAB230046.00\CAD\CIVIL\LWR\GISPLAN SETS\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-SA-----LAYOUT L-200 NOTE

NOTES:
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH
AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE ROUGH TO AVOID MATTING OF SOIL LAYERS AS
NEW SOIL IS ADDED. IT IS PREFERABLE TO TILL THE FIRST LIFT (2 TO 3 IN.) OF PLANTING SOIL INTO THE SUBSOIL.
6.) REFER TO THE CHART "GENERAL RANGE OF SOIL MODIFICATIONS & VOLUMES FOR VARIOUS SOIL CONDITIONS" TO DETERMINE MINIMUM WIDTH OF PREPARED SOIL.
7.) SUBSTITUTE ARBORVITAE STAKING SYSTEM WHEN SPECIFIED.



TREE PLANTING DETAIL
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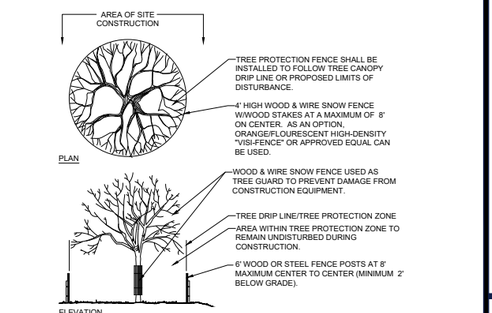

TREE PROTECTION DURING SITE CONSTRUCTION
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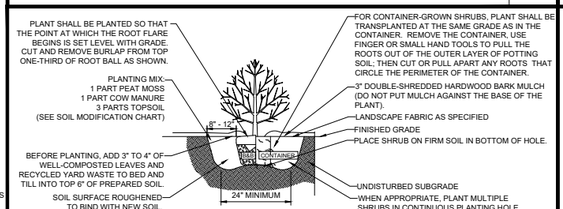

SHRUB PLANTING DETAIL
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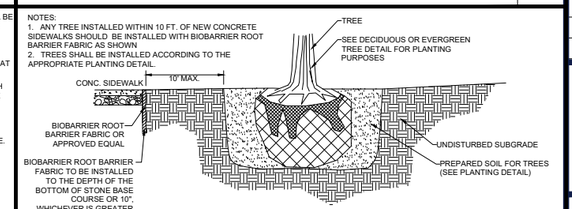

BIOBARRIER ROOT BARRIER DETAIL
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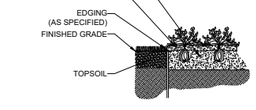

GROUNDCOVER PLANTING
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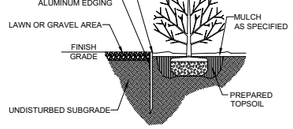
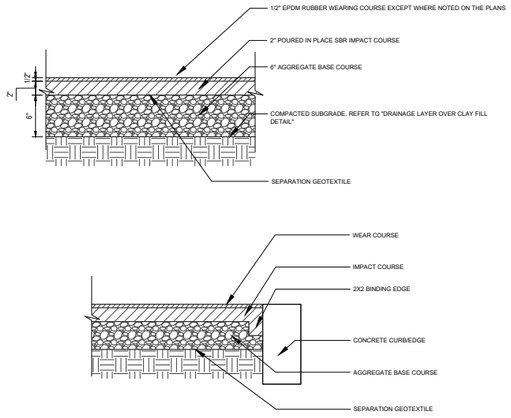


BLACK ALUMINU



RUBBERIZED PLAY SURFACE AT PLAYGROUND

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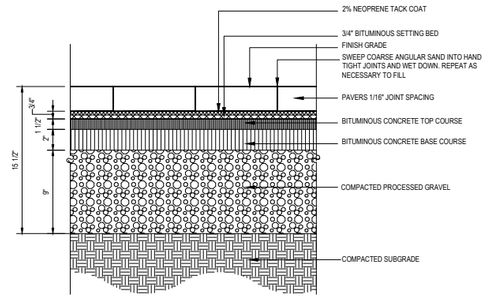

CONCRETE UNIT PAVERS ON VEHICULAR BITUMINOUS

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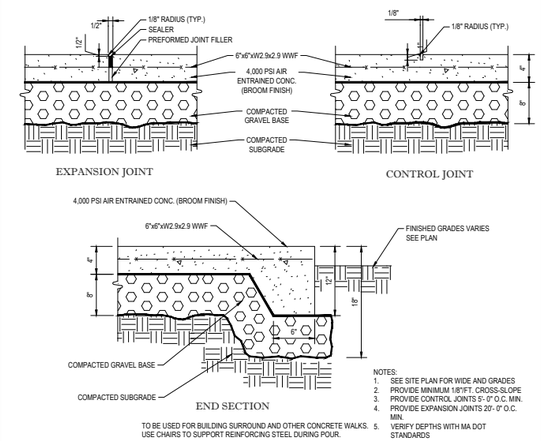

TO BE USED FOR BUILDING SURROUND AND OTHER CONCRETE WALKS. USE CHAIRS TO SUPPORT REINFORCING STEEL DURING POUR.

NOTES:
1. SEE SITE PLAN FOR WIDE AND GRADES
2. PROVIDE MINIMUM 1/8"/FT. CROSS-SLOPE
3. PROVIDE CONTROL JOINTS 5'- 0" O.C. MIN.
4. PROVIDE EXPANSION JOINTS 20'- 0" O.C. MIN.
5. VERIFY DEPTHS WITH MA DOT STANDARDS

CONCRETE PAVEMENT

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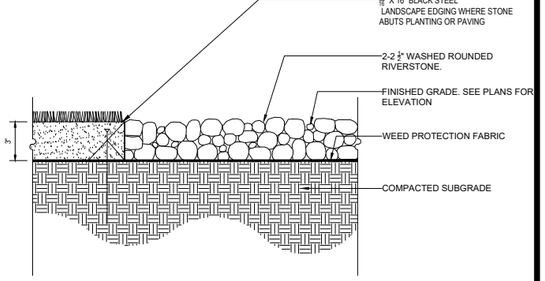

GRAVEL MAINTENANCE STRIP

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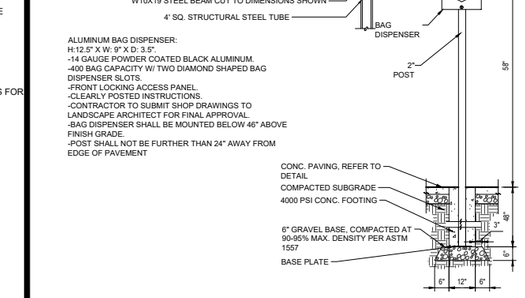

PET WASTE STATION

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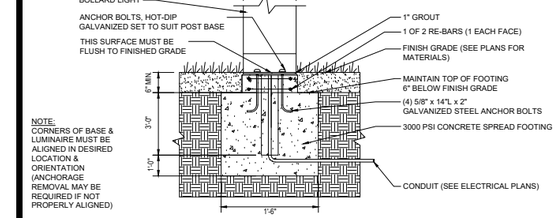
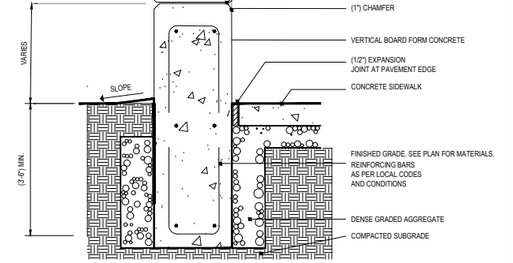


NOTE:
CORNERS OF BASE & LUMINAIRE MUST BE ALIGNED IN DESIRED LOCATION & ORIENTATION (ANCHORAGE REMOVAL MAY BE REQUIRED IF NOT PROPERLY ALIGNED)

LIGHT BOLLARD FOOTING

N.T.S.



CONCRETE SEATWALL

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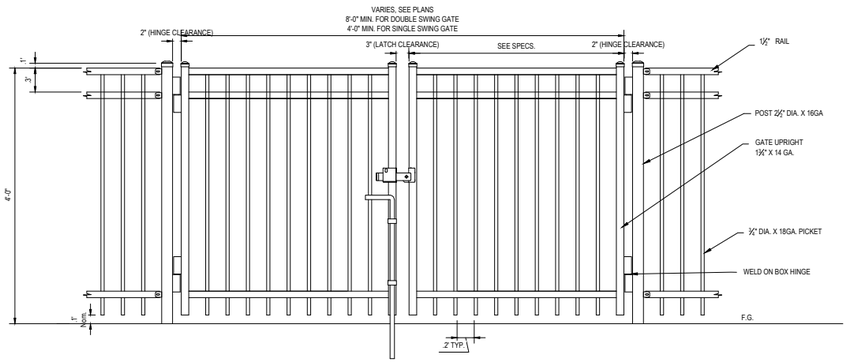

ALUMINUM PICKET FENCE AND GATE

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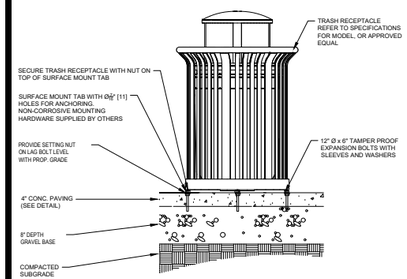
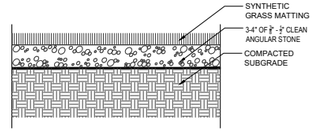


TRASH RECEPTACLE MOUNTING



SYNTHETIC TURF ON GRADE

N.T.S.

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT No.: MAB230046.00
DRAWN BY: MB/JK
CHECKED BY: JE
DATE: 9/20/2024
CAD I.D.: P-CIVL-LSCP-MAB230046.00-0A

PROJECT:

PRELIMINARY SITE PLAN DOCUMENTS

FOR

WORLD DRACUT, LLC

BROADWAY VILLAGE

PARCEL ID: 4924, 8012 & 8011
341 BROADWAY ROAD, 226 LOON HILL ROAD & 250 LOON HILL ROAD
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

BOHLER
45 FRANKLIN STREET, 5th FLOOR
BOSTON, MA 02110
Phone: (617) 849-8040
www.BohlerEngineering.com

SHEET TITLE:

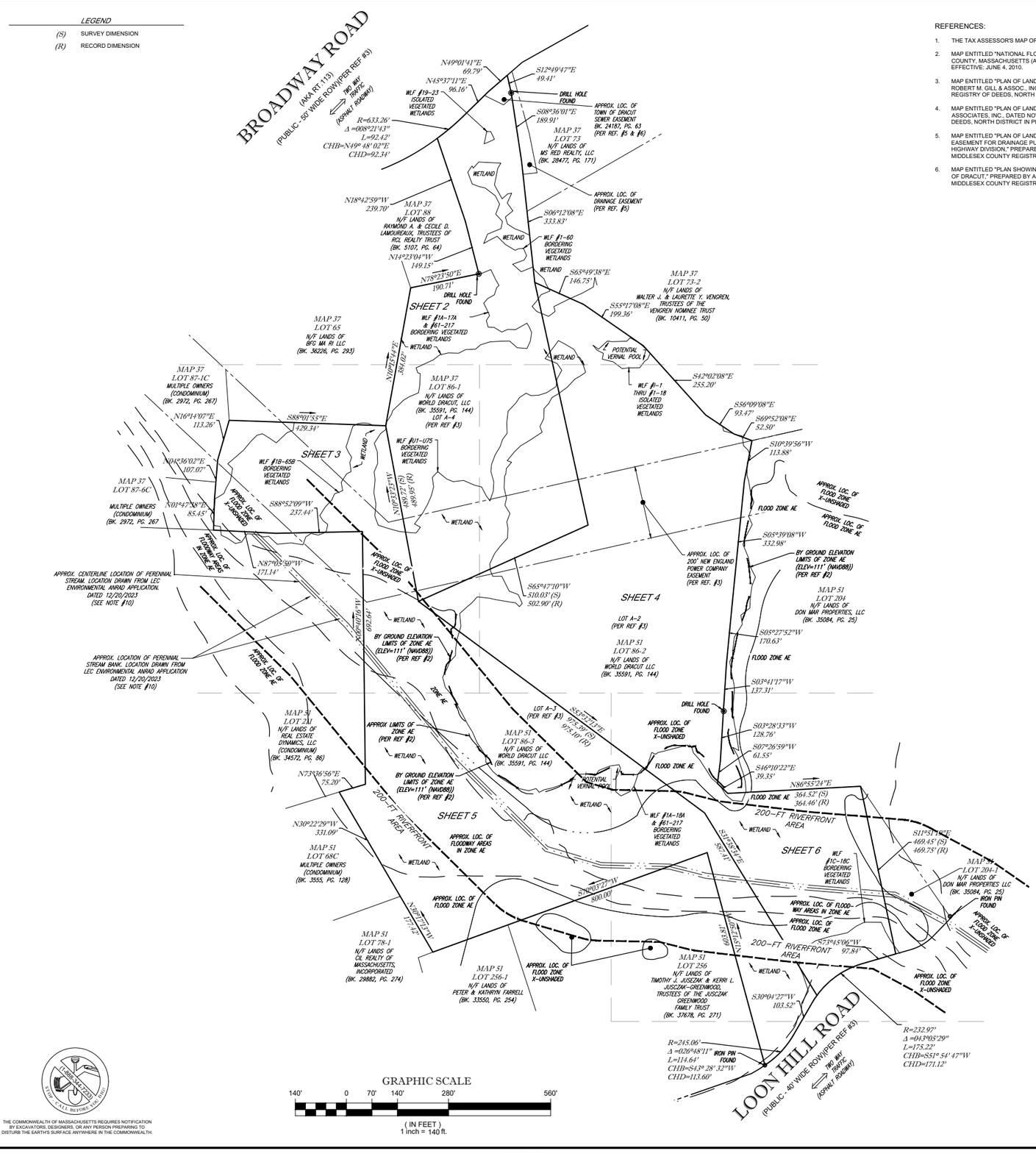
LANDSCAPE DETAILS

SHEET NUMBER:

L-201

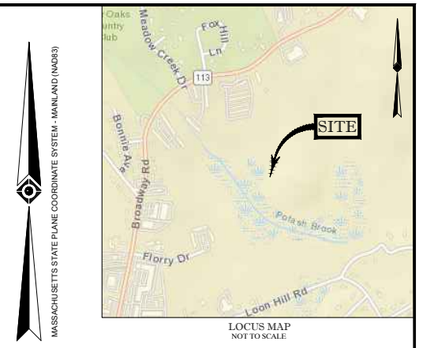
ORG. DATE - 09/20/2024

P:\2023\MAB230046.00\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\P-CIVIL-LSCP-MAB230046.00-0A ——— LAYOUT: L-201 DATE: 9/20/2024 TIME: 2:39 PM USER: JKOSTOPOULOS



REFERENCES:

1. THE TAX ASSESSOR'S MAP OF DRACUT, MIDDLESEX COUNTY, MAPS 37 & 51.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, MIDDLESEX COUNTY, MASSACHUSETTS (ALL JURISDICTIONS), PANEL 141 OF 656," MAP NUMBER 25017C0141E, MAP EFFECTIVE: JUNE 4, 2010.
3. MAP ENTITLED "PLAN OF LAND IN DRACUT, MASS., ASSESSORS MAP: PLATE 37 LOT 86," PREPARED BY ROBERT M. GILL & ASSOC., INC., DATED JANUARY 22, 1987, RECORDED WITH THE MIDDLESEX COUNTY REGISTRY OF DEEDS, NORTH DISTRICT IN PLAN BK. 168, PLAN 112.
4. MAP ENTITLED "PLAN OF LAND IN DRACUT, MASS. FOR G & P DEVELOPMENT," PREPARED BY ROBER M. GILL & ASSOCIATES, INC., DATED NOVEMBER 21, 1989, RECORDED WITH THE MIDDLESEX COUNTY REGISTRY OF DEEDS, NORTH DISTRICT IN PLAN BK. 171, PLAN 148.
5. MAP ENTITLED "PLAN OF LAND IN THE TOWN OF DRACUT, MIDDLESEX COUNTY, SHOWING LOCATION OF AN EASEMENT FOR DRAINAGE PURPOSES TAKEN BY THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION," PREPARED BY WSP USA, INC. DATED OCTOBER 4, 2018. RECORDED WITH THE MIDDLESEX COUNTY REGISTRY OF DEEDS, NORTH DISTRICT IN PLAN BK. 245, PLAN 81. TWO SHEETS.
6. MAP ENTITLED "PLAN SHOWING TAKINGS FOR UTILITY EASEMENTS IN DRACUT, MASS. PREPARED FOR: TOWN OF DRACUT," PREPARED BY ANDOVER CONSULTANTS, INC., DATED MAY 3, 2010. RECORDED WITH THE MIDDLESEX COUNTY REGISTRY OF DEEDS, NORTH DISTRICT IN PLAN BK. 231, PLAN 118.



LOCUS MAP
NOT TO SCALE

NOTES:

1. PROPERTY KNOWN AS LOT 86-1 AS SHOWN ON THE TOWN OF DRACUT, MIDDLESEX COUNTY , COMMONWEALTH OF MASSACHUSETTS, MAP NO. 37, AND LOTS 86-2 & 86-3 AS SHOWN ON THE TOWN OF DRACUT, MIDDLESEX COUNTY, COMMONWEALTH OF MASSACHUSETTS, MAP NO. 51.
2. LOT 86-1 AREA = 443,976 SQUARE FEET OR 10.192 ACRES.
   LOT 86-2 AREA = 793,306 SQUARE FEET OR 18.212 ACRES.
   LOT 86-3 AREA = 788,512 SQUARE FEET OR 18.102 ACRES.
   TOTAL AREA = 2,025,794 SQUARE FEET OR 46.506 ACRES.
3. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE ASBUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES. CONTROL POINT ASSOCIATES, INC. DOES NOT GUARANTEE THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED.

   THE SOURCE OF UNDERGROUND UTILITIES ARE SHOWN UTILIZING A QUALITY LEVEL SYSTEM:

   QUALITY LEVEL D - UTILITIES SHOWN BASED UPON REFERENCE MAPPING OR ORAL HISTORY. NOT FIELD VERIFIED.

   QUALITY LEVEL C - LOCATION OF UTILITY SURFACE FEATURES SUPPLEMENTS REFERENCE MAPPING. INCLUDES MARKOUT BY OTHERS.

   QUALITY LEVEL B - UTILITY LOCATION DATA IS COLLECTED THROUGH GEOPHYSICAL SENSING TECHNOLOGY TO SUPPLEMENT SURFACE FEATURES AND OR REFERENCE MAPPING. INCLUDES MARKOUT BY CONTROL POINT ASSOCIATES, INC.

   QUALITY LEVEL A - HORIZONTAL AND VERTICAL LOCATION OF UTILITIES ARE OBTAINED USING VACUUM EQUIPMENT EXCAVATION OR OTHER METHODS TO EXPOSE THE UTILITY. LOCATION SHOWN AT SINGLE POINT WHERE EXCAVATION OCCURRED UNLESS UTILITY WAS LOCATED PRIOR TO FILLING.

   ALL FOUR TYPES MAY NOT APPEAR ON THE SURVEY.
4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY CLIENT, A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC., AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN. IT IS STRONGLY RECOMMENDED THAT A COMPLETE TITLE SEARCH BE PROVIDED TO THE SURVEYOR FOR REVIEW PRIOR TO THE PLACEMENT OF OR ALTERATION TO IMPROVEMENTS ON THE PROPERTY.
6. EXISTING FIRM: BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN FLOOD HAZARD ZONE X-UNSHADED (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), ZONE AE (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD, BASE FLOOD ELEVATIONS DETERMINED; ELEV=111' (NAVD88)), AND FLOODWAY AREAS IN ZONE AE (THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS) PER REF. #2.
7. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, WAS NOT KNOWN AT THE TIME OF THE FIELD SURVEY.
8. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS).
   TEMPORARY BENCH MARKS SET:

   TBM-A: MAG NAIL SET IN PAVEMENT, ELEVATION= 108.75'

   PRIOR TO CONSTRUCTION IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE BENCHMARKS ILLUSTRATED ON THIS SKETCH HAVE NOT BEEN DISTURBED AND THEIR ELEVATIONS HAVE BEEN CONFIRMED. ANY CONFLICTS MUST BE REPORTED PRIOR TO CONSTRUCTION.
9. THE OFFSETS SHOWN ARE NOT TO BE USED FOR THE CONSTRUCTION OF ANY STRUCTURE, FENCE, PERMANENT ADDITION, ETC.
10. PERENNIAL STREAM AND RIVERFRONT AREA DETERMINATION: GIVEN FLOODED CONDITIONS DUE TO RECENT BEAVER ACTIVITY, AND GIVEN THAT THE MAJORITY OF THE PERENNIAL STREAM OCCURS OFF-SITE, THE PERENNIAL STREAM IS NOT READILY ACCESSIBLE IN THE FIELD. ACCORDINGLY, THE STREAM CENTERLINE WAS TRACED BY LEC ENVIRONMENTAL CONSULTANTS, INC., (LEC) FROM THE 2018 MASSGIS ORTHOPHOTO. ACCORDING TO THE USGS STREAMSTATS PROGRAM, THE PERENNIAL STREAM HAS A PREDICTED BANKFULL WIDTH OF 12.3 FEET. THE 12.3 FEET WAS ROUNDED UP TO 14 FEET, AND ADDED TO THE STREAM CENTERLINE (7 FEET ON EITHER SIDE OF THE CENTERLINE). THE 200-FOOT RIVERFRONT AREA BOUNDARY ON THE SUBJECT PROPERTY AS DEPICTED ON THESE PLANS EXTENDS FROM THE 14-FOOT WIDE STREAM CHANNEL AS INFORMED BY THE 2018 MASSGIS ORTHOPHOTO AND USGS STREAMSTATS."
11. THE WETLANDS BOUNDARY LIMITS SHOWN ON THIS SURVEY ARE BASED ON WETLANDS FIELD IDENTIFICATION MARKERS PLACED BY LEC ENVIRONMENTAL BETWEEN 2019 & 2023, AND FIELD LOCATED BY CONTROL POINT ASSOCIATES INC. ON MARCH 13, 2024.
12. RIGHT OF WAY REFERENCED IN "PLAN OF LAND IN DRACUT, MASS., FOR G&P DEVELOPMENT," DATED NOVEMBER 21, 1989 AND RECORDED WITH THE MIDDLESEX NORTH DISTRICT REGISTRY OF DEEDS IN PLAN BOOK 171, PLAN 148 ON JANUARY 9, 1990 BURDENING LOTS A-4 AND A-2, REFERENCED THEREON, IS NO LONGER IN FORCE AND EFFECT BECAUSE TITLE TO REFERENCED LOTS A-2, A-3 AND A-4 ON SAID PLAN AND ON "PLAN OF LAND IN DRACUT, MASS.," DATED JANUARY 22, 1987 AND RECORDED WITH SAID DEEDS IN PLAN BOOK 168, PLAN 112 MERGED BY VIRTUE OF CONVEYANCE OF LOT A-4 INTO FIRST DRACUT DEVELOPMENT COMPANY, LLC FROM PAREKH CONSTRUCTION, INC., DATED MARCH 16, 2021 AND RECORDED WITH SAID DEEDS IN BOOK 35489, PAGE 67 (SEE ALSO CONFIRMATORY DEEDS RECORDED IN BOOK 35543, PAGE 286 AND BOOK 35549, PAGE 262), AND PRIOR CONVEYANCE INTO SAID FIRST DRACUT DEVELOPMENT COMPANY, LLC EVIDENCED BY DEED DATED NOVEMBER 3, 2000, RECORDED WITH SAID DEEDS IN BOOK 11170, PAGE 323 AND SAID LOTS A-2, A-3, AND A-4 INTO WORLD DRACUT, LLC EVIDENCED BY THAT QUITCLAIM DEED FROM FIRST DRACUT DEVELOPMENT COMPANY, LLC DATED MARCH 29, 2021, RECORDED WITH SAID DEEDS IN BOOK 35591, PAGE 144.

No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN:	APPROVED:	DATE
5	REVISED PER CLIENT COMMENTS & REMOVAL OF R.O.W.	-	R.J.K.	G.L.H.	8-23-2024
4	REVISED PER CLIENT COMMENTS	-	R.J.K.	G.L.H.	4-2-2024
3	REVISED PER NEW WETLAND FLAG LOCATIONS	J.S.A.	J.P.M.	G.L.H.	3-20-2024
2	PERENNIAL STREAM AND RIVERFRONT AREA ADDED	-	R.J.K.	G.L.H.	1-15-2024
1	REVISED PER WETLAND FLAGS ADDED	J.S.A.	R.A.B.	G.L.H.	11-13-2023

THIS SURVEY HAS BEEN PERFORMED IN THE FIELD UNDER MY SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE, BELIEF, AND INFORMATION, THIS SURVEY HAS BEEN PERFORMED IN ACCORDANCE WITH CURRENTLY ACCEPTED ACCURACY STANDARDS.

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COMMONWEALTH OF MASSACHUSETTS GERRY L. HOLDRIGHT NO. 49211 REGISTERED PROFESSIONAL LAND SURVEYOR

8-23-2024
DATE

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

FIELD DATE: 9-29-2023, 10-5-2023, 10-10-2023, 10-24-2023
FIELD BOOK NO.: 23-10-MA
FIELD BOOK PG.: 71-72
FIELD CREW: J.D.O., J.S.A.
DRAWN: E.G.F.
REVIEWED: R.J.K.

EXISTING CONDITIONS PLAN
BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY
WORLD DRACUT, LLC
341 BROADWAY ROAD & 226 LOON HILL ROAD
MAP 37, LOT 86-1 & MAP 51, LOTS 86-1 & 86-3
TOWN OF DRACUT, MIDDLESEX COUNTY
COMMONWEALTH OF MASSACHUSETTS

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX
ALBANY, NY 518-217-5010
CHALFONT, PA 215-712-9800
HAUPPAUGE, NY 631-580-2645
MANHATTAN, NY 646-780-0411
MT LAUREL, NJ 609-857-2099
WARREN, NJ 908-668-0099

APPROVED: G.L.H. | DATE: 10-27-2023 | SCALE: 1"=140' | FILE NO.: 03-230109-00 | DWG. NO.: 1 OF 6

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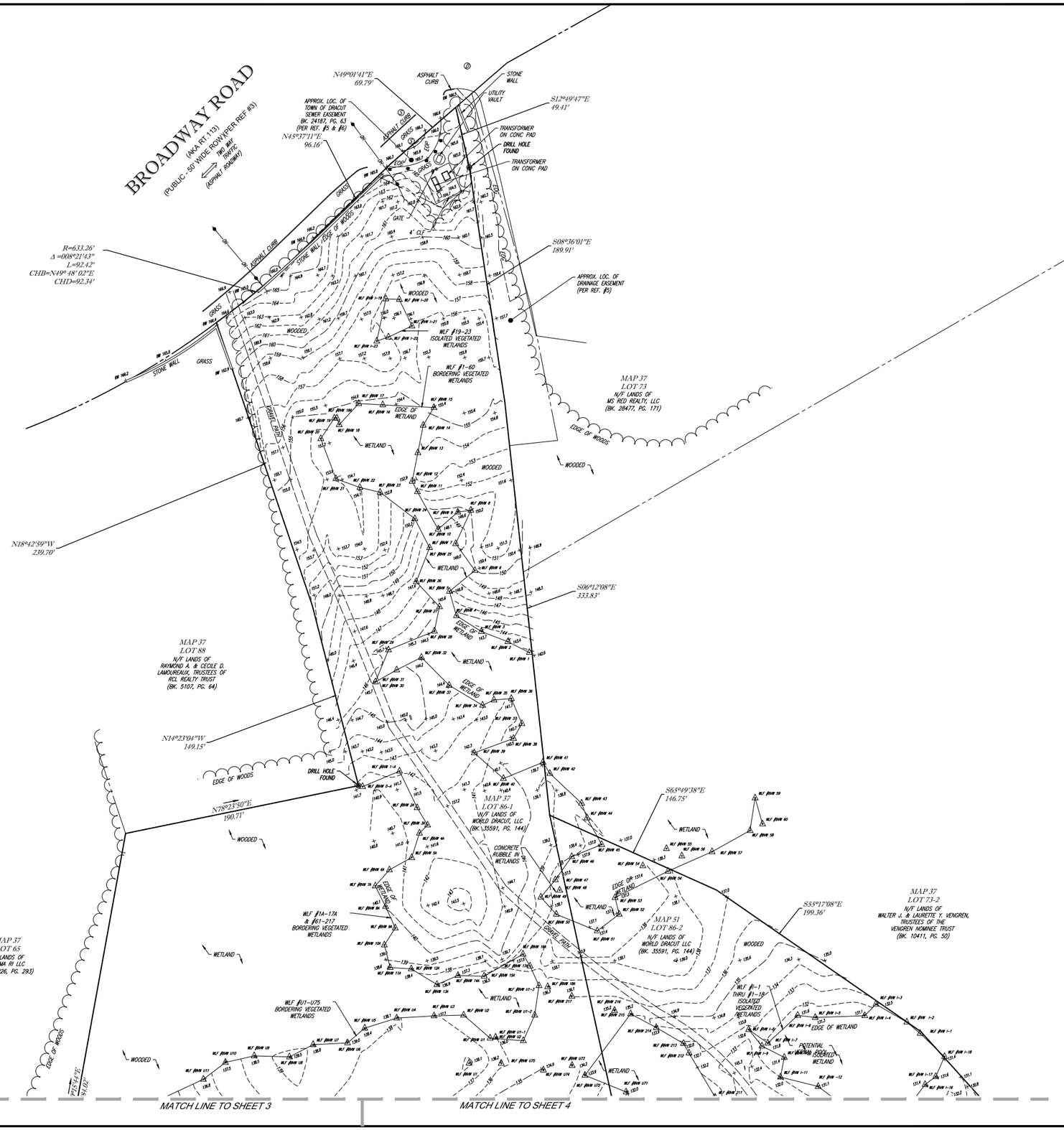

LEGEND

- 124 / 125 — EXISTING CONTOUR
- × 123.45 — EXISTING SPOT ELEVATION
- ×BW 122.95 — EXISTING BOTTOM OF WALL ELEVATION
- OH — OVERHEAD WIRES
- S — SANITARY/SEWER MANHOLE
- D — DRAINAGE/STORM MANHOLE
- CB — CATCH BASIN
- WF — DELINEATION FLAG
- UP — UTILITY POLE
- ULP — UTILITY POLE/LIGHT POLE
- GUY WIRE
- GV — GAS VALVE
- BOLLARD
- GATE POST
- CLF — CHAIN LINK FENCE
- EDP — EDGE OF PAVEMENT
- EOG — EDGE OF GRAVEL
- LSA — LANDSCAPED AREA
- UNKNOWN TERMINUS
- (S) — SURVEY DIMENSION
- (R) — RECORD DIMENSION

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM - MAINLAND (NAD83)

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN	APPROVED	DATE
5	REVISED PER CLIENT COMMENTS & REMOVAL OF R.O.W.	-	R.J.K.	G.L.H.	8-23-2024
4	REVISED PER CLIENT COMMENTS	-	R.J.K.	G.L.H.	4-2-2024
3	REVISED PER NEW WETLAND FLAG LOCATIONS	J.S.A.	J.P.M.	G.L.H.	3-20-2024
2	PERENNIAL STREAM AND RIVERFRONT AREA ADDED	-	R.J.K.	G.L.H.	1-15-2024
1	REVISED PER WETLAND FLAGS ADDED	J.S.A.	R.A.B.	G.L.H.	11-13-2023

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COMMONWEALTH OF MASSACHUSETTS — GERRY L. HOLDRIGHT — NO. 49211 — REGISTERED PROFESSIONAL LAND SURVEYOR

8-23-2024
DATE

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

FIELD DATE: 9-29-2023, 10-5-2023, 10-10-2023, 10-24-2023
FIELD BOOK NO.: 23-10-MA
FIELD BOOK PG.: 71-72
FIELD CREW: J.D.O., J.S.A.
DRAWN: E.G.F.
REVIEWED: E.LOC.

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WORLD DRACUT, LLC
341 BROADWAY ROAD & 226 LOON HILL ROAD
MAP 37, LOT 86-1 & MAP 51, LOTS 86-1 & 86-3
TOWN OF DRACUT, MIDDLESEX COUNTY
COMMONWEALTH OF MASSACHUSETTS

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508.948.3000 - 508.948.3003 FAX

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WARREN, NJ 908-668-0099

APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
G.L.H.	10-27-2023	1"=40'	03-230109-00	2 OF 6

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MATCH LINE TO SHEET 2

MAP 37
LOT 87-1C
MULTIPLE OWNERS
(CONDOMINIUM)
(BK. 2972, PG. 267)

MAP 37
LOT 87-6C
MULTIPLE OWNERS
(CONDOMINIUM)
(BK. 2972, PG. 267

MAP 37
LOT 65
N/F LANDS OF
BFG MA RI LLC
(BK. 36226, PG. 293)

MAP 37
LOT 86-1
N/F LANDS OF
WORLD DRACUT, LLC
(BK. 35591, PG. 144)

LOT A-4
(PER REF #3)

MAP 51
LOT 86-3
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 51
LOT 211
N/F LANDS OF
REAL ESTATE
DYNAMICS, LLC
(CONDOMINIUM)
(BK. 34572, PG. 86)

N16°14'07"E
113.26'

S88°01'55"E
429.34'

N04°36'02"E
107.07'

N01°47'38"E
85.45'

S88°42'09"W
239.44'

N87°05'50"W
171.14'

S65°47'10"W
510.03' (S)
502.90' (R)

N24°12'50"W
(S) 559.95'
(R) 560.00'

N04°36'49"W
1,419.69'

EDGE OF WOODS

WOODED

GRASS

WETLAND

EDGE OF WETLAND

EDGE OF STONE

APPROX. LOC. OF 200' NEW ENGAND POWER COMPANY EASEMENT (PER REF. #3)

APPROX. LOC. OF FLOODWAY

APPROX. LOC. OF FLOOD ZONE X-UNSHADED

APPROX. LOC. OF FLOOD ZONE AE

APPROX. CENTERLINE LOCATION OF PERENNIAL STREAM LOCATION DRAWN FROM LEC ENVIRONMENTAL ANRAD APPLICATION DATED 12/20/2023 (SEE NOTE #10)

APPROX. LOCATION OF PERENNIAL STREAM BANK LOCATION DRAWN FROM LEC ENVIRONMENTAL ANRAD APPLICATION DATED 12/20/2023 (SEE NOTE #10)

WLF #1A-18A & #61-217 BORDERING VEGETATED WETLANDS

WLF #1B-65B BORDERING VEGETATED WETLANDS

WLF #U1-U75 BORDERING VEGETATED WETLANDS

200-FT RIVERFRONT AREA

APPROX LIMITS OF ZONE AE (PER REF #2)

BY GROUND ELEVATION LIMITS OF ZONE AE (ELEV=111' (NAVD88)) (PER REF #2)

ZONE AE BORDERING LAND SUBJECT TO FLOODING

MATCH LINE TO SHEET 4

MATCH LINE TO SHEET 5

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM - MAINLAND (NAD83)

LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
×BW 122.95	EXISTING BOTTOM OF WALL ELEVATION
OH	OVERHEAD WIRES
S	SANITARY/SEWER MANHOLE
D	DRAINAGE/STORM MANHOLE
	CATCH BASIN
WF	DELINEATION FLAG
UP	UTILITY POLE
UPLP	UTILITY POLE/LIGHT POLE
	GUY WIRE
GV	GAS VALVE
	BOLLARD
	GATE POST
CLF	CHAIN LINK FENCE
EOP	EDGE OF PAVEMENT
EOG	EDGE OF GRAVEL
LSA	LANDSCAPED AREA
	UNKNOWN TERMINUS
(S)	SURVEY DIMENSION
(R)	RECORD DIMENSION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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COMMONWEALTH OF MASSACHUSETTS
GERRY L. HOLDRIGHT
NO. 49211
REGISTERED
PROFESSIONAL LAND SURVEYOR

8-23-2024
DATE

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APPROVED: G.L.H.
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SCALE: 1"=40'
FILE NO.: 03-230109-00
DWG. NO.: 3 OF 6

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MATCH LINE TO SHEET 2

MATCH LINE TO SHEET 3

MATCH LINE TO SHEET 5

MATCH LINE TO SHEET 6

WETLAND

WLF #1–1 THRU #1–18
ISOLATED VEGETATED WETLANDS

S42°02'08"E
255.20'

MAP 37
LOT 73-2
N/F LANDS OF
WALTER J. & LAURETTE Y. VENGREN, TRUSTEES OF THE VENGREN NOMINEE TRUST
(BK. 10411, PG. 50)

S56°09'08"E
93.47'

S69°52'08"E
52.50'

S10°39'56"W
113.88'

S05°39'08"W
332.98'

BY GROUND ELEVATION
LIMITS OF ZONE AE
(ELEV=111' (NAVD88))
(PER REF #2)

S05°22'52"W
170.63'

S03°41'17"W
137.31'

MAP 37
LOT 86-1
N/F LANDS OF
WORLD DRACUT, LLC
(BK. 35591, PG. 144)

MAP 51
LOT 86-3
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 51
LOT 86-2
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

LOT A–2
(PER REF #3)

N/F LANDS OF
DON MAR PROPERTIES, LLC
(BK. 13508, PG. 25)
LOT 204

APPROX. LOC. OF
200' NEW ENGLAND
POWER COMPANY
EASEMENT
(PER REF. #3)

APPROX. LOC. OF
50' PROPOSED R.O.W.–EASEMENT
(PER REF. #4)

APPROX. LOC. OF
FLOOD ZONE
X–UNSHADED

APPROX. LOC. OF
FLOOD ZONE
X–UNSHADED

FLOOD ZONE AE

FLOOD ZONE AE

BORDERING LAND
SUBJECT TO FLOODING

WLF #1A–18
& #61–217
BORDERING VEGETATED
WETLANDS

WATER

EDGE OF WETLAND

EDGE OF WOODS

EDGE OF WATER

GRAVEL PATH

GRAVEL PATH–OH

WOODED

GRASS

S65°47'10"W
570.03' (S)
502.90' (R)

51°22'45"E
(S)
630.04'
(R)
631.20'

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM - MAINLAND (NAD83)

LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
×BW 122.85	EXISTING BOTTOM OF WALL ELEVATION
OH	OVERHEAD WIRES
S	SANITARY/SEWER MANHOLE
D	DRAINAGE/STORM MANHOLE
	CATCH BASIN
WF	DELINEATION FLAG
UP	UTILITY POLE
UPLP	UTILITY POLE/LIGHT POLE
	GUY WIRE
GV	GAS VALVE
	BOLLARD
	GATE POST
CLF	CHAIN LINK FENCE
EOP	EDGE OF PAVEMENT
EOG	EDGE OF GRAVEL
LSA	LANDSCAPED AREA
	UNKNOWN TERMINUS
(S)	SURVEY DIMENSION
(R)	RECORD DIMENSION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

No.	DESCRIPTION OF REVISION	FIELD CREW	DRAWN	APPROVED	DATE
5	REVISED PER CLIENT COMMENTS & REMOVAL OF R.O.W.	-	R.J.K.	G.L.H.	8-23-2024
4	REVISED PER CLIENT COMMENTS	-	R.J.K.	G.L.H.	4-2-2024
3	REVISED PER NEW WETLAND FLAG LOCATIONS	J.S.A.	J.P.M.	G.L.H.	3-20-2024
2	PERENNIAL STREAM AND RVERFFONT AREA ADDED	-	R.J.K.	G.L.H.	1-15-2024
1	REVISED PER WETLAND FLAGS ADDED	J.S.A.	R.A.B.	G.L.H.	11-13-2023

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COMMONWEALTH OF MASSACHUSETTS
GERRY L. HOLDRIGHT
NO. 49211
REGISTERED
PROFESSIONAL LAND SURVEYOR

8-23-2024
DATE

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

FIELD DATE	9-29-2023 10-5-2023 10-10-2023 10-24-2023
FIELD BOOK NO.	23-10-MA
FIELD BOOK PG.	71-72
FIELD CREW	J.D.O. J.S.A.
DRAWN:	E.G.F.
REVIEWED:	E.LOC.

EXISTING CONDITIONS PLAN
BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY
WORLD DRACUT, LLC
341 BROADWAY ROAD & 226 LOON HILL ROAD
MAP 37, LOT 86-1 & MAP 51, LOTS 86-1 & 86-3
TOWN OF DRACUT, MIDDLESEX COUNTY
COMMONWEALTH OF MASSACHUSETTS

CONTROL POINT ASSOCIATES, INC.
352 TURNPIKE ROAD
SOUTHBOROUGH, MA 01772
508.948.3000 - 508.948.3003 FAX

ALBANY, NY 518-217-5010
CHALFONT, PA 215-712-0800
HAUPPAUGE, NY 631-580-2645
MANHATTAN, NY 646-780-0411
MT LAUREL, NJ 609-857-2099
WARREN, NJ 908-668-0099

APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
G.L.H.	10-27-2023	1"=40'	03-230109-00	4 OF 6

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MATCH LINE TO SHEET 3

MATCH LINE TO SHEET 4

MATCH LINE TO SHEET 6

MAP 51
LOT 211
N/F LANDS OF
REAL ESTATE
DYNAMICS, LLC
(CONDOMINIUM)
(BK. 34572, PG. 86)

692.64'
S09°40'16"E

N73°36'56"E
75.20'

N30°22'29"W
331.09'

200-FT RIVERFRONT AREA

MAP 51
LOT 68C
MULTIPLE OWNERS
(CONDOMINIUM)
(BK. 3555, PG. 128)

MAP 51
LOT 78-1
N/F LANDS OF
CIL REALTY OF
MASSACHUSETTS,
INCORPORATED
(BK. 29882, PG. 274)

MAP 51
LOT 256-1
N/F LANDS OF
PETER & KATHRYN FARRELL
(BK. 33550, PG. 254)

MAP 51
LOT 256
N/F LANDS OF
TIMOTHY J. JUSEZAK & KERRI L. JUSCZAK-GREENWOOD,
TRUSTEES OF THE JUSCZAK GREENWOOD
FAMILY TRUST
(BK. 37678, PG. 271)

MAP 51
LOT 86-2
N/F LANDS OF
WORLD DRACUT, LLC
(BK. 35591, PG. 144)

MAP 51
LOT 86-3
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

LOT A-3
(PER REF #3)

WLF #14-18A
& #61-217
BORDERING VEGETATED
WETLANDS

APPROX. LIMITS OF
ZONE AE
(PER REF #2)

BY GROUND ELEVATION
LIMITS OF ZONE AE
(ELEV=111' (NAVD88))
(PER REF #2)

BORDERING LAND
SUBJECT TO FLOODING

APPROX. LOC. OF
FLOODWAY AREAS
IN ZONE AE

APPROX. LOC. OF
FLOOD ZONE
X-UNSHADED

APPROX. LOC. OF
FLOOD ZONE AE

APPROX. LOC. OF
FLOOD X-UNSHADED

S70°05'22"W
800.00'

N14°12'42"W
177.42'

EDGE OF WOODS

WOODED

EDGE OF WETLAND

WETLAND

WATER

EDGE OF WATER

DIRT PATH

SCHEMATIC
(SEE NOTE 5)

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM - MAINLAND (NAD83)

LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× BW 122.95	EXISTING BOTTOM OF WALL ELEVATION
OH	OVERHEAD WIRES
S	SANITARY/SEWER MANHOLE
D	DRAINAGE/STORM MANHOLE
	CATCH BASIN
WF	DELINEATION FLAG
UP	UTILITY POLE
UPLP	UTILITY POLE/LIGHT POLE
	GUY WIRE
GV	GAS VALVE
	BOLLARD
	GATE POST
CLF	CHAIN LINK FENCE
EOP	EDGE OF PAVEMENT
EOG	EDGE OF GRAVEL
LSA	LANDSCAPED AREA
	UNKNOWN TERMINUS
(S)	SURVEY DIMENSION
(R)	RECORD DIMENSION

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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DRAWN: E.G.F.
REVIEWED: E.LOC.

EXISTING CONDITIONS PLAN
BOUNDARY, TOPOGRAPHIC & UTILITY SURVEY

WORLD DRACUT, LLC

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MAP 37, LOT 86-1 & MAP 51, LOTS 86-1 & 86-3
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MANHATTAN, NY 646-780-0411
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APPROVED:	DATE	SCALE	FILE NO.	DWG. NO.
G.L.H.	10-27-2023	1"=40'	03-230109-00	5 OF 6

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DIG SAFE 1-888-344-7233 STOP! CALL BEFORE YOU DIG

MATCH LINE TO SHEET 4

MATCH LINE TO SHEET 5

MATCH LINE A

DRILL HOLE FOUND

S07°28'33"W 128.76'

S07°26'59"W 61.55'

S46°10'22"E 39.35'

BORDERING LAND SUBJECT TO FLOODING

N86°55'24"E 364.52' (S) 364.46' (R)

FLOOD ZONE AE

WATER

EDGE OF WATER

WLF #1A-18A & #61-217 BORDERING VEGETATED WETLANDS

APPROX. LOC. OF FLOOD ZONE X-UNSHADED

EDGE OF WOODS

WOODED

DIRT PATH

EDGE OF WETLAND

WETLAND

BORDERING LAND SUBJECT TO FLOODING

FLOOD ZONE AE

BY GROUND ELEVATION LIMITS OF ZONE AE (ELEV=111' (NAVD88)) (PER REF #2)

POTENTIAL VERNAL POOL

200-FT RIVERFRONT AREA

MAP 51
LOT 204
N/F LANDS OF
DON MAR PROPERTIES, LLC
(BK. 35084, PG. 25)

MAP 51
LOT 86-3
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 51
LOT 86-2
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

S11°51'19"E 469.45' (S) 469.75' (R)

S17°09'34"E 50.41'

N16°52'59"W 48.18'

S30°04'27"W 103.52'

S23°45'06"W 97.84'

MAP 51
LOT 256
N/F LANDS OF
TIMOTHY J. JUSZCZAK & KERRI L. JUSZCZAK-GREENWOOD,
TRUSTEES OF THE JUSZCZAK GREENWOOD FAMILY TRUST
(BK. 37678, PG. 271)

MAP 51
LOT 204-1
N/F LANDS OF
DON MAR PROPERTIES LLC
(BK. 35084, PG. 25)

WLF #1C-18C BORDERING VEGETATED WETLANDS

STONE WALL

IRON PIN FOUND

TBM-A

APPROX. LOC. OF FLOOD ZONE X-UNSHADED

LOON HILL ROAD
(PUBLIC - 40' WIDE ROW) (PER REF #3)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)

GRASS

WETLAND

EDGE OF WETLAND

EDGE OF WOODS

EDGE OF WATER

APPROX. LOC. OF FLOOD ZONE AE

APPROX. LOC. OF FLOOD-WAY AREAS IN ZONE AE

APPROX. LOC. OF FLOOD ZONE X-UNSHADED

MATCH LINE A

MAP 51
LOT 86-2
N/F LANDS OF
WORLD DRACUT LLC
(BK. 35591, PG. 144)

MAP 51
LOT 256
N/F LANDS OF
TIMOTHY J. JUSZCZAK & KERRI L. JUSZCZAK-GREENWOOD,
TRUSTEES OF THE JUSZCZAK GREENWOOD FAMILY TRUST
(BK. 37678, PG. 271)

WETLAND

WLF #1C-18C BORDERING VEGETATED WETLANDS

"STOP"

IRON PIN FOUND

APPROX. LOC. OF FLOOD ZONE AE

APPROX. LOC. OF FLOOD ZONE X-UNSHADED

EDGE OF WOODS

WOODED

EDP

OH

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM - MAINLAND (NAD83)

LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
×BW 122.95	EXISTING BOTTOM OF WALL ELEVATION
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S	SANITARY/SEWER MANHOLE
D	DRAINAGE/STORM MANHOLE
	CATCH BASIN
WF	DELINEATION FLAG
UP	UTILITY POLE
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GV	GAS VALVE
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	UNKNOWN TERMINUS
(S)	SURVEY DIMENSION
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COMMONWEALTH OF MASSACHUSETTS · GERRY L. HOLDRIGHT · NO. 49211 · REGISTERED PROFESSIONAL LAND SURVEYOR

8-23-2024
DATE

GERRY L. HOLDRIGHT, PLS
MASSACHUSETTS PROFESSIONAL LAND SURVEYOR #49211

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G.L.H.	10-27-2023	1"=40'	03-230109-00	6 OF 6

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Appendix C –

Conceptual Architect Design Drawings, Floor Plans, Elevations, and Building Summary dated September 20, 2024, prepared by Annino Incorporated in 86 sheets (11 x 17)

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CLIENT	WORLD REALTY & DEVELOPMENT, LTD. PO Box 95025 Newton, Massachusetts
ATTORNEY	THE PANOS LAW GROUP 246 Andover Street, Suite 301 Peabody, Massachusetts
CIVIL ENGINEER	BOHLER ENGINEERING 45 Franklin Street, 5th Floor Boston, Massachusetts
ARCHITECT	ANNINO INCORPORATED 125 North Washington Street North Attleboro, Massachusetts
STRUCTURAL ENGINEER	RIVERMOOR ENGINEERING LLC 146 Front Street, Suite 211 Scituate, Massachusetts
M.E.P. & F.P. ENGINEER	ZADE ASSOCIATES LLC 1 Billings Road, Suite 306 Quincy, Massachusetts

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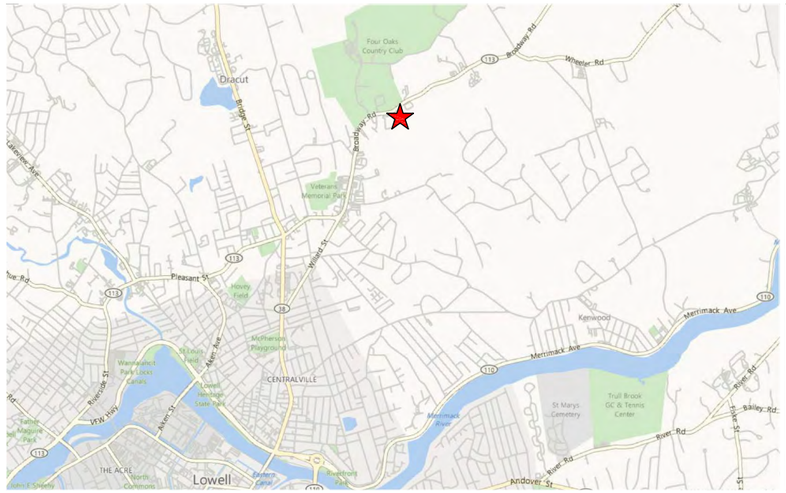
BROADWAY VILLAGE

341 Broadway Road
Dracut, Massachusetts



LOCUS MAP

SATELLITE MAP

Comprehensive Permit ZBA Review September 20, 2024

PRELIMINARY DRAWINGS

GENERAL

	COVER SHEET
	PROJECT SUMMARY (2 SHEETS)
	RENDERINGS (6 SHEETS)

CIVIL

C-101	CIVIL COVER SHEET
C-102	GENERAL NOTES
C-103	EXISTING CONDITIONS PLAN
C-300	OVERALL SITE & KEY PLAN
C-301	SITE LAYOUT PLAN SHEET 1
C-302	SITE LAYOUT PLAN SHEET 2
C-303	SITE LAYOUT PLAN SHEET 3
C-401	GRADING AND DRAINAGE PLAN SHEET 1
C-402	GRADING AND DRAINAGE PLAN SHEET 2
C-403	GRADING AND DRAINAGE PLAN SHEET 3
C-501	UTILITY PLAN SHEET 1
C-502	UTILITY PLAN SHEET 2
C-503	UTILITY PLAN SHEET 3
C-601	SOIL EROSION AND SEDIMENT CONTROL PLAN
C-602	SOIL EROSION AND SEDIMENT CONTROL NOTES & DETAILS
C-901	DETAIL SHEET
C-902	DETAIL SHEET
C-903	DETAIL SHEET
L-101	OVERALL LANDSCAPE PLAN
L-102	LANDSCAPE PLAN - ENLARGEMENT A
L-103	LANDSCAPE PLAN - ENLARGEMENT B
L-104	LANDSCAPE PLAN - ENLARGEMENT C
L-105	LIGHTING PLAN
L-200	LANDSCAPE NOTES & DETAILS
L-201	LANDSCAPE DETAILS
	EXISTING CONDITIONS PLANS (6 SHEETS FROM CONTROL POINT ASSOCIATES)

ARCHITECTURAL

	- BUILDING 1 -
A0.1	OVERALL BUILDING PLANS
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD FLOOR PLAN
A1.4	FOURTH FLOOR PLAN
A1.5	ROOF PLAN
A2.0	OVERALL ELEVATIONS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
A2.3	EXTERIOR ELEVATIONS
	- BUILDING 2 -
A0.1	OVERALL BUILDING PLANS
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD FLOOR PLAN
A1.4	FOURTH FLOOR PLAN
A1.5	ROOF PLAN
A2.0	OVERALL ELEVATIONS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
A2.3	EXTERIOR ELEVATIONS
	- BUILDING 3 -
A0.1	OVERALL BUILDING PLANS
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD FLOOR PLAN
A1.4	FOURTH FLOOR PLAN
A1.5	ROOF PLAN
A2.0	OVERALL ELEVATIONS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
A2.3	EXTERIOR ELEVATIONS
A2.4	EXTERIOR ELEVATIONS

ARCHITECTURAL (continued)

	- BUILDING 4 -
A0.1	OVERALL BUILDING PLANS
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD FLOOR PLAN
A1.4	FOURTH FLOOR PLAN
A1.5	ROOF PLAN
A2.0	OVERALL ELEVATIONS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
A2.3	EXTERIOR ELEVATIONS
	- BUILDING 5 -
A0.1	OVERALL BUILDING PLANS
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD & FOURTH FLOOR PLANS
A1.4	ROOF PLAN
A2.0	OVERALL ELEVATIONS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
	- MARKET MARK -
A1.1	FLOOR PLANS
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS
	- RECREATION CENTER -
A1.0	BASEMENT FLOOR PLAN
A1.1	FIRST FLOOR PLAN
A1.2	SECOND FLOOR PLAN
A1.3	THIRD FLOOR PLAN
A2.1	EXTERIOR ELEVATIONS
A2.2	EXTERIOR ELEVATIONS

ARCHITECTURAL (continued)

	- GENERAL -
A3.1	TYPICAL BUILDING SECTION
A3.2	WALL SECTIONS
A3.3	WALL SECTIONS
A3.4	WALL SECTIONS
A3.5	WALL SECTIONS
A4.1	MATERIAL BOARD
A4.2	ELEVATION TO SECTION REFERENCE
AC1.0	SITE DETAILS
AC1.1	SOLAR CANOPY
AC1.2	PLAYGROUND CONCEPT

Broadway Village, Dracut, MA 20080

Residential unit breakdown 09/20/24

	1 bed / 1 bath with nook	1 bed / 1 bath	2 bed / 2 bath with nook	2 bed / 2 bath	3 bed / 2 bath with nook	number of units
Building #1 - first floor	4		6		2	
Building #1 - second floor	5	1	8		2	
Building #1 - third floor	5	1	8		2	
Building #1 - fourth floor	5	1	8		2	
	19	3	30		8	60
Building #2 - first floor	3		11		2	
Building #2 - second floor	2		13		2	
Building #2 - third floor	2		13		2	
Building #2 - fourth floor	2		13		2	
	9		50		8	67
Building #3 - first floor	4		8	1	2	
Building #3 - second floor	10		12	1	2	
Building #3 - third floor	10		12	1	2	
Building #3 - fourth floor	10		12	1	2	
	34		44	4	8	90
Building #4 - first floor	4	1	6		2	
Building #4 - second floor	5	1	8		2	
Building #4 - third floor	5	1	8		2	
Building #4 - fourth floor	5	1	8		2	
	19	4	30		8	61
Building #5 - first floor	1	1	2	1		
Building #5 - second floor		1	3	1		
Building #5 - third floor		2	3	1		
Building #5 - fourth floor		2	3	1		
	1	6	11	4		22
Total Residential units	82	13	165	8	32	**300**

Residential unit mix	95	173	32
	32%	58%	11%
			10% req'd

ACCESSIBLE UNITS	Group 2A	Hard of Hearing	
1 Bedroom Units	5	2	
2 Bed room Units	9	3	
3 Bedroom Units	2	1	
Total Residential units	15	6	

Broadway Village, Dracut, MA 20080

Affordable unit breakdown 09/20/24

	1 bed / 1 bath with nook	1 bed / 1 bath	2 bed / 2 bath with nook	2 bed / 2 bath	3 bed / 2 bath with nook	number of units
Building #1 - first floor	2		3			
Building #1 - second floor			4		1	
Building #1 - third floor	3		2			
Building #1 - fourth floor	1		2		1	
	6		11		2	19
Building #2 - first floor	2		2		1	
Building #2 - second floor	1		3			
Building #2 - third floor	2		3			
Building #2 - fourth floor	2		3			
	7		11		1	19
Building #3 - first floor	1		2		1	
Building #3 - second floor	1		3		1	
Building #3 - third floor	1		3		1	
Building #3 - fourth floor	1		3		1	
	4		11		4	19
Building #4 - first floor		1	2			
Building #4 - second floor	1		3			
Building #4 - third floor	2		2		1	
Building #4 - fourth floor	1		3			
	4	1	10		1	16
Building #5 - first floor		1				
Building #5 - second floor			1			
Building #5 - third floor						
Building #5 - fourth floor						
	0	1	1			2
Total Affordable units	21	2	44	0	8	**75**

Residential units	95	173	32	300
Market rate units	72	129	24	225
Affordable units	**23**	**44**	**8**	**75**
Affordable (25%)	24	43	8	75

Broadway Village, Dracut, MA 20080

Overall square footage table 09/20/24

	Building Sq. Ft.	Residential	Retail / Commercial	Recreational	Garage	Building Totals
Market - 1st floor market	4,201		4,201			
Market - 1st floor restaurant	2,634		2,634			
Market - 2nd floor	1,023		1,023			7,858
Bldg #1 - Basement	11,030	8,969	2,061			
Bldg #1 - 1st floor	19,030	19,030				
Bldg #1 - 2nd floor	19,000	19,000				
Bldg #1 - 3rd floor	19,000	19,000				
Bldg #1 - 4th floor	19,000	19,000				87,060
Bldg #2 - Basement	21,760	1,709	3,092		16,959	
Bldg #2 - 1st floor	21,760	21,760				
Bldg #2 - 2nd floor	21,767	21,767				
Bldg #2 - 3rd floor	21,767	21,767				
Bldg #2 - 4th floor	21,767	21,767				108,821
Bldg #3 - Basement	19,858	14,866	4,992			
Bldg #3 - 1st floor	27,980	27,980				
Bldg #3 - 2nd floor	28,288	28,288				
Bldg #3 - 3rd floor	28,288	28,288				
Bldg #3 - 4th floor	28,288	28,288				132,702
Bldg #4 - Basement	11,030	8,969	2,061			
Bldg #4 - 1st floor	19,030	19,030				
Bldg #4 - 2nd floor	19,000	19,000				
Bldg #4 - 3rd floor	19,000	19,000				
Bldg #4 - 4th floor	19,000	19,000				87,060
Bldg #5 - Basement	5,179	5,179				
Bldg #5 - 1st floor	8,203	8,203				
Bldg #5 - 2nd floor	7,990	7,990				
Bldg #5 - 3rd floor	7,990	7,990				
Bldg #5 - 4th floor	7,990	7,990				37,352
Pool - 1st floor	7,500	7,500				
Pool - 2nd floor	770	770				8,270
Sports Pavillion - basement	25,376			2,072	23,304	
Sports Pavillion - 1st floor	27,865			27,865		
Sports Pavillion - 2nd floor	24,085			24,085		
Sports Pavillion - 3rd floor	10,361			10,361		87,687
Totals	556,810	432,100	20,064	64,383	40,263	**556,810**

Broadway Village, Dracut, MA 20080

Residential square footages 09/20/24

Net unit square footage	1 bed / 1 bath with nook	1 bed / 1 bath	2 bed / 2 bath with nook	2 bed / 2 bath	3 bed / 2 bath with nook
Building #1	765	747	1034		1324
Building #2	765		1034		1324
Building #3	765		1034	1031	1324
Building #4	765	747	1034		1324
Building #5	881	787 855	1219	1170	

Building square footage	Residential units	Common areas	Retail / Commercial	Garage	Gross square footage
Building #1	58,388	26,611	2,061		87,060
Building #2	69,177	19,593	3,092	16,959	108,821
Building #3	82,098	44,696	5,908		132,702
Building #4	56,147	28,852	2,061		87,060
Building #5	19,772	17,580			37,352
Pool House		8,270			8,270
Totals	285,582	145,602	13,122	16,959	461,265

Parking summary	Multifamily dwelling	Market	Retail (residential)	Sports Pavillion	Totals
Standard Spaces	161	33	62	74	330
Garage Spaces	50			64	114
Covered / Solar	238				238
Accessible (ADA)	19	2		4	25
Sub-totals	468	35	62	142	**707**
National Grid easement					124
	ratio				
Totals	1.56				**831**

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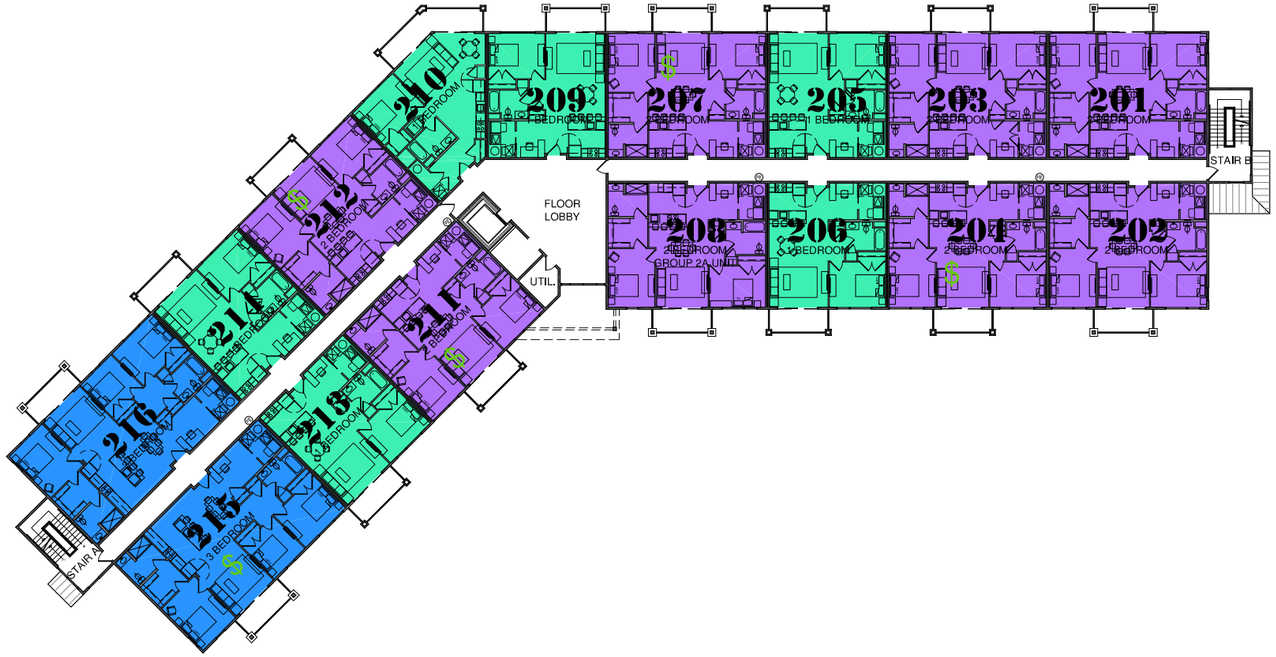
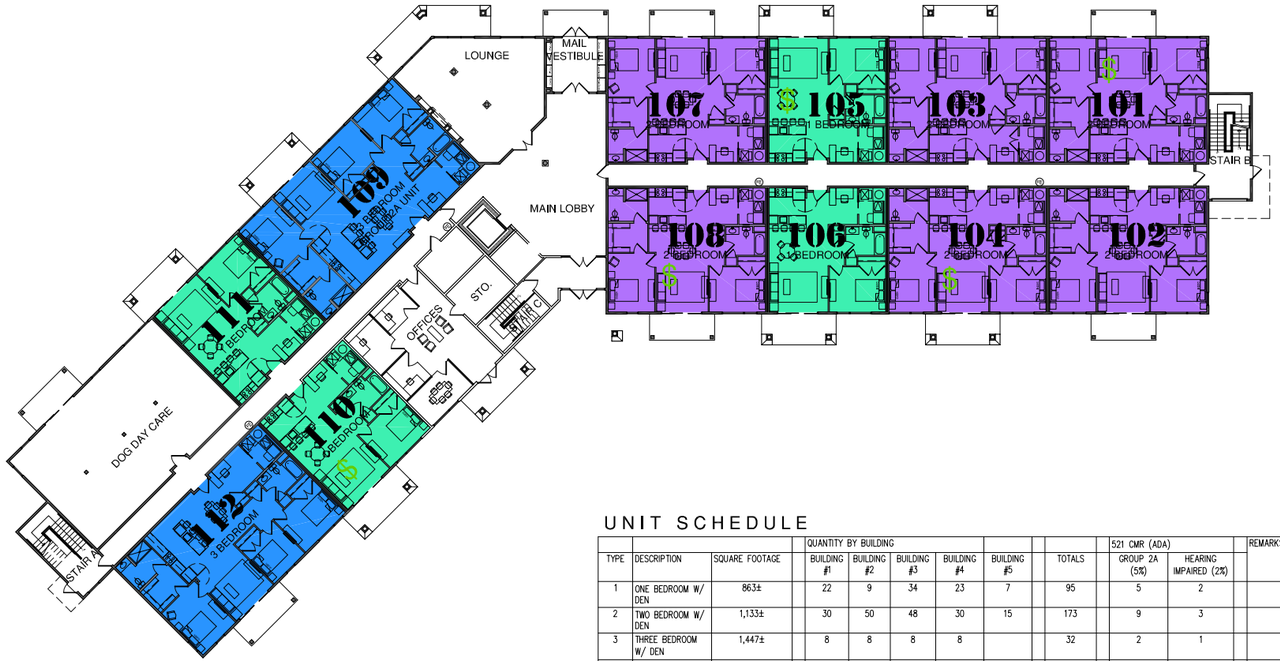


TYPICAL UPPER FLOOR

SECOND FLOOR SHOWN



GROUND FLOOR

UNIT SCHEDULE

TYPE	DESCRIPTION	SQUARE FOOTAGE	QUANTITY BY BUILDING					TOTALS	521 CMR (ADA)		REMARKS
			BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5		GROUP 2A (5%)	HEARING IMPAIRED (2%)	
1	ONE BEDROOM W/ DEN	863±	22	9	34	23	7	95	5	2	
2	TWO BEDROOM W/ DEN	1,133±	30	50	48	30	15	173	9	3	
3	THREE BEDROOM W/ DEN	1,447±	8	8	8	8		32	2	1	
	TOTALS		60	67	90	61	22	300	15 UNITS NEEDED	6 UNITS NEEDED	

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SHEET TITLE: OVERALL BUILDING PLANS

SCALE: 1/16" = 1'-0"

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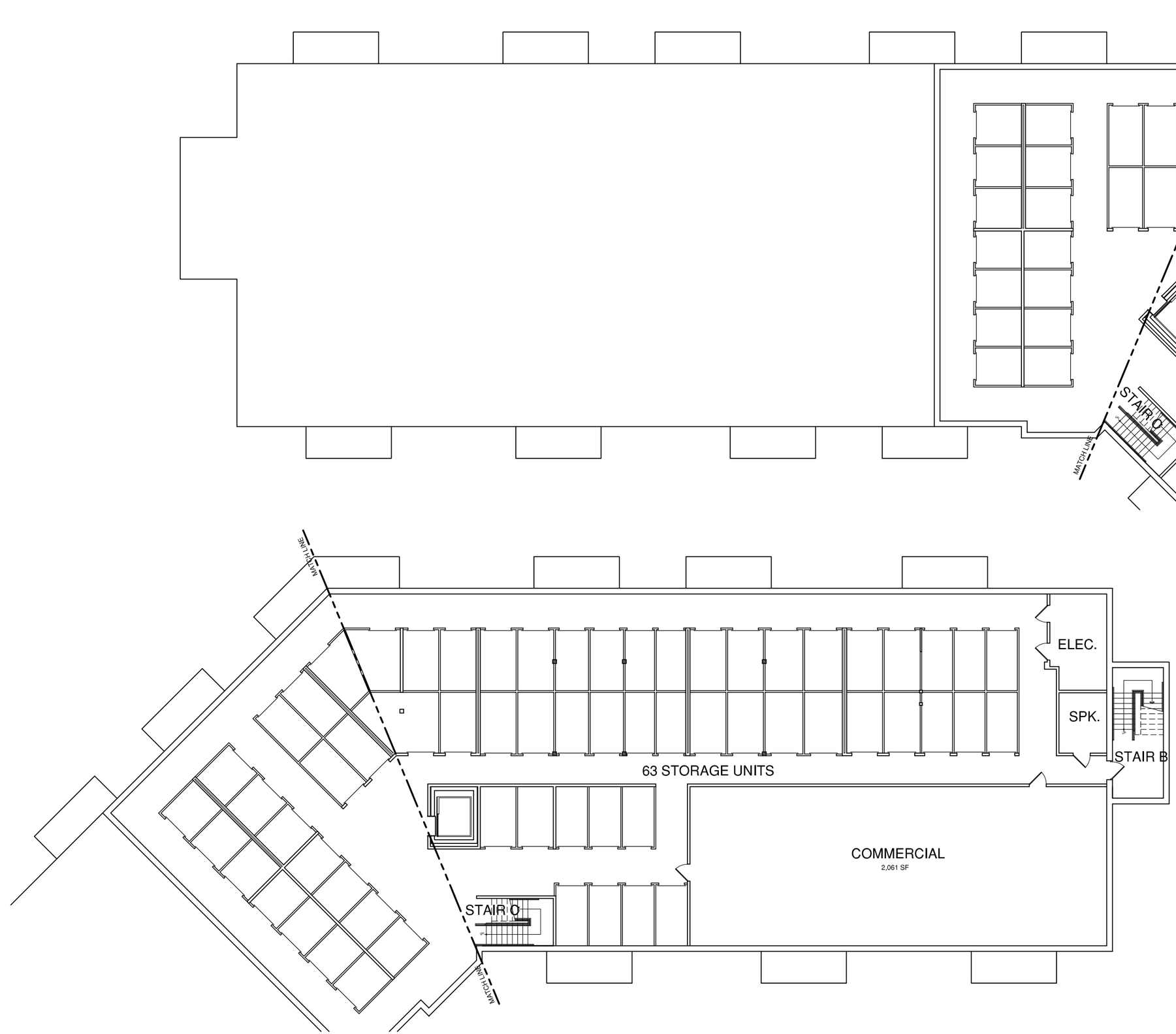

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SHEET TITLE: BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

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SHEET TITLE: GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"
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SHEET TITLE: SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"
SHEET NO.: A1.2
JOB NO.: 20080

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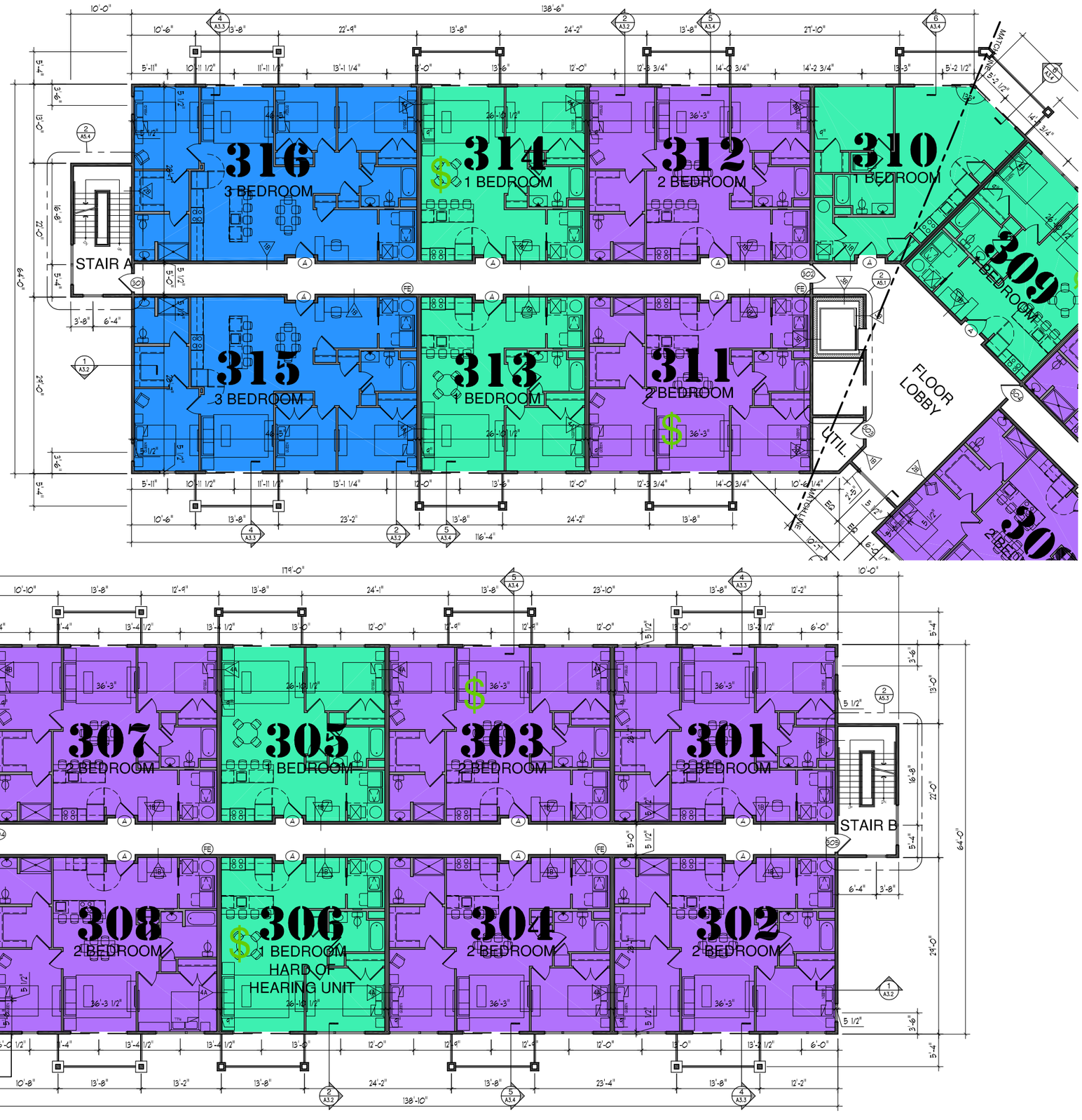

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SHEET TITLE: THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

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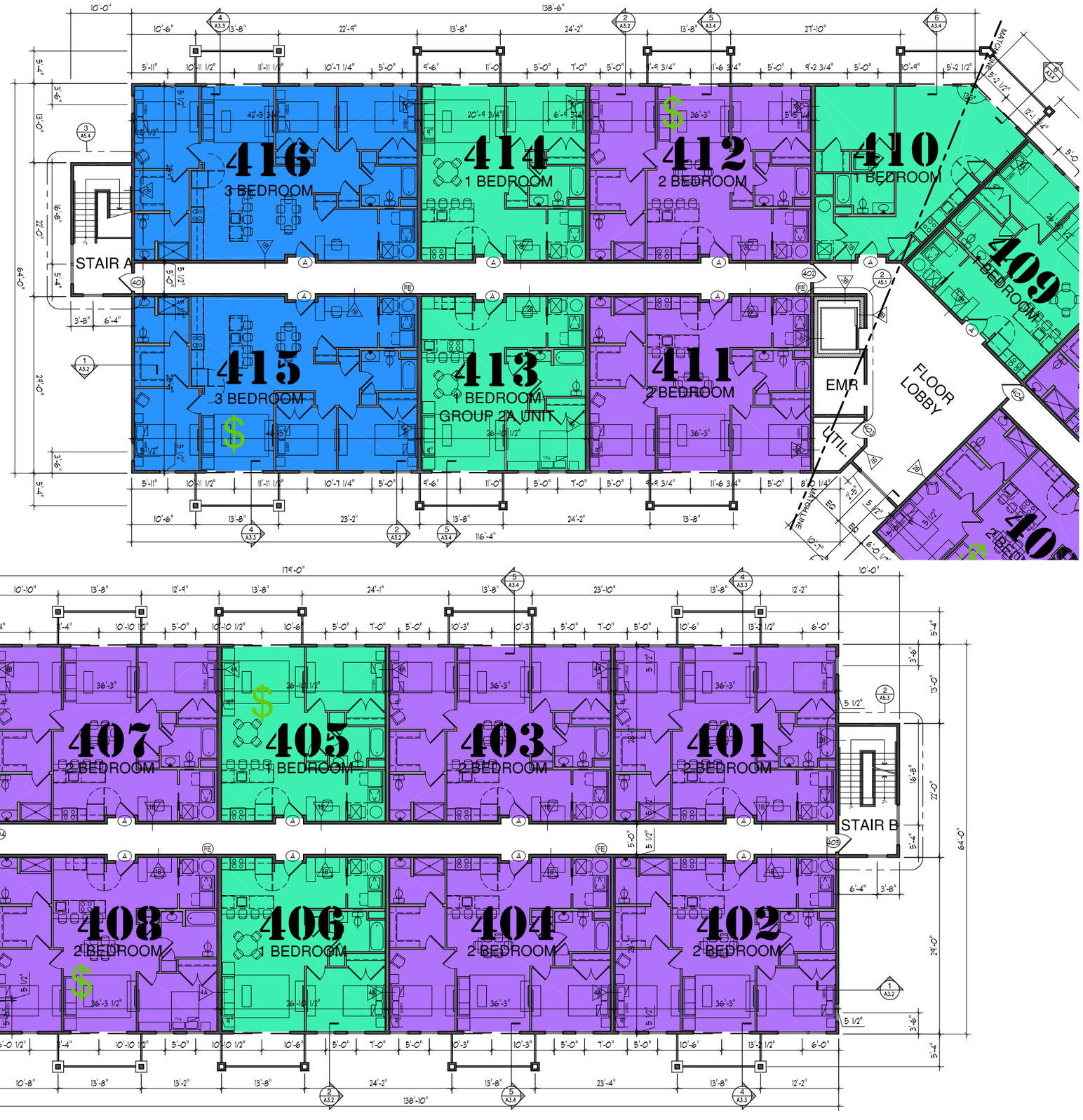

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SHEET TITLE: FOURTH FLOOR PLAN

SCALE: 1/8" = 1'-0"

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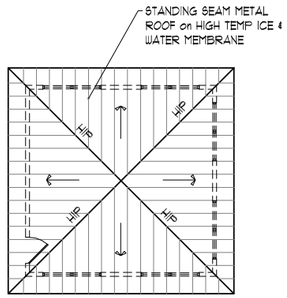
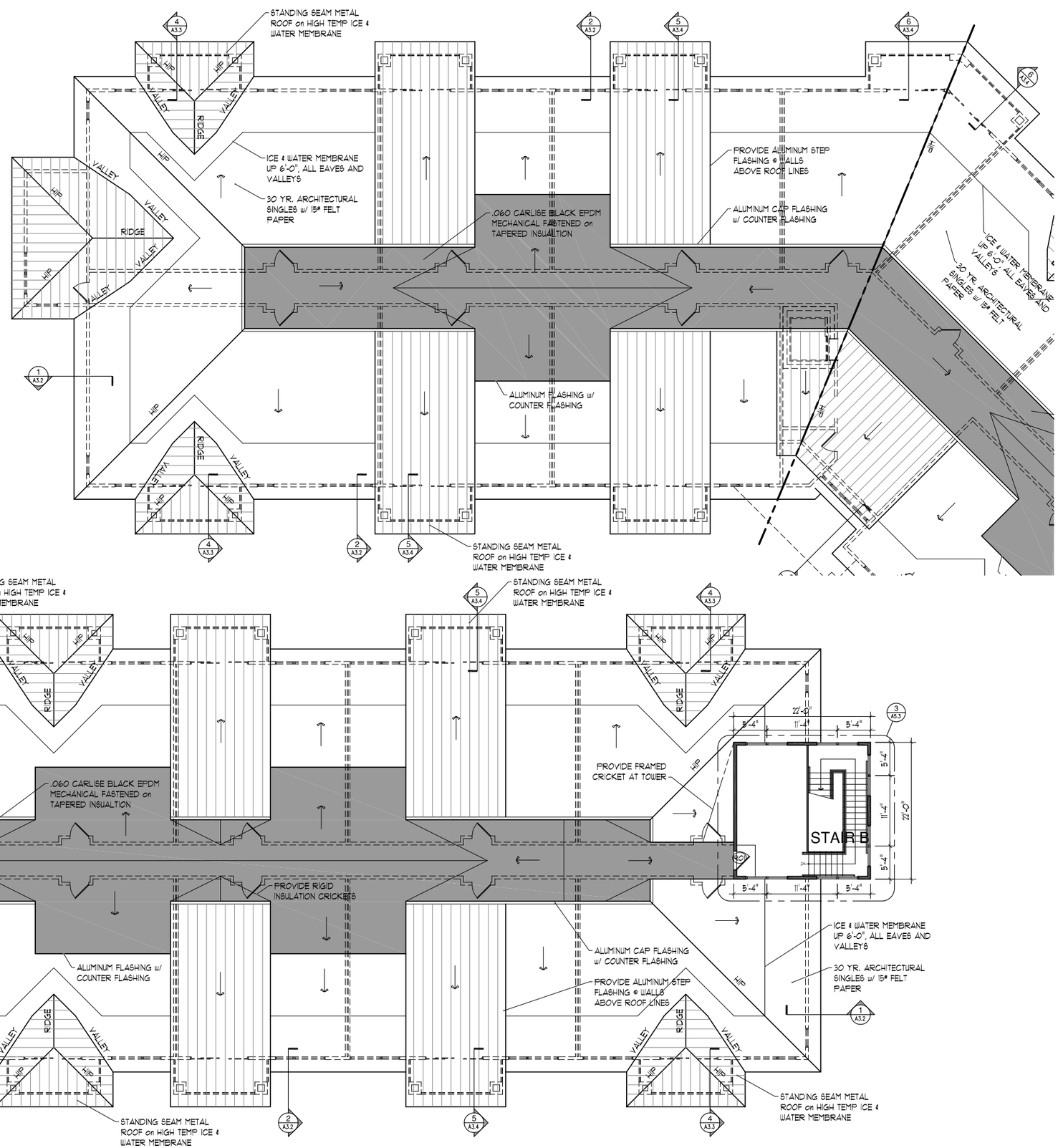


STAIR B TOWER ROOF



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SHEET TITLE: FOURTH FLOOR PLAN

SCALE: 1/8" = 1'-0"

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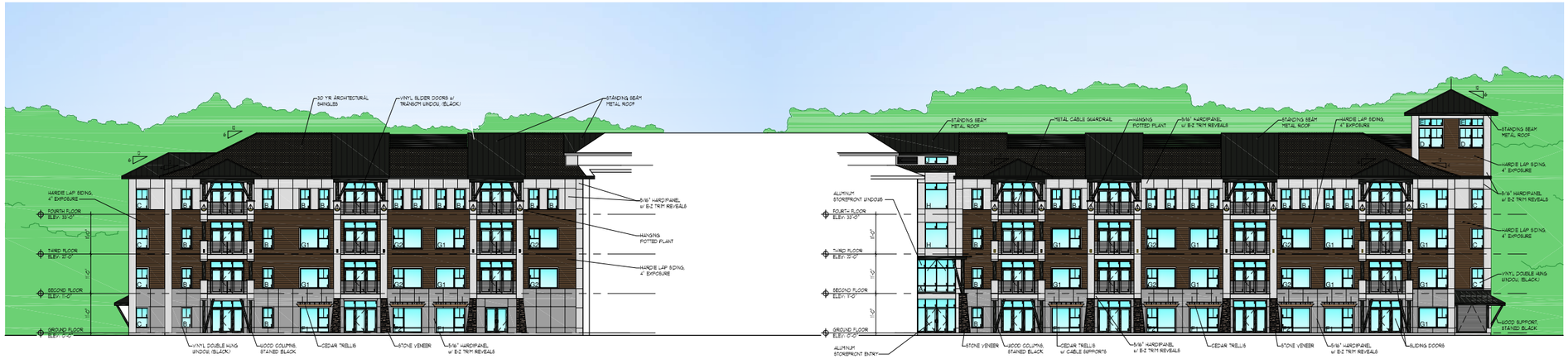

1 FRONT ELEVATIONS
1/16" = 1'-0"

2 LEFT SIDE ELEVATION
1/16" = 1'-0"

3 RIGHT SIDE ELEVATION
1/16" = 1'-0"

4 REAR ELEVATIONS
1/16" = 1'-0"

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SHEET TITLE: OVERALL ELEVATIONS

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2 FRONT ELEVATION - RIGHT SIDE
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SHEET TITLE: EXTERIOR ELEVATIONS
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SHEET TITLE: EXTERIOR ELEVATIONS

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2 REAR ELEVATION - RIGHT SIDE
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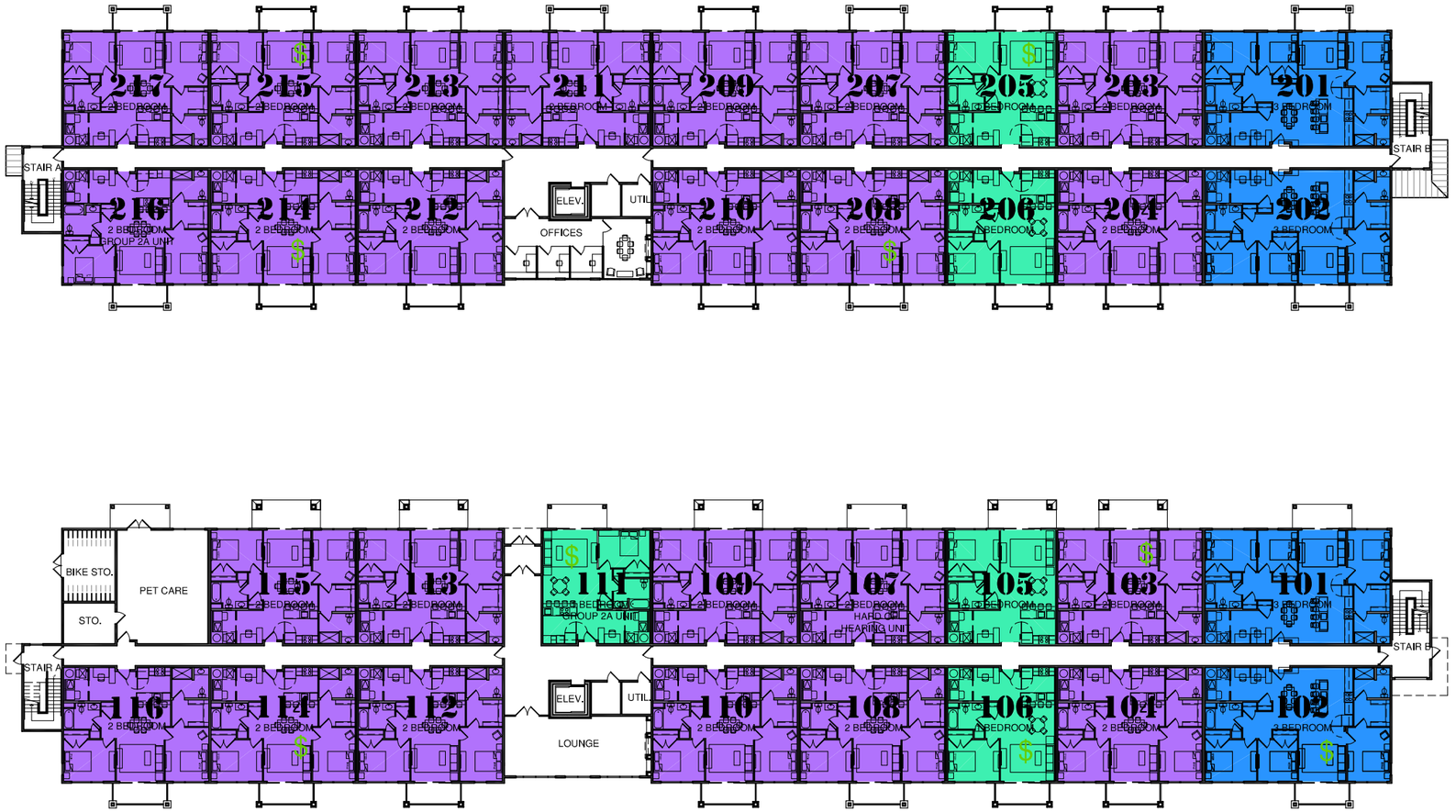

UNIT SCHEDULE

TYPE	DESCRIPTION	SQUARE FOOTAGE	QUANTITY BY BUILDING					TOTALS	521 CMR (ADA)		REMARKS
			BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5		GROUP 2A (5%)	HEARING IMPAIRED (2%)	
1	ONE BEDROOM W/ DEN	863±	22	9	34	23	7	95	5	2	
2	TWO BEDROOM W/ DEN	1,133±	30	50	48	30	15	173	9	3	
3	THREE BEDROOM W/ DEN	1,447±	8	8	8	8		32	2	1	
	TOTALS		60	67	90	61	22	300	15 UNITS NEEDED	6 UNITS NEEDED	

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BROADWAY VILLAGE
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SHEET TITLE:
OVERALL BUILDING PLANS

SCALE: 1/16" = 1'-0"

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JOB NO.: 20080

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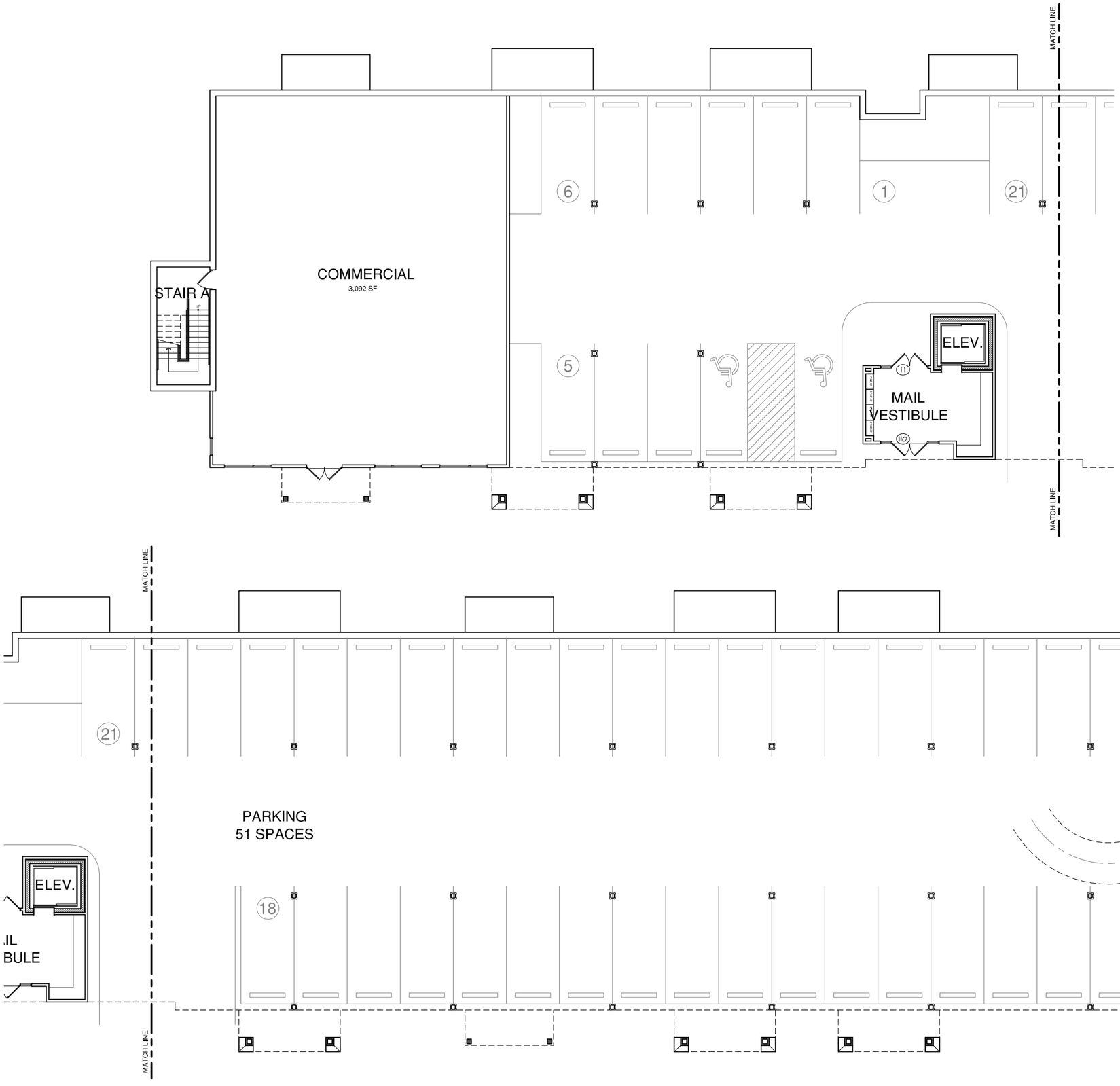

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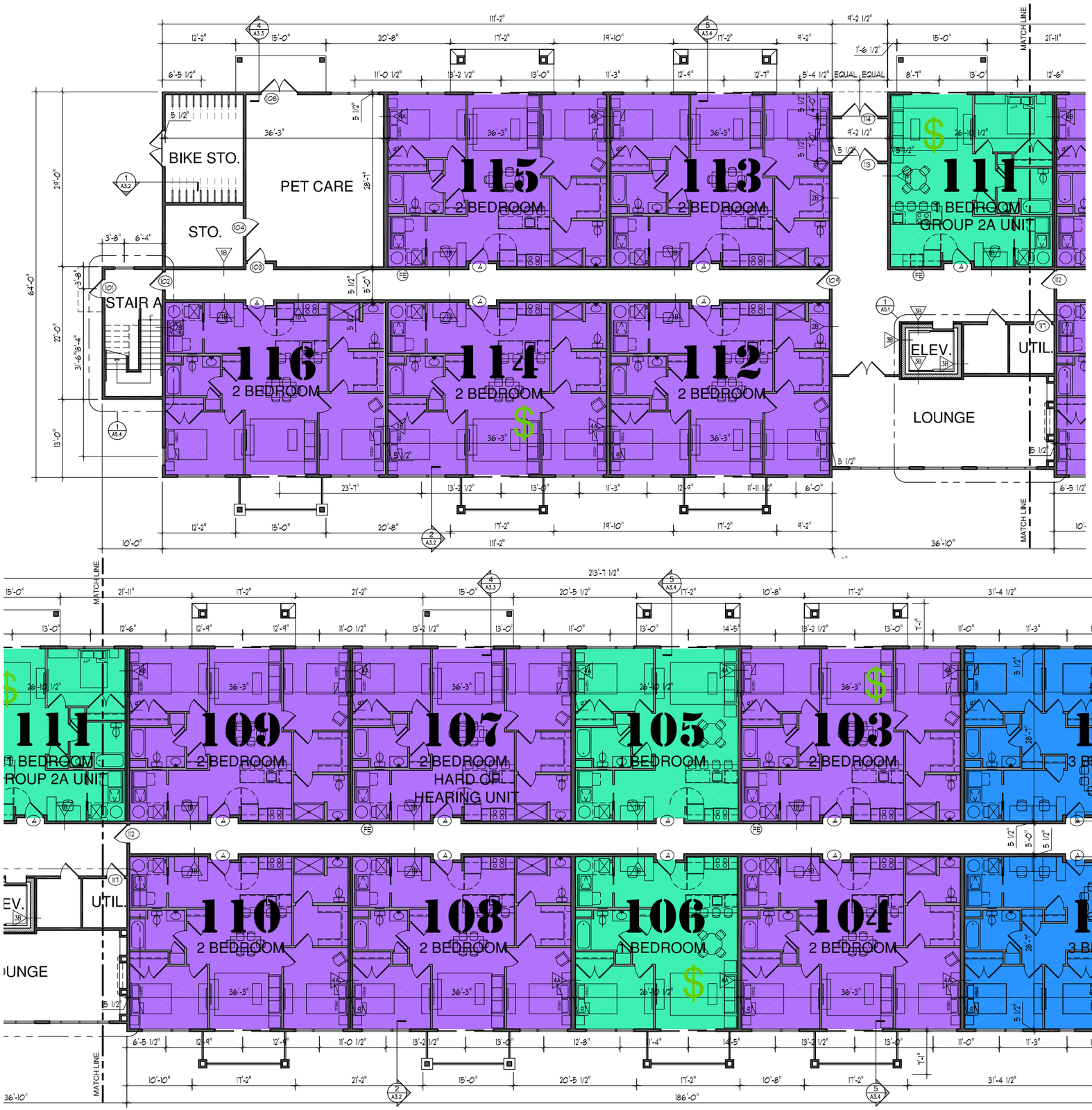

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SEP 20 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: GROUND FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.1

JOB NO.: 20080

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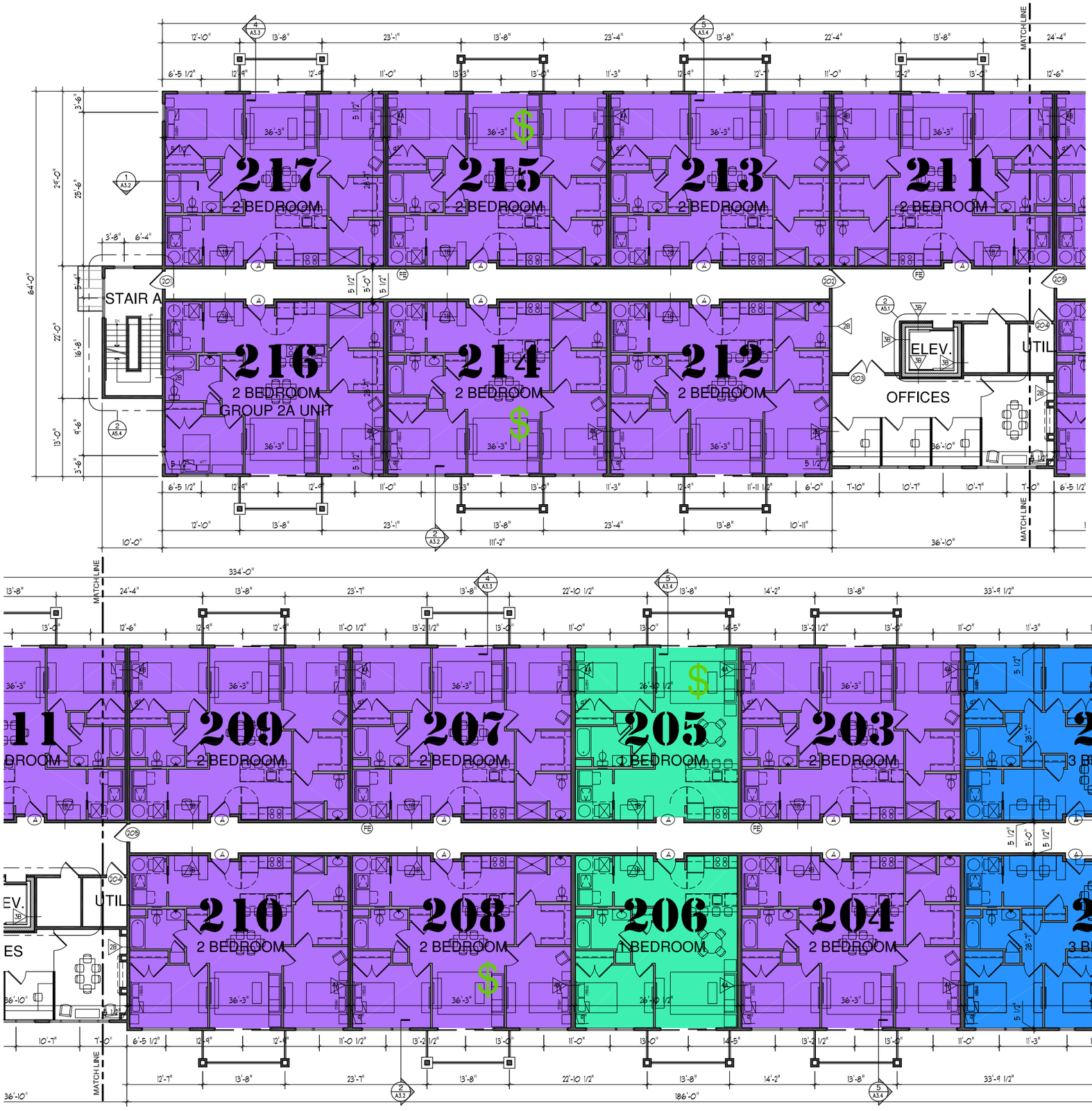

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No. 5496
MANSFIELD, MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:	
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SEP 20 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.2

JOB NO.: 20080

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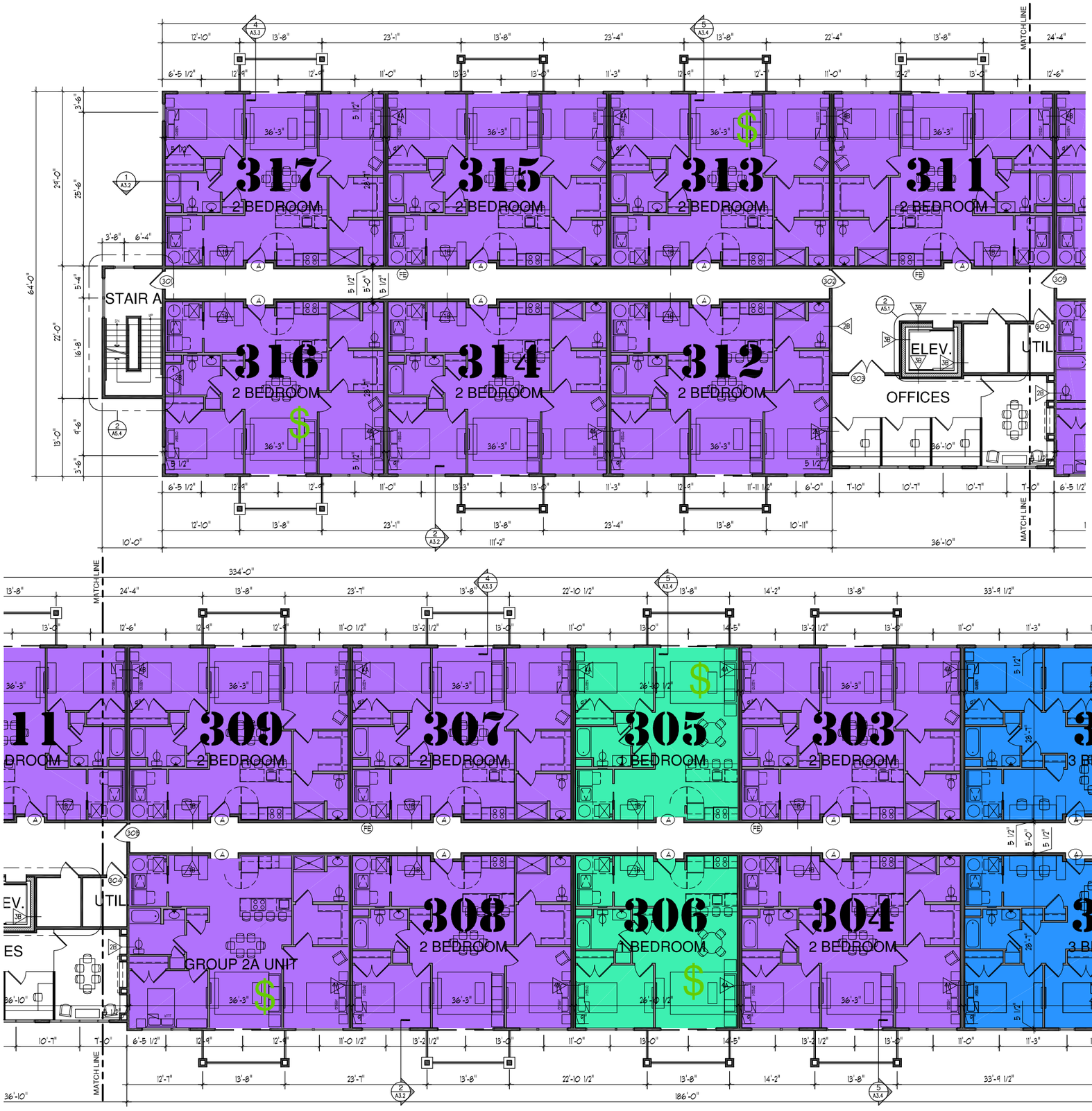

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BROADWAY
VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.3

JOB NO.: 20080

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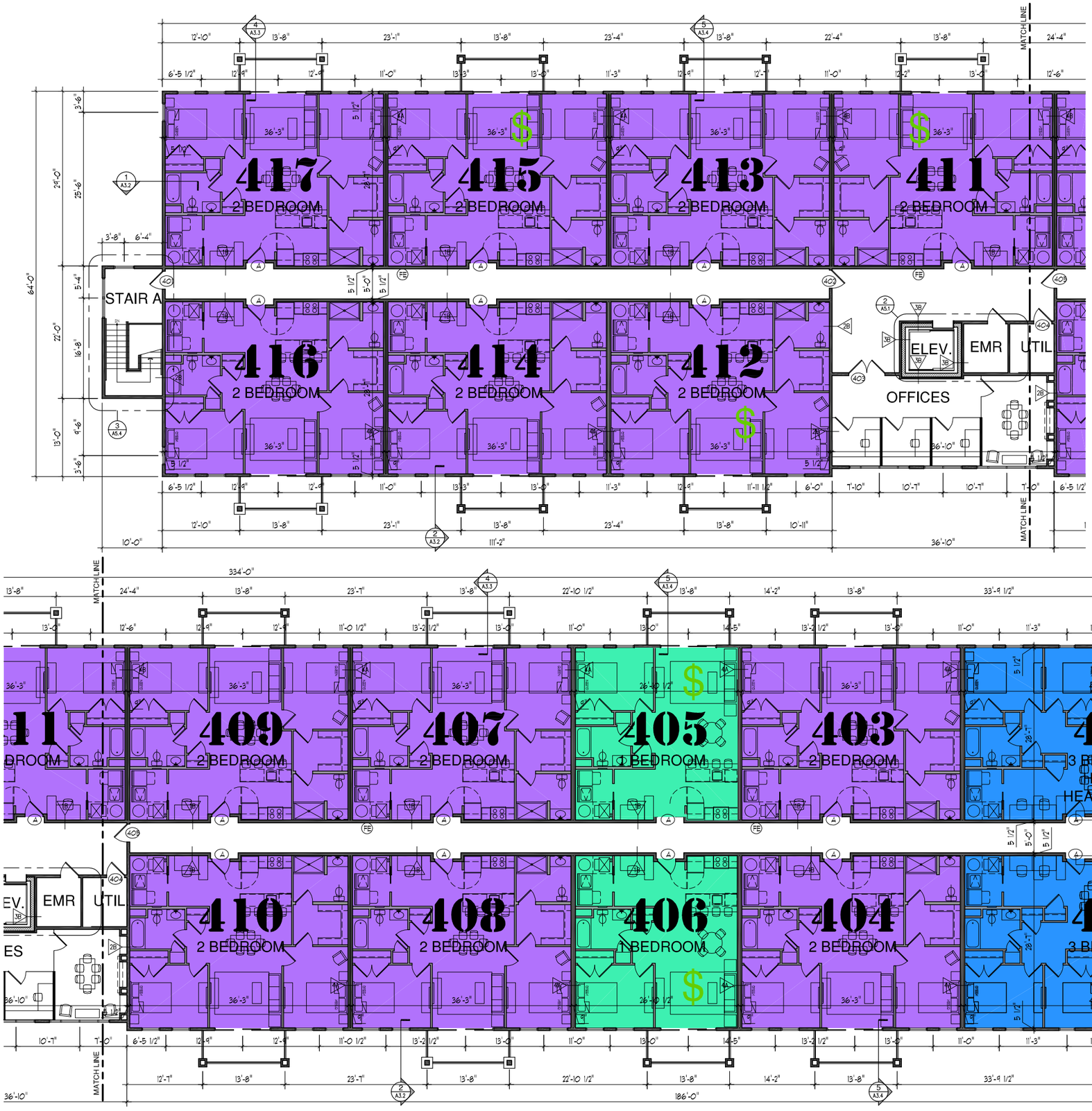

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SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: FOURTH FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.4

JOB NO.: 20080

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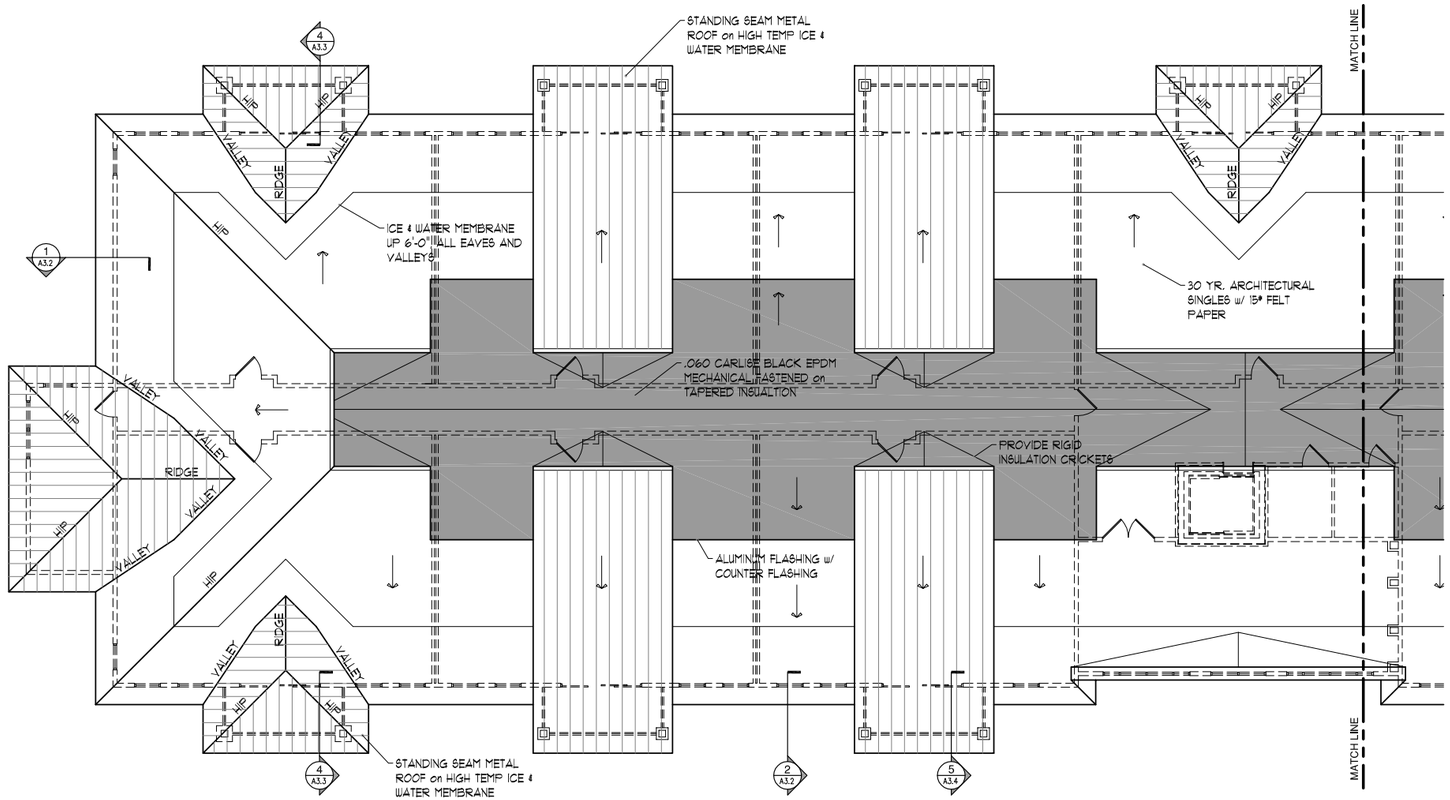

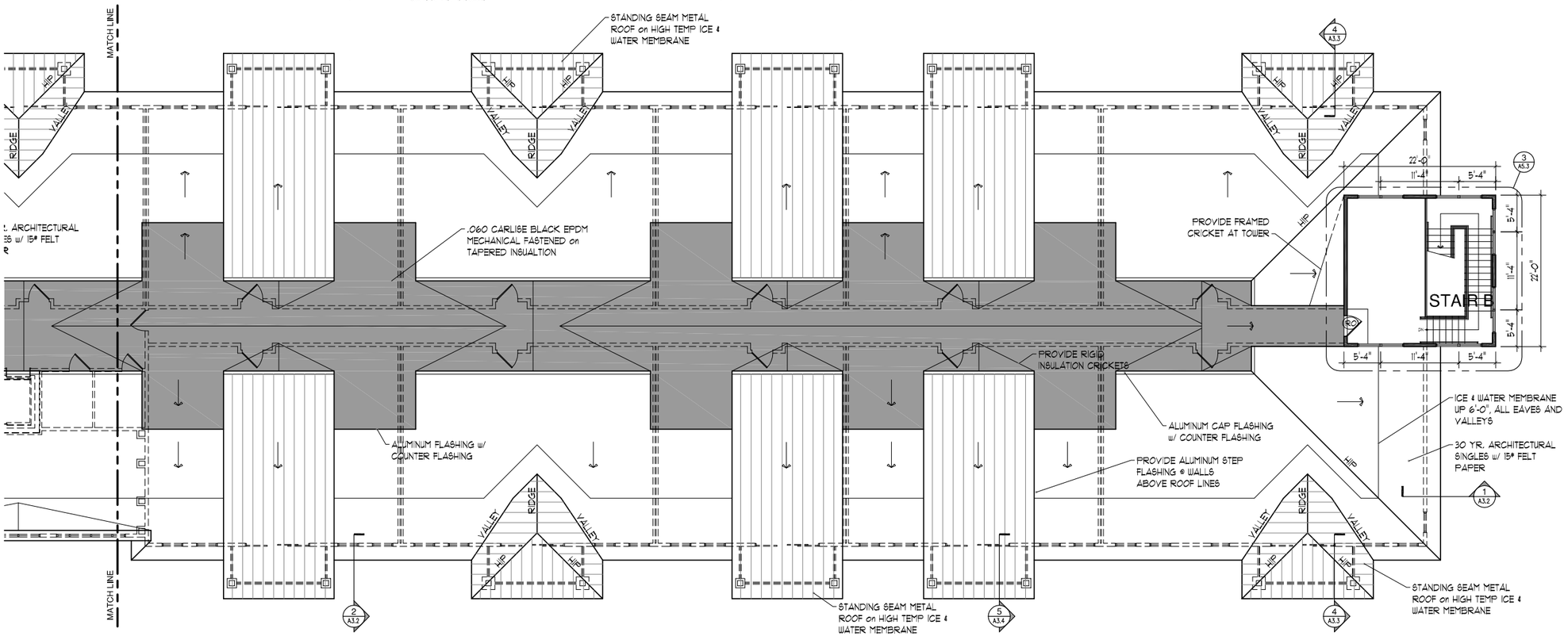

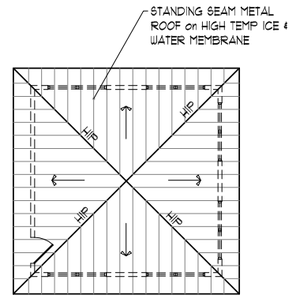

STAIR B TOWER ROOF

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BROADWAY VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: ROOF PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.5

JOB NO.: 20080

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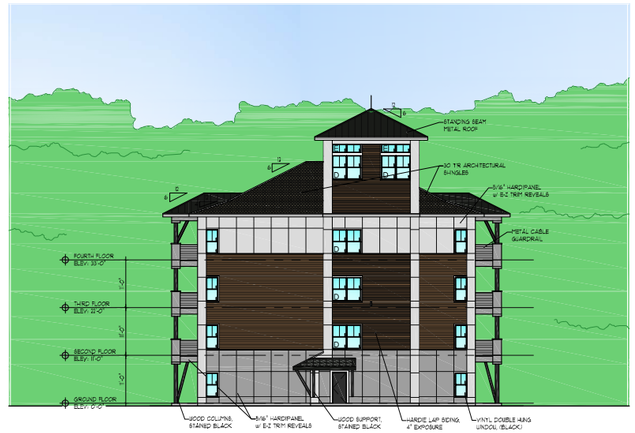
1 FRONT ELEVATIONS
1/16" = 1'-0"

2 LEFT SIDE ELEVATION
1/16" = 1'-0"



3 RIGHT SIDE ELEVATION
1/16" = 1'-0"

4 REAR ELEVATIONS
1/16" = 1'-0"

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BROADWAY VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: OVERALL ELEVATIONS
SCALE: 1/16" = 1'-0"
SHEET NO.: A2.0
JOB NO.: 20080

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1 FRONT ELEVATION - LEFT SIDE
1/8" = 1'-0"

2 FRONT ELEVATION - RIGHT SIDE
1/8" = 1'-0"

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BROADWAY VILLAGE
- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.1

JOB NO.: 20080

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1 LEFT SIDE ELEVATION
1/8" = 1'-0"

2 RIGHT SIDE ELEVATION
1/8" = 1'-0"

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BROADWAY
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- Building #2 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.2

JOB NO.: 20080

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1 REAR ELEVATION - LEFT SIDE
1/8" = 1'-0"

2 REAR ELEVATION - RIGHT SIDE
1/8" = 1'-0"

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- Building #2 -
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SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.3

JOB NO.: 20080

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UNIT SCHEDULE

TYPE	DESCRIPTION	SQUARE FOOTAGE	QUANTITY BY BUILDING					TOTALS	521 CMR (ADA)		REMARKS
			BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5		GROUP 2A (5%)	HEARING IMPAIRED (2%)	
1	ONE BEDROOM W/ DEN	863±	22	9	34	23	7	95	5	2	
2	TWO BEDROOM W/ DEN	1,133±	30	50	48	30	15	173	9	3	
3	THREE BEDROOM W/ DEN	1,447±	8	8	8	8		32	2	1	
	TOTALS		60	67	90	61	22	300	15 UNITS NEEDED	6 UNITS NEEDED	

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No. 5496
MASSACHUSETTS
USA

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BROADWAY VILLAGE
- Building #3 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: OVERALL BUILDING PLANS

SCALE: 1/16" = 1'-0"

SHEET NO.: A0.1

JOB NO.: 20080

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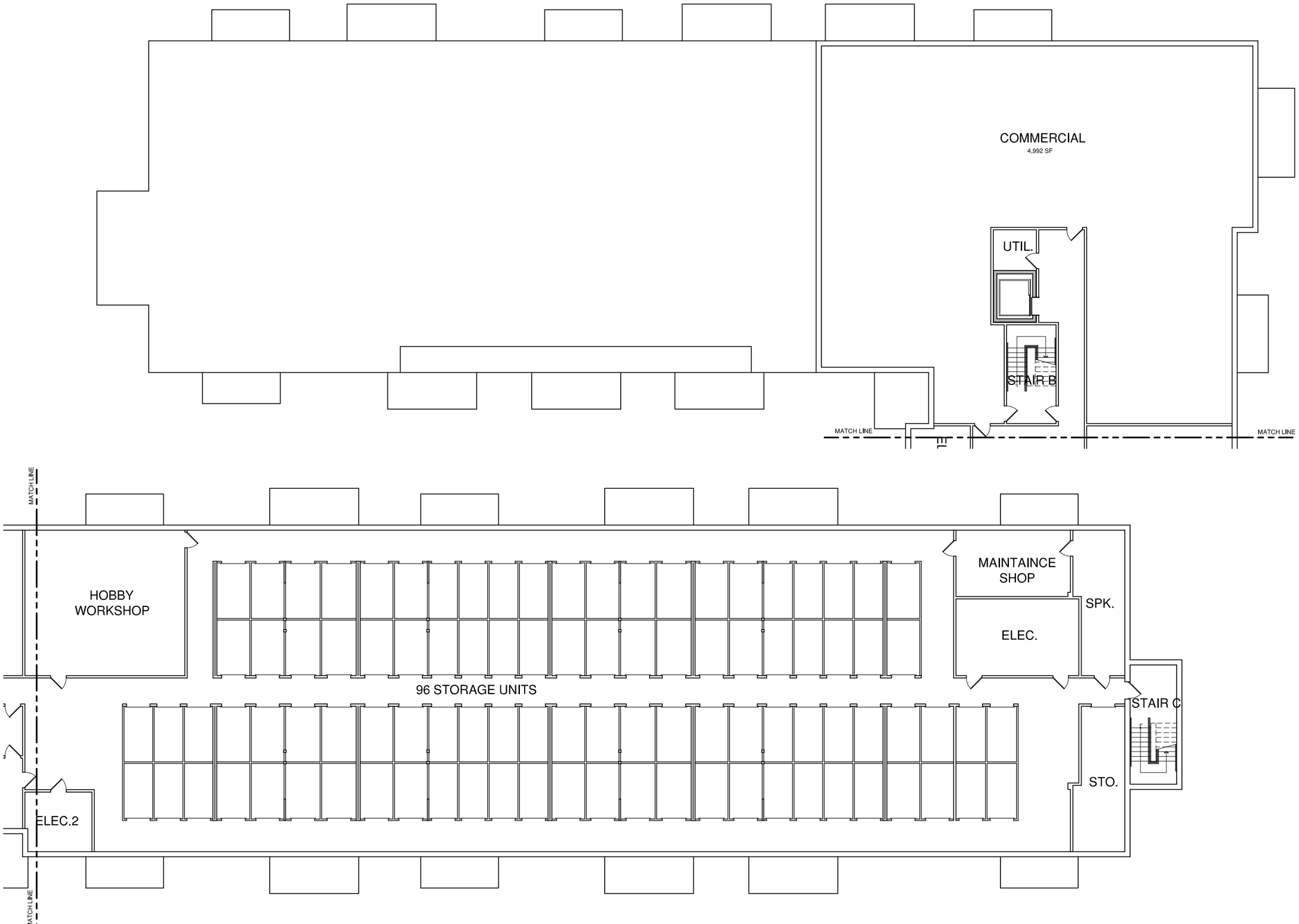

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BROADWAY
VILLAGE
- Building #3 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
BASEMENT
FLOOR PLAN

SCALE:
1/8" = 1'-0"

SHEET NO.:
A1.0

JOB NO.:
20080

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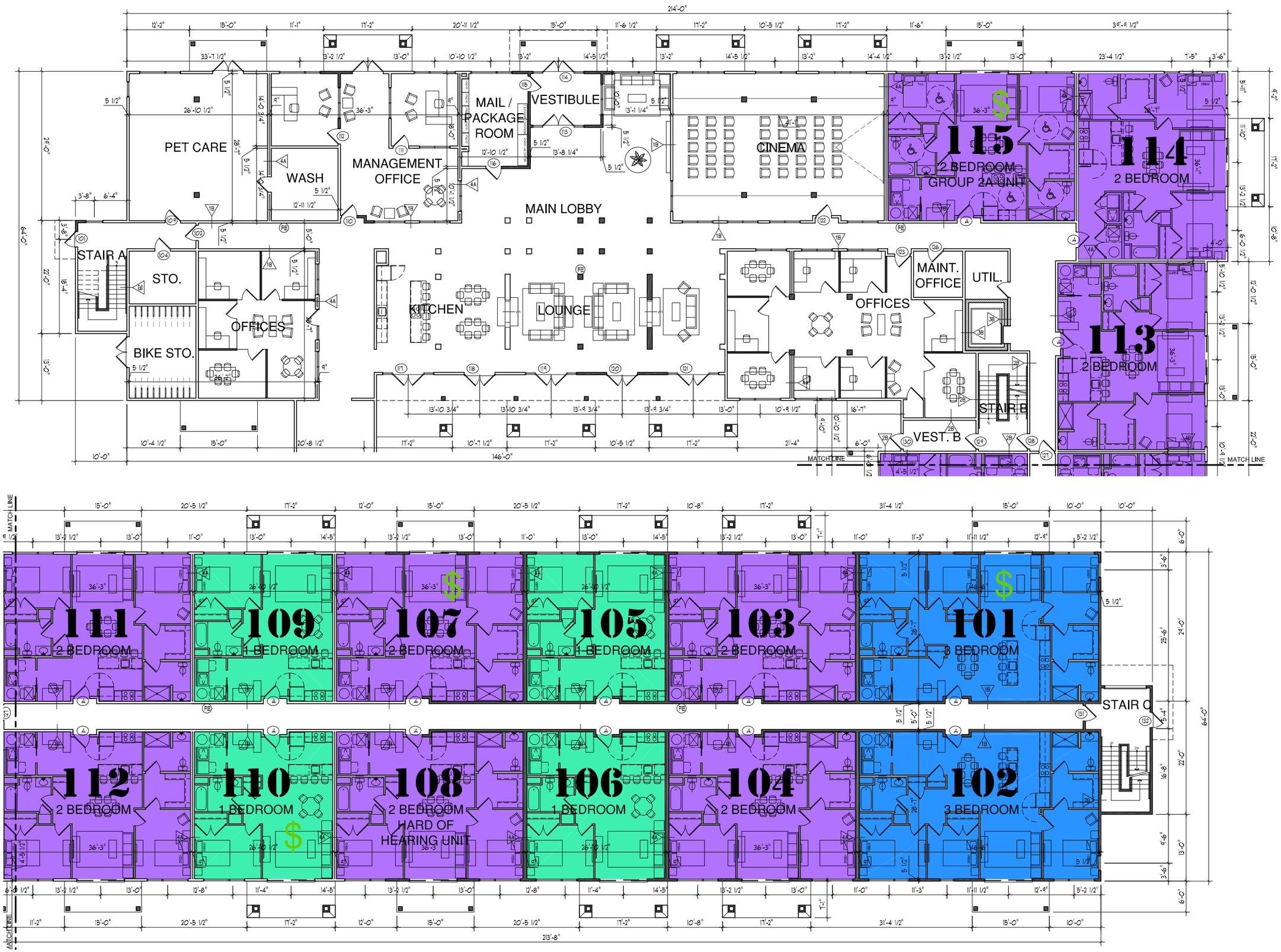

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SHEET TITLE: GROUND FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.1

JOB NO.: 20080

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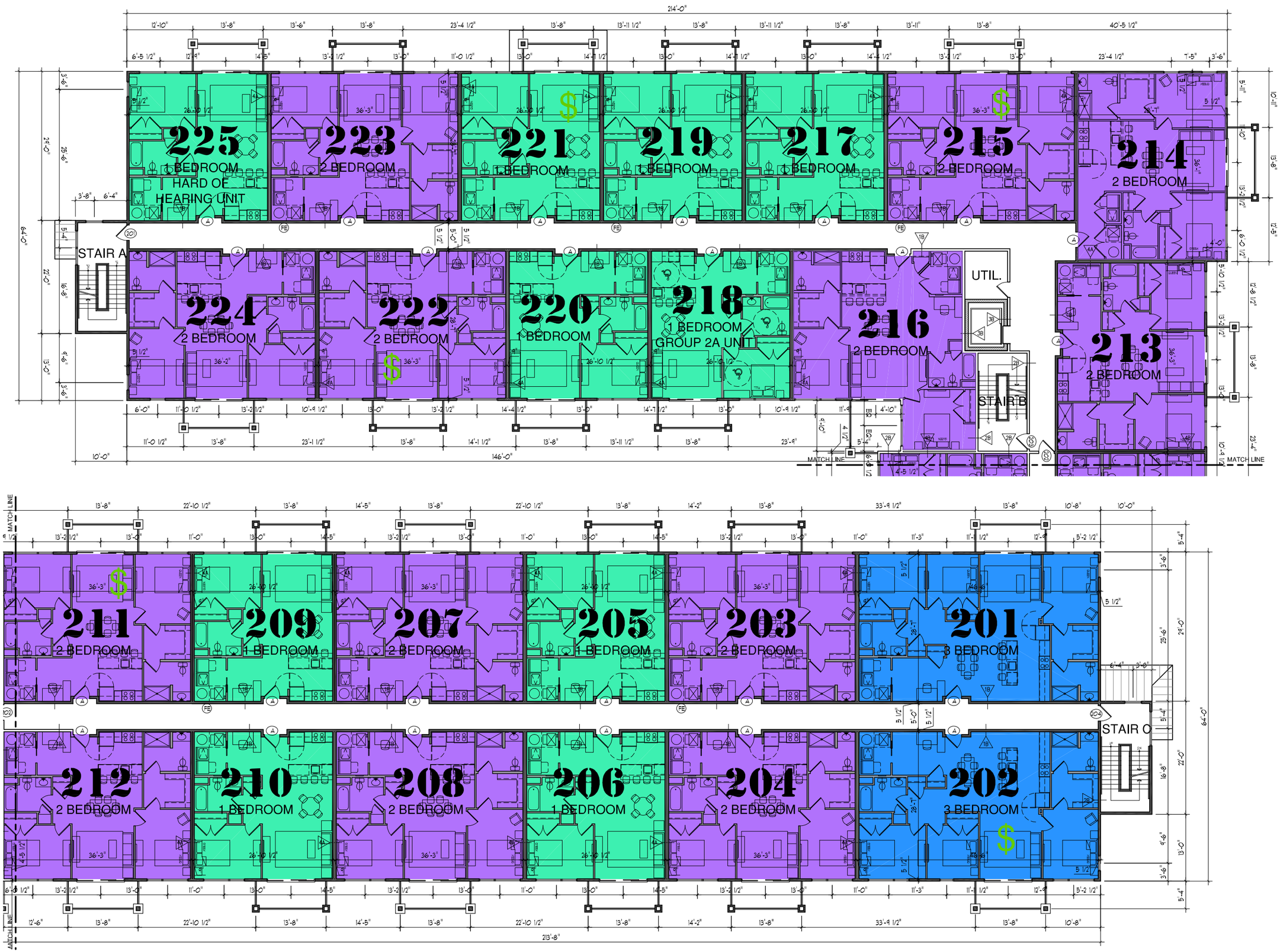

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BROADWAY
VILLAGE
- Building #3 -

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SHEET TITLE: SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.2

JOB NO.: 20080

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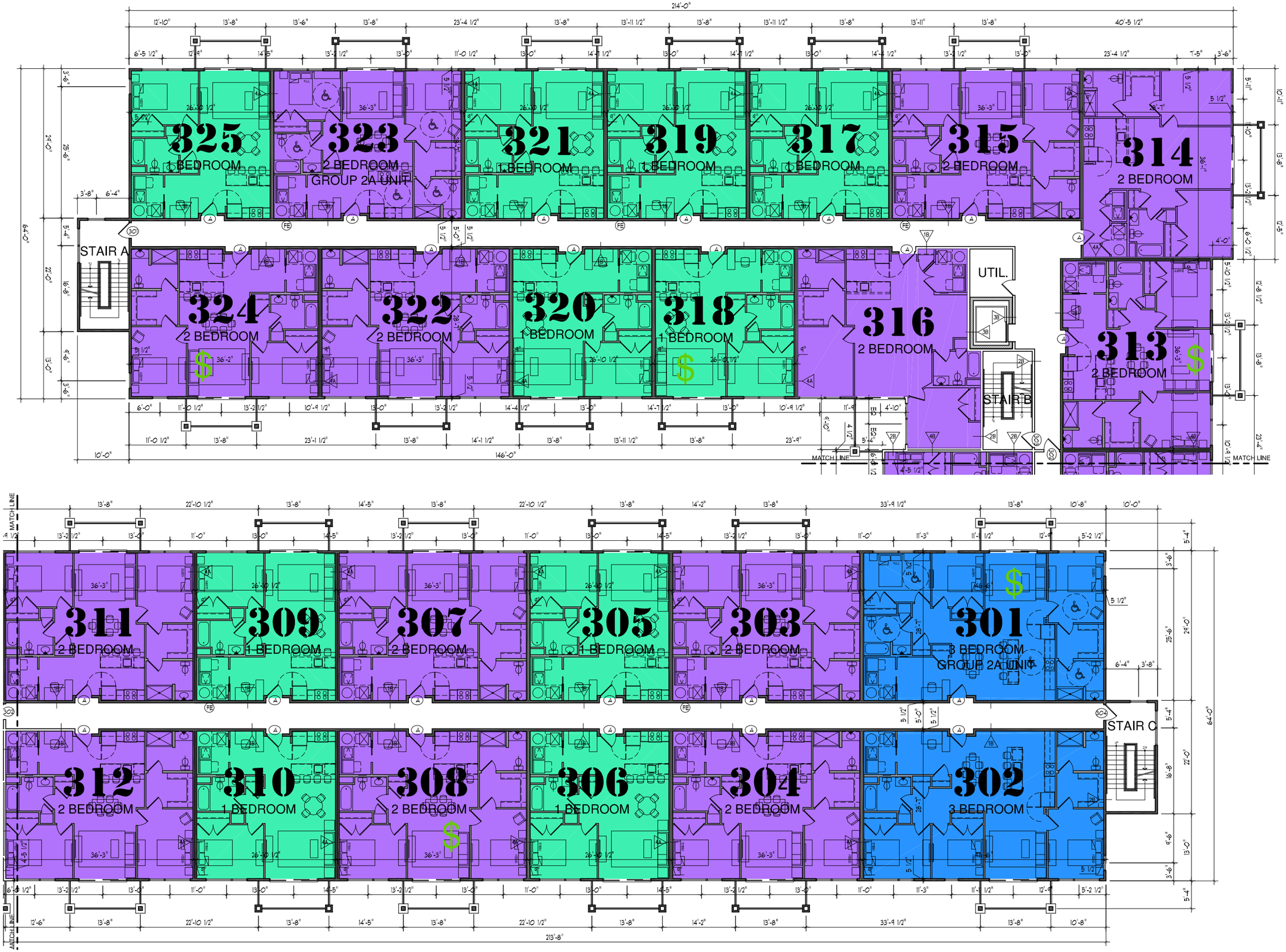

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- Building #3 -

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SHEET TITLE: THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.3

JOB NO.: 20080

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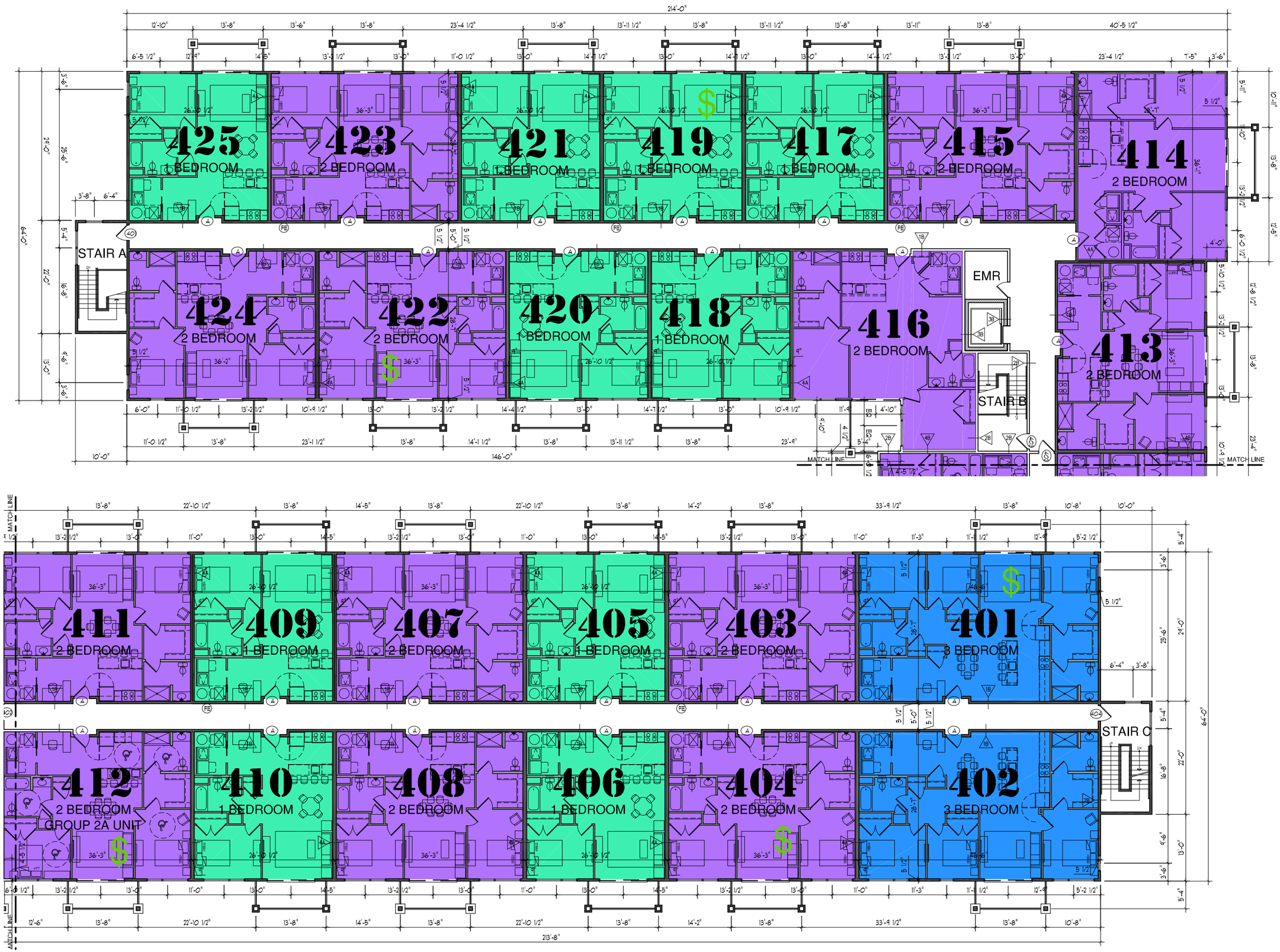

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VILLAGE
- Building #3 -

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SHEET TITLE: FOURTH FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.4

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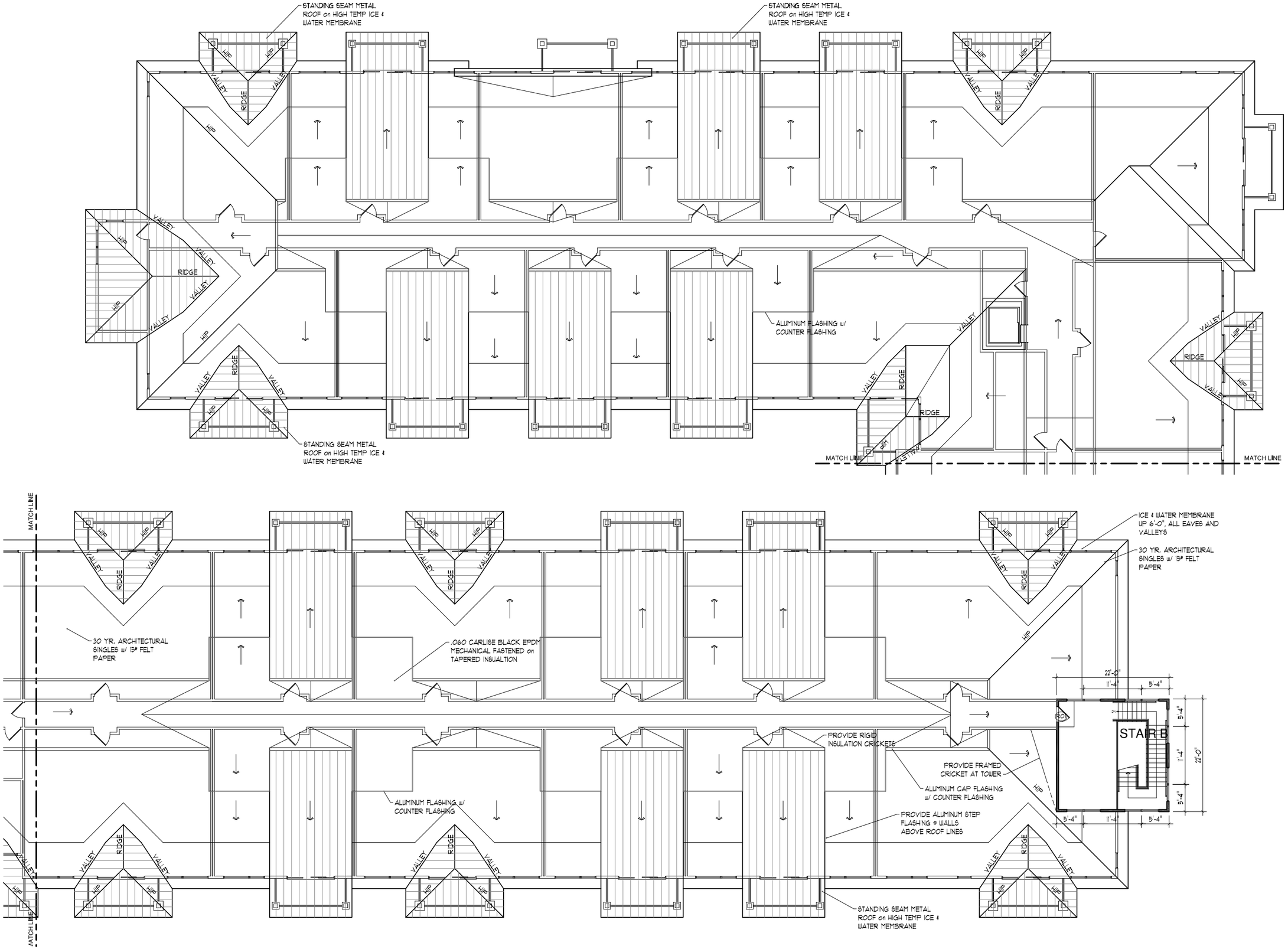

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BROADWAY VILLAGE
- Building #3 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: ROOF PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.5

JOB NO.: 20080

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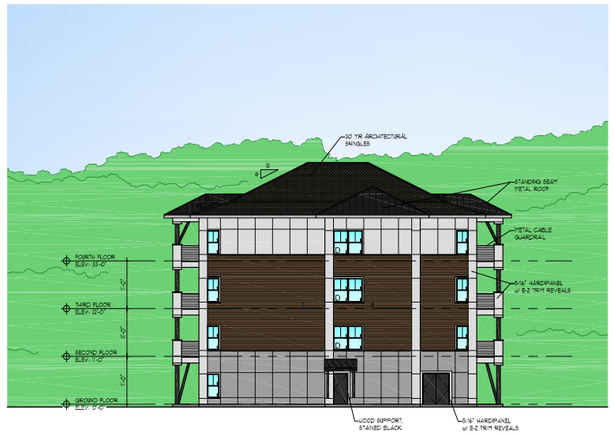
1 FRONT ELEVATION
1/16" = 1'-0"

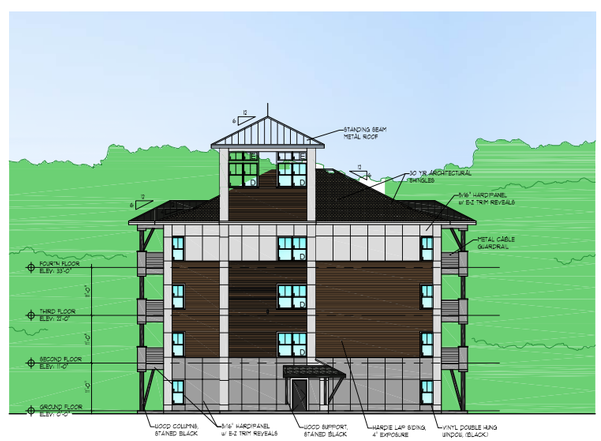
2 REAR ELEVATION
1/16" = 1'-0"



3 RIGHT SIDE ELEVATION
1/16" = 1'-0"

4 LEFT SIDE ELEVATION
1/16" = 1'-0"

5 LEFT SIDE BACK ELEVATION
1/16" = 1'-0"



6 REAR END ELEVATION
1/16" = 1'-0"

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BROADWAY VILLAGE
- Building #3 -
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SHEET TITLE:
OVERALL ELEVATIONS

SCALE: 1/16" = 1'-0"

SHEET NO.: A2.0

JOB NO.: 20080

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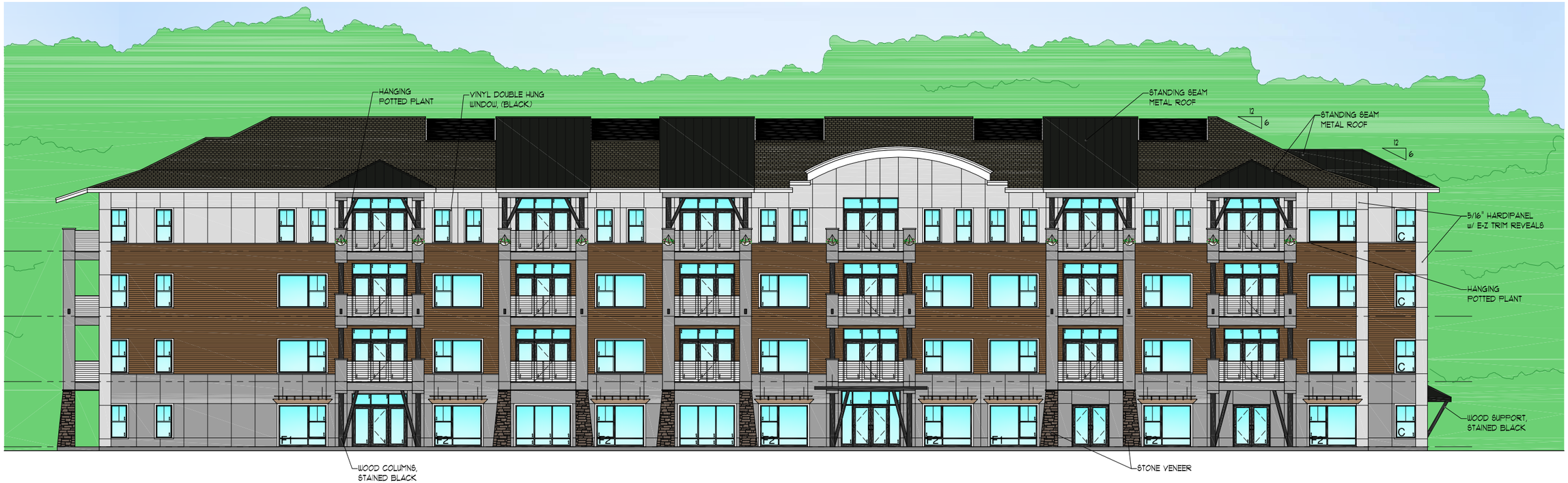

① FRONT ELEVATION
1/8" = 1'-0"

② REAR ELEVATION
1/8" = 1'-0"

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BROADWAY VILLAGE
- Building #3 -
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SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

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1 RIGHT SIDE ELEVATION
1/8" = 1'-0"

2 REAR END ELEVATION
1/8" = 1'-0"

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BROADWAY
VILLAGE
- Building #3 -
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Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.2

JOB NO.: 20080

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1 LEFT ELEVATION
1/8" = 1'-0"

2 LEFT ELEVATION - CONT.
1/8" = 1'-0"

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SHEET TITLE: EXTERIOR ELEVATIONS
SCALE: 1/8" = 1'-0"
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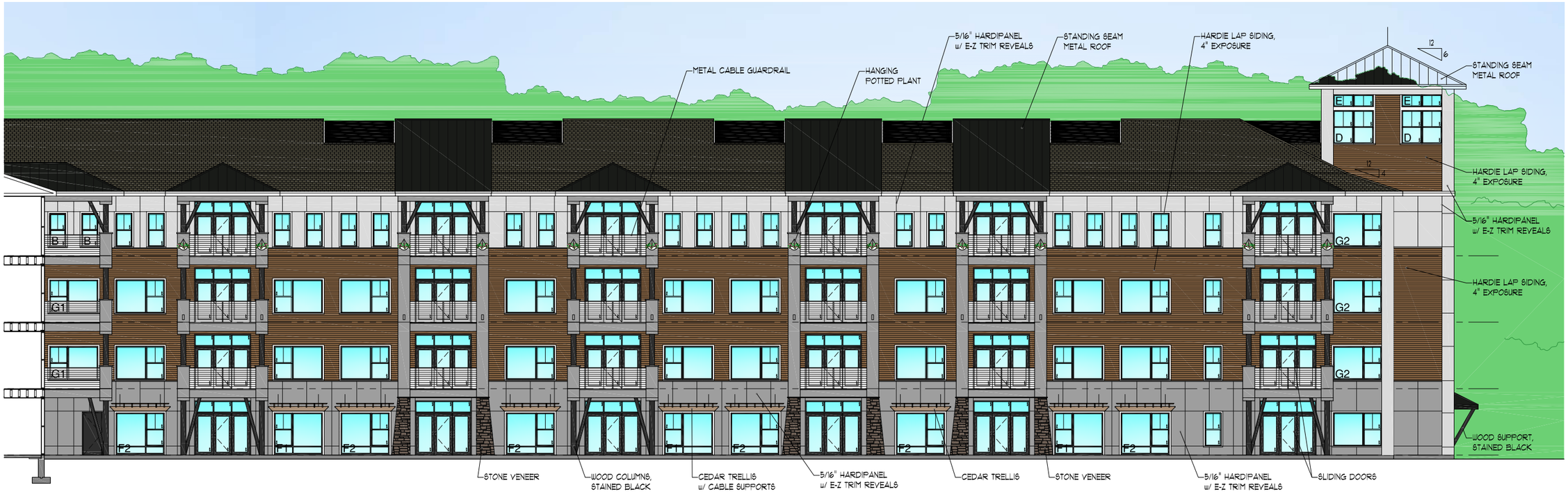

1 LEFT SIDE BACK ELEVATION
1/8" = 1'-0"

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BROADWAY
VILLAGE
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Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.4

JOB NO.: 20080

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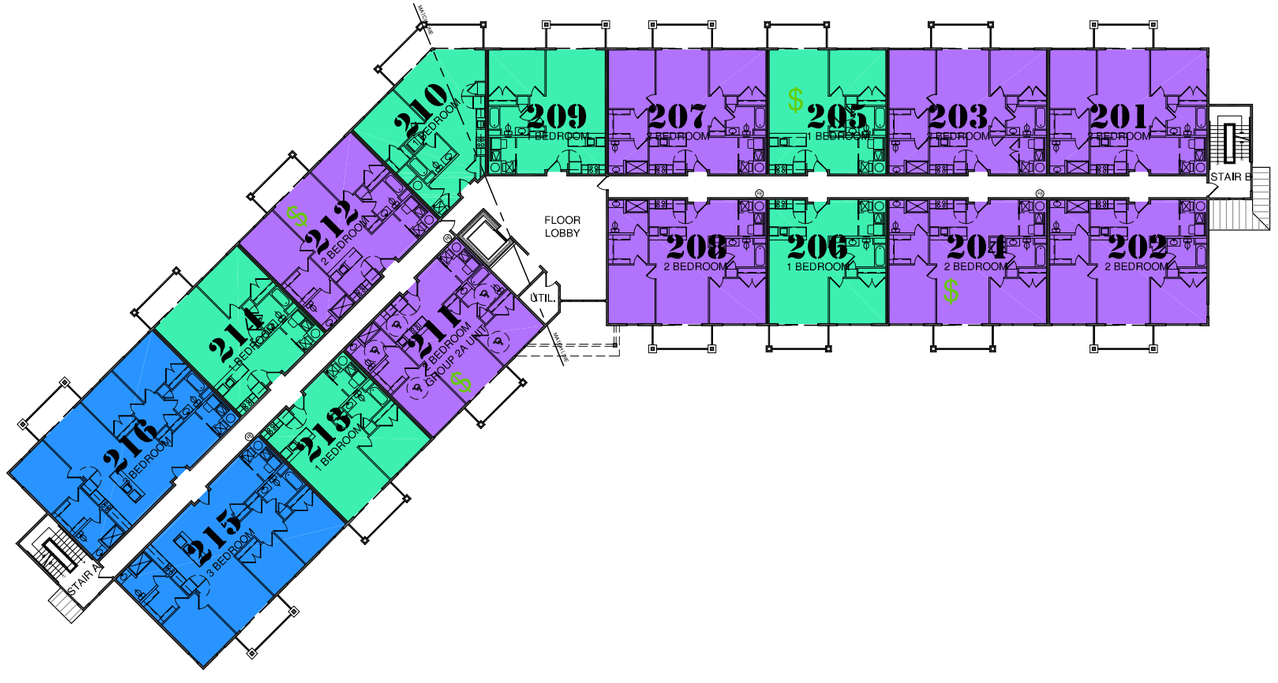
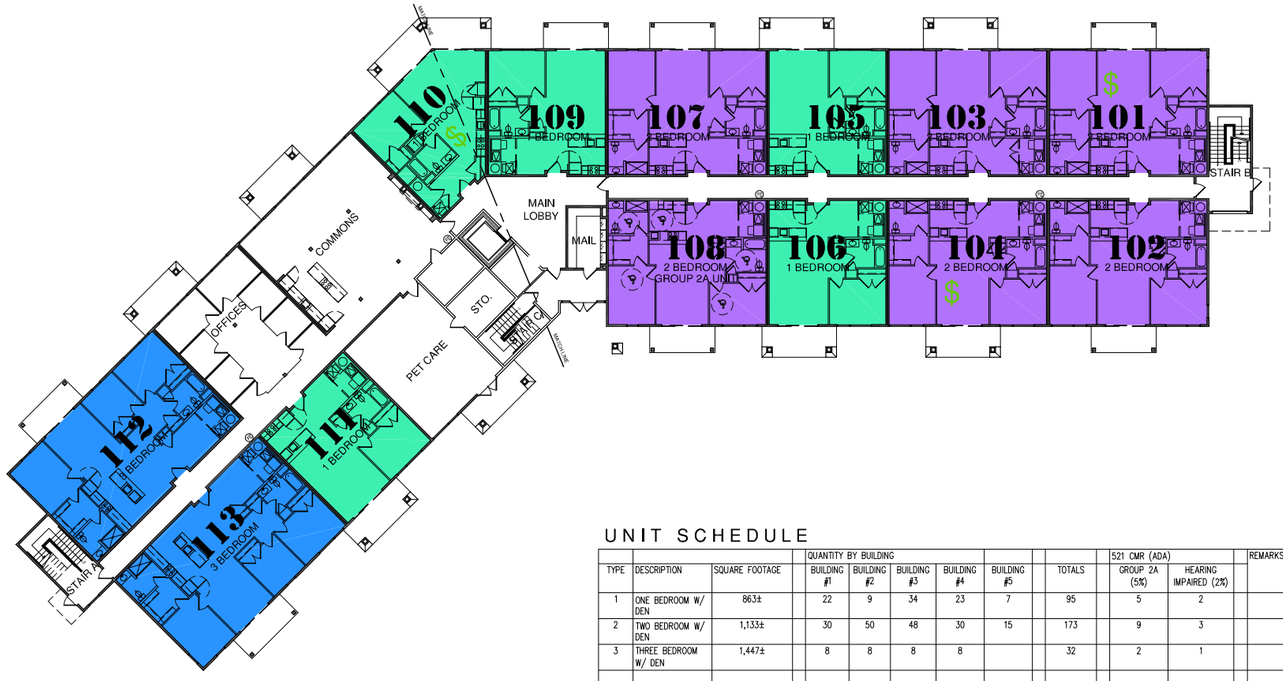


TYPICAL UPPER FLOOR

SECOND FLOOR SHOWN



GROUND FLOOR

UNIT SCHEDULE

TYPE	DESCRIPTION	SQUARE FOOTAGE	QUANTITY BY BUILDING						521 CMR (ADA)		REMARKS
			BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5	TOTALS	GROUP 2A (5%)	HEARING IMPAIRED (2%)	
1	ONE BEDROOM W/ DEN	863±	22	9	34	23	7	95	5	2	
2	TWO BEDROOM W/ DEN	1,133±	30	50	48	30	15	173	9	3	
3	THREE BEDROOM W/ DEN	1,447±	8	8	8	8		32	2	1	
	TOTALS		60	67	90	61	22	300	15 UNITS NEEDED	6 UNITS NEEDED	

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BROADWAY VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: OVERALL BUILDING PLANS

SCALE: 1/16" = 1'-0"

SHEET NO.: A0.1

JOB NO.: 20080

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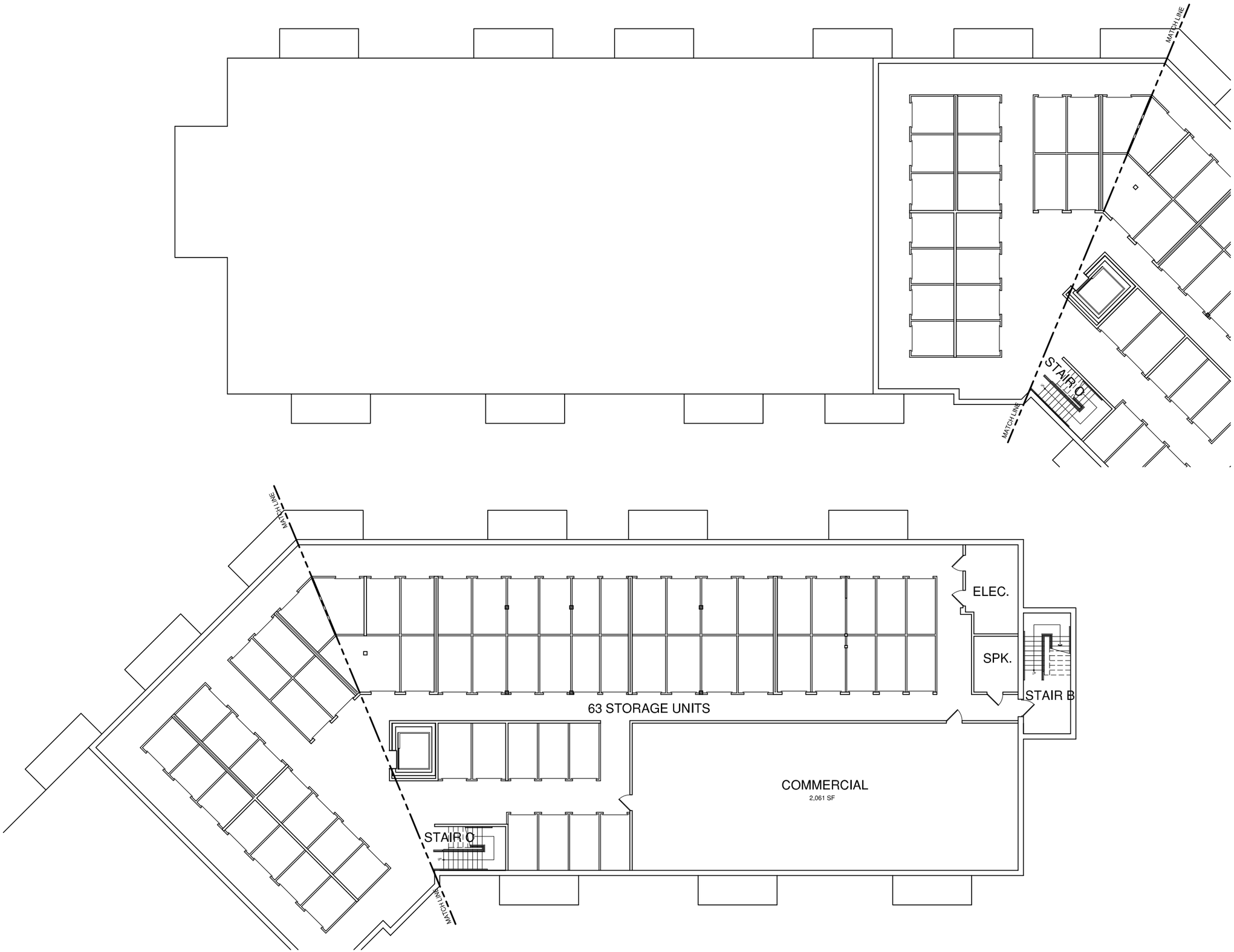

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THOMAS R. ANNINO
No. 5496
MARSHFIELD, MA
COMMONWEALTH OF MASSACHUSETTS

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BROADWAY
VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.0

JOB NO.: 20080

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FE PORTABLE FIRE EXTINGUISHERS
2-A:10-B:C IN SEMI-RECESSED
CABINETS, 42" AFF TO CENTER
(JL INDUSTRIES - 811G V1C-FX2)

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BROADWAY
VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"
SHEET NO.: A1.1
JOB NO.: 20080

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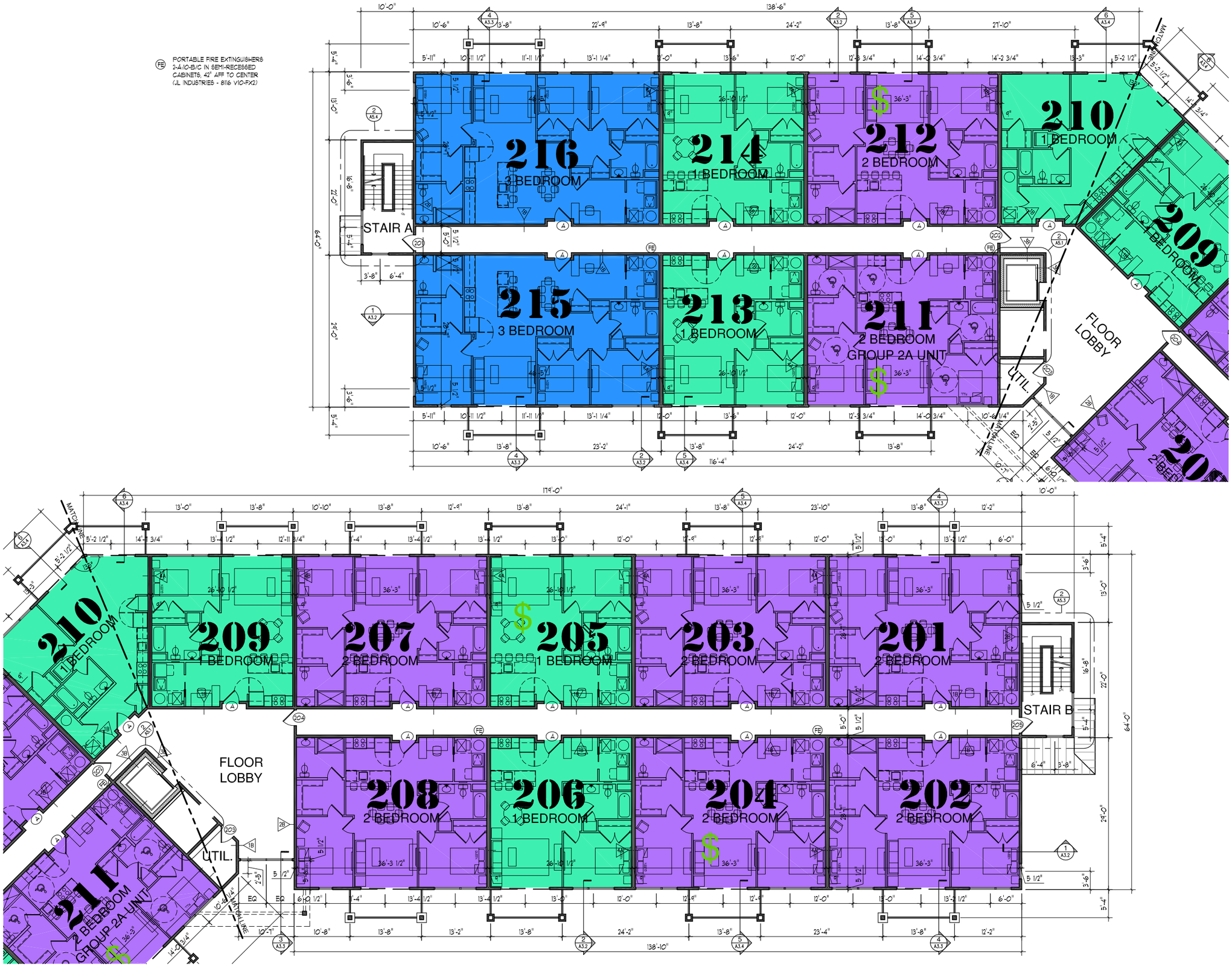
FE PORTABLE FIRE EXTINGUISHERS
2-A:10-B/C IN SEMI-RECESSED
CABINETS, 42" AFF TO CENTER
(JL INDUSTRIES - 8116 VIC-FX2)



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DOUGLAS R. ANNINO
No. 5496
MASSACHUSETTS
COMMONWEALTH OF MASSACHUSETTS

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BROADWAY
VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"
SHEET NO.: A1.2
JOB NO.: 20080

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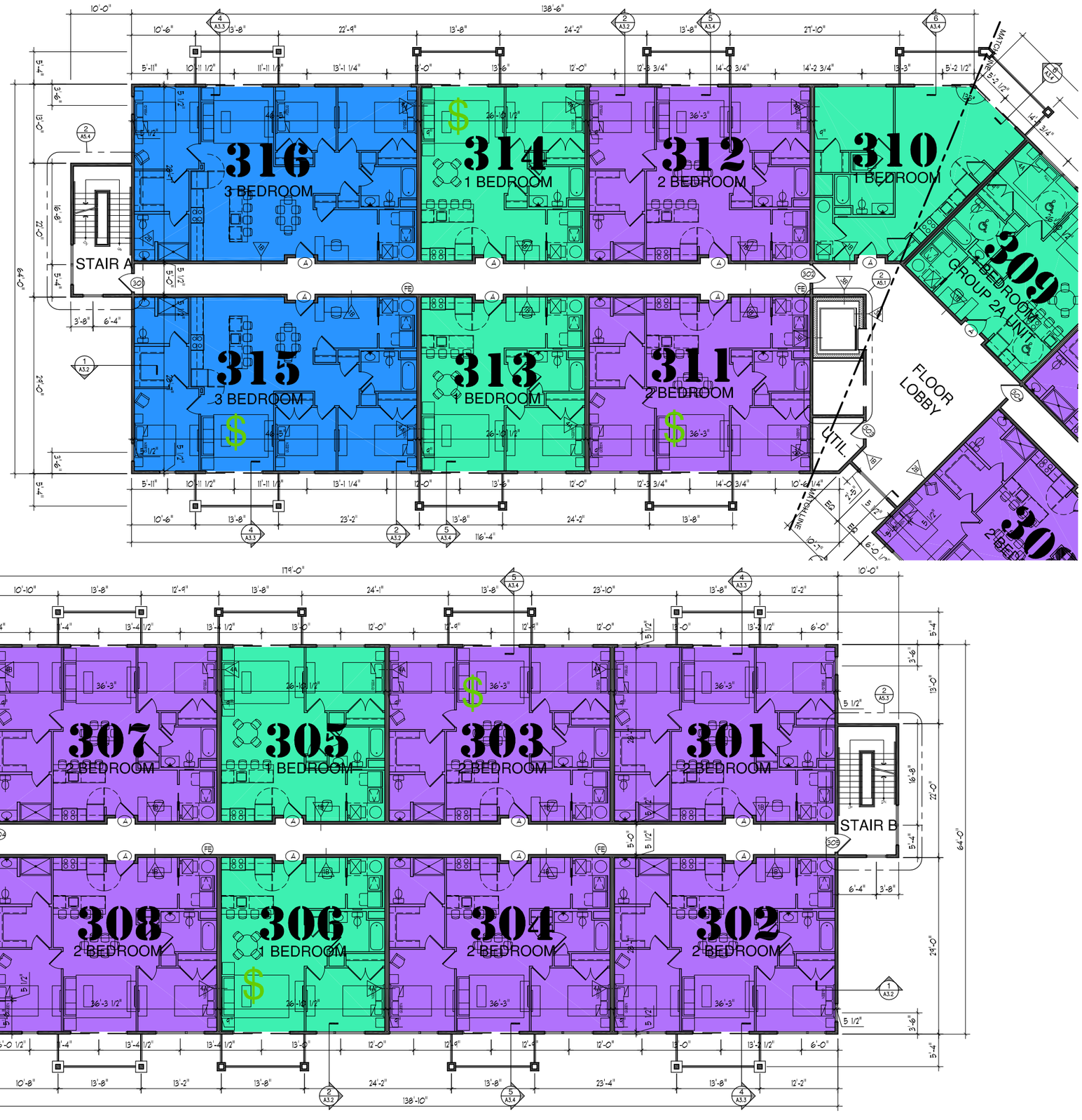
FE PORTABLE FIRE EXTINGUISHERS
2-A:10-B/C IN SEMI-RECESSED
CABINETS, 42" AFF TO CENTER
(JL INDUSTRIES - 8116 VIC-FX2)



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MANSFIELD, MA
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BROADWAY
VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.3

JOB NO.: 20080

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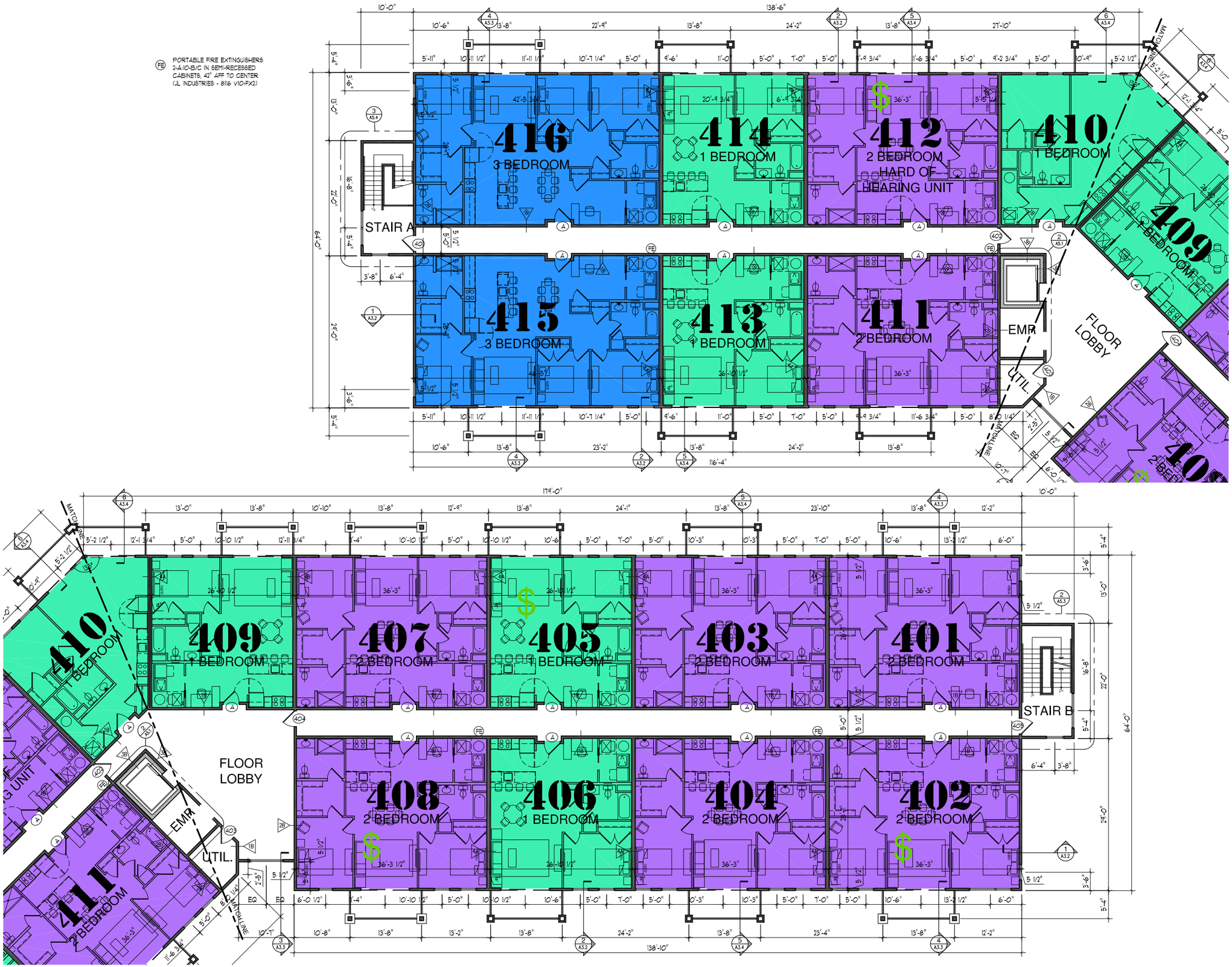
FE PORTABLE FIRE EXTINGUISHERS
2-A:10-B/C IN SEMI-RECESSED
CABINETS, 42" AFF TO CENTER
(JL INDUSTRIES - 8116 VIC-FX2)



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BROADWAY
VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: FOURTH FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.4

JOB NO.: 20080

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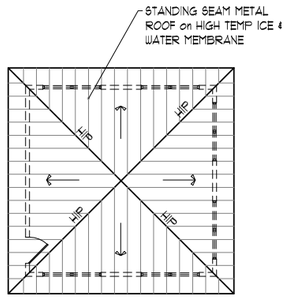
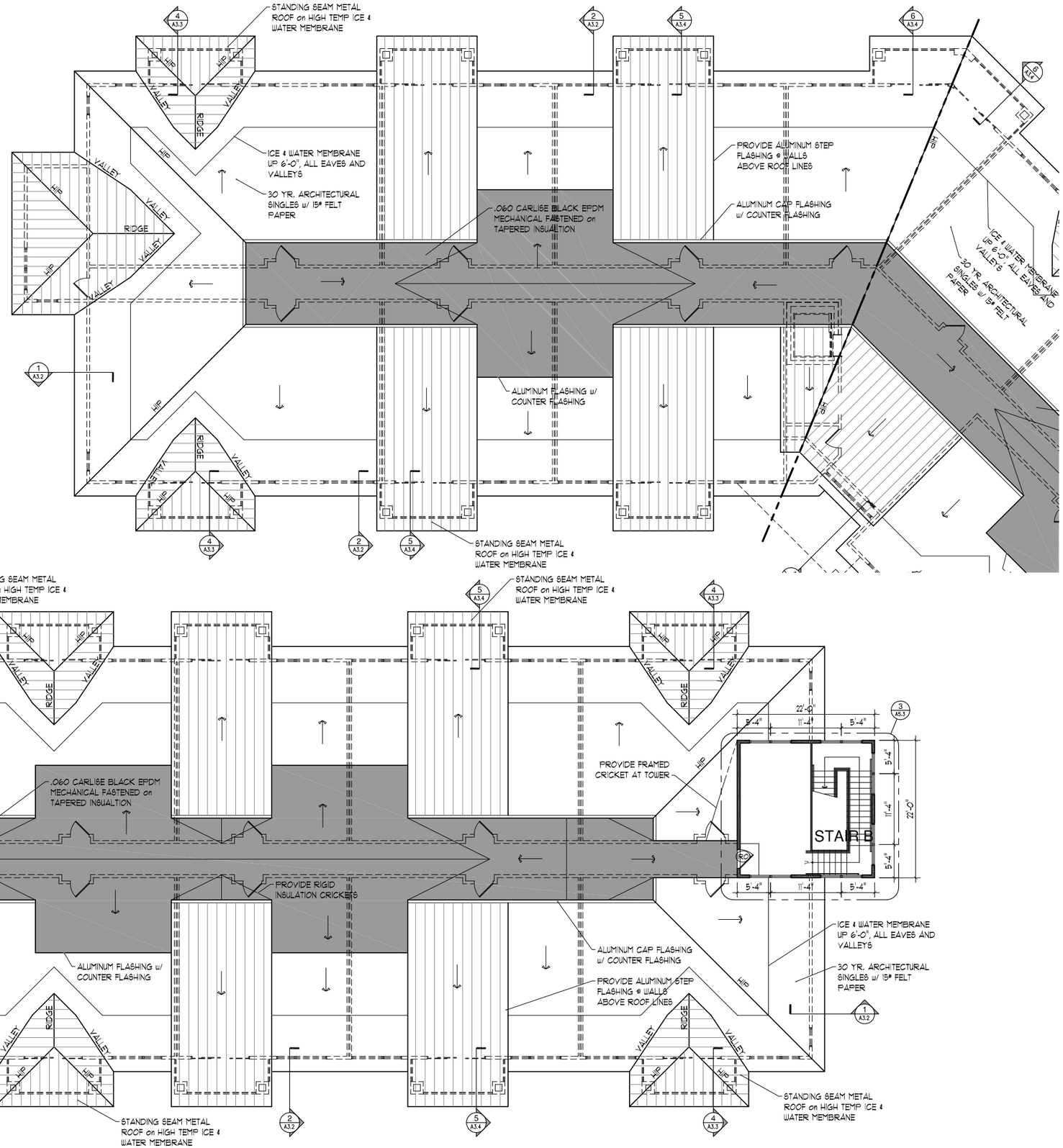


STAIR B TOWER ROOF



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BROADWAY VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: FOURTH FLOOR PLAN
SCALE: 1/8" = 1'-0"
SHEET NO.: A1.5
JOB NO.: 20080

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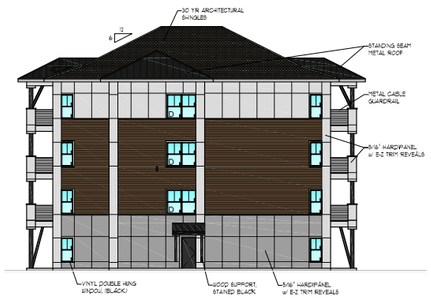
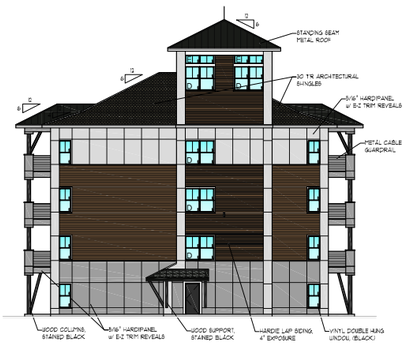
1 FRONT ELEVATIONS
1/16" = 1'-0"



2 LEFT SIDE ELEVATION
1/16" = 1'-0"



3 RIGHT SIDE ELEVATION
1/16" = 1'-0"

4 REAR ELEVATIONS
1/16" = 1'-0"

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No. 5496
MANSFIELD, MA
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BROADWAY VILLAGE
- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: OVERALL ELEVATIONS
SCALE: 1/16" = 1'-0"
SHEET NO.: A2.0
JOB NO.: 20080

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1 FRONT ELEVATION - LEFT SIDE
1/8" = 1'-0"

2 FRONT ELEVATION - RIGHT SIDE
1/8" = 1'-0"

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BROADWAY VILLAGE
- Building #4 -
341 Broadway
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SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.1

JOB NO.: 20080

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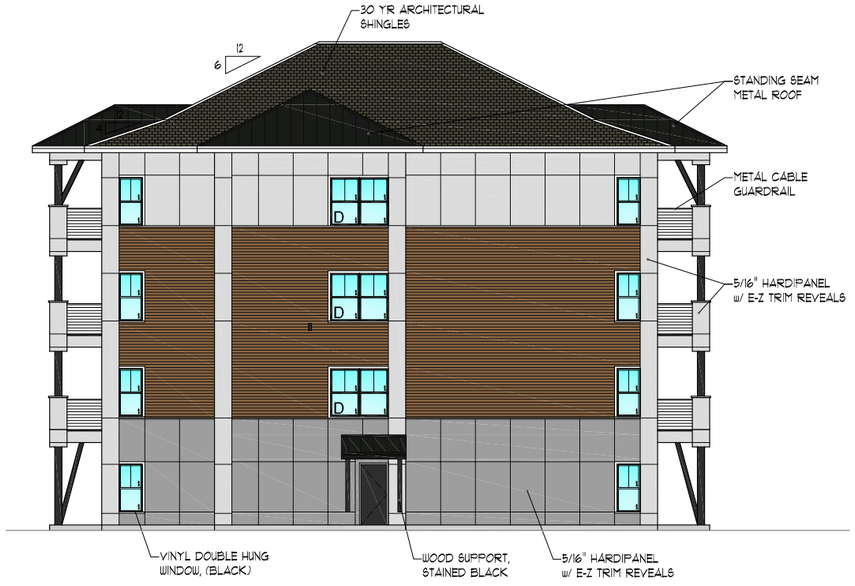
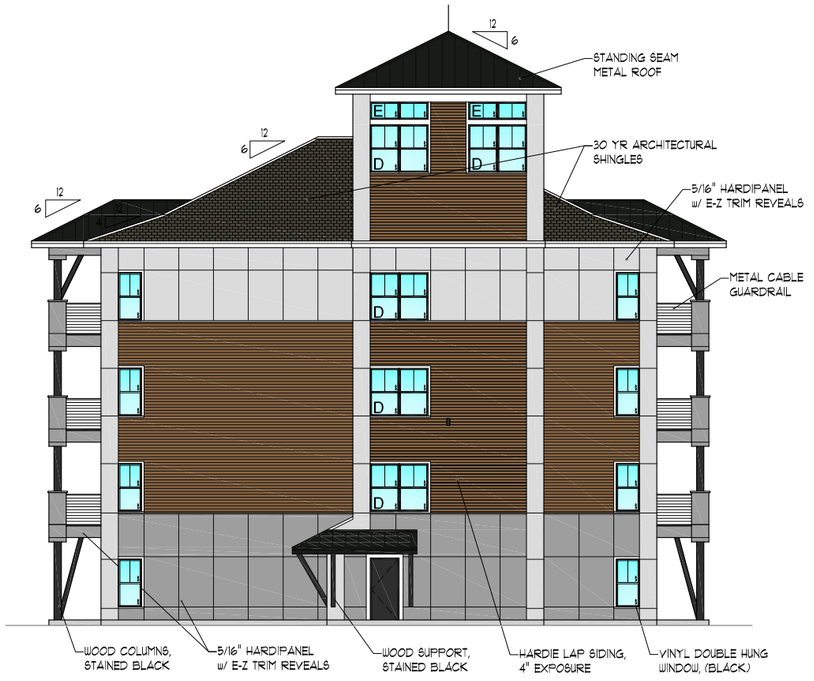


1 LEFT SIDE ELEVATION
1/8" = 1'-0"



2 RIGHT SIDE ELEVATION
1/8" = 1'-0"

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BROADWAY
VILLAGE
- Building #4 -
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Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.2

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1 REAR ELEVATION - LEFT SIDE
1/8" = 1'-0"

2 REAR ELEVATION - RIGHT SIDE
1/8" = 1'-0"

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- Building #4 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.3

JOB NO.: 20080

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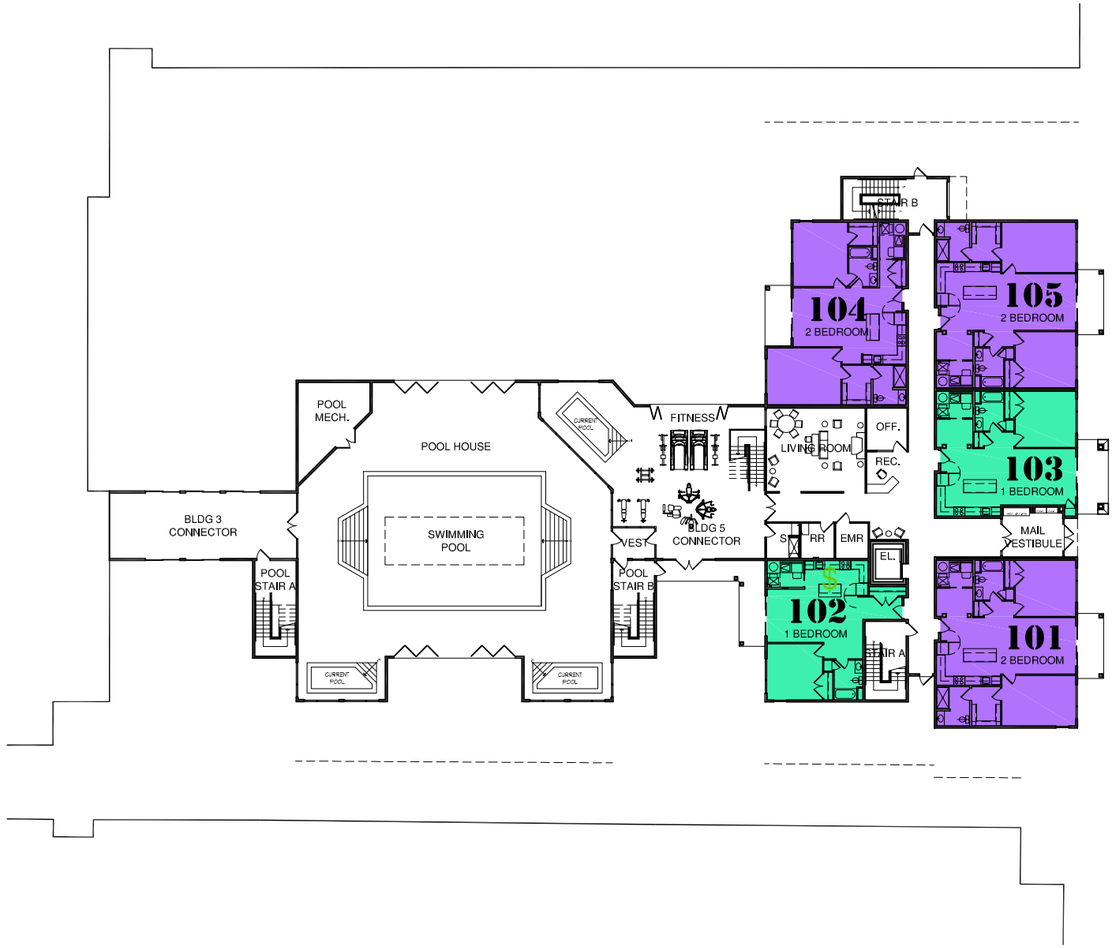
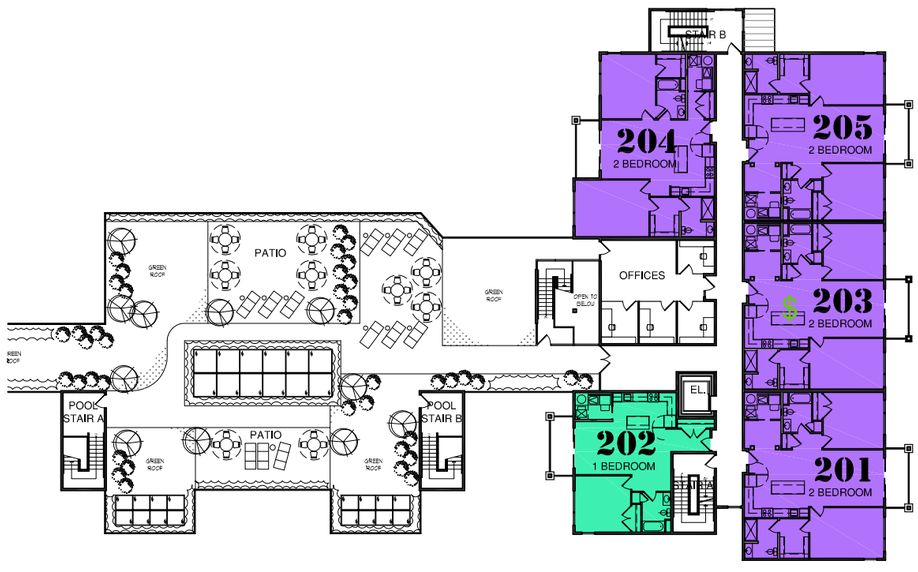
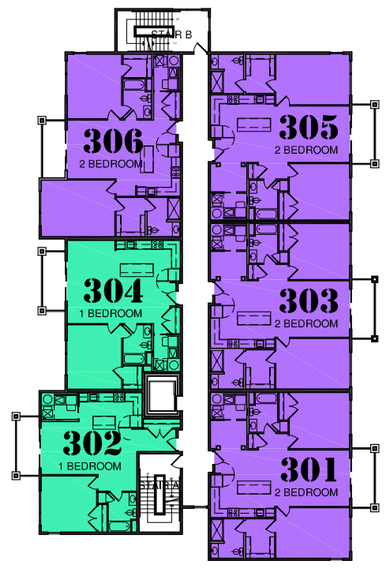
UNIT SCHEDULE

			QUANTITY BY BUILDING						521 CMR (ADA)		REMARKS
TYPE	DESCRIPTION	SQUARE FOOTAGE	BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5	TOTALS	GROUP 2A (5%)	HEARING IMPAIRED (2%)	
1	ONE BEDROOM W/ DEN	863±	22	9	34	23	7	95	5	2	
2	TWO BEDROOM W/ DEN	1,133±	30	50	48	30	15	173	9	3	
3	THREE BEDROOM W/ DEN	1,447±	8	8	8	8		32	2	1	
	TOTALS		60	67	90	61	22	300	15 UNITS NEEDED	6 UNITS NEEDED	







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BROADWAY VILLAGE
- Building #5 -
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Dracut, Massachusetts

SHEET TITLE: OVERALL BUILDING PLANS

SCALE: 1/16" = 1'-0"

SHEET NO.: A0.1

JOB NO.: 20080

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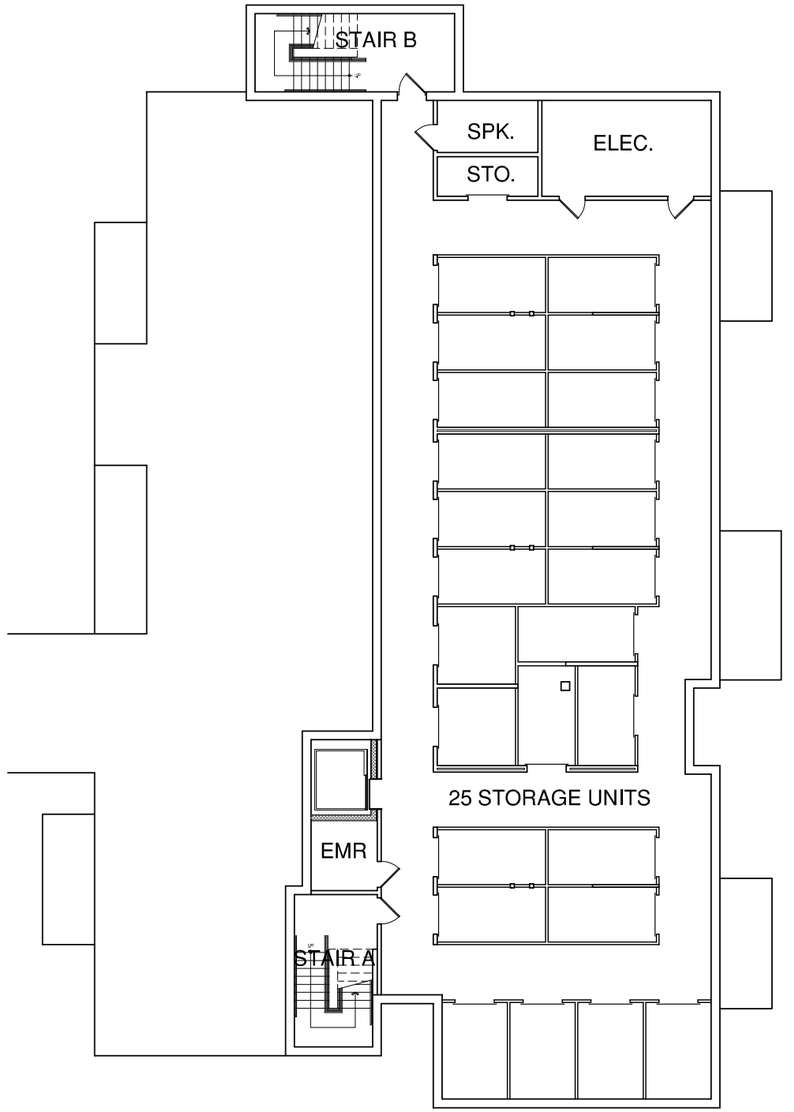

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No. 5496
COMMONWEALTH OF MASSACHUSETTS

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BROADWAY
VILLAGE
- Building #5 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.0

JOB NO.: 20080

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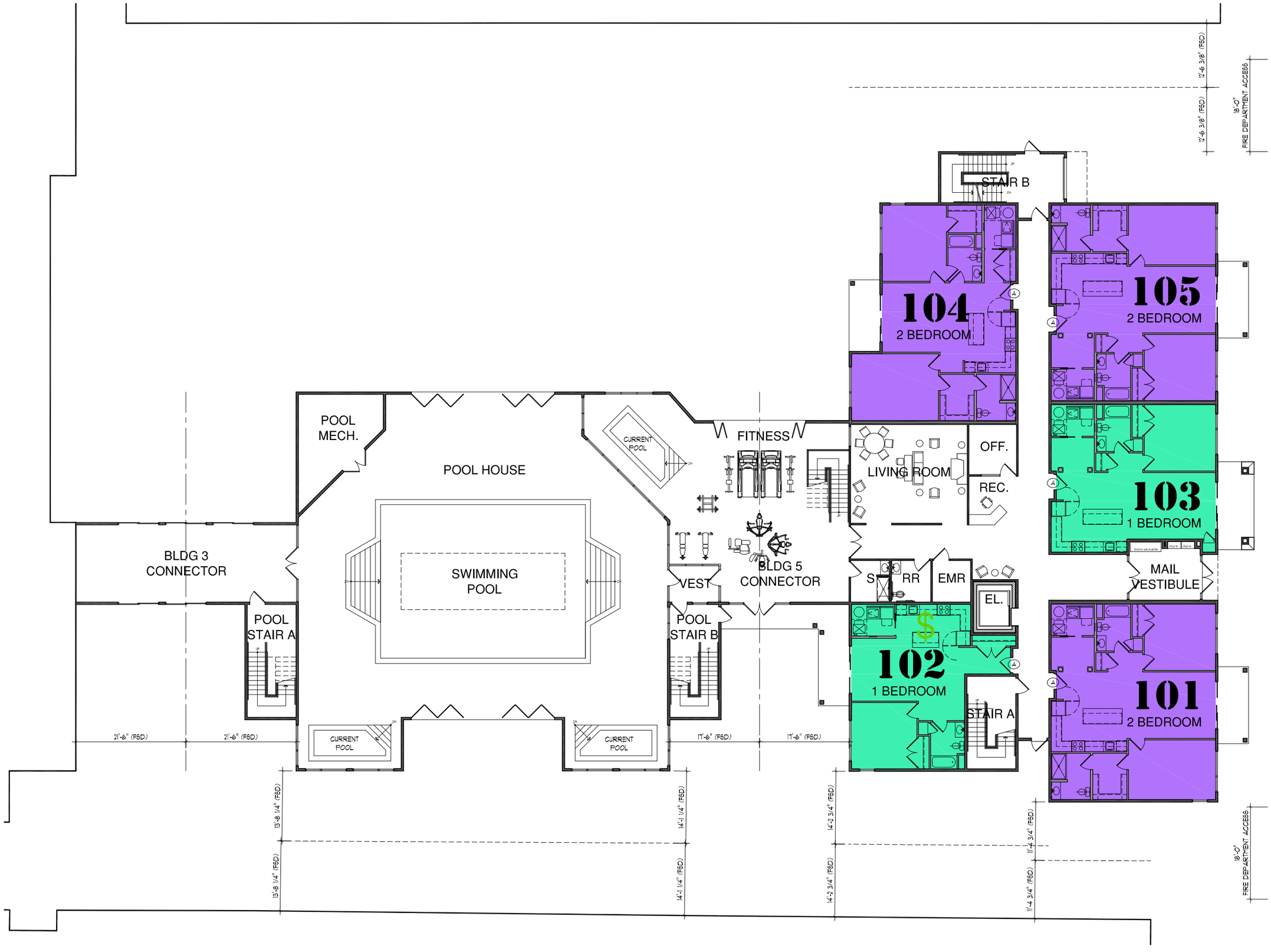

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BROADWAY VILLAGE
- Building #5 -
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SHEET TITLE: GROUND FLOOR PLAN
SCALE: 1/8" = 1'-0"
SHEET NO.: A1.1
JOB NO.: 20080

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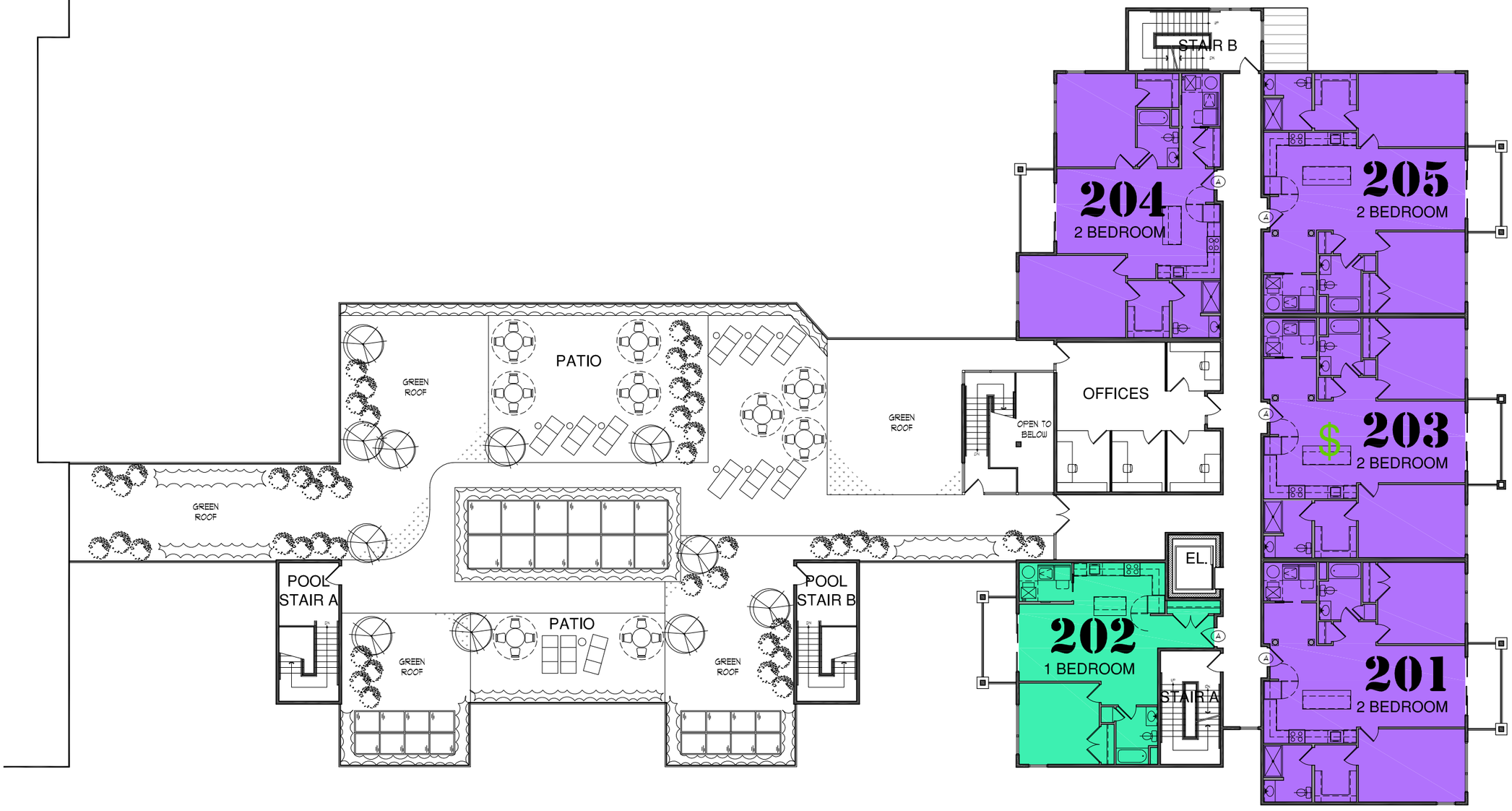

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BROADWAY
VILLAGE
- Building #5 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.2

JOB NO.: 20080

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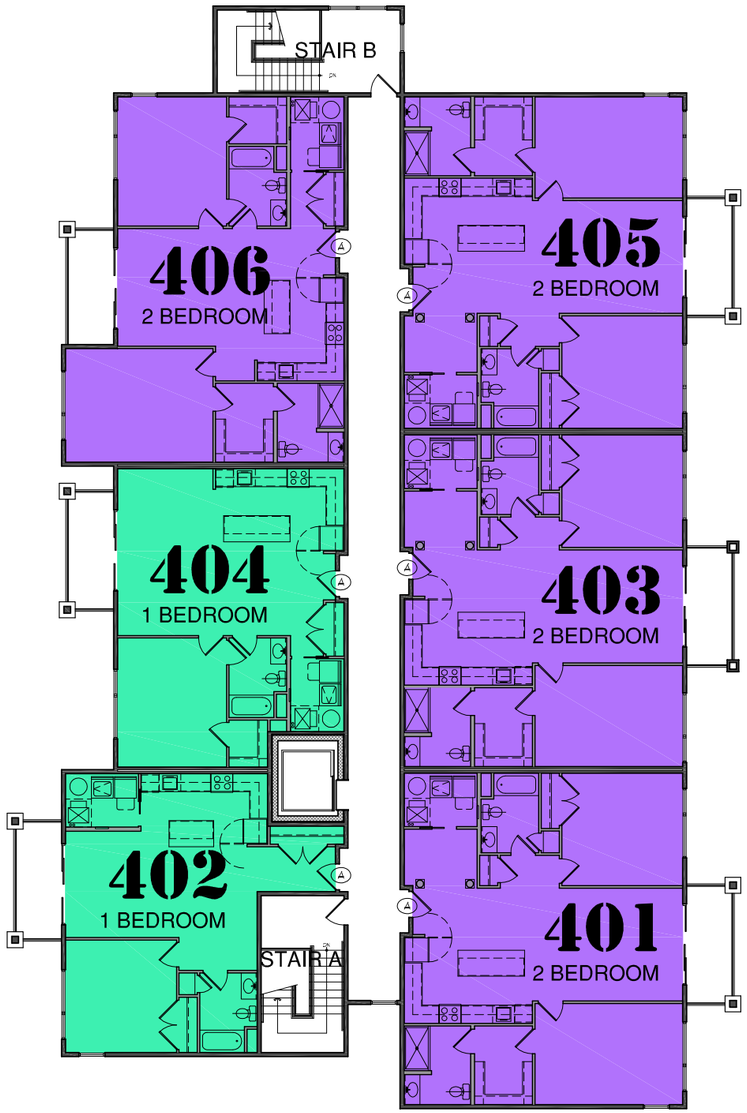

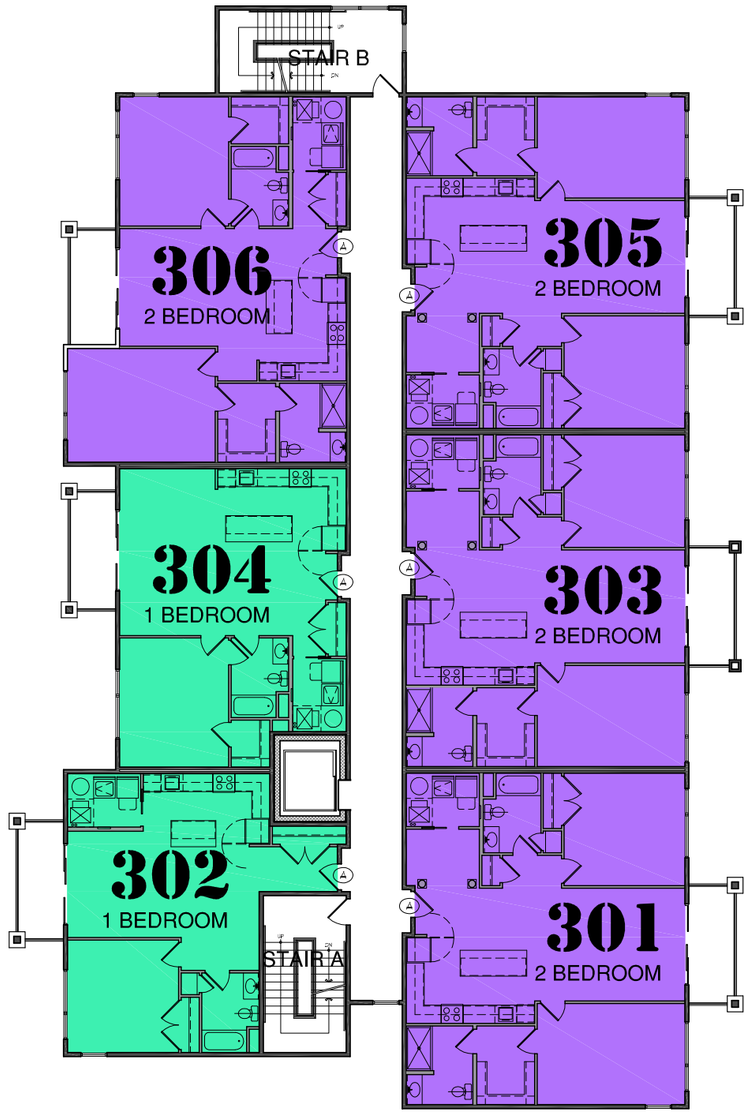

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No. 5496
MANSFIELD, MA
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BROADWAY
VILLAGE
- Building #5 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
THIRD & FOURTH
FLOOR PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.: A1.3

JOB NO.: 20080

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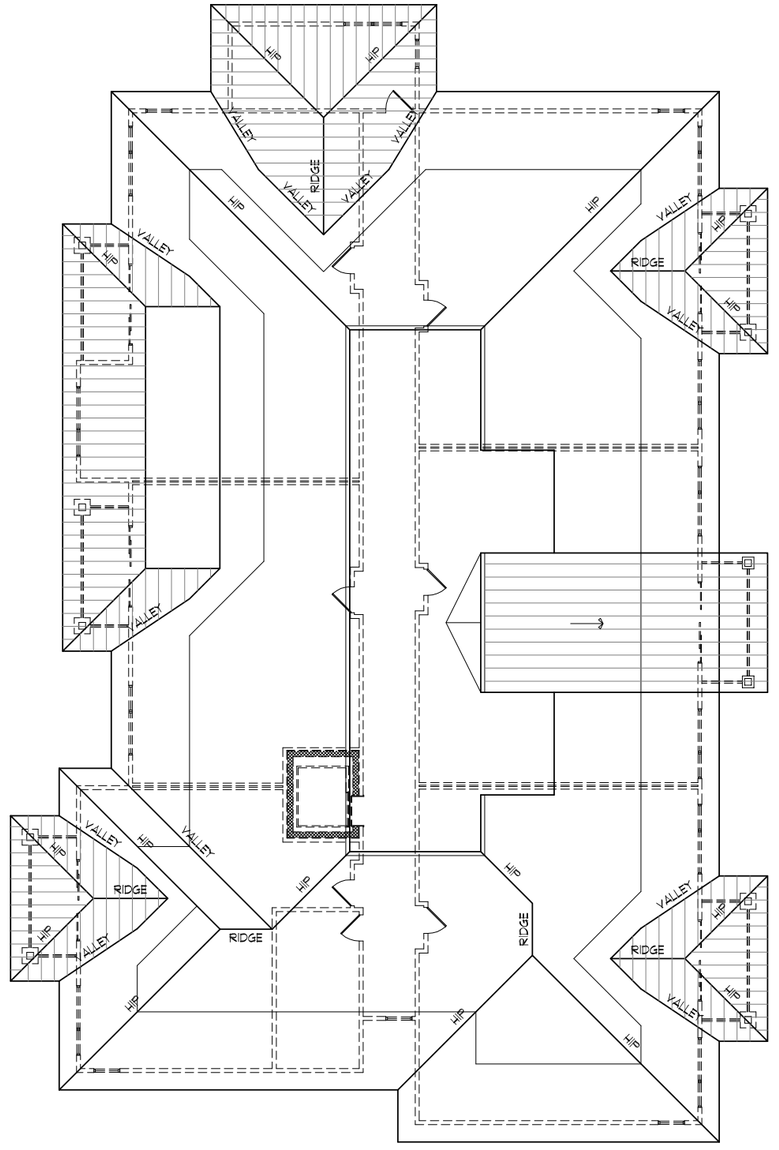

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BROADWAY
VILLAGE
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Dracut, Massachusetts

SHEET TITLE:

ROOF PLAN

SCALE: 1/8" = 1'-0"

SHEET NO.:

A1.4

JOB NO.: 20080

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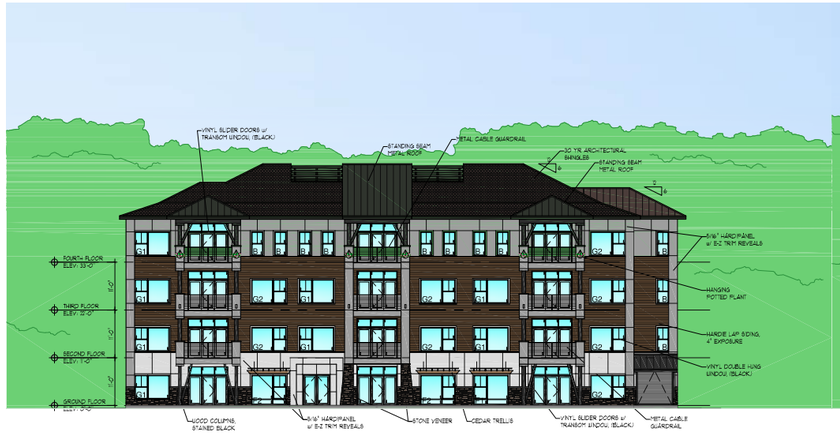

① FRONT ELEVATIONS
1/16" = 1'-0"

② RIGHT SIDE ELEVATION
1/16" = 1'-0"

③ LEFT SIDE ELEVATION
1/16" = 1'-0"

④ REAR ELEVATION
1/16" = 1'-0"

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NORTH ATTLEBORO • MASSACHUSETTS
508 • 643 • 4551

STAMP:

REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MANSFIELD, MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:	
JUN 13 2024	OWNER REVIEW
JUL 24 2024	OWNER REVIEW
SEP 20 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
- Building #5 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: OVERALL ELEVATIONS
SCALE: 1/16" = 1'-0"
SHEET NO.: A2.0
JOB NO.: 20080

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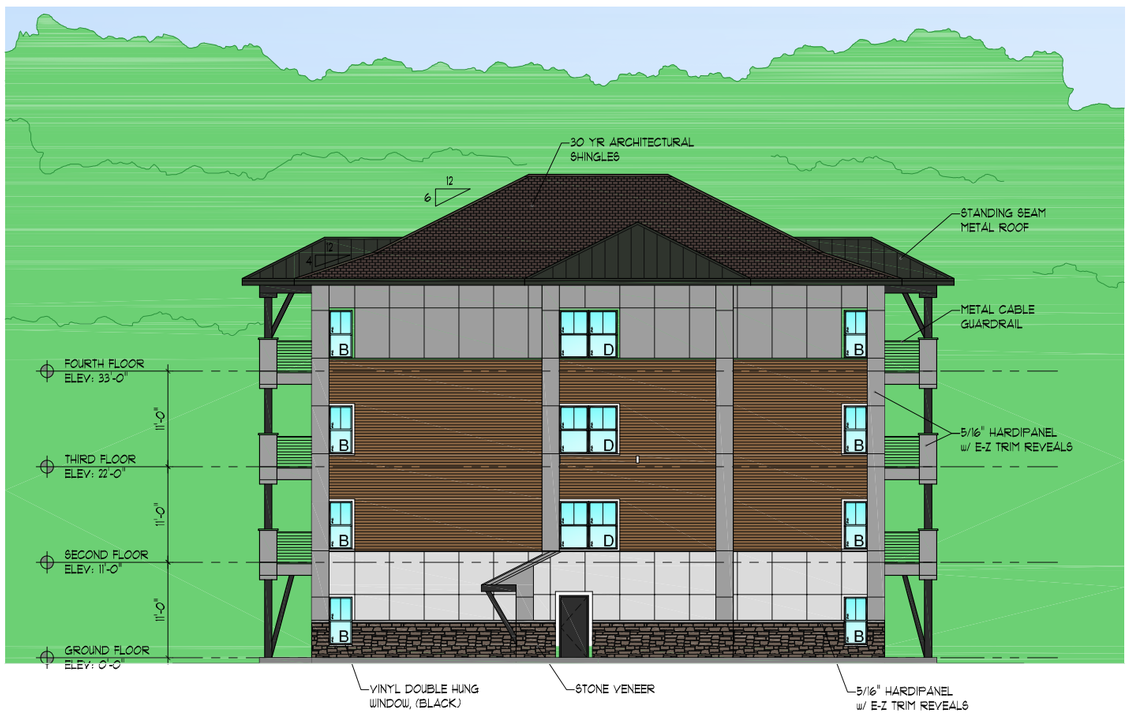
1 FRONT ELEVATION
1/8" = 1'-0"



2 RIGHT SIDE ELEVATION
1/8" = 1'-0"

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STAMP:

REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASTER
MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:	
JUN 13 2024	OWNER REVIEW
JUL 24 2024	OWNER REVIEW
SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
- Building #5 -
341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS
SCALE: 1/8" = 1'-0"
SHEET NO.: A2.1
JOB NO.: 20080

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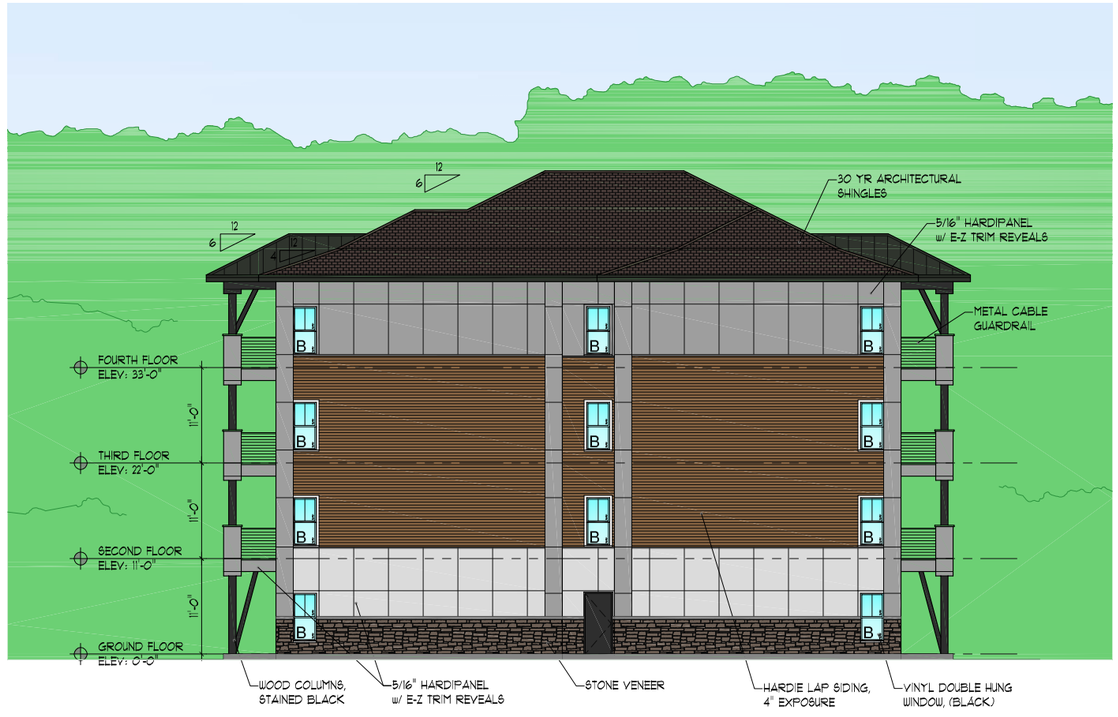

① LEFT SIDE ELEVATION

1/8" = 1'-0"

② REAR ELEVATION

1/8" = 1'-0"

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STAMP:

REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MANSFIELD, MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:	
JUN 13 2024	OWNER REVIEW
JUL 24 2024	OWNER REVIEW
SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
- Building #5 -

341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATIONS

SCALE: 1/8" = 1'-0"

SHEET NO.: A2.2

JOB NO.: 20080

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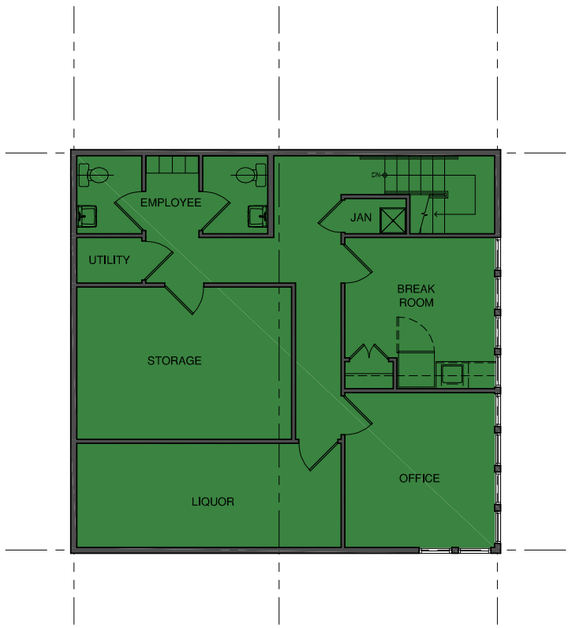
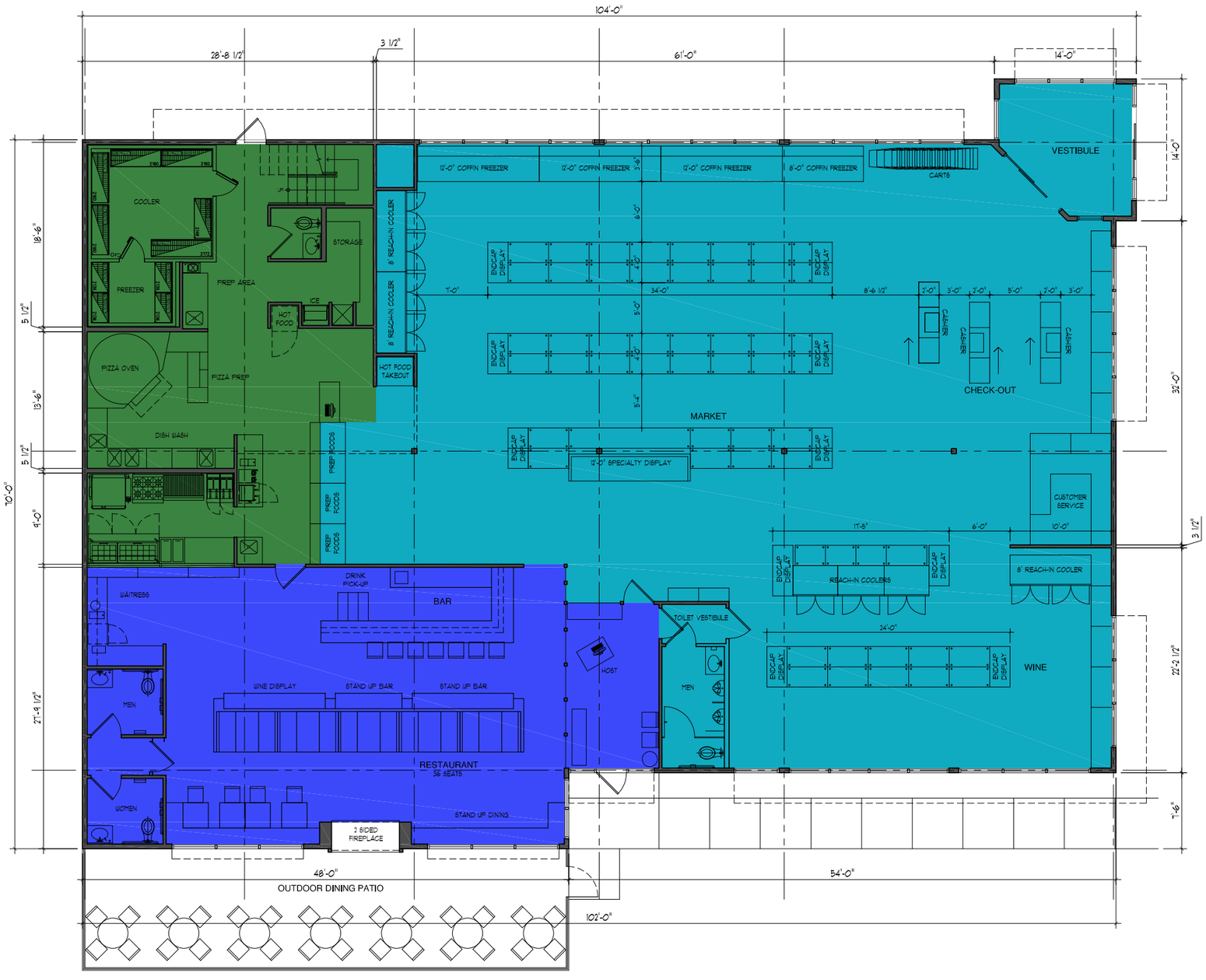


② UPPER FLOOR PLAN
3/16" = 1'-0"

MARKET
RESTAURANT
KITCHEN / EMPLOYEE



① GROUND FLOOR PLAN
3/16" = 1'-0"

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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASTER
MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:

NOV 6, 2023	SCHEMATIC DESIGN
SEP 20, 2024	ZBA SUBMISSION

MARKET MARK
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PROPOSED FLOOR PLAN
SCALE: 3/16" = 1'-0"
SHEET NO.: A1.1
JOB NO.: 2311

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① PROPOSED FRONT ELEVATION
3/16" = 1'-0"

② PROPOSED RIGHT SIDE ELEVATION
3/16" = 1'-0"

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NORTH ATTLEBORO • MASSACHUSETTS
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ISSUED:	
NOV 6, 2023	SCHEMATIC DESIGN
SEP 20, 2024	ZBA SUBMISSION

MARKET MARK
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
PROPOSED EXTERIOR ELEVATIONS

SCALE: 3/16" = 1'-0"

SHEET NO.: A2.1

JOB NO.: 2311T

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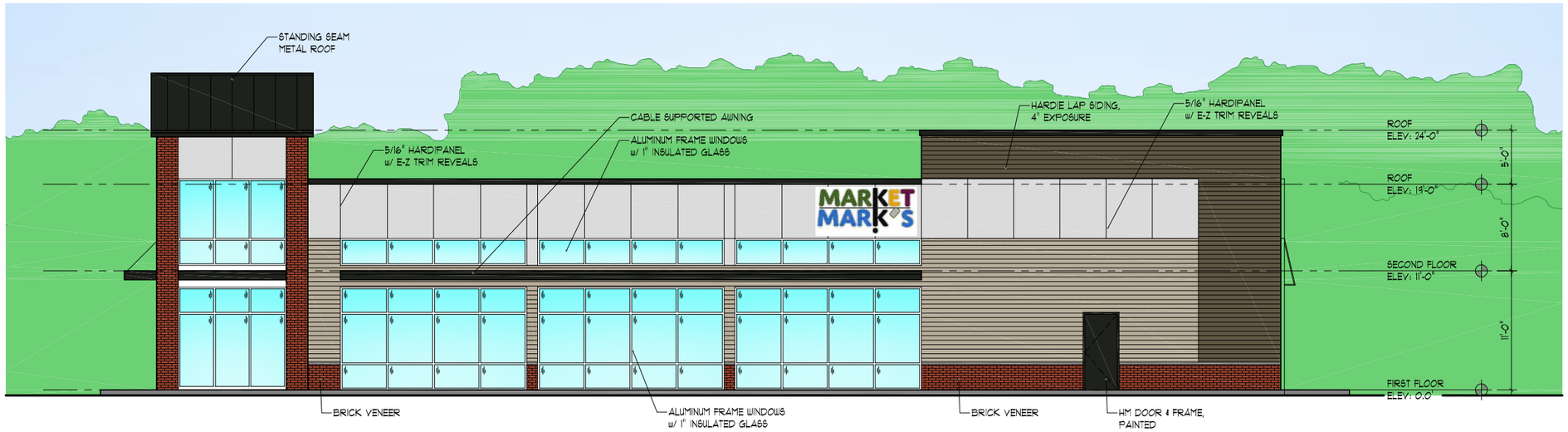
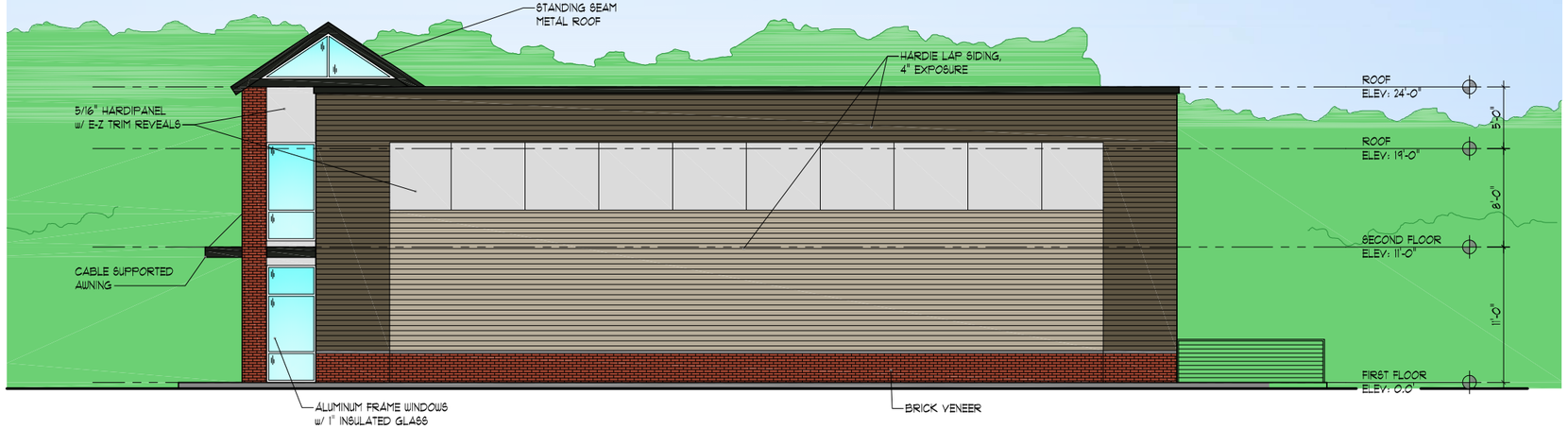


1 PROPOSED REAR ELEVATION
3/16" = 1'-0"



2 PROPOSED RIGHT SIDE ELEVATION
3/16" = 1'-0"

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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASSACHUSETTS
USA

ISSUED:

NOV 6, 2023	SCHEMATIC DESIGN
SEP 20, 2024	ZBA SUBMISSION

MARKET MARK
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
PROPOSED
EXTERIOR ELEVATIONS

SCALE:
3/16" = 1'-0"

SHEET NO.:
A2.2

JOB NO.:
23117

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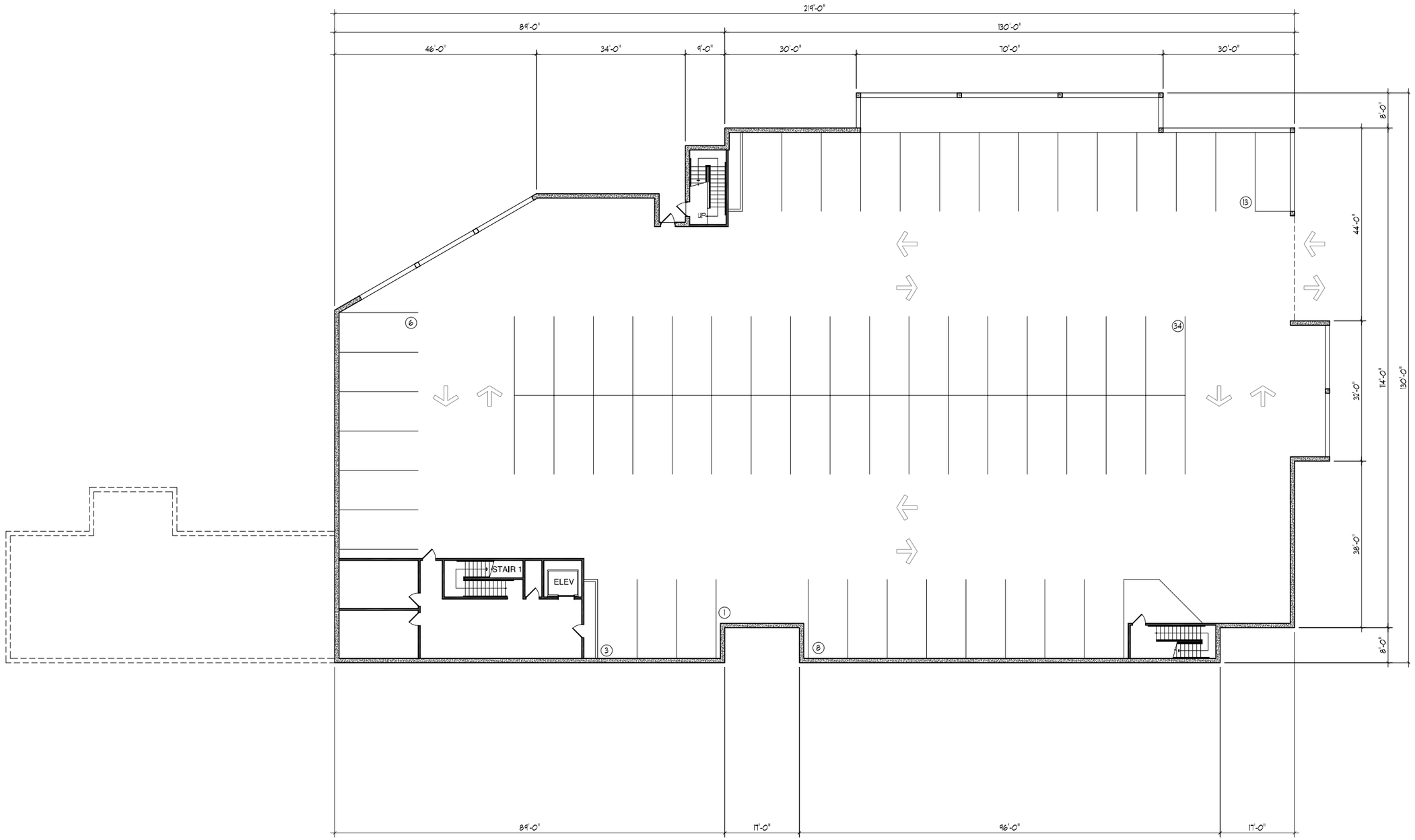

1 PROPOSED PARKING LEVEL PLAN
3/32" = 1'-0"

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NORTH ATTLEBORO • MASSACHUSETTS
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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASSACHUSETTS
USA

ISSUED:

SEP 20, 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PROPOSED FLOOR PLAN

SCALE: 3/32" = 1'-0"

SHEET NO.: A1.0

JOB NO.: 24061

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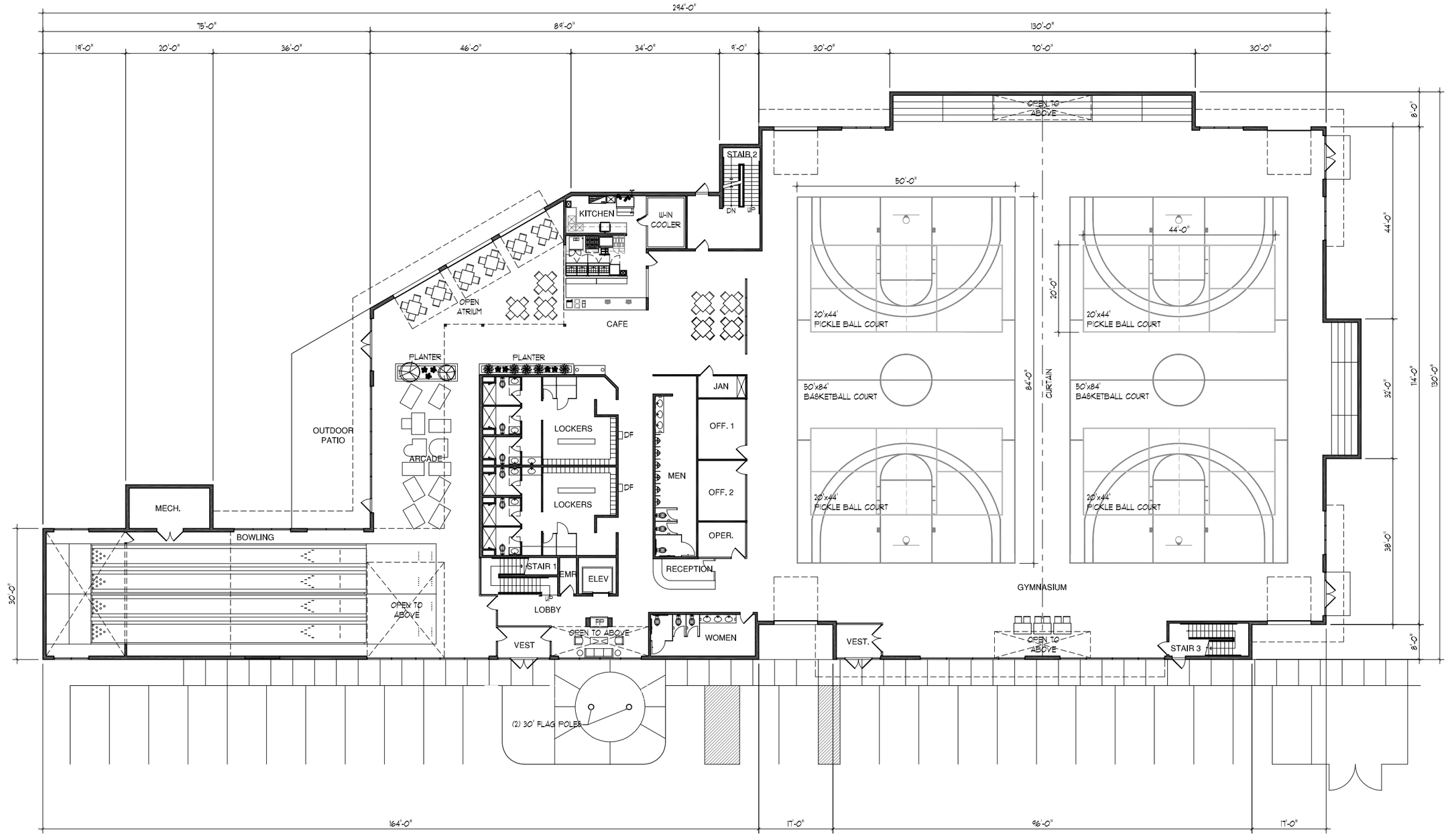

TOTAL THIRD FLOOR AREA = 27,913 SQ.FT.

1 PROPOSED GROUND FLOOR PLAN
3/32" = 1'-0"

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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASSACHUSETTS
COMMONWEALTH OF MASSACHUSETTS

ISSUED:

SEP 20, 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PROPOSED FLOOR PLAN
SCALE: 3/32" = 1'-0"
SHEET NO.: A1.1
JOB NO.: 24061

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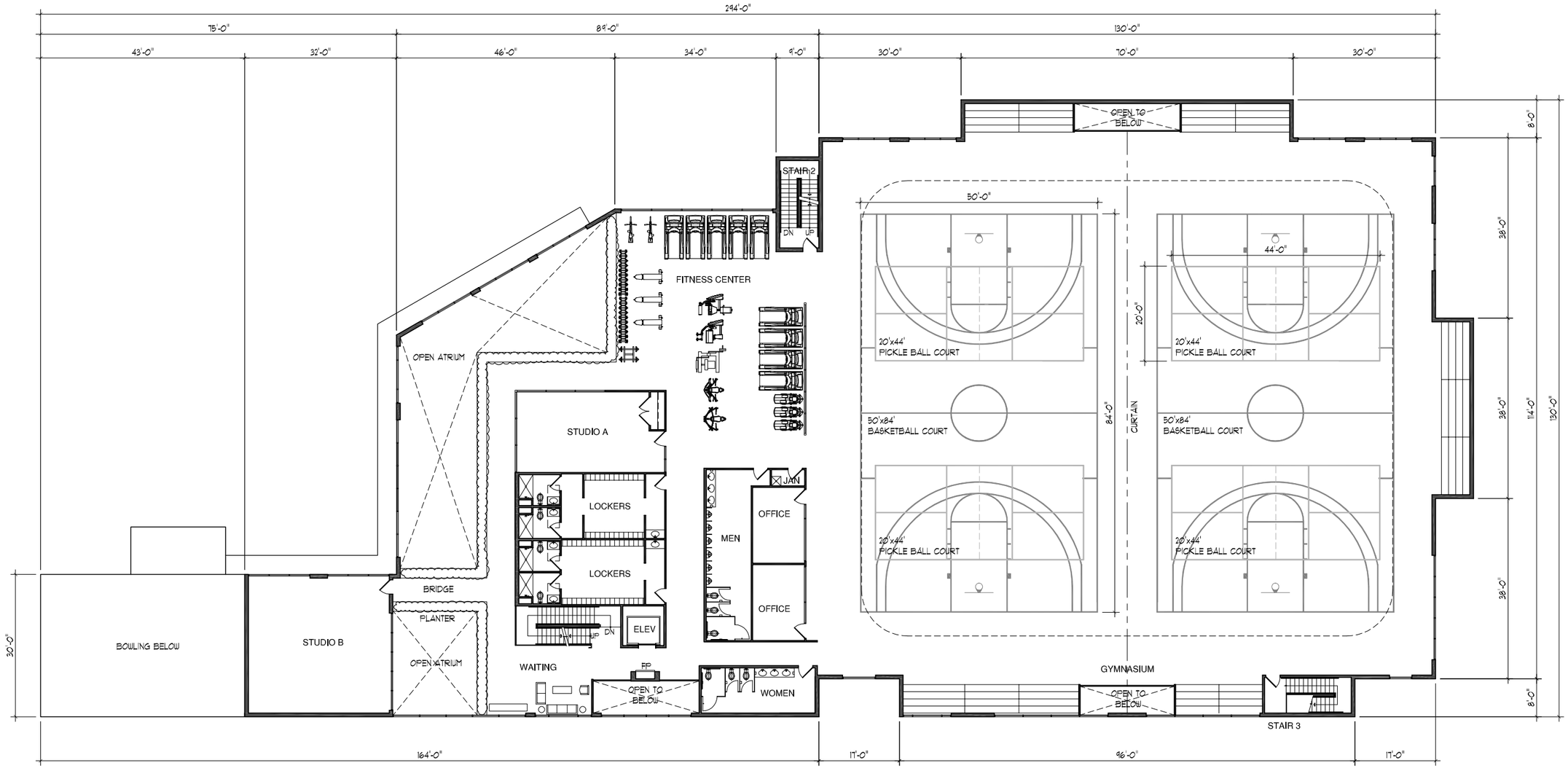

TOTAL SECOND FLOOR AREA = 24,085 SQ.FT.

1 PROPOSED SECOND FLOOR PLAN
3/32" = 1'-0"

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DOUGLAS R. ANNINO No. 5496 REGISTERED ARCHITECT MASSACHUSETTS COMMONWEALTH OF MASSACHUSETTS

ISSUED:
SEP 20, 2024 ZBA SUBMISSION

BROADWAY VILLAGE RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PROPOSED FLOOR PLAN
SCALE: 3/32" = 1'-0"
SHEET NO.: A1.2
JOB NO.: 24061

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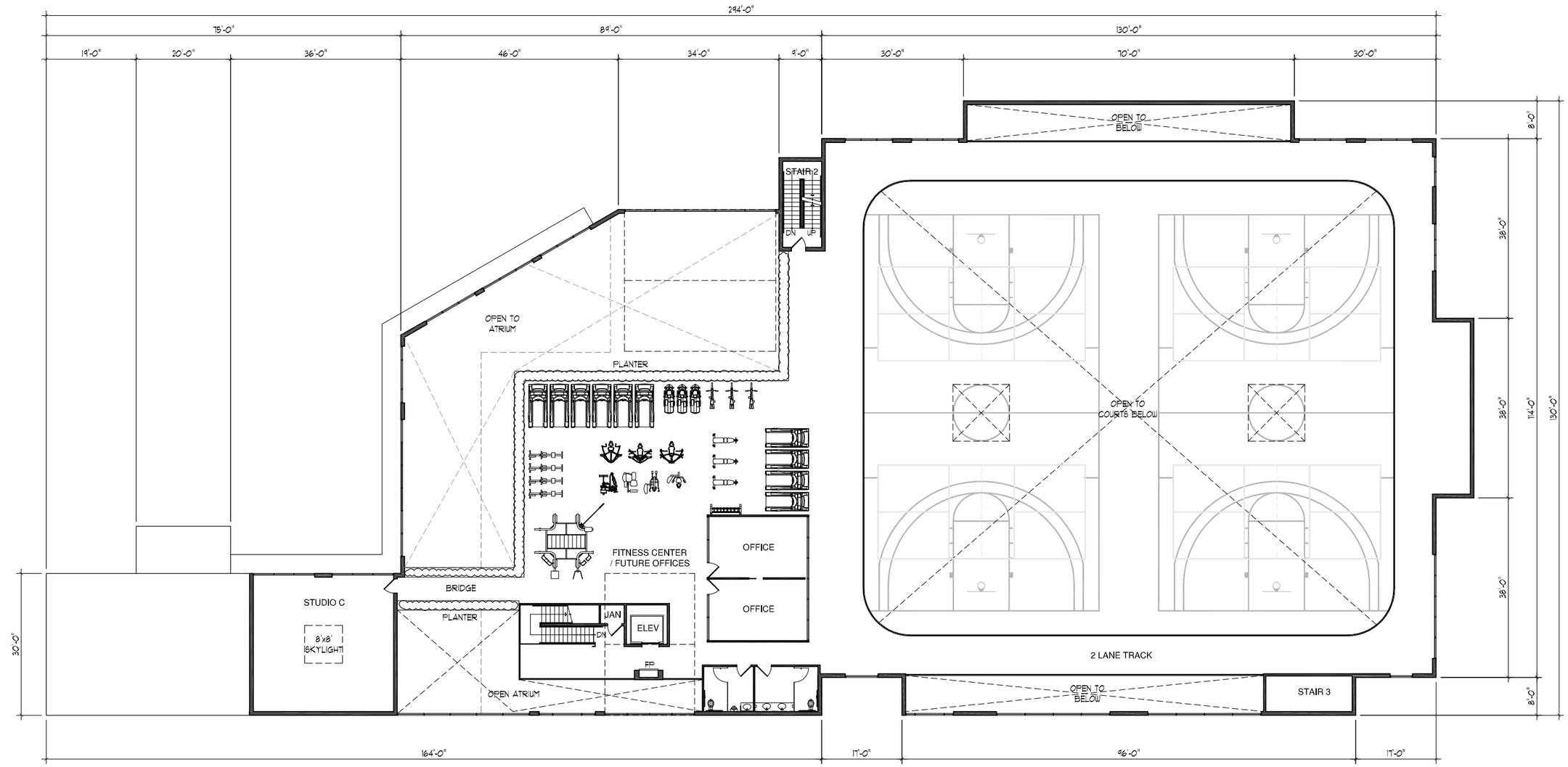

TOTAL THIRD FLOOR AREA = 21,023 SQ.FT.

1 PROPOSED THIRD FLOOR PLAN
3/32" = 1'-0"

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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MANSFIELD, MA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:

SEP 20, 2024	ZBA SUBMISSION

BROADWAY VILLAGE RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PROPOSED FLOOR PLAN
SCALE: 3/32" = 1'-0"
SHEET NO.: A1.3
JOB NO.: 24061

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① PROPOSED FRONT EXTERIOR ELEVATION
3/32" = 1'-0"

② PROPOSED LEFT SIDE EXTERIOR ELEVATION
3/32" = 1'-0"

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NORTH ATTLEBORO • MASSACHUSETTS
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COMMONWEALTH OF MASSACHUSETTS
DOUGLAS R. ANNINO
No. 5496
REGISTERED ARCHITECT

ISSUED:
SEP 20, 2024 ZBA SUBMISSION

BROADWAY
VILLAGE
RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
EXTERIOR
ELEVATION

SCALE:
1/8" = 1'-0"

SHEET NO.:
A2.1

JOB NO.:
24061

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1 PROPOSED REAR EXTERIOR ELEVATION
3/32" = 1'-0"

2 PROPOSED RIGHT SIDE EXTERIOR ELEVATION
3/32" = 1'-0"

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DOUGLAS R. ANNINO REGISTERED ARCHITECT No. 5436 MASTER'S SEAL MA COMMONWEALTH OF MASSACHUSETTS

ISSUED:

SEP 20, 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
RECREATION CENTER
341 Broadway
Dracut, Massachusetts

SHEET TITLE: EXTERIOR ELEVATION

SCALE: 3/32" = 1'-0"

SHEET NO.: A2.2

JOB NO.: 24061

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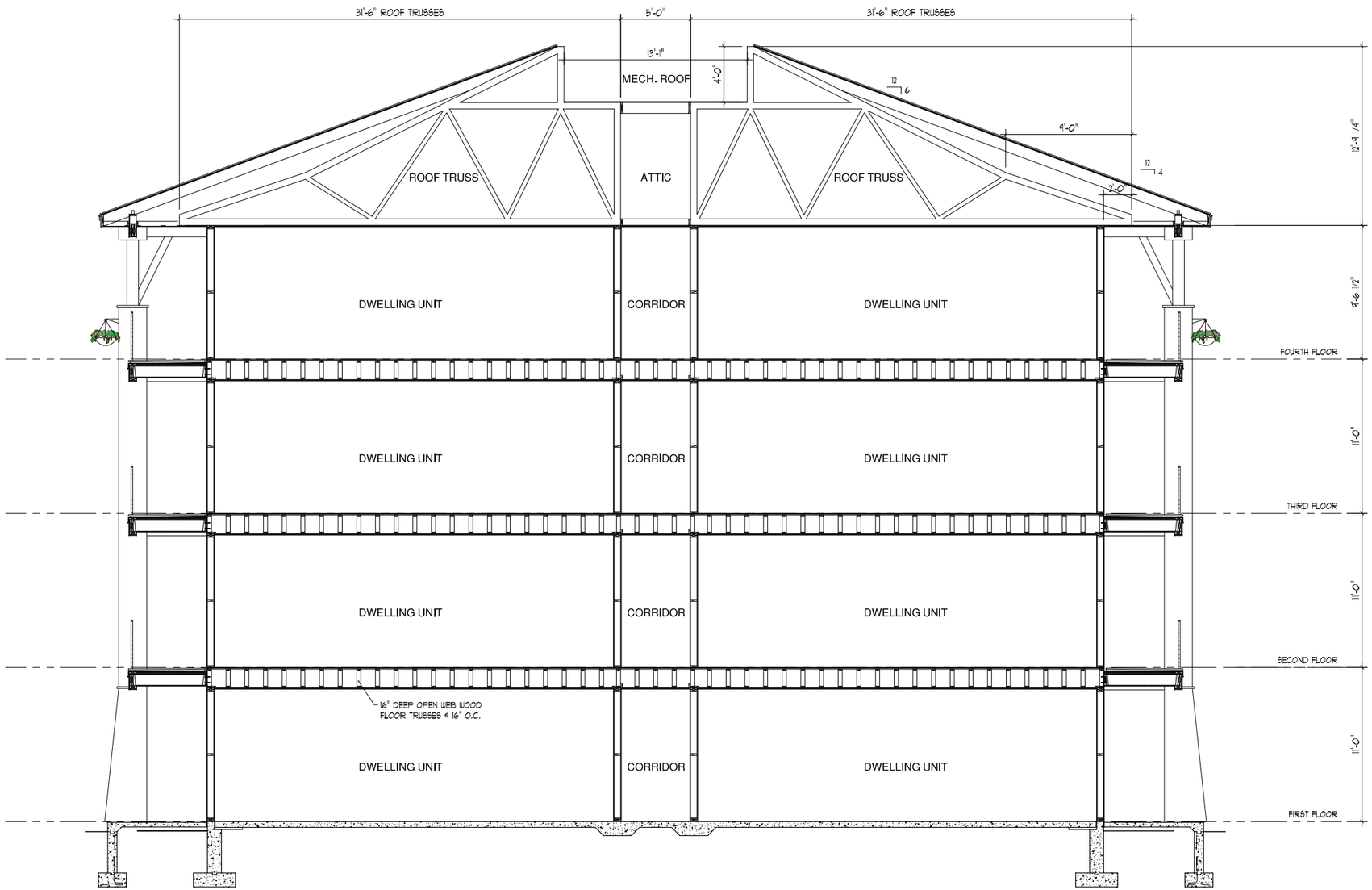

1 TYPICAL BUILDING SECTION
1/4" = 1'-0"

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NORTH ATTLEBORO • MASSACHUSETTS
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REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
MASSACHUSETTS
USA
COMMONWEALTH OF MASSACHUSETTS

ISSUED:
SEP 20 2024 ZBA SUBMISSION

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: TYPICAL BUILDING SECTION
SCALE: 3/8" = 1'-0"
SHEET NO.: A3.1
JOB NO.: 20080

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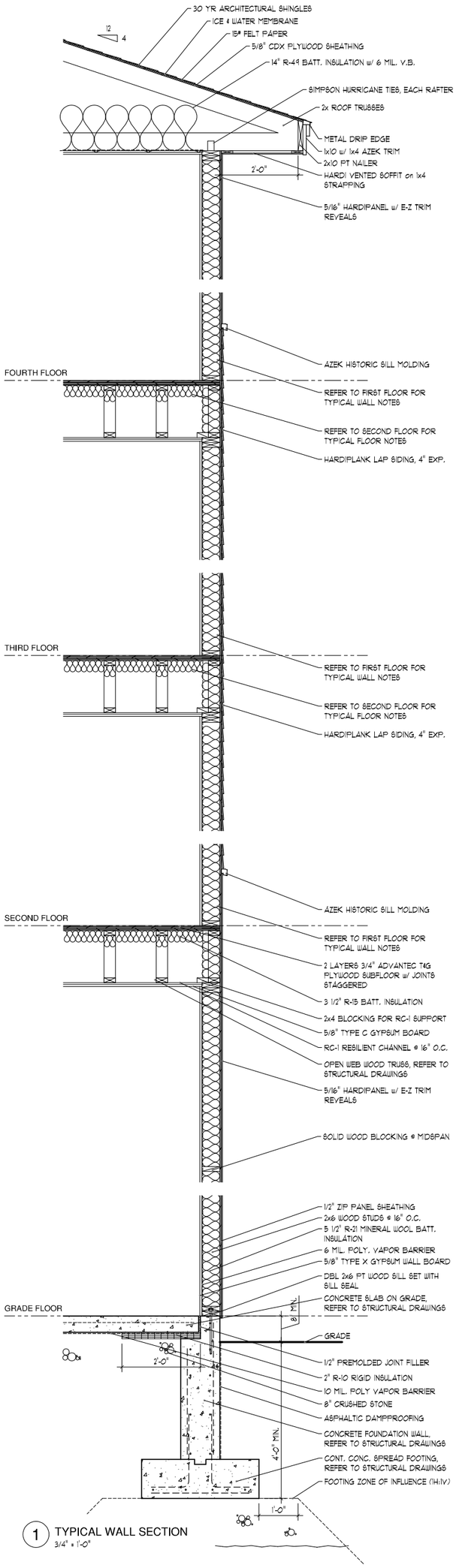
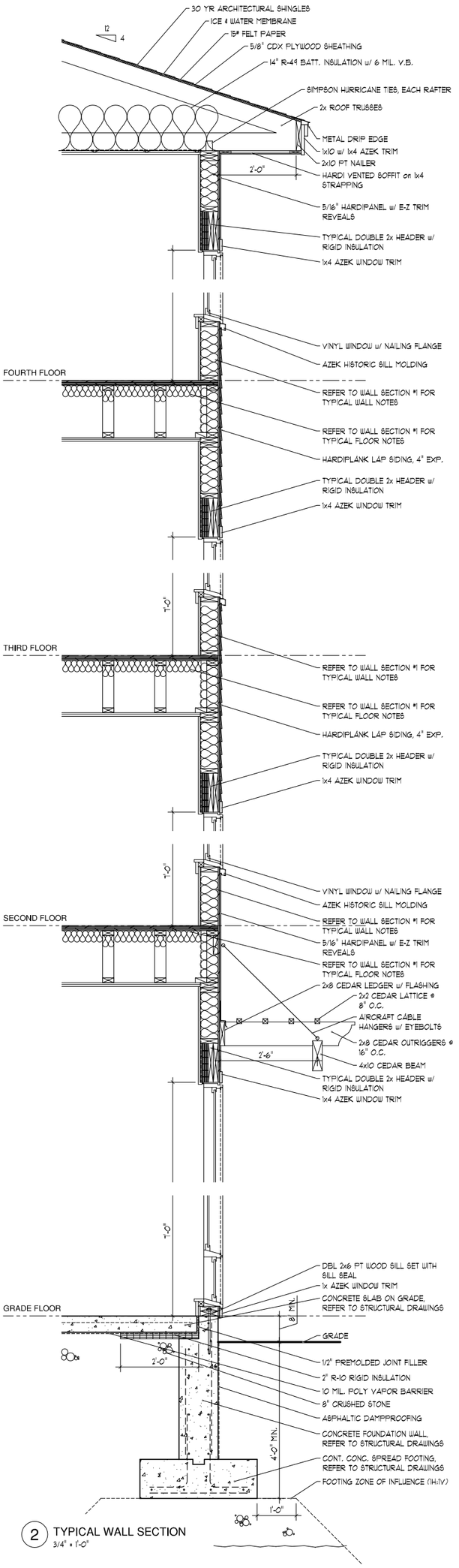


1 TYPICAL WALL SECTION
3/4" = 1'-0"



2 TYPICAL WALL SECTION
3/4" = 1'-0"

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NORTH ANDOVER, MASSACHUSETTS
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STAMP:

ISSUED:
REF: 22-1004
2ND SUBMISSION

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: WALL SECTIONS
SCALE: 3/4" = 1'-0"
SHEET NO.: A3.2
JOB NO.: 20080

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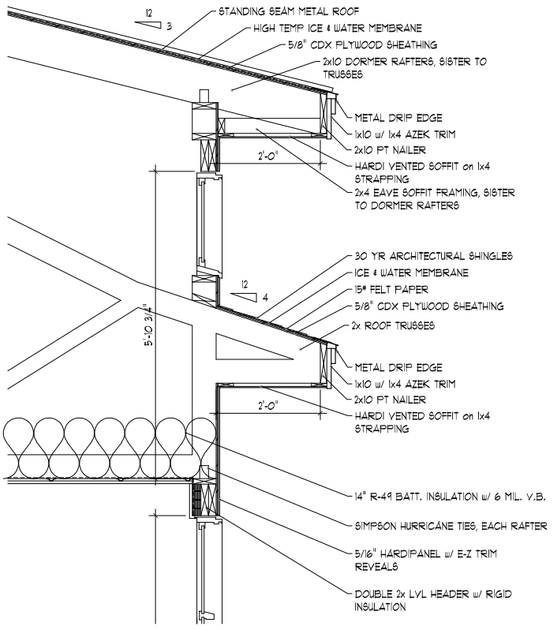
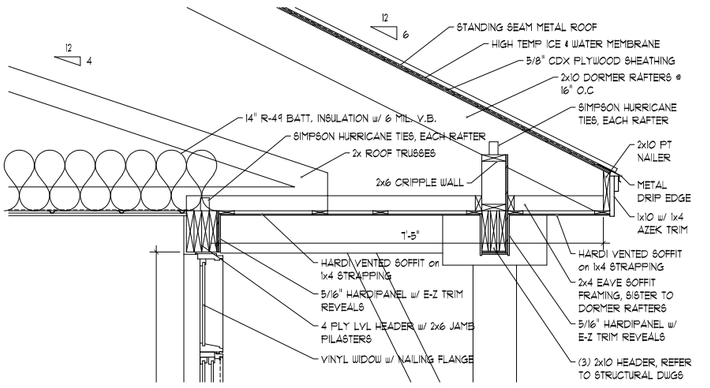
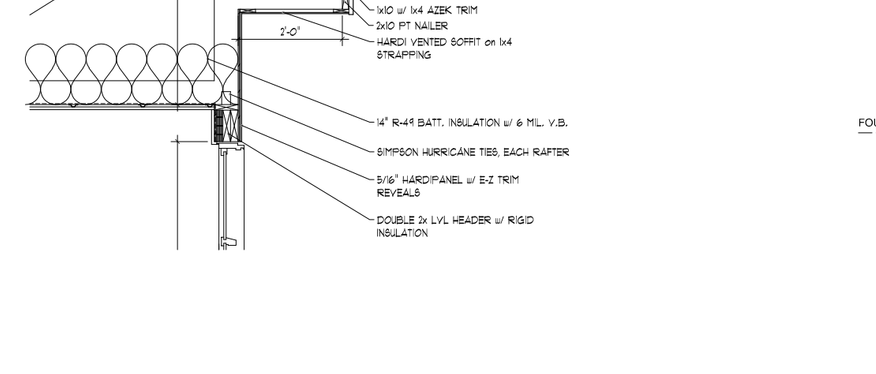
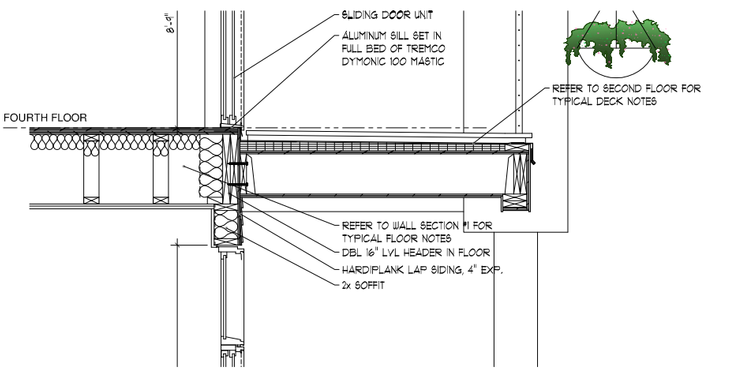
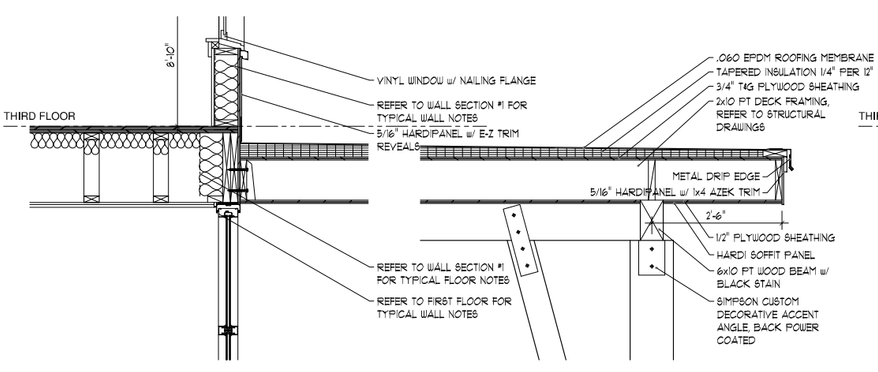
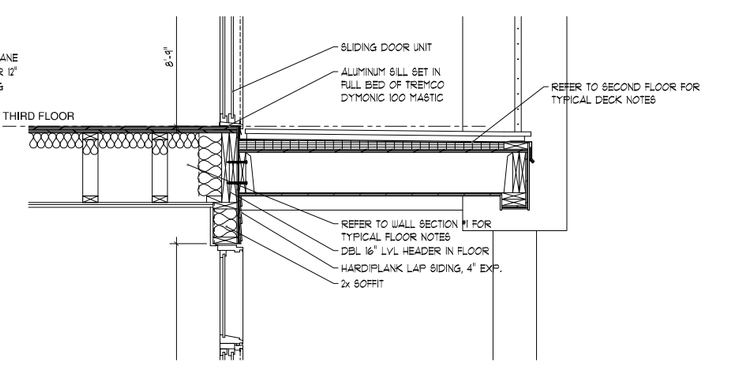


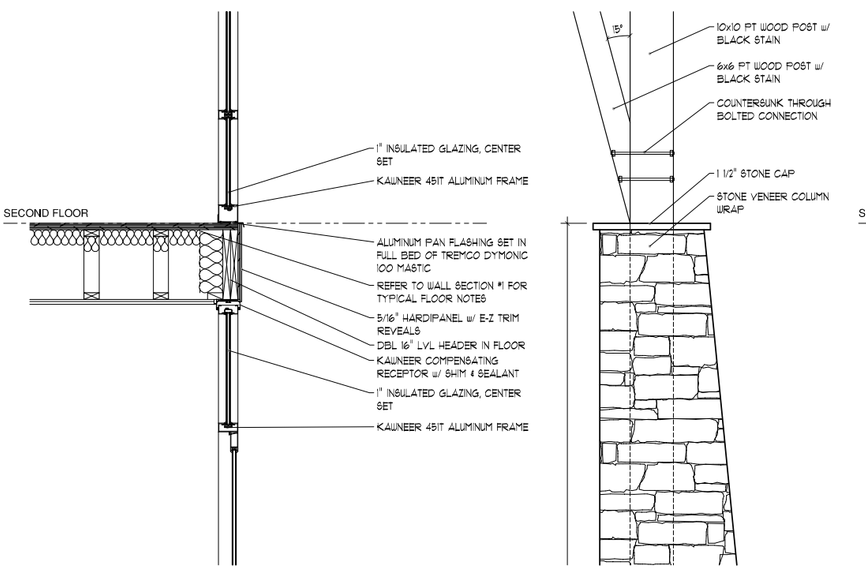




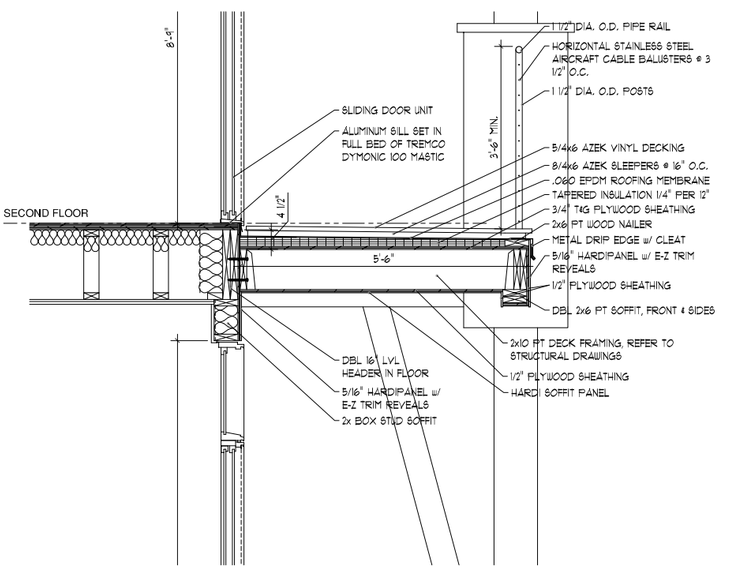


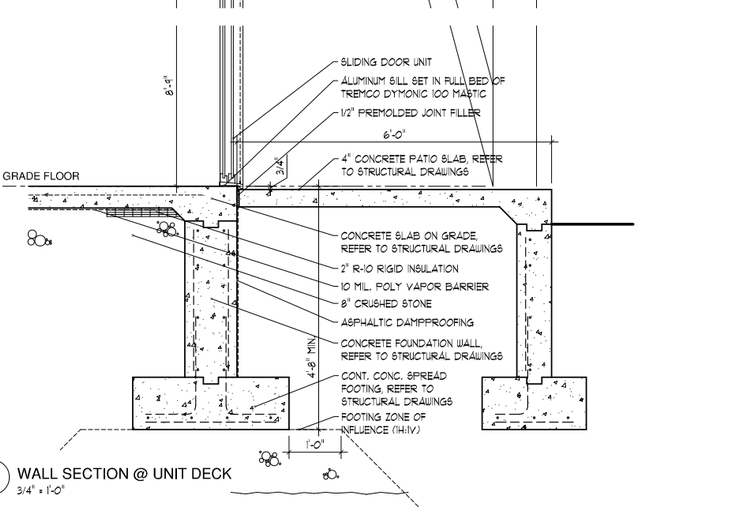






3 WALL SECTION @ MAIN ENTRY
3/4" = 1'-0"





4 WALL SECTION @ UNIT DECK
3/4" = 1'-0"

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: WALL SECTIONS
SCALE: 3/4" = 1'-0"
SHEET NO.: A3.3
JOB NO.: 20080

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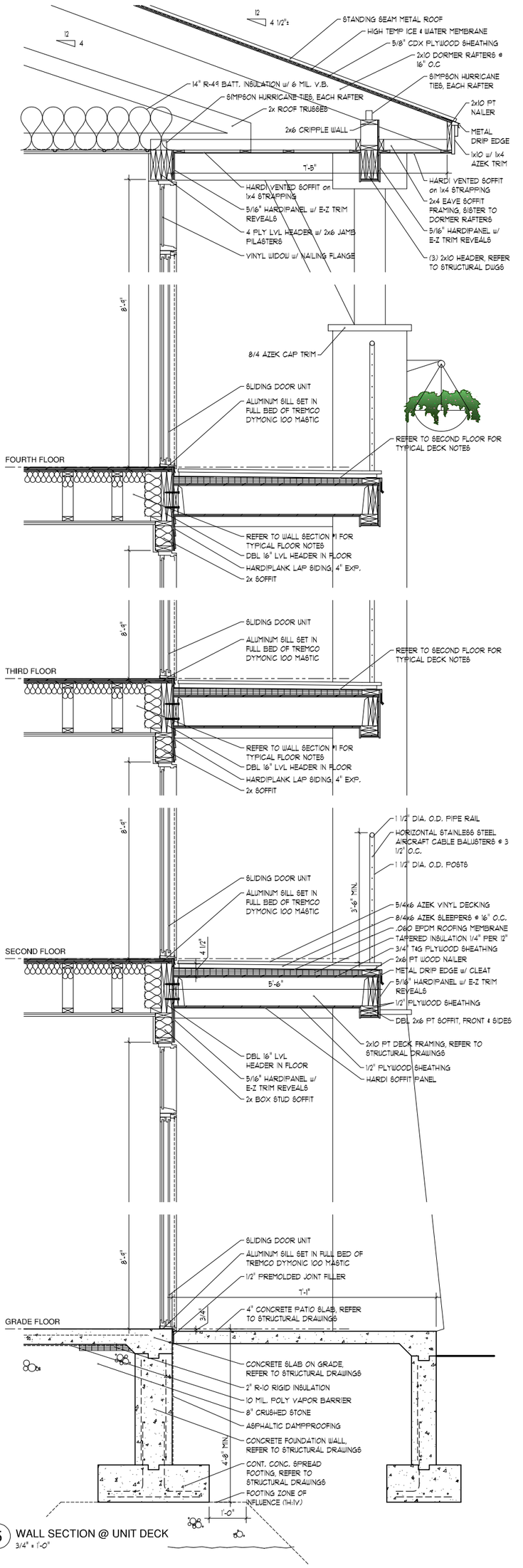
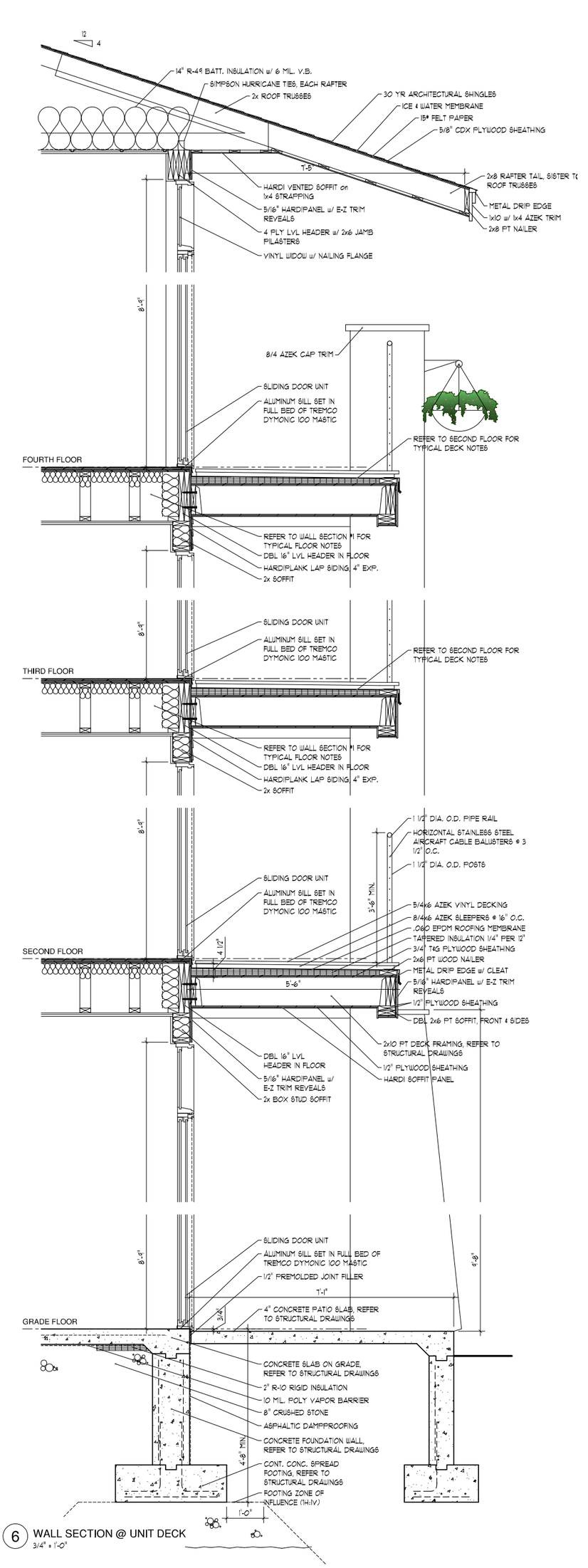
ISSUED:
ISSUED FOR PERMIT 10-30-2020
ISSUED FOR CONSTRUCTION 12-18-2020

AMMINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ANDOVER, MASSACHUSETTS
508 • 683 • 4551



5 WALL SECTION @ UNIT DECK
3/4" = 1'-0"



6 WALL SECTION @ UNIT DECK
3/4" = 1'-0"

ANKINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ADAMS, MASSACHUSETTS
508 • 663 • 4551

STAMP:

COMMONWEALTH OF MASSACHUSETTS
REGISTERED ARCHITECT
No. 5496
MICHAEL J. ANKINO

ISSUED:
REVISIONS:
REVISIONS:

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: WALL SECTIONS
SCALE: 3/4" = 1'-0"
SHEET NO.: A3.4
JOB NO.: 20080

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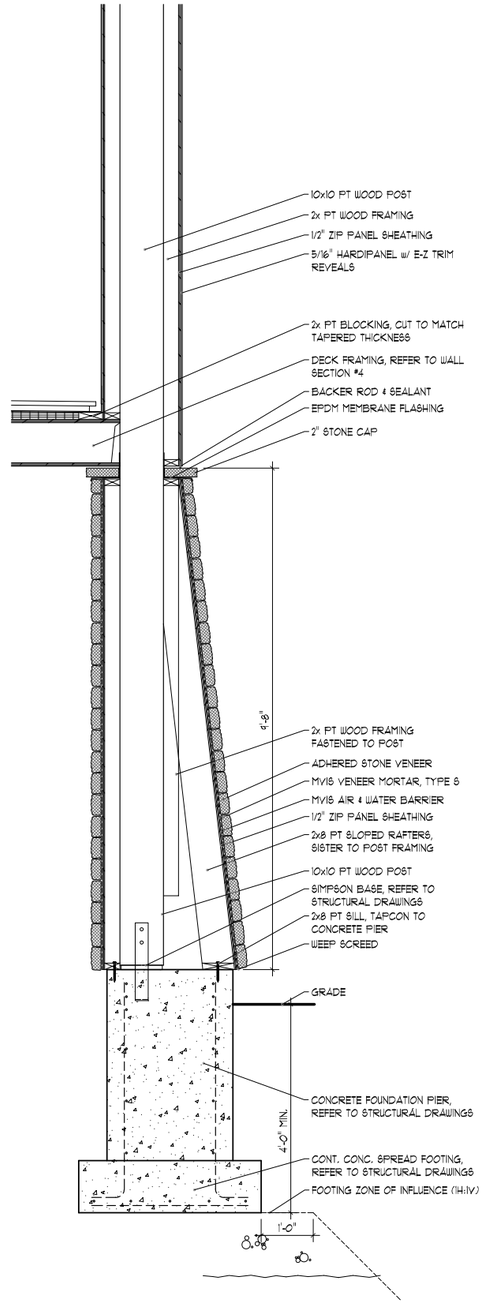
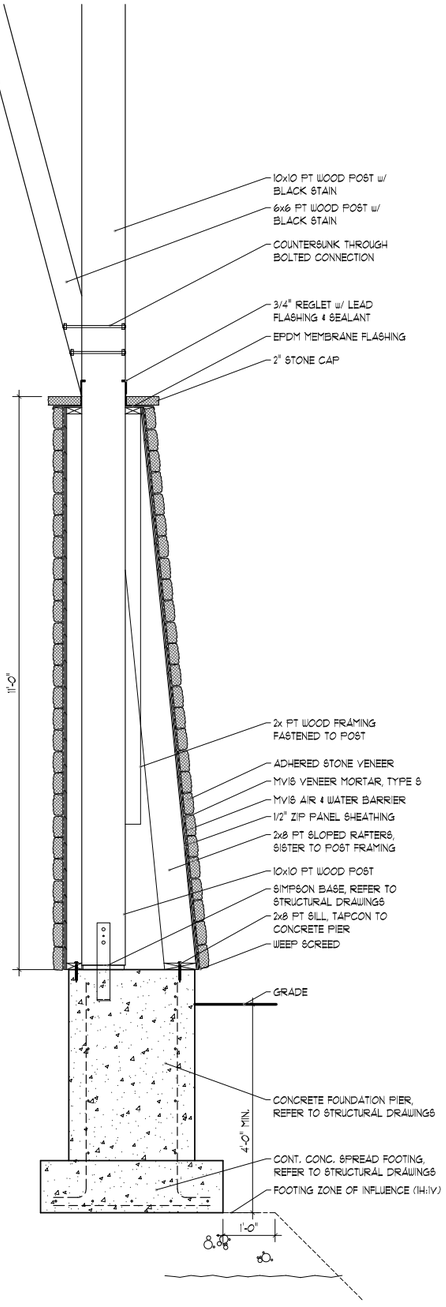
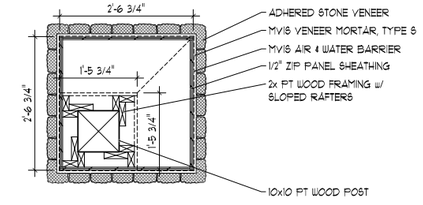
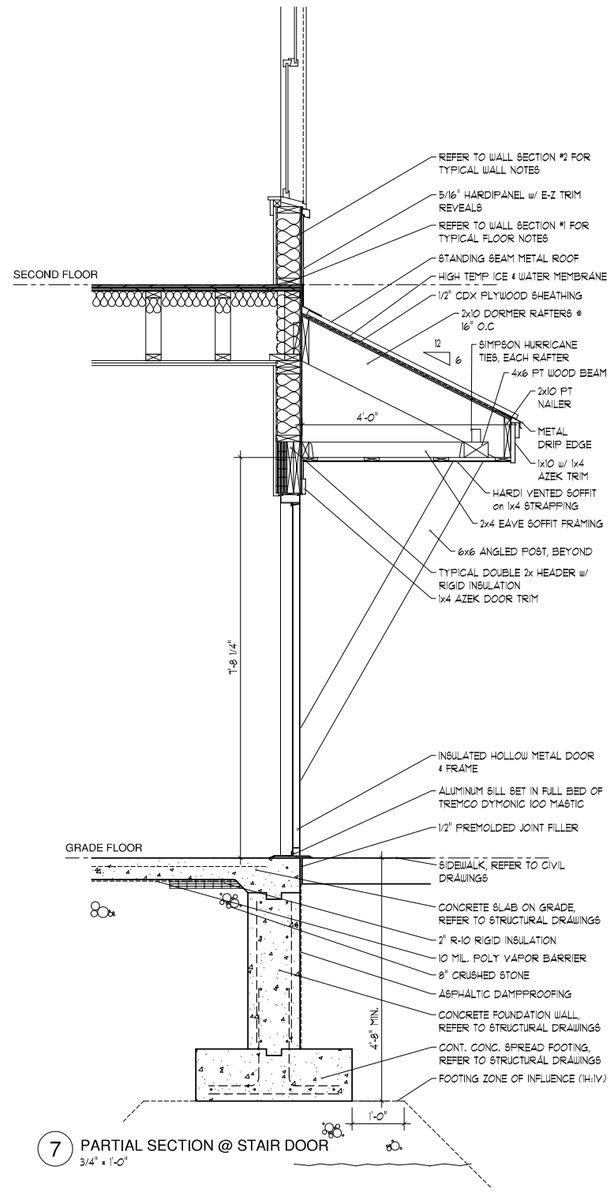


9 DECK COLUMN WRAP
3/4" = 1'-0"





8 ENTRY COLUMN WRAP STONE
3/4" = 1'-0"



7 PARTIAL SECTION @ STAIR DOOR
3/4" = 1'-0"

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COMMONWEALTH OF MASSACHUSETTS · REGISTERED ARCHITECT · DOUGLAS R. ANNINO · No. 5496 · MANSFIELD, MA

ISSUED:

SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: PARTIAL WALL SECTIONS & DETAILS
SCALE: 3/4" = 1'-0"
SHEET NO.: A3.5
JOB NO.: 20080

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ARCHITECTURAL ASPHALT SHINGLES
- DRIFTWOOD

HARDIE PANEL w/ REVEALS
- LIGHT MIST

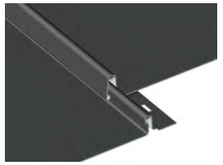
UP / DOWN BUILDING LIGHTING
- BRONZE

HARDIE PANEL w/ REVEALS
- GRAYSLATE

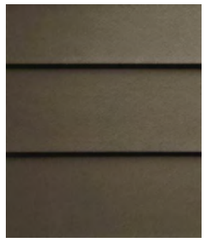
KAWNEER STOREFRONT
- DARK BRONZE

TYPICAL PARTIAL ELEVATION
1/4" = 1'-0"

ATAS STANDING SEAM METAL ROOF
- CLASSIC BRONZE



JAMES HARDIE CLAPBOARD SIDING
- TIMBER BARK



METAL CABLE BALCONY RAILING

IPEA WOOD TRELLIS

PHILADELPHIA FLAT STONE VENEER

ANNINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ATTLEBORO • MASSACHUSETTS
508 • 643 • 4551

STAMP:

ISSUED:

SEP 20 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: MATERIALS BOARD

SCALE: N/A

SHEET NO.: A4.1

JOB NO.: 20080

© Copyright Annino Incorporated, 2021

CONCRETE BOLLARD

BIKE RACK

TRASH RECEPTACLE

PARK BENCH

LITHONIA D-SERIES ILLUMINATED BOLLARD

BUILDING LIGHTING

35' ALUMINUM FLAGPOLE

IN-GROUND FLAGPOLE UP LIGHT

SITE LIGHTING

EV CHARGING STATION

ANNINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ATTLEBORO • MASSACHUSETTS
508 • 643 • 4551

STAMP:

REGISTERED ARCHITECT
DOUGLAS R. ANNINO
No. 5496
COMMONWEALTH OF MASSACHUSETTS

ISSUED:

SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
SITE FEATURES

SCALE:
N/A

SHEET NO.:
AC1.0

JOB NO.:
20080

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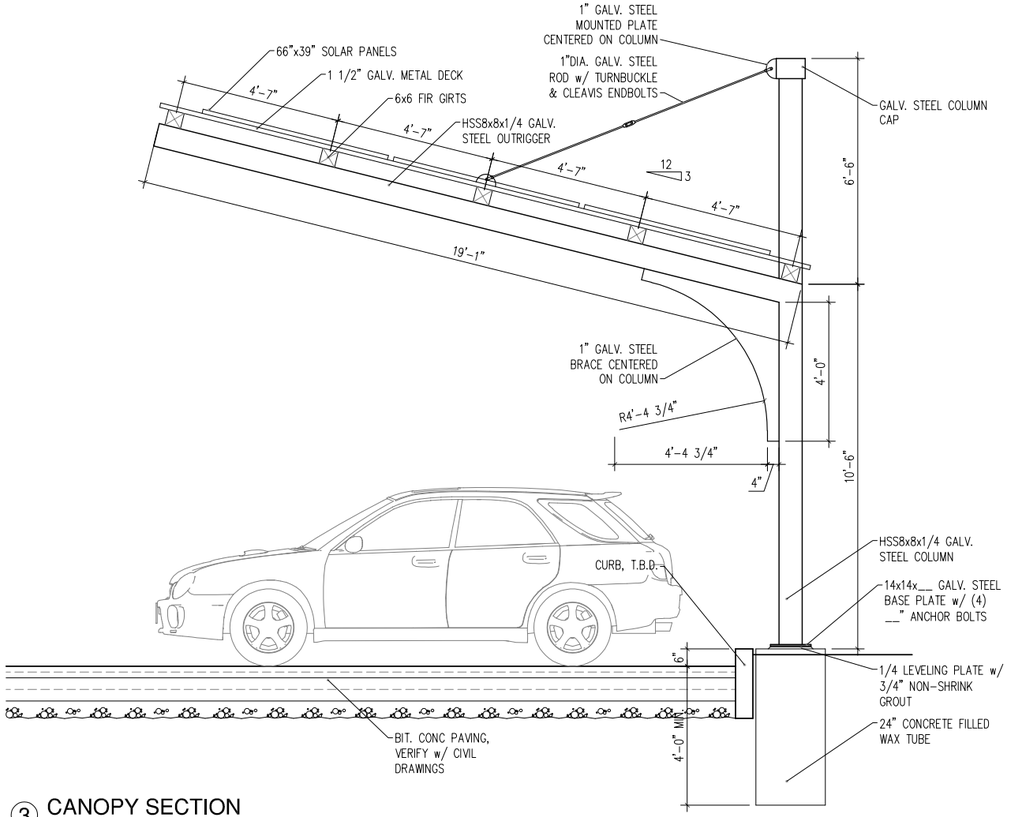
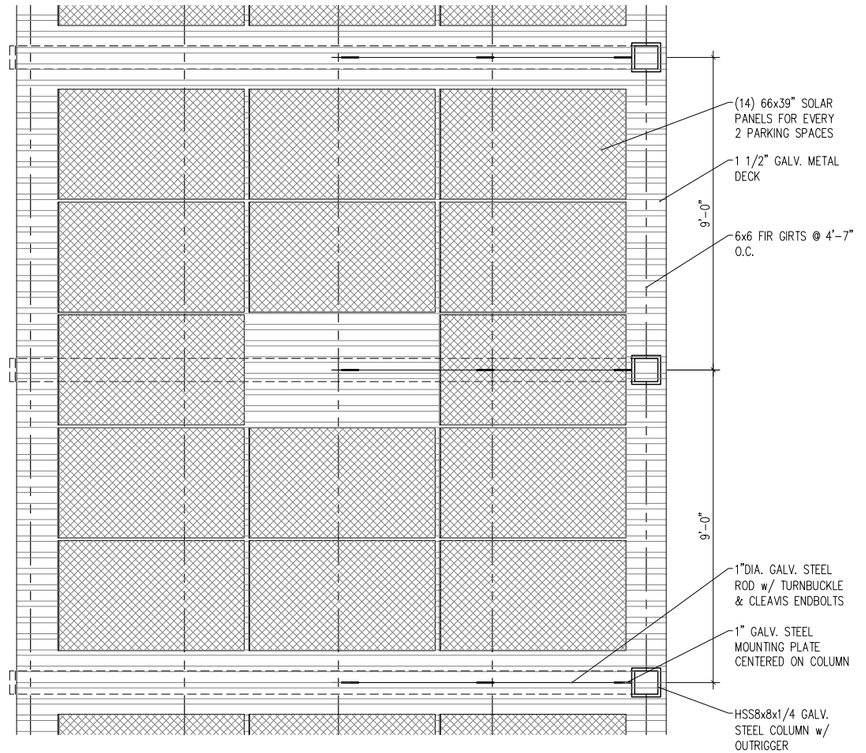
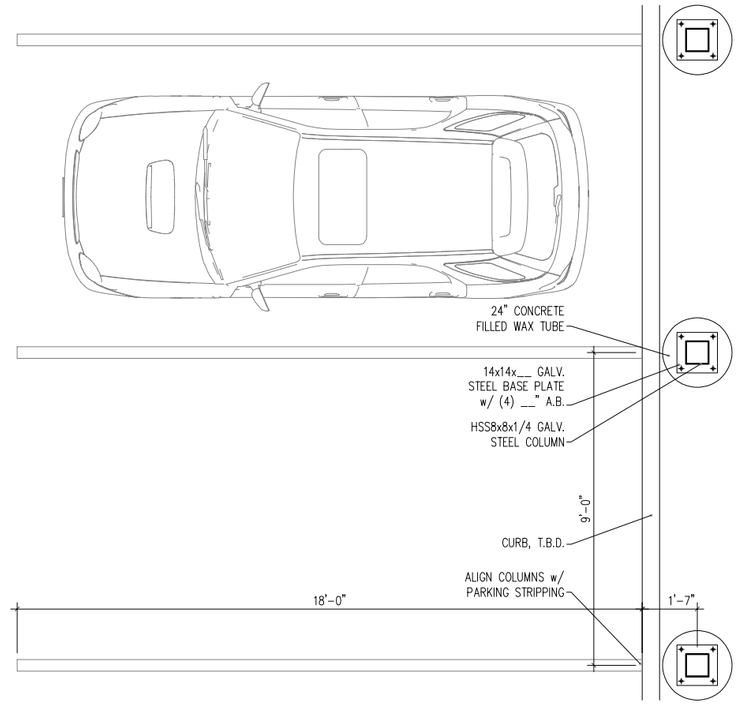


③ CANOPY SECTION
1/2" = 1'-0"



② ROOF PLAN
1/2" = 1'-0"



① FLOOR PLAN
1/2" = 1'-0"

ANNINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ATTLEBORO • MASSACHUSETTS
508 • 643 • 4551

STAMP:

ISSUED:

SEP 20 2024	ZBA SUBMISSION

BROADWAY VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE: SOLAR PARKING CANOPY

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

SHEET NO.: AC1.1

JOB NO.: 20080

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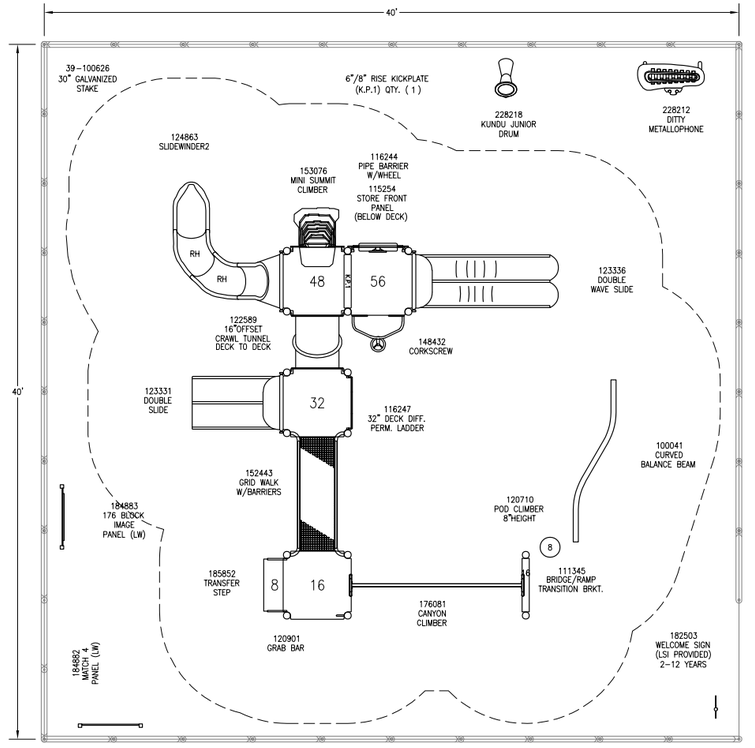
② PLAYGROUND RENDER
N.T.S.

③ PLAYGROUND RENDER
N.T.S.



① PLAYGROUND PLAN
1/4" = 1'-0"

ANNINO
INCORPORATED
ARCHITECTS • PLANNERS
125 NORTH WASHINGTON STREET
NORTH ATTLEBORO • MASSACHUSETTS
508 • 643 • 4551

STAMP:

ISSUED:

SEP 20 2024	ZBA SUBMISSION

BROADWAY
VILLAGE
341 Broadway
Dracut, Massachusetts

SHEET TITLE:
PLAYGROUND
CONCEPT

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

SHEET NO.:
AC1.2

JOB NO.:
20080

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Appendix D –

Project Eligibility Letter from MassDevelopment dated December 22, 2004 with Approved Sale of Property and Change of Ownership to World Dracut, LLC Dated May 20, 2021.

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Exhibit "B"

MASSDEVELOPMENT

December 22, 2004

Mr. Sunder K. Gangiani
First Dracut Development Company, LLC
30 Commerce Way, Suite 300
Woburn, MA 01801

COPY

Re: 341 Broadway Village, Dracut (the "Project")
PROJECT ELIGIBILITY (Site Approval) LETTER

Dear Mr. Gangiani:

Massachusetts Development Finance Agency ("MassDevelopment") received the application submitted by First Dracut Development Company, LLC (the "Applicant") for financing using the MassDevelopment Tax-Exempt Bond Program for Rental Housing and is pleased to provide you with this determination of project eligibility for the above-referenced Project.

MassDevelopment has reviewed the fundability of the Project under the MassDevelopment Tax-Exempt Bond Program for Rental Housing in accordance with 760 CMR 31.01. After receipt of your application for financing, MassDevelopment provided written notice of the application to the Town of Dracut Board of Selectmen through Mr. Glen Edwards, Assistant Town Manager, and we understand that the Board of Selectmen then reviewed the proposed Project at their August 10, 2004 meeting. Following that meeting, MassDevelopment received comments concerning the Project from the Board of Selectmen through the Assistant Town Manager within the review period and considered those comments and the impact of such comments on the fundability of the Project under the MassDevelopment Tax-Exempt Bond Program for Rental Housing prior to issuing this letter.

Based on the application, the Project involves the following characteristics:

Applicant: First Dracut Development Company, LLC
130 Commerce Way
Woburn, MA 01801

Site: Approximately 47.2 acres
341 Broadway
Dracut, MA 01826

01/05/05 WED 21:04 FAX 7819332791 MANNIX WORLD IMP (FAX)1 617 236 5014 P.001/003
Geoffrey, Levin and Muir 002

'est Dracut Development, LLC
)ecember 22, 2004

Project: 341 Broadway Village
A 318-unit rental project consisting of six buildings; 4 dwelling buildings (60 units each), 1 building for age restricted (55+) with (78 units), and a community center. All buildings will have underground parking with additional spaces to be located above-ground on-site.

Subsidizing Program: Massachusetts Development Finance Agency Tax-Exempt Bond Program for Rental Housing.

COPY

Low Income Units: 65 affordable-rent units will be reserved for households each with incomes that are less than 50% of the area median income within the MSA, and must be so restricted for a minimum period of 30 years.

Unit Mix:

Market Rate Units:	50 1BR (850 sf); 203 2BR (1100 sf)
Affordable Units:	13 1BR (850 sf); 52 2BR (1100 sf)

Limited Dividend: The Applicant has agreed to enter into a Regulatory Agreement with MassDevelopment whereby the Applicant's profit, cash flow, and distribution of return to the Applicant or to the members or other owners of the Applicant shall be limited as set forth in MassDevelopment's equity and limited dividend policy.

MassDevelopment has reviewed the materials submitted by the Applicant, including preliminary plans, financial projections, and market information, conducted an on-site inspection, and reviewed the Town's comments, and has determined that the Project appears generally eligible and fundable under the requirements of the MassDevelopment Tax-Exempt Bond Program for Rental Housing, subject to final review of eligibility and approval.

Based on the submitted materials and on-site inspection, MassDevelopment has determined the following:

1. The housing design for the Project is generally appropriate for the Site;
2. The Project appears financially feasible within the housing market in which it is located, based on comparable rentals figures provided by the Applicant;
3. Based on the preliminary pro forma submitted by the Applicant, the Project appears financially feasible based on the Applicant's estimated development costs; and

Teat Dracut Development, LLC
December 22, 2004

4. The Applicant meets the general eligibility standards of the MassDevelopment Tax-Exempt Bond Program for Rental Housing.

While the Project housing design has been determined to be generally appropriate for the Site under the provisions of 760 CMR 31.01, MassDevelopment encourages all applicants to consider and utilize smart growth and anti-sprawl elements in the design and planning of their projects.

This determination of project eligibility is not a binding commitment for financing from MassDevelopment, rather it is a project eligibility letter under the comprehensive permit (G.L. c. 40B) regulations. Any commitment for financing from MassDevelopment is subject to review of the final financing application and the approval of the Board of Directors of MassDevelopment.

Massachusetts Development Finance Agency

By: _____
Name: ANN E. HOWARD
Title: CHIEF OPERATING OFFICER

COPY

Middlesex North Registry of Deeds

Electronically Recorded Document

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Recording Information

Document Number	: 47421
Document Type	: DECIS
Recorded Date	: August 11, 2021
Recorded Time	: 02:27:07 PM
Recorded Book and Page	: 36119 / 248
Number of Pages(including cover sheet)	: 7
Receipt Number	: 947502
Recording Fee	: $105.00

Middlesex North Registry of Deeds
Richard P. Howe Jr., Register
360 Gorham Street
Lowell, Massachusetts 01852
978/322-9000
www.lowelldeeds.com

Town of Dracut
Board of Appeals

62 Arlington Street
Dracut, MA 01826

Tel: (978) 454-0603
Fax: (978) 937-9885
email: boardofappeals@dracutma.gov

THE COMMONWEALTH OF MASSACHUSETTS

TOWN OF DRACUT

BOARD OF APPEALS

Comprehensive Permit pursuant to M.G.L. Chapter 40B
Sale of Property and Change of Ownership

The Board of Appeals of the Town of Dracut hereby certifies that a Public Hearing was held on May 20, 2021 and the Board deems that the Sale of the Property and the Change of Ownership from First Dracut Development Company, LLC to World Dracut, LLC is an insubstantial change to Comprehensive Permit 2005-13.

Granted to:

World Dracut, LLC

On this 20th day of May, 2021

Town of: Dracut Massachusetts

Affecting the rights of the owner with respect to land or buildings at:

341 Broadway Road Deed Book 35591 Page 144

And the said Board of Appeals further certifies that the decision attached hereto is a true and correct copy of its decision granting said Sale of Property and the Change of Ownership as an insubstantial change and that copies of said decision and of all plans referred to in the decision, have been filed with the Board of Appeals and the Town Clerk.

The Board of Appeals also calls to the attention of the owner or applicant that General Laws, pursuant to M.G.L. Chapter 40B provides that no variance and/or special permit, or any extension, modification or renewal thereof, shall take effect until a copy of the decision bearing the certification of the town or city clerk that twenty days have elapsed after the decision has been filed; that it has been dismissed or denied; it is recorded in the registry of deeds for the county and district in which the land is located and 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 fee for such recording or registering shall be paid by the owner or applicant.

I, KATHLEEN GRAHAM, CLERK of the TOWN of DRACUT, MASS., HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE

6/6/2021 Kathleen M Graham
Date Town Clerk, Dracut, Mass.

R. Scott Mallory
Scott Mallory, Chairman, Board of Appeals

Merylle C Chase
Merylle Chase, Clerk, Board of Appeals

Town of Dracut
Board of Appeals

62 Arlington St.
Dracut, MA 01826

Tel: (978) 454-0603
Fax: (978) 937-9885

June 25, 2021

Re: Zoning Board of Appeals #2005-13 Comprehensive Permit (40B) -- 341 Broadway Road, Dracut, MA,

This letter is to confirm receipt of a letter from MassDevelopment indicating that they have reviewed a number of documents provided by World Dracut, LLC. Based on that review, MassDevelopment has indicated it is their opinion that World Dracut, LLC meets the requirements of 760 CMR 56.04(1)(a) and (b). The Dracut Board of Appeals therefore recognizes the ownership transfer from the original owner, First Dracut Development Company, LLC, to World Dracut, LLC.

2021 JUN 29 AM 11:05

Sincerely,

R. Scott Mallory

R. Scott Mallory, Chairman

RSM/apm

(e) Any items which are separately allocated pursuant to Sections 4.05 and/or 4.06 which otherwise would have been taken into account in calculating Profits and Losses pursuant to the above provisions shall not be taken into account and, as the case may be, shall be added to or deducted from such amounts so as to be not part of the calculation of the Profits or Losses.

If the LLC's taxable income or loss for such year, as adjusted in the manner provided above, is a positive amount, such amount shall be the LLC's Profits for such year; and if negative, such amount shall be the LLC's Losses for such year.

"Reasonable Reserves" shall mean such amount as the Managers, acting by Approval, shall deem reasonably necessary to meet the foreseeable liabilities or obligations of the LLC taking into consideration historic costs as well as reasonably projected cash flow, and including, but not limited to the normal expenses of the operation and management of its activities, as such liabilities and obligations become due and payable.

"Regulations" shall mean the Regulations promulgated under the Code, and any successor provisions to such Regulations, as such Regulations may be amended from time to time.

"Transfer" and any grammatical variation thereof shall refer to any sale, exchange, issuance, redemption, assignment, distribution, encumbrance, hypothecation, gift, pledge, retirement, resignation, transfer or other withdrawal, disposition or alienation in any way as to any interest as a Member. Transfer shall specifically, without limitation of the above, include assignments and distributions resulting from death, incompetency, Bankruptcy, liquidation and dissolution.

The definitions set forth in the Act shall be applicable, to the extent not inconsistent herewith, to define terms not defined herein and to supplement definitions contained herein.

ARTICLE XI

Limited Dividend Organization

The LLC shall be "Limited Dividend Organization" within the meaning of Massachusetts General Laws, c. 40B and 760 CMR 56.

IN WITNESS WHEREOF, the Manager and the Member hereto have executed this Agreement under seal as of the day and year first above written.

MEMBERS:

Mark D. Coppola

MANAGER:

Mark D. Coppola

Citizens' Housing and
Planning Association

Board of Directors

President
Amy Schectman

President-Elect
Felicia Jacques

Vice Presidents
Andrew DeFranza
Gordon Pulsifer

Treasurer
Angie Liou

Clerk
Naomi Sweitzer

Andrea Aldana
Kenan Bigby
Rachana Crowley
Aida Franquiz
Soni Gupta
Wendell Joseph
Jason Korb
Dara Kovel
Gloria Leipzig
Kathy McGilvray
Chris Norris
Leslie Reid
Olivia Richard
Dr. Megan Sandel

Chief Executive Officer
Rachel Heller

March 11, 2021

Dracut Zoning Board of Appeals
11 Spring Park Avenue
Dracut, MA 01826

Dear Chairperson:

As you may be aware, Citizens' Housing and Planning Association (CHAPA) is the monitoring agent for three Chapter 40B developments in Dracut: Park Place Estates, Riverside Landing and Robbins Nest. CHAPA is a statewide non-profit organization based in Boston. We were designated by the Zoning Board of Appeals and MassHousing to serve in this capacity.

The purpose of this letter is to provide the Zoning Board of Appeals with an annual update on the status of the Town's Chapter 40B developments.

As the monitoring agent, CHAPA reviews refinance requests from affordable unit owners and coordinates any resales of affordable units at Park Place Estates and Riverside Landing. CHAPA approved no refinances and coordinated one resale Park Place Estates in Dracut in 2020.

Robbins Nest: Robbins Nest is a New England Fund Chapter 40B rental project and has 24 affordable units. As the monitoring agent, CHAPA reviewed and approved the marketing plan and has been overseeing the initial lease-up of the affordable units. We have been verifying that applicants for the affordable units had household income that was at or below 80% of the area median income, as established by HUD, for Dracut and had assets within the established limit. CHAPA performs an annual review of the tenants and a report detailing our 2020 site visit was sent to the Town in December 2020. MassHousing will be reviewing the developer's submission of the total development costs and all third-party financing to determine the "imputed equity" amount with respect to the limited dividend requirements.

If you have any questions regarding our role as a monitoring agent please contact Carol Marine at CHAPA at 617-690-8603 or at cmarine@chapa.org.

Sincerely,

Karen Wiener
Chief Operating Officer

Cc: Jessica Malcolm, MassHousing

Town of Dracut
Board of Appeals

62 Arlington St.
Dracut, MA 01826

Tel: (978) 454-0603
Fax: (978) 937-9885

SPECIAL PERMIT AND/OR VARIANCE

Petitioner:

Address:

Appeals, if any, shall be made pursuant to M.G.L C40A, Section 17, and shall be filed within 20 days after the decision is filed with the Town Clerk's office, 62 Arlington Street, Town Hall, Dracut, MA 01826.

I certify that no appeal has been received within the 20 days of the filing of this notice in my office, or that if any appeal has been field that it has been dismissed or denied.

Kathleen M. Graham

Kathleen M. Graham, Town Clerk or
Jayne Boissonneault, Assistant Town Clerk

TIME STAMP AND SEAL OF THE TOWN OF DRACUT

I, KATHLEEN GRAHAM, CLERK of the TOWN of DRACUT, MASS., HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD of APPEALS has BEEN RECEIVED and RECORDED at this OFFICE and NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT and RECORDING of SAID NOTICE

8/6/2021 Kathleen M. Graham

Date Town Clerk, Dracut, Mass.

Received and entered with the Registry of Deeds in the County of Middlesex District having jurisdiction in Dracut, MA

Book Number: _____

Page _____

(Copy of recording to be attached)

Note: Building Permits shall not be issued until such time as the attestation is made and recording provided.

Appendix E –

World Dracut, LLC Authority, Limited Dividend Organization Certificate of Organization

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D

The Commonwealth of Massachusetts

William Francis Galvin
Secretary of the Commonwealth
One Ashburton Place, Room 1717, Boston, Massachusetts 02108-1512

Limited Liability Company
Certificate of Organization
(General Laws Chapter 156C, Section 12)

Federal Identification No.: _____

(1) The exact name of the limited liability company:

World Dracut, LLC

(2) The street address of the office in the commonwealth at which its records will be maintained:

60 Howard Street, No. 511, Watertown, Massachusetts 02472

(3) The general character of the business:

Real Estate Development

(4) Latest date of dissolution, if specified: _____

(5) The name and street address, of the resident agent in the commonwealth:

NAME	ADDRESS
Mark D. Coppola	60 Howard Street No. 511 Watertown, MA 02472

(6) The name and business address, if different from office location, of each manager, if any:

NAME	ADDRESS
Mark D. Coppola	60 Howard Street No. 511 Watertown, MA 02472

(7) The name and business address, if different from office location, of each person in addition to manager(s) authorized to execute documents filed with the Corporations Division, and at least one person shall be named if there are no managers:

NAME	ADDRESS
Paul T Prew	23 Norfolk Avenue So. Easton, MA 02375

(8) The name and business address, if different from office location, of each person authorized to execute, acknowledge, deliver and record any recordable instrument purporting to affect an interest in real property recorded with a registry of deeds or district office of the land court:

NAME	ADDRESS
Mark D. Coppola	60 Howard Street No. 511 Watertown, MA 02472

(9) Additional matters:

Signed by *(by at least one authorized signatory)*: _____

Consent of resident agent:

I Mark D. Coppola,

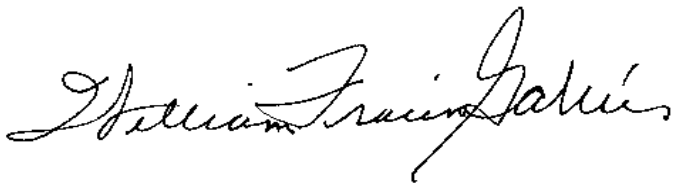
resident agent of the above limited liability company, consent to my appointment as resident agent pursuant to G.L. c 156C § 12*

**or attach resident agent's consent hereto.*

THE COMMONWEALTH OF MASSACHUSETTS

I hereby certify that, upon examination of this document, duly submitted to me, it appears that the provisions of the General Laws relative to corporations have been complied with, and I hereby approve said articles; and the filing fee having been paid, said articles are deemed to have been filed with me on:

November 05, 2020 12:11 PM



WILLIAM FRANCIS GALVIN

Secretary of the Commonwealth

Business Entity Summary

ID Number: 001468885

Request certificate | New search

Summary for: WORLD DRACUT, LLC

The exact name of the Domestic Limited Liability Company (LLC): WORLD DRACUT, LLC	
Entity type: Domestic Limited Liability Company (LLC)	
Identification Number: 001468885	
Date of Organization in Massachusetts: 11-05-2020	Date of Revival:
Date of Involuntary Dissolution by Court Order or by the SOC: 12-29-2023	Last date certain:

The location or address where the records are maintained (A PO box is not a valid location or address):

Address:

City or town, State, Zip code, Country:

The name and address of the Resident Agent:

Name: MARK D. COPPOLA

Address: 60 HOWARD ST., NO 511

City or town, State, Zip code, Country: WATERTOWN, MA 02472 USA

The name and business address of each Manager:

Title	Individual name	Address
MANAGER	MARK D. COPPOLA	60 HOWARD ST., NO 511 WATERTOWN, MA 02472 USA

In addition to the manager(s), the name and business address of the person(s) authorized to execute documents to be filed with the Corporations Division:

Title	Individual name	Address
SOC SIGNATORY	PAUL T. PREW	23 NORFOLK AVE. SO. EASTON, MA 02375

The name and business address of the person(s) authorized to execute, acknowledge, deliver, and record any recordable instrument purporting to affect an interest in real property:

Title	Individual name	Address
REAL PROPERTY	MARK D. COPPOLA	60 HOWARD ST., NO 511 WATERTOWN, MA 02472 USA

☐ Consent ☐ Confidential Data ☐ Merger Allowed ☐ Manufacturing

View filings for this business entity:

ALL FILINGS
Annual Report
Annual Report - Professional
Articles of Entity Conversion
Certificate of Amendment

View filings

Comments or notes associated with this business entity:

New search

Appendix F –

Deed into World Dracut, LLC evidencing Site Control with Dracut Assessor's information, Site Address, GIS Locus Map, with Aerial Map

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Middlesex North Registry of Deeds

Electronically Recorded Document

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Recording Information

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Document Type	: DEED
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Recorded Time	: 03:49:59 PM
Recorded Book and Page	: 35591 / 144
Number of Pages(including cover sheet)	: 4
Receipt Number	: 930085
Recording Fee (including excise)	: $15,773.00

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MASSACHUSETTS EXCISE TAX
Middlesex North ROD #14 001
Date: 04/07/2021 03:49 PM
Ctrl# 092130 28152 Doc# 00020892
Fee: $15,618.00 cons: $3,425,000.00
****

Middlesex North Registry of Deeds
Richard P. Howe Jr., Register
360 Gorham Street
Lowell, Massachusetts 01852
978/322-9000
www.lowelldeeds.com

QUITCLAIM DEED

First Dracut Development Company, LLC, a Massachusetts Limited Liability Company duly established under the laws of Massachusetts and having a usual place of business at 130 Commerce Way, Woburn, Middlesex County, Massachusetts

For consideration paid, and in full consideration of Three Million Four Hundred and Twenty Five Thousand and 00/100 Dollars ($3,425,000.00)

grants to World Dracut, LLC, a Massachusetts Limited Liability Company duly established under the laws of Massachusetts and having a mailing address of PO Box 95025, Newton, MA 02495

with Quitclaim Covenants

The land in Dracut, County of Middlesex, Commonwealth of Massachusetts, shown as Lots A-2, A-3 and A-4 on a plan entitled, "Plan of Land in Dracut, Mass., Scale: 1" = 100', January 22, 1987, Owner/Developer: G & P Construction Corp., 130 Commerce Way, Woburn, MA 01801, Engineer/Surveyor: Robert M. Gill & Assoc., Inc., 418 Bridge St., Lowell, MA", which plan is recorded in Middlesex North District Registry of Deeds, Plan Book 168, Plan 112.

Lot A-4 is subject to a 50-foot wide Right-of-Way Easement as shown on a "Plan of Land in Dracut, Mass. For G & P Development, Scale: 1" = 100", November 21, 1989, Robert M. Gill & Associates, Inc., Civil Engineers & Land Surveyors, 418 Bridge St., Lowell, MA 01850", which plan is recorded in Middlesex North District Registry of Deeds, Book of Plans 171, Plan 148.

Lots A-2, A-3 and A-4 are also subject to a 200-foot wide Easement to New England Power Company which passes through the southerly portion of said lot, as shown on said plan.

The conveyance is in the ordinary course of Grantor's business.

For Grantor's title see deed dated November 3, 2000 and recorded with the Middlesex North Registry of Deeds in Book 11170, Page, Page 323. See also Confirmatory deed from Parekh Construction, Inc. and Mannix World Imports, Inc. recorded in Book 35549, Page 262.

Signatures on the following pages

341 Broadway Road, Dracut, MA

WITNESS my hand and seal this 27th day of March 2021.

First Dracut Development Company, LLC

By: _____

Noah Parekh, Authorized Signatory

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss. March 27, 2021

On this 27th day of March, 2021, before me, the undersigned notary public, personally appeared Noah Parekh, proved to me through satisfactory evidence of identification which was MDL, to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily for its stated purpose as an Authorized Signatory of First Dracut Development Company, LLC.

_____

Notary Public

My Commission Expires: _____

CYNTHIA SHERMAN
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS
MY COMMISSION EXPIRES 11/18/2027

WITNESS my hand and seal this 27 day of March 2021.

First Dracut Development Company, LLC

By:

Sardar Singh K. Ganglani, Manager

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss. March 27, 2021

On this 27 day of March, 2021, before me, the undersigned notary public, personally appeared Sardar Singh K. Ganglani, proved to me through satisfactory evidence of identification which was MDL, to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily for its stated purpose as Manager of First Dracut Development Company, LLC.

Notary Public
My Commission Expires:

CYNTHIA SHERMAN
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS
MY COMMISSION EXPIRES 11/18/2027

226 LOON HILL RD

Location	226 LOON HILL RD	**Mblu**	51/ 86/ 3/ /
Acct#		**Owner**	WORLD DRACUT LLC
Assessment	$375,900	**PID**	8012
Building Count	1		

Current Value

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$0	$375,900	$375,900

Owner of Record

Owner	WORLD DRACUT LLC	**Sale Price**	$3,425,000
Co-Owner		**Certificate**	
Address	P.O. BOX 95025 NEWTON , MA 02495	**Book & Page**	35591/144
		Sale Date	04/07/2021
		Instrument	1N

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WORLD DRACUT LLC	$3,425,000		35591/144	1N	04/07/2021
FIRST DRACUT DEVELOPMENT CO., LLC	$1		11170/0323	1B	11/14/2000
PAREKH NALINIKANT TRUSTEE	$0		03707/0180		09/24/1986

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Building Percent Good:

Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style:	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/DracutMAPhotos//default.jpg)

Building Layout

(https://images.vgsi.com/photos/DracutMAPhotos//Sketches/8012_7795.j

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4400
Description	IND DEV LAND
Zone	I1
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Sqr Feet)	788000
Frontage	0
Depth	0
Assessed Value	$375,900

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2024	$0	$375,900	$375,900
2023	$0	$327,800	$327,800
2022	$0	$309,500	$309,500

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250 LOON HILL RD

Location	250 LOON HILL RD	**Mblu**	51/ 86/ 2/ /
Acct#		**Owner**	WORLD DRACUT LLC
Assessment	$376,900	**PID**	8011
Building Count	1		

Current Value

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$0	$376,900	$376,900

Owner of Record

Owner	WORLD DRACUT LLC	**Sale Price**	$3,250,000
Co-Owner		**Certificate**	
Address	P.O. BOX 95025	**Book & Page**	35591/144
	NEWTON, MA 02495	**Sale Date**	04/07/2021
		Instrument	1N

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WORLD DRACUT LLC	$3,250,000		35591/144	1N	04/07/2021
FIRST DRACUT DEVELOPMENT CO., LLC	$1		11170/0323	1B	11/14/2000
PAREKH NALINIKANT TRUSTEE	$0		03707/0180		09/24/1986

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Building Percent Good:

Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style:	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/DracutMAPhotos//default.jpg)

Building Layout

(https://images.vgsi.com/photos/DracutMAPhotos//Sketches/8011_7794.j

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4400
Description	IND DEV LAND
Zone	I1
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Sqr Feet)	793227
Frontage	0
Depth	0
Assessed Value	$376,900

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2024	$0	$376,900	$376,900
2023	$0	$328,700	$328,700
2022	$0	$310,400	$310,400

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341 BROADWAY RD

Location	341 BROADWAY RD	**Mblu**	37/ 86/ 1/ /
Acct#		**Owner**	WORLD DRACUT LLC
Assessment	$414,600	**PID**	4924
Building Count	1		

Current Value

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$0	$414,600	$414,600

Owner of Record

Owner	WORLD DRACUT LLC	**Sale Price**	$3,425,000
Co-Owner		**Certificate**	
Address	P.O. BOX 95025	**Book & Page**	35591/144
	NEWTON , MA 02495	**Sale Date**	04/07/2021
		Instrument	1N

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WORLD DRACUT LLC	$3,425,000		35591/144	1N	04/07/2021
FIRST DRACUT DEVELOPMENT COMPANY LLC	$1		35549/262	1F	03/30/2021
FIRST DRACUT DEVELOPMENT COMPANY LLC	$1		35489/57	1F	03/17/2021
FIRST DRACUT DEVELOPMENT CO., LLC	$1		11170/0323	1B	11/14/2000
PAREKH CONST INC	$1		5501/0162	1B	04/19/1991

Building Information

Building 1 : Section 1

Year Built:

Building Photo

Living Area: 0
Building Percent Good:
Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style:	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

(https://images.vgsi.com/photos/DracutMAPhotos//default.jpg)

Building Layout

(https://images.vgsi.com/photos/DracutMAPhotos//Sketches/4924_4823.j

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend

No Data for Extra Features

Land

Land Use

Use Code	4400
Description	IND DEV LAND
Zone	I1
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Sqr Feet)	443876
Frontage	0
Depth	0
Assessed Value	$414,600

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2024	$0	$414,600	$414,600
2023	$0	$361,200	$361,200
2022	$0	$335,100	$335,100

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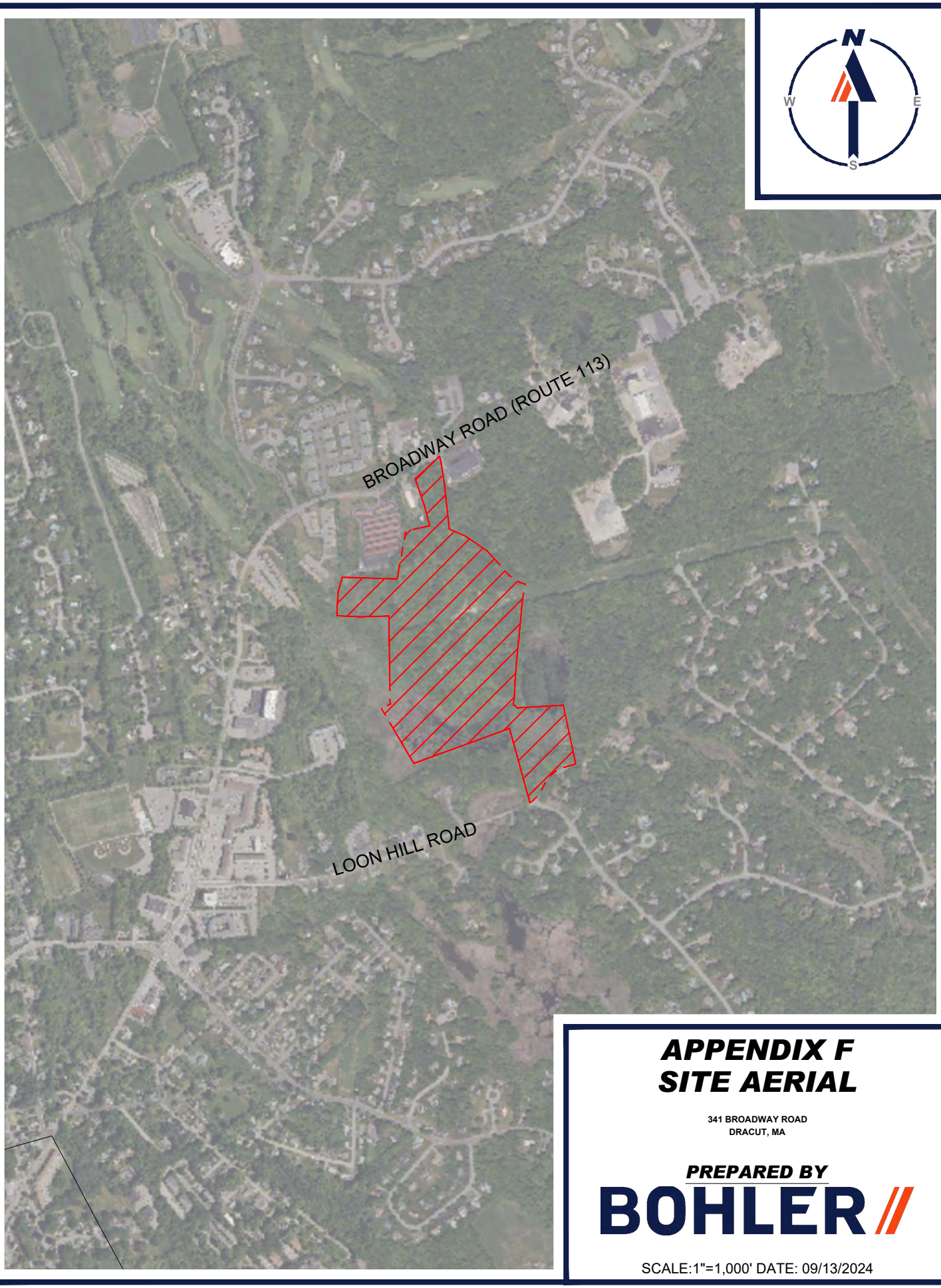

APPENDIX F
SITE AERIAL

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY
BOHLER

SCALE:1"=1,000' DATE: 09/13/2024

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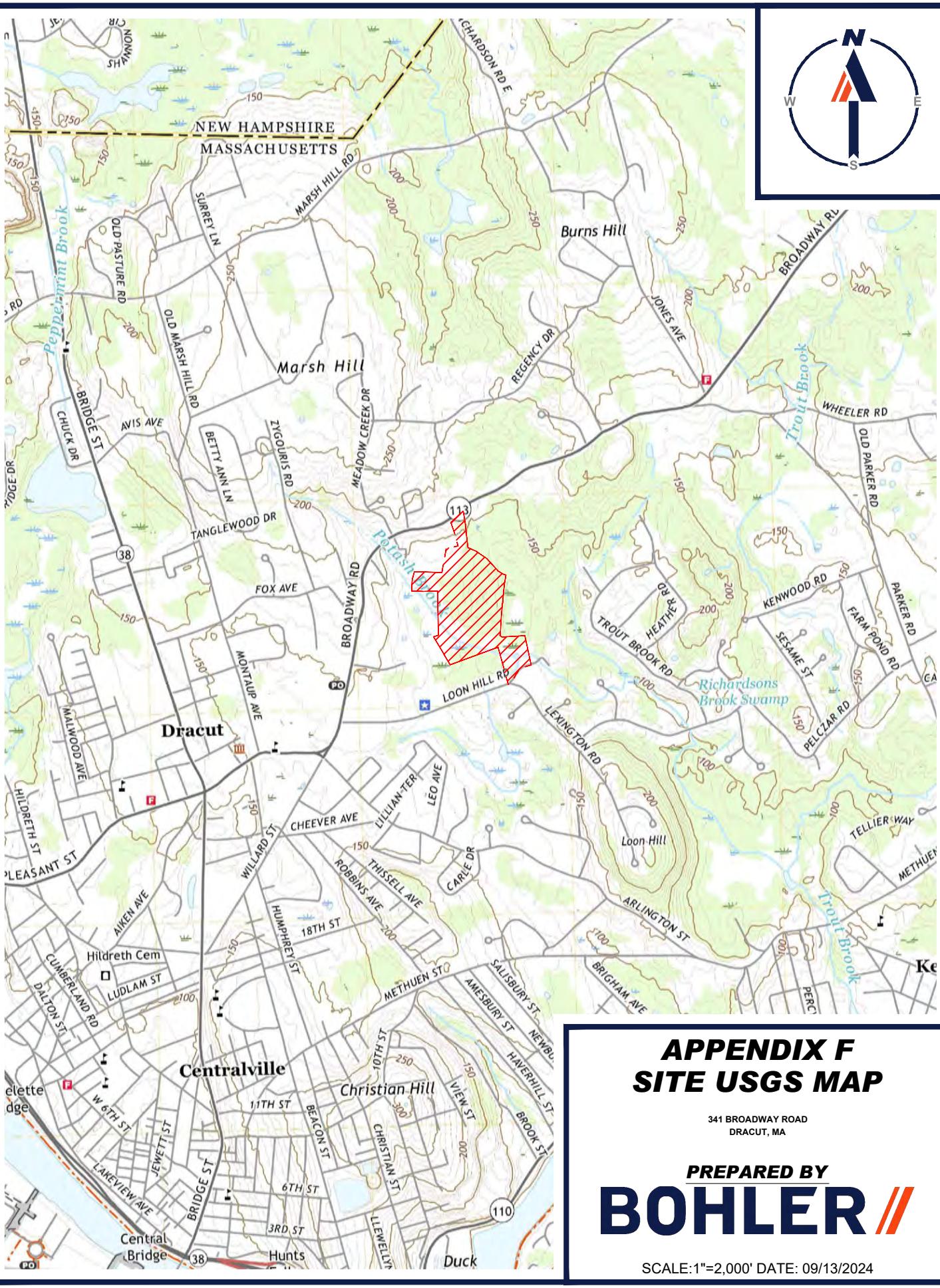

APPENDIX F
SITE USGS MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY

BOHLER

SCALE:1"=2,000' DATE: 09/13/2024

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Appendix G –

Development Team; Background/Resumes

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MIXED USE

River Park Lofts, Watertown, MA

WaterMills, Watertown, MA

Renaissance Station, Attleboro, MA

One Wall Street, Attleboro, MA

One Mansfield, Mansfield, MA

Station Square, Mansfield, MA

ANNINO

INCORPORATED

ARCHITECTS & PLANNERS • 125 NORTH WASHINGTON STREET • NORTH ATTLEBORO • MASSACHUSETTS • 02760
508 • 643 • 4551 FAX 508 • 643 • 4622

DOUGLAS R. ANNINO, NCARB

EDUCATION

University of Detroit
B.S. Architecture
Boston Architectural Center
Continuing Education
Harvard Graduate School of Design
Continuing Education

REGISTRATION

State of Massachusetts
State of Rhode Island
State of Connecticut
State of New Hampshire
State of Vermont
State of New York
State of Virginia

National Council of Architectural
Registration Board

PROFESSIONAL AFFILIATIONS

Former member - American Institute of Architects
Former member - Boston Society of Architects
Former member - New England Society of Architects
Former member - United States Green Building Council
Former member - Urban Land Institute

COMMUNITY

Former member - Town of Mansfield Planning Board
Former member - Town of Mansfield Board of Selectmen
Town of Mansfield Municipal Building Committee
HABITAT for Humanity Planning
Associate Building and Contractors Instructor
North Easton Savings Bank Corporator
Boston Architectural Thesis Advisor
Hockomock Area YMCA Corporator

A N N I N O

I N C O R P O R A T E D

ARCHITECTS & PLANNERS • 125 NORTH WASHINGTON STREET • NORTH ATTLEBORO • MASSACHUSETTS • 02760
508 • 643 • 4551 FAX 508 • 643 • 4622

ERIK L. IMMONEN, NCARB

EDUCATION

Boston Architectural Center
Bachelor of Architecture
Certificate in Sustainable Design and Practices

New England Institute of Technology
Associate in Science Degree
Architectural Drafting Technology

REGISTRATION

State of Massachusetts
National Council of Architectural Registration Board
LEED Green Associate

EXPERIENCE

ANNINO, INCORPORATED
1997 to Present

ADVANCED SIGNING INC.
1995-1997

Project Architect
Educational, Condominium, Retail & Office Design,
Residential & Interior Design, Restaurant & Hospitality,
Construction Documents, Construction Administration and Field Supervision

ACHIEVEMENTS

Eagle Scout

A N N I N O

I N C O R P O R A T E D

ARCHITECTS & PLANNERS • 125 NORTH WASHINGTON STREET • NORTH ATTLEBORO • MASSACHUSETTS • 02760
508 • 643 • 4551 FAX 508 • 643 • 4622

CHRISTINE A. WALSH

EDUCATION

Roger Williams University
Bachelor of Architecture

EXPERIENCE

ANNINO, INCORPORATED
2005 to Present

KAESTLE BOOS ASSOCIATES INC.
2001-2004

GOODY, CLANCY, & ASSOCIATES INC.
1995-2001

ARCHDESIGN, INC.
1995

ARCADD INC.
1993-1994

Project Manager
Educational, Public Service, Condominium, Retail & Office Design
Residential and Interior Design, Historic Mill Revitalization
Construction Documents, Construction Administration and Field Supervision

PROFESSIONAL AFFILIATIONS

Former Associate member American Institute of Architects

COMMUNITY

Former member of the Wrentham Historical Society
Citizen participant of the new Master Plan for the Town of Wrentham

A N N I N O

I N C O R P O R A T E D

ARCHITECTS & PLANNERS • 125 NORTH WASHINGTON STREET • NORTH ATTLEBORO • MASSACHUSETTS • 02760
508 • 643 • 4551 FAX 508 • 643 • 4622

JESSE R. JONES

EDUCATION

New England Institute of Technology
Bachelor of Science in Architectural Building Engineering Technology

EXPERIENCE

ANNINO, INCORPORATED
2015 to Present

AHARONIAN & ASSOCIATES
2010-2015

CVS/CAREMARK
2007-2009

THOMAS LONDARDO & ASSOCIATES
2006-2007

Design Drafter
Condominium, Retail & Commercial Design, Wellness & Fitness Design
Existing Conditions and Construction Documents

ANNINO

INCORPORATED

ARCHITECTS & PLANNERS • 125 NORTH WASHINGTON STREET • NORTH ATTLEBORO • MASSACHUSETTS • 02760
508 • 643 • 4551 FAX 508 • 643 • 4622

Company Biography

CIVILWORKS NEW ENGLAND
CIVIL & WATERFRONT ENGINEERING
P.O. BOX 1166 · 181 WASTON ROAD
DOVER, NEW HAMPSHIRE 03821

Thank you for the opportunity to introduce Civilworks New England. We're a comprehensive civil, coastal, and waterfront engineering and surveying firm proudly serving New England since 1984. We are licensed in New Hampshire, Massachusetts and Vermont. Our team partners with private developers, municipalities, architects, engineers, and contractors to deliver thoughtful, cost-effective solutions tailored to each project's needs.

We provide comprehensive civil site design services for commercial, residential, and industrial developments. This includes grading, drainage, septic design, stormwater management, and full permitting support. Our team is well-versed in working with local planning boards, state environmental agencies, and federal permitting authorities to keep projects moving forward smoothly.

In addition, we offer specialized coastal and waterfront engineering—designing piers, marinas, seawalls, bulkheads, and dredging plans, as well as providing underwater assessments and shoreline stabilization strategies.

Our in-house survey department delivers precise ALTA/NSPS, boundary, topographic, easement, and construction layout surveys. We support every phase of your project, from early feasibility through final construction administration.

As a 100% employee-owned company, we take pride in our work and the long-term partnerships we build. Based in Dover, NH and licensed throughout the region, Civilworks New England is committed to responsive service, regulatory clarity, and engineering that works in the real world.

Mark E. Beaudry, PE

Senior Associate
Senior Project Manager

CIVILWORKS NEW ENGLAND
PO Box 1166, 181 Watson Road, Dover, NH 03820
and, PO BOX 161, Turners Falls, MA 01376

Mark E. Beaudry, PE, is a Senior Associate and Senior Project Manager with the firm, and has over 41 years of experience in civil engineering and land development projects throughout New England. He is responsible for the management, civil/site design and permitting of multidiscipline land development and infrastructure improvement projects for commercial, residential, industrial and municipal clients. Mr. Beaudry has extensive professional experience with various size land development projects. He has acted as liaison to project teams from conceptual design through construction, has managed project planning, design development tasks, permit acquisition and construction document preparation, construction services and the coordination of staff and sub-consultants. He also has extensive experience with project representation before local and state boards and regulatory officials.

Years of Professional Experience
41

Education
B.S. Civil Engineering
University of Lowell, Lowell, MA
Graduate Study towards M.S.
Worcester Polytechnic Institute, Worcester, MA

Registration
Professional Engineer
Commonwealth of Massachusetts, No. 38189

Professional Engineer
State of New Hampshire, No. 7101

Professional Engineer
State of Maine, No. 6116

Certified Soil Evaluator
Commonwealth of Massachusetts, DEP, No. 117

Title 5 Systems Inspector
Commonwealth of Massachusetts, DEP, No. 4844

Project Experience

Comcast
Managed/managing civil/site design, permitting and construction related services on sites to provide broadband digital equipment "headend" facilities to supplement or replace existing telecommunication centers to support the growth of residential and commercial broadband high-speed internet availability within the areas. Feasibility and conceptual design studies are being performed on several other sites. Natick, Lawrence and Marlboro, MA

Benfield Farms
Managed civil/site design, permitting and construction services on this 26-unit affordable senior housing project, provided by Neighborhood of Affordable Housing (NOAH) for the Carlisle Housing Authority on Town-owned land. Services included layout, grading, drainage and the implementation of an on-site public water supply well and a wastewater treatment and disposal system. Permitting with the Town, MassDEP and the US Army Corps of Engineers was required. Recent services included managing disposal system upgrades and permit close-out. Carlisle, MA

Starbucks
Managed civil/site design, permitting and construction related services on this 2,280 square foot stand-alone coffee shop with drive-through facility within Danvers Plaza. Danvers, MA

Dry Goods Retail Store
Managing civil/site design and permitting of a 9,000± square foot store with associated parking and loading facilities that is served by on-site wastewater disposal and water supply well. Gorham, ME

Holden Rehabilitation and Skilled Nursing Facility and Medical Office Building
Managed civil/site design, permitting and construction services for a 13,500+ square foot expansion of the existing Holden Rehabilitation and Nursing Center (HRNC) and a 33,600± square foot Medical Office Building to house a major regional health care provider among other tenants; these projects being two phases of a multi-phase development for Oriol Health Care on the 25-acre campus that is currently in the master planning stages. Holden, MA

Revvity (formerly PerkinElmer)
Managed the civil/site design, permitting and construction services for two building additions; a 40,000+ square foot office building addition at 68 Elm Street and a 25,000+ square foot warehouse addition at 5 Parkwood Drive along with supporting site improvements on both. Current services include annual stormwater observations. Hopkinton, MA

The Governor's Academy
Managed and performed civil/site design, permitting and construction related services on the school's Parker River Environmental Studies Center along with a recently completed cross-county ADA/AAB compliant access pathway to the educational building that included an elevated timber section spanning wetland and flood-plain areas. Byfield, MA

Whitney Farm
Managed civil/site design, permitting and progress construction-related services for this 48-unit 40B Comprehensive Permit development on a 27-acre farm site with significant wetland constraints. Design elements included drainage systems, stormwater recharge and detention facilities, flood plain analysis and sanitary collection and disposal systems. Project permits included Conservation Commission approval, Comprehensive Permit acquisition from the Zoning Board of Appeals and State Housing Appeals Committee and assistance with DEP Groundwater Discharge Permitting. Sherborn, MA

Vicor Corporation
Managed civil/site design, permitting and construction related services on the 96,495 square foot expansion to Vicor's 227,136 square foot modular power product development and manufacturing facility on this 19-acre site that abuts a pond and wetland areas. Related site improvements included relocated and expanded parking and stormwater management facilities and relocated and upgraded utilities. Extensive local permitting along with approval amendments were required as the project evolved. Andover, MA

Sitkowski School Senior Housing
Managed civil/site design, permitting and construction services for the rehabilitation and adaptive re-use of the historic A.J. Sitkowski School into 62 affordable senior housing units. The program also included provision of a new Senior Center. Webster, MA

Church Street Improvements
Managed civil/site design and construction services for the reconstruction of this municipal roadway for the Town of Webster. Services included layout, streetscape, landscape, and utility and lighting improvements. Webster, MA

Dudley Greenville Housing
Managed civil/site design, permitting and construction related services for this affordable housing project which included 43 multi-family residential rental units, 3,000 square feet of retail space, and supporting site improvements on two separate parcels. Services included off-street parking layouts, site grading, stormwater management system design, utility connections, sidewalk improvements and extensive coordination with Boston Water and Sewer Commission. Roxbury, MA

Concord Park
Managed and completed site design and construction related services for this 78 unit Assisted Living and memory care facility on a "land locked" site that required access through a Town and MBTA parking lot and restoration of a degraded site along the Assabet River. After almost 20 years of successful operation, the owner Volunteers of America Massachusetts (VOA) and their operator, Senior Living Residences, provided a 21 unit expansion, with associated parking and utility expansions, for which additional services were provided including off-site roadway, landscape, lighting and signage improvements to rehabilitate aged infrastructure, enhance the entrance experience and assist patrons with way-finding. Concord, MA

SYSCO Corporation
Managed the civil/site design and permitting of a new 620,000± square foot regional food distribution center for Sysco Boston LLC. The 130± acre site included new parking areas for automobiles and Sysco's fleet of trucks and trailers as well as an on-site truck servicing and fueling centers. Services include site layout, design of grading and stormwater management systems and wastewater disposal facilities. Permitting for the project included local Site Plan Approval and several Special Permits as well as various State permits necessary from the MassDEP. Plympton, MA

Lappin Pump Station
Managed civil/site design, bidding and construction services for the upgrade to an outdated municipal pump station for the Town of Ipswich along with the design of a gravity sewer connection from the High School to eliminate the need for a second pump station on that near-by property. The station includes duplex 385 GPM submersible pumps as well as emergency power generation and an estimated wastewater flow of 185,000 GPD. Ipswich, MA

Stephen J. Haight, PE
PRESIDENT

CIVILWORKS NEW ENGLAND
PO BOX 1166 · 181WATSON ROAD
DOVER, NEW HAMPSHIRE 03821

Stephen J. Haight brings thirty-nine (39) years of experience in civil engineering and design, particularly in the area of civil/site design and construction administration. He has designed and monitored construction for a multitude of commercial, industrial, institutional and residential projects throughout New England, across the country as well as overseas. Mr. Haight specializes in construction administration, construction specifications, construction plans, documents and contracts. Mr. Haight also specializes in the preparation of and review of hydrologic analysis and reports utilizing industry standard software: Hydrocad and HECRAS. Mr. Haight also specializes in the planning of, design of, implementation of and review of Storm Water Prevention Pollution Plans.

Haight Engineering PLLC/Civilworks New England: Dover, NH
Principal Engineer responsible for the management and direction of engineering and business aspects of the firm including client acquisition and retention, proposal preparation and fee negotiation, public presentations, permit acquisition and coordination of budgetary policy.

Projects include a wide variety of private and public, commercial and residential developments from concept through construction, as well as technical advisory services related to all civil site design, commercial site plans, residential subdivisions, construction documents & contracts, construction administration, permitting, Stormwater Pollution Prevention plans and implementation, Planning Board, Zoning Board, Conservation Commission client representation.

Civil Engineering, Assessment, Planning & Design

LICENSES/REGISTRATIONS

Professional Engineer – NH (#7978)

Professional Engineer – ME (#7050)

Professional Engineer – MA (#40525)

Licensed Septic Designer:
State of New Hampshire, Designer No. 934

ADDITIONAL CERIFICATIONS

OSHA 10-hour Construction Safety
Road Surface Management Systems
Road Recycling and Rehabilitation (FHWA)
Open Water Diver (PADI)
Notary Public: Strafford County

EDUCATION

Bachelor of Science - Civil Engineering
University of New Hampshire

Graduate studies –
Engineering Management Certificate, 2011
Coastal Engineering, UNH
Project Management, UNH
Construction Project Management, Northeastern University

PRINCIPAL IN CHARGE

West Running Brook – Derry NH
West Running Brook Village is a mixed-use development on four (4) parcels that will consist of apartments, residential condominiums, retail shops, and restaurants. Site improvements include site access, lighting, parking, drainage and utility improvements, on-site recreational opportunities, and connectivity to local parks and the neighboring school. The project will also require offsite improvements of turning lanes and road widening of both South Main Street (NH RTE 28) and Humphrey Road. Proposed drainage improvements incorporate the offsite improvements to ensure the drainage system is designed to mitigate peak flow from all proposed developments. The stormwater system is also designed to treat approximately 23,600± s.f. of off-site impervious area from a combination of both South Main Street and Humphrey Road.

Nesmith Meadows – Windham NH
Nesmith Meadow, LLC, is proposing to construct 2,293 linear feet of roadway for a 50-unit residential condominium, a clubhouse, and an offsite small community water supply and community septic systems. The design of associated site improvements includes site access, parking, drainage, and utility improvements.

Oyster River Middle School – Durham NH
The redevelopment of the Oyster River Middle School with a state-of-the-art LEED certified site and building. Site improvements included coordination to allow the existing school to remain in operation while the new school was constructed. Site improvements included a geothermal system, a solar array, a turf athletic field, separation of bus and parent drop off areas and traffic reconfiguration to facilitate access to the new school and maximize on and offsite parking. Design included eExtensive retaining walls and stormwater management systems.

Future Automation – Dover NH
The project consisted of the design and permitting for the Future Automation campus with two buildings with a total floor area of 35,000 square feet that will be accessed via a single shared access driveway but will be served by separate parking and loading areas. The parcel was purchased from the Dover Business & Industrial Development Authority (DBIDA). The site improvements include public water and sewer connections, underground electric service, natural gas service, and associated drainage improvements. The access driveway required a culverted wetland crossing resulting in 1,631+ sf of wetland impacts.

Leathers Lane Residential Community – Dover NH
The project developed a 16-acre parcel on Leather's Lane with a forty (40) unit detached condominium with site improvements that included private roads to service the units, sidewalks, underground utilities, city water and sewer, storm water mitigation and associated site grading, site lighting, a comprehensive landscape plan and a mail kiosk. Off-site improvements will include an upgrade to Leathers Lane at the Back River Road intersection with a dedicated right turn only exit lane and a combined straight and left turn lane, as well as upgraded sidewalks and a painted pedestrian cross walk across Leathers Lane.

Riverbank Residence (40-B) – Somerset MA
The project was proposed as a redevelopment of an existing restaurant into a 16-unit building with associated parking and enhanced landscaped areas. This site layout proposed a reduction of impervious areas and a corresponding increase of landscaped areas

THE PANOS LAW GROUP
JASON A. PANOS, ESQ.
246 Andover Street, Suite 301
Peabody, Massachusetts 01960
(978) 406-9979
E Mail: jpanos@panos-law.com

EDUCATION

Suffolk University Law School, Boston, Massachusetts: J.D. Class of 1999
Honors: ***Dean's List***
Suffolk Transnational Law Review: Staff Member, 1997-1998
Recipient: Jurisprudence Award for Academic Excellence in Securities Regulations
Honorable Mention: First Year Legal Brief Section Competition

Boston College, Chestnut Hill, Massachusetts: A.B., Political Science/Economics, May 1992
Honors: ***Dean's List***

LEGAL EXPERIENCE

The Panos Law Group: ***Principal/Real Estate/Transactions Attorney, Est. 2015 – Present***

- Counsel and represent private and public sector clients with regard to land use, environmental, planning, zoning, licensing, permitting, sub-divisions and variances including matters under M.G.L. Chapters 40A, 40B, 40R and 41 sections 81K-81GG.
- Counsel and represent lending institutions engaged in all aspects of sophisticated, multi-state, secured lending involving commercial real estate and asset based transactions which representation includes, due diligence review and coordination, opinion review and negotiations, loan document drafting and negotiations, all aspects of title review and resolution, and all aspects of Uniform Commercial Code records review and resolution.
- Counsel and represent private and public sector clients in all aspects of real estate dispositions, leases, public contracts, including procurement, construction and design/build contracts, complex title resolution and general municipal law matters.
- Counsel and represent private clients in all forms of complex, commercial secured lending including real estate mortgages and asset based transactions for institutional, public and private lenders.
- Counsel and represent clients in negotiation of sophisticated commercial construction and services contracts and subcontracts, including solid waste agreements, Brownfields Covenant Not To Sue Applications, Federal Consent Decrees and Records of Decision and full range of real estate development agreements, restrictions and encumbrances.

PROFESSIONAL STATUS

Admitted to the Massachusetts Bar.

COMMUNITY SERVICE/AFFILIATIONS

- Peabody Zoning Board of Appeals, Chair. (2010-2014)
- Peabody Rent Control Board (2014-2016)
- Peabody Main Streets, Inc., Vice President
- Democratic Candidate for Governor's Council (2010)
- Real Estate Bar Association.
- Massachusetts Bar Association.
- Lorman Education Series Faculty (2002-2008).

JASON A. PANOS
The Panos Law Group
246 Andover Street, Suite 301
Peabody, Massachusetts 01960
(978)406-9979
jpanos@panos-law.com

REPRESENTATIVE MATTERS

Land Use/Comprehensive Permit: Successfully obtain "40B" Comprehensive Permit for 134 ownership units pursuant to the New England Fund prescribed by MassHousing including obtaining all Final Approvals and draft phased Condominium Documents on complex site with environmental issues. Coordinate project development professionals and interactions with municipal officials.

Land Use/Comprehensive Permit: Successfully obtain "40B" Comprehensive Permit for 116 rental units pursuant to the Local Initiative Petition program prescribed by the Mass. Department of Housing and Community Development, including obtaining all Final Approvals on complex site with wetlands/conservations issues. Coordinate project development professionals and interactions with municipal officials.

Land Use/Transactions: Represent private developer in acquisition, financing, development and construction contract management for 38 unit condominium project in South Boston on challenging property involving significant title clearing issues and negotiations with various State and municipal offices, departments and agencies allowing for development to proceed.

Land Use/Transactions: Represent historic preservation developer re-purposing multiple Boston properties of historic significance in sophisticated real estate transactions and also obtaining necessary zoning/land use permits, licenses, and relief from City of Boston agencies.

Land Use/Transactions: Represented prominent Merrimack Valley college in various land use matters and real estate dispositions.

Land Use: Successful representation of Asphalt/Brick/Concrete ("ABC") Company with over 20 employees which company was under imminent threat of closure by the local building inspector. Representation included obtaining permits for relief before various town boards, federal and state agencies, coordinating task schedules, due diligence research.

Environmental/Land Use/Real Estate: Represent municipality in re-use of environmentally distressed property designated for use for a senior center and police station utilizing the Massachusetts Brownfields "Covenant Not To Sue" program and also involving complex and extensive negotiations with designated "Potentially Responsible Parties", the U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection regarding performance of responsibilities under Grants of Environmental Restrictions and Easements and other instruments in addition to those obligations required under the "Record of Decision" and the "Consent Decree".

Environmental/Land Use/Real Estate: Represent developer in project to redevelop environmentally distressed land allowing for mixed use.

Article 97 Disposition: Represented quasi-public water district in land swap with town Conservation Commission involving Massachusetts Constitution prescribed process. Coordinated all aspects of transaction among parties

including creating transaction structure, presentation at town meeting, drafting and coordinating filing of State enabling act legislation and presentation before various town boards.

Purchase of Land Subject to Subdivision Control: Represent client in "as-is" purchase of incomplete subdivision with title matters regarding permit to construct on former railroad right of way (M.G.L c. 40 s. 54A); unexecuted abutter agreements and easements necessary to complete process. This matter is currently pending and I am working with the client to bring outstanding matters to conclusion.

Phased Condominium Development: Represented client in formation of a phased, commercial condominium development. Also involved in title clearing matters.

$5,850,000 Municipal Improved Land Transaction: Represent Town in complex purchase of tenanted building for location of new Town Hall including facilitating Town Meeting approvals and Board of Selectmen authorizations.

$41,000,000.00 Senior Credit Facilities Loan Transaction: Represented borrower client for multi-state refinance loan transaction secured by real property and company assets. Coordinated lender required due diligence; drafted due authority/zoning opinion letters; reviewed loan documents.

$85,000,000.00 Asset Based Senior Credit Facilities Loan Transaction: Represented lender in asset based/chattel paper secured loan transaction involving high volume auto dealer seeking line of credit to fund auto finance transactions. Coordinated lender due diligence; drafted and negotiated loan documents; managed Borrower counsel deliverables.

$10,000,000.00 Asset Based Senior Credit Facilities Loan Transaction: Represented Lender in asset based, secured loan transaction to finance business operations and issue stock dividends with several loan re-finances involving aircraft engineering company. Coordinated lender due diligence; drafted and negotiated loan documents; managed Borrower counsel deliverables.

$16,250,000.00 Commercial Real Estate Mortgage Loan Transactions: Assisted in representation of borrower client in mortgage transactions secured by real property and assets including draft of due authority and zoning opinion letters; preparation of title policies; negotiation of loan documents.

$13,950,000.00 Commercial Real Estate Multi-Property Acquisition: Assisted in representation of client in purchase and finance of several multi-family properties and assets.

$5,000,000.00 SBA 504 Loan Transaction: Represented Massachusetts public finance agency lender in transaction involving SBA 504 Loan facility secured by distressed "Brownfields" property.

$10,000,000.00 Massachusetts Development Finance Agency Recovery Zone Facility Bond Transaction: Assisted in representation of borrower client in loan transaction involving distressed property underwritten using public finance bonds.

$10,000,000.00 Construction Loan Transaction Participation: Represented lender participant in complex construction loan facility to a well-established Merrimac Valley credit union using funds to purchase and construct headquarters on environmentally distressed site. Drafted and negotiated participation agreement on client's behalf, reviewed and negotiated transaction documents, coordinated real estate due diligence, including DEP matters, on behalf of lender.

$4,800,000.00 Construction Loan Transaction: Represented lender in construction loan facility for development of Beacon Hill Condominium project. Coordinated all aspects of closing.

$3,000,000.00 Land Acquisition and Construction Contract: Represented national green house supplier in purchase of New York land for placement of manufacturing and storage facility with simultaneous negotiation of construction contracts for facility construction. Representation also included negotiating loan documents on finance transaction secured by property in several states, coordinating all aspects of purchase and project due diligence and title coordination.

$3,500,000.00 Sale of North End Property: Represented client in successful sale of N. End property involving complex title clearing and probate issues requiring relief from the Land Court.

Workout/Foreclosure: Represented lender client in extensive analysis of the merits of proceeding with workout versus foreclosure on partially constructed 200+ unit condominium. Coordinated foreclosure preparations and all aspects of due diligence including comprehensive title review, review of municipal permits, loan documents and condominium documents to resolve lender liability issues and consumer protection implications under M.G.L. c. 183A s. 22.

Leasing: Represent prominent Merrimack Valley mutual bank to draft and negotiate retail, long-term lease sharing space with nationally recognized pharmacy chain.

Leasing: Represent tenant in leasing and land use matters to seek relief to allow for use of land for nationally recognized doughnut chain franchise.

Leasing: Represent landowner to draft and negotiate long term lease arrangement to nationally recognized fast-food franchisee containing build to suit and 3 x net provisions.

Leasing: Represent start up software company in lease of downtown Boston office space.

Telecommunications Facility Placement/Leasing: Represented various mobile telecommunications companies in successful land use permitting for placement of telecommunications facilities throughout Massachusetts avoiding costly Federal litigation and negotiations for property acquisition/leasing for telecommunication facilities placement.

Transactions/Real Estate: Represent municipality to negotiate significant modifications to complex solid waste services operating agreement and ground lease.

Construction Contract Review and Negotiation: Represented prominent Merrimac Valley college in review and negotiation of contracts with architect, engineer and general contractor/project coordinator for construction and renovation of academic buildings and dormitory.

Contractor Representation: Represented contractor client in drafting of template construction contracts for use with subcontractors. Negotiated various project contracts on client's behalf.

Construction Contract Dispute: Represented sub-contractor in complex dispute over payment on failed residential condominium project pursuant for which the client received substantial recovery. The matter involved coordination of settlement and negotiation of competing interests with counsel for other contractors including the project general contractor.

Asset Sale: Assisted in representation of regional petroleum company in the sale of Massachusetts gas station real estate assets involving resolution of various Massachusetts DEP, title 5, local conservation commission and title issues.

Appendix H –

Dracut Subsidized Housing Inventory, September 26, 2024

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EXECUTIVE OFFICE OF HOUSING AND LIVABLE COMMUNITIES CH40B SUBSIDIZED HOUSING INVENTORY

Dracut

DHCD ID #	Project Name	Address	Type	Total SHI Units	Affordability Expires	Built w/ Comp. Permit?	Subsidizing Agency
869	Cluster Gardens Apartments	Phinea Street	Rental	44	Perp	No	*HUD*
870	n/a	971 Mammoth Road	Rental	80	Perp	No	*EOHLC*
871	n/a	901 Mammoth Road	Rental	53	Perp	Yes	*EOHLC*
872	n/a	Perron Lane	Rental	8	Perp	Yes	*EOHLC*
873	n/a	scattered sites	Rental	6	Perp	No	*EOHLC*
874	n/a	Tanglewood Dr/Myron St/Hampson St	Rental	6	Perp	No	*EOHLC*
875	n/a	Perron Lane	Rental	24	Perp	Yes	*EOHLC*
876	Primrose Hill I		Ownership	25	Perp	Yes	*EOHLC*
877	Primrose Hill II	1787 Lakeview Ave.	Ownership	16	Perp	Yes	*EOHLC*
878	Wimbledon Crossing	Wimbledon Crossing	Ownership	17	2035	Yes	*EOHLC*
4261	DDS Group Homes	Confidential	Rental	127	N/A	No	*DDS*
5101	Riverside Landing	Washington Ave (off Brigham)	Ownership	11	Perp	Yes	*FHLBB*
5102	Robbins Nest	Robbins Avenue	Rental	96	Perp	Yes	*FHLBB*
5103	Park Place	Redgate Road (off of Nashua Road)	Ownership	8	Perp	Yes	*FHLBB*
5105	Forest Glen	Gumpus Road	Ownership	8	Perp	Yes	*EOHLC*
7935	Long Pond Estates	615 Nashua Rd	Ownership	7	perp	YES	*EOHLC*
7936	Grassfields Commons	474 Mammoth Rd	Rental	48	perp	YES	*EOHLC*
7937	Mascuppic Village	780 Nashua Rd	Ownership	9	perp	YES	*EOHLC*

This data is derived from information provided to the Executive Office of Housing and Livable Communities (EOHLC) by individual communities and is subject to change as new information is obtained and use restrictions expire.

EXECUTIVE OFFICE OF HOUSING AND LIVABLE COMMUNITIES CH40B SUBSIDIZED HOUSING INVENTORY

Dracut

DHCD ID #	Project Name	Address	Type	Total SHI Units	Affordability Expires	Built w/ Comp. Permit?	Subsidizing Agency
9478	Allard's Grove	760 Nashua Road	Rental	60	Perp	YES	*EOHLC*
							HUD
9618	Princeton Reserve	439 Merrill Lane	Rental	4	Perp	NO	*EOHLC*
	Dracut Totals			657	**Census 2020 Year Round Housing Units**		12,304
					Percent Subsidized		5.34%

This data is derived from information provided to the Executive Office of Housing and Livable Communities (EOHLC) by individual communities and is subject to change as new information is obtained and use restrictions expire.

Appendix I –

Zoning Board of Appeals vote to Remove 55+ Restriction

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It was agreed by all to continue to the next meeting. Chairman Crowley is willing to review the plans with any of the comments to make sure it is adequate prior to the next meeting if the
Board is okay with that. The Board agreed.
A motion to continue to the October 20, 2106 meeting was made by Mr. Hamilton and seconded by Mr. Mallory. The Board voted unanimously to continue.

Acceptance of Minutes:

A motion to accept the July 21, 2016 minutes was made by Mr. Brian Lussier and seconded by Ms. Heather Santiago-Hutchings. The Board voted unanimously to accept the minutes.

Broadway Village Comprehensive Permit Update at 341 Broadway Road:

Mr. Noah Parekh, partner with First Dracut Development gave an overview of the project which contains 278 units in 4 buildings. They have done a tremendous amount of value engineering to get the project to the right economical level for financing. They have encountered a hurdle which is related to HUD. HUD is an organization backed by the FHA which is a program that probably about 90% of these large scaled housing projects are financed. As of May 2016 they put a restriction on 55+ units so they are no longer allowing any financing for new construction that have 55+ which was a huge surprise to them. They wanted this element for the project because they thought it was a good value. The option is to remove the 55+ comprised of 1 building with 68 units.
Mr. Parekh is before the Board to ask for the provision to be amended. He passed out copies of the HUD document indicating the restriction.
Chairman Crowley explained that when you have a Comprehensive Permit there are certain changes that automatically trigger the reopening of the public hearing such as; change in funding source or increase or decrease in the number of units. If you have any of these you are required to open another public hearing or make a presentation to the Board to see whether the Board feels the changes are substantial enough of a nature to require the public's input before the approval of the change. If the Board decides to go through with a public hearing, the discussion will be limited to the impact of over 55 or not over 55 would have on the project. The Board's discussion is the fact they want to lift this age restriction placed on the Comprehensive Permit because they cannot get the funding and whether or not we want to approve that as a matter of course for open up to a public hearing.
Mr. Hamilton questioned if the building dedicated to over 55 would still have the special considerations in the living quarters and bathrooms to accommodate elderly people. Mr. Parekh stated the building would remain the same and will comply with the ADA requirements. The underground parking will remain as they need to comply with the parking ratio.
Chairman Crowley explained that these are for rent and even though 27% has to be kept at low or moderate income with the rest at market rate, the town gets credit on their 40B compliance for the whole project.
Mr. Lussier noted there are programs other than HUD that qualify for 40B projects. Mr. Parekh stated this is a $60,000,000 project which they have gone through all the conventional lending and it is not feasible. HUD is absolutely the only program that will allow them to build.

There was a discussion about 55 and over projects. Mr. Hamilton noted that the Board did not require the 55 and over building, but the petitioner wanted it. The total project will be 278 rental units with 25% affordable. Mr. Hamilton questioned if the request was denied, what would happen to the project. Mr. Parekh said it would set them back a year. They would have to find some way to subdivide the land to separate the 55 and over building and take it out of the project to qualify for HUD financing.
Mr. Hamilton would like to vote on it tonight as he does not feel this needs a hearing.
A motion to accept the change to the Comprehensive Permit for the 55 and over removal as being di minimis, not impacting the overall project nor requiring a public hearing was made by Mr. Stephen Hamilton and seconded by Mr. Heather Santiago-Hutchings. Mr. Mallory feels this is taking away a restriction they put on themselves. Chairman Crowley mentioned they still have to come back to the Board with final plans for final peer review. The Board voted unanimously to approve.

New Business:

Chairman Crowley informed the Board that the Zoning By-Laws Committee has been reinstated. There is a need for the Committee and gives a nice sounding board for some of the by-law changes.
He mentioned that Heather and himself as Chairman, have been representing the ZBA on the Committee. There are two from Zoning, two from Planning, two from Conservation and one from Board of Health, with one Selectmen, Building Inspector and Town Planner as consultative roles, along with a Secretary.
Chairman Crowley intends to circulate the minutes to this Board for consideration and comments. Starting next month we will include Zoning By-Laws Committee Report on the agenda.
At the first of the year, Chairman Crowley encouraged members to think about who would like to be on the Committee so there can be some turn over.

Next Meeting:

Thursday, October 20, 2016.

Adjournment:

A motion to adjourn was made by Mr. Stephen Hamilton and seconded by Mr. Scott Mallory. The Board voted unanimously to adjourn.

Board of Appeals Members

Chairman, John Crowley	Vice Chairman, R. Scott Mallory
Clerk, Stephen Hamilton	Member, Heather Santiago-Hutchings
Member, Brian Lussier	Alternate Member, Richard Ahern
Alternate Member, Scott McKiel	

Appendix J –

Zoning Board of Appeals vote to Extend Comprehensive Permit to December 18, 2023

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Town of Dracut
Board of Appeals

62 Arlington Street
Dracut, MA 01826

Tel: (978) 454-0603
Fax: (978) 937-9885
email: boardofappeals@dracutma.gov

BOARD OF APPEALS FOR THE TOWN OF DRACUT
RECORD OF PROCEEDINGS

APPLICATION NO:	**2005-13 Continued**
PETITIONER:	**First Dracut Development, LLC**
PROPERTY LOCATION:	**341 Broadway Road**
DESCRIPTION:	**Request for Extension of Time for Granted Comprehensive Permit for 278 rental units with 4 buildings**
OWNER:	**Parekh**
DATES OF LEGAL NOTICES:	**Not applicable**
DATE OF HEARING (S):	**September 17, 2020 and October 15, 2020**

MEMBERS PRESENT:

	9/17/2020 Hybrid Meeting	10/15/2020 Hybrid Meeting
R. Scott Mallory, Chairman	**Via Zoom**	**Present**
Brian Lussier, Vice Chairman	**Present**	**Present**
Merylle Chase, Clerk	**Present**	**Present**
John J. Crowley, Member	**Via Zoom**	**Via Zoom**
Warren Hunt, Jr., Member	**Present**	**Present**
Nicholas Jarek, Alternate Member	**Present**	**Via Zoom**
Joseph DiCarlo, Alternate Member	**Present**	**Absent**

I, Clerk of the Board, hereby certify that the following is a detailed record of all its proceedings relative to the petition of First Dracut Development, LLC for a 40B Comprehensive Permit for a Special Permit and Variance waivers from the Dracut Zoning By-laws.

NOTIFICATION

A notice of public hearing was published, posted and mailed to the "Parties in Interest" as indicated below:

A. Published in The Lowell Sun;
B. Posted in a conspicuous place in the Town Hall not less than 48 hours prior to the date of hearing;
C. Mailed by first class mail, postage prepaid, to the applicant, abutters and owners of land within 300 feet of the property line as named in the certificate from assessors and to the Board of Appeals, Building Inspector and the Planning Board of every abutting city and town.

TOWN CLERK'S OFFICE
RECEIVED
2020 OCT -6 AM 9:08

HEARING (S)

As detailed above, hearings were held at the Dracut Town Hall, Douglas G. Willett Board of Selectmen Chambers, 62 Arlington Street, Dracut and also using Zoom Platform on September 17, 2020 and October 15, 2020 at 7:00 p.m. This meeting was held in accordance with the Governor of Massachusetts March 10, 2020 Order Suspending Certain Provisions of the Open Meeting Law M.G.L. Ch. 30A, Section 20.

FINDINGS:

September 17, 2020 hearing;

Mr. Noah Parekh, 50 Newton Street, Boston, MA partner of First Dracut Development and property owner of 341 Broadway. Mr. Parekh stated that they have successfully engaged in a partnership agreement with a local developer and are seeking an extension of the comprehensive building permit so they can secure financing and move forward. Chairman Mallory stated that they were before the Board in 2017 asking for an extension and that they were close at that time and questioned what has happened to cause the delay. Mr. Parekh stated that in 2017, they had a strategy to go with HUD financing but encountered building costs along with labor and material expenses that had skyrocketed. They were not able to find the economics to satisfy the ability to build the project and have continued to look at different strategies and need to partner with a larger more experienced developer. Mr. Lussier asked when this permit will expire that began in 2017 and Mr. Parekh stated December 18, 2020. There was discussion on the water and sewer as far as the revised fees and capacity. Mr. Crowley stated that there should be documentation provided to the Board regarding conversations with their engineers pertaining to the water and sewer. He requested if any final prints have been provided. Mr. Parekh stated no final prints have been put in place because they needed to know the strategy of building this project. This is the largest project in Dracut consisting of 278 units, costing over sixty million dollars to build. They will not be putting final drawings in place until they obtain their financing. They have done 10 years of work and are not looking to jeopardize that work. Mr. Parekh agreed with Mr. Crowley that they are prepared to move along with the changes in Stormwater related to the Zoning by-law section. There was discussion about Conservation and the Order of Conditions which have expired and they will be going before the Conservation Commission once again. Mr. Parekh stated that they are hoping to begin sometime in the spring. Mr. Crowley stated that they should have been receiving periodic updates and Mr. Parekh stated that they will provide monthly reviews to the Board.

Ms. Chase stated that it would be appropriate before granting the extension to continue this hearing to October 15, 2020, so we can receive all of this pertinent information:

- All correspondence from the water and sewer department
- Stormwater compliance
- Orders of conditions from the Conservation Commission

Mr. Parekh also stated that if they do not have sewer available, they will do an on-site sewer system. The Board and Mr. Parekh agreed to a one month continuance to review the extension request.

October 15, 2020 hearing:

Attorney Natasha Ramsingh presented on behalf of First Dracut Development. She stated that in attendance to answer any of the Board's questions were Noah Parek, main principal from First Dracut Development, Matt Hamor, Engineer and Chester Bartels, architect. Attorney Ramsingh

provided updated documents which will address the Board's concerns from the September 17th hearing. She has had numerous conversations with Lori Cahill and dealt with conservation issues. They have executed their Certificate of Compliance which also has been recorded. They are in the process of working on a new Notice of Intent which will be delivered to conservation. Matt Hamor has communicated with Mr. Reynolds, Superintendent of Sewer Commission and confirmed that they have the proper sewer capacity for the project. They are also on the next Water Commission hearing on November 4th to discuss the water supply. They will be complying with the Stormwater as they submit their new Notice of Intent to Conservation.

Mr. Crowley questioned again whether there has been any documentation regarding the discussions in the past three years with these various departments. Attorney Ramsingh stated that they are working with National Heritage and have partnered with an abutter in order to satisfy the conservation commission which has taken over two years to accomplish and is the reason for the delays.

Attorney Ramsingh stated they are trying to finalize their financing and making sure they have adequate time on their permit in order to move forward with this project. She stated that the Governor's Orders does apply to this particular project and provides them with additional days and the expiration on the permit. They want to move forward with this project and that is why they need this extension and have come before the Board. Attorney Ramsingh agreed to provide updated plans once they have been reviewed and approved to the Board.

A motion to grant a three year Extension to extend the Special Permit to December 18, 2023 was made by Mr. John Crowley and seconded by Mr. Brian Lussier. The Board voted unanimously to grant the Extension.

Appeals, if any, shall be made pursuant to G.L.C.40, Subsection 17, and shall be filed within 20 days after the decision filed with the Town Clerk.

Each member voted as following:	**Extension of Time on Granted Special Permit**
R. Scott Mallory, Chairman	**Approved**
Brian Lussier, Vice Chairman	**Approved**
Merylle Chase, Clerk	**Approved**
John Crowley, Member	**Approved**
Warren Hunt, Member	**Approved**
Nicholas Jarek, Alternate Member	**n/a**
Joseph DiCarlo, Alternate Member	**n/a**

Dracut Board of Appeals

R. Scott Mallory, Chairman

Brian Lussier, Vice Chairman

Copies of this record of Proceedings and Decision with all attachments and plans referred to in the Decision, if any, must be filed with the Town Clerk.

Date filed with Town Clerk:

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Appendix K –

Zoning Board of Appeals vote to Extend Comprehensive Permit to December 18, 2025

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Middlesex North Registry of Deeds

Electronically Recorded Document

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Recording Information

Document Number	: 18328
Document Type	: DECIS
Recorded Date	: June 17, 2025
Recorded Time	: 02:42:20 PM
Recorded Book and Page	: 39322 / 201
Number of Pages(including cover sheet)	: 5
Receipt Number	: 1055340
Recording Fee	: $105.00

Middlesex North Registry of Deeds
Karen M. Cassella, Registrar
370 Jackson Street
Lowell, Massachusetts 01852
978/322-9000
www.lowelldeeds.com

Town of Dracut
Board of Appeals

62 Arlington Street
Dracut, MA 01826

Tel: (978) 454-0603
Fax: (978) 937-9885
email: boardofappeals@dracutma.gov

THE COMMONWEALTH OF MASSACHUSETTS

TOWN OF DRACUT

BOARD OF APPEALS

Extension of Time on Granted
Comprehensive Permit pursuant to M.G.L. Chapter 40B

RECEIVED
TOWN CLERK'S OFFICE
2023 NOV 16 AM 11:53
TOWN CLERK
DRACUT, MA

The Board of Appeals of the Town of Dracut hereby certifies that a Public Hearing was held on November 2, 2023 and a two-year Extension of Time on a Comprehensive Permit has been granted to:

World Dracut, LLC

On this 2nd day of November, 2023

Town of: Dracut Massachusetts

Affecting the rights of the owner with respect to land or buildings at

341 Broadway Road (2005-13)

And the said Board of Appeals further certifies that the decision attached hereto is a true and correct copy of its decision granting said Extension and that copies of said decision and of all plans referred to in the decision, have been filed with the Board of Appeals and the Town Clerk.

The Board of Appeals also calls to the attention of the owner or applicant that General Laws, pursuant to M.G.L. Chapter 40B provides that no variance and/or special permit, or any extension, modification or renewal thereof, shall take effect until a copy of the decision bearing the certification of the town or city clerk that twenty days have elapsed after the decision has been filed; that it has been dismissed or denied; it is recorded in the registry of deeds for the county and district in which the land is located and 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 fee for such recording or registering shall be paid by the owner or applicant.

TIME STAMP AND SEAL OF THE TOWN OF DRACUT
I, Jayne Boissonneault, Clerk of the Town of Dracut, Mass,,HEREBY CERTIFY that the NOTICE of VARIANCE by the DRACUT BOARD OF APPEALS has BEEN RECEIVED AND RECORDED AT THE OFFICE AND NO APPEAL was RECEIVED DURING the TWENTY DAYS NEXT AFTER SUCH RECEIPT anddRECORDING of SAID NOTICE

June 16, 2025 Jayne Boissonneault

R. Scott Mallory
Chairman, Scott Mallory

Clerk, Warren Hunt

BOARD OF APPEALS FOR THE TOWN OF DRACUT
RECORD OF PROCEEDINGS

RECEIVED
TOWN CLERK'S OFFICE
2023 NOV 16 AM 11:53
TOWN CLERK
DRACUT, MA

APPLICATION NO: **2005-13 Continued**

PETITIONER: **World Dracut, LLC**

PROPERTY LOCATION: **341 Broadway Road**

DESCRIPTION: **Request for Extension of Time for Granted Comprehensive Permit for 278 rental units with 4 buildings**

OWNER: **World Dracut, LLC**

DATES OF LEGAL NOTICES: **October 19 & 26, 2023**

DATE OF HEARING (S): **November 2, 2023**

MEMBERS PRESENT:

	11/2/2023
R. Scott Mallory, Chairman	**Present**
Brian Lussier, Vice Chairman	**Present**
Warren Hunt Jr., Clerk	**Present**
Nicholas Jarek, Member	**Absent**
Joseph DiCarlo, Member	**Absent**
Ezekiel Haradji, Alternate Member	**Present**
G. Edward Brown, Alternate Member	**Present**

I, Clerk of the Board, hereby certify that the following is a detailed record of all its proceedings relative to the petition of World Dracut, LLC for a 40B Comprehensive Permit for a Special Permit and Variance waivers from the Dracut Zoning By-laws.

NOTIFICATION

A notice of public hearing was published, posted and mailed to the "Parties in Interest" as indicated below:

A. Published in The Lowell Sun; October 19 & 26, 2023
B. Posted in a conspicuous place in the Town Hall not less than 48 hours prior to the date of hearing;
C. Mailed by first class mail, postage prepaid, to the applicant, abutters and owners of land within 300 feet of the property line as named in the certificate from assessors and to the Board of Appeals, Building Inspector and the Planning Board of every abutting city and town.

FINDINGS:

NOVEMBER 2, 2023 HEARING:

David Keele of David A Keele & Associates, LLC on behalf of applicant, World Dracut LLC states the applicant is looking for an extension that expires on December 18, 2023. The last applicant requested two extensions prior because of financial issues. The applicant is hopeful to start construction in April. The applicant shows the board a picture of a modified plan. The applicant is looking for a one-year extension. Alfred Bergin the new team leader for World Dracut, LLC states there is no financial issues at this time and there is a lot that needs to happen to get the project up to date. Chairman Mallory questions if the applicant still needs to file with Conservation, Mr. Bergin stated yes. Mr. Lussier questions why the applicant wouldn't request a two-year extension instead of one. Mr. Keel stated if the board would allow, they would appreciate the two-year extension. Mr. Haradji questioned if the plan was still for 318, 3-bedroom units, Doug Annino of Annino Associates, the Architect stated it will be the same quantity of units. David Sutherland, Chairman of Dracut Conservation of 114 Stonebridge Drive questions the date of this permit and believes it goes back to 2005. Mr. Sutherland states a lot of things have changed since then, including building codes. The last applicant was a no show for a wetlands meeting and they withdrew their application. He would like to see a new wetland delineation and possibly a new permit application all together. Timothy Hayes of Bohler Engineering states the applicant came in after the withdrawal of the wetland application. The applicant intends on getting the wetlands flagged again, the area was flagged about twenty years ago and it is certain the wetlands have changed. Mr. Hunt made a motion to close the hearing, seconded by Mr. Brown. The board voted unanimously to close the hearing. Mr. Hunt made a motion to grant a 2-year extension that will expire on December 18, 2025, seconded by Mr. Haradji. The board voted unanimously to grant the 2-year extension.

Each member voted as following:	**Extension of Time on Granted Special Permit**
R. Scott Mallory, Chairman	**Approved**
Brian Lussier, Vice Chairman	**Approved**
Warren Hunt Jr., Clerk	**Approved**
Nicholas Jarek, Member	**N/A**
Joseph DiCarlo, Member	**N/A**
Ezekiel Haradji, Alternate Member	**Approved**
G. Edward Brown, Alternate Member	**Approved**

Dracut Board of Appeals

R. Scott Mallory

R. Scott Mallory, Chairman

Brian Lussier, Vice Chairman

Copies of this record of Proceedings and Decision with all attachments and plans referred to in the Decision, if any, must be filed with the Town Clerk.

Date filed with Town Clerk:

For Title reference, see Quitclaim Deed of First Dracut Development Company, LLC to World Dracut, LLC dated March 27, 2021 and recorded with the Middlesex North District Registry of Deeds in Book 35591, Page 144.

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Appendix L –

Flood Insurance Rate Map

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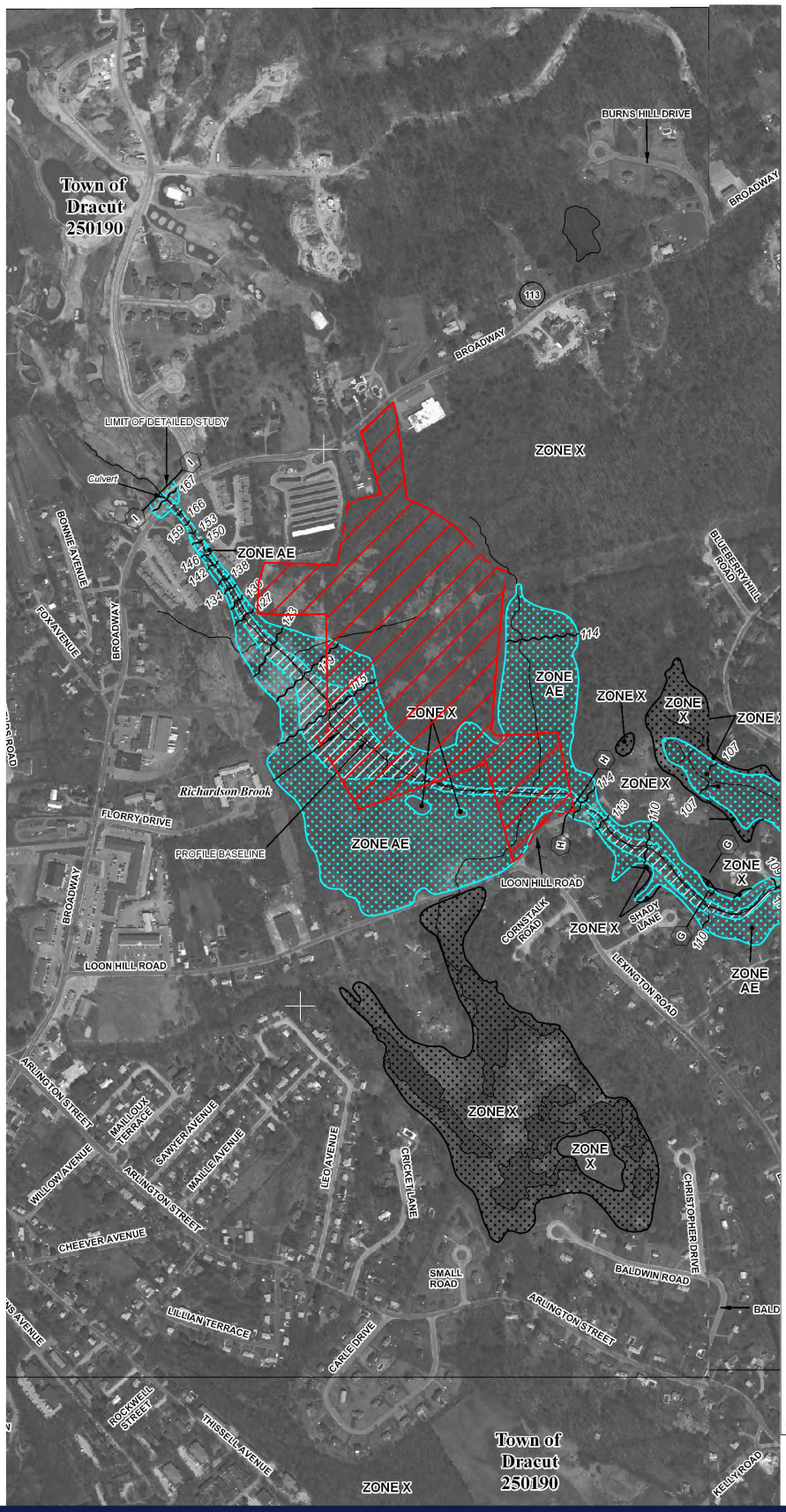

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A—A	Cross section line
23—23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276000mN	1000-meter Universal Transverse Mercator grid values, zone 19
600000 FT	5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPSZONE 2001), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

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APPENDIX L
FLOOD INSURANCE RATE MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY
BOHLER

SCALE:1"=1,000' DATE: 09/13/2024

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Appendix M –

Site Transportation Map

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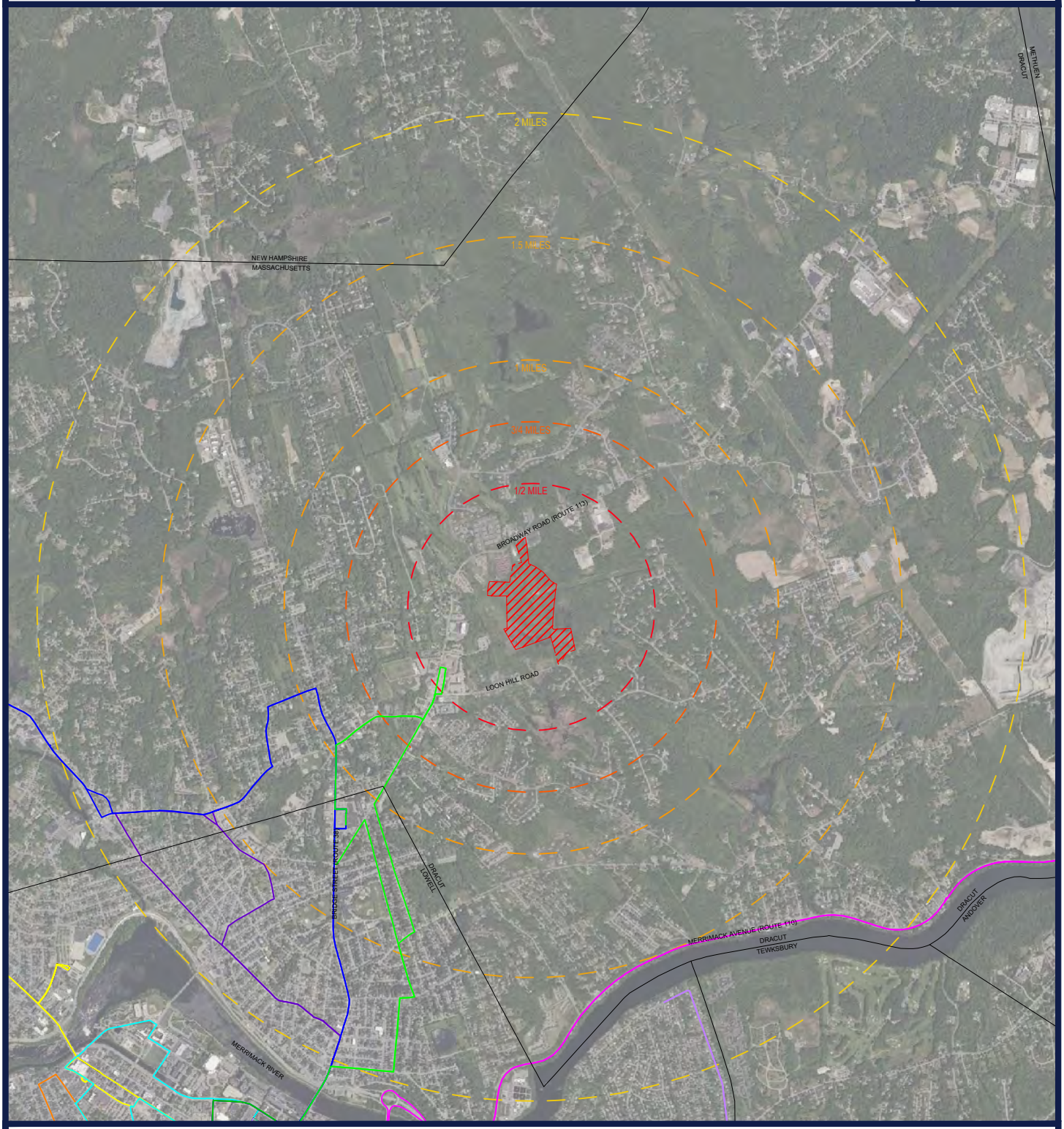
LEGEND LRTA BUS ROUTES

- 1: CHRISTIAN HILL
- 10: DRACUT/TYNGSBOROUGH
- 8: CENTRALVILLE
- 9: LOWELL CIRCULATOR
- 7: PAWTUCKETVILLE / UMASS LOWELL NORTH
- 6: BROADWAY / UMASS LOWELL
- 2: BELVIDERE
- 24: LOWELL-LAWRENCE



APPENDIX M
SITE TRANSPORTATION MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY
BOHLER

SCALE:1"=2,000' DATE: 09/13/2024

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Appendix N –

Site Amenity Context Map

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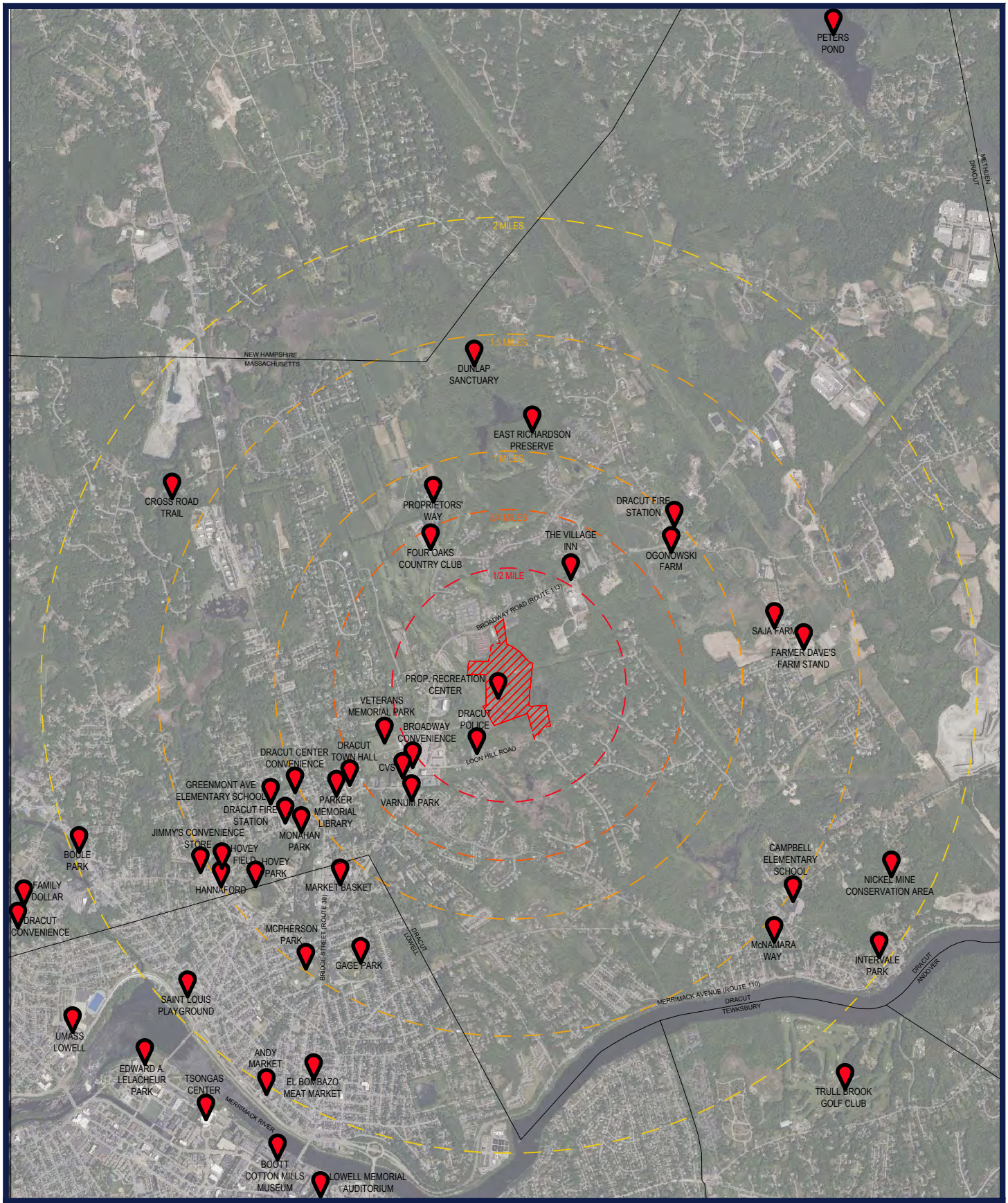

APPENDIX N
SITE AMENITY CONTEXT MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY
BOHLER

SCALE:1"=3,000' DATE: 09/13/2024

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Appendix O –

Design Guidelines

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BROADWAY VILLAGE

WORLD REALTY AND DEVELOPMENT

341 BROADWAY
DRACUT,MA
SEPTEMBER 20, 2024

AN ARTFUL CONTEXT: IF WHAT WE SEE AND EXPERIENCE BECOMES OUR CONTEXT OF LIFE, COMPLETE WITH RECOGNIZABLE FORMS, COLORS, PROPORTIONS, TEXTURES AND MYSTERY, SUCH SETTINGS ENLIVEN OUR SENSES. WE EXPERIENCE GREATER MEANING BECAUSE WE FEEL A KINSHIP TO ALL ABOUT US. INSTINCTIVELY, WE TAP INTO THE STORY IT TELLS ABOUT ITS UNMISTAKABLE CHARACTER AND COMMITMENT. VERNON D. SWABACK, FAIA, FAICP

DESIGN GUIDELINES

Broken down below are the design guidelines we feel are appropriate to apply to the design phase of this especially important project. The improvements to the existing undeveloped site are appropriate in size and scale to the surrounding properties and the physical environment that this property is located in.

We feel this project has a consistent "Community Vision" that is so important for not only the Dracut community but also the residents of this new development. We feel that this project captures the "Spirit and Vitality of Place" that is needed in any project of this scope and magnitude. It will set a design precedent for large scale future developments in Dracut and will create a vibrant, active, and walkable project in this close-knit town. The sense of pride in this community is equally shared by the developer and his design team.

PRINCIPALS OF THE DESIGN GUIDELINES

- All investments should enhance the ability to safely and comfortably walk in a natural environment.

With a variety of environmental conditions present on the site a unique, walkable community can be created. Walking trails, natural wetlands, buffers, woods, and streams all provide variety and interest for residents and visitors alike.

- This new investment will reinforce the creation of a sense of place with high quality design and construction.
  With the opportunity to develop 300 residential units a Sports facility and a Market on the site along with outdoor amenity spaces considerable investment will be made to create a vibrant, well-articulated and comfortable place for a wide variety of residents of different ages and needs.

- This Investment will highlight the natural heritage of the site and connect to narratives about conservation, preservation, and protection of natural features in our environment.
  The exterior of the building was designed to enhance and blend with the site by the detailing and materials used on the facades. With the introduction of towers, pitched roofs and clapboard siding the building will be broken down into well scaled and comfortable proportions. Building placement as well as pedestrian and vehicular circulation all respond to the qualities and conditions on the site.

- Investments here will contribute to the vibrancy and attractiveness of the site it is set within.
  Considerable investment in the building façade, window detailing, and scale and proportion will dramatically enhance the type of development that will take place on this very important site.

- Investments should enhance the connections to and use the wetlands and woodlands as natural features, a treasured amenity that defines this as a special place to be.
  The buildings with their residential uses, the proximity to natural features, views, and vistas up and down the site from the apartments should make it a highly desirable place to live. The residents will have the opportunity to use the natural, beautiful features in and adjacent to the buildings. With enhanced site lighting and the ability to disperse parking around the site, the development will add significantly to the beauty of the wetlands and its wooded surroundings.

STREET DESIGN GUIDELINES

- Provide pedestrian landscape buffers between the sidewalk and the buildings.

- Reduce curb cuts to strengthen the walkability of the district.
- Meander streets throughout the development to take advantage of the natural features and enhance views of the surroundings.
- Meandering streets slow down vehicular traffic and create a safer, more walkable community.
- Keep wetland crossings to a minimum.
- Separate parking and loading areas from the major streets throughout the development.
- Provide safe sidewalk areas to guide pedestrians to the buildings and out into the trails present on site.
- Minimize filling adjacent to the wetland areas.
- Develop a boulevard entry off of Broadway with landscaping and directional signage.

SITE DESIGN GUIDELINES

- Define site entry and exit with clearly delineated sidewalks, paving and landscape beds. Provide boulevard entryway and landscaped island.
- Recognize and enhance the development by providing increased security, resident interaction, site lighting and clearly defined pavement areas.
- Strengthen recreational connections by providing trails, sidewalks, playground, and passive recreation areas. Provide Sports Pavilion on site to encourage wellness and active indoor recreation.
- Provide carports over parking spaces to allow the installation of solar collectors on the roof. The open-air structures will shade and protect vehicles.
- Work to create a nicely landscaped amenity in the center of the site where the electrical easement is located. Strengthen and enhance natural vegetation in the area under the power lines. Improve trails and walks in this area.
- Optimize sloping site by working with the natural grades, wetland areas and wetland vegetation. Building design and integration into the site will enhance the overall views around the site.
- Protect all adjacent wetland features.
- Develop innovative ways to distribute storm water drainage on site. Use of subsurface and surface drainage retention areas will be encouraged.
- Provide EV charging stations to accommodate present and future demands for electric vehicles.

BUILDING DESIGN GUIDELINES

- Sensitive Building Size and Shape.
  The existing design scheme calls for a mixture of four-story buildings on site. The front entry Market building will be one story with a mezzanine which will fit with the texture of structures

on Broadway. The approximately 6,800 sf building will anchor the development to the street. Buildings one through five will be residential in character and each building will be different in size and configuration. The idea that these buildings are integrated into the site and the environment that is present is important to the overall feel of the community we have created.

The buildings have been sensitively detailed to provide a pedestrian scale to the development. Exterior materials and colors break down the elevations into three different horizontal sections. By doing this we help to reduce the apparent height of the total building and create diversity in coloring and materials. The introduction of porches and decks help also to break down the facades. The decks, roof coverings, stone bases and rustic appearance had interest and shadow to the elevations. The use of different complimentary colors helps to add distinction and further aids in the detailing of the facades.

- Sensitive Building Height

  The proposed residential buildings will be four stories in height with stair towers that reach the roof deck and create a signature vertical element for each building. The floor-to-floor height is 11'-0" and the total height of the building from grade is 52 feet. The roof features a parapet that extends up beyond the flat roof area and is 56 feet in height. The shingled roof area will be broken at the third point to add some visual variety to the roof line. There is a general intent to reduce the scale and massing of all buildings on site with the thoughtful integration of many different architectural components and design ideas. The sports facility height is approximately 52 feet, and the massing is broken down with large expanses of glass, skylights, and stone.

- Interesting Rooflines

  The roof lines have been broken down further by the introduction of standing seam roof material and pitch change at all the porch/exterior decks. The roof slope has been broken at the third point to create a change in shingle appearance. The roof features a sloped mansard with a flat roof behind the parapet. The intent was to create an area for the installation of all the condensers for the units below. The roof is further broken with new entry dormers as well as towers at the stair access points that break up the height of the parapets. The pool enclosure between buildings 2 and 3 will feature a flat roof which is designed to accommodate a pedestrian deck for social activities. The sports facility will contain a mixture of flat and sloped roofs as well as skylights and window walls that carry up the slope of the roof. The standing seam sloped roof will add nice detailing to the building.

- Building Orientation

  Buildings have been carefully placed out of the wetland buffers. This placement helps to integrate the structures into the natural environment. The buildings are sited to present themselves to the residential parking areas and feature entries that present a welcoming appeal to the public. The buildings generally are adjacent to resident parking areas. All buildings except for the Market Building are located a minimum of 1,000 feet from Broadway. The buildings are not visible from the street and form their own "enclave."

- Strategic Modifications

We have re invented the original submitted building and site design to create the detailing necessary to make the building fit into the character of the community and the site design respond to the constraints on the site. With the introduction of the extensive detailing on the façade, new sloped roofs, gables, decks, and pergolas add detail and dimension to the buildings. The original design submittal lacked character and detailing necessary to construct a unique sustainable and desirable community.

FAÇADE DESIGN GUIDELINES

- Define Façade With Details

  Use high quality materials to enhance the building façade. The detailing and use of these materials will contribute considerably to the longevity and overall appearance of the building. The different textures and shadowing will break down the scale of the façade and divide it into different bays. The use of clapboard, stone, and flat panels will add significant texture and color to the development.

- High Quality Materials

  Authentic natural looking materials will be specified. Stone will be used on the first floor of the Sports Pavilion as well as accents at columns and entries. The materials are durable and able to withstand a large degree of abuse. All trim, cornices, railings, windows and frames and doors will be made of synthetic materials.

- Façade Organization

  The façade is broken down into three distinct bands. The bottom band is flat Hardi Panel and ties the building to the ground. It emphasizes permeance and solidity. The middle band articulates the use of the structure, residential, less intense use on these two floors and is clapboard. The top of the building contains its hat and is again designed to make use of flat Hardi panels with metal reveals and clean detailing. The roof that protects the inhabitants and offers shelter and weather protection caps the top band and is constructed of architectural asphalt shingles. The accent roofs at the entry and at porches and decks is standing seam metal prefinished roofing.

- Local Character

  The local character of Broadway is lower scale industrial and residential uses. By providing the Market building as an anchor and constructing our residential buildings well into the site we will fit in with the texture and scale of the neighborhood. It will be complimentary with the detailing, colors, and orientation of the building.

- Active Ground Floor Uses

  The vibrancy of the entire community will be enhanced with the variety of first floor tenant amenities. The buildings will feature tenant lounges, kitchens and eating areas, enclosed pool,

theatre, community office spaces, dog and pet grooming and care as well as marketing, leasing, and maintenance offices. All these amenities contribute to the welfare of the community.

- Feature Active Activities
  The ability to provide many diverse activities inside and outside the buildings makes this a very successful project. The sports facility featuring four basketball courts, pickleball, volleyball, bowling, fitness, and aerobics as well as locker rooms and health related offices should provide a huge benefit not only to the Broadway Village Community as a whole but the town of Dracut. All buildings feature exterior dog parks and with the variety of trails on the site passive activities will be encouraged. A playground will be designed to accommodate children as well as a picnic area. Bike use will be encouraged with the ability to provide bike racks at all buildings and bike storage in the buildings.

LANDSCAPE DESIGN GUIDELINES

- Landscape Design Features
  New landscaping will be integrated into the parking lot as well as along the perimeter of the site. The location of trees, decorative plantings, groundcovers, and shrubs will be planted in areas that enhance the overall appearance of the total buildings and site. The pedestrian experience will be further strengthened with the installation of scale appropriate signage and lighting.

- Site Lighting
  Simple lighting, cut off from glare energy efficient and dark sky compliant will concentrate illumination downward or directly over highlighted features.

- Landscape Integration
  Planting features will be located around the building and the liberal use of planters, pergolas, decorative flowering vegetation shall complement and augment the building and the site.

- Parking Landscaping
  Landscaping shall be integrated into the parking lot to reduce the visual impact of automobiles. Landscape beds all feature raised curbs and will include trees and shrubs for a diversity of height and screening.

- Consistent Plant Species
  Plant selection is based upon the character of the district, and are species natural to Eastern Massachusetts. Plants will be low maintenance, hardy and sturdy with salt tolerance when adjacent to roadways or parking lots.

Appendix P –

Traffic Impact and Access Study for Mixed Use Development, 341 Broadway Road, Dracut, Massachusetts: Chappell Engineering Associates, LLC, dated September 24, 2024.

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CHAPPELL ENGINEERING ASSOCIATES, LLC

Civil • Structural • Transportation • Surveying

201 Boston Post Rd. West, Ste 101
Marlborough, MA 01752
Tel.: (508) 481-7400
Fax: (508) 481-7406
www.chappellengineering.com

Quality

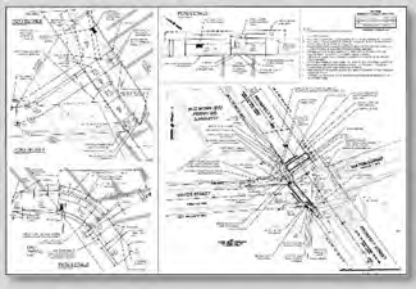
Traffic Impact and Access Study

Mixed-Use Development
341 Broadway Road
Dracut, Massachusetts

Prepared for:

Bohler
Boston, MA 02110

Accuracy



Integrity

COMMONWEALTH OF MASSACHUSETTS
Kirsten
Braun
Civil ENGINEER
NO. 54874
REGISTERED
PROFESSIONAL ENGINEER

September 24, 2024

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil • Structural • Transportation • Surveying

201 Boston Post Road West
Marlborough, MA 01752
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www.chappellengineering.com

Traffic Impact and Access Study

To:	Ms. Emily Anderson, P.E. Project Manager Bohler 45 Franklin Street Boston, MA 02110	Reg:	Mixed-Use Development 341 Broadway Road Dracut, Massachusetts
		Date:	September 24, 2024
From:	Shaun P. Kelly, Sr. Project Manager	Project #:	23097

INTRODUCTION

Chappell Engineering Associates, LLC (CEA) has conducted this Traffic Impact and Access Study (TIAS) to identify the anticipated traffic impacts associated with a proposed mixed-use residential development to be located at 341 Broadway (Route 113) in Dracut, Massachusetts. The proposed project entails the development of 300 units of attached residential housing, as well as an approximately 7,858± square foot (sf) market, approximately 12,972± sf of commercial space, and an approximately 64,383± sf community recreational building. The project proposes a total of 707 parking spaces, including 470 parking spaces that will be solely dedicated to the residential apartments. Access to the site is proposed via a new driveway onto Broadway Road.

This study evaluates existing traffic and safety characteristics of area roadways and intersections expected to accommodate the majority of project-related traffic, provides an estimate of the expected trip generation characteristics of the project, evaluates the impact of that traffic on the adjacent roadways and intersections, and determines the necessity for improvements to the area roadway system. This study was prepared in general conformance with the Town of Dracut, Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11.00), and Massachusetts Department of Transportation (MassDOT) guidelines for the preparation of traffic impact assessments.

As documented in this study, the proposed development is expected to result in only minor impacts to area traffic operations as compared to future No-Build conditions. The site access as proposed allows for safe access and egress, with minimal driveway queuing, amounting to only one to three vehicles during peak hours, expected on the site driveway approach to Broadway Road.

PROJECT DESCRIPTION AND HISTORY

The proposed project entails the development of 300 units of attached residential housing, as well as an approximately 7,858± sf market, approximately 12,972± sf of commercial space, and an approximately 64,383± sf community recreational building. The market, commercial space and community recreational building will be available to the public. The project proposes a total of 707 parking spaces, including 470 parking spaces that will be solely dedicated to the residential apartments. Additionally, 124 additional parking spaces may be provided in a National Grid easement, subject to National Grid approval. Access to the site is proposed via a new driveway onto Broadway Road.

The location of the project site, relative to the surrounding transportation roadway network is displayed on Figure 1.

EXISTING CONDITIONS

Study Area

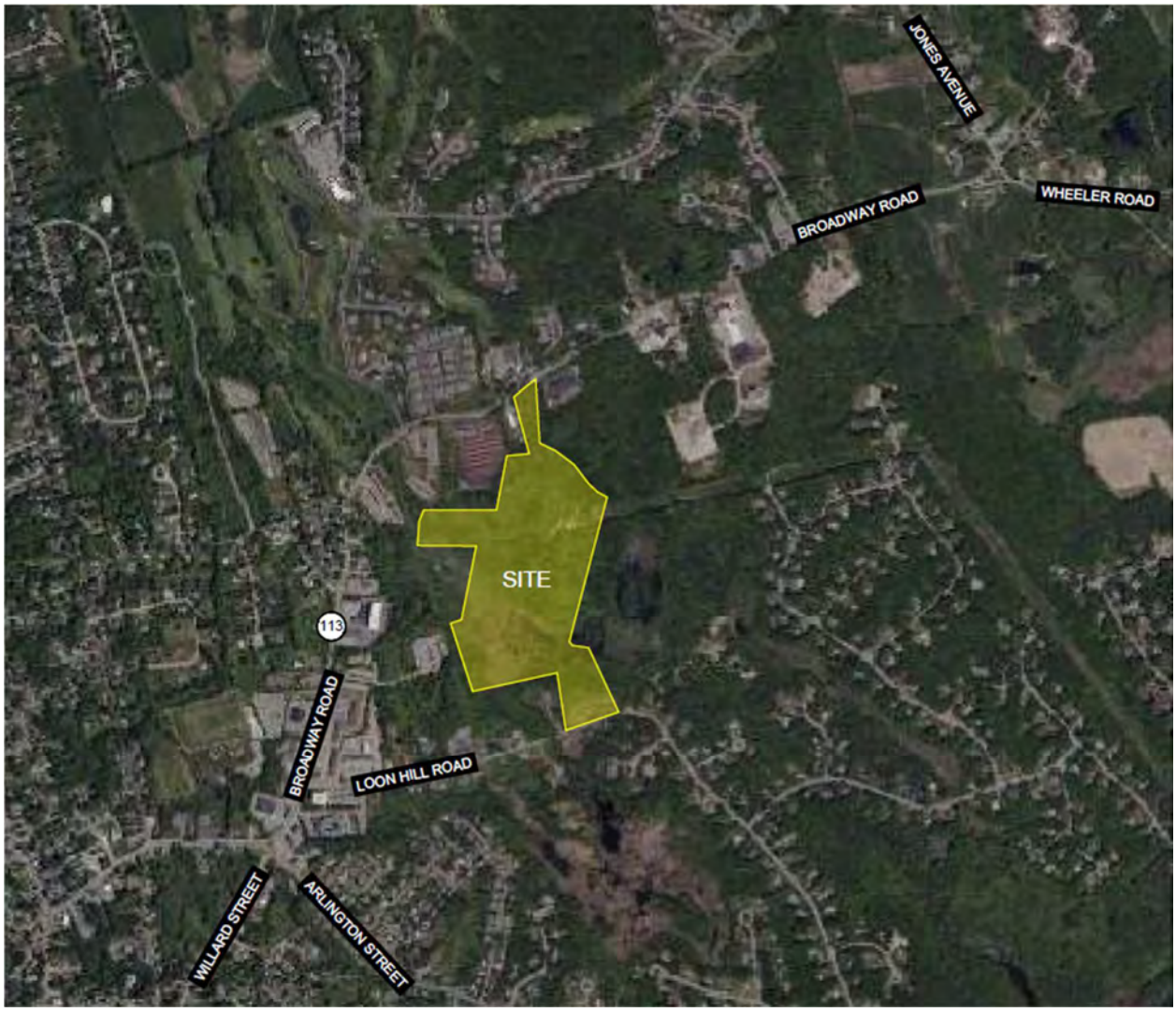
Evaluation of the traffic impacts associated with the project requires an examination of existing and projected traffic volumes, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and intersections. The study area scope for this assessment includes locations expected to accommodate the majority of project-related traffic, including the following intersections:

1. Broadway Road at Jones Avenue and Wheeler Road
2. Broadway Road at Loon Hill Road and private driveway
3. Broadway Road at Willard Street
4. Broadway Road at site driveway

The study area intersections and roadways are described in detail below and depicted on Figure 2.

Broadway Road (Route 113) is classified as an urban minor arterial (U4) that is under MassDOT jurisdiction. In the vicinity of the project site, Broadway Road generally travels in an east-west orientation, providing access to the Interstate 93 (I-93) corridor to the east and the City of Lowell to the west. Further west Broadway Road travels in a general north-south orientation in the vicinity of Arlington Street. Broadway Road provides a single lane approximate 12-foot lane of travel in each direction, separated by a double-yellow centerline, with an approximate 1-foot marked shoulder provided. Land use along the corridor consists primarily of a mix of residential, commercial and industrial uses. There are no formal pedestrian or bicycle accommodations along Broadway Road in the vicinity of the project. Land use along the corridor includes residential,

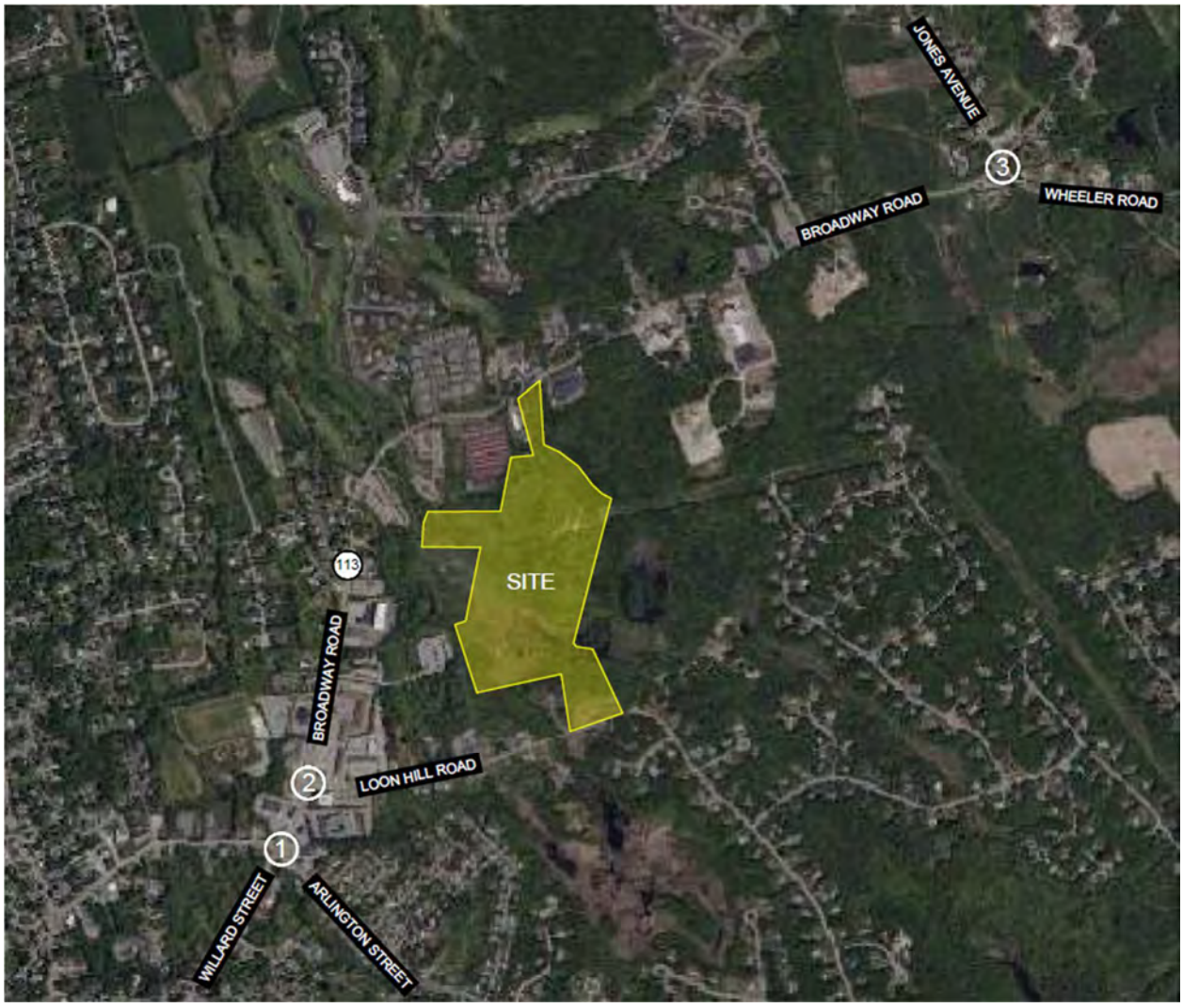
Figure 1
Site Location Map



commercial, and industrial uses. The posted speed limit on Broadway Road in the vicinity of the project is 35 miles per hour (mph).

Broadway Road and Willard Street intersect Arlington Street from the north and south to form a four-way intersection that operates under traffic signal control. The Arlington Street eastbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. The Arlington Street westbound approach provides a single general purpose travel lane. The Broadway Road northbound approach provides a single general purpose travel lane. The Broadway Road

Figure 2
Study Area Intersections



southbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. The traffic signal at this location operates under a four-phase signal sequence, with a protected left-turn phase for eastbound traffic on Arlington Street and an exclusive pedestrian phase provided via push-button activation. Sidewalk is provided continuously along both sides of Broadway Road north of this intersection, along the eastern side of Willard Street, south of this location, along the northern side of Arlington Street, west of this location and along a limited portion of Arlington Street, east of this intersection. Crosswalks are provided across the Willard Street northbound, Broadway Road southbound and Arlington Street westbound approaches to this intersection. Land use in the vicinity of this intersection consists primarily of commercial uses.

Loon Hill Road and a private driveway intersect Broadway Road to form a four-way intersection that operates under traffic signal control. The private driveway eastbound approach provides general purpose travel lane. The Loon Hill Road westbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. The Broadway Road northbound and southbound approaches provide an exclusive left-turn lane and a shared through/right-turn lane. The traffic signal at this location operates under a three-phase signal sequence, with an exclusive pedestrian phase provided via push-button activation. Sidewalk is provided continuously along both sides of Broadway Road and Loon Hill Road at this intersection, with painted crosswalks across all four approaches to this intersection. Land use in the vicinity of this intersection consists of commercial and residential uses.

Jones Avenue and Wheeler Road intersect Broadway Road to form a four-way intersection that operates under traffic signal control. The Broadway Road eastbound and westbound approaches provide a shared left-turn/through lane and a channelized right-turn lane that operates under YIELD-sign control. The Wheeler Road northbound approach provides a wide lane that allows through movements and right-turning traffic to bypass a vehicle turning left onto Broadway Road westbound. The Jones Avenue southbound approach provides a single general purpose travel lane. The traffic signal at this location operates under a two-phase signal sequence. Sidewalk is not provided along either side of any roadway approaches to this intersection. Land use in the vicinity of this intersection consists primarily of residential and commercial uses.

Traffic Volumes

Base traffic conditions within the study area were developed by conducting manual turning movement and vehicle classification counts (TMC's) at the study area intersections in October of 2023. The TMC's were conducted during the weekday AM peak period (7:00 to 9:00 AM) and the weekday PM peak period (4:00 to 6:00 PM). These time periods were chosen as they represent the peak time periods for both roadway and residential project-related traffic. Additionally, automatic traffic recorder (ATR) counts were conducted on Broadway Road adjacent to the site. All traffic count data are provided in the Appendix. The count data indicate that in the vicinity of the project site, the weekday AM peak hour generally occurs between 8:00 and 9:00 AM, with the weekday PM peak hour generally occurs between 4:00 to 5:00 PM. In all instances, individual intersection peak hours were used to provide a conservative assessment.

To determine if the count data needed to be adjusted to represent annual average month conditions consistent with MassDOT guidelines for traffic impact assessment, historical traffic volume data were obtained from MassDOT's Seasonal Weekday Adjustment Factor file. This document provides a monthly adjustment factor based on the roadway classification of the study roadways. Broadway Road is classified as an urban minor arterial (U4). Based on MassDOT seasonal adjustment data, October traffic volumes are approximately 6 percent higher than average annual conditions. As such, no seasonal adjustment factors were applied to the collected data. However,

a 1 percent background growth rate was applied to the collected data to account for potential growth in traffic between 2023 and 2024, the existing condition horizon year for this report. The MassDOT Seasonal Adjustment Factor file is provided in the Appendix.

The MassDOT *Traffic and Safety Engineering 25% Design Submission Guidelines* were updated on May 31, 2022. These new directives note that traffic volume data collected after March 1, 2022, are no longer subject to any adjustments to represent pre-pandemic traffic volume conditions, except in areas where land use is predominantly office. Therefore, since the traffic volume data were collected in May 2024, and land use in the area is predominantly commercial and residential, COVID adjustments do not need to be applied to the data. Table 1 summarizes the 2024 Existing peak hour traffic volumes on the study area roadways, based on the ATRs and TMCs, with the 2024 Existing weekday AM and weekday PM peak hour traffic flow networks provided on Figure 2 and Figure 3, respectively.

As summarized in Table 1, on a typical weekday Broadway Road currently accommodates 9,144 vehicles per day (vpd), including 633 vehicles per hour (vph) during the weekday AM peak hour and 935 vph during the weekday PM peak hour. During the weekday AM peak hour, traffic is oriented 52 percent in the eastbound direction, with traffic oriented 54 percent in the westbound direction during the weekday PM peak hour.

Table 1
Existing Traffic Volume Summary

Location/Time Period	Daily Volume[a]	Peak Hour Volume[b]		K Factor[c]	Directional Distribution[d]
Broadway Road (Route 113)					
Weekday:	9,144	Weekday AM:	633	6.9%	52% EB
		Weekday PM:	935	10.2%	54% WB

[as] In vehicles per day.
[b] In vehicles per hour.
[c] Percentage of daily traffic occurring during the peak hour.
[d] EB = eastbound; WB = westbound.

Vehicle Speeds

Speed measurements were conducted along Broadway Road in conjunction with the ATR counts. The results of the speed measurements are summarized in Table 2.

Figure 2
2024 Existing Weekday AM
Peak Hour Traffic Volumes

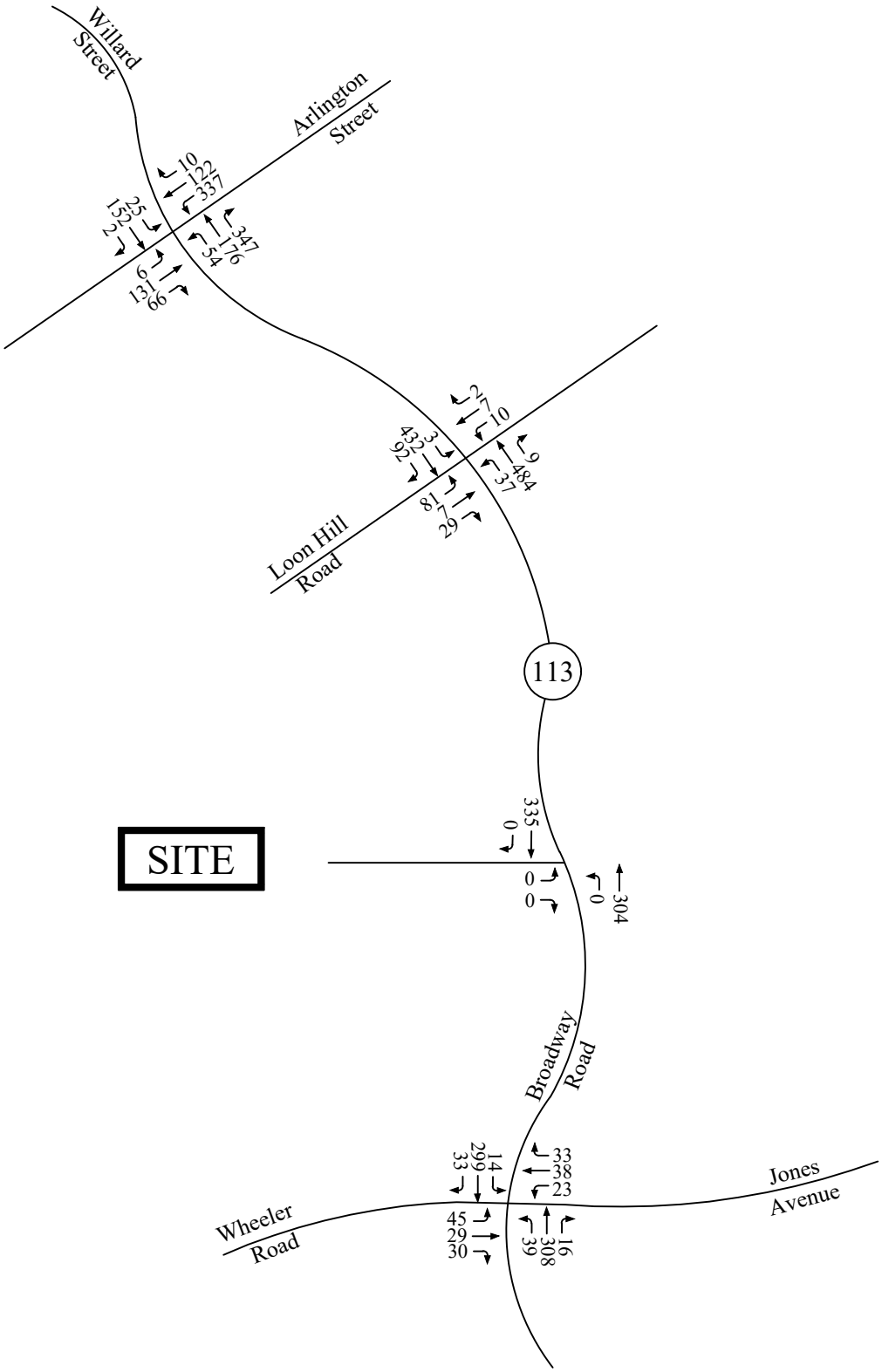


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Figure 3
2024 Existing Weekday PM
Peak Hour Traffic Volumes

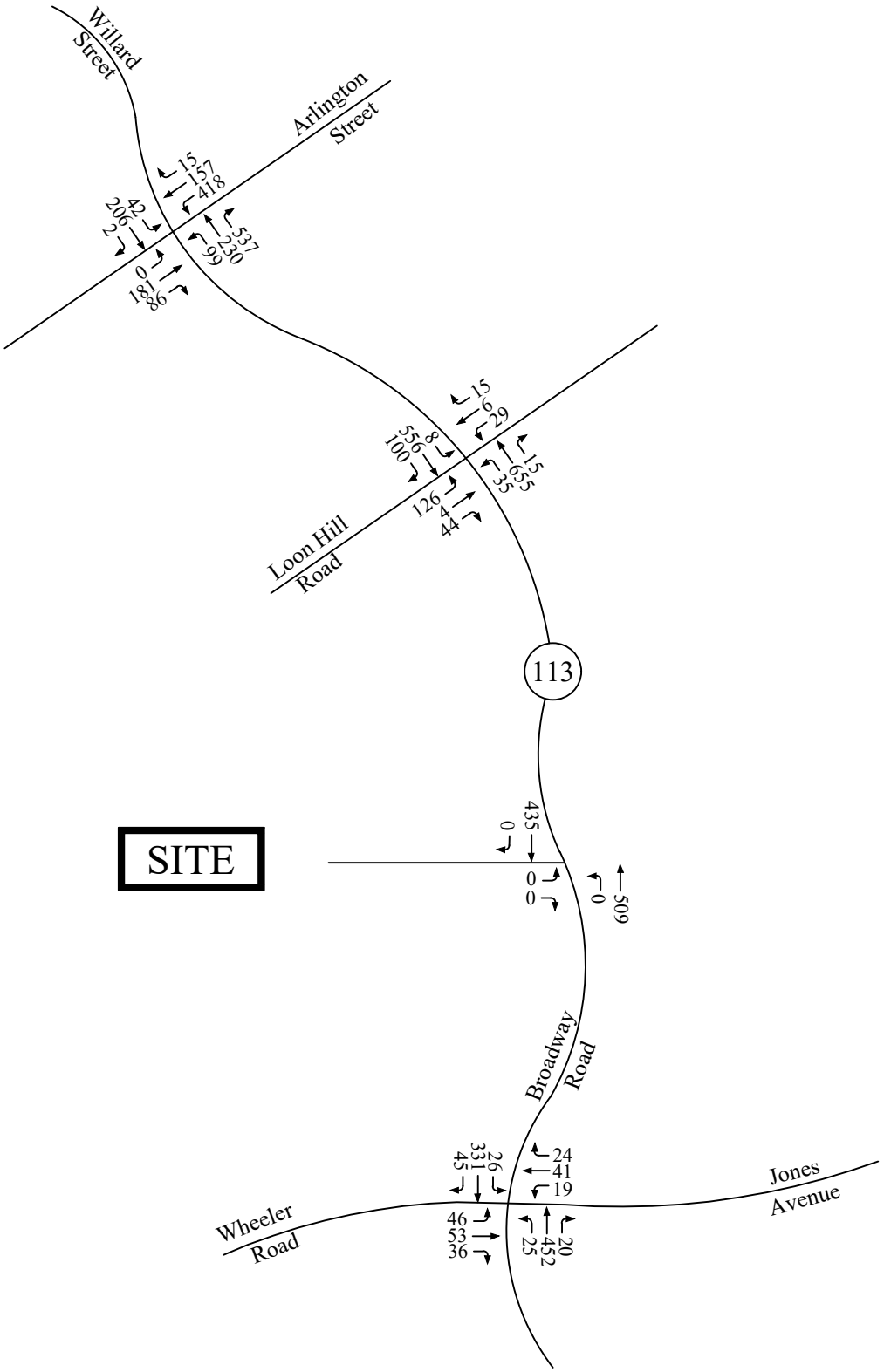

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Table 2
Observed Travel Speeds[a]

Location/Direction	Regulatory Speed Limit	Average Speed	85th Percentile Speed[b]
Broadway Road, adjacent to the site			
Eastbound	35	26	30
Westbound	35	23	26

[a] In miles per hour (mph).
[b] Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 2, the average travel speed along Broadway Road, adjacent to the site was determined to be 26 mph in the eastbound direction and 23 mph in the westbound direction, below the regulatory speed limit. The 85th percentile speed in the eastbound direction was recorded to be 30 mph, while the 85th percentile speed in the westbound direction was recorded to be 26 mph. As the observed travel speeds fall below the regulatory speed limit of 35 mph, this travel speed was utilized for the analysis of required sight distances at the proposed site access.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway intersection with Broadway Road, to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop.

The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[1] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The MassDOT and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level,

[1] *A Policy on Geometric Design of Highways and Streets, 7th Edition*; American Association of State Highway and Transportation Officials (AASHTO); 2018.

equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available intersection sight distances at the proposed site driveway intersection with Broadway Road were measured and compared to minimum requirements as established by AASHTO. The posted speed limit, which is higher than the observed travel speeds, was utilized to identify the required sight distances. The measured and required sight distances are shown in Table 3.

As shown in Table 3, the available sight distances at the proposed site driveway location well exceed the minimum required SSD distances in each direction, with the desirable ISD distances also met in both directions. Accordingly, safe operation of the proposed site driveway can be expected. To ensure the above sight lines are maintained, it is recommended that any proposed landscaping or signs in the vicinity of the site driveway be kept low (maximum 2 feet in height from street level), or set back outside the sight triangles (as defined by AASHTO) so as not to impede the available sight distances.

Table 3
Sight Distance Summary

Location/Direction	Sight Distance (feet) Measured	Minimum Required (SSD)[a]	Desirable (ISD)[b]
Broadway Road at Site Driveway			
East of intersection	400+	250	390
West of intersection	500+	250	335

[a] Values based on AASHTO SSD requirements for 35 mph travel speed.
[b] Values based on AASHTO ISD requirements for 85th percentile travel speeds on each corridor.

Crash History

Crash data for the study intersections were obtained from MassDOT for the period between 2015 and 2019, the latest five years of available data. Data for 2020 were not reviewed as traffic volumes were significantly lower along area roadways during the COVID-19 pandemic. A summary of the MassDOT crash data is provided in Table 4. Additionally, in accordance with MassDOT guidelines for traffic impact assessments, the motor vehicle crash rate was calculated for each study area intersection and compared with the statewide and district-wide averages. An intersection crash rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in crashes per million entering vehicles (crashes/mev). For signalized intersections, the statewide average rate is 0.78 crashes/mev and the district wide (District 4) accident rate is 0.73 crashes/mev. For unsignalized intersections, both the statewide and districtwide average crash rate is 0.57 crashes/mev. A comparison of the calculated crash rate to the average crash rate can be used to establish the significance of crash occurrence and whether or not potential safety problems exist. The crash rate worksheets are provided in the Appendix.

As summarized in Table 4, the intersection of Broadway Road and Willard Street with Arlington Street experienced a total of twenty-four (24) reported motor vehicle crashes over the five-year review period, averaging approximately five (5) motor vehicle collisions per year. The majority of collisions (16 out of 24) involved either angle or rear-end crashes. Of the twenty-four reported collisions, the majority (17 out of 24) resulted in property damage only, with no fatalities reported over the five-year review period. Approximately 50 percent of reported collisions occurred under wet or icy roadway conditions. The calculated crash rate of 0.68 crashes/mev falls below both the districtwide and statewide average crash rates for signalized intersections in this MassDOT District.

Table 4
Crash Summary

Location	Number of Crashes			Severity[a]			Crash Type[b]						% During Wet/Icy Conditions
	Total	Avg./ Year	Crash Rate [c]	PD	PI	U	CM	RE	SS	HO	SV	U	
Broadway Road/ Willard Street at Arlington Street	24	4.8	0.68	17	7	0	10	6	0	3	5	0	50%
Broadway Road at Jones Avenue/ Wheeler Road	15	3.0	0.75	8	7	0	3	4	0	0	7	1	40%
Broadway Road at Loon Hill Road	11	2.2	0.39	7	4	0	3	4	1	1	0	2	45%

Source: MassDOT Traffic Operations Safety Management System – 2015 through 2019 data.
[a] PD = property damage only; PI = personal injury; 0 value indicates severity not reported.
[b] CM = cross movement/angle; RE = rear end; SS = sideswipe; HO = head-on; SV= single vehicle; U= unknown.
[c] Measured in accidents per million entering vehicles.

The intersection of Broadway Road with Jones Avenue and Wheeler Road experienced a total of fifteen (15) reported motor vehicle crashes over the five-year review period, averaging three (3) motor vehicle collisions per year. A significant number of collisions (7 out of 15) involved single vehicle crashes. Of the fifteen reported collisions, the majority (8 out of 15) resulted in property damage only, with no fatalities reported over the five-year review period. Approximately 40 percent of reported collisions occurred under wet or icy roadway conditions. The calculated crash rate of 0.75 crashes/mev falls below the statewide average crash rate and is slightly higher than the districtwide average crash rate for signalized intersections in this MassDOT District.

The intersection of Broadway Road with Loon Hill Road and a private driveway experienced a total of eleven (11) reported motor vehicle crashes over the five-year review period, averaging approximately two (2) motor vehicle collisions per year. The majority of collisions (7 out of 11) involved either angle or rear-end crashes. Of the eleven reported collisions, the majority (7 out of 11) resulted in property damage only, with no fatalities reported over the five-year review period. Approximately 45 percent of reported collisions occurred under wet or icy roadway conditions. The calculated crash rate of 0.39 crashes/mev falls well below both the statewide and districtwide average crash rates for signalized intersections in this MassDOT District.

It is noted that there are no segments of the study area that are identified as top crash locations in the MassDOT database of Highway Safety Improvement Program (HSIP) eligible clusters.

Public Transportation

The project site is not directly served by public transportation services. However, public transportation services are provided within the study area by the Lowell Regional Transit Authority (LRTA). Service along this route is provided to the Kennedy Center and Broadway Road at Loon Hill Road, with service provided to Market Basket at Sunrise Plaza and Dracut Village Square at Scola's. Weekday service is provided between 5:55 AM and 7:18 PM, with peak hour headways of one hour. Public transportation schedules are provided in the appendix of this report.

FUTURE CONDITIONS

Traffic Growth

Future traffic conditions were projected to the year 2031, representing a 7-year design horizon consistent with state requirements for traffic impact analysis. To project traffic conditions within this design horizon, two components of traffic growth were included. First, an annual average traffic growth rate was determined to account for general population growth and smaller development projects (such as residential developments) that may impact traffic along roadways in the site vicinity. Based on traffic count data published by MassDOT at count location located along Broadway Road (Station 3372443), in proximity to the project site, traffic volumes have generally decreased since pre-pandemic levels, and have exhibited little growth over the past few years. However, in order to account for potential unforeseen growth in area traffic, a conservative 1.0 percent per year compounded background growth rate was applied to all study area traffic volumes traveling on roadways adjacent to the site.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next seven years were included. Based on discussions with the Town of Dracut Department of Community Development, the following background development projects were identified and included in the projections of future traffic conditions.

> ***Murphy's Farm – 231 Wheeler Road, Dracut, MA*** – The Murphy's Farm development project entails the construction of a 300-unit multifamily residential development on an approximate 50 acre site located at 231 Wheeler Road. Additional traffic associated with this project were identified based on the traffic study[2] prepared for this development, and have been incorporated into the analysis of future traffic operations.
>
> ***Berube Farms – 270 Wheeler Road, Dracut, MA*** – The Berube Farms development project entails the construction of a 34-unit residential development on a vacant site located

[2] *Transportation Impact Assessment – Proposed Multifamily Residential Development – Murphy's Farm (231 Wheeler Street), Dracut, Massachusetts*, Vanasse & Associates, October 2, 2023.

at 270 Wheeler Road. Additional traffic associated with this project were identified based on trip generation data published by the Institute of Transportation Engineers (ITE), and have been incorporated into the analysis of future traffic operations.

Proposed Industrial Development - 970 Broadway Road, Dracut, MA – the 970 Broadway Road industrial development entails the construction of an approximate 143,600± sf industrial building at 970 Broadway Road. Additional traffic expected to be generated by this project were obtained from the traffic study[3] prepared for this project and have been included in the analysis of future traffic operations.

Roadway Improvement Projects

MassDOT was contacted to identify whether there are any planned roadway improvement projects expected to influence future traffic conditions within the study area. Based on these discussions, there are currently no planned roadway improvements within the study area beyond routine maintenance operations.

No-Build Conditions

The 2031 No-Build conditions were developed by applying a compounded 1.0 percent annual growth rate (7.2 percent over seven years) to the existing adjacent street and intersection volumes, as well as traffic associated with the identified background development projects. The 2031 No-Build weekday AM and weekday PM peak-hour traffic-flow networks are displayed on Figure 4 and Figure 5, respectively.

Trip Generation

In order to identify the anticipated trip generation characteristics of the project, trip generation data published by the Institute of Transportation Engineers (ITE) were reviewed. The ITE publishes trip generation data for a number of Land Use Codes (LUCs), including LUC 221 – *Multi-Family Housing (Mid-Rise) Not Close to Rail Transit*, LUC 495 – *Recreational Community Center*, LUC 822 – *Strip Retail Plaza (<40K)*, and LUC 850 – *Supermarket*, the most appropriate categories for the proposed land uses in the development. Trip generation calculations were performed for the project for a typical weekday, as well as the weekday AM and weekday PM peak hours, which represent the peak impact periods for the project.

The trip generation estimates for the proposed retail and market space were adjusted to reflect a common characteristic of commercial uses, pass-by trips, that are drawn from existing traffic flows

[3] *Traffic Impact and Access Study – Route 113 (Broadway Road) Development*, Green International Affiliates, Inc., June 2023.

Figure 4
2031 No-Build Weekday AM
Peak Hour Traffic Volumes

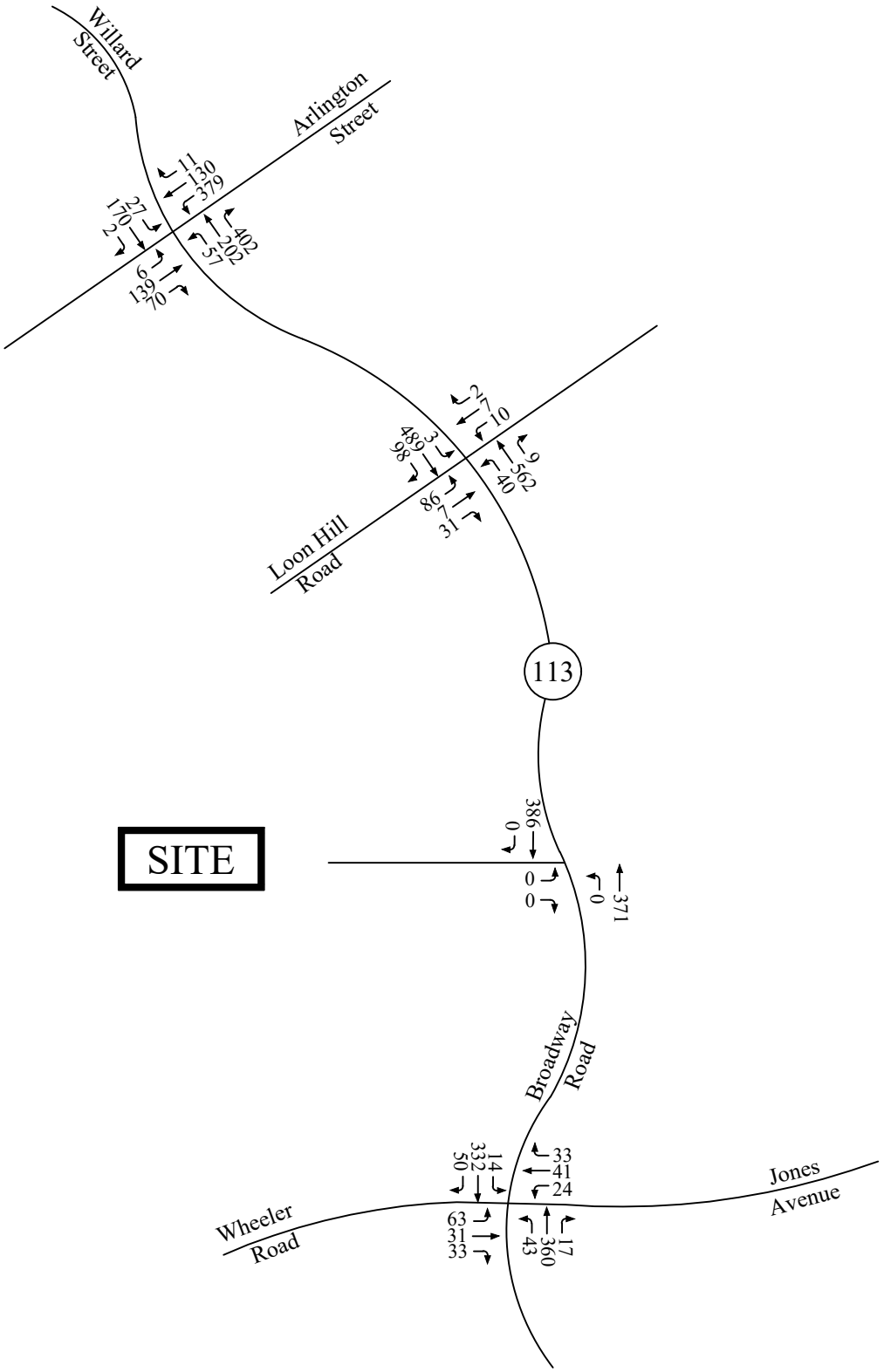

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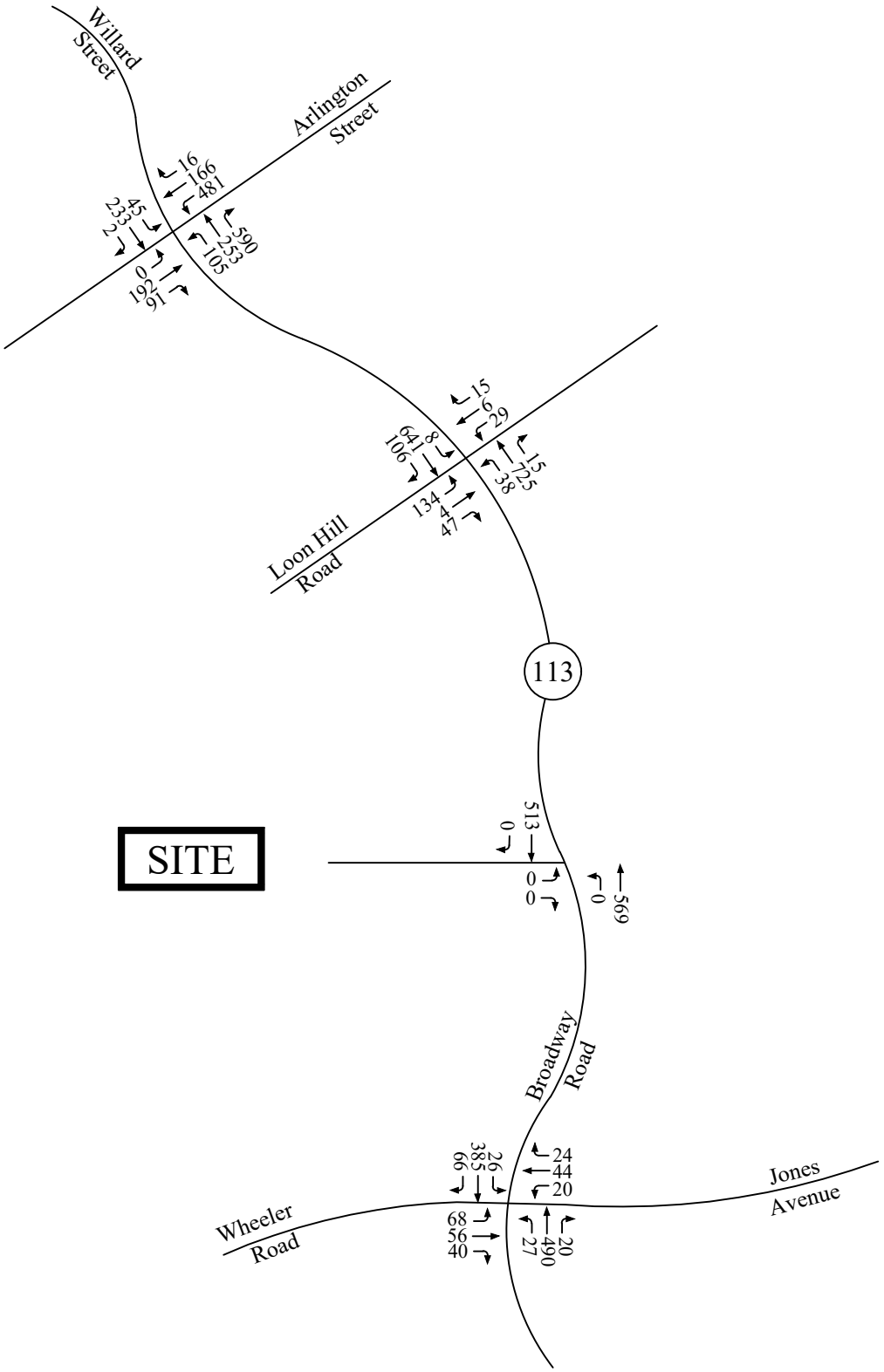
Figure 5
2031 No-Build Weekday PM
Peak Hour Traffic Volumes



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already traveling roadways adjacent to the site. Based on ITE data, the average pass-by rate for markets is approximately 24 percent during weekday peak hours, while the average pass-by percentage for retail trips is 40 percent during weekday peak hours. These pass-by percentages were applied to all trips associated with the market and retail uses.

Additionally, though the proposed market, commercial space and recreational center will be open to the public, it is expected that a significant percentage of the patronage of both uses will be from residents of the project, that would not result in an external trip to the surrounding roadway network. For the purpose of this assessment, it is assumed that 50 percent of the peak hour trips to and from the recreational center will occur internally to and from the proposed residences, with a lower 30 percent rate applied on a daily basis. For the market and commercial trips, a 27 percent internal capture rate was applied to the daily trips, with a more conservative 10 to 17 percent internal capture rate applied to peak hour trips.

The trip generation projections for the project are summarized in Table 5. The trip generation calculations are provided in the Appendix.

Table 5
Trip Generation Summary

Time Period	Residential Trips[a]	Recreational Center Trips[b]	Retail Trips[c]	Market Trips[d]	Pass-by Trips[e]	Internal Trips[f]	**New Trips**
Weekday Daily	1,386	1,856	706	738	-398	-752	**3,536**
Weekday AM Peak Hour							
Enter	28	81	18	13	-7	-46	**87**
Exit	92	42	13	9	-7	-25	**124**
Total	120	123	31	22	-14	-71	**211**
Weekday PM Peak Hour							
Enter	72	76	43	35	-23	-47	**156**
Exit	45	85	42	35	-23	-50	**134**
Total	117	161	85	70	-46	-97	**290**

[a] Based on ITE LUC 221 – *Multifamily Housing – Not Close to Rail Transit* trip generation rates applied to 300 dwelling units.
[b] Based on ITE LUC 495 – *Community Recreational Center* trip generation rates applied to 64,383 sf.
[c] Based on ITE LUC 822 – *Strip Retail Plaza* trip generation rates applied to 12,972 sf.
[d] Based on ITE LUC 850 – *Supermarket* trip generation rates applied to 7,858 sf.
[e] Pass-by trip adjustment of 40 percent applied to retail trips and 24 percent applied to market trips.
[f] Internal trip adjustment of 50 percent applied to recreational center peak hour trips, 30 percent to recreational center daily trips, 17 percent to market and retail AM peak hour trips, 10 percent to market and retail PM peak hour trips, and 13.5 percent to market and retail daily trips.

As summarized in Table 5, on a typical weekday (over a twenty-four hour period) the proposed development is expected to result in a total of 3,536 new vehicle trips (1,768 entering and 1,768 exiting), including 211 new vehicle trips (87 entering and 124 exiting) during the weekday AM peak hour and 290 new vehicle trips (156 entering and 134 exiting) during the weekday PM peak hour.

Trip Distribution

Additional trips expected to be generated by the project were distributed onto the local roadway network, based on a review of existing traffic patterns and anticipated commuter patterns for residential trips. Specifically, U.S. Census Journey to Work data for residents of the Town of Dracut were reviewed to develop the trip distribution patterns of the residential portion of the project, with existing area traffic patterns utilized to develop the anticipated trip distribution patterns for the market, retail and recreational center space.

Based on the U.S. Census data, it is expected that 40 percent of residential traffic will be oriented to and from Willard Street, west of the site; 27 percent to and from Arlington Street, west of Broadway Road; and 33 percent to and from Broadway Road; east of the site.

Based on observed area traffic patterns, it is expected that 30 percent of the market, retail and recreational center traffic will be oriented to and from Arlington Street, west of Broadway Road; 25 percent to and from Broadway Road, east of the site; 15 percent to and from Arlington Street, east of Broadway Road; 10 percent to and from Loon Hill Road, west of the site; 10 percent to and from Willard Street, west of the site; 5 percent to and from Jones Avenue, east of the site; and 5 percent to and from Wheeler Road, east of the site.

The residential trip distribution patterns are displayed on Figure 6. The trip distribution patterns for the market, retail and recreational center are displayed on Figure 7. Based on these patterns, project-related traffic increases were distributed onto the study area roadways and intersections for the weekday AM and weekday PM peak hours, as displayed in Figure 8 and Figure 9, respectively.

Build Conditions

Future 2031 Build condition traffic volumes were developed by applying the project-related traffic volumes to the 2031 No-Build condition. The 2031 Build weekday AM and weekday PM peak hour traffic volume networks are graphically depicted on Figure 10 and Figure 11.

Project-related traffic increases external to the site access drive result in increases to overall intersection traffic volumes of 70 to 313 vehicles per hour, or approximately 1 to 3 new vehicles per minute. This level of traffic results in an approximate 6.7 to 9.0 percent increase in traffic volumes as compared to future 2031 No-Build conditions.

Figure 6
Trip Distribution Map
Residential Trips

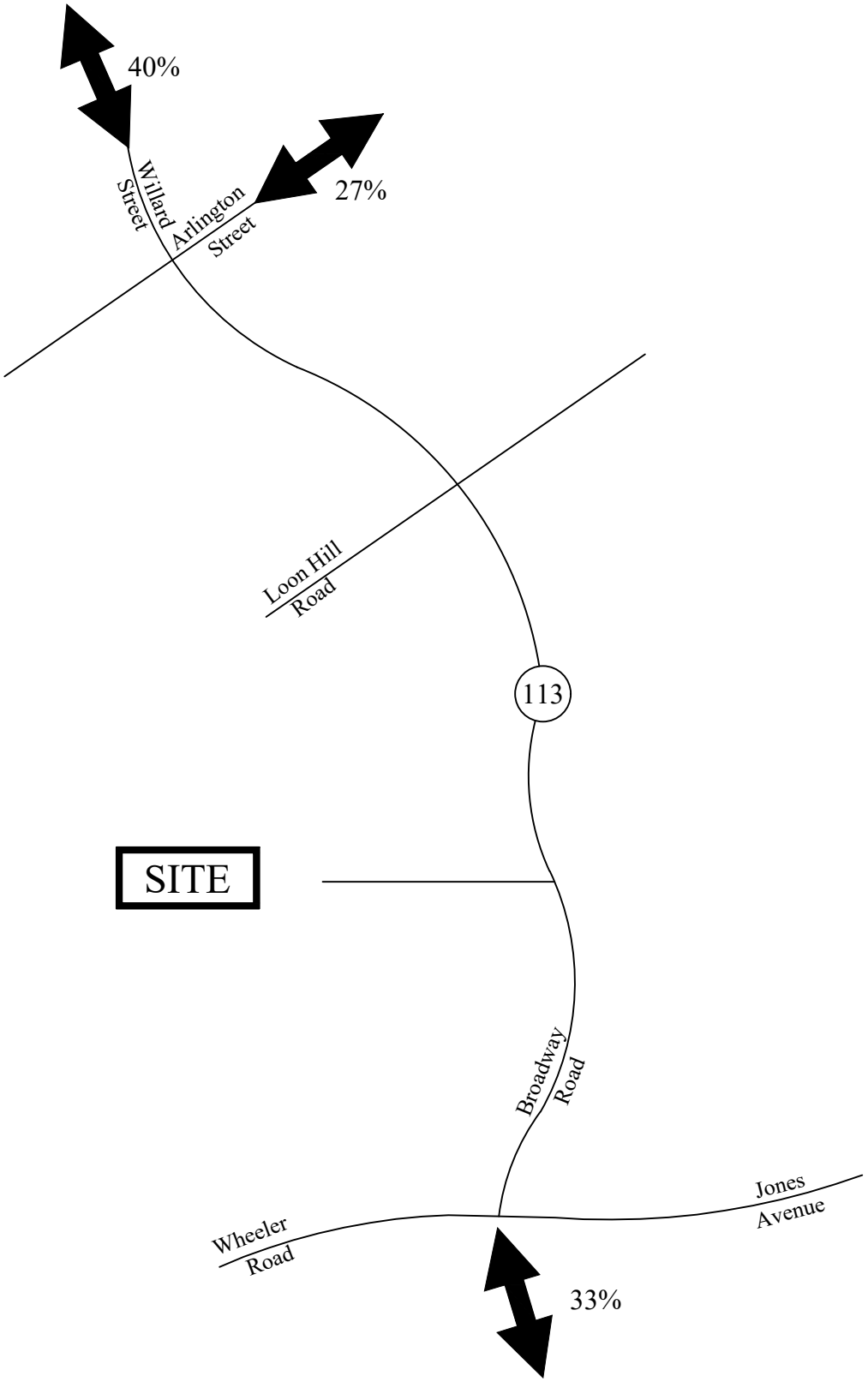

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Figure 7
Trip Distribution Map
Retail Trips

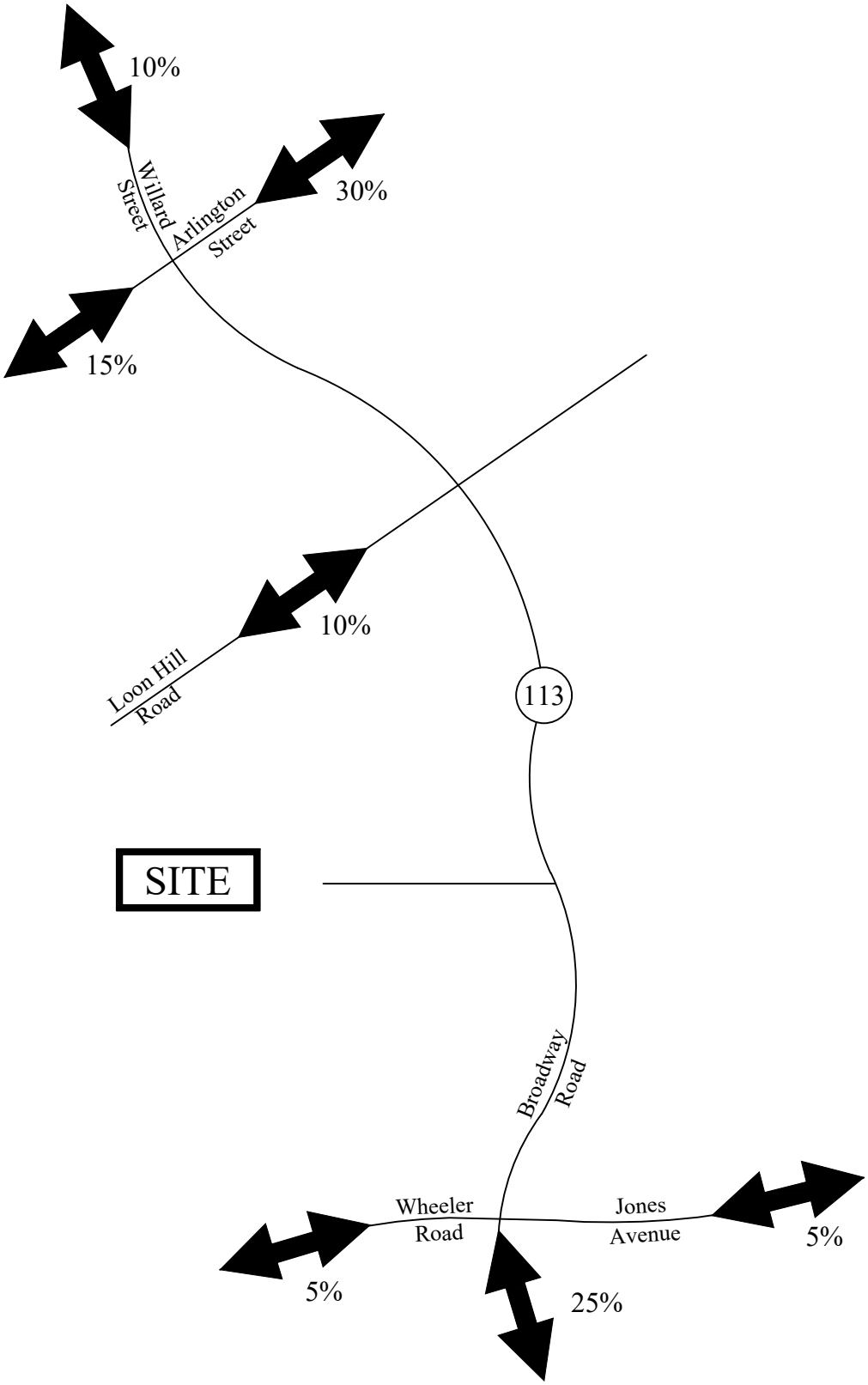

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Figure 8
Weekday AM Project-Generated Peak Hour Traffic Volumes

	Residential/Recreational Facility Trips	Retail Total	Retail Pass-by	Total New
Enter	68	19	-7	87
Exit	113	11	-7	124
Total	181	30	-14	211

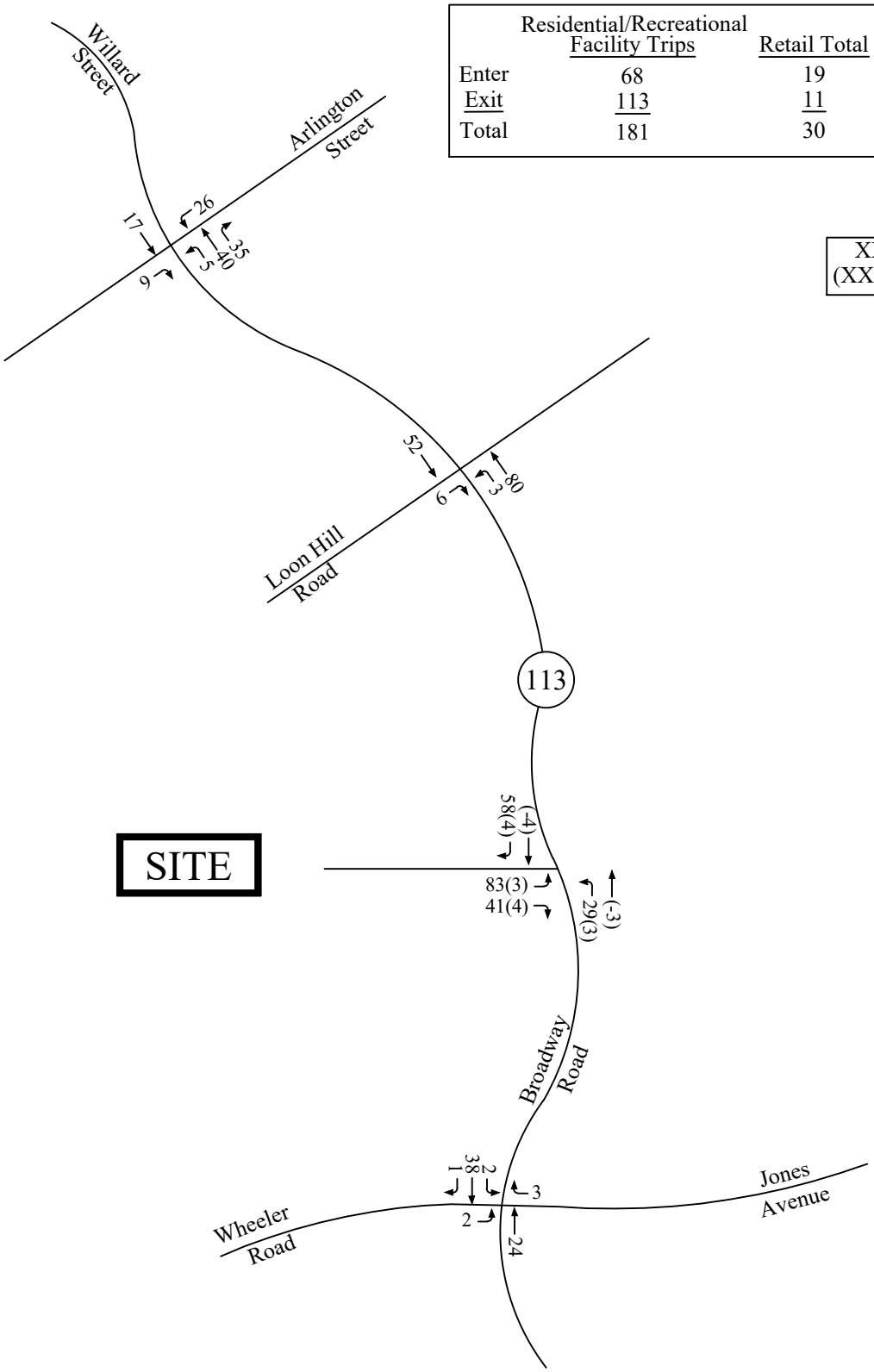

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Figure 9
Weekday PM Project-Generated Peak Hour Traffic Volumes

	Residential/Recreational Facility Trips	Retail Total	Retail Pass-by	Total New
Enter	109	47	-23	156
Exit	88	46	-23	134
Total	197	93	-46	290

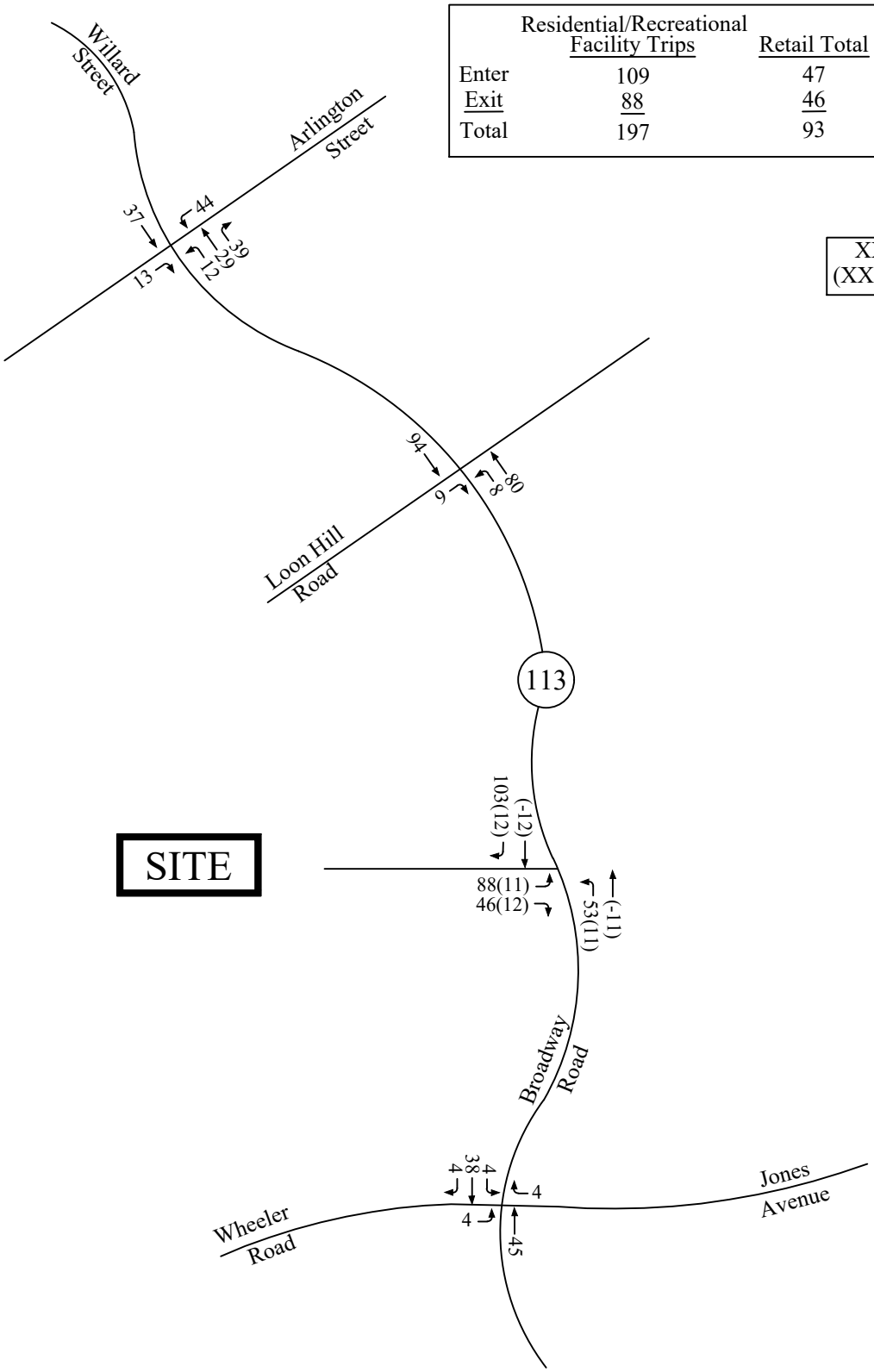

Figure 10
2031 Build Weekday AM
Peak Hour Traffic Volumes

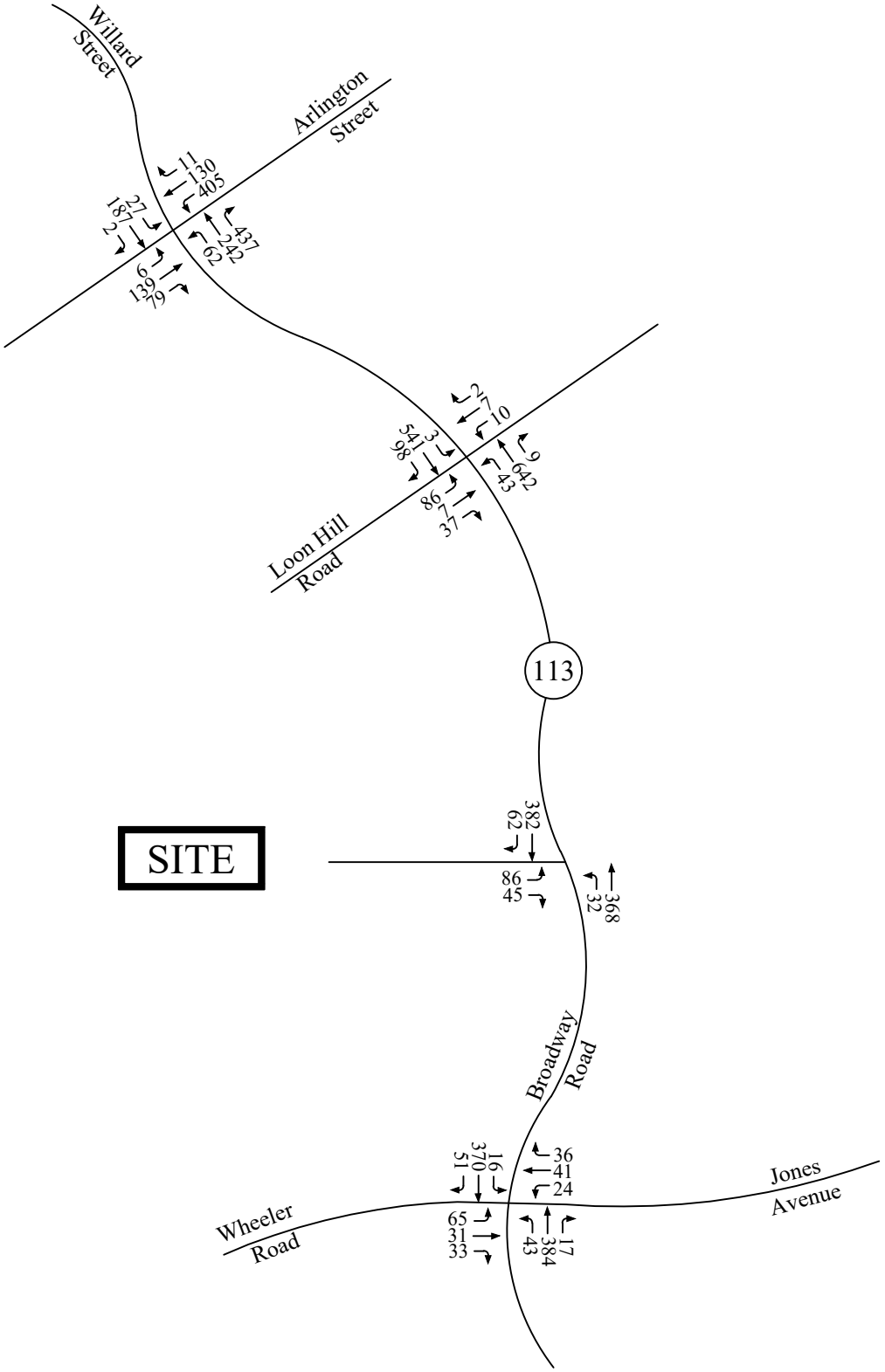

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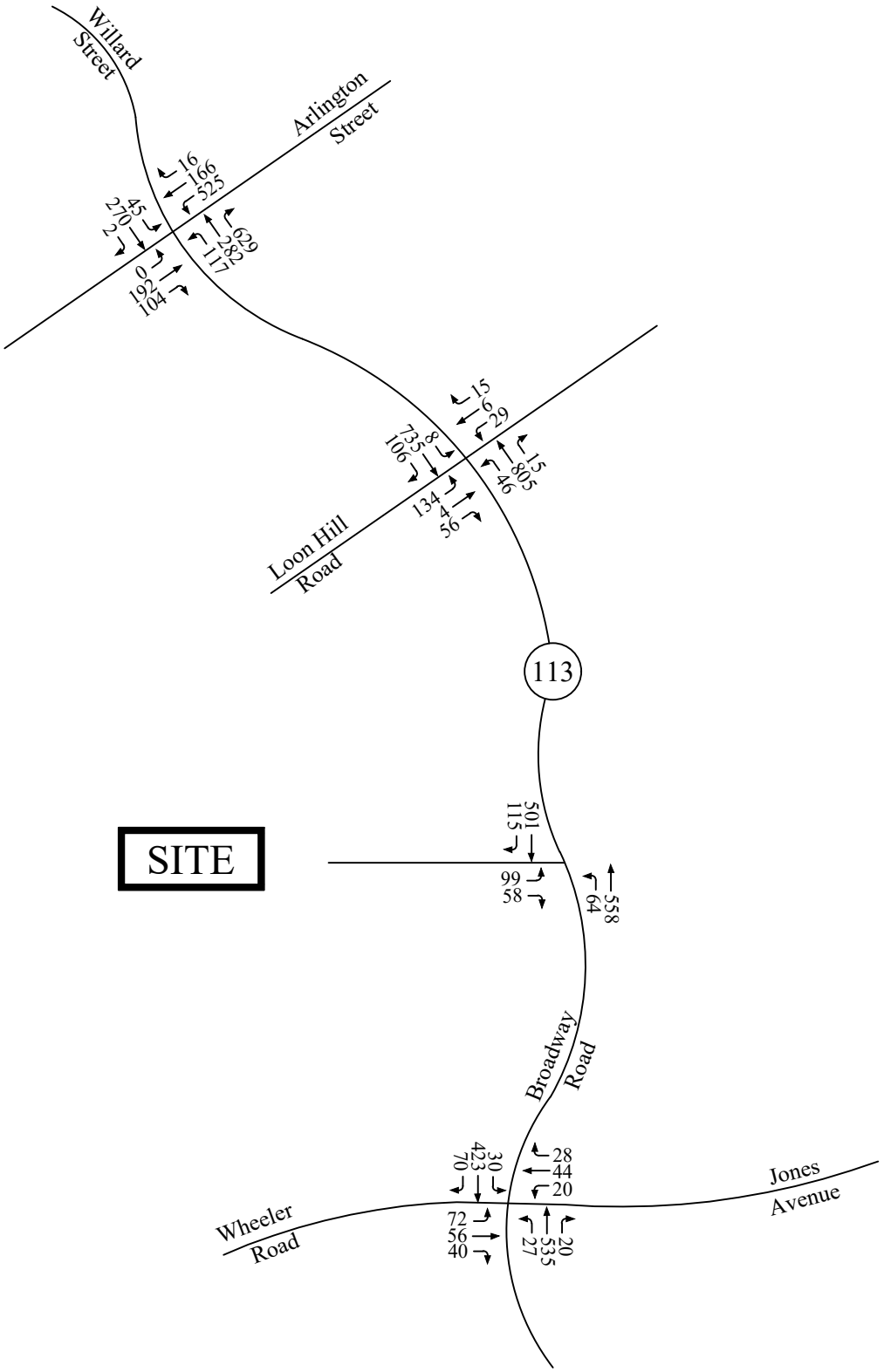
Figure 11
2031 Build Weekday PM
Peak Hour Traffic Volumes



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MEPA/MassDOT Thresholds

Broadway Road, adjacent to the site is under MassDOT jurisdiction and the project will therefore require a Highway Access Permit from MassDOT for the proposed site access. Review and approval through the Massachusetts Environmental Policy Act (MEPA) office is also required if the project exceeds one or more of the following review thresholds:

- Generation of 2,000 or more daily vehicle trips
- Creation of 300 or more new parking spaces
- Generation of 1,000 or more daily vehicle trips plus 150 or more parking spaces
- Creation of 5 or more acres of additional impervious surface
- Alteration of 25 or more acres of additional land
- Site is located within an Area of Critical Environmental Concern (ACEC)

As shown in Table 5, the project is expected to generate 3,536 new daily vehicle trips, as well as the creation of greater than 300 new parking spaces, which exceed both the trip generation and new parking space thresholds, requiring MEPA review.

Site Access, Parking and On-Site Circulation

Access to the site will be provided via a new driveway that intersects the southern side of Broadway Road. It is recommended that the proposed driveway provide a minimum of 22-feet in width on the exit lane to accommodate an 11-foot wide exclusive left-turn lane and 11-foot wide exclusive right-turn lane for vehicles exiting the project, with an inbound lane of at least 12-feet in width to accommodate entering traffic.

It is recommended that a STOP sign (MUTCD R1-1) and a painted stop line be provided on the driveway approach to Broadway Road, with inbound and outbound traffic separated by either a painted double-yellow centerline or raised median island. All signs and pavement markings installed in conjunction with the project should be installed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) design criteria. It is recommended that any landscaping or signage in the vicinity of the site driveway be located outside of the driveway sight triangles or maintained to 2-feet in height or less to ensure adequate sight lines are maintained in both directions along Broadway Road.

CAPACITY ANALYSIS

Level-of-service (LOS) analyses were conducted at the study area intersections under existing and projected volume conditions to determine the effect that the additional site-generated traffic will have on traffic operations. The capacity analysis methodology is based on the concepts and

procedures in the *Highway Capacity Manual*[4] (HCM) and is described in the Appendix. For signalized intersections, the maximum back of queue during an average signal cycle and a 95th percentile signal cycle was calculated for each lane group during the peak periods studied. The back of queue is the length of a backup of vehicles from the stop line of a signalized intersection to the last car in the queue that is required to stop, regardless of the signal indication. The length of this queue depends on a number of factors including signal timing, vehicle arrival patterns, and the saturation flow rate. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). The queue length is a function of the capacity of the movement and the movement's degree of saturation. The Synchro analysis program was used for all capacity analyses. It is noted that due to the conservative nature of the unsignalized capacity analysis software, calculated delays for side street movements are typically overstated as motorists will utilize smaller gaps in traffic than assumed in the parameters of the analysis software. In order to provide a more accurate assessment of side street delays at unsignalized intersections, the critical gap for side street movements has been reduced by 0.5 seconds.

The level-of-service and queue results for signalized and unsignalized intersections are presented in Tables 6 and 7, respectively and are discussed below. All analysis worksheets are provided in the Appendix.

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

Table 6
Signalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2024 Existing					2031 No-Build					2031 Build				
	V/C[a]	Delay[b]	LOS[c]	50 Q[d]	95 Q[e]	V/C	Delay	LOS	50 Q	95 Q	V/C	Delay	LOS	50 Q	95 Q
Broadway Road and Willard Street at Arlington Street															
Weekday AM Peak Hour															
EB Left	0.45	7.1	A	45	110	0.52	8.6	A	60	145	0.57	10.3	B	72	175
EB Thru/Right	0.12	4.5	A	14	41	0.13	5.2	A	18	50	0.13	5.8	A	19	56
WB All	0.56	24.6	C	67	141	0.61	27.5	C	82	158	0.64	29.5	C	93	172
NB All	0.52	26.8	C	63	140	0.50	26.7	C	72	152	0.52	27.0	C	85	163
SB Left	0.26	24.8	C	16	54	0.27	25.0	C	19	56	0.30	25.6	C	23	60
SB Thru	0.43	24.9	C	56	134	0.47	25.8	C	72	151	0.54	27.1	C	95	179
SB Right	0.53	6.1	A	0	62	0.57	5.9	A	0	64	0.58	5.7	A	0	65
Overall	--	**14.8**	**B**	--	--	--	**15.4**	**B**	--	--	--	**16.5**	**B**	--	--
Weekday PM Peak Hour															
EB Left	0.62	13.6	B	83	218	0.74	20.9	C	153	327	0.85	31.3	C	219	409
EB Thru/Right	0.16	6.3	A	27	65	0.19	6.9	A	35	69	0.17	7.4	A	40	69
WB All	0.71	33.6	C	130	206	0.75	37.3	D	153	221	0.80	41.4	D	171	231
NB All	0.74	35.9	D	135	196	0.81	41.8	D	165	224	0.87	48.7	D	197	284
SB Left	0.54	34.7	C	45	97	0.57	37.3	D	50	105	0.64	42.2	D	57	135
SB Thru	0.50	26.8	C	103	174	0.51	27.3	C	117	189	0.53	27.7	C	134	212
SB Right	0.65	5.8	A	0	67	0.66	5.8	A	0	72	0.67	5.6	A	0	74
Overall	--	**19.6**	**B**	--	--	--	**22.7**	**C**	--	--	--	**27.0**	**C**	--	--

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 50th percentile queue in feet, assuming 25 feet per vehicle.
[e] 95th percentile queue in feet, assuming 25 feet per vehicle.

Table 6 (Continued)
Signalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2024 Existing					2031 No-Build					2031 Build				
	V/C[a]	Delay[b]	LOS[c]	50 Q[d]	95 Q[e]	V/C	Delay	LOS	50 Q	95 Q	V/C	Delay	LOS	50 Q	95 Q
Broadway Road at Loon Hill Road and Private Drive															
Weekday AM Peak Hour															
EB All	0.05	11.9	B	3	16	0.05	13.2	B	4	18	0.05	15.5	B	4	20
WB Left	0.26	15.5	B	15	50	0.28	17.2	B	17	59	0.29	19.6	B	20	67
WB Thru/Right	0.09	7.3	A	1	18	0.10	7.8	A	1	20	0.12	8.4	A	1	24
NB Left	0.01	4.3	A	0	3	0.01	4.3	A	0	3	0.01	4.3	A	0	3
NB Thru/Right	0.49	7.0	A	64	156	0.52	7.4	A	75	190	0.55	7.6	A	89	222
SB Left	0.10	5.3	A	3	15	0.11	5.5	A	4	17	0.13	5.5	A	4	18
SB Thru/Right	0.45	6.9	A	59	144	0.51	7.5	A	75	187	0.56	8.1	A	95	235
Overall	--	**7.6**	**A**	--	--	--	**8.2**	**A**	--	--	--	**8.7**	**A**	--	--
Weekday PM Peak Hour															
EB All	0.14	14.7	B	10	37	0.14	14.7	B	10	37	0.15	16.0	B	12	37
WB Left	0.33	21.1	C	30	95	0.35	21.6	C	35	101	0.38	23.9	C	41	101
WB Thru/Right	0.11	8.2	A	1	26	0.12	8.0	A	1	26	0.14	8.0	A	1	28
NB Left	0.03	4.9	A	1	6	0.03	5.0	A	1	6	0.03	5.0	A	1	6
NB Thru/Right	0.55	8.1	A	100	244	0.63	9.7	A	132	321	0.69	11.0	B	174	411
SB Left	0.10	5.5	A	4	17	0.13	6.2	A	4	20	0.19	7.2	A	6	25
SB Thru/Right	0.63	9.7	A	130	278	0.64	10.2	B	140	338	0.69	11.4	B	179	419
Overall	--	**9.9**	**A**	--	--	--	**10.8**	**B**	--	--	--	**12.0**	**B**	--	--

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 50th percentile queue in feet, assuming 25 feet per vehicle.
[e] 95th percentile queue in feet, assuming 25 feet per vehicle.

Table 6 (Continued)
Signalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2024 Existing					2031 No-Build					2031 Build				
	V/C[a]	Delay[b]	LOS[c]	50 Q[d]	95 Q[e]	V/C	Delay	LOS	50 Q	95 Q	V/C	Delay	LOS	50 Q	95 Q
Broadway Road at Jones Avenue and Wheeler Road															
Weekday AM Peak Hour															
EB Left/Thru	0.48	16.2	B	92	117	0.48	14.3	B	93	116	0.51	14.0	B	103	124
EB Right	0.05	3.6	A	0	11	0.07	2.7	A	0	12	0.07	2.5	A	0	12
WB Left/Thru	0.63	19.3	B	124	138	0.65	18.0	B	136	147	0.66	17.3	B	143	149
WB Right	0.03	1.9	A	0	4	0.03	1.6	A	0	4	0.03	1.5	A	0	4
NB Left	0.10	10.5	B	11	28	0.15	12.7	B	18	40	0.16	13.8	B	19	43
NB Thru/Right	0.10	6.6	A	7	23	0.12	7.6	A	8	26	0.12	8.2	A	9	27
SB All	0.12	7.4	A	13	39	0.13	8.8	A	16	45	0.14	9.3	A	16	47
Overall	--	**14.7**	**B**	--	--	--	**13.9**	**B**	--	--	--	**13.9**	**B**	--	--
Weekday PM Peak Hour															
EB Left/Thru	0.53	14.9	B	101	125	0.57	14.7	B	115	140	0.63	15.0	B	124	155
EB Right	0.06	2.6	A	0	11	0.08	2.2	A	0	13	0.08	1.9	A	0	12
WB Left/Thru	0.63	17.2	B	150	174	0.66	16.5	B	158	182	0.68	15.8	B	165	191
WB Right	0.03	1.9	A	0	5	0.03	1.7	A	0	5	0.03	1.5	A	0	5
NB Left	0.09	12.7	B	11	33	0.15	14.1	B	18	47	0.17	15.4	B	20	51
NB Thru/Right	0.13	8.7	A	13	41	0.15	9.2	A	14	44	0.16	10.0	A	15	46
SB All	0.11	9.7	A	14	43	0.12	10.5	B	16	46	0.13	11.1	B	17	48
Overall	--	**14.1**	**B**	--	--	--	**13.8**	**B**	--	--	--	**13.8**	**B**	--	--

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 50th percentile queue in feet, assuming 25 feet per vehicle.
[e] 95th percentile queue in feet, assuming 25 feet per vehicle.

Table 7
Unsignalized Intersection Level-of-Service Analysis Summary

Location/Peak Hour/Movement	2024 Existing				2031 No-Build				2031 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d]	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Broadway Road at Site Driveway												
Weekday AM Peak Hour												
EB All	--	--	--	--	--	--	--	--	0.28	0.0	A	0
WB All	--	--	--	--	--	--	--	--	0.03	1.0	A	0
NB Left	--	--	--	--	--	--	--	--	0.28	19.9	C	25
NB Right	--	--	--	--	--	--	--	--	0.08	11.0	B	0
Weekday PM Peak Hour												
EB All	--	--	--	--	--	--	--	--	0.39	0.0	A	0
WB All	--	--	--	--	--	--	--	--	0.08	1.9	A	0
NB Left	--	--	--	--	--	--	--	--	0.58	48.2	E	75
NB Right	--	--	--	--	--	--	--	--	0.12	12.6	B	0

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 95th percentile queue in feet, assuming 25 feet per vehicle.

Signalized Intersections

As summarized in Table 6, under 2024 Existing conditions, the intersection of Broadway Road and Willard Street with Arlington Street currently operates at an overall LOS B during the weekday AM peak hour and weekday PM peak hour. Under future 2031 No-Build conditions, this location is projected to continue to operate at an overall LOS B during the weekday AM peak hour and at LOS C during the weekday PM peak hour. Under 2031 Build conditions, this location is projected to continue to operate at an overall LOS B during the weekday AM peak hour, and at an overall LOS C during the weekday PM peak hour, with project-related traffic increases resulting in increases to overall delays of approximately 1 to 4 seconds per vehicle as compared to future No-Build conditions.

Under 2024 Existing conditions, the intersection of Broadway Road with Loon Hill Road and a private driveway currently operates at an overall LOS A during the weekday AM and weekday PM peak hours. Under future 2031 No-Build conditions, this location is projected to continue to operate at an overall LOS A during the weekday AM peak hour and operate at LOS B during the weekday PM peak hour. Under 2031 Build conditions, this location is projected to continue to operate at an overall LOS A during the weekday AM peak hour and at an overall LOS B during the weekday PM peak hour, with project-related traffic increases resulting in increases to overall delays of approximately 1 second per vehicle or less.

Under 2024 Existing conditions, the intersection of Broadway Road with Jones Avenue and Wheeler Road currently operates at an overall LOS B during the weekday AM peak hour and weekday PM peak hour. Under future 2031 No-Build conditions, this location is projected to continue to operate at an overall LOS B during the weekday AM peak hour and the weekday PM peak hour. Under 2031 Build conditions, this location is projected to continue to operate at an overall LOS B during the weekday AM peak hour and the weekday PM peak hour, with project-related traffic increases resulting in increases to overall delays of less than 1 second per vehicle.

Unsignalized Intersections

As shown in Table 7, under 2031 Build conditions, critical movements at the intersection of Broadway Road with the proposed site driveway, all turns from the site driveway, are projected to operate at LOS C or better during the weekday AM peak hour and at LOS E or better during the weekday PM peak hour. During both time periods queuing on the stie driveway approach is expected to be minimal, amounting to only 1 to 3 vehicles during peak hours of roadway traffic.

CONCLUSIONS

Existing and future traffic conditions at the study area intersections have been described and analyzed with respect to traffic operations and the impact of the proposed project. Conclusions of this effort and recommendations are presented below.

- The project entails the development of 300 units of attached housing, as well as an approximately 64,383± sf community recreational facility, approximately 12,972± sf of commercial space and an approximately 7,858± sf market.

- The project will provide a total of 707 parking spaces, including 470 spaces dedicated exclusively to the residential units.

- Access to the project is proposed via a new driveway that will intersect the south side of Broadway Road.

- A review of the available sight lines at the site access location reveals no safety issues, with both the required stopping sight distance and desirable intersection sight distance exceeded in both directions.

- It is recommended that any proposed landscaping or signs in the vicinity of the site driveways be kept low (maximum 2 feet in height from street level), or set back outside the sight triangles (as defined by AASHTO) so as not to impede the available sight distances.

- Based on data published by the ITE, the project is expected to result in a total of 3,536 new vehicle trips (1,768 entering and 1,768 exiting) on a typical weekday, including 211 new vehicle trips (87 entering and 124 exiting) during the weekday AM peak hour and 290 new vehicle trips (156 entering and 134 exiting) during the weekday PM peak hour.

- Based on the projected traffic increases, the project will exceed traffic generation thresholds requiring the filing of an Environmental Notification Form with the MEPA Office.

- Once distributed onto the local roadway network, peak hour increases in traffic at any external study area location are expected to result in approximately 1 to 3 new vehicle trips per minute during peak hours of roadway traffic.

- Project-related traffic increases result in no notable impacts to area traffic operations, with minimal increases to both delays and vehicle queuing projected.

- Minimal queuing is projected on the site access driveway, with maximum queues expected to extend one to three vehicles during peak hours.

- It is recommended that the site driveway provide a minimum 11-foot wide exclusive left-turn lane and an 11-foot wide exclusive right-turn lane to accommodate exiting traffic, with a minimum 12-foot lane provided for entering traffic. The site access drive should provide a STOP-sign (MUTCD R1-1) and painted stop line on the approach to Broadway Road, with inbound and outbound traffic flows separated by a raised median island or painted double-yellow centerline.

- All new sidewalks internal to the site should be designed and constructed to meet applicable Americans with Disabilities Act (ADA) design criteria. All new signs and pavement markings installed in conjunction with the project will be installed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) design criteria.

In summary, the project is expected to result in only minor increases to vehicle delays and queuing, that will result in no notable change in traffic operations. The proposed site access has been designed to ensure safe access is provided, with acceptable traffic operations and queuing on the driveway approach to Broadway Road.

APPENDIX

Traffic Count Data
Seasonal Adjustment Data
Motor Vehicle Crash Data
Public Transportation Information
Background Growth Information
Trip Generation Calculations
Capacity Analysis Worksheets

Traffic Count Data

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: WB

Site Code: 23097001

10/25/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	1	3	4	1	0	1	0	0	0	0	0	0	10
1:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2
2:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2
3:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
4:00	0	0	4	3	0	0	0	0	0	0	0	0	0	7
5:00	2	5	8	9	0	0	0	0	0	0	0	0	0	24
6:00	4	29	83	24	3	0	0	0	0	0	0	0	0	143
7:00	2	45	163	69	5	2	0	0	0	0	0	0	0	286
8:00	1	33	182	71	5	7	2	0	0	0	0	0	0	301
9:00	0	28	140	49	5	1	4	0	0	0	0	0	0	227
10:00	0	26	137	51	8	3	1	1	0	0	0	0	0	227
11:00	2	31	166	43	4	1	2	0	0	0	0	0	0	249
12:00 PM	10	16	63	21	3	1	2	0	0	0	0	0	0	116
1:00	1	21	83	28	1	1	0	0	0	0	0	0	0	135
2:00	1	12	76	38	3	2	2	0	0	0	0	0	0	134
3:00	2	54	255	99	13	2	2	0	0	0	0	0	0	427
4:00	2	26	285	95	10	0	1	0	0	0	0	0	0	419
5:00	1	41	245	83	3	2	0	0	0	0	0	0	0	375
6:00	5	41	252	54	7	1	0	0	0	0	0	0	0	360
7:00	2	14	154	60	4	4	0	0	0	0	0	0	0	238
8:00	4	19	79	37	6	1	0	0	0	0	0	0	0	146
9:00	1	7	47	25	1	3	0	0	0	0	0	0	0	84
10:00	0	6	36	11	0	0	0	0	0	0	0	0	0	53
11:00	0	3	14	11	2	0	0	0	0	0	0	0	0	30
Total	40	458	2476	888	84	32	17	1	0	0	0	0	0	3996

Percentile	15th	50th	85th	95th
Speed	20	24	26	29

Mean Speed (Average)	23.4
10 MPH Pace Speed	20-29
Number in Pace	3355
Percent in Pace	84.0%
Number > 25 MPH	1022
Percent > 25 MPH	25.6%

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: WB

Site Code: 23097001

10/26/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	6	3	0	0	0	0	0	0	0	0	0	9
1:00	0	2	3	2	0	0	0	0	0	0	0	0	0	7
2:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
4:00	1	0	2	1	0	0	0	0	0	0	0	0	0	4
5:00	1	4	13	14	0	2	0	0	0	0	0	0	0	34
6:00	5	8	89	27	3	2	3	0	0	0	0	0	0	137
7:00	2	20	174	71	3	3	1	0	0	0	0	0	0	274
8:00	2	41	137	60	6	6	1	0	0	0	0	0	0	253
9:00	6	40	194	42	7	3	1	0	0	0	0	0	0	293
10:00	1	23	153	48	3	1	1	0	0	0	0	0	0	230
11:00	5	29	128	40	6	2	0	0	0	0	0	0	0	210
12:00 PM	3	21	77	43	1	1	1	0	0	0	0	0	0	147
1:00	0	2	8	2	1	1	0	0	0	0	0	0	0	14
2:00	2	12	100	46	2	3	0	0	0	0	0	0	0	165
3:00	7	51	229	107	6	1	3	0	0	0	0	0	0	404
4:00	2	69	324	101	6	1	1	0	0	0	0	0	0	504
5:00	1	50	283	77	3	3	1	0	0	0	0	0	0	418
6:00	1	57	256	52	3	1	0	0	0	0	0	0	0	370
7:00	4	37	143	57	3	1	0	0	0	0	0	0	0	245
8:00	2	17	99	41	2	0	0	0	0	0	0	0	0	161
9:00	0	7	59	22	0	0	0	1	0	0	0	0	0	89
10:00	1	4	24	15	1	0	0	0	0	0	0	0	0	45
11:00	0	0	7	2	0	1	0	0	0	0	0	0	0	10
Total	46	496	2508	874	56	32	13	1	0	0	0	0	0	4026
			Percentile	15th	50th	85th	95th							
			Speed	20	24	26	29							
			Mean Speed (Average)	23.2										
			10 MPH Pace Speed	20-29										
			Number in Pace	3374										
			Percent in Pace	83.8%										
			Number > 25 MPH	976										
			Percent > 25 MPH	24.2%										
Grand Total	86	954	4984	1762	140	64	30	2	0	0	0	0	0	8022
			Percentile	15th	50th	85th	95th							
			Speed	20	24	26	29							
			Mean Speed (Average)	23.3										
			10 MPH Pace Speed	20-29										
			Number in Pace	6730										
			Percent in Pace	83.9%										
			Number > 25 MPH	1998										
			Percent > 25 MPH	24.9%										

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: EB

Site Code: 23097001

10/25/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	5	6	2	1	0	0	0	0	0	0	0	14
1:00	0	1	2	6	2	0	0	0	0	0	0	0	0	11
2:00	0	0	3	3	0	0	0	0	0	0	0	0	0	6
3:00	0	0	1	4	1	2	0	0	0	0	0	0	0	8
4:00	0	0	14	14	8	3	1	0	0	0	0	0	0	40
5:00	0	8	44	72	14	5	3	0	0	0	0	0	0	146
6:00	3	24	111	96	32	6	0	1	0	0	0	0	0	273
7:00	2	14	104	129	65	14	1	0	0	0	0	0	0	329
8:00	5	12	105	142	52	13	3	0	0	0	0	0	0	332
9:00	0	16	97	109	32	6	0	0	0	0	0	0	0	260
10:00	1	16	94	89	44	13	2	0	0	0	0	0	0	259
11:00	2	31	121	105	39	12	0	0	0	0	0	0	0	310
12:00 PM	5	31	144	112	32	14	1	0	0	0	0	0	0	339
1:00	2	30	113	87	32	7	0	0	0	0	0	0	0	271
2:00	1	36	143	150	48	10	4	0	0	0	0	0	0	392
3:00	4	26	112	177	57	21	5	1	0	0	0	0	0	403
4:00	5	25	122	162	68	13	4	0	0	0	0	0	0	399
5:00	1	20	147	150	55	12	0	1	0	0	0	0	0	386
6:00	1	23	143	128	41	10	1	0	0	0	0	0	0	347
7:00	0	9	75	78	28	11	1	0	0	0	0	0	0	202
8:00	1	10	52	58	24	4	2	0	1	0	0	0	0	152
9:00	0	6	39	47	13	2	1	0	0	0	0	0	0	108
10:00	1	2	13	18	10	1	1	0	0	0	0	0	0	46
11:00	0	1	8	9	4	1	1	0	0	0	0	0	0	24
Total	34	341	1812	1951	703	181	31	3	1	0	0	0	0	5057

Percentile	15th	50th	85th	95th
Speed	22	25	30	35

Mean Speed (Average)	26.1
10 MPH Pace Speed	20-29
Number in Pace	3731
Percent in Pace	73.8%
Number > 25 MPH	2870
Percent > 25 MPH	56.8%

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: EB

Site Code: 23097001

10/26/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	2	11	1	0	0	0	0	0	0	0	0	14
1:00	0	0	4	3	1	0	0	0	0	0	0	0	0	8
2:00	0	0	4	8	2	1	0	0	0	0	0	0	0	15
3:00	0	1	8	6	2	0	0	0	0	0	0	0	0	17
4:00	0	1	8	19	8	4	1	0	0	0	0	0	0	41
5:00	0	3	63	58	17	11	1	0	0	0	0	0	0	153
6:00	3	22	112	92	25	6	1	0	0	0	0	0	0	261
7:00	4	34	110	135	49	11	2	0	0	0	0	0	0	345
8:00	0	15	116	132	47	16	0	0	0	0	0	0	0	326
9:00	3	18	119	105	32	6	0	0	0	0	0	0	0	283
10:00	0	19	97	90	23	10	0	0	0	0	0	0	0	239
11:00	3	24	92	111	34	8	0	0	0	0	0	0	0	272
12:00 PM	2	41	129	112	42	10	2	0	0	0	0	0	0	338
1:00	3	31	116	74	21	4	1	0	0	0	0	0	0	250
2:00	4	31	134	131	38	15	3	0	0	0	0	0	0	356
3:00	5	24	139	146	67	13	3	0	0	0	0	0	0	397
4:00	3	34	119	178	73	20	3	1	0	0	0	0	0	431
5:00	0	18	109	166	62	13	4	0	0	0	0	0	0	372
6:00	2	29	135	126	40	8	3	1	0	0	0	0	0	344
7:00	1	19	82	98	22	4	1	0	0	0	0	0	0	227
8:00	0	8	57	54	31	3	0	0	1	0	0	0	0	154
9:00	1	7	47	44	16	1	1	0	0	0	0	0	0	117
10:00	1	1	22	25	9	2	0	0	0	0	0	0	0	60
11:00	0	0	2	2	1	1	0	0	0	0	0	0	0	6
Total	35	380	1826	1926	663	167	26	2	1	0	0	0	0	5026
			Percentile	15th	50th	85th	95th							
			Speed	22	25	30	34							
			Mean Speed (Average)	25.9										
			10 MPH Pace Speed	20-29										
			Number in Pace	3721										
			Percent in Pace	74.0%										
			Number > 25 MPH	2785										
			Percent > 25 MPH	55.4%										
Grand Total	69	721	3638	3877	1366	348	57	5	2	0	0	0	0	10083
			Percentile	15th	50th	85th	95th							
			Speed	22	25	30	35							
			Mean Speed (Average)	26.0										
			10 MPH Pace Speed	20-29										
			Number in Pace	7452										
			Percent in Pace	73.9%										
			Number > 25 MPH	5655										
			Percent > 25 MPH	56.1%										

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: Combined

Site Code: 23097001

10/25/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	1	8	10	3	1	1	0	0	0	0	0	0	24
1:00	0	1	2	8	2	0	0	0	0	0	0	0	0	13
2:00	0	0	4	4	0	0	0	0	0	0	0	0	0	8
3:00	0	0	1	4	1	3	0	0	0	0	0	0	0	9
4:00	0	0	18	17	8	3	1	0	0	0	0	0	0	47
5:00	2	13	52	81	14	5	3	0	0	0	0	0	0	170
6:00	7	53	194	120	35	6	0	1	0	0	0	0	0	416
7:00	4	59	267	198	70	16	1	0	0	0	0	0	0	615
8:00	6	45	287	213	57	20	5	0	0	0	0	0	0	633
9:00	0	44	237	158	37	7	4	0	0	0	0	0	0	487
10:00	1	42	231	140	52	16	3	1	0	0	0	0	0	486
11:00	4	62	287	148	43	13	2	0	0	0	0	0	0	559
12:00 PM	15	47	207	133	35	15	3	0	0	0	0	0	0	455
1:00	3	51	196	115	33	8	0	0	0	0	0	0	0	406
2:00	2	48	219	188	51	12	6	0	0	0	0	0	0	526
3:00	6	80	367	276	70	23	7	1	0	0	0	0	0	830
4:00	7	51	407	257	78	13	5	0	0	0	0	0	0	818
5:00	2	61	392	233	58	14	0	1	0	0	0	0	0	761
6:00	6	64	395	182	48	11	1	0	0	0	0	0	0	707
7:00	2	23	229	138	32	15	1	0	0	0	0	0	0	440
8:00	5	29	131	95	30	5	2	0	1	0	0	0	0	298
9:00	1	13	86	72	14	5	1	0	0	0	0	0	0	192
10:00	1	8	49	29	10	1	1	0	0	0	0	0	0	99
11:00	0	4	22	20	6	1	1	0	0	0	0	0	0	54
Total	74	799	4288	2839	787	213	48	4	1	0	0	0	0	9053

Percentile	15th	50th	85th	95th
Speed	21	25	29	33

Mean Speed (Average)	24.9
10 MPH Pace Speed	20-29
Number in Pace	7086
Percent in Pace	78.3%
Number > 25 MPH	3892
Percent > 25 MPH	43.0%

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA
Direction: Combined

Site Code: 23097001

10/26/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	8	14	1	0	0	0	0	0	0	0	0	23
1:00	0	2	7	5	1	0	0	0	0	0	0	0	0	15
2:00	0	1	4	8	2	1	0	0	0	0	0	0	0	16
3:00	0	2	8	7	2	0	0	0	0	0	0	0	0	19
4:00	1	1	10	20	8	4	1	0	0	0	0	0	0	45
5:00	1	7	76	72	17	13	1	0	0	0	0	0	0	187
6:00	8	30	201	119	28	8	4	0	0	0	0	0	0	398
7:00	6	54	284	206	52	14	3	0	0	0	0	0	0	619
8:00	2	56	253	192	53	22	1	0	0	0	0	0	0	579
9:00	9	58	313	147	39	9	1	0	0	0	0	0	0	576
10:00	1	42	250	138	26	11	1	0	0	0	0	0	0	469
11:00	8	53	220	151	40	10	0	0	0	0	0	0	0	482
12:00 PM	5	62	206	155	43	11	3	0	0	0	0	0	0	485
1:00	3	33	124	76	22	5	1	0	0	0	0	0	0	264
2:00	6	43	234	177	40	18	3	0	0	0	0	0	0	521
3:00	12	75	368	253	73	14	6	0	0	0	0	0	0	801
4:00	5	103	443	279	79	21	4	1	0	0	0	0	0	935
5:00	1	68	392	243	65	16	5	0	0	0	0	0	0	790
6:00	3	86	391	178	43	9	3	1	0	0	0	0	0	714
7:00	5	56	225	155	25	5	1	0	0	0	0	0	0	472
8:00	2	25	156	95	33	3	0	0	1	0	0	0	0	315
9:00	1	14	106	66	16	1	1	1	0	0	0	0	0	206
10:00	2	5	46	40	10	2	0	0	0	0	0	0	0	105
11:00	0	0	9	4	1	2	0	0	0	0	0	0	0	16
Total	81	876	4334	2800	719	199	39	3	1	0	0	0	0	9052
			Percentile	15th	50th	85th	95th							
			Speed	21	24	29	33							
			Mean Speed (Average)	24.7										
			10 MPH Pace Speed	20-29										
			Number in Pace	7096										
			Percent in Pace	78.4%										
			Number > 25 MPH	3761										
			Percent > 25 MPH	41.5%										
Grand Total	155	1675	8622	5639	1506	412	87	7	2	0	0	0	0	18105
			Percentile	15th	50th	85th	95th							
			Speed	21	24	29	33							
			Mean Speed (Average)	24.8										
			10 MPH Pace Speed	20-29										
			Number in Pace	14182										
			Percent in Pace	78.3%										
			Number > 25 MPH	7653										
			Percent > 25 MPH	42.3%										

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA

Site Code: 23097001

10/25/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	3			4	82				
12:15	6	5			3	81				
12:30	2	58			5	107				
12:45	0	50	10	116	2	69	14	339	24	455
1:00	1	66			4	80				
1:15	0	59			3	70				
1:30	0	4			3	55				
1:45	1	6	2	135	1	66	11	271	13	406
2:00	0	3			2	85				
2:15	0	17			0	102				
2:30	1	50			1	92				
2:45	1	64	2	134	3	113	6	392	8	526
3:00	0	104			0	95				
3:15	1	93			5	114				
3:30	0	115			2	100				
3:45	0	115	1	427	1	94	8	403	9	830
4:00	3	107			6	109				
4:15	0	107			5	93				
4:30	1	119			9	112				
4:45	3	86	7	419	20	85	40	399	47	818
5:00	7	93			20	93				
5:15	4	80			39	100				
5:30	4	112			44	98				
5:45	9	90	24	375	43	95	146	386	170	761
6:00	18	93			56	95				
6:15	17	110			61	80				
6:30	36	76			68	88				
6:45	72	81	143	360	88	84	273	347	416	707
7:00	74	69			84	63				
7:15	72	70			83	47				
7:30	69	61			93	41				
7:45	71	38	286	238	69	51	329	202	615	440
8:00	65	38			87	47				
8:15	72	53			83	37				
8:30	74	33			76	38				
8:45	90	22	301	146	86	30	332	152	633	298
9:00	60	13			62	25				
9:15	60	29			82	27				
9:30	53	22			69	35				
9:45	54	20	227	84	47	21	260	108	487	192
10:00	49	10			61	8				
10:15	49	16			61	11				
10:30	66	11			71	15				
10:45	63	16	227	53	66	12	259	46	486	99
11:00	51	13			98	8				
11:15	71	12			62	5				
11:30	63	4			84	8				
11:45	64	1	249	30	66	3	310	24	559	54
Total	1479	2517			1988	3069			3467	5586
Percent	37.0%	63.0%			39.3%	60.7%			38.3%	61.7%

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA

Site Code: 23097001

10/26/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	3	82			4	83				
12:15	3	56			4	97				
12:30	1	5			6	75				
12:45	2	4	9	147	0	83	14	338	23	485
1:00	2	3			3	75				
1:15	4	4			1	65				
1:30	0	3			1	57				
1:45	1	4	7	14	3	53	8	250	15	264
2:00	0	5			2	79				
2:15	1	24			3	101				
2:30	0	88			6	86				
2:45	0	48	1	165	4	90	15	356	16	521
3:00	0	34			3	73				
3:15	0	96			3	115				
3:30	1	128			3	109				
3:45	1	146	2	404	8	100	17	397	19	801
4:00	0	117			4	115				
4:15	1	130			4	90				
4:30	1	139			14	123				
4:45	2	118	4	504	19	103	41	431	45	935
5:00	5	98			21	108				
5:15	8	121			37	105				
5:30	10	87			45	86				
5:45	11	112	34	418	50	73	153	372	187	790
6:00	19	129			42	98				
6:15	23	86			63	78				
6:30	43	86			71	96				
6:45	52	69	137	370	85	72	261	344	398	714
7:00	77	77			89	74				
7:15	69	60			75	50				
7:30	57	57			91	57				
7:45	71	51	274	245	90	46	345	227	619	472
8:00	58	35			73	44				
8:15	65	38			86	41				
8:30	60	57			77	36				
8:45	70	31	253	161	90	33	326	154	579	315
9:00	88	27			68	35				
9:15	79	18			92	35				
9:30	58	27			58	21				
9:45	68	17	293	89	65	26	283	117	576	206
10:00	71	11			70	18				
10:15	35	12			57	19				
10:30	70	12			61	15				
10:45	54	10	230	45	51	8	239	60	469	105
11:00	39	10			65	6				
11:15	54	6			81	4				
11:30	48	5			66	4				
11:45	69	3	210	24	60	7	272	21	482	45
Total	1454	2586			1974	3067			3428	5653
Percent	36.0%	64.0%			39.2%	60.8%			37.7%	62.3%
Grand Total	2933	5103			3962	6136			6895	11239
Percent	36.5%	63.5%			39.2%	60.8%			38.0%	62.0%
ADT		ADT: 9,067		AADT: 9,067						

Accurate Counts
978-664-2565

Location : Broadway Road
Location : East of Fox Hill Lane
City/State: Dracut, MA

Site Code: 23097001

10/23/2023	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Wee. Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	10	14	9	14	*	*	*	*	*	*	10	14
1:00	*	*	*	*	2	11	7	8	*	*	*	*	*	*	4	10
2:00	*	*	*	*	2	6	1	15	*	*	*	*	*	*	2	10
3:00	*	*	*	*	1	8	2	17	*	*	*	*	*	*	2	12
4:00	*	*	*	*	7	40	4	41	*	*	*	*	*	*	6	40
5:00	*	*	*	*	24	146	34	153	*	*	*	*	*	*	29	150
6:00	*	*	*	*	143	273	137	261	*	*	*	*	*	*	140	267
7:00	*	*	*	*	286	329	274	345	*	*	*	*	*	*	280	337
8:00	*	*	*	*	301	332	253	326	*	*	*	*	*	*	277	329
9:00	*	*	*	*	227	260	293	283	*	*	*	*	*	*	260	272
10:00	*	*	*	*	227	259	230	239	*	*	*	*	*	*	228	249
11:00	*	*	*	*	249	310	210	272	*	*	*	*	*	*	230	291
12:00 PM	*	*	*	*	116	339	147	338	*	*	*	*	*	*	132	338
1:00	*	*	*	*	135	271	14	250	*	*	*	*	*	*	74	260
2:00	*	*	*	*	134	392	165	356	*	*	*	*	*	*	150	374
3:00	*	*	*	*	427	403	404	397	*	*	*	*	*	*	416	400
4:00	*	*	*	*	419	399	504	431	*	*	*	*	*	*	462	415
5:00	*	*	*	*	375	386	418	372	*	*	*	*	*	*	396	379
6:00	*	*	*	*	360	347	370	344	*	*	*	*	*	*	365	346
7:00	*	*	*	*	238	202	245	227	*	*	*	*	*	*	242	214
8:00	*	*	*	*	146	152	161	154	*	*	*	*	*	*	154	153
9:00	*	*	*	*	84	108	89	117	*	*	*	*	*	*	86	112
10:00	*	*	*	*	53	46	45	60	*	*	*	*	*	*	49	53
11:00	*	*	*	*	30	24	10	6	*	*	*	*	*	*	20	15
Total	0	0	0	0	3996	5057	4026	5026	0	0	0	0	0	0	4014	5040
Day	0		0		9053		9052		0		0		0		9054	
AM Peak					8:00	8:00	9:00	7:00							7:00	7:00
Volume					301	332	293	345							280	337
PM Peak					3:00	3:00	4:00	4:00							4:00	4:00
Volume					427	403	504	431							462	415
Comb Total	0		0		9053		9052		0		0		0		9054	
ADT	ADT: 9,067		AADT: 9,067													

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	11	40	75	0	32	11	13	36	1	69	30	5	323
07:15 AM	12	43	94	0	27	8	7	36	2	77	49	3	358
07:30 AM	21	30	82	0	23	5	3	47	0	93	49	3	356
07:45 AM	11	36	72	0	29	13	9	47	3	76	39	2	337
Total	55	149	323	0	111	37	32	166	6	315	167	13	1374
08:00 AM	12	38	82	0	31	11	14	38	0	78	44	3	351
08:15 AM	10	48	84	1	39	19	6	36	0	76	30	3	352
08:30 AM	17	42	84	2	42	18	2	36	2	98	24	3	370
08:45 AM	14	46	94	3	18	17	3	40	0	82	23	1	341
Total	53	174	344	6	130	65	25	150	2	334	121	10	1414
Grand Total	108	323	667	6	241	102	57	316	8	649	288	23	2788
Apprch %	9.8	29.4	60.7	1.7	69.1	29.2	15	82.9	2.1	67.6	30	2.4	
Total %	3.9	11.6	23.9	0.2	8.6	3.7	2	11.3	0.3	23.3	10.3	0.8	
Cars	106	317	641	6	234	100	55	308	8	632	280	20	2707
% Cars	98.1	98.1	96.1	100	97.1	98	96.5	97.5	100	97.4	97.2	87	97.1
Trucks	2	6	26	0	7	2	2	8	0	17	8	3	81
% Trucks	1.9	1.9	3.9	0	2.9	2	3.5	2.5	0	2.6	2.8	13	2.9

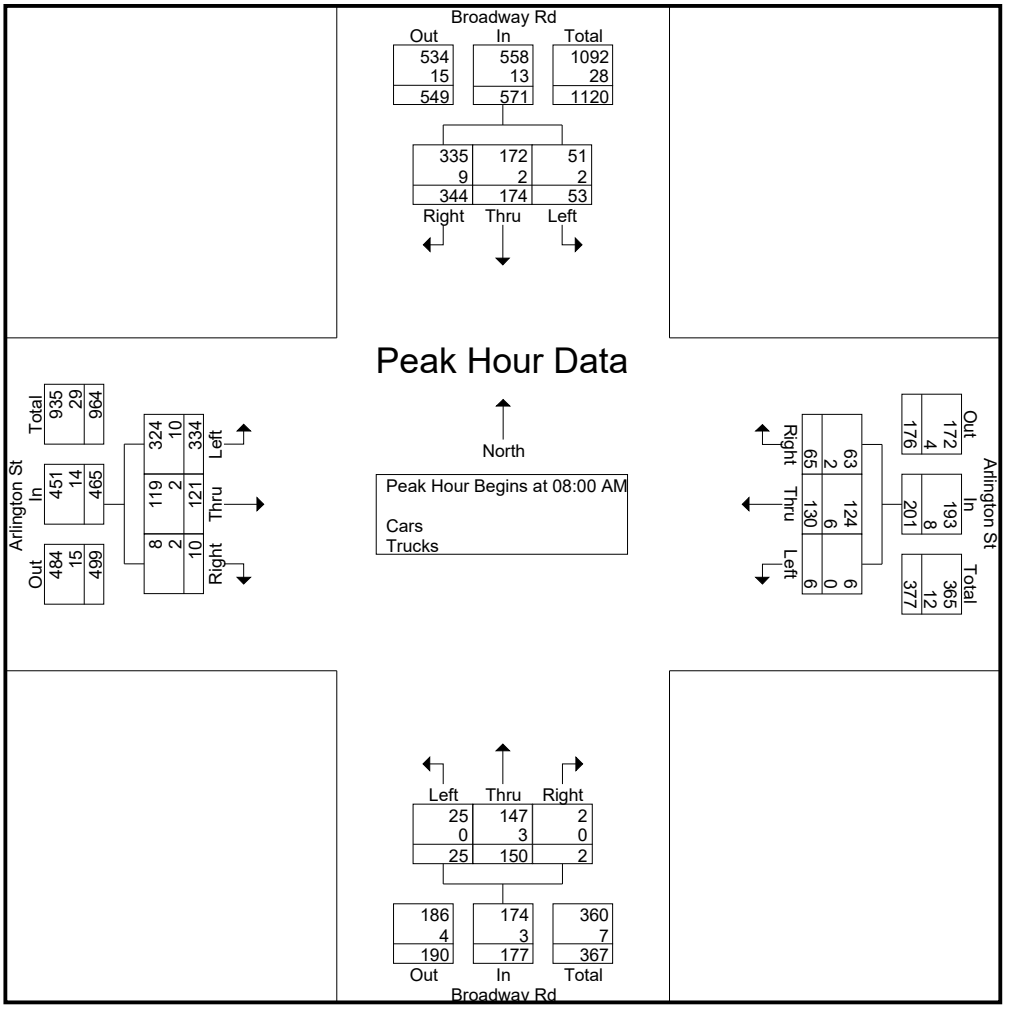
	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	12	38	82	132	0	31	11	42	**14**	38	0	**52**	78	**44**	**3**	**125**	351
08:15 AM	10	**48**	84	142	1	39	**19**	59	6	36	0	42	76	30	3	109	352
08:30 AM	**17**	42	84	143	2	**42**	18	**62**	2	36	**2**	40	**98**	24	3	125	**370**
08:45 AM	14	46	**94**	**154**	**3**	18	17	38	3	**40**	0	43	82	23	1	106	341
Total Volume	53	174	344	571	6	130	65	201	25	150	2	177	334	121	10	465	1414
% App. Total	9.3	30.5	60.2		3	64.7	32.3		14.1	84.7	1.1		71.8	26	2.2		
PHF	.779	.906	.915	.927	.500	.774	.855	.810	.446	.938	.250	.851	.852	.688	.833	.930	.955
Cars	51	172	335	558	6	124	63	193	25	147	2	174	324	119	8	451	1376
% Cars	96.2	98.9	97.4	97.7	100	95.4	96.9	96.0	100	98.0	100	98.3	97.0	98.3	80.0	97.0	97.3
Trucks	2	2	9	13	0	6	2	8	0	3	0	3	10	2	2	14	38
% Trucks	3.8	1.1	2.6	2.3	0	4.6	3.1	4.0	0	2.0	0	1.7	3.0	1.7	20.0	3.0	2.7

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

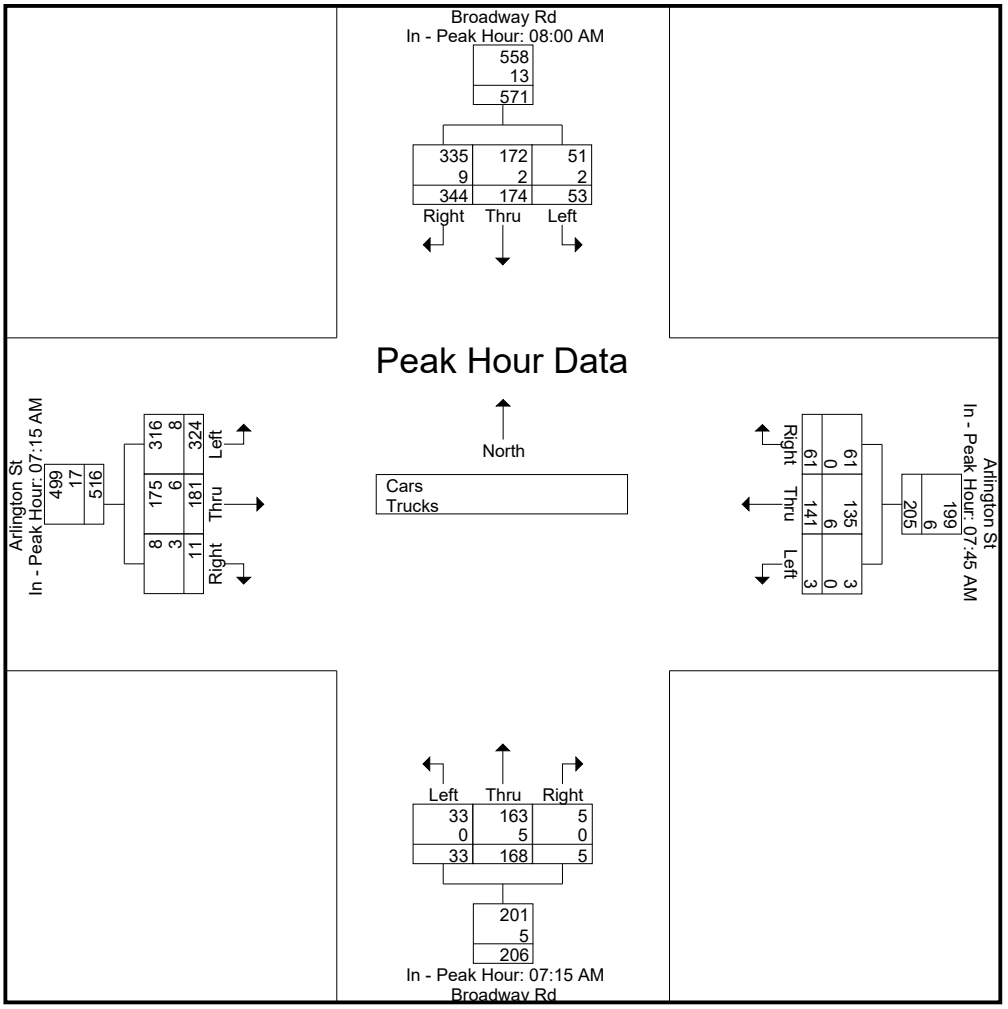
	08:00 AM				07:45 AM				07:15 AM				07:15 AM			
+0 mins.	12	38	82	132	0	29	13	42	7	36	2	45	77	**49**	**3**	129
+15 mins.	10	**48**	84	142	0	31	11	42	3	**47**	0	50	**93**	49	3	**145**
+30 mins.	**17**	42	84	143	1	39	**19**	59	9	47	**3**	**59**	76	39	2	117
+45 mins.	14	46	**94**	**154**	**2**	**42**	18	**62**	**14**	38	0	52	78	44	3	125
Total Volume	53	174	344	571	3	141	61	205	33	168	5	206	324	181	11	516
% App. Total	9.3	30.5	60.2		1.5	68.8	29.8		16	81.6	2.4		62.8	35.1	2.1	
PHF	.779	.906	.915	.927	.375	.839	.803	.827	.589	.894	.417	.873	.871	.923	.917	.890
Cars	51	172	335	558	3	135	61	199	33	163	5	201	316	175	8	499
% Cars	96.2	98.9	97.4	97.7	100	95.7	100	97.1	100	97	100	97.6	97.5	96.7	72.7	96.7
Trucks	2	2	9	13	0	6	0	6	0	5	0	5	8	6	3	17
% Trucks	3.8	1.1	2.6	2.3	0	4.3	0	2.9	0	3	0	2.4	2.5	3.3	27.3	3.3

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023

Groups Printed- Cars

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	11	39	72	0	32	11	11	36	1	68	30	5	316
07:15 AM	12	41	89	0	27	8	7	34	2	74	45	2	341
07:30 AM	21	29	79	0	22	5	3	46	0	92	47	3	347
07:45 AM	11	36	66	0	29	13	9	45	3	74	39	2	327
Total	55	145	306	0	110	37	30	161	6	308	161	12	1331
08:00 AM	11	38	79	0	29	11	14	38	0	76	44	1	341
08:15 AM	9	48	83	1	37	19	6	36	0	72	29	3	343
08:30 AM	17	41	82	2	40	18	2	35	2	97	24	3	363
08:45 AM	14	45	91	3	18	15	3	38	0	79	22	1	329
Total	51	172	335	6	124	63	25	147	2	324	119	8	1376
Grand Total	106	317	641	6	234	100	55	308	8	632	280	20	2707
Apprch %	10	29.8	60.2	1.8	68.8	29.4	14.8	83	2.2	67.8	30	2.1	
Total %	3.9	11.7	23.7	0.2	8.6	3.7	2	11.4	0.3	23.3	10.3	0.7	

	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	11	38	79	128	0	29	11	40	**14**	**38**	0	**52**	76	**44**	1	121	341
08:15 AM	9	**48**	83	140	1	37	**19**	57	6	36	0	42	72	29	**3**	104	343
08:30 AM	**17**	41	82	140	2	**40**	18	**60**	2	35	**2**	39	**97**	24	3	**124**	**363**
08:45 AM	14	45	**91**	**150**	**3**	18	15	36	3	38	0	41	79	22	1	102	329
Total Volume	51	172	335	558	6	124	63	193	25	147	2	174	324	119	8	451	1376
% App. Total	9.1	30.8	60		3.1	64.2	32.6		14.4	84.5	1.1		71.8	26.4	1.8		
PHF	.750	.896	.920	.930	.500	.775	.829	.804	.446	.967	.250	.837	.835	.676	.667	.909	.948

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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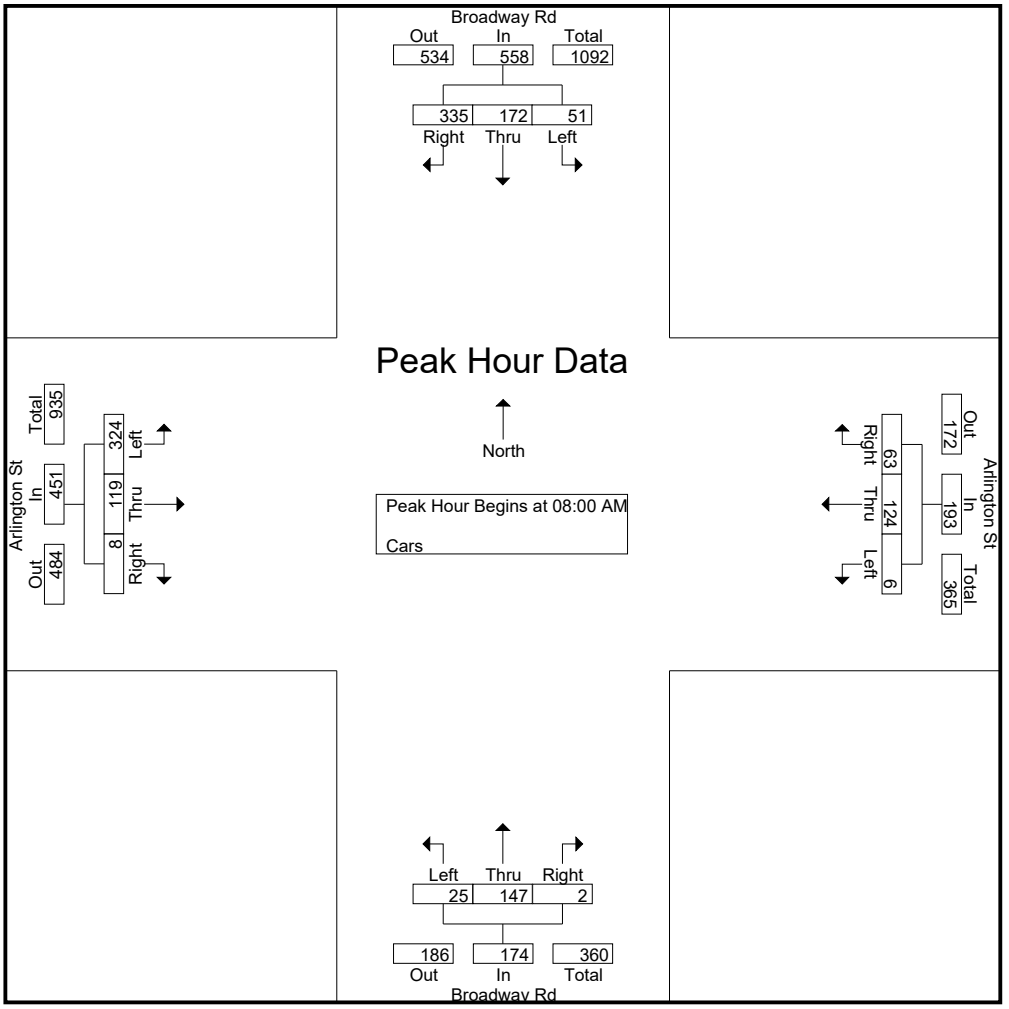


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

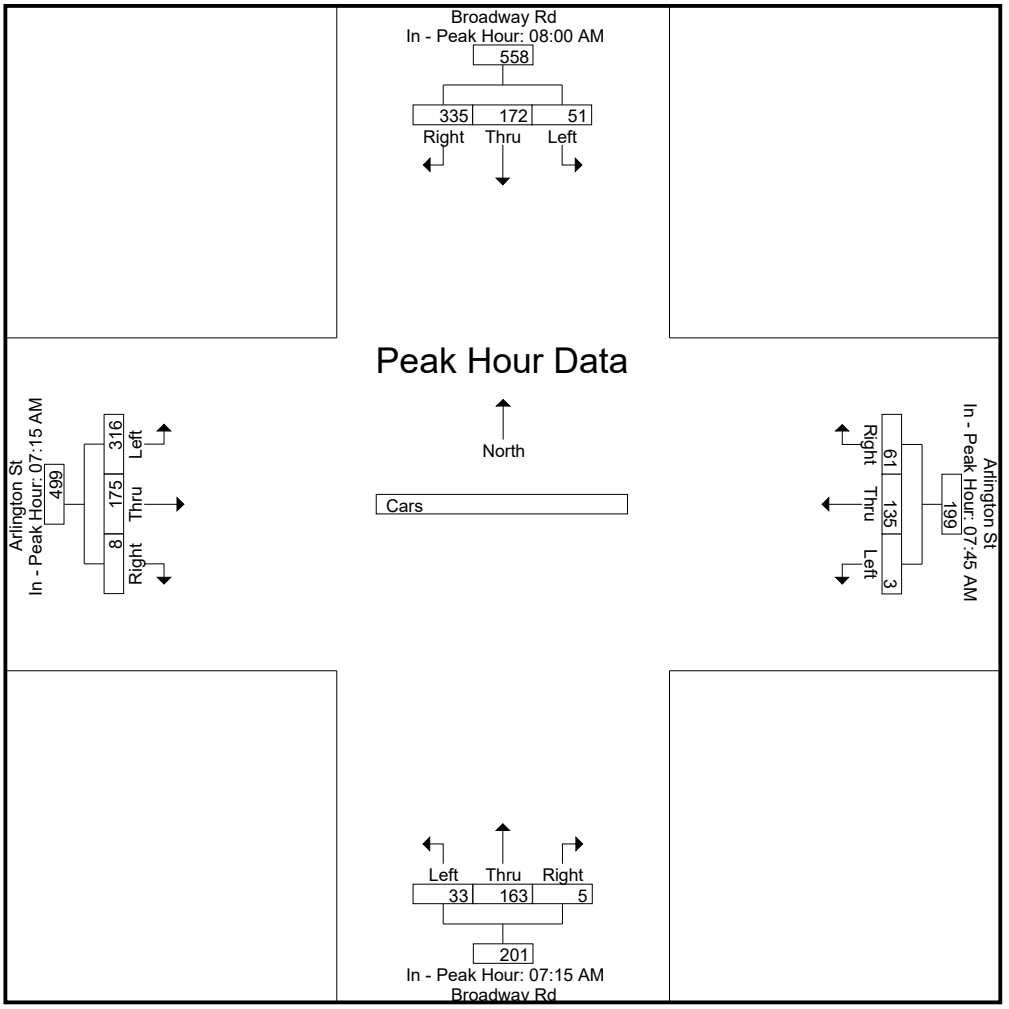
	08:00 AM				07:45 AM				07:15 AM				07:15 AM			
+0 mins.	11	38	79	128	0	29	13	42	7	34	2	43	74	45	2	121
+15 mins.	9	**48**	83	140	0	29	11	40	3	**46**	0	49	**92**	**47**	**3**	**142**
+30 mins.	**17**	41	82	140	1	37	**19**	57	9	45	**3**	**57**	74	39	2	115
+45 mins.	14	45	**91**	**150**	**2**	**40**	18	**60**	**14**	38	0	52	76	44	1	121
Total Volume	51	172	335	558	3	135	61	199	33	163	5	201	316	175	8	499
% App. Total	9.1	30.8	60		1.5	67.8	30.7		16.4	81.1	2.5		63.3	35.1	1.6	
PHF	.750	.896	.920	.930	.375	.844	.803	.829	.589	.886	.417	.882	.859	.931	.667	.879

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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Groups Printed- Trucks

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	3	0	0	0	2	0	0	1	0	0	7
07:15 AM	0	2	5	0	0	0	0	2	0	3	4	1	17
07:30 AM	0	1	3	0	1	0	0	1	0	1	2	0	9
07:45 AM	0	0	6	0	0	0	0	2	0	2	0	0	10
Total	0	4	17	0	1	0	2	5	0	7	6	1	43
08:00 AM	1	0	3	0	2	0	0	0	0	2	0	2	10
08:15 AM	1	0	1	0	2	0	0	0	0	4	1	0	9
08:30 AM	0	1	2	0	2	0	0	1	0	1	0	0	7
08:45 AM	0	1	3	0	0	2	0	2	0	3	1	0	12
Total	2	2	9	0	6	2	0	3	0	10	2	2	38
Grand Total	2	6	26	0	7	2	2	8	0	17	8	3	81
Apprch %	5.9	17.6	76.5	0	77.8	22.2	20	80	0	60.7	28.6	10.7	
Total %	2.5	7.4	32.1	0	8.6	2.5	2.5	9.9	0	21	9.9	3.7	

	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**2**	5	**7**	0	0	0	0	0	**2**	0	**2**	**3**	**4**	1	**8**	**17**
07:30 AM	0	1	3	4	0	1	0	1	0	1	0	1	1	2	0	3	9
07:45 AM	0	0	**6**	6	0	0	0	0	0	2	0	2	2	0	0	2	10
08:00 AM	**1**	0	3	4	0	**2**	0	**2**	0	0	0	0	2	0	**2**	4	10
Total Volume	1	3	17	21	0	3	0	3	0	5	0	5	8	6	3	17	46
% App. Total	4.8	14.3	81		0	100	0		0	100	0		47.1	35.3	17.6		
PHF	.250	.375	.708	.750	.000	.375	.000	.375	.000	.625	.000	.625	.667	.375	.375	.531	.676

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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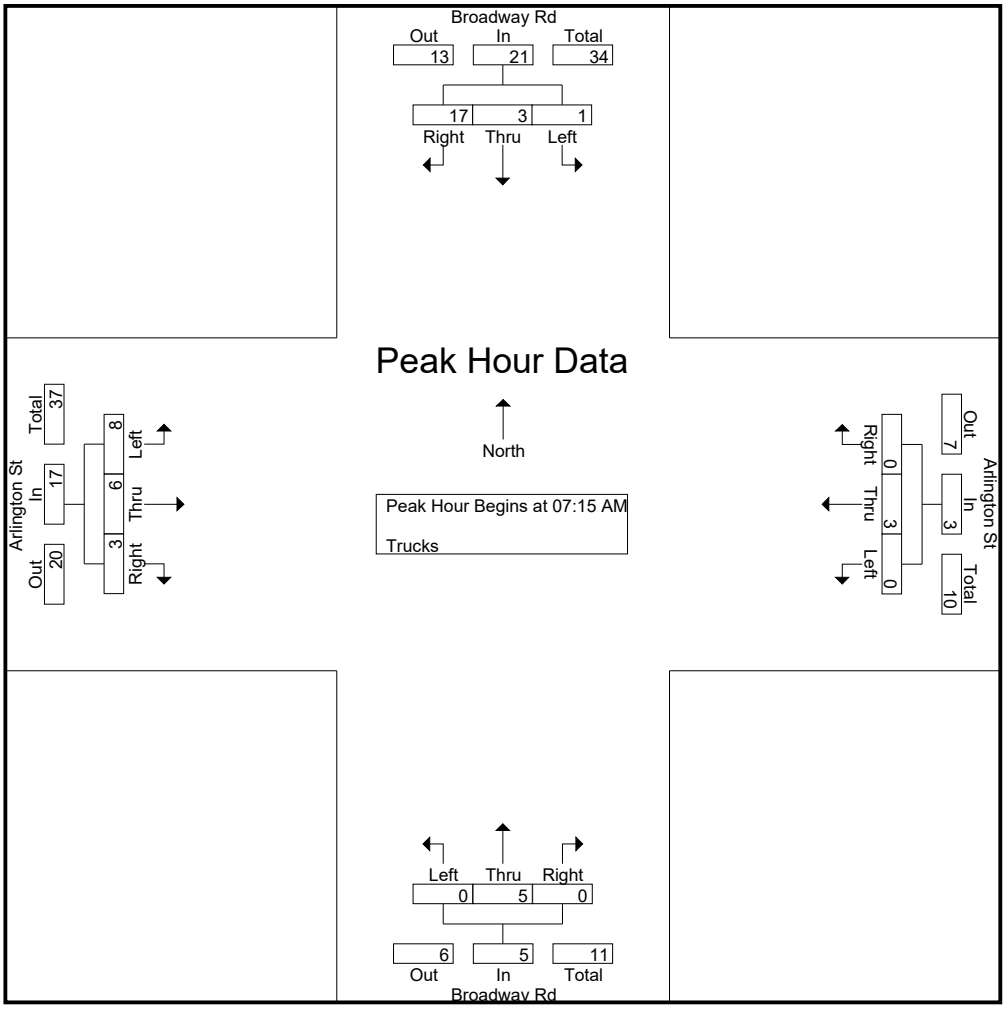

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:00 AM				07:15 AM			
+0 mins.	0	1	3	4	0	**2**	0	**2**	**2**	0	0	**2**	**3**	**4**	1	**8**
+15 mins.	0	**2**	5	**7**	0	2	0	2	0	**2**	0	2	1	2	0	3
+30 mins.	0	1	3	4	0	2	0	2	0	1	0	1	2	0	0	2
+45 mins.	0	0	**6**	6	0	0	**2**	2	0	2	0	2	2	0	**2**	4
Total Volume	0	4	17	21	0	6	2	8	2	5	0	7	8	6	3	17
% App. Total	0	19	81		0	75	25		28.6	71.4	0		47.1	35.3	17.6	
PHF	.000	.500	.708	.750	.000	.750	.250	1.000	.250	.625	.000	.875	.667	.375	.375	.531

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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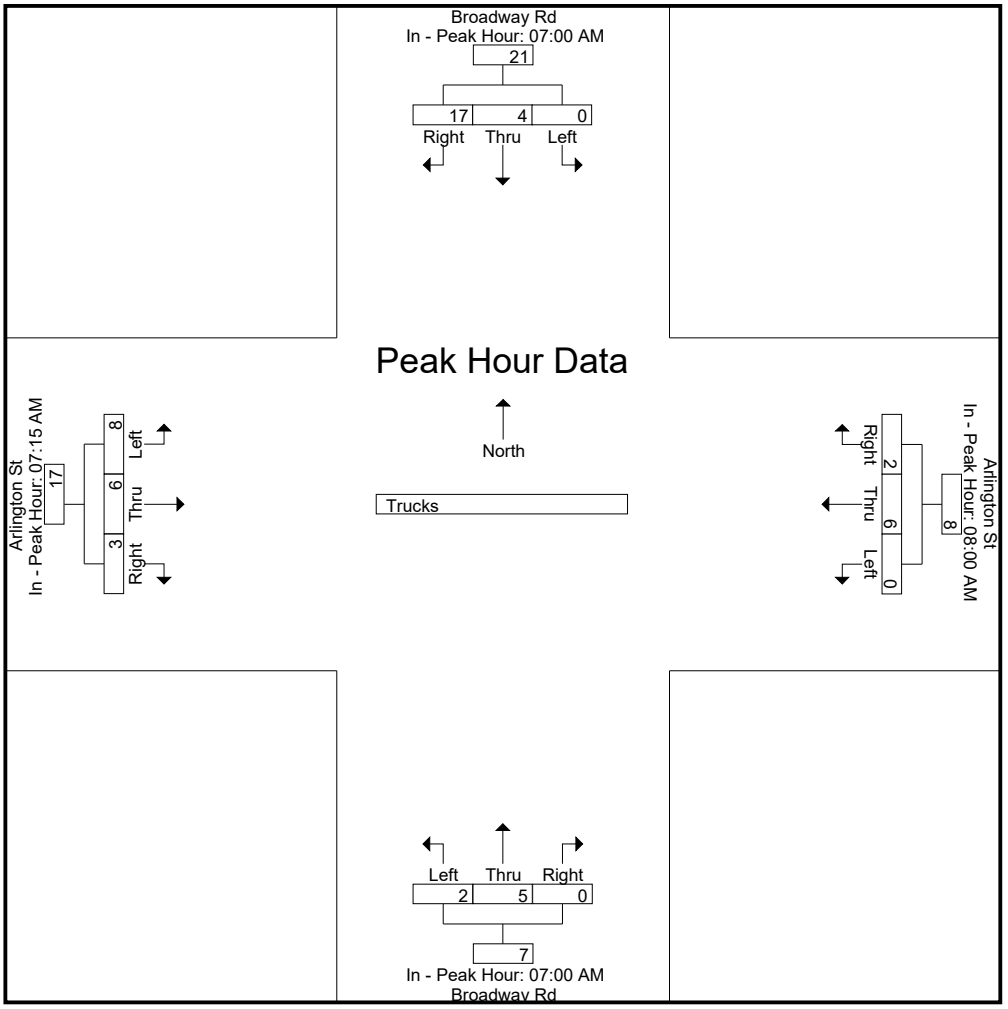

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023

Groups Printed- Bikes Peds

	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2
Total	0	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	3	2	5
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2
Grand Total	0	1	1	3	0	0	0	2	0	0	0	0	0	0	0	0	5	2	7
Apprch %	0	50	50		0	0	0		0	0	0		0	0	0				
Total %	0	50	50		0	0	0		0	0	0		0	0	0		71.4	28.6	

	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	50	50		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.250	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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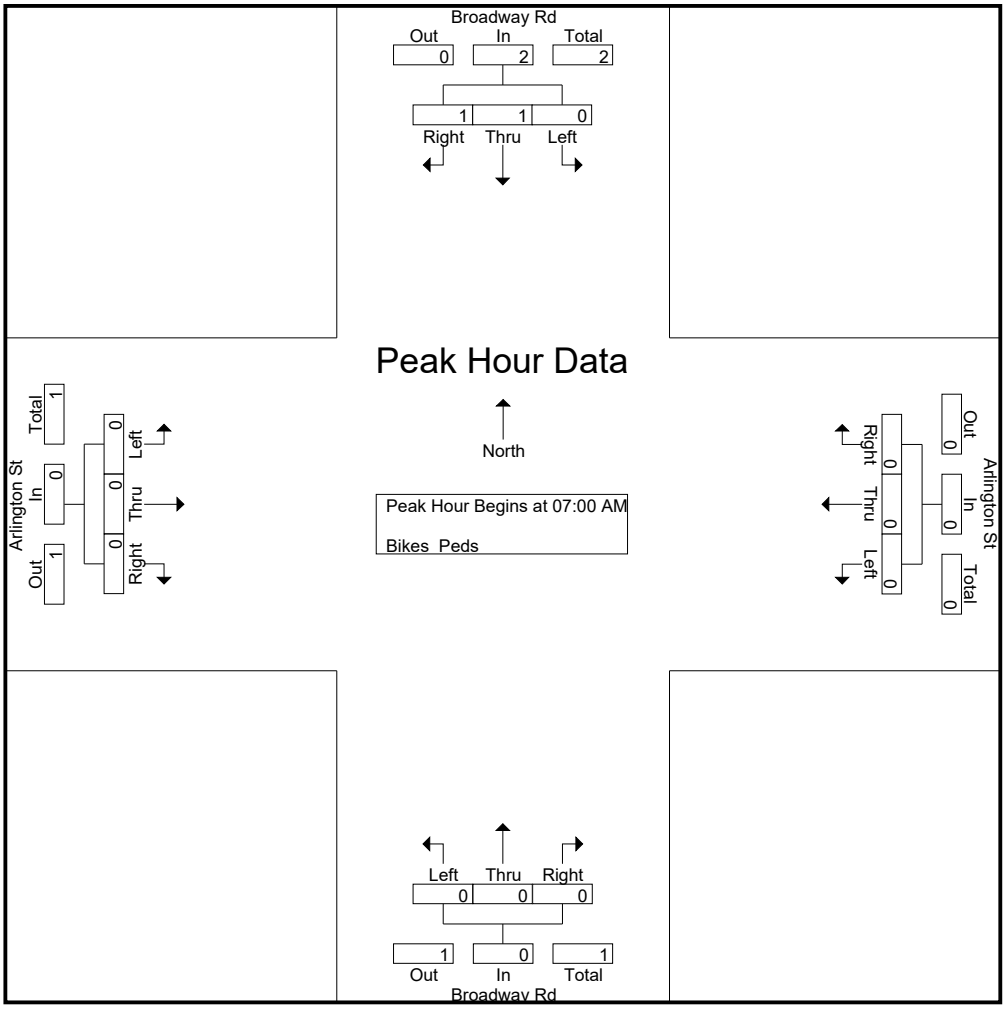

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	50	50		0	0	0		0	0	0		0	0	0	
PHF	.000	.250	.250	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
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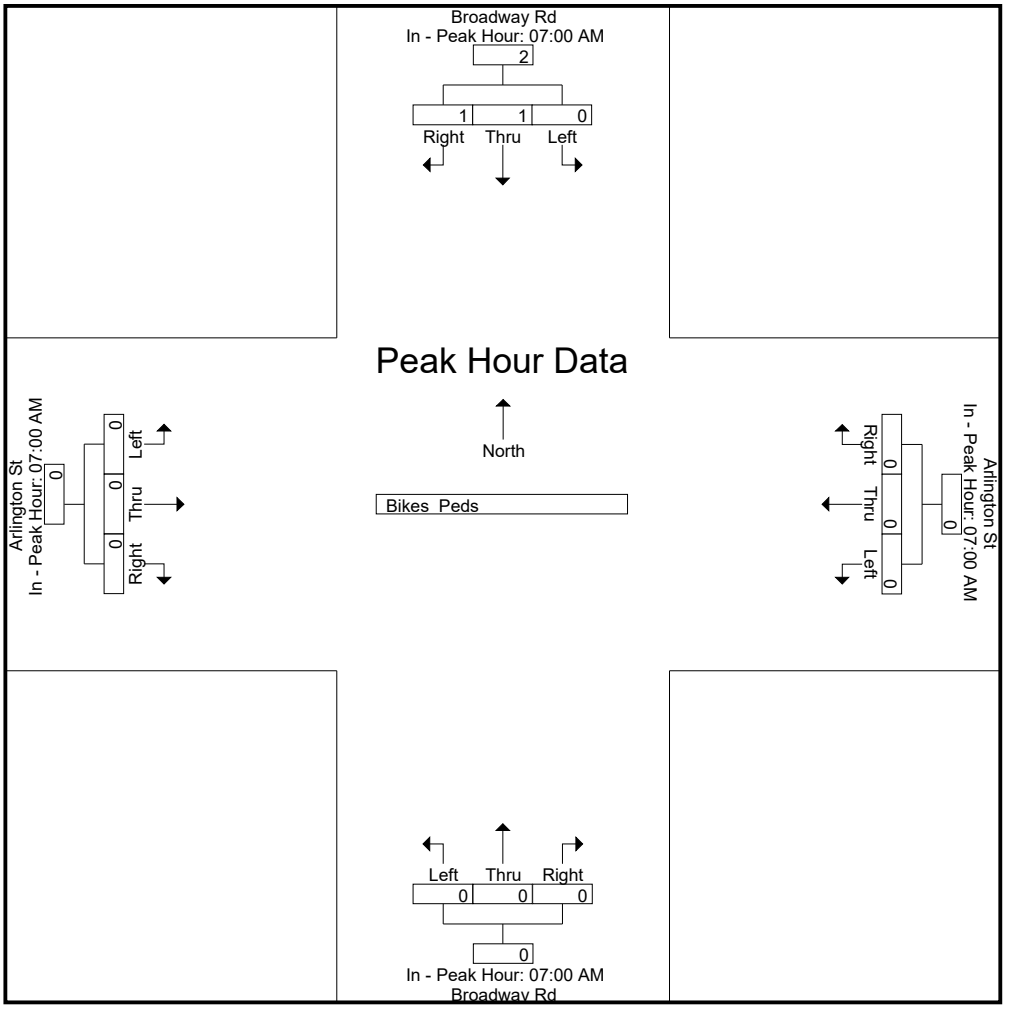


Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	17	59	129	1	39	18	13	67	1	116	25	5	490
04:15 PM	21	59	125	0	41	19	8	48	0	104	40	1	466
04:30 PM	22	67	151	0	46	18	11	60	0	106	43	7	531
04:45 PM	23	48	131	0	42	15	10	67	1	92	34	2	465
Total	83	233	536	1	168	70	42	242	2	418	142	15	1952
05:00 PM	32	54	125	0	50	33	13	29	1	112	38	5	492
05:15 PM	26	35	112	1	34	17	12	58	3	108	36	5	447
05:30 PM	11	49	131	4	42	17	6	46	3	99	34	2	444
05:45 PM	17	40	114	2	22	15	11	55	4	89	29	4	402
Total	86	178	482	7	148	82	42	188	11	408	137	16	1785
Grand Total	169	411	1018	8	316	152	84	430	13	826	279	31	3737
Apprch %	10.6	25.7	63.7	1.7	66.4	31.9	15.9	81.6	2.5	72.7	24.6	2.7	
Total %	4.5	11	27.2	0.2	8.5	4.1	2.2	11.5	0.3	22.1	7.5	0.8	
Cars	169	410	1006	7	316	152	83	424	13	809	278	31	3698
% Cars	100	99.8	98.8	87.5	100	100	98.8	98.6	100	97.9	99.6	100	99
Trucks	0	1	12	1	0	0	1	6	0	17	1	0	39
% Trucks	0	0.2	1.2	12.5	0	0	1.2	1.4	0	2.1	0.4	0	1

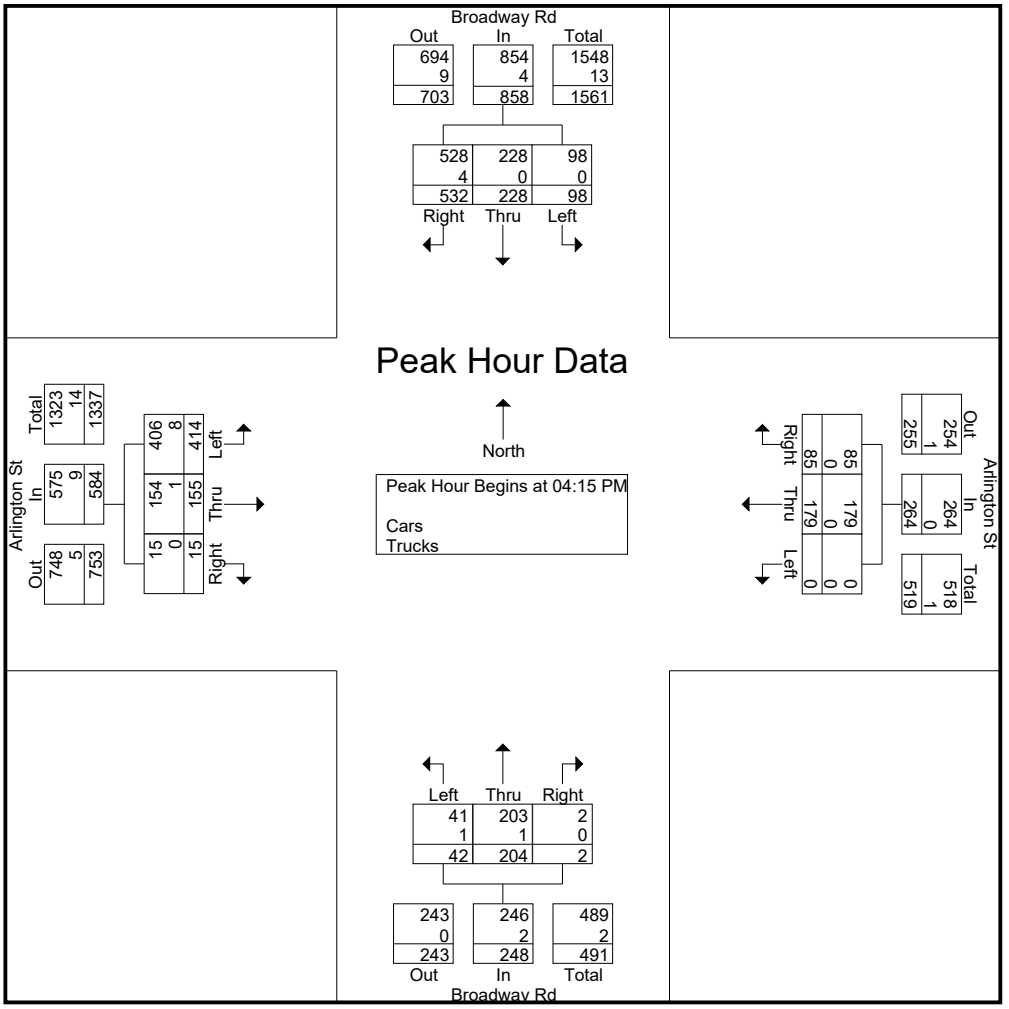
	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	21	59	125	205	0	41	19	60	8	48	0	56	104	40	1	145	466
04:30 PM	22	**67**	**151**	**240**	0	46	18	64	11	60	0	71	106	**43**	**7**	**156**	**531**
04:45 PM	23	48	131	202	0	42	15	57	10	**67**	**1**	**78**	92	34	2	128	465
05:00 PM	**32**	54	125	211	0	**50**	**33**	**83**	**13**	29	1	43	**112**	38	5	155	492
Total Volume	98	228	532	858	0	179	85	264	42	204	2	248	414	155	15	584	1954
% App. Total	11.4	26.6	62		0	67.8	32.2		16.9	82.3	0.8		70.9	26.5	2.6		
PHF	.766	.851	.881	.894	.000	.895	.644	.795	.808	.761	.500	.795	.924	.901	.536	.936	.920
Cars	98	228	528	854	0	179	85	264	41	203	2	246	406	154	15	575	1939
% Cars	100	100	99.2	99.5	0	100	100	100	97.6	99.5	100	99.2	98.1	99.4	100	98.5	99.2
Trucks	0	0	4	4	0	0	0	0	1	1	0	2	8	1	0	9	15
% Trucks	0	0	0.8	0.5	0	0	0	0	2.4	0.5	0	0.8	1.9	0.6	0	1.5	0.8

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

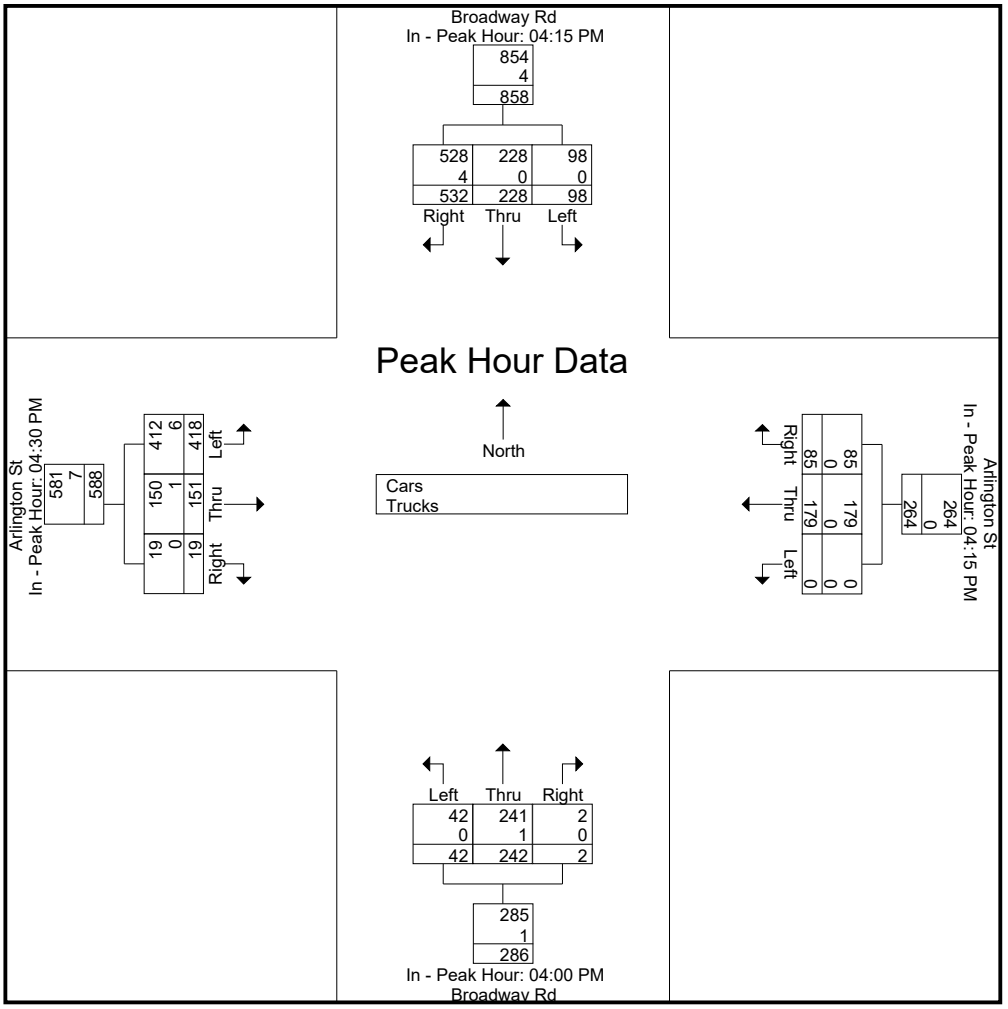
	04:15 PM				04:15 PM				04:00 PM				04:30 PM			
+0 mins.	21	59	125	205	0	41	19	60	**13**	**67**	**1**	**81**	106	**43**	**7**	**156**
+15 mins.	22	**67**	**151**	**240**	0	46	18	64	8	48	0	56	92	34	2	128
+30 mins.	23	48	131	202	0	42	15	57	11	60	0	71	**112**	38	5	155
+45 mins.	**32**	54	125	211	0	**50**	**33**	**83**	10	67	1	78	108	36	5	149
Total Volume	98	228	532	858	0	179	85	264	42	242	2	286	418	151	19	588
% App. Total	11.4	26.6	62		0	67.8	32.2		14.7	84.6	0.7		71.1	25.7	3.2	
PHF	.766	.851	.881	.894	.000	.895	.644	.795	.808	.903	.500	.883	.933	.878	.679	.942
Cars	98	228	528	854	0	179	85	264	42	241	2	285	412	150	19	581
% Cars	100	100	99.2	99.5	0	100	100	100	100	99.6	100	99.7	98.6	99.3	100	98.8
Trucks	0	0	4	4	0	0	0	0	0	1	0	1	6	1	0	7
% Trucks	0	0	0.8	0.5	0	0	0	0	0	0.4	0	0.3	1.4	0.7	0	1.2

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023

Groups Printed- Cars

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	17	59	127	0	39	18	13	67	1	111	25	5	482
04:15 PM	21	59	124	0	41	19	8	48	0	102	40	1	463
04:30 PM	22	67	151	0	46	18	11	59	0	104	43	7	528
04:45 PM	23	48	129	0	42	15	10	67	1	88	33	2	458
Total	83	233	531	0	168	70	42	241	2	405	141	15	1931
05:00 PM	32	54	124	0	50	33	12	29	1	112	38	5	490
05:15 PM	26	35	112	1	34	17	12	57	3	108	36	5	446
05:30 PM	11	49	128	4	42	17	6	45	3	98	34	2	439
05:45 PM	17	39	111	2	22	15	11	52	4	86	29	4	392
Total	86	177	475	7	148	82	41	183	11	404	137	16	1767
Grand Total	169	410	1006	7	316	152	83	424	13	809	278	31	3698
Apprch %	10.7	25.9	63.5	1.5	66.5	32	16	81.5	2.5	72.4	24.9	2.8	
Total %	4.6	11.1	27.2	0.2	8.5	4.1	2.2	11.5	0.4	21.9	7.5	0.8	

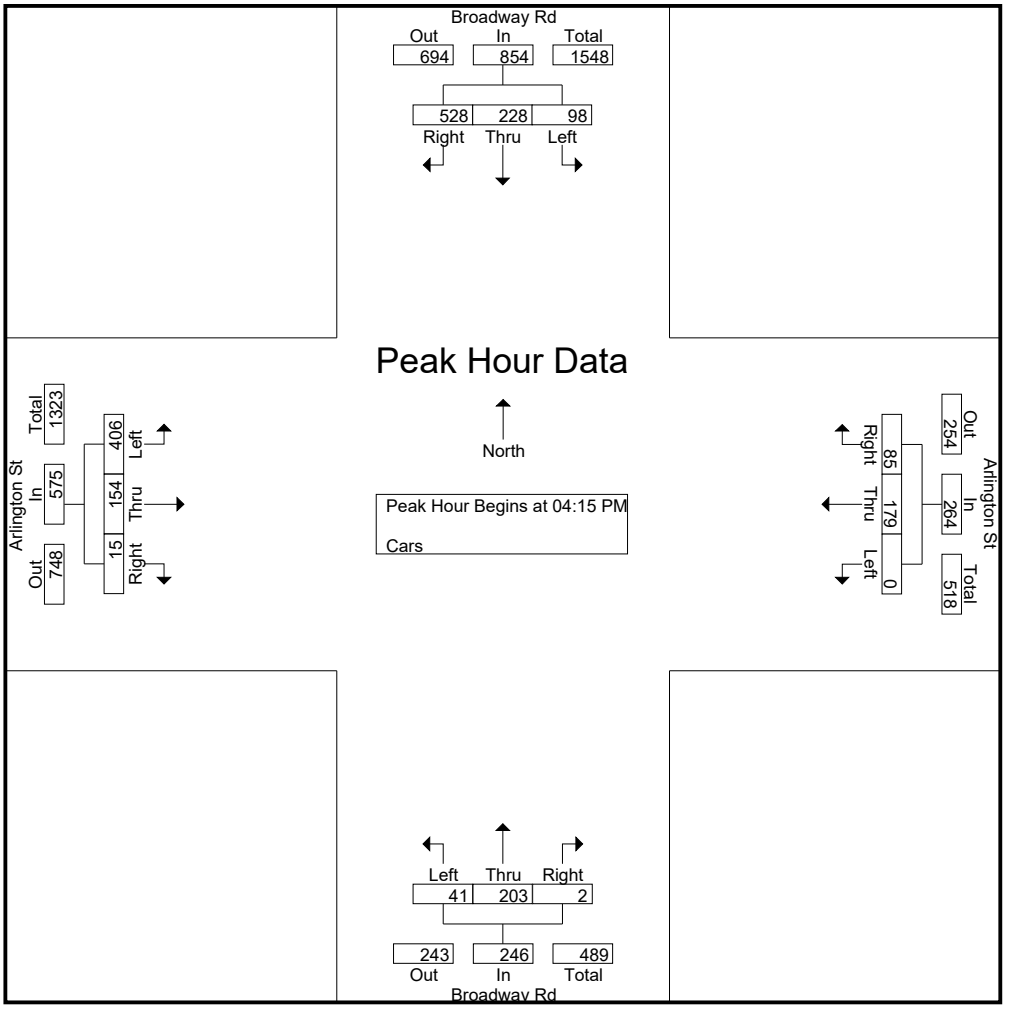
	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	21	59	124	204	0	41	19	60	8	48	0	56	102	40	1	143	463
04:30 PM	22	**67**	**151**	**240**	0	46	18	64	11	59	0	70	104	**43**	**7**	154	**528**
04:45 PM	23	48	129	200	0	42	15	57	10	**67**	**1**	**78**	88	33	2	123	458
05:00 PM	**32**	54	124	210	0	**50**	**33**	**83**	**12**	29	1	42	**112**	38	5	**155**	490
Total Volume	98	228	528	854	0	179	85	264	41	203	2	246	406	154	15	575	1939
% App. Total	11.5	26.7	61.8		0	67.8	32.2		16.7	82.5	0.8		70.6	26.8	2.6		
PHF	.766	.851	.874	.890	.000	.895	.644	.795	.854	.757	.500	.788	.906	.895	.536	.927	.918

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

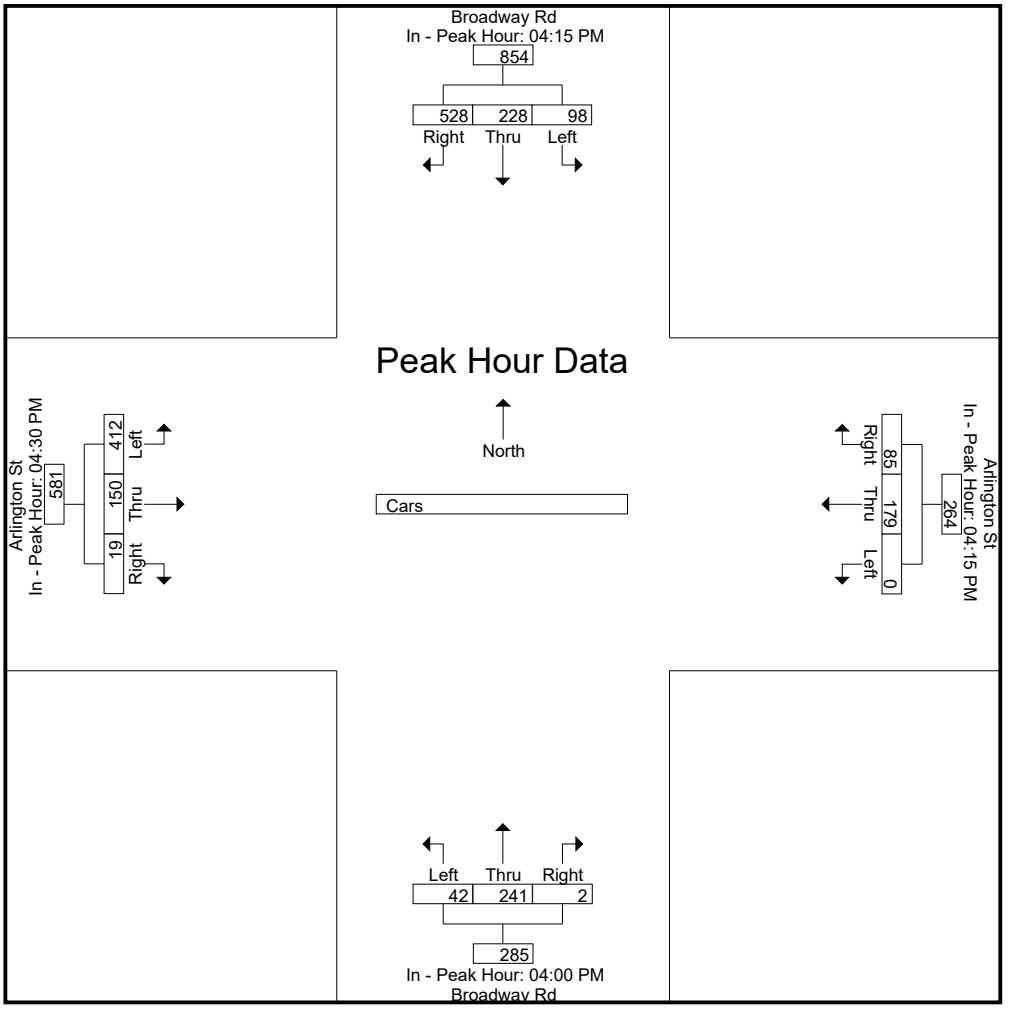
	04:15 PM				04:15 PM				04:00 PM				04:30 PM			
+0 mins.	21	59	124	204	0	41	19	60	**13**	**67**	**1**	**81**	104	**43**	**7**	154
+15 mins.	22	**67**	**151**	**240**	0	46	18	64	8	48	0	56	88	33	2	123
+30 mins.	23	48	129	200	0	42	15	57	11	59	0	70	**112**	38	5	**155**
+45 mins.	**32**	54	124	210	0	**50**	**33**	**83**	10	67	1	78	108	36	5	149
Total Volume	98	228	528	854	0	179	85	264	42	241	2	285	412	150	19	581
% App. Total	11.5	26.7	61.8		0	67.8	32.2		14.7	84.6	0.7		70.9	25.8	3.3	
PHF	.766	.851	.874	.890	.000	.895	.644	.795	.808	.899	.500	.880	.920	.872	.679	.937

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023

Groups Printed- Trucks

	Broadway Rd From North			Arlington St From East			Broadway Rd From South			Arlington St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	2	1	0	0	0	0	0	5	0	0	8
04:15 PM	0	0	1	0	0	0	0	0	0	2	0	0	3
04:30 PM	0	0	0	0	0	0	0	1	0	2	0	0	3
04:45 PM	0	0	2	0	0	0	0	0	0	4	1	0	7
Total	0	0	5	1	0	0	0	1	0	13	1	0	21
05:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	3	0	0	0	0	1	0	1	0	0	5
05:45 PM	0	1	3	0	0	0	0	3	0	3	0	0	10
Total	0	1	7	0	0	0	1	5	0	4	0	0	18
Grand Total	0	1	12	1	0	0	1	6	0	17	1	0	39
Apprch %	0	7.7	92.3	100	0	0	14.3	85.7	0	94.4	5.6	0	
Total %	0	2.6	30.8	2.6	0	0	2.6	15.4	0	43.6	2.6	0	

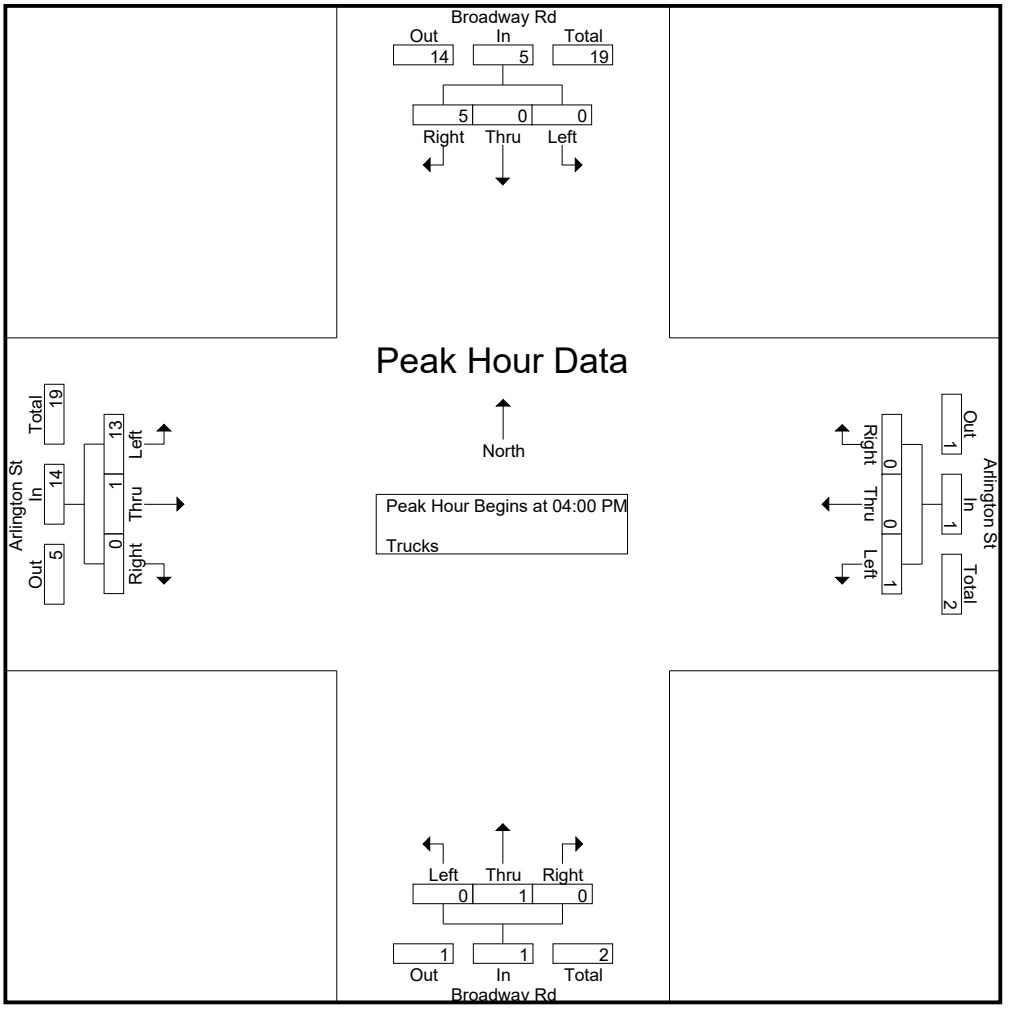
	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	**2**	**2**	**1**	0	0	**1**	0	0	0	0	**5**	0	0	**5**	**8**
04:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	2	0	0	2	3
04:30 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	2	0	0	2	3
04:45 PM	0	0	2	2	0	0	0	0	0	0	0	0	4	**1**	0	5	7
Total Volume	0	0	5	5	1	0	0	1	0	1	0	1	13	1	0	14	21
% App. Total	0	0	100		100	0	0		0	100	0		92.9	7.1	0		
PHF	.000	.000	.625	.625	.250	.000	.000	.250	.000	.250	.000	.250	.650	.250	.000	.700	.656

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

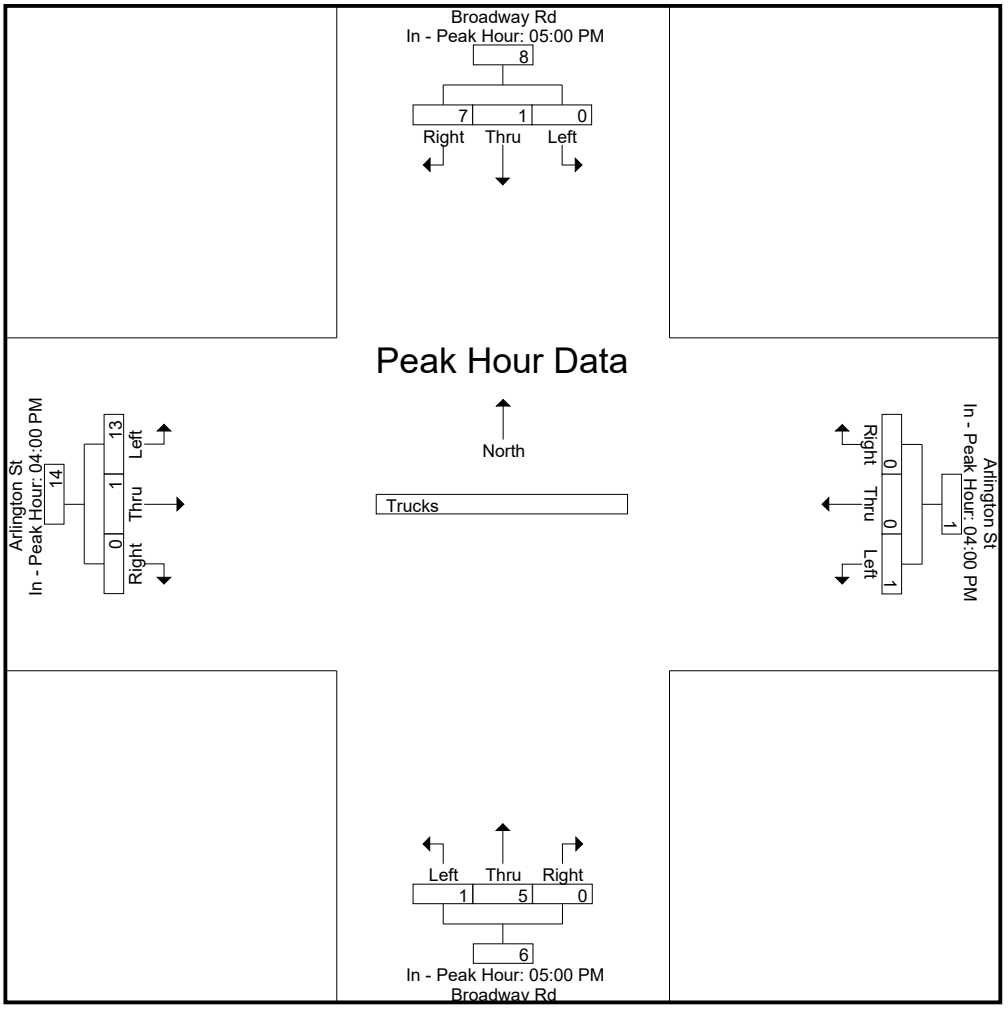
	05:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	0	1	1	**1**	0	0	**1**	**1**	0	0	1	**5**	0	0	**5**
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	2
+30 mins.	0	0	**3**	3	0	0	0	0	0	1	0	1	2	0	0	2
+45 mins.	0	**1**	3	**4**	0	0	0	0	0	**3**	0	**3**	4	**1**	0	5
Total Volume	0	1	7	8	1	0	0	1	1	5	0	6	13	1	0	14
% App. Total	0	12.5	87.5		100	0	0		16.7	83.3	0		92.9	7.1	0	
PHF	.000	.250	.583	.500	.250	.000	.000	.250	.250	.417	.000	.500	.650	.250	.000	.700

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 10

Groups Printed- Bikes Peds

	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	2
04:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	2	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	2	4	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2	1	3
Total	0	0	0	2	0	0	0	1	0	1	0	1	0	0	0	0	4	1	5
Grand Total	2	0	0	2	0	1	0	2	0	1	0	2	1	0	0	0	6	5	11
Apprch %	100	0	0		0	100	0		0	100	0		100	0	0				
Total %	40	0	0		0	20	0		0	20	0		20	0	0		54.5	45.5	

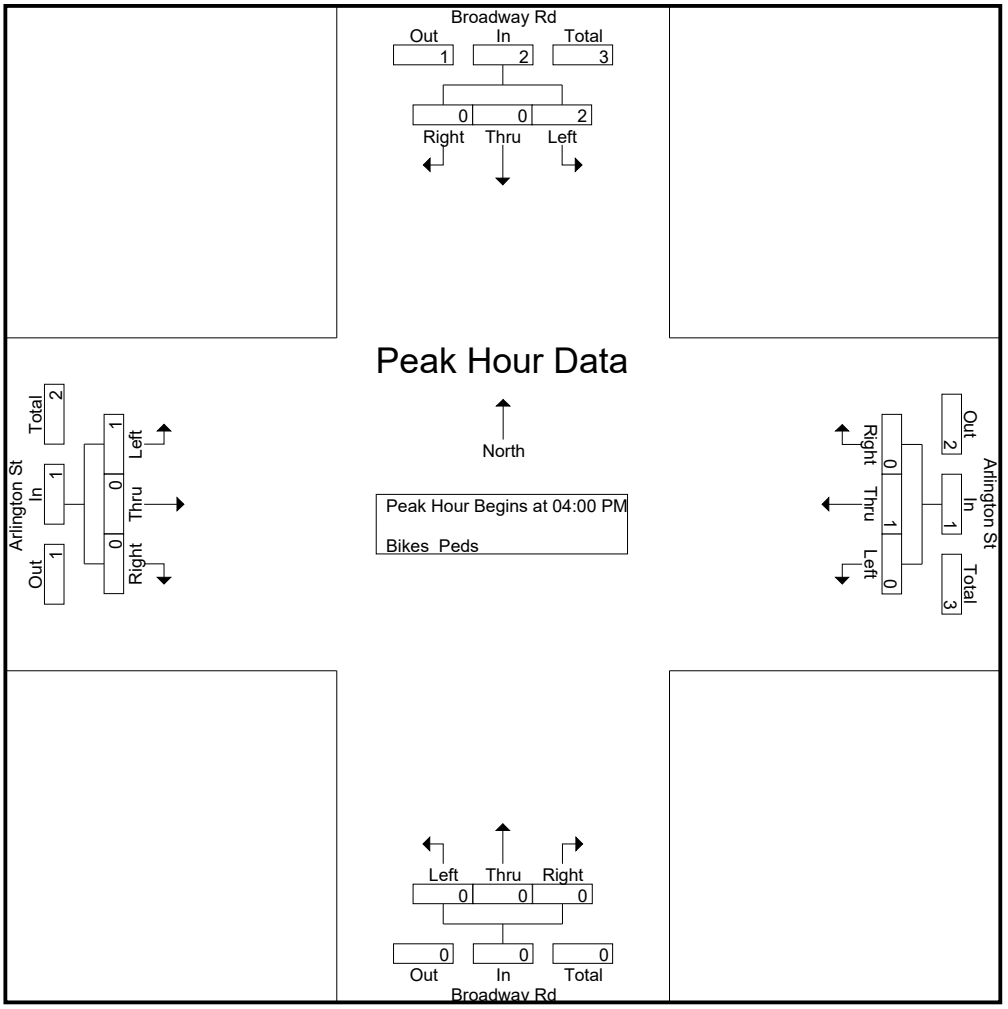
	Broadway Rd From North				Arlington St From East				Broadway Rd From South				Arlington St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
04:30 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
04:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	2	0	0	2	0	1	0	1	0	0	0	0	1	0	0	1	4
% App. Total	100	0	0		0	100	0		0	0	0		100	0	0		
PHF	.500	.000	.000	.500	.000	.250	.000	.250	.000	.000	.000	.000	.250	.000	.000	.250	1.00

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

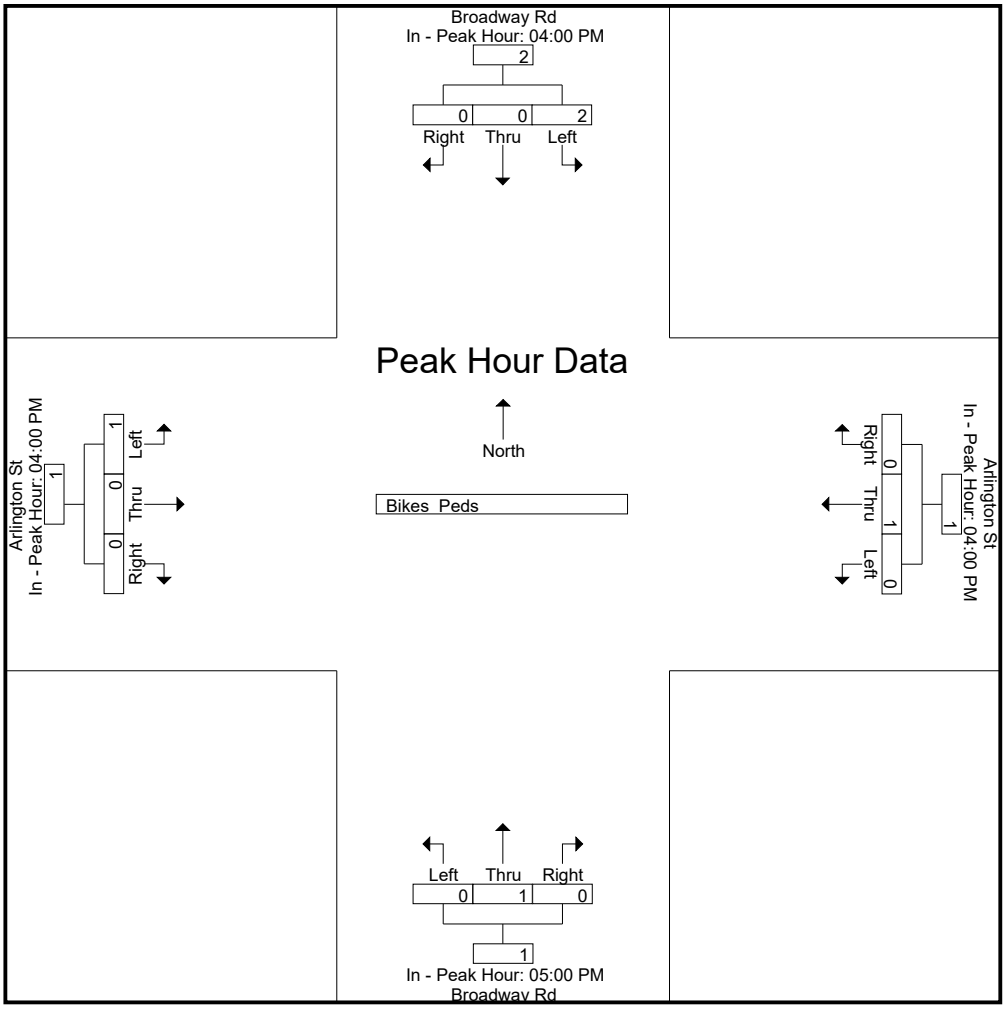
	04:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**
+30 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+45 mins.	1	0	0	1	0	0	0	0	0	**1**	0	**1**	0	0	0	0
Total Volume	2	0	0	2	0	1	0	1	0	1	0	1	1	0	0	1
% App. Total	100	0	0		0	100	0		0	100	0		100	0	0	
PHF	.500	.000	.000	.500	.000	.250	.000	.250	.000	.250	.000	.250	.250	.000	.000	.250

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Arlington Street
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097001
Site Code : 23097001
Start Date : 10/25/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	109	1	17	1	4	0	93	9	1	0	0	239
07:15 AM	4	113	1	24	0	5	0	106	10	0	0	3	266
07:30 AM	7	114	2	15	1	6	2	111	22	0	0	1	281
07:45 AM	13	93	1	22	1	15	2	109	21	2	0	1	280
Total	28	429	5	78	3	30	4	419	62	3	0	5	1066
08:00 AM	14	107	2	19	1	3	1	92	24	1	2	2	268
08:15 AM	9	111	1	23	3	8	1	104	16	4	1	0	281
08:30 AM	8	131	1	17	3	9	1	114	31	1	2	0	318
08:45 AM	6	130	5	21	0	9	0	118	20	4	2	0	315
Total	37	479	9	80	7	29	3	428	91	10	7	2	1182
Grand Total	65	908	14	158	10	59	7	847	153	13	7	7	2248
Apprch %	6.6	92	1.4	69.6	4.4	26	0.7	84.1	15.2	48.1	25.9	25.9	
Total %	2.9	40.4	0.6	7	0.4	2.6	0.3	37.7	6.8	0.6	0.3	0.3	
Cars	64	877	13	157	10	58	7	828	148	13	7	6	2188
% Cars	98.5	96.6	92.9	99.4	100	98.3	100	97.8	96.7	100	100	85.7	97.3
Trucks	1	31	1	1	0	1	0	19	5	0	0	1	60
% Trucks	1.5	3.4	7.1	0.6	0	1.7	0	2.2	3.3	0	0	14.3	2.7

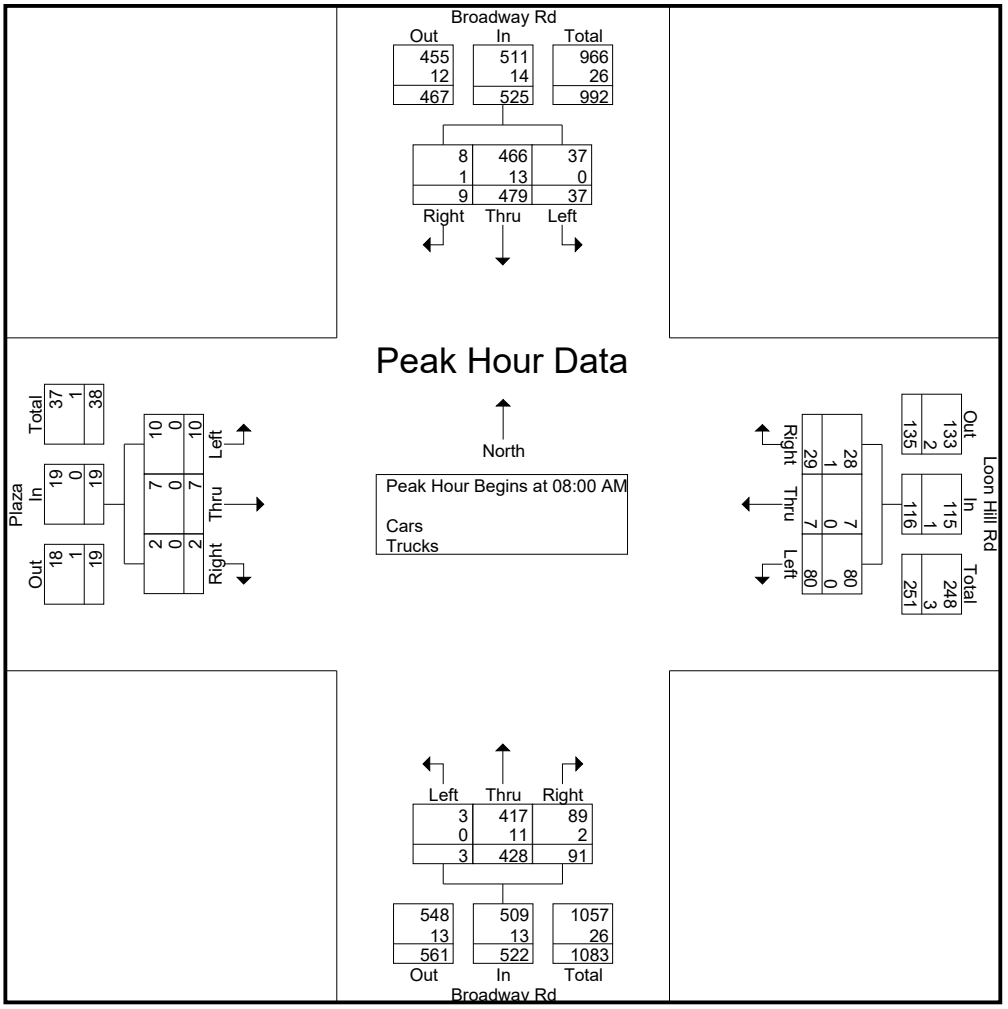
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**14**	107	2	123	19	1	3	23	**1**	92	24	117	1	**2**	**2**	5	268
08:15 AM	9	111	1	121	**23**	**3**	8	**34**	1	104	16	121	**4**	1	0	5	281
08:30 AM	8	**131**	1	140	17	3	**9**	29	1	114	**31**	**146**	1	2	0	3	**318**
08:45 AM	6	130	**5**	**141**	21	0	9	30	0	**118**	20	138	4	2	0	**6**	315
Total Volume	37	479	9	525	80	7	29	116	3	428	91	522	10	7	2	19	1182
% App. Total	7	91.2	1.7		69	6	25		0.6	82	17.4		52.6	36.8	10.5		
PHF	.661	.914	.450	.931	.870	.583	.806	.853	.750	.907	.734	.894	.625	.875	.250	.792	.929
Cars	37	466	8	511	80	7	28	115	3	417	89	509	10	7	2	19	1154
% Cars	100	97.3	88.9	97.3	100	100	96.6	99.1	100	97.4	97.8	97.5	100	100	100	100	97.6
Trucks	0	13	1	14	0	0	1	1	0	11	2	13	0	0	0	0	28
% Trucks	0	2.7	11.1	2.7	0	0	3.4	0.9	0	2.6	2.2	2.5	0	0	0	0	2.4

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

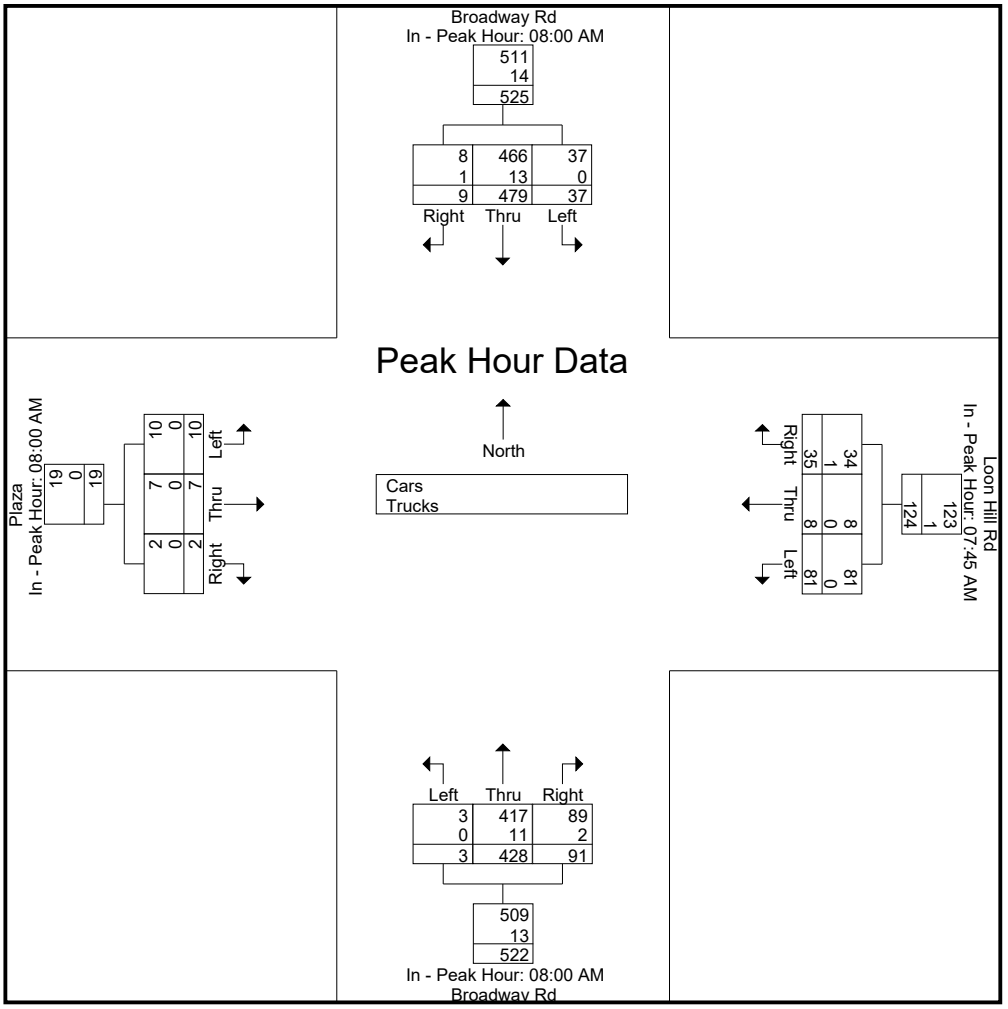
	08:00 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	**14**	107	2	123	22	1	**15**	**38**	**1**	92	24	117	1	**2**	**2**	5
+15 mins.	9	111	1	121	19	1	3	23	1	104	16	121	**4**	1	0	5
+30 mins.	8	**131**	1	140	**23**	**3**	8	34	1	114	**31**	**146**	1	2	0	3
+45 mins.	6	130	**5**	**141**	17	3	9	29	0	**118**	20	138	4	2	0	**6**
Total Volume	37	479	9	525	81	8	35	124	3	428	91	522	10	7	2	19
% App. Total	7	91.2	1.7		65.3	6.5	28.2		0.6	82	17.4		52.6	36.8	10.5	
PHF	.661	.914	.450	.931	.880	.667	.583	.816	.750	.907	.734	.894	.625	.875	.250	.792
Cars	37	466	8	511	81	8	34	123	3	417	89	509	10	7	2	19
% Cars	100	97.3	88.9	97.3	100	100	97.1	99.2	100	97.4	97.8	97.5	100	100	100	100
Trucks	0	13	1	14	0	0	1	1	0	11	2	13	0	0	0	0
% Trucks	0	2.7	11.1	2.7	0	0	2.9	0.8	0	2.6	2.2	2.5	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023

Groups Printed- Cars

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	104	1	17	1	4	0	92	9	1	0	0	233
07:15 AM	4	109	1	23	0	5	0	102	10	0	0	2	256
07:30 AM	7	111	2	15	1	6	2	110	21	0	0	1	276
07:45 AM	12	87	1	22	1	15	2	107	19	2	0	1	269
Total	27	411	5	77	3	30	4	411	59	3	0	4	1034
08:00 AM	14	103	2	19	1	2	1	90	24	1	2	2	261
08:15 AM	9	109	1	23	3	8	1	100	16	4	1	0	275
08:30 AM	8	127	1	17	3	9	1	113	30	1	2	0	312
08:45 AM	6	127	4	21	0	9	0	114	19	4	2	0	306
Total	37	466	8	80	7	28	3	417	89	10	7	2	1154
Grand Total	64	877	13	157	10	58	7	828	148	13	7	6	2188
Apprch %	6.7	91.9	1.4	69.8	4.4	25.8	0.7	84.2	15.1	50	26.9	23.1	
Total %	2.9	40.1	0.6	7.2	0.5	2.7	0.3	37.8	6.8	0.6	0.3	0.3	

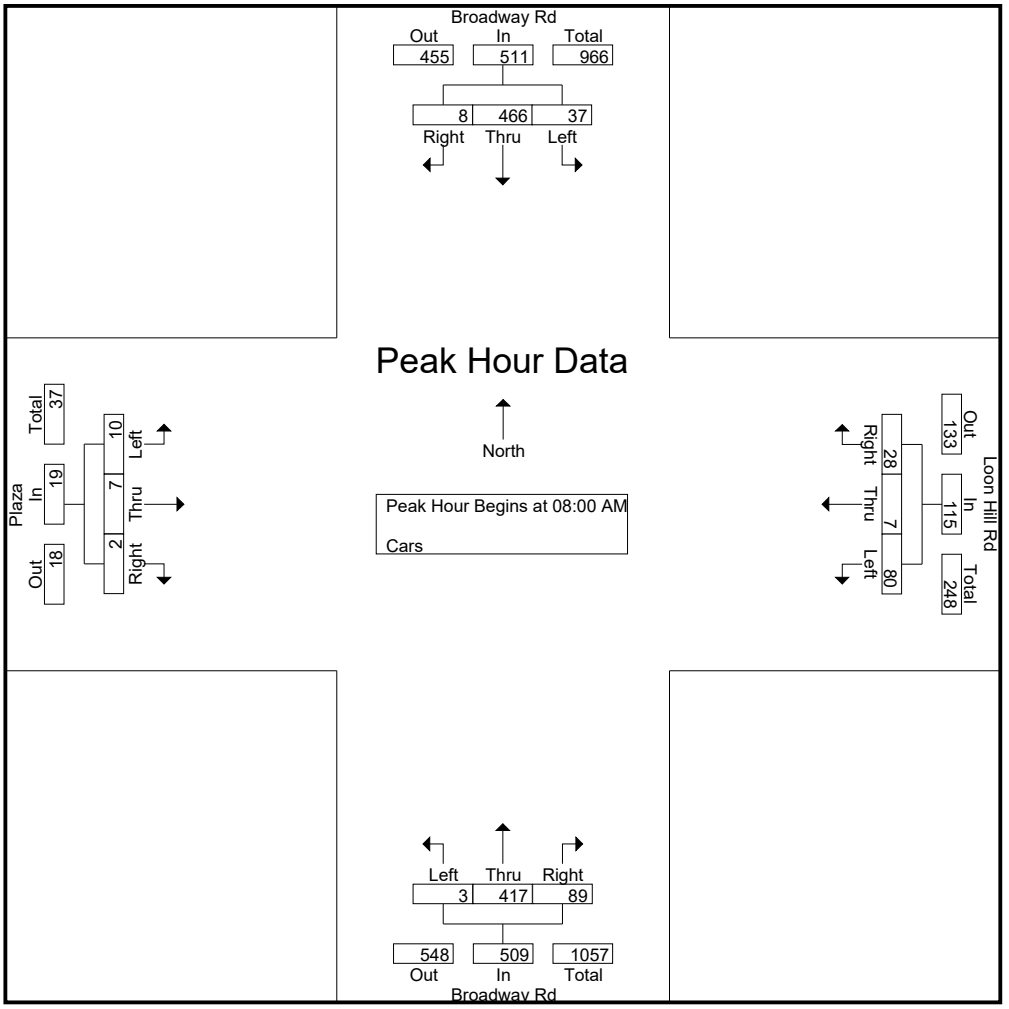
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**14**	103	2	119	19	1	2	22	**1**	90	24	115	1	**2**	**2**	5	261
08:15 AM	9	109	1	119	**23**	**3**	8	**34**	1	100	16	117	**4**	1	0	5	275
08:30 AM	8	**127**	1	136	17	3	**9**	29	1	113	**30**	**144**	1	2	0	3	**312**
08:45 AM	6	127	**4**	**137**	21	0	9	30	0	**114**	19	133	4	2	0	**6**	306
Total Volume	37	466	8	511	80	7	28	115	3	417	89	509	10	7	2	19	1154
% App. Total	7.2	91.2	1.6		69.6	6.1	24.3		0.6	81.9	17.5		52.6	36.8	10.5		
PHF	.661	.917	.500	.932	.870	.583	.778	.846	.750	.914	.742	.884	.625	.875	.250	.792	.925

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 5



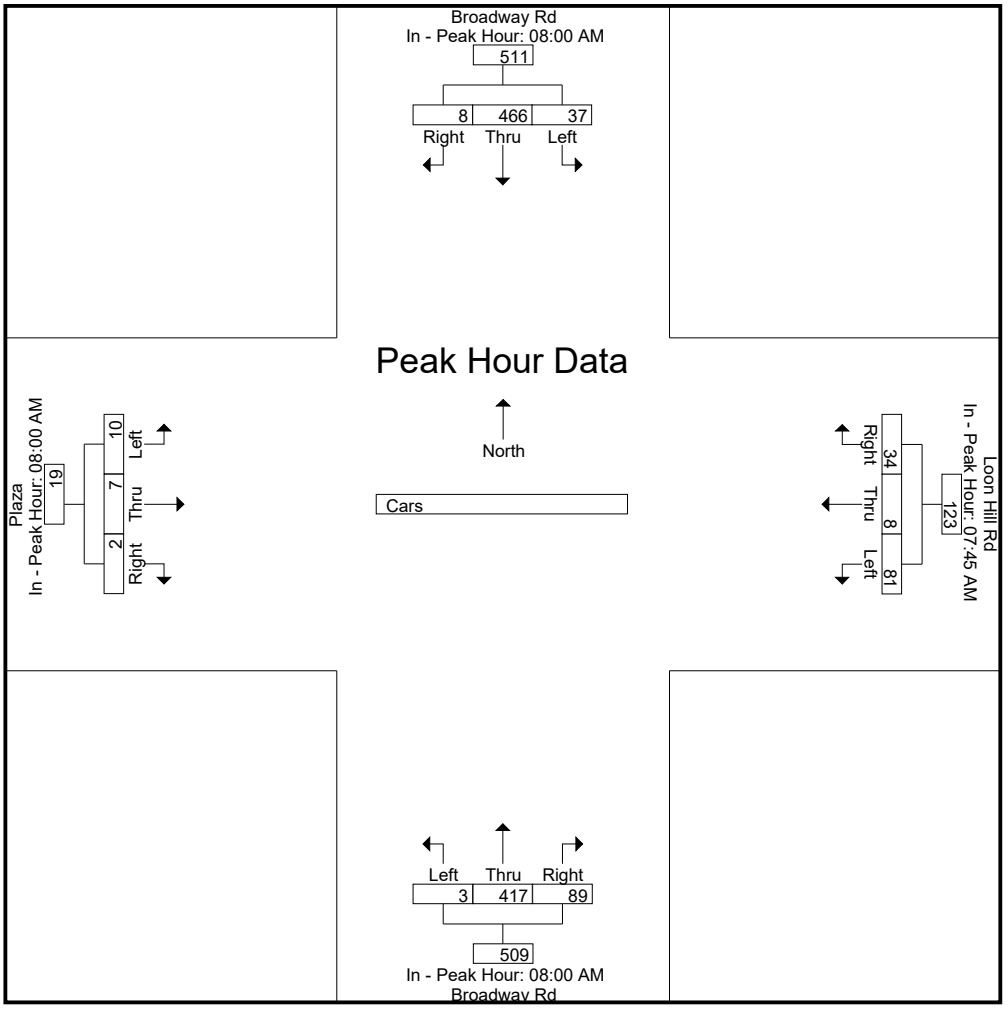
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	**14**	103	2	119	22	1	**15**	**38**	**1**	90	24	115	1	**2**	**2**	5
+15 mins.	9	109	1	119	19	1	2	22	1	100	16	117	**4**	1	0	5
+30 mins.	8	**127**	1	136	**23**	**3**	8	34	1	113	**30**	**144**	1	2	0	3
+45 mins.	6	127	**4**	**137**	17	3	9	29	0	**114**	19	133	4	2	0	**6**
Total Volume	37	466	8	511	81	8	34	123	3	417	89	509	10	7	2	19
% App. Total	7.2	91.2	1.6		65.9	6.5	27.6		0.6	81.9	17.5		52.6	36.8	10.5	
PHF	.661	.917	.500	.932	.880	.667	.567	.809	.750	.914	.742	.884	.625	.875	.250	.792

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023

Groups Printed- Trucks

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	5	0	0	0	0	0	1	0	0	0	0	6
07:15 AM	0	4	0	1	0	0	0	4	0	0	0	1	10
07:30 AM	0	3	0	0	0	0	0	1	1	0	0	0	5
07:45 AM	1	6	0	0	0	0	0	2	2	0	0	0	11
Total	1	18	0	1	0	0	0	8	3	0	0	1	32
08:00 AM	0	4	0	0	0	1	0	2	0	0	0	0	7
08:15 AM	0	2	0	0	0	0	0	4	0	0	0	0	6
08:30 AM	0	4	0	0	0	0	0	1	1	0	0	0	6
08:45 AM	0	3	1	0	0	0	0	4	1	0	0	0	9
Total	0	13	1	0	0	1	0	11	2	0	0	0	28
Grand Total	1	31	1	1	0	1	0	19	5	0	0	1	60
Apprch %	3	93.9	3	50	0	50	0	79.2	20.8	0	0	100	
Total %	1.7	51.7	1.7	1.7	0	1.7	0	31.7	8.3	0	0	1.7	

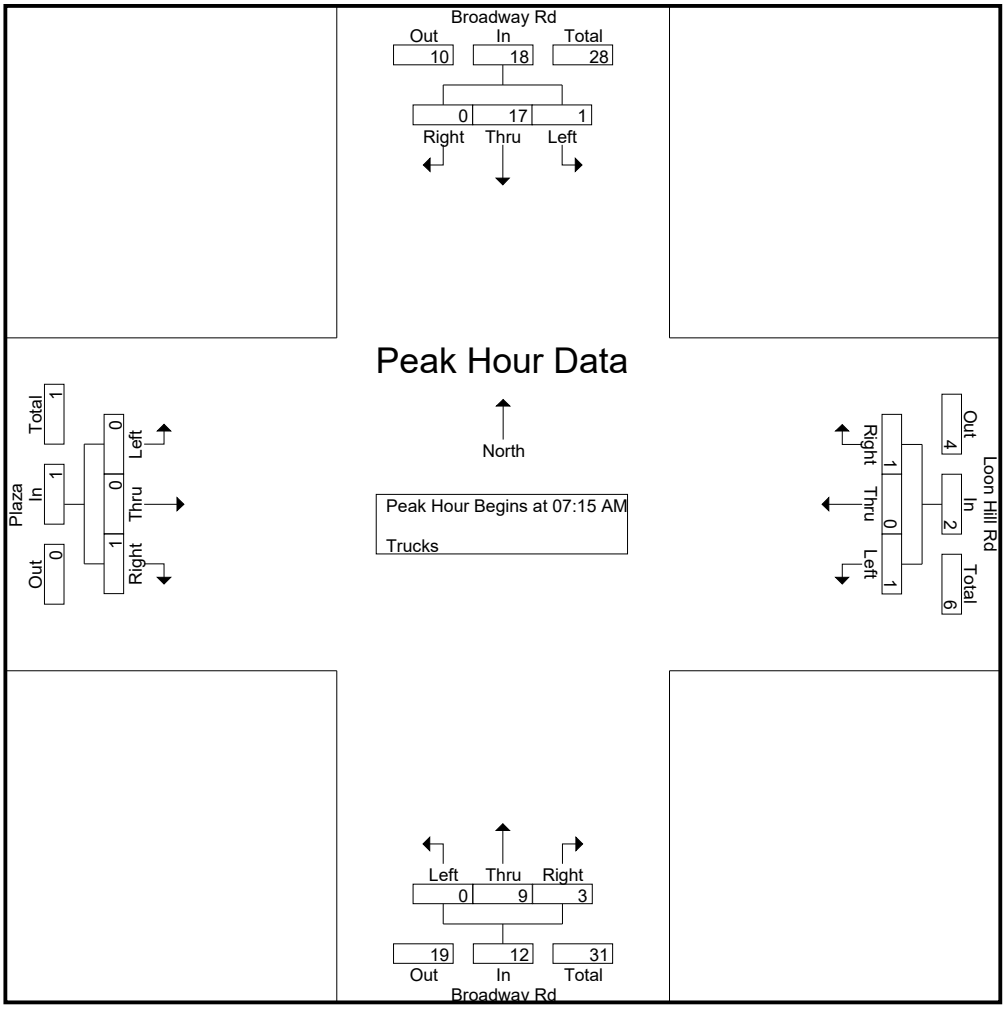
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	4	0	4	**1**	0	0	**1**	0	**4**	0	**4**	0	0	**1**	**1**	10
07:30 AM	0	3	0	3	0	0	0	0	0	1	1	2	0	0	0	0	5
07:45 AM	**1**	**6**	0	**7**	0	0	0	0	0	2	**2**	4	0	0	0	0	**11**
08:00 AM	0	4	0	4	0	0	**1**	1	0	2	0	2	0	0	0	0	7
Total Volume	1	17	0	18	1	0	1	2	0	9	3	12	0	0	1	1	33
% App. Total	5.6	94.4	0		50	0	50		0	75	25		0	0	100		
PHF	.250	.708	.000	.643	.250	.000	.250	.500	.000	.563	.375	.750	.000	.000	.250	.250	.750

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

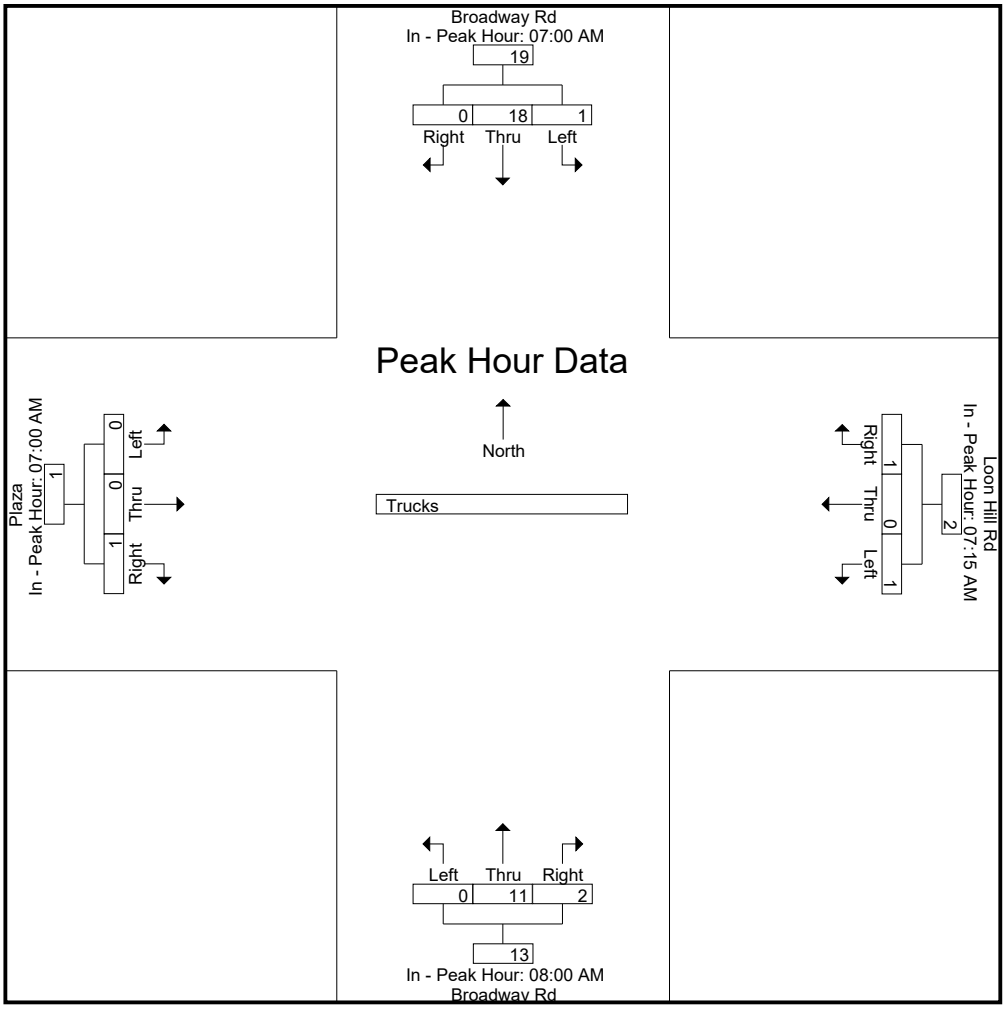
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				08:00 AM				07:00 AM			
+0 mins.	0	5	0	5	**1**	0	0	**1**	0	2	0	2	0	0	0	0
+15 mins.	0	4	0	4	0	0	0	0	0	**4**	0	4	0	0	**1**	**1**
+30 mins.	0	3	0	3	0	0	0	0	0	1	**1**	2	0	0	0	0
+45 mins.	**1**	**6**	0	**7**	0	0	**1**	1	0	4	1	**5**	0	0	0	0
Total Volume	1	18	0	19	1	0	1	2	0	11	2	13	0	0	1	1
% App. Total	5.3	94.7	0		50	0	50		0	84.6	15.4		0	0	100	
PHF	.250	.750	.000	.679	.250	.000	.250	.500	.000	.688	.500	.650	.000	.000	.250	.250

Accurate Counts
978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 10

Groups Printed- Bikes Peds

	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	2	7	0	7
Grand Total	0	2	0	2	0	0	0	0	0	0	0	3	0	0	0	3	8	2	10
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0				
Total %	0	100	0		0	0	0		0	0	0		0	0	0		80	20	

	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
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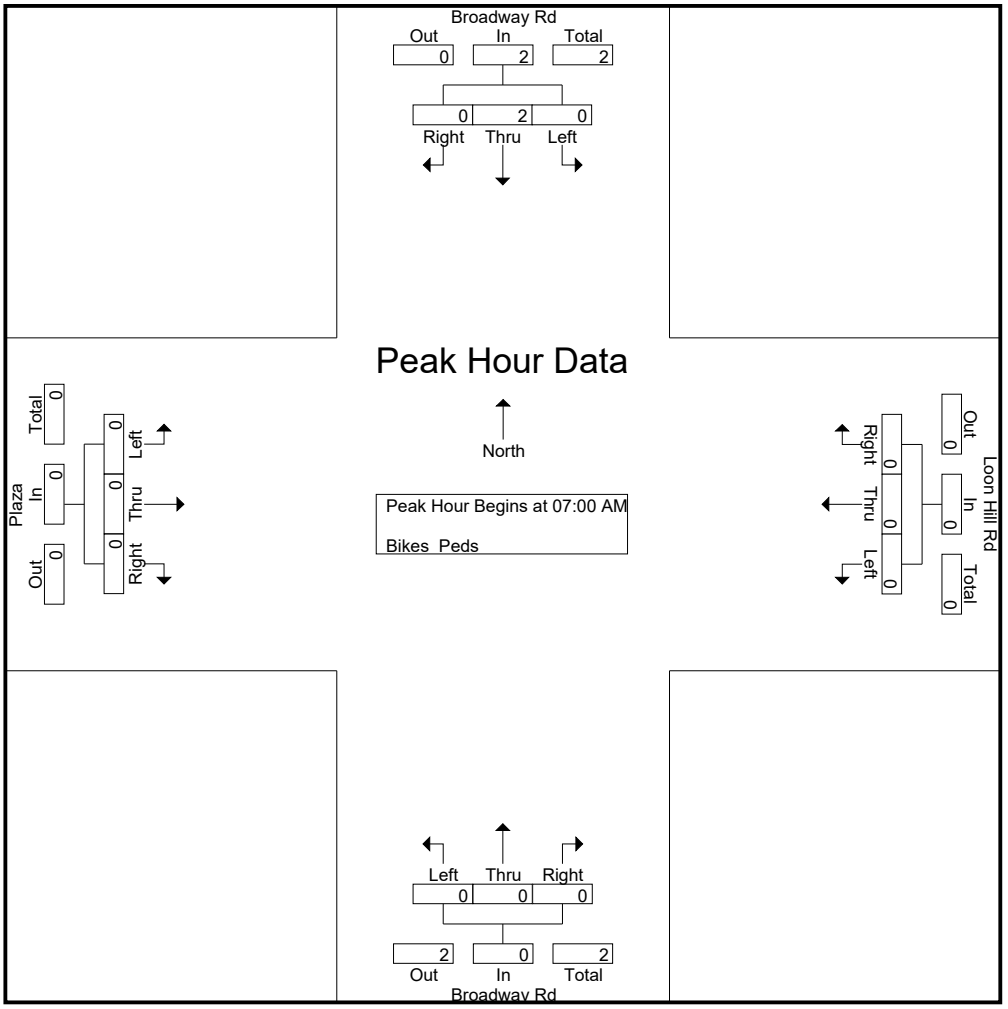

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
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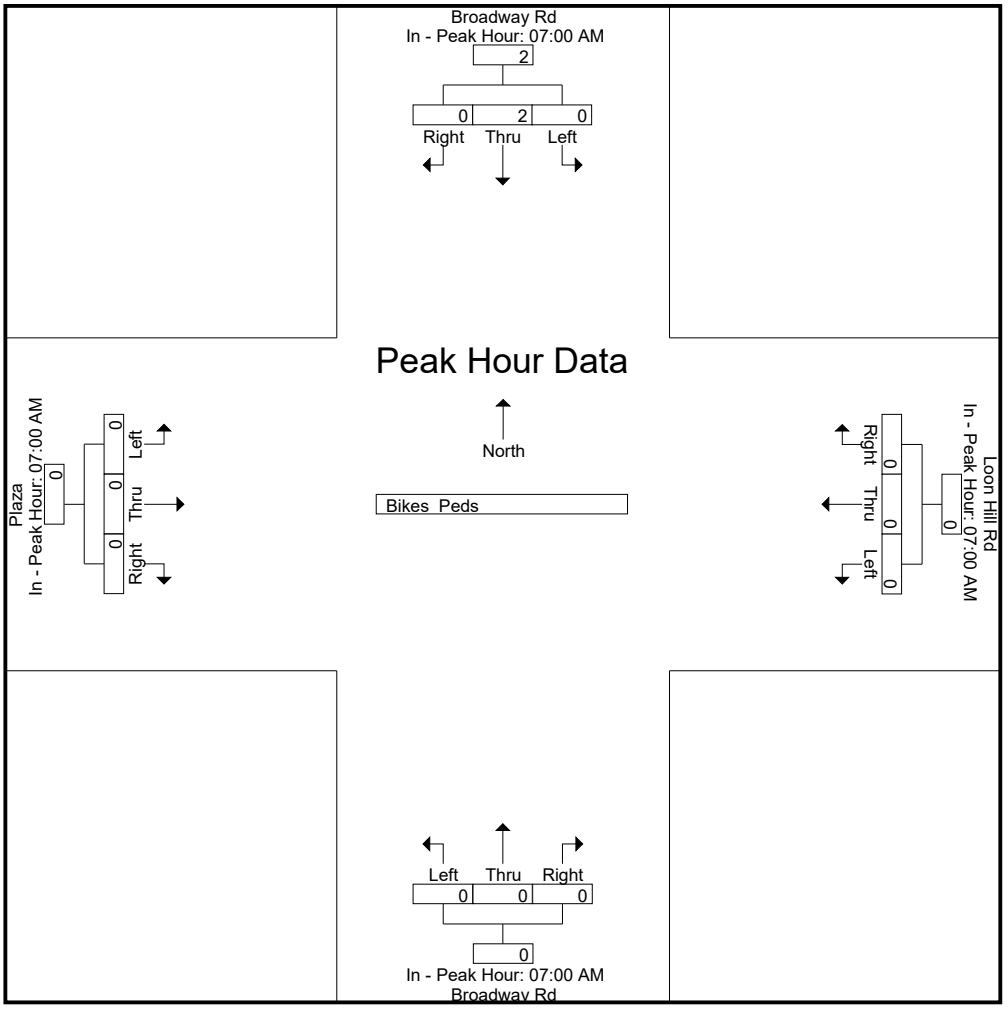


Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	8	161	2	32	1	12	4	139	32	9	2	4	406
04:15 PM	6	147	3	30	0	9	2	128	22	7	2	7	363
04:30 PM	14	186	5	34	2	10	1	148	19	9	1	1	430
04:45 PM	7	155	5	29	1	13	1	135	26	4	1	3	380
Total	35	649	15	125	4	44	8	550	99	29	6	15	1579
05:00 PM	7	152	4	28	2	7	3	119	23	11	3	4	363
05:15 PM	8	141	5	27	1	11	0	138	25	5	4	2	367
05:30 PM	9	157	2	28	1	13	3	135	25	7	2	2	384
05:45 PM	6	129	3	25	1	3	3	115	19	8	1	6	319
Total	30	579	14	108	5	34	9	507	92	31	10	14	1433
Grand Total	65	1228	29	233	9	78	17	1057	191	60	16	29	3012
Apprch %	4.9	92.9	2.2	72.8	2.8	24.4	1.3	83.6	15.1	57.1	15.2	27.6	
Total %	2.2	40.8	1	7.7	0.3	2.6	0.6	35.1	6.3	2	0.5	1	
Cars	65	1215	29	233	9	78	17	1040	187	60	16	29	2978
% Cars	100	98.9	100	100	100	100	100	98.4	97.9	100	100	100	98.9
Trucks	0	13	0	0	0	0	0	17	4	0	0	0	34
% Trucks	0	1.1	0	0	0	0	0	1.6	2.1	0	0	0	1.1

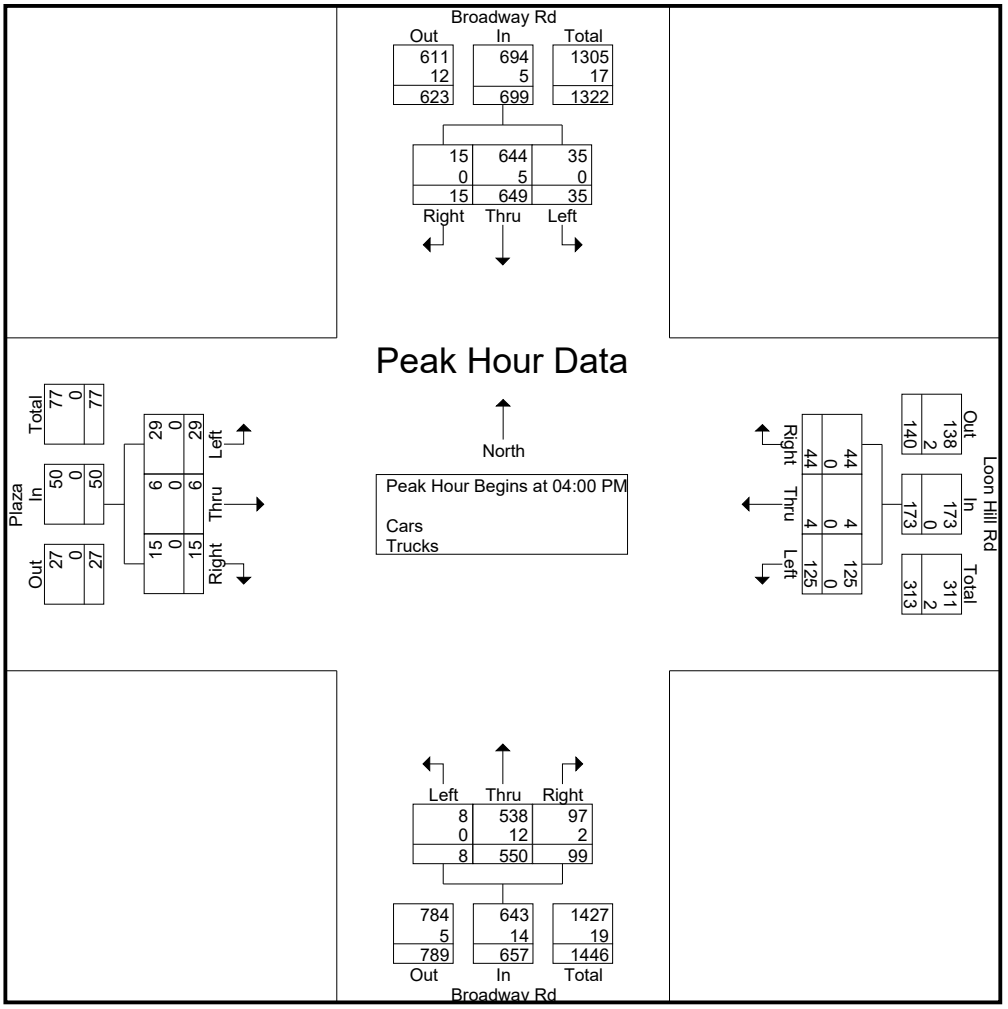
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	8	161	2	171	32	1	12	45	**4**	139	**32**	**175**	**9**	**2**	4	15	406
04:15 PM	6	147	3	156	30	0	9	39	2	128	22	152	7	2	**7**	**16**	363
04:30 PM	**14**	**186**	**5**	**205**	**34**	**2**	10	**46**	1	**148**	19	168	9	1	1	11	**430**
04:45 PM	7	155	5	167	29	1	**13**	43	1	135	26	162	4	1	3	8	380
Total Volume	35	649	15	699	125	4	44	173	8	550	99	657	29	6	15	50	1579
% App. Total	5	92.8	2.1		72.3	2.3	25.4		1.2	83.7	15.1		58	12	30		
PHF	.625	.872	.750	.852	.919	.500	.846	.940	.500	.929	.773	.939	.806	.750	.536	.781	.918
Cars	35	644	15	694	125	4	44	173	8	538	97	643	29	6	15	50	1560
% Cars	100	99.2	100	99.3	100	100	100	100	100	97.8	98.0	97.9	100	100	100	100	98.8
Trucks	0	5	0	5	0	0	0	0	0	12	2	14	0	0	0	0	19
% Trucks	0	0.8	0	0.7	0	0	0	0	0	2.2	2.0	2.1	0	0	0	0	1.2

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

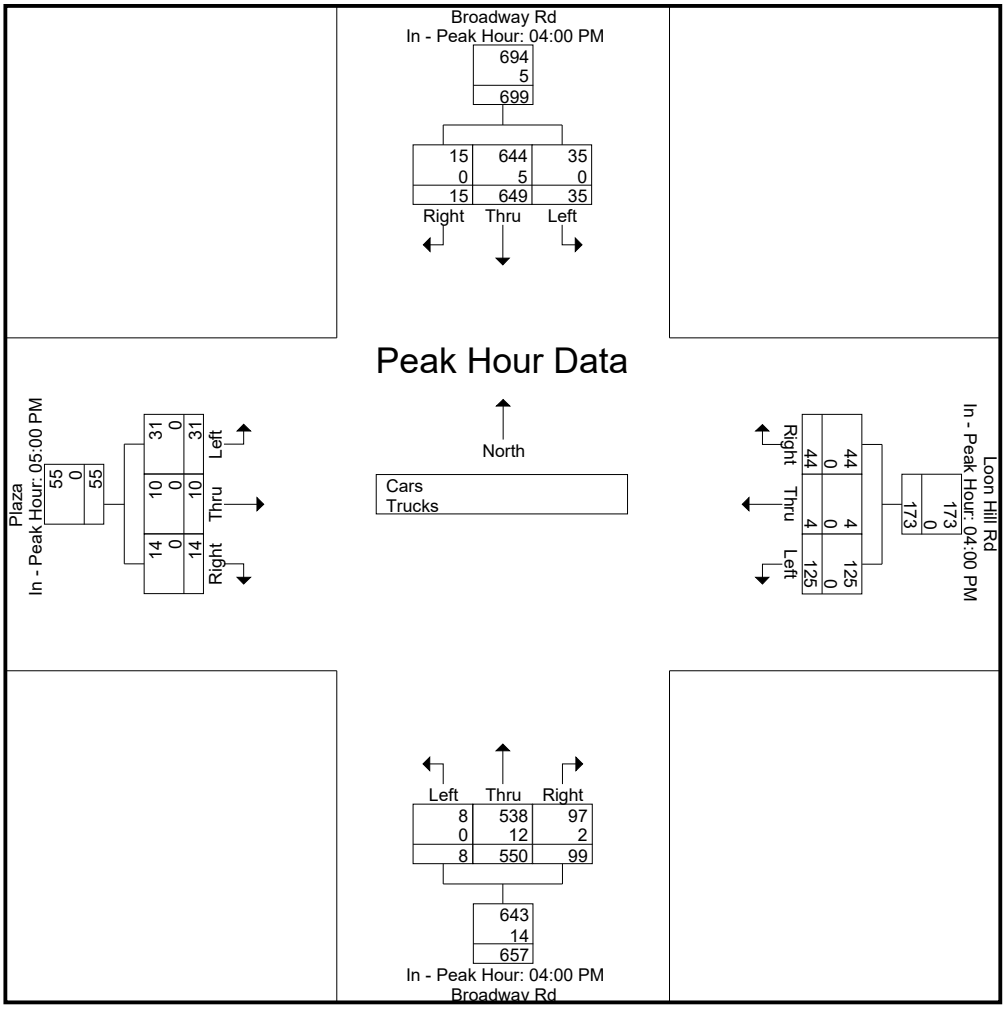
	04:00 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	8	161	2	171	32	1	12	45	**4**	139	**32**	**175**	**11**	3	4	**18**
+15 mins.	6	147	3	156	30	0	9	39	2	128	22	152	5	**4**	2	11
+30 mins.	**14**	**186**	**5**	**205**	**34**	**2**	10	**46**	1	**148**	19	168	7	2	2	11
+45 mins.	7	155	5	167	29	1	**13**	43	1	135	26	162	8	1	**6**	15
Total Volume	35	649	15	699	125	4	44	173	8	550	99	657	31	10	14	55
% App. Total	5	92.8	2.1		72.3	2.3	25.4		1.2	83.7	15.1		56.4	18.2	25.5	
PHF	.625	.872	.750	.852	.919	.500	.846	.940	.500	.929	.773	.939	.705	.625	.583	.764
Cars	35	644	15	694	125	4	44	173	8	538	97	643	31	10	14	55
% Cars	100	99.2	100	99.3	100	100	100	100	100	97.8	98	97.9	100	100	100	100
Trucks	0	5	0	5	0	0	0	0	0	12	2	14	0	0	0	0
% Trucks	0	0.8	0	0.7	0	0	0	0	0	2.2	2	2.1	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 4

Groups Printed- Cars

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	8	159	2	32	1	12	4	137	32	9	2	4	402
04:15 PM	6	146	3	30	0	9	2	123	22	7	2	7	357
04:30 PM	14	186	5	34	2	10	1	145	19	9	1	1	427
04:45 PM	7	153	5	29	1	13	1	133	24	4	1	3	374
Total	35	644	15	125	4	44	8	538	97	29	6	15	1560
05:00 PM	7	151	4	28	2	7	3	118	23	11	3	4	361
05:15 PM	8	141	5	27	1	11	0	137	25	5	4	2	366
05:30 PM	9	154	2	28	1	13	3	134	24	7	2	2	379
05:45 PM	6	125	3	25	1	3	3	113	18	8	1	6	312
Total	30	571	14	108	5	34	9	502	90	31	10	14	1418
Grand Total	65	1215	29	233	9	78	17	1040	187	60	16	29	2978
Apprch %	5	92.8	2.2	72.8	2.8	24.4	1.4	83.6	15	57.1	15.2	27.6	
Total %	2.2	40.8	1	7.8	0.3	2.6	0.6	34.9	6.3	2	0.5	1	

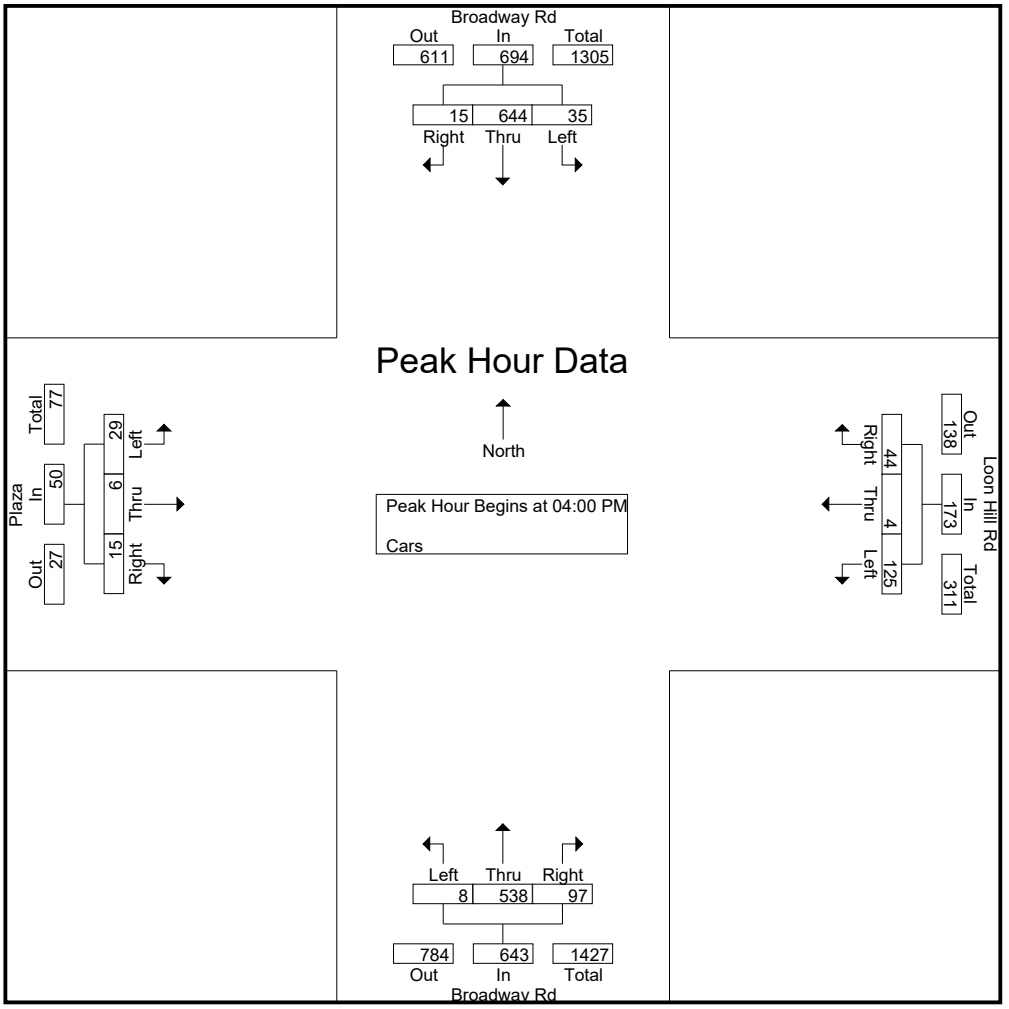
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	8	159	2	169	32	1	12	45	**4**	137	**32**	**173**	**9**	**2**	4	15	402
04:15 PM	6	146	3	155	30	0	9	39	2	123	22	147	7	2	**7**	**16**	357
04:30 PM	**14**	**186**	**5**	**205**	**34**	**2**	10	**46**	1	**145**	19	165	9	1	1	11	**427**
04:45 PM	7	153	5	165	29	1	**13**	43	1	133	24	158	4	1	3	8	374
Total Volume	35	644	15	694	125	4	44	173	8	538	97	643	29	6	15	50	1560
% App. Total	5	92.8	2.2		72.3	2.3	25.4		1.2	83.7	15.1		58	12	30		
PHF	.625	.866	.750	.846	.919	.500	.846	.940	.500	.928	.758	.929	.806	.750	.536	.781	.913

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

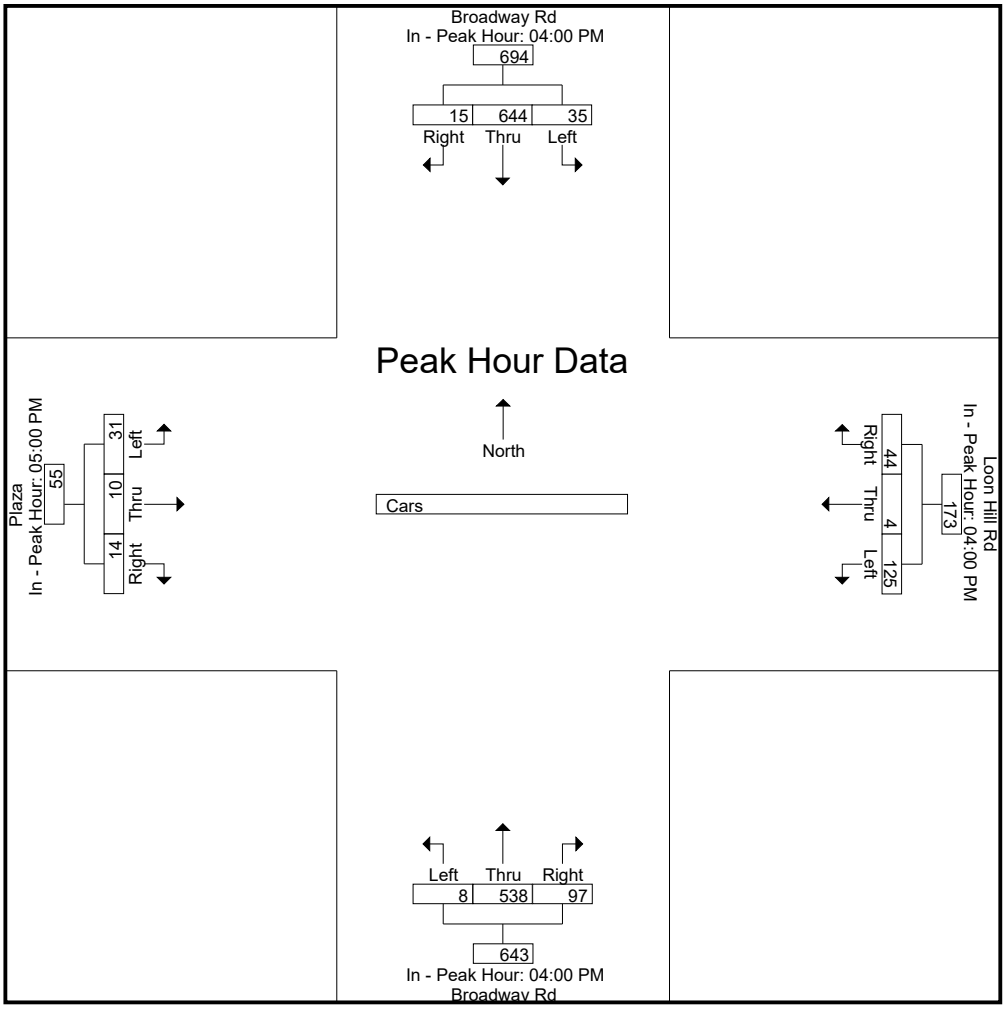
	04:00 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	8	159	2	169	32	1	12	45	**4**	137	**32**	**173**	**11**	3	4	**18**
+15 mins.	6	146	3	155	30	0	9	39	2	123	22	147	5	**4**	2	11
+30 mins.	**14**	**186**	**5**	**205**	**34**	**2**	10	**46**	1	**145**	19	165	7	2	2	11
+45 mins.	7	153	5	165	29	1	**13**	43	1	133	24	158	8	1	**6**	15
Total Volume	35	644	15	694	125	4	44	173	8	538	97	643	31	10	14	55
% App. Total	5	92.8	2.2		72.3	2.3	25.4		1.2	83.7	15.1		56.4	18.2	25.5	
PHF	.625	.866	.750	.846	.919	.500	.846	.940	.500	.928	.758	.929	.705	.625	.583	.764

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 7

Groups Printed- Trucks

	Broadway Rd From North			Loon Hill Rd From East			Broadway Rd From South			Plaza From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	0	0	0	0	2	0	0	0	0	4
04:15 PM	0	1	0	0	0	0	0	5	0	0	0	0	6
04:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
04:45 PM	0	2	0	0	0	0	0	2	2	0	0	0	6
Total	0	5	0	0	0	0	0	12	2	0	0	0	19
05:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	3	0	0	0	0	0	1	1	0	0	0	5
05:45 PM	0	4	0	0	0	0	0	2	1	0	0	0	7
Total	0	8	0	0	0	0	0	5	2	0	0	0	15
Grand Total	0	13	0	0	0	0	0	17	4	0	0	0	34
Apprch %	0	100	0	0	0	0	0	81	19	0	0	0	
Total %	0	38.2	0	0	0	0	0	50	11.8	0	0	0	

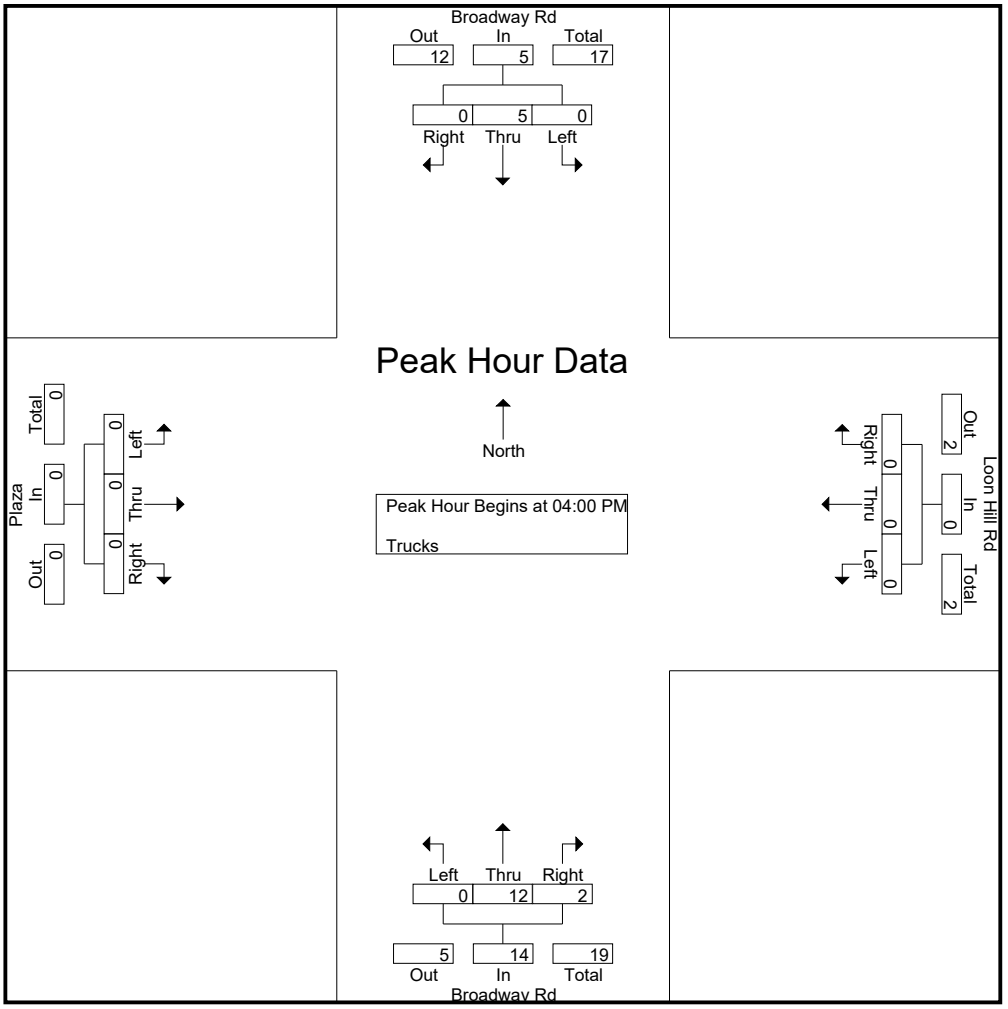
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**2**	0	**2**	0	0	0	0	0	2	0	2	0	0	0	0	4
04:15 PM	0	1	0	1	0	0	0	0	0	**5**	0	**5**	0	0	0	0	**6**
04:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
04:45 PM	0	2	0	2	0	0	0	0	0	2	**2**	4	0	0	0	0	6
Total Volume	0	5	0	5	0	0	0	0	0	12	2	14	0	0	0	0	19
% App. Total	0	100	0		0	0	0		0	85.7	14.3		0	0	0		
PHF	.000	.625	.000	.625	.000	.000	.000	.000	.000	.600	.250	.700	.000	.000	.000	.000	.792

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

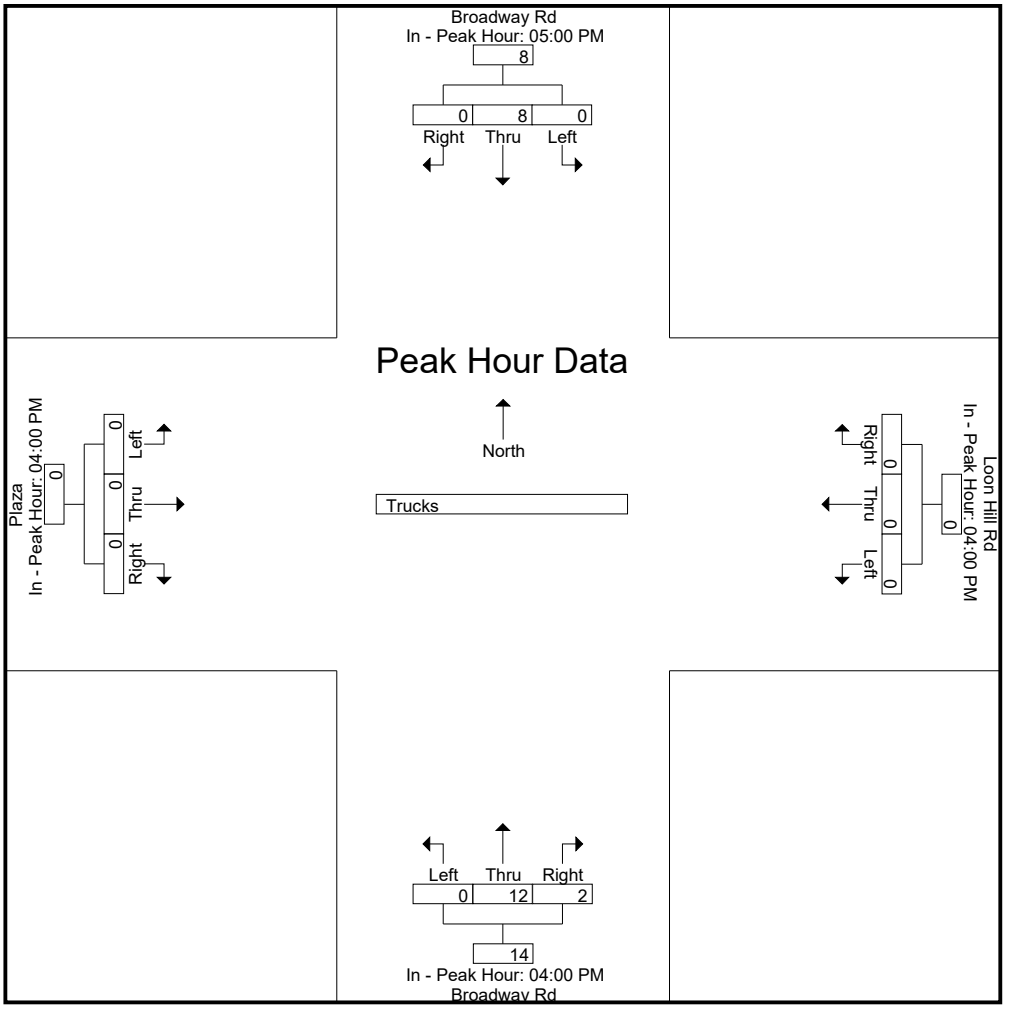
	05:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**5**	0	**5**	0	0	0	0
+30 mins.	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0
+45 mins.	0	**4**	0	**4**	0	0	0	0	0	2	**2**	4	0	0	0	0
Total Volume	0	8	0	8	0	0	0	0	0	12	2	14	0	0	0	0
% App. Total	0	100	0		0	0	0		0	85.7	14.3		0	0	0	
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.600	.250	.700	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 10

Groups Printed- Bikes Peds

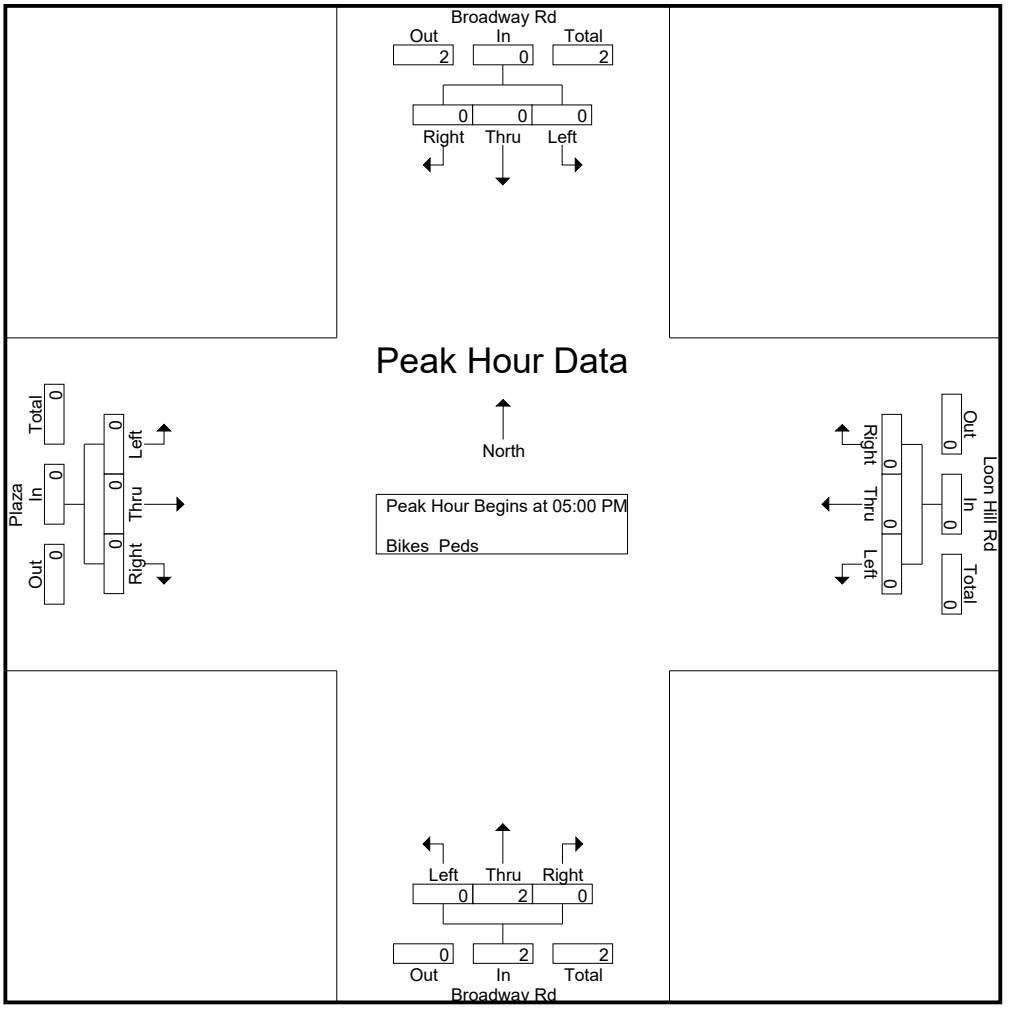
	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6
04:15 PM	0	1	0	7	0	0	0	1	0	0	0	2	0	0	0	0	10	1	11
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	13	0	0	0	2	0	0	0	2	0	0	0	0	17	1	18
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2
05:15 PM	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	3	7	0	7
05:30 PM	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	2	1	3
05:45 PM	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	0	3	1	4
Total	0	0	0	4	0	0	0	4	0	2	0	2	0	0	0	4	14	2	16
Grand Total	0	1	0	17	0	0	0	6	0	2	0	4	0	0	0	4	31	3	34
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	33.3	0		0	0	0		0	66.7	0		0	0	0		91.2	8.8	

	Broadway Rd From North				Loon Hill Rd From East				Broadway Rd From South				Plaza From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 11



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

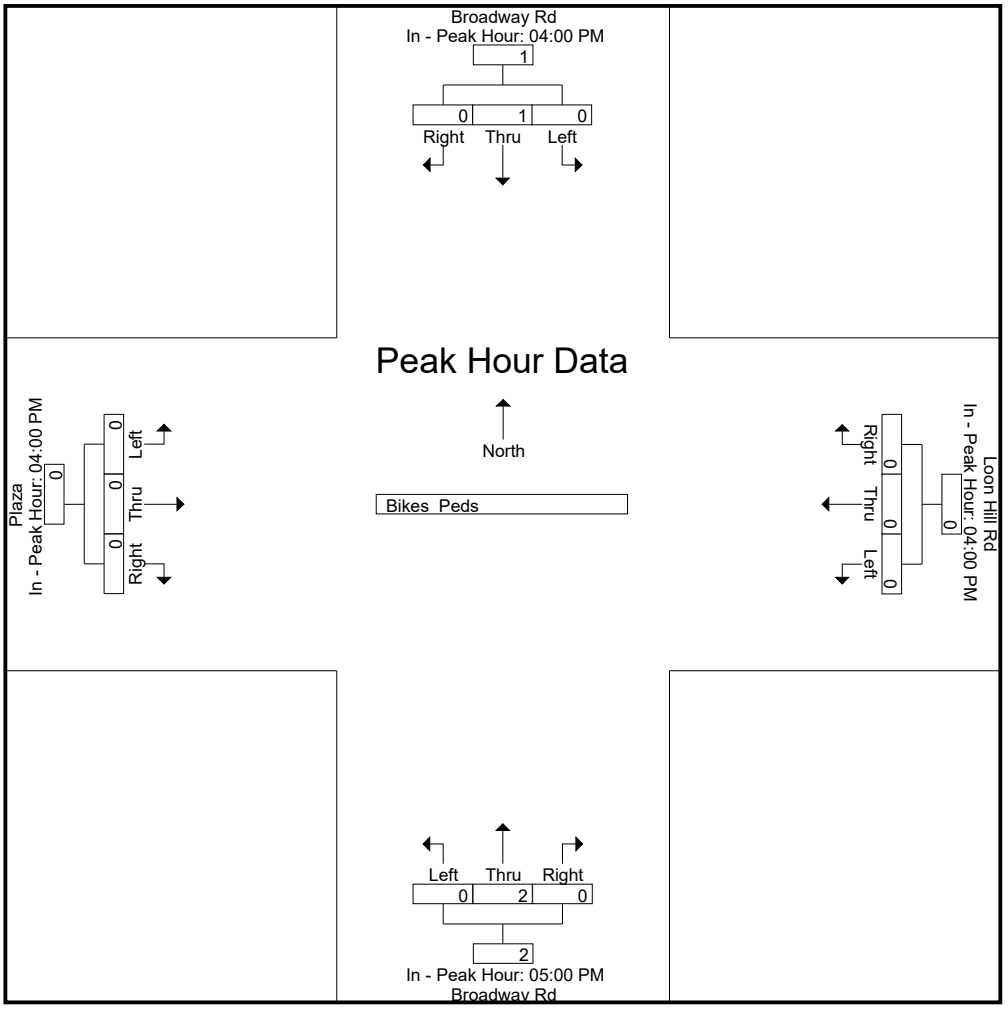
	04:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Loon Hill Road / Plaza
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097002
Site Code : 23097002
Start Date : 10/25/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	60	3	19	8	7	4	75	7	5	6	9	207
07:15 AM	8	72	1	9	3	6	2	72	9	4	15	11	212
07:30 AM	10	75	3	10	11	3	3	81	12	8	14	5	235
07:45 AM	6	70	3	11	6	6	2	68	9	11	10	11	213
Total	28	277	10	49	28	22	11	296	37	28	45	36	867
08:00 AM	13	68	1	12	8	4	2	67	11	7	13	6	212
08:15 AM	15	69	4	13	13	11	4	75	7	8	13	8	240
08:30 AM	5	72	4	5	5	13	3	77	7	2	8	10	211
08:45 AM	6	96	7	15	3	2	5	77	8	6	4	9	238
Total	39	305	16	45	29	30	14	296	33	23	38	33	901
Grand Total	67	582	26	94	57	52	25	592	70	51	83	69	1768
Apprch %	9.9	86.2	3.9	46.3	28.1	25.6	3.6	86.2	10.2	25.1	40.9	34	
Total %	3.8	32.9	1.5	5.3	3.2	2.9	1.4	33.5	4	2.9	4.7	3.9	
Cars	64	557	25	93	55	50	25	578	68	51	82	68	1716
% Cars	95.5	95.7	96.2	98.9	96.5	96.2	100	97.6	97.1	100	98.8	98.6	97.1
Trucks	3	25	1	1	2	2	0	14	2	0	1	1	52
% Trucks	4.5	4.3	3.8	1.1	3.5	3.8	0	2.4	2.9	0	1.2	1.4	2.9

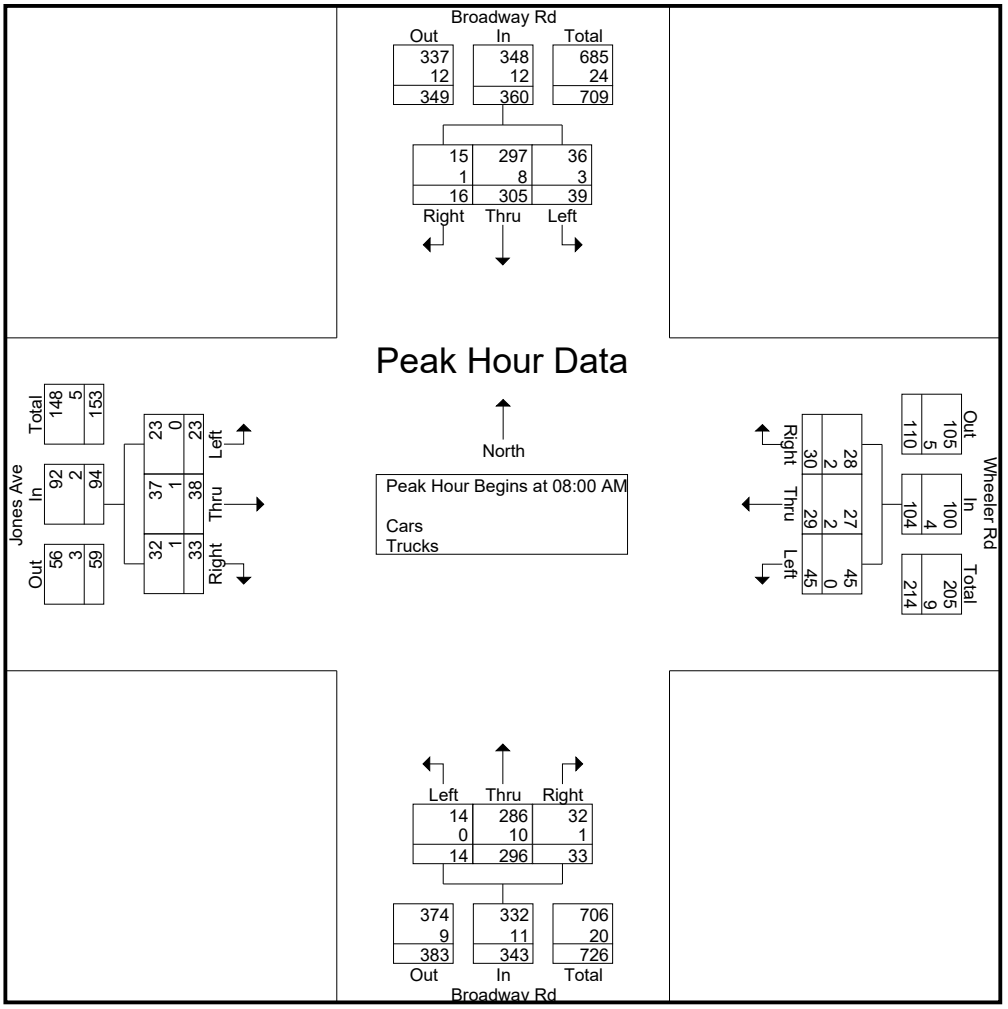
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	13	68	1	82	12	8	4	24	2	67	**11**	80	7	**13**	6	26	212
08:15 AM	**15**	69	4	88	13	**13**	11	**37**	4	75	7	86	**8**	13	8	**29**	**240**
08:30 AM	5	72	4	81	5	5	**13**	23	3	**77**	7	87	2	8	**10**	20	211
08:45 AM	6	**96**	**7**	**109**	**15**	3	2	20	**5**	77	8	**90**	6	4	9	19	238
Total Volume	39	305	16	360	45	29	30	104	14	296	33	343	23	38	33	94	901
% App. Total	10.8	84.7	4.4		43.3	27.9	28.8		4.1	86.3	9.6		24.5	40.4	35.1		
PHF	.650	.794	.571	.826	.750	.558	.577	.703	.700	.961	.750	.953	.719	.731	.825	.810	.939
Cars	36	297	15	348	45	27	28	100	14	286	32	332	23	37	32	92	872
% Cars	92.3	97.4	93.8	96.7	100	93.1	93.3	96.2	100	96.6	97.0	96.8	100	97.4	97.0	97.9	96.8
Trucks	3	8	1	12	0	2	2	4	0	10	1	11	0	1	1	2	29
% Trucks	7.7	2.6	6.3	3.3	0	6.9	6.7	3.8	0	3.4	3.0	3.2	0	2.6	3.0	2.1	3.2

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

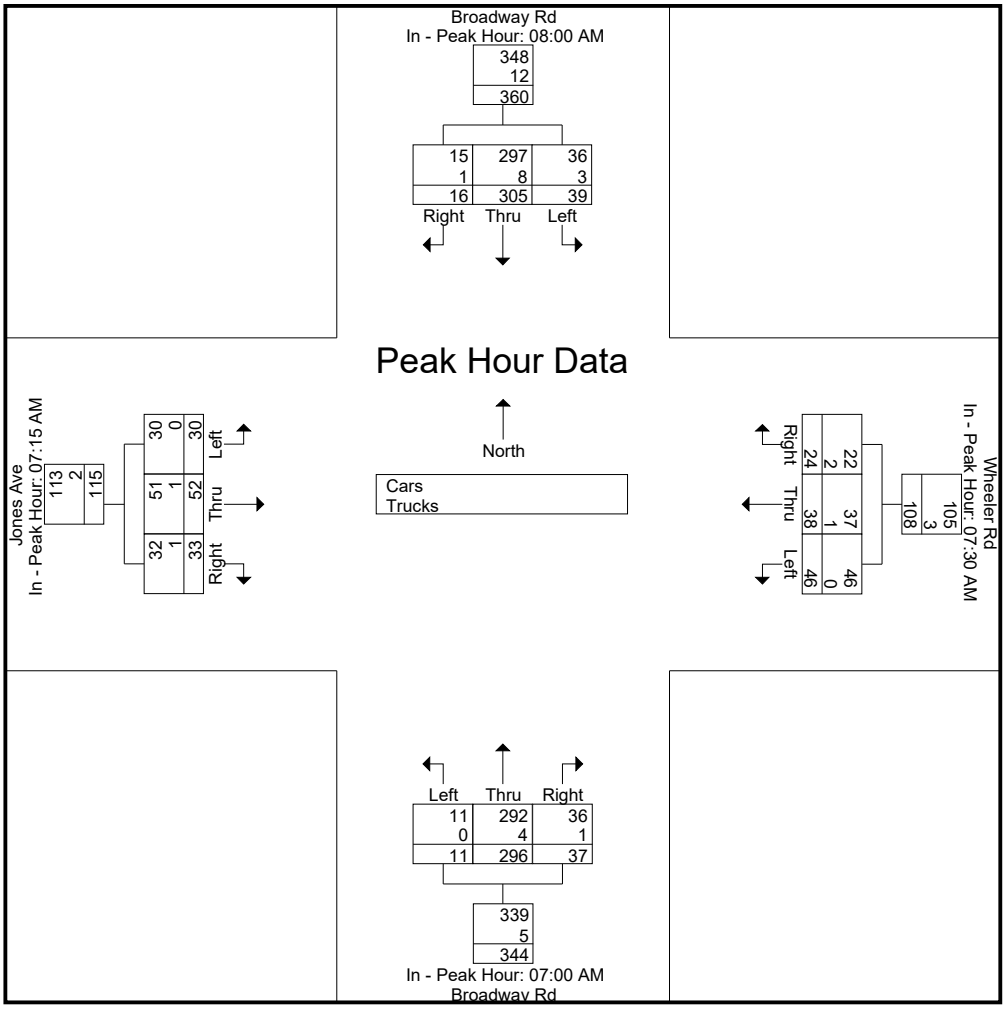
	08:00 AM				07:30 AM				07:00 AM				07:15 AM			
+0 mins.	13	68	1	82	10	11	3	24	**4**	75	7	86	4	**15**	**11**	30
+15 mins.	**15**	69	4	88	11	6	6	23	2	72	9	83	8	14	5	27
+30 mins.	5	72	4	81	12	8	4	24	3	**81**	**12**	**96**	**11**	10	11	**32**
+45 mins.	6	**96**	**7**	**109**	**13**	**13**	**11**	**37**	2	68	9	79	7	13	6	26
Total Volume	39	305	16	360	46	38	24	108	11	296	37	344	30	52	33	115
% App. Total	10.8	84.7	4.4		42.6	35.2	22.2		3.2	86	10.8		26.1	45.2	28.7	
PHF	.650	.794	.571	.826	.885	.731	.545	.730	.688	.914	.771	.896	.682	.867	.750	.898
Cars	36	297	15	348	46	37	22	105	11	292	36	339	30	51	32	113
% Cars	92.3	97.4	93.8	96.7	100	97.4	91.7	97.2	100	98.6	97.3	98.5	100	98.1	97	98.3
Trucks	3	8	1	12	0	1	2	3	0	4	1	5	0	1	1	2
% Trucks	7.7	2.6	6.2	3.3	0	2.6	8.3	2.8	0	1.4	2.7	1.5	0	1.9	3	1.7

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023

Groups Printed- Cars

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	57	3	18	8	7	4	75	7	5	6	9	203
07:15 AM	8	67	1	9	3	6	2	71	9	4	15	11	206
07:30 AM	10	69	3	10	11	3	3	79	11	8	14	5	226
07:45 AM	6	67	3	11	6	6	2	67	9	11	10	11	209
Total	28	260	10	48	28	22	11	292	36	28	45	36	844
08:00 AM	10	66	1	12	8	4	2	66	11	7	12	5	204
08:15 AM	15	69	3	13	12	9	4	72	6	8	13	8	232
08:30 AM	5	68	4	5	5	13	3	73	7	2	8	10	203
08:45 AM	6	94	7	15	2	2	5	75	8	6	4	9	233
Total	36	297	15	45	27	28	14	286	32	23	37	32	872
Grand Total	64	557	25	93	55	50	25	578	68	51	82	68	1716
Apprch %	9.9	86.2	3.9	47	27.8	25.3	3.7	86.1	10.1	25.4	40.8	33.8	
Total %	3.7	32.5	1.5	5.4	3.2	2.9	1.5	33.7	4	3	4.8	4	

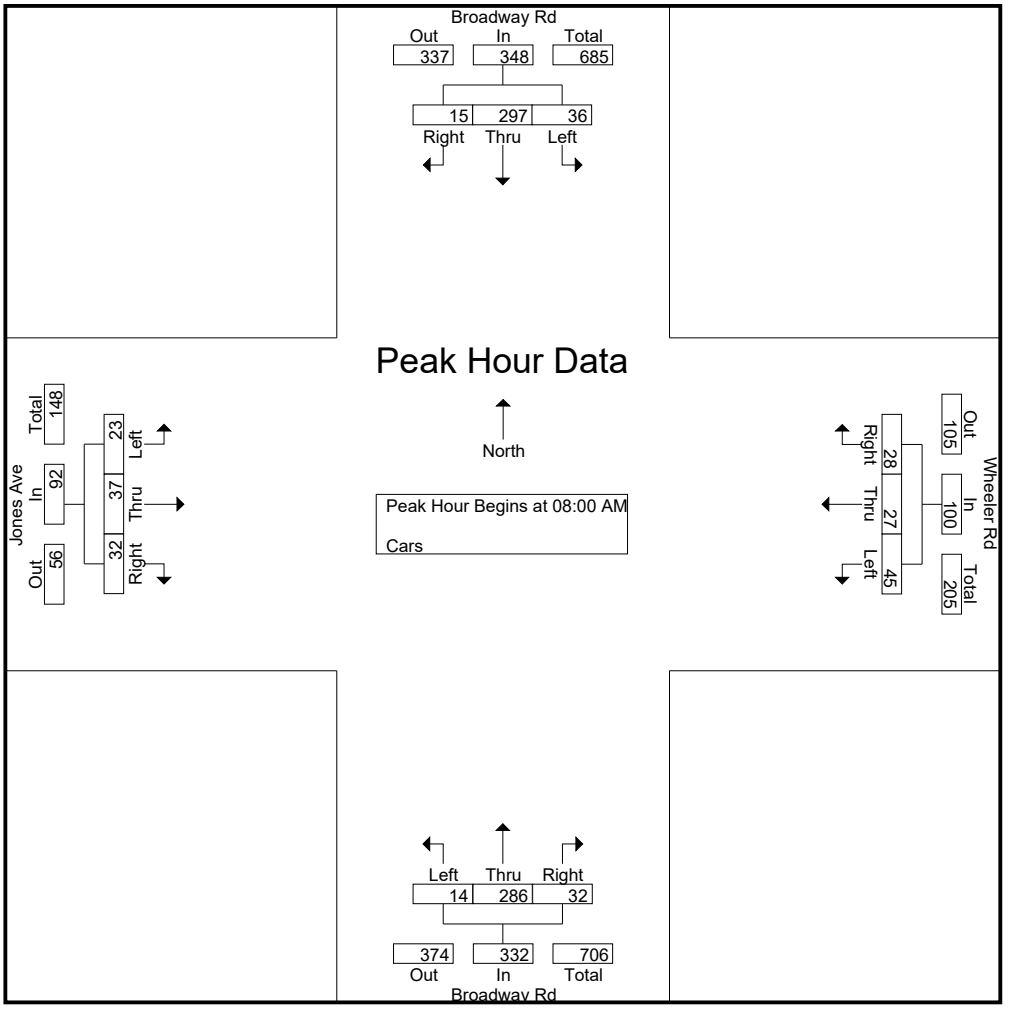
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	10	66	1	77	12	8	4	24	2	66	**11**	79	7	12	5	24	204
08:15 AM	**15**	69	3	87	13	**12**	9	**34**	4	72	6	82	**8**	**13**	8	**29**	232
08:30 AM	5	68	4	77	5	5	**13**	23	3	73	7	83	2	8	**10**	20	203
08:45 AM	6	**94**	**7**	**107**	**15**	2	2	19	**5**	**75**	8	**88**	6	4	9	19	**233**
Total Volume	36	297	15	348	45	27	28	100	14	286	32	332	23	37	32	92	872
% App. Total	10.3	85.3	4.3		45	27	28		4.2	86.1	9.6		25	40.2	34.8		
PHF	.600	.790	.536	.813	.750	.563	.538	.735	.700	.953	.727	.943	.719	.712	.800	.793	.936

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

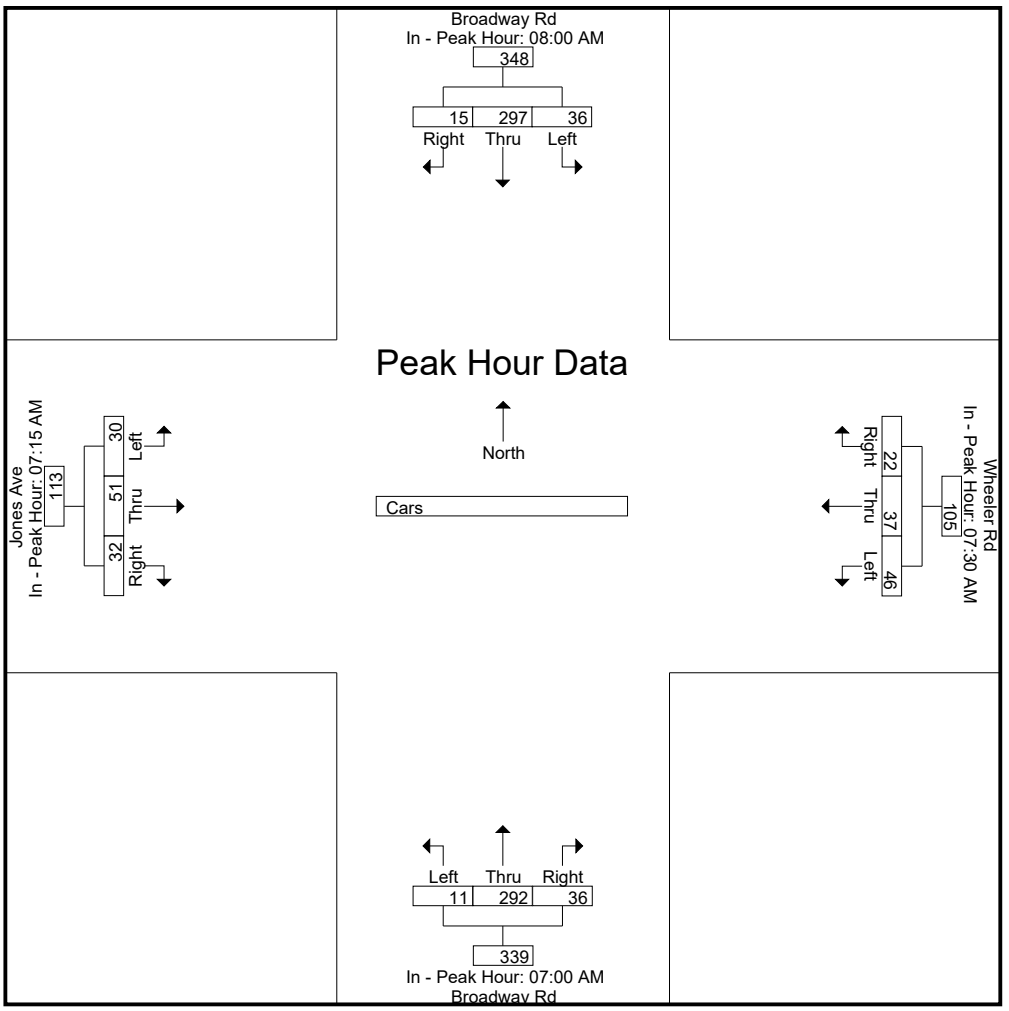
	08:00 AM				07:30 AM				07:00 AM				07:15 AM			
+0 mins.	10	66	1	77	10	11	3	24	**4**	75	7	86	4	**15**	**11**	30
+15 mins.	**15**	69	3	87	11	6	6	23	2	71	9	82	8	14	5	27
+30 mins.	5	68	4	77	12	8	4	24	3	**79**	**11**	**93**	**11**	10	11	**32**
+45 mins.	6	**94**	**7**	**107**	**13**	**12**	**9**	**34**	2	67	9	78	7	12	5	24
Total Volume	36	297	15	348	46	37	22	105	11	292	36	339	30	51	32	113
% App. Total	10.3	85.3	4.3		43.8	35.2	21		3.2	86.1	10.6		26.5	45.1	28.3	
PHF	.600	.790	.536	.813	.885	.771	.611	.772	.688	.924	.818	.911	.682	.850	.727	.883

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023

Groups Printed- Trucks

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	3	0	1	0	0	0	0	0	0	0	0	4
07:15 AM	0	5	0	0	0	0	0	1	0	0	0	0	6
07:30 AM	0	6	0	0	0	0	0	2	1	0	0	0	9
07:45 AM	0	3	0	0	0	0	0	1	0	0	0	0	4
Total	0	17	0	1	0	0	0	4	1	0	0	0	23
08:00 AM	3	2	0	0	0	0	0	1	0	0	1	1	8
08:15 AM	0	0	1	0	1	2	0	3	1	0	0	0	8
08:30 AM	0	4	0	0	0	0	0	4	0	0	0	0	8
08:45 AM	0	2	0	0	1	0	0	2	0	0	0	0	5
Total	3	8	1	0	2	2	0	10	1	0	1	1	29
Grand Total	3	25	1	1	2	2	0	14	2	0	1	1	52
Apprch %	10.3	86.2	3.4	20	40	40	0	87.5	12.5	0	50	50	
Total %	5.8	48.1	1.9	1.9	3.8	3.8	0	26.9	3.8	0	1.9	1.9	

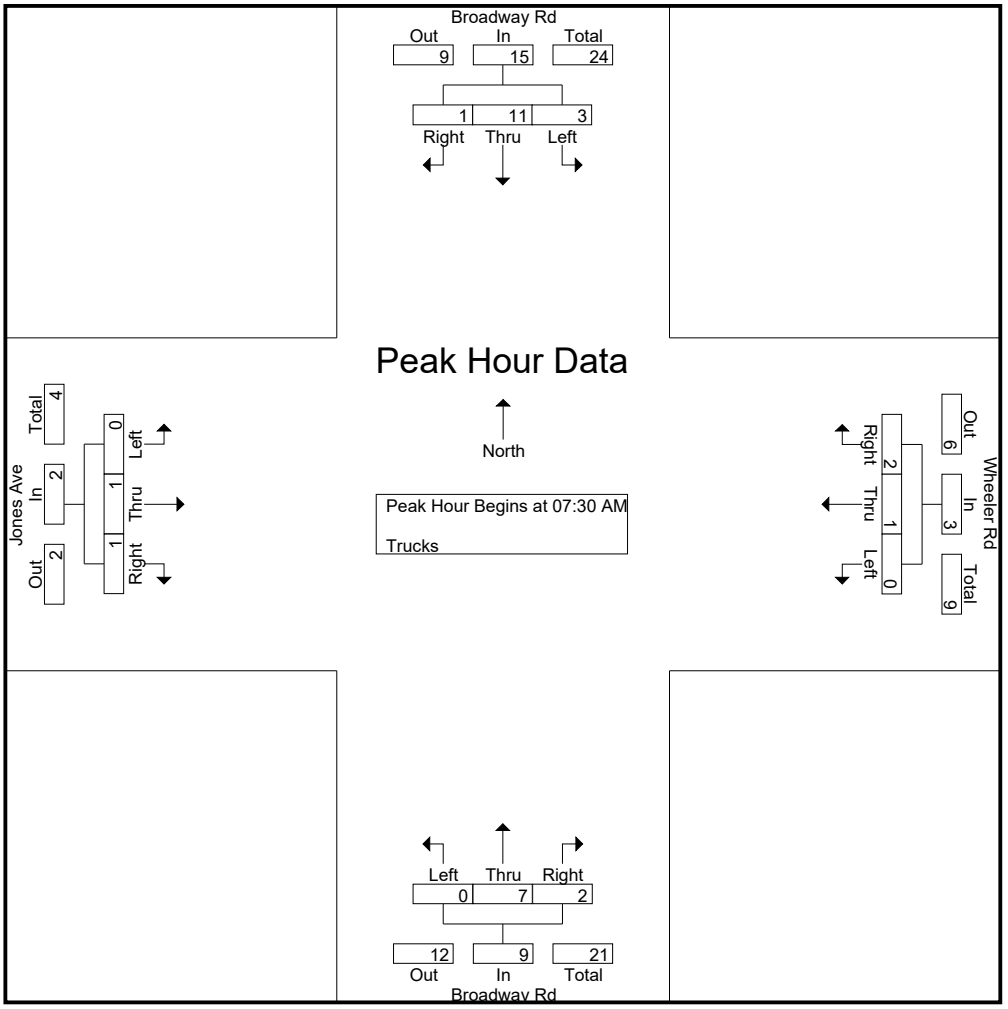
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**6**	0	**6**	0	0	0	0	0	2	**1**	3	0	0	0	0	**9**
07:45 AM	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
08:00 AM	**3**	2	0	5	0	0	0	0	0	1	0	1	0	**1**	**1**	**2**	8
08:15 AM	0	0	**1**	1	0	**1**	**2**	**3**	0	**3**	1	**4**	0	0	0	0	8
Total Volume	3	11	1	15	0	1	2	3	0	7	2	9	0	1	1	2	29
% App. Total	20	73.3	6.7		0	33.3	66.7		0	77.8	22.2		0	50	50		
PHF	.250	.458	.250	.625	.000	.250	.250	.250	.000	.583	.500	.563	.000	.250	.250	.250	.806

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 8



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				08:00 AM				07:15 AM			
+0 mins.	0	5	0	5	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	**6**	0	**6**	0	**1**	**2**	**3**	0	3	**1**	**4**	0	0	0	0
+30 mins.	0	3	0	3	0	0	0	0	0	**4**	0	4	0	0	0	0
+45 mins.	**3**	2	0	5	0	1	0	1	0	2	0	2	0	**1**	**1**	**2**
Total Volume	3	16	0	19	0	2	2	4	0	10	1	11	0	1	1	2
% App. Total	15.8	84.2	0		0	50	50		0	90.9	9.1		0	50	50	
PHF	.250	.667	.000	.792	.000	.500	.250	.333	.000	.625	.250	.688	.000	.250	.250	.250

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
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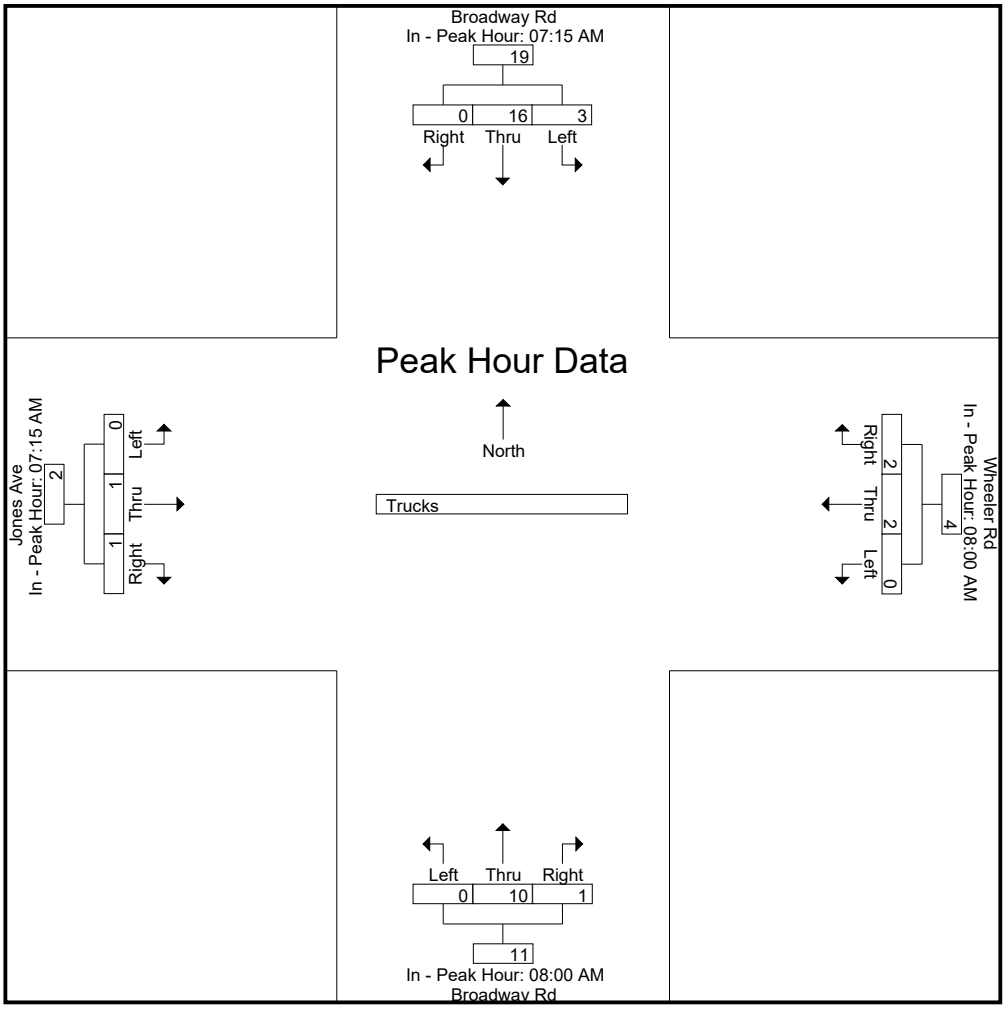

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 10

Groups Printed- Bikes Peds

	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Grand Total	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	3
Apprch %	0	100	0		0	0	0		100	0	0		0	0	0				
Total %	0	66.7	0		0	0	0		33.3	0	0		0	0	0		0	100	

	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
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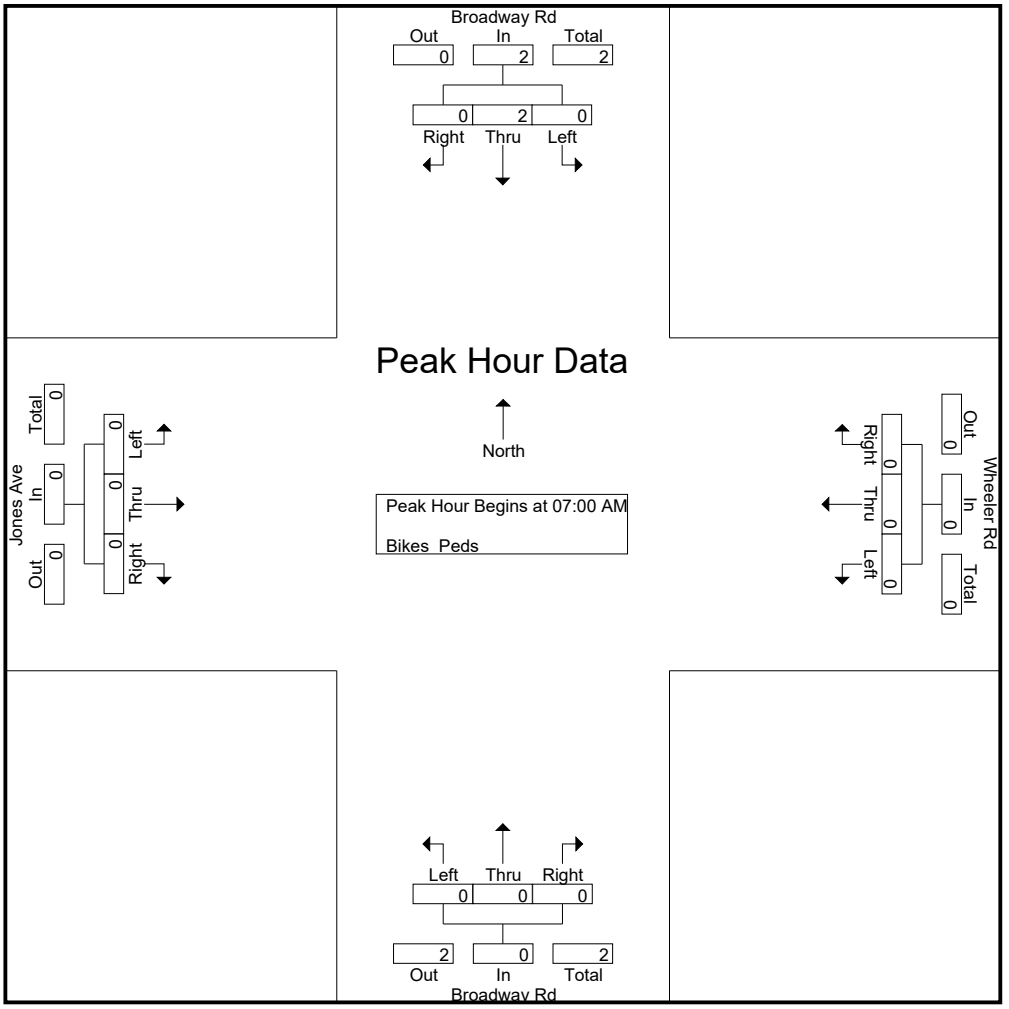

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				07:00 AM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	**1**	0	0	**1**	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0
% App. Total	0	100	0		0	0	0		100	0	0		0	0	0	
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
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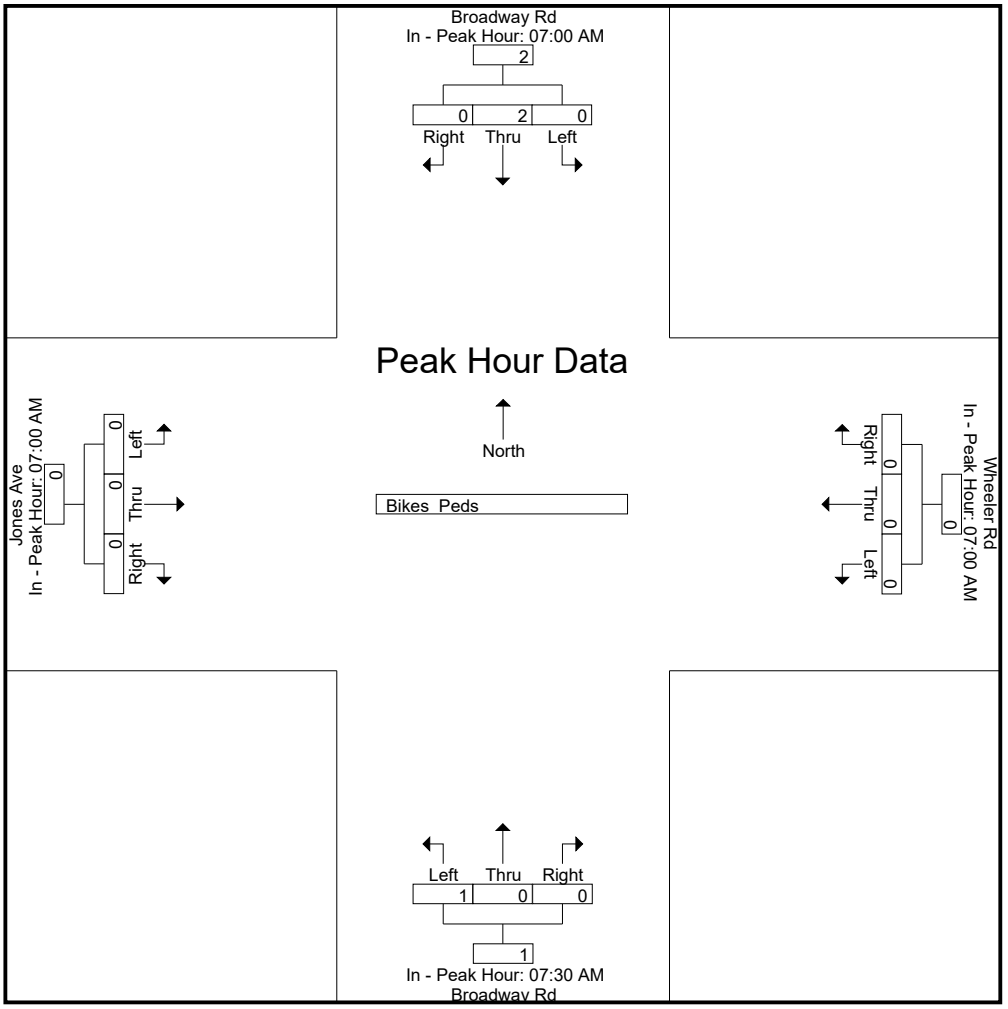


Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 1

Groups Printed- Cars - Trucks

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	5	121	5	11	11	1	10	70	15	3	10	4	266
04:15 PM	8	113	5	10	10	13	6	71	15	2	13	9	275
04:30 PM	7	128	3	12	11	7	7	84	18	2	14	5	298
04:45 PM	4	100	10	14	9	8	7	81	8	3	10	5	259
Total	24	462	23	47	41	29	30	306	56	10	47	23	1098
05:00 PM	7	105	2	9	18	14	7	84	10	5	9	6	276
05:15 PM	7	115	5	11	14	7	5	79	9	9	8	8	277
05:30 PM	4	106	6	11	11	3	10	81	9	8	10	5	264
05:45 PM	2	99	3	9	15	5	9	50	19	2	19	8	240
Total	20	425	16	40	58	29	31	294	47	24	46	27	1057
Grand Total	44	887	39	87	99	58	61	600	103	34	93	50	2155
Apprch %	4.5	91.4	4	35.7	40.6	23.8	8	78.5	13.5	19.2	52.5	28.2	
Total %	2	41.2	1.8	4	4.6	2.7	2.8	27.8	4.8	1.6	4.3	2.3	
Cars	44	882	38	86	99	56	61	584	103	33	93	49	2128
% Cars	100	99.4	97.4	98.9	100	96.6	100	97.3	100	97.1	100	98	98.7
Trucks	0	5	1	1	0	2	0	16	0	1	0	1	27
% Trucks	0	0.6	2.6	1.1	0	3.4	0	2.7	0	2.9	0	2	1.3

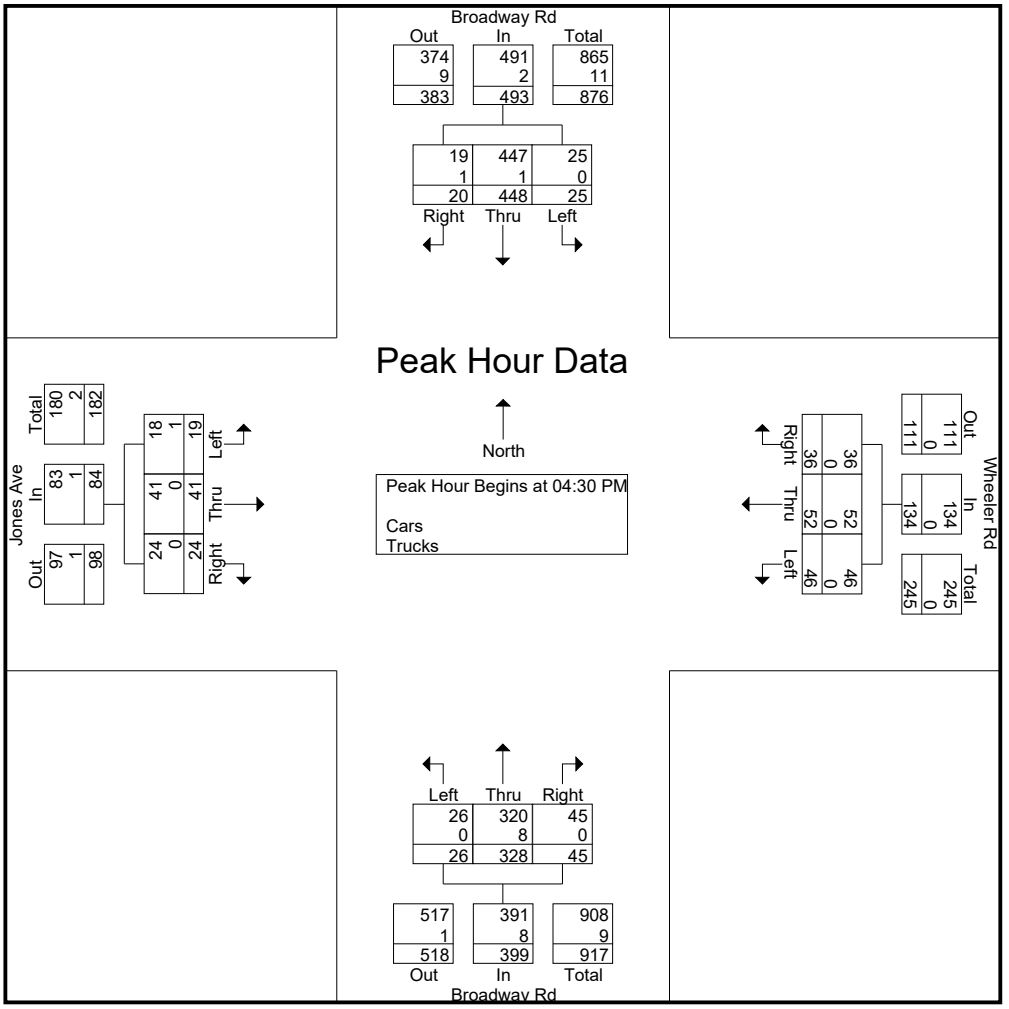
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**7**	**128**	3	**138**	12	11	7	30	**7**	**84**	**18**	**109**	2	**14**	5	21	**298**
04:45 PM	4	100	**10**	114	**14**	9	8	31	7	81	8	96	3	10	5	18	259
05:00 PM	7	105	2	114	9	**18**	**14**	**41**	7	84	10	101	5	9	6	20	276
05:15 PM	7	115	5	127	11	14	7	32	5	79	9	93	**9**	8	**8**	**25**	277
Total Volume	25	448	20	493	46	52	36	134	26	328	45	399	19	41	24	84	1110
% App. Total	5.1	90.9	4.1		34.3	38.8	26.9		6.5	82.2	11.3		22.6	48.8	28.6		
PHF	.893	.875	.500	.893	.821	.722	.643	.817	.929	.976	.625	.915	.528	.732	.750	.840	.931
Cars	25	447	19	491	46	52	36	134	26	320	45	391	18	41	24	83	1099
% Cars	100	99.8	95.0	99.6	100	100	100	100	100	97.6	100	98.0	94.7	100	100	98.8	99.0
Trucks	0	1	1	2	0	0	0	0	0	8	0	8	1	0	0	1	11
% Trucks	0	0.2	5.0	0.4	0	0	0	0	0	2.4	0	2.0	5.3	0	0	1.2	1.0

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

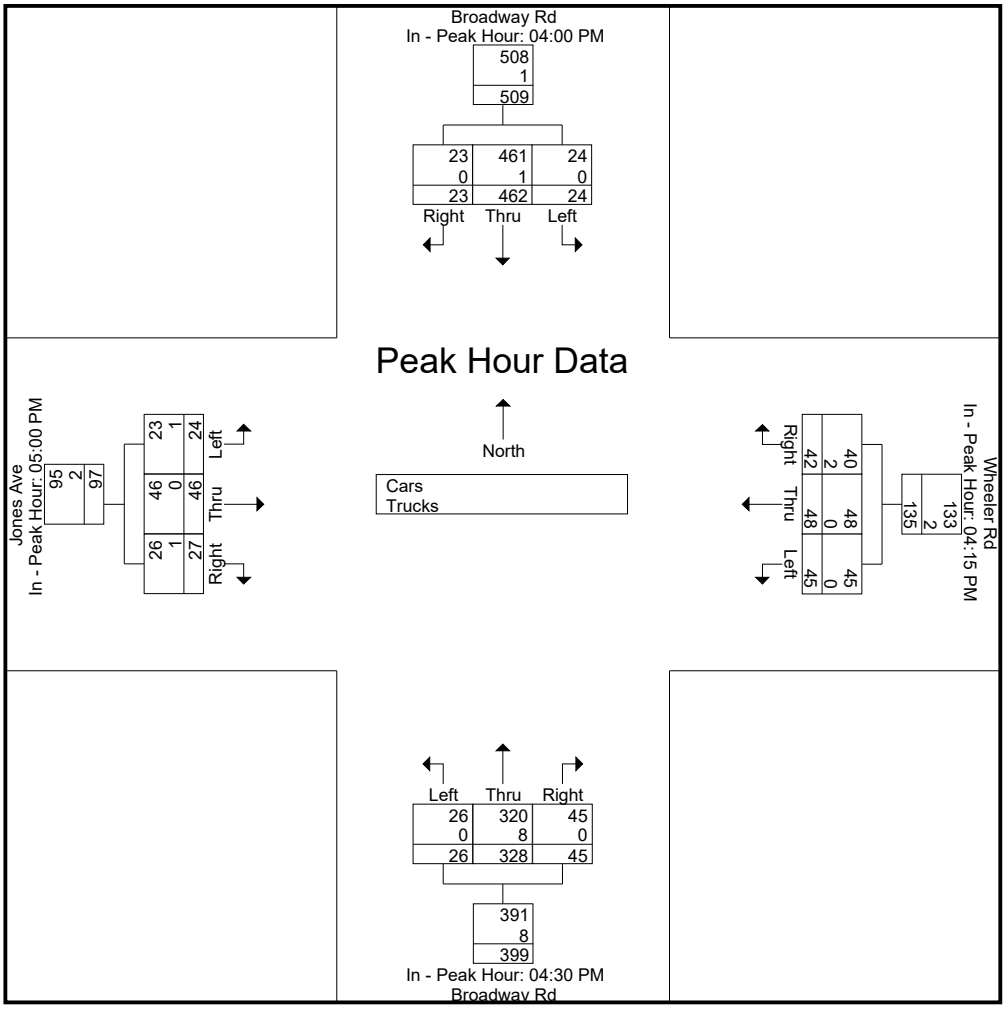
	04:00 PM				04:15 PM				04:30 PM				05:00 PM			
+0 mins.	5	121	5	131	10	10	13	33	**7**	**84**	**18**	**109**	5	9	6	20
+15 mins.	**8**	113	5	126	12	11	7	30	7	81	8	96	**9**	8	**8**	25
+30 mins.	7	**128**	3	**138**	**14**	9	8	31	7	84	10	101	8	10	5	23
+45 mins.	4	100	**10**	114	9	**18**	**14**	**41**	5	79	9	93	2	**19**	8	**29**
Total Volume	24	462	23	509	45	48	42	135	26	328	45	399	24	46	27	97
% App. Total	4.7	90.8	4.5		33.3	35.6	31.1		6.5	82.2	11.3		24.7	47.4	27.8	
PHF	.750	.902	.575	.922	.804	.667	.750	.823	.929	.976	.625	.915	.667	.605	.844	.836
Cars	24	461	23	508	45	48	40	133	26	320	45	391	23	46	26	95
% Cars	100	99.8	100	99.8	100	100	95.2	98.5	100	97.6	100	98	95.8	100	96.3	97.9
Trucks	0	1	0	1	0	0	2	2	0	8	0	8	1	0	1	2
% Trucks	0	0.2	0	0.2	0	0	4.8	1.5	0	2.4	0	2	4.2	0	3.7	2.1

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023

Groups Printed- Cars

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	5	120	5	10	11	1	10	68	15	3	10	4	262
04:15 PM	8	113	5	10	10	11	6	66	15	2	13	9	268
04:30 PM	7	128	3	12	11	7	7	82	18	2	14	5	296
04:45 PM	4	100	10	14	9	8	7	77	8	3	10	5	255
Total	24	461	23	46	41	27	30	293	56	10	47	23	1081
05:00 PM	7	104	2	9	18	14	7	83	10	4	9	6	273
05:15 PM	7	115	4	11	14	7	5	78	9	9	8	8	275
05:30 PM	4	104	6	11	11	3	10	81	9	8	10	4	261
05:45 PM	2	98	3	9	15	5	9	49	19	2	19	8	238
Total	20	421	15	40	58	29	31	291	47	23	46	26	1047
Grand Total	44	882	38	86	99	56	61	584	103	33	93	49	2128
Apprch %	4.6	91.5	3.9	35.7	41.1	23.2	8.2	78.1	13.8	18.9	53.1	28	
Total %	2.1	41.4	1.8	4	4.7	2.6	2.9	27.4	4.8	1.6	4.4	2.3	

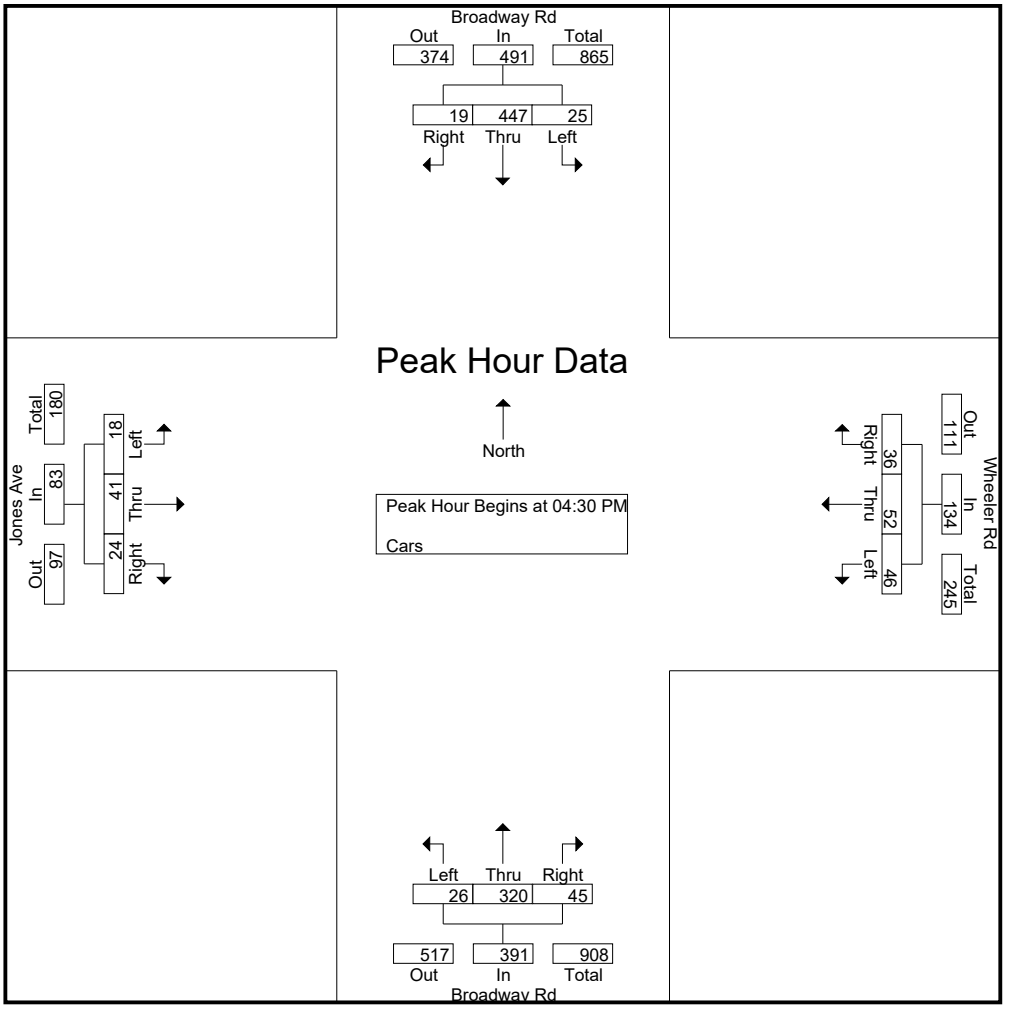
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**7**	**128**	3	**138**	12	11	7	30	**7**	82	**18**	**107**	2	**14**	5	21	**296**
04:45 PM	4	100	**10**	114	**14**	9	8	31	7	77	8	92	3	10	5	18	255
05:00 PM	7	104	2	113	9	**18**	**14**	**41**	7	**83**	10	100	4	9	6	19	273
05:15 PM	7	115	4	126	11	14	7	32	5	78	9	92	**9**	8	**8**	**25**	275
Total Volume	25	447	19	491	46	52	36	134	26	320	45	391	18	41	24	83	1099
% App. Total	5.1	91	3.9		34.3	38.8	26.9		6.6	81.8	11.5		21.7	49.4	28.9		
PHF	.893	.873	.475	.889	.821	.722	.643	.817	.929	.964	.625	.914	.500	.732	.750	.830	.928

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

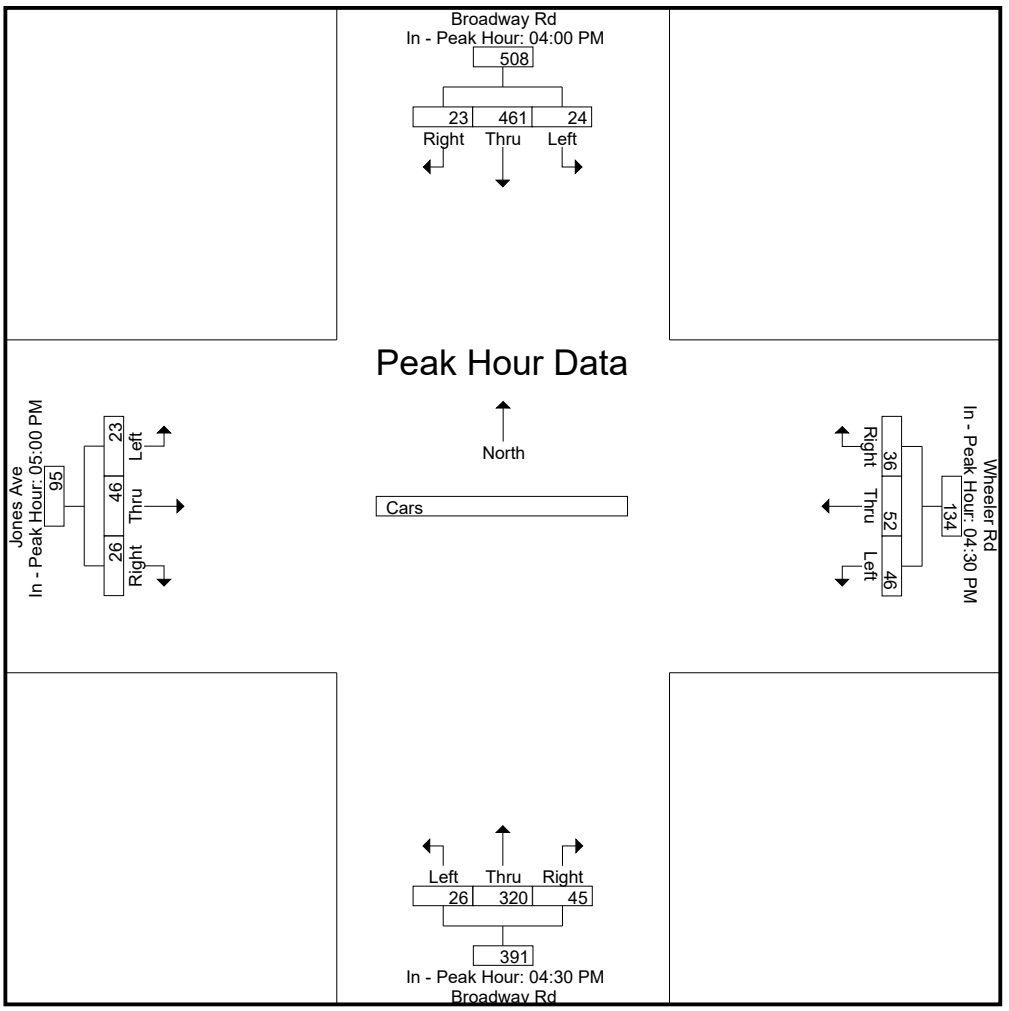
	04:00 PM				04:30 PM				04:30 PM				05:00 PM			
+0 mins.	5	120	5	130	12	11	7	30	**7**	82	**18**	**107**	4	9	6	19
+15 mins.	**8**	113	5	126	**14**	9	8	31	7	77	8	92	**9**	8	**8**	25
+30 mins.	7	**128**	3	**138**	9	**18**	**14**	**41**	7	**83**	10	100	8	10	4	22
+45 mins.	4	100	**10**	114	11	14	7	32	5	78	9	92	2	**19**	8	**29**
Total Volume	24	461	23	508	46	52	36	134	26	320	45	391	23	46	26	95
% App. Total	4.7	90.7	4.5		34.3	38.8	26.9		6.6	81.8	11.5		24.2	48.4	27.4	
PHF	.750	.900	.575	.920	.821	.722	.643	.817	.929	.964	.625	.914	.639	.605	.813	.819

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 7

Groups Printed- Trucks

	Broadway Rd From North			Wheeler Rd From East			Broadway Rd From South			Jones Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	0	1	0	0	0	2	0	0	0	0	4
04:15 PM	0	0	0	0	0	2	0	5	0	0	0	0	7
04:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	4	0	0	0	0	4
Total	0	1	0	1	0	2	0	13	0	0	0	0	17
05:00 PM	0	1	0	0	0	0	0	1	0	1	0	0	3
05:15 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
05:30 PM	0	2	0	0	0	0	0	0	0	0	0	1	3
05:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	4	1	0	0	0	0	3	0	1	0	1	10
Grand Total	0	5	1	1	0	2	0	16	0	1	0	1	27
Apprch %	0	83.3	16.7	33.3	0	66.7	0	100	0	50	0	50	
Total %	0	18.5	3.7	3.7	0	7.4	0	59.3	0	3.7	0	3.7	

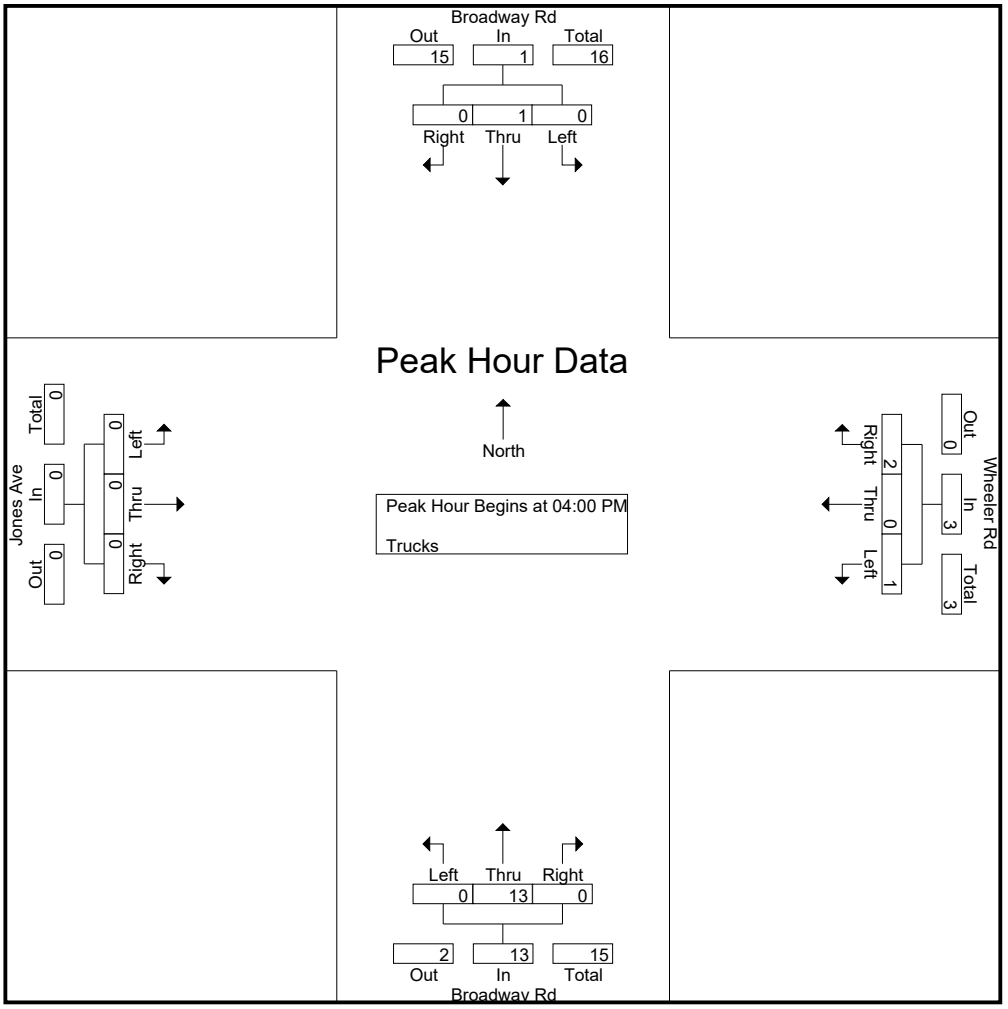
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**1**	0	**1**	**1**	0	0	1	0	2	0	2	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	**2**	**2**	0	**5**	0	**5**	0	0	0	0	**7**
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	4
Total Volume	0	1	0	1	1	0	2	3	0	13	0	13	0	0	0	0	17
% App. Total	0	100	0		33.3	0	66.7		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.250	.000	.250	.375	.000	.650	.000	.650	.000	.000	.000	.000	.607

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

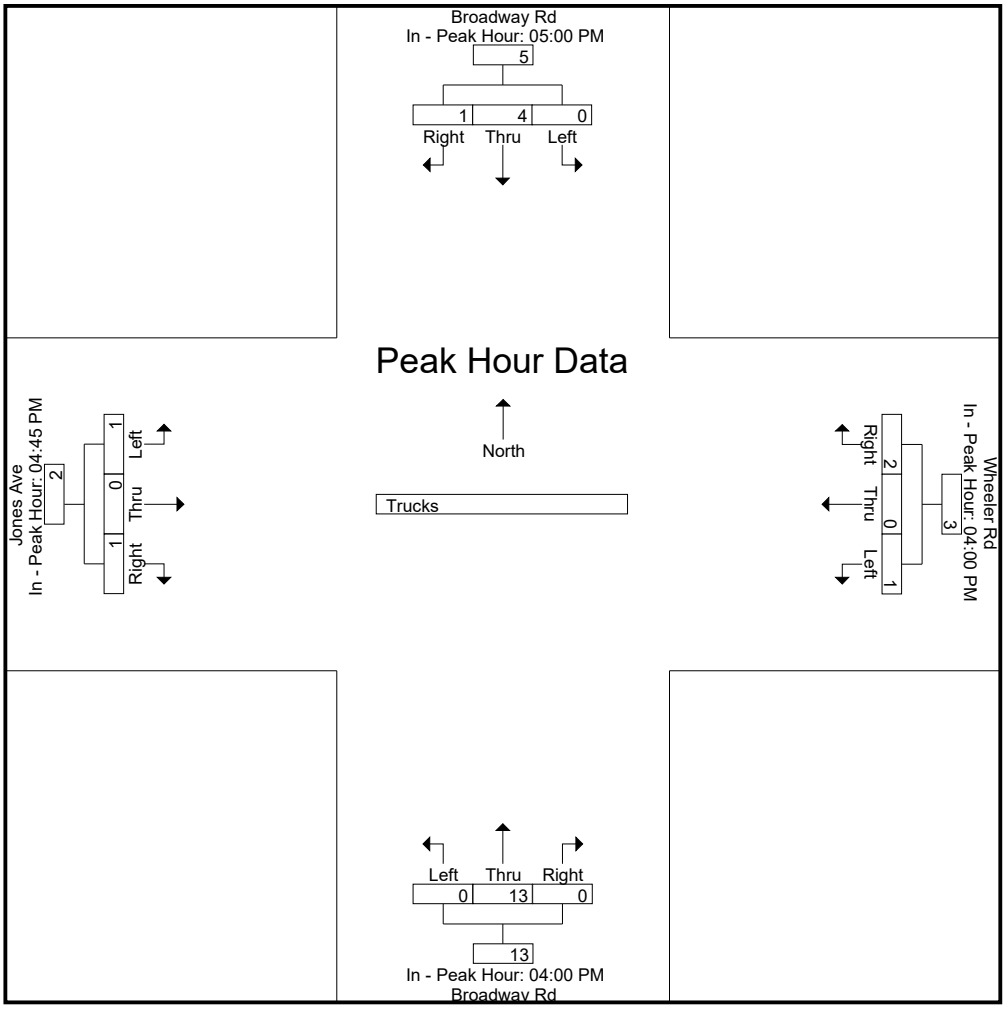
	05:00 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	0	1	0	1	**1**	0	0	1	0	2	0	2	0	0	0	0
+15 mins.	0	0	**1**	1	0	0	**2**	**2**	0	**5**	0	**5**	**1**	0	0	**1**
+30 mins.	0	**2**	0	**2**	0	0	0	0	0	2	0	2	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	4	0	4	0	0	**1**	1
Total Volume	0	4	1	5	1	0	2	3	0	13	0	13	1	0	1	2
% App. Total	0	80	20		33.3	0	66.7		0	100	0		50	0	50	
PHF	.000	.500	.250	.625	.250	.000	.250	.375	.000	.650	.000	.650	.250	.000	.250	.500

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023

Groups Printed- Bikes Peds

	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

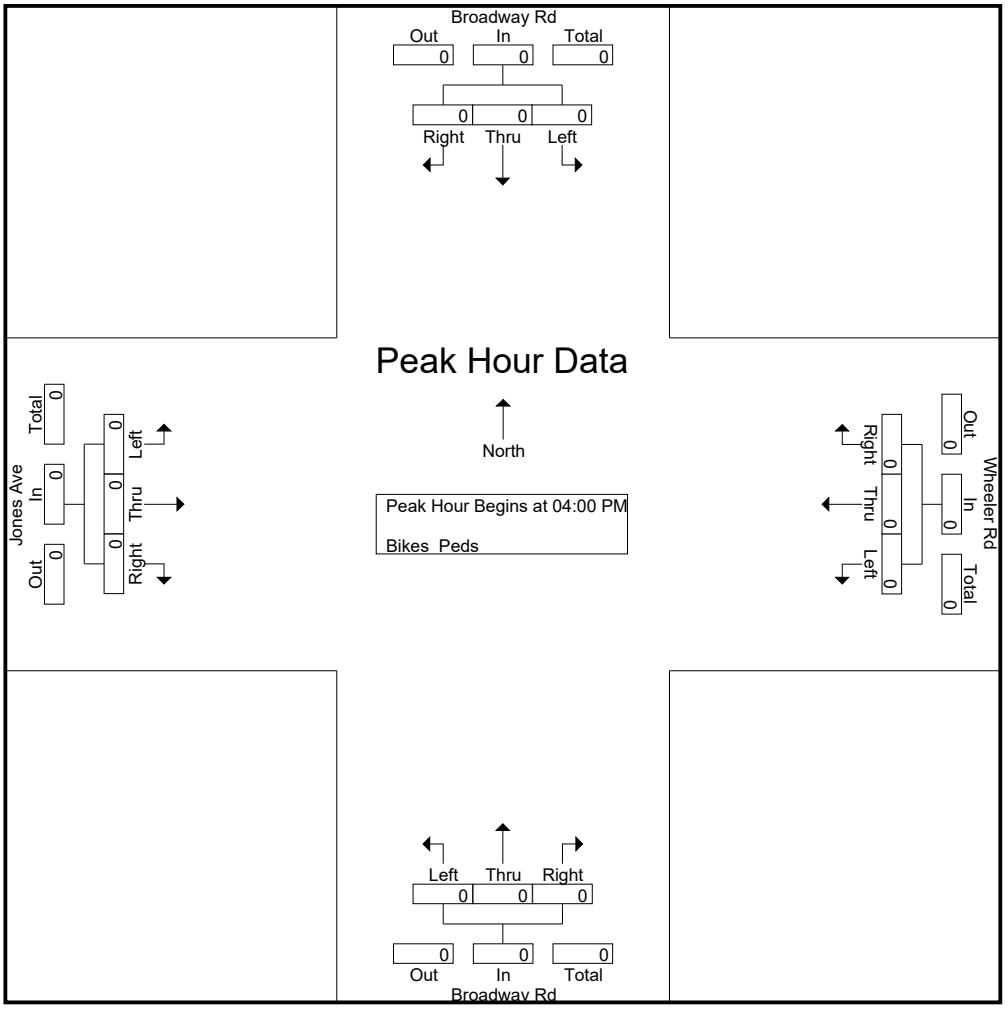
	Broadway Rd From North				Wheeler Rd From East				Broadway Rd From South				Jones Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

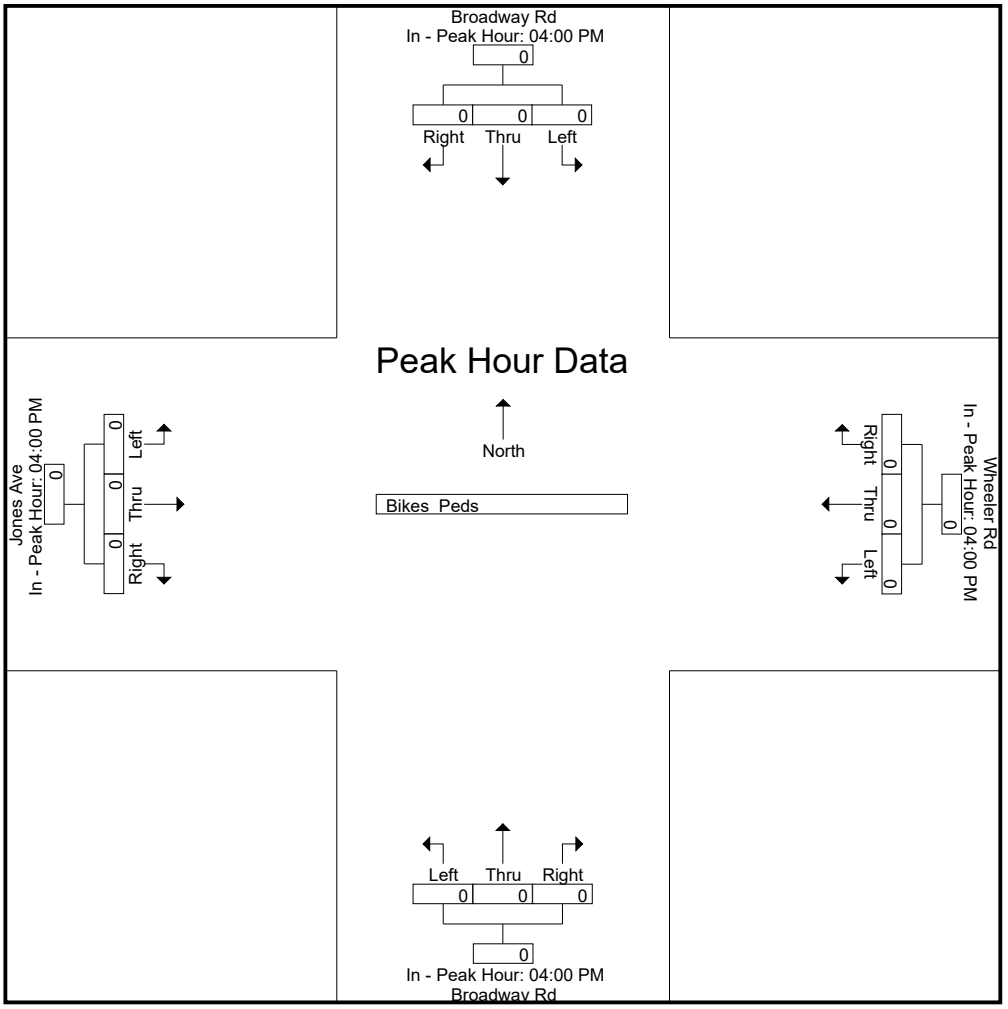
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Broadway Road
E/W Street : Wheeler Rd / Jones Ave
City/State : Dracut, MA
Weather : Clear / Cloudy

File Name : 23097003
Site Code : 23097003
Start Date : 10/25/2023
Page No : 12



Seasonal Adjustment Data

Massachusetts Highway Department
Statewide Traffic Data Collection
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

9/25/2024

Motor Vehicle Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : DRACUT COUNT DATE : Jul-24

DISTRICT : 4 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY ROAD/WILLARD STREET (ROUTE 113)

MINOR STREET(S) : ARLINGTON STREET

INTERSECTION DIAGRAM
(Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	590	267	250	866		**1,973**

" K " FACTOR : **0.102** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **19,343**

TOTAL # OF CRASHES :	24	# OF YEARS :	5	AVERAGE # OF CRASHES PER YEAR (**A**) :	**4.80**

CRASH RATE CALCULATION : **0.68** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Source : MassDOT Crash Portal

Project Title & Date: Residential Development - Dracut, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : DRACUT COUNT DATE : Jul-24

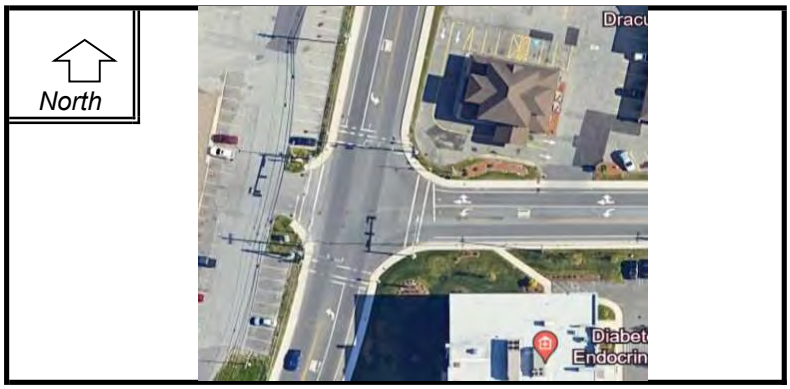
DISTRICT : 4 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY ROAD (ROUTE 113)

MINOR STREET(S) : LOON HILL ROAD

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	50	174	664	705		**1,593**

" K " FACTOR : **0.102** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **15,618**

TOTAL # OF CRASHES : 11 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.20**

CRASH RATE CALCULATION : **0.39** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Source : MassDOT Crash Portal

Project Title & Date: Residential Development - Dracut, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : DRACUT COUNT DATE : Jul-24

DISTRICT : 4 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : BROADWAY ROAD (ROUTE 113)

MINOR STREET(S) : JONES AVENUE, WHEELER ROAD

INTERSECTION DIAGRAM
(Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	84	135	402	497		**1,118**

" K " FACTOR : **0.102** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **10,961**

TOTAL # OF CRASHES : 15 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **3.00**

CRASH RATE CALCULATION : **0.75** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Source : MassDOT Crash Portal

Project Title & Date: Residential Development - Dracut, MA

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Number of Vehicles	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions	Street Number	Roadway
4079265	DRACUT	01/10/2015	Property damage only (none injured)	Closed	3:55 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Clear		ARLINGTON STREET / WILLARD STREET
4079391	DRACUT	01/24/2015	Property damage only (none injured)	Closed	9:41 AM	1	Collision with tree	Daylight	Single vehicle crash	Snow	Snow/Blowing sand, snow		PARK SQUARE Rte 113
4092699	DRACUT	03/17/2015	Non-fatal injury	Closed	8:20 PM	1	Collision with guardrail	Dark - lighted roadway	Single vehicle crash	Ice	Clear		PARK SQUARE Rte 113 E
4116603	DRACUT	09/18/2015	Non-fatal injury	Closed	12:19 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Clear/Clear	313	WILLARD STREET
4149596	DRACUT	11/08/2015	Non-fatal injury	Closed	8:22 PM	1	Collision with curb	Dark - lighted roadway	Single vehicle crash	Dry	Clear	144	ARLINGTON STREET
4149570	DRACUT	11/12/2015	Property damage only (none injured)	Closed	9:05 AM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Wet	Cloudy/Rain		BROADWAY ROAD / ARLINGTON STREET
4117210	DRACUT	11/25/2015	Property damage only (none injured)	Closed	4:15 PM	2	Collision with motor vehicle in traffic	Dusk	Angle	Dry	Clear/Unknown		WILLARD STREET / ARLINGTON STREET / BROADWAY ROAD
4255879	DRACUT	08/03/2016	Property damage only (none injured)	Closed	1:00 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Clear		ARLINGTON STREET / BROADWAY ROAD / WILLARD STREET
4258689	DRACUT	09/11/2016	Non-fatal injury	Closed	11:40 AM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Cloudy		BROADWAY ROAD / ARLINGTON STREET
4285034	DRACUT	09/18/2016	Property damage only (none injured)	Closed	12:57 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Wet	Cloudy/Rain	4	BROADWAY ROAD
4307236	DRACUT	12/05/2016	Non-fatal injury	Closed	11:10 AM	1	Collision with other light pole or other post/support	Daylight	Single vehicle crash	Wet	Cloudy/Snow		BROADWAY ROAD Rte 113 E / ARLINGTON STREET
4308578	DRACUT	12/05/2016	Property damage only (none injured)	Closed	6:40 AM	2	Collision with motor vehicle in traffic	Dawn	Front to Rear	Snow	Snow	4	BROADWAY ROAD Rte 113 S
4347178	DRACUT	02/11/2017	Property damage only (none injured)	Closed	5:35 PM	2	Collision with motor vehicle in traffic	Dark - lighted roadway	Head-on	Snow	Clear		ARLINGTON STREET / BROADWAY ROAD
4431938	DRACUT	10/01/2017	Property damage only (none injured)	Closed	8:45 AM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Clear		WILLARD ST / BROADWAY ROAD Rte 113 N / WILLARD STREET Rte 113 W
4469760	DRACUT	12/17/2017	Property damage only (none injured)	Closed	8:21 AM	2	Collision with motor vehicle in traffic	Daylight	Single vehicle crash	Dry	Clear		ARLINGTON ST / ALRINGTON STREET / BROADWAY ROAD
4496705	DRACUT	02/07/2018	Property damage only (none injured)	Closed	1:10 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Snow	Snow		ARLINGTON ST / ARLINGTON ST. / BROADWAY RD.
4498239	DRACUT	02/08/2018	Property damage only (none injured)	Closed	2:38 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Wet	Clear		BROADWAY RD / ARLINGTON ST Rte 113 E / WILLARD ST
4509942	DRACUT	03/02/2018	Property damage only (none injured)	Closed	5:58 PM	2	Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Wet	Cloudy/Rain		BROADWAY RD / ARLINGTON ST. Rte 113 E / BROADWAY RD. Rte 113 N
4579819	DRACUT	08/11/2018	Non-fatal injury	Closed	3:01 PM	2	Collision with motor vehicle in traffic	Daylight	Head-on	Wet	Rain	4	BROADWAY RD
4598825	DRACUT	09/20/2018	Non-fatal injury	Closed	9:02 PM	2	Collision with motor vehicle in traffic	Dark - lighted roadway	Head-on	Dry	Clear		BROADWAY RD / WILLARD ST. Rte 113 E / BROADWAY RD. Rte 113 W
4624163	DRACUT	11/17/2018	Property damage only (none injured)	Closed	5:06 PM	2	Collision with motor vehicle in traffic	Dark - lighted roadway	Rear-end	Dry	Clear	4	BROADWAY RD Rte 113 W
4649852	DRACUT	01/11/2019	Property damage only (none injured)	Closed	6:54 AM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Clear/Clear		BROADWAY RD Rte 113 W / ARLINGTON STREET / BROADWAY ROAD
4665375	DRACUT	02/17/2019	Property damage only (none injured)	Closed	5:52 PM	2	Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Dry	Clear		BROADWAY ROAD / ARLINGTON STREET
4670590	DRACUT	02/28/2019	Property damage only (none injured)	Closed	2:09 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Wet	Clear	144	ARLINGTON ST

property damage only:	17
non-fatal injury:	7
unknown:	0
total:	24

cross movement/angle:	10
rear end:	6
sideswipe:	0
head-on:	3
single vehicle:	5
unknown:	0
total:	24

50%

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Number of Vehicles	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions	Street Number	Roadway
4115783	DRACUT	08/13/2015	Property damage only (none injured)	Closed	5:00 PM	2	Collision with motor vehicle in traffic	Daylight	Sideswipe, opposite direction	Wet	Cloudy/Rain		LOON HILL ROAD / BROADWAY ROAD
4236697	DRACUT	07/08/2016	Non-fatal injury	Closed	1:33 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Cloudy	4	BROADWAY ROAD
4353803	DRACUT	03/14/2017	Non-fatal injury	Closed	8:02 AM	2	Collision with utility pole	Daylight	Angle	Snow	Snow/Cloudy	34	BROADWAY ROAD Rte 113 W
4372913	DRACUT	05/25/2017	Property damage only (none injured)	Closed	2:42 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Wet	Rain	14	LOON HILL RD
4378331	DRACUT	06/16/2017	Property damage only (none injured)	Closed	9:06 AM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Cloudy	14	BROADWAY RD
4388282	DRACUT	07/07/2017	Property damage only (none injured)	Closed	12:05 PM	2	Collision with motor vehicle in traffic	Daylight	Not reported	Wet	Cloudy/Rain	34	BROADWAY RD
4413696	DRACUT	08/28/2017	Property damage only (none injured)	Closed	3:35 PM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Cloudy/Clear	34	BROADWAY RD Rte 113 N
4470496	DRACUT	12/18/2017	Property damage only (none injured)	Closed	3:52 PM	2	Collision with motor vehicle in traffic	Dusk	Angle	Wet	Cloudy/Cloudy		LOON HILL RD / BROADWAY RD Rte 113 E
4487730	DRACUT	01/20/2018	Non-fatal injury	Closed	7:14 PM	1	Collision with pedestrian	Dark - lighted roadway	Not reported	Dry	Clear		BROADWAY RD / LOON HILL RD
4543130	DRACUT	05/24/2018	Property damage only (none injured)	Closed	6:00 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Clear/Clear	23	BROADWAY RD
4597136	DRACUT	09/19/2018	Non-fatal injury	Closed	2:39 PM	4	Collision with motor vehicle in traffic	Daylight	Head-on	Dry	Clear/Clear	23	BROADWAY RD

property damage only: 7
non-fatal injury: 4
unknown: 0
total: 11

cross movement/angle: 3
rear end: 4
sideswipe: 1
head-on: 1
single vehicle: 0
unknown: 2
total: 11

45%

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Number of Vehicles	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions	Street Number	Roadway
4079899	DRACUT	01/28/2015	Property damage only (none injured)	Closed	8:58 PM	1	Collision with unknown fixed object	Dark - lighted roadway	Single vehicle crash	Snow	Cloudy	20	WHEELER ROAD
4100473	DRACUT	03/10/2015	Non-fatal injury	Closed	3:43 PM	3	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Clear	702	BROADWAY ROAD
4116667	DRACUT	09/30/2015	Non-fatal injury	Closed	10:59 AM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Wet	Cloudy/Rain		BROADWAY ROAD Rte 113 W / JONES AVENUE / WHEELER ROAD
4159096	DRACUT	12/29/2015	Property damage only (none injured)	Closed	3:28 PM	1	Collision with utility pole	Dark - unknown roadway lighting	Single vehicle crash	Snow	Sleet, hail (freezing rain or drizzle)	40	JONES AVENUE
4203190	DRACUT	05/06/2016	Property damage only (none injured)	Closed	5:10 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Clear/Clear		BROADWAY ROAD Rte 113 E / WHEELER ROAD / /
4284175	DRACUT	10/13/2016	Non-fatal injury	Closed	7:51 PM	2	Collision with motor vehicle in traffic	Dark - roadway not lighted	Angle	Dry	Cloudy		BROADWAY ROAD / JONES AVENUE
4295158	DRACUT	11/08/2016	Non-fatal injury	Closed	2:52 PM	2	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	Clear		BROADWAY ROAD / JONES AVENUE
4307259	DRACUT	12/17/2016	Property damage only (none injured)	Closed	1:51 PM	1	Collision with utility pole	Daylight	Single vehicle crash	Snow	Snow	760	BROADWAY ROAD
4403517	DRACUT	08/07/2017	Property damage only (none injured)	Closed	8:05 AM	2	Collision with motor vehicle in traffic	Daylight	Angle	Dry	Not Reported		JONES AV / BROADWAY RD. Rte 113 S / WHEELER RD.
4515992	DRACUT	03/18/2018	Property damage only (none injured)	Closed	2:51 AM	1	Collision with other movable object	Dark - lighted roadway	Single vehicle crash	Dry	Clear		BROADWAY ROAD / BROADWAY ROAD Rte 113 E / WHEELER ROAD
4577476	DRACUT	08/07/2018	Property damage only (none injured)	Closed	3:29 PM	2	Collision with motor vehicle in traffic	Daylight	Not reported	Dry	Clear/Clear	730	BROADWAY RD
4608793	DRACUT	10/13/2018	Non-fatal injury	Closed	12:32 AM	2	Collision with animal - deer	Dark - lighted roadway	Angle	Dry	Clear	702	BROADWAY RD
4695873	DRACUT	05/01/2019	Non-fatal injury	Closed	8:38 AM	1	Other	Daylight	Single vehicle crash	Wet	Cloudy/Rain	713	BROADWAY RD
4710246	DRACUT	06/08/2019	Non-fatal injury	Closed	3:22 AM	1	Collision with other light pole or other post/support	Dark - lighted roadway	Single vehicle crash	Dry	Clear	713	BROADWAY RD
4773459	DRACUT	11/08/2019	Property damage only (none injured)	Closed	6:33 AM	1	Collision with tree	Dawn	Single vehicle crash	Ice	Clear	700	BROADWAY RD

property damage only: 8
non-fatal injury: 7
unknown: 0
total: 15

cross movement/angle: 3
rear end: 4
sideswipe: 0
head-on: 0
single vehicle: 7
unknown: 1
total: 15

40%

Background Growth Information

Traffic Count (TCDS)

Home | Locate | Locate All | Email This | Auto-Locate:

Disclaimer: MassDOT has a wide range of traffic volume data. What is displayed here is data that has been captured within the past 10 years. ... more

List View | All DIRs | Report Corner

Record 1 of 1 Goto Record go

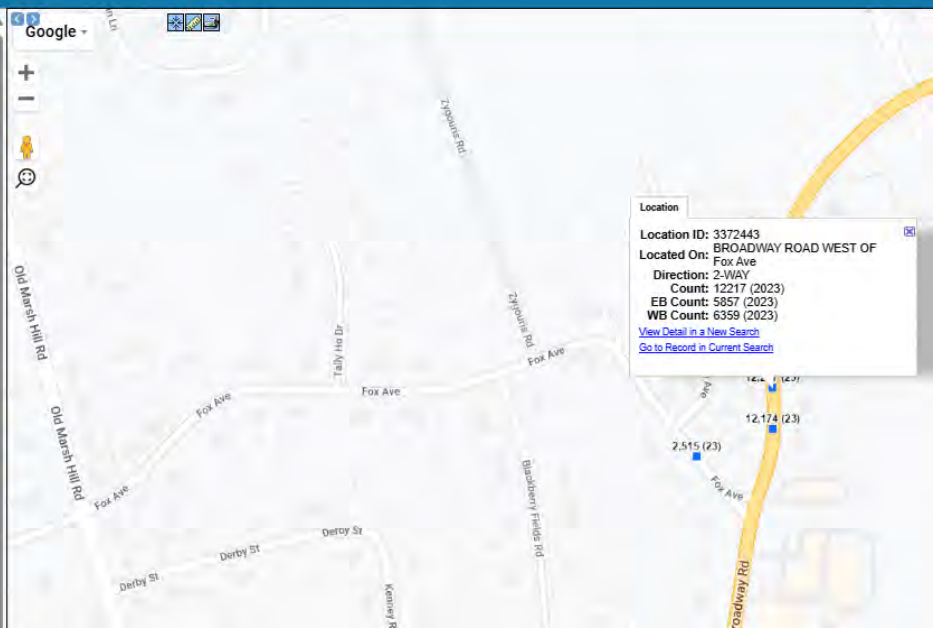
Location ID	3372443	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	SR113 EB	LRS Loc Pt	21.81609
SF Group	U4-7	Route Type	SR
AF Group	U4-7	Route	113
GF Group	U4-7	Active	Yes
Class Dist Grp	U4-7	Category	
Seas Clss Grp	MHD Statewide		
WIM Group			
QC Group	Default		
Fnct'l Class	(4) Minor Arterial	Milepost	
Located On	BROADWAY ROAD		
Loc On Alias			
WEST OF	Fox Ave		
More Detail			

STATION DATA

Directions: 2-WAY | EB | WB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2023	12,217[3]				11,423 (94%)	794 (6%)	Grown from 2022
2022	11,954[3]				11,188 (94%)	766 (6%)	Grown from 2021
2021	11,966[3]				11,164 (93%)	802 (7%)	Grown from 2020
2020	10,684[3]				9,990 (94%)	694 (6%)	Grown from 2019
2019	12,950[3]				12,370 (96%)	580 (4%)	Grown from 2018



Trip Generation Calculations

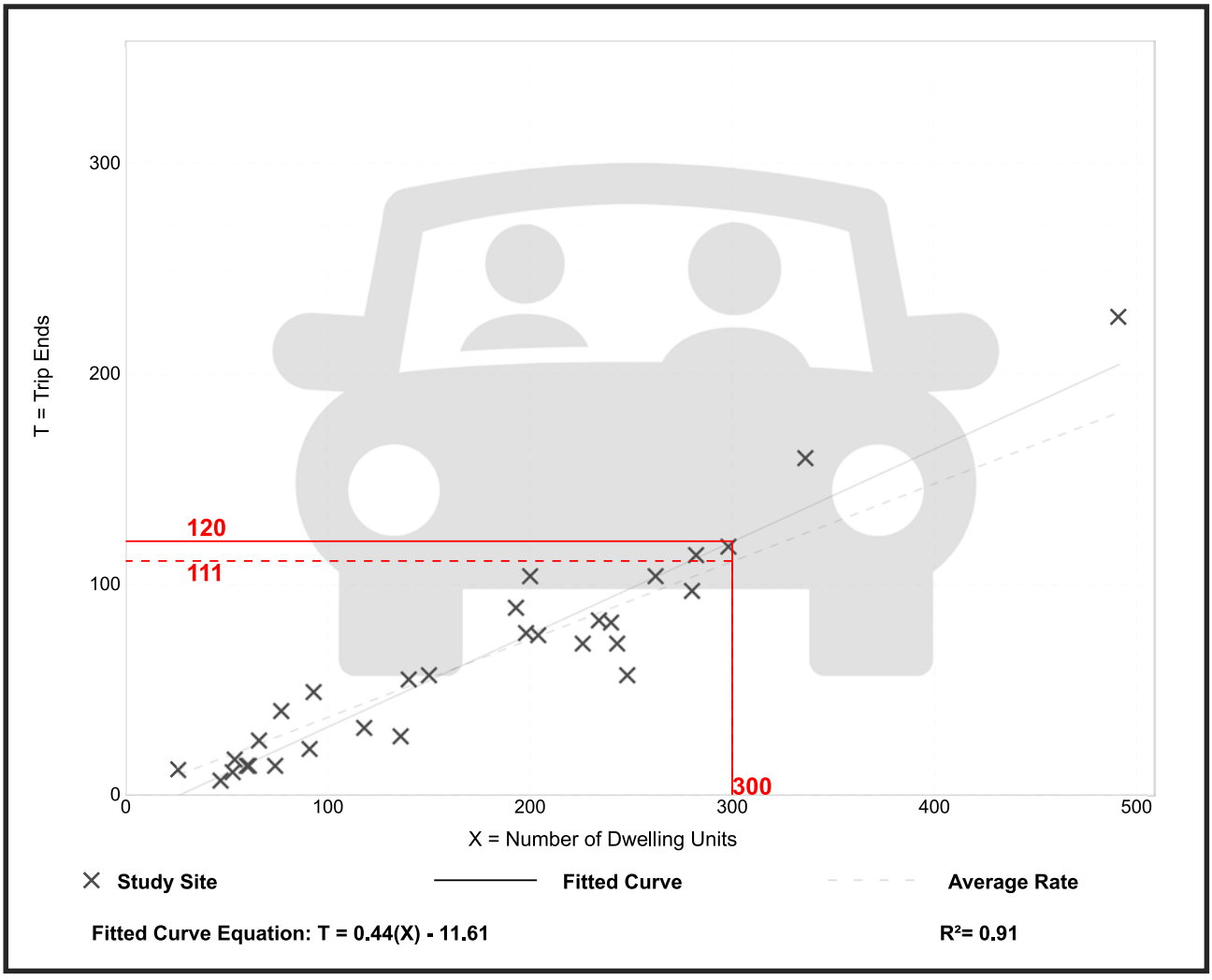
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	30
Avg. Num. of Dwelling Units:	173
Directional Distribution:	23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



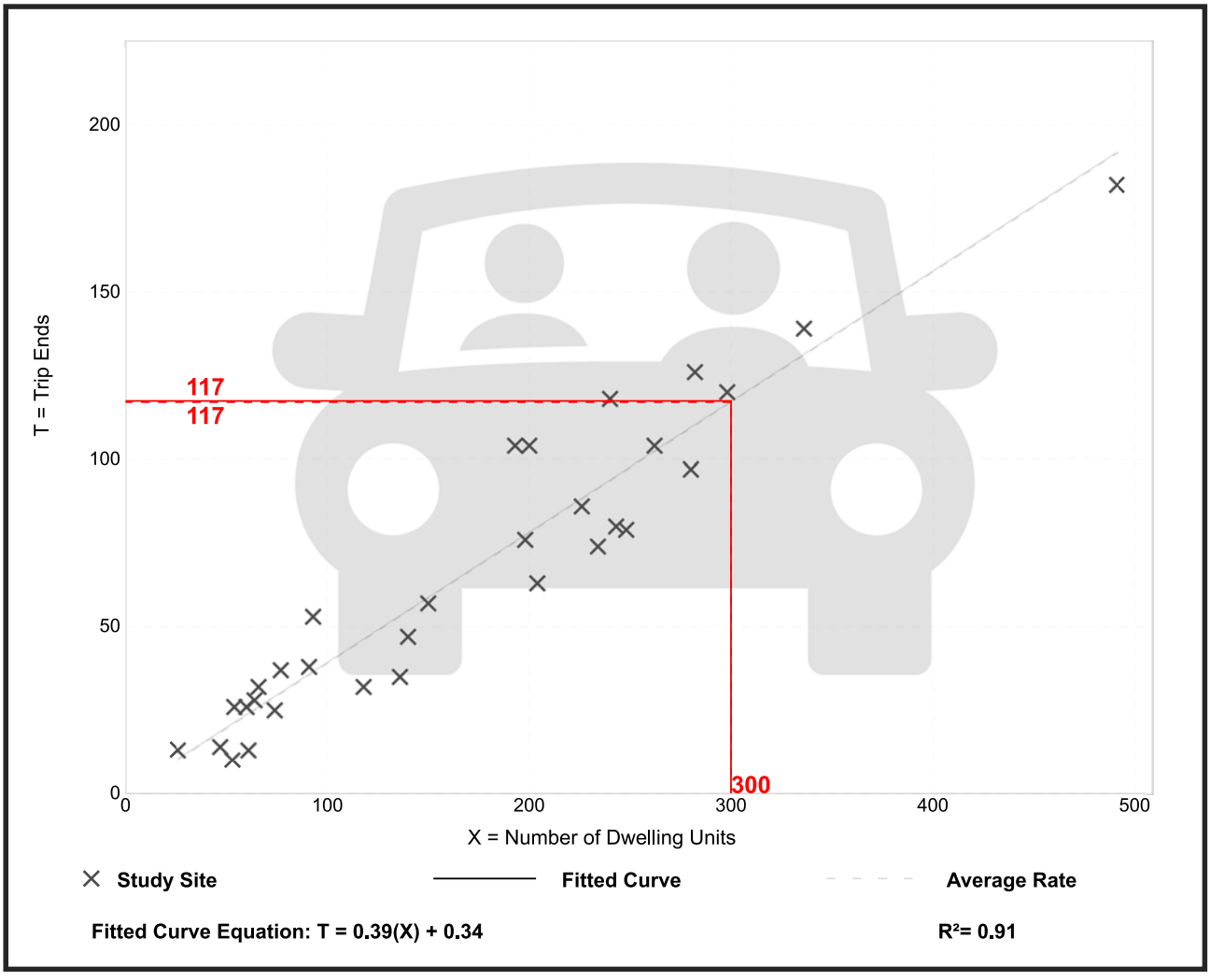
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

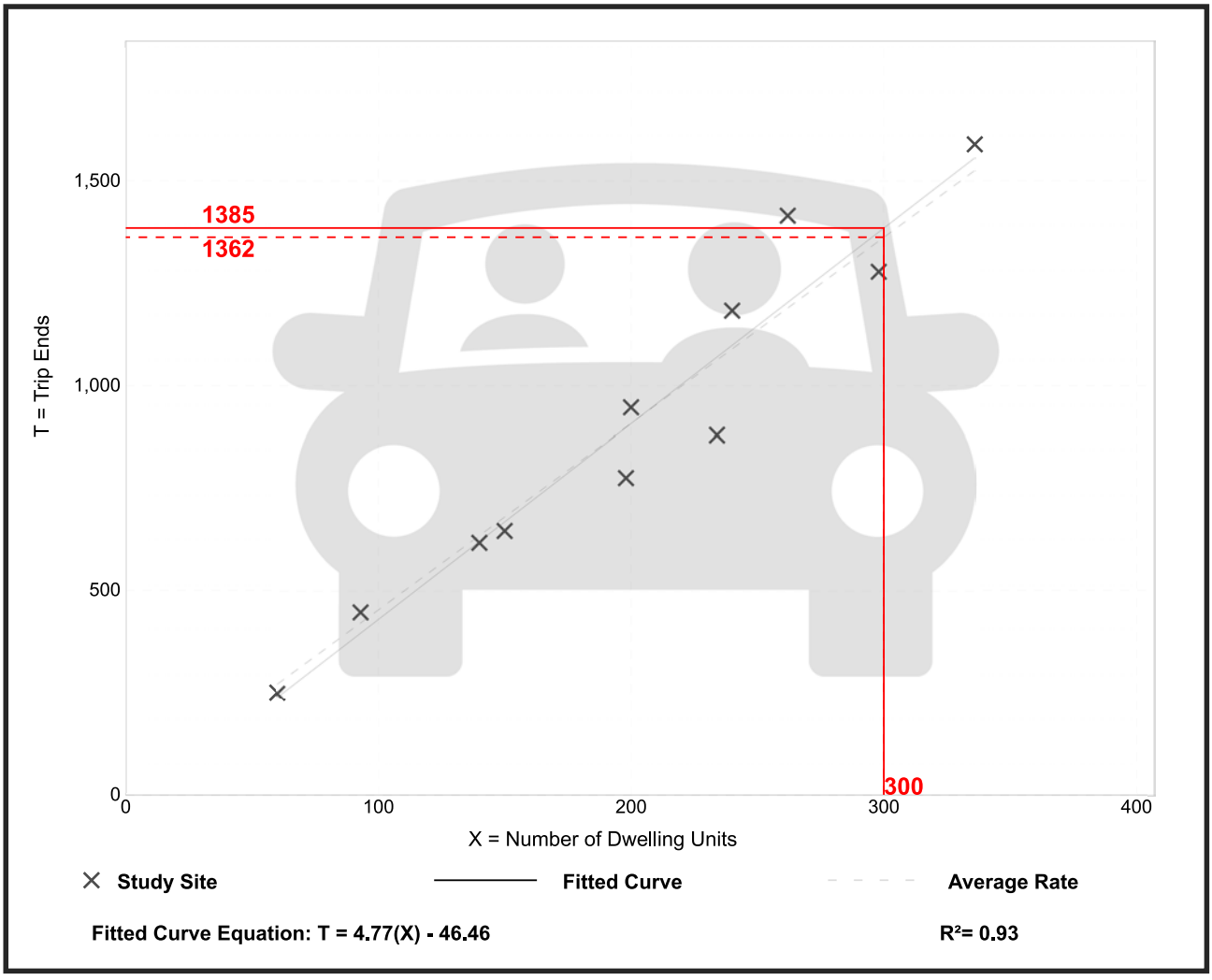
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

Data Plot and Equation



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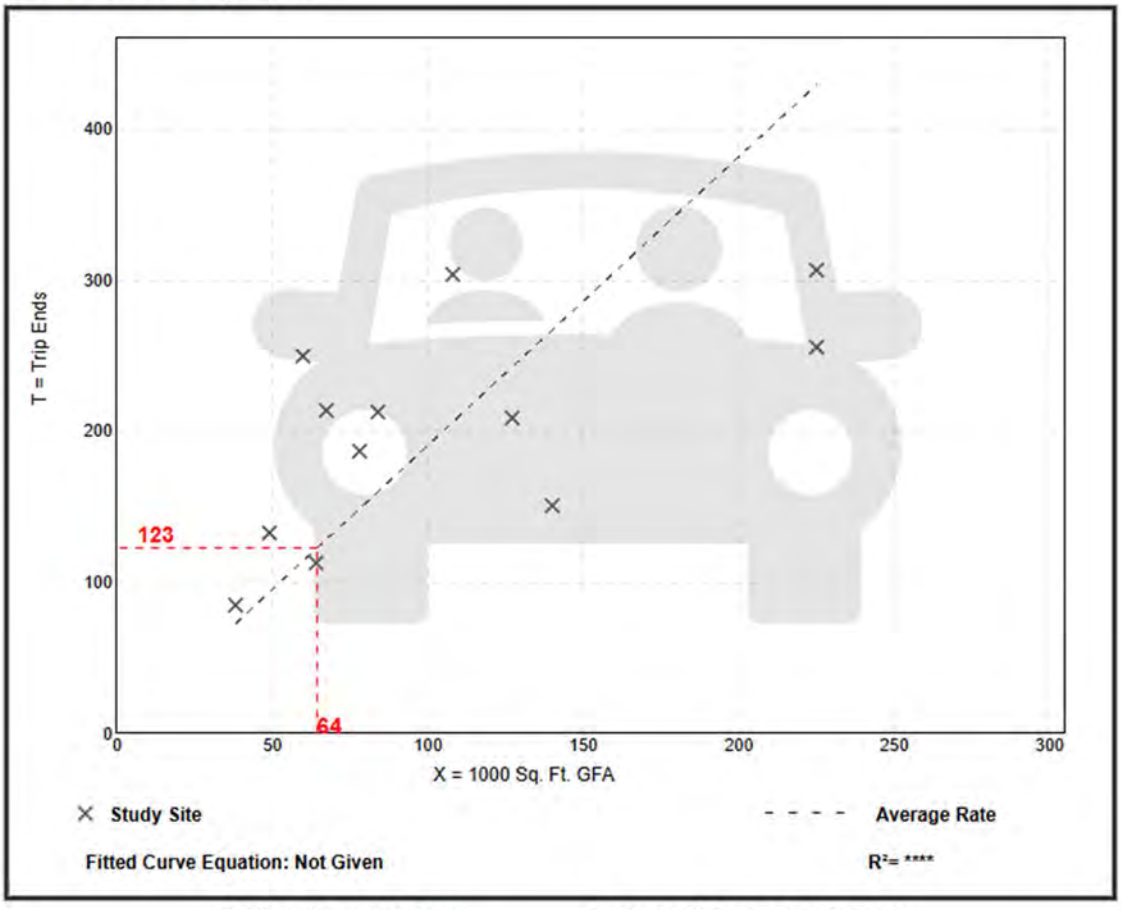
Recreational Community Center
(495)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	12
Avg. 1000 Sq. Ft. GFA:	105
Directional Distribution:	66% entering, 34% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.91	1.08 - 4.18	0.88

Data Plot and Equation



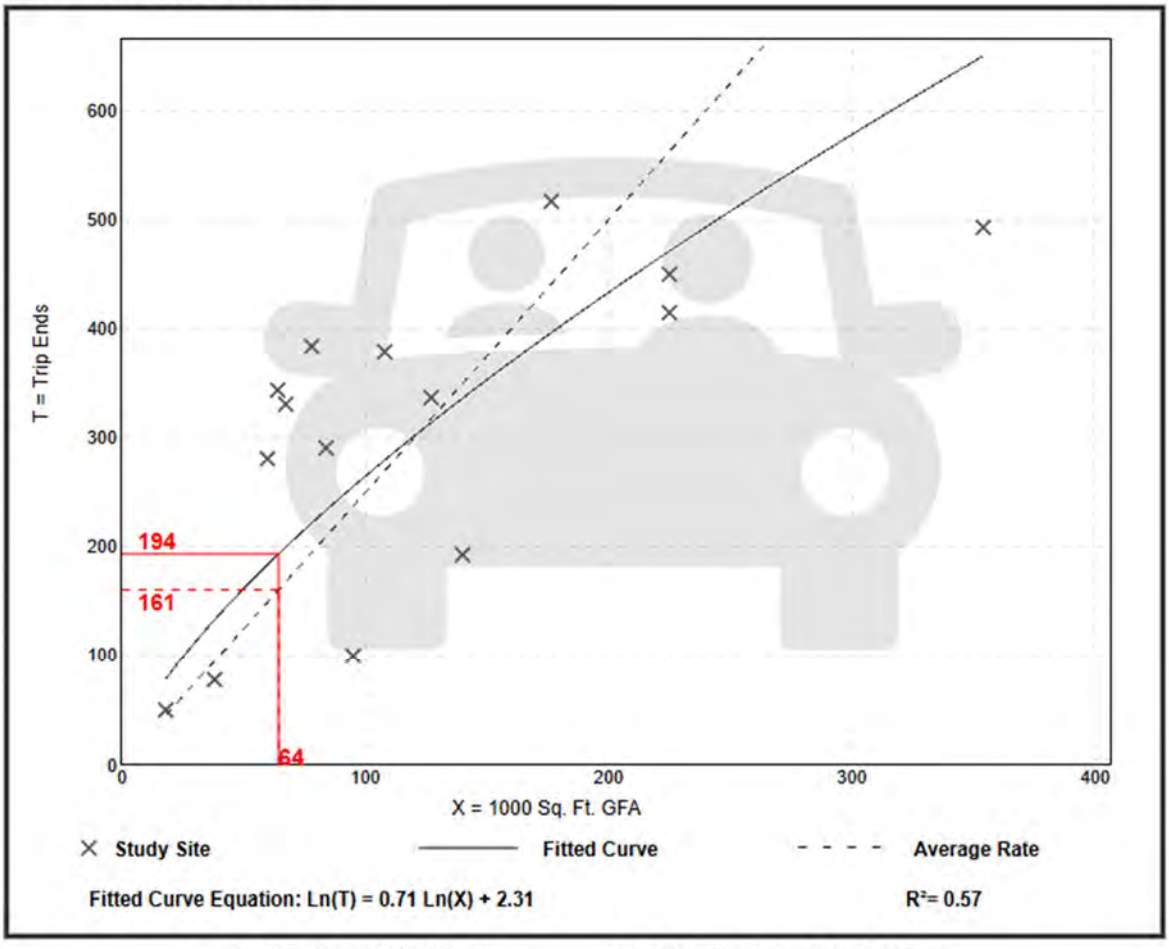
Recreational Community Center
(495)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 15
Avg. 1000 Sq. Ft. GFA: 124
Directional Distribution: 47% entering, 53% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.50	1.05 - 5.37	1.28

Data Plot and Equation



Recreational Community Center
(495)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

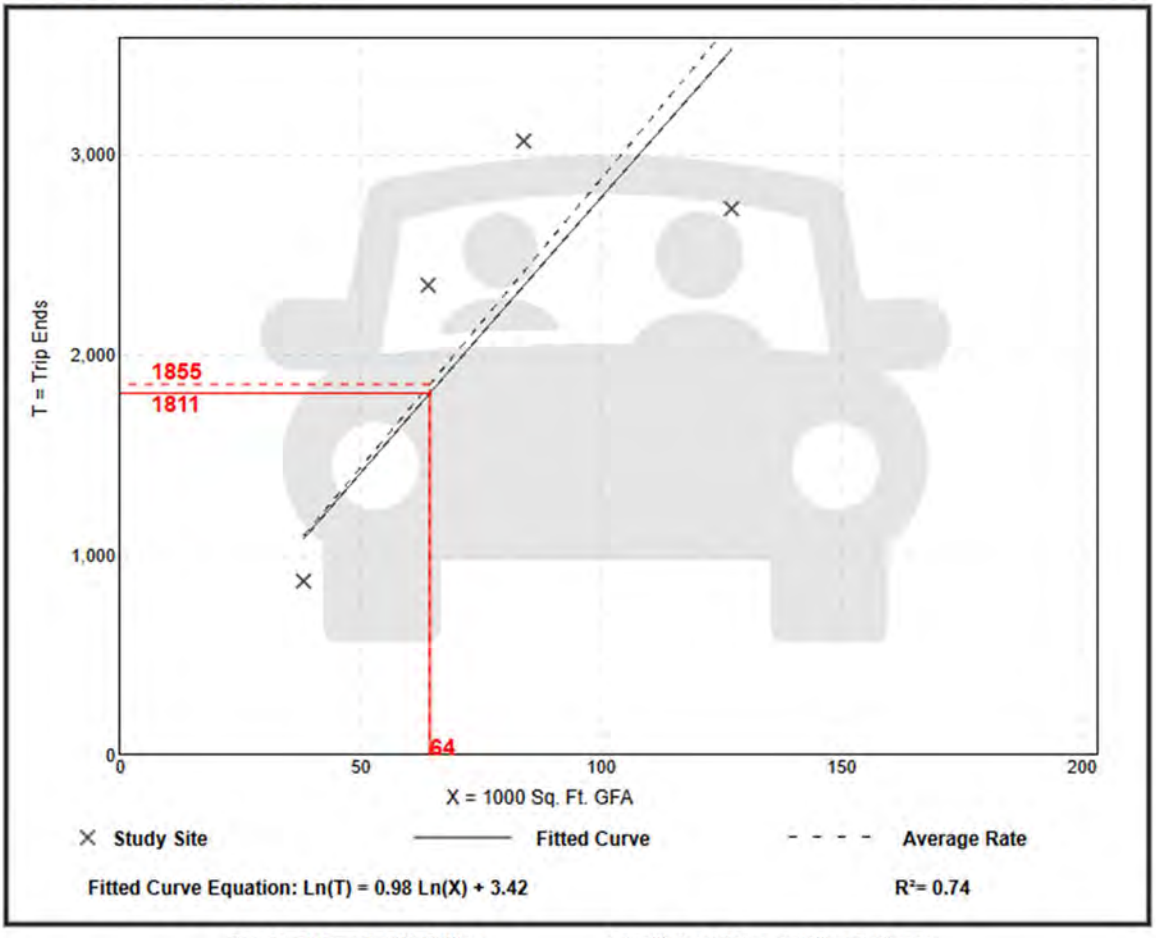
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 78
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
28.82	21.49 - 36.71	8.56

Data Plot and Equation

Caution – Small Sample Size



Strip Retail Plaza (<40k)
(822)

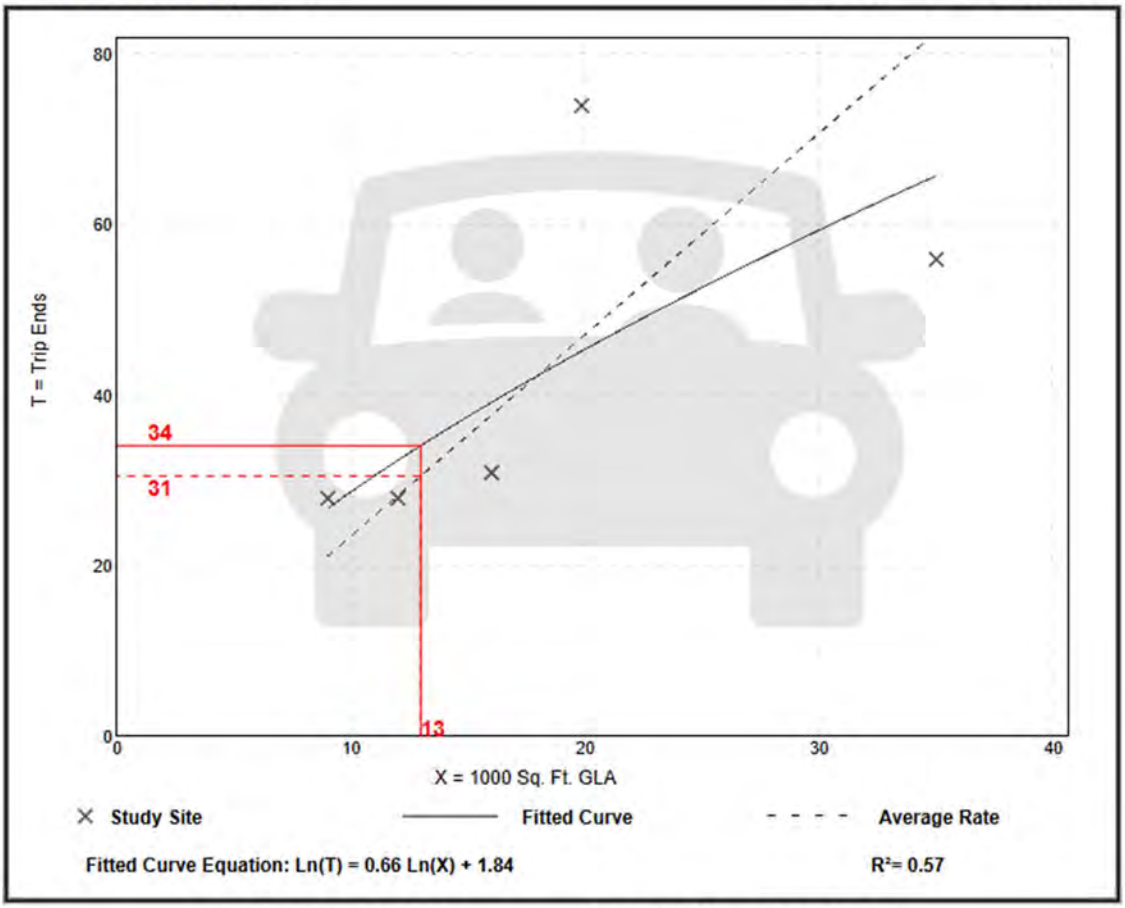
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. 1000 Sq. Ft. GLA: 18
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



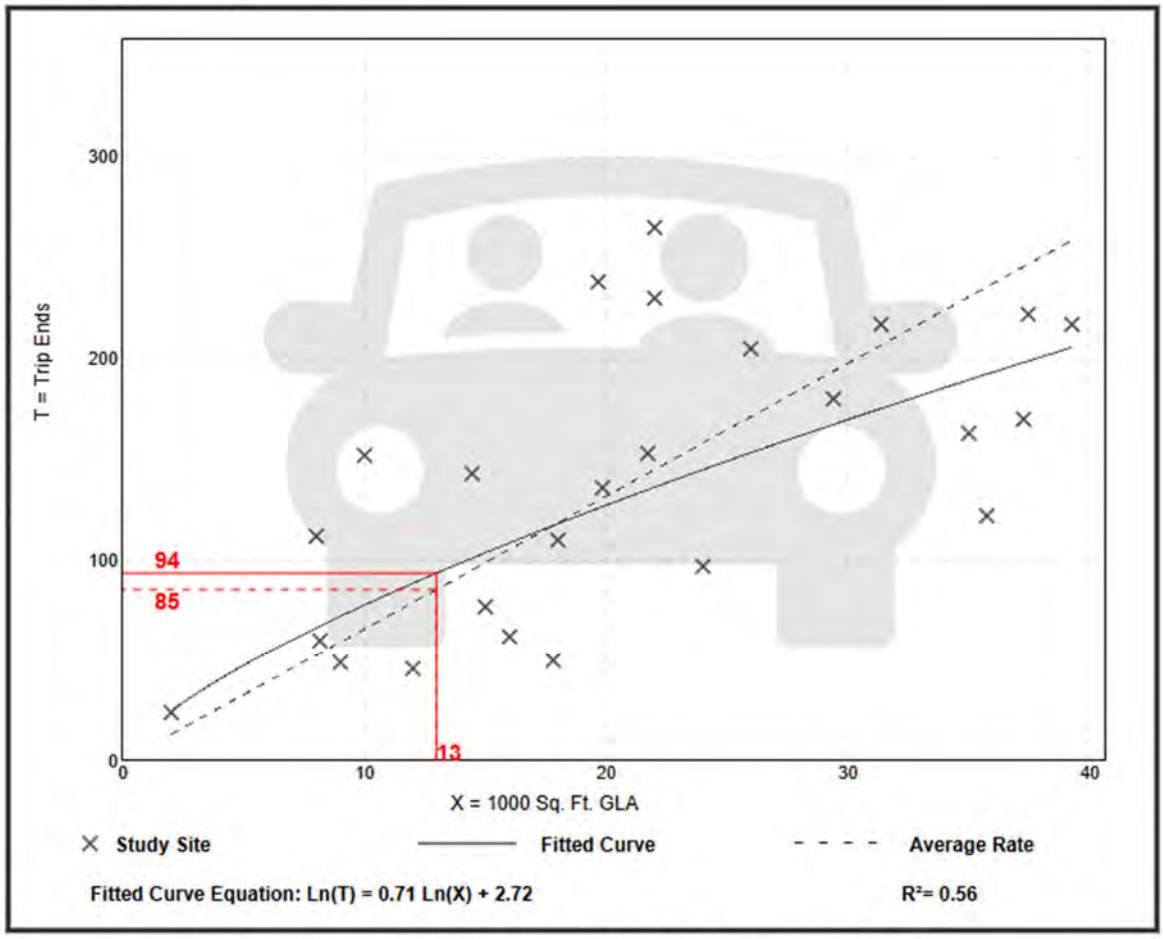
Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 25
Avg. 1000 Sq. Ft. GLA: 21
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday**

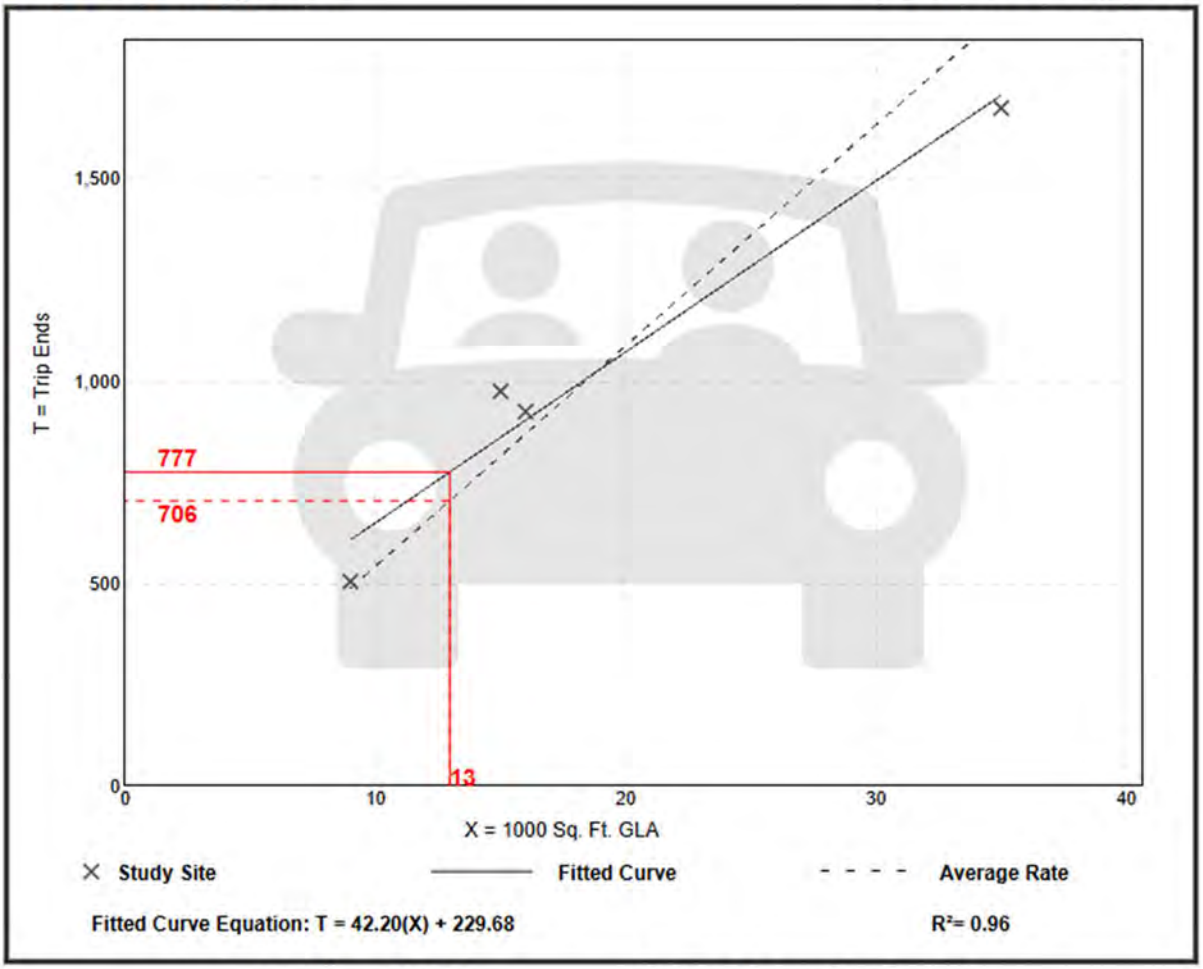
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GLA: 19
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
54.45	47.86 - 65.07	7.81

Data Plot and Equation

Caution – Small Sample Size



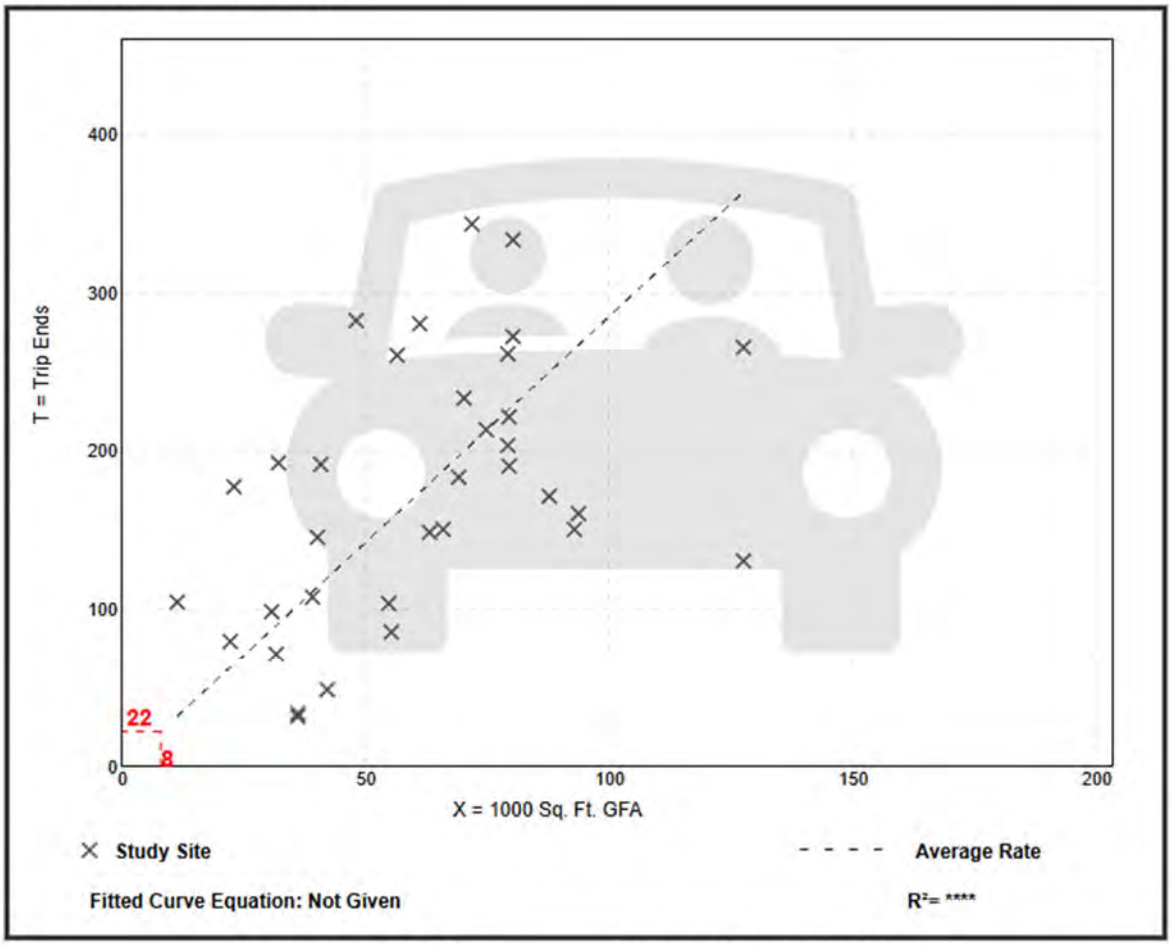
Supermarket
(850)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. 1000 Sq. Ft. GFA: 61
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.86	0.89 - 9.35	1.45

Data Plot and Equation



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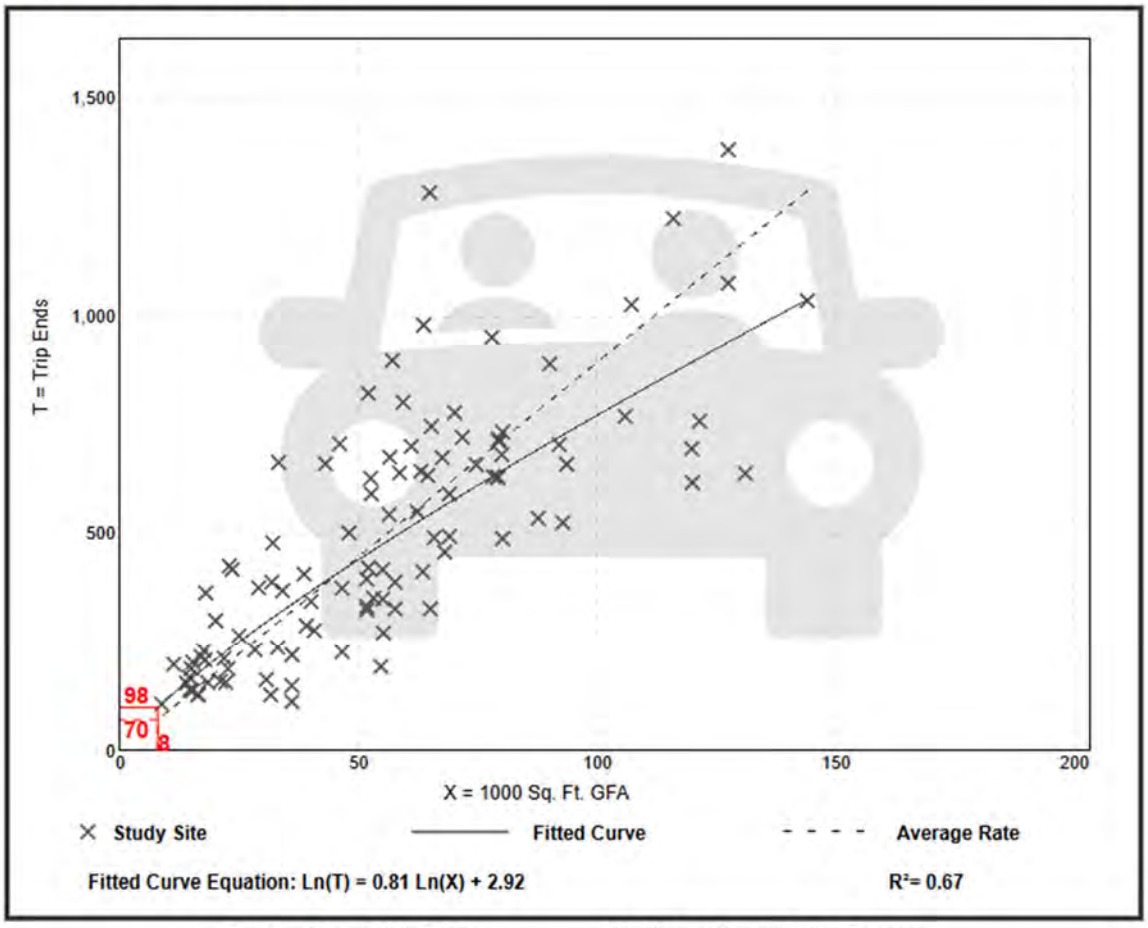
Supermarket
(850)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	104
Avg. 1000 Sq. Ft. GFA:	55
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
8.95	3.11 - 20.30	3.32

Data Plot and Equation



Supermarket
(850)

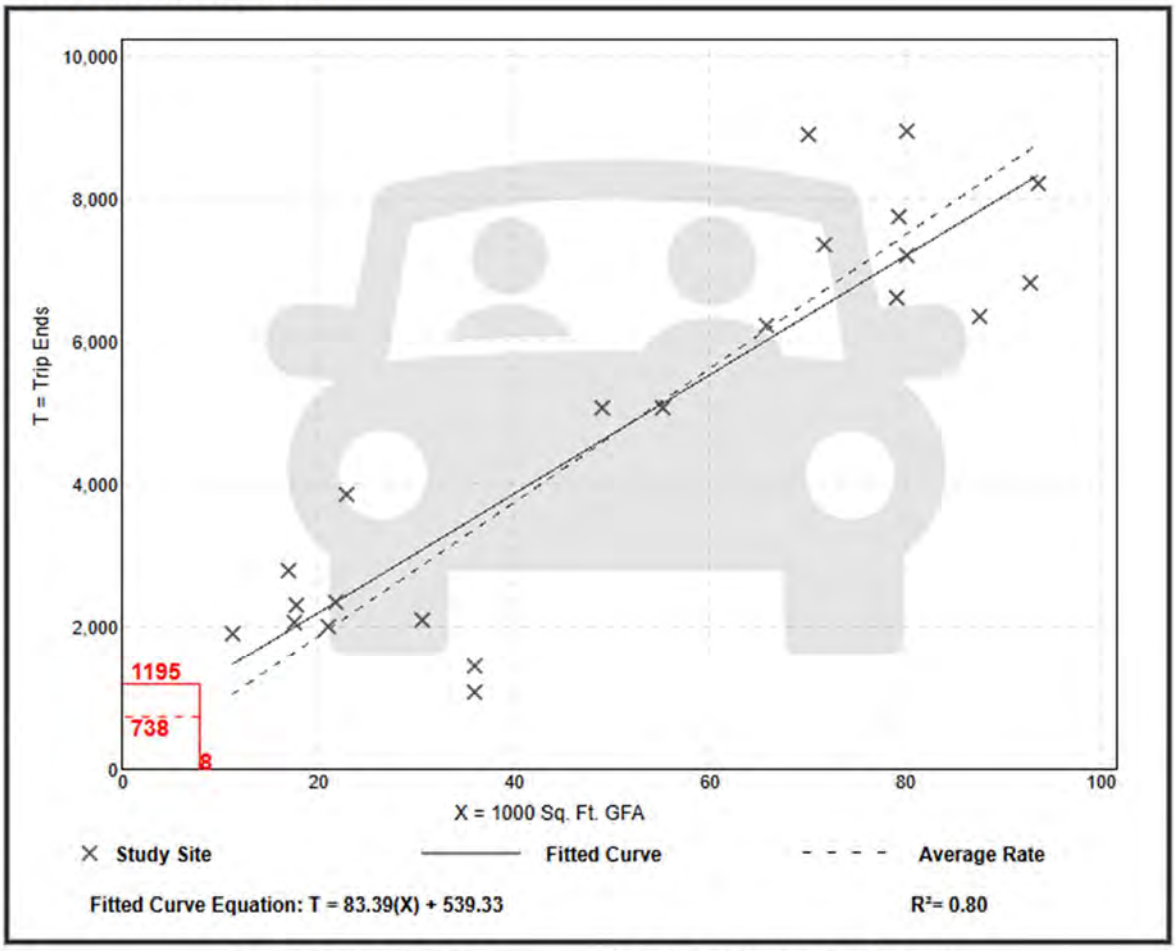
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. 1000 Sq. Ft. GFA: 52
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
93.84	30.09 - 170.24	27.05

Data Plot and Equation



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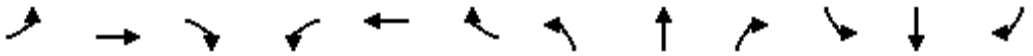
Capacity Analysis Worksheets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	7	2	81	7	29	3	432	92	37	484	9
Future Volume (vph)	10	7	2	81	7	29	3	432	92	37	484	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.879			0.974			0.997	
Flt Protected		0.975		0.950			0.950			0.950		
Satd. Flow (prot)	0	2066	0	1745	1576	0	1805	1800	0	1572	1779	0
Flt Permitted		0.853		0.741			0.411			0.371		
Satd. Flow (perm)	0	1807	0	1361	1576	0	781	1800	0	614	1779	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			34			26			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.79	0.79	0.79	0.85	0.85	0.85	0.89	0.89	0.89	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	3%	2%	11%	3%	0%
Adj. Flow (vph)	13	9	3	95	8	34	3	485	103	40	520	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	95	42	0	3	588	0	40	530	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

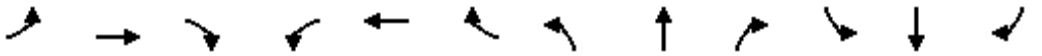
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		11.2		11.2	11.2		27.7	27.7		27.7	27.7	
Actuated g/C Ratio		0.27		0.27	0.27		0.67	0.67		0.67	0.67	
v/c Ratio		0.05		0.26	0.09		0.01	0.49		0.10	0.45	
Control Delay		11.9		15.5	7.3		4.3	7.0		5.3	6.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		11.9		15.5	7.3		4.3	7.0		5.3	6.9	
LOS		B		B	A		A	A		A	A	
Approach Delay		11.9			13.0			7.0			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 41.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	95	42	3	588	40	530
v/c Ratio	0.05	0.26	0.09	0.01	0.49	0.10	0.45
Control Delay	11.9	15.5	7.3	4.3	7.0	5.3	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	15.5	7.3	4.3	7.0	5.3	6.9
Queue Length 50th (ft)	3	15	1	0	64	3	59
Queue Length 95th (ft)	16	50	18	3	156	15	144
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	1004	755	890	764	1761	600	1740
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.05	0.00	0.33	0.07	0.30

Intersection Summary

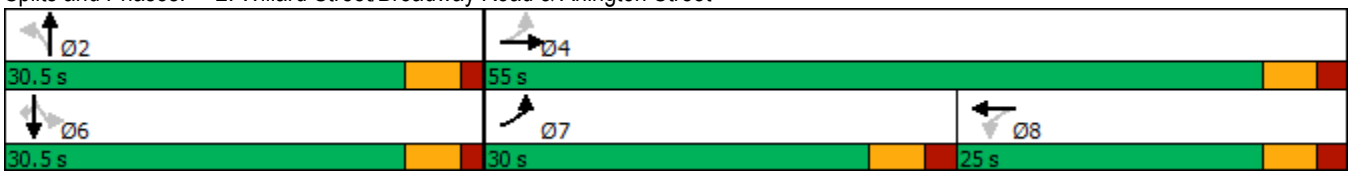


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	337	122	10	6	131	66	25	152	2	54	176	347
Future Volume (vph)	337	122	10	6	131	66	25	152	2	54	176	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.956			0.999				0.850
Flt Protected	0.950				0.999			0.993		0.950		
Satd. Flow (prot)	1752	1816	0	0	1741	0	0	1853	0	1736	1881	1777
Flt Permitted	0.371				0.991			0.937		0.520		
Satd. Flow (perm)	684	1816	0	0	1727	0	0	1749	0	950	1881	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			27			1				373
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.85	0.85	0.85	0.93	0.93	0.93
Heavy Vehicles (%)	3%	2%	20%	0%	5%	3%	0%	2%	0%	4%	1%	3%
Adj. Flow (vph)	362	131	11	7	162	81	29	179	2	58	189	373
Shared Lane Traffic (%)												
Lane Group Flow (vph)	362	142	0	0	250	0	0	210	0	58	189	373
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	38.0	38.0			14.5			13.8		13.8	13.8	13.8
Actuated g/C Ratio	0.64	0.64			0.25			0.23		0.23	0.23	0.23
v/c Ratio	0.45	0.12			0.56			0.52		0.26	0.43	0.53
Control Delay	7.1	4.5			24.6			26.8		24.8	24.9	6.1
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	7.1	4.5			24.6			26.8		24.8	24.9	6.1
LOS	A	A			C			C		C	C	A
Approach Delay		6.4			24.6			26.8			13.6	
Approach LOS		A			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 59.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	362	142	250	210	58	189	373
v/c Ratio	0.45	0.12	0.56	0.52	0.26	0.43	0.53
Control Delay	7.1	4.5	24.6	26.8	24.8	24.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	4.5	24.6	26.8	24.8	24.9	6.1
Queue Length 50th (ft)	45	14	67	63	16	56	0
Queue Length 95th (ft)	110	41	141	140	54	134	62
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	948	1563	679	843	457	905	1049
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.09	0.37	0.25	0.13	0.21	0.36

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

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

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	299	33	39	308	16	45	29	30	23	38	33
Future Volume (vph)	14	299	33	39	308	16	45	29	30	23	38	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923			0.952	
Flt Protected		0.998			0.994		0.950				0.988	
Satd. Flow (prot)	0	1905	1777	0	1945	1625	1685	1584	0	0	1980	0
Flt Permitted		0.974			0.929		0.723				0.941	
Satd. Flow (perm)	0	1859	1777	0	1818	1625	1282	1584	0	0	1886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			36			36		43			41	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.95	0.95	0.95	0.83	0.83	0.83	0.70	0.70	0.70	0.81	0.81	0.81
Heavy Vehicles (%)	0%	3%	3%	8%	3%	6%	0%	7%	7%	0%	3%	3%
Adj. Flow (vph)	15	315	35	47	371	19	64	41	43	28	47	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	330	35	0	418	19	64	84	0	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

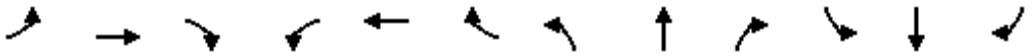
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		22.4	22.4		22.4	22.4	31.6	31.6			31.6	
Actuated g/C Ratio		0.37	0.37		0.37	0.37	0.52	0.52			0.52	
v/c Ratio		0.48	0.05		0.63	0.03	0.10	0.10			0.12	
Control Delay		16.2	3.6		19.3	1.9	10.5	6.6			7.4	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		16.2	3.6		19.3	1.9	10.5	6.6			7.4	
LOS		B	A		B	A	B	A			A	
Approach Delay		15.0			18.5			8.3			7.4	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 61			
Actuated Cycle Length: 61			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 13:

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	330	35	418	19	64	84	116
v/c Ratio	0.48	0.05	0.63	0.03	0.10	0.10	0.12
Control Delay	16.2	3.6	19.3	1.9	10.5	6.6	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	3.6	19.3	1.9	10.5	6.6	7.4
Queue Length 50th (ft)	92	0	124	0	11	7	13
Queue Length 95th (ft)	117	11	138	4	28	23	39
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1127	1092	1102	999	663	840	995
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.03	0.38	0.02	0.10	0.10	0.12

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	6	15	126	4	44	8	556	100	35	655	15
Future Volume (vph)	29	6	15	126	4	44	8	556	100	35	655	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.862			0.977			0.997	
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	2009	0	1745	1583	0	1805	1820	0	1745	1813	0
Flt Permitted		0.821		0.834			0.254			0.308		
Satd. Flow (perm)	0	1697	0	1532	1583	0	483	1820	0	566	1813	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			47			22			3	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.78	0.78	0.78	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Adj. Flow (vph)	37	8	19	134	4	47	9	591	106	41	771	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	134	51	0	9	697	0	41	789	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

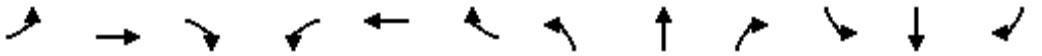
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		13.4		13.4	13.4		35.3	35.3		35.3	35.3	
Actuated g/C Ratio		0.26		0.26	0.26		0.69	0.69		0.69	0.69	
v/c Ratio		0.14		0.33	0.11		0.03	0.55		0.10	0.63	
Control Delay		14.7		21.1	8.2		4.9	8.1		5.5	9.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		14.7		21.1	8.2		4.9	8.1		5.5	9.7	
LOS		B		C	A		A	A		A	A	
Approach Delay		14.7			17.5			8.0			9.5	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 51			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 52.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	134	51	9	697	41	789
v/c Ratio	0.14	0.33	0.11	0.03	0.55	0.10	0.63
Control Delay	14.7	21.1	8.2	4.9	8.1	5.5	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	21.1	8.2	4.9	8.1	5.5	9.7
Queue Length 50th (ft)	10	30	1	1	100	4	130
Queue Length 95th (ft)	37	95	26	6	244	17	278
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	806	719	768	426	1609	499	1600
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.19	0.07	0.02	0.43	0.08	0.49

Intersection Summary

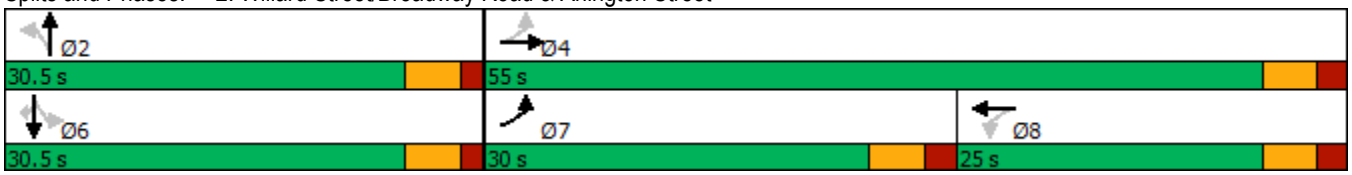


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	418	157	15	0	181	86	42	206	2	99	230	537
Future Volume (vph)	418	157	15	0	181	86	42	206	2	99	230	537
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.956			0.999				0.850
Flt Protected	0.950							0.992		0.950		
Satd. Flow (prot)	1770	1858	0	0	1816	0	0	1861	0	1805	1900	1812
Flt Permitted	0.243							0.843		0.403		
Satd. Flow (perm)	453	1858	0	0	1816	0	0	1582	0	766	1900	1812
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			27			1				603
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80	0.89	0.89	0.89
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	1%	0%	0%	0%	1%
Adj. Flow (vph)	445	167	16	0	226	108	53	258	3	111	258	603
Shared Lane Traffic (%)												
Lane Group Flow (vph)	445	183	0	0	334	0	0	314	0	111	258	603
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	44.4	44.4			17.5			19.1		19.1	19.1	19.1
Actuated g/C Ratio	0.63	0.63			0.25			0.27		0.27	0.27	0.27
v/c Ratio	0.62	0.16			0.71			0.74		0.54	0.50	0.65
Control Delay	13.6	6.3			33.6			35.9		34.7	26.8	5.8
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	13.6	6.3			33.6			35.9		34.7	26.8	5.8
LOS	B	A			C			D		C	C	A
Approach Delay		11.5			33.6			35.9			14.7	
Approach LOS		B			C			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 70.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	445	183	334	314	111	258	603
v/c Ratio	0.62	0.16	0.71	0.74	0.54	0.50	0.65
Control Delay	13.6	6.3	33.6	35.9	34.7	26.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	6.3	33.6	35.9	34.7	26.8	5.8
Queue Length 50th (ft)	83	27	130	135	45	103	0
Queue Length 95th (ft)	218	65	206	196	97	174	67
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	799	1391	594	631	305	757	1084
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.13	0.56	0.50	0.36	0.34	0.56

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

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

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	331	45	25	452	20	46	53	36	19	41	24
Future Volume (vph)	26	331	45	25	452	20	46	53	36	19	41	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.961	
Flt Protected		0.996			0.997		0.950				0.989	
Satd. Flow (prot)	0	1920	1830	0	2021	1641	1685	1725	0	0	2024	0
Flt Permitted		0.904			0.968		0.737				0.942	
Satd. Flow (perm)	0	1743	1830	0	1962	1641	1307	1725	0	0	1927	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			49			36		44			29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84
Heavy Vehicles (%)	0%	2%	0%	0%	0%	5%	0%	0%	0%	5%	0%	0%
Adj. Flow (vph)	28	360	49	28	508	22	56	65	44	23	49	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	49	0	536	22	56	109	0	0	101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

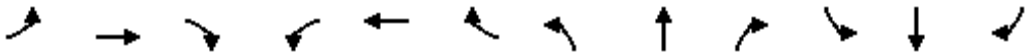
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		25.7	25.7		25.7	25.7	28.3	28.3			28.3	
Actuated g/C Ratio		0.42	0.42		0.42	0.42	0.46	0.46			0.46	
v/c Ratio		0.53	0.06		0.65	0.03	0.09	0.13			0.11	
Control Delay		14.9	2.6		17.2	1.9	12.7	8.7			9.7	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		14.9	2.6		17.2	1.9	12.7	8.7			9.7	
LOS		B	A		B	A	B	A			A	
Approach Delay		13.5			16.6			10.0			9.7	
Approach LOS		B			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 61			
Actuated Cycle Length: 61			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 62.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 13:

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	388	49	536	22	56	109	101
v/c Ratio	0.53	0.06	0.65	0.03	0.09	0.13	0.11
Control Delay	14.9	2.6	17.2	1.9	12.7	8.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	2.6	17.2	1.9	12.7	8.7	9.7
Queue Length 50th (ft)	101	0	150	0	11	13	14
Queue Length 95th (ft)	125	11	174	5	33	41	43
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1057	1129	1190	1009	607	825	910
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.04	0.45	0.02	0.09	0.13	0.11

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	7	2	86	7	31	3	489	98	40	562	9
Future Volume (vph)	10	7	2	86	7	31	3	489	98	40	562	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.877			0.975			0.998	
Flt Protected		0.975		0.950			0.950			0.950		
Satd. Flow (prot)	0	2066	0	1745	1572	0	1805	1801	0	1572	1780	0
Flt Permitted		0.855		0.741			0.357			0.341		
Satd. Flow (perm)	0	1812	0	1361	1572	0	678	1801	0	564	1780	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			36			25			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.79	0.79	0.79	0.85	0.85	0.85	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	3%	2%	11%	3%	0%
Adj. Flow (vph)	13	9	3	101	8	36	3	532	107	43	604	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	101	44	0	3	639	0	43	614	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		11.7		11.7	11.7		29.7	29.7		29.7	29.7	
Actuated g/C Ratio		0.27		0.27	0.27		0.68	0.68		0.68	0.68	
v/c Ratio		0.05		0.28	0.10		0.01	0.52		0.11	0.51	
Control Delay		13.2		17.2	7.8		4.3	7.4		5.5	7.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		13.2		17.2	7.8		4.3	7.4		5.5	7.5	
LOS		B		B	A		A	A		A	A	
Approach Delay		13.3			14.3			7.4			7.4	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 43.9			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	101	44	3	639	43	614
v/c Ratio	0.05	0.28	0.10	0.01	0.52	0.11	0.51
Control Delay	13.2	17.2	7.8	4.3	7.4	5.5	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	17.2	7.8	4.3	7.4	5.5	7.5
Queue Length 50th (ft)	4	17	1	0	75	4	75
Queue Length 95th (ft)	18	59	20	3	190	17	187
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	962	721	850	648	1724	539	1703
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.14	0.05	0.00	0.37	0.08	0.36

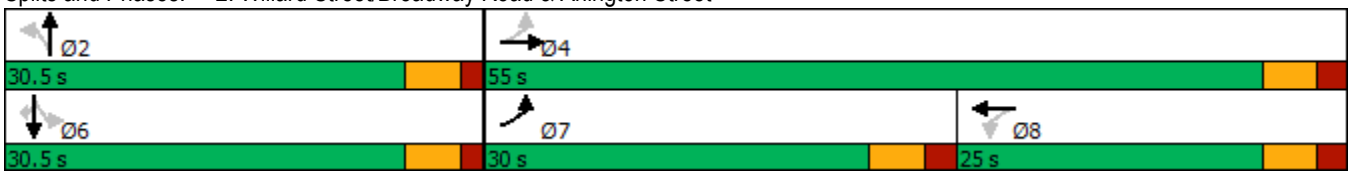
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	130	11	6	139	70	27	170	2	57	202	402
Future Volume (vph)	379	130	11	6	139	70	27	170	2	57	202	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.956			0.999				0.850
Flt Protected	0.950				0.999			0.993		0.950		
Satd. Flow (prot)	1752	1815	0	0	1741	0	0	1853	0	1736	1881	1777
Flt Permitted	0.341				0.991			0.937		0.510		
Satd. Flow (perm)	629	1815	0	0	1727	0	0	1749	0	932	1881	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			27			1				432
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	3%	2%	20%	0%	5%	3%	0%	2%	0%	4%	1%	3%
Adj. Flow (vph)	408	140	12	7	172	86	29	185	2	61	217	432
Shared Lane Traffic (%)												
Lane Group Flow (vph)	408	152	0	0	265	0	0	216	0	61	217	432
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	40.3	40.3			15.3			15.5		15.5	15.5	15.5
Actuated g/C Ratio	0.64	0.64			0.24			0.25		0.25	0.25	0.25
v/c Ratio	0.52	0.13			0.61			0.50		0.27	0.47	0.57
Control Delay	8.6	5.2			27.5			26.7		25.0	25.8	5.9
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	8.6	5.2			27.5			26.7		25.0	25.8	5.9
LOS	A	A			C			C		C	C	A
Approach Delay		7.7			27.5			26.7			13.6	
Approach LOS		A			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 63.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 67.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	408	152	265	216	61	217	432
v/c Ratio	0.52	0.13	0.61	0.50	0.27	0.47	0.57
Control Delay	8.6	5.2	27.5	26.7	25.0	25.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	5.2	27.5	26.7	25.0	25.8	5.9
Queue Length 50th (ft)	60	18	82	72	19	72	0
Queue Length 95th (ft)	145	50	158	152	56	151	64
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	899	1490	638	791	421	850	1039
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.10	0.42	0.27	0.14	0.26	0.42

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

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

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	332	50	43	360	17	63	31	33	24	41	33
Future Volume (vph)	14	332	50	43	360	17	63	31	33	24	41	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923			0.955	
Flt Protected		0.998			0.995		0.950				0.988	
Satd. Flow (prot)	0	1905	1777	0	1948	1625	1685	1584	0	0	1987	0
Flt Permitted		0.974			0.928		0.713				0.936	
Satd. Flow (perm)	0	1859	1777	0	1817	1625	1264	1584	0	0	1882	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			53			36		47			41	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.95	0.95	0.95	0.83	0.83	0.83	0.70	0.70	0.70	0.81	0.81	0.81
Heavy Vehicles (%)	0%	3%	3%	8%	3%	6%	0%	7%	7%	0%	3%	3%
Adj. Flow (vph)	15	349	53	52	434	20	90	44	47	30	51	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	364	53	0	486	20	90	91	0	0	122	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

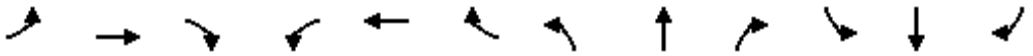
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		25.0	25.0		25.0	25.0	29.0	29.0			29.0	
Actuated g/C Ratio		0.41	0.41		0.41	0.41	0.48	0.48			0.48	
v/c Ratio		0.48	0.07		0.65	0.03	0.15	0.12			0.13	
Control Delay		14.3	2.7		18.0	1.6	12.7	7.6			8.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		14.3	2.7		18.0	1.6	12.7	7.6			8.8	
LOS		B	A		B	A	B	A			A	
Approach Delay		12.8			17.3			10.1			8.8	
Approach LOS		B			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 61			
Actuated Cycle Length: 61			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 13:

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	364	53	486	20	90	91	122
v/c Ratio	0.48	0.07	0.65	0.03	0.15	0.12	0.13
Control Delay	14.3	2.7	18.0	1.6	12.7	7.6	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	2.7	18.0	1.6	12.7	7.6	8.8
Queue Length 50th (ft)	93	0	136	0	18	8	16
Queue Length 95th (ft)	116	12	147	4	40	26	45
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1127	1098	1102	999	599	776	914
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.44	0.02	0.15	0.12	0.13

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	6	15	134	4	47	8	641	106	38	725	15
Future Volume (vph)	29	6	15	134	4	47	8	641	106	38	725	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.861			0.979			0.997	
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	2009	0	1745	1581	0	1805	1824	0	1745	1813	0
Flt Permitted		0.822		0.828			0.244			0.250		
Satd. Flow (perm)	0	1699	0	1521	1581	0	464	1824	0	459	1813	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			50			21			3	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.78	0.78	0.78	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Adj. Flow (vph)	37	8	19	143	4	50	9	682	113	41	788	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	143	54	0	9	795	0	41	804	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		13.8		13.8	13.8		36.0	36.0		36.0	36.0	
Actuated g/C Ratio		0.26		0.26	0.26		0.69	0.69		0.69	0.69	
v/c Ratio		0.14		0.35	0.12		0.03	0.63		0.13	0.64	
Control Delay		14.7		21.6	8.0		5.0	9.7		6.2	10.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		14.7		21.6	8.0		5.0	9.7		6.2	10.2	
LOS		B		C	A		A	A		A	B	
Approach Delay		14.7			17.9			9.6			10.0	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 52.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 10.8		Intersection LOS: B	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	143	54	9	795	41	804
v/c Ratio	0.14	0.35	0.12	0.03	0.63	0.13	0.64
Control Delay	14.7	21.6	8.0	5.0	9.7	6.2	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	21.6	8.0	5.0	9.7	6.2	10.2
Queue Length 50th (ft)	10	35	1	1	132	4	140
Queue Length 95th (ft)	37	101	26	6	321	20	338
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	793	701	756	401	1582	397	1570
Starvation Cap Reductn	0	0	0	0	19	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.20	0.07	0.02	0.51	0.10	0.51

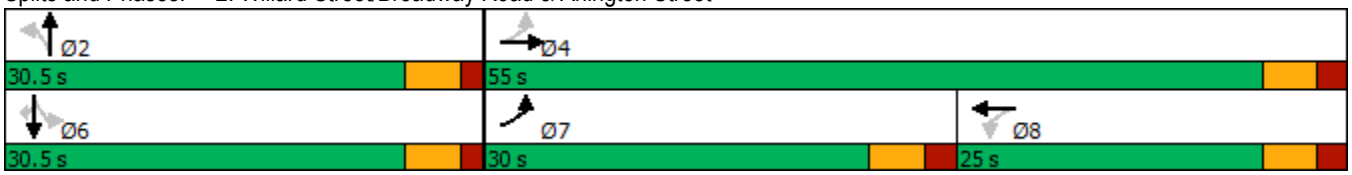
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	481	166	16	0	192	91	45	233	2	105	253	590
Future Volume (vph)	481	166	16	0	192	91	45	233	2	105	253	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.957			0.999				0.850
Flt Protected	0.950							0.992		0.950		
Satd. Flow (prot)	1770	1858	0	0	1818	0	0	1861	0	1805	1900	1812
Flt Permitted	0.209							0.817		0.372		
Satd. Flow (perm)	389	1858	0	0	1818	0	0	1533	0	707	1900	1812
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			27			1				641
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	1%	0%	0%	0%	1%
Adj. Flow (vph)	512	177	17	0	240	114	56	291	3	114	275	641
Shared Lane Traffic (%)												
Lane Group Flow (vph)	512	194	0	0	354	0	0	350	0	114	275	641
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	47.2	47.2			18.7			21.4		21.4	21.4	21.4
Actuated g/C Ratio	0.62	0.62			0.25			0.28		0.28	0.28	0.28
v/c Ratio	0.74	0.17			0.75			0.81		0.57	0.51	0.66
Control Delay	20.9	6.9			37.3			41.8		37.3	27.3	5.8
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	20.9	6.9			37.3			41.8		37.3	27.3	5.8
LOS	C	A			D			D		D	C	A
Approach Delay		17.0			37.3			41.8			15.0	
Approach LOS		B			D			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 75.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 83.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	512	194	354	350	114	275	641
v/c Ratio	0.74	0.17	0.75	0.81	0.57	0.51	0.66
Control Delay	20.9	6.9	37.3	41.8	37.3	27.3	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	6.9	37.3	41.8	37.3	27.3	5.8
Queue Length 50th (ft)	153	35	153	165	50	117	0
Queue Length 95th (ft)	#327	69	221	224	105	189	72
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	739	1304	550	563	259	697	1070
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.15	0.64	0.62	0.44	0.39	0.60

Intersection Summary

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 0.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

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

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1622	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	385	66	27	490	20	68	56	40	20	44	24
Future Volume (vph)	26	385	66	27	490	20	68	56	40	20	44	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.937			0.963	
Flt Protected		0.997			0.997		0.950				0.989	
Satd. Flow (prot)	0	1921	1830	0	2021	1641	1685	1721	0	0	2028	0
Flt Permitted		0.905			0.965		0.730				0.938	
Satd. Flow (perm)	0	1744	1830	0	1956	1641	1295	1721	0	0	1923	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72			36		49			29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84
Heavy Vehicles (%)	0%	2%	0%	0%	0%	5%	0%	0%	0%	5%	0%	0%
Adj. Flow (vph)	28	418	72	30	551	22	83	68	49	24	52	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	72	0	581	22	83	117	0	0	105	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

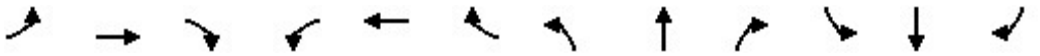
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		27.3	27.3		27.3	27.3	26.7	26.7			26.7	
Actuated g/C Ratio		0.45	0.45		0.45	0.45	0.44	0.44			0.44	
v/c Ratio		0.57	0.08		0.66	0.03	0.15	0.15			0.12	
Control Delay		14.7	2.2		16.5	1.7	14.1	9.2			10.5	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		14.7	2.2		16.5	1.7	14.1	9.2			10.5	
LOS		B	A		B	A	B	A			B	
Approach Delay		13.0			15.9			11.2			10.5	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 61			
Actuated Cycle Length: 61			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13:

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	446	72	581	22	83	117	105
v/c Ratio	0.57	0.08	0.66	0.03	0.15	0.15	0.12
Control Delay	14.7	2.2	16.5	1.7	14.1	9.2	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	2.2	16.5	1.7	14.1	9.2	10.5
Queue Length 50th (ft)	115	0	158	0	18	14	16
Queue Length 95th (ft)	140	13	182	5	47	44	46
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1057	1138	1186	1009	567	782	859
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.06	0.49	0.02	0.15	0.15	0.12

Intersection Summary

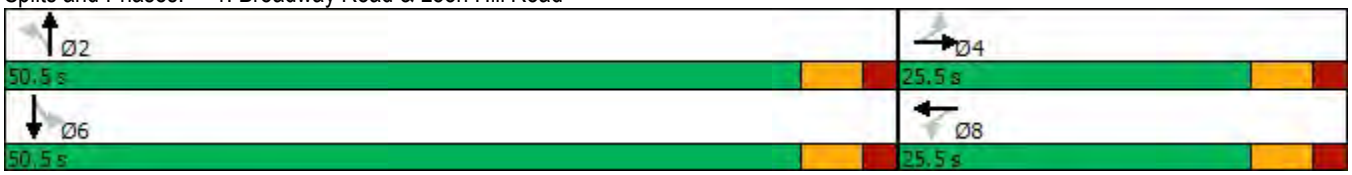


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	7	2	86	7	37	3	541	98	43	642	9
Future Volume (vph)	10	7	2	86	7	37	3	541	98	43	642	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.873			0.977			0.998	
Flt Protected		0.975		0.950			0.950			0.950		
Satd. Flow (prot)	0	2066	0	1745	1564	0	1805	1805	0	1572	1780	0
Flt Permitted		0.854		0.741			0.310			0.313		
Satd. Flow (perm)	0	1810	0	1361	1564	0	589	1805	0	518	1780	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			44			23			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.79	0.79	0.79	0.85	0.85	0.85	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	3%	2%	11%	3%	0%
Adj. Flow (vph)	13	9	3	101	8	44	3	588	107	46	690	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	0	101	52	0	3	695	0	46	700	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		12.1		12.1	12.1		33.1	33.1		33.1	33.1	
Actuated g/C Ratio		0.25		0.25	0.25		0.70	0.70		0.70	0.70	
v/c Ratio		0.05		0.29	0.12		0.01	0.55		0.13	0.56	
Control Delay		15.5		19.6	8.4		4.3	7.6		5.5	8.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		15.5		19.6	8.4		4.3	7.6		5.5	8.1	
LOS		B		B	A		A	A		A	A	
Approach Delay		15.5			15.8			7.6			7.9	
Approach LOS		B			B			A			A	

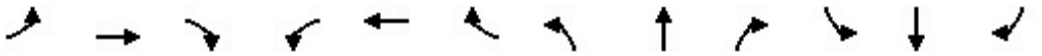
Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 47.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 50.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	101	52	3	695	46	700
v/c Ratio	0.05	0.29	0.12	0.01	0.55	0.13	0.56
Control Delay	15.5	19.6	8.4	4.3	7.6	5.5	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	19.6	8.4	4.3	7.6	5.5	8.1
Queue Length 50th (ft)	4	20	1	0	89	4	95
Queue Length 95th (ft)	20	67	24	3	222	18	235
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	902	677	800	542	1663	477	1638
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.15	0.07	0.01	0.42	0.10	0.43

Intersection Summary

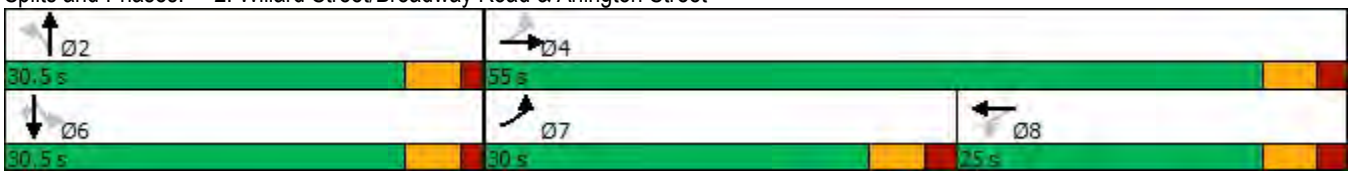


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	405	130	11	6	139	79	27	187	2	62	242	437
Future Volume (vph)	405	130	11	6	139	79	27	187	2	62	242	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.952			0.999				0.850
Flt Protected	0.950				0.999			0.994		0.950		
Satd. Flow (prot)	1752	1815	0	0	1735	0	0	1855	0	1736	1881	1777
Flt Permitted	0.318				0.992			0.937		0.485		
Satd. Flow (perm)	587	1815	0	0	1723	0	0	1748	0	886	1881	1777
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			31			1				470
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.93	0.93	0.93	0.81	0.81	0.81	0.92	0.92	0.92	0.93	0.93	0.93
Heavy Vehicles (%)	3%	2%	20%	0%	5%	3%	0%	2%	0%	4%	1%	3%
Adj. Flow (vph)	435	140	12	7	172	98	29	203	2	67	260	470
Shared Lane Traffic (%)												
Lane Group Flow (vph)	435	152	0	0	277	0	0	234	0	67	260	470
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	42.0	42.0			15.9			17.1		17.1	17.1	17.1
Actuated g/C Ratio	0.63	0.63			0.24			0.26		0.26	0.26	0.26
v/c Ratio	0.57	0.13			0.64			0.52		0.30	0.54	0.58
Control Delay	10.3	5.8			29.5			27.0		25.6	27.1	5.7
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	10.3	5.8			29.5			27.0		25.6	27.1	5.7
LOS	B	A			C			C		C	C	A
Approach Delay		9.1			29.5			27.0			14.3	
Approach LOS		A			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 66.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 72.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	435	152	277	234	67	260	470
v/c Ratio	0.57	0.13	0.64	0.52	0.30	0.54	0.58
Control Delay	10.3	5.8	29.5	27.0	25.6	27.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	5.8	29.5	27.0	25.6	27.1	5.7
Queue Length 50th (ft)	72	19	93	85	23	95	0
Queue Length 95th (ft)	175	56	172	163	60	179	65
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	861	1428	609	750	380	807	1030
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.11	0.45	0.31	0.18	0.32	0.46

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	382	62	32	368	86	45
Future Volume (vph)	382	62	32	368	86	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.981					0.850
Flt Protected				0.996	0.950	
Satd. Flow (prot)	1832	0	0	1858	1805	1615
Flt Permitted				0.996	0.950	
Satd. Flow (perm)	1832	0	0	1858	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	415	67	35	400	93	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	482	0	0	435	93	49
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

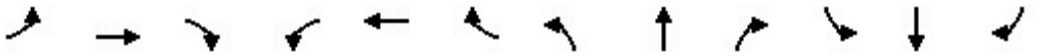
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	382	62	32	368	86	45
Future Volume (Veh/h)	382	62	32	368	86	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	415	67	35	400	93	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			482		918	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			482		918	448
tC, single (s)			4.1		*5.9	*5.8
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		72	92
cM capacity (veh/h)			1091		334	646

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	482	435	93	49
Volume Left	0	35	93	0
Volume Right	67	0	0	49
cSH	1700	1091	334	646
Volume to Capacity	0.28	0.03	0.28	0.08
Queue Length 95th (ft)	0	2	28	6
Control Delay (s)	0.0	1.0	19.9	11.0
Lane LOS		A	C	B
Approach Delay (s)	0.0	1.0	16.8	
Approach LOS			C	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

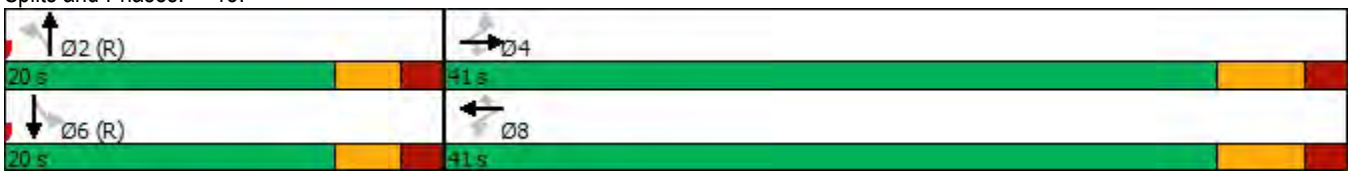


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	370	51	43	384	17	65	31	33	24	41	36
Future Volume (vph)	16	370	51	43	384	17	65	31	33	24	41	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923			0.952	
Flt Protected		0.998			0.995		0.950				0.988	
Satd. Flow (prot)	0	1905	1777	0	1948	1625	1685	1584	0	0	1980	0
Flt Permitted		0.972			0.927		0.708				0.936	
Satd. Flow (perm)	0	1855	1777	0	1815	1625	1256	1584	0	0	1876	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			36		47			44	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.95	0.95	0.95	0.83	0.83	0.83	0.70	0.70	0.70	0.81	0.81	0.81
Heavy Vehicles (%)	0%	3%	3%	8%	3%	6%	0%	7%	7%	0%	3%	3%
Adj. Flow (vph)	17	389	54	52	463	20	93	44	47	30	51	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	406	54	0	515	20	93	91	0	0	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		26.3	26.3		26.3	26.3	27.7	27.7			27.7	
Actuated g/C Ratio		0.43	0.43		0.43	0.43	0.45	0.45			0.45	
v/c Ratio		0.51	0.07		0.66	0.03	0.16	0.12			0.14	
Control Delay		14.0	2.5		17.3	1.5	13.8	8.2			9.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		14.0	2.5		17.3	1.5	13.8	8.2			9.3	
LOS		B	A		B	A	B	A			A	
Approach Delay		12.6			16.7			11.0			9.3	
Approach LOS		B			B			B			A	

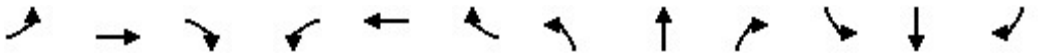
Intersection Summary	
Area Type:	Other
Cycle Length: 61	
Actuated Cycle Length: 61	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 13:



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	406	54	515	20	93	91	125
v/c Ratio	0.51	0.07	0.66	0.03	0.16	0.12	0.14
Control Delay	14.0	2.5	17.3	1.5	13.8	8.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	2.5	17.3	1.5	13.8	8.2	9.3
Queue Length 50th (ft)	103	0	143	0	19	9	16
Queue Length 95th (ft)	124	12	149	4	43	27	47
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1125	1099	1100	999	571	746	877
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.05	0.47	0.02	0.16	0.12	0.14

Intersection Summary

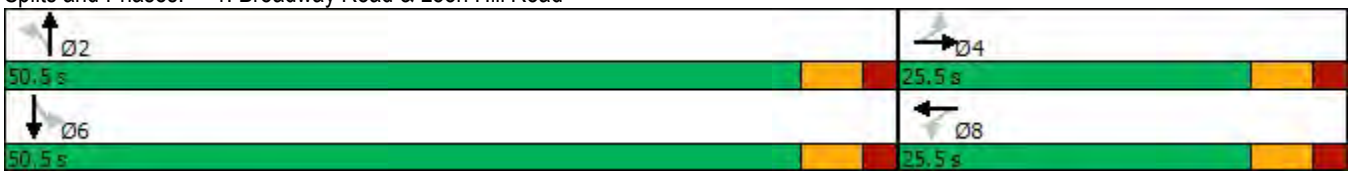


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	6	15	134	4	56	8	735	106	46	805	15
Future Volume (vph)	29	6	15	134	4	56	8	735	106	46	805	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	11	11	11	12	12	12	11	11	11
Storage Length (ft)	0		0	250		0	280		0	215		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.859			0.981			0.997	
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	2009	0	1745	1578	0	1805	1827	0	1745	1813	0
Flt Permitted		0.816		0.817			0.206			0.204		
Satd. Flow (perm)	0	1687	0	1501	1578	0	391	1827	0	375	1813	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			60			18			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		227			824			625			1166	
Travel Time (s)		5.2			18.7			12.2			22.7	
Peak Hour Factor	0.78	0.78	0.78	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	1%	0%
Adj. Flow (vph)	37	8	19	143	4	60	9	782	113	50	875	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	143	64	0	9	895	0	50	891	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	1.04	1.04	1.04	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		23.5	23.5		23.5	23.5		23.5	23.5	
Total Split (s)	25.5	25.5		25.5	25.5		50.5	50.5		50.5	50.5	
Total Split (%)	33.6%	33.6%		33.6%	33.6%		66.4%	66.4%		66.4%	66.4%	
Maximum Green (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		3.5		3.5	3.5		3.5	3.5		3.5	3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		14.1		14.1	14.1		39.6	39.6		39.6	39.6	
Actuated g/C Ratio		0.25		0.25	0.25		0.71	0.71		0.71	0.71	
v/c Ratio		0.15		0.38	0.14		0.03	0.69		0.19	0.69	
Control Delay		16.0		23.9	8.0		5.0	11.0		7.2	11.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		16.0		23.9	8.0		5.0	11.0		7.2	11.4	
LOS		B		C	A		A	B		A	B	
Approach Delay		16.0			19.0			10.9			11.2	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 55.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Broadway Road & Loon Hill Road



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	143	64	9	895	50	891
v/c Ratio	0.15	0.38	0.14	0.03	0.69	0.19	0.69
Control Delay	16.0	23.9	8.0	5.0	11.0	7.2	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	23.9	8.0	5.0	11.0	7.2	11.4
Queue Length 50th (ft)	12	41	1	1	174	6	179
Queue Length 95th (ft)	37	101	28	6	411	25	419
Internal Link Dist (ft)	147		744		545		1086
Turn Bay Length (ft)		250		280		215	
Base Capacity (vph)	737	646	714	324	1515	310	1501
Starvation Cap Reductn	0	0	0	0	16	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.22	0.09	0.03	0.60	0.16	0.59

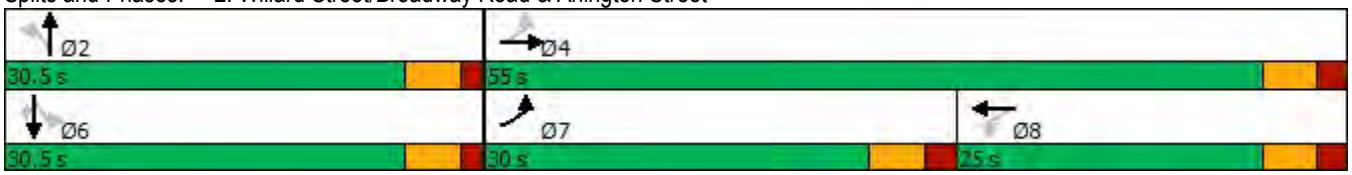
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	525	166	16	0	192	104	45	270	2	117	282	629
Future Volume (vph)	525	166	16	0	192	104	45	270	2	117	282	629
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	16
Storage Length (ft)	140		0	0		0	0		0	195		100
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.953			0.999				0.850
Flt Protected	0.950							0.993		0.950		
Satd. Flow (prot)	1770	1858	0	0	1811	0	0	1864	0	1805	1900	1812
Flt Permitted	0.174							0.801		0.344		
Satd. Flow (perm)	324	1858	0	0	1811	0	0	1503	0	654	1900	1812
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			30							684
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		852			735			771			625	
Travel Time (s)		16.6			14.3			15.0			12.2	
Peak Hour Factor	0.94	0.94	0.94	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	2%	1%	0%	0%	0%	1%
Adj. Flow (vph)	559	177	17	0	240	130	56	338	3	127	307	684
Shared Lane Traffic (%)												
Lane Group Flow (vph)	559	194	0	0	370	0	0	397	0	127	307	684
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA		Perm	NA		Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	10.5	23.5		23.5	23.5		23.0	23.0		23.0	23.0	23.0
Total Split (s)	30.0	55.0		25.0	25.0		30.5	30.5		30.5	30.5	30.5
Total Split (%)	35.1%	64.3%		29.2%	29.2%		35.7%	35.7%		35.7%	35.7%	35.7%
Maximum Green (s)	24.5	49.5		19.5	19.5		25.5	25.5		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		1.5	1.5		1.5	1.5	1.5
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-1.5		-1.5	-1.5	-1.5
Total Lost Time (s)	3.5	3.5			3.5			3.5		3.5	3.5	3.5
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effct Green (s)	49.0	49.0			19.6			24.3		24.3	24.3	24.3
Actuated g/C Ratio	0.61	0.61			0.24			0.30		0.30	0.30	0.30
v/c Ratio	0.85	0.17			0.80			0.87		0.64	0.53	0.67
Control Delay	31.3	7.4			41.4			48.7		42.2	27.7	5.6
Queue Delay	0.0	0.0			0.0			0.0		0.0	0.0	0.0
Total Delay	31.3	7.4			41.4			48.7		42.2	27.7	5.6
LOS	C	A			D			D		D	C	A
Approach Delay		25.1			41.4			48.7			15.8	
Approach LOS		C			D			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85.5			
Actuated Cycle Length: 80.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 27.0		Intersection LOS: C	
Intersection Capacity Utilization 90.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Willard Street/Broadway Road & Arlington Street



Lane Group	EBL	EBT	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	559	194	370	397	127	307	684
v/c Ratio	0.85	0.17	0.80	0.87	0.64	0.53	0.67
Control Delay	31.3	7.4	41.4	48.7	42.2	27.7	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	7.4	41.4	48.7	42.2	27.7	5.6
Queue Length 50th (ft)	219	40	171	197	57	134	0
Queue Length 95th (ft)	#409	69	231	#284	#135	212	74
Internal Link Dist (ft)		772	655	691		545	
Turn Bay Length (ft)	140				195		100
Base Capacity (vph)	680	1209	512	511	222	646	1068
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.16	0.72	0.78	0.57	0.48	0.64

Intersection Summary

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

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	501	115	64	558	99	58
Future Volume (vph)	501	115	64	558	99	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975					0.850
Flt Protected				0.995	0.950	
Satd. Flow (prot)	1823	0	0	1857	1805	1615
Flt Permitted				0.995	0.950	
Satd. Flow (perm)	1823	0	0	1857	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	1007			1940	393	
Travel Time (s)	22.9			44.1	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	2%	0%	0%
Adj. Flow (vph)	545	125	70	607	108	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	670	0	0	677	108	63
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	501	115	64	558	99	58
Future Volume (Veh/h)	501	115	64	558	99	58
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	545	125	70	607	108	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			670		1354	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			670		1354	608
tC, single (s)			4.1		*5.9	*5.8
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		42	88
cM capacity (veh/h)			930		186	535

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	670	677	108	63
Volume Left	0	70	108	0
Volume Right	125	0	0	63
cSH	1700	930	186	535
Volume to Capacity	0.39	0.08	0.58	0.12
Queue Length 95th (ft)	0	6	79	10
Control Delay (s)	0.0	1.9	48.2	12.6
Lane LOS		A	E	B
Approach Delay (s)	0.0	1.9	35.1	
Approach LOS			E	

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

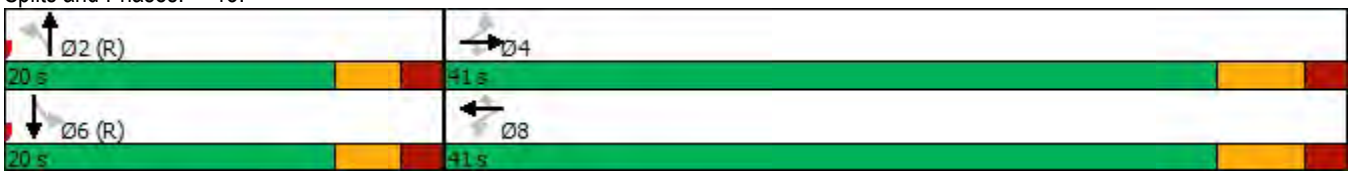
* User Entered Value

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	423	70	27	535	20	72	56	40	20	44	28
Future Volume (vph)	30	423	70	27	535	20	72	56	40	20	44	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	14	14	14	10	11	11	16	16	16
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.937			0.959	
Flt Protected		0.997			0.998		0.950				0.989	
Satd. Flow (prot)	0	1922	1830	0	2023	1641	1685	1721	0	0	2020	0
Flt Permitted		0.860			0.965		0.723				0.939	
Satd. Flow (perm)	0	1658	1830	0	1956	1641	1282	1721	0	0	1918	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			36		49			33	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1940			687			872			752	
Travel Time (s)		44.1			15.6			19.8			17.1	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84
Heavy Vehicles (%)	0%	2%	0%	0%	0%	5%	0%	0%	0%	5%	0%	0%
Adj. Flow (vph)	33	460	76	30	601	22	88	68	49	24	52	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	493	76	0	631	22	88	117	0	0	109	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			10			10	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.96	0.96	0.85	0.92	0.92	0.92	1.09	1.04	1.04	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	20.0	20.0		20.0	20.0	
Total Split (%)	67.2%	67.2%	67.2%	67.2%	67.2%	67.2%	32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0			-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	3.0	3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min	Min	C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		28.9	28.9		28.9	28.9	25.1	25.1			25.1	
Actuated g/C Ratio		0.47	0.47		0.47	0.47	0.41	0.41			0.41	
v/c Ratio		0.63	0.08		0.68	0.03	0.17	0.16			0.13	
Control Delay		15.0	1.9		15.8	1.5	15.4	10.0			11.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0			0.0	
Total Delay		15.0	1.9		15.8	1.5	15.4	10.0			11.1	
LOS		B	A		B	A	B	A			B	
Approach Delay		13.2			15.3			12.3			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 61			
Actuated Cycle Length: 61			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13:



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	493	76	631	22	88	117	109
v/c Ratio	0.63	0.08	0.68	0.03	0.17	0.16	0.13
Control Delay	15.0	1.9	15.8	1.5	15.4	10.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	1.9	15.8	1.5	15.4	10.0	11.1
Queue Length 50th (ft)	124	0	165	0	20	15	17
Queue Length 95th (ft)	155	12	191	5	51	46	48
Internal Link Dist (ft)	1860		607			792	672
Turn Bay Length (ft)		100					
Base Capacity (vph)	1005	1139	1186	1009	527	736	808
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.07	0.53	0.02	0.17	0.16	0.13

Intersection Summary

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Appendix Q –

Drainage Report (Stormwater Management Report): Bohler, September 20, 2024.

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DRAINAGE REPORT

For

WORLD DRACUT, LLC

PROPOSED
DEVELOPMENT

Parcel ID: 4924, 8011, 8012
341 BROADWAY ROAD, 226 & 250 LOON HILL ROAD,
TOWN OF DRACUT,
MIDDLESEX COUNTY, MA

Prepared by:

BOHLER ENGINEERING
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Timothy Hayes
Massachusetts P.E. Lic. #51929

BOHLER

September 20, 2024
#MAB230046.00

BOHLER

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I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the development of a proposed mixed-use development project located at 341 Broadway Rd in the Town of Dracut, Massachusetts. The site, which contains approximately 46.5 acres of land, consists of multiple parcels identified as 4924, 8011, and 8012 in the municipal assessor's database. The existing parcel is primarily wooded with narrow gravel driveways and a clearing along high-tension overhead power lines through the middle of the property. The limit of work is primarily on the northern portion of the project site, with no proposed work within the remaining which consist primarily of wetlands and a perennial stream located along the southwest in the project site. A portion of the site is within the Flood Zone AE, but no development is proposed there.

The proposed project includes the construction of retail market store w/ restaurant use, residential, mixed-used, and recreational buildings along with new paved parking areas, access roadways, landscaping, storm water management components and associated utilities. This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans prepared by Bohler. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at one (1) "design point" where stormwater runoff currently drains to under existing conditions. These design points are described in further detail in **Section II** below. A summary of the existing and proposed conditions peak runoff rates for the 2-, 10-, 25-, and 100-year storms can be found in **Table 1.1** below. In addition, the project has been designed to meet or exceed the Stormwater Management Standards as detailed herein.

Table 1.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	3.92	3.41	**-0.51**	6.54	5.96	**-0.58**	8.61	8.32	**-0.29**	16.55	14.94	**-1.61**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description

The site, which contains approximately 46.5 acres of land, consists of multiple parcels identified as 4924, 8011, and 8012 in the municipal assessor's database. The existing parcel is primarily wooded with narrow gravel driveways and a clearing along high-tension overhead power lines through the middle of the property. The limit of work is primarily on the northern portion of the project site, with no proposed work within the remaining which consist primarily of wetlands and a perennial stream located along the southwest in the project site. A portion of the site is within the Flood Zone AE, but no development is proposed there.

On-Site Soil Information

Soils within the analyzed area consist of the following as classified by the Natural Resource Conservation Service (NRCS):

Table 2.1: Existing Soil Information

Soil Unit Symbol	Soil Name / Description	Hydrologic Soil Group (HSG)
300C	Montauk fine sandy loam	C
420B	Canton fine sandy loam	B
103B	Charlton-Hollis-Rock outcrop complex	A
315B	Scituate fine sandy loam	D

Onsite soil testing was performed by Bohler on April 24th & 25th, 2024. A majority of the site was determined to be Sand or Loamy Sand placing the HSG classification as A. Refer to **Appendix C** for additional information.

Existing Collection and Conveyance

Generally, stormwater runoff moves towards the south, southwest, and southeast, towards the abutting bordering vegetated wetlands throughout and around the site. Based on review of existing LiDAR data, these wetlands are generally hydraulically connected and appear to eventually flow towards the wetland system towards the southwest.

Existing Watersheds and Design Point Information

For the purposes of this analysis, the pre- and post-development drainage conditions were analyzed at one (1) "design point" as described below where stormwater runoff currently drains

to under existing conditions. The existing site was subdivided into three (3) separate sub catchments, as described below, to analyze existing and proposed flow rates at each design point. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr). The extents of the analysis is limited to the limits of the Bordering Vegetated Wetlands, property line(s), and generally the limit of work.

Design Point #1 (DP1) is the major wetland system towards the southwest of the project site. Under existing conditions, this design point receives stormwater flows from approximately 23.4 acres of land, designated as watersheds EX-1, EX-2, and EX-3.

Refer to **Table 1.1 and 6.1** for the existing conditions peak rates of runoff. Refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the existing drainage areas.

III. PROPOSED SITE CONDITIONS

Proposed Development Description

The proposed project consists of the construction of the following buildings along with paved parking areas, access roadways, landscaping, associated utilities, and a new stormwater management system:

- One (1) grocery store and restaurant building identified as a Market Building
- Three (3) residential buildings identified as Buildings 1, 4 and 5. Building 5 includes a pool and community center that connects to Building 3
- Two (2) mixed-use buildings identified as Buildings 2 and 3.
- One (1) recreation use building identified as Recreation Building.

  The Recreation Building and Building 2 both have subsurface parking garages.

The site, including proposed parking areas, has been designed to drain to deep-sump, hooded catch basins, water quality inlets (hydrodynamic separators) or trench drain(s). The inlet structures will capture and convey stormwater runoff, via an underground pipe system, to either above-ground infiltration/detention basins or subsurface infiltration basins. Pretreatment of stormwater runoff will be provided by a combination of the deep-sump, hooded catch basins and hydrodynamic separators prior to discharge into the proposed infiltration basins. Rooftop runoff has been designed to flow to the basins as well.

Proposed Development Collection and Conveyance

Deep sump hooded catch basins, water quality inlets (hydrodynamic separators), and trench drains are proposed to collect and route runoff from the paved parking areas to the proposed stormwater management basins. Pipes have been designed for the 25-year storm using the Rational Method. Pipe sizing calculations are included in **Appendix F**.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meets, or exceeds, the standards set forth in the Massachusetts Department of Environmental Protection Stormwater Handbook standards. Refer to **Section V** for additional information.

Proposed Watersheds and Design Point Information

The project has been designed to maintain existing drainage watersheds to the greatest extent possible, with the same design points described in **Section II** above. The site was subdivided

into separate sub catchments with a minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Under proposed conditions DP#1 receives stormwater flows from approximately 23.4 acres of land from the contributing watersheds.

Refer to **Table 1.1 and 6.1** for the calculated proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the proposed drainage areas.

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the latest edition of the Massachusetts DEP Stormwater Handbook. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in table 4.1 below for stormwater calculations is based on NOAA. Refer to **Appendix F** for more information.

Table 4.1: NOAA Rainfall Intensities

Frequency	2 year	10 year	25 year	100 year
Rainfall* (inches)	3.13	4.89	5.98	7.68

*Values derived from NOAA ATLAS on 01/05/2024

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets, or exceeds, the MADEP Stormwater Management standards. Compliance with these standards is described further below.

V. STORMWATER MANAGEMENT STANDARDS

Standard #1: No New Untreated Discharges

The project has been designed so that proposed impervious areas (including the building roof and paved parking/driveway areas) shall be collected and passed through the proposed drainage system for treatment prior to discharge.

Standard #2: Peak Rate Attenuation

As outlined in **Table 1.1** and **Table 6.1**, the development of the site and the proposed stormwater management system, have been designed so that post-development peak rates of runoff are below pre-development conditions for the 2-, 10-, 25-, and 100-year storm events at all design points.

Standard #3: Recharge

The stormwater runoff from the project will be collected and diverted to their respective proposed infiltration or detention systems. The project as proposed will involve the creation of approximately 12.07 acres of impervious area and is required to infiltrate 26,307 cubic feet (adjusted to 27,780-cf to compensate for flow directed to detention basins) of stormwater as defined in Stormwater Standard 3. The proposed infiltration basins will provide 157,511 cubic feet of volume below the lowest outlet for groundwater recharge. Refer to **Appendix F** of this report for calculations documenting required and provided recharge volumes.

The DEP Stormwater Standards require that the infiltration BMP drains completely within 72 hours of the end of the storm event. Calculations showing that the proposed infiltration basin will drain within the required time are included in **Appendix F** of this report.

Standard #4: Water Quality

Water quality treatment is provided via deep sump catch basins, hydrodynamic separators, and infiltration basins. TSS removal calculations are included in **Appendix F** of this report. The project as proposed will involve the creation of approximately 12.07 acres of impervious area and is required to treat 43,845 cubic feet of water quality volume as defined in Stormwater Standard 4. The proposed infiltration basin provides 157,511 cubic feet of water quality volume below the lowest outlet for water quality treatment. Refer to **Appendix F** of this report for calculations documenting required and provided water quality volumes.

Standard #5: Land Use with Higher Potential Pollutant Loads

The proposed project involves "Land Uses with Higher Potential Pollutant Loads" as it proposes the creation of more than 1,000 vehicular trips per day. Accordingly, the stormwater management system includes an oil-grit separator (Stormceptor unit) prior to discharge. In addition, the project will provide 44% TSS removal prior to infiltration and treat the 1.0 in water quality depth, as further illustrated in **Appendix E** of this report.

Standard #6: Critical Areas

Not Applicable for this project.

Standard #7: Redevelopment

Not Applicable for this project.

Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes a proposed construction exit, protection for stormwater inlets, protection around temporary material stock piles and various other techniques as outlined on the erosion and sediment control sheets. Additionally, the project is required to file a Notice of Intent with the US EPA and implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP will be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the project's proponent. Refer to **Appendix H**.

Standard #9: Operation and Maintenance Plan (O&M Plan)

An Operation and Maintenance (O&M) Plan for this site has been prepared and is included in **Appendix G** of this report. The O&M Plan outlines procedures and time tables for the long-term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction, and periodic monitoring of the system components, in accordance with established practices and the manufacturer's recommendations. The O&M Plan includes a list of responsible parties.

Standard #10: Prohibition of Illicit Discharges

The proposed stormwater system will only convey allowable non-stormwater discharges (firefighting waters, irrigation, air conditioning condensates, etc.) and will not contain any illicit discharges from prohibited sources. An Illicit Discharge Statement is included in **Appendix G** of this report.

VI. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler results in a reduction in peak rates of runoff and volume from the subject site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies. In addition, the proposed best management practices will result in an effective removal of total suspended solids from the post-development runoff. The pre-development versus post-development stormwater discharge comparisons are contained in **Table 6.1** and **Table 6.2** below:

Table 6.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP1	3.92	3.41	**-0.51**	6.54	5.96	**-0.58**	8.61	8.32	**-0.29**	16.55	14.94	**-1.61**

**Flows are represented in cubic feet per second (cfs)Table 6.2: Design Point Volume Summary*

As outlined in the table above, the proposed stormwater management system as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year storm events.

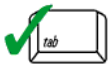
APPENDIX A: MASSACHUSETTS STORMWATER MANAGEMENT CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

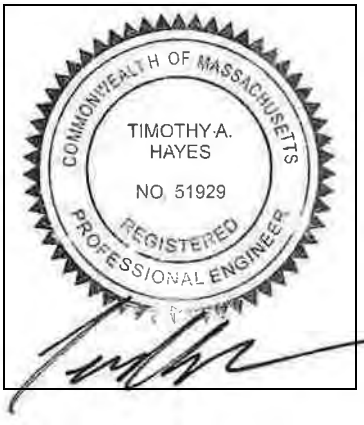
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



09/20/2024

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

APPENDIX B: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*

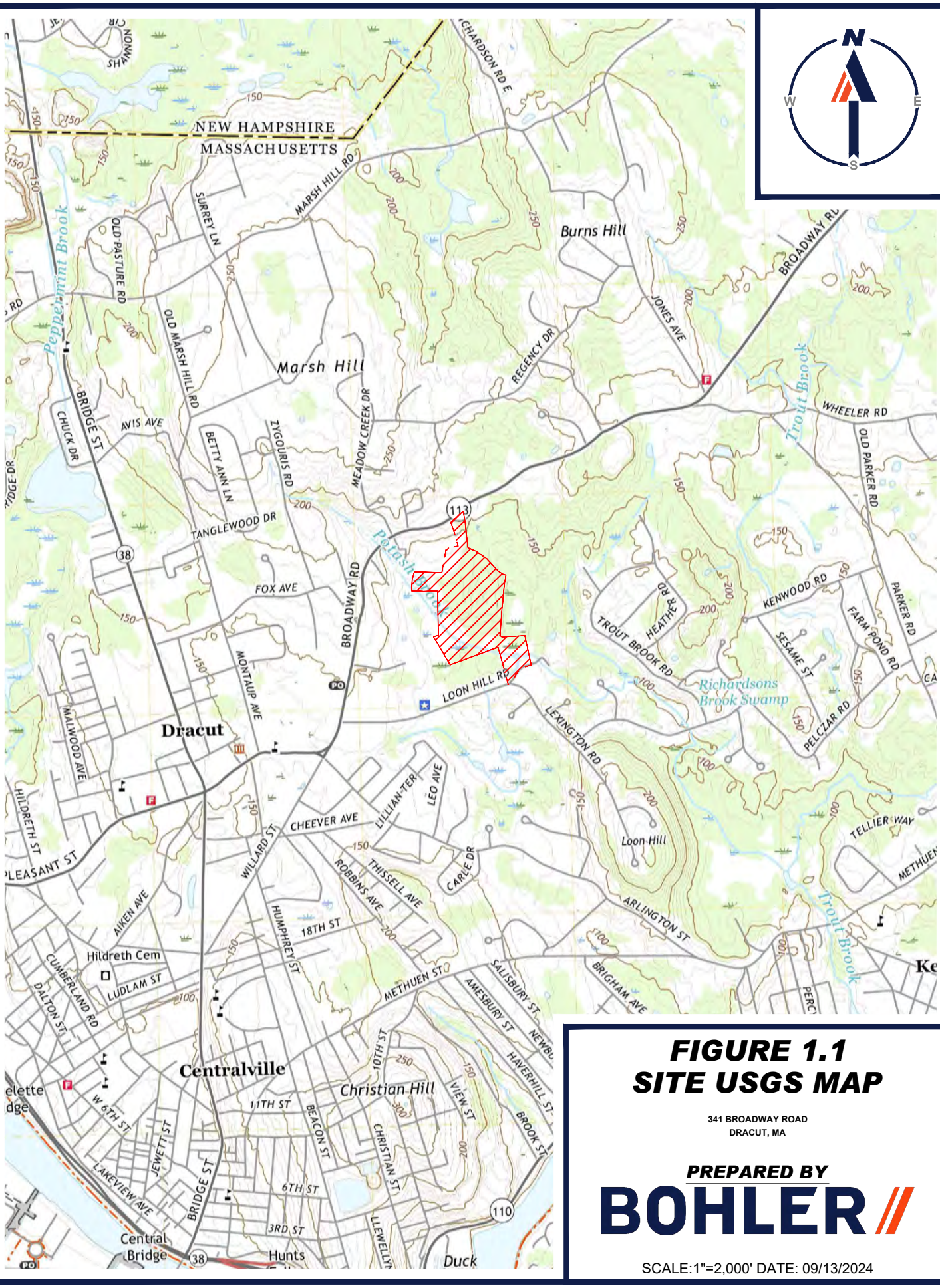


FIGURE 1.1
SITE USGS MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY

BOHLER

SCALE:1"=2,000' DATE: 09/13/2024

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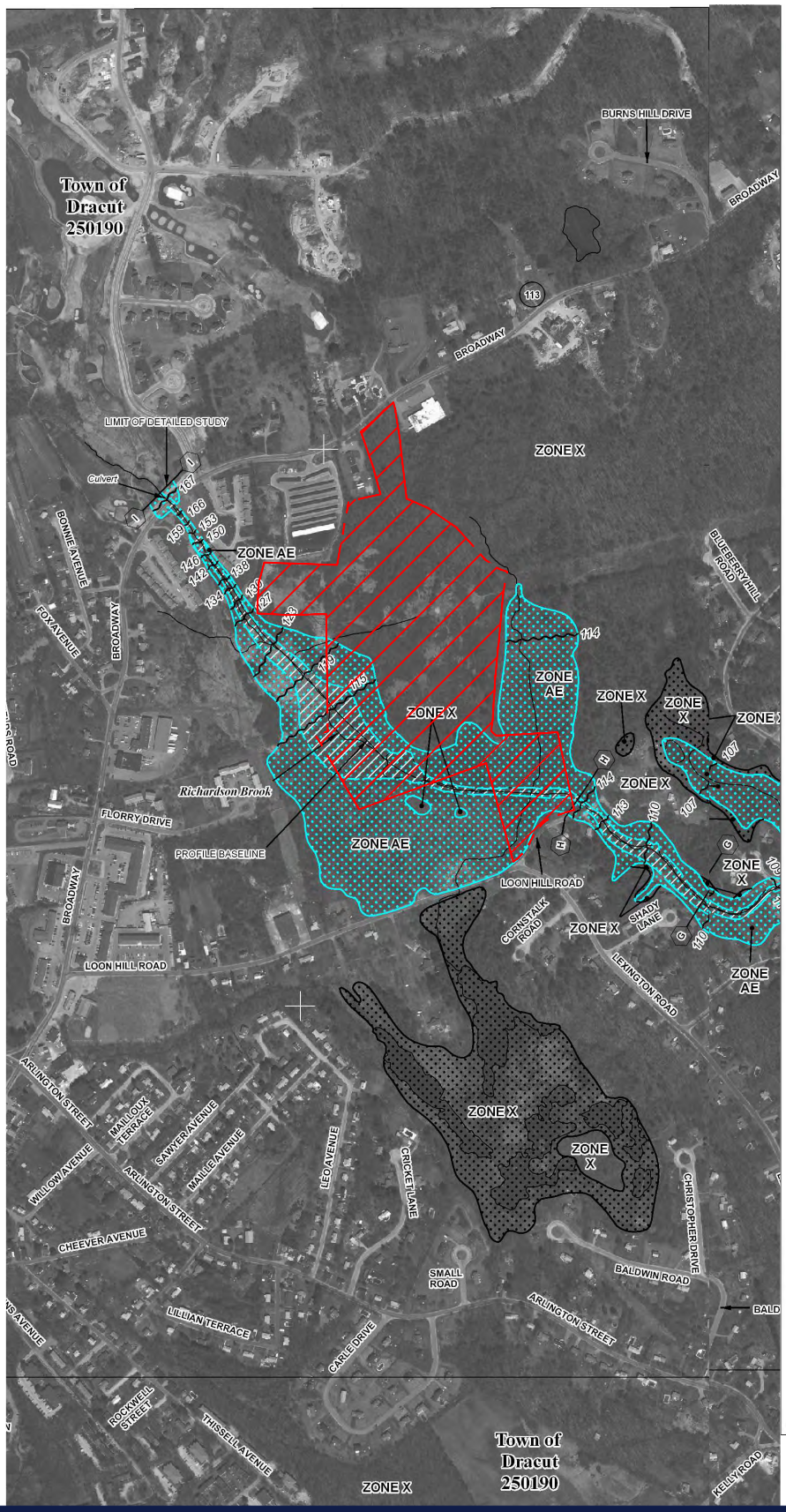

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 (EL 987)	Base Flood Elevation line and value; elevation in feet*
	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276000mN	1000-meter Universal Transverse Mercator grid values, zone 19
600000 FT	5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPSZONE 2001), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

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FIGURE 2.5
FLOOD INSURANCE RATE MAP

341 BROADWAY ROAD
DRACUT, MA

PREPARED BY
BOHLER

SCALE:1"=1,000' DATE: 09/13/2024

APPENDIX C: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*
- *REPORT OF GEOTECHNICAL INVESTIGATION*

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Middlesex County, Massachusetts

April 23, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,640 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 23, Sep 12, 2023

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
51A	Swansea muck, 0 to 1 percent slopes	4.0	7.7%
52A	Freetown muck, 0 to 1 percent slopes	0.2	0.3%
71B	Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony	5.0	9.8%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	13.0	25.4%
300C	Montauk fine sandy loam, 8 to 15 percent slopes	8.8	17.1%
315B	Scituate fine sandy loam, 3 to 8 percent slopes	5.5	10.7%
420B	Canton fine sandy loam, 3 to 8 percent slopes	15.0	29.1%
Totals for Area of Interest		**51.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a

given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Middlesex County, Massachusetts

51A—Swansea muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2trl2
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Swansea and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swansea

Setting

Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 34 inches: muck
Cg - 34 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Freetown

Percent of map unit: 10 percent
Landform: Bogs, swamps

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Depressions, depressions, swamps, kettles, marshes, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs, swamps, marshes, depressions, depressions, kettles
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

71B—Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w69c
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Drumlins, depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Woodbridge, extremely stony
Percent of map unit: 10 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Whitman, extremely stony
Percent of map unit: 8 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Paxton, extremely stony
Percent of map unit: 2 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

103B—Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 98yc
Elevation: 0 to 1,490 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Charlton and similar soils: 50 percent
Hollis and similar soils: 25 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Ground moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Granite and gneiss

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Canton

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Narragansett

Percent of map unit: 2 percent
Landform: Hills, ridges
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder, toeslope
Landform position (three-dimensional): Head slope, nose slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scituate

Percent of map unit: 2 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Montauk

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

300C—Montauk fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w80p
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Montauk and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montauk

Setting

Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 26 inches: fine sandy loam
Bw2 - 26 to 34 inches: sandy loam
2Cd - 34 to 72 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Scituate

Percent of map unit: 6 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Canton

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 4 percent
Landform: Depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

315B—Scituate fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: vqqw
Elevation: 70 to 1,120 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Scituate and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scituate

Setting

Landform: Hillslopes, depressions
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable loamy eolian deposits over dense sandy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 20 inches: sandy loam
H3 - 20 to 27 inches: loamy fine sand
H4 - 27 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 33 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, toeslope
Landform position (three-dimensional): Nose slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Montauk

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

420B—Canton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w81b
Elevation: 0 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Canton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Landform: Hills, moraines, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest

Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: gravelly fine sandy loam
2C - 26 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate

Percent of map unit: 10 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk

Percent of map unit: 5 percent
Landform: Moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton

Percent of map unit: 4 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear

Across-slope shape: Convex
Hydric soil rating: No

Swansea

Percent of map unit: 1 percent
Landform: Marshes, depressions, bogs, swamps, kettles
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1A
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Canton 420B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	30 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	20 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
12"	Ap	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
32"	Bw	Sandy Loam	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
52"	C	Loamy Sand	2.5Y 6/2	Grav: N/A, C&S: 20%, Massive, Friable (Very Fine)
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	36"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:		Not Observed			
		Depth to weeping from side of obs. hole:		36"			
		Depth to soil mottles, description:		30"			
		Groundwater adjustment:		N/A			
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		30"					

Notes:	TP ended early due to large boulders / excavator capability.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1B
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Canton 420B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	40 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
8"	Ap	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
20"	Bw	Sandy Loam	10YR 4/3	Grav: N/A, C&S: N/A, Massive, Friable
44"	C1	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
106"	C2	Loamy Sand	2.5Y 6/2	Grav: N/A, C&S: N/A, Massive, Friable (Very Fine)

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	74"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			74"		
		Depth to soil mottles, description:			58"		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		58"					

Notes:	TP ended early due to excavator capability.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1C
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
4"	Ap	Loamy Sand	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
12"	Bw	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
112"	C	Fine Sand	2.5Y 5/2	Grav: N/A, C&S: 5%, Single Grain, Loose
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	Not Observed	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			Not Observed		
		Depth to soil mottles, description:			Not Observed		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		N/A					

Notes:	TP ended early due to excavator capability.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1D
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Ridgebury 71B	
Vegetation:	Trees, shrubs, grass		Slope:	6-10%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	50 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	50 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
10"	Ap	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
20"	Bw	Sandy Loam	10YR 3/3	Grav: N/A, C&S: N/A, Massive, Friable
52"	C1	Loamy Sand	10YR 5/4	Grav: N/A, C&S: N/A, Massive, Friable
90"	C2	Loamy Sand	2.5Y 5/2	Grav: N/A, C&S: 5%, Massive, Friable (Very Fine)

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	86"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			86"		
		Depth to soil mottles, description:			60" (see notes)		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		86"					

Notes:	TP ended early due to potential refusal. Mottles present on one side of TP @ 60" - potentially roots.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1E
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	6-10%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	60 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
12"	Ap	Loamy Sand	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
24"	Bw	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
108"	C	Fine Sand	2.5Y 4/2	Grav: 5%, C&S: 10%, Single Grain, Loose
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	Not Observed	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			Not Observed		
		Depth to soil mottles, description:			Not Observed		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		N/A					

Notes:	TP ended early due to excavator capability.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1F
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/25/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	6-10%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	60 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	30 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
12"	Ap	Loamy Sand	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
26"	Bw	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
84"	C1	Fine Sand	2.5Y 5/2	Grav: 5%, C&S: 10%, Single Grain, Loose
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	Not Observed	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			Not Observed		
		Depth to soil mottles, description:			Not Observed		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		N/A					

Notes:	TP ended early due to excavator issue.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1G
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	60 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	50 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
12"	A	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
36"	Bw	Loamy Sand	10YR 6/3	Grav: N/A, C&S: N/A, Massive, Friable
74"	C	Sand	2.5Y 6/2	Grav: 5%, C&S: 20%, Single Grain, Loose
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	74"	
	Weeping From Pit Face:	72"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:		74"			
		Depth to weeping from side of obs. hole:		72"			
		Depth to soil mottles, description:		32"			
		Groundwater adjustment:		N/A			
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		32"					

Notes:	TP terminated early due to potential ledge / refusal. Redox features on one side of TP.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd	DEEP HOLE # TP-1H
Applicant/owner:	World Realty and Development, Ltd.	

DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º
LOCATION: (Refer to sketch attached)				
PERFORMED BY:	Avishek Pramanik (SE# 14376)			
WITNESSED BY:	N/A			

Land Use:	Wooded	Landform:	Charlton 103B
Vegetation:	Trees, shrubs, grass	Slope:	2-6%
Stone Walls:	☒ Y ☐ N	Surface Stones:	☒ Y ☐ N

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	50 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
20"	A	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
48"	C	Sand	2.5Y 6/2	Grav: 5%, C&S: 40, Single Grain, Loose
-	-	-	-	-
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	48"	
	Weeping From Pit Face:	30"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:		48"		
		Depth to weeping from side of obs. hole:		30"		
		Depth to soil mottles, description:		30"		
		Groundwater adjustment:		N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		30"				

Notes:	TP terminated early due to potential ledge / refusal.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1J
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	>100 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
12"	Ap	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
20"	Bw	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
52"	C1	Loamy Sand	2.5Y 5/4	Grav: N/A, C&S: N/A, Massive, Friable
120"	C2	Loamy Sand	2.5Y 6/2	Grav: N/A, C&S: N/A, Massive, Friable

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	Not Observed	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			Not Observed		
		Depth to soil mottles, description:			Not Observed		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		N/A					

Notes:	

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1K
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Charlton 103B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	70 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
14"	A	Loam	10YR 3/1	Grav: N/A, C&S: N/A, Massive, Granular
30"	Bw	Loamy Sand	10YR 5/6	Grav: N/A, C&S: N/A, Massive, Friable
112"	C2	Loamy Sand	2.5Y 6/2	Grav: N/A, C&S: N/A, Massive, Friable
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	Not Observed	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:			Not Observed		
		Depth to weeping from side of obs. hole:			Not Observed		
		Depth to soil mottles, description:			Not Observed		
		Groundwater adjustment:			N/A		
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		N/A					

Notes:	Redox features along one side of TP to 36", but not present below.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1L
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Scituate 315B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	70 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
16"	A	Loam	10YR 2/1	Grav: N/A, C&S: N/A, Massive, Granular
40"	Bw	Loamy Sand	10YR 5/4	Grav: N/A, C&S: N/A, Massive, Friable
108"	C	Loamy Sand	2.5Y 6/2	Grav: 5%, C&S: 5%, Massive, Friable
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	108"	
	Weeping From Pit Face:	48"	
	Estimated Seasonal High Groundwater:		-

DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:		108"			
		Depth to weeping from side of obs. hole:		48"			
		Depth to soil mottles, description:		32"			
		Groundwater adjustment:		N/A			
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		32"					

Notes:	Large boulders present.

Site Location or lot #	341 Broadway Rd; 226, 250, 262 Loon Hill Rd				DEEP HOLE # TP-1M
Applicant/owner:	World Realty and Development, Ltd.				
DATE:	04/26/2024	WEATHER:	Sunny	TEMP: 50s º	
LOCATION: (Refer to sketch attached)					
PERFORMED BY:	Avishek Pramanik (SE# 14376)				
WITNESSED BY:	N/A				
Land Use:	Wooded		Landform:	Scituate 315B	
Vegetation:	Trees, shrubs, grass		Slope:	2-6%	
Stone Walls:	☒ Y ☐ N		Surface Stones:	☒ Y ☐ N	

Distance From:			
Open Water Bodies:	>100 ft.	Possible Wet Area:	40 ft.
Drinking Water Well:	>100 ft.	Drainageway:	>100 ft.
Property Line:	>100 ft.	Other:	(drainage only)

DEEP OBSERVATION HOLE LOG

Depth	Soil Horizon	Soil Texture	Soil Color	Other: Structures; Stones; Boulders; Consistency; % gravel
14"	A	Loam	10YR 2/1	Grav: N/A, C&S: N/A, Massive, Granular
54"	Bw	Loamy Sand	10YR 5/4	Grav: N/A, C&S: 10%, Massive, Friable
110"	C	Loamy Sand	2.5Y 6/2	Grav: 5%, C&S: 10%, Massive, Friable
-	-	-	-	-

Parent Material (geologic):	-	Depth to Bedrock:	-
Depth to Groundwater:	Standing Water in Hole:	Not Observed	
	Weeping From Pit Face:	60"	
	Estimated Seasonal High Groundwater:		-

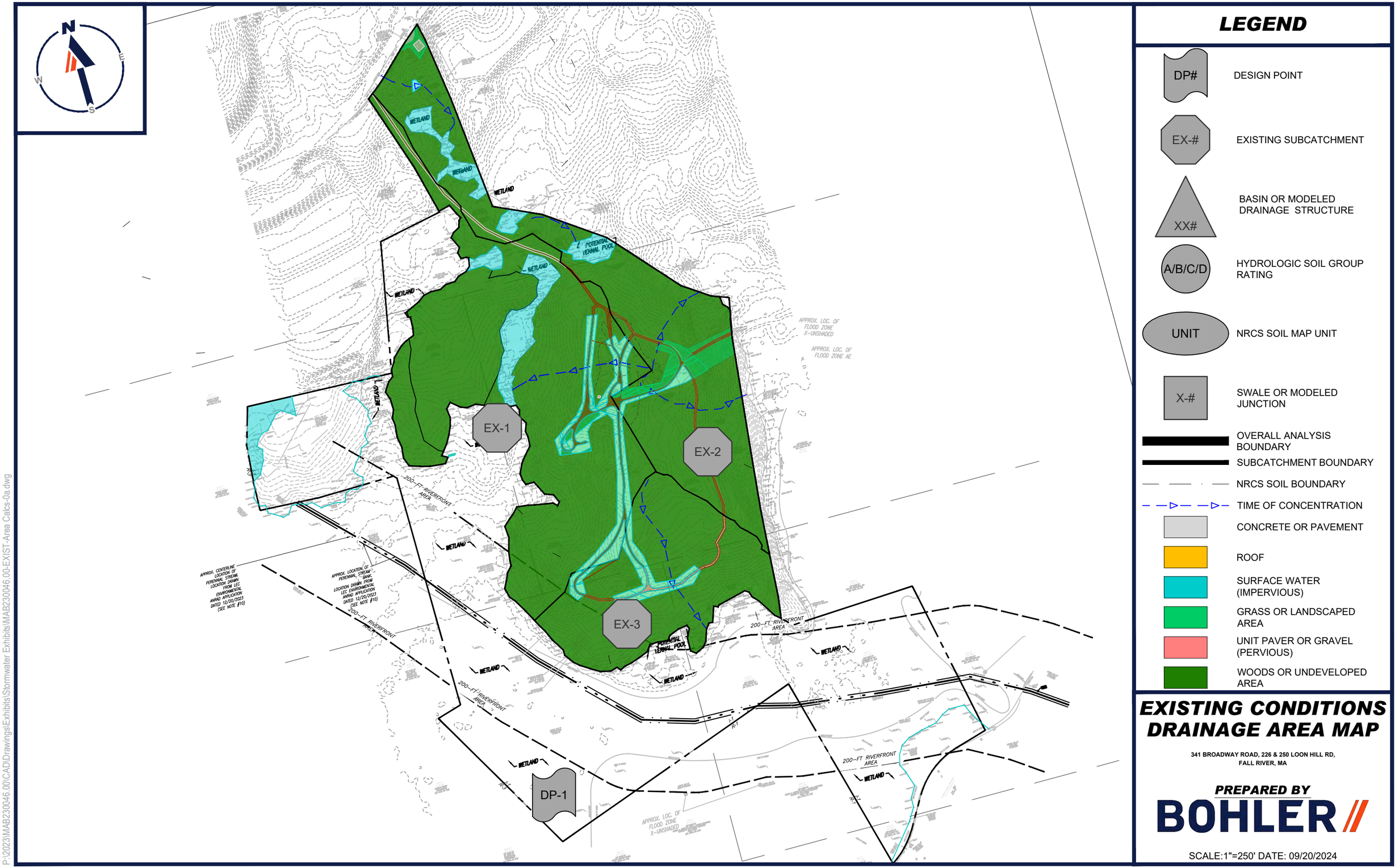
DETERMINATION FOR SEASONAL HIGH WATER TABLE

Method used:		Depth observed standing in obs. hole:		Not Observed			
		Depth to weeping from side of obs. hole:		60"			
		Depth to soil mottles, description:		36"			
		Groundwater adjustment:		N/A			
Index Well #:	-	Reading Date:	-	Index Well Level:	-	Adj. Factor:	-
Adj. ground water level:		36"					

Notes:	Large boulders present.

APPENDIX D: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*



LEGEND

- DP# — DESIGN POINT
- EX-# — EXISTING SUBCATCHMENT
- XX# — BASIN OR MODELED DRAINAGE STRUCTURE
- A/B/C/D — HYDROLOGIC SOIL GROUP RATING
- UNIT — NRCS SOIL MAP UNIT
- X-# — SWALE OR MODELED JUNCTION
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY
- NRCS SOIL BOUNDARY
- TIME OF CONCENTRATION
- CONCRETE OR PAVEMENT
- ROOF
- SURFACE WATER (IMPERVIOUS)
- GRASS OR LANDSCAPED AREA
- UNIT PAVER OR GRAVEL (PERVIOUS)
- WOODS OR UNDEVELOPED AREA

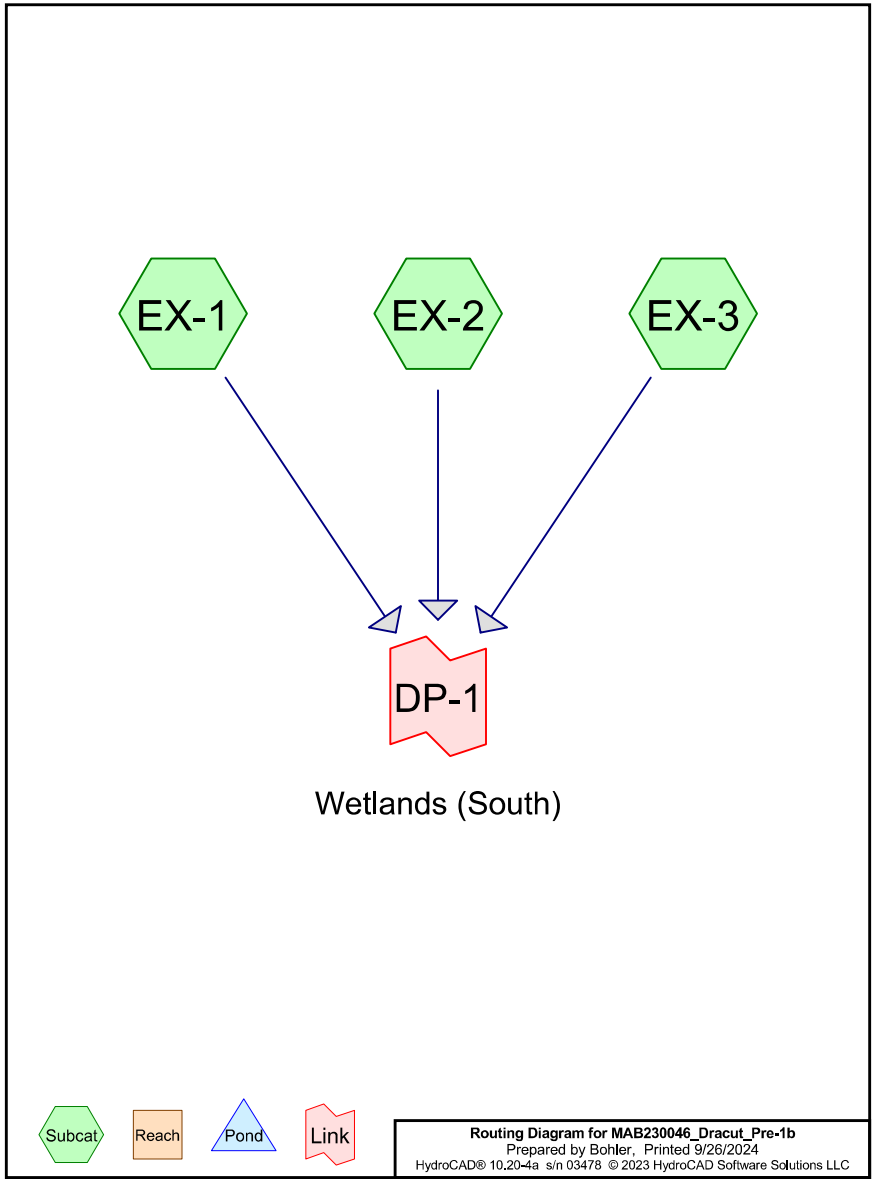
EXISTING CONDITIONS DRAINAGE AREA MAP

341 BROADWAY ROAD, 226 & 250 LOON HILL RD,
FALL RIVER, MA

PREPARED BY
BOHLER

SCALE:1"=250' DATE: 09/20/2024

P:\2023\MAB230046.00\CAD\Drawings\Exhibits\Stormwater Exhibits\MAB230046.00-EXIST-Area Calcs-0a.dwg



Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
72,804	49	50-75% Grass cover, Fair, HSG A (EX-1, EX-2, EX-3)
27,746	96	Gravel surface, HSG A (EX-1, EX-2, EX-3)
1,147	98	Paved parking, HSG A (EX-2)
56,291	98	Water Surface, HSG A (EX-1, EX-2)
863,221	36	Woods, Fair, HSG A (EX-1, EX-2, EX-3)
1,021,209	**42**	**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Runoff Area=477,258 sf 6.30% Impervious Runoff Depth=0.27"
Flow Length=426' Tc=21.1 min CN=WQ Runoff=2.04 cfs 10,723 cf

Subcatchment EX-2: Runoff Area=332,341 sf 8.23% Impervious Runoff Depth=0.31"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=1.66 cfs 8,635 cf

Subcatchment EX-3: Runoff Area=211,610 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=495' Tc=23.1 min CN=WQ Runoff=0.23 cfs 1,291 cf

Link DP-1: Wetlands (South) Inflow=3.92 cfs 20,649 cf
Primary=3.92 cfs 20,649 cf

Total Runoff Area = 1,021,209 sf Runoff Volume = 20,649 cf Average Runoff Depth = 0.24"
94.38% Pervious = 963,771 sf 5.62% Impervious = 57,438 sf

Summary for Subcatchment EX-1:

Runoff = 2.04 cfs @ 12.27 hrs, Volume= 10,723 cf, Depth= 0.27"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
398,293	36	Woods, Fair, HSG A
14,249	96	Gravel surface, HSG A
34,637	49	50-75% Grass cover, Fair, HSG A
30,079	98	Water Surface, HSG A
477,258		Weighted Average
447,179		93.70% Pervious Area
30,079		6.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.1660	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
8.5	108	0.0018	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	139	0.1006	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	107	0.0469	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	22	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.1	426	Total			

Summary for Subcatchment EX-2:

Runoff = 1.66 cfs @ 12.26 hrs, Volume= 8,635 cf, Depth= 0.31"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
273,824	36	Woods, Fair, HSG A
8,262	96	Gravel surface, HSG A
22,896	49	50-75% Grass cover, Fair, HSG A
1,147	98	Paved parking, HSG A
26,212	98	Water Surface, HSG A
332,341		Weighted Average
304,982		91.77% Pervious Area
27,359		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment EX-3:

Runoff = 0.23 cfs @ 12.30 hrs, Volume= 1,291 cf, Depth= 0.07"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
191,104	36	Woods, Fair, HSG A
5,235	96	Gravel surface, HSG A
15,271	49	50-75% Grass cover, Fair, HSG A
211,610		Weighted Average
211,610		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	50	0.0360	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.6	49	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	335	0.0686	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	61	0.0458	1.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	495	Total			

Summary for Link DP-1: Wetlands (South)

Inflow Area = 1,021,209 sf, 5.62% Impervious, Inflow Depth = 0.24" for 2-yr event
Inflow = 3.92 cfs @ 12.27 hrs, Volume= 20,649 cf
Primary = 3.92 cfs @ 12.27 hrs, Volume= 20,649 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Runoff Area=477,258 sf 6.30% Impervious Runoff Depth=0.55"
Flow Length=426' Tc=21.1 min CN=WQ Runoff=3.39 cfs 21,731 cf

Subcatchment EX-2: Runoff Area=332,341 sf 8.23% Impervious Runoff Depth=0.61"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=2.73 cfs 16,919 cf

Subcatchment EX-3: Runoff Area=211,610 sf 0.00% Impervious Runoff Depth=0.24"
Flow Length=495' Tc=23.1 min CN=WQ Runoff=0.44 cfs 4,173 cf

Link DP-1: Wetlands (South) Inflow=6.54 cfs 42,823 cf
Primary=6.54 cfs 42,823 cf

Total Runoff Area = 1,021,209 sf Runoff Volume = 42,823 cf Average Runoff Depth = 0.50"
94.38% Pervious = 963,771 sf 5.62% Impervious = 57,438 sf

Summary for Subcatchment EX-1:

Runoff = 3.39 cfs @ 12.28 hrs, Volume= 21,731 cf, Depth= 0.55"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
398,293	36	Woods, Fair, HSG A
14,249	96	Gravel surface, HSG A
34,637	49	50-75% Grass cover, Fair, HSG A
30,079	98	Water Surface, HSG A
477,258		Weighted Average
447,179		93.70% Pervious Area
30,079		6.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.1660	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
8.5	108	0.0018	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	139	0.1006	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	107	0.0469	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	22	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.1	426	Total			

Summary for Subcatchment EX-2:

Runoff = 2.73 cfs @ 12.27 hrs, Volume= 16,919 cf, Depth= 0.61"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
273,824	36	Woods, Fair, HSG A
8,262	96	Gravel surface, HSG A
22,896	49	50-75% Grass cover, Fair, HSG A
1,147	98	Paved parking, HSG A
26,212	98	Water Surface, HSG A
332,341		Weighted Average
304,982		91.77% Pervious Area
27,359		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment EX-3:

Runoff = 0.44 cfs @ 12.34 hrs, Volume= 4,173 cf, Depth= 0.24"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
191,104	36	Woods, Fair, HSG A
5,235	96	Gravel surface, HSG A
15,271	49	50-75% Grass cover, Fair, HSG A
211,610		Weighted Average
211,610		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	50	0.0360	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.6	49	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	335	0.0686	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	61	0.0458	1.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	495	Total			

Summary for Link DP-1: Wetlands (South)

Inflow Area = 1,021,209 sf, 5.62% Impervious, Inflow Depth = 0.50" for 10-yr event
Inflow = 6.54 cfs @ 12.28 hrs, Volume= 42,823 cf
Primary = 6.54 cfs @ 12.28 hrs, Volume= 42,823 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Runoff Area=477,258 sf 6.30% Impervious Runoff Depth=0.85"
Flow Length=426' Tc=21.1 min CN=WQ Runoff=4.44 cfs 33,655 cf

Subcatchment EX-2: Runoff Area=332,341 sf 8.23% Impervious Runoff Depth=0.92"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=3.53 cfs 25,549 cf

Subcatchment EX-3: Runoff Area=211,610 sf 0.00% Impervious Runoff Depth=0.48"
Flow Length=495' Tc=23.1 min CN=WQ Runoff=0.69 cfs 8,388 cf

Link DP-1: Wetlands (South) Inflow=8.61 cfs 67,592 cf
Primary=8.61 cfs 67,592 cf

Total Runoff Area = 1,021,209 sf Runoff Volume = 67,592 cf Average Runoff Depth = 0.79"
94.38% Pervious = 963,771 sf 5.62% Impervious = 57,438 sf

Summary for Subcatchment EX-1:

Runoff = 4.44 cfs @ 12.29 hrs, Volume= 33,655 cf, Depth= 0.85"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
398,293	36	Woods, Fair, HSG A
14,249	96	Gravel surface, HSG A
34,637	49	50-75% Grass cover, Fair, HSG A
30,079	98	Water Surface, HSG A
477,258		Weighted Average
447,179		93.70% Pervious Area
30,079		6.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.1660	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
8.5	108	0.0018	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	139	0.1006	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	107	0.0469	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	22	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.1	426	Total			

Summary for Subcatchment EX-2:

Runoff = 3.53 cfs @ 12.28 hrs, Volume= 25,549 cf, Depth= 0.92"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
273,824	36	Woods, Fair, HSG A
8,262	96	Gravel surface, HSG A
22,896	49	50-75% Grass cover, Fair, HSG A
1,147	98	Paved parking, HSG A
26,212	98	Water Surface, HSG A
332,341		Weighted Average
304,982		91.77% Pervious Area
27,359		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment EX-3:

Runoff = 0.69 cfs @ 12.45 hrs, Volume= 8,388 cf, Depth= 0.48"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
191,104	36	Woods, Fair, HSG A
5,235	96	Gravel surface, HSG A
15,271	49	50-75% Grass cover, Fair, HSG A
211,610		Weighted Average
211,610		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	50	0.0360	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.6	49	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	335	0.0686	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	61	0.0458	1.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	495	Total			

Summary for Link DP-1: Wetlands (South)

Inflow Area = 1,021,209 sf, 5.62% Impervious, Inflow Depth = 0.79" for 25-yr event
Inflow = 8.61 cfs @ 12.30 hrs, Volume= 67,592 cf
Primary = 8.61 cfs @ 12.30 hrs, Volume= 67,592 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Runoff Area=477,258 sf 6.30% Impervious Runoff Depth=1.47"
Flow Length=426' Tc=21.1 min CN=WQ Runoff=8.26 cfs 58,632 cf

Subcatchment EX-2: Runoff Area=332,341 sf 8.23% Impervious Runoff Depth=1.57"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=6.25 cfs 43,381 cf

Subcatchment EX-3: Runoff Area=211,610 sf 0.00% Impervious Runoff Depth=1.02"
Flow Length=495' Tc=23.1 min CN=WQ Runoff=2.22 cfs 18,002 cf

Link DP-1: Wetlands (South) Inflow=16.55 cfs 120,015 cf
Primary=16.55 cfs 120,015 cf

Total Runoff Area = 1,021,209 sf Runoff Volume = 120,015 cf Average Runoff Depth = 1.41"
94.38% Pervious = 963,771 sf 5.62% Impervious = 57,438 sf

Summary for Subcatchment EX-1:

Runoff = 8.26 cfs @ 12.35 hrs, Volume= 58,632 cf, Depth= 1.47"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
398,293	36	Woods, Fair, HSG A
14,249	96	Gravel surface, HSG A
34,637	49	50-75% Grass cover, Fair, HSG A
30,079	98	Water Surface, HSG A
477,258		Weighted Average
447,179		93.70% Pervious Area
30,079		6.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.1660	0.09		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
8.5	108	0.0018	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	139	0.1006	1.59		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.6	107	0.0469	1.08		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	22	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.1	426	Total			

Summary for Subcatchment EX-2:

Runoff = 6.25 cfs @ 12.33 hrs, Volume= 43,381 cf, Depth= 1.57"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
273,824	36	Woods, Fair, HSG A
8,262	96	Gravel surface, HSG A
22,896	49	50-75% Grass cover, Fair, HSG A
1,147	98	Paved parking, HSG A
26,212	98	Water Surface, HSG A
332,341		Weighted Average
304,982		91.77% Pervious Area
27,359		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment EX-3:

Runoff = 2.22 cfs @ 12.45 hrs, Volume= 18,002 cf, Depth= 1.02"
Routed to Link DP-1 : Wetlands (South)

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
191,104	36	Woods, Fair, HSG A
5,235	96	Gravel surface, HSG A
15,271	49	50-75% Grass cover, Fair, HSG A
211,610		Weighted Average
211,610		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	50	0.0360	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.6	49	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.3	335	0.0686	1.31		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	61	0.0458	1.07		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	495	Total			

Summary for Link DP-1: Wetlands (South)

Inflow Area = 1,021,209 sf, 5.62% Impervious, Inflow Depth = 1.41" for 100-yr event
Inflow = 16.55 cfs @ 12.35 hrs, Volume= 120,015 cf
Primary = 16.55 cfs @ 12.35 hrs, Volume= 120,015 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

APPENDIX E: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYDROCAD CALCULATIONS*

LEGEND

- DP# — DESIGN POINT
- PR-# — PROPOSED SUBCATCHMENT
- XX# — BASIN OR MODELED DRAINAGE STRUCTURE
- A/B/C/D — HYDROLOGIC SOIL GROUP RATING
- UNIT — NRCS SOIL MAP UNIT
- X-# — SWALE OR MODELED JUNCTION
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY
- NRCS SOIL BOUNDARY
- TIME OF CONCENTRATION
- CONCRETE OR PAVEMENT
- ROOF
- SURFACE WATER (IMPERVIOUS)
- GRASS OR LANDSCAPED AREA
- WOODS OR UNDEVELOPED AREA

PROPOSED CONDITIONS DRAINAGE AREA MAP

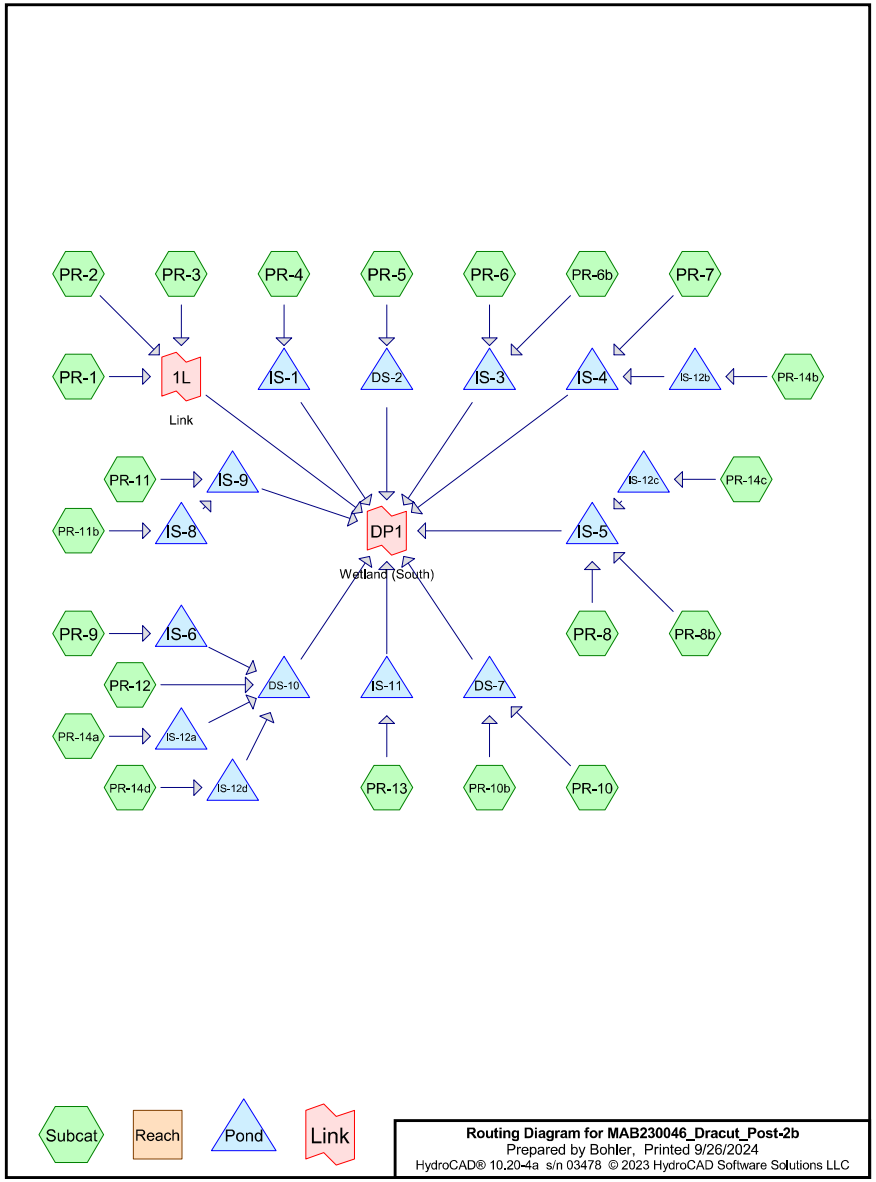
341 BROADWAY RD, 226 & 250 LOON HILL RD,
FALL RIVER, MA

PREPARED BY

BOHLER

SCALE:1"=250' DATE: 09/20/2024

P:\2023\MAB230046.00\CAD\Drawings\Exhibits\Stormwater Exhibits\MAB230046.00-PROP-Area Calcs-1a.dwg



Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
285,760	49	50-75% Grass cover, Fair, HSG A (PR-1, PR-10, PR-10b, PR-11, PR-12, PR-13, PR-14a, PR-14b, PR-14c, PR-14d, PR-2, PR-3, PR-4, PR-5, PR-6, PR-6b, PR-7, PR-8, PR-8b, PR-9)
22,250	96	Gravel surface, HSG A (PR-10b, PR-12, PR-13, PR-14a, PR-14b, PR-14c, PR-14d, PR-2, PR-7, PR-8b)
381,720	98	Paved parking, HSG A (PR-10, PR-11, PR-12, PR-13, PR-14a, PR-14b, PR-14c, PR-14d, PR-4, PR-5, PR-6, PR-7, PR-8, PR-9)
144,420	98	Roofs, HSG A (PR-11b, PR-4, PR-7, PR-8, PR-9)
57,090	98	Water Surface, HSG A (PR-1, PR-2)
129,970	36	Woods, Fair, HSG A (PR-1, PR-2, PR-3)
1,021,210	**76**	**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Runoff Area=144,300 sf 23.54% Impervious Runoff Depth=0.73"
Flow Length=118' Tc=17.3 min CN=WQ Runoff=1.71 cfs 8,760 cf

Subcatchment PR-10: Runoff Area=57,490 sf 82.21% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=WQ Runoff=3.29 cfs 11,494 cf

Subcatchment PR-10b: Runoff Area=15,030 sf 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=WQ Runoff=0.22 cfs 824 cf

Subcatchment PR-11: Runoff Area=70,830 sf 84.53% Impervious Runoff Depth=2.46"
Flow Length=654' Tc=6.0 min CN=WQ Runoff=4.17 cfs 14,545 cf

Subcatchment PR-11b: Runoff Area=20,970 sf 100.00% Impervious Runoff Depth=2.90"
Tc=6.0 min CN=WQ Runoff=1.46 cfs 5,064 cf

Subcatchment PR-12: Runoff Area=21,310 sf 38.67% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=WQ Runoff=0.63 cfs 2,288 cf

Subcatchment PR-13: Runoff Area=10,990 sf 75.16% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 2,090 cf

Subcatchment PR-14a: Runoff Area=20,210 sf 70.26% Impervious Runoff Depth=2.38"
Tc=6.0 min CN=WQ Runoff=1.16 cfs 4,015 cf

Subcatchment PR-14b: Runoff Area=16,460 sf 59.90% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=WQ Runoff=0.86 cfs 2,972 cf

Subcatchment PR-14c: Runoff Area=13,700 sf 52.26% Impervious Runoff Depth=2.03"
Tc=6.0 min CN=WQ Runoff=0.67 cfs 2,320 cf

Subcatchment PR-14d: Runoff Area=20,140 sf 69.22% Impervious Runoff Depth=2.36"
Tc=6.0 min CN=WQ Runoff=1.14 cfs 3,954 cf

Subcatchment PR-2: Runoff Area=110,890 sf 20.85% Impervious Runoff Depth=0.69"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=1.16 cfs 6,415 cf

Subcatchment PR-3: Runoff Area=75,310 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=183' Tc=6.0 min CN=WQ Runoff=0.00 cfs 131 cf

Subcatchment PR-4: Runoff Area=40,490 sf 78.78% Impervious Runoff Depth=2.30"
Tc=6.0 min CN=WQ Runoff=2.22 cfs 7,772 cf

Subcatchment PR-5: Runoff Area=24,380 sf 70.55% Impervious Runoff Depth=2.07"
Flow Length=382' Tc=6.0 min CN=WQ Runoff=1.20 cfs 4,211 cf

Subcatchment PR-6: Runoff Area=26,110 sf 92.45% Impervious Runoff Depth=2.69"
Flow Length=339' Tc=7.0 min CN=WQ Runoff=1.63 cfs 5,845 cf

Subcatchment PR-6b: Runoff Area=3,420 sf 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=WQ Runoff=0.00 cfs 27 cf

Subcatchment PR-7: Runoff Area=84,920 sf 79.52% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=WQ Runoff=4.88 cfs 17,006 cf

Subcatchment PR-8: Runoff Area=119,330 sf 76.78% Impervious Runoff Depth=2.25"
Tc=6.0 min CN=WQ Runoff=6.39 cfs 22,346 cf

Subcatchment PR-8b: Runoff Area=14,580 sf 0.00% Impervious Runoff Depth=0.70"
Tc=6.0 min CN=WQ Runoff=0.23 cfs 851 cf

Subcatchment PR-9: Runoff Area=110,350 sf 94.24% Impervious Runoff Depth=2.74"
Flow Length=387' Tc=6.0 min CN=WQ Runoff=7.25 cfs 25,162 cf

Pond DS-10: Peak Elev=122.16' Storage=762 cf Inflow=0.63 cfs 2,288 cf
Outflow=0.11 cfs 2,288 cf

Pond DS-2: Peak Elev=140.79' Storage=1,724 cf Inflow=1.20 cfs 4,211 cf
Outflow=0.19 cfs 4,201 cf

Pond DS-7: Peak Elev=117.50' Storage=6,558 cf Inflow=3.51 cfs 12,318 cf
Outflow=0.30 cfs 12,228 cf

Pond IS-1: Peak Elev=157.97' Storage=2,780 cf Inflow=2.22 cfs 7,772 cf
Discarded=0.18 cfs 7,773 cf Primary=0.00 cfs 0 cf Outflow=0.18 cfs 7,773 cf

Pond IS-11: Peak Elev=119.11' Storage=1,007 cf Inflow=0.60 cfs 2,090 cf
Discarded=0.03 cfs 2,090 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 2,090 cf

Pond IS-12a: Peak Elev=125.21' Storage=1,717 cf Inflow=1.16 cfs 4,015 cf
Discarded=0.06 cfs 4,016 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 4,016 cf

Pond IS-12b: Peak Elev=129.10' Storage=1,202 cf Inflow=0.86 cfs 2,972 cf
Discarded=0.05 cfs 2,973 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 2,973 cf

Pond IS-12c: Peak Elev=127.42' Storage=840 cf Inflow=0.67 cfs 2,320 cf
Discarded=0.05 cfs 2,320 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 2,320 cf

Pond IS-12d: Peak Elev=124.19' Storage=1,678 cf Inflow=1.14 cfs 3,954 cf
Discarded=0.06 cfs 3,954 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 3,954 cf

Pond IS-3: Peak Elev=122.12' Storage=3,004 cf Inflow=1.63 cfs 5,872 cf
Discarded=0.07 cfs 5,873 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 5,873 cf

Pond IS-4: Peak Elev=126.67' Storage=5,460 cf Inflow=4.88 cfs 17,006 cf
Discarded=0.51 cfs 17,010 cf Primary=0.00 cfs 0 cf Outflow=0.51 cfs 17,010 cf

Pond IS-5: Peak Elev=120.65' Storage=13,255 cf Inflow=6.62 cfs 23,197 cf
Discarded=0.21 cfs 23,198 cf Primary=0.00 cfs 0 cf Outflow=0.21 cfs 23,198 cf

Pond IS-6: Peak Elev=126.52' Storage=10,469 cf Inflow=7.25 cfs 25,162 cf
Discarded=0.43 cfs 25,163 cf Primary=0.00 cfs 0 cf Outflow=0.43 cfs 25,163 cf

Pond IS-8: Peak Elev=130.69' Storage=1,640 cf Inflow=1.46 cfs 5,064 cf
Discarded=0.15 cfs 5,064 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 5,064 cf

Pond IS-9: Peak Elev=127.45' Storage=5,917 cf Inflow=4.17 cfs 14,545 cf
Discarded=0.26 cfs 14,548 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 14,548 cf

Link 1L: Link Inflow=2.85 cfs 15,305 cf
Primary=2.85 cfs 15,305 cf

Link DP1: Wetland (South) Inflow=3.41 cfs 34,022 cf
Primary=3.41 cfs 34,022 cf

Total Runoff Area = 1,021,210 sf Runoff Volume = 148,092 cf Average Runoff Depth = 1.74"
42.89% Pervious = 437,980 sf 57.11% Impervious = 583,230 sf

Summary for Subcatchment PR-1:

Runoff = 1.71 cfs @ 12.23 hrs, Volume= 8,760 cf, Depth= 0.73"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
40,710	36	Woods, Fair, HSG A
69,620	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
33,970	98	Water Surface, HSG A
144,300		Weighted Average
110,330	44	76.46% Pervious Area
33,970	98	23.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0400	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.8	68	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.3	118	Total			

Summary for Subcatchment PR-10:

Runoff = 3.29 cfs @ 12.08 hrs, Volume= 11,494 cf, Depth= 2.40"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,230	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
47,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
57,490		Weighted Average
10,230	49	17.79% Pervious Area
47,260	98	82.21% Impervious Area

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

Summary for Subcatchment PR-10b:

Runoff = 0.22 cfs @ 12.08 hrs, Volume= 824 cf, Depth= 0.66"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,760	49	50-75% Grass cover, Fair, HSG A
3,270	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
15,030		Weighted Average
15,030	59	100.00% Pervious Area

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

Summary for Subcatchment PR-11:

Runoff = 4.17 cfs @ 12.08 hrs, Volume= 14,545 cf, Depth= 2.46"
Routed to Pond IS-9 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,960	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
59,870	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
70,830		Weighted Average
10,960	49	15.47% Pervious Area
59,870	98	84.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.9	604	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.6	654	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-11b:

Runoff = 1.46 cfs @ 12.08 hrs, Volume= 5,064 cf, Depth= 2.90"
Routed to Pond IS-8 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
0	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
20,970	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,970		Weighted Average
20,970	98	100.00% Impervious Area

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

Summary for Subcatchment PR-12:

Runoff = 0.63 cfs @ 12.08 hrs, Volume= 2,288 cf, Depth= 1.29"
Routed to Pond DS-10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
12,170	49	50-75% Grass cover, Fair, HSG A
900	96	Gravel surface, HSG A
8,240	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
21,310		Weighted Average
13,070	52	61.33% Pervious Area
8,240	98	38.67% Impervious Area

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

Summary for Subcatchment PR-13:

Runoff = 0.60 cfs @ 12.08 hrs, Volume= 2,090 cf, Depth= 2.28"
Routed to Pond IS-11 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
2,390	49	50-75% Grass cover, Fair, HSG A
340	96	Gravel surface, HSG A
8,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
10,990		Weighted Average
2,730	55	24.84% Pervious Area
8,260	98	75.16% Impervious Area

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

Summary for Subcatchment PR-14a:

Runoff = 1.16 cfs @ 12.08 hrs, Volume= 4,015 cf, Depth= 2.38"
Routed to Pond IS-12a :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,510	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
14,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,210		Weighted Average
6,010	69	29.74% Pervious Area
14,200	98	70.26% Impervious Area

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

Summary for Subcatchment PR-14b:

Runoff = 0.86 cfs @ 12.08 hrs, Volume= 2,972 cf, Depth= 2.17"
Routed to Pond IS-12b :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,100	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
9,860	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
16,460		Weighted Average
6,600	67	40.10% Pervious Area
9,860	98	59.90% Impervious Area

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

Summary for Subcatchment PR-14c:

Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,320 cf, Depth= 2.03"
Routed to Pond IS-12c :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,040	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
7,160	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
13,700		Weighted Average
6,540	67	47.74% Pervious Area
7,160	98	52.26% Impervious Area

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

Summary for Subcatchment PR-14d:

Runoff = 1.14 cfs @ 12.08 hrs, Volume= 3,954 cf, Depth= 2.36"
Routed to Pond IS-12d :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,700	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
13,940	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,140		Weighted Average
6,200	68	30.78% Pervious Area
13,940	98	69.22% Impervious Area

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

Summary for Subcatchment PR-2:

Runoff = 1.16 cfs @ 12.26 hrs, Volume= 6,415 cf, Depth= 0.69"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
30,310	36	Woods, Fair, HSG A
55,730	49	50-75% Grass cover, Fair, HSG A
1,730	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
23,120	98	Water Surface, HSG A
110,890		Weighted Average
87,770	45	79.15% Pervious Area
23,120	98	20.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment PR-3:

Runoff = 0.00 cfs @ 13.74 hrs, Volume= 131 cf, Depth= 0.02"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
58,950	36	Woods, Fair, HSG A
16,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
75,310		Weighted Average
75,310	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0840	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	23	0.0650	3.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	110	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	183	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-4:

Runoff = 2.22 cfs @ 12.08 hrs, Volume= 7,772 cf, Depth= 2.30"
Routed to Pond IS-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
8,590	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
25,090	98	Paved parking, HSG A
6,810	98	Roofs, HSG A
0	98	Water Surface, HSG A
40,490		Weighted Average
8,590	49	21.22% Pervious Area
31,900	98	78.78% Impervious Area

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

Summary for Subcatchment PR-5:

Runoff = 1.20 cfs @ 12.08 hrs, Volume= 4,211 cf, Depth= 2.07"
Routed to Pond DS-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
7,180	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
17,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
24,380		Weighted Average
7,180	49	29.45% Pervious Area
17,200	98	70.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0400	1.56		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	116	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	216	0.0790	12.75	10.01	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.3	382	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-6:

Runoff = 1.63 cfs @ 12.10 hrs, Volume= 5,845 cf, Depth= 2.69"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
1,970	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
24,140	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
26,110		Weighted Average
1,970	49	7.55% Pervious Area
24,140	98	92.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.3	289	0.0310	3.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	339	Total			

Summary for Subcatchment PR-6b:

Runoff = 0.00 cfs @ 13.74 hrs, Volume= 27 cf, Depth= 0.10"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,420	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
3,420		Weighted Average
3,420	49	100.00% Pervious Area

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

Summary for Subcatchment PR-7:

Runoff = 4.88 cfs @ 12.08 hrs, Volume= 17,006 cf, Depth= 2.40"
Routed to Pond IS-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
14,790	49	50-75% Grass cover, Fair, HSG A
2,600	96	Gravel surface, HSG A
46,730	98	Paved parking, HSG A
20,800	98	Roofs, HSG A
0	98	Water Surface, HSG A
84,920		Weighted Average
17,390	56	20.48% Pervious Area
67,530	98	79.52% Impervious Area

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

Summary for Subcatchment PR-8:

Runoff = 6.39 cfs @ 12.08 hrs, Volume= 22,346 cf, Depth= 2.25"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
27,710	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
49,180	98	Paved parking, HSG A
42,440	98	Roofs, HSG A
0	98	Water Surface, HSG A
119,330		Weighted Average
27,710	49	23.22% Pervious Area
91,620	98	76.78% Impervious Area

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

Summary for Subcatchment PR-8b:

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 851 cf, Depth= 0.70"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,170	49	50-75% Grass cover, Fair, HSG A
3,410	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
14,580		Weighted Average
14,580	60	100.00% Pervious Area

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

Summary for Subcatchment PR-9:

Runoff = 7.25 cfs @ 12.08 hrs, Volume= 25,162 cf, Depth= 2.74"
Routed to Pond IS-6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.13"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
6,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
50,590	98	Paved parking, HSG A
53,400	98	Roofs, HSG A
0	98	Water Surface, HSG A
110,350		Weighted Average
6,360	49	5.76% Pervious Area
103,990	98	94.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1040	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	164	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	173	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	387	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond DS-10:

Inflow Area = 172,010 sf, 81.61% Impervious, Inflow Depth = 0.16" for 2-yr event
Inflow = 0.63 cfs @ 12.08 hrs, Volume= 2,288 cf
Outflow = 0.11 cfs @ 12.54 hrs, Volume= 2,288 cf, Atten= 83%, Lag= 27.6 min
Primary = 0.11 cfs @ 12.54 hrs, Volume= 2,288 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.16' @ 12.54 hrs Surf.Area= 954 sf Storage= 762 cf

Plug-Flow detention time= 72.6 min calculated for 2,287 cf (100% of inflow)
Center-of-Mass det. time= 72.7 min (842.9 - 770.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	5,935 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	370	0	0
122.00	860	615	615
123.00	1,440	1,150	1,765
124.00	2,070	1,755	3,520
125.00	2,760	2,415	5,935

Device	Routing	Invert	Outlet Devices
#1	Device 4	121.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	124.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	124.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	121.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.11 cfs @ 12.54 hrs HW=122.16' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.11 cfs of 5.39 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.11 cfs @ 5.00 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-2:

Inflow Area = 24,380 sf, 70.55% Impervious, Inflow Depth = 2.07" for 2-yr event
Inflow = 1.20 cfs @ 12.08 hrs, Volume= 4,211 cf
Outflow = 0.19 cfs @ 12.55 hrs, Volume= 4,201 cf, Atten= 84%, Lag= 28.2 min
Primary = 0.19 cfs @ 12.55 hrs, Volume= 4,201 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 140.79' @ 12.55 hrs Surf.Area= 2,402 sf Storage= 1,724 cf

Plug-Flow detention time= 140.2 min calculated for 4,201 cf (100% of inflow)
Center-of-Mass det. time= 139.1 min (899.7 - 760.6)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	8,565 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,950	0	0
141.00	2,520	2,235	2,235
142.00	3,150	2,835	5,070
143.00	3,840	3,495	8,565

Device	Routing	Invert	Outlet Devices
#1	Device 4	140.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	142.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	142.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	140.00'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.19 cfs @ 12.55 hrs HW=140.79' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.19 cfs of 2.87 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 3.93 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-7:

Inflow Area = 72,520 sf, 65.17% Impervious, Inflow Depth = 2.04" for 2-yr event
Inflow = 3.51 cfs @ 12.08 hrs, Volume= 12,318 cf
Outflow = 0.30 cfs @ 13.02 hrs, Volume= 12,228 cf, Atten= 92%, Lag= 55.9 min
Primary = 0.30 cfs @ 13.02 hrs, Volume= 12,228 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 117.50' @ 13.02 hrs Surf.Area= 6,944 sf Storage= 6,558 cf

Plug-Flow detention time= 326.7 min calculated for 12,226 cf (99% of inflow)
Center-of-Mass det. time= 322.2 min (1,084.1 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	116.50'	45,833 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.50	6,200	0	0
117.00	6,570	3,193	3,193
118.00	7,320	6,945	10,138
119.00	8,100	7,710	17,848
120.00	8,910	8,505	26,353
121.00	9,730	9,320	35,673
122.00	10,590	10,160	45,833

Device	Routing	Invert	Outlet Devices
#1	Device 6	116.50'	**3.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 6	119.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 6	120.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	120.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Device 6	121.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#6	Primary	116.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.50' / 113.00' S= 0.1250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.30 cfs @ 13.02 hrs HW=117.50' TW=0.00' (Dynamic Tailwater)
- **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **6=Culvert** (Passes 0.30 cfs of 5.33 cfs potential flow)
  - **1=Orifice/Grate** (Orifice Controls 0.30 cfs @ 4.45 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-1:

Inflow Area = 40,490 sf, 78.78% Impervious, Inflow Depth = 2.30" for 2-yr event
Inflow = 2.22 cfs @ 12.08 hrs, Volume= 7,772 cf
Outflow = 0.18 cfs @ 11.69 hrs, Volume= 7,773 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.18 cfs @ 11.69 hrs, Volume= 7,773 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 157.97' @ 13.03 hrs Surf.Area= 3,277 sf Storage= 2,780 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 108.8 min (868.1 - 759.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.00'	0 cf	**24.00'W x 56.00'L x 4.17'H Field A** 5,600 cf Overall - 5,600 cf Embedded = 0 cf x 40.0% Voids
#2A	157.00'	4,094 cf	**retain_it retain_it 3.5'** x 21 Inside #1 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 122.8 cf perimeter wall
#3B	157.00'	0 cf	**24.00'W x 80.00'L x 4.17'H Field B** 8,000 cf Overall - 8,000 cf Embedded = 0 cf x 40.0% Voids
#4B	157.00'	5,864 cf	**retain_it retain_it 3.5'** x 30 Inside #3 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 159.6 cf perimeter wall
#5	157.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		10,008 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	159.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	158.00'	**18.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 158.00' / 157.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.18 cfs @ 11.69 hrs HW=157.04' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.00' TW=0.00' (Dynamic Tailwater)
- **3=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-11:

Inflow Area = 10,990 sf, 75.16% Impervious, Inflow Depth = 2.28" for 2-yr event
Inflow = 0.60 cfs @ 12.08 hrs, Volume= 2,090 cf
Outflow = 0.03 cfs @ 11.03 hrs, Volume= 2,090 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.03 hrs, Volume= 2,090 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 119.11' @ 14.85 hrs Surf.Area= 1,088 sf Storage= 1,007 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 332.5 min (1,092.6 - 760.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	118.00'	0 cf	**32.00'W x 8.00'L x 3.67'H Field A** 939 cf Overall - 939 cf Embedded = 0 cf x 40.0% Voids
#2A	118.00'	635 cf	**retain_it retain_it 3.0'** x 4 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 4 Rows adjusted for 47.2 cf perimeter wall
#3B	118.00'	0 cf	**64.00'W x 8.00'L x 3.67'H Field B** 1,877 cf Overall - 1,877 cf Embedded = 0 cf x 40.0% Voids
#4B	118.00'	1,280 cf	**retain_it retain_it 3.0'** x 8 Inside #3 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 8 Rows adjusted for 85.0 cf perimeter wall
#5C	118.00'	0 cf	**40.00'W x 8.00'L x 3.67'H Field C** 1,173 cf Overall - 1,173 cf Embedded = 0 cf x 40.0% Voids
#6C	118.00'	796 cf	**retain_it retain_it 3.0'** x 5 Inside #5 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 56.6 cf perimeter wall
		2,712 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	118.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	120.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	118.00'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.00' / 114.50' S= 0.1750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 11.03 hrs HW=118.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-12a:

Inflow Area = 20,210 sf, 70.26% Impervious, Inflow Depth = 2.38" for 2-yr event
Inflow = 1.16 cfs @ 12.08 hrs, Volume= 4,015 cf
Outflow = 0.06 cfs @ 11.65 hrs, Volume= 4,016 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.06 cfs @ 11.65 hrs, Volume= 4,016 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 125.21' @ 13.92 hrs Surf.Area= 2,746 sf Storage= 1,717 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 215.1 min (976.4 - 761.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	124.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	124.50'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		7,313 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.40'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 11.65 hrs HW=124.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-12b:

Inflow Area = 16,460 sf, 59.90% Impervious, Inflow Depth = 2.17" for 2-yr event
Inflow = 0.86 cfs @ 12.08 hrs, Volume= 2,972 cf
Outflow = 0.05 cfs @ 11.73 hrs, Volume= 2,973 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.73 hrs, Volume= 2,973 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 129.10' @ 13.66 hrs Surf.Area= 2,280 sf Storage= 1,202 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 176.4 min (939.7 - 763.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	128.50'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	128.50'	65 cf	**4.00'D x 5.20'H Vertical Cone/Cylinder**
		6,075 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	128.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	133.60'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 11.73 hrs HW=128.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' TW=126.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12c:

Inflow Area = 13,700 sf, 52.26% Impervious, Inflow Depth = 2.03" for 2-yr event
Inflow = 0.67 cfs @ 12.08 hrs, Volume= 2,320 cf
Outflow = 0.05 cfs @ 11.84 hrs, Volume= 2,320 cf, Atten= 92%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.84 hrs, Volume= 2,320 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 127.42' @ 13.06 hrs Surf.Area= 2,280 sf Storage= 840 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 114.1 min (879.1 - 765.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.00'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	127.00'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	127.00'	64 cf	**4.00'D x 5.10'H Vertical Cone/Cylinder**
		6,074 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	127.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	132.00'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 11.84 hrs HW=127.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' TW=119.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12d:

Inflow Area = 20,140 sf, 69.22% Impervious, Inflow Depth = 2.36" for 2-yr event
Inflow = 1.14 cfs @ 12.08 hrs, Volume= 3,954 cf
Outflow = 0.06 cfs @ 11.68 hrs, Volume= 3,954 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.06 cfs @ 11.68 hrs, Volume= 3,954 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 124.19' @ 13.89 hrs Surf.Area= 2,746 sf Storage= 1,678 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 209.5 min (970.9 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	123.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	123.50'	69 cf	**4.00'D x 5.50'H Vertical Cone/Cylinder**
		7,320 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	128.90'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 11.68 hrs HW=123.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=123.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-3:

Inflow Area = 29,530 sf, 81.75% Impervious, Inflow Depth = 2.39" for 2-yr event
Inflow = 1.63 cfs @ 12.10 hrs, Volume= 5,872 cf
Outflow = 0.07 cfs @ 14.99 hrs, Volume= 5,873 cf, Atten= 96%, Lag= 173.6 min
Discarded = 0.07 cfs @ 14.99 hrs, Volume= 5,873 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.12' @ 14.99 hrs Surf.Area= 2,929 sf Storage= 3,004 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 392.6 min (1,152.4 - 759.8)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	9,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	2,420	0	0
122.00	2,870	2,645	2,645
123.00	3,350	3,110	5,755
124.00	3,860	3,605	9,360

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 4	123.50'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	123.80'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Primary	119.50'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.50' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.07 cfs @ 14.99 hrs HW=122.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=121.00' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**4=Culvert** (Passes 0.00 cfs of 3.78 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-4:

Inflow Area = 101,380 sf, 76.34% Impervious, Inflow Depth = 2.01" for 2-yr event
Inflow = 4.88 cfs @ 12.08 hrs, Volume= 17,006 cf
Outflow = 0.51 cfs @ 11.78 hrs, Volume= 17,010 cf, Atten= 89%, Lag= 0.0 min
Discarded = 0.51 cfs @ 11.78 hrs, Volume= 17,010 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 126.67' @ 12.79 hrs Surf.Area= 9,207 sf Storage= 5,460 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 69.2 min (828.6 - 759.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field A** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #1 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#3B	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field B** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#4B	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #3 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#5	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		28,501 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.51 cfs @ 11.78 hrs HW=126.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-5:

Inflow Area = 147,610 sf, 66.92% Impervious, Inflow Depth = 1.89" for 2-yr event
Inflow = 6.62 cfs @ 12.08 hrs, Volume= 23,197 cf
Outflow = 0.21 cfs @ 15.84 hrs, Volume= 23,198 cf, Atten= 97%, Lag= 225.2 min
Discarded = 0.21 cfs @ 15.84 hrs, Volume= 23,198 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 120.65' @ 15.84 hrs Surf.Area= 8,797 sf Storage= 13,255 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 586.3 min (1,347.5 - 761.2)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	36,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	7,320	0	0
120.00	8,210	7,765	7,765
121.00	9,120	8,665	16,430
122.00	10,050	9,585	26,015
123.00	11,010	10,530	36,545

Device	Routing	Invert	Outlet Devices
#1	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	122.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	118.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.50' / 118.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.21 cfs @ 15.84 hrs HW=120.65' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=119.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.00 cfs of 1.48 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-6:

Inflow Area = 110,350 sf, 94.24% Impervious, Inflow Depth = 2.74" for 2-yr event
Inflow = 7.25 cfs @ 12.08 hrs, Volume= 25,162 cf
Outflow = 0.43 cfs @ 11.46 hrs, Volume= 25,163 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.43 cfs @ 11.46 hrs, Volume= 25,163 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 126.52' @ 13.76 hrs Surf.Area= 7,693 sf Storage= 10,469 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 193.2 min (950.6 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1B	125.00'	0 cf	**72.67'W x 105.69'L x 5.50'H Field B** 42,240 cf Overall - 42,240 cf Embedded = 0 cf x 40.0% Voids
#2B	125.00'	34,313 cf	**StormTrap ST2 SingleTrap 5-0** x 42 Inside #1 Inside= 101.7"W x 60.0"H => 38.33 sf x 15.40'L = 590.2 cf Outside= 101.7"W x 66.0"H => 46.64 sf x 15.40'L = 718.0 cf 42 Chambers in 7 Rows 59.35' x 92.38' Core + 6.66' Border = 72.67' x 105.69' System
#3	125.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		34,364 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	125.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	126.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.00' / 122.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.43 cfs @ 11.46 hrs HW=125.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' TW=121.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-8:

Inflow Area = 20,970 sf,100.00% Impervious, Inflow Depth = 2.90" for 2-yr event
Inflow = 1.46 cfs @ 12.08 hrs, Volume= 5,064 cf
Outflow = 0.15 cfs @ 11.80 hrs, Volume= 5,064 cf, Atten= 90%, Lag= 0.0 min
Discarded = 0.15 cfs @ 11.80 hrs, Volume= 5,064 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 130.69' @ 12.79 hrs Surf.Area= 2,733 sf Storage= 1,640 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 70.0 min (826.8 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	0 cf	**30.27'W x 90.29'L x 3.00'H Field A** 8,200 cf Overall - 8,200 cf Embedded = 0 cf x 40.0% Voids
#2A	130.00'	5,953 cf	**StormTrap ST2 SingleTrap 2-6** x 10 Inside #1 Inside= 101.7"W x 30.0"H => 18.82 sf x 15.40'L = 289.8 cf Outside= 101.7"W x 36.0"H => 25.44 sf x 15.40'L = 391.6 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	130.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder** -Impervious
		6,016 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	132.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	130.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.00' / 128.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 11.80 hrs HW=130.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' TW=126.00' (Dynamic Tailwater)
3=Culvert (Controls 0.00 cfs)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond IS-9:

Inflow Area = 91,800 sf, 88.06% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 4.17 cfs @ 12.08 hrs, Volume= 14,545 cf
Outflow = 0.26 cfs @ 11.50 hrs, Volume= 14,548 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.50 hrs, Volume= 14,548 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 127.45' @ 13.67 hrs Surf.Area= 4,621 sf Storage= 5,917 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 180.1 min (938.7 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**32.00'W x 112.00'L x 5.17'H Field A** 18,517 cf Overall - 18,517 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,299 cf	**retain_it retain_it 4.5'** x 56 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 4 Rows adjusted for 322.9 cf perimeter wall
#3B	126.00'	0 cf	**16.00'W x 64.00'L x 5.17'H Field B** 5,291 cf Overall - 5,291 cf Embedded = 0 cf x 40.0% Voids
#4	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
#5B	126.00'	3,998 cf	**retain_it retain_it 4.5'** x 16 Inside #3 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 2 Rows adjusted for 179.4 cf perimeter wall
		18,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	130.20'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**20.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.18 sf

Discarded OutFlow Max=0.26 cfs @ 11.50 hrs HW=126.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
3=Culvert (Controls 0.00 cfs)
2=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 1L: Link

Inflow Area = 330,500 sf, 17.27% Impervious, Inflow Depth = 0.56" for 2-yr event
Inflow = 2.85 cfs @ 12.24 hrs, Volume= 15,305 cf
Primary = 2.85 cfs @ 12.24 hrs, Volume= 15,305 cf, Atten= 0%, Lag= 0.0 min
Routed to Link DP1 : Wetland (South)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link DP1: Wetland (South)

Inflow Area = 1,021,210 sf, 57.11% Impervious, Inflow Depth > 0.40" for 2-yr event
Inflow = 3.41 cfs @ 12.24 hrs, Volume= 34,022 cf
Primary = 3.41 cfs @ 12.24 hrs, Volume= 34,022 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Runoff Area=144,300 sf 23.54% Impervious Runoff Depth=1.41"
Flow Length=118' Tc=17.3 min CN=WQ Runoff=3.06 cfs 16,951 cf

Subcatchment PR-10: Runoff Area=57,490 sf 82.21% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=5.26 cfs 18,835 cf

Subcatchment PR-10b: Runoff Area=15,030 sf 0.00% Impervious Runoff Depth=1.43"
Tc=6.0 min CN=WQ Runoff=0.44 cfs 1,790 cf

Subcatchment PR-11: Runoff Area=70,830 sf 84.53% Impervious Runoff Depth=4.03"
Flow Length=654' Tc=6.0 min CN=WQ Runoff=6.65 cfs 23,761 cf

Subcatchment PR-11b: Runoff Area=20,970 sf 100.00% Impervious Runoff Depth=4.65"
Tc=6.0 min CN=WQ Runoff=2.30 cfs 8,132 cf

Subcatchment PR-12: Runoff Area=21,310 sf 38.67% Impervious Runoff Depth=2.33"
Tc=6.0 min CN=WQ Runoff=1.09 cfs 4,132 cf

Subcatchment PR-13: Runoff Area=10,990 sf 75.16% Impervious Runoff Depth=3.76"
Tc=6.0 min CN=WQ Runoff=0.96 cfs 3,447 cf

Subcatchment PR-14a: Runoff Area=20,210 sf 70.26% Impervious Runoff Depth=3.92"
Tc=6.0 min CN=WQ Runoff=1.85 cfs 6,603 cf

Subcatchment PR-14b: Runoff Area=16,460 sf 59.90% Impervious Runoff Depth=3.61"
Tc=6.0 min CN=WQ Runoff=1.38 cfs 4,949 cf

Subcatchment PR-14c: Runoff Area=13,700 sf 52.26% Impervious Runoff Depth=3.42"
Tc=6.0 min CN=WQ Runoff=1.08 cfs 3,899 cf

Subcatchment PR-14d: Runoff Area=20,140 sf 69.22% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=WQ Runoff=1.83 cfs 6,511 cf

Subcatchment PR-2: Runoff Area=110,890 sf 20.85% Impervious Runoff Depth=1.36"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=2.11 cfs 12,610 cf

Subcatchment PR-3: Runoff Area=75,310 sf 0.00% Impervious Runoff Depth=0.20"
Flow Length=183' Tc=6.0 min CN=WQ Runoff=0.14 cfs 1,271 cf

Subcatchment PR-4: Runoff Area=40,490 sf 78.78% Impervious Runoff Depth=3.79"
Tc=6.0 min CN=WQ Runoff=3.56 cfs 12,797 cf

Subcatchment PR-5: Runoff Area=24,380 sf 70.55% Impervious Runoff Depth=3.46"
Flow Length=382' Tc=6.0 min CN=WQ Runoff=1.94 cfs 7,027 cf

Subcatchment PR-6: Runoff Area=26,110 sf 92.45% Impervious Runoff Depth=4.35"
Flow Length=339' Tc=7.0 min CN=WQ Runoff=2.58 cfs 9,459 cf

Subcatchment PR-6b: Runoff Area=3,420 sf 0.00% Impervious Runoff Depth=0.60"
Tc=6.0 min CN=WQ Runoff=0.03 cfs 170 cf

Subcatchment PR-7: Runoff Area=84,920 sf 79.52% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=WQ Runoff=7.80 cfs 27,881 cf

Subcatchment PR-8: Runoff Area=119,330 sf 76.78% Impervious Runoff Depth=3.71"
Tc=6.0 min CN=WQ Runoff=10.26 cfs 36,906 cf

Subcatchment PR-8b: Runoff Area=14,580 sf 0.00% Impervious Runoff Depth=1.49"
Tc=6.0 min CN=WQ Runoff=0.45 cfs 1,812 cf

Subcatchment PR-9: Runoff Area=110,350 sf 94.24% Impervious Runoff Depth=4.42"
Flow Length=387' Tc=6.0 min CN=WQ Runoff=11.46 cfs 40,641 cf

Pond DS-10: Peak Elev=122.80' Storage=1,491 cf Inflow=1.09 cfs 4,132 cf
Outflow=0.14 cfs 4,132 cf

Pond DS-2: Peak Elev=141.26' Storage=2,913 cf Inflow=1.94 cfs 7,027 cf
Outflow=0.25 cfs 7,017 cf

Pond DS-7: Peak Elev=118.14' Storage=11,143 cf Inflow=5.70 cfs 20,625 cf
Outflow=0.39 cfs 20,526 cf

Pond IS-1: Peak Elev=158.96' Storage=5,590 cf Inflow=3.56 cfs 12,797 cf
Discarded=0.18 cfs 12,798 cf Primary=0.00 cfs 0 cf Outflow=0.18 cfs 12,798 cf

Pond IS-11: Peak Elev=120.22' Storage=2,010 cf Inflow=0.96 cfs 3,447 cf
Discarded=0.03 cfs 3,447 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 3,447 cf

Pond IS-12a: Peak Elev=125.92' Storage=3,461 cf Inflow=1.85 cfs 6,603 cf
Discarded=0.06 cfs 6,603 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 6,603 cf

Pond IS-12b: Peak Elev=129.73' Storage=2,473 cf Inflow=1.38 cfs 4,949 cf
Discarded=0.05 cfs 4,949 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 4,949 cf

Pond IS-12c: Peak Elev=127.86' Storage=1,739 cf Inflow=1.08 cfs 3,899 cf
Discarded=0.05 cfs 3,899 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,899 cf

Pond IS-12d: Peak Elev=124.90' Storage=3,391 cf Inflow=1.83 cfs 6,511 cf
Discarded=0.06 cfs 6,512 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 6,512 cf

Pond IS-3: Peak Elev=122.99' Storage=5,717 cf Inflow=2.60 cfs 9,629 cf
Discarded=0.08 cfs 9,629 cf Primary=0.00 cfs 0 cf Outflow=0.08 cfs 9,629 cf

Pond IS-4: Peak Elev=127.33' Storage=10,833 cf Inflow=7.80 cfs 27,881 cf
Discarded=0.51 cfs 27,881 cf Primary=0.00 cfs 0 cf Outflow=0.51 cfs 27,881 cf

Pond IS-5: Peak Elev=121.93' Storage=25,293 cf Inflow=10.70 cfs 38,719 cf
Discarded=0.24 cfs 38,720 cf Primary=0.00 cfs 0 cf Outflow=0.24 cfs 38,720 cf

Pond IS-6: Peak Elev=128.00' Storage=20,618 cf Inflow=11.46 cfs 40,641 cf
Discarded=0.43 cfs 40,648 cf Primary=0.00 cfs 0 cf Outflow=0.43 cfs 40,648 cf

Pond IS-8: Peak Elev=131.32' Storage=3,163 cf Inflow=2.30 cfs 8,132 cf
Discarded=0.15 cfs 8,134 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 8,134 cf

Pond IS-9: Peak Elev=128.91' Storage=11,858 cf Inflow=6.65 cfs 23,761 cf
Discarded=0.26 cfs 23,762 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 23,762 cf

Link 1L: Link Inflow=5.24 cfs 30,832 cf
Primary=5.24 cfs 30,832 cf

Link DP1: Wetland (South) Inflow=5.96 cfs 62,507 cf
Primary=5.96 cfs 62,507 cf

Total Runoff Area = 1,021,210 sf Runoff Volume = 249,585 cf Average Runoff Depth = 2.93"
42.89% Pervious = 437,980 sf 57.11% Impervious = 583,230 sf

Summary for Subcatchment PR-1:

Runoff = 3.06 cfs @ 12.24 hrs, Volume= 16,951 cf, Depth= 1.41"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
40,710	36	Woods, Fair, HSG A
69,620	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
33,970	98	Water Surface, HSG A
144,300		Weighted Average
110,330	44	76.46% Pervious Area
33,970	98	23.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0400	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.8	68	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.3	118	Total			

Summary for Subcatchment PR-10:

Runoff = 5.26 cfs @ 12.08 hrs, Volume= 18,835 cf, Depth= 3.93"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,230	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
47,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
57,490		Weighted Average
10,230	49	17.79% Pervious Area
47,260	98	82.21% Impervious Area

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

Summary for Subcatchment PR-10b:

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 1,790 cf, Depth= 1.43"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,760	49	50-75% Grass cover, Fair, HSG A
3,270	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
15,030		Weighted Average
15,030	59	100.00% Pervious Area

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

Summary for Subcatchment PR-11:

Runoff = 6.65 cfs @ 12.08 hrs, Volume= 23,761 cf, Depth= 4.03"
Routed to Pond IS-9 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,960	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
59,870	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
70,830		Weighted Average
10,960	49	15.47% Pervious Area
59,870	98	84.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.9	604	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.6	654	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-11b:

Runoff = 2.30 cfs @ 12.08 hrs, Volume= 8,132 cf, Depth= 4.65"
Routed to Pond IS-8 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
0	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
20,970	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,970		Weighted Average
20,970	98	100.00% Impervious Area

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

Summary for Subcatchment PR-12:

Runoff = 1.09 cfs @ 12.09 hrs, Volume= 4,132 cf, Depth= 2.33"
Routed to Pond DS-10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
12,170	49	50-75% Grass cover, Fair, HSG A
900	96	Gravel surface, HSG A
8,240	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
21,310		Weighted Average
13,070	52	61.33% Pervious Area
8,240	98	38.67% Impervious Area

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

Summary for Subcatchment PR-13:

Runoff = 0.96 cfs @ 12.08 hrs, Volume= 3,447 cf, Depth= 3.76"
Routed to Pond IS-11 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
2,390	49	50-75% Grass cover, Fair, HSG A
340	96	Gravel surface, HSG A
8,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
10,990		Weighted Average
2,730	55	24.84% Pervious Area
8,260	98	75.16% Impervious Area

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

Summary for Subcatchment PR-14a:

Runoff = 1.85 cfs @ 12.08 hrs, Volume= 6,603 cf, Depth= 3.92"
Routed to Pond IS-12a :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,510	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
14,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,210		Weighted Average
6,010	69	29.74% Pervious Area
14,200	98	70.26% Impervious Area

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

Summary for Subcatchment PR-14b:

Runoff = 1.38 cfs @ 12.08 hrs, Volume= 4,949 cf, Depth= 3.61"
Routed to Pond IS-12b :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,100	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
9,860	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
16,460		Weighted Average
6,600	67	40.10% Pervious Area
9,860	98	59.90% Impervious Area

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

Summary for Subcatchment PR-14c:

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 3,899 cf, Depth= 3.42"
Routed to Pond IS-12c :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,040	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
7,160	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
13,700		Weighted Average
6,540	67	47.74% Pervious Area
7,160	98	52.26% Impervious Area

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

Summary for Subcatchment PR-14d:

Runoff = 1.83 cfs @ 12.08 hrs, Volume= 6,511 cf, Depth= 3.88"
Routed to Pond IS-12d :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,700	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
13,940	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,140		Weighted Average
6,200	68	30.78% Pervious Area
13,940	98	69.22% Impervious Area

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

Summary for Subcatchment PR-2:

Runoff = 2.11 cfs @ 12.30 hrs, Volume= 12,610 cf, Depth= 1.36"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
30,310	36	Woods, Fair, HSG A
55,730	49	50-75% Grass cover, Fair, HSG A
1,730	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
23,120	98	Water Surface, HSG A
110,890		Weighted Average
87,770	45	79.15% Pervious Area
23,120	98	20.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment PR-3:

Runoff = 0.14 cfs @ 12.13 hrs, Volume= 1,271 cf, Depth= 0.20"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
58,950	36	Woods, Fair, HSG A
16,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
75,310		Weighted Average
75,310	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0840	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	23	0.0650	3.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	110	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	183	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-4:

Runoff = 3.56 cfs @ 12.08 hrs, Volume= 12,797 cf, Depth= 3.79"
Routed to Pond IS-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
8,590	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
25,090	98	Paved parking, HSG A
6,810	98	Roofs, HSG A
0	98	Water Surface, HSG A
40,490		Weighted Average
8,590	49	21.22% Pervious Area
31,900	98	78.78% Impervious Area

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

Summary for Subcatchment PR-5:

Runoff = 1.94 cfs @ 12.09 hrs, Volume= 7,027 cf, Depth= 3.46"
Routed to Pond DS-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
7,180	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
17,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
24,380		Weighted Average
7,180	49	29.45% Pervious Area
17,200	98	70.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0400	1.56		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	116	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	216	0.0790	12.75	10.01	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.3	382	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-6:

Runoff = 2.58 cfs @ 12.10 hrs, Volume= 9,459 cf, Depth= 4.35"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
1,970	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
24,140	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
26,110		Weighted Average
1,970	49	7.55% Pervious Area
24,140	98	92.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.3	289	0.0310	3.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	339	Total			

Summary for Subcatchment PR-6b:

Runoff = 0.03 cfs @ 12.13 hrs, Volume= 170 cf, Depth= 0.60"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,420	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
3,420		Weighted Average
3,420	49	100.00% Pervious Area

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

Summary for Subcatchment PR-7:

Runoff = 7.80 cfs @ 12.08 hrs, Volume= 27,881 cf, Depth= 3.94"
Routed to Pond IS-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
14,790	49	50-75% Grass cover, Fair, HSG A
2,600	96	Gravel surface, HSG A
46,730	98	Paved parking, HSG A
20,800	98	Roofs, HSG A
0	98	Water Surface, HSG A
84,920		Weighted Average
17,390	56	20.48% Pervious Area
67,530	98	79.52% Impervious Area

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

Summary for Subcatchment PR-8:

Runoff = 10.26 cfs @ 12.08 hrs, Volume= 36,906 cf, Depth= 3.71"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
27,710	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
49,180	98	Paved parking, HSG A
42,440	98	Roofs, HSG A
0	98	Water Surface, HSG A
119,330		Weighted Average
27,710	49	23.22% Pervious Area
91,620	98	76.78% Impervious Area

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

Summary for Subcatchment PR-8b:

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 1,812 cf, Depth= 1.49"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,170	49	50-75% Grass cover, Fair, HSG A
3,410	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
14,580		Weighted Average
14,580	60	100.00% Pervious Area

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

Summary for Subcatchment PR-9:

Runoff = 11.46 cfs @ 12.08 hrs, Volume= 40,641 cf, Depth= 4.42"
Routed to Pond IS-6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-yr Rainfall=4.89"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
6,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
50,590	98	Paved parking, HSG A
53,400	98	Roofs, HSG A
0	98	Water Surface, HSG A
110,350		Weighted Average
6,360	49	5.76% Pervious Area
103,990	98	94.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1040	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	164	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	173	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	387	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond DS-10:

Inflow Area = 172,010 sf, 81.61% Impervious, Inflow Depth = 0.29" for 10-yr event
Inflow = 1.09 cfs @ 12.09 hrs, Volume= 4,132 cf
Outflow = 0.14 cfs @ 12.78 hrs, Volume= 4,132 cf, Atten= 87%, Lag= 41.2 min
Primary = 0.14 cfs @ 12.78 hrs, Volume= 4,132 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.80' @ 12.78 hrs Surf.Area= 1,325 sf Storage= 1,491 cf

Plug-Flow detention time= 107.4 min calculated for 4,132 cf (100% of inflow)
Center-of-Mass det. time= 107.3 min (882.5 - 775.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	5,935 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	370	0	0
122.00	860	615	615
123.00	1,440	1,150	1,765
124.00	2,070	1,755	3,520
125.00	2,760	2,415	5,935

Device	Routing	Invert	Outlet Devices
#1	Device 4	121.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	124.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	124.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	121.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.14 cfs @ 12.78 hrs HW=122.80' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.14 cfs of 8.73 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.31 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-2:

Inflow Area = 24,380 sf, 70.55% Impervious, Inflow Depth = 3.46" for 10-yr event
Inflow = 1.94 cfs @ 12.09 hrs, Volume= 7,027 cf
Outflow = 0.25 cfs @ 12.64 hrs, Volume= 7,017 cf, Atten= 87%, Lag= 33.3 min
Primary = 0.25 cfs @ 12.64 hrs, Volume= 7,017 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 141.26' @ 12.64 hrs Surf.Area= 2,684 sf Storage= 2,913 cf

Plug-Flow detention time= 151.4 min calculated for 7,016 cf (100% of inflow)
Center-of-Mass det. time= 150.8 min (908.1 - 757.3)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	8,565 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,950	0	0
141.00	2,520	2,235	2,235
142.00	3,150	2,835	5,070
143.00	3,840	3,495	8,565

Device	Routing	Invert	Outlet Devices
#1	Device 4	140.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	142.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	142.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	140.00'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.25 cfs @ 12.64 hrs HW=141.26' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.25 cfs of 6.06 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.25 cfs @ 5.13 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-7:

Inflow Area = 72,520 sf, 65.17% Impervious, Inflow Depth = 3.41" for 10-yr event
Inflow = 5.70 cfs @ 12.09 hrs, Volume= 20,625 cf
Outflow = 0.39 cfs @ 13.56 hrs, Volume= 20,526 cf, Atten= 93%, Lag= 88.6 min
Primary = 0.39 cfs @ 13.56 hrs, Volume= 20,526 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 118.14' @ 13.56 hrs Surf.Area= 7,426 sf Storage= 11,143 cf

Plug-Flow detention time= 379.4 min calculated for 20,526 cf (100% of inflow)
Center-of-Mass det. time= 376.2 min (1,134.7 - 758.5)

Volume	Invert	Avail.Storage	Storage Description
#1	116.50'	45,833 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.50	6,200	0	0
117.00	6,570	3,193	3,193
118.00	7,320	6,945	10,138
119.00	8,100	7,710	17,848
120.00	8,910	8,505	26,353
121.00	9,730	9,320	35,673
122.00	10,590	10,160	45,833

Device	Routing	Invert	Outlet Devices
#1	Device 6	116.50'	**3.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 6	119.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 6	120.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	120.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Device 6	121.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#6	Primary	116.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.50' / 113.00' S= 0.1250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.39 cfs @ 13.56 hrs HW=118.14' TW=0.00' (Dynamic Tailwater)
- **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **6=Culvert** (Passes 0.39 cfs of 11.98 cfs potential flow)
  - **1=Orifice/Grate** (Orifice Controls 0.39 cfs @ 5.88 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-1:

Inflow Area = 40,490 sf, 78.78% Impervious, Inflow Depth = 3.79" for 10-yr event
Inflow = 3.56 cfs @ 12.08 hrs, Volume= 12,797 cf
Outflow = 0.18 cfs @ 11.11 hrs, Volume= 12,798 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.18 cfs @ 11.11 hrs, Volume= 12,798 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 158.96' @ 14.26 hrs Surf.Area= 3,277 sf Storage= 5,590 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 249.9 min (1,004.2 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.00'	0 cf	**24.00'W x 56.00'L x 4.17'H Field A** 5,600 cf Overall - 5,600 cf Embedded = 0 cf x 40.0% Voids
#2A	157.00'	4,094 cf	**retain_it retain_it 3.5'** x 21 Inside #1 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 122.8 cf perimeter wall
#3B	157.00'	0 cf	**24.00'W x 80.00'L x 4.17'H Field B** 8,000 cf Overall - 8,000 cf Embedded = 0 cf x 40.0% Voids
#4B	157.00'	5,864 cf	**retain_it retain_it 3.5'** x 30 Inside #3 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 159.6 cf perimeter wall
#5	157.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		10,008 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	159.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	158.00'	**18.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 158.00' / 157.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.18 cfs @ 11.11 hrs HW=157.04' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.00' TW=0.00' (Dynamic Tailwater)
- **3=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-11:

Inflow Area = 10,990 sf, 75.16% Impervious, Inflow Depth = 3.76" for 10-yr event
Inflow = 0.96 cfs @ 12.08 hrs, Volume= 3,447 cf
Outflow = 0.03 cfs @ 9.60 hrs, Volume= 3,447 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.03 cfs @ 9.60 hrs, Volume= 3,447 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 120.22' @ 16.45 hrs Surf.Area= 1,088 sf Storage= 2,010 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 675.1 min (1,430.1 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	118.00'	0 cf	**32.00'W x 8.00'L x 3.67'H Field A** 939 cf Overall - 939 cf Embedded = 0 cf x 40.0% Voids
#2A	118.00'	635 cf	**retain_it retain_it 3.0'** x 4 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 4 Rows adjusted for 47.2 cf perimeter wall
#3B	118.00'	0 cf	**64.00'W x 8.00'L x 3.67'H Field B** 1,877 cf Overall - 1,877 cf Embedded = 0 cf x 40.0% Voids
#4B	118.00'	1,280 cf	**retain_it retain_it 3.0'** x 8 Inside #3 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 8 Rows adjusted for 85.0 cf perimeter wall
#5C	118.00'	0 cf	**40.00'W x 8.00'L x 3.67'H Field C** 1,173 cf Overall - 1,173 cf Embedded = 0 cf x 40.0% Voids
#6C	118.00'	796 cf	**retain_it retain_it 3.0'** x 5 Inside #5 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 56.6 cf perimeter wall
		2,712 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	118.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	120.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	118.00'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.00' / 114.50' S= 0.1750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 9.60 hrs HW=118.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=118.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-12a:

Inflow Area = 20,210 sf, 70.26% Impervious, Inflow Depth = 3.92" for 10-yr event
Inflow = 1.85 cfs @ 12.08 hrs, Volume= 6,603 cf
Outflow = 0.06 cfs @ 10.68 hrs, Volume= 6,603 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.06 cfs @ 10.68 hrs, Volume= 6,603 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 125.92' @ 15.55 hrs Surf.Area= 2,746 sf Storage= 3,461 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 455.8 min (1,210.8 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	124.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	124.50'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		7,313 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.40'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 10.68 hrs HW=124.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-12b:

Inflow Area = 16,460 sf, 59.90% Impervious, Inflow Depth = 3.61" for 10-yr event
Inflow = 1.38 cfs @ 12.08 hrs, Volume= 4,949 cf
Outflow = 0.05 cfs @ 11.03 hrs, Volume= 4,949 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.03 hrs, Volume= 4,949 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 129.73' @ 15.31 hrs Surf.Area= 2,280 sf Storage= 2,473 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 391.5 min (1,149.8 - 758.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	128.50'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	128.50'	65 cf	**4.00'D x 5.20'H Vertical Cone/Cylinder**
		6,075 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	128.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	133.60'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 11.03 hrs HW=128.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' TW=126.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12c:

Inflow Area = 13,700 sf, 52.26% Impervious, Inflow Depth = 3.42" for 10-yr event
Inflow = 1.08 cfs @ 12.09 hrs, Volume= 3,899 cf
Outflow = 0.05 cfs @ 11.51 hrs, Volume= 3,899 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.51 hrs, Volume= 3,899 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 127.86' @ 14.53 hrs Surf.Area= 2,280 sf Storage= 1,739 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 269.7 min (1,030.6 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.00'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	127.00'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	127.00'	64 cf	**4.00'D x 5.10'H Vertical Cone/Cylinder**
		6,074 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	127.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	132.00'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 11.51 hrs HW=127.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' TW=119.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12d:

Inflow Area = 20,140 sf, 69.22% Impervious, Inflow Depth = 3.88" for 10-yr event
Inflow = 1.83 cfs @ 12.08 hrs, Volume= 6,511 cf
Outflow = 0.06 cfs @ 10.79 hrs, Volume= 6,512 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.06 cfs @ 10.79 hrs, Volume= 6,512 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 124.90' @ 15.52 hrs Surf.Area= 2,746 sf Storage= 3,391 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 446.4 min (1,201.8 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	123.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	123.50'	69 cf	**4.00'D x 5.50'H Vertical Cone/Cylinder**
		7,320 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	128.90'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 10.79 hrs HW=123.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=123.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-3:

Inflow Area = 29,530 sf, 81.75% Impervious, Inflow Depth = 3.91" for 10-yr event
Inflow = 2.60 cfs @ 12.10 hrs, Volume= 9,629 cf
Outflow = 0.08 cfs @ 16.02 hrs, Volume= 9,629 cf, Atten= 97%, Lag= 235.4 min
Discarded = 0.08 cfs @ 16.02 hrs, Volume= 9,629 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.99' @ 16.02 hrs Surf.Area= 3,345 sf Storage= 5,717 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 683.0 min (1,437.2 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	9,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	2,420	0	0
122.00	2,870	2,645	2,645
123.00	3,350	3,110	5,755
124.00	3,860	3,605	9,360

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 4	123.50'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	123.80'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Primary	119.50'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.50' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.08 cfs @ 16.02 hrs HW=122.99' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=121.00' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**4=Culvert** (Passes 0.00 cfs of 3.78 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-4:

Inflow Area = 101,380 sf, 76.34% Impervious, Inflow Depth = 3.30" for 10-yr event
Inflow = 7.80 cfs @ 12.08 hrs, Volume= 27,881 cf
Outflow = 0.51 cfs @ 11.51 hrs, Volume= 27,881 cf, Atten= 93%, Lag= 0.0 min
Discarded = 0.51 cfs @ 11.51 hrs, Volume= 27,881 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 127.33' @ 13.58 hrs Surf.Area= 9,207 sf Storage= 10,833 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 160.9 min (914.4 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field A** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #1 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#3B	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field B** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#4B	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #3 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#5	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		28,501 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.51 cfs @ 11.51 hrs HW=126.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-5:

Inflow Area = 147,610 sf, 66.92% Impervious, Inflow Depth = 3.15" for 10-yr event
Inflow = 10.70 cfs @ 12.09 hrs, Volume= 38,719 cf
Outflow = 0.24 cfs @ 17.44 hrs, Volume= 38,720 cf, Atten= 98%, Lag= 321.1 min
Discarded = 0.24 cfs @ 17.44 hrs, Volume= 38,720 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 121.93' @ 17.44 hrs Surf.Area= 9,983 sf Storage= 25,293 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,017.0 min (1,774.6 - 757.6)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	36,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	7,320	0	0
120.00	8,210	7,765	7,765
121.00	9,120	8,665	16,430
122.00	10,050	9,585	26,015
123.00	11,010	10,530	36,545

Device	Routing	Invert	Outlet Devices
#1	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	122.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	118.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.50' / 118.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.24 cfs @ 17.44 hrs HW=121.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=119.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.00 cfs of 1.48 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-6:

Inflow Area = 110,350 sf, 94.24% Impervious, Inflow Depth = 4.42" for 10-yr event
Inflow = 11.46 cfs @ 12.08 hrs, Volume= 40,641 cf
Outflow = 0.43 cfs @ 10.38 hrs, Volume= 40,648 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.43 cfs @ 10.38 hrs, Volume= 40,648 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 128.00' @ 15.24 hrs Surf.Area= 7,693 sf Storage= 20,618 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 404.4 min (1,154.1 - 749.8)

Volume	Invert	Avail.Storage	Storage Description
#1B	125.00'	0 cf	**72.67'W x 105.69'L x 5.50'H Field B** 42,240 cf Overall - 42,240 cf Embedded = 0 cf x 40.0% Voids
#2B	125.00'	34,313 cf	**StormTrap ST2 SingleTrap 5-0** x 42 Inside #1 Inside= 101.7"W x 60.0"H => 38.33 sf x 15.40'L = 590.2 cf Outside= 101.7"W x 66.0"H => 46.64 sf x 15.40'L = 718.0 cf 42 Chambers in 7 Rows 59.35' x 92.38' Core + 6.66' Border = 72.67' x 105.69' System
#3	125.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		34,364 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	125.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	126.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.00' / 122.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.43 cfs @ 10.38 hrs HW=125.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' TW=121.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-8:

Inflow Area = 20,970 sf,100.00% Impervious, Inflow Depth = 4.65" for 10-yr event
Inflow = 2.30 cfs @ 12.08 hrs, Volume= 8,132 cf
Outflow = 0.15 cfs @ 11.56 hrs, Volume= 8,134 cf, Atten= 93%, Lag= 0.0 min
Discarded = 0.15 cfs @ 11.56 hrs, Volume= 8,134 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 131.32' @ 13.45 hrs Surf.Area= 2,733 sf Storage= 3,163 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 155.6 min (904.0 - 748.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	0 cf	**30.27'W x 90.29'L x 3.00'H Field A** 8,200 cf Overall - 8,200 cf Embedded = 0 cf x 40.0% Voids
#2A	130.00'	5,953 cf	**StormTrap ST2 SingleTrap 2-6** x 10 Inside #1 Inside= 101.7"W x 30.0"H => 18.82 sf x 15.40'L = 289.8 cf Outside= 101.7"W x 36.0"H => 25.44 sf x 15.40'L = 391.6 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	130.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder** -Impervious
		6,016 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	132.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	130.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.00' / 128.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 11.56 hrs HW=130.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' TW=126.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-9:

Inflow Area = 91,800 sf, 88.06% Impervious, Inflow Depth = 3.11" for 10-yr event
Inflow = 6.65 cfs @ 12.08 hrs, Volume= 23,761 cf
Outflow = 0.26 cfs @ 10.46 hrs, Volume= 23,762 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.26 cfs @ 10.46 hrs, Volume= 23,762 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 128.91' @ 15.22 hrs Surf.Area= 4,621 sf Storage= 11,858 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 387.8 min (1,140.2 - 752.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**32.00'W x 112.00'L x 5.17'H Field A** 18,517 cf Overall - 18,517 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,299 cf	**retain_it retain_it 4.5'** x 56 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 4 Rows adjusted for 322.9 cf perimeter wall
#3B	126.00'	0 cf	**16.00'W x 64.00'L x 5.17'H Field B** 5,291 cf Overall - 5,291 cf Embedded = 0 cf x 40.0% Voids
#4	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
#5B	126.00'	3,998 cf	**retain_it retain_it 4.5'** x 16 Inside #3 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 2 Rows adjusted for 179.4 cf perimeter wall
		18,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	130.20'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**20.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.18 sf

Discarded OutFlow Max=0.26 cfs @ 10.46 hrs HW=126.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Link

Inflow Area = 330,500 sf, 17.27% Impervious, Inflow Depth = 1.12" for 10-yr event
Inflow = 5.24 cfs @ 12.26 hrs, Volume= 30,832 cf
Primary = 5.24 cfs @ 12.26 hrs, Volume= 30,832 cf, Atten= 0%, Lag= 0.0 min
Routed to Link DP1 : Wetland (South)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link DP1: Wetland (South)

Inflow Area = 1,021,210 sf, 57.11% Impervious, Inflow Depth > 0.73" for 10-yr event
Inflow = 5.96 cfs @ 12.26 hrs, Volume= 62,507 cf
Primary = 5.96 cfs @ 12.26 hrs, Volume= 62,507 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Runoff Area=144,300 sf 23.54% Impervious Runoff Depth=1.95"
Flow Length=118' Tc=17.3 min CN=WQ Runoff=4.31 cfs 23,404 cf

Subcatchment PR-10: Runoff Area=57,490 sf 82.21% Impervious Runoff Depth=4.91"
Tc=6.0 min CN=WQ Runoff=6.57 cfs 23,519 cf

Subcatchment PR-10b: Runoff Area=15,030 sf 0.00% Impervious Runoff Depth=2.03"
Tc=6.0 min CN=WQ Runoff=0.68 cfs 2,542 cf

Subcatchment PR-11: Runoff Area=70,830 sf 84.53% Impervious Runoff Depth=5.02"
Flow Length=654' Tc=6.0 min CN=WQ Runoff=8.28 cfs 29,617 cf

Subcatchment PR-11b: Runoff Area=20,970 sf 100.00% Impervious Runoff Depth=5.74"
Tc=6.0 min CN=WQ Runoff=2.82 cfs 10,034 cf

Subcatchment PR-12: Runoff Area=21,310 sf 38.67% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=WQ Runoff=1.48 cfs 5,433 cf

Subcatchment PR-13: Runoff Area=10,990 sf 75.16% Impervious Runoff Depth=4.72"
Tc=6.0 min CN=WQ Runoff=1.21 cfs 4,320 cf

Subcatchment PR-14a: Runoff Area=20,210 sf 70.26% Impervious Runoff Depth=4.90"
Tc=6.0 min CN=WQ Runoff=2.31 cfs 8,253 cf

Subcatchment PR-14b: Runoff Area=16,460 sf 59.90% Impervious Runoff Depth=4.54"
Tc=6.0 min CN=WQ Runoff=1.74 cfs 6,228 cf

Subcatchment PR-14c: Runoff Area=13,700 sf 52.26% Impervious Runoff Depth=4.32"
Tc=6.0 min CN=WQ Runoff=1.38 cfs 4,931 cf

Subcatchment PR-14d: Runoff Area=20,140 sf 69.22% Impervious Runoff Depth=4.85"
Tc=6.0 min CN=WQ Runoff=2.28 cfs 8,145 cf

Subcatchment PR-2: Runoff Area=110,890 sf 20.85% Impervious Runoff Depth=1.90"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=2.99 cfs 17,525 cf

Subcatchment PR-3: Runoff Area=75,310 sf 0.00% Impervious Runoff Depth=0.46"
Flow Length=183' Tc=6.0 min CN=WQ Runoff=0.35 cfs 2,878 cf

Subcatchment PR-4: Runoff Area=40,490 sf 78.78% Impervious Runoff Depth=4.75"
Tc=6.0 min CN=WQ Runoff=4.47 cfs 16,024 cf

Subcatchment PR-5: Runoff Area=24,380 sf 70.55% Impervious Runoff Depth=4.36"
Flow Length=382' Tc=6.0 min CN=WQ Runoff=2.46 cfs 8,866 cf

Subcatchment PR-6: Runoff Area=26,110 sf 92.45% Impervious Runoff Depth=5.39"
Flow Length=339' Tc=7.0 min CN=WQ Runoff=3.18 cfs 11,725 cf

Subcatchment PR-6b: Runoff Area=3,420 sf 0.00% Impervious Runoff Depth=1.06"
Tc=6.0 min CN=WQ Runoff=0.07 cfs 303 cf

Subcatchment PR-7: Runoff Area=84,920 sf 79.52% Impervious Runoff Depth=4.92"
Tc=6.0 min CN=WQ Runoff=9.73 cfs 34,815 cf

Subcatchment PR-8: Runoff Area=119,330 sf 76.78% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=WQ Runoff=12.89 cfs 46,292 cf

Subcatchment PR-8b: Runoff Area=14,580 sf 0.00% Impervious Runoff Depth=2.10"
Tc=6.0 min CN=WQ Runoff=0.69 cfs 2,554 cf

Subcatchment PR-9: Runoff Area=110,350 sf 94.24% Impervious Runoff Depth=5.47"
Flow Length=387' Tc=6.0 min CN=WQ Runoff=14.12 cfs 50,321 cf

Pond DS-10: Peak Elev=123.22' Storage=2,098 cf Inflow=1.48 cfs 5,433 cf
Outflow=0.15 cfs 5,433 cf

Pond DS-2: Peak Elev=141.56' Storage=3,756 cf Inflow=2.46 cfs 8,866 cf
Outflow=0.28 cfs 8,856 cf

Pond DS-7: Peak Elev=118.56' Storage=14,370 cf Inflow=7.24 cfs 26,061 cf
Outflow=0.45 cfs 25,956 cf

Pond IS-1: Peak Elev=159.71' Storage=7,736 cf Inflow=4.47 cfs 16,024 cf
Discarded=0.18 cfs 16,027 cf Primary=0.00 cfs 0 cf Outflow=0.18 cfs 16,027 cf

Pond IS-11: Peak Elev=120.72' Storage=2,461 cf Inflow=1.21 cfs 4,320 cf
Discarded=0.03 cfs 4,050 cf Primary=0.04 cfs 270 cf Outflow=0.07 cfs 4,320 cf

Pond IS-12a: Peak Elev=126.44' Storage=4,707 cf Inflow=2.31 cfs 8,253 cf
Discarded=0.06 cfs 8,253 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 8,253 cf

Pond IS-12b: Peak Elev=130.20' Storage=3,417 cf Inflow=1.74 cfs 6,228 cf
Discarded=0.05 cfs 6,229 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 6,229 cf

Pond IS-12c: Peak Elev=128.21' Storage=2,442 cf Inflow=1.38 cfs 4,931 cf
Discarded=0.05 cfs 4,932 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 4,932 cf

Pond IS-12d: Peak Elev=125.40' Storage=4,621 cf Inflow=2.28 cfs 8,145 cf
Discarded=0.06 cfs 8,146 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 8,146 cf

Pond IS-3: Peak Elev=123.51' Storage=7,519 cf Inflow=3.25 cfs 12,028 cf
Discarded=0.09 cfs 11,980 cf Primary=0.02 cfs 48 cf Outflow=0.10 cfs 12,028 cf

Pond IS-4: Peak Elev=127.83' Storage=14,924 cf Inflow=9.73 cfs 34,815 cf
Discarded=0.51 cfs 34,822 cf Primary=0.00 cfs 0 cf Outflow=0.51 cfs 34,822 cf

Pond IS-5: Peak Elev=122.71' Storage=33,442 cf Inflow=13.57 cfs 48,846 cf
Discarded=0.25 cfs 48,621 cf Primary=0.05 cfs 226 cf Outflow=0.30 cfs 48,847 cf

Pond IS-6: Peak Elev=129.04' Storage=27,775 cf Inflow=14.12 cfs 50,321 cf
Discarded=0.43 cfs 50,328 cf Primary=0.00 cfs 0 cf Outflow=0.43 cfs 50,328 cf

Pond IS-8: Peak Elev=131.78' Storage=4,270 cf Inflow=2.82 cfs 10,034 cf
Discarded=0.15 cfs 10,036 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 10,036 cf

Pond IS-9: Peak Elev=129.96' Storage=16,164 cf Inflow=8.28 cfs 29,617 cf
Discarded=0.26 cfs 29,619 cf Primary=0.00 cfs 0 cf Outflow=0.26 cfs 29,619 cf

Link 1L: Link Inflow=7.51 cfs 43,807 cf
Primary=7.51 cfs 43,807 cf

Link DP1: Wetland (South) Inflow=8.32 cfs 84,595 cf
Primary=8.32 cfs 84,595 cf

Total Runoff Area = 1,021,210 sf Runoff Volume = 317,729 cf Average Runoff Depth = 3.73"
42.89% Pervious = 437,980 sf 57.11% Impervious = 583,230 sf

Summary for Subcatchment PR-1:

Runoff = 4.31 cfs @ 12.24 hrs, Volume= 23,404 cf, Depth= 1.95"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
40,710	36	Woods, Fair, HSG A
69,620	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
33,970	98	Water Surface, HSG A
144,300		Weighted Average
110,330	44	76.46% Pervious Area
33,970	98	23.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0400	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.8	68	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.3	118	Total			

Summary for Subcatchment PR-10:

Runoff = 6.57 cfs @ 12.08 hrs, Volume= 23,519 cf, Depth= 4.91"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,230	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
47,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
57,490		Weighted Average
10,230	49	17.79% Pervious Area
47,260	98	82.21% Impervious Area

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

Summary for Subcatchment PR-10b:

Runoff = 0.68 cfs @ 12.09 hrs, Volume= 2,542 cf, Depth= 2.03"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,760	49	50-75% Grass cover, Fair, HSG A
3,270	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
15,030		Weighted Average
15,030	59	100.00% Pervious Area

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

Summary for Subcatchment PR-11:

Runoff = 8.28 cfs @ 12.08 hrs, Volume= 29,617 cf, Depth= 5.02"
Routed to Pond IS-9 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,960	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
59,870	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
70,830		Weighted Average
10,960	49	15.47% Pervious Area
59,870	98	84.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.9	604	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.6	654	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-11b:

Runoff = 2.82 cfs @ 12.08 hrs, Volume= 10,034 cf, Depth= 5.74"
Routed to Pond IS-8 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
0	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
20,970	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,970		Weighted Average
20,970	98	100.00% Impervious Area

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

Summary for Subcatchment PR-12:

Runoff = 1.48 cfs @ 12.09 hrs, Volume= 5,433 cf, Depth= 3.06"
Routed to Pond DS-10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
12,170	49	50-75% Grass cover, Fair, HSG A
900	96	Gravel surface, HSG A
8,240	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
21,310		Weighted Average
13,070	52	61.33% Pervious Area
8,240	98	38.67% Impervious Area

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

Summary for Subcatchment PR-13:

Runoff = 1.21 cfs @ 12.08 hrs, Volume= 4,320 cf, Depth= 4.72"
Routed to Pond IS-11 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
2,390	49	50-75% Grass cover, Fair, HSG A
340	96	Gravel surface, HSG A
8,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
10,990		Weighted Average
2,730	55	24.84% Pervious Area
8,260	98	75.16% Impervious Area

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

Summary for Subcatchment PR-14a:

Runoff = 2.31 cfs @ 12.08 hrs, Volume= 8,253 cf, Depth= 4.90"
Routed to Pond IS-12a :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,510	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
14,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,210		Weighted Average
6,010	69	29.74% Pervious Area
14,200	98	70.26% Impervious Area

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

Summary for Subcatchment PR-14b:

Runoff = 1.74 cfs @ 12.08 hrs, Volume= 6,228 cf, Depth= 4.54"
Routed to Pond IS-12b :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,100	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
9,860	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
16,460		Weighted Average
6,600	67	40.10% Pervious Area
9,860	98	59.90% Impervious Area

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

Summary for Subcatchment PR-14c:

Runoff = 1.38 cfs @ 12.09 hrs, Volume= 4,931 cf, Depth= 4.32"
Routed to Pond IS-12c :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,040	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
7,160	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
13,700		Weighted Average
6,540	67	47.74% Pervious Area
7,160	98	52.26% Impervious Area

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

Summary for Subcatchment PR-14d:

Runoff = 2.28 cfs @ 12.08 hrs, Volume= 8,145 cf, Depth= 4.85"
Routed to Pond IS-12d :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,700	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
13,940	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,140		Weighted Average
6,200	68	30.78% Pervious Area
13,940	98	69.22% Impervious Area

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

Summary for Subcatchment PR-2:

Runoff = 2.99 cfs @ 12.30 hrs, Volume= 17,525 cf, Depth= 1.90"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
30,310	36	Woods, Fair, HSG A
55,730	49	50-75% Grass cover, Fair, HSG A
1,730	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
23,120	98	Water Surface, HSG A
110,890		Weighted Average
87,770	45	79.15% Pervious Area
23,120	98	20.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment PR-3:

Runoff = 0.35 cfs @ 12.11 hrs, Volume= 2,878 cf, Depth= 0.46"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
58,950	36	Woods, Fair, HSG A
16,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
75,310		Weighted Average
75,310	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0840	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	23	0.0650	3.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	110	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	183	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-4:

Runoff = 4.47 cfs @ 12.08 hrs, Volume= 16,024 cf, Depth= 4.75"
Routed to Pond IS-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
8,590	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
25,090	98	Paved parking, HSG A
6,810	98	Roofs, HSG A
0	98	Water Surface, HSG A
40,490		Weighted Average
8,590	49	21.22% Pervious Area
31,900	98	78.78% Impervious Area

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

Summary for Subcatchment PR-5:

Runoff = 2.46 cfs @ 12.09 hrs, Volume= 8,866 cf, Depth= 4.36"
Routed to Pond DS-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
7,180	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
17,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
24,380		Weighted Average
7,180	49	29.45% Pervious Area
17,200	98	70.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0400	1.56		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	116	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	216	0.0790	12.75	10.01	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.3	382	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-6:

Runoff = 3.18 cfs @ 12.10 hrs, Volume= 11,725 cf, Depth= 5.39"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
1,970	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
24,140	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
26,110		Weighted Average
1,970	49	7.55% Pervious Area
24,140	98	92.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.3	289	0.0310	3.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	339	Total			

Summary for Subcatchment PR-6b:

Runoff = 0.07 cfs @ 12.11 hrs, Volume= 303 cf, Depth= 1.06"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,420	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
3,420		Weighted Average
3,420	49	100.00% Pervious Area

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

Summary for Subcatchment PR-7:

Runoff = 9.73 cfs @ 12.08 hrs, Volume= 34,815 cf, Depth= 4.92"
Routed to Pond IS-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
14,790	49	50-75% Grass cover, Fair, HSG A
2,600	96	Gravel surface, HSG A
46,730	98	Paved parking, HSG A
20,800	98	Roofs, HSG A
0	98	Water Surface, HSG A
84,920		Weighted Average
17,390	56	20.48% Pervious Area
67,530	98	79.52% Impervious Area

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

Summary for Subcatchment PR-8:

Runoff = 12.89 cfs @ 12.08 hrs, Volume= 46,292 cf, Depth= 4.66"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
27,710	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
49,180	98	Paved parking, HSG A
42,440	98	Roofs, HSG A
0	98	Water Surface, HSG A
119,330		Weighted Average
27,710	49	23.22% Pervious Area
91,620	98	76.78% Impervious Area

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

Summary for Subcatchment PR-8b:

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,554 cf, Depth= 2.10"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,170	49	50-75% Grass cover, Fair, HSG A
3,410	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
14,580		Weighted Average
14,580	60	100.00% Pervious Area

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

Summary for Subcatchment PR-9:

Runoff = 14.12 cfs @ 12.08 hrs, Volume= 50,321 cf, Depth= 5.47"
Routed to Pond IS-6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-yr Rainfall=5.98"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
6,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
50,590	98	Paved parking, HSG A
53,400	98	Roofs, HSG A
0	98	Water Surface, HSG A
110,350		Weighted Average
6,360	49	5.76% Pervious Area
103,990	98	94.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1040	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	164	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	173	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	387	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond DS-10:

Inflow Area = 172,010 sf, 81.61% Impervious, Inflow Depth = 0.38" for 25-yr event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 5,433 cf
Outflow = 0.15 cfs @ 12.97 hrs, Volume= 5,433 cf, Atten= 90%, Lag= 53.0 min
Primary = 0.15 cfs @ 12.97 hrs, Volume= 5,433 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 123.22' @ 12.97 hrs Surf.Area= 1,579 sf Storage= 2,098 cf

Plug-Flow detention time= 136.9 min calculated for 5,433 cf (100% of inflow)
Center-of-Mass det. time= 136.8 min (913.4 - 776.6)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	5,935 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	370	0	0
122.00	860	615	615
123.00	1,440	1,150	1,765
124.00	2,070	1,755	3,520
125.00	2,760	2,415	5,935

Device	Routing	Invert	Outlet Devices
#1	Device 4	121.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	124.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	124.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	121.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.15 cfs @ 12.97 hrs HW=123.22' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.15 cfs of 10.32 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.04 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-2:

Inflow Area = 24,380 sf, 70.55% Impervious, Inflow Depth = 4.36" for 25-yr event
Inflow = 2.46 cfs @ 12.09 hrs, Volume= 8,866 cf
Outflow = 0.28 cfs @ 12.74 hrs, Volume= 8,856 cf, Atten= 88%, Lag= 39.6 min
Primary = 0.28 cfs @ 12.74 hrs, Volume= 8,856 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 141.56' @ 12.74 hrs Surf.Area= 2,875 sf Storage= 3,756 cf

Plug-Flow detention time= 164.1 min calculated for 8,856 cf (100% of inflow)
Center-of-Mass det. time= 163.3 min (919.6 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	8,565 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,950	0	0
141.00	2,520	2,235	2,235
142.00	3,150	2,835	5,070
143.00	3,840	3,495	8,565

Device	Routing	Invert	Outlet Devices
#1	Device 4	140.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	142.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	142.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	140.00'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.28 cfs @ 12.74 hrs HW=141.56' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.28 cfs of 7.68 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.78 fps)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-7:

Inflow Area = 72,520 sf, 65.17% Impervious, Inflow Depth = 4.31" for 25-yr event
Inflow = 7.24 cfs @ 12.09 hrs, Volume= 26,061 cf
Outflow = 0.45 cfs @ 13.84 hrs, Volume= 25,956 cf, Atten= 94%, Lag= 105.6 min
Primary = 0.45 cfs @ 13.84 hrs, Volume= 25,956 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 118.56' @ 13.84 hrs Surf.Area= 7,758 sf Storage= 14,370 cf

Plug-Flow detention time= 417.2 min calculated for 25,956 cf (100% of inflow)
Center-of-Mass det. time= 414.5 min (1,171.9 - 757.4)

Volume	Invert	Avail.Storage	Storage Description
#1	116.50'	45,833 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.50	6,200	0	0
117.00	6,570	3,193	3,193
118.00	7,320	6,945	10,138
119.00	8,100	7,710	17,848
120.00	8,910	8,505	26,353
121.00	9,730	9,320	35,673
122.00	10,590	10,160	45,833

Device	Routing	Invert	Outlet Devices
#1	Device 6	116.50'	**3.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 6	119.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 6	120.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	120.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Device 6	121.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#6	Primary	116.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.50' / 113.00' S= 0.1250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.45 cfs @ 13.84 hrs HW=118.56' TW=0.00' (Dynamic Tailwater)
- **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **6=Culvert** (Passes 0.45 cfs of 15.58 cfs potential flow)
  - **1=Orifice/Grate** (Orifice Controls 0.45 cfs @ 6.66 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-1:

Inflow Area = 40,490 sf, 78.78% Impervious, Inflow Depth = 4.75" for 25-yr event
Inflow = 4.47 cfs @ 12.08 hrs, Volume= 16,024 cf
Outflow = 0.18 cfs @ 10.57 hrs, Volume= 16,027 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.18 cfs @ 10.57 hrs, Volume= 16,027 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 159.71' @ 15.10 hrs Surf.Area= 3,277 sf Storage= 7,736 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 354.9 min (1,107.4 - 752.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.00'	0 cf	**24.00'W x 56.00'L x 4.17'H Field A** 5,600 cf Overall - 5,600 cf Embedded = 0 cf x 40.0% Voids
#2A	157.00'	4,094 cf	**retain_it retain_it 3.5'** x 21 Inside #1 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 122.8 cf perimeter wall
#3B	157.00'	0 cf	**24.00'W x 80.00'L x 4.17'H Field B** 8,000 cf Overall - 8,000 cf Embedded = 0 cf x 40.0% Voids
#4B	157.00'	5,864 cf	**retain_it retain_it 3.5'** x 30 Inside #3 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 159.6 cf perimeter wall
#5	157.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		10,008 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	159.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	158.00'	**18.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 158.00' / 157.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.18 cfs @ 10.57 hrs HW=157.04' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=157.00' TW=0.00' (Dynamic Tailwater)
- **3=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-11:

Inflow Area = 10,990 sf, 75.16% Impervious, Inflow Depth = 4.72" for 25-yr event
Inflow = 1.21 cfs @ 12.08 hrs, Volume= 4,320 cf
Outflow = 0.07 cfs @ 13.92 hrs, Volume= 4,320 cf, Atten= 94%, Lag= 110.3 min
Discarded = 0.03 cfs @ 8.98 hrs, Volume= 4,050 cf
Primary = 0.04 cfs @ 13.92 hrs, Volume= 270 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 120.72' @ 13.92 hrs Surf.Area= 1,088 sf Storage= 2,461 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 778.7 min (1,531.8 - 753.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	118.00'	0 cf	**32.00'W x 8.00'L x 3.67'H Field A** 939 cf Overall - 939 cf Embedded = 0 cf x 40.0% Voids
#2A	118.00'	635 cf	**retain_it retain_it 3.0'** x 4 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 4 Rows adjusted for 47.2 cf perimeter wall
#3B	118.00'	0 cf	**64.00'W x 8.00'L x 3.67'H Field B** 1,877 cf Overall - 1,877 cf Embedded = 0 cf x 40.0% Voids
#4B	118.00'	1,280 cf	**retain_it retain_it 3.0'** x 8 Inside #3 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 8 Rows adjusted for 85.0 cf perimeter wall
#5C	118.00'	0 cf	**40.00'W x 8.00'L x 3.67'H Field C** 1,173 cf Overall - 1,173 cf Embedded = 0 cf x 40.0% Voids
#6C	118.00'	796 cf	**retain_it retain_it 3.0'** x 5 Inside #5 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 56.6 cf perimeter wall
		2,712 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	118.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	120.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	118.00'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.00' / 114.50' S= 0.1750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 8.98 hrs HW=118.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.04 cfs @ 13.92 hrs HW=120.72' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.04 cfs of 5.64 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.49 fps)

Summary for Pond IS-12a:

Inflow Area = 20,210 sf, 70.26% Impervious, Inflow Depth = 4.90" for 25-yr event
Inflow = 2.31 cfs @ 12.08 hrs, Volume= 8,253 cf
Outflow = 0.06 cfs @ 10.03 hrs, Volume= 8,253 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.06 cfs @ 10.03 hrs, Volume= 8,253 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 126.44' @ 16.13 hrs Surf.Area= 2,746 sf Storage= 4,707 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 623.3 min (1,376.1 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	124.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	124.50'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		7,313 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.40'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 10.03 hrs HW=124.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-12b:

Inflow Area = 16,460 sf, 59.90% Impervious, Inflow Depth = 4.54" for 25-yr event
Inflow = 1.74 cfs @ 12.08 hrs, Volume= 6,228 cf
Outflow = 0.05 cfs @ 10.43 hrs, Volume= 6,229 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.05 cfs @ 10.43 hrs, Volume= 6,229 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 130.20' @ 15.94 hrs Surf.Area= 2,280 sf Storage= 3,417 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 545.7 min (1,302.3 - 756.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	128.50'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	128.50'	65 cf	**4.00'D x 5.20'H Vertical Cone/Cylinder**
		6,075 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	128.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	133.60'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 10.43 hrs HW=128.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' TW=126.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12c:

Inflow Area = 13,700 sf, 52.26% Impervious, Inflow Depth = 4.32" for 25-yr event
Inflow = 1.38 cfs @ 12.09 hrs, Volume= 4,931 cf
Outflow = 0.05 cfs @ 11.11 hrs, Volume= 4,932 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.05 cfs @ 11.11 hrs, Volume= 4,932 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 128.21' @ 15.35 hrs Surf.Area= 2,280 sf Storage= 2,442 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 386.8 min (1,146.1 - 759.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.00'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	127.00'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	127.00'	64 cf	**4.00'D x 5.10'H Vertical Cone/Cylinder**
		6,074 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	127.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	132.00'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 11.11 hrs HW=127.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' TW=119.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12d:

Inflow Area = 20,140 sf, 69.22% Impervious, Inflow Depth = 4.85" for 25-yr event
Inflow = 2.28 cfs @ 12.08 hrs, Volume= 8,145 cf
Outflow = 0.06 cfs @ 10.16 hrs, Volume= 8,146 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.06 cfs @ 10.16 hrs, Volume= 8,146 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 125.40' @ 16.10 hrs Surf.Area= 2,746 sf Storage= 4,621 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 611.9 min (1,365.2 - 753.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	123.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	123.50'	69 cf	**4.00'D x 5.50'H Vertical Cone/Cylinder**
		7,320 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	128.90'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 10.16 hrs HW=123.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=123.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-3:

Inflow Area = 29,530 sf, 81.75% Impervious, Inflow Depth = 4.89" for 25-yr event
Inflow = 3.25 cfs @ 12.10 hrs, Volume= 12,028 cf
Outflow = 0.10 cfs @ 15.97 hrs, Volume= 12,028 cf, Atten= 97%, Lag= 232.2 min
Discarded = 0.09 cfs @ 15.97 hrs, Volume= 11,980 cf
Primary = 0.02 cfs @ 15.97 hrs, Volume= 48 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 123.51' @ 15.97 hrs Surf.Area= 3,609 sf Storage= 7,519 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 845.8 min (1,598.0 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	9,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	2,420	0	0
122.00	2,870	2,645	2,645
123.00	3,350	3,110	5,755
124.00	3,860	3,605	9,360

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 4	123.50'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	123.80'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Primary	119.50'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.50' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 15.97 hrs HW=123.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.02 cfs @ 15.97 hrs HW=123.51' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**4=Culvert** (Passes 0.02 cfs of 7.08 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.02 cfs @ 0.27 fps)

Summary for Pond IS-4:

Inflow Area = 101,380 sf, 76.34% Impervious, Inflow Depth = 4.12" for 25-yr event
Inflow = 9.73 cfs @ 12.08 hrs, Volume= 34,815 cf
Outflow = 0.51 cfs @ 11.18 hrs, Volume= 34,822 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.51 cfs @ 11.18 hrs, Volume= 34,822 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 127.83' @ 14.10 hrs Surf.Area= 9,207 sf Storage= 14,924 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 234.5 min (985.9 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field A** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #1 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#3B	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field B** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#4B	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #3 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#5	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		28,501 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.51 cfs @ 11.18 hrs HW=126.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-5:

Inflow Area = 147,610 sf, 66.92% Impervious, Inflow Depth = 3.97" for 25-yr event
Inflow = 13.57 cfs @ 12.09 hrs, Volume= 48,846 cf
Outflow = 0.30 cfs @ 17.42 hrs, Volume= 48,847 cf, Atten= 98%, Lag= 320.0 min
Discarded = 0.25 cfs @ 17.42 hrs, Volume= 48,621 cf
Primary = 0.05 cfs @ 17.42 hrs, Volume= 226 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.71' @ 17.42 hrs Surf.Area= 10,736 sf Storage= 33,442 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,263.1 min (2,019.5 - 756.4)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	36,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	7,320	0	0
120.00	8,210	7,765	7,765
121.00	9,120	8,665	16,430
122.00	10,050	9,585	26,015
123.00	11,010	10,530	36,545

Device	Routing	Invert	Outlet Devices
#1	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	122.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	118.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.50' / 118.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.25 cfs @ 17.42 hrs HW=122.71' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.05 cfs @ 17.42 hrs HW=122.71' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.05 cfs of 27.12 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.05 cfs @ 0.39 fps)

Summary for Pond IS-6:

Inflow Area = 110,350 sf, 94.24% Impervious, Inflow Depth = 5.47" for 25-yr event
Inflow = 14.12 cfs @ 12.08 hrs, Volume= 50,321 cf
Outflow = 0.43 cfs @ 9.68 hrs, Volume= 50,328 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.43 cfs @ 9.68 hrs, Volume= 50,328 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 129.04' @ 15.82 hrs Surf.Area= 7,693 sf Storage= 27,775 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 549.0 min (1,295.9 - 746.9)

Volume	Invert	Avail.Storage	Storage Description
#1B	125.00'	0 cf	**72.67'W x 105.69'L x 5.50'H Field B** 42,240 cf Overall - 42,240 cf Embedded = 0 cf x 40.0% Voids
#2B	125.00'	34,313 cf	**StormTrap ST2 SingleTrap 5-0** x 42 Inside #1 Inside= 101.7"W x 60.0"H => 38.33 sf x 15.40'L = 590.2 cf Outside= 101.7"W x 66.0"H => 46.64 sf x 15.40'L = 718.0 cf 42 Chambers in 7 Rows 59.35' x 92.38' Core + 6.66' Border = 72.67' x 105.69' System
#3	125.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		34,364 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	125.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	126.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.00' / 122.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.43 cfs @ 9.68 hrs HW=125.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' TW=121.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-8:

Inflow Area = 20,970 sf,100.00% Impervious, Inflow Depth = 5.74" for 25-yr event
Inflow = 2.82 cfs @ 12.08 hrs, Volume= 10,034 cf
Outflow = 0.15 cfs @ 11.24 hrs, Volume= 10,036 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.15 cfs @ 11.24 hrs, Volume= 10,036 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 131.78' @ 13.94 hrs Surf.Area= 2,733 sf Storage= 4,270 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 221.2 min (966.4 - 745.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	0 cf	**30.27'W x 90.29'L x 3.00'H Field A** 8,200 cf Overall - 8,200 cf Embedded = 0 cf x 40.0% Voids
#2A	130.00'	5,953 cf	**StormTrap ST2 SingleTrap 2-6** x 10 Inside #1 Inside= 101.7"W x 30.0"H => 18.82 sf x 15.40'L = 289.8 cf Outside= 101.7"W x 36.0"H => 25.44 sf x 15.40'L = 391.6 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	130.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder** -Impervious
		6,016 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	132.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	130.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.00' / 128.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 11.24 hrs HW=130.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=130.00' TW=126.00' (Dynamic Tailwater)
↑**3=Culvert** (Controls 0.00 cfs)
↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-9:

Inflow Area = 91,800 sf, 88.06% Impervious, Inflow Depth = 3.87" for 25-yr event
Inflow = 8.28 cfs @ 12.08 hrs, Volume= 29,617 cf
Outflow = 0.26 cfs @ 9.77 hrs, Volume= 29,619 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.26 cfs @ 9.77 hrs, Volume= 29,619 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 129.96' @ 15.84 hrs Surf.Area= 4,621 sf Storage= 16,164 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 533.6 min (1,283.9 - 750.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**32.00'W x 112.00'L x 5.17'H Field A** 18,517 cf Overall - 18,517 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,299 cf	**retain_it retain_it 4.5'** x 56 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 4 Rows adjusted for 322.9 cf perimeter wall
#3B	126.00'	0 cf	**16.00'W x 64.00'L x 5.17'H Field B** 5,291 cf Overall - 5,291 cf Embedded = 0 cf x 40.0% Voids
#4	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
#5B	126.00'	3,998 cf	**retain_it retain_it 4.5'** x 16 Inside #3 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 2 Rows adjusted for 179.4 cf perimeter wall
		18,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	130.20'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**20.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.18 sf

Discarded OutFlow Max=0.26 cfs @ 9.77 hrs HW=126.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
↑**3=Culvert** (Controls 0.00 cfs)
↑**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: Link

Inflow Area = 330,500 sf, 17.27% Impervious, Inflow Depth = 1.59" for 25-yr event
Inflow = 7.51 cfs @ 12.26 hrs, Volume= 43,807 cf
Primary = 7.51 cfs @ 12.26 hrs, Volume= 43,807 cf, Atten= 0%, Lag= 0.0 min
Routed to Link DP1 : Wetland (South)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link DP1: Wetland (South)

Inflow Area = 1,021,210 sf, 57.11% Impervious, Inflow Depth = 0.99" for 25-yr event
Inflow = 8.32 cfs @ 12.26 hrs, Volume= 84,595 cf
Primary = 8.32 cfs @ 12.26 hrs, Volume= 84,595 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Runoff Area=144,300 sf 23.54% Impervious Runoff Depth=2.92"
Flow Length=118' Tc=17.3 min CN=WQ Runoff=6.72 cfs 35,057 cf

Subcatchment PR-10: Runoff Area=57,490 sf 82.21% Impervious Runoff Depth=6.46"
Tc=6.0 min CN=WQ Runoff=8.65 cfs 30,972 cf

Subcatchment PR-10b: Runoff Area=15,030 sf 0.00% Impervious Runoff Depth=3.10"
Tc=6.0 min CN=WQ Runoff=1.11 cfs 3,881 cf

Subcatchment PR-11: Runoff Area=70,830 sf 84.53% Impervious Runoff Depth=6.59"
Flow Length=654' Tc=6.0 min CN=WQ Runoff=10.86 cfs 38,910 cf

Subcatchment PR-11b: Runoff Area=20,970 sf 100.00% Impervious Runoff Depth=7.44"
Tc=6.0 min CN=WQ Runoff=3.63 cfs 13,002 cf

Subcatchment PR-12: Runoff Area=21,310 sf 38.67% Impervious Runoff Depth=4.30"
Tc=6.0 min CN=WQ Runoff=2.14 cfs 7,635 cf

Subcatchment PR-13: Runoff Area=10,990 sf 75.16% Impervious Runoff Depth=6.24"
Tc=6.0 min CN=WQ Runoff=1.60 cfs 5,716 cf

Subcatchment PR-14a: Runoff Area=20,210 sf 70.26% Impervious Runoff Depth=6.46"
Tc=6.0 min CN=WQ Runoff=3.05 cfs 10,878 cf

Subcatchment PR-14b: Runoff Area=16,460 sf 59.90% Impervious Runoff Depth=6.04"
Tc=6.0 min CN=WQ Runoff=2.32 cfs 8,283 cf

Subcatchment PR-14c: Runoff Area=13,700 sf 52.26% Impervious Runoff Depth=5.78"
Tc=6.0 min CN=WQ Runoff=1.85 cfs 6,599 cf

Subcatchment PR-14d: Runoff Area=20,140 sf 69.22% Impervious Runoff Depth=6.40"
Tc=6.0 min CN=WQ Runoff=3.01 cfs 10,747 cf

Subcatchment PR-2: Runoff Area=110,890 sf 20.85% Impervious Runoff Depth=2.86"
Flow Length=161' Tc=20.7 min CN=WQ Runoff=4.73 cfs 26,429 cf

Subcatchment PR-3: Runoff Area=75,310 sf 0.00% Impervious Runoff Depth=1.03"
Flow Length=183' Tc=6.0 min CN=WQ Runoff=1.23 cfs 6,485 cf

Subcatchment PR-4: Runoff Area=40,490 sf 78.78% Impervious Runoff Depth=6.28"
Tc=6.0 min CN=WQ Runoff=5.92 cfs 21,181 cf

Subcatchment PR-5: Runoff Area=24,380 sf 70.55% Impervious Runoff Depth=5.83"
Flow Length=382' Tc=6.0 min CN=WQ Runoff=3.31 cfs 11,836 cf

Subcatchment PR-6: Runoff Area=26,110 sf 92.45% Impervious Runoff Depth=7.03"
Flow Length=339' Tc=7.0 min CN=WQ Runoff=4.13 cfs 15,289 cf

Subcatchment PR-6b: Runoff Area=3,420 sf 0.00% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=WQ Runoff=0.16 cfs 558 cf

Subcatchment PR-7: Runoff Area=84,920 sf 79.52% Impervious Runoff Depth=6.48"
Tc=6.0 min CN=WQ Runoff=12.81 cfs 45,845 cf

Subcatchment PR-8: Runoff Area=119,330 sf 76.78% Impervious Runoff Depth=6.17"
Tc=6.0 min CN=WQ Runoff=17.13 cfs 61,329 cf

Subcatchment PR-8b: Runoff Area=14,580 sf 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=WQ Runoff=1.10 cfs 3,869 cf

Subcatchment PR-9: Runoff Area=110,350 sf 94.24% Impervious Runoff Depth=7.12"
Flow Length=387' Tc=6.0 min CN=WQ Runoff=18.29 cfs 65,515 cf

Pond DS-10: Peak Elev=124.17' Storage=3,871 cf Inflow=2.14 cfs 14,141 cf
Outflow=1.05 cfs 14,141 cf

Pond DS-2: Peak Elev=142.03' Storage=5,158 cf Inflow=3.31 cfs 11,836 cf
Outflow=0.39 cfs 11,826 cf

Pond DS-7: Peak Elev=119.24' Storage=19,855 cf Inflow=9.75 cfs 34,853 cf
Outflow=0.52 cfs 34,739 cf

Pond IS-1: Peak Elev=160.01' Storage=8,610 cf Inflow=5.92 cfs 21,181 cf
Discarded=0.18 cfs 17,695 cf Primary=1.27 cfs 3,487 cf Outflow=1.45 cfs 21,183 cf

Pond IS-11: Peak Elev=120.82' Storage=2,547 cf Inflow=1.60 cfs 5,716 cf
Discarded=0.03 cfs 4,261 cf Primary=0.52 cfs 1,454 cf Outflow=0.55 cfs 5,716 cf

Pond IS-12a: Peak Elev=127.30' Storage=6,806 cf Inflow=3.05 cfs 10,878 cf
Discarded=0.06 cfs 10,878 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 10,878 cf

Pond IS-12b: Peak Elev=131.00' Storage=5,032 cf Inflow=2.32 cfs 8,283 cf
Discarded=0.05 cfs 8,283 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 8,283 cf

Pond IS-12c: Peak Elev=128.83' Storage=3,687 cf Inflow=1.85 cfs 6,599 cf
Discarded=0.05 cfs 6,600 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 6,600 cf

Pond IS-12d: Peak Elev=126.26' Storage=6,697 cf Inflow=3.01 cfs 10,747 cf
Discarded=0.06 cfs 10,748 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 10,748 cf

Pond IS-3: Peak Elev=123.61' Storage=7,886 cf Inflow=4.29 cfs 15,847 cf
Discarded=0.09 cfs 12,631 cf Primary=0.93 cfs 3,217 cf Outflow=1.02 cfs 15,848 cf

Pond IS-4: Peak Elev=128.73' Storage=22,241 cf Inflow=12.81 cfs 45,845 cf
Discarded=0.51 cfs 45,850 cf Primary=0.00 cfs 0 cf Outflow=0.51 cfs 45,850 cf

Pond IS-5: Peak Elev=122.89' Storage=35,327 cf Inflow=18.23 cfs 65,198 cf
Discarded=0.26 cfs 50,402 cf Primary=2.15 cfs 14,797 cf Outflow=2.40 cfs 65,200 cf

Pond IS-6: Peak Elev=129.97' Storage=34,141 cf Inflow=18.29 cfs 65,515 cf
Discarded=0.43 cfs 59,016 cf Primary=0.89 cfs 6,506 cf Outflow=1.32 cfs 65,522 cf

Pond IS-8: Peak Elev=132.36' Storage=5,644 cf Inflow=3.63 cfs 13,002 cf
Discarded=0.15 cfs 12,337 cf Primary=0.18 cfs 666 cf Outflow=0.33 cfs 13,004 cf

Pond IS-9: Peak Elev=130.44' Storage=18,094 cf Inflow=10.86 cfs 39,576 cf
Discarded=0.26 cfs 32,679 cf Primary=1.50 cfs 6,899 cf Outflow=1.75 cfs 39,578 cf

Link 1L: Link Inflow=12.30 cfs 67,971 cf
Primary=12.30 cfs 67,971 cf

Link DP1: Wetland (South) Inflow=14.94 cfs 158,532 cf
Primary=14.94 cfs 158,532 cf

Total Runoff Area = 1,021,210 sf Runoff Volume = 430,016 cf Average Runoff Depth = 5.05"
42.89% Pervious = 437,980 sf 57.11% Impervious = 583,230 sf

Summary for Subcatchment PR-1:

Runoff = 6.72 cfs @ 12.24 hrs, Volume= 35,057 cf, Depth= 2.92"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
40,710	36	Woods, Fair, HSG A
69,620	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
33,970	98	Water Surface, HSG A
144,300		Weighted Average
110,330	44	76.46% Pervious Area
33,970	98	23.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	50	0.0400	0.05		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
0.8	68	0.0750	1.37		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.3	118	Total			

Summary for Subcatchment PR-10:

Runoff = 8.65 cfs @ 12.08 hrs, Volume= 30,972 cf, Depth= 6.46"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,230	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
47,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
57,490		Weighted Average
10,230	49	17.79% Pervious Area
47,260	98	82.21% Impervious Area

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

Summary for Subcatchment PR-10b:

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 3,881 cf, Depth= 3.10"
Routed to Pond DS-7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,760	49	50-75% Grass cover, Fair, HSG A
3,270	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
15,030		Weighted Average
15,030	59	100.00% Pervious Area

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

Summary for Subcatchment PR-11:

Runoff = 10.86 cfs @ 12.08 hrs, Volume= 38,910 cf, Depth= 6.59"
Routed to Pond IS-9 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
10,960	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
59,870	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
70,830		Weighted Average
10,960	49	15.47% Pervious Area
59,870	98	84.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
2.9	604	0.0290	3.46		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.6	654	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-11b:

Runoff = 3.63 cfs @ 12.08 hrs, Volume= 13,002 cf, Depth= 7.44"
Routed to Pond IS-8 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
0	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
20,970	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,970		Weighted Average
20,970	98	100.00% Impervious Area

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

Summary for Subcatchment PR-12:

Runoff = 2.14 cfs @ 12.09 hrs, Volume= 7,635 cf, Depth= 4.30"
Routed to Pond DS-10 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
12,170	49	50-75% Grass cover, Fair, HSG A
900	96	Gravel surface, HSG A
8,240	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
21,310		Weighted Average
13,070	52	61.33% Pervious Area
8,240	98	38.67% Impervious Area

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

Summary for Subcatchment PR-13:

Runoff = 1.60 cfs @ 12.08 hrs, Volume= 5,716 cf, Depth= 6.24"
Routed to Pond IS-11 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
2,390	49	50-75% Grass cover, Fair, HSG A
340	96	Gravel surface, HSG A
8,260	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
10,990		Weighted Average
2,730	55	24.84% Pervious Area
8,260	98	75.16% Impervious Area

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

Summary for Subcatchment PR-14a:

Runoff = 3.05 cfs @ 12.08 hrs, Volume= 10,878 cf, Depth= 6.46"
Routed to Pond IS-12a :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,510	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
14,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,210		Weighted Average
6,010	69	29.74% Pervious Area
14,200	98	70.26% Impervious Area

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

Summary for Subcatchment PR-14b:

Runoff = 2.32 cfs @ 12.08 hrs, Volume= 8,283 cf, Depth= 6.04"
Routed to Pond IS-12b :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,100	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
9,860	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
16,460		Weighted Average
6,600	67	40.10% Pervious Area
9,860	98	59.90% Impervious Area

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

Summary for Subcatchment PR-14c:

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 6,599 cf, Depth= 5.78"
Routed to Pond IS-12c :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
4,040	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
7,160	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
13,700		Weighted Average
6,540	67	47.74% Pervious Area
7,160	98	52.26% Impervious Area

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

Summary for Subcatchment PR-14d:

Runoff = 3.01 cfs @ 12.08 hrs, Volume= 10,747 cf, Depth= 6.40"
Routed to Pond IS-12d :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,700	49	50-75% Grass cover, Fair, HSG A
2,500	96	Gravel surface, HSG A
13,940	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
20,140		Weighted Average
6,200	68	30.78% Pervious Area
13,940	98	69.22% Impervious Area

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

Summary for Subcatchment PR-2:

Runoff = 4.73 cfs @ 12.30 hrs, Volume= 26,429 cf, Depth= 2.86"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
30,310	36	Woods, Fair, HSG A
55,730	49	50-75% Grass cover, Fair, HSG A
1,730	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
23,120	98	Water Surface, HSG A
110,890		Weighted Average
87,770	45	79.15% Pervious Area
23,120	98	20.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	50	0.0280	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.13"
1.7	111	0.0480	1.10		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.7	161	Total			

Summary for Subcatchment PR-3:

Runoff = 1.23 cfs @ 12.12 hrs, Volume= 6,485 cf, Depth= 1.03"
Routed to Link 1L : Link

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
58,950	36	Woods, Fair, HSG A
16,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
75,310		Weighted Average
75,310	39	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	50	0.0840	0.26		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	23	0.0650	3.82		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	110	0.0410	1.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	183	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-4:

Runoff = 5.92 cfs @ 12.08 hrs, Volume= 21,181 cf, Depth= 6.28"
Routed to Pond IS-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
8,590	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
25,090	98	Paved parking, HSG A
6,810	98	Roofs, HSG A
0	98	Water Surface, HSG A
40,490		Weighted Average
8,590	49	21.22% Pervious Area
31,900	98	78.78% Impervious Area

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

Summary for Subcatchment PR-5:

Runoff = 3.31 cfs @ 12.09 hrs, Volume= 11,836 cf, Depth= 5.83"
Routed to Pond DS-2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
7,180	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
17,200	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
24,380		Weighted Average
7,180	49	29.45% Pervious Area
17,200	98	70.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0400	1.56		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	116	0.0430	4.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	216	0.0790	12.75	10.01	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
1.3	382	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PR-6:

Runoff = 4.13 cfs @ 12.10 hrs, Volume= 15,289 cf, Depth= 7.03"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
1,970	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
24,140	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
26,110		Weighted Average
1,970	49	7.55% Pervious Area
24,140	98	92.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
1.3	289	0.0310	3.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
7.0	339	Total			

Summary for Subcatchment PR-6b:

Runoff = 0.16 cfs @ 12.10 hrs, Volume= 558 cf, Depth= 1.96"
Routed to Pond IS-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
3,420	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
3,420		Weighted Average
3,420	49	100.00% Pervious Area

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

Summary for Subcatchment PR-7:

Runoff = 12.81 cfs @ 12.08 hrs, Volume= 45,845 cf, Depth= 6.48"
Routed to Pond IS-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
14,790	49	50-75% Grass cover, Fair, HSG A
2,600	96	Gravel surface, HSG A
46,730	98	Paved parking, HSG A
20,800	98	Roofs, HSG A
0	98	Water Surface, HSG A
84,920		Weighted Average
17,390	56	20.48% Pervious Area
67,530	98	79.52% Impervious Area

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

Summary for Subcatchment PR-8:

Runoff = 17.13 cfs @ 12.08 hrs, Volume= 61,329 cf, Depth= 6.17"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
27,710	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
49,180	98	Paved parking, HSG A
42,440	98	Roofs, HSG A
0	98	Water Surface, HSG A
119,330		Weighted Average
27,710	49	23.22% Pervious Area
91,620	98	76.78% Impervious Area

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

Summary for Subcatchment PR-8b:

Runoff = 1.10 cfs @ 12.09 hrs, Volume= 3,869 cf, Depth= 3.18"
Routed to Pond IS-5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
11,170	49	50-75% Grass cover, Fair, HSG A
3,410	96	Gravel surface, HSG A
0	98	Paved parking, HSG A
0	98	Roofs, HSG A
0	98	Water Surface, HSG A
14,580		Weighted Average
14,580	60	100.00% Pervious Area

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

Summary for Subcatchment PR-9:

Runoff = 18.29 cfs @ 12.08 hrs, Volume= 65,515 cf, Depth= 7.12"
Routed to Pond IS-6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-yr Rainfall=7.68"

Area (sf)	CN	Description
0	36	Woods, Fair, HSG A
6,360	49	50-75% Grass cover, Fair, HSG A
0	96	Gravel surface, HSG A
50,590	98	Paved parking, HSG A
53,400	98	Roofs, HSG A
0	98	Water Surface, HSG A
110,350		Weighted Average
6,360	49	5.76% Pervious Area
103,990	98	94.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	50	0.1040	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	164	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	173	0.0320	3.63		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	387	Total, Increased to minimum Tc = 6.0 min			

Summary for Pond DS-10:

Inflow Area = 172,010 sf, 81.61% Impervious, Inflow Depth = 0.99" for 100-yr event
Inflow = 2.14 cfs @ 12.09 hrs, Volume= 14,141 cf
Outflow = 1.05 cfs @ 13.36 hrs, Volume= 14,141 cf, Atten= 51%, Lag= 76.1 min
Primary = 1.05 cfs @ 13.36 hrs, Volume= 14,141 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 124.17' @ 13.36 hrs Surf.Area= 2,184 sf Storage= 3,871 cf

Plug-Flow detention time= 142.5 min calculated for 14,139 cf (100% of inflow)
Center-of-Mass det. time= 142.7 min (953.7 - 811.1)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	5,935 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	370	0	0
122.00	860	615	615
123.00	1,440	1,150	1,765
124.00	2,070	1,755	3,520
125.00	2,760	2,415	5,935

Device	Routing	Invert	Outlet Devices
#1	Device 4	121.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	124.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	124.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	121.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.05 cfs @ 13.36 hrs HW=124.17' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 1.05 cfs of 13.22 cfs potential flow)
├**1=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.45 fps)
├**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.87 cfs @ 1.33 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-2:

Inflow Area = 24,380 sf, 70.55% Impervious, Inflow Depth = 5.83" for 100-yr event
Inflow = 3.31 cfs @ 12.09 hrs, Volume= 11,836 cf
Outflow = 0.39 cfs @ 12.73 hrs, Volume= 11,826 cf, Atten= 88%, Lag= 38.5 min
Primary = 0.39 cfs @ 12.73 hrs, Volume= 11,826 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 142.03' @ 12.73 hrs Surf.Area= 3,169 sf Storage= 5,158 cf

Plug-Flow detention time= 185.0 min calculated for 11,826 cf (100% of inflow)
Center-of-Mass det. time= 184.5 min (939.6 - 755.1)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	8,565 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,950	0	0
141.00	2,520	2,235	2,235
142.00	3,150	2,835	5,070
143.00	3,840	3,495	8,565

Device	Routing	Invert	Outlet Devices
#1	Device 4	140.00'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	142.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	142.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#4	Primary	140.00'	**18.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.39 cfs @ 12.73 hrs HW=142.03' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.39 cfs of 9.62 cfs potential flow)
├**1=Orifice/Grate** (Orifice Controls 0.33 cfs @ 6.64 fps)
├**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.06 cfs @ 0.54 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond DS-7:

Inflow Area = 72,520 sf, 65.17% Impervious, Inflow Depth = 5.77" for 100-yr event
Inflow = 9.75 cfs @ 12.09 hrs, Volume= 34,853 cf
Outflow = 0.52 cfs @ 14.22 hrs, Volume= 34,739 cf, Atten= 95%, Lag= 127.8 min
Primary = 0.52 cfs @ 14.22 hrs, Volume= 34,739 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 119.24' @ 14.22 hrs Surf.Area= 8,298 sf Storage= 19,855 cf

Plug-Flow detention time= 478.4 min calculated for 34,739 cf (100% of inflow)
Center-of-Mass det. time= 476.1 min (1,232.4 - 756.3)

Volume	Invert	Avail.Storage	Storage Description
#1	116.50'	45,833 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.50	6,200	0	0
117.00	6,570	3,193	3,193
118.00	7,320	6,945	10,138
119.00	8,100	7,710	17,848
120.00	8,910	8,505	26,353
121.00	9,730	9,320	35,673
122.00	10,590	10,160	45,833

Device	Routing	Invert	Outlet Devices
#1	Device 6	116.50'	**3.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 6	119.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 6	120.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	120.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Device 6	121.80'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#6	Primary	116.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 116.50' / 113.00' S= 0.1250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.52 cfs @ 14.22 hrs HW=119.24' TW=0.00' (Dynamic Tailwater)
- **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **6=Culvert** (Passes 0.52 cfs of 19.98 cfs potential flow)
  - **1=Orifice/Grate** (Orifice Controls 0.52 cfs @ 7.76 fps)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **5=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-1:

Inflow Area = 40,490 sf, 78.78% Impervious, Inflow Depth = 6.28" for 100-yr event
Inflow = 5.92 cfs @ 12.08 hrs, Volume= 21,181 cf
Outflow = 1.45 cfs @ 12.47 hrs, Volume= 21,183 cf, Atten= 75%, Lag= 22.8 min
Discarded = 0.18 cfs @ 9.73 hrs, Volume= 17,695 cf
Primary = 1.27 cfs @ 12.47 hrs, Volume= 3,487 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 160.01' @ 12.47 hrs Surf.Area= 3,277 sf Storage= 8,610 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 320.2 min (1,070.9 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.00'	0 cf	**24.00'W x 56.00'L x 4.17'H Field A** 5,600 cf Overall - 5,600 cf Embedded = 0 cf x 40.0% Voids
#2A	157.00'	4,094 cf	**retain_it retain_it 3.5'** x 21 Inside #1 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 122.8 cf perimeter wall
#3B	157.00'	0 cf	**24.00'W x 80.00'L x 4.17'H Field B** 8,000 cf Overall - 8,000 cf Embedded = 0 cf x 40.0% Voids
#4B	157.00'	5,864 cf	**retain_it retain_it 3.5'** x 30 Inside #3 Inside= 84.0"W x 42.0"H => 25.10 sf x 8.00'L = 200.8 cf Outside= 96.0"W x 50.0"H => 33.33 sf x 8.00'L = 266.7 cf 3 Rows adjusted for 159.6 cf perimeter wall
#5	157.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		10,008 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	157.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	159.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	158.00'	**18.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 158.00' / 157.90' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.18 cfs @ 9.73 hrs HW=157.04' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=1.27 cfs @ 12.47 hrs HW=160.01' TW=0.00' (Dynamic Tailwater)
- **3=Culvert** (Passes 1.27 cfs of 8.56 cfs potential flow)
  - **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.27 cfs @ 1.51 fps)

Summary for Pond IS-11:

Inflow Area = 10,990 sf, 75.16% Impervious, Inflow Depth = 6.24" for 100-yr event
Inflow = 1.60 cfs @ 12.08 hrs, Volume= 5,716 cf
Outflow = 0.55 cfs @ 12.36 hrs, Volume= 5,716 cf, Atten= 66%, Lag= 16.5 min
Discarded = 0.03 cfs @ 8.06 hrs, Volume= 4,261 cf
Primary = 0.52 cfs @ 12.36 hrs, Volume= 1,454 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 120.82' @ 12.36 hrs Surf.Area= 1,088 sf Storage= 2,547 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 632.8 min (1,384.1 - 751.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	118.00'	0 cf	**32.00'W x 8.00'L x 3.67'H Field A** 939 cf Overall - 939 cf Embedded = 0 cf x 40.0% Voids
#2A	118.00'	635 cf	**retain_it retain_it 3.0'** x 4 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 4 Rows adjusted for 47.2 cf perimeter wall
#3B	118.00'	0 cf	**64.00'W x 8.00'L x 3.67'H Field B** 1,877 cf Overall - 1,877 cf Embedded = 0 cf x 40.0% Voids
#4B	118.00'	1,280 cf	**retain_it retain_it 3.0'** x 8 Inside #3 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 8 Rows adjusted for 85.0 cf perimeter wall
#5C	118.00'	0 cf	**40.00'W x 8.00'L x 3.67'H Field C** 1,173 cf Overall - 1,173 cf Embedded = 0 cf x 40.0% Voids
#6C	118.00'	796 cf	**retain_it retain_it 3.0'** x 5 Inside #5 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 56.6 cf perimeter wall
		2,712 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	118.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	120.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	118.00'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.00' / 114.50' S= 0.1750 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 8.06 hrs HW=118.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.52 cfs @ 12.36 hrs HW=120.82' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.52 cfs of 5.76 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.52 cfs @ 1.12 fps)

Summary for Pond IS-12a:

Inflow Area = 20,210 sf, 70.26% Impervious, Inflow Depth = 6.46" for 100-yr event
Inflow = 3.05 cfs @ 12.08 hrs, Volume= 10,878 cf
Outflow = 0.06 cfs @ 9.23 hrs, Volume= 10,878 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.06 cfs @ 9.23 hrs, Volume= 10,878 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 127.30' @ 17.37 hrs Surf.Area= 2,746 sf Storage= 6,806 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 900.4 min (1,650.8 - 750.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	124.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	124.50'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
		7,313 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	124.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	129.40'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 9.23 hrs HW=124.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-12b:

Inflow Area = 16,460 sf, 59.90% Impervious, Inflow Depth = 6.04" for 100-yr event
Inflow = 2.32 cfs @ 12.08 hrs, Volume= 8,283 cf
Outflow = 0.05 cfs @ 9.61 hrs, Volume= 8,283 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.05 cfs @ 9.61 hrs, Volume= 8,283 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 131.00' @ 17.13 hrs Surf.Area= 2,280 sf Storage= 5,032 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 805.0 min (1,559.7 - 754.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	128.50'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	128.50'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	128.50'	65 cf	**4.00'D x 5.20'H Vertical Cone/Cylinder**
		6,075 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	128.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	133.60'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 9.61 hrs HW=128.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=128.50' TW=126.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12c:

Inflow Area = 13,700 sf, 52.26% Impervious, Inflow Depth = 5.78" for 100-yr event
Inflow = 1.85 cfs @ 12.09 hrs, Volume= 6,599 cf
Outflow = 0.05 cfs @ 10.36 hrs, Volume= 6,600 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.05 cfs @ 10.36 hrs, Volume= 6,600 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond IS-5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 128.83' @ 16.15 hrs Surf.Area= 2,280 sf Storage= 3,687 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 590.1 min (1,347.9 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	127.00'	0 cf	**30.27'W x 74.90'L x 3.50'H Field A** 7,935 cf Overall - 7,935 cf Embedded = 0 cf x 40.0% Voids
#2A	127.00'	6,010 cf	**StormTrap ST2 SingleTrap 3-0** x 8 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 8 Chambers in 2 Rows 16.96' x 61.58' Core + 6.66' Border = 30.27' x 74.90' System
#3	127.00'	64 cf	**4.00'D x 5.10'H Vertical Cone/Cylinder**
		6,074 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	127.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	132.00'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.05 cfs @ 10.36 hrs HW=127.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.00' TW=119.00' (Dynamic Tailwater)
2=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond IS-12d:

Inflow Area = 20,140 sf, 69.22% Impervious, Inflow Depth = 6.40" for 100-yr event
Inflow = 3.01 cfs @ 12.08 hrs, Volume= 10,747 cf
Outflow = 0.06 cfs @ 9.35 hrs, Volume= 10,748 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.06 cfs @ 9.35 hrs, Volume= 10,748 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 126.26' @ 17.33 hrs Surf.Area= 2,746 sf Storage= 6,697 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 886.3 min (1,637.2 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	123.50'	0 cf	**30.27'W x 90.29'L x 3.50'H Field A** 9,566 cf Overall - 9,566 cf Embedded = 0 cf x 40.0% Voids
#2A	123.50'	7,250 cf	**StormTrap ST2 SingleTrap 3-0** x 10 Inside #1 Inside= 101.7"W x 36.0"H => 22.99 sf x 15.40'L = 354.0 cf Outside= 101.7"W x 42.0"H => 29.68 sf x 15.40'L = 456.9 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	123.50'	69 cf	**4.00'D x 5.50'H Vertical Cone/Cylinder**
		7,320 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	123.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	128.90'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 9.35 hrs HW=123.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=123.50' TW=121.00' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond IS-3:

Inflow Area = 29,530 sf, 81.75% Impervious, Inflow Depth = 6.44" for 100-yr event
Inflow = 4.29 cfs @ 12.10 hrs, Volume= 15,847 cf
Outflow = 1.02 cfs @ 12.50 hrs, Volume= 15,848 cf, Atten= 76%, Lag= 24.0 min
Discarded = 0.09 cfs @ 12.50 hrs, Volume= 12,631 cf
Primary = 0.93 cfs @ 12.50 hrs, Volume= 3,217 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 123.61' @ 12.50 hrs Surf.Area= 3,660 sf Storage= 7,886 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 694.8 min (1,444.9 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	9,360 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	2,420	0	0
122.00	2,870	2,645	2,645
123.00	3,350	3,110	5,755
124.00	3,860	3,605	9,360

Device	Routing	Invert	Outlet Devices
#1	Discarded	121.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 4	123.50'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	123.80'	**6.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#4	Primary	119.50'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.50' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 12.50 hrs HW=123.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.93 cfs @ 12.50 hrs HW=123.61' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**4=Culvert** (Passes 0.93 cfs of 7.18 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.93 cfs @ 1.07 fps)

Summary for Pond IS-4:

Inflow Area = 101,380 sf, 76.34% Impervious, Inflow Depth = 5.43" for 100-yr event
Inflow = 12.81 cfs @ 12.08 hrs, Volume= 45,845 cf
Outflow = 0.51 cfs @ 10.52 hrs, Volume= 45,850 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.51 cfs @ 10.52 hrs, Volume= 45,850 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 128.73' @ 15.12 hrs Surf.Area= 9,207 sf Storage= 22,241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 361.3 min (1,110.5 - 749.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field A** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #1 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#3B	126.00'	0 cf	**30.27'W x 151.88'L x 4.00'H Field B** 18,390 cf Overall - 18,390 cf Embedded = 0 cf x 40.0% Voids
#4B	126.00'	14,225 cf	**StormTrap ST2 SingleTrap 3-6** x 18 Inside #3 Inside= 101.7"W x 42.0"H => 26.77 sf x 15.40'L = 412.1 cf Outside= 101.7"W x 48.0"H => 33.92 sf x 15.40'L = 522.2 cf 18 Chambers in 2 Rows 16.96' x 138.56' Core + 6.66' Border = 30.27' x 151.88' System
#5	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		28,501 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.51 cfs @ 10.52 hrs HW=126.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.00' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Controls 0.00 cfs)
└**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond IS-5:

Inflow Area = 147,610 sf, 66.92% Impervious, Inflow Depth = 5.30" for 100-yr event
Inflow = 18.23 cfs @ 12.09 hrs, Volume= 65,198 cf
Outflow = 2.40 cfs @ 12.63 hrs, Volume= 65,200 cf, Atten= 87%, Lag= 32.6 min
Discarded = 0.26 cfs @ 12.63 hrs, Volume= 50,402 cf
Primary = 2.15 cfs @ 12.63 hrs, Volume= 14,797 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 122.89' @ 12.63 hrs Surf.Area= 10,903 sf Storage= 35,327 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,005.9 min (1,761.1 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1	119.00'	36,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.00	7,320	0	0
120.00	8,210	7,765	7,765
121.00	9,120	8,665	16,430
122.00	10,050	9,585	26,015
123.00	11,010	10,530	36,545

Device	Routing	Invert	Outlet Devices
#1	Discarded	119.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Device 3	122.70'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (39% open area) Limited to weir flow at low heads
#3	Primary	118.50'	**24.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 118.50' / 118.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.26 cfs @ 12.63 hrs HW=122.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=2.15 cfs @ 12.63 hrs HW=122.89' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 2.15 cfs of 27.85 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 2.15 cfs @ 1.42 fps)

Summary for Pond IS-6:

Inflow Area = 110,350 sf, 94.24% Impervious, Inflow Depth = 7.12" for 100-yr event
Inflow = 18.29 cfs @ 12.08 hrs, Volume= 65,515 cf
Outflow = 1.32 cfs @ 13.24 hrs, Volume= 65,522 cf, Atten= 93%, Lag= 69.5 min
Discarded = 0.43 cfs @ 8.92 hrs, Volume= 59,016 cf
Primary = 0.89 cfs @ 13.24 hrs, Volume= 6,506 cf
Routed to Pond DS-10 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 129.97' @ 13.24 hrs Surf.Area= 7,693 sf Storage= 34,141 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 603.6 min (1,347.4 - 743.9)

Volume	Invert	Avail.Storage	Storage Description
#1B	125.00'	0 cf	**72.67'W x 105.69'L x 5.50'H Field B** 42,240 cf Overall - 42,240 cf Embedded = 0 cf x 40.0% Voids
#2B	125.00'	34,313 cf	**StormTrap ST2 SingleTrap 5-0** x 42 Inside #1 Inside= 101.7"W x 60.0"H => 38.33 sf x 15.40'L = 590.2 cf Outside= 101.7"W x 66.0"H => 46.64 sf x 15.40'L = 718.0 cf 42 Chambers in 7 Rows 59.35' x 92.38' Core + 6.66' Border = 72.67' x 105.69' System
#3	125.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
		34,364 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	125.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	129.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	126.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 126.00' / 122.00' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Discarded OutFlow Max=0.43 cfs @ 8.92 hrs HW=125.06' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.89 cfs @ 13.24 hrs HW=129.97' TW=124.16' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.89 cfs of 15.26 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.89 cfs @ 1.34 fps)

Summary for Pond IS-8:

Inflow Area = 20,970 sf,100.00% Impervious, Inflow Depth = 7.44" for 100-yr event
Inflow = 3.63 cfs @ 12.08 hrs, Volume= 13,002 cf
Outflow = 0.33 cfs @ 12.91 hrs, Volume= 13,004 cf, Atten= 91%, Lag= 49.6 min
Discarded = 0.15 cfs @ 10.59 hrs, Volume= 12,337 cf
Primary = 0.18 cfs @ 12.91 hrs, Volume= 666 cf
Routed to Pond IS-9 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 132.36' @ 12.91 hrs Surf.Area= 2,733 sf Storage= 5,644 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 283.5 min (1,025.2 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	130.00'	0 cf	**30.27'W x 90.29'L x 3.00'H Field A** 8,200 cf Overall - 8,200 cf Embedded = 0 cf x 40.0% Voids
#2A	130.00'	5,953 cf	**StormTrap ST2 SingleTrap 2-6** x 10 Inside #1 Inside= 101.7"W x 30.0"H => 18.82 sf x 15.40'L = 289.8 cf Outside= 101.7"W x 36.0"H => 25.44 sf x 15.40'L = 391.6 cf 10 Chambers in 2 Rows 16.96' x 76.98' Core + 6.66' Border = 30.27' x 90.29' System
#3	130.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder** -Impervious
		6,016 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	130.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	132.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	130.00'	**12.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 130.00' / 128.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.15 cfs @ 10.59 hrs HW=130.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.18 cfs @ 12.91 hrs HW=132.36' TW=130.39' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.18 cfs of 3.55 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.18 cfs @ 0.79 fps)

Summary for Pond IS-9:

Inflow Area = 91,800 sf, 88.06% Impervious, Inflow Depth = 5.17" for 100-yr event
Inflow = 10.86 cfs @ 12.08 hrs, Volume= 39,576 cf
Outflow = 1.75 cfs @ 12.56 hrs, Volume= 39,578 cf, Atten= 84%, Lag= 28.3 min
Discarded = 0.26 cfs @ 9.00 hrs, Volume= 32,679 cf
Primary = 1.50 cfs @ 12.56 hrs, Volume= 6,899 cf
Routed to Link DP1 : Wetland (South)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 130.44' @ 12.56 hrs Surf.Area= 4,621 sf Storage= 18,094 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 483.8 min (1,232.7 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	126.00'	0 cf	**32.00'W x 112.00'L x 5.17'H Field A** 18,517 cf Overall - 18,517 cf Embedded = 0 cf x 40.0% Voids
#2A	126.00'	14,299 cf	**retain_it retain_it 4.5'** x 56 Inside #1 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 4 Rows adjusted for 322.9 cf perimeter wall
#3B	126.00'	0 cf	**16.00'W x 64.00'L x 5.17'H Field B** 5,291 cf Overall - 5,291 cf Embedded = 0 cf x 40.0% Voids
#4	126.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder**
#5B	126.00'	3,998 cf	**retain_it retain_it 4.5'** x 16 Inside #3 Inside= 84.0"W x 54.0"H => 32.64 sf x 8.00'L = 261.1 cf Outside= 96.0"W x 62.0"H => 41.33 sf x 8.00'L = 330.7 cf 2 Rows adjusted for 179.4 cf perimeter wall
		18,348 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	126.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	130.20'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Primary	127.00'	**20.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.00' / 126.60' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.18 sf

Discarded OutFlow Max=0.26 cfs @ 9.00 hrs HW=126.05' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=1.50 cfs @ 12.56 hrs HW=130.44' TW=0.00' (Dynamic Tailwater)
└**3=Culvert** (Passes 1.50 cfs of 16.95 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.50 cfs @ 1.59 fps)

Summary for Link 1L: Link

Inflow Area = 330,500 sf, 17.27% Impervious, Inflow Depth = 2.47" for 100-yr event
Inflow = 12.30 cfs @ 12.26 hrs, Volume= 67,971 cf
Primary = 12.30 cfs @ 12.26 hrs, Volume= 67,971 cf, Atten= 0%, Lag= 0.0 min
Routed to Link DP1 : Wetland (South)

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link DP1: Wetland (South)

Inflow Area = 1,021,210 sf, 57.11% Impervious, Inflow Depth = 1.86" for 100-yr event
Inflow = 14.94 cfs @ 12.48 hrs, Volume= 158,532 cf
Primary = 14.94 cfs @ 12.48 hrs, Volume= 158,532 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

APPENDIX F: STORMWATER CALCULATIONS

- *MA STANDARD #3 – RECHARGE AND DRAWDOWN TIME*
- *MA STANDARD #4 – WATER QUALITY AND TSS REMOVAL*
- *NOAA RAINFALL DATA*
- *PIPE SIZING*

Proposed Development
341 Broadway Rd, 226, 250, 262 Loon Hill Rd
Dracut, MA
Bohler Job Number: MAB230046.00
September 20, 2024

MA DEP Standard 3: Recharge Volume Calculations

Required Recharge Volume - A Soils (0.60 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	12.079
Proposed Increase in Site Impervious Area (ac)	12.079
Recharge Volume Required (cf)	**26,307**

Required Recharge Volume - B Soils (0.35 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**

Required Recharge Volume - C Soils (0.25 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**

Required Recharge Volume - D Soils (0.10 in.)	
Existing Site Impervious Area (ac)	0.000
Proposed Site Impervious Area (ac)	0.000
Proposed Increase in Site Impervious Area (ac)	0.000
Recharge Volume Required (cf)	**0**

Total Recharge Volume Required (cf)	**26,307**

Recharge Volume Adjustment Factor	
Impervious Area Directed to Infiltration BMP (ac)	**11.438**
%Impervious Directed to Infiltration BMP	95%
Adjustment Factor	1.06
Adjusted Total Recharge Volume Required (cf)	**27,780**

Provided Recharge Volume*	
IS-1	7,951
IS-3	7,490
IS-4	24,370
IS-5	33,280
IS-6	32,940
IS-8	5,440
IS-9	17,080
IS-11	2,440
IS-12a	7,250
IS-12b	6,010
IS-12c	6,010
IS-12d	7,250
Total Recharge Volume Provided (cf)	**157,511**

Provided greater than or Equal to Required

*Volume provided below lowest outlet in cubic feet (cf)

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Dracut, MA
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September 20, 2024

MA DEP Standard 3: Drawdown Time Calculations

Drawdown Time - IS-1	
Volume below outlet pipe (Rv) (cf)	7,951
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,499
Drawdown time (Hours)*	**15.8**

Drawdown Time - IS-3	
Volume below outlet pipe (Rv) (cf)	7,490
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,420
Drawdown time (Hours)**	**15.4**

Drawdown Time - IS-4	
Volume below outlet pipe (Rv) (cf)	24,370
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	9,150
Drawdown time (Hours)**	**13.3**

Drawdown Time - IS-5	
Volume below outlet pipe (Rv) (cf)	33,280
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	7,320
Drawdown time (Hours)**	**22.6**

Drawdown Time - IS-6	
Volume below outlet pipe (Rv) (cf)	32,940
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	7,650
Drawdown time (Hours)**	**21.4**

Drawdown Time - IS-8	
Volume below outlet pipe (Rv) (cf)	5,440
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,680
Drawdown time (Hours)**	**10.1**

Drawdown Time - IS-9	
Volume below outlet pipe (Rv) (cf)	17,080
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	3,528
Drawdown time (Hours)**	**24.1**

Drawdown Time - IS-11	
Volume below outlet pipe (Rv) (cf)	2,440
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	833
Drawdown time (Hours)**	**14.6**

Drawdown Time - IS-12a	
Volume below outlet pipe (Rv) (cf)	7,250
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,700
Drawdown time (Hours)**	**13.4**

Drawdown Time - IS-12b	
Volume below outlet pipe (Rv) (cf)	6,010
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,280
Drawdown time (Hours)**	**13.1**

Drawdown Time - IS-12c	
Volume below outlet pipe (Rv) (cf)	6,010
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,280
Drawdown time (Hours)**	**13.1**

Drawdown Time - IS-12d	
Volume below outlet pipe (Rv) (cf)	7,250
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	2,700
Drawdown time (Hours)**	**13.4**

*Infiltration Rates taken from Rawls Table
**Drawdown time = Rv / (K) x (bottom area)

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September 20, 2024

MA DEP Standard 4: Water Quality Volume Calculations

Water Quality Volume Required	
Water Quality Volume runoff (in.)*	1.0
Total Post Development Impervious Area (sf)	526,140
Required Water Quality Volume (cf)	**43,845**
*Water Quality volume runoff is equal to 0.5 or 1.0 inches of runoff times the total impervious area of the post development project site.	

Water Quality Volume Provided*	
IS-1	7,951
IS-3	7,490
IS-4	24,370
IS-5	33,280
IS-6	32,940
IS-8	5,440
IS-9	17,080
IS-11	2,440
IS-12a	7,250
IS-12b	6,010
IS-12c	6,010
IS-12d	7,250
Total Provided Water Quality Volume (cf)	**157,511**

Required Recharge Provided

*Volume provided below lowest outlet pipe in cubic feet (cf)

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MA DEP Standard 4: TSS Removal Calculation Worksheet

BMP Treatment Train: #1 - Hydrodynamic Separator, Infiltration Basin / Chambers

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Hydrodynamic Separator	**0.80**	**1.00**	**0.80**	**0.20**
Infiltration System	**0.80**	**0.20**	**0.16**	**0.04**
		Total TSS Removal =	**96%**	

*Equals remaining load from previous BMP (E) which enters BMP

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MA DEP Standard 4: TSS Removal Calculation Worksheet

BMP Treatment Train: #2 - Deep sump Catch Basin, Hydrodynamic Separator, Dry Detention Basin

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Hydrodynamic Separator	**0.80**	**0.75**	**0.60**	**0.15**
Dry Detention Basin	**0.00**	**0.15**	**0.00**	**0.15**
		Total TSS Removal =	**85%**	

*Equals remaining load from previous BMP (E) which enters BMP

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Dracut, MA
Bohler Job Number: MAB230046.00
September 20, 2024

MA DEP Standard 4: TSS Removal Calculation Worksheet

BMP Treatment Train: #2 - Hydrodynamic Separator, Dry Detention Basin

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Hydrodynamic Separator	**0.80**	**1.00**	**0.80**	**0.20**
Dry Detention Basin	**0.00**	**0.20**	**0.00**	**0.20**
		Total TSS Removal =	**80%**	

*Equals remaining load from previous BMP (E) which enters BMP

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Proposed Development
341 Broadway Rd, 226, 250, 262 Loon Hill Rd
Dracut, MA
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September 20, 2024

MA DEP Standard 4: Weighted TSS Removal Rate

Design Point - Treatment Train Description(s)	TSS Removal (%)	Treated Imp. Area* (ac)	TSS Removal (%)	Untreated Imp. Area (ac)	Total Area
Treatment Train #1	96%	7.11	0%	0.00	7.11
Treatment Train #2	85%	1.48	0%	0.00	1.48
Treatment Train #3	80%	0.19	0%	0.00	0.00
Weighted TSS Removal Rate	**96%**				

*Excludes roof runoff

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General Information
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Precipitation Frequency
Data Server
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Record Precipitation

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Inquiries

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: MA

Data description

Data type: Precipitation depth **Units:** English **Time series type:** Partial duration

Select location

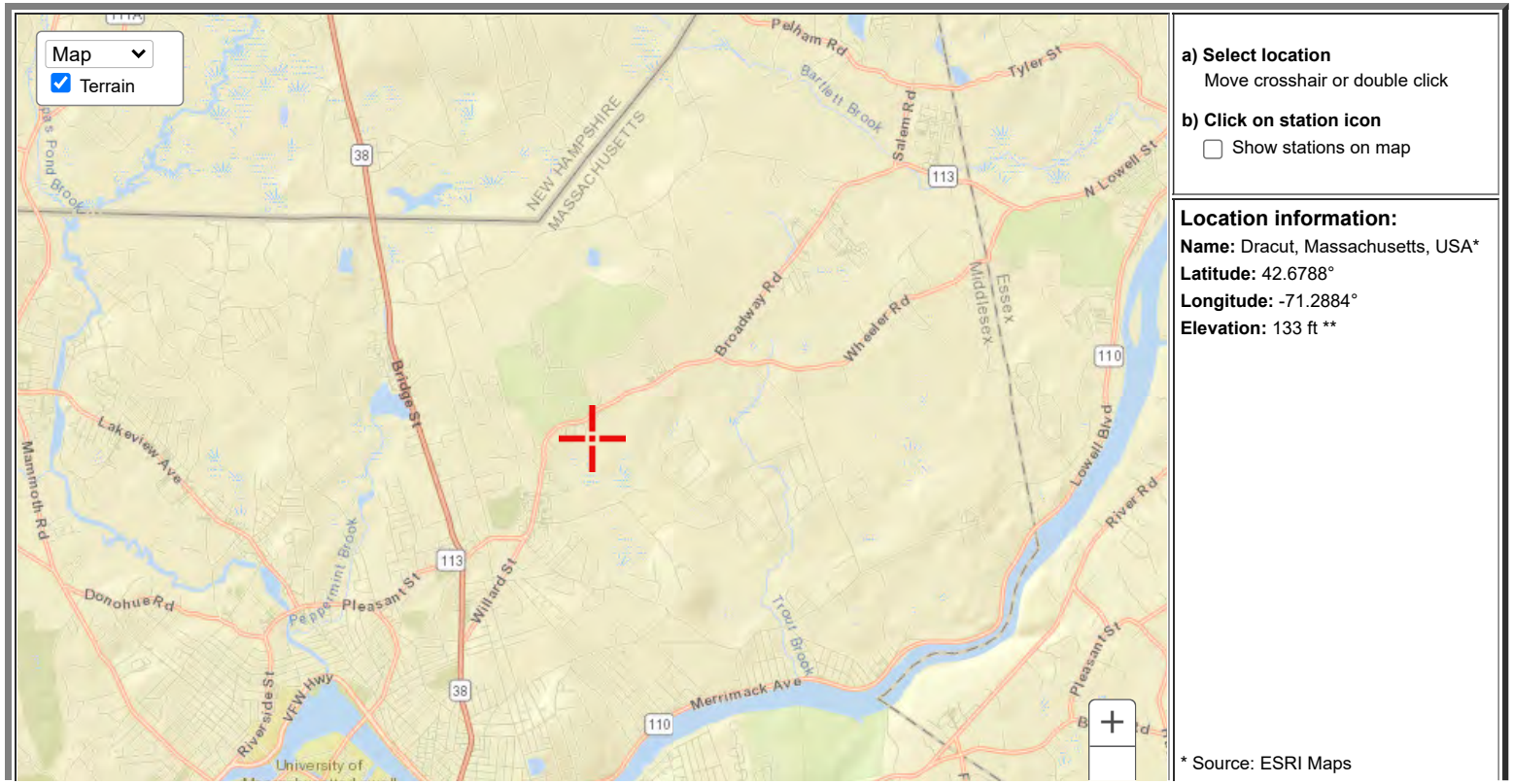
1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: Longitude: Submit

b) By station (list of MA stations): Select station

c) By address 341 Broadway Road, Dracut, MA, 018

2) Use map:



a) Select location
Move crosshair or double click

b) Click on station icon
Show stations on map

Location information:
Name: Dracut, Massachusetts, USA*
Latitude: 42.6788°
Longitude: -71.2884°
Elevation: 133 ft **

* Source: ESRI Maps

** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 10, Version 3

PF tabular | PF graphical | Supplementary information | Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.315** (0.250-0.393)	**0.375** (0.298-0.468)	**0.473** (0.375-0.592)	**0.554** (0.436-0.697)	**0.665** (0.504-0.870)	**0.749** (0.555-1.00)	**0.836** (0.600-1.16)	**0.933** (0.633-1.32)	**1.07** (0.697-1.56)	**1.18** (0.750-1.76)
10-min	**0.446** (0.355-0.556)	**0.531** (0.422-0.662)	**0.670** (0.529-0.838)	**0.784** (0.616-0.986)	**0.942** (0.714-1.23)	**1.06** (0.787-1.42)	**1.18** (0.849-1.64)	**1.32** (0.896-1.87)	**1.52** (0.987-2.21)	**1.68** (1.06-2.49)
15-min	**0.525** (0.417-0.655)	**0.625** (0.496-0.779)	**0.788** (0.624-0.986)	**0.923** (0.725-1.16)	**1.11** (0.840-1.45)	**1.25** (0.925-1.66)	**1.39** (0.999-1.92)	**1.56** (1.05-2.20)	**1.79** (1.16-2.60)	**1.97** (1.25-2.93)
30-min	**0.722** (0.574-0.899)	**0.859** (0.682-1.07)	**1.08** (0.856-1.36)	**1.27** (0.996-1.59)	**1.52** (1.16-1.99)	**1.72** (1.27-2.29)	**1.92** (1.37-2.64)	**2.14** (1.45-3.02)	**2.46** (1.60-3.58)	**2.71** (1.72-4.03)
60-min	**0.918** (0.730-1.14)	**1.09** (0.867-1.36)	**1.38** (1.09-1.72)	**1.61** (1.27-2.03)	**1.94** (1.47-2.54)	**2.18** (1.62-2.92)	**2.44** (1.75-3.37)	**2.72** (1.84-3.84)	**3.13** (2.03-4.55)	**3.45** (2.18-5.13)
2-hr	**1.16** (0.932-1.44)	**1.40** (1.12-1.74)	**1.79** (1.43-2.23)	**2.12** (1.68-2.65)	**2.56** (1.96-3.35)	**2.89** (2.17-3.87)	**3.25** (2.37-4.52)	**3.68** (2.50-5.17)	**4.34** (2.83-6.30)	**4.91** (3.12-7.24)
3-hr	**1.34** (1.07-1.65)	**1.62** (1.30-2.00)	**2.08** (1.67-2.58)	**2.47** (1.96-3.08)	**3.00** (2.31-3.92)	**3.39** (2.56-4.53)	**3.82** (2.80-5.32)	**4.35** (2.96-6.09)	**5.18** (3.38-7.48)	**5.90** (3.75-8.67)
6-hr	**1.70** (1.38-2.08)	**2.07** (1.67-2.54)	**2.68** (2.16-3.30)	**3.18** (2.54-3.94)	**3.87** (3.00-5.04)	**4.38** (3.33-5.83)	**4.94** (3.65-6.86)	**5.65** (3.86-7.86)	**6.76** (4.42-9.70)	**7.73** (4.93-11.3)
12-hr	**2.14** (1.74-2.61)	**2.61** (2.13-3.18)	**3.38** (2.74-4.14)	**4.02** (3.24-4.94)	**4.90** (3.82-6.32)	**5.55** (4.23-7.32)	**6.26** (4.63-8.60)	**7.13** (4.90-9.86)	**8.49** (5.58-12.1)	**9.67** (6.19-14.0)
24-hr	**2.54** (2.09-3.08)	**3.13** (2.57-3.80)	**4.09** (3.34-4.98)	**4.89** (3.97-5.98)	**5.98** (4.69-7.68)	**6.79** (5.21-8.91)	**7.68** (5.71-10.5)	**8.77** (6.04-12.0)	**10.5** (6.90-14.8)	**11.9** (7.66-17.2)
2-day	**2.87** (2.37-3.45)	**3.58** (2.96-4.31)	**4.74** (3.90-5.72)	**5.70** (4.66-6.92)	**7.02** (5.54-8.97)	**7.99** (6.18-10.5)	**9.06** (6.81-12.4)	**10.4** (7.21-14.2)	**12.6** (8.30-17.7)	**14.4** (9.30-20.7)
3-day	**3.14** (2.61-3.76)	**3.90** (3.24-4.68)	**5.14** (4.25-6.19)	**6.17** (5.06-7.47)	**7.58** (6.01-9.65)	**8.62** (6.68-11.2)	**9.77** (7.36-13.3)	**11.2** (7.78-15.3)	**13.5** (8.96-19.0)	**15.5** (10.0-22.2)
4-day	**3.40** (2.84-4.07)	**4.18** (3.48-5.01)	**5.46** (4.53-6.56)	**6.53** (5.37-7.88)	**7.99** (6.35-10.1)	**9.06** (7.04-11.8)	**10.2** (7.72-13.9)	**11.7** (8.15-15.9)	**14.1** (9.35-19.7)	**16.2** (10.4-23.0)
7-day	**4.13** (3.46-4.91)	**4.94** (4.14-5.89)	**6.28** (5.24-7.51)	**7.39** (6.12-8.88)	**8.91** (7.11-11.2)	**10.0** (7.82-12.9)	**11.3** (8.50-15.1)	**12.8** (8.92-17.3)	**15.2** (10.1-21.1)	**17.2** (11.2-24.4)
10-day	**4.80** (4.04-5.69)	**5.64** (4.74-6.70)	**7.02** (5.88-8.36)	**8.16** (6.78-9.77)	**9.73** (7.78-12.2)	**10.9** (8.50-13.9)	**12.2** (9.16-16.2)	**13.7** (9.58-18.4)	**16.0** (10.7-22.2)	**18.0** (11.7-25.4)
20-day	**6.73** (5.71-7.93)	**7.66** (6.49-9.03)	**9.17** (7.74-10.9)	**10.4** (8.74-12.4)	**12.2** (9.77-15.0)	**13.5** (10.5-17.0)	**14.8** (11.1-19.3)	**16.3** (11.5-21.8)	**18.4** (12.4-25.4)	**20.1** (13.1-28.3)
30-day	**8.34** (7.11-9.79)	**9.34** (7.95-11.0)	**11.0** (9.30-12.9)	**12.3** (10.4-14.6)	**14.2** (11.4-17.4)	**15.6** (12.2-19.5)	**17.1** (12.8-21.9)	**18.5** (13.1-24.6)	**20.5** (13.8-28.1)	**22.0** (14.3-30.8)
45-day	**10.4** (8.88-12.1)	**11.5** (9.80-13.4)	**13.2** (11.3-15.5)	**14.7** (12.4-17.4)	**16.7** (13.5-20.4)	**18.3** (14.3-22.7)	**19.9** (14.8-25.3)	**21.3** (15.1-28.2)	**23.2** (15.7-31.6)	**24.5** (16.0-34.2)
60-day	**12.1** (10.4-14.1)	**13.3** (11.4-15.5)	**15.2** (12.9-17.8)	**16.7** (14.2-19.7)	**18.9** (15.3-22.9)	**20.6** (16.1-25.4)	**22.2** (16.6-28.1)	**23.7** (16.8-31.2)	**25.5** (17.3-34.7)	**26.7** (17.5-37.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

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National Oceanic and Atmospheric Administration
National Weather Service
Office of Water Prediction (OWP)
1325 East West Highway
Silver Spring, MD 20910
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Proposed Development
341 Broadway Rd, 226, 250, 262 Loon Hill Rd
Dracut, MA
Bohler Job Number: MAB230046.00
September 23, 2024

Rational Pipe Sizing Calculations

Design Period Storm:		25	Year	Design Period Intensity*			5.98	in/hr									
LOCATION		IMPERVIOUS			OTHER			SUM	Tc	I	Q	D	S	Material	n	Q Full	V Full
FROM	TO	A	C	CA	A	C	CA	CA	(min)	(in/hr)	(cfs)	(in)	(ft/ft)			(cfs)	(fps)
WQU-1	IS-1	0.30	0.95	0.28	0.16	0.30	0.05	0.33	6	5.98	1.98	12	0.010	HDPE	0.012	3.86	4.91
WQU-2	IS-1	0.28	0.95	0.26	0.04	0.30	0.01	0.27	6	5.98	1.64	12	0.010	HDPE	0.012	3.86	4.91
OCS-1	Out	0.73	0.95	0.70	0.20	0.30	0.06	0.75	6	5.98	4.51	18	0.020	HDPE	0.012	16.09	9.11
WQU-3	DS-2	0.39	0.95	0.38	0.16	0.30	0.05	0.42	6	5.98	2.54	12	0.010	HDPE	0.012	3.86	4.91
WQU-4	IS-3	0.55	0.95	0.53	0.45	0.30	0.14	0.66	6	5.98	3.96	18	0.010	HDPE	0.012	11.38	6.44
CB-11	WQU-4	0.13	0.95	0.12	0.00	0.30	0.00	0.12	6	5.98	0.73	18	0.010	HDPE	0.012	11.38	6.44
CB-11	WQU-4	0.13	0.95	0.12	0.00	0.30	0.00	0.12	6	5.98	0.73	18	0.010	HDPE	0.012	11.38	6.44
DMH-6	WQU-4	0.34	0.95	0.33	0.03	0.30	0.01	0.34	6	5.98	2.01	12	0.010	HDPE	0.012	3.86	4.91
WQU-5	IS-4	0.78	0.95	0.75	0.07	0.30	0.02	0.77	6	5.98	4.59	18	0.010	HDPE	0.012	11.38	6.44
WQU-6	IS-4	0.35	0.95	0.33	0.27	0.30	0.08	0.41	6	5.98	2.45	12	0.010	HDPE	0.012	3.86	4.91
OCS-4	Out	1.61	0.95	1.53	0.34	0.30	0.10	1.63	6	5.98	9.76	24	0.010	HDPE	0.012	24.51	7.80
DMH-17	IS-9	2.11	0.95	2.01	0.05	0.30	0.02	2.02	6	5.98	12.11	20	0.009	HDPE	0.012	14.30	6.55
WQU-15	DMH-17	0.62	0.95	0.59	0.03	0.30	0.01	0.60	6	5.98	3.59	12	0.010	HDPE	0.012	3.86	4.91
WQU-16	IS-9	0.54	0.95	0.51	0.13	0.30	0.04	0.55	6	5.98	3.29	12	0.010	HDPE	0.012	3.86	4.91
WQU-7	IS-5	1.70	0.95	1.62	0.73	0.30	0.22	1.83	6	5.98	10.97	18	0.010	HDPE	0.012	11.38	6.44
DMH-9	WQU-7	0.91	0.95	0.86	0.15	0.30	0.05	0.91	6	5.98	5.42	18	0.010	HDPE	0.012	11.38	6.44
DMH-10	WQU-7	0.95	0.95	0.91	0.08	0.30	0.02	0.93	6	5.98	5.57	18	0.010	HDPE	0.012	11.38	6.44
DMH-10	WQU-7	0.64	0.95	0.61	0.10	0.30	0.03	0.64	6	5.98	3.82	18	0.010	HDPE	0.012	11.38	6.44
OCS-5	Out	2.40	0.95	2.28	0.99	0.30	0.30	2.58	6	5.98	15.42	24	0.010	HDPE	0.012	24.51	7.80
WQU-8	DS-7	0.27	0.95	0.26	0.02	0.30	0.01	0.26	6	5.98	1.58	12	0.010	HDPE	0.012	3.86	4.91
WQU-9	DS-7	0.93	0.95	0.89	0.09	0.30	0.03	0.91	6	5.98	5.47	18	0.010	HDPE	0.012	11.38	6.44
CB-28	DMH-21	0.66	0.95	0.63	0.07	0.30	0.02	0.65	6	5.98	3.88	18	0.010	HDPE	0.012	11.38	6.44
DS-7	Out	1.08	0.95	1.03	0.23	0.30	0.07	1.10	6	5.98	6.58	18	0.010	HDPE	0.012	11.38	6.44
WQU-12	IS-6	0.65	0.95	0.62	0.03	0.30	0.01	0.63	6	5.98	3.77	12	0.010	HDPE	0.012	3.86	4.91
OCS-6	DS-10	2.39	0.95	2.27	0.15	0.30	0.04	2.31	6	5.98	13.82	20	0.010	HDPE	0.012	15.07	6.91
OCS-10	Out	3.20	0.95	3.04	0.75	0.30	0.23	3.26	6	5.98	19.52	24	0.010	HDPE	0.012	24.51	7.80

*Rainfall intensity provided by TR55 Exhibit X-XX or Cornell University's NRCC Atlas of Precipitation Extremes for the North Eastern United States and Canada or NOAA Atlas 14, Volume 10, Version 2 on DATE

Prepared By:
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APPENDIX G: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENANCE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *SPILL PREVENTION*
- *PROPOSED OPERATION AND MAINTENANCE MAP*
- *MANUFACTURER'S INSPECTION AND MAINTENANCE MANUALS*

STORMWATER OPERATION AND MAINTENANCE PLAN

341 Broadway Rd
Dracut, MA 01826

RESPONSIBLE PARTY DURING CONSTRUCTION:

General Contractor [TBD]
c/o World Dracut, LLC
350 Pleasant Street
Watertown, MA 02472

RESPONSIBLE PARTY POST CONSTRUCTION:

World Dracut, LLC
350 Pleasant Street
Watertown, MA 02472

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the U.S. EPA Construction General Permit and associated Stormwater Pollution Prevention Plan (SWPPP). Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Contact information of both the Owner and Contractor shall be listed in the SWPPP for this site. The SWPPP will include information regarding construction period allowable and illicit discharges, housekeeping, and emergency response procedures. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee). Provided maintenance budgets are approximate. The Owner, or their representative, are responsible for contracting service providers that conduct the recommended maintenance at the recommended frequency, regardless of budgeted values presented herein.

1. Parking lots: Sweep at least four times per year and on a more frequent basis depending on sanding operations. Swept areas shall include all parking, drive aisles, and access aisles. All resulting sweepings shall be collected and properly disposed of offsite in accordance with MADEP and other applicable requirements.

   Approximate Maintenance Budget: $1,000/year

2. Catch basins, area/yard drains, trench drains, manholes and piping: Inspect two times per year at the end of foliage and snow-removal seasons. These features shall be cleaned two times per year or whenever the depth of deposits is greater than or equal to one half

the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off-site in accordance with MADEP and other applicable requirements.

Approximate Maintenance Budget: $500/year per structure.

3. Riprap apron / Scour Hole: Riprap and scour holes should be checked at least annually and after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for displaced stones, slumping, and erosion at edges, especially downstream or downslope. If the riprap is damaged, it should be repaired before further damage can take place. Note and repair any erosion, stone displacement or low spots in the areas. Woody vegetation should be removed from the riprap annually.

   Approximate Maintenance Budget: $250/year per location.

4. Water Quality Unit (Proprietary Separator): Follow manufacturer's recommendations (attached).

   Approximate Maintenance Budget: $1,000/year per unit.

5. Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements. Inspect basin inlets, outlets, and emergency overflow for signs of erosion.

   Approximate Maintenance Budget: $2,000/year per basin

6. Underground Infiltration Basins: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. The outlet of the basin, if any, shall be inspected for erosion and sedimentation, and riprap shall be promptly repaired in the case of erosion. Sediment collecting in the bottom of the basin shall be inspected twice annually, and removal shall commence any time the sediment reaches a depth of six inches anywhere in the basin. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements. Approximate Maintenance Budget: Cleaning - $1,000/year, Inspection - $200/year

7. Detention Basin: Inspect the detention basin at least twice a year, including inspection of the outlet structure for evidence of clogging or outflow release velocities greater than the design flow. Mow the upper-stage, side slopes, embankment, and emergency spillway at least twice a year, and remove trash and debris twice a year. Remove sediment from the basin at least once every five (5) years. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements. Inspect basin inlets, outlets, and emergency overflow for signs of erosion.

Approximate Maintenance Budget: Cleaning - $1,000 once every 5 years, Inspection - $200/year

All components of the stormwater system will be accessible by the owner or their assignee.

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

341 Broadway Rd
Dracut, MA 01826

RESPONSIBLE PARTY:

World Dracut, LLC
350 Pleasant Street
Watertown, MA 02472

NAME OF INSPECTOR:	INSPECTION DATE:

Stormwater BMP	Condition	Course of Action
Catch Basins:		
Discharge Points/ Flared End Sections / Rip Rap:		
Infiltration Basin:		
Water Quality Units:		
Underground Infiltration Basins:		
Detention Basin:		

Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM			
341 Broadway Rd Dracut, MA 01826			
Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

341 Broadway Rd
Dracut, MA 01826

RESPONSIBLE PARTY DURING CONSTRUCTION:

General Contractor [TBD]
c/o World Dracut, LLC
350 Pleasant Street
Watertown, MA 02472

RESPONSIBLE PARTY POST CONSTRUCTION:

World Dracut, LLC
350 Pleasant Street
Watertown, MA 02472

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of parking lots, drive aisles and access aisles a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Sweeping of roadways a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.
- No outdoor maintenance or washing of vehicles allowed.
- Residents will be encouraged to implement the following methods when washing vehicles: Use soap sparingly, use a hose nozzle with a trigger to save water, and pour the bucket of soapy water down the sink or in a landscape area when done and not in the street or, when possible, use a commercial car wash.
- Trash and other debris shall be removed from all areas of the site at least twice yearly.

- Reseed any bare areas as soon as they occur. Erosion control measures shall be installed in these areas to prevent deposits of sediment from entering the drainage system.

- Grass shall be maintained at a minimum blade height of two to three inches and only 1/3 of the plant height shall be removed at a time. Clippings shall not be disposed of within stormwater management areas or adjacent resource areas.

- Plants shall be pruned as necessary.

- The use of fertilizers will be kept at a level consistent with typical residential use. Fertilizer will be applied a maximum of once to twice per year during the initial planting and stabilization of landscaped areas. Once plants are established and growing well fertilizer will be applied judiciously.

- The use of pesticides will be kept at a level consistent with typical residential use. Where possible mechanical methods (i.e. pest traps) or biological methods (i.e. beneficial insects) of pest control shall be implemented. If pesticides (insecticide, herbicide, and fungicide) are required to be used, a pesticide which poses the lowest risk to public health and the environment shall be used.

- Pet waste shall be disposed of in accordance with local regulations. Pet waste shall not be disposed of in a storm drain or catch basin.

- Homeowners will be encouraged to implement the following methods when washing vehicles: Use soap sparingly, use a hose nozzle with a trigger to save water, and pour the bucket of soapy water down the sink when done and not in the street or when possible use a commercial car wash.

- Snow piles shall be located adjacent to or on pervious surfaces in upland areas. This will allow snow melt water to filter into the soil, leaving behind sand and debris which can be removed in the springtime.

- In no case shall snow be disposed of or stored in resource areas (wetlands, floodplain, streams, or other water bodies).

- In no case shall snow be disposed of or stored in the detention basins, infiltration basins or bioretention areas.

- If necessary, stockpiled snow will be removed from the Site and disposed of at an off-site location in accordance with all local, state and federal regulations.

- The amount of sand and deicing chemicals shall be kept at the minimum amount required to provide safe pedestrian and vehicle travel.

- Deicing chemicals are recommended as a pretreatment to storm events to minimize the amount of applied sand.

- Sand and deicing chemicals should be stockpiled under covered storage facilities that prevent precipitation and adjacent runoff from coming in contact with the deicing materials. Stockpile areas shall be located outside resource areas.

- The primary agents used for deicing at parking lots, sidewalks and the access roads shall consist of salt alternatives such as calcium carbonate (CaCO3) or potassium chloride (KCl) or sodium chloride.

- Deliveries shall be monitored by owner or owner's representative to ensure proper delivery and, in the event that a spillage occurs, it shall be contained and cleaned up immediately in accordance with the spill prevention program for the project.

- Recycle materials whenever possible. Provide separate containers for recycle materials. Recycling products will be removed by a certified waste hauler.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner is responsible for coordinating an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan:

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures:

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

Duly Acknowledged:

_____

Name & Title Date

SPILL PREVENTION AND RESPONSE PROCEDURES (POST CONSTRUCTION)

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps will be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on site.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

5. It is the OWNER's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.

3. For spills greater than five (5) gallons of material immediately contact the MADEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department (**9-1-1**) and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).

4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

SPILL PREVENTION CONTROL AND COUNTERMEASURE FORM

341 Broadway Rd
Dracut, MA 01826

Where a release containing a hazardous substance occurs, the following steps shall be taken by the facility manager and/or supervisor:

1. Immediately notify Dracut Fire Department (at **9-1-1**)

2. All measures must be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to off-site locations, receiving waters, wetlands and/or resource areas.

3. Notify the Dracut Health Department at 978-453-8162 and the Dracut Conservation Commission at 978-770-2587.

4. Provide documentation from licensed contractor showing disposal and cleanup procedures were completed as well as details on chemicals that were spilled to the Town Health Department and Conservation Commission.

Date of spill:_____ Time:_____ Reported By:_____

Weather Conditions:_____

Material Spilled	Location of Spill	Approximate Quantity of Spill (in gallons)	Agency(s) Notified	Date of Notification

Cause of Spill:_____
_____

Measures Taken to Clean up Spill:_____
_____

Type of equipment: _____ Make: _____ Size:_____

License or S/N: _____

Location and Method of Disposal_____
_____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring:_____
_____
_____

Additional Contact Numbers:

- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) EMERGENCY PHONE: 1-888-304-1133
- NATIONAL RESPONSE CENTER PHONE: (800) 424-8802
- U.S. ENVIRONMENTAL PROTECTION AGENCY PHONE: (888) 372-7341

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CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266; 7,517,450 related foreign patents or other patents pending.

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

retain-it®
Stormwater Management Systems

OWNERS MAINTENANCE MANUAL

retain-it, LLC
560 Salmon Brook Street
Granby, CT 06035
(860) 413-3050

retain-it ®

Owners Maintenance Manual

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Description

Engineering Design Specifications

Daily Operation and Long Term Maintenance
- System Operation
- Periodic Inspection
- Visual Inspection Guide
  - Internal Flow Evaluation
    - Low, Medium and High Flow
  - Pollution Storage Capacities
    - Oil and Grease
    - Sediments
    - Trash and Debris
- Standard Maintenance
- Emergency Spill Conditions

Sample Maintenance Log

Description

retain-it ® is a subsurface Storm Water Management system constructed of precast concrete structures. They are installed in a side by side configuration creating a continuous internal flow channel integrated throughout the system. Systems are constructed with designated inlet and outlet modules, some with multiple inlets and outlets depending on the site storm water system layout. Infiltration systems typically have an inlet and sidewalls/ base constructed on a stone infiltration blanket with geofabric installed at the native soil interface. Other systems incorporate outlet flow control devices. Detention systems are typically lined with a watertight membrane and have inlet and outlet control devices.

The retain-it ® system can consist of multiple varying layouts, with no two the same. Given this, it should be noted that the operation and maintenance requirements are very similar regardless of the intended layout. It is important that the end user know the specific elements of each system so as to understand how best to optimize it's operation.

Installation per Design: Operation is simple to follow where the installation was performed in accordance with the design specifications, drawings and calculations. Specifics shall be identified in the design drawings. As-built drawings will benefit the locating of specific design modules where the system has been buried below a parking lot area. Optional access manholes or removable grates may be installed above every inlet/outlet pipe and at critical design elements designated by the design.

Daily Operation and Long Term Maintenance: In general, daily usage of the system is self sufficient and will operate without requiring any outside assistance, except for periodic inspection to verify optimal performance and maintenance for removal of collected pollutants. A longer term maintenance program should incorporate a more thorough inspection of the all elements of the system to verify proper operating condition. This is more important with the infiltration type of systems where the soil infiltration surface may become restricted due to fine particle build up. Long term maintenance should include provisions for cleaning and removal of collected solids, oils and debris from the system.

System Operation: The system operational function is initiated according to rainfall runoff flows entering the structure. Internally, the runoff flows in a set pattern or sequence throughout the module layout in accordance with the hydraulic design conditions. The flows primarily operate on system head derived from the changes in

elevation from the internal water surface and the outlet invert elevation. Some designs incorporate internal flow controls to satisfy hydraulic conditions that enhance water quality treatment or other intended purposes. Modified systems may incorporate a pump, but in general there are no mechanical apparatus required.

End user operations primarily consist of inspection and maintenance of the system over time.

Periodic Inspection: Important note - All storm water management systems react differently depending on the conditions that are characteristic to the contributing water shed. Variables such as storm intensity, runoff flow rates, site geology, surface stabilization and pollution load will affect the system operation. As does the inspection and maintenance frequency to ensure optimum effectiveness.

Inspections should be done periodically, with a greater number scheduled during the system start up and less frequently as the operator becomes familiar with the system performance characteristics. It is recommended that the end user keep records of the performance using the inspection log record sheet found in the back of this manual. These records shall identify the cycle of maintenance “system calibration” required for the specific applications based on the contributing water shed variables operating under “normal” conditions.

Please note that immediate maintenance may be required during “non-normal” events such as during adverse weather conditions or emergency fuel spills. See information on emergency spills in this manual.

Visual inspection of all assessable components shall be performed throughout the lifetime of the system. Access has been supplied at critical points to monitor hydraulic performance and removed pollutants buildup.

Standard Maintenance:

After construction has been completed and all disturbed surfaces have been stabilized by means of vegetation, asphalt or concrete surfaces, and all drainage system components have been constructed and are free of construction debris and sediments; then the storm water management system can be considered in an operational status.

Periodic visual inspections will help to identify issues of concern.The usual indicators are signs of slow flows, backed up water, visible oil, trash and debris or an excessive amount of sediment in the storage area.

Normal operational flows can be observed to flow freely at the predicted design elevations, from the inlet to the outlet module, following a serpintine path thru the storage and attenuation modules. Note that some modules are designed to permanently

retain water where others may hold water and slowly release it over a typical 24 hour period. During a storm water event, the flows and water surface elevations will fluctuate from a low flow to a high flow/ storage status. The storage modules should fill during the event and drain down within a 24 hour period after the event has stopped. All pipes, orifices, weirs and standpipes should pass flows freely and at optimum capacity.

Standard maintenance is performed using a vacuum truck to suction the accumulated sediments, oils and greases and trash and debris from the system. Whereas an on-site maintenance staff can remove these items by hand, it is preferred that the vacuum truck be used as dictated by specific system conditions. When a specialized module designed to have a permanent water level is used, the vacuum truck should pump the liquid level down to inspect the below water elevation structures and sump storage areas.

Oils and greases can be handled by on-site staff by utilizing absorbent products that soak up the oils (and not) converting the oils from a liquid into a manageable solid form. These oil soaked absorbent materials should be disposed of in an approved manner.

Sediments, trash and debris shall be removed and disposed of in an approved manner.

Any indications of hazardous material, determined by visual inspection, testing, smell or abnormality, should be reported and handled per appropriate regulations.

Flow Conditions

System operators should familiarize themselves with proper hydraulic flow condition indicators, acceptable depths of sedimentation, debris and trash build up, and concentrations of oils and greases.

Hydraulic flow conditions are those that are established by the design as either a flow/storage or as a water quality treatment function. Both have performance characteristics that can be visually identified so as to determine the effective and efficient operation of the system.

The engineering design drawings should note the various expected water surface level elevations that are achieved during different design storms within the various modules. Since it is difficult for a visual inspection to coincide with the exact time given water elevations are predicted, the following guidelines are given for evaluation.

Visual Inspection Guide:

<u>Internal Flow Evaluation</u>

Low flow: water should flow freely from the inlet to the outlet, travelling the intended attenuation path thru the system with the water surface elevation below the structure

beam height (12” deep), the system should drain completely 24 hours after a storm event,

Medium flow: the system should hold and maintain a water level during the 24 hour storm event and yet continually fill as the storm increases or drain downward as the event recedes. Flow within the system should occur freely from inlet to outlet only being restricted when a flow control structure has been integrally designed in place. Flow control devices may result in a water level backing up either temporarily or permanently; noting devices such as water quality modules may require a permanent water level to operate properly (see water quality treatment). Other system applications should drain completely 24 hours after a storm event.

High flow: the system should fill to the maximum design storm water level elevation (hydraulic grade line) per design. In most cases, that is the highest storage elevation available in the system, at the underside of the module top slab, or the invert of the overflow pipe. As the storm event recedes, the water level should begin to drain down via flow thru the system and discharge. The system should drain completely within 24 hours after a storm event.

Pollutant Storage Capacities

<u>Oil and Grease</u>

Oil and Grease Collection (with optional Oil water separator module specified) - Oil and grease accumulation is generally a function related to vehicle parking lot and drive areas, oil generating land uses or emergency spill conditions. It is important to maintain the system from accumulating excessive volumes of oils in that they may wash over into other sections of the system potentially clogging and reducing the infiltration capacity, blocking control devices and contaminating the overall system. The following standards apply.

Oil should not accumulate more than a visible sheen on the water surface in the oil water separation module only. A sheen is described as a fine, thin oil layer on the water surface identified by the glossy rainbow colors. A dipstick (dry wooden stick) can be used as a probe to determine the thickness of oil on the surface.

Accumulated oils could be associated with insufficient maintenance or a potential large volume oil resource. Any accumulation of oil should be promptly maintained by an experienced waste handler. Emergency spills such as those generated by an accidental spill shall be contained and removed immediately before the next storm event. Spills shall be handled in accordance with local environmental regulations. See spill and accumulated oil maintenance procedures.

Sediments

Sediments (with optional primary grit module or sedimentation modules specified) - Sediments shall be periodically removed from the system as they accumulate within the designated storage modules. The inlet modules are generally equipped with a sediment storage sump located in the base of the inlet structure. Inspection should be performed after major storm events or a minimum of annually, unless a different inspection cycle has been determined to be sufficient. Inspection shall consist of using a probe to determine the presence of and depth of the accumulated solids. Access is via the 24" manhole.

Note that excessive volumes of sediments will reduce the performance and efficiency of the system. Regional accumulations of solids such as those associated with ice and snow, may result in large springtime volumes of sand and gravels used for traction and ice control.

Trash and Debris

Trash and Debris (with optional trash and debris module specified) - Trash and debris accumulates in the inlet module in three forms; floating debris, neutrally buoyant, and heavy material. The floating debris is visible from the access manhole floating on the water surface in the form of but not limited to wood, paper, plastic, foam, bottles and cans. The neutrally buoyant material resides below the surface and combines with the natural flow regime of the system. It is hard to detect and can only be recognized when at a high concentration appears as a thickening of the water viscosity. Heavier material will simply settle to the sump base and combine with the sediments.

Note that trash and debris typically cause the most problems when they become lodged in a flow control device such as an outlet elbow, riser pipe, and orifice or weir structure. This can be detected visibly when the system is pumped down during maintenance. It can also be evaluated as a condition when flow is impeded and the water level backs up higher than the design elevations.

Emergency Spill Conditions (with optional emergency spill control module specified):

Emergency spill conditions are defined as an excessive accumulation of hydrocarbons such as oil, gasoline, diesel fuel, transmission oil or antifreeze usually resulting from an accidental discharge. Excessive accumulation is described as any amount larger than a thin "sheen" visible on the water surface.

Care should be given in handling these types of fluids. The incident should be reported to the appropriate authorities and should be mitigated by a hazardous waste consultant approved for such matters.

retain-it ®

Maintenance Log

Storm Water Management System

Location: ID #:

Date	Inspection Notes	Inspector

Note the following conditions:

Inlet Module

Outlet Module

Water Quality Module

Oil Elbow

Oil Accumulation

Sedimentation Accumulation

Trash and Debris Quantity

Flow Conditions

Flow Control Outlet Structure

Overflow Pipe

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Appendix R –

Waiver Requests and Local By-Laws Exceptions.

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LIST OF REQUESTED EXEMPTIONS/ EXCEPTIONS/WAIVERS FROM THE APPLICABLE TOWN OF DRACUT BY-LAWS AND REGULATIONS FOR MODIFICTION APPLICATION BY WORLD DRACUT, LLC (September 26, 2024)

Property:

341 Broadway Road, Dracut, MA (Parcel ID: 4924; M/B/L: 37-086-1)	**Zoning District:**	**I-1 Industrial 1 Zoning District**
226 Loon Hill Road, Dracut, MA (Parcel ID: 8012; M/B/L: 51-086-3)	**Zoning District:**	**I-1 Industrial 1 Zoning District**
250 Loon Hill Road, Dracut, MA (Parcel ID: 8011; M/B/L: 51-086-2)	**Zoning District:**	**I-1 Industrial 1 Zoning District**

ZONING BY LAWS (revised through November 13, 2023 as amended)

	Section	Provision	Requested Exemption/Exception/Waivers
1.	§ 1.3, Authority and Purpose; Applicability § 1.5, Authority and Purpose; Appeals	Sub-sections A., B., C., D., E. regarding Applicability of the Zoning By Laws to the proposed Development. Applicant Appeals are governed by the provisions of G.L. c. 40B, §§ 20-23 and 760 CMR 56.05(9)(b) and NOT G.L. c. 40A, § 17.	Waiver sought from entire Sections referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By-law prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and

			any and all other relief required to allow for the development of the property. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
2.	§ 2.3, Administration and Procedures; Special Permits § 2.4, Administration and Procedures; Site Plan Review; 2.4.2.A. 1-6, Applicability; §§2.4.3, General Standards; 2.4.4, Submission Procedure; 2.4.5 Submission Requirements; 2.4.6,	The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property for both residential and non-residential components of the proposed Development as shown on the Plans as may be amended and superseded in accordance with applicable provisions of M.G.L. c. 40B §§ 21-23 and 760 CMR 56. See above. Planning Board Site Plan Review is required for "new construction or reconstruction of any multi-family, community facility, commercial, industrial or business building; or any additions or alterations in excess of twenty-five hundred (2,500) square feet…; Grading, clearing, or land development activity that	Waiver is generally sought from the cited Zoning By Laws provisions, §§ 2.4.1 through 2.4.14. Waiver sought from entire Sections referenced generally for Site Plan Review requirements to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By Laws, including, without limitation, Min. Site Landscaping where 1.4 +/- are proposed. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By-law prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property.

	Security Posting; 2.4.7, Technical Consultant Services; 2.4.8, Waiver; 2.4.9, Compliance; 2.4.10, Maintenance; 2.4.11, Site Lighting; 2.4.12, Site Landscaping; 2.4.14, Application and Checklist. (See also § 8.1, Site Plan Review – Major Business Complex, below)	disturbs 5,000 square feet or more except for the following: work incidental to agricultural activities; clearing necessary for percolation and other site tests; work in conjunction with an approved Definitive Subdivision Plan, or an earth removal permit…Any activity or use that is indicated elsewhere in this bylaw as requiring site plan review." Min. Site Landscaping applicable to the Development equals 20% of impervious surface area or 2.2 acres.	A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut. Notwithstanding the foregoing, the Board shall act instead of the Planning Board regarding any applicable provisions of cited Zoning By Laws provisions, §§ 2.4.1 through 2.4.14. which are not waived to the extent the proposed development shown on the Plans is in compliance with the applicable Site Plan Review provisions of the Zoning By Laws.
3.	§ 3 District Regulations; § 3.2 Regulation of Uses.	The cited provisions of the Zoning By Laws regulate uses strictly in accordance with the applicable provisions of the By Laws; prohibit uses not listed in or restrict uses to those referenced in the §3.3 "Table of Uses" or permit multiple principal uses on a lot in accordance with the provisions of the "District the lot is located."	Waiver sought from entire Sections referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By Laws prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property.

			A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
	§ 3.3, Table of Permitted Uses.	Multi-Family Dwellings are prohibited in the I-1 Zoning District; Retail Store > 5,000 G.S.F. is prohibited in the I-1 Zoning District; Restaurant Uses require a Planning Board Special Permit in the I-1 Zoning District; Commercial Recreation facilities require a Select Board Special Permit; Amusement Facility Indoor is prohibited in the I-1 Zoning District.	
	§ 3.4, Accessory Use Regulations; 3.4.1, Accessory Uses Permitted.	The cited provisions of the Zoning By Laws regulate accessory uses strictly in accordance with the applicable provisions of the By Laws; prohibit uses not listed in or restrict uses to those referenced in the §3.3 "Table of Uses."	
4.	§ 4. Intensity of Use (Dimensional) Requirements; §§ 4.1, standard Dimensional Provisions; 4.3, Methods for Calculating Dimensional Requirements; 4.5, Buffering and Screening and Grading; 4.6, Landscaping	Generally.	Waiver sought from entire Sections referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law.

	Requirements in Business Districts; 4.7, Grading and Retaining Walls.		
	§ 4.4 Table of Standard Dimensional Requirement	For the I-1 Zoning District: Minimum Lot Area: 90,000 s/f; Min. Lot Frontage: 225 Lin. Feet; Min. Lot Width: 50 Lin. Feet; Min. Front Yard: 60 Lin. Feet; Min. Side Yard: 30 Lin. Feet; Min. Rear Yard: 40 Lin. Feet (80 Lin. Feet if adjoining a residential district) Max. Building Height: 4 stories/50 feet; Max. Lot Coverage: 65% Maximum Lot Coverage (%): 65.	The Development complies with Min. Lot Area 46.5 acres); Min. Lot Frontage (258 Lin. Feet); Min. Lot Width (150 Lin. Feet); Min. Rear Yard (472.1 Lin. Feet); and Max. Lot Coverage (39.3%). Waiver sought for: Min. Front Yard: 17.0 Lin. Feet Proposed; Min. Side Yard: 1.0 Lin. Feet Proposed; Max. Building Height: 68 feet Proposed. While more than one principal structure is allowed in the I-1 Zoning District, waiver is sought from the Section referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law.
	§ 4.4.1, Multiple Principal Structures	Generally.	The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By Laws prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and

			any and all other relief required to allow for the development of the property. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
5.	§ 6. General Regulations	Generally.	Waiver sought from entire Sections referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By Laws prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed

			mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
6.	§ 6.1 Off Street Parking and Loading; 6.1.2, Parking Requirements; 6.1.3, Exceptions to Minimum Requirements; 6.1.4, Use of Common Parking Areas; 6.1.5, Number of Spaces; 6.1.6, Table of Off Street Parking Requirements; 6.1.8, Parking and Loading Area Design and Location; 6.1.9, Surfacing, Drainage and Grade; 6.1.10, Landscaping.	Generally; Surfacing, Drainage Grade Dimensional Requirements; Parking Requirements for Number of Spaces, Planning Board and Select Board Special Permit Requirements and criteria to reduce By Laws parking requirements; Required Parking Space Dimensions in accordance with 6.1.8.1.D., E., G. Loading Area Requirements, G. Marking, H. Availability and Snow Storage; and Landscaping Requirements. 818 Parking Spaces are Required and 707 are proposed for the Development including residential and non-residential uses as further set forth in the accompanying Plans as follows: The Multi-Family uses require 600 spaces while 468 are proposed for a ratio of 1.56 spaces per unit; the non-residential uses require an aggregate of 218 parking spaces while 218 are proposed. Note: An additional 124 parking spaces are shown on the Plans over a National Grid easement area and are permitted and countable after permission from National Grid is obtained and therefore is not countable towards the Parking Space to Unit Ratio.	Waiver sought from entire Section referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing providing for 468 parking spaces (1.56 ratio) where 600 are required and applicable outdoor illumination, landscaping, parking, loading, unloading, surface, drainage and grade requirements as cited with attention to pole heights, fixture mounting heights, lumen limits and other applicable restrictions and exception is sought from the cited Zoning By Law prohibitions accordingly and with respect to surfacing, dimensional requirements and egress to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded and proposed appurtenant, non-residential uses. Consistent with the Existing Comprehensive Permit, waiver is sought from required parking spaces dimensions where 8.5' x 18' parking spaces are proposed. The Zoning Board of Appeals shall act on behalf of all “Local Boards” as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and

			any and all other relief required to allow for the development of the property. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
7.	§ 6.2 Signs Regulations	Generally.	Waiver sought from entire Section referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By-law.
8.	§ 6.3 Soil, Vegetation, Rock, and Gravel Removal	Generally; Excavation, removal, stripping, or mining of any earth material, soil and vegetation except as hereinafter permitted on any parcel of land, public or private, in Dracut is prohibited; Exclusive jurisdiction to issue Earth Removal Permits shall be with the Board of Selectmen; The Board of Selectmen or the Building Inspector shall have the authority to issue an Operating Hours Extension Permit, as defined in subsection 6.3.6.A.; All earth removal operations in existence in Dracut on the effective date of this section shall be subject to the requirements stated herein. However, all Earth Removal Permits issued prior to the effective date of this Section shall remain in effect until their expiration date and/or annual review. At such time, said operation shall be subject to the	Waiver sought from entire Section referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By Law. The Applicant seeks waiver of the referenced provisions, without limitation, and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By Laws prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, , subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property.

		provisions of this Section, unless otherwise allowed by the Board of Selectmen for a period not to exceed six (6) months; An annual fee of shall be required for Earth Removal Permits as established by the Board of Selectmen; Violation of this Section of the zoning By-law imposes a penalty of $100.00 for the first offense, $100.00 for the second and each subsequent offense. Each day of operation in violation of this section will be considered a separate offense; Materials Required for Submission to obtain a Select Board Soil, Vegetation, Rock and Gravel Removal Permit; Operation Standards for Removal and Restoration.	A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
9.	§ 6.4, Environmental Protection Standards.	Generally.	Waiver sought from entire Section referenced generally to the extent the proposed development shown on the Plans is not in compliance with the provisions of the Zoning By Law to the extent such provisions imposed more restrictive requirements beyond applicable Federal and State Laws, Regulations, Codes and Statutes.
10.	§ 8, Special Regulations; 8.1, Site Plan Review – Major Business Complex; 8.1.2, Submission Requirements; 8.1.3, Decision Criteria.	Generally and Any premises having more than 10,000 square feet gross floor area used as retail stores or services (including motor vehicle), restaurant, fast food establishment, bank, finance agency, or indoor or	The cited provisions are applicable to the proposed Recreation Building (Sports Pavilion) requiring a Special Permit from the Select Board (See § 3.3, Table of Permitted Uses) and Planning Board Site Plan Review. The Applicant seeks waiver of the referenced provisions, without limitation,

		outdoor commercial recreation shall be considered a Major Business Complex. Construction or change of use resulting in such a complex is allowable only if approved by the Planning Board pursuant to Section 2.4 Site Plan Review of this By-law for the principal use in accordance with the following: The objectives for allowing Major Business Complexes are: A. to increase the diversity and convenience of goods and services available in Dracut, B. to provide entrepreneurial and employment opportunities for area residents, C. to focus development at locations able to support it with relatively small environmental or municipal cost, and D. to protect the town's natural environment, existing character and development, and ability to provide public services.	and seeks zoning relief to allow construction of 300 units of apartment style, rental, multi-family housing and proposed appurtenant, non-residential uses and exception is sought from the cited Zoning By-law prohibitions accordingly to allow the proposed Multi-family Development as shown on the Plans as may be amended and superseded. The Zoning Board of Appeals shall act on behalf of all "Local Boards" as defined in 760 CMR 56 in the grant of any and all required variances, special permits, site plan review, subdivision control approval, local conservation relief pursuant to the Town of Dracut Wetlands Regulations and any and all other relief required to allow for the development of the property. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
11.	Zoning By-law Generally	Any and all provisions contained in the Zoning By-law which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.	The Applicant seeks waiver of the referenced provisions and sections, without limitation, and seeks zoning relief from the specific and applicable requirements of these provisions and to allow the proposed mixed-use, Multi-family Development as shown on the Plans submitted herewith as may be amended and superseded. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

TOWN OF DRACUT BY LAWS, CHAPTER 18, WETLANDS PROTECTION AND ACCOMPANYING WETLAND BY LAW REGULATIONS AS AMENDED, UPDATED OR REVISED

1.	Wetlands Protection By Laws §§ 1., Purpose; II., Jurisdiction; III., Conditional Excepts; IV., Application for Permits and Requests for Determination; VI., Coordination with Other Boards; VII., Permits and Conditions; VIII., Regulations; IX., Definitions; X., Security; XI., Enforcement; XII., burden of Proof; XIII., Appeals; XIV., Relations to the Wetlands Protection Act.	Generally.	The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. Waiver is sought from any and all provisions contained in the Town of Dracut Wetlands Protection By Law and Wetland Protection By Law Regulations which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent otherwise applicable, waiver is sought from any applicable provision of the referenced Wetlands By-law and Regulations to allow the proposed mixed-use, Multi-family Development as shown on the Plans as may be amended and superseded. Waiver is sought on any applicable provision of the referenced Wetlands By Law and Regulation to allow the proposed Development as shown on the Plans as may be amended and superseded. The proposed Development is designed in accordance with the applicable provisions of the G.L. c. 30, §§ 61-62H and 310 CMR 10.00, *et seq.*, being the Commonwealth of Massachusetts Wetlands Protection Act. To the extent any relief under the Town of Dracut Wetlands Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of

			Appeals will act instead of the Conservation Commission to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Massachusetts Wetlands Protection Act. A Comprehensive Permit issued by the Zoning Board of Appeals may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
2.	Wetland By Law Regulations § 3, Relationship with Massachusetts Wetlands Protection Act, § 3.1 and § 4, Procedures, Generally.	Except as specified herein, all of the standards, requirements, and procedures set forth in the Massachusetts Wetlands Protection Act (the "Act") [M.G.L. c. 131, § 40] and the Massachusetts Wetlands Protection Act Regulations (the "State Regulations") [310 CMR 10.00] are incorporated and made part of these Regulations as if restated herein. Where the Regulations differ from the State Regulations, these Regulations shall apply and those provisions shall supersede the State Regulations. See also § 4, Procedures, Generally.	The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. Waiver is sought from any and all provisions contained in the Town of Dracut Wetlands Protection By Law and Wetland Protection By Law Regulations which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent otherwise applicable, waiver is sought from any applicable provision of the referenced Wetlands By-law and Regulations to allow the proposed mixed-use, Multi-family Development as shown on the Plans as may be amended and superseded. Waiver is sought on any applicable provision of the referenced Wetlands By Law and Regulation to allow the proposed Development as shown on the Plans as may be amended and superseded.

			The proposed Development is designed in accordance with the applicable provisions of the G.L. c. 30, §§ 61-62H and 310 CMR 10.00, *et seq.*, being the Commonwealth of Massachusetts Wetlands Protection Act. To the extent any relief under the Town of Dracut Wetlands Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Conservation Commission to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Massachusetts Wetlands Protection Act. A Comprehensive Permit issued by the Zoning Board of Appeals may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
3.	Wetland By Law Regulations § 5.1.3 Wildlife Habitat Impact and Mitigation.	Generally.	The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. Waiver is sought from any and all provisions contained in the Town of Dracut Wetlands Protection By Law and Wetland Protection By Law Regulations which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent otherwise applicable, waiver is sought from any applicable provision of the referenced Wetlands By-law and

			Regulations to allow the proposed mixed-use, Multi-family Development as shown on the Plans as may be amended and superseded. Waiver is sought on any applicable provision of the referenced Wetlands By Law and Regulation to allow the proposed Development as shown on the Plans as may be amended and superseded. The proposed Development is designed in accordance with the applicable provisions of the G.L. c. 30, §§ 61-62H and 310 CMR 10.00, *et seq.*, being the Commonwealth of Massachusetts Wetlands Protection Act. To the extent any relief under the Town of Dracut Wetlands Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Conservation Commission to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Massachusetts Wetlands Protection Act. A Comprehensive Permit issued by the Zoning Board of Appeals may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
4.	Wetland By Law Regulations § 5.1.4 Buffer Zone and Bordering Vegetated Wetland, Vernal Pools, Rivers and Streams.	Generally.	The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. Waiver is sought from any and all provisions contained in the Town of Dracut Wetlands Protection By Law and Wetland Protection By Law Regulations which are

	Wetland By Law Regulations § 5.1.4.1.2	Within 25 feet of a resource area, the Commission does not allow any disturbance of the land. Minor pruning or cutting of limbs, hazardous tree removal, hand dug tree planting, and hand dug fencing is allowed with approval of the Conservation Agent.	more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent otherwise applicable, waiver is sought from any applicable provision of the referenced Wetlands By-law and to allow the proposed mixed-use, Multi-family Development as shown on the Plans as may be amended and superseded. Waiver sought on any applicable provision of the referenced Wetlands Regulation to allow the proposed Development as shown on the Plans as may be amended and superseded. The proposed Development is designed in accordance with the applicable provisions of the G.L. c. 30, §§ 61-62H and 310 CMR 10.00, *et seq.*, being the Commonwealth of Massachusetts Wetlands Protection Act. To the extent any relief under the Town of Dracut Wetlands Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Conservation Commission to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Massachusetts Wetlands Protection Act. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
	Wetland By Law Regulations § 5.1.4.1.3	Within 50 feet of a resource area, the Commission does not allow building of new structures, retaining walls, or impervious surfaces.	

5.	Wetland By Law Regulations §§ 7. Enforcement; 8., and Security.	Generally.	The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. Waiver is sought from any and all provisions contained in the Town of Dracut Wetlands Protection By Law and Wetland Protection By Law Regulations which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.

TOWN OF DRACUT STORMWATER MANAGEMENT RULES AND REGULATIONS, ADOPTED AUGUST 2020, AS AMENDED, UPDATED OR REVISED

1.	Stormwater Management Rules and Regulations	Generally	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. Waiver is sought from any and all provisions contained in

			the Town of Dracut Stormwater Management Rules and Regulations which are more restrictive than applicable state requirements and standards which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.
2.	§ 3. Authority and Administration	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. The Development is subject only to the requirements of the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are more restrictive than applicable state requirements and standards which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.

3.	§ 4. Waivers	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
4.	§5. Stormwater Management Permitting	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and

	Procedure and Standards.		Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
5.	§ 6., Fees	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by

			applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut.
6.	§ 7. Stormwater Management Plan for Permit Applications.	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56

			enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
7.	§ 7. Stormwater Management Plan for Permit Applications, Sub-section, D(1).	Stormwater management systems shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post construction impervious surface area on the site. Average annual pollutant removal requirements shall be achieved through one of the following methods: (a) installing stormwater BMPs that meet the pollutant removal percentages required in 9.D.(1) based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or (b) retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to

		surface area on the new development site; or (c) meeting a combination of retention and treatment that achieves the above standards.	meet the local and regional Housing Need in the Town of Dracut.
8.	§ 7.G, Stormwater Management Design Standards, Generally and Sub-Section (22)	Generally and Sub-Section (22) Drainage easements are to provide sufficient access for maintenance and repairs of system components and be at least 20 feet wide.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to

			meet the local and regional Housing Need in the Town of Dracut.
9.	§ 9. Operation and Maintenance Plan for Permit Applications., Sub-section B. (4)	Generally and Sub-Section B. (4): Stormwater Management Easement(s) (a) Stormwater Management easements shall be provided by the property owner(s) as necessary for: i. Access for facility inspections and maintenance; ii. Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event; and iii. Direct maintenance access by heavy equipment to structures requiring maintenance. (b) The purpose of each easement shall be specified in the Maintenance Agreement signed by the property owner. (c) Stormwater Management easements are required for all areas used for permanent stormwater control, unless a waiver is granted by the Stormwater Permitting Authority pursuant to Section 4(B). (d) Easements shall be recorded with the Lowell Registry of Deeds prior to issuance of a Certificate of Compliance by the Stormwater Authority pursuant to Section 13.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

10.	§ 10., Inspection and Site Supervision for Permit Applicants.	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.
11.	§ 11. Surety for Project Requiring Permits	Generally.	Waiver is sought from any and all provisions contained in the Town of Dracut Stormwater Management Rules and

			Regulations which are in effect as of the date hereof and which are NOT consistent with the provisions prescribed by applicable Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook in effect and inhibit the development of housing to meet the local and regional Housing Need in the Town of Dracut. To the extent any relief under the Town of Dracut Stormwater Management Rules and Regulations would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Stormwater Permitting Authority to grant such applicable and requested waivers, exemptions and relief excepting that relief which may be required under the Wetlands Protection Act, M.G.L. Chapter 131, Section 40, Regulations and 310 CMR 10.00, et. seq. and the Massachusetts Clean Waters Act G.L. c. 21, §. 23-56 and applicable provisions of the Massachusetts Stormwater Management Standards and the Massachusetts Stormwater Management Handbook. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

RULES AND REGULATIONS GOVENRING THE SUBDIVISION OF LAND IN DRACUT, ADOPTED JUNE 24, 2020, AS AMENDED, UPDATED OR REVISED

1.	Rules and Regulations Governing the	Generally.	While no subdivision is contemplated for the Development, waiver is sought from any applicable provision of this Regulation

	Subdivision of Land in the Town of Dracut		regarding, joining of lots, the regulation of roadways, driveways, passageways or which are otherwise applicable to the instant project and to allow the proposed mixed-use, Multi-family Development as shown on the Plans as may be amended and superseded. To the extent any relief under the Town of Dracut Rules and Regulations Regarding the Subdivision of Land would be required for the proposed development as depicted in the Plans as may be amended and superseded, the Zoning Board of Appeals will act instead of the Planning Board to grant such applicable and requested waivers, exemptions and relief. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

TOWN OF DRACUT CHARTER, GENERAL BY-LAWS

1.	Generally and Charter and General By-laws	Any and all provisions contained in the Town of Dracut Charter and General By-laws which are more restrictive than state requirements which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.	To exempt from and waive the specific and applicable requirements of these provisions, including, without limitation, any regulations and requirements which are more restrictive than state Building, Public Health and Fire Code requirements and/or from any conditions which may be imposed on the proposed development which require utility, water, waste water connection fees and inflow and infiltration (I/I) fees which are not required by local By-law or written regulation and which are not charged, in the normal course, to market rate and non-subsidized housing and to, generally allow the proposed Multi-family Development as shown on the Plans

			submitted herewith as may be amended and superseded. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

TOWN OF DRACUT BOARD OF APPEALS – PROCEDURES FOR A 40B APPLICATION

1.	Generally	Any and all provisions contained in the Town of Dracut Comprehensive Permit Regulations and Guidelines which are not inconsistent with state requirements prescribed in G.L. c. 40B, §§ 21-23, and 760 CMR 56.00 *et seq.* which are in effect as of the date hereof and which are NOT consistent with the development of housing to meet the local and regional Housing Need in the Town of Dracut.	Pursuant to 760 CMR 56.05(1), "The Zoning Board of Appeals shall adopt rules, not inconsistent with M.G.L. c. 40B, §§ 20 through 23, for the conduct of its business …Such rules shall be consistent with the purpose of M.G.L. c. 40B, §§ 20 through 23 to provide a streamlined permitting process that overcomes regulatory barriers to the development of Low or Moderate Income Housing." To exempt from and waive the specific and applicable requirements of these provisions, including, without limitation, any regulations and requirements which are not inconsistent with state requirements and to, generally provide for a more streamlined process that overcomes regulatory barriers to allow for the proposed Multi-family Development as shown on the Plans submitted herewith as may be amended and superseded. A Comprehensive Permit may provide all local permits and approvals pursuant to M.G.L. c. 40B §§ 21-23 and 760 CMR 56 enabling construction of the proposed mixed-use, Multi-family Development to meet the local and regional Housing Need in the Town of Dracut.

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Appendix S –

Certified Abutters List (Certified by the Town of Dracut Assessor's Office, June 12, 2025).

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ZONING BOARD
BOARD OF ASS. ORS

ABUTTER TO:
250 LOON L ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
341 BROADWAY RD	341	BROADWAY RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
274 LOON HILL RD	274	LOON HILL RD	DON MAR PROPERTIES LLC		1112 BROADWAY RD	DRACUT	MA	01826
278 LOON HILL RD	278	LOON HILL RD	NIEMASZYK REALTY TRUST	NIEMASZYK, WALTER S. TRUSTEE	278 LOON HILL RD	DRACUT	MA	01826
200 LOON HILL RD	200	LOON HILL RD	JUSCZAK GREENWOOD FAMILY TRUST	TIMOTHY JUSCZAK TRUSTEE (ET AL)	200 LOON HILL RD	DRACUT	MA	01826
321 BROADWAY RD	321	BROADWAY RD	LAMOUREUX RAYMOND ETAL TRST	RCL REALTY TRUST	321 BROADWAY RD	DRACUT	MA	01826
10 LEXINGTON RD	10	LEXINGTON RD	CHOURB, PHIN (TE)	NUON, YANN	10 LEXINGTON RD	DRACUT	MA	01826
193 LOON HILL RD	193	LOON HILL RD	TRUSTEE OF THE BOURDELAIS REALTY TRUST	KATHLEEN M BOURDELAIS	193 LOON HILL RD	DRACUT	MA	01826
145 BROADWAY RD	145	BROADWAY RD	REAL ESTATE DYNAMICS LLC		145 BROADWAY RD	DRACUT	MA	01826
20 LEXINGTON RD	20	LEXINGTON RD	CHISHOLM JENNIFER (TE)	JAMES R. CHISHOLM	20 LEXINGTON RD	DRACUT	MA	01826
7 LEXINGTON RD	7	LEXINGTON RD	LANE JAMES J. (TE)	BETH A. LANE	7 LEXINGTON RD	DRACUT	MA	01826
366 LOON HILL RD	366	LOON HILL RD	CONNELL JAMES		366 LOON HILL RD	DRACUT	MA	01826
277 LOON HILL RD	277	LOON HILL RD	BISHOP PAUL R.		277 LOON HILL RD	DRACUT	MA	01826
9 CORNSTALK RD	9	CORNSTALK RD	HUNT WARREN E. JR & SUSAN E., TSTS	WARREN & SUSAN E. HUNT REV. TRUST	9 CORNSTALK RD	DRACUT	MA	01826
167 LOON HILL RD	167	LOON HILL RD	YENOWSKAS, SEAN M. (TE)	YENOWSKAS, JULIE A.	167 LOON HILL RD	DRACUT	MA	01826
226 LOON HILL RD	226	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
250 LOON HILL RD	250	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
262 LOON HILL RD	262	LOON HILL RD	DON MAR PROPERTIES LLC		1112 BROADWAY RD	DRACUT	MA	01826
401 BROADWAY RD	401	BROADWAY RD	MS RED REALTY, LLC		401 BROADWAY RD	DRACUT	MA	01826
445 BROADWAY RD	445	BROADWAY RD	VENGREN NOMINEE TRUST	C/O LAURETTE VENGREN	148 WOODWARD AV	LOWELL	MA	01854
285 LOON HILL RD	285	LOON HILL RD	BISHOP BOB	C/O K. BOURDELAIS/P.R. BISHOP/R. BISHOP	193 LOON HILL ROAD	DRACUT	MA	01826

BOARD OF ASSESSORS:

KAREN GOLDEN, CHIEF ASSESSOR: _____

ASHLEY ANTIFONARIO, ASSESSOR: _____

ZONING BOARD
BOARD OF ASS ORS

ABUTTER TO:
226 LOOI LL ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
341 BROADWAY RD	341	BROADWAY RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
60 FLORRY DR #01	60	FLORRY DR	BEDARD DONNA J.		60 FLORRY DR UN 01	DRACUT	MA	01826
60 FLORRY DR #02	60	FLORRY DR	FLAHERTY BRIAN		60 FLORRY DR UN 02	DRACUT	MA	01826
60 FLORRY DR #03	60	FLORRY DR	MCDEVITT SEAN M. (TE)	JENNIFER M. POUCHE-MCDEVITT	60 FLORRY DR UN 03	DRACUT	MA	01826
60 FLORRY DR #04	60	FLORRY DR	HALL DIDRICK J.		60 FLORRY DR UN 04	DRACUT	MA	01826
60 FLORRY DR #05	60	FLORRY DR	KOUTROBIS WILLIAM P.		60 FLORRY DR UN 05	DRACUT	MA	01826
60 FLORRY DR #07	60	FLORRY DR	MORGAN JANET H. (TE)	KENNETH M. MORGAN	60 FLORRY DR UN 07	DRACUT	MA	01826
60 FLORRY DR #08	60	FLORRY DR	FADDEN PATRICIA D.		60 FLORRY DR UN 08	DRACUT	MA	01826
60 FLORRY DR #10	60	FLORRY DR	PEREIRA CARLOS IND.		60 FLORRY DR UN 10	DRACUT	MA	01826
60 FLORRY DR #12	60	FLORRY DR	CARGAN NATA S.		60 FLORRY DR UN 12	DRACUT	MA	01826
60 FLORRY DR #13	60	FLORRY DR	KEILEY JOHN M. (TE)	TINA M. KEILEY	60 FLORRY DR UN 13	DRACUT	MA	01826
60 FLORRY DR #14	60	FLORRY DR	KUTASH LEA		60 FLORRY DR UN 14	DRACUT	MA	01826
60 FLORRY DR #18	60	FLORRY DR	PERRY LYNNE		60 FLORRY DR UN 18	DRACUT	MA	01826
60 FLORRY DR #19	60	FLORRY DR	GAGNON ANNE MARIE T.		60 FLORRY DR UN 19	DRACUT	MA	01826
60 FLORRY DR #20	60	FLORRY DR	PETERSON MAUREEN A. IND.		60 FLORRY DR UN 20	DRACUT	MA	01826
60 FLORRY DR #23	60	FLORRY DR	KURPIS ANTHONY F		60 FLORRY DR UN 23	DRACUT	MA	01826
60 FLORRY DR #24	60	FLORRY DR	CARTEIRO PAULINO M.		60 FLORRY DR UN 24	DRACUT	MA	01826
60 FLORRY DR #26	60	FLORRY DR	BURKE LYNN		60 FLORRY DR UN 26	DRACUT	MA	01826
60 FLORRY DR #29	60	FLORRY DR	MARION TARA M. (JTRS)	SCOTT P. GERVAIS	60 FLORRY DR UN 29	DRACUT	MA	01826
60 FLORRY DR #31	60	FLORRY DR	FADDEN PAUL S		60 FLORRY DR UN 31	DRACUT	MA	01826
60 FLORRY DR #32	60	FLORRY DR	WARREN DOUANGMANY		10 WEDGE ST	LOWELL	MA	01851
60 FLORRY DR #21	60	FLORRY DR	BOWMAN, DANIELLE		60 FLORRY DR UN 21	DRACUT	MA	01826
60 FLORRY DR #25	60	FLORRY DR	HAMILTON, SUSAN MARIE		60 FLORRY DR UN 25	DRACUT	MA	01826
60 FLORRY DR #15	60	FLORRY DR	AMARI, JENNIFER		60 FLORRY DR UN 15	DRACUT	MA	01826
60 FLORRY DR #22	60	FLORRY DR	AUGUSTINE, MATTHEW A. (TE)	GAIL G AUGUSTINE	2716 HERNDON ST	VALRICO	FL	33596
60 FLORRY DR #06	60	FLORRY DR	KLOSOWSKI, NATHAN (JTRS)	WALTER KLOSOWSKI	60 FLORRY DR UN 06	DRACUT	MA	01826
60 FLORRY DR #11	60	FLORRY DR	NAGY DRACUT TRUST	NAGY, JOZEF TRUSTEE ET UX	14 CRICKLEWOOD DR	STONEHAM	MA	02180
60 FLORRY DR #16	60	FLORRY DR	COLLINS, KYLE ET AL	COLLINS, LISA (JT)	60 FLORRY DR #16	DRACUT	MA	01826
60 FLORRY DR #09	60	FLORRY DR	PAUL L. NOEL AND PAULA J. NOEL TRUST	NOEL, PAUL L. TRUSTEE	75 CONCORD RD	DRACUT	MA	01826
60 FLORRY DR #28	60	FLORRY DR	PAUL L. NOEL AND PAULA J. NOEL LIVING TRST	PAUL L. NOEL(TE)	75 CONCORD RD	DRACUT	MA	01826
60 FLORRY DR #30	60	FLORRY DR	HAKEEM, ABEER(JTRS)	PITTMAN, RUSTY	60 FLORRY DR #30	DRACUT	MA	01826
60 FLORRY DR #17	60	FLORRY DR	NAGUDI, ASHA		1077 MAIN ST	WAKEFIELD	MA	01880
60 FLORRY DR #27	60	FLORRY DR	DRUKPA, DORJI RABTEN (TE)	MINA DEVI RAI	60 FLORRY DR #27	DRACUT	MA	01826

ZONING BOARD
BOARD OF ASSESSORS

ABUTTER TO:
226 LOON HILL ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
274 LOON HILL RD	274	LOON HILL RD	DON MAR PROPERTIES LLC		1112 BROADWAY RD	DRACUT	MA	01826
200 LOON HILL RD	200	LOON HILL RD	JUSCZAK GREENWOOD FAMILY TRUST	TIMOTHY JUSCZAK TRUSTEE (ET AL)	200 LOON HILL RD	DRACUT	MA	01826
303 BROADWAY RD	303	BROADWAY RD	BFG MA RI LLC		P.O. BOX 320099	ALEXANDRIA	VA	22320
315 BROADWAY RD #01	315	BROADWAY RD	MCDONOUGH CHERYL IND.		315 BROADWAY RD UN 01	DRACUT	MA	01826
315 BROADWAY RD #03	315	BROADWAY RD	CHEVALIER JOSEPH O., JR. (TE)	RHONDA L. CHEVALIER	40 HEATHER RD	DRACUT	MA	01826
315 BROADWAY RD #05	315	BROADWAY RD	GILMAN MARLENE		315 BROADWAY RD UN 05	DRACUT	MA	01826
315 BROADWAY RD #06	315	BROADWAY RD	CIRILLO GEORGIA M., TRUSTEE	GEORGIA M. CIRILLO REV. TRUST	315 BROADWAY RD UN 06	DRACUT	MA	01826
315 BROADWAY RD #07	315	BROADWAY RD	WELCH CLAYBORNE W. (TE)	DIANE D. WELCH	315 BROADWAY RD UNIT 07	DRACUT	MA	01826
315 BROADWAY RD #08	315	BROADWAY RD	MAXFIELD HEATHER		315 BROADWAY RD UN 08	DRACUT	MA	01826
315 BROADWAY RD #10	315	BROADWAY RD	NGURJRI RUTH N. IND.		315 BROADWAY RD UN 10	DRACUT	MA	01826
315 BROADWAY RD #11	315	BROADWAY RD	KEATING JOHN PAUL (TE)	LAUREN ASHLEY KEATING	315 BROADWAY RD UN 11	DRACUT	MA	01826
315 BROADWAY RD #12	315	BROADWAY RD	COUILLARD DIANE (JTRS)	CLAIRE HALLIGAN	315 BROADWAY RD UN 12	DRACUT	MA	01826
315 BROADWAY RD #13	315	BROADWAY RD	BEATON CHERYL A.	KEITH W. BEATON	315 BROADWAY RD UN 13	DRACUT	MA	01826
315 BROADWAY RD #04	315	BROADWAY RD	SILVA, BARBARA (TE)	MAY, NANCY	315 BROADWAY RD UN 04	DRACUT	MA	01826
315 BROADWAY RD #02	315	BROADWAY RD	MIRANDA, DANIEL		315 BROADWAY RD UN 02	DRACUT	MA	01826
315 BROADWAY RD #09	315	BROADWAY RD	TAPE, DAWN (JTRS)	ALMEIDA, MARIANELA	315 BROADWAY RD #09	DRACUT	MA	01826
291 BROADWAY RD #14	291	BROADWAY RD	CORBEIL JENNIFER A. (TE)	ALAN R. CORBEIL	291 BROADWAY RD UN 14	DRACUT	MA	01826
291 BROADWAY RD #15	291	BROADWAY RD	BORRIELLO PAUL J., JR. & MARLENE C., TRS	JPB REALTY TRUST	PO BOX 542	DRACUT	MA	01826
291 BROADWAY RD #16	291	BROADWAY RD	SBRIZZA JOHN J. IND.		291 BROADWAY RD UN 16	DRACUT	MA	01826
291 BROADWAY RD #18	291	BROADWAY RD	STATHAS FRANK S	MARIA B STATHAS (TE)	291 BROADWAY RD UN 18	DRACUT	MA	01826
291 BROADWAY RD #20	291	BROADWAY RD	MEDEIROS BROADWAY ROAD TRUST	DIANE K MEDEIROS TRUSTEE	291 BROADWAY RD UN 20	DRACUT	MA	01826
291 BROADWAY RD #19	291	BROADWAY RD	BETTENCOURT CAPITAL, LLC		274 BROADWAY RD UNIT 40	DRACUT	MA	01826
291 BROADWAY RD #17	291	BROADWAY RD	PRESUME FAMILY TRUST	PRESUME, LUDWIG TRUSTEE	291 BROADWAY RD #17	DRACUT	MA	01826
261 BROADWAY RD #22	261	BROADWAY RD	KUKULSKI BRIAN F.		261 BROADWAY RD UN 22	DRACUT	MA	01826
261 BROADWAY RD #24	261	BROADWAY RD	CORCORAN JAMES	VIRGINIA CORCORAN	261 BROADWAY RD UN 24	DRACUT	MA	01826
261 BROADWAY RD #25	261	BROADWAY RD	HUTTER MICHELLE		261 BROADWAY RD UN 25	DRACUT	MA	01826
261 BROADWAY RD #26	261	BROADWAY RD	PETITTI RONALD F.		261 BROADWAY RD UN 26	DRACUT	MA	01826
261 BROADWAY RD #27	261	BROADWAY RD	ROONEY DAVID J.		261 BROADWAY RD UN 27	DRACUT	MA	01826
261 BROADWAY RD #30	261	BROADWAY RD	ANISE, MAZEN		261 BRADOWAY RD UNIT 30	DRAUCT	MA	01826
261 BROADWAY RD #28	261	BROADWAY RD	SOTO, JETHZIEL G TORRES		261 BROADWAY RD UNIT 28	DRACUT	MA	01826
261 BROADWAY RD #23	261	BROADWAY RD	DASILVA , EVAN		261 BROADWAY RD UN 23	DRACUT	MA	01826
261 BROADWAY RD #21	261	BROADWAY RD	ROUSSEAU, ERIK		35 BURNS HILL DR	DRACUT	MA	01826
261 BROADWAY RD #29	261	BROADWAY RD	FRANCOIS, TONY (JT)	DURANDISSE, DAVID	261 BROADWAY RD #29	DRACUT	MA	01826

ZONING BOARD
BOARD OF ASS. ORS

ABUTTER TO:
226 LOON LL ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
253 BROADWAY RD #59	253	BROADWAY RD	DANEAU VALERIA A. IND.		253 BROADWAY RD UN 59	DRACUT	MA	01826
253 BROADWAY RD #60	253	BROADWAY RD	TROUVILLE FRANCOIS J., III (TE)	MARIA TROUVILLE	253 BROADWAY RD UN 60	DRACUT	MA	01826
253 BROADWAY RD #61	253	BROADWAY RD	CAYON ARTHUR J. JR.		253 BROADWAY RD UN 61	DRACUT	MA	01826
253 BROADWAY RD #62	253	BROADWAY RD	GIGLIO VICTOR		253 BROADWAY RD UN 62	DRACUT	MA	01826
253 BROADWAY RD #63	253	BROADWAY RD	RENZULLO JOHN C. , JR. (TE)	NANCY K. RENZULLO	253 BROADWAY RD UN 63	DRACUT	MA	01826
253 BROADWAY RD #64	253	BROADWAY RD	CONNOR RYAN (TE)	DANIELLE CONNOR	12 BARN RD	DRACUT	MA	01826
253 BROADWAY RD #65	253	BROADWAY RD	MENNELLA CHERYL (JTRS)	FOROTHY NORDSTROM	253 BROADWAY RD UN 65	DRACUT	MA	01826
10 LEXINGTON RD	10	LEXINGTON RD	CHOURB, PHIN (TE)	NUON, YANN	10 LEXINGTON RD	DRACUT	MA	01826
193 LOON HILL RD	193	LOON HILL RD	TRUSTEE OF THE BOURDELAIS REALTY TRUST	KATHLEEN M BOURDELAIS	193 LOON HILL RD	DRACUT	MA	01826
241 BROADWAY RD #45	241	BROADWAY RD	SCIACCA GINO L. (JTRS)	FRED NICOLOSI	241 BROADWAY RD UN 45	DRACUT	MA	01826
241 BROADWAY RD #46	241	BROADWAY RD	LYONS DAWN M.		241 BROADWAY RD UNIT 46	DRACUT	MA	01826
241 BROADWAY RD #48	241	BROADWAY RD	TAO TOM KE (TE)	AMY YAN LU	241 BROADWAY RD UN 48	DRACUT	MA	01826
241 BROADWAY RD #49	241	BROADWAY RD	BROTHER SHARON R.		241 BROADWAY RD UN 49	DRACUT	MA	01826
241 BROADWAY RD #50	241	BROADWAY RD	PICARDI DIANE IND.		241 BROADWAY RD UN 50	DRACUT	MA	01826
241 BROADWAY RD #51	241	BROADWAY RD	HORAN THOMAS R (TE)	MARTHA J HORAN	241 BROADWAY RD UN 51	DRACUT	MA	01826
241 BROADWAY RD #53	241	BROADWAY RD	HORAN EILEEN L		241 BROADWAY RD UN 53	DRACUT	MA	01826
241 BROADWAY RD #54	241	BROADWAY RD	MCCARTHY CAROL F.		241 BROADWAY RD UN 54	DRACUT	MA	01826
241 BROADWAY RD #55	241	BROADWAY RD	F&S REALTY INVESTMENTS, LLC		17 BRIDLE PATH	TYNGSBORO	MA	01879
241 BROADWAY RD #57	241	BROADWAY RD	DONOGHUE PAUL		152 BETTY ANN LN	DRACUT	MA	01826
241 BROADWAY RD #58	241	BROADWAY RD	COPELAND JERELYN A		241 BROADWAY RD UN 58	DRACUT	MA	01826
241 BROADWAY RD #47	241	BROADWAY RD	THE BROADWAY ROAD 2020 REALTY TRUST	PINTI, NANCY A. TRUSTEE	241 BROADWAY RD UN 47	DRACUT	MA	01826
241 BROADWAY RD #56	241	BROADWAY RD	THE THERRIAULT TRUST	MARIE LINDA THERRIAULT TRUSTEE	241 BROADWAY RD UN 56	DRACUT	MA	01826
241 BROADWAY RD #52	241	BROADWAY RD	KENNEY, STEVEN (TE)	KENNEY, LISA	241 BROADWAY RD #52	DRACUT	MA	01826
145 BROADWAY RD	145	BROADWAY RD	REAL ESTATE DYNAMICS LLC		145 BROADWAY RD	DRACUT	MA	01826
20 LEXINGTON RD	20	LEXINGTON RD	CHISHOLM JENNIFER (TE)	JAMES R. CHISHOLM	20 LEXINGTON RD	DRACUT	MA	01826
7 LEXINGTON RD	7	LEXINGTON RD	LANE JAMES J. (TE)	BETH A. LANE	7 LEXINGTON RD	DRACUT	MA	01826
130 LOON HILL RD	130	LOON HILL RD	GRACE KEVIN (TE)	JOANNE GRACE	130 LOON HILL RD	DRACUT	MA	01826
277 LOON HILL RD	277	LOON HILL RD	BISHOP PAUL R.		277 LOON HILL RD	DRACUT	MA	01826
9 CORNSTALK RD	9	CORNSTALK RD	HUNT WARREN E. JR & SUSAN E., TSTS	WARREN & SUSAN E. HUNT REV. TRST	9 CORNSTALK RD	DRACUT	MA	01826
167 LOON HILL RD	167	LOON HILL RD	YENOWSKAS, SEAN M. (TE)	YENOWSKAS, JULIE A.	167 LOON HILL RD	DRACUT	MA	01826
226 LOON HILL RD	226	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
250 LOON HILL RD	250	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
262 LOON HILL RD	262	LOON HILL RD	DON MAR PROPERTIES LLC		1112 BROADWAY RD	DRACUT	MA	01826

ZONING BOARD
BOARD OF ASSESSORS

ABUTTER TO:
226 LOON HILL ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
140 LOON HILL RD	140	LOON HILL RD	CIL REALTY OF MA, INC.		57 CHARTER OAK AV	HARTFORD	CT	06106
247 BROADWAY RD #32	247	BROADWAY RD	LESSIEUR M. ANN IND.		247 BROADWAY RD UN 32	DRACUT	MA	01826
247 BROADWAY RD #33	247	BROADWAY RD	NOVEL LINDA H. (TE)	DENNIS C. NOVEL	247 BROADWAY RD UN 33	DRACUT	MA	01826
247 BROADWAY RD #36	247	BROADWAY RD	PHILBRICK ROGER K (TE)	PAULA PHILBRICK	247 BROADWAY RD UN 36	DRACUT	MA	01826
247 BROADWAY RD #38	247	BROADWAY RD	SWEENEY JOSEPH D. (TE)	PAULA A. SWEENEY	247 BROADWAY RD UN 38	DRACUT	MA	01826
247 BROADWAY RD #41	247	BROADWAY RD	VANDERLINDEN VINCENT (TE)	JENNIFER VANDERLINDEN	247 BROADWAY RD UN 41	DRACUT	MA	01826
247 BROADWAY RD #42	247	BROADWAY RD	SANCHEZ LAWRENCE N. (JTRS)	ANDREA ARENA	247 BROADWAY RD UN 42	DRACUT	MA	01826
247 BROADWAY RD #43	247	BROADWAY RD	ALEXANDER JACOB (TE)	SETHU ALEXANDER	4 STONYBROOK RD	WESTFORD	MA	01886
247 BROADWAY RD #44	247	BROADWAY RD	CONNELL JOHN F. (TE)	ANN MARIE JOHNSON	247 BROADWAY RD UN 44	DRACUT	MA	01826
247 BROADWAY RD #34	247	BROADWAY RD	BAEZ, EDWIN	MERCADO-BAEZ, MARIA T	247 BRADOWAY RD UNIT 34	DRACUT	MA	01826
247 BROADWAY RD #37	247	BROADWAY RD	MICHELLE M. RITCHOTTE REVOCABLE TRUST	RITCHOTTE, MICHELLE M. TRUSTEE	247 BROADWAY RD UN 37	DRACUT	MA	01826
247 BROADWAY RD #39	247	BROADWAY RD	THE R. COTUGNO IRREVOCVABLE TRUST	RACHEL A. COTUGNO TRUSTEE ET AL	247 BROADWAY RD UN 39	DRACUT	MA	01826
247 BROADWAY RD #31	247	BROADWAY RD	LINDSAY KARA JOHNSON		247 BROADWAY RD UN 31	DRACUT	MA	01826
247 BROADWAY RD #35	247	BROADWAY RD	AYOTTE, ROGER G. (JTRS)	HARVEY, DENISE M.	247 BROADWAY RD #35	DRACUT	MA	01826
247 BROADWAY RD #40	247	BROADWAY RD	PICANCO, GUSTAVO RODRIGO	PICANCO, STELA BORGES	247 BROADWAY RD #40	DRACUT	MA	01826
160 LOON HILL RD	160	LOON HILL RD	FARRELL, PETER	FARRELL, KATHRYN	160 LOON HILL RD	DRACUT	MA	01826

BOARD OF ASSESSORS:

KAREN GOLDEN, CHIEF ASSESSOR: _____

ASHLEY ANTIFONARIO, ASSESSOR: _____

ZONING BOARD
BOARD OF ASS. ORS

ABUTTER TO:
341 BROA. AY ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
341 BROADWAY RD	341	BROADWAY RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
408 BROADWAY RD	408	BROADWAY RD	SOUTHERN N.E. CONFERENCE ASSOC.	OF 7TH DAY ADVENTISTS	PO BOX 1169	SOUTH LANCASTER	MA	01561
5 FOX HILL LN	5	FOX HILL LN	SASSO JOSEPH C. (TE)	KAREN M. SASSO	5 FOX HILL LN	DRACUT	MA	01826
11 FOX HILL LN	11	FOX HILL LN	STRANGE NICOLE, TRUSTEE	THE ST. AMAND IRREV TRUST	11 FOX HILL LN	DRACUT	MA	01826
13 FOX HILL LN	13	FOX HILL LN	TVEEKREM ELAINE		13 FOX HILL LN	DRACUT	MA	01826
15 FOX HILL LN	15	FOX HILL LN	BARROS JOSEPH F. (TE)	MARYJANE BARROS	15 FOX HILL LN	DRACUT	MA	01826
21 FOX HILL LN	21	FOX HILL LN	DELETIS RICHARD J. (TE)	PYONG W. DELETIS	21 FOX HILL LN	DRACUT	MA	01826
23 FOX HILL LN	23	FOX HILL LN	SAGER HOWARD N., JR.		23 FOX HILL LN	DRACUT	MA	01826
25 FOX HILL LN	25	FOX HILL LN	PERRONE DRACUT REALTY TRUST	RAYMOND D. PERRONE TRUSTEE	25 FOX HILL LN	DRACUT	MA	01826
31 FOX HILL LN	31	FOX HILL LN	SEITSINGER RAYMOND C. (TE)	ANN M. SEITSINGER	31 FOX HILL LN	DRACUT	MA	01826
39 FOX HILL LN	39	FOX HILL LN	PELOSI RALPH T. (TE)	P. ANNA SEUBERT PELOSI	39 FOX HILL LN UN 20	DRACUT	MA	01826
41 FOX HILL LN	41	FOX HILL LN	SCANNELL JOHN P., JR. (TE)	ANN M. SCANNELL	41 FOX HILL LN	DRACUT	MA	01826
43 FOX HILL LN	43	FOX HILL LN	LAMBERT MICHAEL J. (TE)	MAUREEN E. LAMBERT	43 FOX HILL LN	DRACUT	MA	01826
49 FOX HILL LN	49	FOX HILL LN	COUTURE DAVID A	PAULA M COUTURE	49 FOX HILL LN	DRACUT	MA	01826
53 FOX HILL LN	53	FOX HILL LN	BLAND CHRISTINA		53 FOX HILL LN	DRACUT	MA	01826
12 FOX HILL LN	12	FOX HILL LN	LAPORTE RICHARD T. & NORMA V. (LE)	LAPORTE REALTY TRUST	12 FOX HILL LN	DRACUT	MA	01826
16 FOX HILL LN	16	FOX HILL LN	TIGHE WILLIAM J. (TE)	JUDITH E. TIGHE	16 FOX HILL LN	DRACUT	MA	01826
18 FOX HILL LN	18	FOX HILL LN	FLEMING THOMAS A. (TE)	JEANNE L. FLEMING	18 FOX HILL LN UN 39	DRACUT	MA	01826
38 FOX HILL LN	38	FOX HILL LN	KEATING ROBERT	SANDRA A. PETTI	38 FOX HILL LN	DRACUT	MA	01826
36 FOX HILL LN	36	FOX HILL LN	HOLDEN FRANK J. (TE)	ILENE M. HALLISEY	36 FOX HILL LN	DRACUT	MA	01826
59 FOX HILL LN	59	FOX HILL LN	CATHERINE MONOXELOS TRUST	CATHERINE , MONOXELOS TRUSTEE ET AL	59 FOX HILL LANE	DRACUT	MA	01826
67 FOX HILL LN	67	FOX HILL LN	HART, JACQUELINE L		67 FOX HILL LN	DRACUT	MA	01826
1 FOX HILL LN	1	FOX HILL LN	THE WHITE REVOCABLE TRUST	THOMAS J WHITE TRUSTEE ET UX	1 FOX HILL LN	DRACUT	MA	01826
61 FOX HILL LN	61	FOX HILL LN	THE R & G O'CONNOR REALTY TRUST	O'CONNOR ROBERT P TRUSTEE ET AL	61 FOX HILL LN	DRACUT	MA	01826
45 FOX HILL LN	45	FOX HILL LN	JAMES A HAYNER REVOCABLE TRUST	HOLLY I HAYNER REVOCABLE TRUST	45 FOX HILL LN	DRACUT	MA	01826
14 FOX HILL LN	14	FOX HILL LN	DM SALVI TRUST	SALVI, DAVID A TRUSTEE ET AL	14 FOX HILL LN	DRACUT	MA	01826
55 FOX HILL LN	55	FOX HILL LN	THOMAS C BERGERON REVOCABLE TRST	JEANNINE L BERGERON REVOCABLE TRUST	55 FOX HILL LN	DRACUT	MA	01826
10 FOX HILL LN	10	FOX HILL LN	WITHERELL, FREDERICK EVERETT	WITHERELL, MARILYN ALICE	10 FOX HILL LN	DRACUT	MA	01826
17 FOX HILL LN	17	FOX HILL LN	VA FOLEY FAMILY TRUST	FOLEY, VANESSA A TRUSTEE	17 FOX HILL LN	DRACUT	MA	01826
27 FOX HILL LN	27	FOX HILL LN	LIABOE, PHILIP S. (TE)	LIABOE, LAUREN R. (TE)	27 FOX HILL LN	DRACUT	MA	01826
57 FOX HILL LN	57	FOX HILL LN	KOSTLYA FAMILY TRUST	KOSTYLA, MARK W. TRUSTEE ET UX	57 FOX HILL LN	DRACUT	MA	01826
37 FOX HILL LN	37	FOX HILL LN	GIBSON, CAMPBELL S. (TE)	GIBSON, EILEEN M.	37 FOX HILL LN	DRACUT	MA	01826
32 FOX HILL LN	32	FOX HILL LN	BRIERE, PATRICIA ANN (TE)	BRIERE, THOMAS RAYMOND	32 FOX HILL LN	DRACUT	MA	01826

ZONING BOARD
BOARD OF ASS. ORS

ABUTTER TO:
341 BROA. AY ROAD

JUNE 12, 2025

LOCATION	ST #	ST	OWNER	CO-OWNER	MAILING ADDRESS	CITY	STATE	ZIP
35 FOX HILL LN	35	FOX HILL LN	GROVES , ERIC T (TE)	GROVES, MAUREEN E	35 FOX HILL LN	DRACUT	MA	01826
51 FOX HILL LN	51	FOX HILL LN	SUMMERTIME TRUST	RICHARD J SUMMER TRUSTEE ET UX	51 FOX HILL LN	DRACUT	MA	01826
19 FOX HILL LN	19	FOX HILL LN	MICHAEL S BORGES	ANA P REGO	19 FOX HILL LN	DRACUT	MA	01826
33 FOX HILL LN	33	FOX HILL LN	YENNACO, NICOLE B.		33 FOX HILL LN	DRACUT	MA	01826
7 FOX HILL LN	7	FOX HILL LN	LYTLE FAMILY REALTY TRUST	RICHARD A. LYTLE TRUSTEE ET UX	7 FOX HILL LN	DRACUT	MA	01826
34 FOX HILL LN	34	FOX HILL LN	BILODEAU, ROBERT B.	MARY ELIZABETH C BILODEAU	34 FOX HILL LN	DRACUT	MA	01826
47 FOX HILL LN	47	FOX HILL LN	DAVID J BROWN (LE)	PATRICIA E DALTON-BROWN	47 FOX HILL LN	DRACUT	MA	01826
29 FOX HILL LN	29	FOX HILL LN	SHIELDS FAMILY IRREVOCABLE TRUST	JAMES J SHIELDS TRUSTEE ET UX	29 FOX HILL LN	DRACUT	MA	01826
63 FOX HILL LN	63	FOX HILL LN	TRUDEL, JAMES R (TE)	ANN TRUDEL	63 FOX HILL LN	DRACUT	MA	01826
40 FOX HILL LN	40	FOX HILL LN	QUATTROCHI, JUDITH ANN (LE)		40 FOX HILL LN	DRACUT	MA	01826
65 FOX HILL LN	65	FOX HILL LN	CAMPBELL, BRIAN D. (LE)	CAMPBELL, SHARON	65 FOX HILL LN	DRACUT	MA	01826
3 FOX HILL LN	3	FOX HILL LN	GRENON, STEVEN M. (TE)	GRENON, ROBIN G.	3 FOX HILL LN	DRACUT	MA	01826
9 FOX HILL LN	9	FOX HILL LN	NYDER, SHARON LEE (JTRS)	BUONOCORE, KENDRA LEE	9 FOX HILL LN	DRACUT	MA	01826
358 BROADWAY RD	358	BROADWAY RD	PAN, CHAMRATH (TE)	NANCY PAN	358 BROADWAY RD	DRACUT	MA	01826
321 BROADWAY RD	321	BROADWAY RD	LAMOUREUX RAYMOND ETAL TRST	RCL REALTY TRUST	321 BROADWAY RD	DRACUT	MA	01826
390 BROADWAY RD	390	BROADWAY RD	DEFELICE GEORGE, JR. (JT)	GEORGE DEFELICE, III	390 BROADWAY RD	DRACUT	MA	01826
386 BROADWAY RD	386	BROADWAY RD	DEFELICE GEORGE III TRUSTEE	BROADWAY REALTY TRUST	386 BROADWAY RD	DRACUT	MA	01826
303 BROADWAY RD	303	BROADWAY RD	BFG MA RI LLC		P.O. BOX 320099	ALEXANDRIA	VA	22320
145 BROADWAY RD	145	BROADWAY RD	REAL ESTATE DYNAMICS LLC		145 BROADWAY RD	DRACUT	MA	01826
226 LOON HILL RD	226	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
250 LOON HILL RD	250	LOON HILL RD	WORLD DRACUT LLC		P.O. BOX 95025	NEWTON	MA	02495
401 BROADWAY RD	401	BROADWAY RD	MS RED REALTY, LLC		401 BROADWAY RD	DRACUT	MA	01826
445 BROADWAY RD	445	BROADWAY RD	VENGREN NOMINEE TRUST	C/O LAURETTE VENGREN	148 WOODWARD AV	LOWELL	MA	01854

BOARD OF ASSESSORS:

KAREN GOLDEN, CHIEF ASSESSOR: _____

ASHLEY ANTIFONARIO, ASSESSOR: _____

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Appendix T –

Filing fee to the Town of Dracut in the amount of $500.00 was included with the October 1, 2024 Application filing as evidenced by Check No. 15751 a copy of which is provided herewith.

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WORLD REALTY & DEVELOPMENT
PO BOX 95025
NEWTON, MA 02495-0025

EXPLANATION	AMOUNT	
	500	00

15751 53-7185/2113

CHECK ARMOR FRAUD PROTECTION

PAY AMOUNT OF Five Hundred even 00/100 DOLLARS

Security Features Details on Back.

DATE	TO THE ORDER OF	DESCRIPTION	CHECK NUMBER
9.25.24	TOWN OF DRACUT	BROADWAY VILLAGE AMENDMENT FILING FEE	15751

$ 500.00

THE VILLAGE BANK

Marla D. Caputo MP
AUTHORIZED SIGNATURE

⑈015751⑈ ⑆211371858⑆ [redacted]