□□□ □ □□ □□S□□□

TO: Planning Board, Town Clerk, Code Enforcement Officers, Town Supervisor, Highway Superintendent, Town Assessor, Town Board Members, Town Attorney, Planning Consultant

AGE□□A

SPE□□A□ P□A□□□□G □□A□□ □ EE□□□G

Septem□er 5□2□23 at □□□□pm

□o□n □all – □ourt □oom

1) Call meeting to order.

2) Old Business

   a. 7072 Boston State Rd LLC – Requesting Site Plan Approval and a Special Use Permit for a project involving the construction of a 5,183 sq.ft. building consisting of a convenience store with fuel and a Tim Horton's with drive-thru, as well as a 6,000 sq.ft. office building at 7072 Boston State Rd.

3) Motion to adjourn.

JASON A. KEDING
Supervisor

MICHAEL A. CARTECHINE
JENNIFER L. LUCACHIK
KELLY L. MARTIN
KATHLEEN SELBY
Town Board

SANDRA L. QUINLAN
Town Clerk -Tax Collector

ROBERT J. TELAAK
Highway Supt.

DEBRA K. BENDER
KELLY A. VACCO
Town Justice

SEAN W. COSTELLO
Town Attorney

Prosecutor

Thelma Hornberger
Assessor

Thomas Murphy
Code Enforcement Officer

TOWN HALL
(716) 941-6113
Fax (716) 941-6116

TOWN SUPERVISOR
(716) 941-6518
Fax (716) 941-9264

TOWN COURT
(716) 941-6115
Fax (716) 941-5169

HIGHWAY GARAGE
(716) 941-5869
Fax (716) 941-3677

NUTRITION PROGRAM
(716) 941-5773

The Town of Boston is an equal opportunity provider and employer.
If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call 1-866-632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or fax 202-690-7442 or e-mail at program.intake@usda.gov.

August 18, 2023

Sandra L. Quinlan, Town Clerk
Town of Boston Town Hall
8500 Boston State Road
Boston, NY 14025

Re: Special Use Permit Application & Supporting Documentation
Proposed Commercial Mixed-Use Project
Applicant: Miranda Development LLC
7072 Boston State Road – Town of Boston

Dear Ms. Quinlan:

This letter and the enclosed supporting documentation is being submitted on behalf of Miranda Development LLC (the "Applicant") in connection with a request for a Special Use Permit for the proposed filling station that a component of the proposed commercial project to be located at 7072 Boston State Road ("Project Site"). The Project Site consists of approximately 2.65 acres located on the west side of Boston State Road (NY-391) and south of the Route 219 exit/entrance ramps.

The proposed commercial project consists of the construction of a proposed 5,000 sq. ft. office building, a 5,183 sq. ft. convenience store building with an accessory drive-through facility as well as a proposed filling station (fueling facility) requiring the issuance of a Special Use Permit by the Town Board.[1] The Project Site is properly zoned C-1 Local Retail Business District ("C-1") pursuant to the Town of Boston Zoning Map.

On July 21, 2023, Boston Valley Capital, the owner of a commercial project located at 7074 Boston State Road, commenced an Article 78 proceeding for the purpose of challenging decisions issued by the Town Board for the proposed project to be located at 7072 Boston State Road. Rather than both the Town and the Applicant defending the approvals issued by the Town Board after a lengthy review process, the Applicant has decided to seek the required approvals once again for the project in a manner that will provide the opportunity to address concerns raised in the Verified Petition of Boston Valley Capital.

Article XIV of the Zoning Code is titled "C-1 Local Retail Business District" and Section 123-71B of the Zoning Code sets forth the categories of land uses requiring a special use permit in the C-1 zoning district.[2] Section 123-71B(1) of the Zoning Code states as follows:

[1] The proposed project also includes all required utility improvements, a stormwater management system, 57 parking spaces, landscaping and lighting and all other related improvements depicted on the enclosed engineered plans prepared by Christopher Wood, P.E. of Carmina Wood Design.

[2] A copy of Article XIV of the Zoning Code is attached as Exhibit "1".

HOPKINS SORGI & MCCARTHY PLLC
Attorneys at Law
5500 Main Street, Suite 343 • Williamsville, New York 14221
Direct: 716-510-4338 • E-mail: shopkins@hsmlegal.com • www.hsmlegal.com

> "Filling stations and/or gasoline stations, subject to Article XXIII, and provided that all servicing of vehicles and storage of parts and materials at gasoline stations except fueling and minor emergency repairs, will be conducted in an enclosed building."[3]

I. Requested Special Use Permit for the Proposed Filling Stations ("Fueling Facility"):

Enclosed are copies of the following project documentation being submitted for the Town Board's consideration in connection with the requested Special Use Permit for the proposed filling station:

1. Ten (10) sets of the engineered plans prepared by Carmina Wood Design;

2. Ten (10) sets of the Elevation Plans for the two proposed buildings;

3. Ten (10) copies of the Part 1 of the Full Environmental Assessment Form prepared pursuant to the State Environmental Quality Review Act ("SEQRA") dated August 8, 2023 with Attachments "1" and "2" consisting of the following:

   - **Attachment 1**: Wetland Investigation Letter prepared by Thomas Somerville of Earth Dimensions dated September 21, 2022[4] and;

   - **Attachment 2**: No Impact Determination Letter issued by Sydney Snyder of the New York State Office of Parks, Recreation and Historic Preservation dated February 9, 2023[5]

4. Ten (10) copies of the updated Traffic Impact Study prepared by Amy Dake, P.E., of Passero Associates dated August of 2023;

---

[3] A copy of Article XXIII of the Zoning Code (titled "Supplemental Use Regulations") is attached as Exhibit "2".

[4] Earth Dimensions, Inc. completed a preliminary wetland investigation at the Project Site on September 21, 2022. As indicated on the preliminary wetland investigation map attached to the letter, Earth Dimensions, Inc. did not identify any wetlands as defined by the U.S. Army Corps of Engineers ("USACE") wetland delineation manual.

[5] The No Impact Determination Letter issued by the New York State Office of Parks, Recreation and Historic Preservation dated February 9, 2023 stated as follows: "We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. The OPRHP has reviewed the Phase IA/IB archaeological survey report prepared for this project (February 2023; 23SR00093). No archaeological sites were identified by the survey. Therefore, it is the opinion of the OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project."

5. Ten (10) copies of the Phase I (IA and IB) Cultural Resource Investigation Report dated February 8, 2023 prepared by Powers Archaeology LLC; and

6. Ten (10) copies of the Geotechnical Report prepared by Barron & Associates dated May 2, 2023

A. <u>Special Use Permit Review Process</u>:

The Special Use Permit review process is set forth in Article XXXII of the Zoning Code (titled "Special Use Permit Procedure"). A copy of Article XXXII of the Zoning Code is attached as Exhibit "3". Section 123-174 of the Zoning Code is titled "Application procedure" and states as follows:

> A. Applications for special use permits shall be acted on by the Town Board after a public hearing. Notice of such public hearing shall be published in the official newspaper of the Town of Boston at least five days prior to the date thereof. Prior to such public hearing, applications shall be referred to the Town Planning Board for review and recommendation. In the event that the Planning Board shall fail to submit a report within 60 days after said referral, the Town Board may hold a public hearing at the earliest possible date.
>
> B. A plan for the proposed development of a site for a permitted special use shall be submitted with an application for a special permit, and such plan shall comply with the requirements for site plan review under Article XXX of this chapter.[6]

B. <u>Special Use Permit Standards for the Proposed Filling Station</u>:

Section 123-119 of the Zoning Code is titled "Limitations on filling stations, gasoline service stations and public garages" and states as follows:

> A. No part of any building used as a filling station, gasoline service station or public garage and no filling pump, lift or other service appliance shall be erected within 25 feet of any R District boundary or within 300 feet of any school, church, playground or park located in an R District.
>
> B. No gasoline or oil pump, no oiling or greasing mechanism and no other service appliance shall be installed in connection with any filling station, gasoline station or public garage within 20 feet of any street line.

[6] The engineered plans for the proposed commercial project included with this Special Use Permit Application submission as prepared by Carmina Wood Design comply with the requirements for site plan review as set forth in Article XXX of the Zoning Code. The proposed commercial project will also require site plan approval by the Town Board. A Site Plan Application will be submitted once the Planning Board completes the pending Conceptual Plot Plan review.

> C. Two reservoir spaces for each gasoline pump shall be provided on the lot for waiting vehicles. Such reservoir space shall not include space at the pump or required parking space.
>
> D. Storage of gasoline shall be in underground tanks in accordance with the rules and regulations of the New York State Department of Environmental Conservation and the Environmental Protection Agency.
>
> E. There shall be no use of the lot, except for landscaping or screening, within 20 feet of any R District boundary or lot used for residential purposes.
>
> F. All portions of the lot not enclosed in a building and used for reservoir space or for storage, parking or servicing of a motor vehicle shall be subject to the provisions of § 123-120 of this chapter.[7]

The proposed filling station satisfies the standards set forth in Section 123-119 of the Zoning Code for the following reasons:

1. The proposed filling station will not be located within 25 feet of any R District boundary or within 300 feet of any school, church, playground or park located in an R District.

2. The filling station will not be located within 20 ft. of the Boston State Road Right-of-Way.

3. The required number of reservoir spaces will be provided as depicted on the Site Plan [Drawing C-100] prepared by Carmina Wood Design included in the engineered plans accompanying this Special Use Permit Application submission.

4. The storage of gasoline will consist of underground tanks complying with the applicable stringent standards of both the New York State Department of Environmental Conservation and the United States Environmental Protection Agency.

5. The Project Site is not contiguous to property zoned R District.

6. The portion of the Project Site to be utilized as filling station will comply with the requirements set forth in Section 123-20 of the Zoning Code.[8] Section 123-120 of the Zoning Code is titled "Limitations on automotive use areas" and states as follows:

   > "Except for farms, any portion of a lot used for open off-street parking or reservoir space, or for open sales, service or storage areas for motor vehicles, contractors'

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[7] A copy of Section 123-119 of the Zoning Code is contained in the Supplemental Use Regulations attached as Exhibit "2".

[8] A copy of Section 123-119 of the Zoning Code is contained in the Supplemental Use Regulations attached as Exhibit "2".

equipment or boats shall be deemed to be an automotive use area and shall be subject to the following requirements:

A. Surfacing. Every automotive use area and access driveway thereto shall be surfaced with a durable and dustless material and shall be so graded and drained so as to disperse of surface water accumulation.

B. Lighting. Any fixture used to illuminate any automotive area shall be so arranged as to direct the light away from the street and away from adjoining premises.

C. Screening. Every automotive use area, except off-street parking areas for less than five vehicles, shall be screened from any adjoining lot in any R District or lot used for residential purposes, including lots situated across the street, as follows:

(1) Along a street line, by a planting strip five feet wide; provided, however, that no shrub planting or tree foliage shall be placed or maintained which obstructs vision at an elevation between three feet and seven feet above the street level. Such screening may be interrupted by normal entrances and exits.

(2) Along a rear lot line or an interior side lot line which abuts an existing or future rear yard or side yard on such adjoining lots, by a compact evergreen hedge which will reach a height of five feet within three years or by a solid uniformly painted fence or an unpierced masonry wall five feet in height. Such screening shall be maintained in good condition at all times.

D. Access.

(1) No entrance or exit to any automotive use area shall be permitted within 30 feet of any intersecting street lines; and, except for off-street parking areas for uses permitted in any R District requiring less than 10 parking spaces, no entrance or exit shall be permitted within 20 feet of a lot in any R District or lot used for residential purposes.

(2) Access to automotive use areas, except for off-street parking areas in an R District for fewer than five vehicles, shall be approved by the Town Engineer and shall be so arranged that vehicles shall not be required to back into a street.

E. Restriction of use. No automotive use area shall be used for auto wrecking or for the storage of wrecked, partially dismantled or junked vehicles or equipment, or motor vehicles which do not qualify for New York State motor vehicle registration.

II. <u>Conclusion</u>:

The Project Sponsor is requesting that the Town Board adopt a resolution during its meeting to be held on August 23rd for the purpose of seeking lead agency status for a coordinated environmental

review of the proposed project pursuant to SEQRA and referring the request for a Special Use Permit for the proposed filling station to the Planning Board for its review and recommendation.

Please feel free to contact me at 716.510-4338 or via e-mail at shopkins@hsmlegal.com if you have any questions regarding this letter or the enclosed project documentation being submitted in support of the requested Special Use Permit.

Sincerely,

HOPKINS SORGI & MCCARTHY PLLC

Sean W. Hopkins, Esq.

Enc.

cc: Town of Boston Town Board
Town of Boston Planning Board
Sarah desJardins, Planning Consultant
Sean W. Costello, Esq., Town Attorney
Colin M. Knoer, Esq., The Knoer Group, PLLC [Via e-mail]
Ray Miranda, Miranda Development LLC
Christopher Wood, P.E., Carmina Wood Design [Via e-mail]
Jonathan Barniak, Carmina Wood Design [Via e-mail]

Exhibit 1 - Article XIV of the Zoning Code [Titled "C-1 Local Retail Business District"]

ARTICLE XI
-1 ocal etail usiness istrict

§ 123-71. Permitted uses and structures.

Uses and structures permitted in the C-1 District are as follows:

A. Principal uses and structures:

1 Permitted uses and structures permitted in an R-C District, except that no residential single-family, two-family or three-or-more-family dwellings, cluster housing, private horse stable or accessory apartments shall be permitted. **Amended 7-1 -1 7 . . o. 5-1 7**

2 The following uses, when conducted entirely within an enclosed building.

a Retail sales, but not including any use first permitted in the C-2, -1 or -2 District.

b Personal service establishments, including but not limited to barbershops, beauty parlors and shoe or hat cleaning or repair and martial arts or related physical fitness facilities.

c and laundries, laundromats and dry cleaning or laundry pic up stations.

d Dry-cleaning and pressing establishments limited to 2,000 square feet of floor area per establishment, provided that only solvents with a flash point of not less than 138.2 shall be used and the total aggregate dry load of machines shall not exceed 60 pounds.

e Theaters.

f Eating or drin ing establishments, provided that any entertainment shall be limited to television, radio or music, and further provided that no sale of alcoholic beverages for consumption on the premises shall be permitted on any lot where the principal building is less than 100 feet from a side or rear lot line that abuts any R District boundary.

3 otels or motels, subject to the above restrictions on eating and drin ing establishments.

Drive-in ban s, provided that at least five reservoir spaces are provided on the lot for each drive-in teller s window. uch reservoir space shall be exclusive of required par ing spaces.

B. Uses subject to special permit:

1 illing stations and/or gasoline stations, subject to Article XXIII, and provided that all servicing of vehicles and storage of parts and materials at gasoline stations except fueling and minor emergency repairs, will be conducted in an enclosed building.

2 Radio or television transmission facilities and/or receive-only antennas and mountings having a combined weight exceeding or equal to 50 pounds, subject to the conditions and limitations of § 123- 8B 1 .[1] **Added 4-17-1 1 . . o. 1-1 1**

3 Buildings constructed for the storage of tools and materials for use in a business not situated on the same lot, subject to the following conditions and limitations: **Added 1 -7-1 2 . . o. 2-1 2**

1. **Editor s ote ormer Su section 2 ic provided or certain t o- amil d ellin s to e uses su ect to special permit as repealed 7-1 -1 7 . . o. 5-1 7. Said local la also redesi nated ormer Su sections 3 and 4 as Su sections 2 and 3 respectivel .**

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[a] The total area of any building or buildings, including all accessory buildings, shall not exceed the lesser of 3,000 square feet or 15% of the lot area.

[b] No more than one principal building shall be permitted on any lot pursuant to this section.

[c] The construction of accessory buildings shall be subject to special permit procedure of this section.

[d] No vehicles shall be parked on the premises except inside a permitted principal or accessory building.

[e] All buildings or structures permitted by this section shall be used in the operation of a single business except where two businesses have identical owners, then and in that event, no more than two businesses shall use the buildings or structures permitted by this section.

[f] Property principally improved by buildings or structures, permitted by this section, shall not be considered as making goods or services available for sale, hire or use on the premises for the purposes of § 5-5 of the Boston Town Code.

[Added 5-1-1[illegible].; Amd. 2-1[illegible]]

[5] Topsoil. [Added 4-5-2[illegible].; Amd. 1-2[illegible]]

[a] Screening of topsoil, provided that:

[1] All machinery, or other devices, shall remain mobile and shall not be permanently affixed to the property.

[2] Screening activity shall be limited to the hours of 8:00 a.m. to 7:00 p.m., weekdays only.

[3] No screening activity shall exceed three hours in any one day.

[4] No more than 200 cubic yards shall be processed on the site in any one calendar month.

[5] Importation of any soil or fill into the Town of Boston for the purpose of processing same, without regard to the location of its intended use, shall be subject to the provisions of the Boston Town Code.

[6] No more than 60 cubic yards of processed soil and 60 cubic yards of unprocessed soil shall be stored on the premises.

[7] All screening operations shall be conducted in such a fashion as to minimize noise, dust, odor, or any other condition interfering with the use and enjoyment of adjacent property.

[8] All soil stored on the property shall be so arranged or enclosed as to prevent erosion thereof and to further prevent same from otherwise unreasonably interfering with the use of adjacent property.

[9] Any application for a permit shall be subject to site plan approval.

[10] No application for a special permit pursuant to this section shall be approved unless the applicant shall demonstrate that 10,000 square feet can be dedicated to the said

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use without violating all area and bul requirements for the remaining uses on the property.

11 Any permit granted by the Town Board shall expire on December 31 in the calendar year in which said permit was granted, and may be renewed, from time to time, without a public hearing, upon application therefor, accompanied by a statement from the Code Enforcement Officer that the applicant substantially complied with the conditions of the current permit as set forth herein or as added by the Town Board.

12 No permit shall be granted or renewed unless the premises for which the permit is sought shall be contiguous to at least one property in a C or one.

13 The original application for a special permit shall be accompanied by the fee set forth herein. Renewal applications shall be accompanied by a fee of 25.

b The Town Board shall have the power to impose additional and/or more stringent conditions than those contained herein, based upon the topography and/or configuration of the premises, reports or recommendations of the Code Enforcement Officer, the Planning Board or the Town Engineer, personal observations, and comments received in the course of processing the application for a permit or any renewal thereof.

6 Live performances of musical entertainment, stage shows, reviews or other live performances using sound amplification devices, at eating or drin ing establishments authorized as a permitted use in this section, subject to the following conditions: **Added -1-2 2 . . o. 4-2 2**

a Term. No such permit shall be issued for a period to exceed two years. Unless otherwise provided, the first such permit issued to any applicant shall expire on the 30th day of une of the first full calendar year following the issuance of the permit additional permits shall expire on the 30th day of une of the second calendar year following the date of issuance.

b Renewal. Applications for renewal may, within the discretion of the Town Board, be subject to a public hearing.

c Revocability. The Town Board of the Town of Boston may revo e any such permit, after a public hearing held thereon. The grounds for such revocation shall be limited to the provisions of this subsection or the failure of the permit holder to comply with such additional conditions imposed at the time of issuance of the permit.

d Criteria for determination. In determining whether or not any such application shall be granted or existing permit revo ed, the Town Board shall consider the following criteria:

1 Proximity of adjacent residential structures.

2 Compliance with other provisions of the Town Code, including but not limited to those provisions relating to the generation of noise, vehicular and pedestrian traffic, odors, vapors or other noxious fumes.

3 Availability of par ing.

Any other factors that the Town Board determines are relevant to a decision on the application.

5 odification of the premises or alteration of the site on which is the subject of the

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permit.

(e) Hours of operation. Any such permit may limit, within the discretion of the Town Board, the hours of such performances.

(f) Continuation of existing performances. The Town Board of the Town of Boston hereby finds that certain business establishments may have entered into contracts for live performances in the future. As a result of such finding, no permit shall be required for any business establishment that currently provides for live entertainment until July 1, 2003, based on any contract entered into on or before the effective date of this provision. No exemption from the requirement of obtaining a permit shall be obtained unless copies of qualifying contracts are filed in the office of the Town Clerk on or before the first day of October 2002.

(g) Conditions. The Town Board of the Town of Boston may impose appropriate conditions on the issuance of any permit pursuant to this section, based upon the proximity of residential development or any other relevant factors, including but not limited to:

(1) Limitations on performances or the placing of any speakers broadcasting any performance outside of any structure.

(2) Requirement that all windows and doors remain closed except for normal ingress and egress.

(3) Limitation of the volume of any amplified sound generated during a live performance, measured at any or all speakers broadcasting such sound.

(4) Limitation on the volume of all nonamplified sound at the point of origin.

(5) Appropriate control of patrons at all times, including, but not limited to, activities outside of the establishment where live entertainment is occurring.

(h) Inspection. As a condition of the issuance of this permit, the permit holder shall permit any duly appointed enforcement officer of the Town of Boston or any police office to enter onto the premises for the purpose of verifying compliance with the conditions of this permit.

(i) Exceptions. The provisions of this subsection shall not be applicable to any live performance on property owned by the Town of Boston or the Hamburg Central School District.

(j) Fees. The fee for such special permit and the renewal thereof shall be set forth in the Schedule of Fees, as adopted by the Town Board of the Town of Boston.[2]

C. Accessory uses and structures:

(1) Accessory uses permitted in the R-C District, except accessory uses.

(2) Unless otherwise provided, accessory uses and structures customarily incidental to permitted principal uses.

(3) Shops for the manufacture or processing of articles incidental to the conduct of a retail business

2. **Editor's Note: See § 55, Fees.**

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lawfully conducted on the premises, provided that:

□a□ All such articles manufactured or processed are sold at retail on the premises.

□b□ Not more than four persons are engaged in such manufacturing or processing at any one time and in any one establishment.

□c□ □uch activity shall not produce offensive odors, noise, vibration, heat, glare or dust.

§ 123-72. □ inimum lot si□e.

Unless otherwise provided, the minimum lot size for dwellings in the C-1 District shall be as specified in this section.

A. Lot area:

□1□ □ inimum of 15,000 square feet.

□2□ Two-family dwellings: 20,000 square feet.

□3□ Three-or-more family dwellings: minimum lot: 20,000 square feet per structure, plus 3,000 square feet per dwelling unit.

B. Lot width at the building line:

□1□ □ here a lot is served by a public sanitary sewer: 75 feet for one dwelling unit or other principal building or use□100 feet for a two-family dwelling and an additional 25 feet for each dwelling unit over two, but need not exceed 200 feet.

□2□ □ here a lot is not served by a public sanitary sewer: and 25 feet to the minimum lot width.

C. The lot width at the front lot line shall be equal to minimum required lot width at the building line.

NOTE: All area and bul□requirements pertaining to one- and two-family dwellings in this section are for historical purposes only. □**Added 7-1□-1□□7 □□ □.□. □o. 5-1□□7**□

§ 123-73. □ aximum □ei□□t o□□uildin□s.

Unless otherwise provided, the maximum height of buildings in the C-1 District shall be as specified in this section.

A. □ingle-family, two-family or three-or-more family dwellings: 2 1/2 stories, not to exceed 30 feet.

B. Other principal buildings: as regulated by yard requirements, not to exceed 35 feet.

C. Accessory buildings: one story, not to exceed 18 feet, measured from the top of the floor to the top of the ridge.

NOTE: All area and bul□requirements pertaining to one- and two-family dwellings in this section are for historical purposes only. □**Added 7-1□-1□□7 □□ □.□. □o. 5-1□□7**□

§ 123-74. □e□uired □ards.

Unless otherwise provided, the minimum required yards and other open spaces in the C-1 District shall be as specified in this section.

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A. □ront yard: 50 feet.

B. □ide yards:

□1□ Dwellings: two required.

□a□ □ingle-family or two-family dwellings: The minimum width of any side yard shall be 10 feet.

□b□ Three-or-more family dwellings: minimum of 30 feet from any property line.

□2□ Other principal buildings: none required, except that:

□a□ □ here a side yard is provided, it shall be no less than five feet.

□b□ □ here a side yard abuts any R District boundary, it shall be not less than 20 feet or the height of the principal building, whichever is greater.

□c□ □ here a side yard is used for either vehicular ingress or egress, it shall not be less than 25 feet.

C. Rear yard: No rear yard shall have a depth less than 30 feet or a distance equal to the height of the principal building, whichever is greater.

D. □ aximum lot coverage: □0□.

NOTE: All area and bul□requirements pertaining to one- and two-family dwellings in this section are for historical purposes only. □**Added 7-1□-1□□7 □□ □.□. □o. 5-1□□7**□

§ 123-75. □□-street par□in□re□erence.

□or applicable off-street par□ing regulations, see Article X□III.

§ 123-7□. Si□n re□ulations re□erence.

□or applicable sign regulations, see the Town of Boston chapter regulating signs.[3]

§ 123-77. Supplemental re□ulations re□erence.

□or applicable supplemental regulations pertaining to use, height, area or open space, see Articles XXIII through XX□.

3. **Editor□s □ote□See □□. □5□Si□ns.**

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Exhibit 2 - Article XXIII of the Zoning Code [Titled "Supplemental Use Regulations"]

ARTICLE XXIII
Supplemental Use e ulations

§ 123-11 . emporar structures or uses.

A. The following temporary structures shall be deemed to be permitted uses in all zoning districts:

1 Temporary structures or uses incidental to construction wor shall be permitted for a period of time not to exceed one year, provided that any such structure shall be removed forthwith upon the completion or abandonment of the construction wor Any extension of said time limit shall require the approval of the oning Board of Appeals.

2 The temporary use of a dwelling as a model home shall be permitted for a period of time not to exceed nine months. Any extension of said time limit shall require the approval of the oning Board of Appeals.

3 Any temporary structures or uses permitted by the oning Board of Appeals as authorized in Article XXXI.

B. pecial permits.

1 The Town Board may authorize a temporary and revocable permit for not more than two years for uses or structures that do not conform to the regulations of this chapter for the district in which they are located, provided that the following findings are made:

a uch uses are of a temporary nature and do not involve the erection or enlargement of any permanent structure.

b In the case of renewal of such permit, that all conditions and safeguards previously required have been complied with.

2 Permitted temporary structures or uses, extension of time limit: The Town Board may authorize the continuation of temporary structures or uses incidental to construction wor , provided that the following findings are made:

a That the structure and scale of the construction are such as to require a longer period of time for completion.

b That such construction has been diligently prosecuted or that any delays have been unavoidable.

§ 123-11 . imitations on illin stations asoline service stations and pu lic ara es.

A. No part of any building used as a filling station, gasoline service station or public garage and no filling pump, lift or other service appliance shall be erected within 25 feet of any R District boundary or within 300 feet of any school, church, playground or par located in an R District.

B. No gasoline or oil pump, no oiling or greasing mechanism and no other service appliance shall be installed in connection with any filling station, gasoline station or public garage within 20 feet of any street line.

C. Two reservoir spaces for each gasoline pump shall be provided on the lot for waiting vehicles. uch reservoir space shall not include space at the pump or required par ing space.

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D. Storage of gasoline shall be in underground tanks in accordance with the rules and regulations of the New York State Department of Environmental Conservation and the Environmental Protection Agency.

E. There shall be no use of the lot, except for landscaping or screening, within 20 feet of any R District boundary or lot used for residential purposes.

F. All portions of the lot not enclosed in a building and used for reservoir space or for storage, parking or servicing of a motor vehicle shall be subject to the provisions of § 123-120 of this chapter.

§ 123-120. Limitations on automotive use areas.

Except for farms, any portion of a lot used for open off-street parking or reservoir space, or for open sales, service or storage areas for motor vehicles, contractors' equipment or boats shall be deemed to be an automotive use area and shall be subject to the following requirements:

A. Surfacing. Every automotive use area and access driveway thereto shall be surfaced with a durable and dustless material and shall be so graded and drained so as to disperse of surface water accumulation.

B. Lighting. Any fixture used to illuminate any automotive area shall be so arranged as to direct the light away from the street and away from adjoining premises.

C. Screening. Every automotive use area, except off-street parking areas for less than five vehicles, shall be screened from any adjoining lot in any R District or lot used for residential purposes, including lots situated across the street, as follows:

(1) Along a street line, by a planting strip five feet wide; provided, however, that no shrub planting or tree foliage shall be placed or maintained which obstructs vision at an elevation between three feet and seven feet above the street level. Such screening may be interrupted by normal entrances and exits.

(2) Along a rear lot line or an interior side lot line which abuts an existing or future rear yard or side yard on such adjoining lots, by a compact evergreen hedge which will reach a height of five feet within three years or by a solid uniformly painted fence or an unpierced masonry wall five feet in height. Such screening shall be maintained in good condition at all times.

D. Access.

(1) No entrance or exit to any automotive use area shall be permitted within 30 feet of any intersecting street lines and, except for off-street parking areas for uses permitted in any R District requiring less than 10 parking spaces, no entrance or exit shall be permitted within 20 feet of a lot in any R District or lot used for residential purposes.

(2) Access to automotive use areas, except for off-street parking areas in an R District for fewer than five vehicles, shall be approved by the Town Engineer and shall be so arranged that vehicles shall not be required to back into a street.

E. Restriction of use. No automotive use area shall be used for auto wrecking or for the storage of wrecked, partially dismantled or junked vehicles or equipment, or motor vehicles which do not qualify for New York State motor vehicle registration.

§ 123-121. Lots divided by district boundaries.

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A. here a lot is divided by any zoning district boundary so as to be in more than one zoning district and where such lot was an existing lot when such district boundary was established, a conforming use, occupying 50 or more of the area of said lot and having street frontage in the district where permitted, may be extended on such lot not more than 25 feet, measured perpendicular to the district boundary, into any district where such use is not permitted.

B. uch use shall be subject to all regulations applicable to the district where permitted.

§ 123-122. ot ronta e on street re uired or d ellin s.

No dwelling shall be erected on any lot which does not have immediate frontage on a street held by the owner thereof in fee simple, subject to easements of record, as defined in this chapter.

§ 123-123. Screenin o service entrance in and istricts.

here a loading or unloading platform or any service entrance in a C or District faces any lot line which coincides with any R District boundary, such platform or service entrance shall be effectively screened from such R District or lot used for residential purposes in a manner approved by the Town Planning Board.

§ 123-124. Adult uses.

Adult uses shall be allowable in an Industrial District only as a special exception by the Board of Appeals after public hearing.

A. Purposes and considerations.

1 In the execution of this chapter, it is recognized that there are some uses, which due to their very nature, have serious objectionable characteristics. The objectionable characteristics of these uses are further heightened by their concentration in any one area, thereby having deleterious effects on adjacent areas. pecial regulation of these uses is necessary to ensure that these adverse effects will not contribute to the blighting or downgrading of the surrounding neighborhoods or land uses.

2 It is further declared that the location of these uses in regard to areas where our youth may regularly assemble and the general atmosphere encompassing their operation is of great concern to the Town of Boston.

3 These special regulations are itemized in this section to accomplish the primary purposes of preventing a concentration of these uses in any one area and restricting their accessibility to minors.

B. Definitions. As used in this chapter, the following terms shall have the meanings indicated:

ADULT BOO TORE An establishment having as a substantial or significant portion of its stoc -in-trade boo s, magazines, other periodicals, films, slides and video tapes and which establishment is customarily not open to the public generally but excludes any minor by reason of age.

ADULT DRI E-IN T EATER A drive-in theater that customarily presents motion pictures that are not open to the public generally but excludes any minor by reason of age.

ADULT ENTERTAIN ENT CABARET A public or private establishment which presents topless dancers, strippers, male or female impersonators or exotic dancers or other similar

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entertainments and which establishment is customarily not open to the public generally but excludes any minor by reason of age.

ADULT □OTEL □ A motel which is not open to the public generally but excludes minors by reason of age or which ma□es available to its patrons in their rooms films, slide slows or videotapes, which if presented in a public movie theater would not be open to the public generally but would exclude any minor by reason of age.

ADULT T□EATER □ A theater that customarily presents motion pictures, films, videotapes or slide shows, that are not open to the public generally but exclude any minor by reason of age.

□A□□A□E E□TABLI□□□ENT □ Any establishment having a fixed place of business where massages are administered for pay, including but not limited to massage parlors, sauna baths and steam baths. This definition shall not be construed to include a hospital, nursing home or medical clinic or the office of a physician, surgeon, chiropractor, osteopath or duly licensed physical therapist or barbershops or beauty salons in which massages are administered only to the scalp, face, nec□or shoulders. This definition also shall exclude health clubs which have facilities for physical exercise, such as tennis courts, racquetball courts or exercise rooms, and which do not receive their primary source of revenue through the administration of massages.

PEEP □□O□ □□ A theater which presents material in the form of live shows, films or videotapes, viewed from an individual enclosure, for which a fee is charged and which is not open to the public generally but excludes any minor by reason of age.

C. The adult uses, as defined in □ubsection B above, are to be restricted as to location in the following manner in addition to any other requirements of this Code.

□1□ Any of the above uses shall not be located within a five-hundred-foot radius of any area zoned for residential use.

□2□ Any of the above uses shall not be located within a one-half-mile radius of another such use.

□3□ Any of the above uses shall not be located within a five-hundred-foot radius of any school, church or other place of religious worship, par□, playground or playing field.

D. The restrictions enumerated in □ubsection C above may be waived by the Town □oning Board of Appeals if the applicant shows and the Board finds that the following conditions have been met, in addition to the general conditions contained in Article XXXI of this chapter:

□1□ That the proposed use will not be contrary to the public interest or injurious to nearby properties and that the spirit and intent of this chapter will be observed.

□2□ That the establishment of an additional use of this type in the area will not be contrary to any program of neighborhood conservation or improvement, either residential or nonresidential.

□3□ That 51□ or more of the property owners within the restricted area as defined in □ubsection C□1□ of this section have signed a petition stating that they have no objection to the establishment of one of the uses defined above.

E. Registration. No person, firm, corporation or other entity shall lease, rent, maintain, operate, use or allow to be operated or used any business or establishment, any part of which contains an adult use, without first complying with the provisions of this subsection, as follows:

□1□ In addition to any and all other necessary licenses and permits, no form of adult use shall be allowed to operate or be allowed to continue to operate, until a certificate of registration is filed

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with the Cler of the Town of Boston, containing:

a. The address of the premises.

b. The name and address of the owner s of the premises and the name and address of the beneficial owner s if the property is in a land trust.

c. The name of the business or the establishment subject to the provisions of this section.

d. The name, business and home address, business or home phone number of all owners of the business or establishment, subject to the provisions of this section.

e. The names, business and home addresses, business or home phone numbers of all those persons having a substantial connection with the business or establishment subject to the provisions of this section.

f. The date of the initiation of the adult use.

g. The exact nature of the adult use.

h. If the premises or the building in which the business containing the adult use is located is leased, a copy of the lease.

2. If there occurs any change in the information required for the certificate of registration, the Cler of the Town of Boston shall be notified of such change, and a new or amended certificate shall be filed within 30 days of such change.

3. The processing fee for each such certificate of registration or amendment thereto shall be 50.

. No certificate of registration issued under the provisions of this section shall be transferable to any person other than the registrant, nor shall a certificate of registration be transferable for use at any premises, building or location other than stated in the certificate of registration.

5. The owner, manager or agent of any adult use shall cause a copy of the certificate of registration issued under the provisions of this section to be prominently displayed on the premises, building or location for which it is issued.

6. Any nowingly false statement or any statement which the registrant or applicant should reasonably have nown to be false, which is provided in the certificate of registration or any document or information supplied therewith shall be grounds for rejection, suspension or revocation of the certificate of registration.

7. It is a violation of this chapter for the owner or person in control of any property to establish or operate an adult use without having in force a certificate of registration complying with this section.

. Prohibition regarding public observation. No adult use shall be conducted in any manner that permits the observation of any material depicting, describing or relating to specified sexual activities or specified anatomical areas from any public way or from any property not registered as an adult use. This provision shall apply to any display, decoration, sign, show window, screen or other opening.

. No more than one of the adult uses as defined above shall be located on any lot.

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§ 123-125. Limitation on accessory buildings.

No more than one accessory building shall be constructed on a lot, except when authorized by the Town Board.

§ 123-126. Uses subject to a special permit in all districts.

A. Operation of radio-controlled airplanes. No person, firm or corporation shall use, permit or allow the flying of any fuel-driven or radio-controlled model airplane or airplanes of whatever size or dimension from, on or over any lands situate in the Town of Boston, New York, except where a permit for said use shall have been granted by the Town Board after a public hearing and a determination that said use would not unreasonably conflict with the rights of adjoining owners and the general public; provided, however, that the provisions of this section shall not apply to said use of property by a resident owner or the members of his immediate family.

B. Dumping of material. It shall be unlawful for any person, firm or corporation to throw, dump or deposit or to permit the throwing, dumping, emptying or depositing on any real property in the Town of Boston of any garbage, building debris, tree stumps, paper, cardboard, wood, plastic material, metal, glass, rags, ashes, lumber, brick, stone, concrete or of any type of garbage or discarded or salvaged material which originates from any source outside of the Town of Boston without first having obtained a written permit from the Town Board of the Town of Boston. Such permit shall continue for a period of one year after the date of issuance thereof, if not sooner revoked by the Town Board. Any original permit which may be issued by the Town Board shall be after public hearing thereon, and upon such conditions and stipulations as the Town Board may require at the time of the issuance of said permit. The requirements specified herein shall not be construed to apply to agricultural or gardening uses of land within the Town.[1]

§ 123-127. Limitation on unlicensed automobiles.

No unregistered or unlicensed automobile or automobile incapable of being registered and inspected shall be stored in any R District, except in a completely enclosed structure; provided, however, that no more than one unlicensed or unregistered automobile may be stored in an R District except in a totally enclosed structure.

§ 123-127.1. Limitation on harboring dogs. [Added 7-17-1997 by L.L. No. 5-1997]

Except on property within an R-A District containing three or more acres, no person or organization or other occupant of land shall harbor more than three dogs that are more than six months old for a period exceeding 30 days.

§ 123-128. Prohibition on mixed use. [Amended 4-17-1991 by L.L. No. 1-1991; 5-24-1995 by L.L. No. 2-1995]

A. Except as otherwise provided herein only one use shall be permitted on a lot. No residential use shall be permitted on the same lot with a nonresidential use. No residential use shall be permitted on the same lot with a hotel, motel, tourist home, guesthouse, bed-and-breakfast or nursing or convalescent home except for one residence provided for the manager or custodian thereof. This section shall not apply to home occupations or permitted accessory uses as defined in this chapter.

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1. Editor's Note: Former Subsection C, Satellite dish antennas, was repealed 4-17-1991 by L.L. No. 1-1991. This local law also provided for the redesignation of former Subsection D as Subsection C.

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B. In any R-C or C-1 District, the Town Board, by special use permit, may allow a portion of a single-family, owner occupied dwelling to be connected to a retail sales area for the sale of handicrafts, collectibles and wor□s of art, subject to the following conditions:

□1□ □aid sales area shall be operated, in part, by the owner of the single-family dwelling or by a member of the owner□s immediate family, residing in the household.

□2□ The special use permit application shall be subject to simultaneous site plan approval by the Town Board in accordance with the applicable provisions of the Town Code.

□3□ The special use permit shall expire on December 31 of the second full calendar year after the date of issuance thereof□and may be renewed by the Town Board for additional three-year periods upon presentation of evidence to the Town Board that all of the conditions required for issuance of the permit continue to be met by the original holder thereof.

□□□ This special use permit shall not run with the land, but shall be specific to the holder thereof and, notwithstanding any provision to the contrary, shall expire immediately upon the sale of the premises□or upon the termination of the use for a period of one year, at any time during the permit period.

□5□ The maximum floor area used for retail sales activities shall not exceed 20□ of the floor area of the first floor of the dwelling.

§ 123-12□.1. Approval and construction o□telecommunications □acilities. □Added □-1□-1□□7 □□□.□. □o. □-1□□7□

A. Legislative intent. The Town of Boston recognizes the increased demand for wireless communication transmitting facilities and the need for the services they provide. Often, these facilities require the construction of a communications tower and/or similar facilities in a manner consistent with sound land use planning by: minimizing adverse visual effects of towers and/or similar facilities through careful design, siting, and vegetative screening□avoiding potential damage to adjacent properties from tower failure or falling debris through engineering and careful siting of tower structures□maximizing use of any new and existing tower, or existing building and/or structures to reduce the number of towers and/or similar facilities needed□while also allowing wireless service providers to meet their technological and service objectives.

B. Definitions. As used in this section, the following terms shall have the meanings indicated:

ACCE□□ORY □TRUCTURE □ An accessory facility or structure serving or being used in conjunction with a communications tower and/or similar facility, and located on the same lot as the communications tower. Examples of such structures include utility or transmission equipment storage sheds or cabinets.

ANTENNA □ A system of electrical conductors that transmits or receives radio frequency signals. □uch signals shall include, but not be limited to, radio, television, cellular, paging, personal communication services □PC□□and microwave communications.

COLLOCATED ANTENNA□ □ Telecommunications facilities which utilize existing towers, buildings or other structures for placement of antenna□s□and do not require construction of a new tower.

□ALL DO□ N □ONE □ The radius around a tower within which all portions of the tower and antenna□s□would fall in the event of a structural failure of the tower.

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TELECO□ □ UNICATION□ □ACILITIE□ □ Towers and/or antennas and accessory structures together used in connection with the provision of cellular telephone service, personal communications services, paging services, radio and television broadcast services, and similar broadcast services, except ham radio antennas as defined in this chapter.□**Amended 1□-1-1□□7 □□ □.□. □o. □-1□□7□**

TO□ ER □ A structure designed to support antennas. It includes, without limitation, freestanding towers, guyed towers, monopoles, and similar structures which do or which do not employ camouflage technology.

C. Telecommunications facility permit required.

□1□ A telecommunications facility is permitted only if specifically permitted by a permit granted by the Town Board pursuant to § 123-□8B of the Town Code.

□2□ The Town Board shall have the right to waive any provision of this section for facilities whose total height above ground does not exceed 35 feet.

D. □eneral standards for issuance of permit. No permit or renewal thereof or modification of the conditions of a current permit relating to a telecommunications facility shall be authorized unless such telecommunications facility:

□1□ Is necessary to meet current or expected demands for the services supported by the telecommunications facility□

□2□ Conforms with all applicable regulations promulgated by the □ederal Communications Commission□

□3□ Is designed and constructed in a manner which minimizes its visual impact□

□□□ Complies with all other requirements of this chapter□

□5□ Is the most appropriate site within the immediate area for the location of the telecommunications facility. It is preferred that telecommunications facilities be located more than 1,500 feet from the nearest residence property, provided that there is a technologically feasible location available at a commercially reasonable rate.

E. Collocated antenna preferred. The shared use of existing telecommunications facilities or other structures shall be preferred to the construction of new such facilities. Any application for a telecommunications facility permit or renewal thereof or modification of the conditions of a current telecommunications facility permit shall include proof that reasonable efforts have been made to collocate with an existing telecommunications facility or upon an existing structure. The application shall include an adequate inventory report specifying existing telecommunications facility sites and structures of height exceeding 75□ of the height of the proposed tower within a two-mile radius from the proposed site if the application is for cellular telephone or personal communications use, or a five-mile radius for other services, and for cellular telephone or personal communications use, or a five-mile radius for other services, and outlining opportunities for shared use as an alternative to the proposed location. The application must demonstrate that the proposed telecommunications facility cannot be accommodated on all sites in the inventory due to one or more of the following reasons:

□1□ The planned equipment would exceed the structural capacity of existing and approved telecommunications facilities or other structures, considering existing and planned uses for those facilities□

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(2) The planned equipment would cause radio frequency interference with other existing or planned equipment, which cannot be reasonably prevented.

(3) Existing or approved telecommunications facilities or other structures do not have space on which proposed equipment can be placed so it can function effectively and reasonably.

(4) Other technical reasons make it impracticable to place the equipment proposed by the applicant on existing facilities or structures.

D. Tower permit application procedure.

(1) Application materials. All applicants for a telecommunications facility permit shall make written application to the Town Board, which application shall include the following information:

(a) Town supplied permit application form to be used as tower permit application form.

(b) Town supplied environmental assessment form.

(c) Site plan, in form and content in conformance with the site plan.

(1) The exact location of the proposed tower, together with guy wires and guy anchors, if applicable showing in addition to all other information: Regulations of the Town of Boston Chapter 7 and Article XXX of Chapter 123 of the Town Code.

(2) The maximum height of the proposed tower.

(3) A detail of tower type (monopole, guyed, freestanding, or other).

(4) The color or colors of the tower.

(5) The location, type and intensity of any lighting on the tower.

(6) The property's boundaries. A copy of a property survey must also be provided.

(7) Proof of the landowner's consent if the applicant will not own the property. A copy of a lease agreement must also be provided if the applicant will not own the property.

(8) The location of all structures on the property and all structures on any adjacent property within 50 feet of the property lines, together with the distance of these structures to the tower.

(9) The names of adjacent landowners.

(10) The location, nature and extent of any proposed fencing and landscaping or screening.

(11) The location and nature of proposed utility easements and access road, if applicable.

(12) Building elevations of accessory structures or immediately adjacent buildings.

(13) Before and after propagation studies prepared by a qualified radio frequency engineer signed and sealed by a professional engineer registered in the State of New York demonstrating existing signal coverage, contrasted with the proposed signal coverage resulting from the proposed telecommunications facility.

(14) A search ring prepared by a qualified radio frequency engineer signed and sealed

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documents by a professional engineer registered in the State of New York and overlaid on an appropriate background map demonstrating the area within which the telecommunications facility needs to be located in order to provide proper signal strength and coverage to the target cell. The applicant must be prepared to explain to the Town Board why it selected the proposed site, discuss the availability or lack of availability of a suitable structure within the search ring which would have allowed for a collocated antenna(s), and to what extent the applicant explored locating the proposed tower in a more intensive use district. Correspondence with other telecommunications companies concerning collocation is part of this requirement.

(15) The Town Board, Planning Board or any advisor or consultant, upon reviewing the application, may request reasonable additional visual and aesthetic information as it deems appropriate on a case-by-case basis. Such additional information may include, among other things, enhanced landscaping plans, line-of-sight drawings, and/or visual simulations from viewpoints selected by the Town. Line-of-sight drawings and visual simulations are mandatory for applications within 1,500 feet of R-1, R-2, R-3 or R-C Zoning Districts.

(d) The applicant must submit a copy of its policy regarding collocation on the proposed tower with other potential applications. Such policy should allow collocation under the following conditions: the new antenna(s) and equipment do not exceed structural loading requirements, interfere with tower space used or to be used by the applicant nor pose any technical or radio frequency interference with existing equipment; the party desiring to collocate pays the applicant an appropriate and reasonable sum to collocate; and the party desiring to collocate has a similar policy of collocation for the applicant.

(e) A report, prepared by a New York State licensed professional engineer, which, in the case of a tower, describes its height and design, including a cross section of the structure; demonstrates the tower's compliance and applicable structural standards; and describes the tower's capacity, including the number and type of antennas it can accommodate. In the case of an antenna(s) mounted on an existing structure, the report shall indicate the existing structure's suitability to accept the antenna, and proposed method of affixing the antenna(s) to the structure. Complete details of all fixtures and couplings and the precise point of attachment shall be indicated.

(f) An agreement by the applicant, in writing, to remove the telecommunications facility if such facility becomes technically obsolete or ceases to be used for its originally intended purpose for 12 consecutive months.

(g) The applicant, at the time of obtaining a building permit, must provide a financial security bond with the Town as assignee, in an amount fixed by the Town Board but not less than $100,000.

(2) Referral to the Planning Board. Upon receipt of the application material set forth in Subsection D(1) above, the Town Board shall refer the application to the Town Planning Board. The Town Planning Board shall review the site plan and recommend changes, if any, to the Town Board. The Town Board shall consider the application and approve or deny the same in accordance with the procedures and standards set forth therein in § 123-8B and this section.

E. Each proposed telecommunications facility shall meet the following design requirements:

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(1) Shall be separated from residential dwellings, schools, houses of worship, places of public assembly and designated historical districts by the greater of 1,500 feet to five times the height of the facility. The Town Board may modify this condition if the facility is attached to an existing structure or for other satisfactory reasons supported by expert testimony.

(2) Shall have the least possible practical visual effect on the environment as determined by the Town Board and shall be less than 150 feet above ground level. Towers, antennas and masts shall not be artificially lighted unless otherwise required by the Federal Aviation Administration or other federal, state or local authority. Towers shall have a galvanized finish, or shall be painted gray above the surrounding treeline and gray or green below the treeline or as decided by the Town Board. Antennas shall have the least obtrusive finish that is technically feasible.

(3) Shall provide vegetative screening, as determined by the Zoning Board, if the proposed site abuts residential or public property or community facilities.

(4) Shall include a fall zone surrounding any support towers, which fall zone must have a radius at least equal to the height of such support tower and any antennas attached thereto. The entire fall zone may not include public roads and must be on property either owned or leased by the applicant or for which the applicant has obtained an easement, may not contain any structure other than those associated with the telecommunications facilities, and may not be located within any set back area established by this chapter. If the facility is attached to any existing structure, fall zone requirements may be relaxed by specific permission of the Town Board.

(5) Towers and auxiliary structures shall be surrounded by a fence or wall at least eight feet in height of a design approved by the Town Engineer so as to make intrusion extremely difficult, but with limited visual impact. Barbed wire is not to be used in residential areas or on public property unless specifically permitted by the Town Board.

(6) Shall be equipped with an alarm system providing that any intrusion or attempt to climb the fence or wall is signaled to both the New York State Police and to the owner of the facility. There shall be no permanent climbing pegs within 15 feet of the ground on any tower.

(7) No tower shall contain any signs or advertising devices.

D. Telecommunications facilities continuing standard. All telecommunications facilities, both predating and antedating this section, shall fulfill the requirements of this section. The Code Enforcement Officer is empowered to enforce these regulations.

(1) The sufficiency of the facility removal bond shall be confirmed at least every five years by an analysis of the cost of removal and property restoration performed by a New York State licensed professional engineer. The results of such analysis shall be communicated to the Town Board. If the bond amount in force is insufficient to cover the costs of removal, it shall be immediately increased to cover such amount.

(2) The facility shall be inspected at least every second year for structural integrity by a New York State licensed professional engineer, and a copy of the inspection report submitted to the Town Code Enforcement Officer and the Town Board.

(3) Any work to augment or repair the facility shall comply with all applicable code requirements, and a building permit shall be obtained to conduct such work.

(4) Any additional antennas, reception or transmission dishes, or other similar receiving or

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transmitting devices proposed for attachment to an existing facility shall require review in accordance with this section. The intent of this requirement is to ensure the structural integrity, visual aesthetics, and land use compatibility of communication towers upon which additional antennas, communication dishes, etc. are to be installed. The application for approval to install additional antennas, dishes or other similar receiving devices shall include certification from a New Yor□ □tate licensed professional engineer indicating that the additional device or devices installed will not adversely affect the structural integrity of the facility. A visual impact analysis shall be included as part of the application for approval to install one or more additional communications devices to an existing facility.

□5□ No outside storage of vehicles, materials or waste shall be allowed, except for limited periods when the facility is undergoing additions, repairs or renovations.

□6□ The facility shall be maintained in good order and repair at all times. Paint and other finishes on towers, auxiliary buildings, fences and walls shall be renewed as required to maintain the appearance of the facility. Accumulations of rubbish, papers, etc. on the grounds shall be promptly removed. Trees and shrubs shall be trimmed as necessary and weeds and grass removed from any fenced yards. Access roads are to be maintained in good order□care shall be ta□en to see that weeds and grass do not grow through its surface. If the road is temporary, its presence shall be obliterated according to a plan provided to and approved by the Building Inspector.

I. Exclusivity. Article XII is meant to control towers and similar facilities in the Town of Boston, other sections of the □oning Law are intended to be inapplicable when same are determined to be inconsistent with this section.

§ 123-12□.2. □imitation on special permits □or construction o□ □am radio antennas. □Added 1□-1-1□□7 □□ □.□. □o. □-1□□7□

Any special permit for the construction of a ham radio antenna shall expire on December 31 of the second calendar year following the year in which the permit was issued. Thereafter said special permit may be renewed for a period not exceeding three years, after review and comment by the Planning Board, upon the applicant demonstrating that he or she possesses a valid license, issued by the □ederal Communications Commission pursuant to Part □7 of the Regulations of the □ederal Communications Commission, and that the antenna is a ham radio antenna as defined by the □oning Law of the Town of Boston. In the event that the antenna no longer qualifies as a ham radio antenna, said renewal application shall be treated as an application for the construction of a new telecommunications facility as defined in this chapter.

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Exhibit 3 - Article XXXII of the Zoning Code [Titled "Special Use Permit Procedure")

ARTICLE XXXII
Special Use Permit Procedure

§ 123-173. General provisions.

Unless otherwise provided, the special uses for which conformance to additional standards is required shall be deemed to be permitted uses in their respective districts, subject to the satisfaction of the requirements and standards set forth herein, in addition to all other requirements of this chapter. All such uses are hereby declared to possess characteristics of such unique and special forms that each specific use shall be considered as an individual case.

§ 123-174. Application procedure.

A. Applications for special use permits shall be acted on by the Town Board after a public hearing. Notice of such public hearing shall be published in the official newspaper of the Town of Boston at least five days prior to the date thereof. Prior to such public hearing, applications shall be referred to the Town Planning Board for review and recommendation. In the event that the Planning Board shall fail to submit a report within 60 days after said referral, the Town Board may hold a public hearing at the earliest possible date.

B. A plan for the proposed development of a site for a permitted special use shall be submitted with an application for a special permit, and such plan shall comply with the requirements for site plan review under Article XXX of this chapter.

§ 123-175. Expiration.

A special use permit shall be deemed to authorize only one particular special use and shall expire if the special use shall cease for more than one year.

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TOWN OF BOSTON

SPECIAL USE PERMIT APPLICATION

OFFICE USE ONLY

( ) APPROVED ( ) DISAPPROVED

PERMIT NO: _____

PERMIT FEE: _____

DATE RECEIVED: _____

ISSUED BY: _____

OWNER NAME: Miranda Holdings, Inc.

ADDRESS: 7072 Boston State Road P.O. Box 312

North Boston, NY 14110

TELEPHONE: (716)941-7043; (716)913-5593(m)

EMAIL: ray@mirandaholdingsinc.com

CONTRACTOR: _____

PHONE: _____

APPLICATION IS HEREBY MADE FOR PERMISSION TO:

( ) DUMPING OF MATERIAL ( ) RENEWAL OF EXISTING PERMIT ( ) ACCESSORY APARTMENTS

( ) TOP SOIL SCREENING ( ) BED & BREAKFAST (x) OTHER 123-71B.(1) Filling station in C-1 needs special permit

Does this project require approval from any other agency? If so, who? The project requires Site Plan Approval from the Planning Board along with various other approvals from involved agencies including a Highway Work Permit from the New York State Department of Transportation.

LOCATION TO BE USED: 7072 Boston State Road

INTENT:

Detailed information in support of the requested Special Use Permit is contained in the letter prepared by Sean Hopkins, Esq. dated August 18, 2023 and the accompanying supporting documentation.

THE UNDERSIGNED APPLICANTS DO HEREBY AFFIRM THAT THE INFORMATION HEREBY SUPPLIED IS TRUE AND CORRECT.

OWNER: R E _____ DATE: August 18, 2023

Ray Miranda

Public Hearing Date: _____ Site Inspection Date: _____

Town Board Approval: _____

Conditions of Approval: _____

Mixed-Use Development

7072 Boston State Road (NY-391)
Boston, New York 14025
SITE DEVELOPMENT DRAWINGS

AGENCIES

TOWN OF BOSTON
COMPANY/DEPT: TOWN OF BOSTON
ADDRESS: 8500 BOSTON STATE ROAD
BOSTON, NEW YORK 14025

TELEPHONE 716-941-6113

SURVEYOR
COMPANY/DEPT: TRUE NORTH LAND SURVEYING, PLLC
ADDRESS: 150 AERO DRIVE
BUFFALO, NEW YORK 14225

TELEPHONE 716-631-5140

NEW YORK STATE DEPT. OF TRANSPORTATION
NAME/TITLE: RONALD FREI
COMPANY/DEPT: NYSDOT SOUTH ERIE RESIDENCY
ADDRESS: 3754 LAKEVIEW ROAD
HAMBURG, NEW YORK 14075

TELEPHONE 716-649-2157

ERIE COUNTY SEWER
NAME/TITLE: MATT SALAH, PE
COMPANY/DEPT: ERIE COUNTY DEPT. OF ENV. & PLANNING
ADDRESS: 95 FRANKLIN STREET
BUFFALO, NEW YORK 14202

TELEPHONE 716-858-6990

UTILITIES

NATURAL GAS
COMPANY: NATIONAL FUEL GAS
TELEPHONE: 1-716-686-6123

ELECTRIC
COMPANY: NYSEG
TELEPHONE: 1-716-681-5030

CABLE
COMPANY: CHARTER SPECTRUM
TELEPHONE: 1-888-406-7063

WATER
COMPANY: ERIE COUNTY WATER AUTHORITY
TELEPHONE: 1-716-684-0900

TELEPHONE
COMPANY: VERIZON COMMUNICATIONS INC.
TELEPHONE: 1-716-840-8688

UNDERGROUND FACILITIES PROTECTION ORGANIZATION
COMPANY: DIG SAFELY NEW YORK
TELEPHONE: 811

OWNER/DEVELOPER

NAME: Miranda Development, LLC
ADDRESS PO Box 312
North Boston, New York 14110
CONTACT: Ray Miranda, President
TELEPHONE 716-941-7034

CARMINAWOOD DESIGN

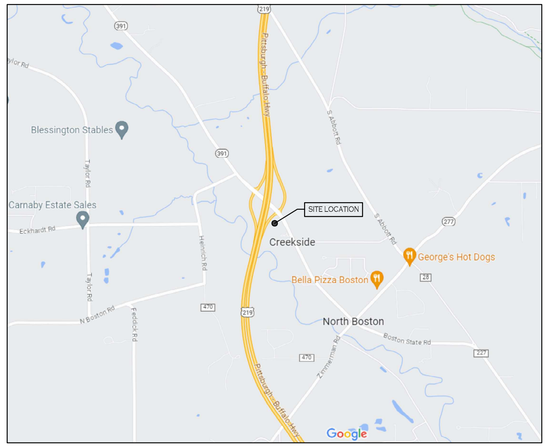
487 Main Street, Suite 500
Buffalo, New York 14203
Phone: (716) 842-3165

111 Bain Street, Suite 332
Greensboro, North Carolina 27406
Phone: (336) 937-9009

April 2023

REVISIONS:

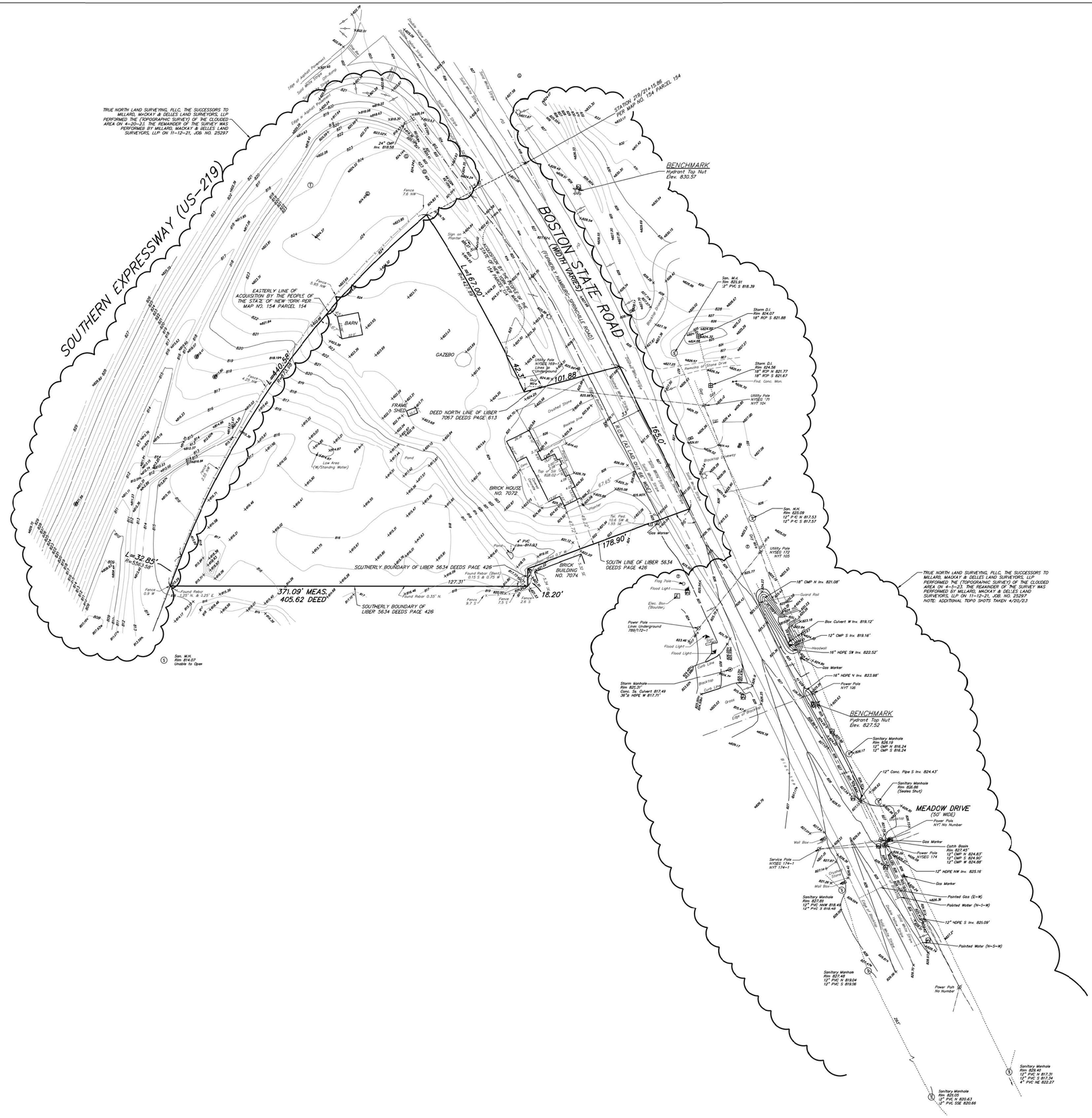
No.	Description	Date
1	Rev. C-Store Bldg. Footprint	7/25/2023



LOCATION MAP
NOT TO SCALE

DWG NO.	DRAWING TITLE
–	COVER SHEET
–	SURVEY – BY TRUE NORTH (NTS)
C-001	DEMOLITION & EROSION CONTROL PLAN
C-002	DEMOLITION & EROSION CONTROL DETAILS
C-100	SITE PLAN
C-101	SITE DETAILS
C-102	SITE DETAILS
C-200	GRADING PLAN
C-300	STORM DRAINAGE PLAN
C-301	STORM DRAINAGE DETAILS
C-302	STORM DRAINAGE DETAILS
C-400	UTILITY PLAN
C-401	WATER DETAILS
C-402	SANITARY SEWER DETAILS
C-403	SANITARY SEWER DETAILS
C-404	SANITARY SEWER DETAILS
C-500	SITE LIGHTING PLAN
L-100	LANDSCAPE PLAN

Mixed-Use Development
7072 Boston State Road (NY-391)
Boston, New York 14025
SITE DEVELOPMENT DRAWINGS



40 0 40 80 120

SCALE: 1"=40'

LEGEND

- UTILITY / SERVICE POLE
- WATER LINE VALVE
- FIRE HYDRANT
- D.I. (DROP INLET - STORM)
- MANHOLE (STORM)
- MANHOLE (ELECTRIC)
- MANHOLE (TRAFFIC)
- MANHOLE (SANITARY)
- MANHOLE (TELEPHONE)
- GASLINE MARKER
- GAS LINE VALVE
- LIGHT STANDARD
- SIGN
- H.C. HANDICAP
- GAS LINE MARKER
- MAILBOX
- ELECTRIC HANDHOLE

- R.O.W. RIGHT OF WAY
- CONC. CONCRETE
- INV. INVERT
- M.H. MANHOLE
- GAS LINE
- WATER LINE
- TELEPHONE LINE
- ELECTRIC LINE
- UTILITY LINES
- CABLE LINES
- D. DEED
- M. MEASURED
- L. LIBER
- P. PAGE

UTILITIES

The underground utilities shown have been located from field survey information & existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from the information available. This surveyor has not physically located the underground utilities.

Note: Underground Utility information has been ordered from the respective utility companies. As the information is received, this map will be amended to reflect said information.

National Fuel Attn: Ed Kubas (716) 857-7967	Time Warner Cable Attn: Chris Smith (800) 262-8600	Verizon Attn: Mark Granoshow (716) 840-8656
Erie County Water Dept. Attn: Steve Danzer (716) 685-8289	N.Y.S. Electric & Gas Attn: Sam Cappiello (716) 651-1256	National Grid Attn: Roy Schultz (315) 428-6319

ELEVATION DATUM

ELEVATIONS ON THIS MAP WERE DETERMINED UTILIZING GPS DATUM: NAD83 (2011) EPOCH 2010.0 DATUM

SITE BENCH MARK:
TOP SHUTOFF, FIRE HYDRANTS AS SHOWN HEREON

INSTRUMENT(S) UTILIZED IN DETERMINING LOCATION OF BOUNDARY LINES: Liber 7213 Deeds P.8231
THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS THAT MAY BE REVEALED IN SAID ABSTRACT.
NOTE: PROPERTY CORNER MONUMENTS WERE NOT PLACED AS PART OF THIS SURVEY.

THIS SURVEY MAP WAS PREPARED IN ACCORDANCE WITH THE CURRENT STANDARDS FOR LAND SURVEYS ADOPTED BY THE BAR ASSOCIATION OF ERIE COUNTY AT THE REQUEST OF Miranda Development LLC.

CHRISTOPHER J. BARR — NYSPLS NO. 050068

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TRUE NORTH
LAND SURVEYING, PLLC
150 AERO DRIVE
BUFFALO, NEW YORK 14225
(716)631-5140 ~ Truenorthpllc@aol.com

AMEN'): 4-24-23
SURVEY DATE: 4-5-23
©DRAWING DATE: 4-8-23
SCALE: 1" = 40'
"ALL RIGHTS RESERVED"

BOUNDARY AND TOPOGRAPHIC SURVEY

PART OF LOT 30 SECTION ____ TOWNSHIP 8 RANGE 7 OF THE Holland Land Company's SURVEY~ Erie COUNTY, N.Y.

SURVEY OF: 7072 Boston State Road, Town of Boston

THIS MAP VOID UNLESS EMBOSSED WITH NEW YORK STATE LICENSED LAND SURVEYOR'S SEAL. ALTERING ANY ITEM ON THIS MAP IS A VIOLATION OF THE LAW EXCEPT AS PROVIDED IN SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

SBL No. 211.00-2-2

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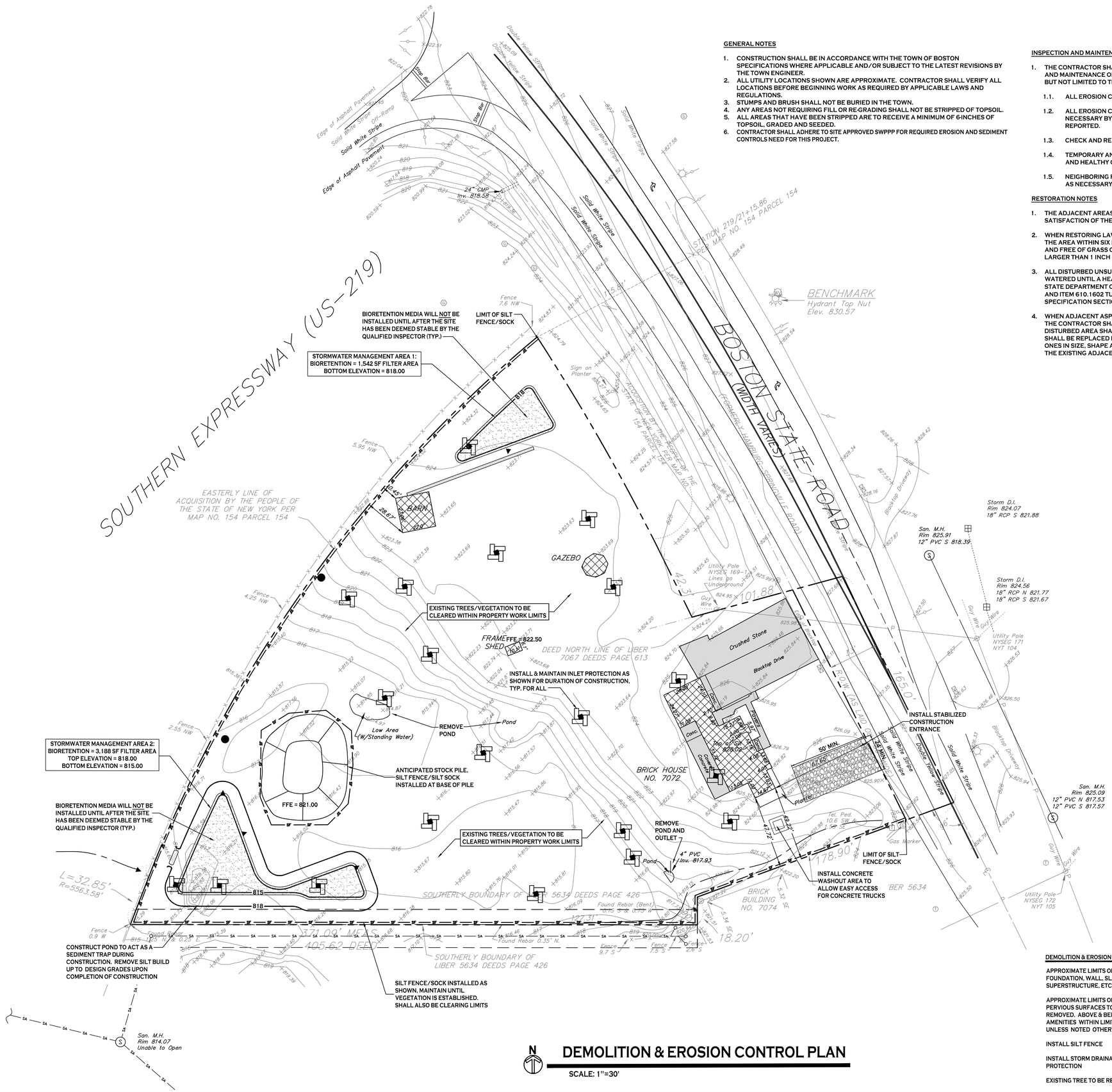

N

DEMOLITION & EROSION CONTROL PLAN

SCALE: 1"=30'

GENERAL NOTES

1. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF BOSTON SPECIFICATIONS WHERE APPLICABLE AND/OR SUBJECT TO THE LATEST REVISIONS BY THE TOWN ENGINEER.
2. ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL LOCATIONS BEFORE BEGINNING WORK AS REQUIRED BY APPLICABLE LAWS AND REGULATIONS.
3. STUMPS AND BRUSH SHALL NOT BE BURIED IN THE TOWN.
4. ANY AREAS NOT REQUIRING FILL OR RE-GRADING SHALL NOT BE STRIPPED OF TOPSOIL.
5. ALL AREAS THAT HAVE BEEN STRIPPED ARE TO RECEIVE A MINIMUM OF 6-INCHES OF TOPSOIL, GRADED AND SEEDED.
6. CONTRACTOR SHALL ADHERE TO SITE APPROVED SWPPP FOR REQUIRED EROSION AND SEDIMENT CONTROLS NEED FOR THIS PROJECT.

INSPECTION AND MAINTENANCE PROCEDURES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSIGNING AN INDIVIDUAL TO BE RESPONSIBLE FOR THE INSPECTION AND MAINTENANCE OF TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES. THE WORK MAY INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:
   - 1.1. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDER DAYS.
   - 1.2. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER. AS DEEMED NECESSARY BY THE TOWN AND ENGINEER, REPAIRS SHALL BE COMPLETED WITHIN 24 HOURS OF BEING REPORTED.
   - 1.3. CHECK AND REPAIR SILT FENCING AND STRAW BALE BARRIERS, AS NECESSARY.
   - 1.4. TEMPORARY AND PERMANENT SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH AND REPAIRED AS NECESSARY.
   - 1.5. NEIGHBORING ROADWAYS WILL BE MONITORED TO ENSURE THAT ANY TRACKED MUD, DIRT, OR ROCK IS SWEPT AS NECESSARY.

RESTORATION NOTES

1. THE ADJACENT AREAS DISTURBED OR DAMAGED DURING CONSTRUCTION MUST BE RESTORED IN KIND TO THE SATISFACTION OF THE OWNER.
2. WHEN RESTORING LAWN AREAS ADJACENT TO NEW CONSTRUCTION, ON-SITE MATERIAL MAY BE USED TO BACKFILL THE AREA WITHIN SIX INCHES OF THE FINISHED SURFACE. ON-SITE MATERIAL SHALL BE THOROUGHLY COMPACTED AND FREE OF GRASS CLUMPS, TREE ROOTS PIECES OF ASPHALT AND OTHER EXTRANEOUS MATERIALS, AND STONES LARGER THAN 1 INCH IN SIZE.
3. ALL DISTURBED UNSURFACED AREAS SHALL RECEIVE FOUR INCHES OF TOPSOIL, SEED AND MULCH AND SHALL BE WATERED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. ALL DISTURBED LAWN AREAS WITHIN THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT) ROW BE RESTORED USING ITEM 610.1402 TOPSOIL - ROADSIDE AND ITEM 610.1602 TURF ESTABLISHMENT - LAWNS (OR EQUAL) AND COMPLY WITH NYSDOT STANDARD SPECIFICATION SECTION 713 - LANDSCAPE DEVELOPMENT MATERIALS.
4. WHEN ADJACENT ASPHALT, CONCRETE OR PAVING STONE AREAS ARE DISTURBED AS PART OF THE CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO REPLACE THE DAMAGED OR EXCAVATED AREA. THE PERIMETER OF THE DISTURBED AREA SHALL BE SAW CUT FULL DEPTH, SO THAT ALL LINES ARE STRAIGHT AND TRUE. PAVING STONES SHALL BE REPLACED IN WHOLE UNITS ONLY, AND ALL REPLACEMENT PAVING STONES ARE TO MATCH THE EXISTING ONES IN SIZE, SHAPE AND COLOR. ASPHALT SHALL BE COMPACTED TO A SMOOTH FINISH AND SHALL BE FLUSH WITH THE EXISTING ADJACENT AREA THAT IS TO REMAIN.

EROSION CONTROL PLAN

THE FOLLOWING EROSION CONTROL PROCEDURE SHALL BE ADHERED TO BY THE CONTRACTOR:

1. INSTALL TEMPORARY SILT FENCE BARRIERS AS DIRECTED BY THE OWNER AND AT ALL EXISTING STORMWATER CATCH BASINS WITHIN THE WORK AREA TO PREVENT SEDIMENT MIGRATION. ALL SILT FENCE BARRIERS SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS.
2. THE TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE FOR RE-USE AS DIRECTED BY THE OWNER. ALL LOCAL ORDINANCES REGARDING THE SALE OF TOPSOIL MUST BE FOLLOWED. TOPSOIL MAY NOT BE REMOVED WITHOUT A PERMIT.
3. ALL SILT FENCE BARRIERS SHALL BE REPLACED WHEREVER THEY BECOME CLOGGED OR INOPERABLE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AND REMOVAL OF TEMPORARY SEDIMENTATION CONTROLS.
5. THE CONTRACTOR MUST CONTROL DUST DURING CONSTRUCTION. DURING EARTHWORK OPERATIONS, WATER-SPREADING EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR, AND WATER SPREAD AS NECESSARY AND AS DIRECTED BY THE OWNER IN ORDER TO CONTROL DUST.
6. DIRT OR DEBRIS LEFT ON LOCAL PUBLIC ROADS AS A RESULT OF THIS CONSTRUCTION PROJECT SHALL BE REMOVED AND ROAD SURFACES CLEANED BY THE CONTRACTOR ON A DAILY BASIS.
7. ALL DISTURBED AREAS (EXCEPT AREAS TO BE PAVED OR BUILT UPON) SHALL BE TOPSOILED TO A MINIMUM 4" DEPTH AND SEEDED IMMEDIATELY AFTER FINE GRADING TAKES PLACE AND AS SOON AS PHYSICALLY POSSIBLE.
8. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF DOWNSTREAM STORM SEWERS, DITCHES, AND CULVERTS. SILT BUILDUP FOUND TO BE A RESULT OF THIS SITE CONSTRUCTION WORK SHALL BE REMOVED FROM DOWNSTREAM CULVERTS BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER OR THE CITY.
9. ALL SOIL EROSION AND SEDIMENT CONTROL DEVICES AND MATERIALS SHALL BE IN PLACE PRIOR TO BEGINNING EARTHWORK OPERATIONS AND SHALL BE MAINTAINED UNTIL THE NEW SLOPES ARE STABILIZED WITH SEEDING AND/OR SLOPE PROTECTION, AS DIRECTED BY THE ENGINEER.
10. INSTALL TEMPORARY SILT FENCE AROUND THE BASE OF STOCKPILES.

NOTES:

1. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT THOSE ITEMS TO REMAIN, SUCH AS TREES, PROPERTY CORNER PINS, UTILITY POLES, VALVES, HYDRANTS, CURBS, MANHOLES AND CATCH BASINS.
2. TEMPORARY SILT FENCE AND STRAW BALES TO BE INSTALLED AS DIRECTED BY THE OWNERS FIELD REPRESENTATIVE. MAINTAIN UNTIL VEGATATION IS ESTABLISHED AND PAVEMENT IS INSTALLED.
3. FOR THOSE STRUCTURES TO BE DEMOLISHED, ALL EXISTING UTILITY SERVICES SHALL BE ABANDONED IN ACCORDANCE WITH LOCAL REGULATIONS, ALL METERS SHALL BE RETURNED TO PROPER OWNERS.
4. THE CONTRACTOR SHALL INSTALL STABILIZED CONSTRUCTION ENTRANCES WHERE ACCESSING THE SITE FROM PAVED ROADWAYS.
5. THE CONTRACTOR SHALL INSTALL TEMPORARY TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH NYS M.U.T.C.D. STANDARDS PRIOR TO STARTING WORK.
6. ADD SILT SACKS TO ALL CATCH BASINS. CATCH BASINS ARE TO RECEIVE REGULAR MAINTENANCE THROUGHOUT THE ENTIRE PROJECT.
7. COVERED DUMPSTERS SHALL BE PROVIDED ONSITE AS REQUIRED FOR CONSTRUCTION WASTE.
8. SILT SOCK (COMPOST FILTER SOCK) CAN BE USED AS AN ACCEPTABLE SUBSTITUTE FOR SILT FENCE PER THE 'NYS STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL'. BOTH SILT SOCKS AND FENCE CAN BE USED WHERE EROSION WILL OCCUR IN THE FORM OF SHEET EROSION WITH NO CONCENTRATION OF WATER FLOWING TO THE BARRIER. BOTH PRACTICES CAN BE UTILIZED AT THE PERIMETER OF THE SITE.

DEMOLITION & EROSION CONTROL LEGEND

- APPROXIMATE LIMITS OF EXISTING BUILDING FOUNDATION, WALL, SLAB, SUPERSTRUCTURE, ETC. TO BE REMOVED
- APPROXIMATE LIMITS OF IMPERVIOUS & PERVIOUS SURFACES TO BE CLEARED/ REMOVED. ABOVE & BELOW GROUND AMENITIES WITHIN LIMITS TO BE REMOVED UNLESS NOTED OTHERWISE
- INSTALL SILT FENCE
- INSTALL STORM DRAINAGE INLET PROTECTION
- EXISTING TREE TO BE REMOVED

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

CARMINAWOOD DESIGN
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Buffalo, New York 14203
Phone: (716) 842-3165

Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

STATE OF NEW YORK — R. CHRISTOPHER HOLT — 076394 — PROFESSIONAL ENGINEER

DRAWING NAME:

Demolition & Erosion Control Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-001

Project No: 22.305

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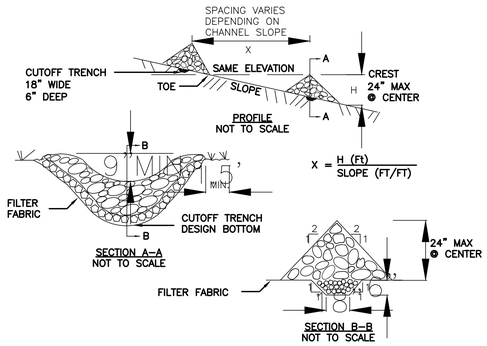


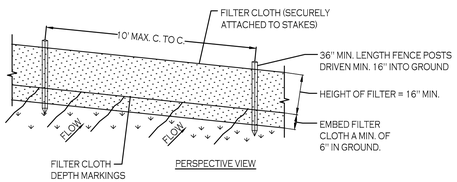
CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

STONE CHECK DAM DETAIL

NOT TO SCALE

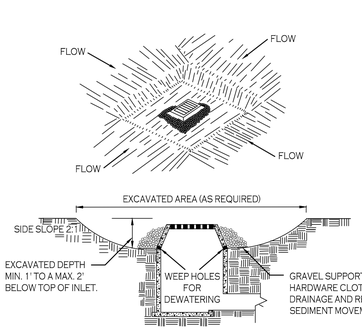


CONSTRUCTION SPECIFICATIONS

1. WOVEN FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

SILT FENCE DETAIL

NOT TO SCALE



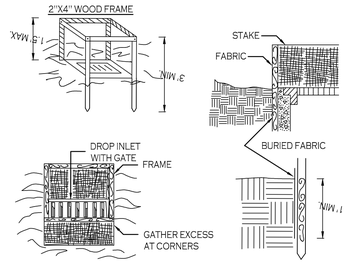
CONSTRUCTION SPECIFICATIONS

1. CLEAR THE AREA OF ALL DEBRIS THAT WILL HINDER EXCAVATION.
2. GRADE APPROACH TO THE INLET UNIFORMLY AROUND THE BASIN.
3. WEEP HOLES SHALL BE PROTECTED BY GRAVEL.
4. UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA, SEAL WEEP HOLES, FILL BASIN WITH STABLE SOIL TO FINAL GRADE, COMPACT IT PROPERLY AND STABILIZE WITH PERMANENT SEEDING.

MAXIMUM DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 1

NOT TO SCALE



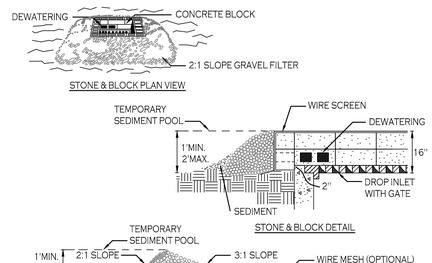
CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN EOS OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2" x 4" WOOD OR EQUIVALENT. METAL WITH A MINIMUM LENGTH OF 3 FEET.
4. SPACE STAKES EVENLY AROUND INLET 3 FEET APART AND DRIVE A MINIMUM 18 INCHES DEEP. SPANS GREATER THAN 3 FEET MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1 FOOT MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2" x 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.

MAXIMUM DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 2

NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

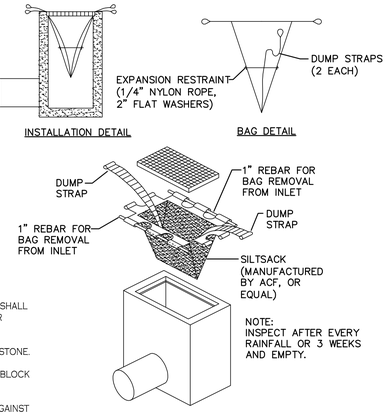
1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE FOR DEWATERING. FOUNDATION SHALL BE 2 INCHES MINIMUM BELOW REST OF INLET AND BLOCKS SHALL BE PLACED AGAINST INLET FOR SUPPORT.
2. HARDWARE CLOTH OR 1/2" WIRE MESH SHALL BE PLACED OVER BLOCK OPENINGS TO SUPPORT STONE.
3. USE CLEAN STONE OR GRAVEL 1/2-3/4 INCH IN DIAMETER PLACED 2 INCHES BELOW TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER.
4. FOR STONE STRUCTURES ONLY, A 1 FOOT THICK LAYER OF THE FILTER STONE WILL BE PLACED AGAINST THE 3 INCH STONE AS SHOWN ON THE DRAWINGS.

MAXIMUM DRAINAGE AREA 1 ACRE

INLET PROTECTION DETAIL 3

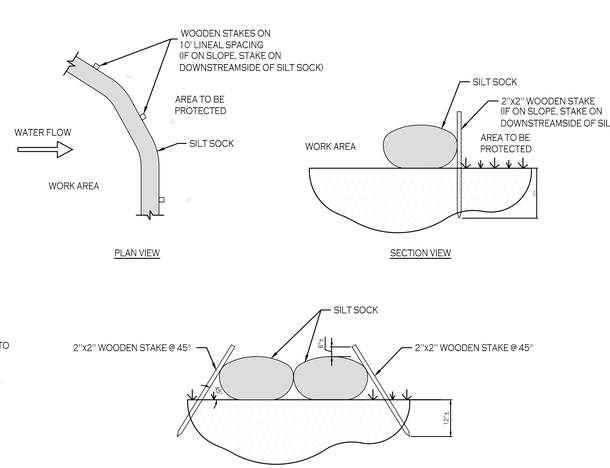
NOT TO SCALE

NOTE: INSTALL ONE OF THE INLET PROTECTION OPTIONS SHOWN PRIOR TO CONSTRUCTION



SILT SACK DETAIL

NOT TO SCALE



NOTES:

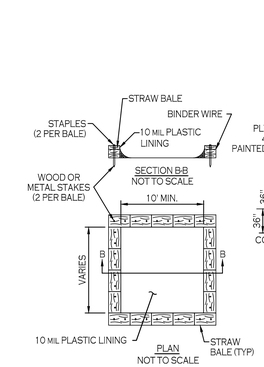
CONTRACTOR SHALL INSPECT AND MAINTAIN SILT SOCK AS NEEDED DURING THE DURATION OF CONSTRUCTION PROJECT.

CONTRACTOR SHALL REMOVE SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK WHEN IT HAS REACHED ½ OF THE EXPOSED HEIGHT OF THE SILT SOCK. ALTERNATIVELY, RATHER THAN CREATE A SOIL DISTURBING ACTIVITY, THE ENGINEER MAY CALL FOR ADDITIONAL SILT SOCK TO BE ADDED AT AREAS OF HIGH SEDIMENTATION, PLACED IMMEDIATELY ON TOP OF THE EXISTING SEDIMENT LADEN SILT SOCK.

SILT SOCK SHALL BE OVERLAPPED 12" AT JOINTS AND STAKED ON EACH SIDE OF THE SOCK AT A 45° ANGLE

SILT SOCK DETAIL

NOT TO SCALE



NOTES

1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.

CONCRETE WASHOUT DETAIL

NOT TO SCALE

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Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

STATE OF NEW YORK
R. CHRISTOPHER WOOD
076394
LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:

Demolition & Erosion Control Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-002

Project No: 22.305

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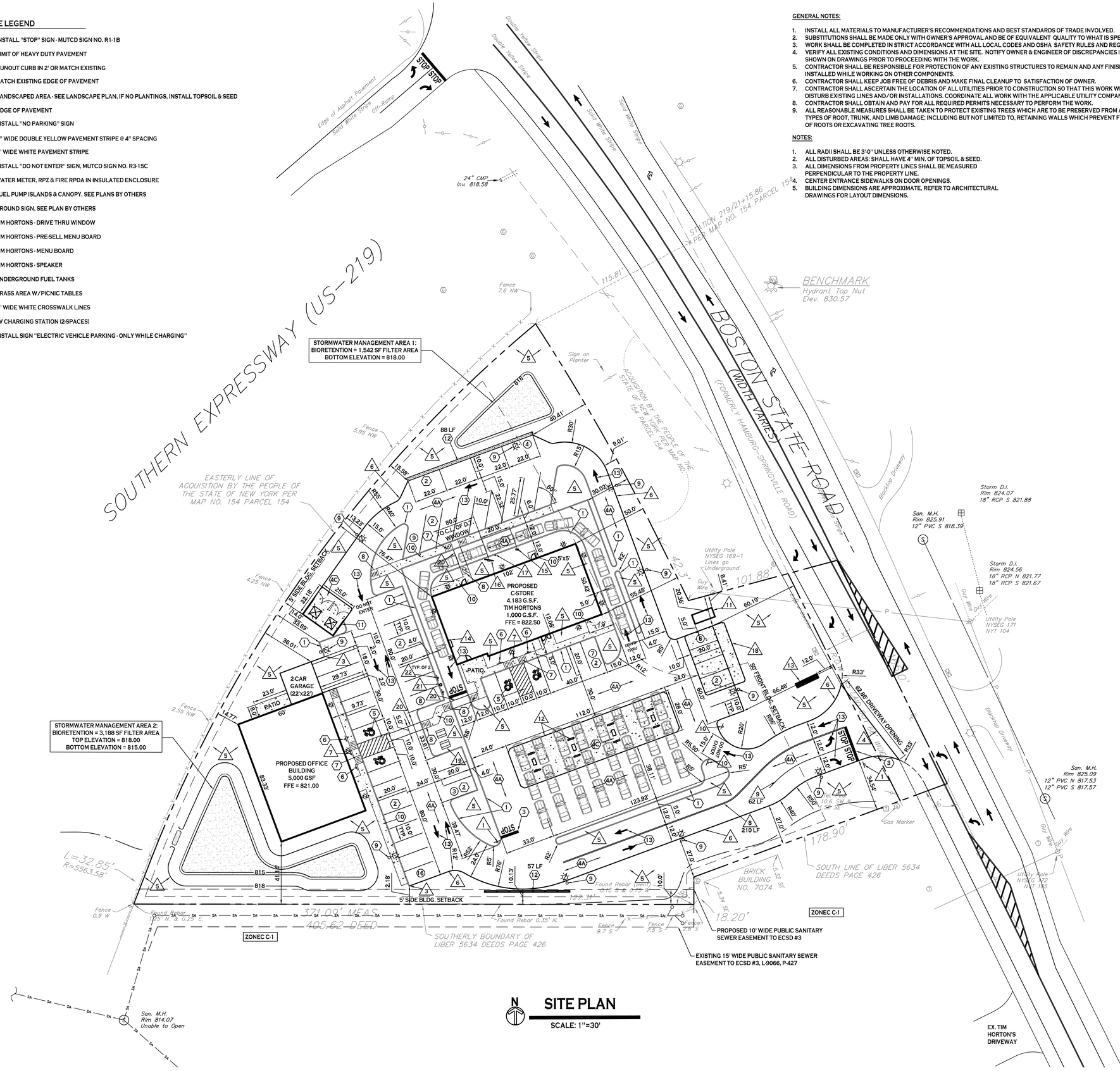
NOTE LEGEND

1. INSTALL "STOP" SIGN - MUTCD SIGN NO. R1-1B
2. LIMIT OF HEAVY DUTY PAVEMENT
3. RUNOUT CURB IN 2' OR MATCH EXISTING
4. MATCH EXISTING EDGE OF PAVEMENT
5. LANDSCAPED AREA - SEE LANDSCAPE PLAN, IF NO PLANTINGS, INSTALL TOPSOIL & SEED
6. EDGE OF PAVEMENT
7. INSTALL "NO PARKING" SIGN
8. 4" WIDE DOUBLE YELLOW PAVEMENT STRIPE @ 4" SPACING
9. 4" WIDE WHITE PAVEMENT STRIPE
10. INSTALL "DO NOT ENTER" SIGN, MUTCD SIGN NO. R3-15C
11. WATER METER, RPZ & FIRE RPDA IN INSULATED ENCLOSURE
12. FUEL PUMP ISLANDS & CANOPY, SEE PLANS BY OTHERS
13. GROUND SIGN, SEE PLAN BY OTHERS
14. TIM HORTONS - DRIVE THRU WINDOW
15. TIM HORTONS - PRE-SELL MENU BOARD
16. TIM HORTONS - MENU BOARD
17. TIM HORTONS - SPEAKER
18. UNDERGROUND FUEL TANKS
19. GRASS AREA W/PICNIC TABLES
20. 4" WIDE WHITE CROSSWALK LINES
21. EV CHARGING STATION (2-SPACES)
22. INSTALL SIGN "ELECTRIC VEHICLE PARKING - ONLY WHILE CHARGING"



SITE PLAN

SCALE: 1"=30'

GENERAL NOTES:

1. INSTALL ALL MATERIALS TO MANUFACTURER'S RECOMMENDATIONS AND BEST STANDARDS OF TRADE INVOLVED.
2. SUBSTITUTIONS SHALL BE MADE ONLY WITH OWNER'S APPROVAL AND BE OF EQUIVALENT QUALITY TO WHAT IS SPECIFIED.
3. WORK SHALL BE COMPLETED IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND OSHA SAFETY RULES AND REGULATIONS.
4. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AT THE SITE. NOTIFY OWNER & ENGINEER OF DISCREPANCIES IN CONDITIONS SHOWN ON DRAWINGS PRIOR TO PROCEEDING WITH THE WORK.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ANY EXISTING STRUCTURES TO REMAIN AND ANY FINISH MATERIAL INSTALLED WHILE WORKING ON OTHER COMPONENTS.
6. CONTRACTOR SHALL KEEP JOB FREE OF DEBRIS AND MAKE FINAL CLEANUP TO SATISFACTION OF OWNER.
7. CONTRACTOR SHALL ASCERTAIN THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION SO THAT THIS WORK WILL NOT DISTURB EXISTING LINES AND/OR INSTALLATIONS. COORDINATE ALL WORK WITH THE APPLICABLE UTILITY COMPANIES.
8. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS NECESSARY TO PERFORM THE WORK.
9. ALL REASONABLE MEASURES SHALL BE TAKEN TO PROTECT EXISTING TREES WHICH ARE TO BE PRESERVED FROM ALL POSSIBLE TYPES OF ROOT, TRUNK, AND LIMB DAMAGE; INCLUDING BUT NOT LIMITED TO, RETAINING WALLS WHICH PREVENT FILLING ON TOP OF ROOTS OR EXCAVATING TREE ROOTS.

NOTES:

1. ALL RADII SHALL BE 3'-0" UNLESS OTHERWISE NOTED.
2. ALL DISTURBED AREAS: SHALL HAVE 4" MIN. OF TOPSOIL & SEED.
3. ALL DIMENSIONS FROM PROPERTY LINES SHALL BE MEASURED PERPENDICULAR TO THE PROPERTY LINE.
4. CENTER ENTRANCE SIDEWALKS ON DOOR OPENINGS.
5. BUILDING DIMENSIONS ARE APPROXIMATE, REFER TO ARCHITECTURAL DRAWINGS FOR LAYOUT DIMENSIONS.

SITE DATA

SITE AREA = 2.65 AC
ZONED: C-1 - LOCAL RETAIL BUSINESS DISTRICT
DESCRIPTION: 5,000 SF OFFICE BLDG., 5,183 SF C-STORE & RESTAURANT W/FUEL PUMPS

	REQUIRED	PROVIDED
SETBACKS - BUILDING		
FRONT:	50 FT	50.0 FT MIN.
SIDE:	5 FT *	> 5 FT
SIDE (ABUTTING RES.)	20 FT OR HGT. OF BLDG.	N/A
REAR	30 FT OR HGT. OF BLDG.	N/A
SETBACKS - PARKING		
FRONT (STREET LINE):	20 FT	>20 FT
SIDE/REAR:	NONE	5.54 FT MIN.
SIDE/REAR (ABUTTING RES.)	10 FT	N/A
GREENSPACE		
TOTAL SITE :	15%	1.03 AC (39%)
PARKING (10' x 20')		53 SPACES
# OF SPACES - SEE CALCULATION BELOW	54	2 GARAGE
		55 SPACES
MAX. BUILDING HEIGHT	35 FT	< 35 FT
LOT COVERAGE	40% (46,174 SF)	8.8% (10,183 SF)

* 25 FT IS USED FOR VEHICULAR INGRESS OR EGRESS

PARKING CALCULATION:
"RETAIL"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 4,183 GSF / 200 = 21 SPACES

"RESTAURANT"
REQ'D PARKING = 2 SPACES PER 5 SEATS
= (20 SEATS / 5) x 2 = 8 SPACES

"OFFICE"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 5,000 GSF / 200 = 25 SPACES

TOTAL = 54 SPACES

DETAIL LEGEND SEE SITE DETAIL SHEET

1. TYPE "A" CONCRETE CURB
2. 90° PARKING STALL
3. STOP BAR
4A. STANDARD DUTY ASPHALT
4B. HEAVY DUTY ASPHALT
4C. EXTERIOR CONCRETE SLAB ON GRADE
5. HANDICAPPED PAVEMENT MARKINGS
6. HANDICAPPED PARKING SIGN
7. HANDICAPPED PAVEMENT RAMP
8. SIDEWALK CURB RAMP
9. LIGHT POLE FOUNDATION
10. CONCRETE SIDEWALK, 5' WIDE UNLESS OTHERWISE NOTED
11. DUMPSTER ENCLOSURE
12. DECORATIVE WOODEN GUIDE RAIL
13. PAINTED TRAFFIC ARROWS

SITE LEGEND

- PROPERTY LINE
- PROPOSED CONCRETE CURB
- PROPOSED CONCRETE SIDEWALK
- PROPOSED SIGN
- PROPOSED PARKING NUMBER (27)
- PROPOSED LIGHT POLE FOUNDATION
- PROPOSED WALL-MOUNTED LIGHT

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

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7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Rev. plan per ECDSM comments	7/5/2023
2	Rev. C-Store Bldg. Footprint	7/25/2023
3	Added EV Charging Spaces	7/31/2023
4	Removed Retaining Wall	8/4/2023

STATE OF NEW YORK
R. CHRISTOPHER WOOD
07639A
PROFESSIONAL ENGINEER

DRAWING NAME:
Site Plan

Date: 4/24/2023
Drawn By: C. Wood
Scale: As Noted

DRAWING NO.
C-100

Project No: 22.305

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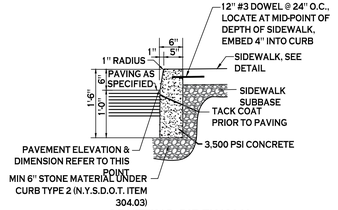
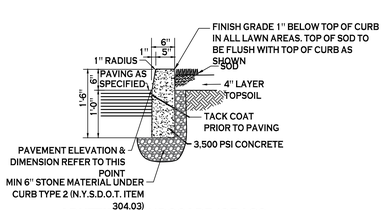


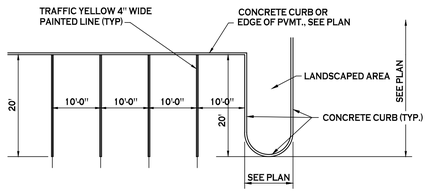
ABUTTING SIDEWALK



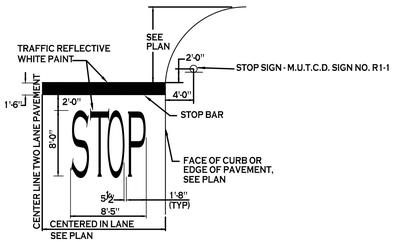
ABUTTING LANDSCAPE/GRASS

NOTES:
1. CONTROL JOINTS TO BE 2" DEEP AT 15'-0" O.C. - SEE SPECIFICATIONS FOR FURTHER JOINT REQUIREMENTS NYSDOT 702-0700.
2. WHERE THE CURB DROPS (IS FLUSH WITH ASPHALT) THE DEPTH OF CURB BELOW GRADE SHALL BE INCREASED TO 1'-6" AND OTHER DIMENSIONS ADJUSTED ACCORDINGLY.

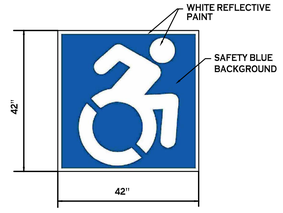
TYPE "A" CONCRETE CURB - 1



90° PARKING STALL LAYOUT - 2

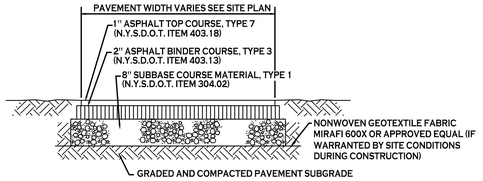


STOP BAR DETAIL - 3



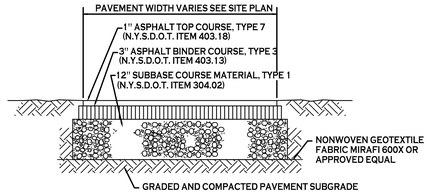
SYMBOL TO BE CENTERED IN PARKING SPACE

INTERNATIONAL HANDICAP SYMBOL



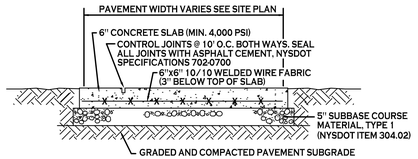
NOTE: CONSTRUCTION METHODS FOR ASPHALT PAVEMENT SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 401-3, WITH SUBBASE CONSTRUCTION METHODS CONFORMING TO NYSDOT STANDARD SPECIFICATION 304-3.

STANDARD DUTY ASPHALT SECTION - 4A



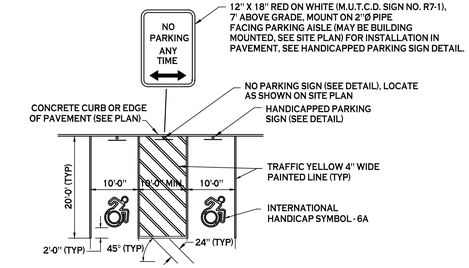
NOTE: CONSTRUCTION METHODS FOR ASPHALT PAVEMENT SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 401-3, WITH SUBBASE CONSTRUCTION METHODS CONFORMING TO NYSDOT STANDARD SPECIFICATION 304-3.

HEAVY DUTY ASPHALT SECTION - 4B

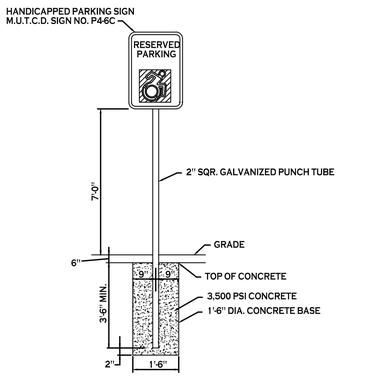


NOTE: CONCRETE PAVEMENT MATERIAL SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 501 AND CONSTRUCTION METHODS SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 502-3.

EXTERIOR CONCRETE SLAB-ON-GRADE SECTION - 4C



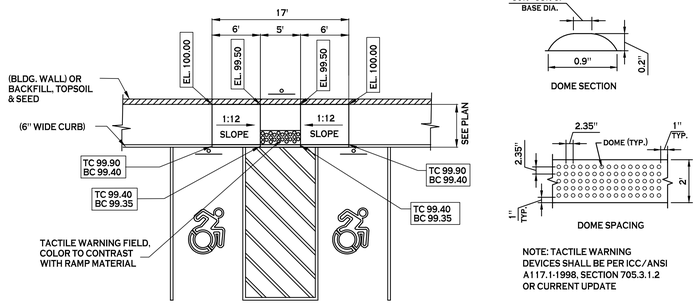
HANDICAPPED PAVEMENT MARKINGS & SIGNAGE - 5



NOTES:
1. HANDICAPPED PARKING SIGN SHALL CONFORM WITH CURRENT STATE AND LOCAL CODES AND REGULATIONS.

HANDICAP PARKING SIGNS - 6

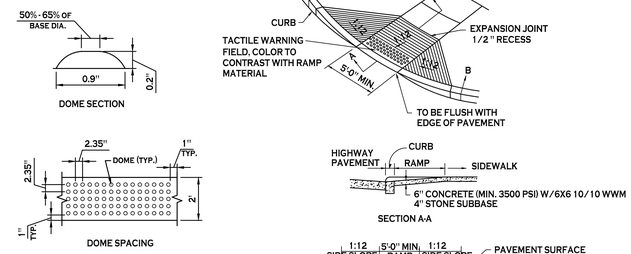
INSTALLED IN GRASS/LANDSCAPED AREA



NOTE: TACTILE WARNING DEVICES SHALL BE PER ICC/ANSI A117.1-1998, SECTION 705.3.1.2 OR CURRENT UPDATE

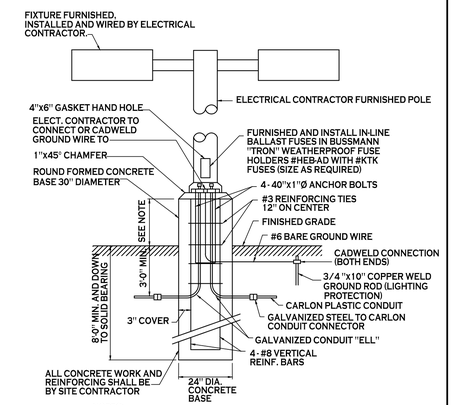
NOTE: ELEVATIONS & DIMENSIONS SHOWN ARE TO ILLUSTRATE GRADE CHANGE ONLY. SEE SITE & GRADING PLAN FOR ACTUAL DATUM & DIMENSIONS

HANDICAPPED PAVEMENT RAMP - 7



NOTE: TACTILE WARNING DEVICES SHALL BE PER ICC/ANSI A117.1-1998, SECTION 705.3.1.2 OR CURRENT UPDATE

SIDEWALK CURB RAMP - 8



NOTES:
1. FOR LOCATIONS OF FOUNDATIONS SEE SITE PLAN
2. FOR LIGHT FIXTURE ORDERING INFORMATION SEE SITE LIGHTING PLAN
3. LIGHT POLE BASE EXPOSURE ABOVE GRADE SHALL BE:
   IN CURBED ISLANDS: 6" ABOVE TOP OF CURB ELEVATION
   IN PAVEMENT: 3" ABOVE GRADE
   IN NON-CURBED GRASS AREAS: 6" ABOVE GRADE

LIGHT POLE FOUNDATION - 9

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Mixed-Use Development

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Boston, New York 14025

REVISIONS:

No.	Description	Date

STATE OF NEW YORK
R. CHRISTOPHER WOOD
076394
LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:

Site Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-101

Project No: 22.305

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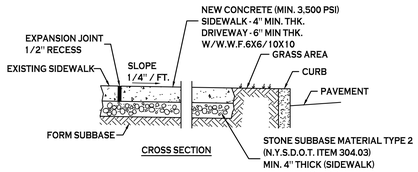
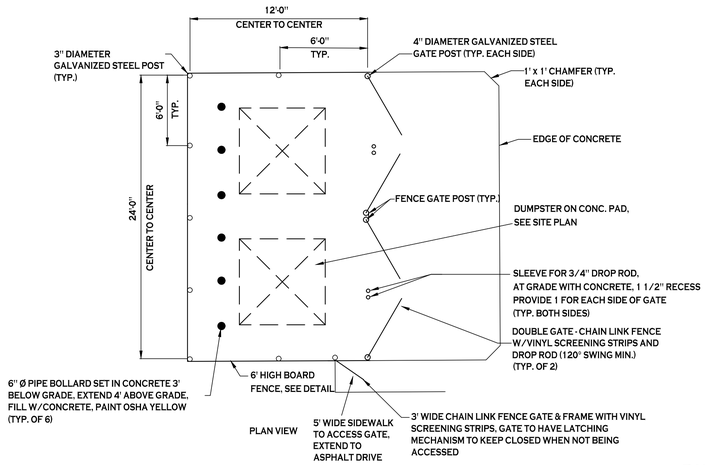
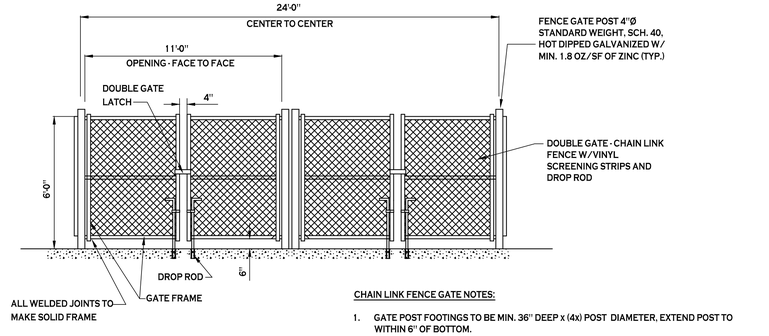


NOTES:

1. CONTROL JOINTS TO BE AT 5'-0" O.C., BOTH WAYS WHERE APPLICABLE. SEE SPECIFICATIONS FOR FURTHER JOINT REQUIREMENTS NYSDOT 702-0700.
2. CONCRETE SIDEWALK AND DRIVEWAY MATERIAL SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 501 AND CONSTRUCTION METHODS SHALL CONFORM TO NYSDOT STANDARD SPECIFICATION 608-3.
3. SUBBASE GRADE SHALL FOLLOW THE PROPOSED GRADE OF THE SIDEWALK AND SLOPE AWAY FROM BUILDING WHERE APPLICABLE, PROVIDE CONTINUOUS STONE PATH TO CURB UNDERDRAIN WHERE PROVIDED.
4. FULL DEPTH EXPANSION JOINTS SHALL BE INSTALLED EVERY 20' O.C., BOTHWAYS WHERE APPLICABLE. SEE SPECIFICATIONS FOR FURTHER JOINT REQUIREMENTS NYSDOT 702-0700.
5. SEE CURB DETAIL FOR DOWLING REQUIREMENTS WHERE ABUTTING CURB.
6. INSTALL 6" LONG #3 DOWELS @ 12" O.C. WHERE SIDEWALK ABUTS A BUILDING WALL AT AN ENTRANCE, THICKEN SIDEWALK TO 6" AT BUILDING WALL AND INSTALL DOWEL CENTERED IN THE 6" DEPTH. DOWELS AND THICKENING OF SIDEWALK SHALL EXTEND 18" EITHER SIDE OF ENTRANCE.
7. INSTALL 1/2" PREMOLDED EXPANSION JOINT WITH BACKER ROD & SEALANT WHERE SIDEWALK ABUTS BUILDING OR OTHER STRUCTURE.

CONCRETE SIDEWALK - 10

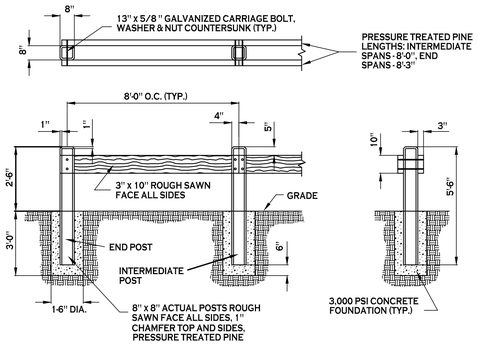




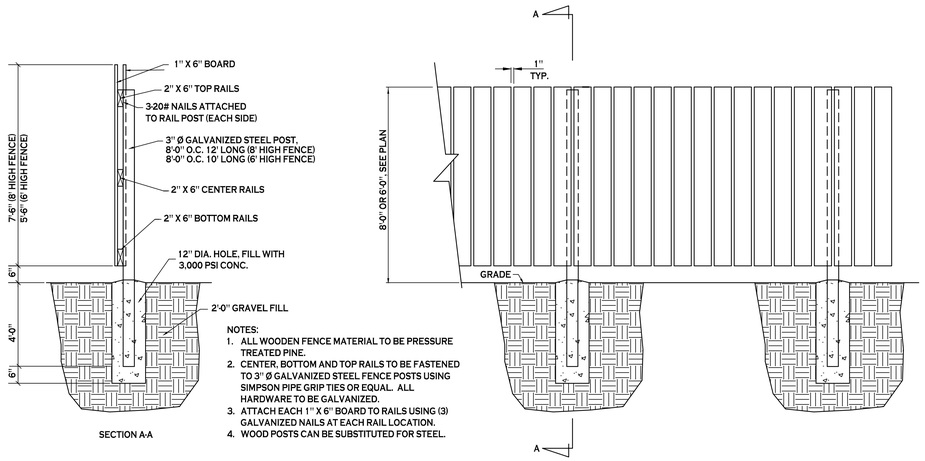
DUMPSTER ENCLOSURE - 11

CHAIN LINK FENCE GATE NOTES:

1. GATE POST FOOTINGS TO BE MIN. 36" DEEP x (4x) POST DIAMETER, EXTEND POST TO WITHIN 6" OF BOTTOM.
2. GATE FRAMES TO BE 2" SQ. GALVANIZED STEEL, WEIGHING 2.60 LB/FT IN ACCORDANCE WITH ASTM F 900.
3. CHAIN LINK FENCE FABRIC SHALL BE 2" MESH, 9 GAUGE, ZINC COATED STEEL CORE WIRE. INSTALL MESH WITH HOOK BOLTS AND TENSION BARS ON ALL 4 SIDES. ATTACH AT 15" MAX.
4. DOUBLE GATE LATCH TO BE FORKED TYPE CAPABLE OF RETAINING GATE IN CLOSED POSITION AND HAVE PROVISION FOR PAD LOCK. LATCH SHALL BE OPERABLE FROM EITHER SIDE OF GATE.
5. ALL HARDWARE TO BE HOT DIPPED GALVANIZED STEEL TO SUIT GATE SIZE.



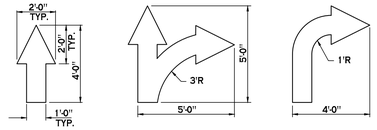
DECORATIVE WOODEN GUIDE RAIL - 12



NOTES:

1. ALL WOODEN FENCE MATERIAL TO BE PRESSURE TREATED PINE.
2. CENTER, BOTTOM AND TOP RAILS TO BE FASTENED TO 3" Ø GALVANIZED STEEL FENCE POSTS USING SIMPSON PIPE GRIP TIES OR EQUAL. ALL HARDWARE TO BE GALVANIZED.
3. ATTACH EACH 1" X 6" BOARD TO RAILS USING (3) GALVANIZED NAILS AT EACH RAIL LOCATION.
4. WOOD POSTS CAN BE SUBSTITUTED FOR STEEL.

BOARD ON BOARD FENCE FENCE - FOR DUMPSTER ENCLOSURE



PAINTED TRAFFIC ARROWS - 13

CARMINAWOOD
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111 Bain Street, Suite 332
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Phone: (716) 842-3165

Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Removed Retaining Wall	8/4/2023

STATE OF NEW YORK
R. CHRISTOPHER WOOD
076304
LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:

Site
Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-102

Project No: 22.305

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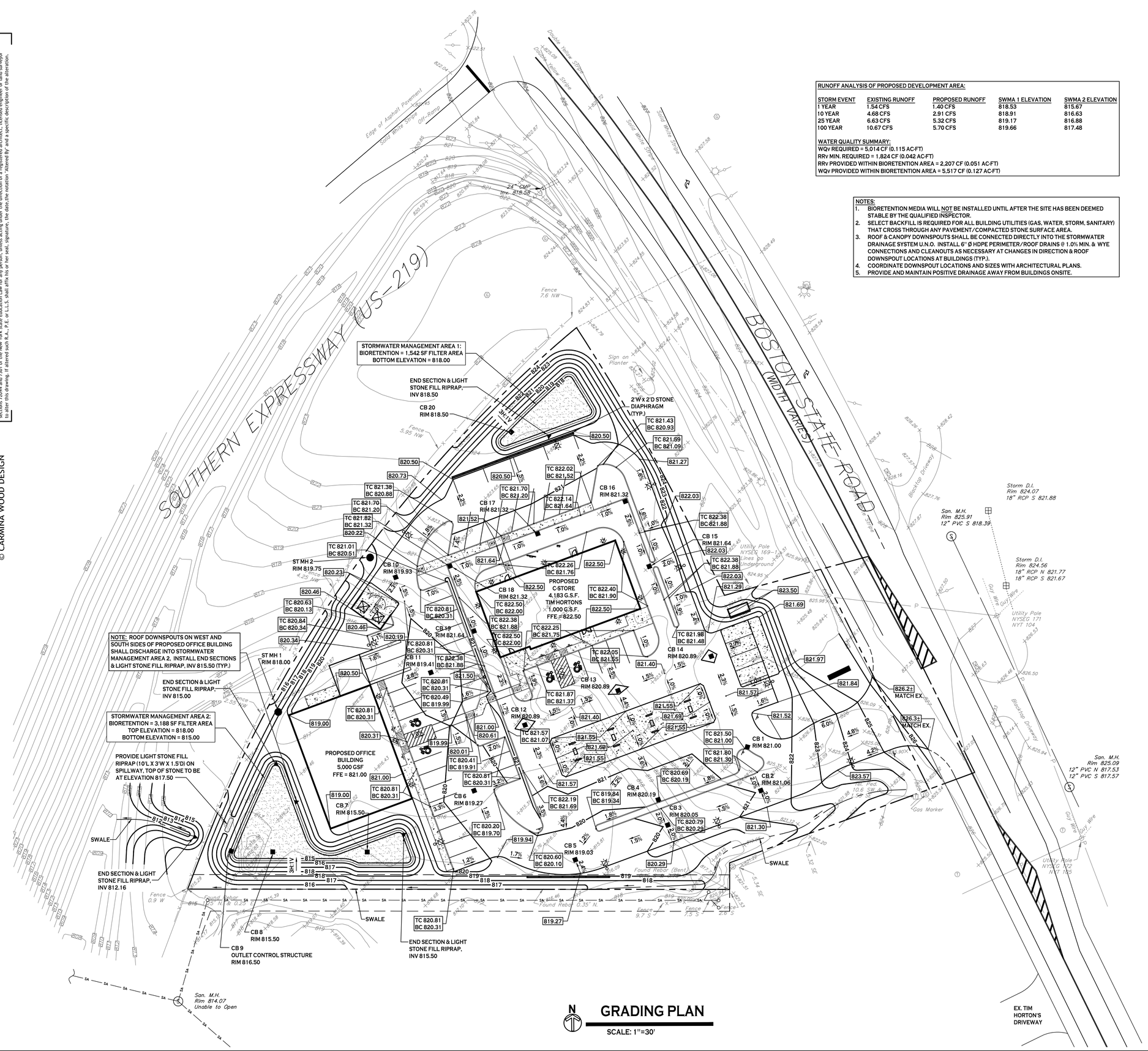
RUNOFF ANALYSIS OF PROPOSED DEVELOPMENT AREA:				
STORM EVENT	EXISTING RUNOFF	PROPOSED RUNOFF	SWMA 1 ELEVATION	SWMA 2 ELEVATION
1 YEAR	1.54 CFS	1.40 CFS	818.53	815.67
10 YEAR	4.68 CFS	2.91 CFS	818.91	816.63
25 YEAR	6.63 CFS	5.32 CFS	819.17	816.88
100 YEAR	10.67 CFS	5.70 CFS	819.66	817.48

WATER QUALITY SUMMARY:
WQv REQUIRED = 5,014 CF (0.115 AC-FT)
RRv MIN. REQUIRED = 1,824 CF (0.042 AC-FT)
RRv PROVIDED WITHIN BIORETENTION AREA = 2,207 CF (0.051 AC-FT)
WQv PROVIDED WITHIN BIORETENTION AREA = 5,517 CF (0.127 AC-FT)

NOTES:
1. BIORETENTION MEDIA WILL NOT BE INSTALLED UNTIL AFTER THE SITE HAS BEEN DEEMED STABLE BY THE QUALIFIED INSPECTOR.
2. SELECT BACKFILL IS REQUIRED FOR ALL BUILDING UTILITIES (GAS, WATER, STORM, SANITARY) THAT CROSS THROUGH ANY PAVEMENT/COMPACTED STONE SURFACE AREA.
3. ROOF & CANOPY DOWNSPOUTS SHALL BE CONNECTED DIRECTLY INTO THE STORMWATER DRAINAGE SYSTEM U.N.O. INSTALL 6" Ø HDPE PERIMETER/ROOF DRAINS @ 1.0% MIN. & WYE CONNECTIONS AND CLEANOUTS AS NECESSARY AT CHANGES IN DIRECTION & ROOF DOWNSPOUT LOCATIONS AT BUILDINGS (TYP.).
4. COORDINATE DOWNSPOUT LOCATIONS AND SIZES WITH ARCHITECTURAL PLANS.
5. PROVIDE AND MAINTAIN POSITIVE DRAINAGE AWAY FROM BUILDINGS ONSITE.



GRADING PLAN

SCALE: 1"=30'

PROPOSED DRIVEWAY ℄ PROFILE

SCALE: HORIZONTAL: 1"=30'
VERTICAL: 1"=5'

PROPOSED GRADING LEGEND

- PROPOSED CONTOUR — 101
- PROPOSED SPOT ELEVATION — 100.80
- PROPOSED TOP/BOTTOM OF CURB ELEV. — TC 100.50 / BC 100.00
- PROPOSED CATCH BASIN — CB
- PAVEMENT/GROUND SLOPE
- PROPOSED YARD DRAIN — YD
- PROPOSED MANHOLE — MH
- PROPOSED STORM SEWER — ST
- PROPOSED STORM W/ SELECT FILL — ST

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

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Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:		
No.	Description	Date
1	Rev. C-Store Bldg. Footprint	7/25/2023
2	Removed Retaining Wall	8/4/2023

STATE OF NEW YORK — R. CHRISTOPHER WOOD — 076394 — LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:
Grading Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-200

Project No: 22.305

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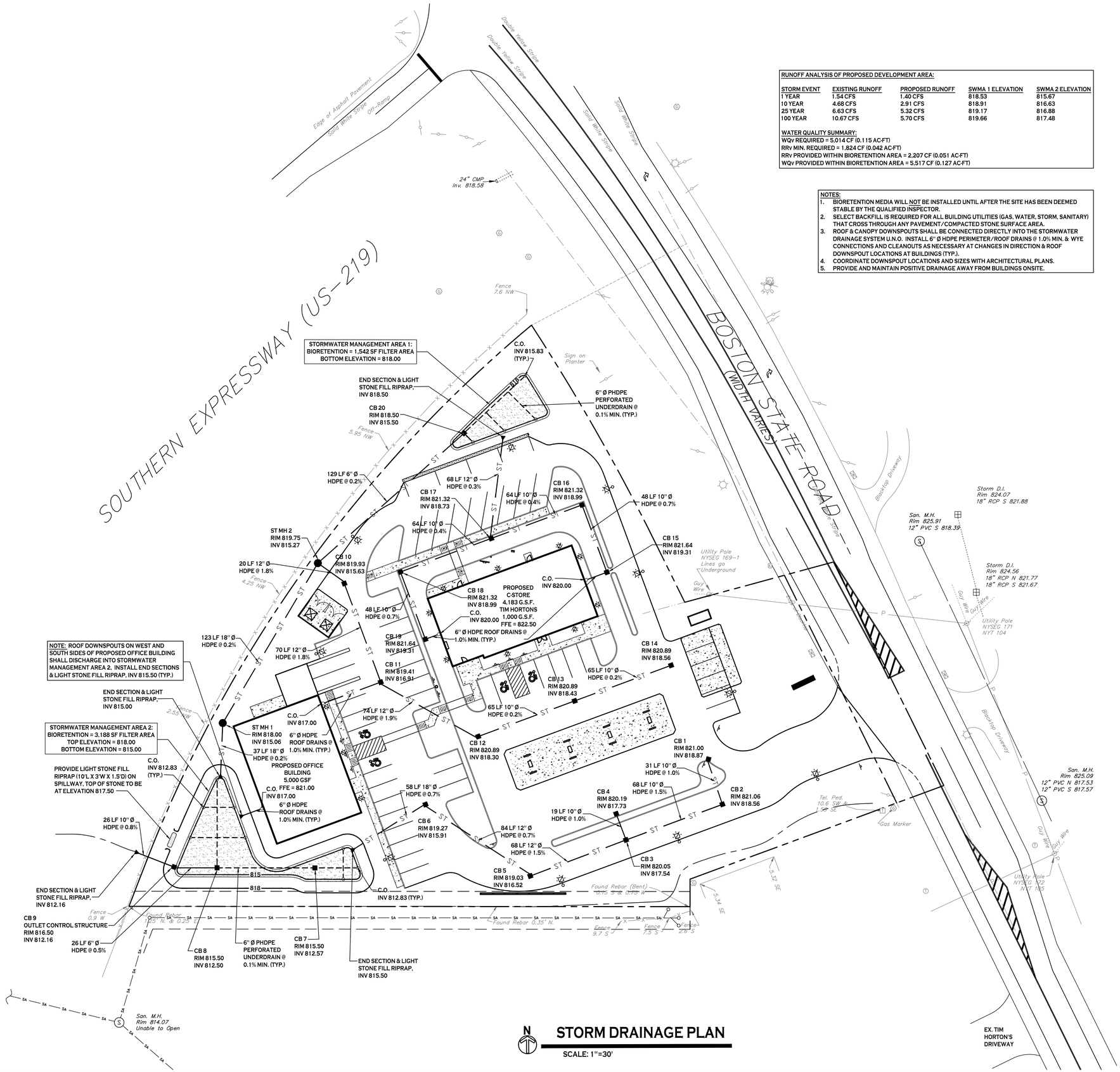

STORM DRAINAGE PLAN

SCALE: 1"=30'

RUNOFF ANALYSIS OF PROPOSED DEVELOPMENT AREA:

STORM EVENT	EXISTING RUNOFF	PROPOSED RUNOFF	SWMA 1 ELEVATION	SWMA 2 ELEVATION
1 YEAR	1.54 CFS	1.40 CFS	818.53	815.67
10 YEAR	4.68 CFS	2.91 CFS	818.91	816.63
25 YEAR	6.63 CFS	5.32 CFS	819.17	816.88
100 YEAR	10.67 CFS	5.70 CFS	819.66	817.48

WATER QUALITY SUMMARY:
WQv REQUIRED = 5,014 CF (0.115 AC-FT)
RRv MIN. REQUIRED = 1,824 CF (0.042 AC-FT)
RRv PROVIDED WITHIN BIORETENTION AREA = 2,207 CF (0.051 AC-FT)
WQv PROVIDED WITHIN BIORETENTION AREA = 5,517 CF (0.127 AC-FT)

NOTES:
1. BIORETENTION MEDIA WILL NOT BE INSTALLED UNTIL AFTER THE SITE HAS BEEN DEEMED STABLE BY THE QUALIFIED INSPECTOR.
2. SELECT BACKFILL IS REQUIRED FOR ALL BUILDING UTILITIES (GAS, WATER, STORM, SANITARY) THAT CROSS THROUGH ANY PAVEMENT/COMPACTED STONE SURFACE AREA.
3. ROOF & CANOPY DOWNSPOUTS SHALL BE CONNECTED DIRECTLY INTO THE STORMWATER DRAINAGE SYSTEM U.N.O. INSTALL 6" Ø HDPE PERIMETER/ROOF DRAINS @ 1.0% MIN. & WYE CONNECTIONS AND CLEANOUTS AS NECESSARY AT CHANGES IN DIRECTION & ROOF DOWNSPOUT LOCATIONS AT BUILDINGS (TYP.).
4. COORDINATE DOWNSPOUT LOCATIONS AND SIZES WITH ARCHITECTURAL PLANS.
5. PROVIDE AND MAINTAIN POSITIVE DRAINAGE AWAY FROM BUILDINGS ONSITE.

PROPOSED UTILITY LEGEND

PROPOSED STORM SEWER	ST
PROPOSED SANITARY SEWER	6"SA
PROPOSED WATERLINE	1"W
PROPOSED GAS (G), ELECTRIC (E), CABLE (C), & TELEPHONE (T)	G E C T
PROPOSED CATCH BASIN	CB
PROPOSED YARD DRAIN	YD
PROPOSED MANHOLE	MH
PROPOSED HYDRANT ASSEMBLY	
PROPOSED GATE VALVE	GV
INSTALL SELECT FILL	SFR

NOTE: FOR PROPOSED VALVE BOXES, CLEANOUTS, ETC., INSTALL A 3000 PSI CONCRETE COLLAR AROUND THE ITEM AT GRADE. THE COLLAR SHALL BE A MIN. OF 6" WIDER, ON ALL SIDES, THAN THE BOX, CLEANOUT, ETC. THE COLLAR SHALL BE A MIN. OF 6" THICK.

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS. CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

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Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Rev. C-Store Bldg. Footprint	7/25/2023

STATE OF NEW YORK
CHRISTOPHER HOOD
076394
LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:
Storm Drainage Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-300

Project No: 22.305

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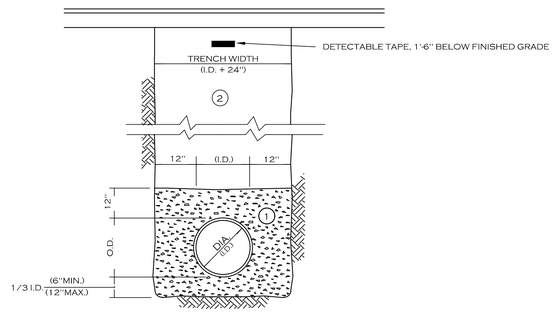


NOTES:

A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.

C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.

D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYSDOT 1985 EDITION)

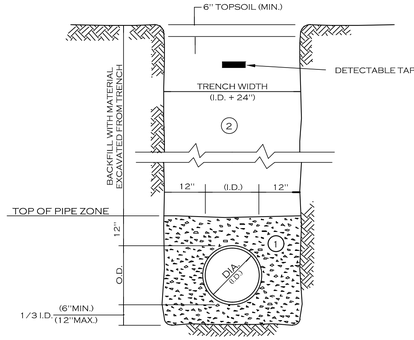
(1) NO. 1 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE MATERIAL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6'' LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NO SLAG SHALL BE ALLOWED FOR MATERIAL (1)

(2) TYPE 2 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 304-2.02 TYPE 2. THE MATERAIL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN TWO INCHES AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6'' LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NO SLAG SHALL BE ALLOWED FOR MATERIAL (2)

STORM SEWER TRENCH SECTION IN PAVED AREAS



NOTES:

A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.

C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.

D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

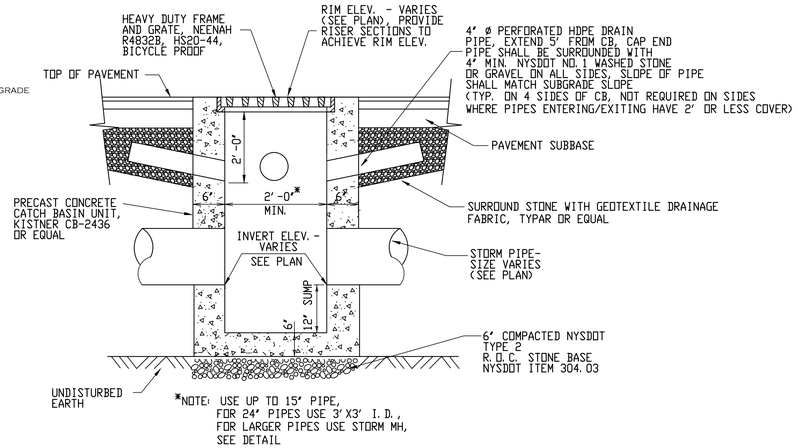
PIPE BEDDING MATERIAL (NYSDOT 1985 EDITION)

(1) NO. 1 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE MATERIAL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6'' LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NO SLAG SHALL BE ALLOWED FOR MATERIAL (1)

(2) BACKFILL MATERIAL SHALL BE NATIVE SOIL, CONTAINING NO UNSUITABLE MATERIAL COMPACTED IN 6'' LIFTS.

STORM SEWER TRENCH SECTION IN UNPAVED AREAS



TYPICAL PRECAST CATCH BASIN

NOTES:
1. FILTER FABRIC TO BE NON-WOVEN CLASS 'C', MIRAFI 180N OR APPROVED EQUIVALENT
2. MULCH TO BE SHREDDED HARDWOOD, AGED 12 MONTHS MIN.
3. DRAINAGE GRAVEL TO MEET AASHTO M-43, NO.67, SIZE 0.25'' TO 0.75''
4. CONTRACTOR TO PROVIDE PLANTING SOIL SUBMITTAL SPECIFICATION FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

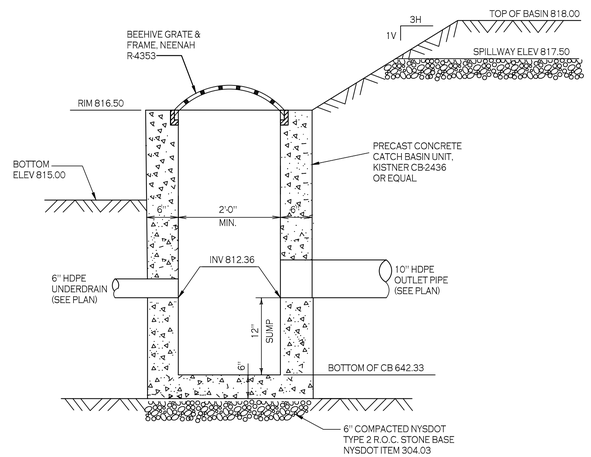
NOTE: PLANTING SOIL SHALL BE LOAM/SAND MIX CONTAINING A MINIMUM OF 35 TO 60% SAND BY VOLUME AND LESS THAN 25% CLAY. SOIL SHOULD FALL WITHIN USCS TYPES SM OR ML WITH PERMEABILITY OF AT LEAST 1.0 FEET PER DAY. SOIL SHOULD BE FREE FROM STONES, STUMPS, ROOTS OR OTHER WOODY MATERIAL OVER 1'' IN DIAMETER. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN LIFTS OF 12'' TO 18'', LOOSELY COMPACTED.

CHARACTERISTICS SHALL BE:
PH RANGE: 5.2 - 7.00
ORGANIC MATTER: 1.5 - 4.0%
MAGNESIUM: 35 LBS PER ACRE MIN.
PHOSPHORUS: 75 LBS PER ACRE MIN.
POTASSIUM: 85 LBS PER ACRE MIN.
SOLUBLE SALTS: 500 PPM
CLAY: 10 TO 25%
SILT: 30 TO 55%
SAND: 35 TO 60%

BIO-RETENTION AREA SEEDING SPEC (NORTHEAST WETLAND GRASS SEED MIX):

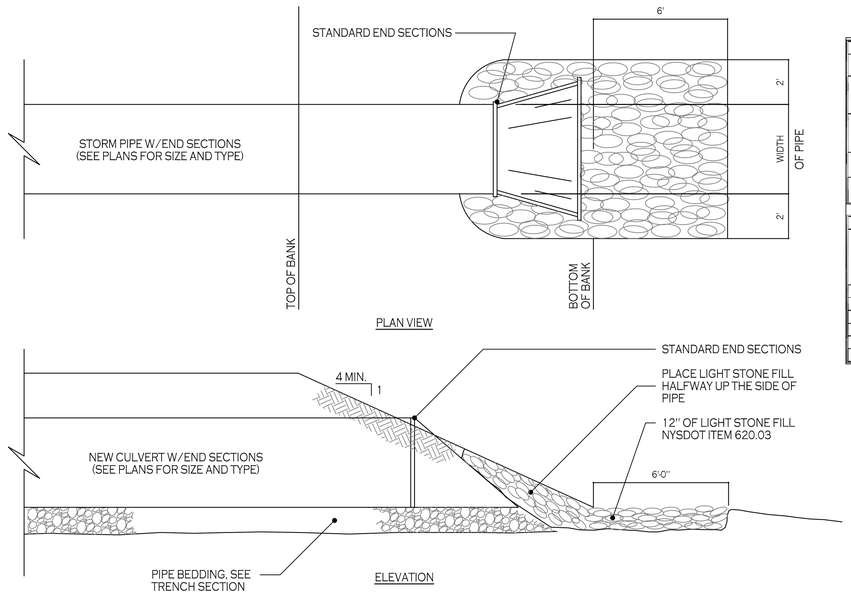
SEED MIXTURE	VARIETY	PERCENT BY NO. OF SEEDS
CREEPING BENTGRASS	AGROSTIS STOLONIFERA	63.0
ROUGH BLUEGRASS	POA TRIVIALIS	17.0
MEADOW FOXTAIL	ALOPECURUS ARUNDINACEUS	11.0
ANNUAL RYEGRASS	LOLIUM MULTIFLORUM	4.5
DEERTONGUE	PANICUM CLANDESTINUM	4.5

BIORETENTION AREA - TYPICAL SECTION



OUTLET CONTROL STRUCTURE

NOT TO SCALE



TYPICAL PIPE OUTLET W/END SECTION & RIP RAP

NOT TO SCALE

NYSDOT STANDARD SPECIFICATIONS

FIGURE 620-1 STONE FILLING GRADATION REQUIREMENTS

Stone Filling Item	See Notes	Stone Size[1]	Percent of Total by Weight
Fine	2, 3, 4	Smaller than 8 inch	90 - 100
		Larger than 3 inch	50 - 100
		Smaller than No. 10 Sieve	0 - 10
Light	2, 3, 4	Lighter than 100 pounds	90 - 100
		Larger than 6 inch	50 - 100
		Smaller than 1/2 inch	0 - 10
Medium	2, 4	Heavier than 100 pounds	50 - 100
		Smaller than 6 inch	0 - 10
Heavy	2, 4, 5	Heavier than 600 pounds	50 - 100
		Smaller than 6 inch	0 - 10

APPROXIMATE SHAPE					
Specified Weights and Sizes					
600 pounds	d = 18 inches	d = 23 inches	d = 15 inches	d = 23 inches	d = 27 inches
300 pounds	d = 15 inches	d = 18 inches	d = 12 inches	d = 18 inches	d = 21 inches
150 pounds	d = 12 inches	d = 15 inches	d = 9 inches	d = 15 inches	d = 17 inches
100 pounds	d = 10 inches	d = 13 inches	d = 8 inches	d = 13 inches	d = 15 inches
d = 8 inches	50 lbs.	25 lbs.	100 lbs.	25 lbs.	16 lbs.
d = 6 inches	20 lbs.	10 lbs.	40 lbs.	10 lbs.	7 lbs.

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7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

STATE OF NEW YORK
JOSEPH CHRISTOPHER WOOD
076394
LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:
Storm Drainage Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-301

Project No: 22.305

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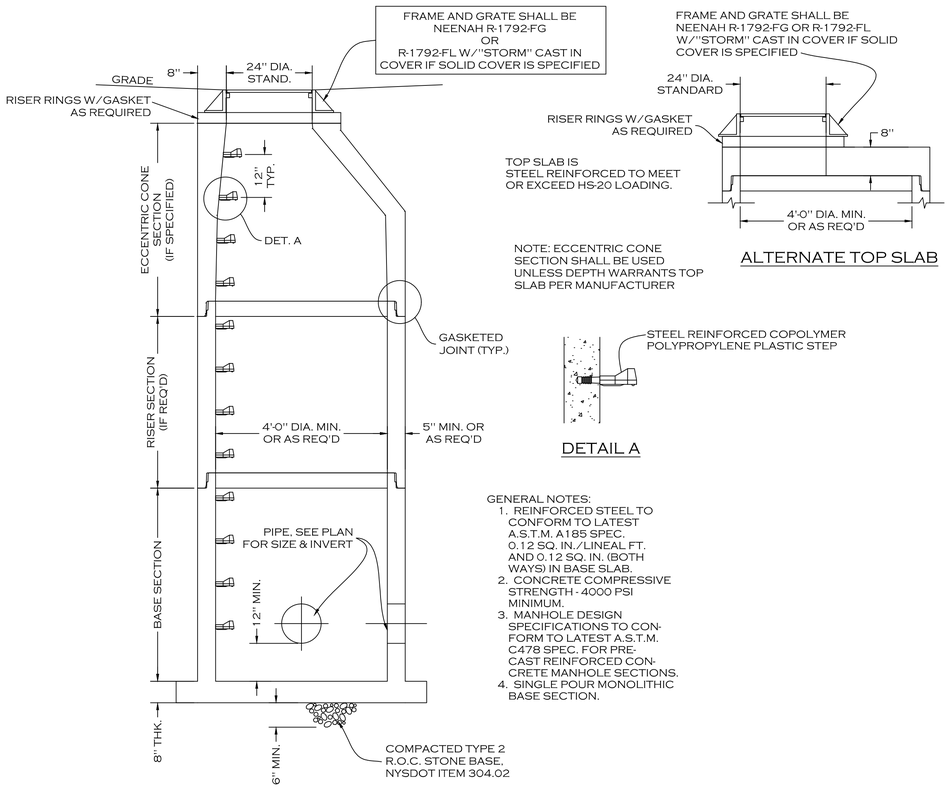

TYPICAL STORM MANHOLE DETAIL

ALTERNATE TOP SLAB

NOTE: ECCENTRIC CONE SECTION SHALL BE USED UNLESS DEPTH WARRANTS TOP SLAB PER MANUFACTURER

DETAIL A

GENERAL NOTES:
1. REINFORCED STEEL TO CONFORM TO LATEST A.S.T.M. A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) IN BASE SLAB.
2. CONCRETE COMPRESSIVE STRENGTH - 4000 PSI MINIMUM.
3. MANHOLE DESIGN SPECIFICATIONS TO CONFORM TO LATEST A.S.T.M. C478 SPEC. FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS.
4. SINGLE POUR MONOLITHIC BASE SECTION.

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7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

DRAWING NAME:

Storm Drainage Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-302

Project No: 22.305

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SANITARY SEWER NOTES:

A. "THE CONTRACTOR IS ADVISED THAT A TRENCH SHIELD AND/OR SHORING DESIGNED IN ACCORDANCE WITH OSHA STANDARDS SHALL BE USED IN ALL OPEN TRENCH EXCAVATIONS."

B. "ANY CONTRACTOR AND/OR PLUMBER PERFORMING WORK IN A CONFINED SPACE (i.e. MANHOLES, WETWELLS, CHAMBERS) OWNED BY AN ERIE COUNTY SEWER DISTRICT, MUST CERTIFY TO THE COUNTY THAT THEY HAVE THEIR OWN CONFINED SPACE ENTRY PROGRAM THAT MEETS OR EXCEEDS OSHA'S REGULATIONS. CERTIFICATION MUST BE NOTARIZED BY A NOTARY PUBLIC."

C. "CONSTRUCTION SHALL CONFORM TO THE RULES AND REGULATIONS FOR ERIE COUNTY SEWER DISTRICTS."

D. IF ANY PROPOSED SEWER LATERAL RUNS UNDER PAVED AREA AND HAS LESS THAN FOUR (4) FEET OF COVER, CONCRETE ENCASEMENT IS REQUIRED. IF MORE THAN FOUR (4) FEET OF COVER IS PROVIDED IN PAVED AREAS, SELECT FILL IS REQUIRED.

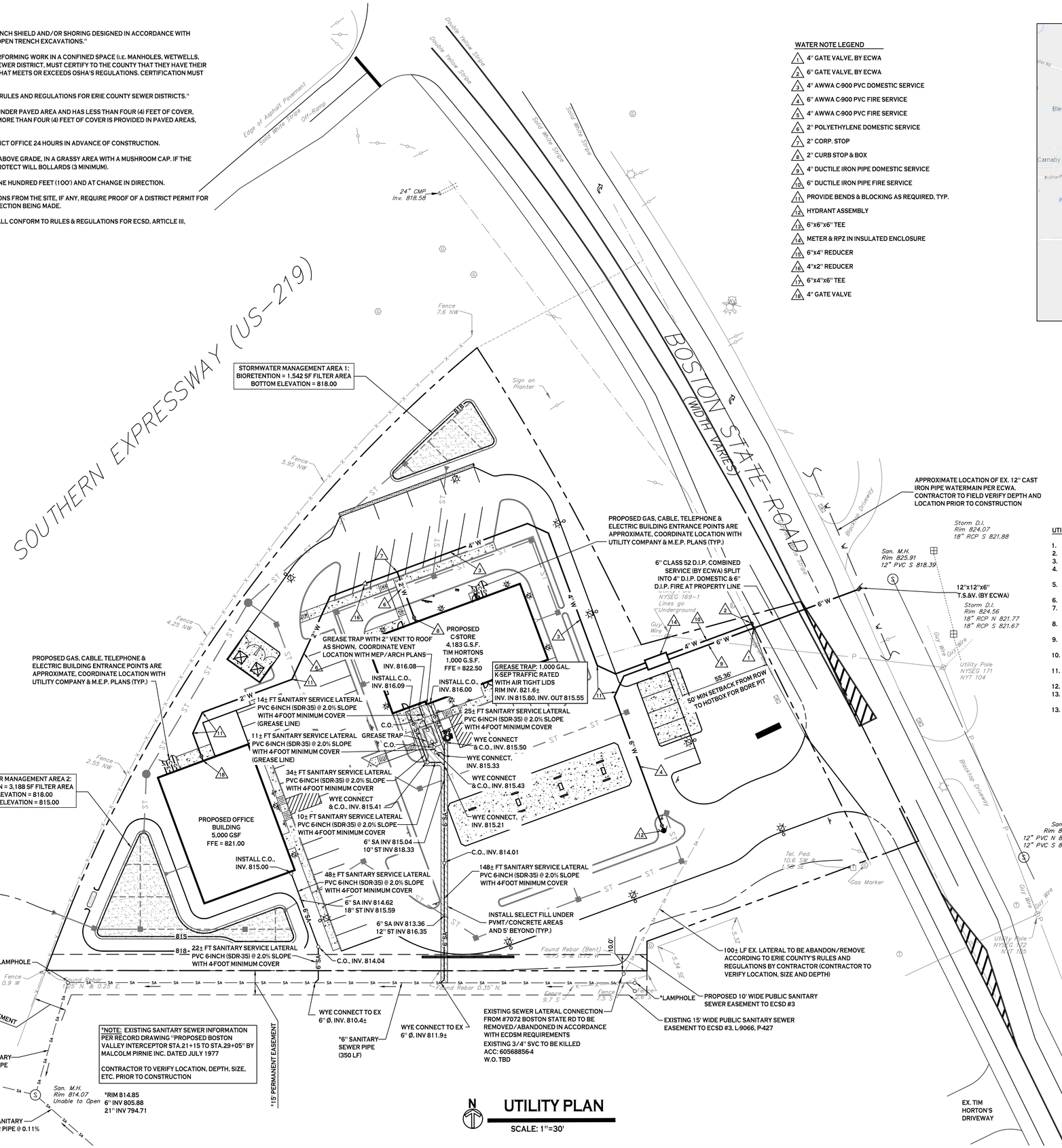
E. THE CONTRACTOR MUST NOTIFY THE DISTRICT OFFICE 24 HOURS IN ADVANCE OF CONSTRUCTION.

F. VENTS MUST BE INSTALLED SIX (6) INCHES ABOVE GRADE, IN A GRASSY AREA WITH A MUSHROOM CAP. IF THE VENT IS IN A SIDEWALK OR PAVED AREA, PROTECT WILL BOLLARDS (3 MINIMUM).

G. CLEANOUTS (C.O.) ARE REQUIRED EVERY ONE HUNDRED FEET (100') AND AT CHANGE IN DIRECTION.

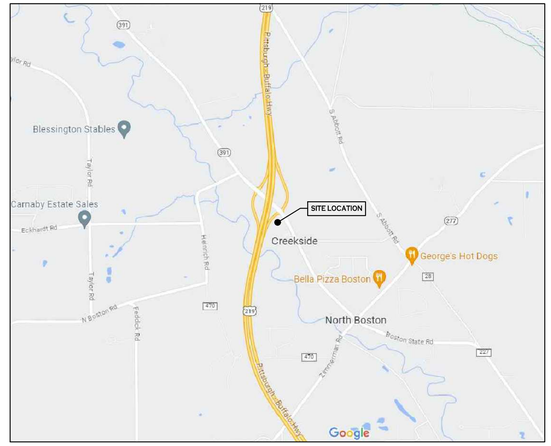
H. ABANDONED SANITARY SEWER CONNECTIONS FROM THE SITE, IF ANY, REQUIRE PROOF OF A DISTRICT PERMIT FOR DISCONNECTION PRIOR TO THE NEW CONNECTION BEING MADE.

I. REUSE OF EXISTING BUILDING SEWERS SHALL CONFORM TO RULES & REGULATIONS FOR ECSD, ARTICLE III, SECTION 304.



WATER NOTE LEGEND

1. 4" GATE VALVE, BY ECWA
2. 6" GATE VALVE, BY ECWA
3. 4" AWWA C-900 PVC DOMESTIC SERVICE
4. 6" AWWA C-900 PVC FIRE SERVICE
5. 4" AWWA C-900 PVC FIRE SERVICE
6. 2" POLYETHYLENE DOMESTIC SERVICE
7. 2" CORP. STOP
8. 2" CURB STOP & BOX
9. 4" DUCTILE IRON PIPE DOMESTIC SERVICE
10. 6" DUCTILE IRON PIPE FIRE SERVICE
11. PROVIDE BENDS & BLOCKING AS REQUIRED, TYP.
12. HYDRANT ASSEMBLY
13. 6"X6"X6" TEE
14. METER & RPZ IN INSULATED ENCLOSURE
15. 6"X4" REDUCER
16. 4"X2" REDUCER
17. 6"X4"X6" TEE
18. 4" GATE VALVE



LOCATION MAP
NOT TO SCALE

UTILITY NOTES:

1. FOR ALL SANITARY SEWERS, INSTALL SELECT FILL IN PAVED AREAS, EXTEND 5' MIN. BEYOND PAVEMENT LIMITS
2. COORDINATE GAS & ELEC. METER BANK LOCATIONS ON BUILDING WITH M.E.P. PLANS & UTILITY CO.'S.
3. COORDINATE LOCATION OF CTV & TELEPHONE SERVICE TO BUILDING WITH M.E.P. PLANS AND UTILITY CO.'S.
4. ANY EXISTING UTILITIES WHICH ARE TO BE ABANDONED AND FALL UNDER PAVEMENT OR BUILDINGS SHALL BE REMOVED VS. BEING ABANDONED UNLESS THOSE UTILITIES ARE FILLED WITH FLOWABLE FILL.
5. EXISTING GAS SERVICES TO REMAIN UNLESS OTHERWISE NOTED. ANY PORTIONS TO BE RELOCATED SHALL BE COORDINATED WITH NATIONAL FUEL GAS.
6. ALL UNDERGROUND TELEPHONE SERVICES SHALL REMAIN AND BE PROTECTED DURING CONSTRUCTION.
7. A MINIMUM OF 10 FEET HORIZONTAL AND 18 INCHES OF VERTICAL SEPARATION MUST BE MAINTAINED BETWEEN ALL SANITARY SEWER AND WATER SERVICES.
8. SELECT BACKFILL IS REQUIRED FOR ALL UTILITIES (GAS, WATER, STORM, SANITARY) THAT CROSS THROUGH PAVEMENT AREAS.
9. ALL SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE TOWN OF BOSTON SPECIFICATIONS AND DETAILS, AND ERIE COUNTY DEPARTMENT DIVISION OF SEWER MANAGEMENT RULES AND REGULATIONS.
10. FILL SHALL BE PLACED AND SATISFACTORILY COMPACTED PRIOR TO INSTALLATION OF UTILITIES, AND MUST BE APPROVED BY THE SUPERVISING PROJECT ENGINEER.
11. ALL WATERLINE SERVICE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE ERIE COUNTY WATER AUTHORITY AND ERIE COUNTY DEPARTMENT OF HEALTH REQUIREMENTS.
12. ALL NEW WATER SERVICES TO HAVE 5'-0" MINIMUM COVER.
13. THE ERIE COUNTY WATER AUTHORITY IS TO BE NOTIFIED A MINIMUM OF 48-HOURS PRIOR TO STARTING THE CONNECTION TO THE NEW WATER SERVICE.
13. ALL OTHER REQUIRED PERMITS BY THE STATE OF NEW YORK, COUNTY OF ERIE AND TOWN OF BOSTON ARE THE RESPONSIBILITY OF THE CONTRACTOR/DEVELOPER.

PROPOSED UTILITY LEGEND

PROPOSED STORM SEWER	— ST —
PROPOSED SANITARY SEWER	— 6"SA —
PROPOSED WATERLINE	— 1"W —
PROPOSED GAS (G), ELECTRIC (E), CABLE (C), & TELEPHONE (T)	— G — E — C — T —
PROPOSED CATCH BASIN	■ CB
PROPOSED YARD DRAIN	● YD
PROPOSED MANHOLE	● MH
PROPOSED HYDRANT ASSEMBLY	
PROPOSED GATE VALVE	⊗ GV
INSTALL SELECT FILL	SFR

NOTE: FOR PROPOSED VALVE BOXES, CLEANOUTS, ETC., INSTALL A 3000 PSI CONCRETE COLLAR AROUND THE ITEM AT GRADE. THE COLLAR SHALL BE A MIN. OF 6" WIDER, ON ALL SIDES, THAN THE BOX, CLEANOUT, ETC. THE COLLAR SHALL BE A MIN. OF 6" THICK.

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

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UTILITY PLAN
SCALE: 1"=30'

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1	Rev. plan per ECDSM comments	7/5/2023
2	Rev. C-Store Bldg. Footprint	7/25/2023
3	Relocated Hyd./Removed Sprinklers	8/7/2023

STATE OF NEW YORK · CHRISTOPHER WOOD · 076394 · LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:
Utility Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-400

Project No: 22.305

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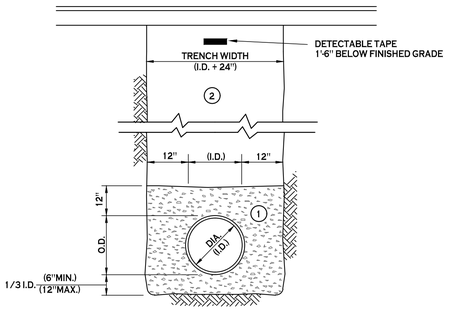


NOTES:

A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.

C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.

D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYSDOT 1985 EDITION)

(1) NO. 1 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE MATERIAL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

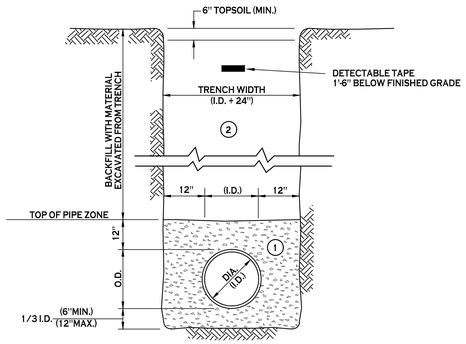
NO SLAG SHALL BE ALLOWED FOR MATERIAL (1)

(2) TYPE 2 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 304-2.02 TYPE 2. THE MATERIAL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN TWO INCHES AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NO SLAG SHALL BE ALLOWED FOR MATERIAL (2)

SEWER/WATERLINE TRENCH SECTION IN PAVED AREAS

NOT TO SCALE



NOTES:

A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.

C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.

D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

MATERIALS

PIPE BEDDING MATERIAL (NYSDOT 1985 EDITION)

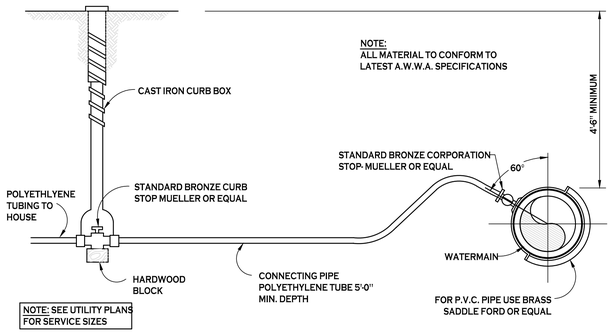
(1) NO. 1 CRUSHED STONE OR CRUSHED GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE MATERIAL SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NO SLAG SHALL BE ALLOWED FOR MATERIAL (1)

(2) BACKFILL MATERIAL SHALL BE NATIVE SOIL CONTAINING NO UNSUITABLE MATERIAL COMPACTED IN 6" LIFTS.

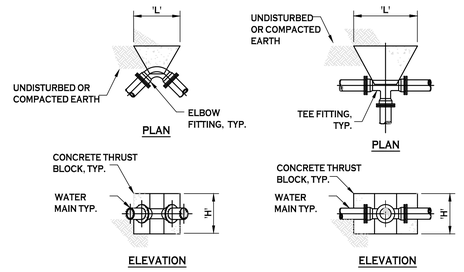
SEWER/WATERLINE TRENCH SECTION IN UNPAVED AREAS

NOT TO SCALE



TYPICAL WATER SERVICE LINE INSTALLATION

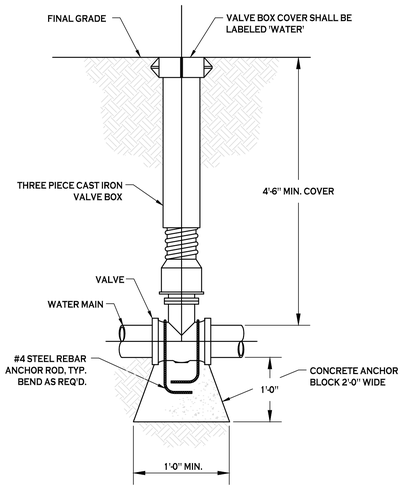
NOT TO SCALE



DIMENSION SCHEDULE								
PIPE SIZE	90° ELBOW		45° ELBOW		22.5° ELBOW		11.25° ELBOW	
	'H'	'L'	'H'	'L'	'H'	'L'	'H'	'L'
4"	1.5'	2.0'	1.0'	2.0'	1.0'	1.0'	1.0'	1.0'
6"	2.0'	2.5'	1.5'	2.0'	1.0'	1.5'	1.0'	1.5'
8"	2.5'	3.5'	2.0'	2.5'	1.5'	1.5'	1.0'	2.0'
10"	3.0'	4.5'	2.5'	3.0'	1.5'	3.0'	1.0'	2.5'
12"	3.5'	5.0'	3.0'	3.5'	2.5'	2.5'	1.5'	2.5'

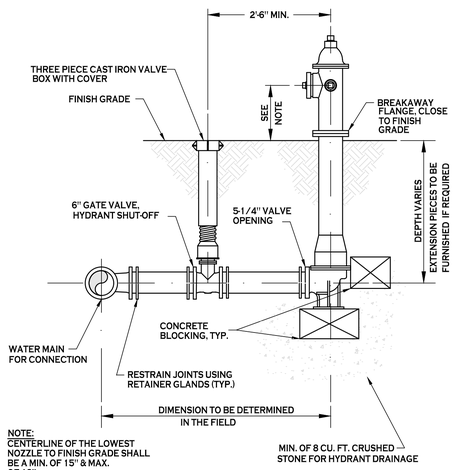
DIMENSION SCHEDULE		
PIPE SIZE	TEE OR TAP SLEEVE	
—	'H'	'L'
4"	1.5'	1.0'
6"	1.5'	2.5'
8"	1.5'	3.5'
10"	2.5'	3.5'
12"	3.5'	3.5'

THRUST BLOCK SCHEDULE



TYPICAL GATE VALVE DETAIL

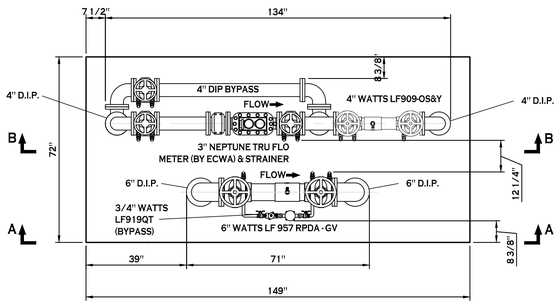
NOT TO SCALE



NOTE:
CENTERLINE OF THE LOWEST NOZZLE TO FINISH GRADE SHALL BE A MIN. OF 15" & MAX. OF 18"

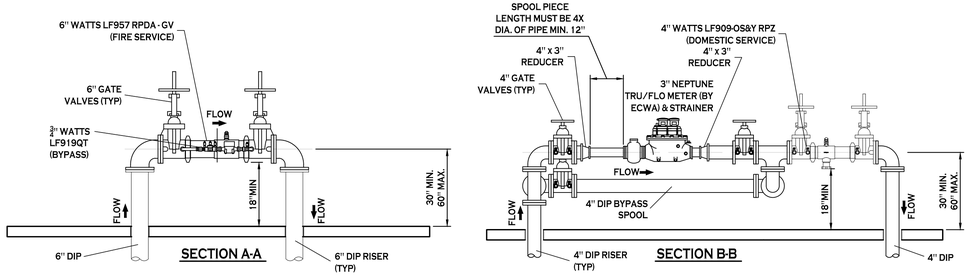
TYPICAL FIRE HYDRANT ASSEMBLY DETAIL

NOT TO SCALE



NOTES:

1. BACKFLOW PREVENTER DIMENSIONS FURNISHED BY WATTS.
2. ALL DIMENSIONS ARE IN INCHES.
3. WALL & INSULATION THICKNESS IS 1-1/2".
4. ROOF & INSULATION THICKNESS IS 3".
5. EXTERIOR ENCLOSURE DIMENSIONS: SEE SITE PLAN.
6. CONCRETE PAD IS 72"W x 149"L x 6"THK W/W.W.F. 6X6/10X10.
7. METER SHOWN: 3" NEPTUNE TRU/FLO COMPOUND METER; SUPPLIED BY ERIE COUNTY WATER AUTHORITY, VERIFY DIMENSIONS PRIOR TO ORDERING. 3/4" WATTS LF919QT (BYPASS)
8. RPZ SHOWN: 4" WATTS LF909-OS&Y RPZ (DOMESTIC SERVICE), 6" WATTS LF957 RPDA (FIRE SERVICE).
9. CONTRACTOR TO INSTALL ELECTRIC SERVICE TO ENCLOSURE, COORDINATE SOURCE WITH OWNER.
10. INSTALL A 120V GFI OUTLET IN THE ENCLOSURE.
11. HEATERS TO HAVE THERMOSTAT CONTROL.



4" METER/RPZ (DOMESTIC) & 6" RPDA (FIRE)

NOT TO SCALE

CARMINAWOOD DESIGN

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Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

DRAWING NAME:

Utility Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-401

Project No: 22.305

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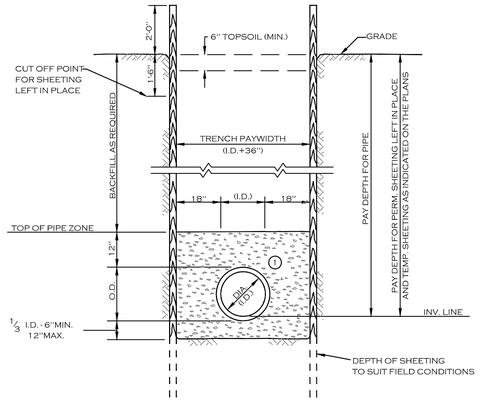
SHEETED TRENCH
(JANUARY 2012)



NOTES:

1. MAINTAIN 18" BETWEEN PIPE AND INSIDE FACE OF TEMPORARY SHEETING. IF SHEETING EXTENDS BELOW PIPE INVERT AS SHOWN, WHEN PVC PIPE MATERIAL IS USED, COMPACT MATERIAL (1) BEFORE PULLING THE SHEETING.
2. SHEETED TRENCH OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING EQUIPMENT.
3. SHEETING DRIVEN BELOW THE INVERT OF THE PIPE FOR BEDDING MATERIAL AND TOE SUPPORT WILL NOT BE CONSIDERED IN THE FORMULA FOR PAYMENT BUT SHOULD BE FIGURED BY THE CONTRACTOR IN DETERMINING HIS UNIT BID PRICE PER SQUARE FOOT OF SHEETING.
4. WHERE INDICATED ON THE PLANS OR AS ORDERED BY THE ENGINEER, TEMPORARY SHEETING WILL BE PAID FOR UNDER THE APPLICABLE BID ITEM. OTHER AREAS WHERE THE CONTRACTOR ELECTS TO USE TEMPORARY SHEETING NOT PREVIOUSLY AUTHORIZED BY THE ENGINEER SHALL BE AT HIS OPTION AND EXPENSE.

MATERIALS

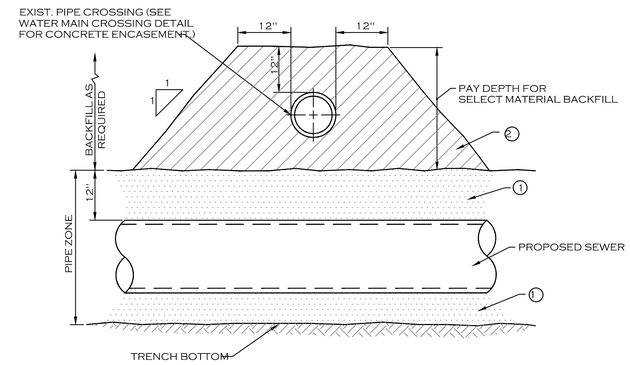
PIPE BEDDING MATERIAL (NYSDOT LATEST EDITION)

(1) NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS (1)

ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	REV. 1 2/7/94	REVISED TOPSOIL DIMENSION	STD.DETAIL 2
	REV. 2 6/5/06	UPDATED MATERIALS TO NYSDOT LATEST EDITION	
	FILE: D-02	DATE: 3/1/91	

PIPE CROSSING SUPPORT DETAIL
(JANUARY 2012)



MATERIALS

PIPE BEDDING MATERIAL (NYSDOT LATEST EDITION)

(1) NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

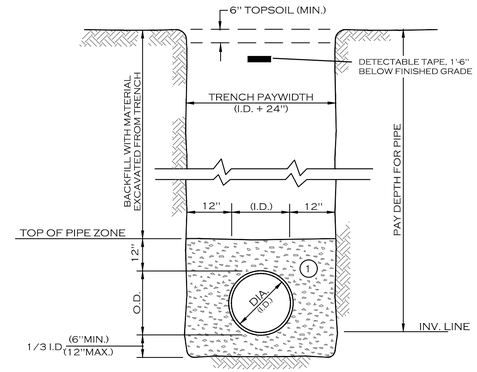
SELECT MATERIAL BACKFILL (NYSDOT LATEST EDITION)

(2) NO.2 RUN OF CRUSHER STONE OR NO.2 RUN OF CRUSHER GRAVEL WITH A GRADATION CONFORMING WITH NYSDOT SECTION 304-2.02 TYPE 4 AND NYSDOT SECTION 703-02. (COMPACTED IN 6"LIFTS TO 90% DENSITY)

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS (1) AND (2)

ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	REV. 1 12/01	UPDATED MATERIALS TO NYSDOT LATEST EDITION	STD.DETAIL 9
	REV. 2		
	FILE: D-09	DATE: 3/1/91	

UNSHEETED TRENCH DETAIL
(JANUARY 2012)



NOTES:

A. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.

C. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND MAXIMUM PAY LIMITS.

D. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

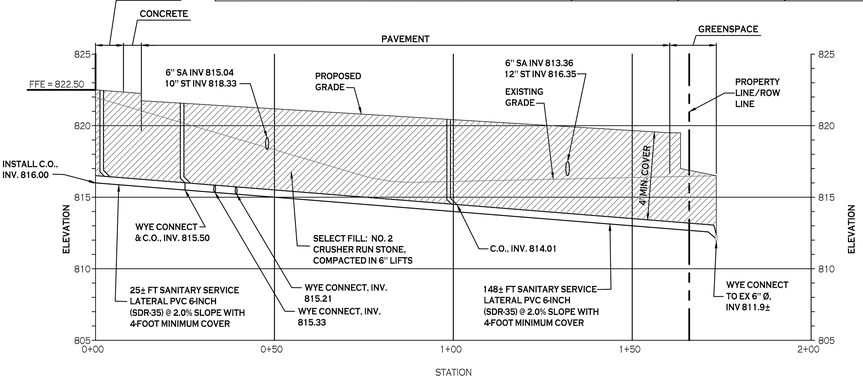
MATERIALS

PIPE BEDDING MATERIAL (NYSDOT LATEST EDITION)

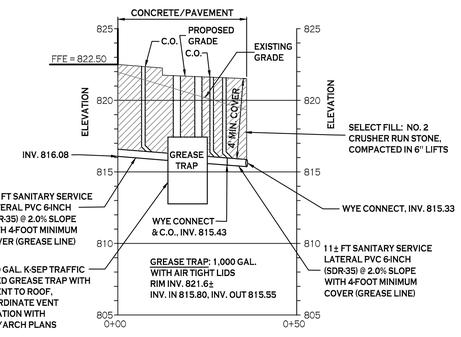
(1) NO.1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN 1" AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER.

NOTE: SLAG SHALL NOT BE ALLOWED FOR MATERIALS (1)

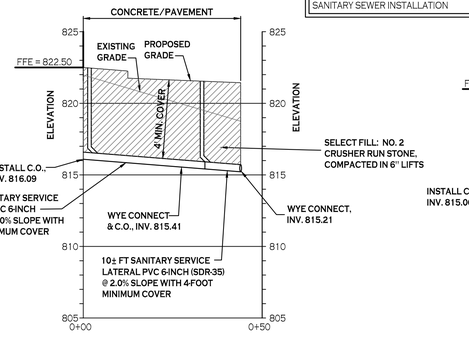
ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	REV. 1 5/20/93	NOTE 2: PIPE INSTALLATION	STD.DETAIL 1
	REV. 2 2/7/94	ADDED NOTE C & D	
	FILE: D-01	DATE: 3/1/91	



C-STORE: 6" SAN. SEWER LATERAL
SCALE: HORIZ.: 1" = 20'
VERT.: 1" = 5'

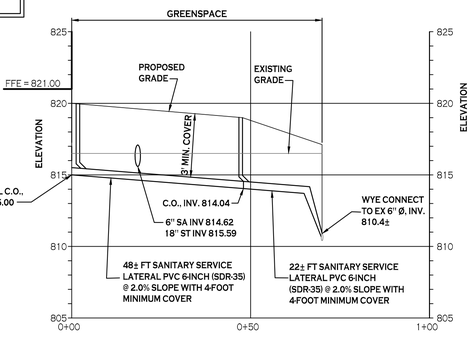


TIM HORTONS: 6" GREASE LINE
SCALE: HORIZ.: 1" = 20'
VERT.: 1" = 5'



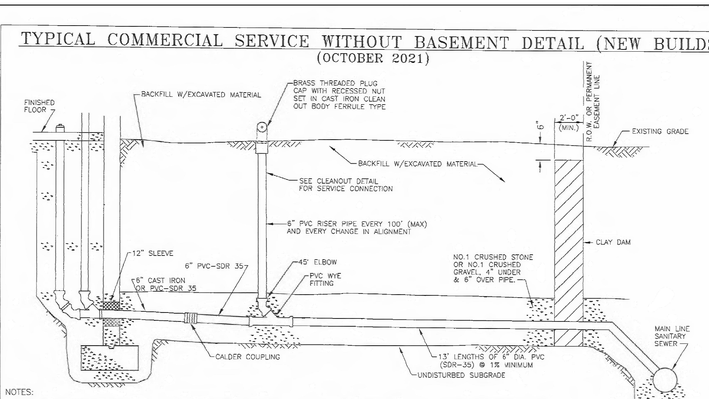
NOTE: FILL IS TO BE SATISFACTORILY INSTALLED AND COMPACTED PRIOR TO SANITARY SEWER INSTALLATION

TIM HORTONS: 6" SAN. SEWER LATERAL
SCALE: HORIZ.: 1" = 20'
VERT.: 1" = 5'



OFFICE BLDG.: 6" SAN. SEWER LATERAL
SCALE: HORIZ.: 1" = 20'
VERT.: 1" = 5'

TYPICAL COMMERCIAL SERVICE WITHOUT BASEMENT DETAIL (NEW BUILDS)
(OCTOBER 2021)



NOTES:

1. NO INSPECTION WILL BE PROVIDED WITHOUT A PERMIT. INSPECTIONS REQUIRE 48 HR. ADVANCED NOTICE FOR SCHEDULING.
2. ALL WORK MUST BE INSPECTED BY A COUNTY INSPECTOR.
3. PVC PIPE MATERIAL SHALL BE MANUFACTURED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST ASTM SPECIFICATION D-3033/D-3034. PIPE SHALL BE MARKED WITH THE EXTRA HEAVY CAST IRON MEETING THE REQUIREMENTS OF ASTM A74-42.
4. CLEANOUTS MUST BE INSTALLED IN LAWN AREAS, NOT IN SIDEWALK OR DRIVEWAY AREAS, PREFERABLY BETWEEN THE CURB OR EDGE OF PAVEMENT AND THE SIDEWALK.
5. SELECT BACKFILL REQUIRED UNDER PAVED AREAS.
6. CONCRETE ENCASEMENT IF COVER DEPTH IS LESS THAN 4'-0" UNDER PAVED AREAS.
7. MIN. DEPTH OF COVER 3'-0".
8. CLEANOUT MEASUREMENTS SHALL START FROM CENTERLINE OF MAIN SEWER FOR WYE/BEND LATERALS AND FROM THE 6" CLEANOUT FOR FAR SIDE CONNECTIONS. A CLEANOUT MAY BE REQUIRED FOR ANY ANGLE CHANGES IN LATERAL DIRECTION FLOW.
9. A 6" CLEANOUT IS REQUIRED AT R.O.W OR EASEMENT LINE AND AT EDGE OF THE PAVEMENT LIMITS ON AT FAR SIDE OF PAVEMENT.
10. ANY SEWER LAID THROUGH OR OVER A SEPTIC TANK MUST BE CAST IRON. (SEPTIC TANK MUST BE FILLED WITH BANK RUN GRAVEL)
11. ANY EXCAVATION TO BE LEFT OPEN OVERNIGHT SHALL BE COMPLETELY ENCLOSED IN FENCING, OR WHERE NECESSARY, COVERED WITH STEEL PLATES.
12. DOWN SPOUTS, SUMP PUMPS, AND FOOTING DRAINS ARE NOT PERMITTED TO BE CONNECTED TO THE LATERAL.
13. NO CONNECTION SHALL BE MADE UNTIL BUILDING ROOF IS ERECTED.

ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	Rev. 6/05	ADDED NOTE 18 & CLASS 52 TYPE CI PIPE	STD. DETAIL 22
	Rev. 1/07	REMOVED OLD NOTES 2 AND 18 ADDED 18. MIN. TO SERVICE PIPE DETAIL	
	Rev. 11/08	ADDED SLEEVE AND PVC-SDR 35	
	Rev. 1/12	REVISED 6" CAST IRON TRAP NOTE	
	Rev. 1/18	ADDED (A) NOTE TO EXISTING VENT & TRAP	
	Rev. 10/21	REMOVED VENT, RISER, AND TRAP ASSEMBLY	
	File: d-22	Date: 3/1/91	

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Buffalo, New York 14203
Phone: (716) 842-3165

Mixed-Use Development
7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date

STATE OF NEW YORK — R. CHRISTOPHER ROSS — 087639 — LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:
Utility Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-402

Project No: 22.305

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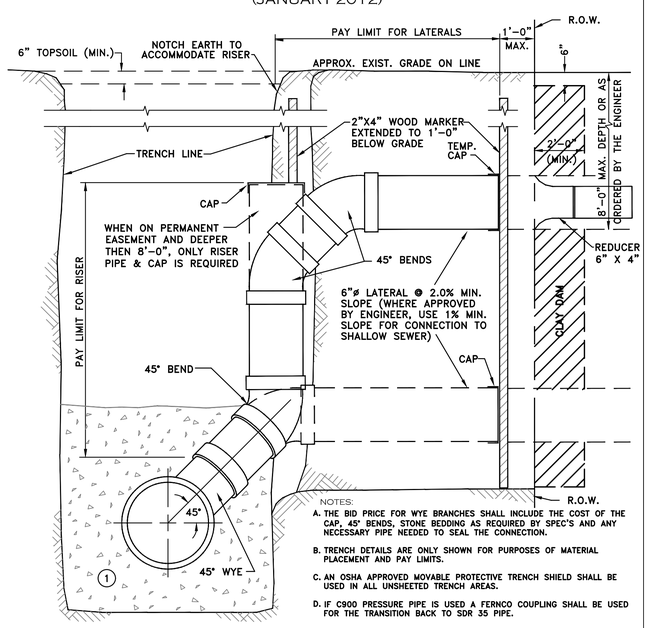
RISER DETAIL - SDR35
(MAIN LINE LATERAL CONNECTION)
(JANUARY 2012)



NOTES:

A. THE BID PRICE FOR WYE BRANCHES SHALL INCLUDE THE COST OF THE CAP, 45° BENDS, STONE BEDDING AS REQUIRED BY SPEC'S AND ANY NECESSARY PIPE NEEDED TO SEAL THE CONNECTION.

B. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT AND PAY LIMITS.

C. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS.

D. IF C900 PRESSURE PIPE IS USED A FERNCO COUPLING SHALL BE USED FOR THE TRANSITION BACK TO SDR 35 PIPE.

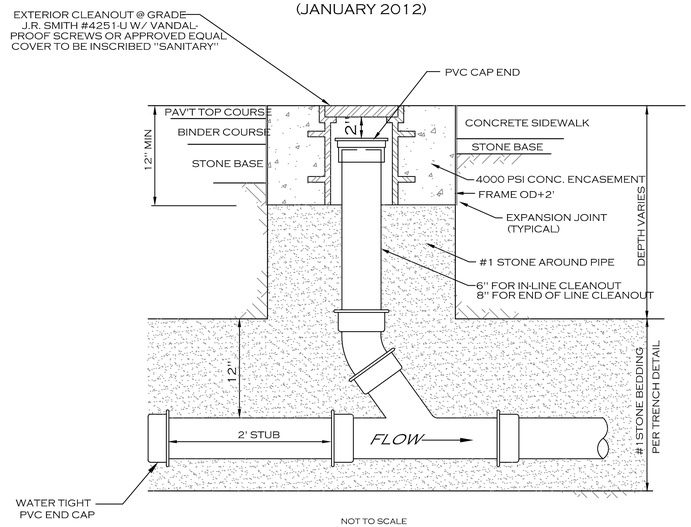
MATERIALS
PIPE BEDDING MATERIAL (NYSDOT LATEST EDITION)

(1) NO. 1 CRUSHED STONE WITH A GRADATION CONFORMING WITH NYSDOT SECTION 703-02. THE CRUSHED STONE SHALL BE WELL GRADED WITH NO PARTICLES LARGER THAN ONE INCH AND HAVING A MAXIMUM GRADATION MEETING THE LIMITS DESCRIBED IN THE SPECIFICATIONS. THE BEDDING SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER. NO SLAG WILL BE ALLOWED.

ERIE COUNTY
DEPT. OF ENVIRONMENT & PLANNING
DIVISION OF SEWERAGE MANAGEMENT

Rev. 2 1/97	ADDED 1/8 BELL & SPIGOT LONG SWEEP BEND	STD.DETAIL
Rev. 3 12/01	ADDED NOTE D REGARDING LOCATION OF VENTS AND CLEAN OUTS	27
Rev. 4 5/02	CHANGED LONG SWEEP TO NORMAL 45° ADDED CAPS & CORRECTED PAY LIMITS	
FILE: D-27	DATE: 3/1/91	

CLEANOUT IN PAVEMENT/SIDEWALKS
NON RESIDENTIAL AND COMMERCIAL PROJECTS
(JANUARY 2012)



NOT TO SCALE

ERIE COUNTY
DEPT. OF ENVIRONMENT & PLANNING
DIVISION OF SEWERAGE MANAGEMENT

REV 07/98	ADD MIN. DISTANCE AND MARKER	STD. DETAIL
REV 12/01	ADDED #1 STONE AROUND PIPE	53
REV 01/13	REMOVED 2X4 MARKER	
FILE: D-53	DATE: 5/13/97	

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Scale: As Noted

DRAWING NO.
C-403

Project No: 22.305

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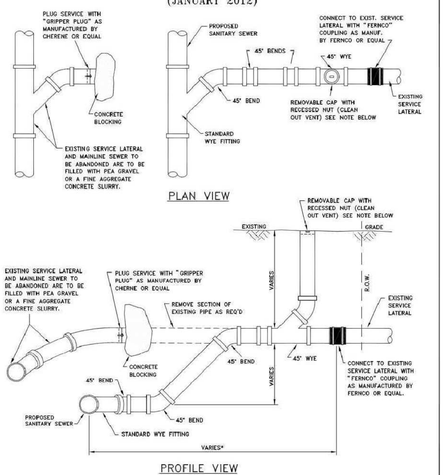
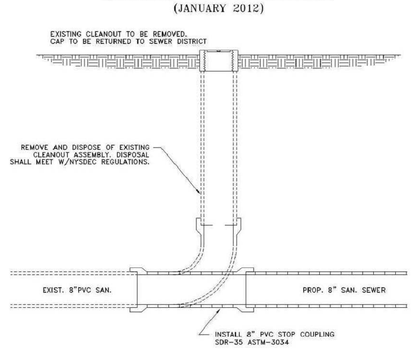
TYPICAL HOUSE CONNECTION/ABANDONMENT DETAIL
(JANUARY 2012)



*NOTES:
1.) THE CONTRACTOR SHALL CONNECT TO THE FIRST GOOD STRUCTURALLY SOUND SECTION OF PIPE ON THE EXISTING SERVICE LATERAL AS DETERMINED IN THE FIELD DURING CONSTRUCTION.
2.) VENTS AND CLEAN OUTS MUST BE INSTALLED IN LAWN AREAS, NOT IN SIDEWALK OR DRIVEWAY AREAS, PREFERABLY BETWEEN THE CURB OR EDGE OF PAVEMENT AND THE SIDEWALK.

ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	Rev. 1 12/9/96	ADDED *NOTE, LATERAL CONNECTION	STD.DETAIL
	Rev. 2 12/19/00	ADDED NOTE 2 IN REGARDS TO LOCATION OF VENTS & C.O.	34
	File: d-34	Date: 7/19/91	

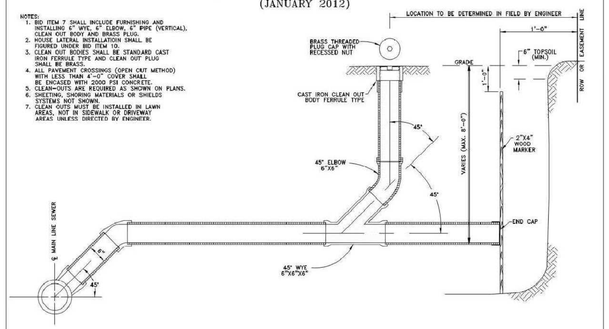
EXISTING CLEANOUT REMOVAL
(JANUARY 2012)



ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	Rev. 1		STD. DETAIL
	Rev. 2		52
	File: d-52	Date: 12/6/96	

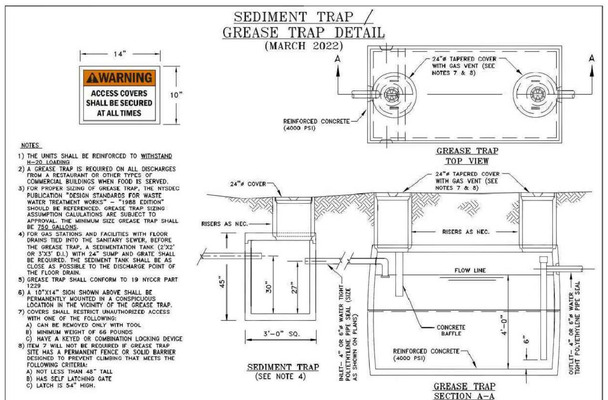
CLEAN-OUT DETAIL FOR SERVICE CONNECTION
(JANUARY 2012)

NOTES:
1. BID ITEM 7 SHALL INCLUDE FURNISHING AND INSTALLING 6" WYE, 6" ELBOW, 6" PIPE (VERTICAL), CLEAN OUT BODY AND BRASS PLUG.
2. HOUSE LATERAL INSTALLATION SHALL BE FIGURED UNDER BID ITEM 10.
3. CLEAN OUT BODIES SHALL BE STANDARD CAST IRON FERRULE TYPE AND CLEAN OUT PLUG SHALL BE BRASS.
4. ALL PAVEMENT CROSSINGS (OPEN CUT METHOD) WITH LESS THAN 4'-0" COVER SHALL BE ENCASED WITH 2000 PSI CONCRETE.
5. CLEAN-OUTS ARE REQUIRED AS SHOWN ON PLANS.
6. SHEETING, SHORING MATERIALS OR SHIELDS SYSTEMS NOT SHOWN.
7. CLEAN OUTS MUST BE INSTALLED IN LAWN AREAS, NOT IN SIDEWALK OR DRIVEWAY AREAS UNLESS DIRECTED BY ENGINEER.



ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	Rev. 1 15/83 d-0" COVER, C.I. CAP "RECESSED NUT"		STD. DETAIL
	Rev. 2 12/94 CHANGED DIM LINE FOR MAX. DEPTH		28
	Rev. 3 12/96 ADDED NOTE 7		
	Rev. 4 5/02 CHANGED C.I. CAP TO BRASS		
	Rev. 5 6/03 1- MIN. FROM EDGE OF WALL NOTE		
	Rev. 6 1/12 CHANGED C.I. TO BRASS NOTES 1 & 2		
	File: d-28	Date: 3/1/91	

SEDIMENT TRAP / GREASE TRAP DETAIL
(MARCH 2022)



NOTES:
1) THE UNITS SHALL BE REINFORCED TO WITHSTAND H-20 LOADING
2) A GREASE TRAP IS REQUIRED ON ALL DISCHARGES FROM A RESTAURANT OR OTHER TYPES OF COMMERCIAL BUILDINGS WHEN FOOD IS SERVED.
3) FOR PROPER SIZING OF GREASE TRAP, THE NYSDEC PUBLICATION "DESIGN STANDARDS FOR WASTE WATER TREATMENT WORKS" – "1988 EDITION" SHALL BE UTILIZED. UNLESS THE TRAP SIZING ASSUMPTION CALCULATIONS ARE SUBMITTED TO AND APPROVAL THE MINIMUM SIZE GREASE TRAP SHALL BE 750 GALLONS.
4) FOR GAS STATIONS AND FACILITIES WITH FLOOR DRAINS TIED INTO THE SANITARY SEWER, BEFORE THE GREASE TRAP, A SEDIMENTATION TANK (2'X2' OR 3'X3' E.I.) WITH 24" SUMP AND GRATE SHALL BE REQUIRED. THE SEDIMENT TANK SHALL BE AS CLOSE AS POSSIBLE TO THE DISCHARGE POINT OF THE FLOOR DRAIN.
5) GREASE TRAP SHALL CONFORM TO 19 NYCRR PART 1239
6) A 7"X14" SIGN SHOWN ABOVE SHALL BE PERMANENTLY MOUNTED IN A CONSPICUOUS LOCATION IN THE VICINITY OF THE GREASE TRAP.
7) COVERS SHALL RESTRICT UNAUTHORIZED ACCESS WITH ONE OF THE FOLLOWING:
   A) CAN BE REMOVED ONLY WITH TOOL.
   B) MINIMUM WEIGHT OF 66 POUNDS
   C) HAVE A KEYED OR COMBINATION LOCKING DEVICE
8) ITEM 7 WILL NOT BE REQUIRED IF GREASE TRAP SITE HAS A PERMANENT FENCE OR SOLID BARRIER DESIGNED TO PREVENT CLIMBING THAT MEETS THE FOLLOWING CRITERIA:
   A) NOT LESS THAN 48" TALL
   B) HAS SELF LATCHING GATE
   C) LATCH IS 54" HIGH.

ERIE COUNTY DEPT. OF ENVIRONMENT & PLANNING DIVISION OF SEWERAGE MANAGEMENT	Rev. 1 11/2/98 CHANGED NOTE 2		STD. DETAIL
	Rev. 2 12/19/00 ADDED NOTE 8		29
	Rev. 3 6/03 1- MIN. FROM EDGE OF WALL NOTE		
	Rev. 4 1/12 CHANGED NOTE 3		
	Rev. 5 8/12 ADDED PART 1239		
	File: d-29	Date: 3/1/91	

20. SEWERS CROSSING WATERMAINS - *TEN STATE STANDARDS, LATEST EDITION, CHAPTER 30, SECTION 38.32, PAGE 30-11 TO 30-12:* SEWERS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18-INCHES (460 MM) BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.

21. WHEN IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS STIPULATED ABOVE, ONE OF THE FOLLOWING METHODS MUST BE SPECIFIED:
   A. THE SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO WATER PIPE, AND SHALL BE PRESSURE TESTED AT 150 PSI (1034 KPA) TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
   B. EITHER THE WATER MAIN OR THE SEWER LINE MAY BE ENCASED IN A WATERTIGHT CARRIER PIPE WHICH EXTENDS TEN (10') FEET (THREE (3) METERS) ON BOTH SIDES OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATER MAIN. THE CARRIER PIPE SHALL BE OF MATERIALS APPROVED BY THE REGULATORY AGENCY FOR USE IN WATER MAIN CONSTRUCTION.
   C. THE SEWER SHALL BE ENCASED IN CONCRETE PER THE DSM WATERMAIN CROSSING DETAIL TYPICAL FOR ENCASEMENT

22. THE MANHOLE COVERS ARE TO BEAR THE INSCRIPTION "ECSD SANITARY" AND COMPLY WITH THE DSM STANDARD FRAME AND COVER DETAIL. FOR PRIVATE PROJECTS THE COVERS SHALL BEAR THE INSCRIPTION "SANITARY SEWER" AND COMPLY WITH THE DSM STANDARD FRAME AND COVER (PRIVATE SEWER) DETAIL.

23. BUILDING SANITARY SEWER VENTS MUST BE INSTALLED SIX (6) INCHES ABOVE FINISHED GRADE IN A GRASSY AREA WITH A MUSHROOM CAP. IF THE VENT IS IN A SIDEWALK OR PAVED AREA, THEN PROTECT WITH 6" DIAMETER BOLLARDS (2 MINIMUM).

24. CLEANOUTS (C.O.) ARE REQUIRED ON 4" AND 6" BUILDING SEWERS EVERY FIFTY FEET AND ONE HUNDRED FEET RESPECTIVELY, AND AT EVERY CHANGE OF ALIGNMENT.

25. ABANDONED BUILDING SEWER CONNECTIONS FROM THE SITE, IF ANY, REQUIRE PROOF OF A DISTRICT PERMIT FOR DISCONNECTION PRIOR TO THE NEW CONNECTION BEING MADE.

26. THE FOLLOWING PERTAINS ONLY FOR DIRECT REPLACEMENT OF IN SERVICE SANITARY SEWERS:
   A. EACH NEW PIPE JOINT SHALL BE ULTRASONIC TESTED AFTER IT IS LAID, BUT BEFORE THE NEXT PIPE IS LAID. ALL TESTS SHALL BE IN ACCORDANCE WITH THE TESTING EQUIPMENT MANUFACTURE RECOMMENDATIONS.
   B. THE ULTRASONIC TEST SHALL BE PERFORMED IN LIEU OF THE HYDROSTATIC AND AIR TESTS.
   C. A VIDEO INSPECTION OF THE ENTIRE SEWER SHALL BE PERFORMED. FORWARD THE VIDEO INSPECTION TAPE AND RELATED PAPERWORK TO DSM FOR REVIEW AND APPROVAL.
   D. A DEFLECTION TEST IS REQUIRED IN ALL CASES.

27. FOR ALL SANITARY SEWER INSTALLATIONS, A WRITTEN CERTIFICATE OF CONSTRUCTION COMPLETENESS AND COMPLIANCE, INCLUDING THE RESULTS OF THE HYDROSTATIC LEAKAGE TEST, DEFLECTION TEST AND AIR TEST, ETC. SHALL BE SUBMITTED TO THE ERIE COUNTY HEALTH DEPARTMENT AND DSM WITHIN THIRTY (30) DAYS AFTER COMPLETION OF CONSTRUCTION.

28. FOR ALL PUBLIC AND PRIVATE 8" DIAMETER PIPE OR LARGER SANITARY SEWER INSTALLATIONS, THE DEVELOPER/CONTRACTOR MUST PROVIDE ONE (1) SET OF RECORD DRAWINGS ON "D" SIZE PAPER (24" X 36") AND IN AN ELECTRONIC FILE FORMAT (CD OR FLASH DRIVE) COMPATIBLE WITH THE LATEST AUTOCAD RELEASE.

29. ALL PUBLIC SEWER EXTENSION PROJECTS THAT CONSIST OF MORE THAN 750 LF OF 8" DIAMETER PIPE OR LARGER, SHALL FURNISH A 2 YEAR MAINTENANCE BOND TO THE DSM.

30. FINAL CERTIFICATION WILL BE ISSUED UPON THE FULL COMPLETENESS AND COMPLIANCE OF THE PROJECT INCLUDING ANY REQUIREMENT(S) OF I&I REMEDIAL WORK.

DSM GENERAL NOTES:

1. THE ERIE COUNTY DIVISION OF SEWERAGE MANAGEMENT (DSM), WHO OPERATES AND MAINTAINS THE EXISTING SEWER LINES AND APPURTENANCES WITHIN ERIE COUNTY SEWER DISTRICTS (ECSD), IS TO BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF THE START OF CONSTRUCTION.
2. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS FOR ERIE COUNTY SEWER DISTRICTS.
3. ALL PERMITS REQUIRED BY THE FEDERAL, STATE, COUNTY, CITY AND/OR TOWN GOVERNMENTS TO PERFORM WORK MUST BE OBTAINED PRIOR TO THE START OF WORK, AND PAID FOR BY THE CONTRACTOR.
4. IF EASEMENT AND/OR OUT OF DISTRICT AGREEMENTS ARE REQUIRED, THEY MUST BE COMPLETE AND READY TO BE FILED BEFORE THE PROJECT WILL BE APPROVED FOR CONSTRUCTION.
5. THE CONTRACTOR SHALL COMPLY IN ALL RESPECTS TO THE INDUSTRIAL CODE PART (RULE NO.) 53 RELATING TO CONSTRUCTION, EXCAVATION, AND DEMOLITION OPERATIONS AT OR NEAR UNDERGROUND FACILITIES, AS ISSUED BY THE STATE OF NEW YORK DEPARTMENT OF LABOR, BOARD OF STANDARD AND APPEALS.
6. THE CONSTRUCTION OF THE SANITARY SEWER FACILITIES SHALL BE UNDER THE SUPERVISION OF A PERSON OR FIRM QUALIFIED TO PRACTICE PROFESSIONAL ENGINEERING IN NEW YORK STATE UNDER THE EDUCATION LAW OF THE STATE, WHENEVER ENGINEERING SERVICES ARE REQUIRED BY SUCH LAW FOR SUCH PURPOSES.
7. WHERE SUCH SANITARY SEWER FACILITIES ARE UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER, HE/SHE SHALL CERTIFY TO THE DSM AND TO THE APPLICANT THAT THE CONSTRUCTED FACILITIES HAVE BEEN UNDER HIS/HER SUPERVISION AND THAT THE WORK HAS BEEN FULLY COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING REPORTS, PLANS, SPECIFICATIONS, AND APPROVALS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SITE SAFETY. THE CONTRACTOR'S EQUIPMENT AND METHODS OF OPERATION SHALL BE IN FULL COMPLIANCE WITH OSHA STANDARDS AND SATISFY ALL FEDERAL, STATE AND LOCAL HEALTH AND SAFETY REGULATIONS.
9. THE CONTRACTOR IS ADVISED A TRENCH SHIELD AND/OR SHORING DESIGNED IN ACCORDANCE WITH OSHA STANDARDS SHALL BE USED IN ALL OPEN TRENCH EXCAVATIONS.
10. ANY CONTRACTOR AND/OR PLUMBER PERFORMING WORK IN A CONFINED SPACE (I.E. MANHOLES, WETWELLS, AND CHAMBERS) OWNED BY AN ERIE COUNTY SEWER DISTRICT, MUST CERTIFY TO THE COUNTY THAT THEY HAVE THEIR OWN CONFINED SPACE ENTRY PROGRAM THAT MEETS OR EXCEEDS OSHA'S REGULATIONS. CERTIFICATION MUST BE NOTARIZED BY A NOTARY PUBLIC.
11. THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AHEAD OF THE PIPE LAYING OPERATION, SO IF MINOR ADJUSTMENTS MUST BE MADE IN THE PIPE ELEVATION AND/OR ALIGNMENT DUE TO INTERFERENCE FROM THESE UTILITIES, SAID CHANGES CAN BE MADE IN ADVANCE OF THE WORK.
12. THE CONTRACTOR SHALL RETAIN THE SERVICES OF A QUALIFIED TREE EXPERT TO REMOVE, WHERE NECESSARY, BRANCHES WHICH INTERFERE WITH THE CONSTRUCTION OPERATION, OR TO REPAIR TREES HAVING SUFFERED DAMAGE BY CONSTRUCTION ACTIVITIES. THE COST INVOLVED IS TO BE INCLUDED IN THE VARIOUS ITEMS OF THE CONTRACT.
13. THE PROPOSED 8 THROUGH 12 INCH DIAMETER SANITARY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE CONFORMING TO THE LATEST REVISIONS OF AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) DESIGNATION D-3034, SDR-35, INSTALLED IN ACCORDANCE WITH THE ASTM DESIGNATION D-2321-83A OR THE LATEST REVISION THEREOF, OR APPROVED EQUAL. LARGER DIAMETER PIPES WILL BE REVIEWED ON A CASE BY CASE BASIS.
14. SEWERS SHALL BE LAID WITH STRAIGHT ALIGNMENT BETWEEN MANHOLES AND SHALL BE CHECKED BY USING A LASER BEAM OR LAMPING.
15. SHOULD A FLUID CONDITION BE ENCOUNTERED AT THE TRENCH BOTTOM, THE CONTRACTOR IS TO UNDERCUT THE TRENCH AND PROVIDE SUITABLE FILL MATERIAL (STONE & FABRIC) TO STABILIZE THE TRENCH BOTTOM.
16. SANITARY SEWER BEDDING MATERIAL SHALL BE NO. 1 CRUSHED STONE WITH A GRADATION CONFORMING TO THE *DSM SPECIFICATIONS FOR SUBDIVISIONS AND SANITARY SEWER EXTENSIONS.*
17. BACKFILL SHALL BE OF A SUITABLE MATERIAL REMOVED FROM THE EXCAVATION EXCEPT WHERE OTHER MATERIAL IS SPECIFIED. DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER, OR OTHER UNSTABLE MATERIALS SHALL NOT BE USED FOR BACKFILL WITHIN TWO (2') FEET OF THE TOP OF THE PIPE.
18. ALL PIPES CROSSING UNDER PAVED AREAS ARE TO BE BACKFILLED TO SUB-GRADE WITH COMPACTED SELECT MATERIAL (NO. 2 CRUSHED STONE) TO FIVE (5') FEET OUTSIDE THE PAVEMENT EDGES OR AS REQUIRED BY THE HIGHWAY PERMIT. IF ANY PROPOSED SEWER RUNS UNDER PAVED AREAS AND HAS LESS THAN FOUR (4) FEET OF COVER, THEN CONCRETE ENCASEMENT IS REQUIRED AS SHOWN ON THE DSM TYPICAL CONCRETE ENCASEMENT DETAIL.
19. SEWERS PARALLEL TO WATERMAINS - *TEN STATE STANDARDS, LATEST EDITION, CHAPTER 30, SECTION 38.31, AND PAGE 30-11:* SEWERS SHALL BE LAID AT LEAST TEN (10') FEET (THREE (3) METERS) HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE. IN CASES WHERE IT IS NOT PRACTICAL TO MAINTAIN A TEN (10') FOOT SEPARATION, THE APPROPRIATE REVIEWING AGENCY MAY ALLOW DEVIATION ON A CASE-BY-CASE BASIS, IF SUPPORTED BY DATA FROM THE DESIGN ENGINEER. SUCH DEVIATION MAY ALLOW INSTALLATION OF THE SEWER CLOSER TO A WATER MAIN, PROVIDED THAT THE WATER MAIN IS IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER AND AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST 18-INCHES (460 MM) ABOVE THE TOP OF THE SEWER.

    IF IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS DESCRIBED ABOVE, BOTH THE WATER MAIN AND SEWER MUST BE CONSTRUCTED OF SLIP-ON OR MECHANICAL JOINT PIPE COMPLYING WITH PUBLIC WATER SUPPLY DESIGN STANDARDS OF THE REGULATORY AGENCY AND BE PRESSURE TESTED TO 150 POUNDS PER SQUARE INCH (PSI) (1034 KPA) TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.

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Greensboro, North Carolina 27406
Phone: (336) 937-9009
487 Main Street, Suite 500
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Phone: (716) 842-3165

Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Rev. plan per ECDSM comments	7/5/2023

STATE OF NEW YORK
R. CHRISTOPHER WOOD
076394
PROFESSIONAL ENGINEER

DRAWING NAME:
Utility Details

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.
C-404

Project No: 22.305

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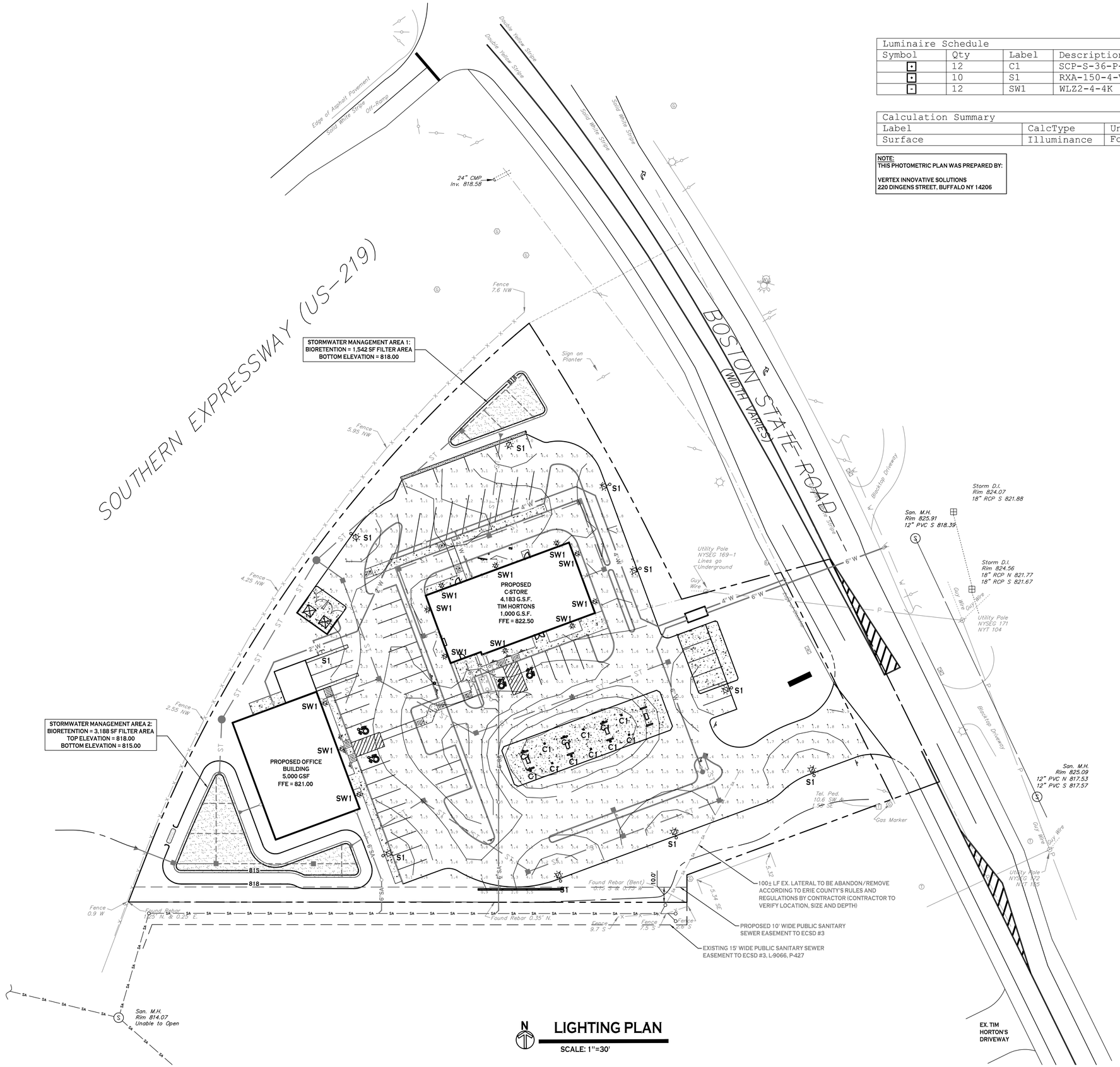

LIGHTING PLAN

SCALE: 1"=30'

Luminaire Schedule			
Symbol	Qty	Label	Description
	12	C1	SCP-S-36-P-VS-4K (CANOPY LIGHT) M.H. 15'
	10	S1	RXA-150-4-VS-4K-BR-A (SITE LIGHT POLE) M.H.20'
	12	SW1	WLZ2-4-4K (BUILDING WALL PACK) M.H. 12'

Calculation Summary					
Label	CalcType	Units	Avg	Max	Min
Surface	Illuminance	Fc	3.05	18.6	0.2

NOTE:
THIS PHOTOMETRIC PLAN WAS PREPARED BY:

VERTEX INNOVATIVE SOLUTIONS
220 DINGENS STREET, BUFFALO NY 14206

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

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Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Rev. C-Store Bldg. Footprint	7/25/2023

STATE OF NEW YORK
R. CHRISTOPHER WOOD
LICENSED PROFESSIONAL ENGINEER
087639

DRAWING NAME:

Site Lighitng Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

C-500

Project No: 22.305

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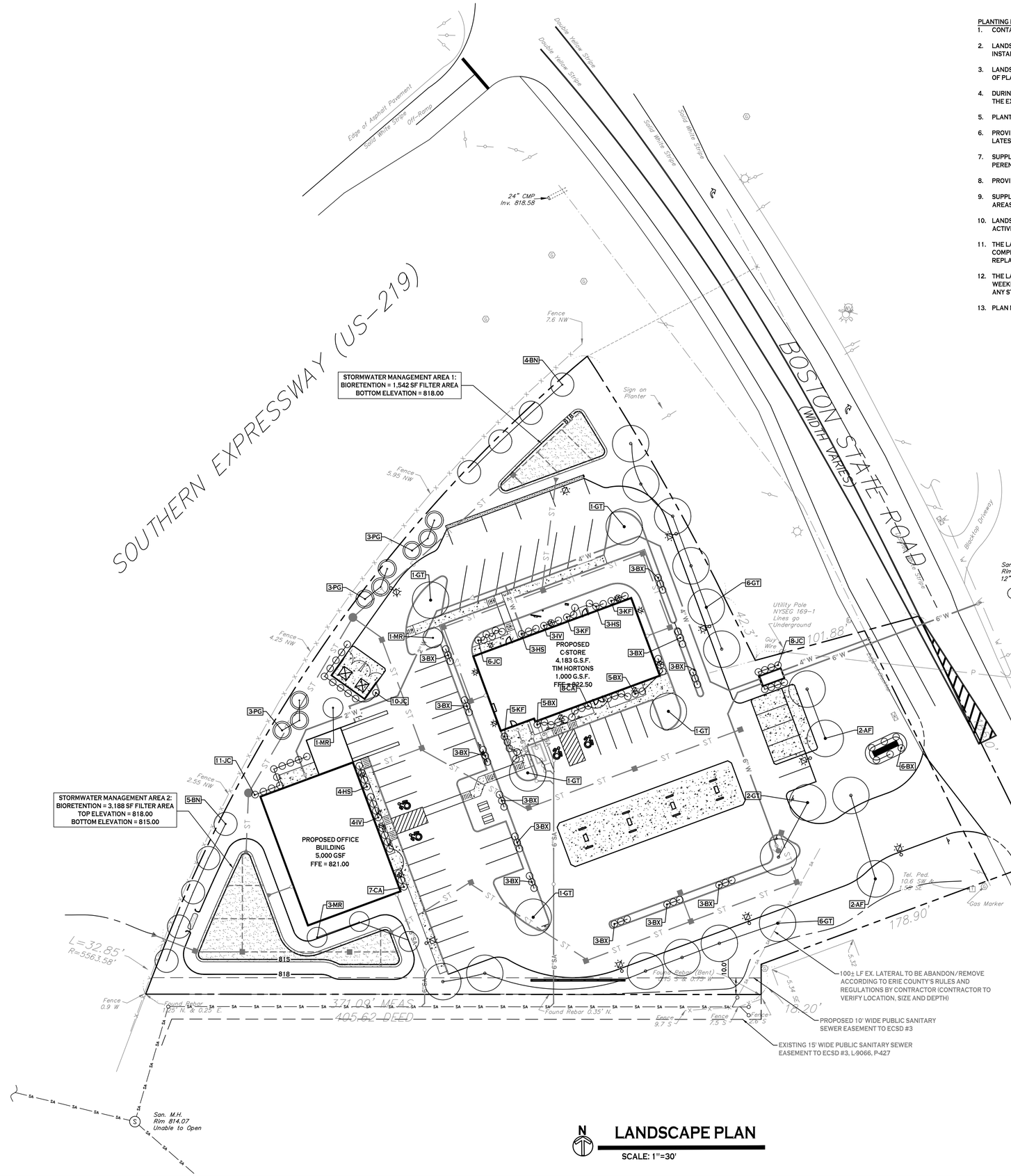


LANDSCAPE PLAN

SCALE: 1"=30'

PLANTING NOTES:

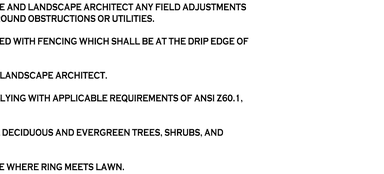
1. CONTACT DIG SAFELY NY (811 OR (800 962-7962) TO LOCATE EXISTING UTILITIES PRIOR TO ANY LANDSCAPE CONSTRUCTION.
2. LANDSCAPE CONTRACTOR SHALL SUPPLY ALL MATERIALS FOR THE COMPLETION OF ALL LANDSCAPE WORK ITEMS ASSOCIATED WITH THIS INSTALLATION PER LANDSCAPE PLANS AND DETAILS.
3. LANDSCAPE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT ANY FIELD ADJUSTMENTS OF PLANT LOCATIONS THAT ARE IN CONFLICT WITH EXISTING VEGETATION, UNDERGROUND OBSTRUCTIONS OR UTILITIES.
4. DURING CONSTRUCTION, ALL EXISTING TREES TO BE PRESERVED SHALL BE PROTECTED WITH FENCING WHICH SHALL BE AT THE DRIP EDGE OF THE EXISTING TREES TO BE PRESERVED.
5. PLANT SUBSTITUTIONS ARE NOT PERMITTED UNLESS APPROVED IN ADVANCE BY THE LANDSCAPE ARCHITECT.
6. PROVIDE QUANTITY SIZE, GENUS, SPECIES AND VARIETY OF PLANTS INDICATED COMPLYING WITH APPLICABLE REQUIREMENTS OF ANSI Z60.1, LATEST EDITION.
7. SUPPLY AND APPLY FERTILIZER TABLETS (AGRIFORM 20-10-5 OR EQUIVALENT) TO ALL DECIDUOUS AND EVERGREEN TREES, SHRUBS, AND PERENNIALS PER MANUFACTURER'S SPECIFICATIONS.
8. PROVIDE A 3' DIAMETER MULCHED RING AROUND ALL TREES, WITH A SPADE CUT EDGE WHERE RING MEETS LAWN.
9. SUPPLY AND INSTALL SHREDDED HARDWOOD MULCH (WITH NO ADDED COLOR) IN ALL TREE RINGS TO A DEPTH OF 3" AND IN PLANT BED AREAS TO A DEPTH OF 2" DO NOT ALLOW MULCH TO CONTACT OR BURY TRUNK/STEMS.
10. LANDSCAPE CONTRACTOR SHALL REPAIR ANY AREAS WITHIN OR OUTSIDE OF THE PROJECT LIMITS THAT ARE DAMAGED BY CONSTRUCTION ACTIVITIES. DISTURBED LAWN AREAS SHOULD BE DECOMPACTED AS NECESSARY AND RECEIVE TOPSOIL, SEED, & MULCHED.
11. THE LANDSCAPE CONTRACTOR SHALL WARRANT ALL TREES FOR A PERIOD OF TWELVE MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION. LANDSCAPE CONTRACTOR SHALL INSPECT SITE AT THE END OF THE OF WARRANTY PERIOD AND MAKE ANY NECESSARY PLANT REPLACEMENTS, REMOVE ANY STAKES AND BELTING FROM TREES, ADJUST TREES THAT ARE NOT STRAIGHT, ETC.
12. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN TREES UNTIL SUBSTANTIAL COMPLETION ACCEPTANCE. MAINTAIN PLANTS BY: WATERING WEEKLY WHEN RAINFALL IS LESS THAN 1" PER WEEK; REMOVING WEEDS FROM PLANT BEDS AND TREE RINGS; MAINTAINING INTEGRITY OF ANY STAKES; REPOSITIONING ANY PLANTS THAT ARE LEANING.
13. PLAN NOTES ARE NOT INTENDED TO BE A SUBSTITUTE FOR APPROVAL OF INSTALLATION PRACTICES OF THE CONTRACTOR.

PLANTING SCHEDULE - MIXED-USE DEVELOPMENT, 7072 BOSTON STATE ROAD, BOSTON NY

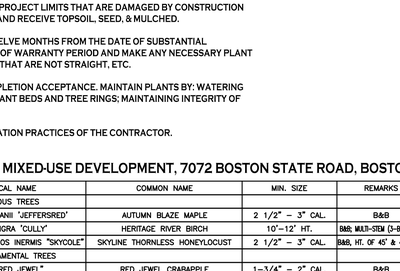
KEY	QTY.	BOTANICAL NAME	COMMON NAME	MIN. SIZE	REMARKS
		DECIDUOUS TREES			
AF	4	ACER X FREEMANII "JEFFERSRED"	AUTUMN BLAZE MAPLE	2 1/2" – 3" CAL.	B&B
BN	9	BETULA NIGRA 'CULLY'	HERITAGE RIVER BIRCH	10'–12' HT.	B&B; MULTI-STEM (3-BOLE MIN)
GT	19	GLEDITSIA TRIACANTHOS INERMIS "SKYCOLE"	SKYLINE THORNLESS HONEYLOCUST	2 1/2" – 3" CAL.	B&B, HT. OF 45' & 45' WIDE
		SMALL/ORNAMENTAL TREES			
MR	5	MALUS "RED JEWEL"	RED JEWEL CRABAPPLE	1–3/4" – 2" CAL.	B&B
		EVERGREEN TREES			
PG	9	PICEA GLAUCA	WHITE SPRUCE	5' MIN. HT.	B&B, FULL TO GROUND
		SHRUBS			
BX	52	BUXUS "GREEN VELVET"	GREEN VELVET BOXWOOD	24" HT. MIN.	NO. 5 CONT.
CA	15	CLETHRA ALNIFOLIA SUGARTINA 'CRYSTALINA'	SUGARTINA CRYSTALINA SUMMERSWEET		NO. 5 CONT.
HS	10	HYDRANGEA SERRATA 'SMNMAKTSR'	TUFF STUFF RED HYDRANGEA		NO. 3 CONT.
IV	7	ITEA VIRGINICA 'SMNVDFC'	SCENTLANDIA ITEA		NO. 3 CONT.
JC	34	JUNIPERUS CHINESIS 'HETZII'	HETZ STAKED JUNIPER	4' MIN. HT.	B&B, FULL TO GROUND
		ORNAMENTAL GRASS			
KF	11	CALAMAGROSTIS X ACUTIFOLIA 'KARL FOERSTER'	KARL FOERSTER FEATHER REED GRASS	NO. 2 CONT.	SEE NOTE 1

LANDSCAPE NOTES:

1. ORNAMENTAL GRASSES SHOULD BE PRUNED BACK IN LATE FALL OR EARLY SPRING TO ALLOW FOR NEW FOLIAGE TO GROW IN SPRING.
2. ALL PLANTING BEDS & TREE PLANTING PITS SHALL RECEIVE A MINIMUM 3-INCH DEPTH OF DARK SHREDDED HARDWOOD BARK MULCH.
3. ALL EVERGREEN TREES SHALL BE MEASURED FROM THE BOTTOM OF LEADER.



SHRUB PLANTING DETAIL



TREE PLANTING DETAIL

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS, CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

CARMINAWOOD DESIGN

487 Main Street, Suite 500
Buffalo, New York 14203
Phone: (716) 842-3165

111 Bain Street, Suite 332
Greensboro, North Carolina 27406
Phone: (336) 937-9009

Mixed-Use Development

7072 Boston State Road
Boston, New York 14025

REVISIONS:

No.	Description	Date
1	Rev. C-Store Bldg. Footprint	7/25/2023

STATE OF NEW YORK — R. CHRISTOPHER WOOD — 076394 — LICENSED PROFESSIONAL ENGINEER

DRAWING NAME:

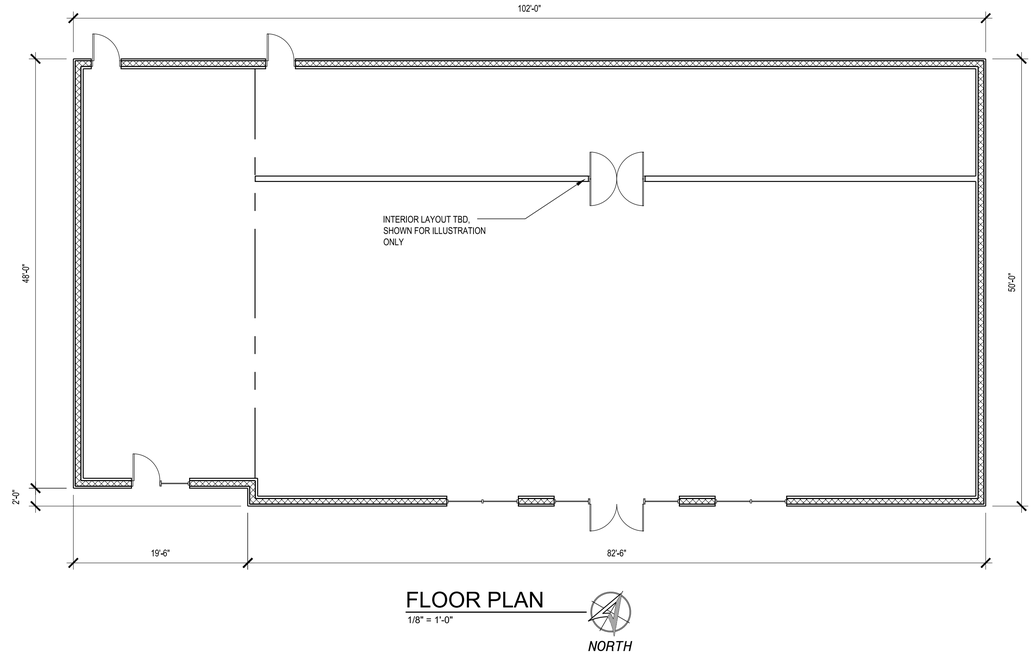
Landscape Plan

Date: 4/24/2023
Drawn By: JPB
Scale: As Noted

DRAWING NO.

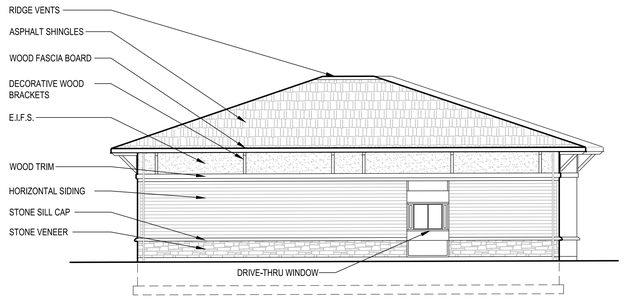
L-100

Project No: 22.305



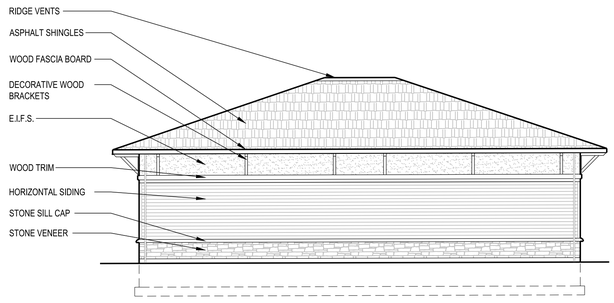
FLOOR PLAN
1/8" = 1'-0"

NORTH



WEST EXTERIOR ELEVATION
1/8" = 1'-0"

SOUTH EXTERIOR ELEVATION
1/8" = 1'-0"



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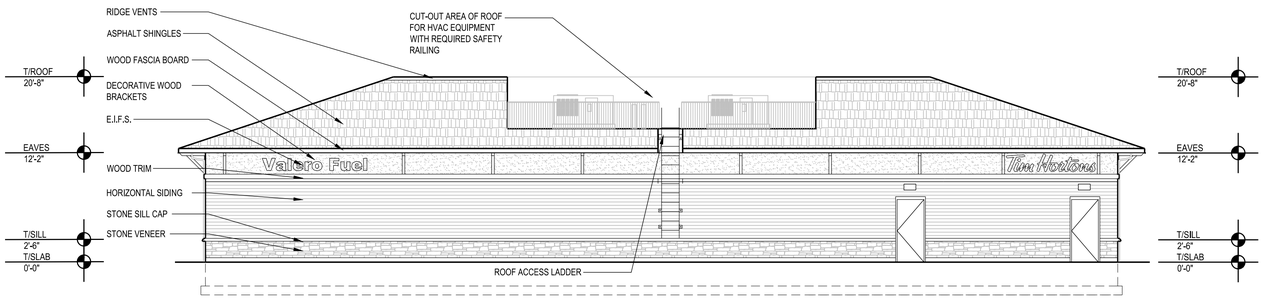

NORTH EXTERIOR ELEVATION
1/8" = 1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION

SEAL

Arkinetics
www.arkinetics.com
3723 Pearl Road
Cleveland, OH 44109
216.749.7800

PROJECT:

NEW BUILDING:
MIRANDA C STORE
7072 BOSTON STATE RD.
NORTH BOSTON, NY 14025

MARK: ISSUE: DATE:

PROJECT #: 23019.01

DRAWN BY: BP CHECKED BY: CI

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DRAWING TITLE:
EXTERIOR ELEVATIONS

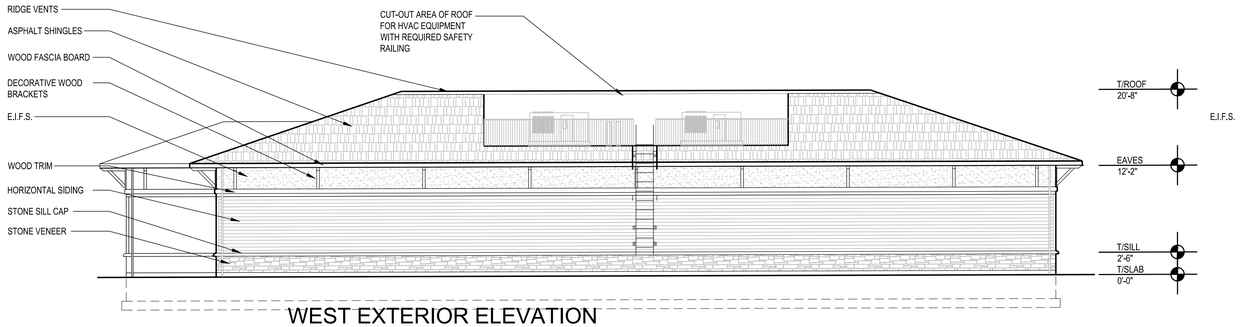
SHEET #:
A2.01

SOUTH EXTERIOR ELEVATION

1/8" = 1'-0"

NORTH EXTERIOR ELEVATION

1/8" = 1'-0"

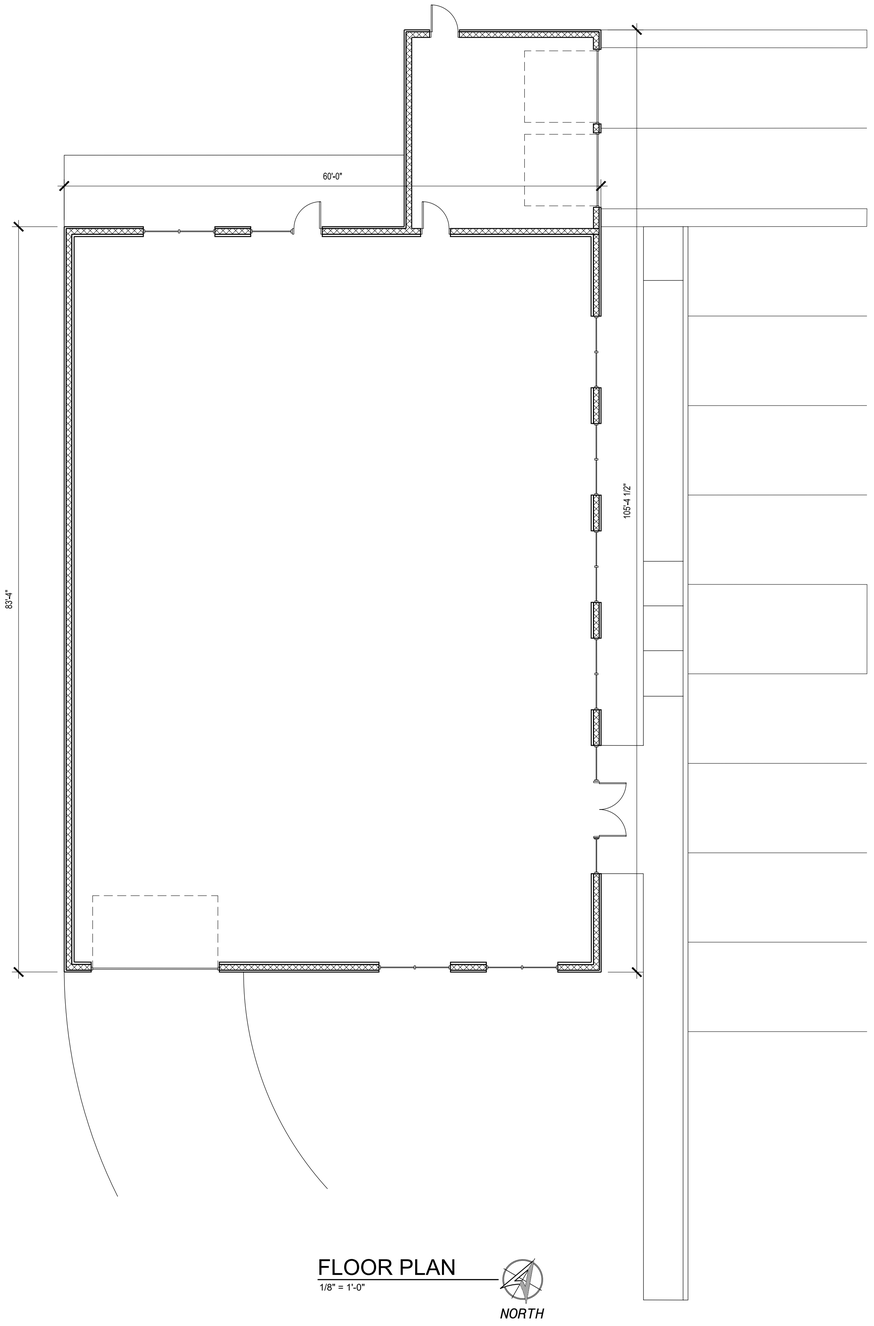


WEST EXTERIOR ELEVATION

1/8" = 1'-0"

EAST EXTERIOR ELEVATION

1/8" = 1'-0"



FLOOR PLAN

1/8" = 1'-0"

NORTH

PRELIMINARY
NOT FOR CONSTRUCTION

SEAL

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DRAWING TITLE:

EXTERIOR ELEVATIONS
OFFICE BUILDING

SHEET #:

A2.01

Traffic Impact Study

for the proposed

Mixed Use Development

Town of Boston
Erie County, New York

December 2022
Updated January 2023, August 2023

Project No. 43101

Prepared For:

Miranda Development, LLC

PO Box 312
North Boston, New York 14110

Prepared By:

SRF ASSOCIATES
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PASSERO ASSOCIATES
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EXECUTIVE SUMMARY

OVERVIEW

The purpose of this report is to identify the potential traffic impacts associated with the proposed Mixed Use Development located on Boston State Road (NY 391) in the Town of Boston, Erie County, New York. The operating characteristics of the proposed access points and impacts to the adjacent roadway network are identified and mitigating measures, if any, are provided to minimize capacity or safety concerns.

To define traffic impact, this analysis establishes existing baseline traffic conditions, projects background traffic flow including area growth, and determines the traffic operations that would result from the proposed project.

The proposed development is located along the south-west side of Boston State Road, just south/east of the US 219 highway and immediately north/west of the existing Tim Horton's in the Town of Boston, Erie County, New York. The project site is bounded by US 219 to the north and west, Boston State Road to the east, and the existing Tim Horton's to the south. The study area consists of the intersections of:

- US Route 219 SB Ramps/Hamburg-Springville Road
- US Route 219 NB Ramps/ Hamburg-Springville Road
- Boston State Road (NY-391)/Tim Horton's Driveway
- Boston State Road (NY-391)/Herman Hill Road (NY-277)-Zimmerman Road

The proposed Mixed-Use Development project consists of:

- ±6,000 SF office building
- ±1,000 SF Tim Horton's Restaurant with a drive-thru window (housed within the new convenience store building
- ±4,183 SF convenience store
- Fueling island with 3 fuel dispensers totaling 6 fueling positions

Access to the site will be provided via one new full access driveway located at the southeast end of the site.

Construction of the proposed project is anticipated to reach full build-out in approximately one year. Widely accepted methodology for preparing traffic impact studies requires that any projects in the study area that are currently approved and/or under construction must be considered in the traffic analysis. Town of Boston personnel were contacted regarding any other specific projects that are currently approved or under construction that would generate additional traffic in the study area. No information on projects was provided by Town of Boston officials regarding background projects for inclusion in this study.

Historical traffic volume data obtained from the New York State Department of Transportation indicates that traffic has decreased in this area over the last 10 years. To account for normal increases in background traffic growth and including any unforeseen developments in the project study area, a conservative growth rate of 0.5% was applied to the existing traffic volumes in the study area for the one year build out period.

CONCLUSIONS & RECOMMENDATIONS

This Traffic Impact Study identifies and evaluates the potential traffic impacts that can be expected from the proposed Mixed-Use Development located at 7072 Boston State Road (NY 391) in the Town of Boston, Erie County, New York. The results of this study determined that the existing transportation network can adequately accommodate the projected traffic volumes and resulting minor impacts to study area intersections with the recommended improvements installed. The following sets forth the conclusions based upon the results of the analyses:

1. The existing crash analysis results indicates that no inherent safety concerns were identified at any of the study intersections.

2. The proposed development is expected to generate approximately 189 entering/172 exiting vehicle driveway trips during the weekday AM peak hour and 135 entering/148 exiting vehicle driveway trips during the weekday PM peak hour. Not all these driveway volumes are new, but instead a portion of the proposed volume is reduced considering pass-by adjustments. Thus, the proposed site is expected to generate approximately 56 entering/45 exiting primary new vehicle trips during the weekday AM peak hour and 54 entering/64 exiting primary new vehicle trips during the weekday PM peak hour.

3. It is noted that no adjustments were made to account for trips between the office use, convenience store/gas use, and Tim Horton's. This results in an overestimation of the actual traffic volumes that will enter/exit the site and that will be added to the study area intersections.

4. The available sight distances along Boston State Rd at the proposed driveway intersection to the left and right exceed the required stopping sight distance (SSD) and desirable intersection sight distance (ISD).

5. The available sight distances along Boston State Rd at the redesigned NY Route 219 NB Off-Ramp intersection to the left and right exceed the required SSD and desirable ISD.

6. All approaches operate at LOS "B" or better during all peak hours under all conditions at the Boston State Rd/NY Route 219 SB Ramp intersection. No changes in levels of service are anticipated as a result of the proposed development and no improvements are warranted or recommended.

7. Under full build conditions at the Boston State Rd/NY Route 219 NB ramp intersection, the northbound left/thru lane operates at LOS "F" during the PM peak hour with an increase in delay of 6.7 seconds per vehicle over background conditions. The northbound ramp currently provides separate left and right turn lanes; the thru movement is shared with the left turn movement. Based on the traffic volumes using the northbound off-ramp and the existing stop sign control (as opposed to yield control) for that movement, it is recommended that the channelized right turn lane be re-striped to provide a traditional right turn lane with a perpendicular approach to Boston State Road. The channelized right turn movement and the acceleration lane on Boston State Road should be removed. There are several reasons to consider removing the existing acceleration lane:

- Removing the channelized right turn and acceleration lane will slow down the right turn traffic as they enter Boston State Road.
- The new right turn lane at the site driveway could create a safety concern as eastbound vehicles on Boston State Road that travel through the intersection with the northbound ramp would have to cross the acceleration lane to enter the right turn lane approaching the site driveway.
- Left turns into the site would have to cross two through lanes and a right turn lane to enter the site.
- The lane drop from the acceleration lane begins immediately past the proposed site driveway.

8. All approaches at the Boston State Rd/Zimmerman Rd/Herman Hill Rd intersection operate at LOS "B" or better under existing, background, and full build conditions during all peak hours. No changes in levels of service are anticipated and no improvements are warranted nor recommended at this location.

9. The combination of westbound traffic volumes turning left onto the proposed site driveway from Boston State Road indicates a left-turn treatment is warranted during both peak hours. Additionally, an eastbound right turn lane is warranted for traffic entering the site based on the speed of the roadway and right turn volume. As such, both an eastbound right turn lane and a westbound left turn lane should be installed on Boston State Road for traffic entering the proposed site driveway. The left turn lane can be contained within the existing pavement width given the recommended changes to the NY Route 219 NB ramp intersection and removal of the existing eastbound acceleration/merge lane for the northbound right turn movement.

10. The results of the drive-through queuing analysis indicate 95th percentile queue lengths of ten (10) vehicles during the AM peak hour, and two (2) vehicles during the PM peak hour. Based on an analysis of the current site plan, the dedicated drive-through lane would provide storage for 12 passenger vehicles (with additional capacity available within the aisle of the parking lot/fuel station, if needed. The analyses indicate that there is sufficient stacking space on-site to accommodate the projected drive-through demands during all peak hours. It is unlikely that this site would experience any spillback onto Boston State Road.

11. Given the acceptable capacity analysis results and that only Warrant 2 is met at the Boston State Rd/US-219 NB Off-Ramp intersection, signalization is not recommended at this intersection. Additionally, the proposed Boston State Rd/Proposed Driveway intersection is projected to operate with acceptable levels of service and delays and considering that the traffic volumes may not develop to the levels projected, signalization is not recommended at this intersection.

12. The projected traffic impacts resulting from full development of the proposed project during all peak hours can be accommodated by the existing transportation network with the recommended highway improvements.

13. For purposes of the environmental review of the proposed project pursuant to the State Environmental Quality Review Act (SEQRA), it is our firm's professional opinion that the proposed project will not result in any potentially significant adverse traffic impacts to the study area intersections.

I. INTRODUCTION

The purpose of this report is to identify the potential traffic impacts associated with the proposed Mixed Use Development located at 7072 Boston State Road (NY 391) in the Town of Boston, Erie County, New York. The operating characteristics of the proposed access points and impacts to the adjacent roadway network are identified and mitigating measures, if any, are provided to minimize capacity or safety concerns.

To define traffic impact, this analysis establishes existing baseline traffic conditions, projects background traffic flow including area growth, and determines the traffic operations that would result from the proposed project.

This updated report addresses comments received from the New York State Department of Transportation (NYSDOT).

II. LOCATION

The proposed development is located along the south-west side of Boston State Road, just south/east of the US 219 highway and immediately north/west of the existing Tim Horton's in the Town of Boston, Erie County, New York. The project site is bounded by US 219 to the north and west, Boston State Road to the east, and the existing Tim Horton's to the south. The study area consists of the intersections of:

- US Route 219 SB Ramps/Hamburg-Springville Road
- US Route 219 NB Ramps/ Hamburg-Springville Road
- Boston State Road (NY-391)/Tim Horton's Driveway
- Boston State Road (NY-391)/Herman Hill Road (NY-277)-Zimmerman Road

The site location and study area are shown in **Figure 1** (all figures are included at the end of the report).

III. EXISTING HIGHWAY SYSTEM

A. Vehicular Network Description

The following information outlined in **Table I** provides a description of the existing roadway network within project study area. **Figure 2** illustrates the lane geometry at each of the study intersections and the Annual Average Daily Traffic (AADT) volumes on the study roadways. The AADTs reflect the most recently collected data obtained from the New York State Department of Transportation (NYSDOT).

Functional classification of highways within the study area is determined by the NYSDOT and the Federal Highway Administration (FHWA). Definitions of the functional classifications shown in **Table I** are provided after the table.

TABLE I: EXISTING HIGHWAY SYSTEM

ROADWAY	CLASS[1]	AGENCY[2]	SPEED LIMIT[3]	TRAVEL LANES[4]	TRAVEL PATTERN/ DIRECTION	EST. AADT & SOURCE[5]
Boston State Rd (NY-391)	16	NYSDOT	45	2	Two-way/ North-South	11,022 NYSDOT (2017)
Zimmerman Rd	19	Town of Boston	45	2	Two-way/ North-South	4,600 NYSDOT (2016)
Herman Hill Rd (NY-277)	16	NYSDOT	40	2	Two-way/ East-West	2,794 NYSDOT (2018)

Notes:
1. State Functional Classification of Roadway.
2. Jurisdictional Agency of Roadway. "NYSDOT" = New York State Department of Transportation
3. Posted or Statewide Limit in Miles per Hour (mph).
4. Number of travel lanes. Excludes turning/auxiliary lanes developed at intersections.
5. Estimated AADT in Vehicles per Day (vpd).
6. AADT Source (Year).

Urban Minor Arterial (Class 16)

An urban minor arterial provides service for trips of moderate length that serve geographic areas that are smaller than higher arterial roadways and offer connectivity to higher arterial systems. These roadways distribute traffic to smaller geographic areas, provide more land access without disrupting neighborhood access, and provide urban connections for rural collectors.

Local Roadways (Class 19)

Local roadways are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Bus routes generally do not traverse Local Roads. They are often designed to discourage through traffic.

B. Multi-Modal Network Description

This evaluation reviewed the study area's pedestrian, bicycle, and transit network via field and aerial reconnaissance. A description of the multi-modal infrastructure is described hereafter.

Pedestrian & Bicycle Facilities

There are no sidewalks along any of the roadways within the study area.

There are no dedicated bicycle facilities; however, bicyclists are permitted to share the road on all roadways within the study area.

Transit Facilities

The North Boston Park & Ride Lot is located along the north side of Boston State Rd in the Village of Boston between the 7-11 Convenience Store/Sunoco Fuel Station and Brunner's Eatery. The lot provides parking for 38 vehicles. However, during the winter months parking is restricted to one side of the lot and alternates daily. There are no transit routes that service

this area and the Park & Ride lot is used primarily for parking within the Village of Boston and/or carpool.

IV. EXISTING TRAFFIC CONDITIONS

A. Peak Intervals for Analysis

Given the functional characteristics of the corridors and the land use proposed for the site (gas station/convenience store, Time Horton's, and office), the peak hours selected for analysis are the weekday commuter AM and PM peak periods. The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

B. Existing Traffic Volume Data

Weekday commuter AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hour volumes were collected by Passero Associates at the study area intersections, as noted in *Section II*, on Tuesday, October 18th, 2022 during the AM and PM peak hour periods. The peak hour traffic periods generally occurred between 7:00-8:00 AM and 4:30-5:30 PM at the study intersections.

All turning movement count data was collected on a typical weekday. No adverse weather conditions impacted the traffic counts. The traffic volumes were reviewed to confirm the accuracy and relative balance of the collective traffic counts. The actual differences in traffic volumes can be attributed to temporal variations in traffic volumes as well as activity related to driveways located in the segments between the study intersections. **Figure 3** illustrates the weekday AM and PM peak hour volumes used for analysis purposes in this study.

C. Field Observations

The study intersections were observed during both peak intervals to assess current traffic operations. Signal timing information was obtained by the NYSDOT through a Freedom of Information Request at Boston State Rd/Zimmerman Road-Herman Hill Road to determine peak hour phasing plans and phase durations during each interval.

D. Existing Crash Investigation

The purpose of this crash analysis is to identify inherent safety issues by studying and quantifying historical crashes at the study intersections and identifying potential crash patterns and clusters.

A crash cluster is defined as an abnormal occurrence of similar crash types occurring at approximately the same location or involving the same geometric features. The severity of the crashes should also be considered. A history of crashes is an indication that further analysis is required to determine the cause(s) of the crash(es) and to identify what actions, if any, could be taken to mitigate the crashes.

A crash investigation at the study intersections was conducted to assess the safety history from June 1, 2017, through May 31, 2022. The data was provided by the New York State Department of Motor Vehicles through a Freedom of Information (FOIL) request.

Reportable (non-injury, injury, and fatal injury) type crashes are defined as damage to one person's property in the amount of $1,001 or more. The Non-Reportable type crashes result in property damage of $1,000 or less. Crash rates were computed for the study intersection and compared with NYSDOT average crash rates for similar intersections, as summarized in **Table II**. Intersection rates are listed as crashes per million entering vehicle (CR/MEV). Pertinent crash data is provided in the Attachments.

TABLE II: EXISTING CRASH RATES

INTERSECTION	NUMBER OF CRASHES	NUMBER OF ENTERING VEHICLES	ACTUAL CRASH RATE	STATEWIDE AVERAGE CRASH RATE
Boston State Rd/NY Route 219 SB Ramps	13	14,926 vpd	**0.48**	0.19
Boston State Rd/NY Route 219 NB Ramps	8	13,526 vpd	**0.32**	0.19
Boston State Rd/Existing Tim Horton's Driveway	2	11,684 vpd	0.09	0.19
Boston State Rd/Zimmerman Rd/Herman Hill Rd	19	12,284 vpd	**0.85**	0.56

Notes:
1. vpd = vehicles per day.
2. **Bold** text denotes crash rate above statewide average
3. Crash rates are based on most recent NYSDOT rates from 2019.

As shown in **Table II**, the study intersections all have crash rates that are higher than the statewide average crash rate for similar intersections with the exception of the Tim Horton's Driveway. Each intersection is discussed in greater detail below. Detailed crash information and crash diagrams are included in Appendix A.2 for each study intersection. Notable crash clusters are approaches with three or greater identifiable consistent crash types.

Boston State Rd/NY Route 219 SB Ramps

As shown in **Table II**, the study intersection has a crash rate that is approximately 2.52 times higher than the statewide average crash rate for similar intersections. The following crashes occurred:

- 3 northbound rear-end
- 3 southbound rear-end
- 4 eastbound rear-end
- 2 right angle
- 1 animal

Based on the noted collisions, there are no discernible crash patterns that require mitigation. Rear end crashes are common at signalized intersections.

Boston State Rd/NY Route 219 NB Ramps

As shown in **Table II**, the study intersection has a crash rate that is approximately 1.68 times higher than the statewide average crash rate for similar intersections. No discernible crash patterns exist; thus, no geometric improvements are recommended.

Boston State Rd/Existing Tim Horton's Driveway
As shown in **Table II**, the study intersection has a crash rate that is lower than the statewide average crash rate for similar intersections. No discernible crash patterns exist.

Boston State Rd/Zimmerman Rd/Herman Hill Rd
As shown in **Table II**, the study intersection has a crash rate that is approximately 1.52 times higher than the statewide average crash rate for similar intersections. No discernible crash patterns exist; thus, no geometric improvements are recommended.

V. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH

Construction of the proposed project is anticipated to reach full build-out in approximately one year. Widely accepted methodology for preparing traffic impact studies requires that any projects in the study area that are currently approved and/or under construction must be considered in the traffic analysis. Town of Boston personnel were contacted regarding any other specific projects that are currently approved or under construction that would generate additional traffic in the study area. No information on projects was provided by Town of Boston officials regarding background projects for inclusion in this study.

Historical traffic volume data obtained from the New York State Department of Transportation indicates that traffic has decreased in this area over the last 10 years. To account for normal increases in background traffic growth and including any unforeseen developments in the project study area, a conservative growth rate of 0.5% was applied to the existing traffic volumes in the study area for the one year build out period. The 2023 background traffic volumes are depicted in **Figure 4**.

VI. DEVELOPMENT

A. Description

The proposed Mixed-Use Development project consists of:

- ±6,000 SF office building
- ±1,000 SF Tim Horton's Restaurant with a drive-thru window (housed within the new convenience store building
- ±4,183 SF convenience store
- Fueling island with 3 fuel dispensers totaling 6 fueling positions

Access to the site will be provided via one new full access driveway located at the southeast end of the site. **Figure 5** illustrates the proposed concept plan for the project.

B. Site Generated Traffic

The next step in evaluation of the potential traffic impacts related to the proposed mixed-use development was to determine the additional traffic consisting of vehicle trips entering and exiting the project site that are attributable to the development. The volume of traffic generated by a site is dependent on the intended land use and size of the development. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of traffic entering and exiting the development. Trip Generation, 11th Edition (2021) published by the Institute of Transportation Engineers (ITE) is

used as a reference for this information. The trip rate for the peak hour of the generator may or may not coincide in time or volume with the trip rate for the peak hour of adjacent street traffic. Volumes generated during the peak hour of the adjacent street traffic and proposed land uses, in this case, the weekday commuter AM and PM peaks, represent a more critical volume when analyzing the capacity of the system; those intervals will provide the basis of this analysis.

According to the Institute of Transportation Engineers (ITE), the following steps are recommended when determining trip generation for proposed land uses:

i. Check for the availability of local trip generation rates for comparable uses.

ii. If local trip data for similar developments are not available and time and funding permit, conduct trip generation studies at sites with characteristics similar to those of the proposed development.

Trip generation data for the proposed project was derived from a combination of ITE data for the convenience store/fuel station and office building and local data collected at the existing Tim Horton's restaurant adjacent to the proposed site. Traffic turning in and out of the existing Tim Horton's Restaurant will now turn in and out of the proposed driveway.

Additionally, for certain types of developments, the total number of trips generated is different from the amount of new traffic added to the adjacent highway network by the generator. Service-oriented developments (such as convenience stores, gas stations, shopping centers, discount stores, restaurants, service stations, retail storefronts, and supermarkets) often locate adjacent to busy streets to attract the motorists already passing the site on the adjacent street. The "pass-by" traffic refers to the amount of existing traffic already on the roadway adjacent to the site that, as it "passes by" the site, will enter the site driveways to patronize the project site. The quantifying of "pass-by" trips has the net result of reducing the volume of new traffic that is added to the site driveways and/or adjacent roadways.

ITE data indicates that pass-by rates for gas stations and convenience store uses can vary from 60% to 65% during both the AM and PM peak hours. Given the nature of the surrounding area and considering the location of the site along Boston State Rd, pass-by rates of 50% were used during both the AM and PM peak hours. **Table III** shows the total site generated trips, pass-by trips, and resulting primary (new) trips that are added to the existing highway system for full development of the project. Pass-by trip calculations are included in the Appendices.

The proposed development is expected to generate approximately 189 entering/172 exiting vehicle driveway trips during the weekday AM peak hour and 135 entering/148 exiting vehicle driveway trips during the weekday PM peak hour. Not all these driveway volumes are new, but instead a portion of the proposed volume is reduced considering both the existing Tim Horton's trips and pass-by adjustments for the Convenience Store/Gas Station.

Thus, the proposed site is expected to generate approximately 56 entering/45 exiting primary new vehicle trips during the weekday AM peak hour and 54 entering/64 exiting primary new vehicle trips during the weekday PM peak hour. These new trips are added to study intersections.

TABLE III: SITE GENERATED TRIPS

DESCRIPTION	ITE LUC[1]	SIZE	AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Tim Horton's w/Drive-thru[2]	N/A	1,000 SF	91	85	31	34
General Office Building	710	6,000 SF	13	2	3	13
Convenience Store/Gas Station	945	4,183 SF	85	85	101	101
Total Site Generated Driveway Trips			**189**	**172**	**135**	**148**
Pass-by Trips[3]			*-42*	*-42*	*-50*	*-50*
Total New Site Generated Trips			**56**	**45**	**54**	**64**

Note:
1. ITE LUC = ITE Land Use Code.
2. Tim Horton's Trips are Based on Actual Driveway Counts from the adjacent site. These trips are existing at the study area intersections.
3. Pass-by Trips applied to Convenience Store/Gas Station trips only.

It is noted that no adjustments were made to account for trips between the office use, convenience store/gas use, and Tim Horton's. This results in an overestimation of the actual traffic volumes that will enter/exit the site and that will be added to the study area intersections.

C. Site Traffic Distribution

The cumulative effect of site traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drives serving the site. The proposed arrival/departure distribution of traffic to be generated at this site is considered a function of several parameters, including the following:

- Existing Tim Horton's traffic distribution.
- Existing highway network.
- Employment centers.
- Residential centers.
- Existing traffic patterns, traffic conditions, and controls.

Figure 6 shows the anticipated trip distribution pattern percentages for the Mixed-Use development. **Figures 7A, 7B, 7C and 7D** illustrate the peak hour site-generated traffic based on those percentages for pass-by trips, existing Tim Horton's trips, new site trips, and total site generated trips, respectively.

VII. FULL DEVELOPMENT VOLUMES

The projected design hour traffic volumes were developed for the weekday AM and PM peak hours by combining the future background traffic conditions (**Figure 4**), and projected site generated volumes for full build-out of the proposed site (**Figure 7D**) to yield the total traffic conditions expected at full development. **Figure 8** illustrates the total weekday AM and PM peak hour volumes anticipated for the proposed development under full build-out conditions.

VIII. FUTURE RE-USE OF EXISTING TIM HORTON'S SITE

The existing Tim Horton's site will likely be redeveloped in the future. To account for potential traffic associated with the redevelopment, a Future Condition was analyzed assuming that the existing building may be redeveloped as a drive-in bank. It is unlikely that the building would be redeveloped as another fast-food use given the location and current traffic volumes on Boston State Rd. The following table summarizes the trips expected to be generated by a 4,800 SF drive-in bank.

TABLE IV: SITE GENERATED TRIPS – FUTURE BUILDING RE-USE

DESCRIPTION	ITE LUC[1]	SIZE	AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Drive-in Bank	912	4,800 SF	28	20	50	50

Note:
1. ITE LUC = ITE Land Use Code.

The future bank trips are distributed to the study intersections based on the distribution shown in Figure 6. **Figure 9** shows the resulting bank trips and **Figure 10** shows the future build traffic volumes.

IX. DRIVE-THROUGH QUEUE ASSESSMENT

A drive-through queuing analysis was conducted for the proposed Tim Horton's site during the weekday AM, and PM peak hours to determine the anticipated queue length and adequacy of the proposed on-site stacking space using the drive-through. A formula was developed based upon the average service rates and observed queuing to estimate queue lengths at coffee/donut shops given the projected arrival rate at the drive-through. This formula assumes that both arrival and service rates are random. This is based on observations that vehicle arrivals are random, and that service times in the drive-through vary based on type and number of items ordered. For example, service time for ordering a coffee is less than that of a customer who orders coffee and a breakfast sandwich.

Since both the arrival and service times at the proposed drive-through are randomly distributed, stochastic queuing equations were used for this analysis. Since only a portion of site generated traffic will utilize the drive-through, site trip data and drive-through was taken at 16 different coffee and coffee/donut shops across Upstate New York. This data was used to determine the percentage of patrons that utilize the drive-through to order their food/drink. It was determined that on average, 69% of the site traffic for a coffee or coffee/donut shop with drive-through will go through the drive-through. Given that the proposed Tim Horton's will contained within a convenience store, we assumed that 75% of the total entering traffic would use the drive-thru facility. Therefore, the peak projected arrival rate at the proposed drive-through is 69 vehicles per hour during the AM peak hour. Using a service rate of approximately 40 seconds (excluding the waiting time in a storage area immediately in advance of the service positions after placing an order at the order window) during the AM peak hour, the average service rate in the drive-through is 90 vehicles per hour. This service rate in the drive-through is based on service by two persons. Based on service rates collected at similar single-order

drive-through facilities in the Western New York/Finger Lakes Region, there is variability in service times ranging from 25 to 35 seconds during the AM peak hour.

Using the same drive-through utilization percentage as the AM peak hour, the peak projected arrival rate at the proposed drive-through is 24 vehicles per hour during the PM peak hour. Assuming a dinnertime service rate of approximately 55 seconds, based upon previous studies at existing coffee and coffee/donut shops, the average service rate in the drive-through is 65 vehicles per hour for the PM peak hour.

Table V summarizes the results of the proposed drive-through queue assessment.

TABLE V: PEAK HOUR DRIVE-THROUGH QUEUING RESULTS

PEAK HOUR	PARAMETER	RESULTS
AM Peak Hour	Arrival Rate	69 vph
	Service Rate	90 vph
	95% Confidence Queue Length	10 vehicles
PM Peak Hour	Arrival Rate	24 vph
	Service Rate	65 vph
	95% Confidence Queue Length	2 vehicles

Notes:
1. vph = vehicles per Hour.

The results of the drive-through queuing analysis indicate 95th percentile queue lengths of ten (10) vehicles during the AM peak hour, and two (2) vehicles during the PM peak hour.

Based on an analysis of the current site plan, the dedicated drive-through lane would provide storage for 12 passenger vehicles (with additional capacity available within the aisle of the parking lot/fuel station, if needed. The analyses indicate that there is sufficient stacking space on-site to accommodate the projected drive-through demands during all peak hours. It is unlikely that this site would experience any spillback onto Boston State Road.

X. CAPACITY ANALYSIS

A. Description of Capacity Analysis

A capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis focuses on intersections, as opposed to highway segments.

Six Levels of Service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the conditions with little to no delay, and LOS "F"

conditions with very long delays. Suggested ranges of service capacity and an explanation of Levels of Service are included in the Appendices.

The standard procedure for capacity analysis of signalized and un-signalized intersections is outlined in the Highway Capacity Manual (HCM 2016) published by the Transportation Research Board (TRB). Traffic analysis software, Synchro 11, which is based on procedures and methodologies contained in the HCM, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service based on the HCM as an indicator of how well intersections operate.

B. Capacity Analysis Results

2022 existing base and 2023 background operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions. The full build traffic conditions generated by the project were analyzed to assess the operation of the study area intersections. Additionally, a future build condition was evaluated to provide information regarding future conditions assuming that the existing Tim Horton's site is redeveloped as a drive-in bank. Capacity analysis results for existing, background, full development, and future development conditions are listed in **Table VI**. The discussion following the table summarizes capacity conditions. All capacity analysis calculations are included in the Appendices.

TABLE IV: CAPACITY ANALYSIS RESULTS

INTERSECTION	2022 EXISTING BASE CONDITIONS				2023 BACKGROUND CONDITIONS				2023 FULL BUILD CONDITIONS				2023 FULL BUILD CONDITIONS WITH MITIGATION				2023 FUTURE BUILD CONDITIONS			
	AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
1. Boston State Rd/NY Route 219 SB Ramps (S)																				
EB Thru - Boston State Rd	A	6.5	B	14.1	A	6.5	B	14.1	A	6.6	B	14.6					A	6.7	B	14.9
EB Right - Boston State Rd	A	1.8	A	3.0	A	1.8	A	3.0	A	1.8	A	3.1					A	1.8	A	3.0
WB Left - Boston State Rd	A	4.8	A	9.8	A	4.8	A	9.8	A	4.7	B	10.2					A	4.7	B	10.3
WB Thru - Boston State Rd	A	6.2	B	12.8	A	6.2	B	12.9	A	6.2	B	13.4					A	6.2	B	13.6
SB Left/thru - NY 219 SB Off-Ramp	B	15.3	B	17.1	B	15.4	B	17.3	B	16.0	B	18.0	N/A		N/A		B	16.2	B	18.6
SB Right - NY 219 SB Off-Ramp	A	6.2	A	3.6	A	6.3	A	3.7	A	6.5	A	3.7					A	6.5	A	3.7
Overall LOS	***A***	***6.7***	***B***	***11.8***	***A***	***6.7***	***B***	***11.8***	***A***	***6.8***	***B***	***12.3***					***A***	***6.9***	***B***	***12.7***
Volume-to-Capacity (v/c) Ratio	***0.39***		***0.59***		***0.39***		***0.59***		***0.40***		***0.61***						***0.41***		***0.61***	
2. Boston State Rd/NY Route 219 NB Ramps (U)																				
EB Left - Boston State Rd	A	8.9	A	8.1	A	8.9	A	8.1	A	9.0	A	8.2	A	9.0	A	8.2	A	9.0	A	8.2
NB Left/thru - NY 219 NB Off-Ramp	F	70.0	E	46.1	F	71.0	E	46.5	F	82.3	F	53.2	F	82.3	F	53.2	F	87.7	F	59.7
NB Right - NY 219 NB Off-Ramp	A	9.8	B	13.7	A	9.8	B	13.7	A	9.9	B	14.2	A	9.9	B	14.2	B	10.0	B	14.5
3. Boston State Rd/Zimmerman Rd-Herman Hill Rd (S)																				
EB Left/Thru - Boston State Rd	A	7.9	B	11.8	A	7.9	B	11.9	A	8.0	B	12.7					A	8.1	B	13.3
EB Right - Boston State Rd	A	2.9	A	3.3	A	2.9	A	3.3	A	2.8	A	3.5					A	2.8	A	3.6
WB - Boston State Rd	A	9.5	A	8.3	A	9.5	A	8.3	A	9.8	A	8.6					B	10.0	A	8.9
NB - Zimmerman Rd	B	15.5	B	18.1	B	15.6	B	18.2	B	16.4	B	19.1	N/A		N/A		B	16.8	B	19.7
SB - Herman Hill Rd	A	6.3	B	13.9	A	6.3	B	13.9	A	6.5	B	13.9					A	6.4	B	13.9
Overall LOS	***A***	***9.6***	***B***	***11.0***	***A***	***9.6***	***B***	***11.0***	***A***	***10.0***	***B***	***11.5***					***B***	***10.1***	***B***	***11.9***
Volume-to-Capacity (v/c) Ratio	***0.43***		***0.58***		***0.44***		***0.58***		***0.45***		***0.62***						***0.46***		***0.63***	
4. Boston State Rd/Proposed Site Driveway (U)																				
WB Left - Boston State Rd									A	8.3	A	9.5	A	8.3	A	9.5	A	8.4	A	9.6
NB Left - Proposed Site Driveway	N/A		N/A		N/A		N/A		F	101.8	E	39.0	D	28.4	C	18.4	D	29.2	C	19.1
NB Right - Proposed Site Driveway									A	9.6	B	11.8	B	10.0	B	14.9	B	10.1	C	15.2

Notes:

1. A(2.8) = Level of Service (Delay in seconds per vehicle)
2. NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NEB = Northeastbound, SWB = Southwestbound
3. (S) = Signalized; (U) = Unsignalized
4. N/A = Approach does not exist and/or was not analyzed during this condition
5. Green shaded cells indicate low delays, yellow shaded cells indicate moderate delays, red shaded cells indicate long delays.

1. Boston State Rd/NY Route 219 SB Ramps

All approaches operate at LOS "B" or better during all peak hours under all conditions. The westbound left approach changes from LOS "B" to "C" during the PM peak hour between background and full build conditions. This is considered a borderline condition as the threshold between LOS "B" and "C" is 10.0 seconds per vehicle and the actual increase in delay projected is 1.4 seconds per vehicle. No other changes in levels of service are anticipated and no mitigation is warranted or recommended.

2. Boston State Rd/NY Route 219 NB Ramps

All approaches operate at LOS "B" or better during all peak hours under all conditions with the exception of the northbound left/thru lane which operates at LOS "F" during the AM peak hour and LOS "E" during the PM peak hour. Under full build conditions, the northbound left/thru lane also operates at LOS "F" during the PM peak hour based on an increase in delay of 6.7 seconds per vehicle. The northbound ramp currently provides a separate left turn lane and a channelized right turn lane that becomes an acceleration lane on Boston State Road; the thru movement is shared with the left turn movement. Based on the traffic volumes using the northbound off-ramp and the existing stop sign control (as opposed to yield control) for that movement, it is recommended that the channelized right turn lane be re-striped to provide a traditional right turn lane with a perpendicular approach to Boston State Road. Although this does not change the level of service results, there are several reasons to consider removing the existing acceleration lane:

- Removing the channelized right turn and acceleration lane will slow down the right turn traffic as they enter Boston State Road.
- The new right turn lane at the site driveway could create a safety concern as eastbound vehicles on Boston State Road that travel through the intersection with the northbound ramp would have to cross the acceleration lane to enter the right turn lane approaching the site driveway.
- Left turns into the site would have to cross two through lanes and a right turn lane to enter the site.
- The lane drop from the acceleration lane begins immediately past the proposed site driveway.

It is noted that the capacity analysis results show the same level of service and delay under the full build condition and the mitigated condition. This is due to the fact that the northbound right turn movement is stop controlled in both scenarios. The existing acceleration lane for the northbound right turn movement is not a factor in the capacity analysis and does not change how the right turn movement functions due to the stop-controlled condition.

3. Boston State Rd/Zimmerman Rd/Herman Hill Rd

All approaches operate at LOS "B" or better under existing, background, and full build conditions during all peak hours. No changes in levels of service are anticipated and no improvements are warranted nor recommended at this location.

4. Boston State Rd/Proposed Driveway

The westbound left turn movement for traffic entering the site driveway is projected to operate at LOS "A" during both peak hours. The driveway will provide separate left and right turn lanes for traffic exiting the site. The northbound right turn exiting the driveway is projected to operate at LOS "A"("B") and the left turn is projected to operate at LOS "F"("E") during the AM(PM) peak hours respectively with no mitigation/improvements. A left turn treatment warrant investigation was performed at this location, and it was determined that a westbound left turn

lane is warranted during both peak hours. Additionally, an eastbound right turn lane is warranted per NYSDOT based on the speed of the roadway and volume of right turns entering the site. Therefore, the applicant should design and install both a westbound left turn lane and an eastbound right turn lane for traffic entering the site. The left turn lane can be contained within the existing pavement width given the recommended changes to the NY Route 219 NB ramp intersection and removal of the existing eastbound acceleration/merge lane for the northbound right turn movement. The left turn movement exiting the driveway will improve to LOS "D"("C") during the AM(PM) peak hours and the right turn exiting the driveway will operate at LOS "B" with these improvements in place.

XI. LEFT-TURN TREATMENT WARRANT INVESTIGATION

Volume warrants for left-turn treatments on Boston State Road at the proposed driveway were investigated using the Transportation Research Board's NCHRP Report 279, Intersection Channelization Design Guide, 1985. Provisions for left-turn lane facilities should be established where traffic volumes are high enough and safety considerations are sufficient to warrant the additional lane. This investigation analyzes warrants during the weekday AM and PM peak hours for the proposed driveway intersection under full development conditions.

The combination of westbound traffic volumes turning left onto the proposed site driveway from Boston State Road indicates a left-turn treatment is warranted during both peak hours. As such, a westbound left turn lane should be installed on Boston State Road for traffic entering the proposed site driveway. All supporting calculations are included in the Appendix of this report.

XII. TRAFFIC SIGNAL WARRANT INVESTIGATION

A traffic signal warrant analysis was completed at two of the study intersections: Boston State Rd/US 219 NB Off Ramp and Boston State Rd/Proposed Site Driveway. The need for a traffic signal is determined by comprehensive investigation of existing and future traffic conditions and physical characteristics at the location. The Standard Specifications Update for the adoption of the National MUTCD (FHWA) and the New York State Supplement were reviewed to investigate the need for a traffic control signal at this location.

According to the MUTCD "Standards for traffic control signals are important because traffic control signals need to attract the attention of a variety of road users, including those who are older, those with impaired vision, as well as those who are fatigued or distracted, or who are not expecting to encounter a signal at a particular location. The selection and use of traffic control signals should be based on an engineering study of roadway, traffic, and other conditions." "Since vehicular delay and the frequency of some types of crashes are sometimes greater under traffic signal control than under STOP sign control, consideration should be given to providing alternatives to traffic control signals even if one or more of the signal warrants has been satisfied."

"A careful analysis of traffic operations, pedestrian and bicyclist needs, and other factors at a large number of signalized and unsignalized locations, coupled with engineering judgment, has provided a series of signal warrants, described in Chapter 4C, that define the minimum conditions under which installing traffic control signals might be justified."

There are nine (9) warrants as follows:

- Warrant 1 Eight-Hour Vehicular Volume
- Warrant 2 Four-Hour Vehicular Volume
- Warrant 3 Peak Hour Vehicular Volume
- Warrant 4 Pedestrian Volume
- Warrant 5 School Crossing
- Warrant 6 Coordinated Signal System
- Warrant 7 Crash Experience
- Warrant 8 Roadway Network
- Warrant 9 Intersection Near a Grade Crossing

Prior to applying warrants, the MUTCD suggests consideration of the effects of right-turn volumes on the minor street approach, and a reduction taken in the number of right turning vehicles, where appropriate. Right turn volumes were omitted entirely at the existing and future US-219 NB Off-ramp considering the existing channelized right turn lane and the future right turn lane – given the very low right turn volume, it is assumed that most if not all right turns would be right turn on red (RTOR) movements. Right turns exiting the proposed site driveway were reduced by 50% to account for anticipated RTOR movements. ITE data for "convenience store with gas" was used to project the hourly distribution of traffic exiting the proposed site driveway. The posted speed limit on Boston State Rd is 45 MPH, thus 70% thresholds in Table 4C-1, Figure 4C-2, and Figure 4C-4 are used as a basis for analysis.

1. Warrant 1 is subdivided into Condition A and Condition B. The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. These conditions are satisfied when, for each of any eight hours of an average day, anticipated volumes on the artery and side road are more than the minimum values presented in Tables 4C-1 in the MUTCD. **Warrant A is not met under any conditions at either location. Warrant B is met for 7 of 8 hours under existing and full build conditions at the US 219 NB off-ramp. Warrant B is also projected to be met for 13 hours under full build conditions at the proposed site driveway.**

2. Warrant 2, the Four-Hour Vehicular Volume signal warrant conditions, are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant stipulates that for any four hours of a day, minimum threshold volumes are met on the artery and side road. **This warrant is met under existing and full build conditions at the US 219 NB off-ramp and under full build conditions at the proposed site driveway.**

3. Warrant 3 is intended for application where minor street traffic suffers undue delay in entering or crossing the major street for one hour of the day. It stipulates that the warrant shall be applied in unusual cases (high-occupancy vehicle facilities – i.e., shopping centers, office parks) where a large number of vehicles discharge over a short period of time. **This warrant is not met under any conditions at the US 219 NB off-ramp. This warrant is met under full build conditions at the proposed site driveway.**

4. Warrant 4 is met when pedestrians experience excessive delay in crossing the major street because the traffic volumes are so heavy. The intersection currently has low pedestrian activity and is not likely to increase significantly under future development phases. This warrant is not met for either location.

5. Warrant 5 is met when a sufficient number of gaps in traffic do not exist for certain size and frequency of school children to cross the major roadway. This warrant is not met for either location.

6. Warrant 6 is met when a traffic signal is needed to maintain progressive movement and vehicle platooning in a coordinated signal system. Neither intersection are likely to be coordinated with adjacent signals, if warranted. Therefore, this warrant is not met at either location.

7. Warrant 7 is intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. The need for a traffic control signal shall be considered if *all* of the following criteria are met:

    a. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce crash frequency.

    b. Five (5) or more reported crashes, of types susceptible to correction by a traffic signal, to have occurred within a 12-month period, each crash involving a personal injury or property damage.

    Based on the crash analysis, this warrant is not met for either location.

8. Warrant 8 is met when a traffic signal might encourage concentration and organization of traffic flow on a roadway network. This warrant primarily focuses on two major intersecting roadways, which is not the case at the study intersections. This warrant is not met for either location.

9. Warrant 9 is applicable when an intersection is located near an at-grade rail crossing. This warrant is not met for either location.

TABLE VII: SIGNAL WARRANT ANALYSIS RESULTS

SIGNAL WARRANT	SATISFACTION OF SIGNAL WARRANTS		
	US-219 NB RAMP EXISTING CONDITIONS	US-219 NB RAMP FULL BUILD CONDITIONS	PROPOSED SITE DRIVEWAY FULL BUILD CONDITIONS
1A – Eight-Hour Condition A	NO	NO	NO
1B – Eight-Hour Condition B	NO	NO	YES
2 – Four-Hour	YES	YES	YES
3 – Peak-Hour	NO	NO	YES
4 – Pedestrian Volume	NO	NO	NO
5 – School Crossing	NO	NO	NO
6 – Coordinated Signal System	NO	NO	NO
7 – Crash Experience	NO	NO	NO
8 – Roadway Network	NO	NO	NO
9 – Intersection Near a Grade Crossing	NO	NO	NO

Table VII summarizes the signal warrant findings at the existing Boston State Rd/US-219 NB Off-Ramp and the proposed Boston State Rd/Proposed Driveway intersections under existing and full build conditions. Based upon the results, Warrant 2 is the only warrant met at the Boston State Rd/US-219 NB Off-Ramp intersection. Warrants 1B, 2, and 3 are met at the proposed site driveway intersection. Given the acceptable capacity analysis results and that only Warrant 2 is met at the Boston State Rd/US-219 NB Off-Ramp intersection, signalization is not recommended at this intersection. Additionally, the proposed Boston State Rd/Proposed Driveway intersection is projected to operate with acceptable levels of service and delays and considering that the traffic volumes may not develop to the levels projected, signalization is not recommended at this intersection.

XIII. SIGHT DISTANCE EVALUATION

Available sight distances were investigated at the proposed driveway access point along Boston State Rd. Additionally, available sight distances were investigated at the NY Route 219 NB Off-Ramp, which will be redesigned as a part of this project as discussed in Section VIII.B. Sight distance is provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles. This should occur in sufficient time for a motorist to stop or adjust their speed, as appropriate, to avoid a collision at the intersection.

Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to anticipate and avoid potential incidents. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate Stopping Sight Distance (SSD) for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. To enhance traffic operations, Intersection Sight Distances (ISD) that exceed stopping sight distances are desirable along the major road.

A Policy on Geometric Design of Highways and Streets 7th Edition (2018), published by the American Association of State Highway and Transportation Officials (AASHTO), was used as a reference to establish the required SSD and desirable ISD for the proposed access driveway location.

Required SSD and desirable ISD are based on the design speed for a given section of roadway; generally, the design speed is the posted speed limit plus 5 MPH. In this case, the posted speed limit at the proposed driveway location along Boston State Rd is 45 MPH. Hence a design speed of 50 MPH was used. Stopping sight distance is dependent on the driver's eye height above the road surface, the specified object height above the road surface, and the height and lateral position of sight obstructions within the driver's line of sight. For design purposes, the recommended height is 3.50 feet above the road surface. The specified object height above the road surface is assumed to be 2.0 feet, representative of the shortest object at risk to drivers, including the height of automobile headlights or taillights.

The required SSD and desirable ISD based on the design speeds are shown in **Table VIII** for the proposed site driveway and redesigned off-ramp.

TABLE VIII: SIGHT DISTANCE REQUIREMENTS AND MEASUREMENTS

INTERSECTION	SPEED LIMIT (MPH)	DESIGN SPEED (MPH)	Desirable ISD	Required SSD	AVAILABLE ISD TO THE:		AVAILABLE SSD TO THE:	
					LEFT	RIGHT	LEFT	RIGHT
Boston State Rd/ Proposed Driveway	45	50	555	425	650	700+	700+	700+
Boston State Rd/ NY Route 219 NB Off-Ramp	45	50	555	425	640	700+	700+	700+

Note:
1. All sight distance measurements shown in feet.

Proposed Driveway: The available sight distances along Boston State Rd at the proposed driveway intersection to the left and right exceed the required SSD and desirable ISD.

NY Route 219 NB Off-Ramp: The available sight distances along Boston State Rd at the redesigned NY Route 219 NB Off-Ramp intersection to the left and right exceed the required SSD and desirable ISD.

XIV. CONCLUSIONS & RECOMMENDATIONS

This Traffic Impact Study identifies and evaluates the potential traffic impacts that can be expected from the proposed Mixed-Use Development located at 7072 Boston State Road (NY 391) in the Town of Boston, Erie County, New York. The results of this study determined that the existing transportation network can adequately accommodate the projected traffic volumes and resulting minor impacts to study area intersections with the recommended improvements installed. The following sets forth the conclusions based upon the results of the analyses:

1. The existing crash analysis results indicates that no inherent safety concerns were identified at any of the study intersections.

2. The proposed development is expected to generate approximately 189 entering/172 exiting vehicle driveway trips during the weekday AM peak hour and 135 entering/148 exiting vehicle driveway trips during the weekday PM peak hour. Not all these driveway volumes are new, but instead a portion of the proposed volume is reduced considering pass-by adjustments. Thus, the proposed site is expected to generate approximately 56 entering/45 exiting primary new vehicle trips during the weekday AM peak hour and 54 entering/64 exiting primary new vehicle trips during the weekday PM peak hour.

3. It is noted that no adjustments were made to account for trips between the office use, convenience store/gas use, and Tim Horton's. This results in an overestimation of the actual traffic volumes that will enter/exit the site and that will be added to the study area intersections.

4. The available sight distances along Boston State Rd at the proposed driveway intersection to the left and right exceed the required stopping sight distance (SSD) and desirable intersection sight distance (ISD).

5. The available sight distances along Boston State Rd at the redesigned NY Route 219 NB Off-Ramp intersection to the left and right exceed the required SSD and desirable ISD.

6. All approaches operate at LOS "B" or better during all peak hours under all conditions at the Boston State Rd/NY Route 219 SB Ramp intersection. No changes in levels of service are anticipated as a result of the proposed development and no improvements are warranted or recommended.

7. Under full build conditions at the Boston State Rd/NY Route 219 NB ramp intersection, the northbound left/thru lane operates at LOS "F" during the PM peak hour with an increase in delay of 6.7 seconds per vehicle over background conditions. The northbound ramp currently provides separate left and right turn lanes; the thru movement is shared with the left turn movement. Based on the traffic volumes using the northbound off-ramp and the existing stop sign control (as opposed to yield control) for that movement, it is recommended that the channelized right turn lane be re-striped to provide a traditional right turn lane with a perpendicular approach to Boston State Road. The channelized right turn movement and the acceleration lane on Boston

State Road should be removed. There are several reasons to consider removing the existing acceleration lane:

- Removing the channelized right turn and acceleration lane will slow down the right turn traffic as they enter Boston State Road.
- The new right turn lane at the site driveway could create a safety concern as eastbound vehicles on Boston State Road that travel through the intersection with the northbound ramp would have to cross the acceleration lane to enter the right turn lane approaching the site driveway.
- Left turns into the site would have to cross two through lanes and a right turn lane to enter the site.
- The lane drop from the acceleration lane begins immediately past the proposed site driveway.

8. All approaches at the Boston State Rd/Zimmerman Rd/Herman Hill Rd intersection operate at LOS "B" or better under existing, background, and full build conditions during all peak hours. No changes in levels of service are anticipated and no improvements are warranted nor recommended at this location.

9. The combination of westbound traffic volumes turning left onto the proposed site driveway from Boston State Road indicates a left-turn treatment is warranted during both peak hours. Additionally, an eastbound right turn lane is warranted for traffic entering the site based on the speed of the roadway and right turn volume. As such, both an eastbound right turn lane and a westbound left turn lane should be installed on Boston State Road for traffic entering the proposed site driveway. The left turn lane can be contained within the existing pavement width given the recommended changes to the NY Route 219 NB ramp intersection and removal of the existing eastbound acceleration/merge lane for the northbound right turn movement.

10. The results of the drive-through queuing analysis indicate 95th percentile queue lengths of ten (10) vehicles during the AM peak hour, and two (2) vehicles during the PM peak hour. Based on an analysis of the current site plan, the dedicated drive-through lane would provide storage for 12 passenger vehicles (with additional capacity available within the aisle of the parking lot/fuel station, if needed. The analyses indicate that there is sufficient stacking space on-site to accommodate the projected drive-through demands during all peak hours. It is unlikely that this site would experience any spillback onto Boston State Road.

11. Given the acceptable capacity analysis results and that only Warrant 2 is met at the Boston State Rd/US-219 NB Off-Ramp intersection, signalization is not recommended at this intersection. Additionally, the proposed Boston State Rd/Proposed Driveway intersection is projected to operate with acceptable levels of service and delays and considering that the traffic volumes may not develop to the levels projected, signalization is not recommended at this intersection.

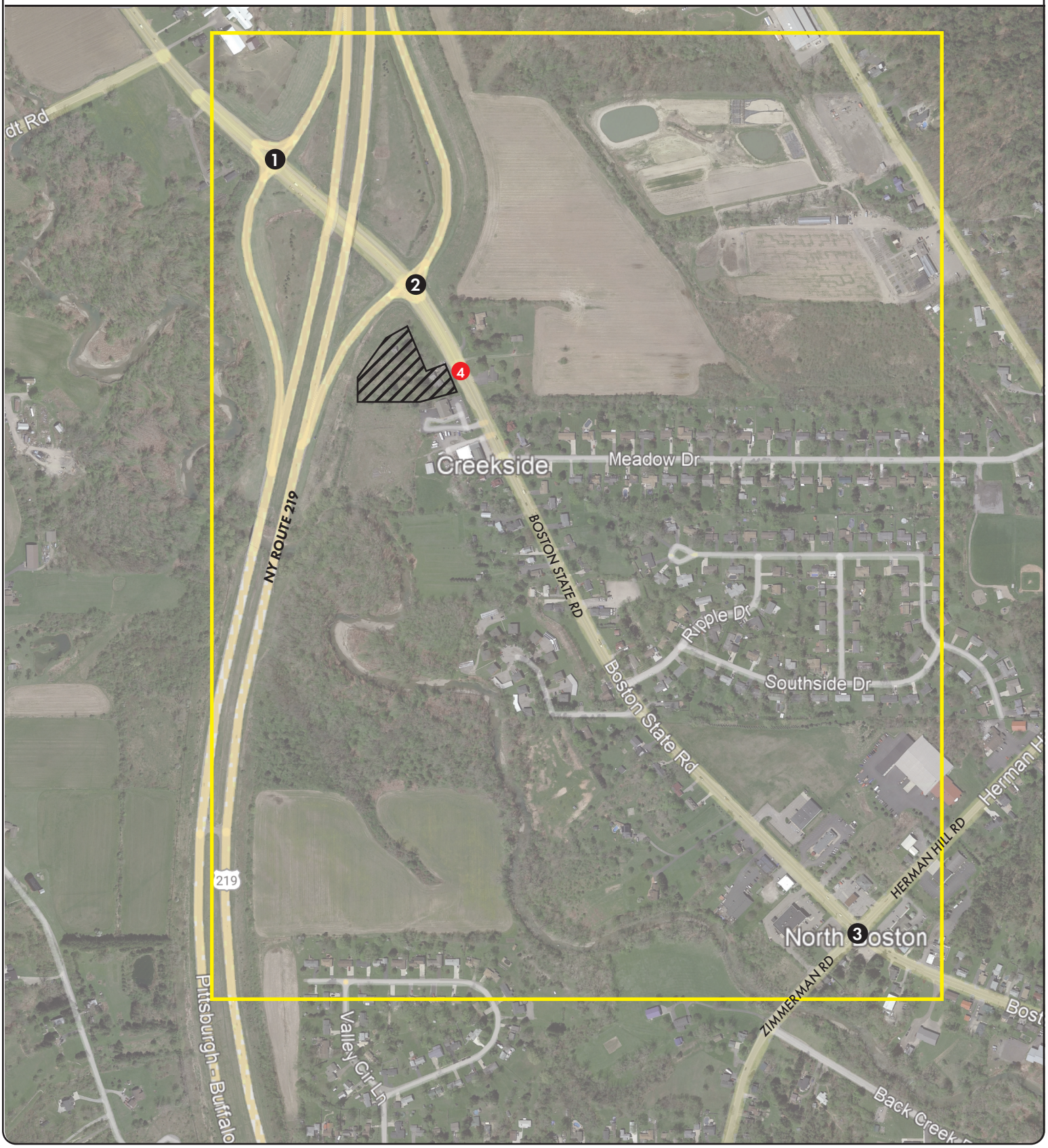
12. The projected traffic impacts resulting from full development of the proposed project during all peak hours can be accommodated by the existing transportation network with the recommended highway improvements.

13. For purposes of the environmental review of the proposed project pursuant to the State Environmental Quality Review Act (SEQRA), it is our firm's professional opinion that the proposed project will not result in any potentially significant adverse traffic impacts to the study area intersections.

XV. FIGURES

Figures 1 through 10 are included on the following pages.

FIGURE 1: SITE LOCATION AND STUDY AREA



Key

- 1 Study Intersection
- 1 Proposed Intersection
- Site Location
- Study Area

PROPOSED TIM HORTON'S DEVELOPMENT

TOWN OF HAMBURG, ERIE COUNTY, NEW YORK

N

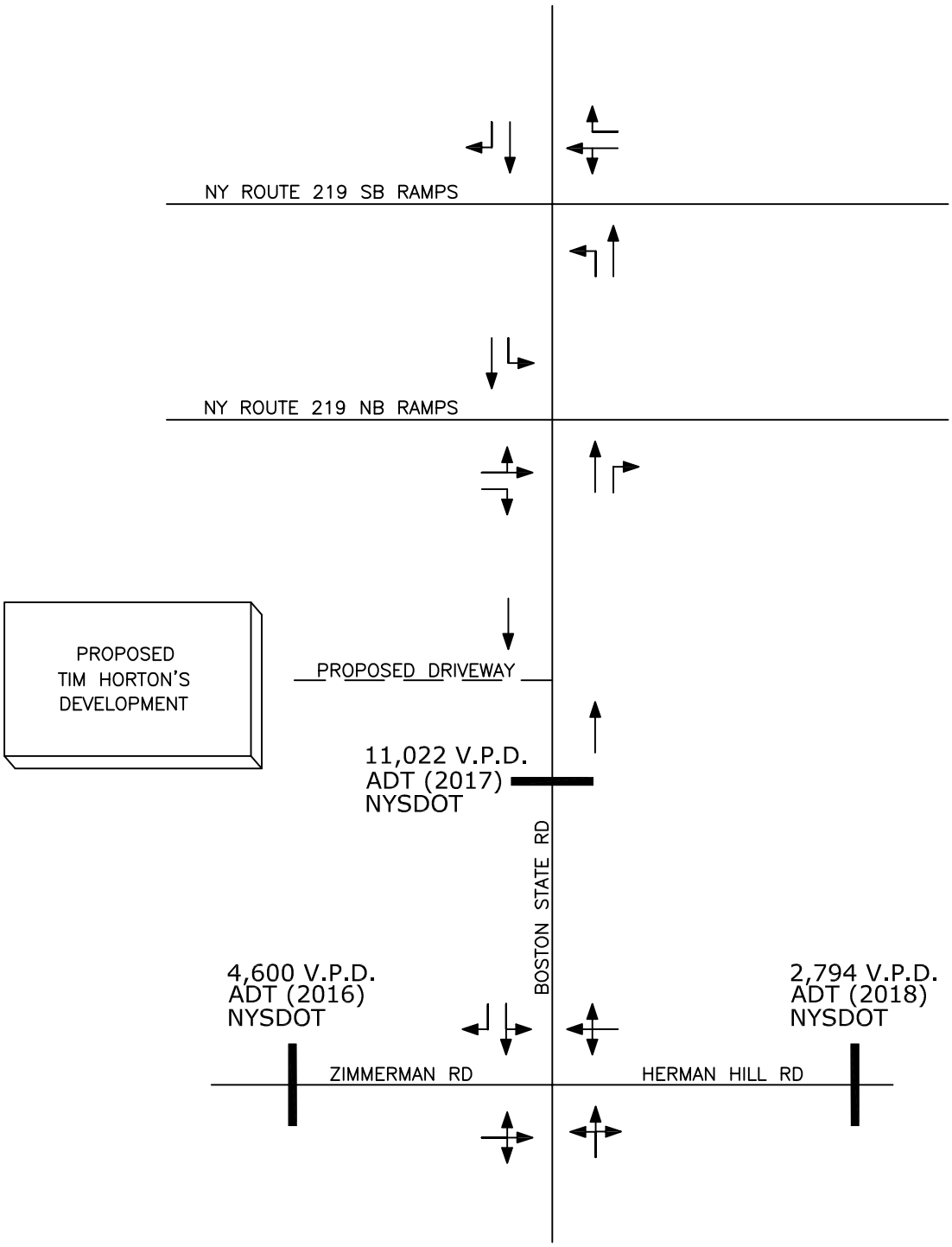
0 400 800 1200 1600 2000

Feet

SRF ASSOCIATES PA

Project No: 42101

Note: All counts by New York State Dept of Transportation
V.P.D. = Vehicles Per Day



PROJECT NO: 43101

KEY

N

NOT TO SCALE

00(00) = AM(PM)

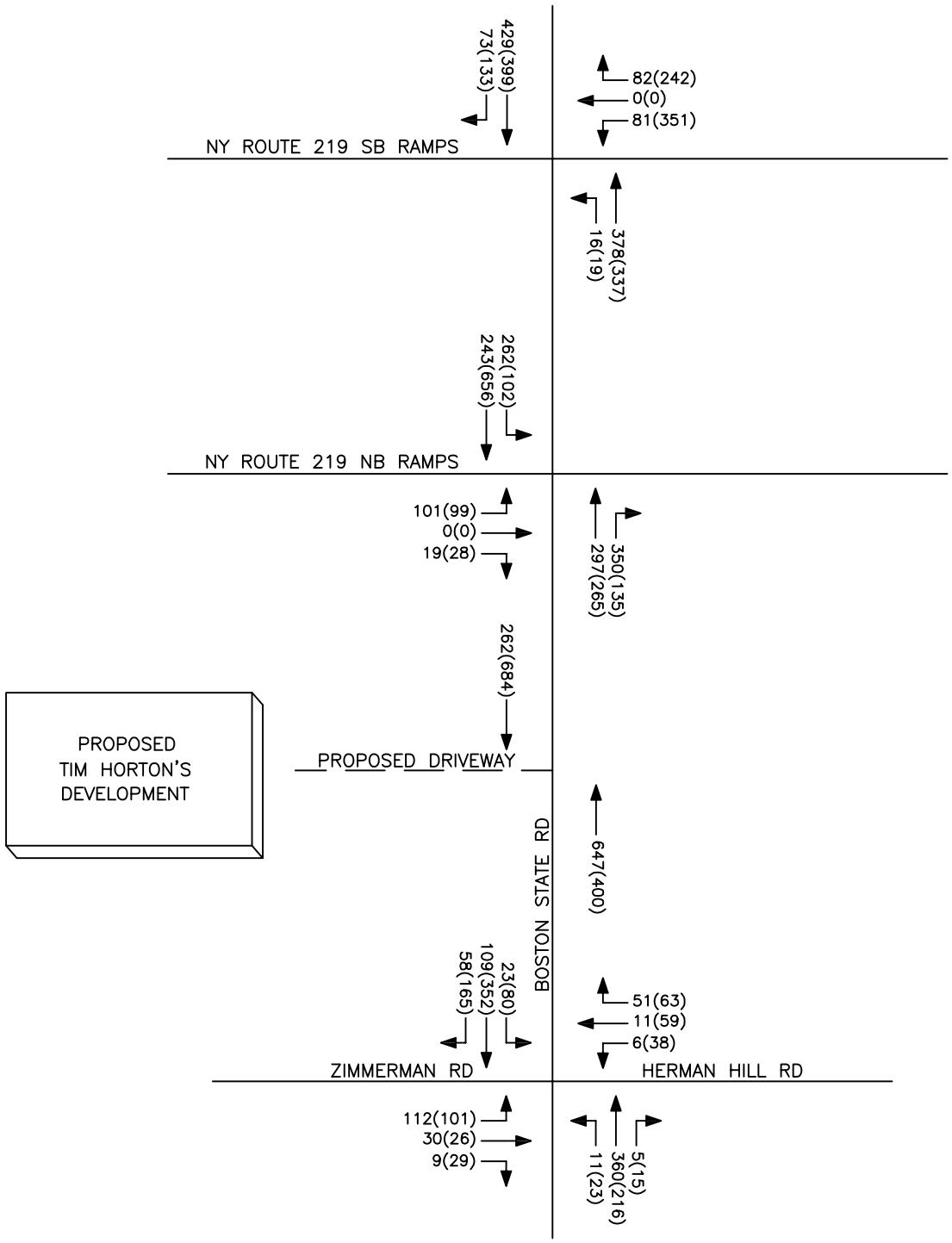
FIGURE 2

LANE GEOMETRY &
AVERAGE DAILY TRAFFIC

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

PA



PROJECT NO: 43101

KEY

N

NOT TO SCALE

00(00) = AM(PM)

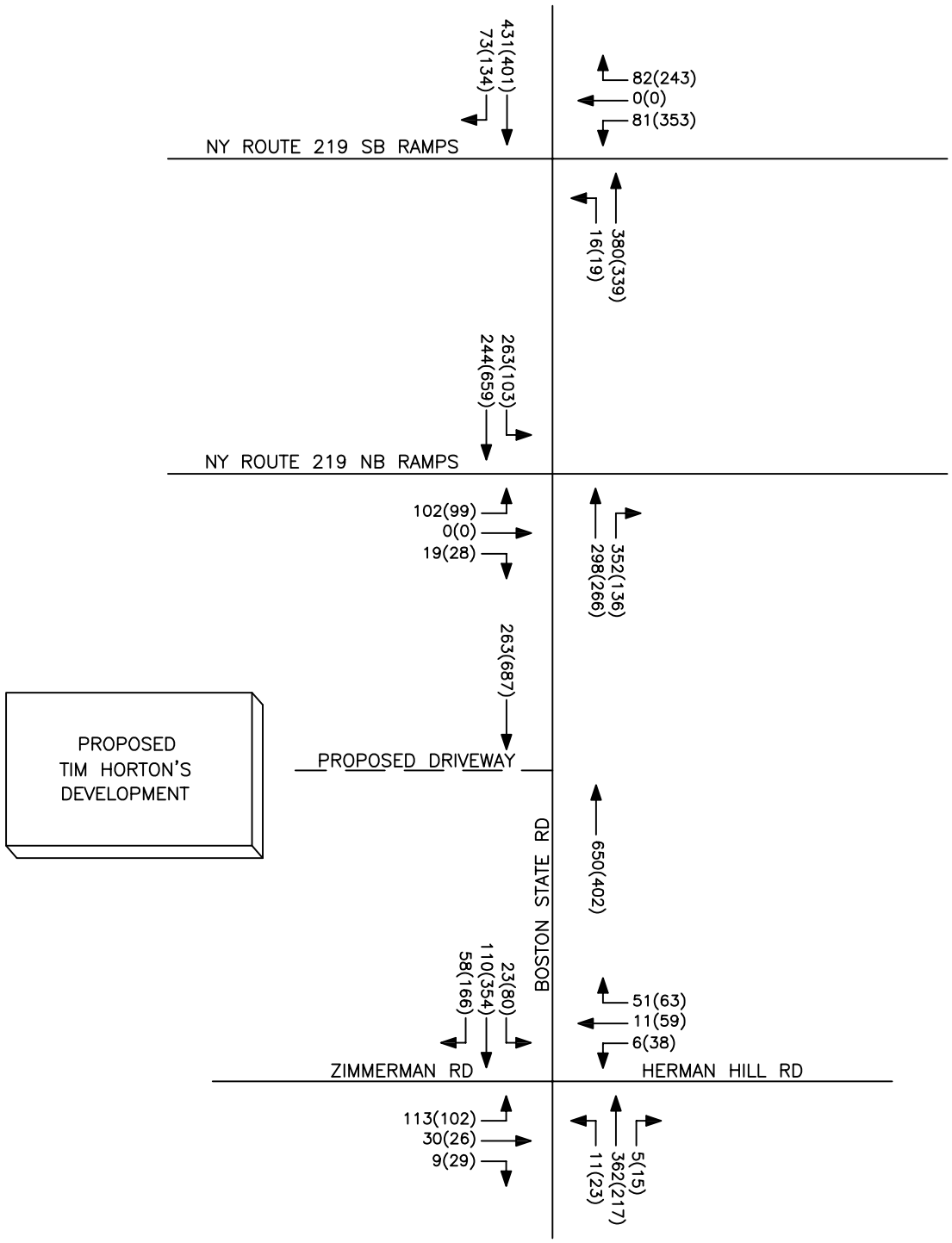
FIGURE 3

PEAK HOUR VOLUMES
2022 EXISTING TRAFFIC

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

PA



PROJECT NO: 43101

KEY

NOT TO SCALE

00(00) = AM(PM)

N

FIGURE 4

PEAK HOUR VOLUMES
2023 BACKGROUND CONDITIONS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

PA

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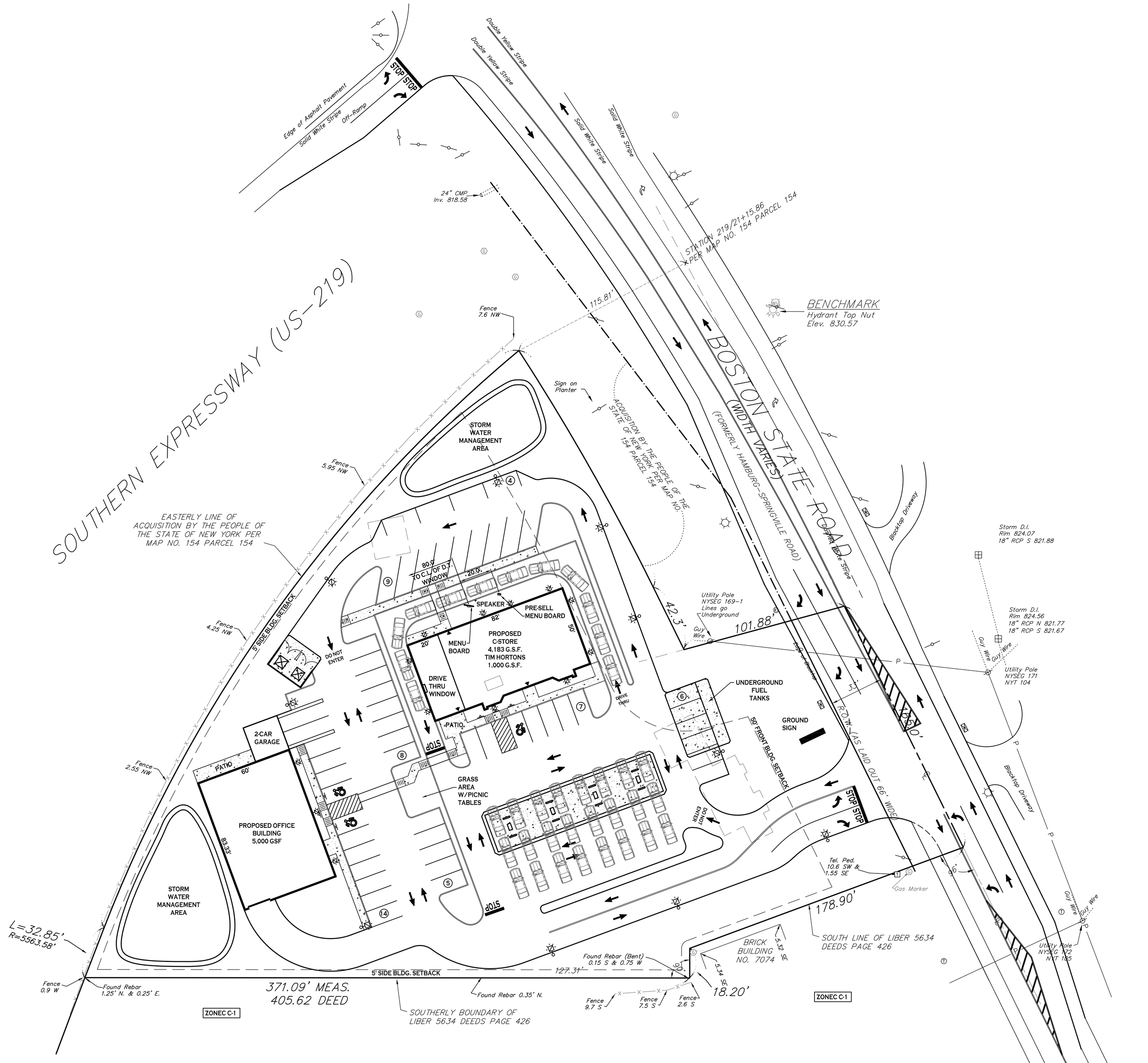


N

SITE PLAN

SCALE: 1"=30'

SITE DATA

SITE AREA = 2.5± AC
ZONED: C-1 - LOCAL RETAIL BUSINESS DISTRICT
DESCRIPTION: 5,000 SF OFFICE BLDG., 5,183 SF C-STORE & RESTAURANT W/FUEL PUMPS

	REQUIRED	PROVIDED
SETBACKS - BUILDING		
FRONT:	50 FT	50.0 FT MIN.
SIDE (ABUTTING COMM.):	0 FT OR 5 FT *	> 5 FT
SIDE (ABUTTING RES.)	20 FT OR HGT. OF BLDG.	N/A
REAR	30 FT OR HGT. OF BLDG.	> 30 FT
SETBACKS - PARKING		
FRONT:	20 FT	20 FT MIN.
SIDE/REAR (ABUTTING COMM.):	NONE	25 FT MIN.
SIDE/REAR (ABUTTING RES.)	10 FT	45 FT MIN.
GREENSPACE		
TOTAL SITE :	NONE	X.X AC (XX%)
PARKING (10' x 20')		53 SPACES
# OF SPACES - SEE CALCULATION BELOW	54	2 GARAGE
		55 SPACES
MAX. BUILDING HEIGHT	35 FT	< 35 FT
LOT COVERAGE	40% (43,560 SF)	10.3% (11,183 SF)

* 25 FT IS USED FOR VEHICULAR INGRESS OR EGRESS

PARKING CALCULATION:
"RETAIL"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 4,183 GSF / 200 = 21 SPACES

"RESTAURANT"
REQ'D PARKING = 2 SPACES PER 5 SEATS
= (20 SEATS / 5) x 2 = 8 SPACES

"OFFICE"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 5,000 GSF / 200 = 25 SPACES

TOTAL = 54 SPACES

SITE LEGEND

- PROPERTY LINE
- PROPOSED CONCRETE CURB
- PROPOSED CONCRETE SIDEWALK
- PROPOSED SIGN
- PROPOSED PARKING NUMBER (27)
- PROPOSED LIGHT POLE FOUNDATION
- PROPOSED WALL-MOUNTED LIGHT

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS. CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60Ft.

CARMINAWOOD
DESIGN
111 Bain Street, Suite 332
Greensboro, North Carolina 27406
Phone: (336) 937-9009
487 Main Street, Suite 500
Buffalo, New York 14203
Phone: (716) 842-5165

Mixed-use Development

7072 Boston State Road
Boston, New York

REVISIONS:
No. Description Date

PRELIMINARY
NOT FOR CONSTRUCTION

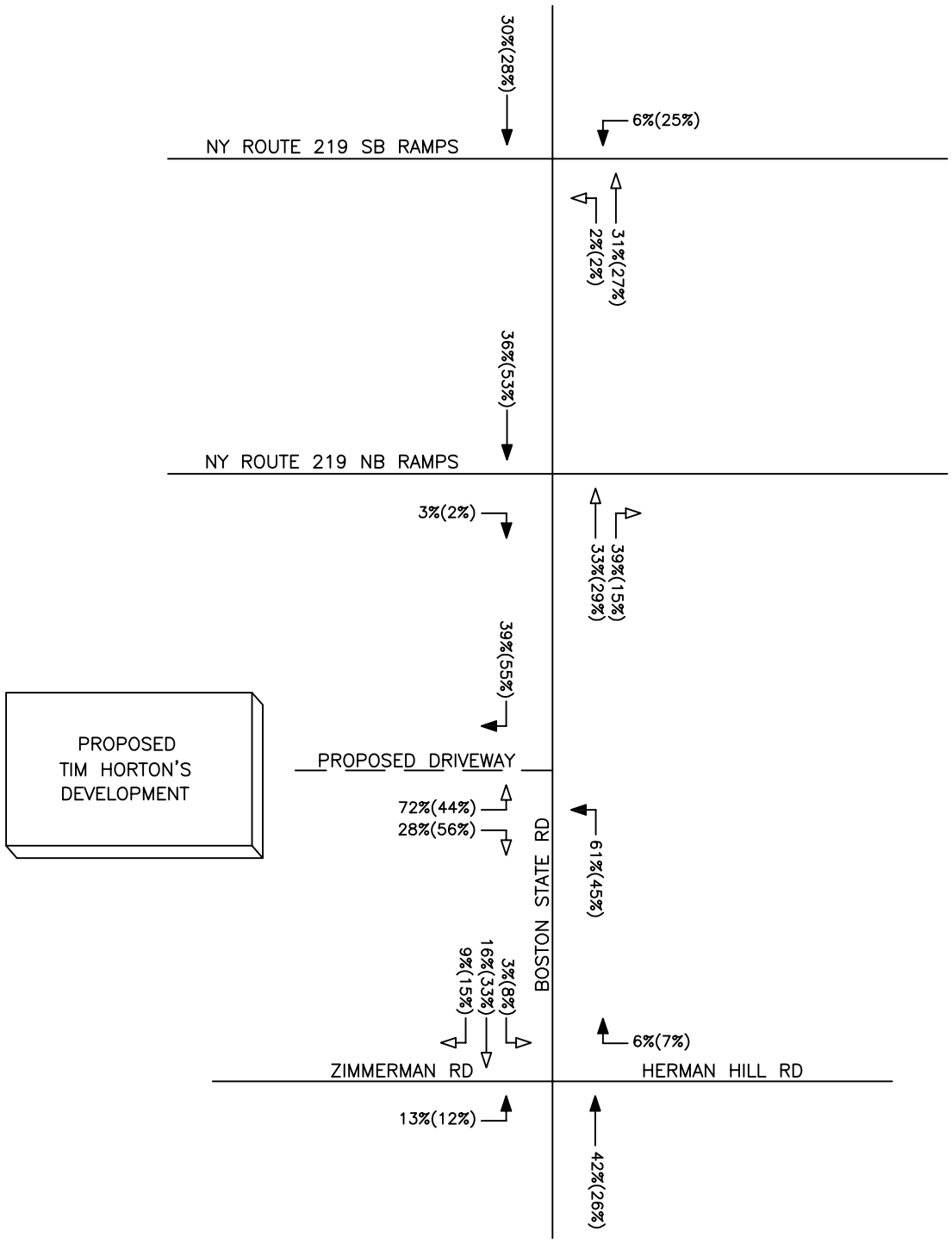
Sealed: XX.XX.XXXX

DRAWING NAME:
Concept Site Plan

Date: 3/14/23
Drawn By: C. Wood
Scale: As Noted

DRAWING NO.
C-100

Project No: 22.305



PROJECT NO: 43101

KEY

N

NOT TO SCALE

→ = ENTERING TRIPS

→ = EXITING TRIPS

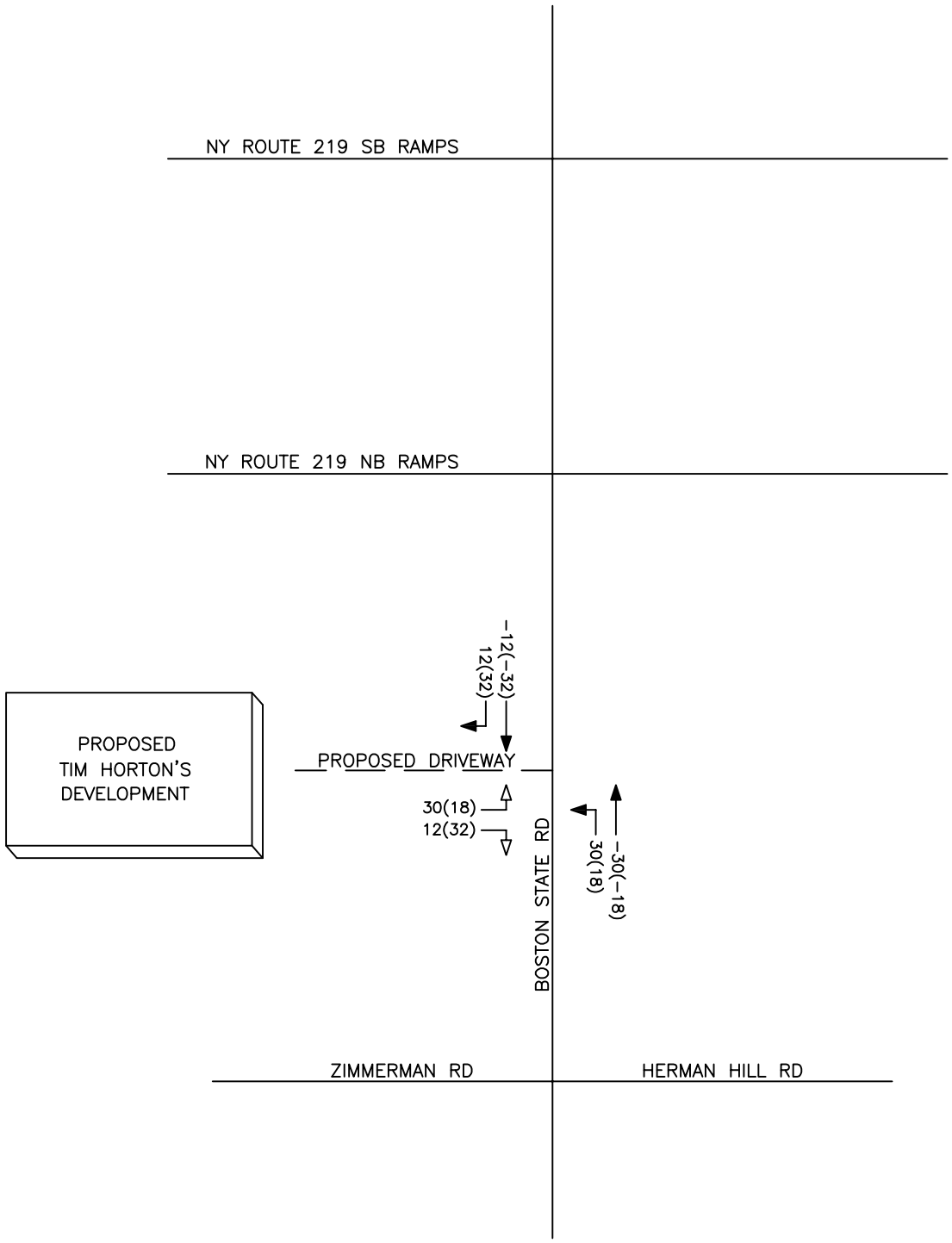
FIGURE 6

TRIP DISTRIBUTION

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

PA



PROJECT NO: 43101

KEY

NOT TO SCALE

00(00) = AM(PM)

N

→ = ENTERING TRIPS

→ = EXITING TRIPS

FIGURE 7A

PASS-BY TRIPS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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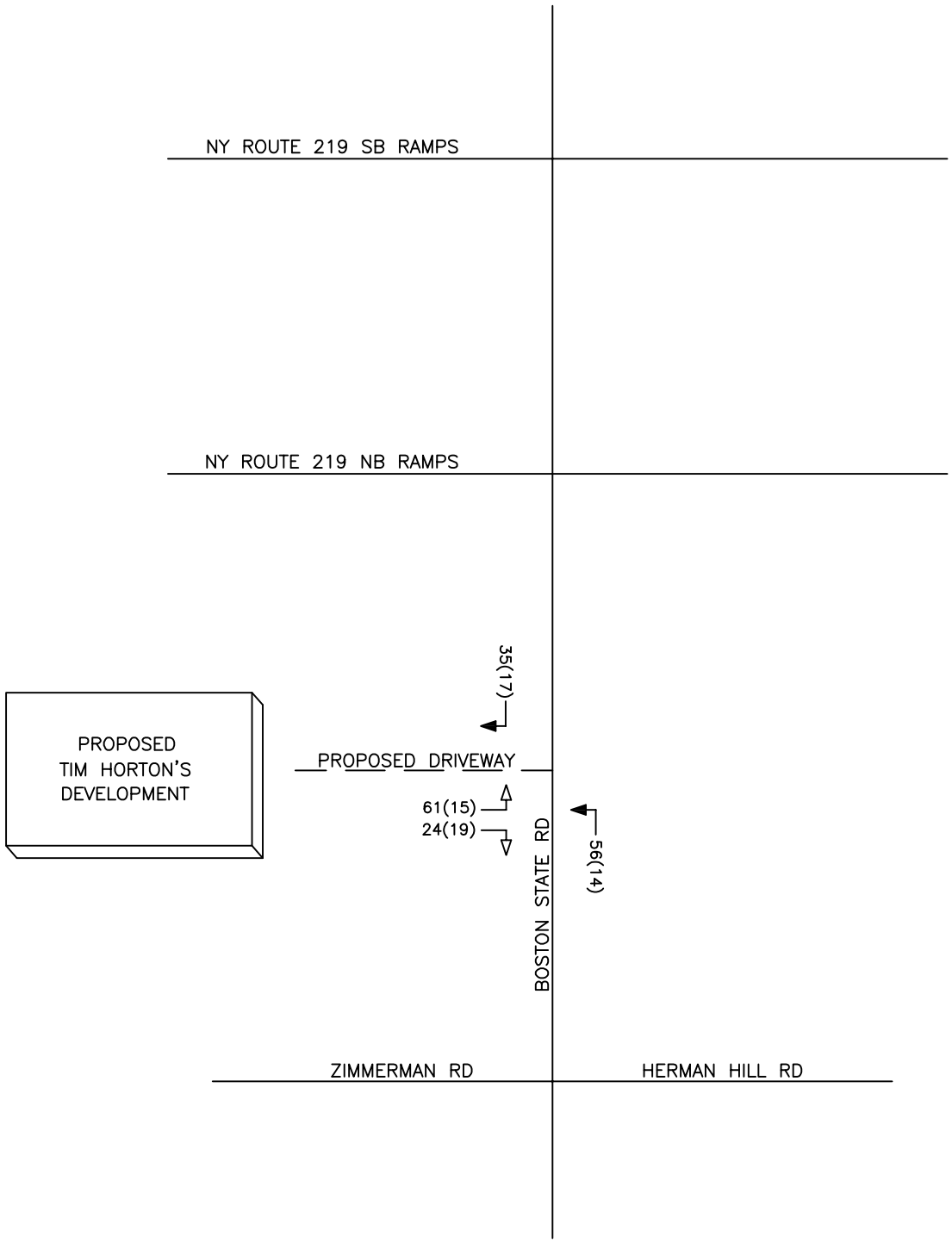

PROJECT NO: 43101

KEY

N

NOT TO SCALE

00(00) = AM(PM)

→ = ENTERING TRIPS

→ = EXITING TRIPS

FIGURE 7B

TIM HORTON'S TRIPS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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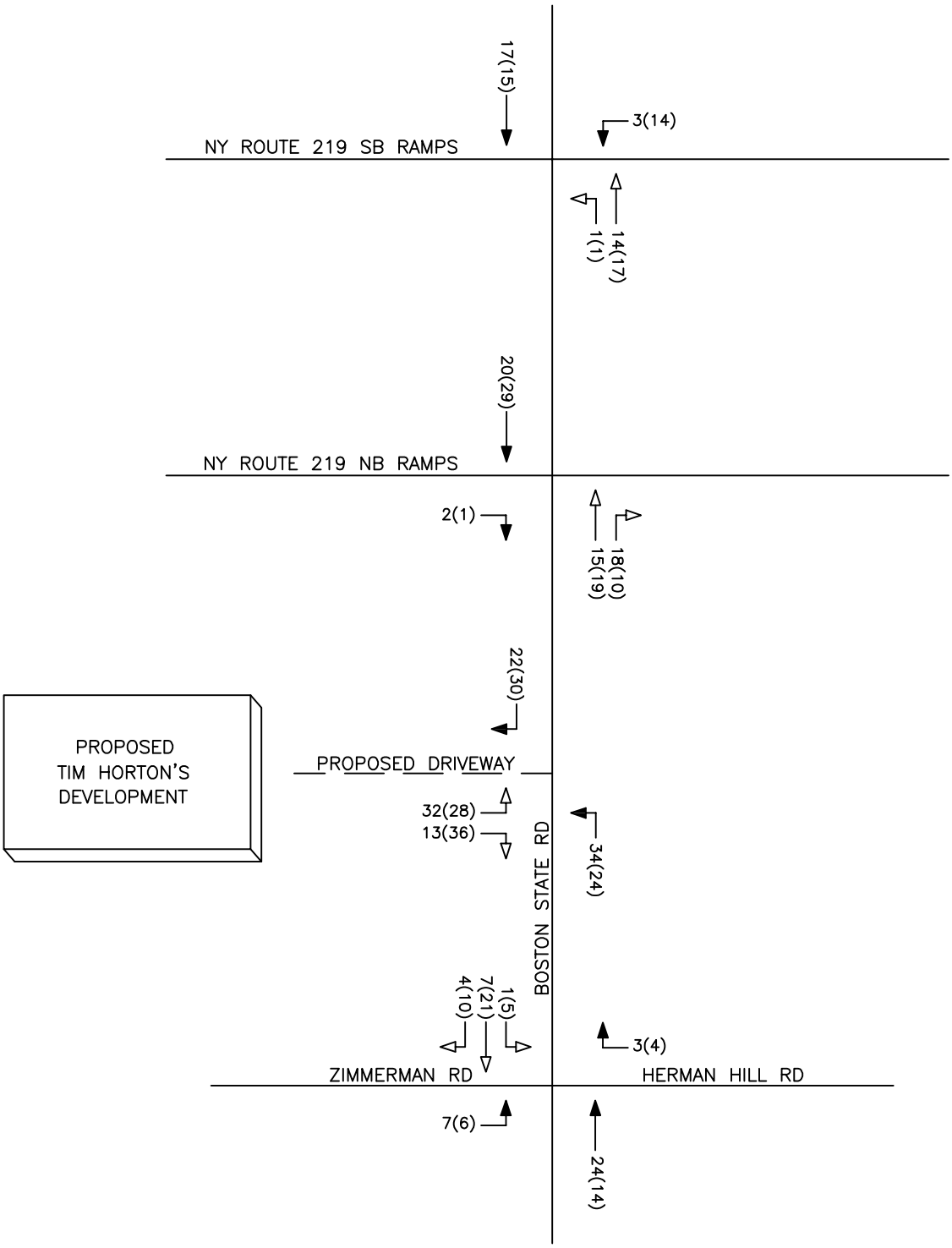

PROJECT NO: 43101

KEY

N

NOT TO SCALE

00(00) = AM(PM)

→ = ENTERING TRIPS

→ = EXITING TRIPS

FIGURE 7C

NEW SITE TRIPS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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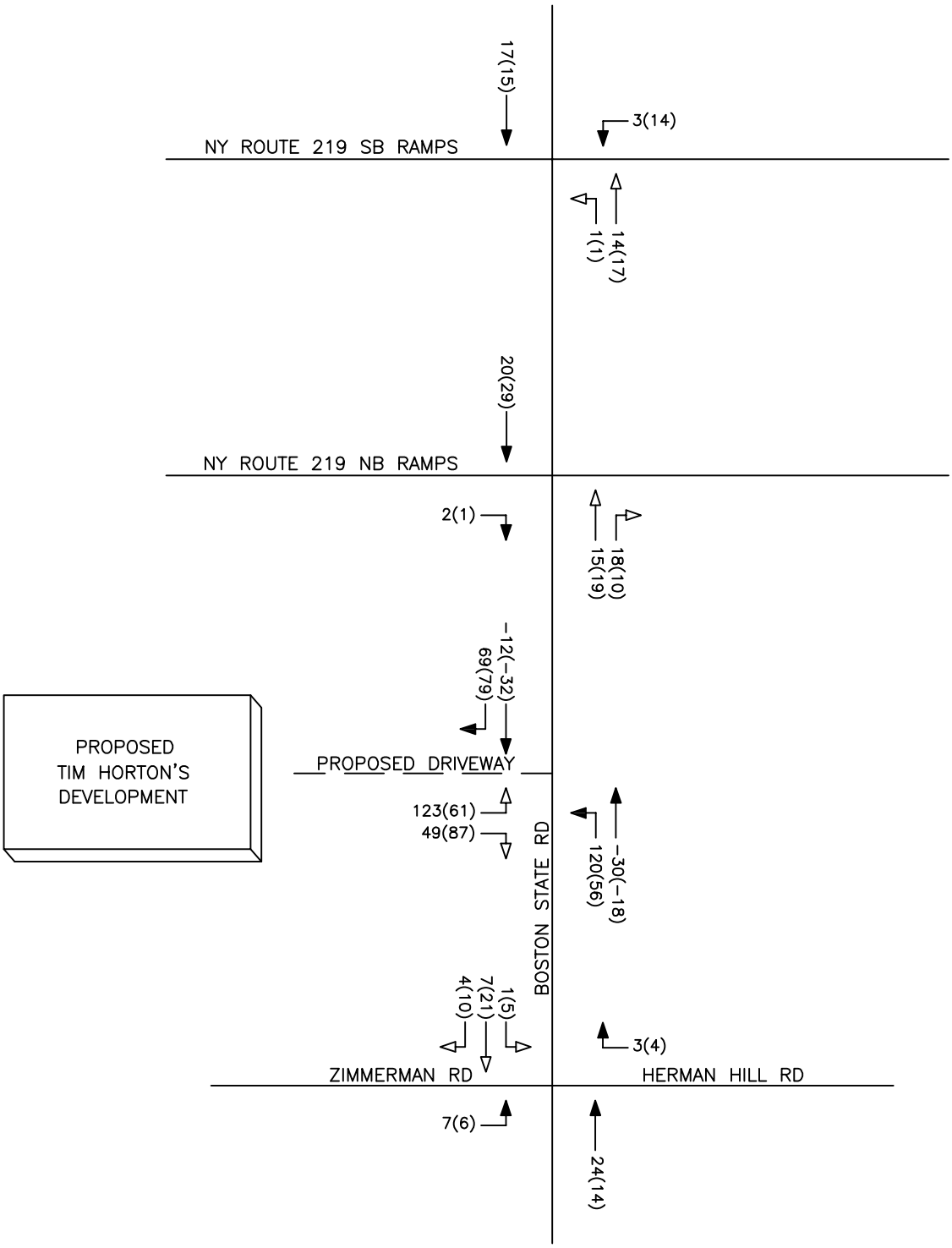

PROJECT NO: 43101

KEY

N

NOT TO SCALE

00(00) = AM(PM)

→ = ENTERING TRIPS

→ = EXITING TRIPS

FIGURE 7D

TOTAL SITE GENERATED TRIPS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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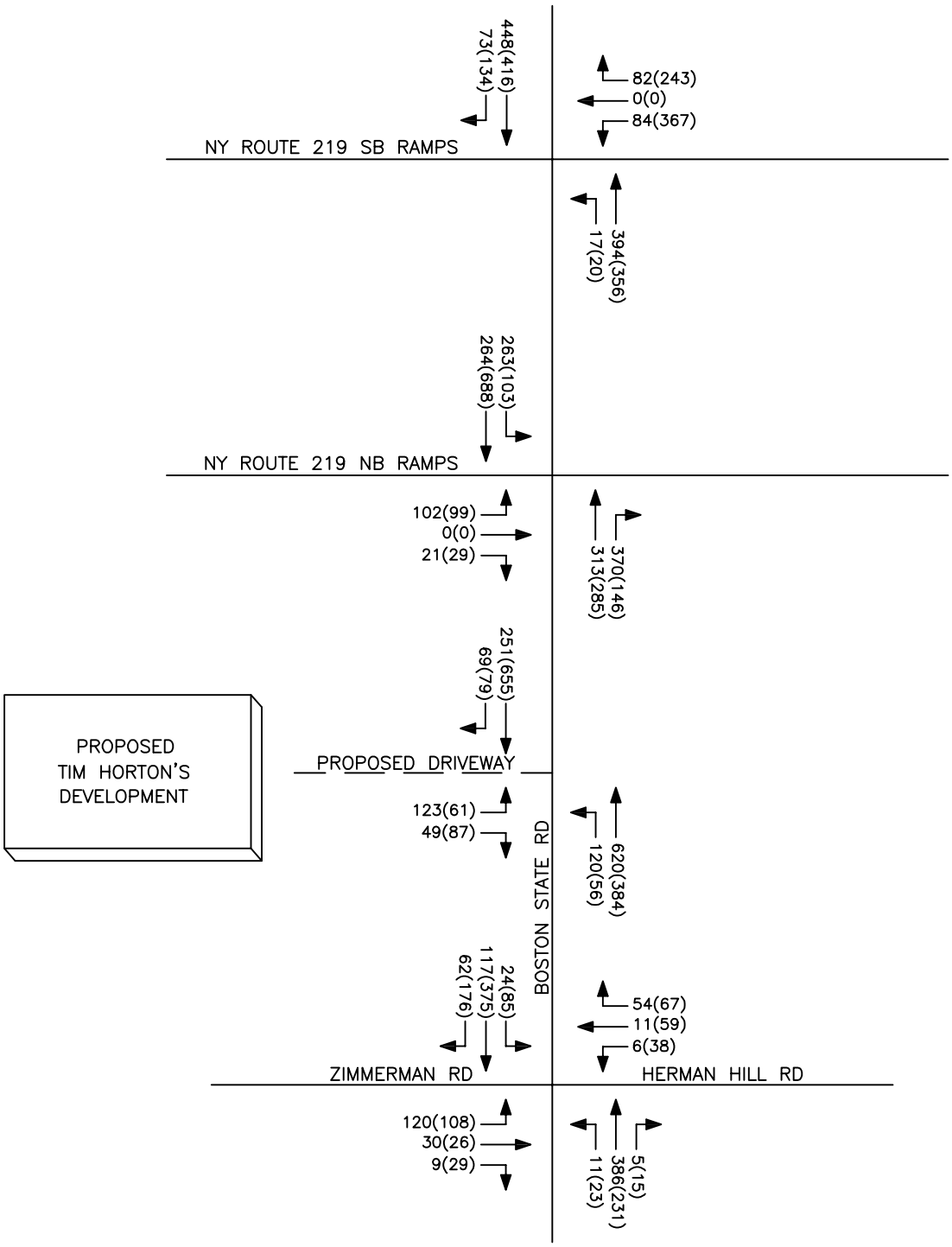

PROJECT NO: 43101

KEY

NOT TO SCALE

00(00) = AM(PM)

N

FIGURE 8

PEAK HOUR VOLUMES
FULL DEVELOPMENT CONDITIONS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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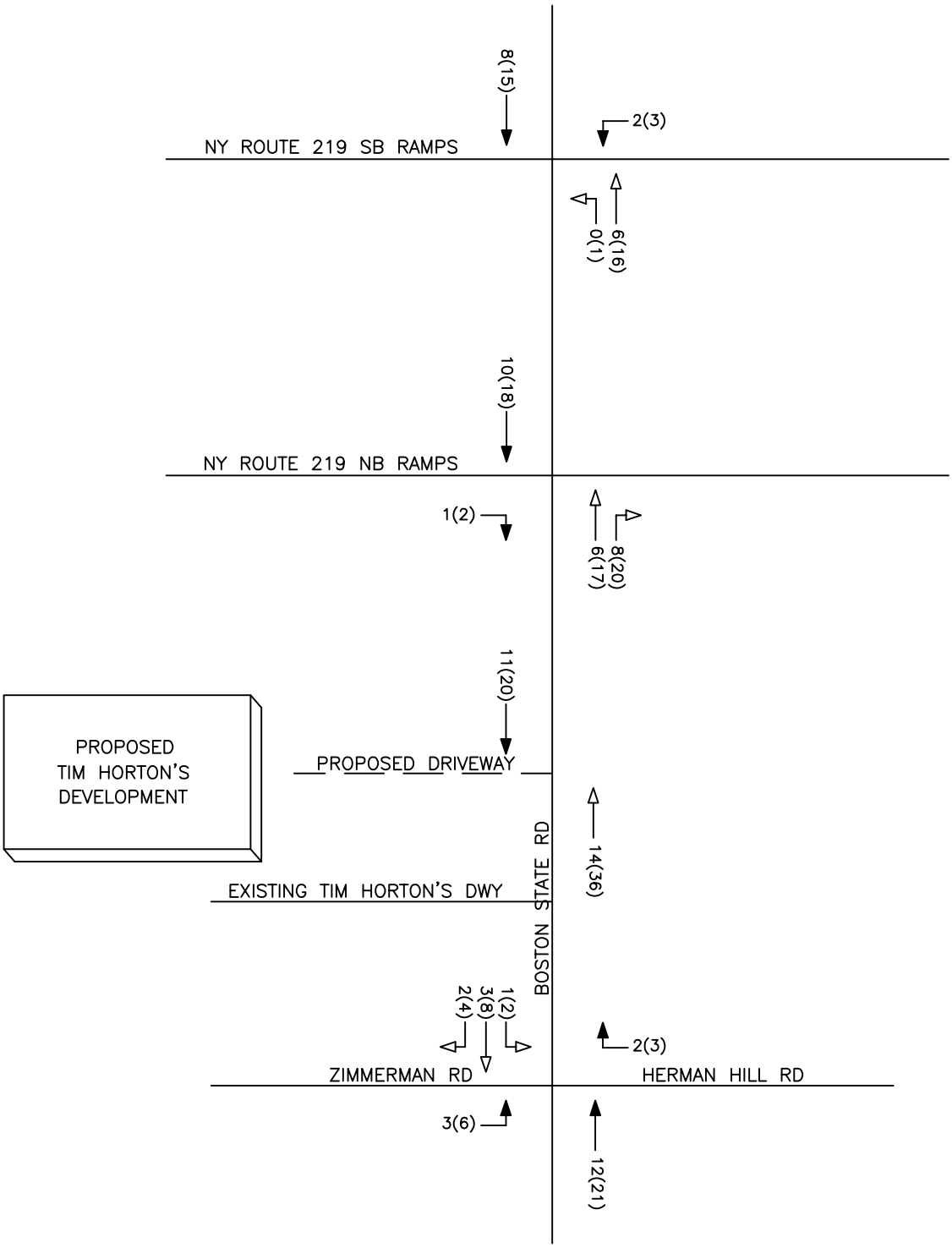

PROJECT NO: 43101

KEY

NOT TO SCALE

00(00) = AM(PM)

N

→ = ENTERING TRIPS

→ = EXITING TRIPS

FIGURE 9

FUTURE BUILDING RE-USE SITE TRIPS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

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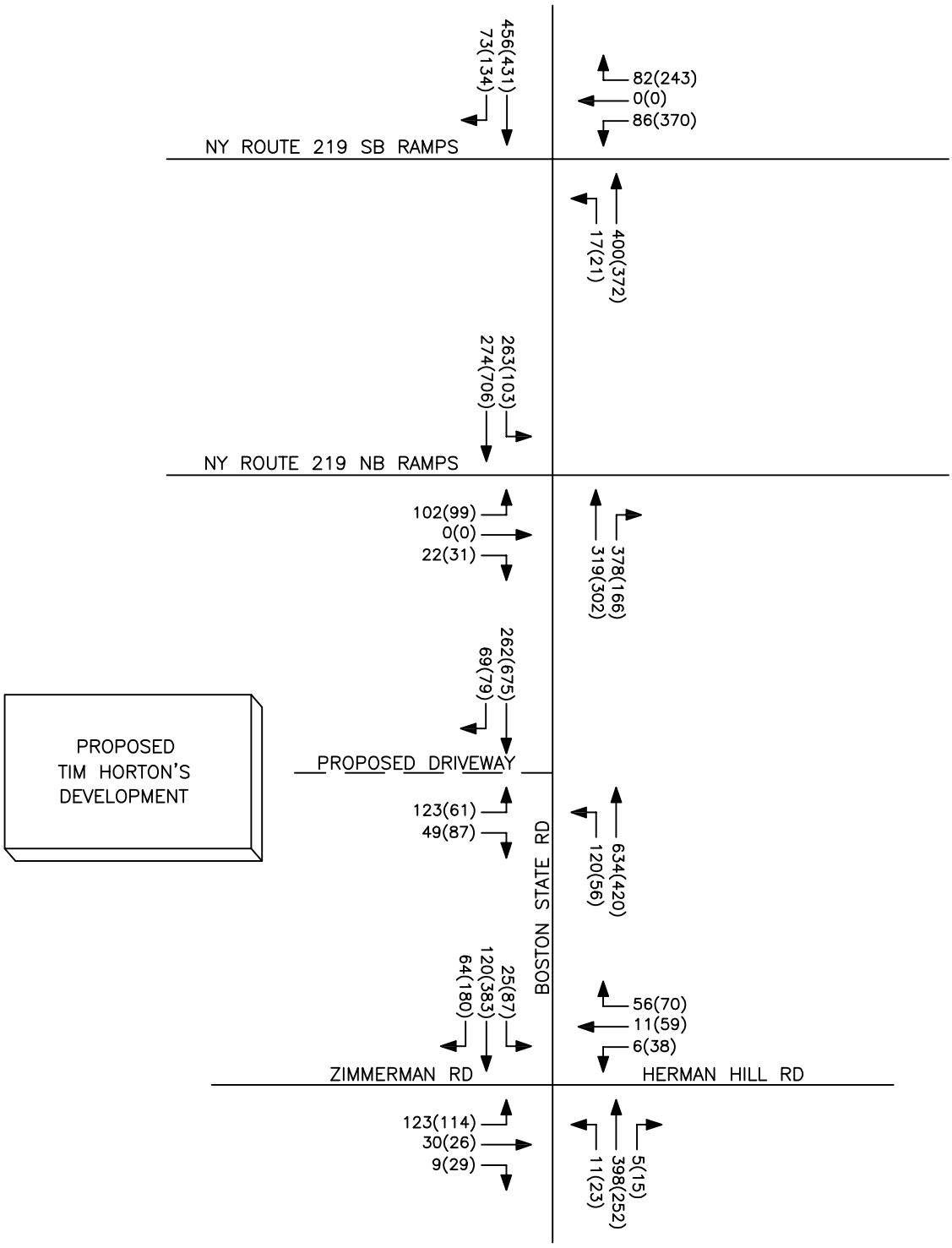


PROJECT NO: 43101

KEY

NOT TO SCALE

00(00) = AM(PM)

N

FIGURE 10

PEAK HOUR VOLUMES
FUTURE DEVELOPMENT CONDITIONS

PROPOSED TIM HORTON'S DEVELOPMENT
BOSTON STATE ROAD
TOWN OF BOSTON, NY

SRF ASSOCIATES

PA

APPENDICES

A1

Collected Traffic Volume Data

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

Turning Movement Data

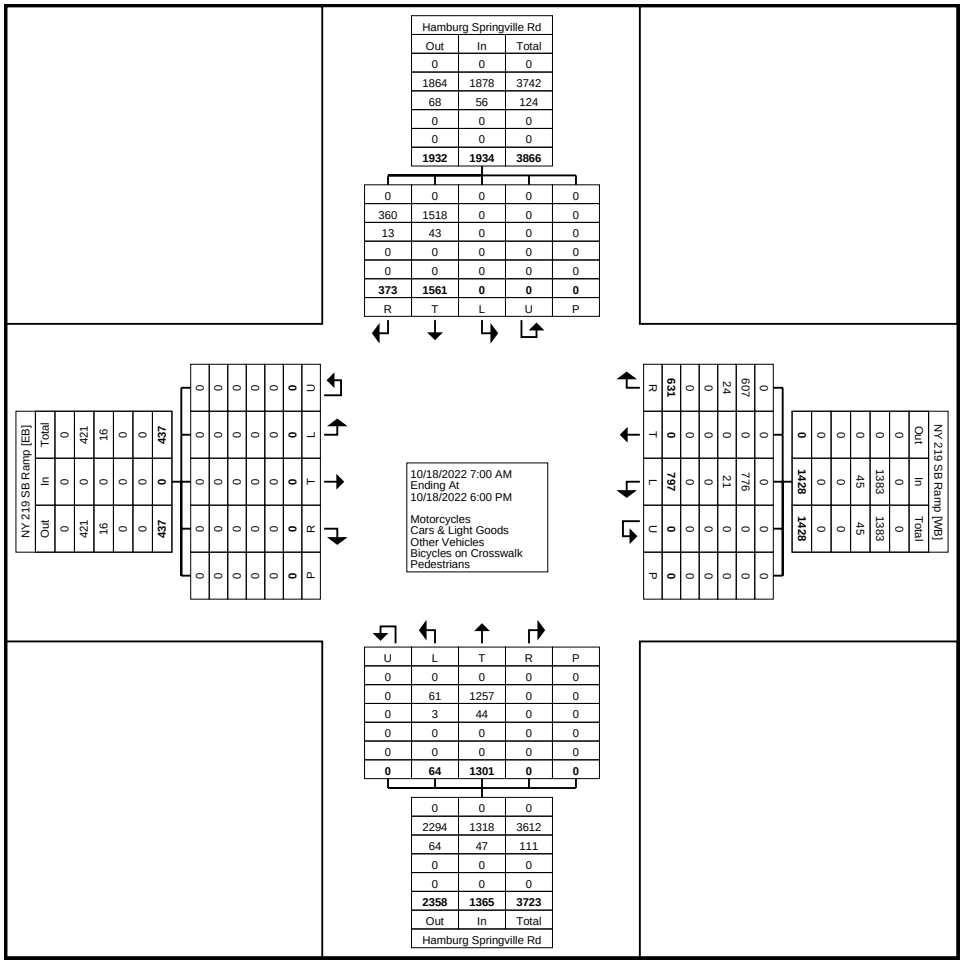
Start Time	Hamburg Springville Rd Southbound						NY 219 SB Ramp Westbound						Hamburg Springville Rd Northbound						NY 219 SB Ramp Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:00 AM	11	95	0	0	0	106	19	0	7	0	0	26	0	123	3	0	0	126	0	0	0	0	0	0	258
7:15 AM	25	95	0	0	0	120	24	0	19	0	0	43	0	83	3	0	0	86	0	0	0	0	0	0	249
7:30 AM	19	141	0	0	0	160	16	0	30	0	0	46	0	70	8	0	0	78	0	0	0	0	0	0	284
7:45 AM	18	98	0	0	0	116	23	0	25	0	0	48	0	102	2	0	0	104	0	0	0	0	0	0	268
Hourly Total	73	429	0	0	0	502	82	0	81	0	0	163	0	378	16	0	0	394	0	0	0	0	0	0	1059
8:00 AM	17	76	0	0	0	93	25	0	15	0	0	40	0	65	3	0	0	68	0	0	0	0	0	0	201
8:15 AM	17	90	0	0	0	107	17	0	14	0	0	31	0	62	1	0	0	63	0	0	0	0	0	0	201
8:30 AM	15	72	0	0	0	87	21	0	31	0	0	52	0	73	10	0	0	83	0	0	0	0	0	0	222
8:45 AM	16	73	0	0	0	89	23	0	23	0	0	46	0	70	4	0	0	74	0	0	0	0	0	0	209
Hourly Total	65	311	0	0	0	376	86	0	83	0	0	169	0	270	18	0	0	288	0	0	0	0	0	0	833
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	36	88	0	0	0	124	58	0	88	0	0	146	0	79	5	0	0	84	0	0	0	0	0	0	354
4:15 PM	38	103	0	0	0	141	74	0	97	0	0	171	0	77	3	0	0	80	0	0	0	0	0	0	392
4:30 PM	23	84	0	0	0	107	52	0	93	0	0	145	0	100	7	0	0	107	0	0	0	0	0	0	359
4:45 PM	36	124	0	0	0	160	58	0	73	0	0	131	0	81	4	0	0	85	0	0	0	0	0	0	376
Hourly Total	133	399	0	0	0	532	242	0	351	0	0	593	0	337	19	0	0	356	0	0	0	0	0	0	1481
5:00 PM	25	111	0	0	0	136	58	0	73	0	0	131	0	80	5	0	0	85	0	0	0	0	0	0	352
5:15 PM	39	126	0	0	0	165	57	0	79	0	0	136	0	90	2	0	0	92	0	0	0	0	0	0	393
5:30 PM	21	99	0	0	0	120	59	0	71	0	0	130	0	69	3	0	0	72	0	0	0	0	0	0	322
5:45 PM	17	86	0	0	0	103	47	0	59	0	0	106	0	77	1	0	0	78	0	0	0	0	0	0	287
Hourly Total	102	422	0	0	0	524	221	0	282	0	0	503	0	316	11	0	0	327	0	0	0	0	0	0	1354
Grand Total	373	1561	0	0	0	1934	631	0	797	0	0	1428	0	1301	64	0	0	1365	0	0	0	0	0	0	4727
Approach %	19.3	80.7	0.0	0.0	-	-	44.2	0.0	55.8	0.0	-	-	0.0	95.3	4.7	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-
Total %	7.9	33.0	0.0	0.0	-	40.9	13.3	0.0	16.9	0.0	-	30.2	0.0	27.5	1.4	0.0	-	28.9	0.0	0.0	0.0	0.0	-	0.0	-
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0
Cars & Light Goods	360	1518	0	0	-	1878	607	0	776	0	-	1383	0	1257	61	0	-	1318	0	0	0	0	-	0	4579
% Cars & Light Goods	96.5	97.2	-	-	-	97.1	96.2	-	97.4	-	-	96.8	-	96.6	95.3	-	-	96.6	-	-	-	-	-	-	96.9
Other Vehicles	13	43	0	0	-	56	24	0	21	0	-	45	0	44	3	0	-	47	0	0	0	0	-	0	148
% Other Vehicles	3.5	2.8	-	-	-	2.9	3.8	-	2.6	-	-	3.2	-	3.4	4.7	-	-	3.4	-	-	-	-	-	-	3.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Data Plot

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

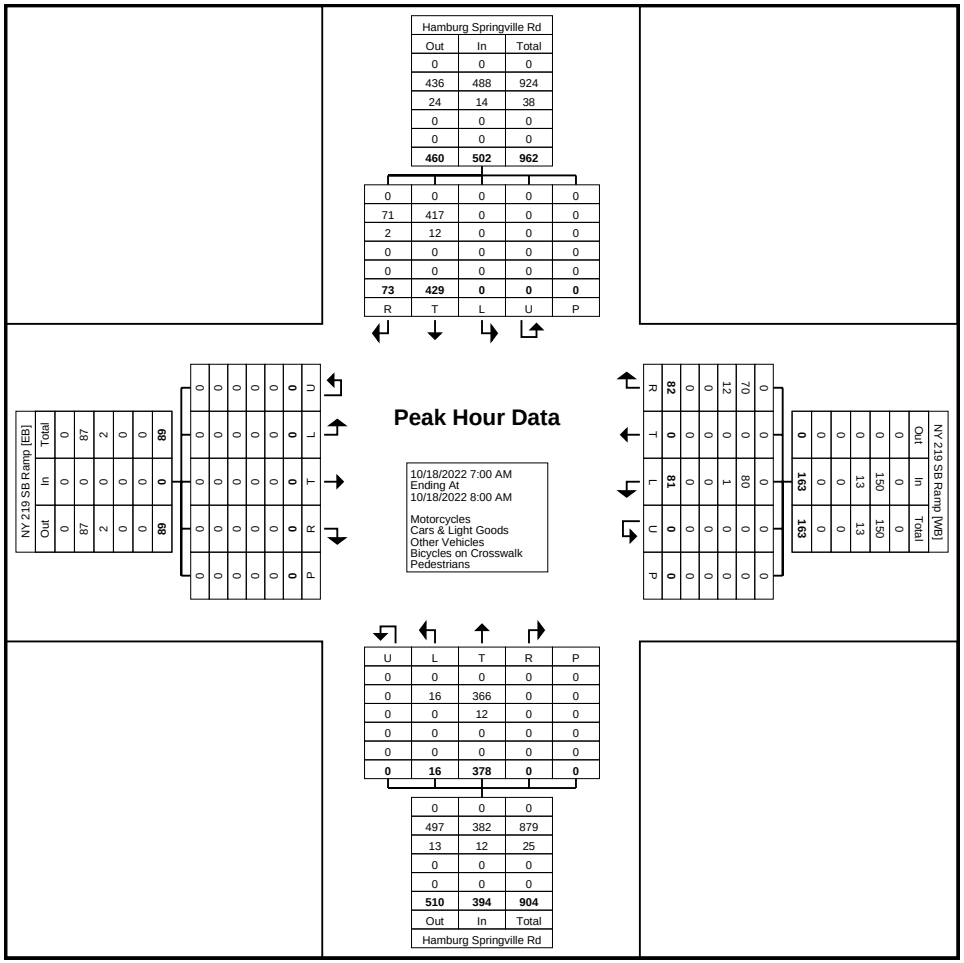
Turning Movement Peak Hour Data (7:00 AM)

Start Time	Hamburg Springville Rd Southbound						NY 219 SB Ramp Westbound						Hamburg Springville Rd Northbound						NY 219 SB Ramp Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:00 AM	11	95	0	0	0	106	19	0	7	0	0	26	0	123	3	0	0	126	0	0	0	0	0	0	258
7:15 AM	25	95	0	0	0	120	24	0	19	0	0	43	0	83	3	0	0	86	0	0	0	0	0	0	249
7:30 AM	19	141	0	0	0	160	16	0	30	0	0	46	0	70	8	0	0	78	0	0	0	0	0	0	284
7:45 AM	18	98	0	0	0	116	23	0	25	0	0	48	0	102	2	0	0	104	0	0	0	0	0	0	268
Total	73	429	0	0	0	502	82	0	81	0	0	163	0	378	16	0	0	394	0	0	0	0	0	0	1059
Approach %	14.5	85.5	0.0	0.0	-	-	50.3	0.0	49.7	0.0	-	-	0.0	95.9	4.1	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-
Total %	6.9	40.5	0.0	0.0	-	47.4	7.7	0.0	7.6	0.0	-	15.4	0.0	35.7	1.5	0.0	-	37.2	0.0	0.0	0.0	0.0	-	0.0	-
PHF	0.730	0.761	0.000	0.000	-	0.784	0.854	0.000	0.675	0.000	-	0.849	0.000	0.768	0.500	0.000	-	0.782	0.000	0.000	0.000	0.000	-	0.000	0.932
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0
Cars & Light Goods	71	417	0	0	-	488	70	0	80	0	-	150	0	366	16	0	-	382	0	0	0	0	-	0	1020
% Cars & Light Goods	97.3	97.2	-	-	-	97.2	85.4	-	98.8	-	-	92.0	-	96.8	100.0	-	-	97.0	-	-	-	-	-	-	96.3
Other Vehicles	2	12	0	0	-	14	12	0	1	0	-	13	0	12	0	0	-	12	0	0	0	0	-	0	39
% Other Vehicles	2.7	2.8	-	-	-	2.8	14.6	-	1.2	-	-	8.0	-	3.2	0.0	-	-	3.0	-	-	-	-	-	-	3.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Peak Hour Data Plot (7:00 AM)

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

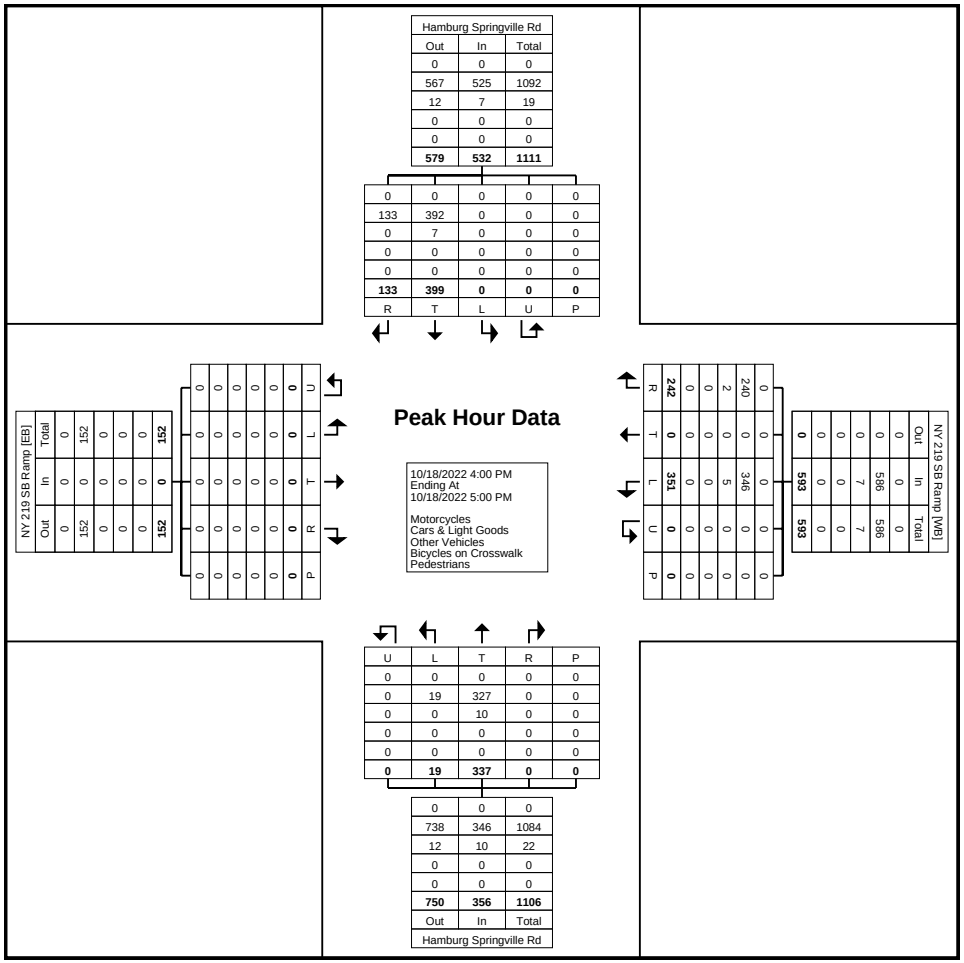
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Hamburg Springville Rd Southbound						NY 219 SB Ramp Westbound						Hamburg Springville Rd Northbound						NY 219 SB Ramp Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
4:00 PM	36	88	0	0	0	124	58	0	88	0	0	146	0	79	5	0	0	84	0	0	0	0	0	0	354
4:15 PM	38	103	0	0	0	141	74	0	97	0	0	171	0	77	3	0	0	80	0	0	0	0	0	0	392
4:30 PM	23	84	0	0	0	107	52	0	93	0	0	145	0	100	7	0	0	107	0	0	0	0	0	0	359
4:45 PM	36	124	0	0	0	160	58	0	73	0	0	131	0	81	4	0	0	85	0	0	0	0	0	0	376
Total	133	399	0	0	0	532	242	0	351	0	0	593	0	337	19	0	0	356	0	0	0	0	0	0	1481
Approach %	25.0	75.0	0.0	0.0	-	-	40.8	0.0	59.2	0.0	-	-	0.0	94.7	5.3	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-
Total %	9.0	26.9	0.0	0.0	-	35.9	16.3	0.0	23.7	0.0	-	40.0	0.0	22.8	1.3	0.0	-	24.0	0.0	0.0	0.0	0.0	-	0.0	-
PHF	0.875	0.804	0.000	0.000	-	0.831	0.818	0.000	0.905	0.000	-	0.867	0.000	0.843	0.679	0.000	-	0.832	0.000	0.000	0.000	0.000	-	0.000	0.945
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0
Cars & Light Goods	133	392	0	0	-	525	240	0	346	0	-	586	0	327	19	0	-	346	0	0	0	0	-	0	1457
% Cars & Light Goods	100.0	98.2	-	-	-	98.7	99.2	-	98.6	-	-	98.8	-	97.0	100.0	-	-	97.2	-	-	-	-	-	-	98.4
Other Vehicles	0	7	0	0	-	7	2	0	5	0	-	7	0	10	0	0	-	10	0	0	0	0	-	0	24
% Other Vehicles	0.0	1.8	-	-	-	1.3	0.8	-	1.4	-	-	1.2	-	3.0	0.0	-	-	2.8	-	-	-	-	-	-	1.6
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: NY 219 SB Ramps / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Peak Hour Data Plot (4:00 PM)

NY 219 NB Ramps / Hamburg Springville Rd - TMC

Tue Oct 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

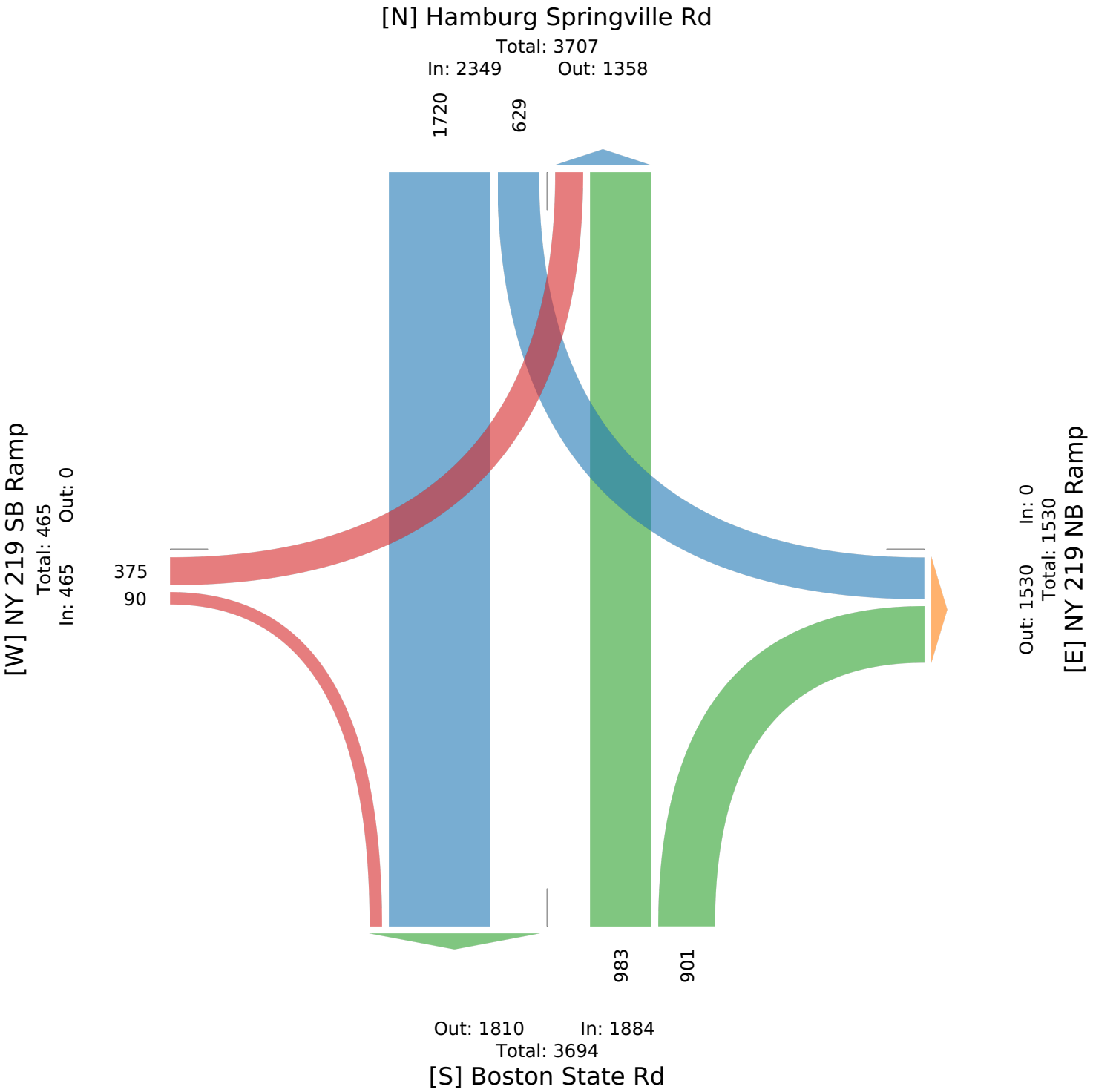
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg / Direction	Hamburg Springville Rd Southbound						NY 219 NB Ramp Westbound						Boston State Rd Northbound						NY 219 SB Ramp Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2022-10-18 7:00AM	0	243	262	0	**505**	0	0	0	0	0	**0**	0	350	297	0	0	**647**	0	19	0	101	0	**120**	0	**1272**
8:00AM	0	222	170	0	**392**	0	0	0	0	0	**0**	0	303	204	0	0	**507**	0	23	0	79	0	**102**	0	**1001**
9:00AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
4:00PM	0	652	94	0	**746**	0	0	0	0	0	**0**	0	137	242	0	0	**379**	0	26	0	109	0	**135**	0	**1260**
5:00PM	0	603	103	0	**706**	0	0	0	0	0	**0**	0	111	240	0	0	**351**	0	22	0	86	0	**108**	0	**1165**
6:00PM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
Total	0	1720	629	0	**2349**	0	0	0	0	0	**0**	0	901	983	0	0	**1884**	0	90	0	375	0	**465**	0	**4698**
% Approach	0%	73.2%	26.8%	0%	**-**	-	0%	0%	0%	0%	**-**	-	47.8%	52.2%	0%	0%	**-**	-	19.4%	0%	80.6%	0%	**-**	-	-
% Total	0%	36.6%	13.4%	0%	**50.0%**	-	0%	0%	0%	0%	**0%**	-	19.2%	20.9%	0%	0%	**40.1%**	-	1.9%	0%	8.0%	0%	**9.9%**	-	-
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	0	1681	603	0	**2284**	-	0	0	0	0	**0**	-	882	953	0	0	**1835**	-	84	0	360	0	**444**	-	4563
% Lights	0%	97.7%	95.9%	0%	**97.2%**	-	0%	0%	0%	0%	**-**	-	97.9%	96.9%	0%	0%	**97.4%**	-	93.3%	0%	96.0%	0%	**95.5%**	-	97.1%
Heavy	0	39	26	0	**65**	-	0	0	0	0	**0**	-	19	30	0	0	**49**	-	6	0	15	0	**21**	-	135
% Heavy	0%	2.3%	4.1%	0%	**2.8%**	-	0%	0%	0%	0%	**-**	-	2.1%	3.1%	0%	0%	**2.6%**	-	6.7%	0%	4.0%	0%	**4.5%**	-	2.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NY 219 NB Ramps / Hamburg Springville Rd - TMC
Tue Oct 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



NY 219 NB Ramps / Hamburg Springville Rd - TMC

Tue Oct 18, 2022
AM Peak (7 AM - 8 AM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

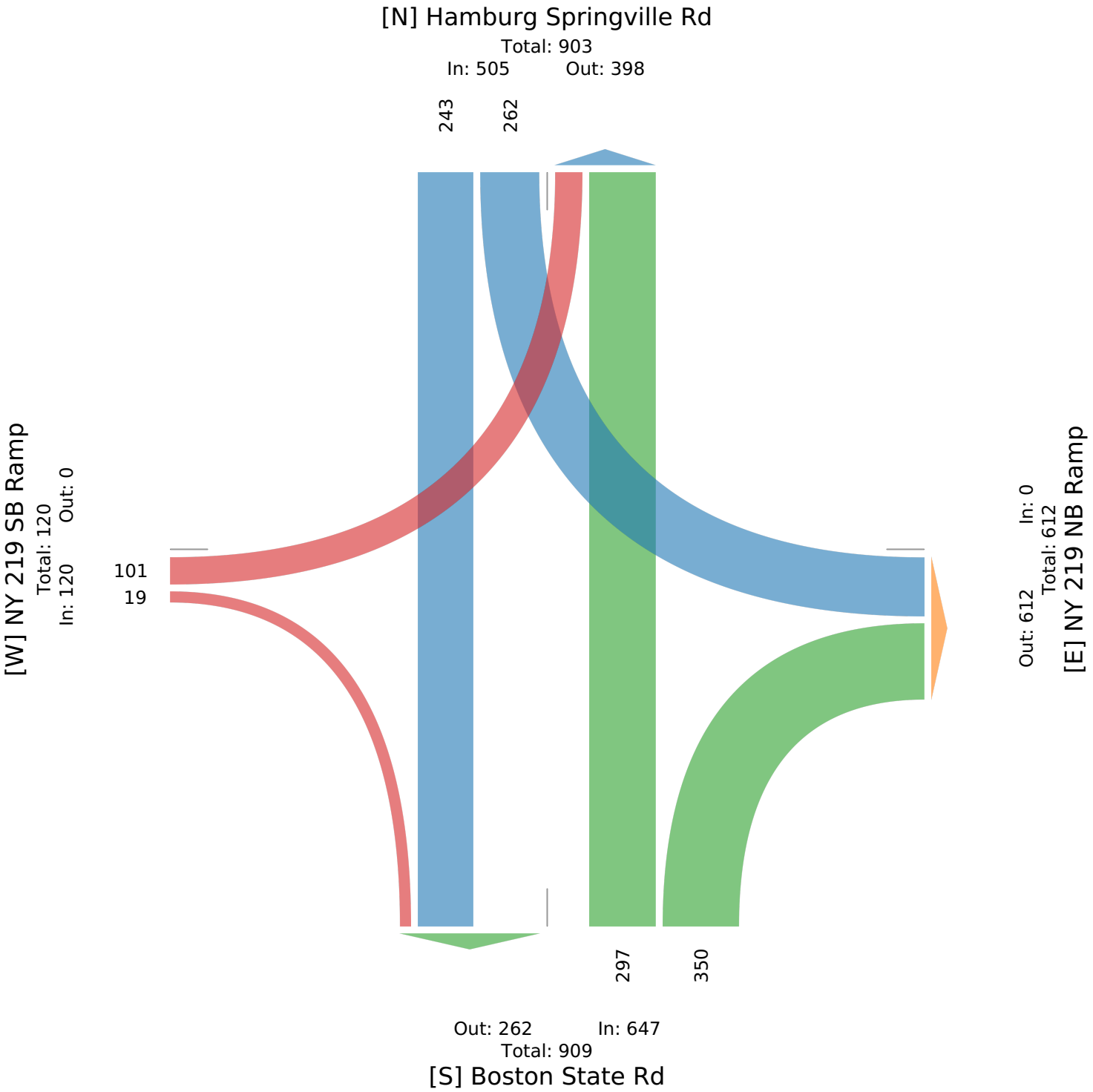
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg / Direction	Hamburg Springville Rd Southbound						NY 219 NB Ramp Westbound						Boston State Rd Northbound						NY 219 SB Ramp Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 7:00AM	0	35	68	0	**103**	0	0	0	0	0	**0**	0	94	102	0	0	**196**	0	7	0	23	0	**30**	0	**329**
7:15AM	0	46	65	0	**111**	0	0	0	0	0	**0**	0	99	67	0	0	**166**	0	3	0	17	0	**20**	0	**297**
7:30AM	0	95	78	0	**173**	0	0	0	0	0	**0**	0	93	56	0	0	**149**	0	6	0	26	0	**32**	0	**354**
7:45AM	0	67	51	0	**118**	0	0	0	0	0	**0**	0	64	72	0	0	**136**	0	3	0	35	0	**38**	0	**292**
Total	0	243	262	0	**505**	0	0	0	0	0	**0**	0	350	297	0	0	**647**	0	19	0	101	0	**120**	0	**1272**
% Approach	0%	48.1%	51.9%	0%	**-**	-	0%	0%	0%	0%	**-**	-	54.1%	45.9%	0%	0%	**-**	-	15.8%	0%	84.2%	0%	**-**	-	**-**
% Total	0%	19.1%	20.6%	0%	**39.7%**	-	0%	0%	0%	0%	**0%**	-	27.5%	23.3%	0%	0%	**50.9%**	-	1.5%	0%	7.9%	0%	**9.4%**	-	**-**
PHF	-	0.639	0.840	-	**0.730**	-	-	-	-	-	**-**	-	0.884	0.728	-	-	**0.825**	-	0.679	-	0.721	-	**0.789**	-	0.898
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	0	241	251	0	**492**	-	0	0	0	0	**0**	-	348	289	0	0	**637**	-	19	0	97	0	**116**	-	1245
% Lights	0%	99.2%	95.8%	0%	**97.4%**	-	0%	0%	0%	0%	**-**	-	99.4%	97.3%	0%	0%	**98.5%**	-	100%	0%	96.0%	0%	**96.7%**	-	97.9%
Heavy	0	2	11	0	**13**	-	0	0	0	0	**0**	-	2	8	0	0	**10**	-	0	0	4	0	**4**	-	27
% Heavy	0%	0.8%	4.2%	0%	**2.6%**	-	0%	0%	0%	0%	**-**	-	0.6%	2.7%	0%	0%	**1.5%**	-	0%	0%	4.0%	0%	**3.3%**	-	2.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NY 219 NB Ramps / Hamburg Springville Rd - TMC
Tue Oct 18, 2022
AM Peak (7 AM - 8 AM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



NY 219 NB Ramps / Hamburg Springville Rd - TMC

Tue Oct 18, 2022
PM Peak, Forced Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

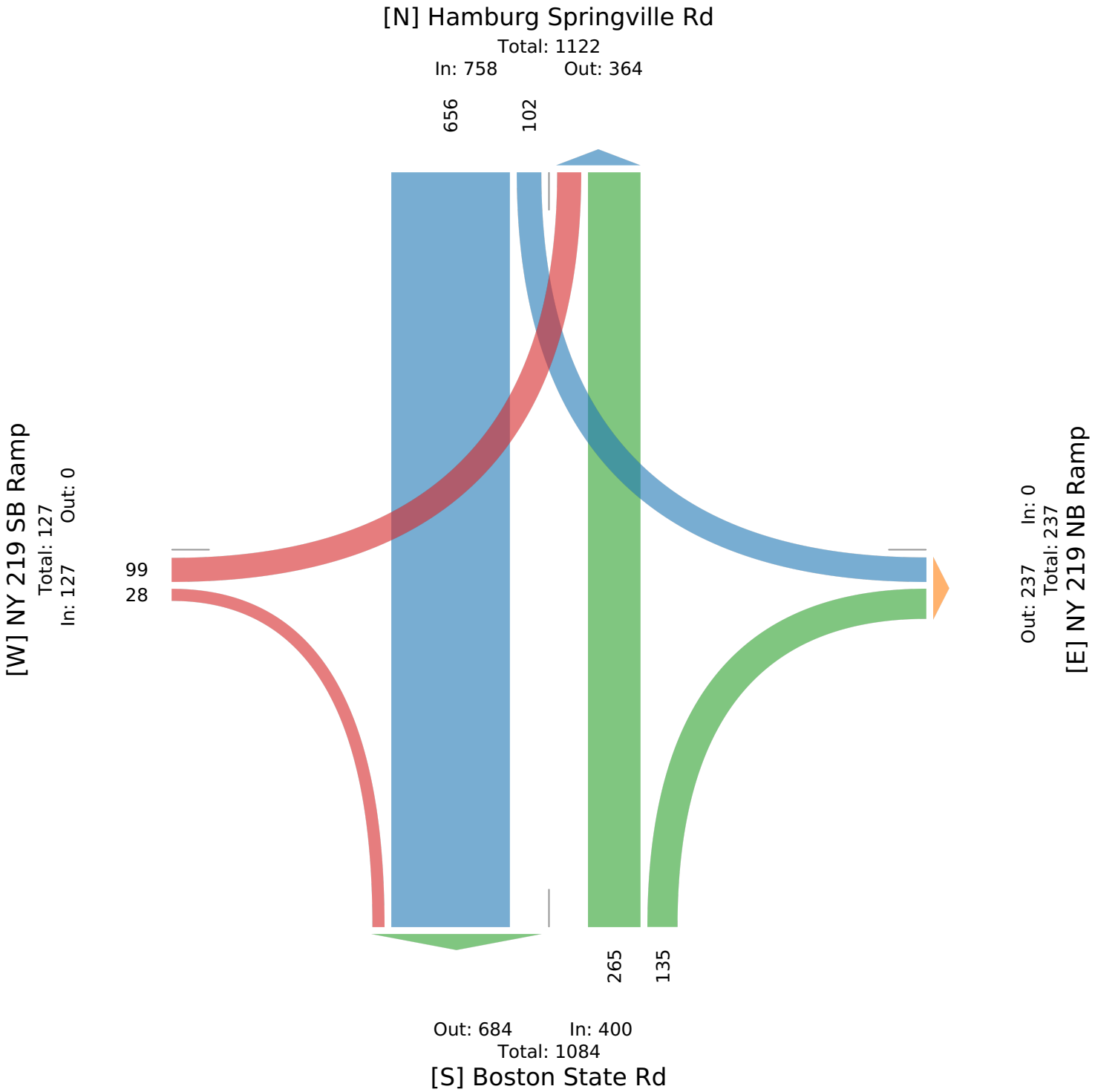
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg / Direction	Hamburg Springville Rd Southbound						NY 219 NB Ramp Westbound						Boston State Rd Northbound						NY 219 SB Ramp Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 4:30PM	0	162	16	0	**178**	0	0	0	0	0	**0**	0	39	71	0	0	**110**	0	9	0	29	0	**38**	0	**326**
4:45PM	0	159	31	0	**190**	0	0	0	0	0	**0**	0	37	59	0	0	**96**	0	6	0	25	0	**31**	0	**317**
5:00PM	0	160	26	0	**186**	0	0	0	0	0	**0**	0	22	71	0	0	**93**	0	9	0	17	0	**26**	0	**305**
5:15PM	0	175	29	0	**204**	0	0	0	0	0	**0**	0	37	64	0	0	**101**	0	4	0	28	0	**32**	0	**337**
Total	0	656	102	0	**758**	0	0	0	0	0	**0**	0	135	265	0	0	**400**	0	28	0	99	0	**127**	0	**1285**
% Approach	0%	86.5%	13.5%	0%	**-**	-	0%	0%	0%	0%	**-**	-	33.8%	66.3%	0%	0%	**-**	-	22.0%	0%	78.0%	0%	**-**	-	**-**
% Total	0%	51.1%	7.9%	0%	**59.0%**	-	0%	0%	0%	0%	**0%**	-	10.5%	20.6%	0%	0%	**31.1%**	-	2.2%	0%	7.7%	0%	**9.9%**	-	**-**
PHF	-	0.937	0.823	-	**0.929**	-	-	-	-	-	**-**	-	0.865	0.933	-	-	**0.909**	-	0.778	-	0.853	-	**0.836**	-	0.953
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	0	653	96	0	**749**	-	0	0	0	0	**0**	-	135	262	0	0	**397**	-	27	0	92	0	**119**	-	1265
% Lights	0%	99.5%	94.1%	0%	**98.8%**	-	0%	0%	0%	0%	**-**	-	100%	98.9%	0%	0%	**99.3%**	-	96.4%	0%	92.9%	0%	**93.7%**	-	98.4%
Heavy	0	3	6	0	**9**	-	0	0	0	0	**0**	-	0	3	0	0	**3**	-	1	0	7	0	**8**	-	20
% Heavy	0%	0.5%	5.9%	0%	**1.2%**	-	0%	0%	0%	0%	**-**	-	0%	1.1%	0%	0%	**0.8%**	-	3.6%	0%	7.1%	0%	**6.3%**	-	1.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NY 219 NB Ramps / Hamburg Springville Rd - TMC
Tue Oct 18, 2022
PM Peak, Forced Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004347, Location: 42.693987, -78.784496

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



Boston State Rd / Zimmerman Rd / Herman Hill... - TMC

Tue Oct 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

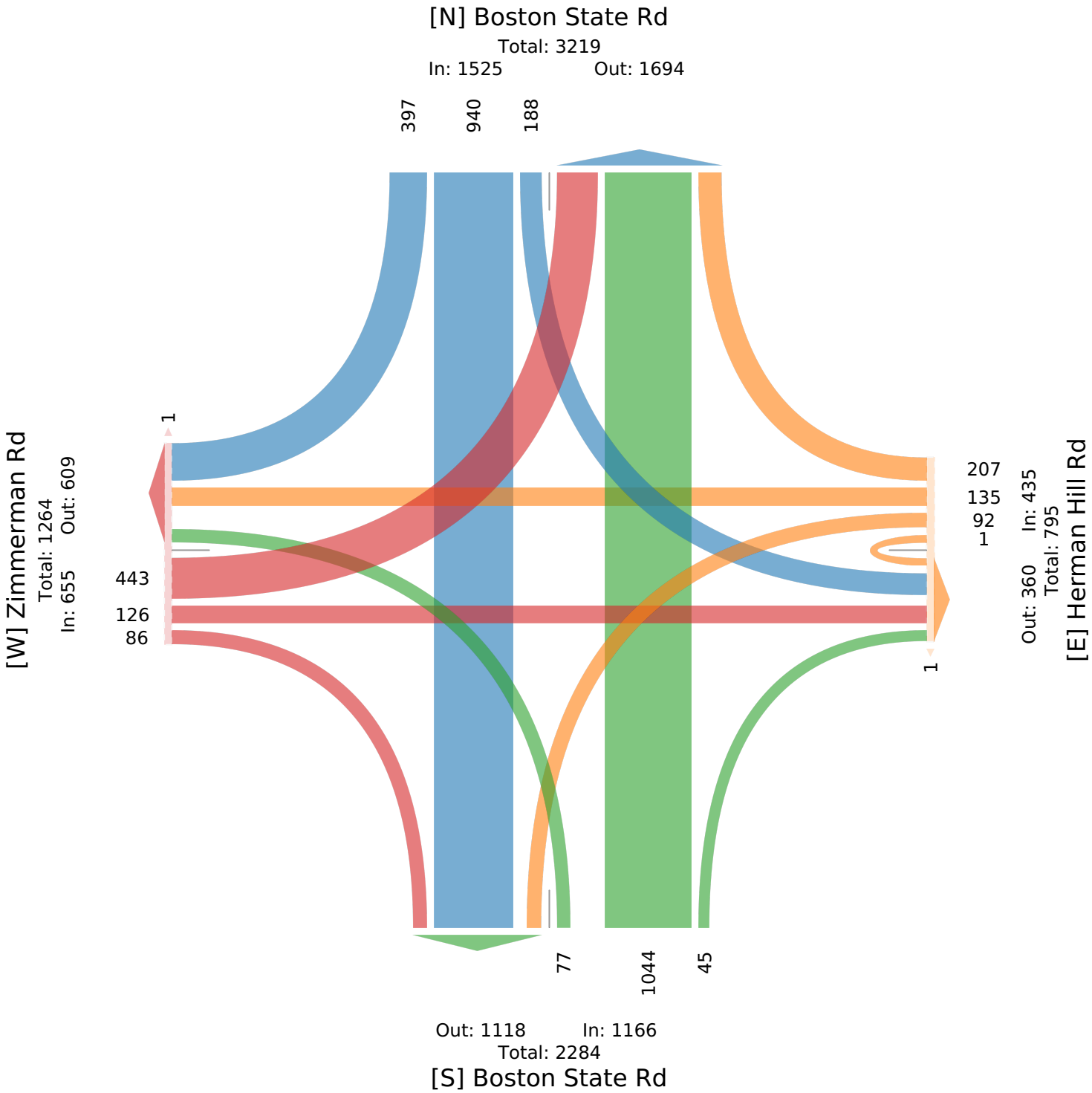
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg	Boston State Rd						Herman Hill Rd						Boston State Rd						Zimmerman Rd						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 7:00AM	58	109	23	0	**190**	0	51	11	6	0	**68**	0	5	360	11	0	**376**	0	9	30	112	0	**151**	0	**785**
8:00AM	51	117	29	0	**197**	0	38	17	11	0	**66**	0	10	274	17	0	**301**	0	13	30	155	0	**198**	0	**762**
9:00AM	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**0**
4:00PM	142	362	70	0	**574**	0	57	55	31	1	**144**	0	10	210	22	0	**242**	0	31	34	90	0	**155**	0	**1115**
5:00PM	146	352	66	0	**564**	0	61	52	44	0	**157**	1	20	200	27	0	**247**	0	33	32	86	0	**151**	1	**1119**
Total	397	940	188	0	**1525**	0	207	135	92	1	**435**	1	45	1044	77	0	**1166**	0	86	126	443	0	**655**	1	**3781**
% Approach	26.0%	61.6%	12.3%	0%	**-**	-	47.6%	31.0%	21.1%	0.2%	**-**	-	3.9%	89.5%	6.6%	0%	**-**	-	13.1%	19.2%	67.6%	0%	**-**	-	**-**
% Total	10.5%	24.9%	5.0%	0%	**40.3%**	-	5.5%	3.6%	2.4%	0%	**11.5%**	-	1.2%	27.6%	2.0%	0%	**30.8%**	-	2.3%	3.3%	11.7%	0%	**17.3%**	-	**-**
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	382	921	180	0	**1483**	-	192	132	91	1	**416**	-	45	1028	73	0	**1146**	-	83	123	429	0	**635**	-	3680
% Lights	96.2%	98.0%	95.7%	0%	**97.2%**	-	92.8%	97.8%	98.9%	100%	**95.6%**	-	100%	98.5%	94.8%	0%	**98.3%**	-	96.5%	97.6%	96.8%	0%	**96.9%**	-	97.3%
Heavy	15	19	8	0	**42**	-	15	3	1	0	**19**	-	0	16	4	0	**20**	-	3	3	14	0	**20**	-	101
% Heavy	3.8%	2.0%	4.3%	0%	**2.8%**	-	7.2%	2.2%	1.1%	0%	**4.4%**	-	0%	1.5%	5.2%	0%	**1.7%**	-	3.5%	2.4%	3.2%	0%	**3.1%**	-	2.7%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Boston State Rd / Zimmerman Rd / Herman Hill... - TMC
Tue Oct 18, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



Boston State Rd / Zimmerman Rd / Herman Hill... - TMC

Tue Oct 18, 2022
AM Peak (7 AM - 8 AM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

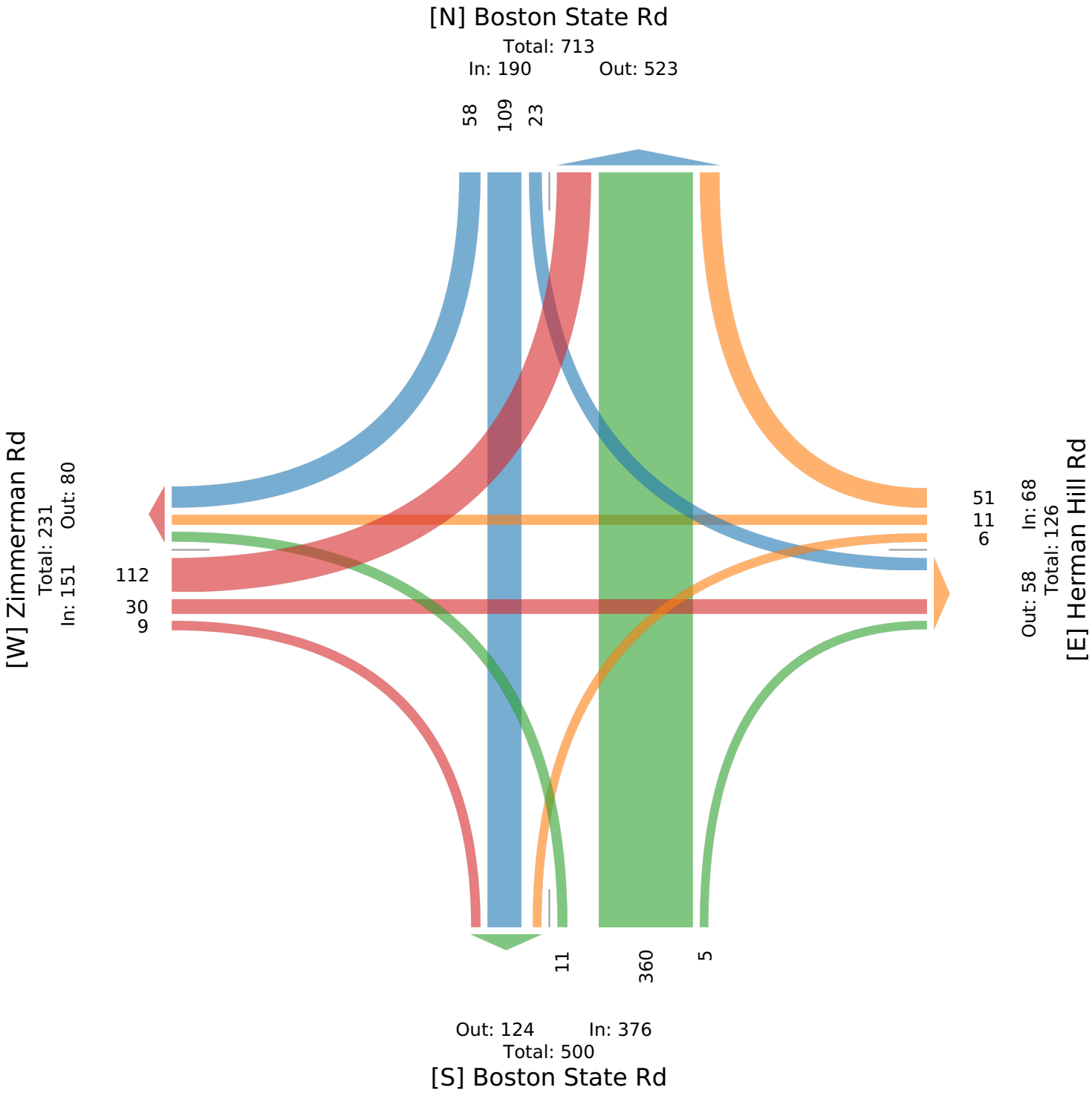
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg	Boston State Rd						Herman Hill Rd						Boston State Rd						Zimmerman Rd						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 7:00AM	5	17	1	0	**23**	0	18	0	1	0	**19**	0	2	102	4	0	**108**	0	4	8	19	0	**31**	0	**181**
7:15AM	12	19	1	0	**32**	0	10	2	2	0	**14**	0	0	95	1	0	**96**	0	2	6	36	0	**44**	0	**186**
7:30AM	24	38	7	0	**69**	0	12	5	2	0	**19**	0	2	80	2	0	**84**	0	2	12	30	0	**44**	0	**216**
7:45AM	17	35	14	0	**66**	0	11	4	1	0	**16**	0	1	83	4	0	**88**	0	1	4	27	0	**32**	0	**202**
Total	58	109	23	0	**190**	0	51	11	6	0	**68**	0	5	360	11	0	**376**	0	9	30	112	0	**151**	0	**785**
% Approach	30.5%	57.4%	12.1%	0%	**-**	-	75.0%	16.2%	8.8%	0%	**-**	-	1.3%	95.7%	2.9%	0%	**-**	-	6.0%	19.9%	74.2%	0%	**-**	-	-
% Total	7.4%	13.9%	2.9%	0%	**24.2%**	-	6.5%	1.4%	0.8%	0%	**8.7%**	-	0.6%	45.9%	1.4%	0%	**47.9%**	-	1.1%	3.8%	14.3%	0%	**19.2%**	-	-
PHF	0.604	0.717	0.411	-	**0.688**	-	0.708	0.550	0.750	-	**0.895**	-	0.625	0.882	0.688	-	**0.870**	-	0.563	0.625	0.778	-	**0.858**	-	0.909
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	57	107	23	0	**187**	-	48	11	6	0	**65**	-	5	355	11	0	**371**	-	9	29	112	0	**150**	-	773
% Lights	98.3%	98.2%	100%	0%	**98.4%**	-	94.1%	100%	100%	0%	**95.6%**	-	100%	98.6%	100%	0%	**98.7%**	-	100%	96.7%	100%	0%	**99.3%**	-	98.5%
Heavy	1	2	0	0	**3**	-	3	0	0	0	**3**	-	0	5	0	0	**5**	-	0	1	0	0	**1**	-	12
% Heavy	1.7%	1.8%	0%	0%	**1.6%**	-	5.9%	0%	0%	0%	**4.4%**	-	0%	1.4%	0%	0%	**1.3%**	-	0%	3.3%	0%	0%	**0.7%**	-	1.5%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Boston State Rd / Zimmerman Rd / Herman Hill... - TMC
Tue Oct 18, 2022
AM Peak (7 AM - 8 AM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



Boston State Rd / Zimmerman Rd / Herman Hill... - TMC

Tue Oct 18, 2022
PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

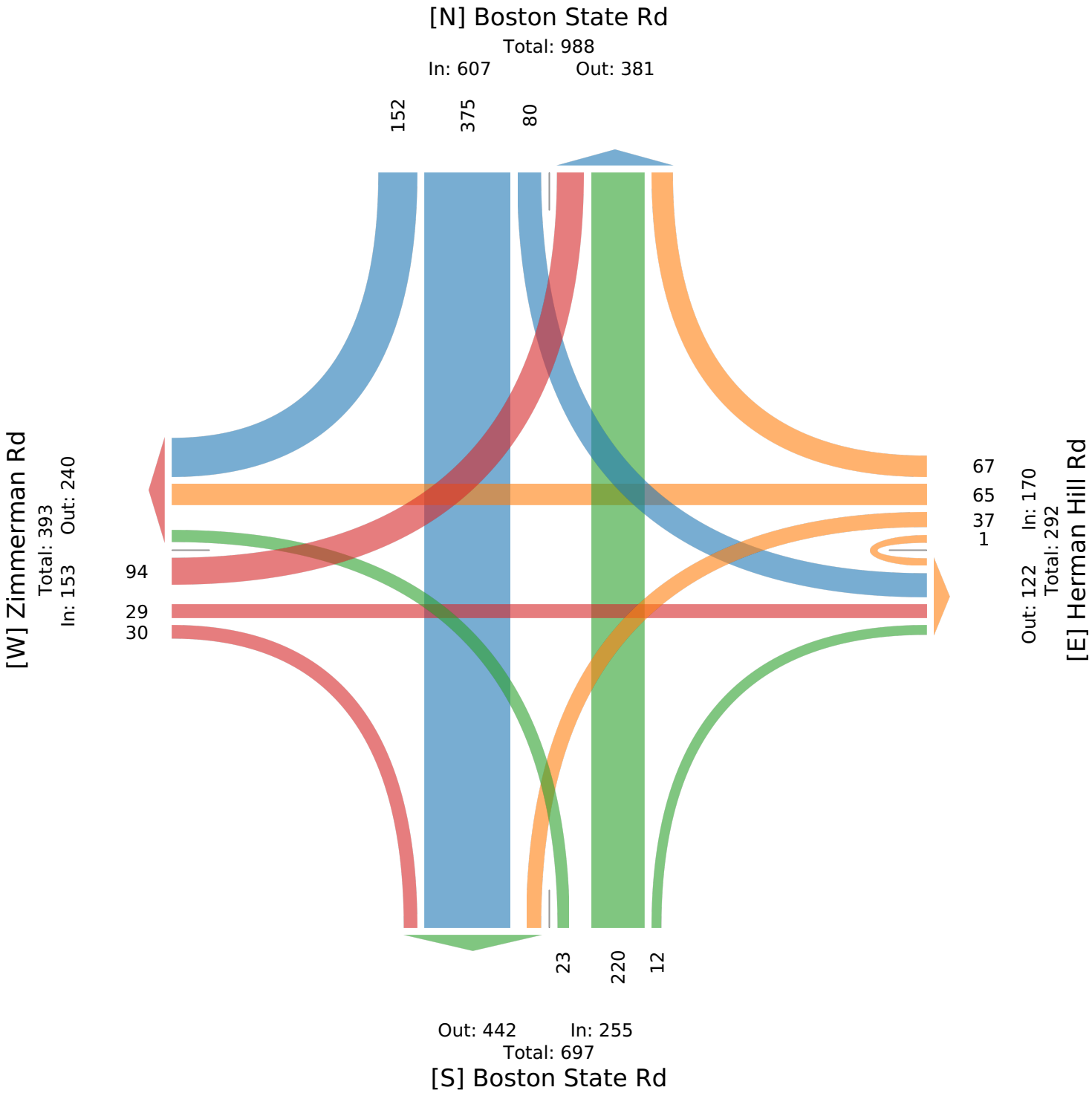
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg	Boston State Rd						Herman Hill Rd						Boston State Rd						Zimmerman Rd						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 4:15PM	38	105	15	0	**158**	0	16	15	12	0	**43**	0	1	55	8	0	**64**	0	7	7	24	0	**38**	0	**303**
4:30PM	31	90	20	0	**141**	0	19	15	9	1	**44**	0	3	59	6	0	**68**	0	6	6	27	0	**39**	0	**292**
4:45PM	40	88	20	0	**148**	0	10	15	4	0	**29**	0	3	52	3	0	**58**	0	7	7	18	0	**32**	0	**267**
5:00PM	43	92	25	0	**160**	0	22	20	12	0	**54**	0	5	54	6	0	**65**	0	10	9	25	0	**44**	0	**323**
Total	152	375	80	0	**607**	0	67	65	37	1	**170**	0	12	220	23	0	**255**	0	30	29	94	0	**153**	0	**1185**
% Approach	25.0%	61.8%	13.2%	0%	**-**	-	39.4%	38.2%	21.8%	0.6%	**-**	-	4.7%	86.3%	9.0%	0%	**-**	-	19.6%	19.0%	61.4%	0%	**-**	-	-
% Total	12.8%	31.6%	6.8%	0%	**51.2%**	-	5.7%	5.5%	3.1%	0.1%	**14.3%**	-	1.0%	18.6%	1.9%	0%	**21.5%**	-	2.5%	2.4%	7.9%	0%	**12.9%**	-	-
PHF	0.884	0.893	0.800	-	**0.948**	-	0.761	0.813	0.771	0.250	**0.787**	-	0.600	0.932	0.719	-	**0.938**	-	0.750	0.806	0.870	-	**0.869**	-	0.917
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	151	368	79	0	**598**	-	66	65	37	1	**169**	-	12	219	23	0	**254**	-	30	29	94	0	**153**	-	1174
% Lights	99.3%	98.1%	98.8%	0%	**98.5%**	-	98.5%	100%	100%	100%	**99.4%**	-	100%	99.5%	100%	0%	**99.6%**	-	100%	100%	100%	0%	**100%**	-	99.1%
Heavy	1	7	1	0	**9**	-	1	0	0	0	**1**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	11
% Heavy	0.7%	1.9%	1.3%	0%	**1.5%**	-	1.5%	0%	0%	0%	**0.6%**	-	0%	0.5%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Boston State Rd / Zimmerman Rd / Herman Hill... - TMC
Tue Oct 18, 2022
PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



Boston State Rd / Zimmerman Rd / Herman Hill... - TMC

Tue Oct 18, 2022
Forced Peak (4:30 PM - 5:30 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

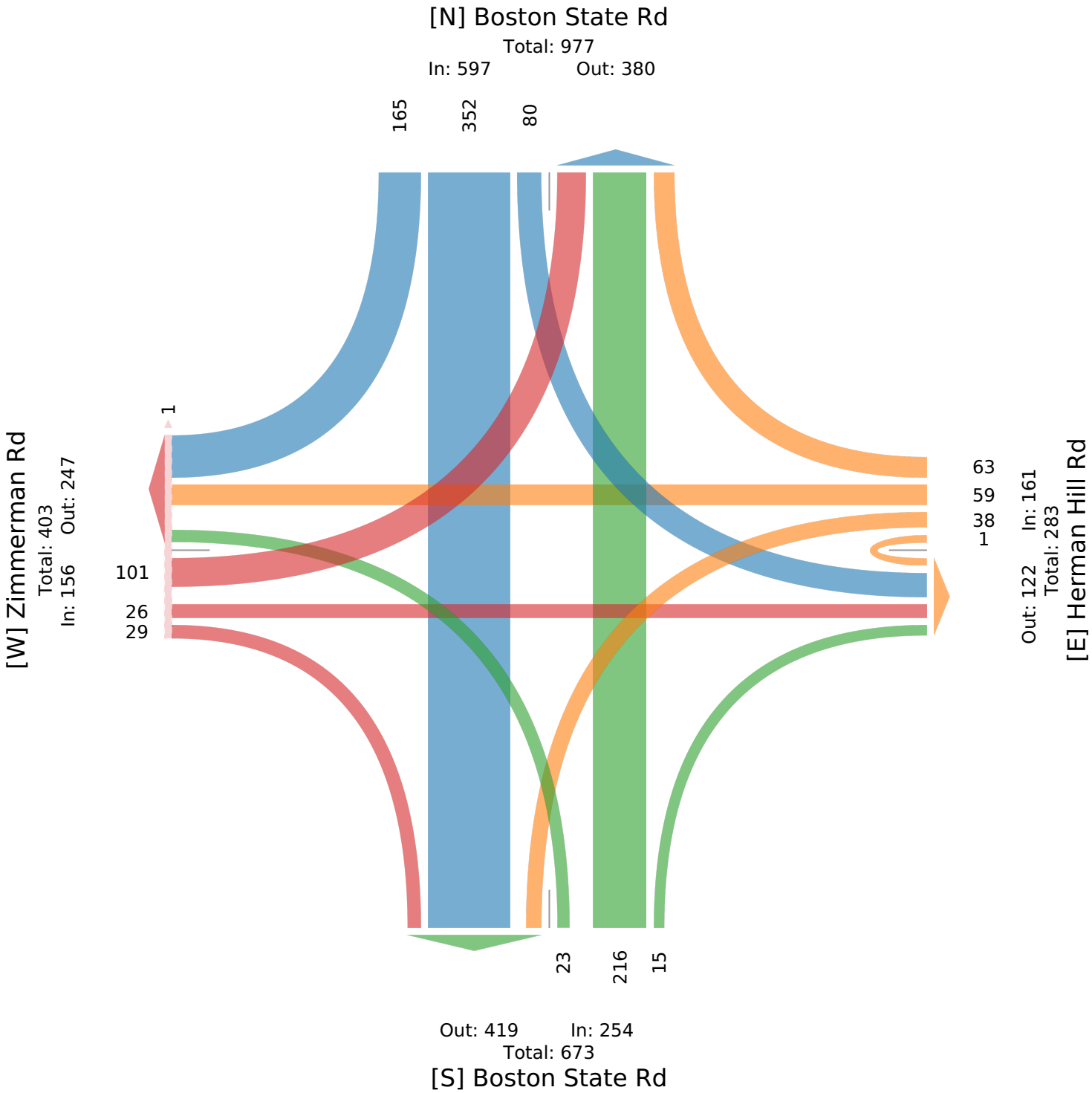
Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US

Leg	Boston State Rd						Herman Hill Rd						Boston State Rd						Zimmerman Rd						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2022-10-18 4:30PM	31	90	20	0	**141**	0	19	15	9	1	**44**	0	3	59	6	0	**68**	0	6	6	27	0	**39**	0	**292**
4:45PM	40	88	20	0	**148**	0	10	15	4	0	**29**	0	3	52	3	0	**58**	0	7	7	18	0	**32**	0	**267**
5:00PM	43	92	25	0	**160**	0	22	20	12	0	**54**	0	5	54	6	0	**65**	0	10	9	25	0	**44**	0	**323**
5:15PM	51	82	15	0	**148**	0	12	9	13	0	**34**	0	4	51	8	0	**63**	0	6	4	31	0	**41**	1	**286**
Total	165	352	80	0	**597**	0	63	59	38	1	**161**	0	15	216	23	0	**254**	0	29	26	101	0	**156**	1	**1168**
% Approach	27.6%	59.0%	13.4%	0%	**-**	-	39.1%	36.6%	23.6%	0.6%	**-**	-	5.9%	85.0%	9.1%	0%	**-**	-	18.6%	16.7%	64.7%	0%	**-**	-	-
% Total	14.1%	30.1%	6.8%	0%	**51.1%**	-	5.4%	5.1%	3.3%	0.1%	**13.8%**	-	1.3%	18.5%	2.0%	0%	**21.7%**	-	2.5%	2.2%	8.6%	0%	**13.4%**	-	-
PHF	0.809	0.957	0.800	-	**0.933**	-	0.716	0.738	0.731	0.250	**0.745**	-	0.750	0.915	0.719	-	**0.934**	-	0.725	0.722	0.815	-	**0.886**	-	0.904
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Lights	165	349	79	0	**593**	-	61	59	38	1	**159**	-	15	215	23	0	**253**	-	29	26	101	0	**156**	-	1161
% Lights	100%	99.1%	98.8%	0%	**99.3%**	-	96.8%	100%	100%	100%	**98.8%**	-	100%	99.5%	100%	0%	**99.6%**	-	100%	100%	100%	0%	**100%**	-	99.4%
Heavy	0	3	1	0	**4**	-	2	0	0	0	**2**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	7
% Heavy	0%	0.9%	1.3%	0%	**0.7%**	-	3.2%	0%	0%	0%	**1.2%**	-	0%	0.5%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Boston State Rd / Zimmerman Rd / Herman Hill... - TMC
Tue Oct 18, 2022
Forced Peak (4:30 PM - 5:30 PM)
All Classes (Motorcycles, Lights, Heavy, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1004372, Location: 42.685706, -78.776655

Provided by: Tri-State Traffic Data: New York Division
1016 Hoosick Rd, Troy, NY, 12180, US



Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

Turning Movement Data

Start Time	Hamburg Springville Rd Southbound					Boston State Rd Northbound					Tim Hortons Dw Eastbound					Int. Total
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	
7:00 AM	8	36	0	0	44	175	13	0	0	188	3	20	0	0	23	255
7:15 AM	14	34	0	0	48	151	16	0	0	167	5	15	0	0	20	235
7:30 AM	10	85	0	0	95	130	12	0	0	142	7	19	0	0	26	263
7:45 AM	3	73	0	0	76	121	15	0	0	136	9	7	0	0	16	228
Hourly Total	35	228	0	0	263	577	56	0	0	633	24	61	0	0	85	981
8:00 AM	6	48	0	0	54	111	18	0	0	129	9	11	0	0	20	203
8:15 AM	6	54	0	0	60	103	10	0	0	113	7	13	0	0	20	193
8:30 AM	8	52	0	0	60	127	18	0	0	145	9	17	0	0	26	231
8:45 AM	6	60	0	0	66	115	20	0	0	135	8	18	0	0	26	227
Hourly Total	26	214	0	0	240	456	66	0	0	522	33	59	0	0	92	854
9:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
4:00 PM	5	156	0	0	161	86	6	0	0	92	11	3	0	0	14	267
4:15 PM	9	175	0	0	184	78	6	0	0	84	8	3	0	0	11	279
4:30 PM	2	158	0	0	160	109	3	0	0	112	4	6	0	0	10	282
4:45 PM	6	160	0	0	166	93	4	0	0	97	8	3	0	0	11	274
Hourly Total	22	649	0	0	671	366	19	0	0	385	31	15	0	0	46	1102
5:00 PM	4	168	0	0	172	85	5	0	0	90	3	4	0	0	7	269
5:15 PM	5	174	0	0	179	98	2	0	0	100	4	2	0	0	6	285
5:30 PM	4	151	0	0	155	72	4	0	0	76	6	3	0	0	9	240
5:45 PM	1	125	0	0	126	89	2	0	0	91	2	1	0	0	3	220
Hourly Total	14	618	0	0	632	344	13	0	0	357	15	10	0	0	25	1014
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	97	1709	0	0	1806	1744	154	0	0	1898	103	145	0	0	248	3952
Approach %	5.4	94.6	0.0	-	-	91.9	8.1	0.0	-	-	41.5	58.5	0.0	-	-	-
Total %	2.5	43.2	0.0	-	45.7	44.1	3.9	0.0	-	48.0	2.6	3.7	0.0	-	6.3	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	96	1662	0	-	1758	1697	152	0	-	1849	102	144	0	-	246	3853
% Cars & Light Goods	99.0	97.2	-	-	97.3	97.3	98.7	-	-	97.4	99.0	99.3	-	-	99.2	97.5
Other Vehicles	1	47	0	-	48	47	2	0	-	49	1	1	0	-	2	99
% Other Vehicles	1.0	2.8	-	-	2.7	2.7	1.3	-	-	2.6	1.0	0.7	-	-	0.8	2.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-

% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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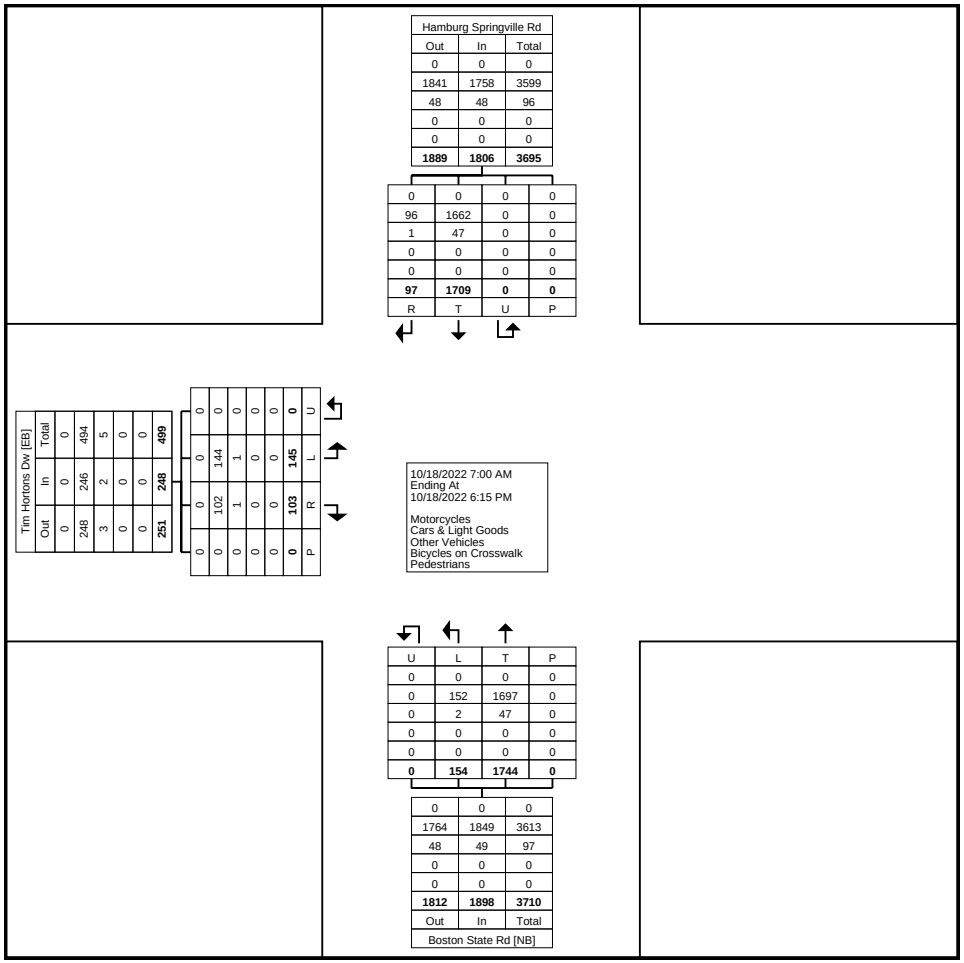
Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Data Plot

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Hamburg Springville Rd Southbound					Boston State Rd Northbound					Tim Hortons Dw Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
7:00 AM	8	36	0	0	44	175	13	0	0	188	3	20	0	0	23	255
7:15 AM	14	34	0	0	48	151	16	0	0	167	5	15	0	0	20	235
7:30 AM	10	85	0	0	95	130	12	0	0	142	7	19	0	0	26	263
7:45 AM	3	73	0	0	76	121	15	0	0	136	9	7	0	0	16	228
Total	35	228	0	0	263	577	56	0	0	633	24	61	0	0	85	981
Approach %	13.3	86.7	0.0	-	-	91.2	8.8	0.0	-	-	28.2	71.8	0.0	-	-	-
Total %	3.6	23.2	0.0	-	26.8	58.8	5.7	0.0	-	64.5	2.4	6.2	0.0	-	8.7	-
PHF	0.625	0.671	0.000	-	0.692	0.824	0.875	0.000	-	0.842	0.667	0.763	0.000	-	0.817	0.933
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	35	224	0	-	259	568	56	0	-	624	24	61	0	-	85	968
% Cars & Light Goods	100.0	98.2	-	-	98.5	98.4	100.0	-	-	98.6	100.0	100.0	-	-	100.0	98.7
Other Vehicles	0	4	0	-	4	9	0	0	-	9	0	0	0	-	0	13
% Other Vehicles	0.0	1.8	-	-	1.5	1.6	0.0	-	-	1.4	0.0	0.0	-	-	0.0	1.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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184 Baker Rd

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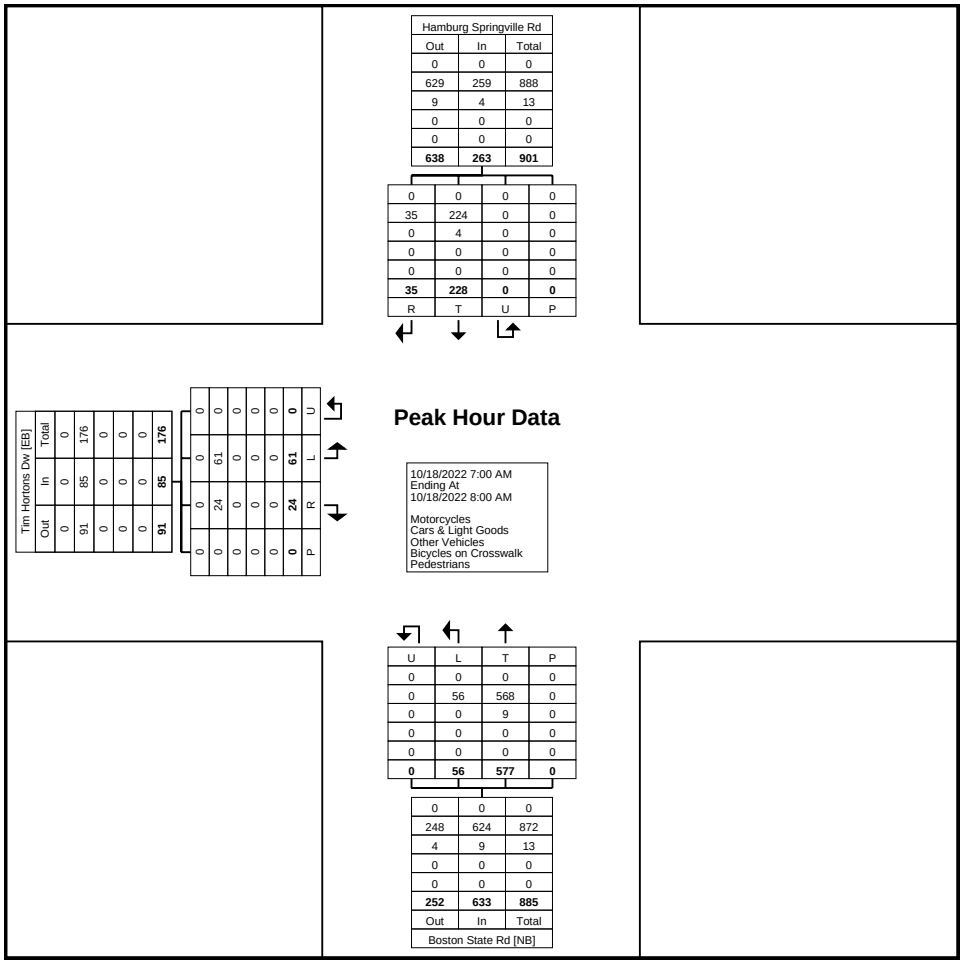
Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Peak Hour Data Plot (7:00 AM)

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022

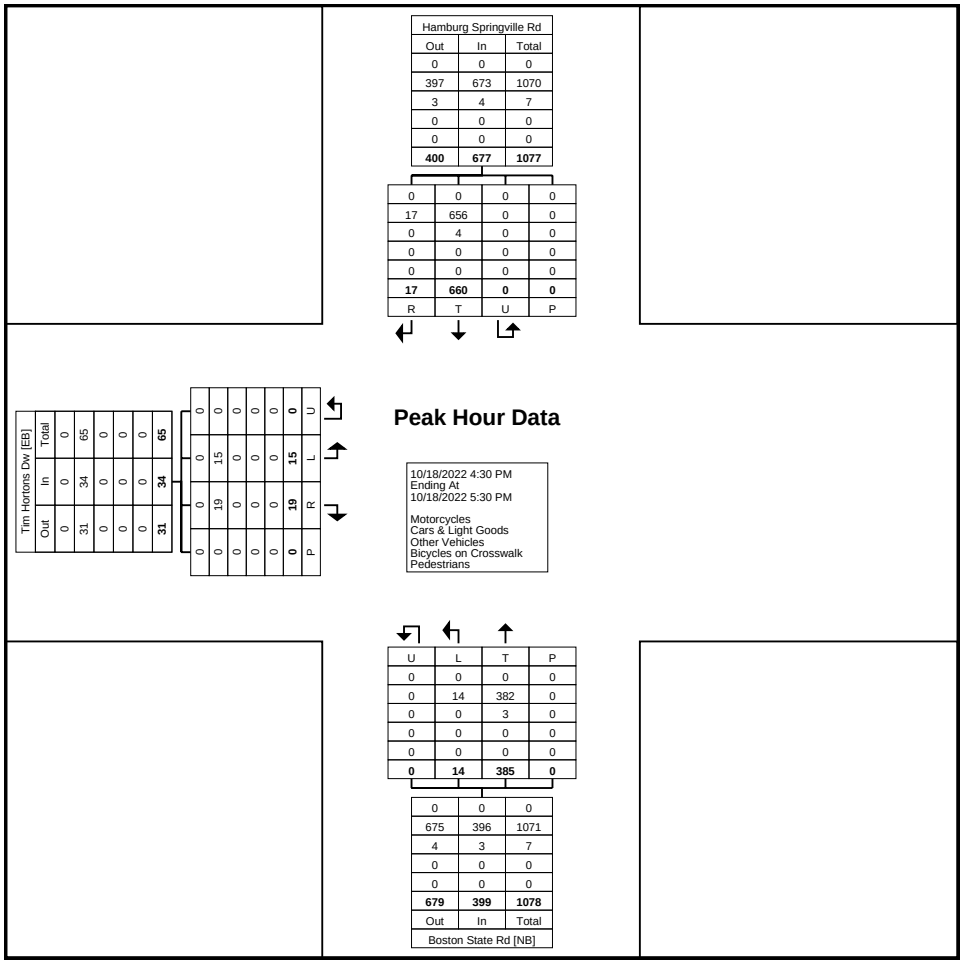
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Hamburg Springville Rd Southbound					Boston State Rd Northbound					Tim Hortons Dw Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
4:30 PM	2	158	0	0	160	109	3	0	0	112	4	6	0	0	10	282
4:45 PM	6	160	0	0	166	93	4	0	0	97	8	3	0	0	11	274
5:00 PM	4	168	0	0	172	85	5	0	0	90	3	4	0	0	7	269
5:15 PM	5	174	0	0	179	98	2	0	0	100	4	2	0	0	6	285
Total	17	660	0	0	677	385	14	0	0	399	19	15	0	0	34	1110
Approach %	2.5	97.5	0.0	-	-	96.5	3.5	0.0	-	-	55.9	44.1	0.0	-	-	-
Total %	1.5	59.5	0.0	-	61.0	34.7	1.3	0.0	-	35.9	1.7	1.4	0.0	-	3.1	-
PHF	0.708	0.948	0.000	-	0.946	0.883	0.700	0.000	-	0.891	0.594	0.625	0.000	-	0.773	0.974
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	17	656	0	-	673	382	14	0	-	396	19	15	0	-	34	1103
% Cars & Light Goods	100.0	99.4	-	-	99.4	99.2	100.0	-	-	99.2	100.0	100.0	-	-	100.0	99.4
Other Vehicles	0	4	0	-	4	3	0	0	-	3	0	0	0	-	0	7
% Other Vehicles	0.0	0.6	-	-	0.6	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tri-State Traffic Data: New York Division
184 Baker Rd

Coatesville , Pennsylvania, United States 19320
610-517-2338 bkarz@tstdata.com

Count Name: Tim Hortons Dw / Hamburg Springville Rd
Site Code:
Start Date: 10/18/2022



Turning Movement Peak Hour Data Plot (4:30 PM)

A2

Miscellaneous Traffic Data and Calculations

NYSDOT - Region 5 Timing Sheet 10/11/2022 11:42:51 AM

Station : 3352 - 391 @ Zimmerman (Standard File)

Phase [1.1.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clearance	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Green	25	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
Passage	3.5	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Max1	40	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0
Max2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red	1	0	1.6	0	0	0	0	0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Red Revert	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Added Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time Before Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Before Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduce By	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Step	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auto Exit																
Rest In Walk																

Phase Option [1.1.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	ON		ON													
Auto Entry																
Non Act1																
Non Act2																
Lock Call	ON															
Min Recall	ON															
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Guar Passage																
Cond Service																
Add Init Calc																

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

ENTRY	Call Phases				From	to	From	to	From	to	From	to	Assigned Ph
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

ENTRY	Call Phases				From	to	From	to	From	to	From	to	Assigned Ph
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	

Prepared By	Date Implemented	Reviewed By	Traffic Engineer

NYSDOT - Region 5 Timing Sheet 10/11/2022 11:42:51 AM

Station : 3352 - 391 @ Zimmerman (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Aux Switch Function	Local Flash Start	Console Timeout	Yellow 3 Second Disable	Tone Disable	Omit Yellow Enable	MCE Timeout	Enable Run	Start Red Time	Phase Mode	Disable Init Ped	Diamond Mode	TOD Dim Enable	Extra Maps Enable	D Connector Enable	SDLC Retry Time	TS2 Det Faults	Stop Time Over Preempt
	OFF	900	3	STOPTM	RED	20	OFF	OFF	OFF		ON	6	STD8	OFF	4PH	OFF	DEFAULT			ON	OFF

COMM, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	PORT	System-Up	Sys-Down	PC/Print	Aux 232
3352								

Port Parameters [6.2]

COMM	Mode	Baud	MsgTime	Duplex	Enable	DialTime	Modem	ModemTime	Tel#1	Tel#2
System Up(P-A)										
System Down(P-B)										
PC/Print(P-2)										

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
OFF	OFF	OFF	ON	

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1																	NORMAL		3.5	1.5
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6																	NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds							
Overlap 1																								
Overlap 2																								
Overlap 3																								
Overlap 4																								
Overlap 5																								
Overlap 6																								
Overlap 7																								
Overlap 8																								

Detector, Vehicle Parameters 1-16 [5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	1	1	1	3	3	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0

Detector, Vehicle Parameters 17-32 [5.1]

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Call Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NYSDOT - Region 5 Timing Sheet 10/11/2022 11:42:51 AM

Station : 3352 - 391 @ Zimmerman (Standard File)

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Channels/SDLC, Assign to Phases [1.3.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #	1		3																					
Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH
Flash	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Channel/SDLC, Parameters [1.3.3]

TOD Dim Enable	Extra Maps Enable	D Connector Enable	Single BIU Map	IO Mode	Preempt or Ext Output

Channel/SDLC, MMU Map [1.3.5]

MMU-to-Controller Channel Map

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Channel/SDLC, Permissive [1.3.4]

Channel	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

Channel/SDLC, Permissive [1.3.7]

SDLC Device	Term/Fac		Detector														MMU	DIAG
BIU#	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Present																		
Peer to Peer																		

Ring Sequence [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

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Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	ON
10	
11	
12	ON
13	
14	ON
15	
16	
17	ON
18	ON
19	ON
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	ON
29	ON
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	ON
44	ON
45	
46	
47	
48	ON
49	ON
50	ON
51	ON
52	ON
53	ON
54	ON
55	ON
56	ON
57	ON
58	ON
59	
60	
61	ON
62	
63	
64	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	
14	ON
15	
16	
17	
18	
19	
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
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48	
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57	
58	
59	
60	
61	
62	
63	
64	

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green						
Min Walk						
Ped Clear						
Track Green						
Min Dwell	2	2	2	2	2	2
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1						
Dwell P2						
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Alarms, Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
45	20	PH OVER	D-CONN

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
OFF	OFF

Alarms, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

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Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable	ON	ON	ON	ON	ON	ON
Type	RAIL	RAIL	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt	ON	ON	ON	ON	ON	ON
Max2						
Return Max/Min	MAX	MAX	MAX	MAX	MAX	MAX
Extend Dwell						
Pattern						
Output Mode	DWELL	DWELL	DWELL	DWELL	DWELL	DWELL
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Max Green						

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX 1	FLOAT

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active
FRC	TIMED	TIMED	NO_RECYCLE	OFF	OFF	ON	OFF	OFF	0	+	ON

Coordination, Pattern 1-16 [2.1]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time																
Offset Time																
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

Coordination, Pattern 17-32 [2.1]

Pattern	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cycle Time																
Offset Time																
Split Number	17	18	19	20	21	22	23	24								
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn

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Coordination, Splits [2.7.1]

Split Table1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table2	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table3	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table4	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table5	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table6	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

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Split Table13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

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TB Coor, Advanced Scheduler [4.3]

	Month												Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1																																																1
2																																																1
3																																																1
4																																																1
5																																																1
6																																																1
7																																																1
8																																																1
9																																																1
10																																																1
11																																																1
12																																																1
13																																																1
14																																																1
15																																																1
16																																																1
17																																																1
18																																																1
19																																																1
20																																																1
21																																																1
22																																																1
23																																																1
24																																																1
25																																																1
26																																																1
27																																																1
28																																																1
29																																																1
30																																																1
31																																																1
32																																																1

TB Coor, Day Plan [4.4]

Day Plan Table1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

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Day Plan Table7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

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TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1				0	0						
2	2				0	0						
3	3				0	0						
4	4				0	0						
5	5				0	0						
6	6				0	0						
7	7				0	0						
8	8				0	0						
9	9				0	0						
10	10				0	0						
11	11				0	0						
12	12				0	0						
13	13				0	0						
14	14				0	0						
15	15				0	0						
16	16				0	0						
17	17				0	0						
18	18				0	0						
19	19				0	0						
20	20				0	0						
21	21				0	0						
22	22				0	0						
23	23				0	0						
24	24				0	0						
25					0	0						
26					0	0						
27					0	0						
28					0	0						
29					0	0						
30					0	0						
31					0	0						
32					0	0						
33					0	0						
34					0	0						
35					0	0						
36					0	0						
37					0	0						
38					0	0						
39					0	0						
40					0	0						
41					0	0						
42					0	0						
43					0	0						
44					0	0						
45					0	0						
46					0	0						
47					0	0						
48					0	0						
49					0	0						
50					0	0						
51					0	0						
52					0	0						
53					0	0						
54					0	0						
55					0	0						
56					0	0						
57					0	0						
58					0	0						
59					0	0						
60					0	0						
61					0	0						
62					0	0						
63					0	0						
64					0	0						
99					0	0						
100	255				0	0						

Station : 3376 - 219 @ 391 (Standard File)

Phase [1.1.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clearance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Green	20	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
Passage	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Max1	40	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0
Max2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	4.3	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red	1	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Red Revert	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Added Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time Before Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Before Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduce By	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamic Max Step	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auto Exit																
Rest In Walk																

Phase Option [1.1.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	ON		ON													
Auto Entry																
Non Act1																
Non Act2																
Lock Call			ON													
Min Recall	ON															
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Guar Passage																
Cond Service																
Add Init Calc																

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

ENTRY	Call Phases				From	to	From	to	From	to	From	to	Assigned Ph
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

ENTRY	Call Phases				From	to	From	to	From	to	From	to	Assigned Ph
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	

Prepared By	Date Implemented	Reviewed By	Traffic Engineer

NYSDOT - Region 5 Timing Sheet 12/1/2022 7:30:17 AM

Station : 3376 - 219 @ 391 (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Aux Switch Function	Local Flash Start	Console Timeout	Yellow 3 Second Disable	Tone Disable	Omit Yellow Enable	MCE Timeout	Enable Run	Start Red Time	Phase Mode	Disable Init Ped	Diamond Mode	TOD Dim Enable	Extra Maps Enable	D Connector Enable	SDLC Retry Time	TS2 Det Faults	Stop Time Over Preempt
	OFF	900	3	STOPTM	RED	20	OFF	OFF	OFF		ON	6	STD8	OFF	4PH	OFF	DEFAULT			ON	OFF

COMM, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	PORT	System-Up	Sys-Down	PC/Print	Aux 232
3376								

Port Parameters [6.2]

COMM	Mode	Baud	MsgTime	Duplex	Enable	DialTime	Modem	ModemTime	Tel#1	Tel#2
System Up(P-A)										
System Down(P-B)										
PC/Print(P-2)										

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
OFF	OFF	OFF	ON	

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1																	NORMAL		3.5	1.5
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6																	NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds							
Overlap 1																								
Overlap 2																								
Overlap 3																								
Overlap 4																								
Overlap 5																								
Overlap 6																								
Overlap 7																								
Overlap 8																								

Detector, Vehicle Parameters 1-16 [5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	1	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0

Detector, Vehicle Parameters 17-32 [5.1]

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Call Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Station : 3376 - 219 @ 391 (Standard File)

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Switch Phase	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Channels/SDLC, Assign to Phases [1.3.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #	1						3																	
Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH
Flash	YEL	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Channel/SDLC, Parameters [1.3.3]

TOD Dim Enable	Extra Maps Enable	D Connector Enable	Single BIU Map	IO Mode	Preempt or Ext Output

Channel/SDLC, MMU Map [1.3.5]

MMU-to-Controller Channel Map

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Channel/SDLC, Permissive [1.3.4]

Channel	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

Channel/SDLC, Permissive [1.3.7]

SDLC Device	Term/Fac	Detector																MMU	DIAG
BIU#	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8			
Present																			
Peer to Peer																			

Ring Sequence [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

Station : 3376 - 219 @ 391 (Standard File)

Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	ON
10	
11	
12	ON
13	
14	ON
15	
16	
17	ON
18	ON
19	ON
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	ON
29	ON
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	ON
44	ON
45	
46	
47	
48	ON
49	ON
50	ON
51	ON
52	ON
53	ON
54	ON
55	ON
56	ON
57	ON
58	ON
59	
60	
61	ON
62	
63	
64	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	
14	ON
15	
16	
17	
18	
19	
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
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62	
63	
64	

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green						
Min Walk						
Ped Clear						
Track Green						
Min Dwell	2	2	2	2	2	2
Max Presence						
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1						
Dwell P2						
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Alarms, Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
45	20	PH OVER	D-CONN

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
OFF	OFF

Alarms, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

Station : 3376 - 219 @ 391 (Standard File)

Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable	ON	ON	ON	ON	ON	ON
Type	RAIL	RAIL	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt	ON	ON	ON	ON	ON	ON
Max2						
Return Max/Min	MAX	MAX	MAX	MAX	MAX	MAX
Extend Dwell						
Pattern						
Output Mode	DWELL	DWELL	DWELL	DWELL	DWELL	DWELL
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Max Green						

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX 1	FLOAT

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active
FRC	TIMED	TIMED	NO_RECYCLE	OFF	OFF	ON	OFF	OFF	0	+	ON

Coordination, Pattern 1-16 [2.1]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time																
Offset Time																
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn

Coordination, Pattern 17-32 [2.1]

Pattern	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cycle Time																
Offset Time																
Split Number	17	18	19	20	21	22	23	24								
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn	beggrn

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Coordination, Splits [2.7.1]

Split Table1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table2	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table3	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table4	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table5	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table6	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

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Split Table13	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table14	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table15	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table16	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table17	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table18	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table19	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table20	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table21	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table22	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table23	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table24	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Station : 3376 - 219 @ 391 (Standard File)

TB Coor, Advanced Scheduler [4.3]

	Month												Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1																																																1
2																																																	1
3																																																	1
4																																																	1
5																																																	1
6																																																	1
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27																																																	1
28																																																	1
29																																																	1
30																																																	1
31																																																	1
32																																																	1

TB Coor, Day Plan [4.4]

Day Plan Table1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Station : 3376 - 219 @ 391 (Standard File)

Day Plan Table7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Station : 3376 - 219 @ 391 (Standard File)

TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1				0	0						
2	2				0	0						
3	3				0	0						
4	4				0	0						
5	5				0	0						
6	6				0	0						
7	7				0	0						
8	8				0	0						
9	9				0	0						
10	10				0	0						
11	11				0	0						
12	12				0	0						
13	13				0	0						
14	14				0	0						
15	15				0	0						
16	16				0	0						
17	17				0	0						
18	18				0	0						
19	19				0	0						
20	20				0	0						
21	21				0	0						
22	22				0	0						
23	23				0	0						
24	24				0	0						
25					0	0						
26					0	0						
27					0	0						
28					0	0						
29					0	0						
30					0	0						
31					0	0						
32					0	0						
33					0	0						
34					0	0						
35					0	0						
36					0	0						
37					0	0						
38					0	0						
39					0	0						
40					0	0						
41					0	0						
42					0	0						
43					0	0						
44					0	0						
45					0	0						
46					0	0						
47					0	0						
48					0	0						
49					0	0						
50					0	0						
51					0	0						
52					0	0						
53					0	0						
54					0	0						
55					0	0						
56					0	0						
57					0	0						
58					0	0						
59					0	0						
60					0	0						
61					0	0						
62					0	0						
63					0	0						
64					0	0						
99					0	0						
100	255				0	0						

Intersection Crash Rate Calculations

Tim Horton's Hamburg

Intersection #1: Boston State Rd at NY Route 219 SB Ramps
Date of Count: Tuesday, October 18, 2022

Number of Crashes: 13
Number of Injuries: 3
Number of Fatalities: 0
Entering Vehicles (PM): 1418
ADT: 14926
Start Date: June 1, 2017
End Date: May 31, 2022
Number of Years: 5

Intersection Type: 3 Legged
Area Type: Urban
Control Type: Signal 1-4 Lanes

$$\text{crash rate} = \frac{\text{Number of Crashes x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{crash rate} = \frac{13 \times 1{,}000{,}000}{14926 \times 365 \times 5}$$

	Crash Rate		Fatality Rate	Injury Rate
Study Intersection	**0.48**	**cr/mve**	**0%**	**23%**
Statewide Average*	**0.19**	**cr/mve**		

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

	Direction					
Type	Northbound	Southbound	Eastbound	Westbound	Unknown	Totals
Left turn						0
Rear-end	3	3	4			10
Overtaking						0
Right Angle		1	1			2
Right Turn						0
Head On						0
Side-swipe						0
Fixed Object						0
Backing						0
Other						0
Bike/Ped						0
Animal			1			1
Totals	3	4	6	0	0	13

PDO	10
Injury	3
Injury + PDO	
Fatal	
NR	
Total	13

Intersection Crash Rate Calculations

Tim Horton's Hamburg

Intersection #2: Boston State Rd at NY Route 219 NB Ramps
Date of Count: Tuesday, October 18, 2022

Number of Crashes: 8
Number of Injuries: 2
Number of Fatalities: 0
Entering Vehicles (PM): 1285
ADT: 13526
Start Date: June 1, 2017
End Date: May 31, 2022
Number of Years: 5

Intersection Type: 3 Legged
Area Type: Urban
Control Type: Sign 1-3 Lanes

$$\text{crash rate} = \frac{\text{Number of Crashes x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{crash rate} = \frac{8 \times 1{,}000{,}000}{13526 \times 365 \times 5}$$

	Crash Rate		Fatality Rate	Injury Rate
Study Intersection	**0.32**	**cr/mve**	**0%**	**25%**
Statewide Average*	**0.19**	**cr/mve**		

ADT = Average Daily Total vehicles entering intersection
cr/mve = crashes per million entering vehicles
* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

	Direction					
Type	Northbound	Southbound	Eastbound	Westbound	Unknown	Totals
Left turn	1					1
Rear-end	1	1				2
Overtaking						0
Right Angle	1	1				2
Right Turn						0
Head On						0
Side-swipe						0
Fixed Object						0
Backing						0
Other		2				2
Bike/Ped						0
Animal		1				1
Totals	3	5	0	0	0	8

PDO	6
Injury	2
Injury + PDO	
Fatal	
NR	
Total	8

Intersection Crash Rate Calculations

Tim Horton's Hamburg

Intersection #3:	Boston State Rd at Tim Horton's Dwy
Date of Count:	Tuesday, October 18, 2022
Number of Crashes:	2
Number of Injuries:	1
Number of Fatalities:	0
Entering Vehicles (PM):	1110
ADT:	11684
Start Date:	June 1, 2017
End Date:	May 31, 2022
Number of Years:	5
Intersection Type:	3 Legged
Area Type:	Urban
Control Type:	Sign 1-3 Lanes

crash rate = Number of Crashes x 1 Million / ADT x 365 Days per Year x Number of Years

crash rate = 2 x 1,000,000 / 11684 x 365 x 5

	Crash Rate		Fatality Rate	Injury Rate
Study Intersection	**0.09**	**cr/mve**	**0%**	**50%**
Statewide Average*	**0.19**	**cr/mve**		

ADT = Average Daily Total vehicles entering intersection

cr/mve = crashes per million entering vehicles

* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

	Direction					
Type	Northbound	Southbound	Eastbound	Westbound	Unknown	Totals
Left turn	1					1
Rear-end	1					1
Overtaking						0
Right Angle						0
Right Turn						0
Head On						0
Side-swipe						0
Fixed Object						0
Backing						0
Other						0
Bike/Ped						0
Animal						0
Totals	2	0	0	0	0	2

PDO	1
Injury	1
Injury + PDO	
Fatal	
NR	
Total	2

Intersection Crash Rate Calculations

Tim Horton's Hamburg

Intersection #3:	Boston State Rd at Zimmerman Rd at Herman Hill Rd
Date of Count:	Tuesday, October 18, 2022
Number of Crashes:	19
Number of Injuries:	3
Number of Fatalities:	0
Entering Vehicles (PM):	1167
ADT:	12284
Start Date:	June 1, 2017
End Date:	May 31, 2022
Number of Years:	5
Intersection Type:	4 Legged
Area Type:	Urban
Control Type:	Signal 1-4 Lanes

crash rate = Number of Crashes x 1 Million / ADT x 365 Days per Year x Number of Years

crash rate = 19 x 1,000,000 / 12284 x 365 x 5

	Crash Rate		Fatality Rate	Injury Rate
Study Intersection	**0.85**	**cr/mve**	**0%**	**16%**
Statewide Average*	**0.56**	**cr/mve**		

ADT = Average Daily Total vehicles entering intersection

cr/mve = crashes per million entering vehicles

* Most recent available 2019 Average Crash Rates for State Highways by Facility Type

	Direction					
Type	Northbound	Southbound	Eastbound	Westbound	Unknown	Totals
Left turn			1		4	5
Rear-end			2	1	1	4
Overtaking						0
Right Angle			2	1	1	4
Right Turn						0
Head On						0
Side-swipe					1	1
Fixed Object			2	1	1	4
Backing						0
Other						0
Bike/Ped					1	1
Animal						0
Totals	0	0	7	3	9	19

PDO	16
Injury	3
Injury + PDO	
Fatal	
NR	
Total	19

TE 213 (9/79)

DIAGRAM No.:

COUNTY: Erie **P.I.N.:** 43101
TOWN
CITY
VILLAGE OF Hamburg

ROUTE NO. OR STREET NAME:
Boston State Rd

AT INTERSECTION WITH/OR BETWEEN:
NY 219 NB Ramps

CASE No.:
FILE:
BY: Passero Associates
DATE: 01/06/22

TIME PERIOD **FROM:** 6/1/2017 **TO:** 5/31/2022

No. OF MONTHS: 60

ENVIRONMENTAL:
Use Codes from MV 104 (shown at right) for these categories

Light Conditions:
1. Daylight
2. Dawn
3. Dusk
4. Dark Road Lighted
5. Dark Road Unlighted

Roadway Character:
1. Straight & Level
2. Straight & Grade
3. Straight & Hillcrest
4. Curve & Level
5. Curve & Grade
6. Curve & Hillcrest

Roadway Surface Condition:
1. Dry
2. Wet
3. Muddy
4. Snow/Ice
5. Slush
10. Other

Weather:
1. Clear
2. Cloudy
3. Rain
4. Snow
5. Sleet/Hail/Freezing Rain
6. Fog/Smog/Smoke
10. Other

ACCIDENT No.	DATE	TIME	No. of VEHICLES	SEVERITY	LIGHT CONDITIONS	ROADWAY CHARACTER	ROADWAY SURFACE CONDITION	WEATHER	APPARENT CONTRIBUTING FACTORS	DIRECTION	[1]Use Codes from MV 104 Police Report TYPE[1]	DESCRIPTION	REFERENCE MARKER
1	11/14/2017	03:30pm	2	PDO	1	1	1	2	9	EB	1		
2	12/4/2018	01:40pm	1	PDO	1	1	1	2	19	SB	Overturning		
3	1/5/2019	01:10pm	2	I	1	1	2	2	17, 7	SB	4		219 53021180
4	12/5/2019	03:55pm	2	PDO	1	1	2	2	7, 18	SB	4		
5	1/15/2020	07:30am	2	PDO	1	1	1	1	7	NB	1		
6	01/30/20	08:19pm	2	I	1	1	1	1	7, 62	NB	4		219 53021180
7	11/03/21	06:58pm	1	PDO	4	1	2	4	61	NB	Animal		219 53021180
8	12/04/21	05:37pm	2	PDO	4	1	1	1	4	SB	0		219 53021180

TE 213 (9/79)

DIAGRAM No.:

COUNTY: Erie **P.I.N.:** 43101

TOWN

CITY

VILLAGE OF Hamburg

ROUTE NO. OR STREET NAME: Boston State Rd

AT INTERSECTION WITH/OR BETWEEN: NY 219 SB Ramps

CASE No.:

FILE:

BY: Passero Associates

DATE: 01/06/22

TIME PERIOD **FROM:** 6/1/2017 **TO:** 5/31/2022

No. OF MONTHS: 60

ENVIRONMENTAL: Use Codes from MV 104 (shown at right) for these categories

Light Conditions:
1. Daylight
2. Dawn
3. Dusk
4. Dark Road Lighted
5. Dark Road Unlighted

Roadway Character:
1. Straight & Level
2. Straight & Grade
3. Straight & Hillcrest
4. Curve & Level
5. Curve & Grade
6. Curve & Hillcrest

Roadway Surface Condition:
1. Dry
2. Wet
3. Muddy
4. Snow/Ice
5. Slush
10. Other

Weather:
1. Clear
2. Cloudy
3. Rain
4. Snow
5. Sleet/Hail/Freezing Rain
6. Fog/Smog/Smoke
10. Other

ACCIDENT No.	DATE	TIME	No. of VEHICLES	SEVERITY	LIGHT CONDITIONS	ROADWAY CHARACTER	ROADWAY SURFACE CONDITION	WEATHER	APPARENT CONTRIBUTING FACTORS	DIRECTION	[1]Use Codes from MV 104 Police Report TYPE[1]	DESCRIPTION	REFERENCE MARKER
1	9/23/2017	09:50am	2	PDO	1	1	1	1	9	EB	1		219 53021182
2	11/7/2017	08:27am	1	PDO	5	1	1	1	Unknown	EB	Animal		219 53021182
3	2/13/2018	06:52am	2	PDO	1	1	1	1	9	EB	1		
4	8/4/2018	09:15pm	2	PDO	4	1	1	1	4	SB	1		219 53021182
5	11/6/2018	04:49pm	2	PDO	1	4	1	2	9	WB	1		
6	01/19/19	12:15pm	2	PDO	1	1	4	4	19, 66	WB	4		219 53021182
7	02/08/19	08:30pm	2	PDO	Unknown	Unknown	Unknown	Unknown	Unknown	SB	1		
8	05/02/19	10:35am	2	I	1	2	2	3	9	EB	1		
9	08/12/19	3:55pm	2	I	1	4	1	2	9	WB	1		
10	12/11/19	4:44pm	2	I	1	2	4	4	66	EB	1		219 53021182
11	03/05/20	6:16pm	2	PDO	3	4	1	1	13, 9	WB	1		
12	11/20/20	11:04am	2	PDO	1	1	1	1	40: Reaction to another vehicle	SB	4		
13	05/08/21	1:23pm	2	PDO	1	1	1	1	3	EB	1		

TE 213 (9/79)

DIAGRAM No.:

COUNTY: Erie **P.I.N.:** 43101

TOWN

CITY

VILLAGE OF Hamburg

ROUTE NO. OR STREET NAME:

Boston State Rd

AT INTERSECTION WITH/OR BETWEEN:

Tim Horton's Driveway

CASE No.:

FILE:

BY: Passero Associates

DATE: 01/06/22

TIME PERIOD **FROM:** 6/1/2017 **TO:** 5/31/2022

No. OF MONTHS: 60

ENVIRONMENTAL:
Use Codes from MV 104 (shown at right) for these categories

Light Conditions:
1. Daylight
2. Dawn
3. Dusk
4. Dark Road Lighted
5. Dark Road Unlighted

Roadway Character:
1. Straight & Level
2. Straight & Grade
3. Straight & Hillcrest
4. Curve & Level
5. Curve & Grade
6. Curve & Hillcrest

Roadway Surface Condition:
1. Dry
2. Wet
3. Muddy
4. Snow/Ice
5. Slush
10. Other

Weather:
1. Clear
2. Cloudy
3. Rain
4. Snow
5. Sleet/Hail/Freezing Rain
6. Fog/Smog/Smoke
10. Other

[1]Use Codes from MV 104 Police Report

ACCIDENT No.	DATE	TIME	No. of VEHICLES	SEVERITY	LIGHT CONDITIONS	ROADWAY CHARACTER	ROADWAY SURFACE CONDITION	WEATHER	APPARENT CONTRIBUTING FACTORS	DIRECTION	TYPE[1]	DESCRIPTION	REFERENCE MARKER
1	5/20/2018	12:27pm	2	PDO	1	1	1	2	7	NB	0		219 53021179
2	2/4/2021	04:38pm	2	I	1	1	1	1	9, 4	EB	1		219 53021179

TE 213 (9/79)

DIAGRAM No.:

COUNTY: Erie **P.I.N.:** 43101

TOWN

CITY

VILLAGE OF Hamburg

ROUTE NO. OR STREET NAME: Boston State Rd

AT INTERSECTION WITH/OR BETWEEN: Zimmerman Rd and Herman Hill Rd

CASE No.:

FILE:

BY: Passero Associates

DATE: 01/06/22

TIME PERIOD **FROM:** 6/1/2017 **TO:** 5/31/2022

No. OF MONTHS: 60

ENVIRONMENTAL: Use Codes from MV 104 (shown at right) for these categories

Light Conditions:
1. Daylight
2. Dawn
3. Dusk
4. Dark Road Lighted
5. Dark Road Unlighted

Roadway Character:
1. Straight & Level
2. Straight & Grade
3. Straight & Hillcrest
4. Curve & Level
5. Curve & Grade
6. Curve & Hillcrest

Roadway Surface Condition:
1. Dry
2. Wet
3. Muddy
4. Snow/Ice
5. Slush
10. Other

Weather:
1. Clear
2. Cloudy
3. Rain
4. Snow
5. Sleet/Hail/Freezing Rain
6. Fog/Smog/Smoke
10. Other

[1]Use Codes from MV 104 Police Report

ACCIDENT No.	DATE	TIME	No. of VEHICLES	SEVERITY	LIGHT CONDITIONS	ROADWAY CHARACTER	ROADWAY SURFACE CONDITION	WEATHER	APPARENT CONTRIBUTING FACTORS	DIRECTION	TYPE[1]	DESCRIPTION	REFERENCE MARKER
1	6/28/2017	12:40pm	2	I	1	2	1	1	17	WB	4		277 53011000
2	8/16/2017	05:20pm	2	PDO	1	1	1	1	17	EB	4		
3	12/29/2017	05:20pm	2	PDO	4	1	4	4	40, Failure to keep right	EB	8		219 53021173
4	2/13/2018	12:00am	1	PDO	3	1	4	1	Unknown	EB	Fixed Object		219 53021173
5	8/16/2018	06:33pm	2	PDO	1	1	1	2	7, 5	WB	3		219 53021173
6	09/16/18	12:15pm	2	PDO	1	1	1	1	4	NB	1		219 53021173
7	12/30/18	03:32pm	2	PDO	1	1	2	2	7, 17	EB	3		219 53021173
8	12/21/18	9:30pm	1	I	4	1	1	1	17	Unknown	Pedestrian		219 53021173
9	01/01/19	9:44pm	2	PDO	4	1	1	1	7	NB	0		219 53021173
10	06/18/19	8:55am	2	PDO	1	1	1	2	9	NB	1		
11	06/30/19	2:45pm	1	PDO	1	1	1	1	65	WB	Fixed Object		
12	06/01/20	3:40pm	2	PDO	1	1	1	1	18	NB	3		
13	06/27/20	1:55pm	2	I	1	1	1	2	9	EB	1		219 53021173
14	09/16/20	12:00pm	2	PDO	1	1	1	1	7	Unknown	3		219 53021173
15	02/23/21	1:30pm	2	PDO	1	2	2	2	3	Unknown	Backing		277 53011000
16	02/28/21	3:50pm	1	PDO	Unknown	Unknown	Unknown	Unknown	Unknown	NB	Fixed Object		219 53021173
17	06/12/21	9:53am	1	PDO	1	4	1	1	20	EB	Fixed Object		
18	11/23/21	8:50am	2	PDO	1	1	1	1	Unknown	NB	1		219 53021173
19	04/23/22	9:49am	2	PDO	1	1	1	2	17	EB	4		219 53021173

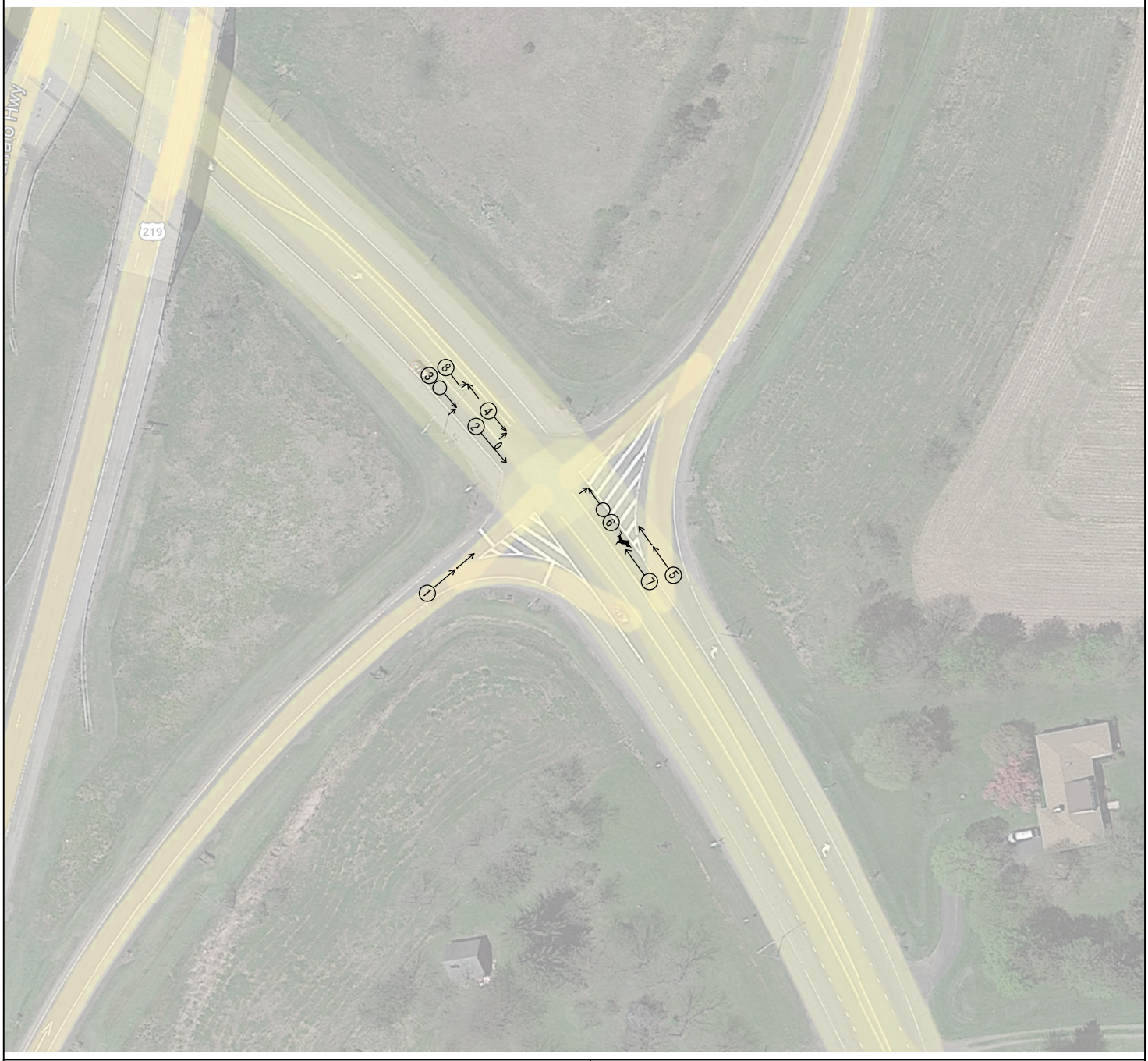
TE 56

DEPARTMENT OF TRANSPORTATION
COLLISION DIAGRAM

MUNICIPALITY: Town of Hamburg | COUNTY: Erie | FILE:

INTERSECTION: Boston State Rd at NY 219 NB Ramps

PERIOD: 5 YR 0 MO | FROM 6 / 1 / 2017 | TO 5 / 31 / 2022 | BY Passero Associates | DATE 1 / 6 / 2023



SYMBOLS

- MOVING VEHICLE
- M — MOTORCYCLE
- BACKING VEHICLE
- STOPPED VEHICLE
- PARKED VEHICLE
- PEDESTRIAN
- B — BICYCLE
- FIXED OBJECT
- PERSONAL INJURY
- FATAL INJURY

MANNER OF COLLISION

- REAR-END
- OVERTAKING
- SIDE-SWIPE
- BACKING
- OUT OF CONTROL
- SKIDDING
- OVERTURNED
- HEAD-ON
- LEFT-TURN
- RIGHT-TURN
- RIGHT-ANGLE
- ANIMAL
- XX — ACCIDENT ID NO.

TE 56

DEPARTMENT OF TRANSPORTATION
COLLISION DIAGRAM

MUNICIPALITY Town of Hamburg COUNTY Erie FILE

INTERSECTION Boston State Rd at NY 219 SB Ramps

PERIOD 5 YR 0 MO FROM 6 / 1 / 2017 TO 5 / 31 / 2022 BY Passero Associates DATE 1 / 6 / 2023

SYMBOLS

- MOVING VEHICLE
- M MOTORCYCLE
- BACKING VEHICLE
- STOPPED VEHICLE
- PARKED VEHICLE
- PEDESTRIAN
- B BICYCLE
- FIXED OBJECT
- PERSONAL INJURY
- FATAL INJURY

MANNER OF COLLISION

- REAR-END
- OVERTAKING
- SIDE-SWIPE
- BACKING
- OUT OF CONTROL
- SKIDDING
- OVERTURNED
- HEAD-ON
- LEFT-TURN
- RIGHT-TURN
- RIGHT-ANGLE
- ANIMAL
- XX ACCIDENT ID NO.

TE 56

DEPARTMENT OF TRANSPORTATION
COLLISION DIAGRAM

MUNICIPALITY Town of Hamburg COUNTY Erie FILE

INTERSECTION Boston State Rd at Tim Horton' s Driveway

PERIOD 5 YR 0 MO FROM 6 / 1 / 2017 TO 5 / 31 / 2022 BY Passero Associates DATE 1 / 6 / 2023

SYMBOLS

- MOVING VEHICLE
- M MOTORCYCLE
- BACKING VEHICLE
- STOPPED VEHICLE
- PARKED VEHICLE
- PEDESTRIAN
- B BICYCLE
- FIXED OBJECT
- PERSONAL INJURY
- FATAL INJURY

MANNER OF COLLISION

- REAR-END
- OVERTAKING
- SIDE-SWIPE
- BACKING
- OUT OF CONTROL
- SKIDDING
- OVERTURNED
- HEAD-ON
- LEFT-TURN
- LEFT-TURN
- RIGHT-TURN
- RIGHT-ANGLE
- ANIMAL
- XX ACCIDENT ID NO.

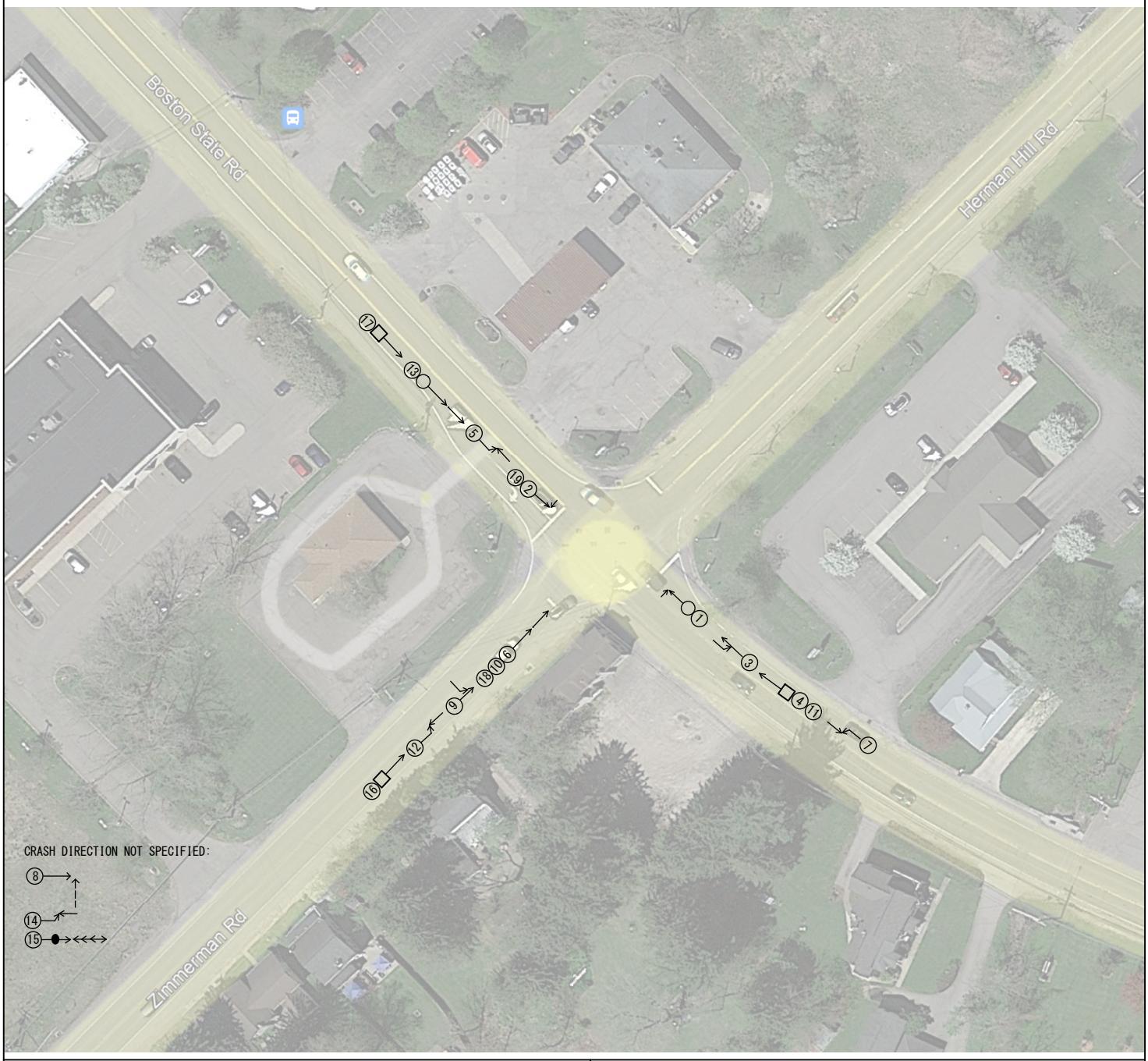
TE 56

DEPARTMENT OF TRANSPORTATION
COLLISION DIAGRAM

MUNICIPALITY: Town of Hamburg | COUNTY: Erie | FILE:

INTERSECTION: Boston State Rd at Zimmerman Rd at Harris Hill Rd

PERIOD: 5 YR 0 MO | FROM 6 / 1 / 2017 | TO 5 / 31 / 2022 | BY Passero Associates | DATE 1 / 6 / 2023



SYMBOLS

- MOVING VEHICLE
- M MOTORCYCLE
- BACKING VEHICLE
- STOPPED VEHICLE
- PARKED VEHICLE
- PEDESTRIAN
- B BICYCLE
- FIXED OBJECT
- PERSONAL INJURY
- FATAL INJURY

MANNER OF COLLISION

- REAR-END
- SIDE-SWIPE
- SIDE-SWIPE
- BACKING
- OUT OF CONTROL
- SKIDDING
- OVERTURNED
- HEAD-ON
- LEFT-TURN
- LEFT-TURN
- RIGHT-TURN
- RIGHT-ANGLE
- ANIMAL
- XX ACCIDENT ID NO.

Proposed Mixed Use Development, Town of Hamburg, Erie County, NY

Documentation of Ambient Traffic Volume Growth

Roadway	Segment starts at	Segment end at	2010	2011	2012	2013	2014	2015	2016	2017	2018	2020	Annual Growth
Boston State Rd	Herman Hill Rd	NY Route 219	11,176			14,192			12,433	11,022		7,112	-0.20%
Zimmerman Rd	Back Creek Rd	NY Route 391		4,831					4,600				-0.98%
Herman Hill Rd	NY Route 391	CR 28 Abbott Rd	2,797			2,818			2,728	2,650	2,794	2,906	-0.01%
												AVERAGE	**-0.40%**

Scenario - 1

Scenario Name: AM Peak Hour
User Group:
Dev. phase: 1
No. of Years to Project Traffic : 0
Analyst Note:
Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
945 - Convenience Store/Gas Station - VFP (2-8)	General Urban/Suburban	1000 Sq. Ft. GFA	4.18	Weekday, Peak Hour of Adjacent Street Traffic,	Average	85	85	170
Data Source: Trip Generation Manual, 11th Ed					40.59	50%	50%	
710 - General Office Building	General Urban/Suburban	1000 Sq. Ft. GFA	6	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	13	2	15
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.86Ln(X) + 1.16	88%	12%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
945 - Convenience Store/Gas Station - VFP (2-8)	100	100	1	1	50	50
710 - General Office Building	99	100	1.1	1.1	88	12

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	85	85	0	0	85	85
	170		0		170	
710 - General Office Building	14	2	0	0	14	2
	16		0		16	

INTERNAL VEHICLE TRIP REDUCTION

LAND USE GROUP ASSIGNMENT:

Land Use	Land Use Group
945 - Convenience Store/Gas Station - VFP (2-8)	Resturant
710 - General Office Building	Office

BALANCED PERSON TRIPS:

945 - Convenience Store/Gas Station-VFP (2-8)

Persons Exit	PAF	UIPTC	Unconstrained Demand	==>>> BALANCED ==>>>	Unconstrained Demand	UIPTC	PAF	Persons Entry
85	0	0	0	**0**	0	0	0	15
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<== BALANCED <<<==	Unconstrained Demand	UIPTC	PAF	Persons Exit
85	0	0	0	**0**	0	0	0	2

710 - General Office Building

INTERNAL PERSON TRIPS:

945 - Convenience Store/Gas Station-VFP (2-8)

Internal Person Trips From	Entry	Exit	Total
Total Internal Person Trips	**0**	**0**	**0**

710 - General Office Building

Internal Person Trips From	Entry	Exit	Total
Total Internal Person Trips	**0**	**0**	**0**

INTERNAL VEHICLE TRIPS AND CAPTURE:

945 - Convenience Store/Gas Station-VFP (2-8)

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	**0**	**0**	**0**
Total External Vehicle Trips	85	85	170
Internal Vehicle Trip Capture	**0%**	**0%**	**0%**

710 - General Office Building

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	**0**	**0**	**0**
Total External Vehicle Trips	13	2	15
Internal Vehicle Trip Capture	**0%**	**0%**	**0%**

PASS-BY VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Pass-by Vehicle Trip %		Pass-by Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	85	85	62.80%	62.80%	53	53
710 - General Office Building	13	2	0.00%	0.00%	0	0

DIVERTED VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Diverted Vehicle Trip %		Diverted Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	85	85	0.00%	0.00%	0	0
710 - General Office Building	13	2	0.00%	0.00%	0	0

EXTRA VEHICLE TRIP REDUCTION

Land Use	(External - (Pass-by + Diverted)) Vehicle Trips		Extra Vehicle Trip Reduction %		Extra Reduced Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	32	32	0.00%	0.00%	0	0
710 - General Office Building	13	2	0.00%	0.00%	0	0

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
945 - Convenience Store/Gas Station - VFP (2-8)	32	32	64
710 - General Office Building	13	2	15

RESULTS

Site Totals	Entry	Exit	Total

Vehicle Trips Before Reduction	98	87	185
Internal Vehicle Trips	0	0	0
External Vehicle Trips	98	87	185
Internal Vehicle Trip Capture	0%	0%	0%
Pass-by Vehicle Trips	53	53	106
Diverted Vehicle Trips	0	0	0
Extra Reduced Vehicle Trips	0	0	0
New Vehicle Trips	45	34	79

Scenario - 2

Scenario Name: PM Peak Hour
User Group:
Dev. phase: 1
No. of Years to Project Traffic : 0
Analyst Note:
Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
945 - Convenience Store/Gas Station - VFP (2-8)	General Urban/Suburban	1000 Sq. Ft. GFA	4.18	Weekday, Peak Hour of Adjacent Street Traffic,	Average	101	101	202
Data Source: Trip Generation Manual, 11th Ed					48.48	50%	50%	
710 - General Office Building	General Urban/Suburban	1000 Sq. Ft. GFA	6	Weekday, Peak Hour of Adjacent Street Traffic,	Best Fit (LOG)	3	13	16
Data Source: Trip Generation Manual, 11th Ed					Ln(T) =0.83Ln(X) + 1.29	17%	83%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
945 - Convenience Store/Gas Station - VFP (2-8)	100	100	1	1	50	50
710 - General Office Building	100	99	1.1	1.1	17	83

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	101	101	0	0	101	101
	202		0		202	
710 - General Office Building	3	15	0	0	3	15
	18		0		18	

INTERNAL VEHICLE TRIP REDUCTION

LAND USE GROUP ASSIGNMENT:

Land Use	Land Use Group
945 - Convenience Store/Gas Station - VFP (2-8)	Resturant
710 - General Office Building	Office

BALANCED PERSON TRIPS:

945 - Convenience Store/Gas Station-VFP (2-8)

Persons Exit	PAF	UIPTC	Unconstrained Demand	==>>> BALANCED ==>>>	Unconstrained Demand	UIPTC	PAF	Persons Entry
101	0	0	0	**0**	0	0	0	3
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<== BALANCED <<<==	Unconstrained Demand	UIPTC	PAF	Persons Exit
101	0	0	0	**0**	0	0	0	15

710 - General Office Building

INTERNAL PERSON TRIPS:

945 - Convenience Store/Gas Station-VFP (2-8)

Internal Person Trips From	Entry	Exit	Total
Total Internal Person Trips	**0**	**0**	**0**

710 - General Office Building

Internal Person Trips From	Entry	Exit	Total
Total Internal Person Trips	**0**	**0**	**0**

INTERNAL VEHICLE TRIPS AND CAPTURE:

945 - Convenience Store/Gas Station-VFP (2-8)

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	**0**	**0**	**0**
Total External Vehicle Trips	101	101	202
Internal Vehicle Trip Capture	**0%**	**0%**	**0%**

710 - General Office Building

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	**0**	**0**	**0**
Total External Vehicle Trips	3	13	16
Internal Vehicle Trip Capture	**0%**	**0%**	**0%**

PASS-BY VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Pass-by Vehicle Trip %		Pass-by Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	101	101	63.90%	63.90%	65	65
710 - General Office Building	3	13	0.00%	0.00%	0	0

DIVERTED VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Diverted Vehicle Trip %		Diverted Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	101	101	0.00%	0.00%	0	0
710 - General Office Building	3	13	0.00%	0.00%	0	0

EXTRA VEHICLE TRIP REDUCTION

Land Use	(External - (Pass-by + Diverted)) Vehicle Trips		Extra Vehicle Trip Reduction %		Extra Reduced Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
945 - Convenience Store/Gas Station - VFP (2-8)	36	36	0.00%	0.00%	0	0
710 - General Office Building	3	13	0.00%	0.00%	0	0

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
945 - Convenience Store/Gas Station - VFP (2-8)	36	36	72
710 - General Office Building	3	13	16

RESULTS

Site Totals	Entry	Exit	Total

Vehicle Trips Before Reduction	104	114	218
Internal Vehicle Trips	0	0	0
External Vehicle Trips	104	114	218
Internal Vehicle Trip Capture	0%	0%	0%
Pass-by Vehicle Trips	65	65	130
Diverted Vehicle Trips	0	0	0
Extra Reduced Vehicle Trips	0	0	0
New Vehicle Trips	39	49	88

PROJECT DETAILS

Project Name:	Tim Hortons Boston Re-Use	Type of Project:	
Project No:		City:	
Country:		Built-up Area(Sq.ft):	
Analyst Name:	Amy Dake	Clients Name:	
Date:	8/7/2023	ZIP/Postal Code:	
State/Province:		No. of Scenarios:	2
Analysis Region:			

SCENARIO SUMMARY

Scenarios	Name	No. of Land Uses	Phases of Development	No. of Years to Project Traffic	User Group	Estimated New Vehicle Trips		
						Entry	Exit	Total
Scenario - 1	AM Peak Hour	1	1	0		28	20	48
Scenario - 2	PM Peak Hour	1	1	0		50	50	100

Scenario - 1

Scenario Name: AM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project Traffic : 0

Analyst Note:

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%	Exit Split%	Total
912 - Drive-in Bank	General Urban/Suburban	1000 Sq. Ft. GFA	4.8	Weekday, Peak Hour of Adjacent Street Traffic,	Average	28	20	48
Data Source: Trip Generation Manual, 11th Ed					9.95	58%	42%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
912 - Drive-in Bank	100	100	1	1	58	42

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
912 - Drive-in Bank	28	20	0	0	28	20
	48		0		48	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
912 - Drive-in Bank	28	20	48

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	28	20	48
External Vehicle Trips	28	20	48
New Vehicle Trips	28	20	48

Scenario - 2

Scenario Name: PM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project Traffic : 0

Analyst Note:

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method	Entry	Exit	Total
					Rate/Equation	Split%	Split%	
912 - Drive-in Bank	General Urban/Suburban	1000 Sq. Ft. GFA	4.8	Weekday, Peak Hour of Adjacent Street Traffic,	Average	50	50	100
Data Source: Trip Generation Manual, 11th Ed					21.01	50%	50%	

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
912 - Drive-in Bank	100	100	1	1	50	50

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
912 - Drive-in Bank	50	50	0	0	50	50
	100		0		100	

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		
	Entry	Exit	Total
912 - Drive-in Bank	50	50	100

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	50	50	100
External Vehicle Trips	50	50	100
New Vehicle Trips	50	50	100

PROJECT: **Proposed Mixed Use Development**
LOCATION: **Boston State Rd, Town of Boston, New York**
PEAK HOUR: **AM Peak**

REV 2023-08-08

Figure Number: 3 | 4 | 6 | 7A | 7B | 7C | 7D | 8 | 9 | 10

Num of yrs: 1

LOCATION NUMBER	INTERSECTION DESCRIPTION	2022 Exist Volumes	2023 Bkgd Vol 0.5%	Proposed Mixed Use Development Enter Dist. %	Exit Dist. %	Trips IN 56	Trips OUT 45	Pass-by Trips	Tim Horton's Trips	New Site Trips	Total Site Trips	Full Build Volumes	Future Re-Use of Former Tim Horton's Site Enter Dist. %	Exit Dist. %	Trips IN 28	Trips OUT 20	Future Re-Use Site Trips	Future Build Volumes
1	Boston State Rd/ NY Route 219 SB Ramps																	
	SR	82	82									82						82
	ST																	
	SL	81	81	6%		3				3	3	84	6%		2		2	86
	WR																	
	WT	378	380		31%		14			14	14	394		31%		6	6	400
	WL	16	16		2%		1			1	1	17		2%		0	0	17
	NR																	
	NT																	
	NL																	
	ER	73	73									73						73
	ET	429	431	30%		17				17	17	448	30%		8		8	456
	EL																	
2	Boston State Rd/ NY Route 219 NB Ramps																	
	SR																	
	ST																	
	SL																	
	WR	350	352		39%		18			18	18	370		39%		8	8	378
	WT	297	298		33%		15			15	15	313		33%		6	6	319
	WL																	
	NR	19	19	3%		2				2	2	21	3%		1		1	22
	NT																	
	NL	101	102									102						102
	ER																	
	ET	243	244	36%		20				20	20	264	36%		10		10	274
	EL	262	263									263						263
3	Boston State Rd/ Zimmerman Rd-Herman Hill Rd																	
	SR	51	51	6%		3				3	3	54	6%		2		2	56
	ST	11	11									11						11
	SL	6	6									6						6
	WR	5	5									5						5
	WT	360	362	42%		24				24	24	386	42%		12		12	398
	WL	11	11									11						11
	NR	9	9									9						9
	NT	30	30									30						30
	NL	112	113	13%		7				7	7	120	13%		3		3	123
	ER	58	58		9%		4			4	4	62		9%		2	2	64
	ET	109	110		16%		7			7	7	117		16%		3	3	120
	EL	23	23		3%		1			1	1	24		3%		1	1	25
4	Boston State Rd/ Proposed Site Driveway																	
	SR																	
	ST																	
	SL																	
	WR																	
	WT	647	650					-30			-30	620		72%		14	14	634
	WL			61%		34		30	56	34	120	120						120
	NR				28%		13	12	24	13	49	49						49
	NT																	
	NL				72%		32	30	61	32	123	123						123
	ER			39%		22		12	35	22	69	69						69
	ET	262	263					-12			-12	251	39%		11		11	262
	EL																	

PROJECT: **Proposed Mixed Use Development**
LOCATION: **Boston State Rd, Town of Boston, New York**
PEAK HOUR: **PM Peak**

REV 2023-08-08

Figure Number:		3	4	6				7A	7B	7C	7D	8					9	10
			Num of yrs															
			1															
LOCATION NUMBER	**INTERSECTION DESCRIPTION**	**2022 Exist Volumes**	**2023 Bkgd Vol** 0.5%	**Proposed Mixed Use Development** Enter Dist. %	Exit Dist. %	Trips IN 54	Trips OUT 64	**Pass-by Trips**	**Tim Horton's Trips**	**New Site Trips**	**Total Site Trips**	**Full Build Volumes**	**Future Re-Use of Former Tim Horton's Site** Enter Dist. %	Exit Dist. %	Trips IN 50	Trips OUT 50	**Future Re-Use Site Trips**	**Future Build Volumes**
1	Boston State Rd/ NY Route 219 SB Ramps																	
	SR	242	243									243						243
	ST																	
	SL	351	353	25%		14				14	14	367	6%		3		3	370
	WR																	
	WT	337	339		27%		17			17	17	356		31%		16	16	372
	WL	19	19		2%		1			1	1	20		2%		1	1	21
	NR																	
	NT																	
	NL																	
	ER	133	134									134						134
	ET	399	401	28%		15				15	15	416	30%		15		15	431
	EL																	
2	Boston State Rd/ NY Route 219 NB Ramps																	
	SR																	
	ST																	
	SL																	
	WR	135	136		15%		10			10	10	146		39%		20	20	166
	WT	265	266		29%		19			19	19	285		33%		17	17	302
	WL																	
	NR	28	28	2%		1				1	1	29	3%		2		2	31
	NT																	
	NL	99	99									99						99
	ER																	
	ET	656	659	53%		29				29	29	688	36%		18		18	706
	EL	102	103									103						103
3	Boston State Rd/ Zimmerman Rd-Herman Hill Rd																	
	SR	63	63	7%		4				4	4	67	6%		3		3	70
	ST	59	59									59						59
	SL	38	38									38						38
	WR	15	15									15						15
	WT	216	217	26%		14				14	14	231	42%		21		21	252
	WL	23	23									23						23
	NR	29	29									29						29
	NT	26	26									26						26
	NL	101	102	12%		6				6	6	108	13%		6		6	114
	ER	165	166		15%		10			10	10	176		9%		4	4	180
	ET	352	354		33%		21			21	21	375		16%		8	8	383
	EL	80	80		8%		5			5	5	85		3%		2	2	87
4	Boston State Rd/ Proposed Site Driveway																	
	SR																	
	ST																	
	SL																	
	WR																	
	WT	400	402					-18			-18	384		72%		36	36	420
	WL			45%		24		18	14	24	56	56						56
	NR				56%		36	32	19	36	87	87						87
	NT																	
	NL				44%		28	18	15	28	61	61						61
	ER			55%		30		32	17	30	79	79						79
	ET	684	687					-32			-32	655	39%		20		20	675
	EL																	

Guideline for determining left-turn Lane at a two-way stop-controlled intersection

TWO LANE ROADWAY

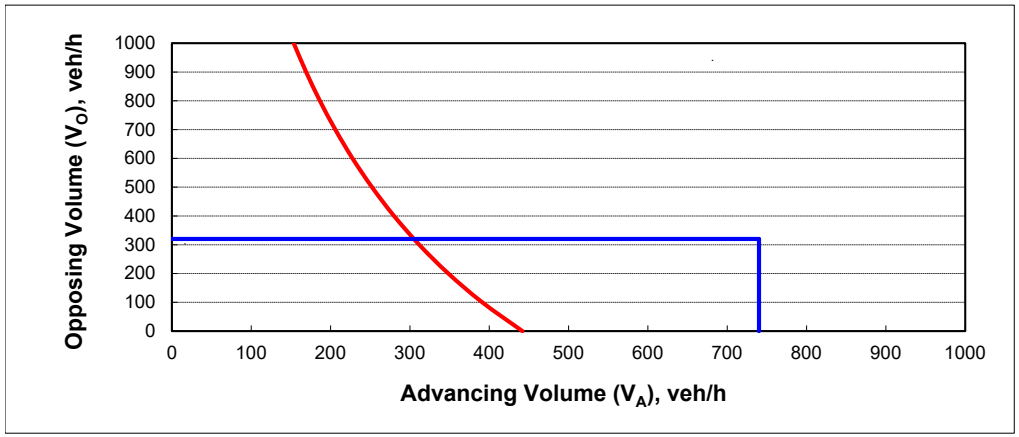
INPUT

Variable	Value
Major Approach	Boston State Rd @ Proposed Dwy
Approach	Westbound (AM Peak)
Design Speed Limit - MPH	45
Percent of left-turns in advancing volume (V_A), %:	16%
Advancing volume (V_A), veh/h:	740
Opposing volume (V_O), veh/h:	320

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PLOT - LINE 1		PLOT - LINE 2	
0	320	740	0
740	320	740	320



OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	305
Guidance for determining the need for a major-road left-turn bay:	
Westbound (AM Peak) Left-turn treatment warranted at Boston State Rd @ Proposed Dwy Intersections	

ρ	0.0175	
f =	0.79	
Wait Time	1.296	s
Service Rate	962	veh/h
Arrival Rate	305	veh/h

Vo	Time_tw
0	0.0
100	0.4
200	0.8
300	1.2
400	1.7
500	2.2
600	2.8
700	3.5
800	4.2
900	5.0
1000	5.8

Vo	Serv_rate
0	1200
100	1121
200	1046
300	976
400	910
500	848
600	789
700	735
800	683
900	635
1000	590

% LT veh.	16%	10%	15%	20%	40%
Vo	V_A	V_A	V_A	V_A	V_A
0	442	543	456	407	332
100	391	481	404	360	294
200	348	428	360	321	262
300	312	383	322	287	235
400	280	344	289	258	211
500	252	310	260	232	190
600	228	280	235	210	171
700	206	253	213	190	155
800	187	229	193	172	140
900	169	208	175	156	127
1000	154	189	159	142	116

Guideline for determining left-turn Lane at a two-way stop-controlled intersection

TWO LANE ROADWAY

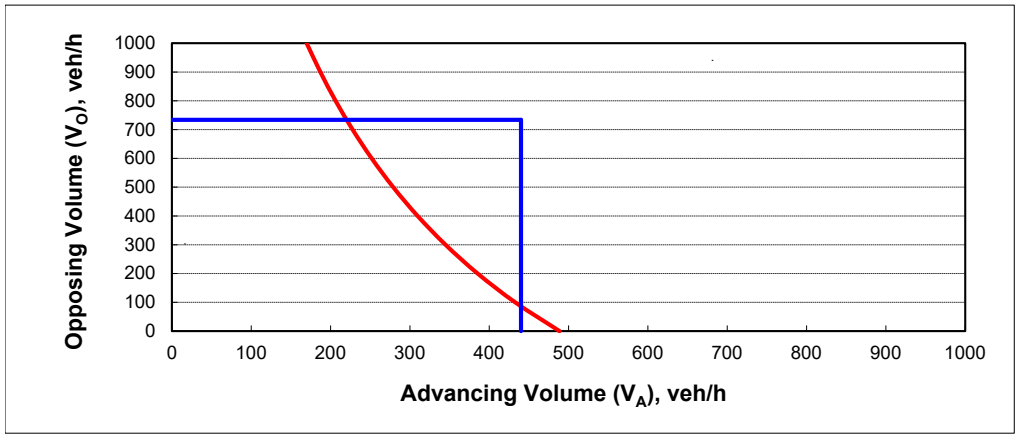
INPUT

Variable	Value
Major Approach	Boston State Rd @ Proposed Dwy
Approach	Westbound (PM Peak)
Design Speed Limit - MPH	45
Percent of left-turns in advancing volume (V_A), %:	13%
Advancing volume (V_A), veh/h:	440
Opposing volume (V_O), veh/h:	734

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

PLOT - LINE 1		PLOT - LINE 2	
0	734	440	0
440	734	440	734



OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	220
Guidance for determining the need for a major-road left-turn bay:	
Westbound (PM Peak) Left-turn treatment warranted at Boston State Rd @ Proposed Dwy Intersections	

ρ	0.0175	
f =	0.79	
Wait Time	3.689	s
Service Rate	717	veh/h
Arrival Rate	220	veh/h

Vo	Time_tw
0	0.0
100	0.4
200	0.8
300	1.2
400	1.7
500	2.2
600	2.8
700	3.5
800	4.2
900	5.0
1000	5.8

Vo	Serv_rate
0	1200
100	1121
200	1046
300	976
400	910
500	848
600	789
700	735
800	683
900	635
1000	590

% LT veh.	13%	10%	15%	20%	40%
Vo	V_A	V_A	V_A	V_A	V_A
0	489	543	456	407	332
100	433	481	404	360	294
200	385	428	360	321	262
300	345	383	322	287	235
400	310	344	289	258	211
500	279	310	260	232	190
600	252	280	235	210	171
700	228	253	213	190	155
800	206	229	193	172	140
900	187	208	175	156	127
1000	170	189	159	142	116

Queue Theory
Tim Hortons, 7072 Boston State Rd
AM Peak Hour - 40 Second Service Rate

The formula assumes both arrival and service distributions are random

Arrival Rate (Per Hour)	69	ALWAYS ARRIVAL RATE > SERVICE RATE UNDER THIS SCENARIO
Service Rate (Per Hour)	90	

Average queue in the system =	3.3	Veh	(waiting and service)
Average Time in System =	171.4	Sec	
Average Waiting Time only =	131.4	Sec	

95% confident that there will be fewer than	10	vehicles in the queue
98% confident that there will be fewer than	13	vehicles in the queue
100% confident that there will be fewer than	19	vehicles in the queue

Queue Theory
Tim Hortons, 7072 Boston State Rd
PM Peak Hour

The formula assumes both arrival and service distributions are random

Arrival Rate (Per Hour)	24	ALWAYS ARRIVAL RATE > SERVICE RATE UNDER THIS SCENARIO
Service Rate (Per Hour)	65	

Average queue in the system =	0.6	Veh	(waiting and service)
Average Time in System =	236.8	Sec	
Average Waiting Time only =	86.8	Sec	

95% confident that there will be fewer than	**2**	vehicles in the queue
98% confident that there will be fewer than	**3**	vehicles in the queue
100% confident that there will be fewer than	**5**	vehicles in the queue

Traffic Signal Warrant Analysis

Boston State Rd/US-219 NB Off-Ramp - Existing Conditions
Town of Boston, Erie County, NY

Hour			Existing Fluctuation in Artery Volumes		**2022 Existing Artery Volume on Boston State Rd**	per 2019 NYSDOT count on NB Off-Ramp	Hourly Fluctuation of NB Off-Ramp	**Hourly Volumes Exiting NB Off-Ramp under 2022 Exisiting Conditions - Excludes Right Turn Volumes**	Warrant 1 - Condition A (70%)	Warrant 1 - Condition B (70%)	Warrant 2 - 4 hour (70%)	Warrant 3 - Peak hour (70%)
			per 2017 NYSDOT count on Boston State Rd	Hourly Fluctuation								
			Two-Way	Two-Way	**Total**	NB	**Total**		420/140	630/70	80 vph	100 vph
7:00 AM	to	8:00 AM	887	8.05%	**996**	132	7.62%	**82**	N	Y	Y	N
8:00 AM	to	9:00 AM	719	6.52%	**808**	113	6.52%	**70**	N	Y	N	N
9:00 AM	to	10:00 AM	583	5.29%	**655**	111	6.41%	**69**	N	N	N	N
10:00 AM	to	11:00 AM	559	5.07%	**628**	111	6.41%	**69**	N	N	N	N
11:00 AM	to	12:00 PM	635	5.76%	**713**	114	6.58%	**71**	N	Y	N	N
12:00 PM	to	1:00 PM	656	5.95%	**737**	111	6.41%	**69**	N	N	N	N
1:00 PM	to	2:00 PM	644	5.84%	**723**	106	6.12%	**66**	N	N	N	N
2:00 PM	to	3:00 PM	759	6.89%	**852**	141	8.14%	**88**	N	Y	N	N
3:00 PM	to	4:00 PM	954	8.66%	**1072**	143	8.26%	**89**	N	Y	Y	N
4:00 PM	to	5:00 PM	1031	9.35%	**1158**	157	9.06%	**98**	N	Y	Y	N
5:00 PM	to	6:00 PM	1026	9.31%	**1152**	159	9.18%	**99**	N	Y	Y	N
6:00 PM	to	7:00 PM	832	7.55%	**934**	93	5.37%	**58**	N	N	N	N
7:00 PM	to	8:00 PM	581	5.27%	**653**	70	4.04%	**44**	N	N	N	N
8:00 PM	to	9:00 PM	394	3.57%	**443**	56	3.23%	**35**	N	N	N	N
9:00 PM	to	10:00 PM	295	2.68%	**331**	46	2.66%	**29**	N	N	N	N
10:00 PM	to	11:00 PM	177	1.61%	**199**	24	1.39%	**15**	N	N	N	N
			11,022		12,380	1,732		**1,078**	0	7	4	0

Traffic Signal Warrant Analysis

Boston State Rd/US-219 NB Off-Ramp - Full Build Conditions
Town of Boston, Erie County, NY

Hour			Existing Fluctuation in Artery Volumes: per 2017 NYSDOT count on Boston State Rd (Two-Way)	Existing Fluctuation in Artery Volumes: Hourly Fluctuation (Two-Way)	**2023 Full Build Artery Volume on Boston State Rd Total**	per NYSDOT count on NB Off-Ramp in 2019 NB	Exiting Hourly Fluctuation of NB Off-Ramp **Total**	**Hourly Volumes Exiting NB Off-Ramp under Full Build Conditions - Excludes Right Turn Volumes**	Warrant 1 - Condition A (70%) 420/140	Warrant 1 - Condition B (70%) 630/70	Warrant 2 - 4 hour (70%) 80 vph	Warrant 3 - Peak hour (70%) 100 vph
7:00 AM	to	8:00 AM	887	8.05%	**1051**	132	7.62%	**82**	N	Y	Y	N
8:00 AM	to	9:00 AM	719	6.52%	**852**	113	6.52%	**70**	N	Y	N	N
9:00 AM	to	10:00 AM	583	5.29%	**691**	111	6.41%	**69**	N	N	N	N
10:00 AM	to	11:00 AM	559	5.07%	**663**	111	6.41%	**69**	N	N	N	N
11:00 AM	to	12:00 PM	635	5.76%	**753**	114	6.58%	**71**	N	Y	N	N
12:00 PM	to	1:00 PM	656	5.95%	**778**	111	6.41%	**69**	N	N	N	N
1:00 PM	to	2:00 PM	644	5.84%	**763**	106	6.12%	**66**	N	N	N	N
2:00 PM	to	3:00 PM	759	6.89%	**900**	141	8.14%	**88**	N	Y	Y	N
3:00 PM	to	4:00 PM	954	8.66%	**1131**	143	8.26%	**89**	N	Y	Y	N
4:00 PM	to	5:00 PM	1031	9.35%	**1222**	157	9.06%	**98**	N	Y	Y	N
5:00 PM	to	6:00 PM	1026	9.31%	**1216**	159	9.18%	**99**	N	Y	Y	N
6:00 PM	to	7:00 PM	832	7.55%	**986**	93	5.37%	**58**	N	N	N	N
7:00 PM	to	8:00 PM	581	5.27%	**689**	70	4.04%	**44**	N	N	N	N
8:00 PM	to	9:00 PM	394	3.57%	**467**	56	3.23%	**35**	N	N	N	N
9:00 PM	to	10:00 PM	295	2.68%	**350**	46	2.66%	**29**	N	N	N	N
10:00 PM	to	11:00 PM	177	1.61%	**210**	24	1.39%	**15**	N	N	N	N
			11,022		13,064	1,732		**1,078**	0	7	5	0

Traffic Signal Warrant Analysis

Boston State Rd/Proposed Dwy - Full Build Conditions
Town of Boston, Erie County, NY

Hour			Existing Fluctuation in Artery Volumes: per 2017 NYSDOT count on Boston State Rd (Two-Way)	Existing Fluctuation in Artery Volumes: Hourly Fluctuation (Two-Way)	**2023 Full Build Artery Volume on Boston State Rd** **Total**	Exiting Hourly Fluctuation of ITE LUC 945 - Convenience Store w/Gas	**Total Hourly Volumes Exiting Proposed Dwy under Full Build Conditions - Assumes 50% RTOR**	Warrant 1 - Condition A (70%) 420/140	Warrant 1 - Condition B (70%) 630/70	Warrant 2 - 4 hour (70%) 80 vph	Warrant 3 - Peak hour (70%) 100 vph
7:00 AM	to	8:00 AM	887	8.05%	**1010**	6.1%	**91**	N	Y	Y	N
8:00 AM	to	9:00 AM	719	6.52%	**819**	5.9%	**88**	N	Y	N	N
9:00 AM	to	10:00 AM	583	5.29%	**664**	5.1%	**75**	N	Y	N	N
10:00 AM	to	11:00 AM	559	5.07%	**637**	5.2%	**76**	N	Y	N	N
11:00 AM	to	12:00 PM	635	5.76%	**723**	5.2%	**77**	N	Y	N	N
12:00 PM	to	1:00 PM	656	5.95%	**747**	5.8%	**85**	N	Y	N	N
1:00 PM	to	2:00 PM	644	5.84%	**733**	5.3%	**79**	N	Y	N	N
2:00 PM	to	3:00 PM	759	6.89%	**864**	5.8%	**86**	N	Y	N	N
3:00 PM	to	4:00 PM	954	8.66%	**1086**	6.4%	**95**	N	Y	Y	N
4:00 PM	to	5:00 PM	1031	9.35%	**1174**	7.1%	**105**	N	Y	Y	Y
5:00 PM	to	6:00 PM	1026	9.31%	**1168**	6.9%	**103**	N	Y	Y	Y
6:00 PM	to	7:00 PM	832	7.55%	**947**	6.6%	**97**	N	Y	Y	N
7:00 PM	to	8:00 PM	581	5.27%	**662**	5.3%	**79**	N	Y	N	N
8:00 PM	to	9:00 PM	394	3.57%	**449**	4.5%	**66**	N	N	N	N
9:00 PM	to	10:00 PM	295	2.68%	**336**	3.7%	**55**	N	N	N	N
10:00 PM	to	11:00 PM	177	1.61%	**202**	2.8%	**41**	N	N	N	N
			11,022		12,551		**1,482**	0	13	5	2

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

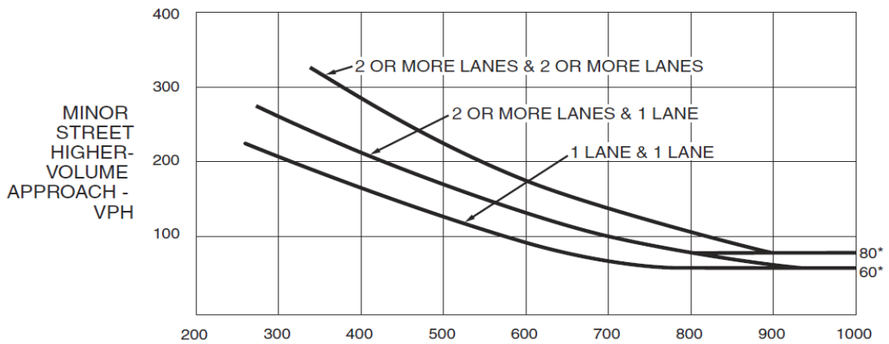
Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

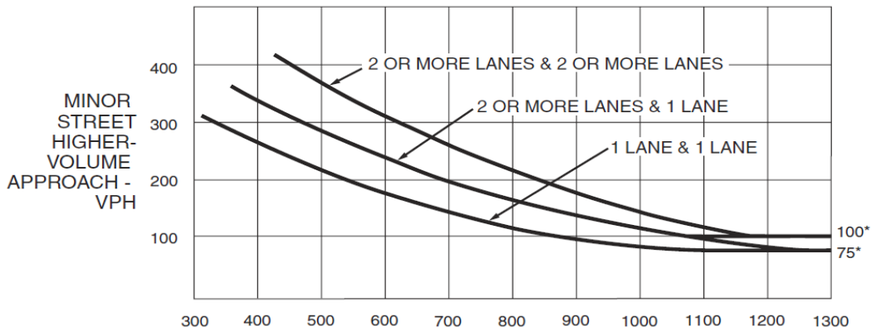
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

A3

Level of Service:
Criteria and Definitions

Level of Service Criteria

Highway Capacity Manual 2016

SIGNALIZED INTERSECTIONS

Level of Service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Level of Service for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15 minute analysis period. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 20
C	20 – 35
D	35 – 55
E	55 – 80
F	>80

UNSIGNALIZED INTERSECTIONS

Level of Service for unsignalized intersections is also defined in terms of delay. However, the delay criteria are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an unsignalized intersection. The total delay threshold for any given Level of Service is less for an unsignalized intersection than for a signalized intersection. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 - 50
F	>50

A4

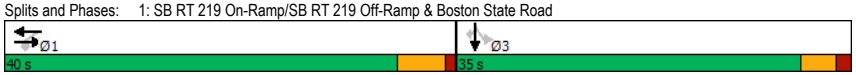
Level of Service Calculations: Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	429	73	16	378	0	0	0	0	81	0	82
Future Volume (vph)	0	429	73	16	378	0	0	0	0	81	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1845	1568	1805	1845	0	0	0	0	0	1787	1404
Flt Permitted				0.492							0.950	
Satd. Flow (perm)	0	1845	1568	935	1845	0	0	0	0	0	1787	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78									88
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	3%	0%	3%	0%	0%	0%	0%	1%	0%	15%
Adj. Flow (vph)	0	461	78	17	406	0	0	0	0	87	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	461	78	17	406	0	0	0	0	0	87	88
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase		1	1	1	1					3	3	3
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					3.0	3.0	3.0
Minimum Split (s)		20.0	20.0	20.0	20.0					8.2	8.2	8.2
Total Split (s)		40.0	40.0	40.0	40.0					35.0	35.0	35.0
Total Split (%)		53.3%	53.3%	53.3%	53.3%					46.7%	46.7%	46.7%
Maximum Green (s)		34.7	34.7	34.7	34.7					30.4	30.4	30.4
Yellow Time (s)		4.3	4.3	4.3	4.3					3.2	3.2	3.2
All-Red Time (s)		1.0	1.0	1.0	1.0					1.4	1.4	1.4
Lost Time Adjust (s)		0.0	0.0	0.0	0.0						0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3	5.3						4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Recall Mode		Min	Min	Min	Min					None	None	None
Act Effct Green (s)		24.5	24.5	24.5	24.5						7.7	7.7
Actuated g/C Ratio		0.64	0.64	0.64	0.64						0.20	0.20
v/c Ratio		0.39	0.08	0.03	0.34						0.24	0.25
Control Delay		6.5	1.8	4.8	6.2						15.3	6.2
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		6.5	1.8	4.8	6.2						15.3	6.2
LOS		A	A	A	A						B	A
Approach Delay		5.9			6.1						10.8	
Approach LOS		A			A						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 38.1			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 51.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	243	0	0	297	350	101	0	19	0	0	0
Future Volume (vph)	262	243	0	0	297	350	101	0	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			709			708			697	
Travel Time (s)		12.5			10.7			8.8			8.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%
Adj. Flow (vph)	291	270	0	0	330	389	112	0	21	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	291	270	0	0	330	389	0	112	21	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization	51.8%
	ICU Level of Service A
Analysis Period (min)	15

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	262	243	0	0	297	350	101	0	19	0	0	0
Future Vol, veh/h	262	243	0	0	297	350	101	0	19	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	1	0	0	3	1	4	0	0	0	0	0
Mvmt Flow	291	270	0	0	330	389	112	0	21	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	330	0	-	-	-	0	1182	1182	270
Stage 1	-	-	-	-	-	-	852	852	-
Stage 2	-	-	-	-	-	-	330	330	-
Critical Hdwy	4.14	-	-	-	-	-	6.44	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.5	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.536	4	3.3
Pot Cap-1 Maneuver	1218	-	0	0	-	-	208	191	774
Stage 1	-	-	0	0	-	-	415	379	-
Stage 2	-	-	0	0	-	-	724	649	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1218	-	-	-	-	-	158	0	774
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	0	-
Stage 1	-	-	-	-	-	-	316	0	-
Stage 2	-	-	-	-	-	-	724	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.6	0	60.5
HCM LOS			F

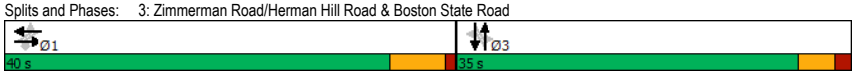
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	158	774	1218	-	-	-
HCM Lane V/C Ratio	0.71	0.027	0.239	-	-	-
HCM Control Delay (s)	70	9.8	8.9	-	-	-
HCM Lane LOS	F	A	A	-	-	-
HCM 95th %tile Q(veh)	4.2	0.1	0.9	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	109	58	11	360	5	112	30	9	6	11	51
Future Volume (vph)	23	109	58	11	360	5	112	30	9	6	11	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.998			0.992			0.899	
Flt Protected		0.991			0.999			0.964			0.995	
Satd. Flow (prot)	0	1852	1583	0	1859	0	0	1806	0	0	1627	0
Flt Permitted		0.899			0.991			0.734			0.960	
Satd. Flow (perm)	0	1680	1583	0	1844	0	0	1375	0	0	1569	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64		1			5			56	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	3%	0%	0%	0%	6%
Adj. Flow (vph)	25	120	64	12	396	5	123	33	10	7	12	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	64	0	413	0	0	166	0	0	75	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		20.3	20.3		20.3			10.2			10.2	
Actuated g/C Ratio		0.55	0.55		0.55			0.27			0.27	
v/c Ratio		0.16	0.07		0.41			0.43			0.16	
Control Delay		7.9	2.9		9.5			15.5			6.3	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		7.9	2.9		9.5			15.5			6.3	
LOS		A	A		A			B			A	
Approach Delay		6.3			9.5			15.5			6.3	
Approach LOS		A			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 37.1			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road

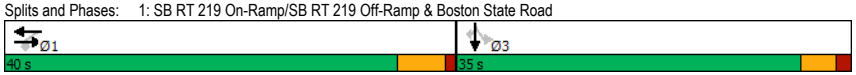


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	399	133	19	337	0	0	0	0	351	0	242
Future Volume (vph)	0	399	133	19	337	0	0	0	0	351	0	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1863	1615	1805	1845	0	0	0	0	0	1787	1599
Flt Permitted				0.445							0.950	
Satd. Flow (perm)	0	1863	1615	846	1845	0	0	0	0	0	1787	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140									255
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	1%	0%	1%
Adj. Flow (vph)	0	420	140	20	355	0	0	0	0	369	0	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	420	140	20	355	0	0	0	0	0	369	255
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase	1	1	1	1						3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0						3.0	3.0	3.0
Minimum Split (s)	20.0	20.0	20.0	20.0						8.2	8.2	8.2
Total Split (s)	40.0	40.0	40.0	40.0						35.0	35.0	35.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%						46.7%	46.7%	46.7%
Maximum Green (s)	34.7	34.7	34.7	34.7						30.4	30.4	30.4
Yellow Time (s)	4.3	4.3	4.3	4.3						3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0						1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0							0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3							4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0						3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min						None	None	None
Act Effct Green (s)	17.9	17.9	17.9	17.9							15.7	15.7
Actuated g/C Ratio	0.40	0.40	0.40	0.40							0.35	0.35
v/c Ratio	0.56	0.19	0.06	0.48							0.59	0.35
Control Delay	14.1	3.0	9.8	12.8							17.1	3.6
Queue Delay	0.0	0.0	0.0	0.0							0.0	0.0
Total Delay	14.1	3.0	9.8	12.8							17.1	3.6
LOS	B	A	A	B							B	A
Approach Delay	11.3			12.6							11.6	
Approach LOS	B			B							B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 44.5			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 56.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	656	0	0	265	135	99	0	28	0	0	0
Future Volume (vph)	102	656	0	0	265	135	99	0	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			709			708			697	
Travel Time (s)		12.5			10.7			8.8			8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	1%	0%	0%	1%	0%	7%	0%	4%	0%	0%	0%
Adj. Flow (vph)	107	691	0	0	279	142	104	0	29	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	691	0	0	279	142	0	104	29	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 56.4%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	102	656	0	0	265	135	99	0	28	0	0	0
Future Vol, veh/h	102	656	0	0	265	135	99	0	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	1	0	0	1	0	7	0	4	0	0	0
Mvmt Flow	107	691	0	0	279	142	104	0	29	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	279	0	-	-	-	0	1184	1184	691
Stage 1	-	-	-	-	-	-	905	905	-
Stage 2	-	-	-	-	-	-	279	279	-
Critical Hdwy	4.16	-	-	-	-	-	6.47	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.5	-
Follow-up Hdwy	2.254	-	-	-	-	-	3.563	4	3.336
Pot Cap-1 Maneuver	1261	-	0	0	-	-	204	191	441
Stage 1	-	-	0	0	-	-	387	358	-
Stage 2	-	-	0	0	-	-	757	683	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1261	-	-	-	-	-	187	0	441
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	0	-
Stage 1	-	-	-	-	-	-	354	0	-
Stage 2	-	-	-	-	-	-	757	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	39
HCM LOS			E

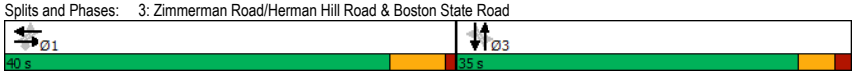
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	187	441	1261	-	-	-
HCM Lane V/C Ratio	0.557	0.067	0.085	-	-	-
HCM Control Delay (s)	46.1	13.7	8.1	-	-	-
HCM Lane LOS	E	B	A	-	-	-
HCM 95th %tile Q(veh)	2.9	0.2	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	352	165	23	216	15	101	26	29	38	59	63
Future Volume (vph)	80	352	165	23	216	15	101	26	29	38	59	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.992			0.975			0.947	
Flt Protected		0.991			0.996			0.969			0.988	
Satd. Flow (prot)	0	1864	1615	0	1861	0	0	1795	0	0	1757	0
Flt Permitted		0.883			0.939			0.763			0.885	
Satd. Flow (perm)	0	1661	1615	0	1755	0	0	1413	0	0	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134		5			18			52	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	88	387	181	25	237	16	111	29	32	42	65	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	475	181	0	278	0	0	172	0	0	176	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		21.8	21.8		21.8			11.1			11.1	
Actuated g/C Ratio		0.49	0.49		0.49			0.25			0.25	
v/c Ratio		0.58	0.21		0.32			0.47			0.41	
Control Delay		11.8	3.3		8.3			18.1			13.9	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		11.8	3.3		8.3			18.1			13.9	
LOS		B	A		A			B			B	
Approach Delay		9.4			8.3			18.1			13.9	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 44.2			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



A5

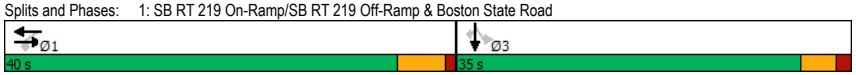
Level of Service Calculations: Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	431	73	16	380	0	0	0	0	81	0	82
Future Volume (vph)	0	431	73	16	380	0	0	0	0	81	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1845	1568	1805	1845	0	0	0	0	0	1787	1404
Flt Permitted				0.491							0.950	
Satd. Flow (perm)	0	1845	1568	933	1845	0	0	0	0	0	1787	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78									88
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	3%	0%	3%	0%	0%	0%	0%	1%	0%	15%
Adj. Flow (vph)	0	463	78	17	409	0	0	0	0	87	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	463	78	17	409	0	0	0	0	0	87	88
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase	1	1	1	1						3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0						3.0	3.0	3.0
Minimum Split (s)	20.0	20.0	20.0	20.0						8.2	8.2	8.2
Total Split (s)	40.0	40.0	40.0	40.0						35.0	35.0	35.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%						46.7%	46.7%	46.7%
Maximum Green (s)	34.7	34.7	34.7	34.7						30.4	30.4	30.4
Yellow Time (s)	4.3	4.3	4.3	4.3						3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0						1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0							0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3							4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0						3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min						None	None	None
Act Effct Green (s)	24.5	24.5	24.5	24.5							7.7	7.7
Actuated g/C Ratio	0.64	0.64	0.64	0.64							0.20	0.20
v/c Ratio	0.39	0.08	0.03	0.35							0.24	0.25
Control Delay	6.5	1.8	4.8	6.2							15.4	6.3
Queue Delay	0.0	0.0	0.0	0.0							0.0	0.0
Total Delay	6.5	1.8	4.8	6.2							15.4	6.3
LOS	A	A	A	A							B	A
Approach Delay	5.9			6.1							10.8	
Approach LOS	A			A							B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 38.1			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 52.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	244	0	0	298	352	101	0	19	0	0	0
Future Volume (vph)	263	244	0	0	298	352	101	0	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			709			708			697	
Travel Time (s)		12.5			10.7			8.8			8.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%
Adj. Flow (vph)	292	271	0	0	331	391	112	0	21	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	271	0	0	331	391	0	112	21	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	263	244	0	0	298	352	101	0	19	0	0	0
Future Vol, veh/h	263	244	0	0	298	352	101	0	19	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	1	0	0	3	1	4	0	0	0	0	0
Mvmt Flow	292	271	0	0	331	391	112	0	21	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	331	0	-	-	-	0	1186	1186	271
Stage 1	-	-	-	-	-	-	855	855	-
Stage 2	-	-	-	-	-	-	331	331	-
Critical Hdwy	4.14	-	-	-	-	-	6.44	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.5	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.536	4	3.3
Pot Cap-1 Maneuver	1217	-	0	0	-	-	207	190	773
Stage 1	-	-	0	0	-	-	413	378	-
Stage 2	-	-	0	0	-	-	723	649	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1217	-	-	-	-	-	157	0	773
Mov Cap-2 Maneuver	-	-	-	-	-	-	157	0	-
Stage 1	-	-	-	-	-	-	314	0	-
Stage 2	-	-	-	-	-	-	723	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.6	0	61.3
HCM LOS			F

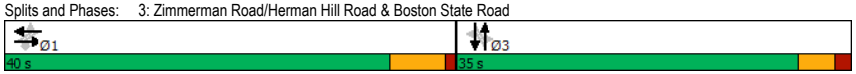
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	157	773	1217	-	-	-
HCM Lane V/C Ratio	0.715	0.027	0.24	-	-	-
HCM Control Delay (s)	71	9.8	8.9	-	-	-
HCM Lane LOS	F	A	A	-	-	-
HCM 95th %tile Q(veh)	4.3	0.1	0.9	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	110	58	11	362	5	113	30	9	6	11	51
Future Volume (vph)	23	110	58	11	362	5	113	30	9	6	11	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.998			0.992			0.899	
Flt Protected		0.992			0.999			0.964			0.995	
Satd. Flow (prot)	0	1854	1583	0	1859	0	0	1806	0	0	1627	0
Flt Permitted		0.899			0.991			0.733			0.959	
Satd. Flow (perm)	0	1680	1583	0	1844	0	0	1373	0	0	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			64		1			5			56	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	3%	0%	0%	0%	6%
Adj. Flow (vph)	25	121	64	12	398	5	124	33	10	7	12	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	64	0	415	0	0	167	0	0	75	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		20.4	20.4		20.4			10.2			10.2	
Actuated g/C Ratio		0.55	0.55		0.55			0.27			0.27	
v/c Ratio		0.16	0.07		0.41			0.44			0.16	
Control Delay		7.9	2.9		9.5			15.6			6.3	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		7.9	2.9		9.5			15.6			6.3	
LOS		A	A		A			B			A	
Approach Delay		6.4			9.5			15.6			6.3	
Approach LOS		A			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 37.2			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 50.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road

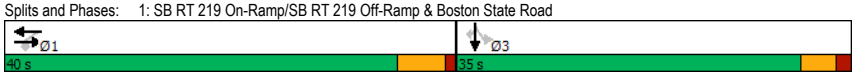


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	401	134	19	339	0	0	0	0	353	0	243
Future Volume (vph)	0	401	134	19	339	0	0	0	0	353	0	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1863	1615	1805	1845	0	0	0	0	0	1787	1599
Flt Permitted				0.442							0.950	
Satd. Flow (perm)	0	1863	1615	840	1845	0	0	0	0	0	1787	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141									256
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	1%	0%	1%
Adj. Flow (vph)	0	422	141	20	357	0	0	0	0	372	0	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	422	141	20	357	0	0	0	0	0	372	256
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase	1	1	1	1						3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0						3.0	3.0	3.0
Minimum Split (s)	20.0	20.0	20.0	20.0						8.2	8.2	8.2
Total Split (s)	40.0	40.0	40.0	40.0						35.0	35.0	35.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%						46.7%	46.7%	46.7%
Maximum Green (s)	34.7	34.7	34.7	34.7						30.4	30.4	30.4
Yellow Time (s)	4.3	4.3	4.3	4.3						3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0						1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0							0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3							4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0						3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min						None	None	None
Act Effct Green (s)	18.0	18.0	18.0	18.0							15.8	15.8
Actuated g/C Ratio	0.40	0.40	0.40	0.40							0.35	0.35
v/c Ratio	0.56	0.19	0.06	0.48							0.59	0.35
Control Delay	14.1	3.0	9.8	12.9							17.3	3.7
Queue Delay	0.0	0.0	0.0	0.0							0.0	0.0
Total Delay	14.1	3.0	9.8	12.9							17.3	3.7
LOS	B	A	A	B							B	A
Approach Delay	11.4			12.7							11.7	
Approach LOS	B			B							B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 44.7			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 56.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	659	0	0	266	136	99	0	28	0	0	0
Future Volume (vph)	103	659	0	0	266	136	99	0	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			709			708			697	
Travel Time (s)		12.5			10.7			8.8			8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	1%	0%	0%	1%	0%	7%	0%	4%	0%	0%	0%
Adj. Flow (vph)	108	694	0	0	280	143	104	0	29	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	694	0	0	280	143	0	104	29	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 56.7%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	659	0	0	266	136	99	0	28	0	0	0
Future Vol, veh/h	103	659	0	0	266	136	99	0	28	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	1	0	0	1	0	7	0	4	0	0	0
Mvmt Flow	108	694	0	0	280	143	104	0	29	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	280	0	-	-	-	0	1190	1190	694
Stage 1	-	-	-	-	-	-	910	910	-
Stage 2	-	-	-	-	-	-	280	280	-
Critical Hdwy	4.16	-	-	-	-	-	6.47	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.5	-
Follow-up Hdwy	2.254	-	-	-	-	-	3.563	4	3.336
Pot Cap-1 Maneuver	1260	-	0	0	-	-	203	189	439
Stage 1	-	-	0	0	-	-	385	356	-
Stage 2	-	-	0	0	-	-	756	683	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1260	-	-	-	-	-	186	0	439
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	0	-
Stage 1	-	-	-	-	-	-	352	0	-
Stage 2	-	-	-	-	-	-	756	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	39.3
HCM LOS			E

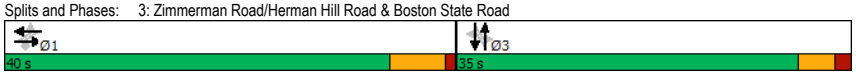
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	186	439	1260	-	-	-
HCM Lane V/C Ratio	0.56	0.067	0.086	-	-	-
HCM Control Delay (s)	46.5	13.8	8.1	-	-	-
HCM Lane LOS	E	B	A	-	-	-
HCM 95th %tile Q(veh)	3	0.2	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	354	166	23	217	15	102	26	29	38	59	63
Future Volume (vph)	80	354	166	23	217	15	102	26	29	38	59	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.992			0.975			0.947	
Flt Protected		0.991			0.996			0.969			0.988	
Satd. Flow (prot)	0	1864	1615	0	1861	0	0	1795	0	0	1757	0
Flt Permitted		0.884			0.939			0.762			0.887	
Satd. Flow (perm)	0	1663	1615	0	1755	0	0	1412	0	0	1577	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134		5			18			52	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	88	389	182	25	238	16	112	29	32	42	65	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	477	182	0	279	0	0	173	0	0	176	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		21.9	21.9		21.9			11.1			11.1	
Actuated g/C Ratio		0.49	0.49		0.49			0.25			0.25	
v/c Ratio		0.58	0.21		0.32			0.47			0.41	
Control Delay		11.9	3.3		8.3			18.2			13.9	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		11.9	3.3		8.3			18.2			13.9	
LOS		B	A		A			B			B	
Approach Delay		9.5			8.3			18.2			13.9	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 44.3			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



A6

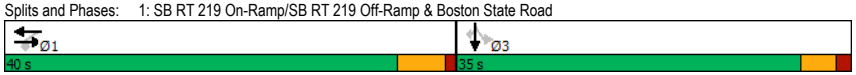
Level of Service Calculations: Full Development Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	448	73	17	394	0	0	0	0	84	0	82
Future Volume (vph)	0	448	73	17	394	0	0	0	0	84	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1845	1568	1805	1845	0	0	0	0	0	1787	1404
Flt Permitted				0.475							0.950	
Satd. Flow (perm)	0	1845	1568	902	1845	0	0	0	0	0	1787	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78									88
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	3%	0%	3%	0%	0%	0%	0%	1%	0%	15%
Adj. Flow (vph)	0	482	78	18	424	0	0	0	0	90	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	482	78	18	424	0	0	0	0	0	90	88
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase	1	1	1	1	1					3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0					3.0	3.0	3.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0					8.2	8.2	8.2
Total Split (s)	40.0	40.0	40.0	40.0	40.0					35.0	35.0	35.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%					46.7%	46.7%	46.7%
Maximum Green (s)	34.7	34.7	34.7	34.7	34.7					30.4	30.4	30.4
Yellow Time (s)	4.3	4.3	4.3	4.3	4.3					3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0					1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0						0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3	5.3						4.6	4.6
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	Min	Min	Min	Min	Min					None	None	None
Act Effct Green (s)	25.1	25.1	25.1	25.1	25.1						7.8	7.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65						0.20	0.20
v/c Ratio	0.40	0.07	0.03	0.36	0.25						0.25	0.25
Control Delay	6.6	1.8	4.7	6.2	6.2						16.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0						0.0	0.0
Total Delay	6.6	1.8	4.7	6.2	6.2						16.0	6.5
LOS	A	A	A	A	A						B	A
Approach Delay	5.9			6.1							11.3	
Approach LOS	A			A							B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 38.8			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 6.8		Intersection LOS: A	
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	264	0	0	313	370	102	0	21	0	0	0
Future Volume (vph)	263	264	0	0	313	370	102	0	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			554			708			697	
Travel Time (s)		12.5			8.4			8.8			8.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%
Adj. Flow (vph)	292	293	0	0	348	411	113	0	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	293	0	0	348	411	0	113	23	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	263	264	0	0	313	370	102	0	21	0	0	0
Future Vol, veh/h	263	264	0	0	313	370	102	0	21	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	1	0	0	3	1	4	0	0	0	0	0
Mvmt Flow	292	293	0	0	348	411	113	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	348	0	-	-	-	0	1225	1225	293
Stage 1	-	-	-	-	-	-	877	877	-
Stage 2	-	-	-	-	-	-	348	348	-
Critical Hdwy	4.14	-	-	-	-	-	6.44	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.5	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.536	4	3.3
Pot Cap-1 Maneuver	1200	-	0	0	-	-	196	180	751
Stage 1	-	-	0	0	-	-	404	369	-
Stage 2	-	-	0	0	-	-	710	638	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1200	-	-	-	-	-	148	0	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	148	0	-
Stage 1	-	-	-	-	-	-	306	0	-
Stage 2	-	-	-	-	-	-	710	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.5	0	69.9
HCM LOS			F

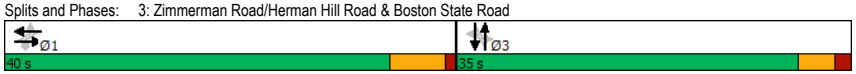
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	148	751	1200	-	-	-
HCM Lane V/C Ratio	0.766	0.031	0.244	-	-	-
HCM Control Delay (s)	82.3	9.9	9	-	-	-
HCM Lane LOS	F	A	A	-	-	-
HCM 95th %tile Q(veh)	4.7	0.1	1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	117	62	11	386	5	120	30	9	6	11	54
Future Volume (vph)	24	117	62	11	386	5	120	30	9	6	11	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.998			0.992			0.898	
Flt Protected		0.992			0.999			0.964			0.996	
Satd. Flow (prot)	0	1854	1583	0	1859	0	0	1807	0	0	1626	0
Flt Permitted		0.897			0.991			0.728			0.962	
Satd. Flow (perm)	0	1676	1583	0	1844	0	0	1364	0	0	1570	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			68		1			5			59	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	3%	0%	0%	0%	6%
Adj. Flow (vph)	26	129	68	12	424	5	132	33	10	7	12	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	68	0	441	0	0	175	0	0	78	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		21.5	21.5		21.5			10.9			10.9	
Actuated g/C Ratio		0.55	0.55		0.55			0.28			0.28	
v/c Ratio		0.17	0.08		0.43			0.45			0.16	
Control Delay		8.0	2.8		9.8			16.4			6.5	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		8.0	2.8		9.8			16.4			6.5	
LOS		A	A		A			B			A	
Approach Delay		6.4			9.8			16.4			6.5	
Approach LOS		A			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 39			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 52.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	251	69	120	620	123	49
Future Volume (vph)	251	69	120	620	123	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		75	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt	0.968					0.850
Flt Protected				0.992	0.950	
Satd. Flow (prot)	3426	0	0	1848	1770	1583
Flt Permitted				0.992	0.950	
Satd. Flow (perm)	3426	0	0	1848	1770	1583
Link Speed (mph)	40			45	30	
Link Distance (ft)	554			155	269	
Travel Time (s)	9.4			2.3	6.1	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	270	74	129	667	132	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	0	0	796	132	53
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 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	11.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	251	69	120	620	123	49
Future Vol, veh/h	251	69	120	620	123	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	270	74	129	667	132	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	344	0	1232	172
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	925	-
Critical Hdwy	-	-	4.13	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1213	-	182	842
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	385	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1213	-	151	842
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	320	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	75.5
HCM LOS			F

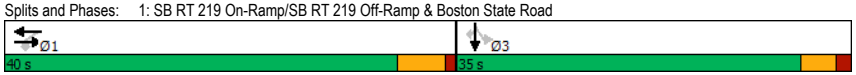
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	151	842	-	-	1213	-
HCM Lane V/C Ratio	0.876	0.063	-	-	0.106	-
HCM Control Delay (s)	101.8	9.6	-	-	8.3	0
HCM Lane LOS	F	A	-	-	A	A
HCM 95th %tile Q(veh)	6	0.2	-	-	0.4	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	416	134	20	356	0	0	0	0	367	0	243
Future Volume (vph)	0	416	134	20	356	0	0	0	0	367	0	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1863	1615	1805	1845	0	0	0	0	0	1787	1599
Flt Permitted				0.423							0.950	
Satd. Flow (perm)	0	1863	1615	804	1845	0	0	0	0	0	1787	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141									256
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	1%	0%	1%
Adj. Flow (vph)	0	438	141	21	375	0	0	0	0	386	0	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	438	141	21	375	0	0	0	0	0	386	256
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase	1	1	1	1						3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0						3.0	3.0	3.0
Minimum Split (s)	20.0	20.0	20.0	20.0						8.2	8.2	8.2
Total Split (s)	40.0	40.0	40.0	40.0						35.0	35.0	35.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%						46.7%	46.7%	46.7%
Maximum Green (s)	34.7	34.7	34.7	34.7						30.4	30.4	30.4
Yellow Time (s)	4.3	4.3	4.3	4.3						3.2	3.2	3.2
All-Red Time (s)	1.0	1.0	1.0	1.0						1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0							0.0	0.0
Total Lost Time (s)	5.3	5.3	5.3	5.3							4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0						3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min						None	None	None
Act Effct Green (s)	18.9	18.9	18.9	18.9							16.5	16.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41							0.36	0.36
v/c Ratio	0.58	0.19	0.06	0.50							0.61	0.35
Control Delay	14.6	3.1	10.2	13.4							18.0	3.7
Queue Delay	0.0	0.0	0.0	0.0							0.0	0.0
Total Delay	14.6	3.1	10.2	13.4							18.0	3.7
LOS	B	A	B	B							B	A
Approach Delay	11.8			13.2							12.3	
Approach LOS	B			B							B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 46.4			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 58.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	688	0	0	285	146	99	0	29	0	0	0
Future Volume (vph)	103	688	0	0	285	146	99	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		60	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			554			708			697	
Travel Time (s)		12.5			8.4			8.8			8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	1%	0%	0%	1%	0%	7%	0%	4%	0%	0%	0%
Adj. Flow (vph)	108	724	0	0	300	154	104	0	31	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	724	0	0	300	154	0	104	31	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	688	0	0	285	146	99	0	29	0	0	0
Future Vol, veh/h	103	688	0	0	285	146	99	0	29	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Stop	-	-	None
Storage Length	175	-	-	-	-	375	-	-	60	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	1	0	0	1	0	7	0	4	0	0	0
Mvmt Flow	108	724	0	0	300	154	104	0	31	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	300	0	-	-	-	0	1240	1240	724
Stage 1	-	-	-	-	-	-	940	940	-
Stage 2	-	-	-	-	-	-	300	300	-
Critical Hdwy	4.16	-	-	-	-	-	6.47	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.5	-
Follow-up Hdwy	2.254	-	-	-	-	-	3.563	4	3.336
Pot Cap-1 Maneuver	1239	-	0	0	-	-	189	177	422
Stage 1	-	-	0	0	-	-	372	345	-
Stage 2	-	-	0	0	-	-	740	669	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1239	-	-	-	-	-	173	0	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	173	0	-
Stage 1	-	-	-	-	-	-	340	0	-
Stage 2	-	-	-	-	-	-	740	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	44.4
HCM LOS			E

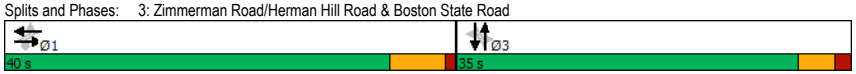
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	173	422	1239	-	-	-
HCM Lane V/C Ratio	0.602	0.072	0.088	-	-	-
HCM Control Delay (s)	53.2	14.2	8.2	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	3.3	0.2	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	375	176	23	231	15	108	26	29	38	59	67
Future Volume (vph)	85	375	176	23	231	15	108	26	29	38	59	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.993			0.976			0.945	
Flt Protected		0.991			0.996			0.968			0.989	
Satd. Flow (prot)	0	1864	1615	0	1863	0	0	1795	0	0	1754	0
Flt Permitted		0.879			0.940			0.749			0.892	
Satd. Flow (perm)	0	1654	1615	0	1758	0	0	1389	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134		5			17			56	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	93	412	193	25	254	16	119	29	32	42	65	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	505	193	0	295	0	0	180	0	0	181	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		22.6	22.6		22.6			11.6			11.6	
Actuated g/C Ratio		0.50	0.50		0.50			0.25			0.25	
v/c Ratio		0.62	0.22		0.34			0.49			0.41	
Control Delay		12.8	3.5		8.6			19.0			13.9	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		12.8	3.5		8.6			19.0			13.9	
LOS		B	A		A			B			B	
Approach Delay		10.2			8.6			19.0			13.9	
Approach LOS		B			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 45.6			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	655	79	56	384	61	87
Future Volume (vph)	655	79	56	384	61	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		75	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt	0.984					0.850
Flt Protected				0.994	0.950	
Satd. Flow (prot)	3483	0	0	1852	1770	1583
Flt Permitted				0.994	0.950	
Satd. Flow (perm)	3483	0	0	1852	1770	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	554			155	269	
Travel Time (s)	12.6			3.5	6.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	675	81	58	396	63	90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	756	0	0	454	63	90
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)		60	60		60	60
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			

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	655	79	56	384	61	87
Future Vol, veh/h	655	79	56	384	61	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	675	81	58	396	63	90

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	756	0	1228	378
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	512	-
Critical Hdwy	-	-	4.13	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	853	-	183	621
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	853	-	167	621
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	23
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	167	621	-	-	853	-
HCM Lane V/C Ratio	0.377	0.144	-	-	0.068	-
HCM Control Delay (s)	39	11.8	-	-	9.5	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	1.6	0.5	-	-	0.2	-

A7

Level of Service Calculations: Full Development Conditions with Mitigation

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	264	0	0	313	370	102	0	21	0	0	0
Future Volume (vph)	263	264	0	0	313	370	102	0	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		40	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			554			708			697	
Travel Time (s)		12.5			8.4			8.8			8.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%
Adj. Flow (vph)	292	293	0	0	348	411	113	0	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	293	0	0	348	411	0	113	23	0	0	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)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	263	264	0	0	313	370	102	0	21	0	0	0
Future Vol, veh/h	263	264	0	0	313	370	102	0	21	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	175	-	-	-	-	375	-	-	40	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	1	0	0	3	1	4	0	0	0	0	0
Mvmt Flow	292	293	0	0	348	411	113	0	23	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	348	0	-	-	-	0	1225	1225	293
Stage 1	-	-	-	-	-	-	877	877	-
Stage 2	-	-	-	-	-	-	348	348	-
Critical Hdwy	4.14	-	-	-	-	-	6.44	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.5	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.536	4	3.3
Pot Cap-1 Maneuver	1200	-	0	0	-	-	196	180	751
Stage 1	-	-	0	0	-	-	404	369	-
Stage 2	-	-	0	0	-	-	710	638	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1200	-	-	-	-	-	148	0	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	0	-
Stage 1	-	-	-	-	-	-	306	0	-
Stage 2	-	-	-	-	-	-	710	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.5	0	31.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	226	751	1200	-	-	-
HCM Lane V/C Ratio	0.501	0.031	0.244	-	-	-
HCM Control Delay (s)	35.9	9.9	9	-	-	-
HCM Lane LOS	E	A	A	-	-	-
HCM 95th %tile Q(veh)	2.6	0.1	1	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	251	69	120	620	123	49
Future Volume (vph)	251	69	120	620	123	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	75		75	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.971					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1809	0	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1809	0	1770	1863	1770	1583
Link Speed (mph)	40			45	30	
Link Distance (ft)	554			155	269	
Travel Time (s)	9.4			2.3	6.1	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	270	74	129	667	132	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	344	0	129	667	132	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes					
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 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	251	69	120	620	123	49
Future Vol, veh/h	251	69	120	620	123	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	270	74	129	667	132	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	344	0	1232	307
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	925	-
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	-	-	1215	-	196	733
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	386	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1215	-	175	733
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	345	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	23.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	279	733	-	-	1215	-
HCM Lane V/C Ratio	0.474	0.072	-	-	0.106	-
HCM Control Delay (s)	29	10.3	-	-	8.3	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2.4	0.2	-	-	0.4	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	688	0	0	285	146	99	0	29	0	0	0
Future Volume (vph)	103	688	0	0	285	146	99	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		375	0		40	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			554			708			697	
Travel Time (s)		12.5			8.4			8.8			8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	1%	0%	0%	1%	0%	7%	0%	4%	0%	0%	0%
Adj. Flow (vph)	108	724	0	0	300	154	104	0	31	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	724	0	0	300	154	0	104	31	0	0	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)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	688	0	0	285	146	99	0	29	0	0	0
Future Vol, veh/h	103	688	0	0	285	146	99	0	29	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	175	-	-	-	-	375	-	-	40	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	1	0	0	1	0	7	0	4	0	0	0
Mvmt Flow	108	724	0	0	300	154	104	0	31	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	300	0	-	-	-	0	1240	1240	724
Stage 1	-	-	-	-	-	-	940	940	-
Stage 2	-	-	-	-	-	-	300	300	-
Critical Hdwy	4.16	-	-	-	-	-	6.47	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.5	-
Follow-up Hdwy	2.254	-	-	-	-	-	3.563	4	3.336
Pot Cap-1 Maneuver	1239	-	0	0	-	-	189	177	422
Stage 1	-	-	0	0	-	-	372	345	-
Stage 2	-	-	0	0	-	-	740	669	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1239	-	-	-	-	-	173	0	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	270	0	-
Stage 1	-	-	-	-	-	-	340	0	-
Stage 2	-	-	-	-	-	-	740	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	23.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	270	422	1239	-	-	-
HCM Lane V/C Ratio	0.386	0.072	0.088	-	-	-
HCM Control Delay (s)	26.5	14.2	8.2	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	1.7	0.2	0.3	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	655	79	56	384	61	87
Future Volume (vph)	655	79	56	384	61	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	75		75	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.986					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1837	0	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1837	0	1770	1863	1770	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	554			155	269	
Travel Time (s)	12.6			3.5	6.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	675	81	58	396	63	90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	756	0	58	396	63	90
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	655	79	56	384	61	87
Future Vol, veh/h	655	79	56	384	61	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	675	81	58	396	63	90

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	756	0	1228	716
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	512	-
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	-	-	855	-	197	430
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	855	-	184	430
Mov Cap-2 Maneuver	-	-	-	-	320	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	430	-	-	855	-
HCM Lane V/C Ratio	0.197	0.209	-	-	0.068	-
HCM Control Delay (s)	19	15.6	-	-	9.5	-
HCM Lane LOS	C	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.8	-	-	0.2	-

A8

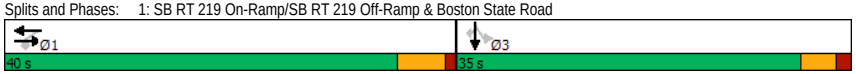
Level of Service Calculations: Future Development Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	456	73	17	400	0	0	0	0	86	0	82
Future Volume (vph)	0	456	73	17	400	0	0	0	0	86	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1845	1568	1805	1845	0	0	0	0	0	1787	1404
Flt Permitted				0.469							0.950	
Satd. Flow (perm)	0	1845	1568	891	1845	0	0	0	0	0	1787	1404
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78									88
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	3%	0%	3%	0%	0%	0%	0%	1%	0%	15%
Adj. Flow (vph)	0	490	78	18	430	0	0	0	0	92	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	490	78	18	430	0	0	0	0	0	92	88
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase		1	1	1	1					3	3	3
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					3.0	3.0	3.0
Minimum Split (s)		20.0	20.0	20.0	20.0					8.2	8.2	8.2
Total Split (s)		40.0	40.0	40.0	40.0					35.0	35.0	35.0
Total Split (%)		53.3%	53.3%	53.3%	53.3%					46.7%	46.7%	46.7%
Maximum Green (s)		34.7	34.7	34.7	34.7					30.4	30.4	30.4
Yellow Time (s)		4.3	4.3	4.3	4.3					3.2	3.2	3.2
All-Red Time (s)		1.0	1.0	1.0	1.0					1.4	1.4	1.4
Lost Time Adjust (s)		0.0	0.0	0.0	0.0						0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3	5.3						4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Recall Mode		Min	Min	Min	Min					None	None	None
Act Effct Green (s)		25.3	25.3	25.3	25.3						7.9	7.9
Actuated g/C Ratio		0.65	0.65	0.65	0.65						0.20	0.20
v/c Ratio		0.41	0.07	0.03	0.36						0.25	0.25
Control Delay		6.7	1.8	4.7	6.2						16.2	6.5
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		6.7	1.8	4.7	6.2						16.2	6.5
LOS		A	A	A	A						B	A
Approach Delay		6.0			6.2						11.4	
Approach LOS		A			A						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 39			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 6.9		Intersection LOS: A	
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	274	0	0	319	378	102	0	22	0	0	0
Future Volume (vph)	263	274	0	0	319	378	102	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		110	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1736	1881	0	0	1845	1599	0	1736	1615	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			222			708			697	
Travel Time (s)		12.5			3.4			8.8			8.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	1%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%
Adj. Flow (vph)	292	304	0	0	354	420	113	0	24	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	304	0	0	354	420	0	113	24	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	263	274	0	0	319	378	102	0	22	0	0	0
Future Vol, veh/h	263	274	0	0	319	378	102	0	22	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	175	-	-	-	-	0	-	-	110	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	4	1	0	0	3	1	4	0	0	0	0	0
Mvmt Flow	292	304	0	0	354	420	113	0	24	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	354	0	-	-	-	0	1242	1242	304
Stage 1	-	-	-	-	-	-	888	888	-
Stage 2	-	-	-	-	-	-	354	354	-
Critical Hdwy	4.14	-	-	-	-	-	6.44	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	5.5	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.536	4	3.3
Pot Cap-1 Maneuver	1194	-	0	0	-	-	191	176	740
Stage 1	-	-	0	0	-	-	399	365	-
Stage 2	-	-	0	0	-	-	706	634	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1194	-	-	-	-	-	144	0	740
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	0	-
Stage 1	-	-	-	-	-	-	301	0	-
Stage 2	-	-	-	-	-	-	706	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.4	0	73.9
HCM LOS			F

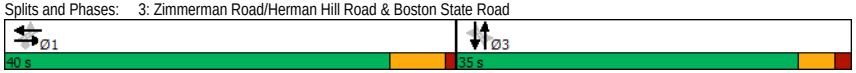
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	144	740	1194	-	-	-
HCM Lane V/C Ratio	0.787	0.033	0.245	-	-	-
HCM Control Delay (s)	87.7	10	9	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	4.9	0.1	1	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	120	64	11	398	5	123	30	9	6	11	56
Future Volume (vph)	25	120	64	11	398	5	123	30	9	6	11	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.999			0.992			0.897	
Flt Protected		0.992			0.999			0.963			0.996	
Satd. Flow (prot)	0	1854	1583	0	1860	0	0	1805	0	0	1623	0
Flt Permitted		0.894			0.992			0.725			0.964	
Satd. Flow (perm)	0	1671	1583	0	1847	0	0	1359	0	0	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70		1			5			62	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	3%	0%	0%	0%	6%
Adj. Flow (vph)	27	132	70	12	437	5	135	33	10	7	12	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	159	70	0	454	0	0	178	0	0	81	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		22.1	22.1		22.1			11.2			11.2	
Actuated g/C Ratio		0.56	0.56		0.56			0.28			0.28	
v/c Ratio		0.17	0.08		0.44			0.46			0.17	
Control Delay		8.1	2.8		10.0			16.8			6.4	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		8.1	2.8		10.0			16.8			6.4	
LOS		A	A		B			B			A	
Approach Delay		6.5			10.0			16.8			6.4	
Approach LOS		A			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 39.8			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 10.1		Intersection LOS: B	
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	262	69	120	634	123	49
Future Volume (vph)	262	69	120	634	123	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		75	75		75	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Link Speed (mph)	40			45	30	
Link Distance (ft)	331			226	269	
Travel Time (s)	5.6			3.4	6.1	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	282	74	129	682	132	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	282	74	129	682	132	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes					
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 46.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	262	69	120	634	123	49
Future Vol, veh/h	262	69	120	634	123	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	75	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	282	74	129	682	132	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	356	0	1222	282
Stage 1	-	-	-	-	282	-
Stage 2	-	-	-	-	940	-
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	-	-	1203	-	198	757
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	380	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1203	-	177	757
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	339	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	23.8
HCM LOS			C

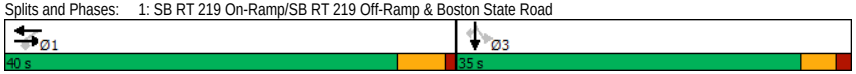
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	278	757	-	-	1203	-
HCM Lane V/C Ratio	0.476	0.07	-	-	0.107	-
HCM Control Delay (s)	29.2	10.1	-	-	8.4	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2.4	0.2	-	-	0.4	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	431	134	21	372	0	0	0	0	370	0	243
Future Volume (vph)	0	431	134	21	372	0	0	0	0	370	0	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		400	160		0	0		0	0		320
Storage Lanes	0		1	1		0	0		0	0		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			0.850									0.850
Flt Protected				0.950							0.950	
Satd. Flow (prot)	0	1863	1615	1805	1845	0	0	0	0	0	1787	1599
Flt Permitted				0.406							0.950	
Satd. Flow (perm)	0	1863	1615	771	1845	0	0	0	0	0	1787	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			141									256
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		671			824			663			908	
Travel Time (s)		10.2			12.5			8.2			11.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	1%	0%	1%
Adj. Flow (vph)	0	454	141	22	392	0	0	0	0	389	0	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	454	141	22	392	0	0	0	0	0	389	256
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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	1
Detector Template		Thru	Right	Left	Thru					Left	Thru	Right
Leading Detector (ft)		100	20	20	100					20	100	20
Trailing Detector (ft)		0	0	0	0					0	0	0
Detector 1 Position(ft)		0	0	0	0					0	0	0
Detector 1 Size(ft)		6	20	20	6					20	6	20
Detector 1 Type		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
Detector 1 Queue (s)		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
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	Perm	NA					Perm	NA	Perm
Protected Phases		1			1						3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			1	1						3		3
Detector Phase		1	1	1	1					3	3	3
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					3.0	3.0	3.0
Minimum Split (s)		20.0	20.0	20.0	20.0					8.2	8.2	8.2
Total Split (s)		40.0	40.0	40.0	40.0					35.0	35.0	35.0
Total Split (%)		53.3%	53.3%	53.3%	53.3%					46.7%	46.7%	46.7%
Maximum Green (s)		34.7	34.7	34.7	34.7					30.4	30.4	30.4
Yellow Time (s)		4.3	4.3	4.3	4.3					3.2	3.2	3.2
All-Red Time (s)		1.0	1.0	1.0	1.0					1.4	1.4	1.4
Lost Time Adjust (s)		0.0	0.0	0.0	0.0						0.0	0.0
Total Lost Time (s)		5.3	5.3	5.3	5.3						4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Recall Mode		Min	Min	Min	Min					None	None	None
Act Effct Green (s)		19.7	19.7	19.7	19.7						16.9	16.9
Actuated g/C Ratio		0.41	0.41	0.41	0.41						0.36	0.36
v/c Ratio		0.59	0.19	0.07	0.51						0.61	0.35
Control Delay		14.9	3.0	10.3	13.6						18.6	3.7
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		14.9	3.0	10.3	13.6						18.6	3.7
LOS		B	A	B	B						B	A
Approach Delay		12.1			13.4						12.7	
Approach LOS		B			B						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 47.6			
Natural Cycle: 40			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 59.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: SB RT 219 On-Ramp/SB RT 219 Off-Ramp & Boston State Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	706	0	0	302	166	99	0	31	0	0	0
Future Volume (vph)	103	706	0	0	302	166	99	0	31	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		110	0		0
Storage Lanes	1		0	0		1	0		1	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			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1703	1881	0	0	1881	1615	0	1687	1553	0	0	0
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		824			222			708			697	
Travel Time (s)		12.5			3.4			8.8			8.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	1%	0%	0%	1%	0%	7%	0%	4%	0%	0%	0%
Adj. Flow (vph)	108	743	0	0	318	175	104	0	33	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	743	0	0	318	175	0	104	33	0	0	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)		12			12			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 59.2%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	103	706	0	0	302	166	99	0	31	0	0	0
Future Vol, veh/h	103	706	0	0	302	166	99	0	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	175	-	-	-	-	0	-	-	110	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	1	0	0	1	0	7	0	4	0	0	0
Mvmt Flow	108	743	0	0	318	175	104	0	33	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	318	0	-	-	-	0	1277	1277	743
Stage 1	-	-	-	-	-	-	959	959	-
Stage 2	-	-	-	-	-	-	318	318	-
Critical Hdwy	4.16	-	-	-	-	-	6.47	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.5	-
Follow-up Hdwy	2.254	-	-	-	-	-	3.563	4	3.336
Pot Cap-1 Maneuver	1220	-	0	0	-	-	179	168	412
Stage 1	-	-	0	0	-	-	364	338	-
Stage 2	-	-	0	0	-	-	726	657	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1220	-	-	-	-	-	163	0	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	163	0	-
Stage 1	-	-	-	-	-	-	332	0	-
Stage 2	-	-	-	-	-	-	726	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1	0	48.9
HCM LOS			E

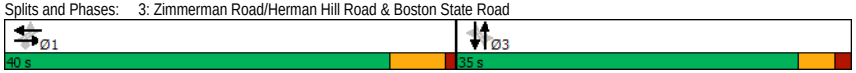
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	163	412	1220	-	-	-
HCM Lane V/C Ratio	0.639	0.079	0.089	-	-	-
HCM Control Delay (s)	59.7	14.5	8.2	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	3.6	0.3	0.3	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	383	180	23	252	15	114	26	29	38	59	70
Future Volume (vph)	87	383	180	23	252	15	114	26	29	38	59	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		75	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		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		0.993			0.977			0.944	
Flt Protected		0.991			0.996			0.967			0.989	
Satd. Flow (prot)	0	1864	1615	0	1863	0	0	1795	0	0	1752	0
Flt Permitted		0.872			0.943			0.739			0.895	
Satd. Flow (perm)	0	1640	1615	0	1764	0	0	1372	0	0	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			135		5			17			58	
Link Speed (mph)		40			40			45			40	
Link Distance (ft)		1416			695			563			689	
Travel Time (s)		24.1			11.8			8.5			11.7	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	96	421	198	25	277	16	125	29	32	42	65	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	517	198	0	318	0	0	186	0	0	184	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			0			0	
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	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
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	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	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	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	1		1	1			3			3		
Detector Phase	1	1	1	1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		24.5	24.5		24.5	24.5	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	34.0	34.0	34.0	34.0	34.0		30.2	30.2		30.2	30.2	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.2	3.2		3.2	3.2	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.6	1.6		1.6	1.6	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0		6.0			4.8			4.8	
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	
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Walk Time (s)							7.0	7.0		7.0	7.0	
Flash Dont Walk (s)							12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)							0	0		0	0	
Act Effct Green (s)		23.3	23.3		23.3			12.0			12.0	
Actuated g/C Ratio		0.50	0.50		0.50			0.26			0.26	
v/c Ratio		0.63	0.23		0.36			0.51			0.41	
Control Delay		13.3	3.6		8.9			19.7			13.9	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		13.3	3.6		8.9			19.7			13.9	
LOS		B	A		A			B			B	
Approach Delay		10.6			8.9			19.7			13.9	
Approach LOS		B			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 46.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Zimmerman Road/Herman Hill Road & Boston State Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	675	79	56	420	61	87
Future Volume (vph)	675	79	56	420	61	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		75	75		75	0
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	331			226	269	
Travel Time (s)	7.5			5.1	6.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	696	81	58	433	63	90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	696	81	58	433	63	90
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane	Yes					
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	675	79	56	420	61	87
Future Vol, veh/h	675	79	56	420	61	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	75	75	-	75	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	696	81	58	433	63	90

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	777	0	1245	696
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	549	-
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	-	-	839	-	192	442
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	839	-	179	442
Mov Cap-2 Maneuver	-	-	-	-	317	-
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	539	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	317	442	-	-	839	-
HCM Lane V/C Ratio	0.198	0.203	-	-	0.069	-
HCM Control Delay (s)	19.1	15.2	-	-	9.6	-
HCM Lane LOS	C	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.8	-	-	0.2	-

P□ase □□A and □□ □ultural □esource □nvesti□ations □or t□e Proposed 7□72 □oston State □oad □ ixed Use □evelopment Pro□ect□ □o□n o□□oston□Erie □ount□□□e□ □or□

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□EP□ □□ A□□ □□ □ □E□G□ E□□S

Powers Archaeology LLC would li□e to than□by □ r. Christopher □ ood, President of Carmina □ ood Design for his efficient contract administration and helpful communications concerning the details of the project.

□a□le o□□ontents

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P ASE A AGE E SU A

Pro ect ame Phase I IA and IB Cultural Resource Investigations for the Proposed 7072 Boston tate Road ixed Use Development Project, Town of Boston, Erie County, New Yor

Pro ect escription The proposed project encompasses the development of retail and office structures, associated par ing, stormwater management, and utilities. Approximately 2.5 acres / 1.01 hectares will be examined during these investigations and considered the Area of Potential Effect APE

Pro ect ocation The project is located on the west side of Boston tate Road, within the Town of Boston, Erie County, New Yor 0 2 1' 3 0" N, 078 7' 03. 2" W). The project area can be accessed via Boston tate Road.

ount Erie County

inor ivil ivision um er 02 0 Town of Boston

USGS 7.5 inute uadran le ap 1 6 U 7.5' amburg, N.Y. uadrangle

SE evie Phase I Cultural Resource Investigations have been requested as part of a tate Environmental uality Review E R

nvolved State and ederal A encies NY DEC

Surve Area
Acreage: 2.5 acres / 1.01 hectares
Depth: Undetermined
Number of Acres urveyed: 2.5 acres / 1.01 hectares

Arc aeolo ical Surve vervie
Number Interval of hovel Tests: 62 total 36 at 50-ft / 15-m intervals, 26 at 25-ft / 7.5-m intervals
Number ize of Units: NA
idth of Plowed trips: NA
urface urvey Transect Interval: NA

esults o Arc aeolo ical Surve
Closest Previously Recorded ite s to the APE: NY LP 327, encompasses APE
Native American Burials Less Than 1/ - ile from APE: 0
Number Name of Prehistoric ites Identified: 0
Number Name of istoric ites Identified: 0
Number Name of ites Recommended for Phase II / Avoidance: 0

esults o Arc itectural Surve
Number of Buildings / tructures / Cemeteries ithin Project Area APE : 0
Number of Buildings / tructures / Cemeteries Adjacent Project Area APE : 0

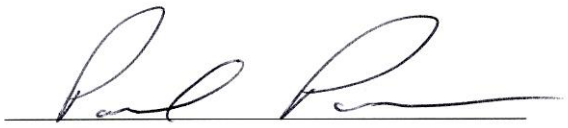
S P P istorical evie
Number of Previously Determined NR Listed or Eligible Buildings / tructures / Cemeteries / Districts: 0
Number of Identified Buildings / tructures / Cemeteries / Districts: 0

ecommendations o P ase ultural esource nvesti ations Phase I Cultural Resource Investigations were performed only for the 2.5 acres / 1.01 hectares that were considered the Area of Potential Effect for the Proposed 7072 Boston tate Road ixed Use Development Project. All wor was conducted in the town of Boston, Erie County, New Yor hile the physiographic context of the APE seems to suggest that Native American habitation was possible, Phase I investigations yielded no evidence of prehistoric occupation. Neither Native American sites nor Euro-American sites were identified within the APE. Therefore, no sites were designated. Consequently, Powers Archaeology LLC believe that current development plans should be allowed to proceed, and that no further archaeological wor is warranted.

ate o eport ebruary 8, 2023

eport Prepared

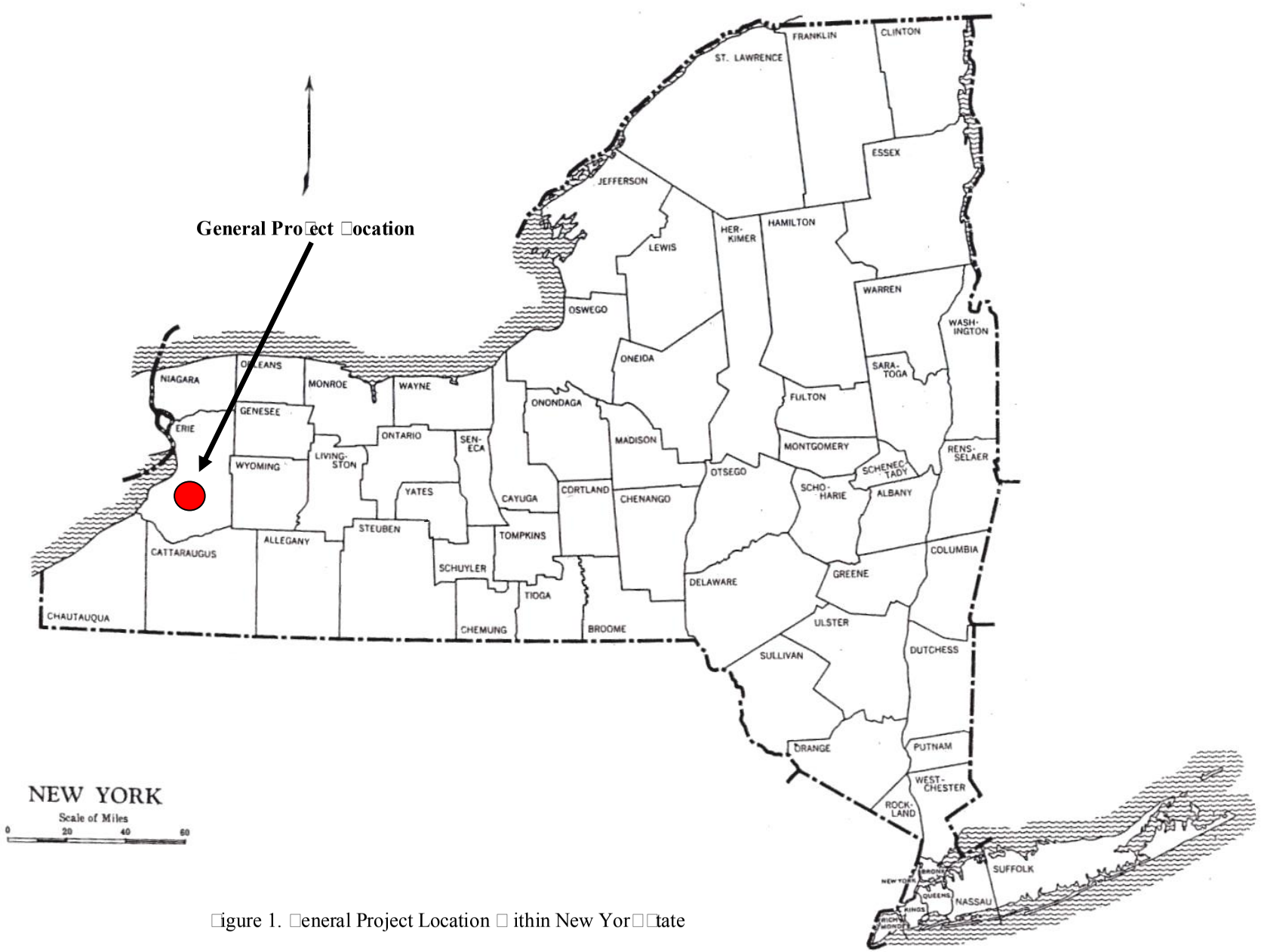
r. Paul Powers



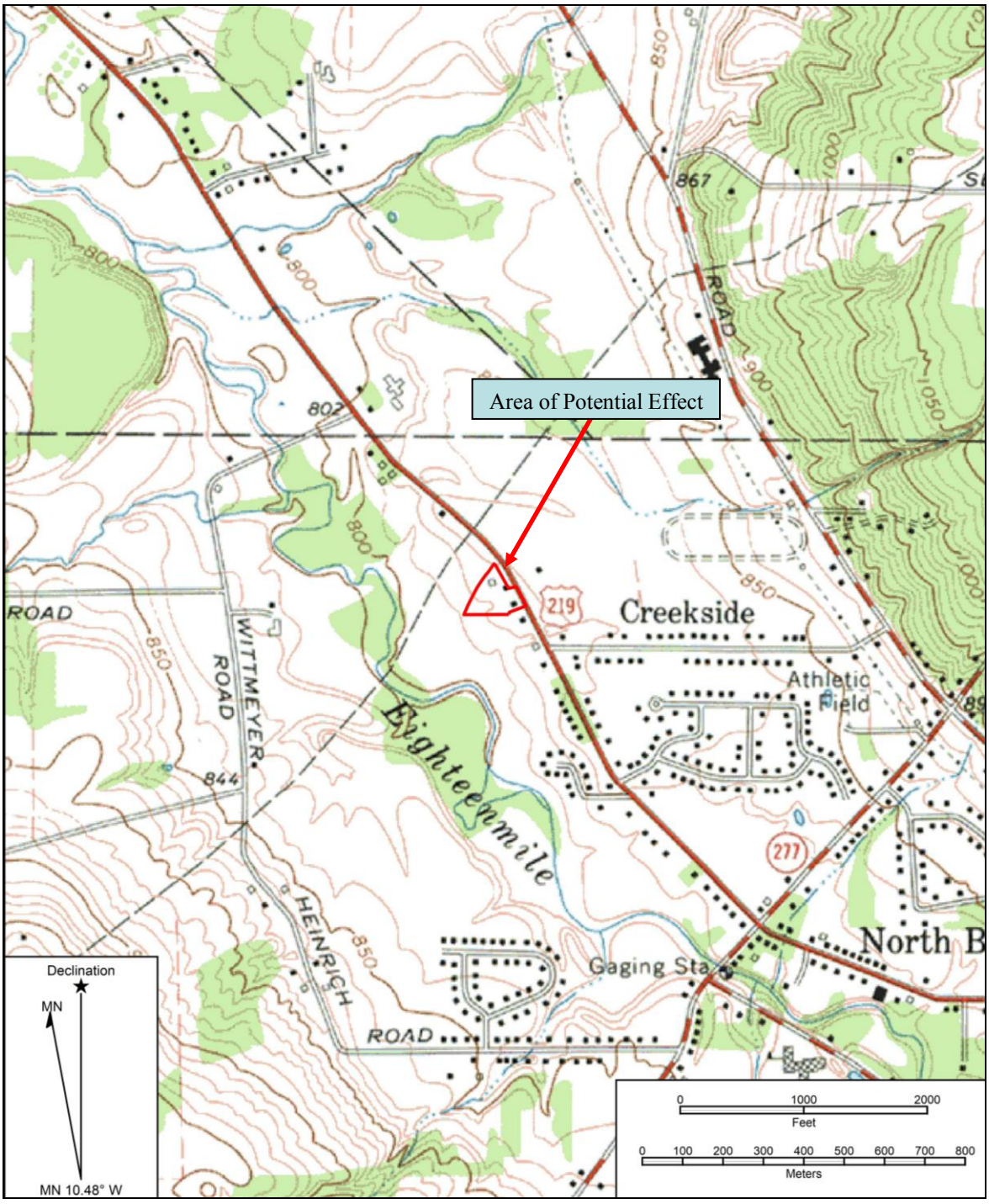
□. P□ASE □P□□ □E□□ □□□□ □□ A□□□ □

Powers Archaeology LLC was contracted to complete Phase I investigations for the Proposed 7072 Boston □tate Road □ixed Use Development Project, town of Boston, Erie County, New Yor□ The proposed project encompasses the development of retail and office structures, associated par□ing, stormwater management, and utilities at 7072 Boston □tate Road, on the west side of Boston □tate Road, within the town of Boston, Erie County, New Yor□ □□igures 1 and 2□ Approximately 2.5 acres / 1.01 hectares will be examined during these investigations and considered the Area of Potential Effect □APE□

□□□



igure 1. eneral Project Location ithin New Yor tate



□igure 2. Area of Potential Effect on the 1□6□U□□□7.5’ □amburg, N.Y. □uadrangle

□□□. E□□□□□□ E□□A□ □□□□ □□ A□□□□

□opo□rap□□and Geolo□□
The proposed project area is located in the south-central section of Erie County, New Yor□, within the Erie-Ontario Lowlands physiographic province. Elevations within Erie County range from 56□-ft A□ □L at La□e Erie to a maximum elevation of approximately 1,□35-ft A□ □L near □pringville □U□DA 1□86:2□. Elevations within the APE range from approximately 815 ft A□ □L to 828 ft A□ □L.

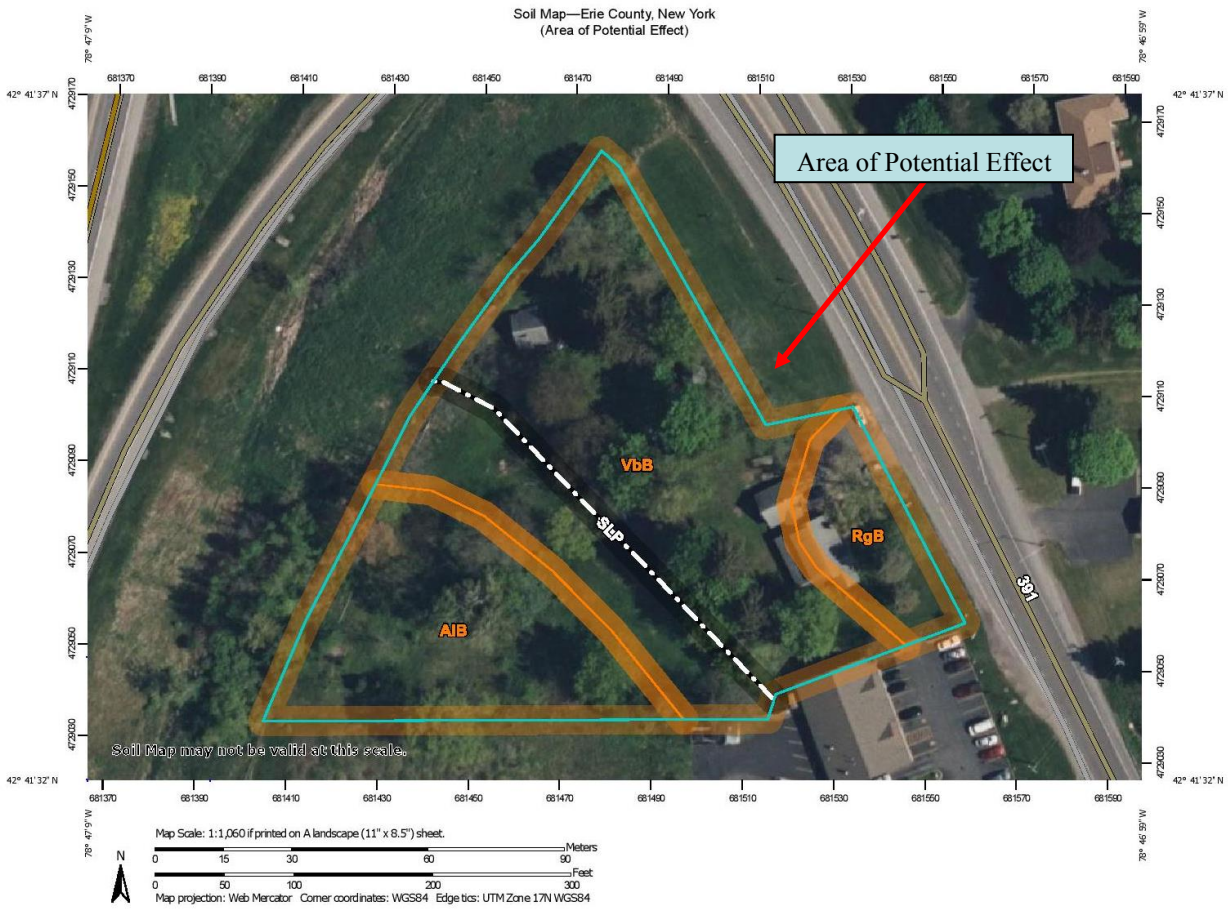
□treams have cut the topography of this area since the time the region was invaded by glacial ice from the north. During the □isconsin glaciation of the Pleistocene epoch, ice blan□eted the entire area of New Yor□ □tate. Ice erosion on this landscape rounded the existing hills, deepened the valleys, and steepened the valley walls in the southern parts of the area. □lacial deposits added the drumlins and □ame moraines. The roc□ formations beneath Erie County are the source of the parent material for the soils. Erie County is underlain by sedimentary glacial bedroc□. □ueenston □hale is the oldest bedroc□ formation in Erie County, deposited □10 million years ago during the final stages of the Ordovician.

Soils
□oils in Erie County have developed in the period since glaciation and formed through the interaction of climate, living organisms, parent materials, topography, and time. The soils in Erie County were formed under a cool-humid climate, aiding in the organic growth found in the surface layer. The extensive forests that once covered the region provided most of the organic matter. Differences among soils in Erie County are the result of variation in parent materials and topography. The parent materials that created the soils in Erie County are glacial till, glacial outwash, glacio-lacustrine materials, recent alluvium, and organic materials.

Alluvial land/soil are sections of nearly level, recent unconsolidated deposits on flood plains. The deposits are generally stratified and range in matrix texture from gravel to sand and clay. Drainage commonly encountered in alluvial soils is generally poor to very poor in nature. Colluvium consisting of soil and/or roc□ travels down slope by gravity. This "slope wash" may, in some cases bury an A □orizon, a culturally rich soil layer.

There are three □3□soil types found within the APE, from the Allard, Rhinebec□, and □arysburg soil series. These soils are found on la□e plains and terraces and range from somewhat poor to well drained □Table 1□. The proposed APE for these cultural investigations *contains* alluvial soils from the Allard soil series. As a result, □r. □ohn □titeler, □eomorphologist was consulted. In his report □Appendix I□□, □r. □titeler concluded that:

> "*In the lower western half of the APE, a thin cap of silty to fine sandy overbank alluvium from Eighteen Mile Creek overlies gravelly glaciofluvial deposits. The low- to moderate-energy overbank alluvium of the Ap, Bw1, and Bw2 horizons (generally to 50-70 cm or 20 to 28 inches bs) appears to be of Early through Middle Holocene age and has the potential to contain prehistoric cultural material. The underlying gravelly glaciofluvial material does not have any potential to contain cultural material.*
>
> *In the higher eastern half of the APE all potential for the presence of cultural material is confined to the Ap horizon, generally the upper 30 cm (12 inches) of the profile. As noted previously, soils of this area are mapped by the USDA-NRCS as Varysburg gravelly loam. The face of the riser along the western limit of this area has been graded and stripped of grass, revealing a very gravelly profile. The area mapped as the Varysburg series forms a long, linear polygon extending north and south of the APE along the western boundary of the un-incised lake plain. Concentration of gravel in this area may be the product of a high energy flow during the last stage of drainage of Lake Whittlesey, with both water and gravelly sediment being introduced to the valley bottom by the many streams draining uplands to the south and east of the study area. These gravelly sediments have been in place and stable since shortly after lake drainage at around the Pleistocene-Holocene boundary. Higher gravel content in the solum of AP2 than seen in AP1 or AP3 probably reflects its proximity to this gravel-rich area and reworking of gravel from the riser face by Eighteen Mile Creek. ".* □Appendix I□□



□igure □ Area of Potential Effect on the 2023 NRC□□ eb □oil □urvey

□a□le 1. Summar□o□Soils □ it□in t□e Area o□Potential E□ect

Soil □ame	Soil □ori□on □ept□ cm □in□	Soil □olor	Soil □exture □nclusions	Slope Percent	□raina□e	□and□orm
Allard silt loam □AIB□ *Alluvium*	Ap 0-20cm □0-8 in□ Bw1 20-35 cm □8-1□in□ Bw2 33-51 cm □1□-20 in□ Bw3 51-61 cm □20-2□in□ 2C1 61-120 cm □2□-□0 in□ 2C2 102-183 cm □□0-72 in□	D□ □Brn YBrn Brn D□YBrn Brn □Brn	□i Lo □i Lo □i Lo □i Lo Lo □a □rl □a	3-8	□ ell	Terraces
Rhinebec□ silt loam □Rb□	Ap 0-23 cm □0-□in□ Eg 23-36 cm □□-1□in□ Bt1 36-58 cm □1□-23 in□ Bt2 58-81 cm □23-32 in□ C1 81-11□cm □32-□5 in□ C2 11□-183 cm □□5-72 in□	□ D□ □Brn □Brn Lt OBrn Lt OBrn Brn Brn	□i Lo □i Cl Lo □i Cl □i Cl Lo □i Cl Lo □a □i-Cl	3-8	□omewhat poor	La□e plains
□arysburg gravelly loam □□bB□	Ap 0-23 cm □0-□in□ BA 23-38 cm □□-15 in□ B/E 38-53 cm □15-21 in□ Bt1 53-71 cm □21-28 in□ 2Bt2 71-8□cm □28-33 in□ 2Bt3 8□-10□cm □33-□1 in□ 2C 10□-183 cm □□1-72 in□	D□ □Brn YBrn YBrn Brn Brn Brn Brn	□rl Lo □ □rl Lo □ □rl Lo □i Cl □i Cl □i Cl / □i Lo	3-8	□ oderately well / well	Dissected la□e plains

□**E**□□ **S□ade**□D□-Dar□, Lt-Light, □-□ery

□**olor**□B□ry-Brownish □ray, Bl□-Blac□, Brn-Brown, □Brn-□rayish Brown, □ry-□ray, OBrn-Olive Brown, PBrn-Pale Brown, P□ry-Pin□ish □ray, RBrn-Reddish Brown, R□ry-Reddish □ray, □trBrn-□trong Brown, RBrn-Red Brown, R□ry-Reddish □ray, □ -□ hite, YBrn-Yellow Brown

Soils□Cl-Clay, Lo-Loam, □ u-□ uc□, □a-□and, □i-□ilt

□**t□er**□B□-Bro□en □ace, Co-Coarse, Cbs-Cobbles, Ex-Extremely, □-□ine, □rl-□ravel, □ -□ ottled, Pbs-Pebbles, Rts-Roots, Ru-Rubbed, □tr-□tratified

□istur□ance

□isual inspection of the area delineated as the APE for the proposed project reveals significant disturbance in portions of the APE. □ravel is apparent on the ground surface in the northern section of the APE adjacent to an extant barn □Appendix II: Photograph 7□, while a large gley pile and evidence of earth movement are apparent as well □Appendix II: Photograph □.

□limate

Erie County generally experiences warm summers and long, cold winters. The climate of Erie County is a humid continental climate. Yearly precipitation is about 37 inches. Approximately 50 percent of the annual precipitation is received during the growing season, April through □eptember. Temperature and atmospheric conditions can change quite drastically within a few days due to the county's location in the path of most major weather systems that travel across the continent or up the Atlantic coast. La□e Erie and La□e Ontario have an important effect on the climate of Erie County. La□e Erie and La□e Ontario provide a classic moderating effect on the local temperatures, helping to cool in the summer and warm in the fall.

□orest □one

□ hen people first arrived in the western part of New Yor□ □tate, most of Erie County was covered with a forest, with a few large open areas such as marshlands. Tree growth in Erie County depended on the soil type and drainage. In the wetter parts of Erie County, the land supported trees such as birch, beech, ash, elm, maple, willow, and hemloc□ Today, few if any virgin timber areas remain in the county. □ome of the more common species of weeds that reside in untended fields are goldenrod, ragweed, and □ueen Anne's lace □U□DA 1□86□ Presently, vegetation within the APE consists of residential lawn, un-mowed grasses and weeds, and a few trees □Appendix II□

□raina□e

Drainage for the Area of Potential Effect is provided by tributaries of Eighteen □ ile Cree□ Eighteen □ ile Cree□ leads to La□e Erie and subsequently into La□e Ontario via the Niagara River. □ aters from La□e Ontario find their way to the Atlantic Ocean via the □t. Lawrence River.

□auna

The general environmental setting of the project area supports the typical array of animal species seen throughout suburban areas of western New Yor□ These include white-tailed deer, opossum, squirrel, and raccoon. Early inhabitants of the western section of New Yor□ □tate would have been able to hunt blac□bear, white-tailed deer, el□, wild tur□ey, pheasants, pigeons, waterfowl, beaver, raccoons, possum, otter, rabbit, squirrel, and gray fox, as sources of food, fur, and raw materials used in tool manufacturing, common amenities, and for trade. □almon, trout, perch and pi□e were also additional food sources.

□ an-□ ade □eatures □Alterations

Aside from the aforementioned disturbance, a residential structure and driveway are found within the APE □Appendix II: Photographs 13,17□ A barn, shed, gazebo, stone fireplace, and decorative pond are also located within the APE □Appendix II: Photographs □-6, 15□ Additionally, adjacent to the southern boundary of the APE is a sewer line □Appendix II: Photographs 10, 11□

□□. □A□□G□□U□□ □ESEA□□□

Site □ile □esearc□

A chec□ of the NY□ site files encompassing a 1-mi / 1.6-□m radius of the APE was completed utilizing the New Yor□ □tate Office of Par□s, Recreation and □istoric Preservation Cultural Resource Information □ystem □NY□OPR□P CRI□□. The site file chec□ revealed the presence of sixteen □16□ previously recorded sites □www.cris.par□s.ny.gov□ NY□□ LP 3721 encompasses the APE, while 2□0□000026 potentially falls adjacent to the southern boundary. □ite information is summarized in Table 2.

□a□le 2. Sites □ocated □ it□in a 1-mi □1.□-□m □adius o□t□e APE

US□ □□□S□ □	Site □ame	Site □□pe	P□ase □ □radition	Status	□istance to APE □t □m
NY□□ LP 3271	ACP ERIE NO□	Traces of Occupation	No Information	Undetermined	*Encompasses APE*
2□0□000026	□ITTRY □ITE	Lithic □catter / Camp	Undetermined Prehistoric	Undetermined	*Adjacent to APE*
2□0□000027	Boston □alley □8 □ite	□tray □ind	Undetermined Prehistoric	Undetermined	□□□/ 152
2□0□000061	□ua□er Estates 1	Lithic □catter	Undetermined Prehistoric	Not Eligible	508 / 155
2□0□000060	□ua□er Estates Precontact □ite 2 □ 3	□tray □ind	Undetermined Prehistoric	Not Eligible	5□3 / 166
2□0□000028	Boston □alley □□ □ite	Camp	Undetermined Prehistoric	Undetermined	5□6 / 166
2□0□000025	□ EI□□I □ITE	Camp	Undetermined Prehistoric	Undetermined	56□/ 172
2□0□000035	□ P/L □□	□tray □ind	Undetermined Prehistoric	Not Eligible	1816 / 55□
2□0□000032	□ P/L 2	□tray □ind	Undetermined Prehistoric	Not Eligible	2078 / 633
2□0□00002□	BAN□O II □ITE	Camp	Archaic / □ oodland	Undetermined	2386 / 727
2□15.000115	□ P 573.1□/□ □EELER I □ITE	Camp	Undetermined Prehistoric	Undetermined	23□8 / 731
2□15.000118	□ P/L □1	□tray □ind	Undetermined Prehistoric	Not Eligible	2□62 / 750
2□15.000008	TO□ N O□ □A□ BUR□ □ITE	Camp	Archaic / □ oodland	Undetermined	2615 / 7□7
2□0□000023	Ban□o I □ite	No Information	Archaic / □ oodland	Undetermined	2□3□/ 8□□
2□15.000133	□ □EELER 3 □ITE □UB 303□□	□tray □ind	Undetermined Prehistoric	Undetermined	3505 / 1068
2□15.000116	□ P 573.15/□ □EELER II □ITE	Camp	Undetermined Prehistoric	Undetermined	□378 / 133□

S□□P / NRH P □esearc□

According to the website for the National Register of □istoric Places and the NY□OPR□P CRI□, three (3) structures fall within the vicinity (.25-mi / .4)-□m radius) of the proposed project area. All three (3) structures were deemed not eligible for the □tate and National Register. This information is summarized in Table 3.

□a□le 3. State / □ational □e□ister Sites in t□e □icinit□ o□ t□e Area o□ Potential E□□ect

US□ / NR#	□ame	Status
2921.000244	Boston □alley Terra Cotta - 6860 □outh Abbott Road 1□127	Not Eligible
2915.000450	5534 Ripple	Not Eligible
2914 000076	Town □unicipal Par□ - 5678 □eadow Dr 14075	Not Eligible

Previous Surve□s

Powers Archaeology LLC also completed a search for previous archaeological and building surveys conducted within the vicinity of the Proposed 7072 Boston □tate Road □ixed Use Development Project. Information gathered from the New Yor□ □tate Office of Par□s, Recreation and □istoric Preservation □NY□OPR□P□office revealed that five (5) archaeological surveys and one ( ) building survey were previously completed within a 1-mi / 1.6-□m radius of the project area. None of these surveys fall within or adjacent to the current APE. □urveys are summarized in Table 4

□a□le 4. Surve□s Previousl□ □onducted □ it□in a 1-mi / 1.6-□m □adius o□ t□e Area o□ Potential E□□ect

□um□er	□ame
08□R58067	Phase I Cultural Resources Investigation Report for the U□E □mith Unit #3 □as □ ell, Town of Boston, Erie County, New Yor□
09□R59065	Phase I Cultural Resources Investigation for the Boston □alley Terra Cotta □acility Expansion Project (6860 □outh Abbott Road) Town of Orchard Par□, Erie County, New Yor□
15□R00867	Phase IB Archaeological Investigation Report Boston □alley Terra Cotta □acility Expansion Project, Town of Orchard Par□, Erie County
16□R00529	Phase 1A/B Cultural Resource Investigation: Proposed Development, □ua□er Estates, Town of Boston, Erie County, New Yor□
16□R00763	Phase 2 Cultural Resource Investigation and Topsoil/Plowzone □tripping, □ua□er Estates 1 □ite, Town of Boston, Erie County, New Yor□
16□R00355*	Town of Orchard Par□Intensive Level □urvey of □istoric Resources

** Building Survey*

Pre□istoric □ontext

Prehistoric occupation of □estern New Yor□ is li□ely to have occurred continuously for at least 12,000 years. Numerous changes in settlement patterns, subsistence strategies, population density, technology, and other aspects of human behavior have transpired through this time. The following section provides a general overview of these changes as documented in the archaeological record for the proposed project region. The Late Archaic, Late □oodland, and the Early □istoric periods are more clearly understood in the New Yor□ □tate region than the Paleo-Indian Period.

Paleo-Indian Period (c. 10,000-8000 B.C.)

□astodons and megafauna □e.g., bison, el□, and deer□entered western New Yor□upon the draining of glacial waters from the lowlands, and thereafter followed early man. The Paleo-Indians were nomadic hunters that traveled in small groups from campsite to campsite. □ost Paleo-Indian sites found in New Yor□ □tate are small □ill sites. □luted flint spear projectile points and stone tools are indicative of this culture. Clovis points have been found in direct association with the bones of the mammoth, elephant, mastodon, and bison □Ritchie 1□65:1□. Traces of Paleo-Indian occupation sites are found in low marshy areas, on cliffs, and locations of higher elevations overloo□ing what once used to be la□ebeds.

Climate change between 6000 B.C. and □000 B.C. caused the vegetation to grow into forests that were unable to support the megafauna in the area. It is widely ac□nowledged that as the faunal and floral environment changed, the need for a greater food source for the large game animals caused their migration to new territories in the north, accompanied by the Paleo Indians. □ubsequently, the people remaining in and or entering □ estern New Yor□began to modify their lithic technology to accommodate their evolving environment. Radiocarbon dating has broadened the temporal limits of the Archaic Period to overlap with the Paleo-Indian stage in various parts of the United □tates □Ritchie 1□65:31□.

Archaic Period (c. 8000-1000 B.C.)

The Archaic period is traditionally divided into three stages. The Early Archaic and □iddle Archaic Periods range between 8000-□000 B.C., and the Late Archaic period from □000-1000 B.C. As the environment changed, less specialized smaller groups of people entered the area. Archaic sites from 3000 B.C. are commonly found along □estern New Yor□rivers, la□es and streams. It is theorized that these peoples focused heavily on the marshlands, rivers, and streams to acquire food resources, since the forests were immature and resources poor. Despite this emphasis on aquatic ecozones, small mammals were also a considerable part of the Archaic diet.

□any Archaic sites identified in the western part of New Yor□are small seasonal camps containing lithic and bone tools. The Archaic sites located in the central and northeastern section of New Yor□ □tate denote a culture based on subsistence hunting, fishing, and gathering. The Lamo□a La□e site □Early Archaic□located in □chuyler County produced lithic, bone, and antler artifacts as well as animal and vegetable refuse, and human burials □Ritchie 1□65:36□. Atlatl weights, T-shaped drills, milling stones, choppers, pestles, and steatites bowls are indicative of the □iddle Archaic Period □Laurentian □ □usquehanna□□Ritchie 1□65:1□6□. The Lamo□a, Bare Island, and Brewerton projectile points reveal some temporal overlap throughout the Archaic Period. □owever, they are most commonly associated with the □iddle Archaic Period. Late Archaic aboriginal groups are noted for their manufacturing assortment and abundance of utilitarian, recreational, decorative, and ceremonial artifacts. The □ent-□ally □ite located in the lower □usquehanna □alley provides the temporal placement of Bare Island projectile points within the Late Archaic □Ritchie 1□65:1□6□. As adaptation to the environment increased in the Late Archaic, tool modification and use adapted as well. As the alterations in bone and lithic tool manufacturing continued, the archaeological record reveals the production of smaller, side-notched projectile points □e.g., □noo□ □ill □ite□□Ritchie 1□65:136-137□.

Transitional Period (c. 1500-1000 B.C.)

The Transitional period bridges the change from the semi-nomadic, seasonal-based lifestyle of the Archaic to a more sedentary lifestyle mar□ed by more permanent villages. It is during the Transitional Period that the emergence of earthenware ceramics, new varieties of projectile points, and carved soapstone pots appear in New Yor□ □Ritchie 1□65:150□. The Transitional Period campsites found in New Yor□are all situated along streams and la□es, exactly as those of the Archaic and □oodland campsites □Ritchie 1□65:15□□. The □usquehanna and Orient □ishtail projectile points are indicative of the Transitional cultural period. These projectile types and locations provide a good picture of the connection between the Late Archaic culture and the Early □oodland culture.

Woodland Period (c. 1000 B.C.-1650 A.D.)
The □ oodland Period is separated into three phases: Early □ oodland □1000 B.C. to 200 B.C.□□□ iddle □ oodland □200 B.C. to 1000 A.D.□□and Late □ oodland □1000 A.D. to 1600 A.D.□ The Early □ oodland Period introduces a new style of prehistoric ceramic □nown as Vinette I. The O'Neil Site excavated in 1□61-62 located in □ estern New Yor□ is one the most significant □ oodland sites in New Yor□ □Ritchie 1□65:156□. The O'Neil □ite provided an in situ, uncontaminated recorded assemblage of soil stratigraphy as well as associated artifacts. The oldest soil strata were radiocarbon dated to around 2000 B.C., while the most recent layer was dated by artifacts associated with the Point Peninsula phase of the □ iddle □ oodland culture. □inette 1 sherds were recovered, as well as □usquehanna Broad projectile points. □mo□ing pipes, gorgets, birdstones, boatstones, bar amulets, copper ornaments, and copper tools also all appear within the Early □ oodland cultural period □Ritchie 1□65:17□□.

The design of pottery □i.e., scallop-shell, roc□er-stamped□and clay pipes □i.e., elbow pipes□start to develop into more intricate types during the □ iddle □ oodland Period □c. 200 A.D.□ The □ iddle □ oodland cultural period also introduces earth mounds and more elaborate burial practices. The Adena and □opewellian cultural phases are represented during the □ iddle □ oodland Period by the burial mounds, pits, and cremated burials found in western and □ estern New Yor□ Corner-notched or straight-stemmed projectile points are indicative of the cultures from the □ iddle □ oodland Period, as well as pitted hammerstones, anvil stones, net sin□ers, steatite potsherds, and gorgets □Ritchie 1□65:227□.

The Late □ oodland period □c. 1000 A.D.□is noted for permanent villages and a dependence on agriculture. Corn, beans, and squash become the staple crops during this time. □unting, fishing, and gathering were still practiced even with the extensive adoption of agriculture. As the cultivation of tobacco increased in the area, clay pipes increased in number and styles. The Owasco and Iroquois cultures fall within the Late □ oodland cultural period. The Owasco culture of New Yor□ is characterized by changes in ceramic styles and decoration □i.e., roc□er-stamped to corded styles and pot lip styles□ The □axon-Derby □ite located in Onondaga County was an open Owasco village / town found on the □axon farm in 1□5□ The □axon-Derby □ite supplied evidence of a small, pre-Iroquoian village without fortification surviving over many years of occupation.

□radual but continual changes in settlement patterns and travel methods brought about Iroquoian culture in New Yor□ The transition from the Owasco culture to the Iroquois culture occurred sometime in the 13th century □Niemczyc□i 1□8□□□. Larger year-round settlements were now being established. The early Iroquois culture is mar□ed by the emergence of high-collared ceramic vessels and multi-family longhouses. The increased isolation and competition of the surrounding tribes forced the development of the distinctive ceramic types and styles of the Iroquois prior to the formation of their confederacy □Niemczyc□i 1□8□33□. Late □ oodland Period sites are noted for the appearance of palisades for defense against hostile neighbors, as well as for wor□shops, seasonal camps, deep storage pits, and ossuaries. Lithic tools such as bifaces and fla□e □nives are also representative of the Late □ oodland cultural period. The □ac□ett □ite and the Bates □ite excavated in the late 1□50s and early 1□60s are two examples of the settlement pattern change that occurred during the Late □ oodland Period. These sites provided evidence of villages containing numerous dwelling structures □i.e., longhouses and wigwam-li□e structures□surrounded by palisades □Ritchie □ □un□ 1□73:213-226□. Both sites provide a good timeline for the transition between Late Iroquois culture and the Contact Period.

Contact Period (c. 1500-1780 A.D.□
The Contact Period is defined by the appearance of European trade goods on Native American sites. An increased use of trade metal □i.e., copper, iron, brass□and an intensification of the fur trade brought further changes to Native American cultures, particularly the Iroquois. □amuel Champlain's attac□ on the Iroquois in 1615 mar□s the first recorded conflict between Euro-Americans and the Native Americans in this region. □ ore hostilities occurred when □acques Rene de Brisay, □arquis de Denonville, governor of Canada, landed on Irondequoit Bay in 1687 and marched southward, destroying Iroquois villages and supplies. The □ullivan campaign ordered by □eneral □ ashington to destroy the homelands of the Iroquois occurred in 177□ The □rench and Indian □ ar □17□□-1763 A.D.□and the American Revolution □1776-1783 A.D.□were the main causes for the loss of Iroquois political power in New Yor□

Pre□istoric Sensitivit□ Assessment

The proposed APE is considered by Powers Archaeology LLC to have the potential to contain intact cultural deposits. Proximity to permanent water sources □i.e., Eighteen □ ile Cree□□, in conjunction with the previously documented sites encompassing and, in the vicinity, indicates the potential for a prehistoric and historic Native American presence surrounding the APE. NY□□ LP 3721 encompasses the APE, listed as "traces of occupation", while 2□0□000026 □□ittry □ite□is listed as s undetermined prehistoric scatter / camp that potentially falls adjacent to the southern boundary □NY□OPR□P CRI□2023□. □ hen identified, previously recorded sites within a 1-mi / 1.6-□m radius of the APE were described as Archaic or □ oodland □Table 2□. Archaic sites in the western and central parts of New Yor□ □tate consist of campsites and small hamlets near cree□s and rivers, while □ oodland sites are characterized by larger habitation sites situated on high hilltops and other defensible positions □Ritchie 1□65□. Native American site types li□ely to be encountered within the proposed project area could range from small camps / resource procurement sites or "traces of occupation," consisting of very diffuse surface scatters of lithic material to larger habitation sites.

□istoric □ontext

Erie County

Erie County is located at the western end of New Yor□ □tate. It is bounded to the north by Niagara County, to the east by □enesee and □ yoming counties, to the south by Cattaraugus and Chautauqua counties, and to the west by La□e Erie and Canada. Tonawanda Cree□, the Niagara River, and Cattaraugus County comprise its northern, western, and southern borders, respectively □□ohnson 1876□. Erie County was once occupied by Iroquoian-spea□ing peoples including the Erie, □ enro and Neutral, until they were dispersed by the □eneca in the 17th century. Euro-American settlement in the area did not begin in earnest until after 1783, when the □eneca ceded these lands to the United □tates.

Erie County was part of Ontario County, which included most of western New Yor□. In 1800, the □olland Land Company purchased these lands from New Yor□ and sold plots to settlers. In 1802, the state legislature split □enesee County from Ontario County, which itself was split in 1808 to form Niagara County. The first towns in Erie County were Clarence and □ illin□, the latter of which was later subdivided. Erie County was split from Niagara County in 1821. The City of Buffalo, incorporated as city in 1832, is the county seat □□ohnson 1876□. The county owes much of its growth in the 1□th century to the opening of the Erie Canal, of which Buffalo served as the western terminus, connecting New Yor□ □tate to other burgeoning settlements on the □reat La□es. Agriculture and heavy industries, especially steel ma□ing in the Buffalo area, brought economic and demographic growth. Today, Erie County is a hub for higher education, medical research, and hi-tech manufacturing.

Town of Boston

The town of Boston is an interior town of Erie County, New Yor□, lying just south of the center of the county. To the north lie the towns of Orchard Par□ and □amburg, to the east lies the town of Colden, to the south lie the towns of Concord and North Collins, and to the west lies the town of Eden. According to United □tates Census estimates compiled in 2021, the population of Boston is approximately 7,□32 people in about 35.82 square miles of territory, placing the population density at about 221.□ people per square mile. The town of Boston was formed out of the eastern portion of the town of Eden in April of 1817, and "was very likely named after the city of Boston, □ assachusetts as our American frontier moved westward" (Kaszubik, n.d.).

□ hen □rench missionaries and explorers first entered □ estern New Yor□ in the early 17th century, they discovered several Native American nations near present day Boston, including one towards the northwest that they would coin the Neuter Nation, translated to Neutral Nation, due to their stance as peace□eepers for the surrounding nations, as well as the Eries who resided along the south side of La□e Erie and up into present day Erie County, and the □enecas, who, at the time, resided a little further east. □owever, it is our understanding that by the mid-17th century, the □eneca Nation, one of the, at the time, five nations of the □audenosaunee, had overpowered the Neuters and the Eries, seizing their land in and around Erie County. Despite this acquisition, the □enecas retained their permanent settlements further east and used the land in Erie and Niagara County for temporary settlements, hunting grounds, and paths to and from the waterways. The □audenosaunee would hold possession of the land for the ensuing years until after The American Revolution, in 177□, when the new American Congress and □eorge □ ashington ordered what became □nown as the □ullivan Campaign: □eneral □ullivan and his troops pushed west across much of New Yor□, razing villages and slaughtering the □audenosaunee, causing them to flee as Sullivan's army "substantially destroyed the league which bound the Six Nations together" (Johnson, 1876:. 63□. This campaign considerably reduced Native American presence in Boston, and New Yor□ on a whole, as they fled towards the Niagara frontier, and paved the way for colonials in the late 18th century to move in, enforcing abusive land acquisitions on any remaining Native American land.

The first settler to locate to Boston was a man named Charles □ohnson, who purchased some land from the □olland Land Company in autumn of 1803, stayed the winter at the cabin of Didymus C. □inney in the present town of □amburg, and then moved to their new Boston land, near what is now Patchin, in the spring of 180□ □□mith 188□□. Boston would grow slowly over the ensuing years, attracting a few families by 1807, including those of □oseph Yaw, an influential citizen, and Benjamin □ haley, who would become a major of militia during the □ ar of 1812. □oseph Yaw would erect the first gristmill in the territory in 180□, the same year in which the town would experience its first death when "Joel Beebe, a little son of the early pioneer, Samuel Beebe, was accidentally killed by the falling of

a hollow log, which was used as a smoke house" (Smith, 1884: 5□3□ Despite this tragedy, the town was remar□ed as being a healthy region seeing how they had managed to avoid a death for around five years after Charles Johnson's initial settlement.

In 1812, the town of Eden was created by the Legislature, and the □ ar of 1812 began in earnest, where "the men of township eight were frequently called out for service under the command of Captain □afterwards Colonel□Charles Johnson" (Smith, 1884: 5□□□. Immediately after the war, the town was the subject of considerable immigration leading to its official formation in 1817, though an official town meeting would not be held until the subsequent year. During the meeting, several decisions were made that would characterize the town's initial concerns: the town should build a pound and that Charles □ohnson should be pound-master, any person who let Canada thistle grow on their property would have to pay a fine of fifty cents for every blossom, and the □ua□ers should be taxed four dollars each in lieu of military duty. By 1818, there were 153 taxable inhabitants in the town of Boston, and by 1820, a new mail route, running from Buffalo south through □amburg, Boston and Concord to Olean, would be established □□mith 188□□. □everal tanneries had been constructed, as well as a hotel at Boston Centre, now □nown as Patchin.

A grisly murder would occur in Boston in December of 1824, becoming a tragedy which would mar the town's history. □ohn Love, a □cotchman, sailor, and peddler, who stayed with the Thayer family when he wasn't out on the water or the road, loaned that same family a sum of money and then proceeded to crowd them for payment. Love had made a considerable amount of money on the la□e, but the Thayer's had fallen on hard times. On December 15th, the three Thayer brothers, Israel □r, Nelson, and Isaac, convinced Love to visit the house of Israel □r, where "Isaac shot him from the outside, through a window, and Nelson completed the crime with an axe" before burying him a short distance from the house "in a grave so shallow that the toes of his shoes pee□ed through the dirt" (Smith 188□: 5□5□. The three brothers got away with it for a time, as □ohn Love had been □nown to go on trips both on the road and out on the la□e, so his absence was not initially noticed. □owever, the three Thayer brothers then began a new scheme where they attempted to collect on debts owed to □ohn Love, pretending that they were acting according to his directions. This shed suspicion on the three and eventually they were caught, tried, and executed in Buffalo on □une 7th of 1825 □□mith 188□□.

Boston continued to receive a steady flow of immigrants in the 1820s and 1830s, including a sizable □erman population that initially settled themselves on the hills on the east and west sides of town. Three distinct communities formed, those of Boston Corners, North Boston, and Boston Centre, which is now □nown as Patchins. Known briefly as Torrey's Corners, the village of Boston Corners grew around Demas Jenks' distillery, the first attempt at manufacturing within the town, established in 1818, and the main post office, established in 1820. North Boston was a small hamlet that acted as a favorite meeting place for the political conventions of southern Erie County due to its central location but was abandoned as such a place when Boston was continuously passed over for a railroad. Patchins, □nown originally as Boston Centre, formed the first settlement of Boston and served as its heart, but it still never became much more than a small hamlet □□mith 1884). Boston Centre's name was changed to Patchins in 1850 when "the citizens of Boston Centre petitioned for a post office but were advised to select another name in order to avoid confusion with the hamlets of Boston Corners and North Boston, which also had post offices" (Kaszubik, n.d.□ Boston remained largely an agricultural district for Erie County, and immigration started to slow down considerably by the mid-19th century, especially considering that a railroad didn't come through the town until 1□03 □Pluta 2008□. To this day, Boston serves merely as a rural town in Erie County and an agricultural community to Buffalo.

□istoric Sensitivit□ Assessment

Accelerated population growth related to new industries and the use of the area as a bedroom community for Buffalo is shown by the dramatic increase in new residential and commercial structures within the existing population centers and along what were once rural roads. In general, development within the project area and the general vicinity appears to mirror regional growth. It should be noted that the scale and accuracy of 1□th-century and early 20th-century maps can be questionable compared to modern maps and surveys because they frequently lac□ the accuracy of location and scale present in modern surveys. Therefore, the location of the APE and recorded structures should be regarded as approximate. A residence falls within the APE as early as 1866 □□igure □□and is present on the 1880 map as well □□igure 5□. The 1□07 quadrangle □□igure 6□places the residence adjacent to the APE, though the 1□0□ atlas shows the residence, along with an outbuilding within □□igure 7□. Aerial photographs give us the most accurate placement of structures, with the 1□26 aerial revealing the residence adjacent to the APE, and an outbuilding partially within □□igure 8□. This remains the case on the 1□58 aerial □□igure □□, and by 1□66, house □ 7072 Boston □tate Road is present as well □□igure 10□. Erie County tax information indicates that □7072 Boston □tate Road was constructed in 1□66 □Erie County Department of Real Tax □ervices 2023□. The 1□77 aerial □□igure 11□reveals drastic alterations within the APE, as the adjacent residence and outbuilding partially within the APE are no longer present, with only □7072 Boston □tate Road and a small shed visible. By 1□□5 the shed is gone, and a small barn appears north of □7072 Boston □tate Road in the former location of the outbuilding that was partially within the APE. Both of these structures remain extant to date □□igures 12-1□□□iven the presence of □ap Documented □tructures, as well as □7072 Boston □tate Road, it is possible that historic cultural material encountered may be found *in* situ or as the result of secondary deposition. □owever, ground disturbance, as is visible on the 1□7□ aerial photograph □□igure 11□, as well as conditions observed in the field □Appendix II□suggest that portions of the APE have been drastically altered.

Propert□ □ame 1□□□ □ ap □i□ure 4□	Propert□ □ame 1□□□ □ ap □i□ure 5□	Present on 1□7 □uad □i□ure □□	Propert□ □ame 1□□□Atlas □i□ure 7□	Present on 1□2□Aerial P□oto□rap□ □i□ure □□	Present on 1□5□Aerial P□oto□rap□ □i□ure □□	Present on 1□□□Aerial P□oto□rap□ □i□ure 1□□	Present on 1□74 Aerial P□oto□rap□ □i□ure 11□	Present on 1□5-2□1□Aerial P□oto□rap□s □i□ures 12-14□
□. □oag	□. □ester	Present, adjacent to APE	□□. □easter 1 residence 1 outbuilding 1 outbuilding adjacent	1 outbuilding □partially within APE□ 1 residence adjacent	1 outbuilding □partially within APE□ 1 residence adjacent	1 outbuilding □partially within APE□ 1 residence adjacent 1 residence within APE □7072 Bost □tate Road□	□7072 Boston □tate Road 1 □hed	□7072 Boston □tate Road 1 Outbuilding □barn□

Table 5. □ ap Documented □tructures □ ithin and Adjacent to the APE

□igure □ Area of Potential Effect on the 1866 □tone and □tewart *Atlas of Erie County, New York*

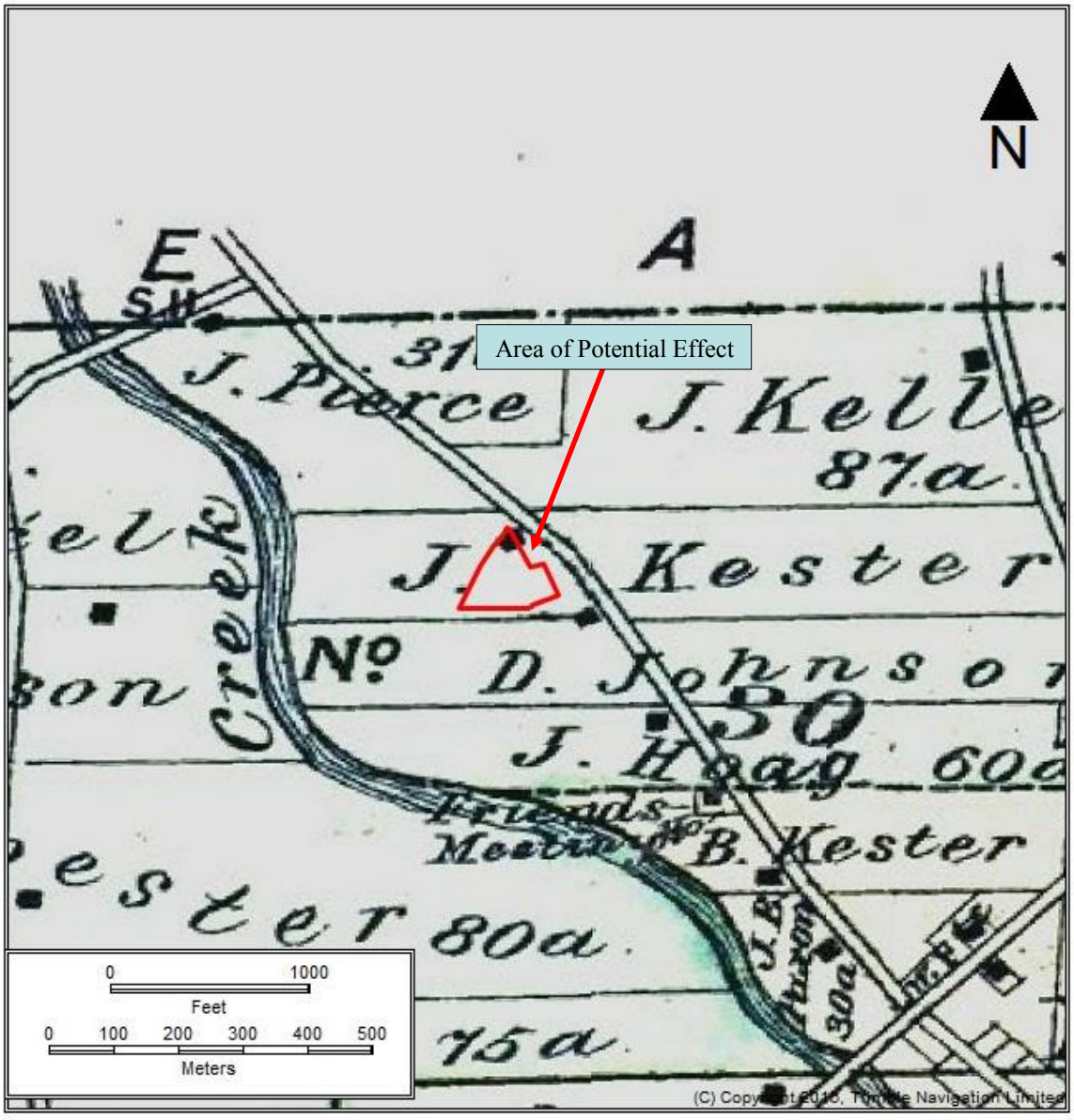
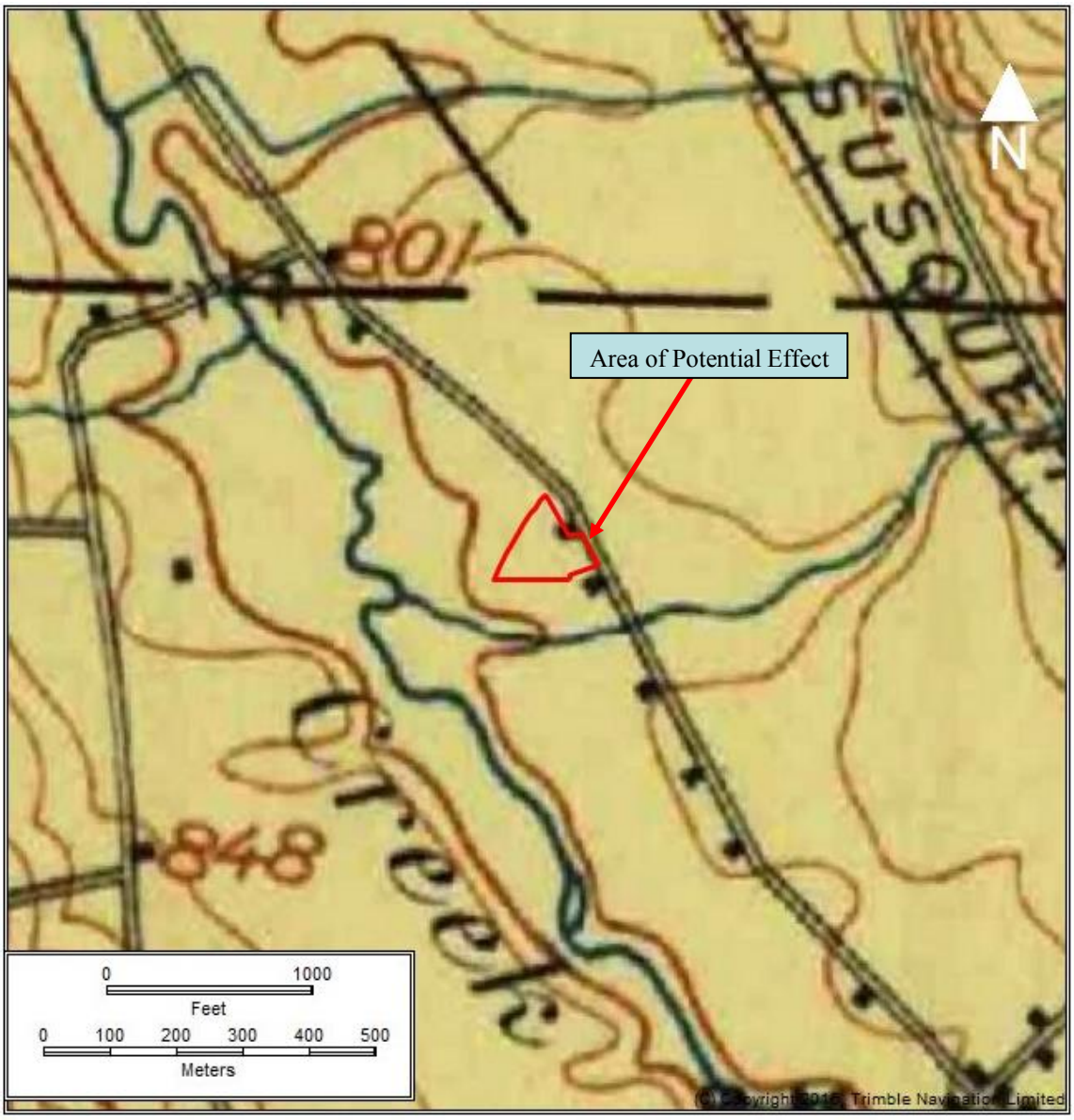
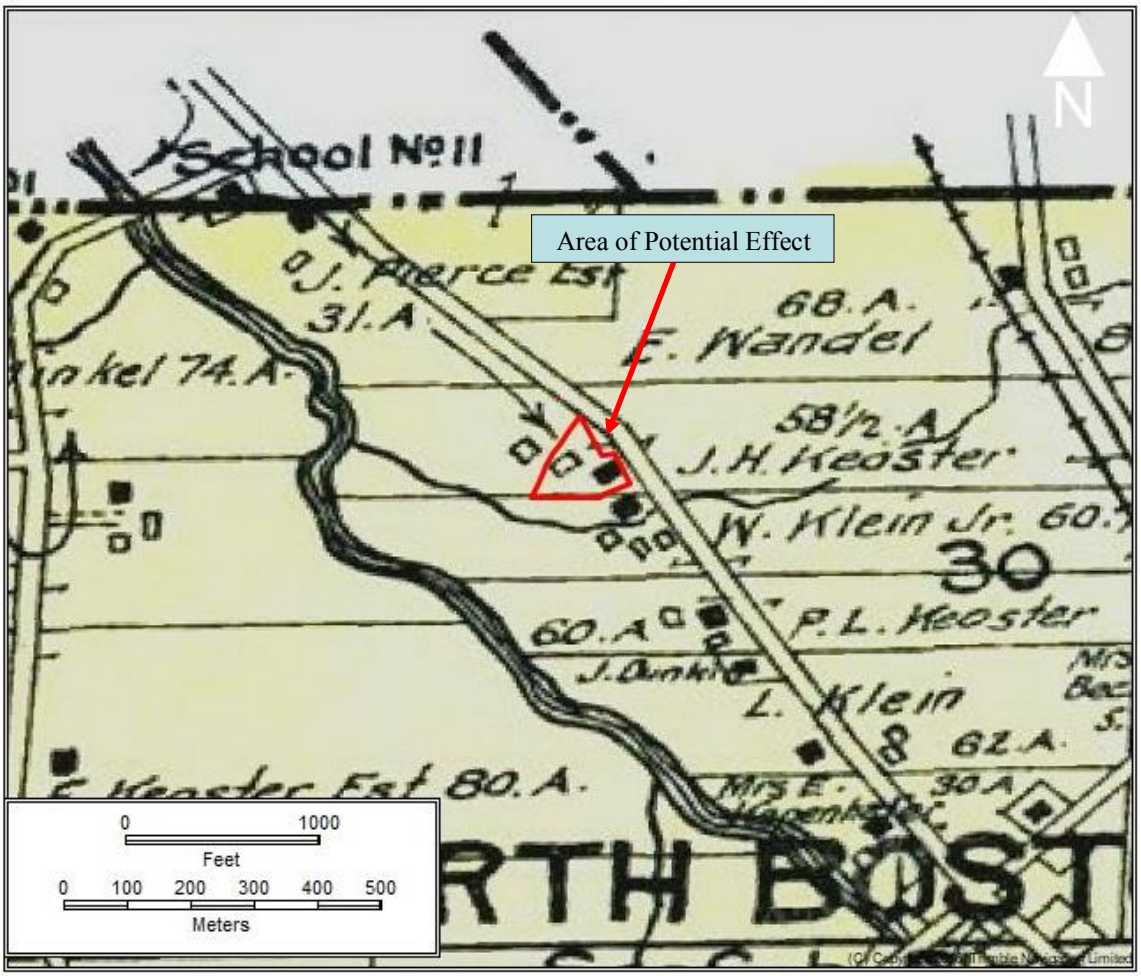


Figure 5. Area of Potential on the 1880 Beers *Atlas of Erie County, New York*

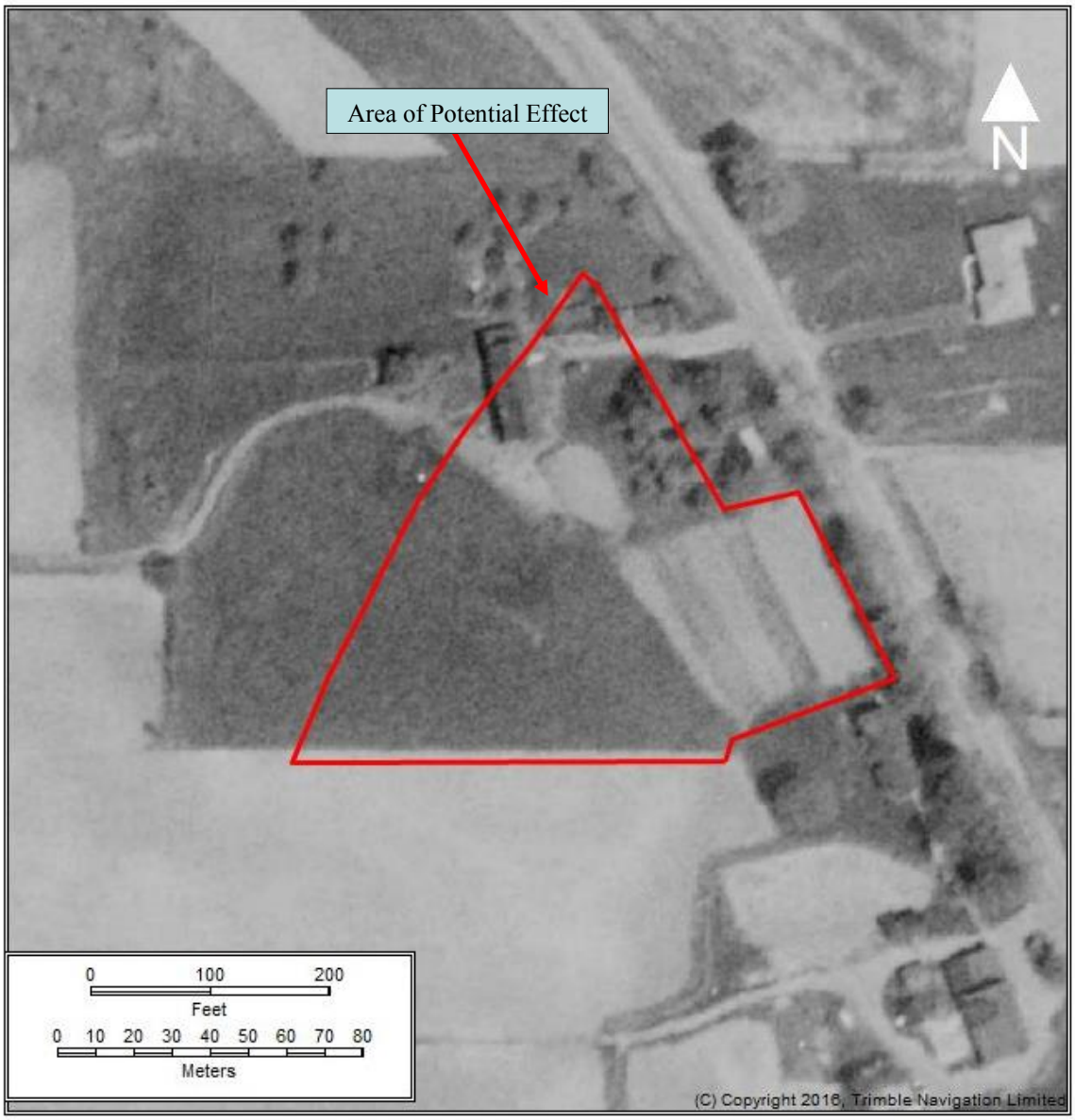


□igure 6. Area of Potential Effect on the 1□07 U□□ □15’ Eden, N.Y. □uadrangle

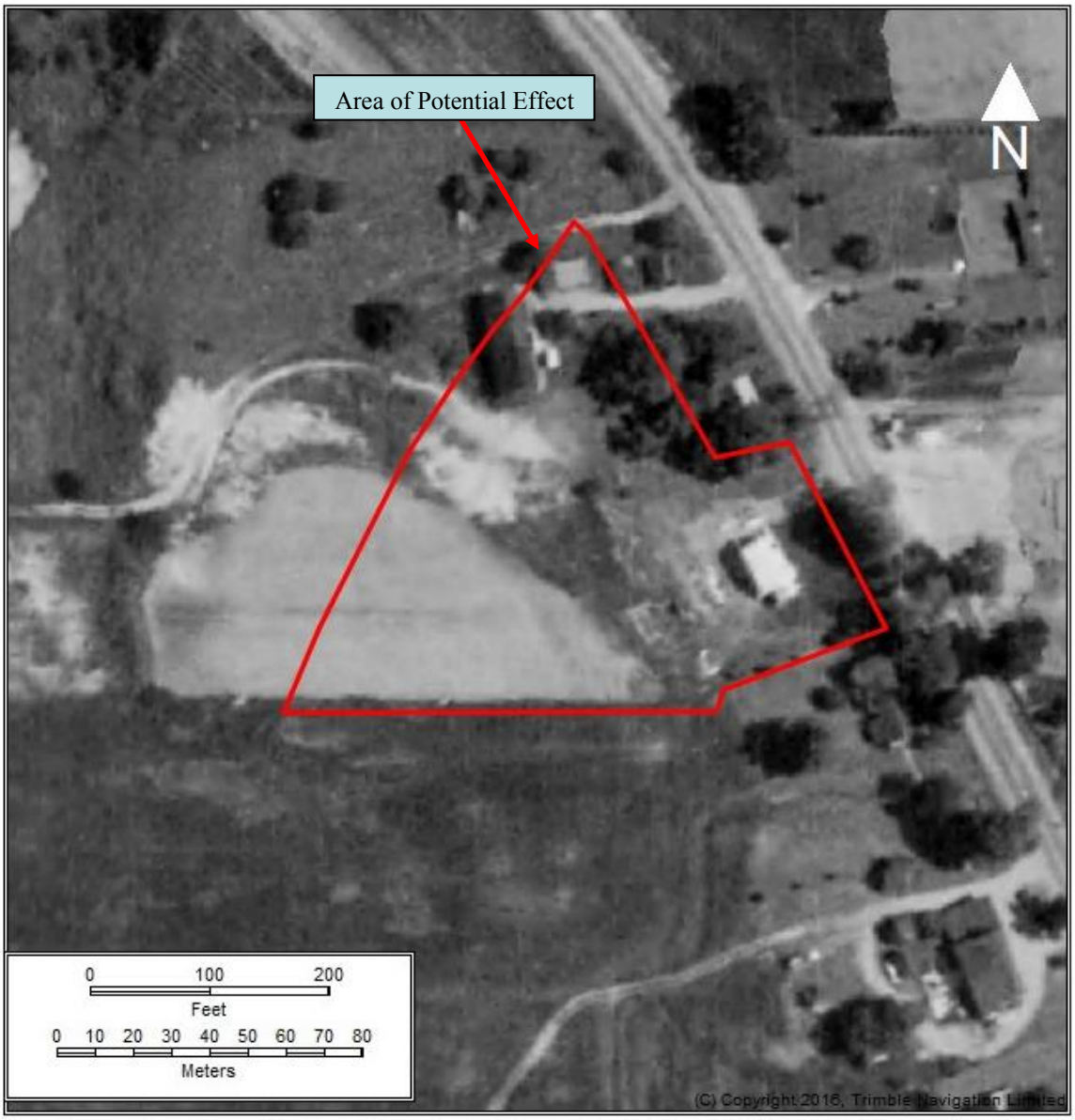


□igure7. Area of Potential Effect on the 1□0□Century □ap Co. *Atlas of Erie County, New York*

□igure 8. Area of Potential Effect on the 1□26 Erie County Public □ or□s - Division of □ighways Aerial Photograph



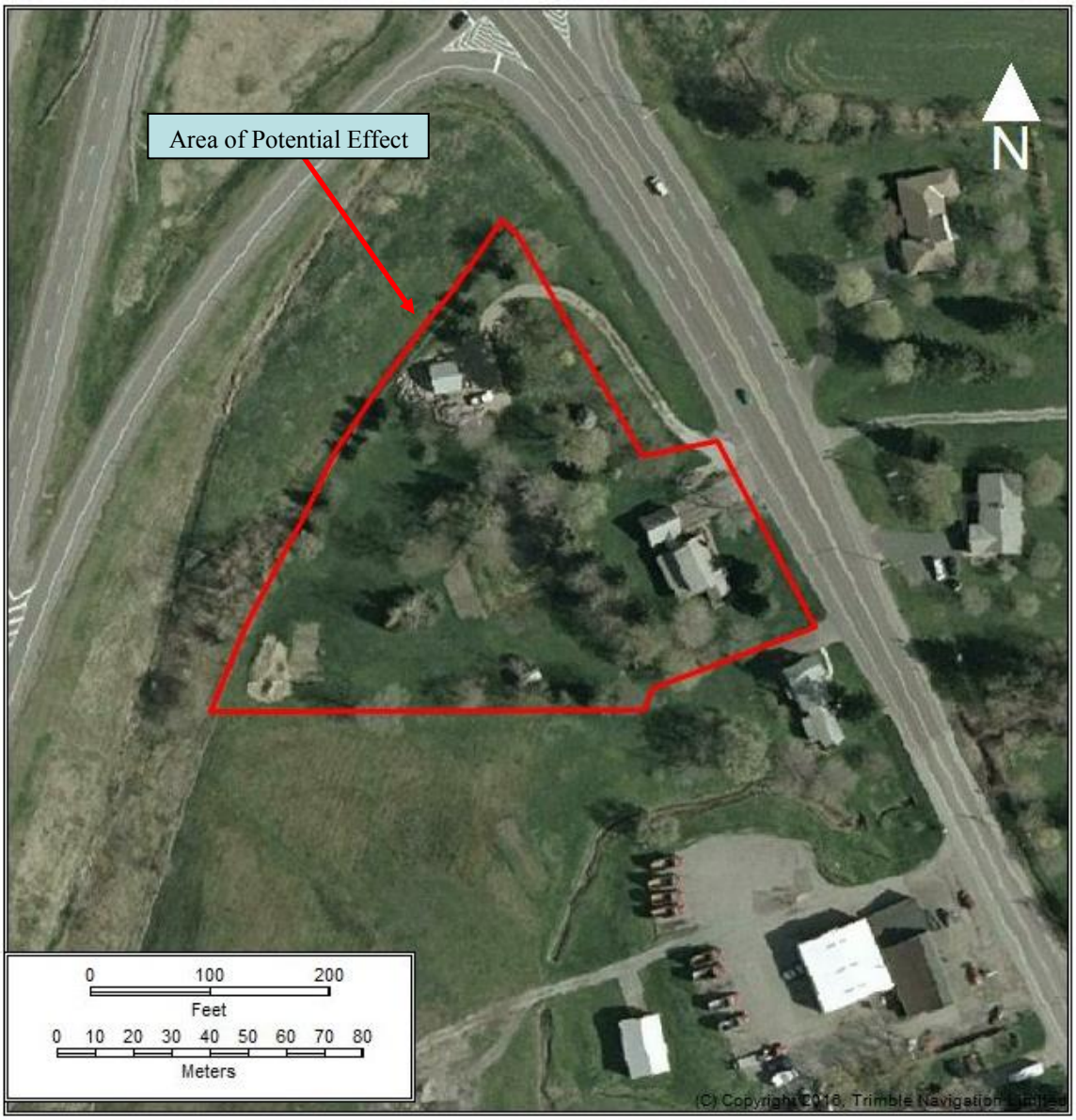
□igure □ Area of Potential Effect on the 1□58 U□DA Aerial Photograph



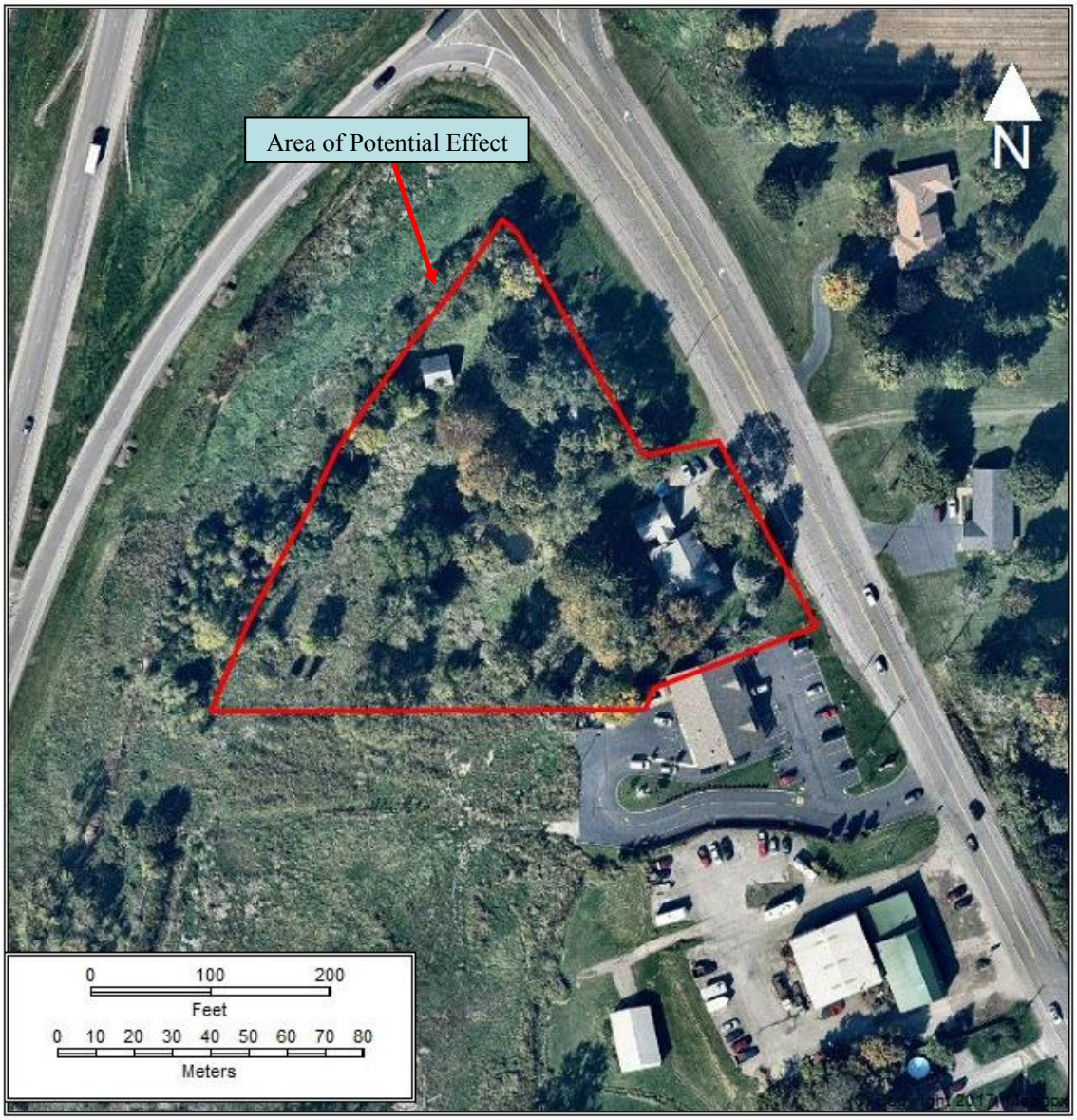
□igure 10. Area of Potential Effect on the 1□66 U□DA Aerial Photograph

□igure 11. Area of Potential Effect on the 1□7□U□□□Aerial Photograph

□igure 12. Area of Potential Effect on the 1□□5 U□□□ Aerial Photograph



□igure 13. Area of Potential Effect on the 2002 U□□□Aerial Photograph



□igure 1□ Area of Potential Effect on the 201□U□□□ Aerial Photograph

□. P□ASE □□ A□□□AE□□□G□□A□ □□□ES□□GA□□□□S

Arc□aeolo□ical Surve□ □eam □□ate
The Powers Archaeology LLC archaeological field team consisted of □ohn □titeler, Paul Powers, Taylor □ alders, Olivia □ ar□ovitz, and □ atthew Bognas□i. The Phase IB testing was conducted in □anuary of 2023.

Ground □onditions
Physical conditions within the APE consists primarily of mowed residential lawn. Areas of disturbance were noted, with gravel present at ground surface, a large gley pile as well as evidence of earth movement within the northern portion of the APE □Appendix II□.

□ield □ et□odolo□□
A site visit included a visual examination of the project area to ascertain whether any sections showed evidence of prior disturbance, wetlands, or excessive slope. A small portion of the APE contained standing water, which was omitted from testing □Appendix I□. This area was not large enough to be considered to have a significant impact on the results of these investigations. The remainder of the APE was deemed testable using standard Phase IB testing methods.

The Phase IB field investigations strategy for this project consisted of shovel testing □Appendices I □ III□. □hovel test placement was determined using project maps provided to Powers Archaeology LLC, research completed during Phase IA investigations, conclusions drawn from geoarchaeological investigations, and conditions observed during the initial field inspection. A total of 62 shovel test units were plotted throughout the APE, with 36 at 50-ft / 15-m intervals. In the location of the □ ap Documented □tructure in the northern section of the APE □Table 5□, the interval was reduced to 25-ft / 7.5-m □n□26□Transects were oriented with a magnetic compass and paced out depending on the project area field conditions. □and-held □P□ units were used to verify accuracy. □hovel tests were excavated by hand and measured a minimum of 1 ft x 1 ft / 30 cm x 30 cm in diameter. Each test was excavated to sterile subsoil or having exceeded 20 in / 50 cm in depth. All soils excavated were screened through 1/□-in metal mesh to recover any cultural material that may have been present. □oil types and textures were recorded in field noteboo□s. Documentation of existing conditions within the APE as well as that of general vicinity was accomplished through photography □Appendix II□.

Arti□act □escriptions
Artifacts were limited to modern trash and a few small bric□ fragments, all of which were discarded.

Pro□lems Encountered
There were no problems encountered during these Phase I excavations.

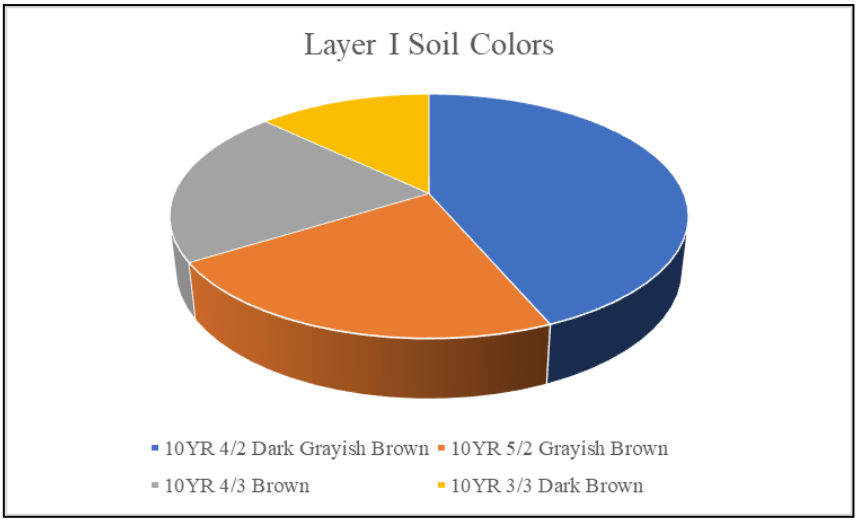
S□ovel □est □esults
The APE was subjected to subsurface testing as part of these Phase I investigations. Ten □10□transects containing a total of 62 shovel tests were placed within the APE □Appendices I and III□. □ hile testing the proposed APE, 5□ □87□ □of the 62 shovel tests excavated reached a second layer. The excavation of 8 □13□ □shovel tests were halted having filled with water, encountering a roc□/ gravel impasse, or having a layer I exceeding 20 in / 50 cm below surface □Appendix III□. □oils encountered in the □TPs were generally those expected as outlined as a typical profile by the *Soil Survey of Erie County* □NRC□ 2022□and during geomorphological investigations □Appendix I□□, though variations were recorded. Other than modern trash and small bric□ fragments, no cultural material was recovered from any of the 62 shovel tests excavated □Appendix III□.

Layer I

Layer I averaged 10 inches / 26 cmbs, with a maximum depth of 25 in / 63 cmbs recorded. □ariations in soil color may be the result of mixed A and B horizons, varying moisture levels within the soil, and disturbance. The following tables summarize soil color and consistency within Layer I □Tables 6 and 7□.

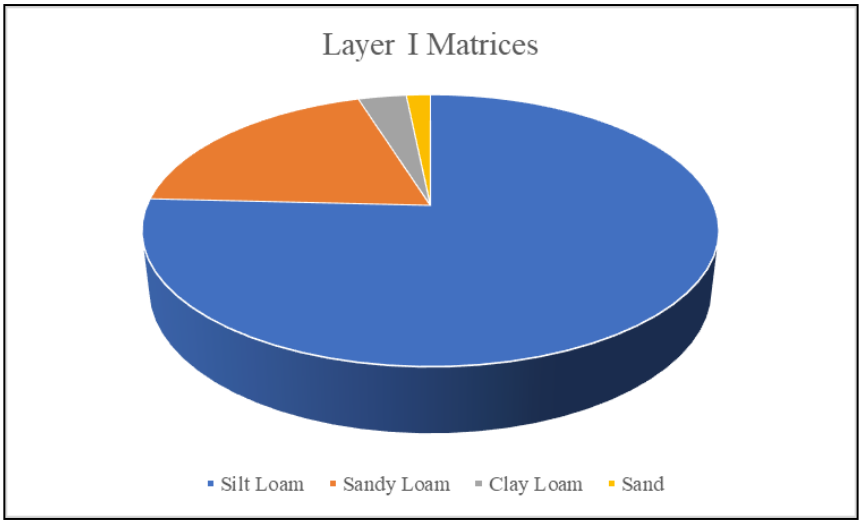
□a□le □. □a□er □Soil □olors

10YR □/2 Dar□ □rayish Brown	□3.55□
10YR 5/2 □rayish Brown	22.58□
10YR □/3 Brown	20.□7□
10YR 3/3 Dar□Brown	12.□0□



□a□le 7. □a□er □Soil □ atrices

□ilt Loam	75.81□
□andy Loam	1□35□
Clay Loam	3.23□
□and	1.61□

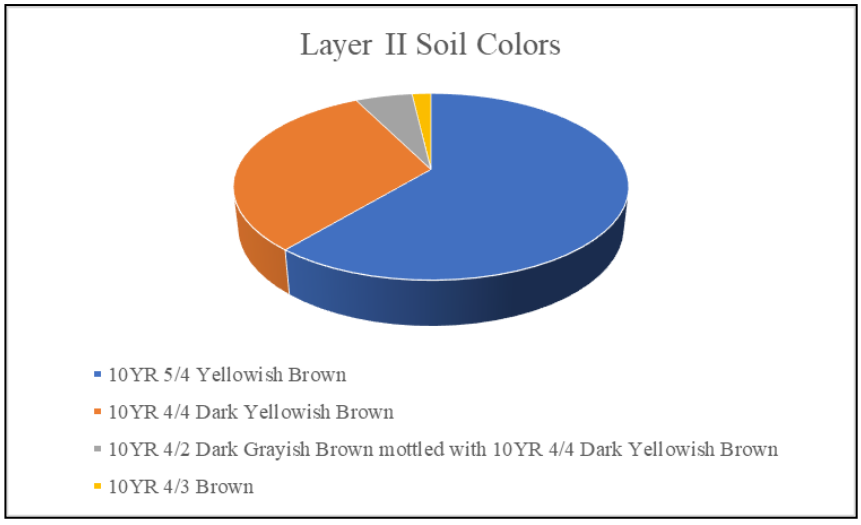


Layer II

Layer II consisted of B horizon soils. Layer II was excavated to an average depth of 20 in / 51 cmbs, with a maximum depth reached of 31 in / 7□cmbs. The following tables summarize soil color and consistency within Layer II □Tables 8 and □□.

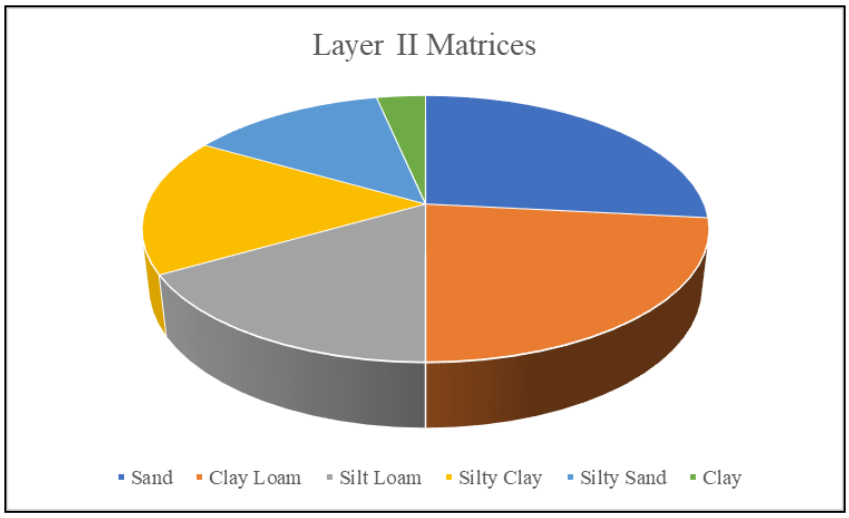
□a□le □. □a□er □□Soil □olors

10YR 5/□ Yellowish Brown	61.11□
10YR □/□ Dar□Yellowish Brown	31.□8□
10YR □/2 Dar□□rayish Brown mottled with 10YR □/□ Dar□Yellowish Brown	5.56□
10YR □/3 Brown	1.85□



□a□le □. □a□er □□Soil □ atrices

□and	1□81□
Clay Loam	12.□6□
□ilt Loam	□26□
□ilty Clay	□26□
□ilty □and	7.□1□
Clay	1.85□



□□. □ES□□□G R E COMM E ND A T □ON S

Phase I Cultural Resource Investigations were performed only for the 2.5 acres / 1.01 hectares that were considered the Area of Potential Effect for the Proposed 7072 Boston □tate Road □ixed Use Development Project. All wor□ was conducted in the Town of Boston, Erie County, New Yor□. □ hile the physiographic context of the APE seems to suggest that Native American habitation was possible, Phase I investigations yielded no evidence of prehistoric occupation. Neither Native American sites nor Euro-American sites were identified within the APE. Therefore, no sites were designated. Consequently, Powers Archaeology LLC believe that current development plans should be allowed to proceed, and that no further archaeological wor□ is warranted.

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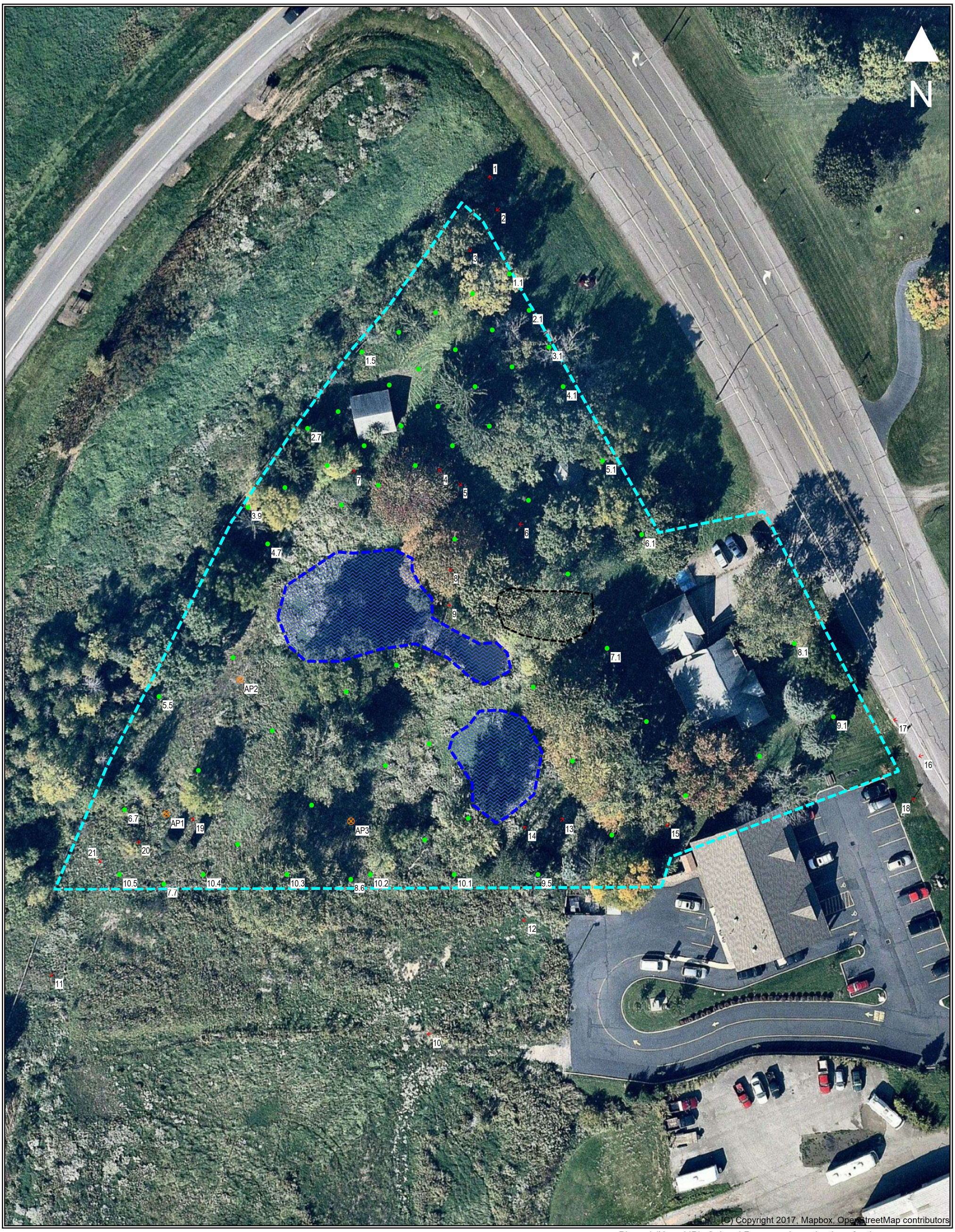
Appendix I
Project Maps



0 10 20 30 40 50 60 70 80 90
Feet

0 10 20
Meters

Legend:

- APE Boundary
- Standing Water
- Gley
- Photograph Angle
- Geomorphologoical Auger Test
- Negative Shovel Test

Phase I (IA and IB) Cultural Resource Investigations for the Proposed 7072 Boston State Road Mixed Use Development Project, Town of Boston, Erie County, New York

MAP #1
Phase I Project Map on the
2019 USGS Aerial Photograph

N

Hamburg Springville Rd

Hamburg Springville Rd

Hamburg Springville Rd

1 2 3 1.1 2.1 3.1 4.1 5.1 6.1 7.1 8.1 9.1 1.5 2.7 3.9 4.7 5.5 6.7 7.7 8.6 9.5 10.1 10.2 10.3 10.4 10.5 AP1 AP2 AP3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

(C) Copyright 2017, Mapbox, OpenStreetMap contributors

0 10 20 30 40 50 60 70 80 90
Feet

0 10 20
Meters

Legend:

- APE Boundary
- Standing Water
- Gley
- Photograph Angle
- Geomorphologoical Auger Test
- Negative Shovel Test

Phase I (IA and IB) Cultural Resource Investigations for the Proposed 7072 Boston State Road Mixed Use Development Project, Town of Boston, Erie County, New York

MAP #2
Phase I Project Map on the
Terrain Navigator Pro Base Map

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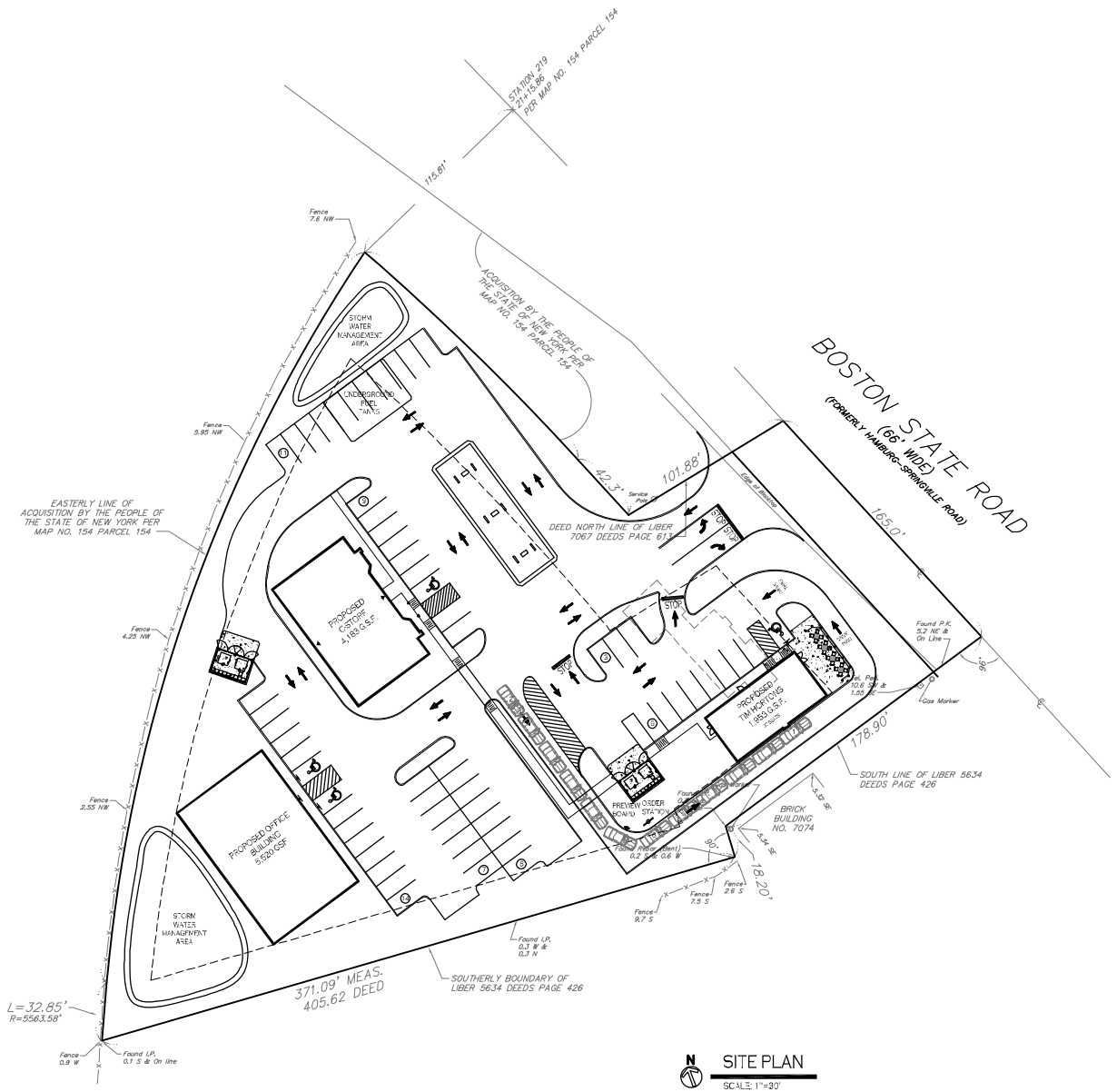


N

SITE PLAN

SCALE: 1"=30'

SITE DATA		
SITE AREA = 2.6± AC		
ZONED: C1 - LOCAL RETAIL BUSINESS DISTRICT		
DESCRIPTION: 1,853 SF RESTAURANT BLDG., 5,520 SF OFFICE		
BLDG., 4,183 SF C-STORE W/FUEL PUMPS		
SETBACKS - BUILDING	REQUIRED	PROVIDED
"FRONT"	50 FT.	>50 FT
SIDE (ABUTTING COMM'L)	0 FT OR 15 FT *	>30 FT
SIDE (ABUTTING RES.)	20 FT OR HGT. OF BLDG.	100 FT MIN.
REAR	30 FT OR HGT. OF BLDG.	>50 FT
SETBACKS - PARKING		
"FRONT"	20 FT	50 FT MIN.
SIDE/REAR (ABUTTING COMM'L)	NONE	25 FT MIN.
SIDE/REAR (ABUTTING RES.)	10 FT	45 FT MIN.
GREEN SPACE		
TOTAL SITE	NONE	X.X AC (XX%)
PARKING (10' x 20')		
# OF SPACES - SEE CALCULATION BELOW	61	61
MAX. BUILDING HEIGHT	35 FT	<35 FT
"LOT" COVERAGE	40% (45,560 SF)	10.7% (*7,856 SF)

* 25 FT IS USED FOR VEHICULAR INGRESS OR EGRESS

PARKING CALCULATIONS:
"SITE WIDE"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 4,183 GSF / 200 = 21 SPACES

"RESTAURANT"
REQ'D PARKING = 2 SPACES PER 5 SEATS
= (60 SEATS / 5) x 2 = 12 SPACES

"OFFICE"
REQ'D PARKING = 1 SPACE PER 200 GSF
= 5,520 GSF / 200 = 28 SPACES

TOTAL = 61 SPACES

NOTE: BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY OTHERS. CARMINA WOOD DESIGN ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY.

30' 30 0 30 60FT

CARMINA WOOD DESIGN
171 Elm Street, Suite 103
Buffalo, New York 14203
Phone: (716) 937-4089
487 Main Street, Suite 500
Buffalo, New York 14203
Phone: (716) 842-1165

Mixed Use Development

7072 Boston State Road
Boston, New York
SBL No.

REVISIONS:
No. Description Date

PRELIMINARY
NOT FOR CONSTRUCTION

Sheet No. 10.XX.XXXX

DRAWING NAME:
Concept Site Plan

Date: 08.24.22
Drawn By: C. Wood
Scale: As Noted

DRAWING NO.
C-100

Project No: 22.XXX

Appendix II
Project Area Photographs

Photograph 1. General project vicinity north of the APE including Boston State Road, NYS Route 219, and ramp, looking north / northwest.

Photograph 2. APE from the northernmost point, looking west / southwest.

Photograph 3. APE and vicinity east, including former location of adjacent house (Figures 6, 8-10), from the northernmost point, looking south / southeast.

Photograph 4. Extant barn (post 1974) within the APE, looking northwest.

Photograph 5. APE, looking southeast.

Photograph 6. Extant shed within the APE, looking west.

Photograph 7. South side of extant barn, including gravel fill on surface, looking east / northeast.

Photograph 8. APE at base of short steep slope including standing water, looking west / southwest.

Photograph 9. Large pile of gley within the APE, looking east.

Photograph 10. Sewer location south of the APE, looking west.

Photograph 11. Sewer location south of the APE, looking south / southwest.

Photograph 12. General project vicinity south of the APE, looking southwest.

Photograph 13. APE, slope, and rear of house # 7022 Boston State Road, looking northeast.

Photograph 14. APE from southern boundary, including standing water and gley, looking north / northwest.

Photograph 15. APE and decorative pond, looking southwest.

Photograph 16. Southern boundary of the APE from Boston State Road, looking west / southwest.

Photograph 17. House # 7072 Boston State Road, looking west / northwest.

Photograph 18. APE and Boston State Road, looking north / northwest.

Photograph 19. APE from the southwest corner, looking north / northeast.

Photograph 20. APE from the southwest corner, looking east / northeast.

Photograph 21. APE and general vicinity south including push piles associated with adjacent sewer, looking east / southeast.

Appendix III
Shovel Test Data

Trans	Shovel Test	Level	Depth Below Surface (CM)	Soil Color	Soil Matrix (Primary)	Soil Matrix (Secondary)	Artifacts Recovered	Comments
1	1	I	13	Dark Brown	Silt Loam	Gravel	No Cultural Material (NCM)	
1	1	II	28	Brown	Silty Sand	Heavy Gravel & Asphalt	NCM	Fill
1	2	I	18	Dark Brown	Sandy Loam	Gravel	2 minute brick fragments - discarded	
1	2	II	31	Yellowish Brown	Sand	Heavy Gravel	NCM	Fill
1	3	I	23	Dark Brown	Sandy Loam	Heavy Gravel	NCM	Rock Impasse (Fill)
1	4	I	17	Dark Brown	Sandy Loam	Gravel & Rocks	NCM	Rock Impasse
1	5	I	52	Grayish Brown	Silt Loam	Gravel & Rocks	NCM	Rock Impasse
2	1	I	17	Brown	Silt Loam		NCM	
2	1	II	40	Yellowish Brown	Silt Loam		NCM	
2	2	I	6	Dark Grayish Brown	Sandy Loam	Gravel & Roots	NCM	Root Impasse
2	3	I	20	Dark Grayish Brown	Sandy Loam	Gravel	NCM	
2	3	II	54	Yellowish Brown	Sand	Gravel	NCM	
2	5	I	63	Dark Grayish Brown mixed with Yellowish Brown	Sandy Loam	Heavy Gravel	NCM	
2	6	I	18	Brown	Sandy Loam	Gravel	NCM	
2	6	II	45	Yellowish Brown	Sand	Gravel	NCM	
2	7	I	32	Grayish Brown	Silt Loam	Gravel	NCM	
2	7	II	49	Yellowish Brown	Silt Loam		NCM	
3	1	I	34	Dark Brown	Silt Loam		NCM	
3	1	II	50	Yellowish Brown	Silt Loam		NCM	
3	2	I	17	Dark Grayish Brown	Sandy Loam	Gravel	NCM	
3	2	II	50	Yellowish Brown	Sand	Gravel	NCM	
3	3	I	11	Dark Grayish Brown	Sand	Gravel	NCM	
3	3	II	52	Yellowish Brown	Sand	Gravel	NCM	
3	4	I	22	Brown	Silt Loam		Brick fragments - discarded	
3	4	II	45	Yellowish Brown	Silt Loam		NCM	
3	5	I	31	Dark Grayish Brown	Silt Loam	Heavy Gravel	Plastic Sheeting - discarded	
3	5	II	43	Yellowish Brown	Silty Clay	Gravel	NCM	
3	6	I	25	Dark Grayish Brown	Silt Loam	Heavy Gravel	NCM	
3	6	II	42	Yellowish Brown	Silty Clay	Gravel	NCM	
3	7	I	23	Dark Grayish Brown	Silt Loam	Heavy Gravel	NCM	
3	7	II	47	Yellowish Brown	Silty Clay	Heavy Gravel	NCM	
3	8	I	26	Dark Grayish Brown	Silt Loam		NCM	
3	8	II	42	Yellowish Brown	Silty Clay		NCM	

Trans	Shovel Test	Level	Depth Below Surface (CM)	Soil Color	Soil Matrix (Primary)	Soil Matrix (Secondary)	Artifacts Recovered	Comments
3	9	I	28	Dark Grayish Brown	Silt Loam		NCM	
3	9	II	34	Yellowish Brown	Silty Clay		NCM	
4	1	I	18	Grayish Brown	Silt Loam	Gravel	NCM	
4	1	II	34	Yellowish Brown	Sandy Loam		NCM	
4	2	I	22	Grayish Brown	Silt Loam	Gravel	NCM	
4	2	II	32	Yellowish Brown	Sandy Loam		NCM	
4	3	I	16	Brown	Silt Loam	Gravel	NCM	
4	3	II	31	Yellowish Brown	Silty Sand	Gravel	NCM	
4	4	I	11	Brown	Silt Loam	Gravel	NCM	
4	4	II	45	Yellowish Brown	Silty Sand	Gravel	NCM	
4	5	I	13	Dark Brown	Silt Loam	Gravel	NCM	Gravel Impasse
4	6	I	14	Brown	Silt Loam	Gravel	NCM	
4	6	II	39	Yellowish Brown	Silty Sand	Gravel	NCM	
4	7	I	12	Grayish Brown	Silt Loam		NCM	
4	7	II	26	Pale Brown	Clay Loam		NCM	Filled with water
5	1	I	27	Dark Grayish Brown	Silt Loam	Gravel	NCM	
5	1	II	43	Yellowish Brown	Sandy Loam	Gravel	NCM	
5	2	I	8	Grayish Brown	Silt Loam		NCM	
5	2	II	53	Pale Brown	Silt Loam	Gravel	1 Cigarette Filter (Discarded)	
5	3	I	13	Dark Grayish Brown	Silt Loam	Gravel	NCM	
5	3	II	24	Dark Yellowish Brown	Sand	Heavy Gravel	NCM	
5	4	I	21	Grayish Brown	Silt Loam		NCM	
5	4	II	37	Pale Brown	Clay Loam		NCM	
5	5	I	32	Dark Grayish Brown	Silt Loam		NCM	
5	5	II	79	Yellowish Brown	Sandy Loam		NCM	
6	1	I	16	Dark Brown	Silt Loam		NCM	
6	1	II	31	Dark Yellowish Brown	Sandy Loam		NCM	
6	2	I	24	Grayish Brown	Sandy Loam	Gravel	NCM	
6	2	II	50	Dark Yellowish Brown	Sandy Loam		NCM	
6	3	I	63	Dark Grayish Brown	Silt Loam		NCM	
6	4	I	28	Brown	Sandy Loam		NCM	
6	4	II	56	Yellowish Brown	Sandy Loam		NCM	
6	5	I	22	Brown	Sandy Loam		NCM	
6	5	II	60	Yellowish Brown	Sand	Gravel	NCM	
6	6	I	32	Brown	Silt Loam		NCM	
6	6	II	75	Yellowish Brown	Sandy Loam		NCM	
6	7	I	36	Brown	Silt Loam		NCM	
6	7	II	78	Yellowish Brown	Sandy Loam		NCM	
7	1	I	26	Brown	Silt Loam		NCM	
7	1	II	40	Yellowish Brown	Sandy Loam		NCM	
7	2	I	5	Dark Grayish Brown	Silt Loam		NCM	Filled with Water
7	3	I	26	Brown	Sandy Loam		NCM	
7	3	II	41	Yellowish Brown	Sandy Loam		NCM	
7	4	I	25	Grayish Brown	Silt Loam		NCM	
7	4	II	68	Dark Yellowish Brown	Sandy Loam		NCM	
7	5	I	28	Dark Grayish Brown	Silt Loam		NCM	
7	5	II	68	Dark Yellowish Brown	Sandy Loam		NCM	
7	6	I	33	Dark Grayish Brown	Silt Loam		NCM	
7	6	II	74	Dark Yellowish Brown	Sandy Loam		NCM	
7	7	I	32	Dark Grayish Brown	Silt Loam		NCM	

Trans	Shovel Test	Level	Depth Below Surface (CM)	Soil Color	Soil Matrix (Primary)	Soil Matrix (Secondary)	Artifacts Recovered	Comments
7	7	II	70	Dark Yellowish Brown	Sandy Loam		NCM	
8	1	I	43	Grayish Brown	Silt Loam		NCM	
8	1	II	54	Yellowish Brown	Clay Loam		NCM	
8	2	I	38	Grayish Brown	Silt Loam		NCM	
8	2	II	50	Yellowish Brown	Clay Loam		NCM	
8	3	I	33	Grayish Brown	Silt Loam		NCM	
8	3	II	75	Yellowish Brown	Sandy Loam		NCM	
8	4	I	35	Dark Grayish Brown	Silt Loam		NCM	
8	4	II	52	Dark Yellowish Brown	Sandy Loam		NCM	
8	5	I	38	Dark Grayish Brown	Silt Loam		NCM	
8	5	II	73	Dark Yellowish Brown	Sandy Loam		NCM	
8	6	I	32	Dark Grayish Brown	Silt Loam		NCM	
8	6	II	70	Dark Yellowish Brown	Sandy Loam		NCM	
9	1	I	36	Grayish Brown	Clay Loam		NCM	
9	1	II	50	Yellowish Brown	Clay Loam		NCM	
9	2	I	32	Grayish Brown	Clay Loam		NCM	
9	2	II	42	Yellowish Brown	Clay Loam		NCM	
9	3	I	35	Dark Grayish Brown	Silt Loam		NCM	
9	3	II	49	Yellowish Brown	Clay Loam		NCM	
9	4	I	25	Dark Grayish Brown	Silt Loam		NCM	
9	4	II	51	Dark Yellowish Brown	Sandy Loam		NCM	
9	5	I	13	Brown	Silt Loam	Gravel Fill	NCM	
9	5	II	33	Dark Yellowish Brown	Clay	Gravel Fill	NCM	
10	1	I	27	Dark Grayish Brown	Silt Loam		NCM	
10	1	II	65	Dark Yellowish Brown	Sandy Loam		NCM	
10	2	I	35	Dark Grayish Brown	Silt Loam		NCM	
10	2	II	71	Dark Yellowish Brown	Sandy Loam		NCM	
10	3	I	28	Dark Grayish Brown	Silt Loam		NCM	
10	3	II	74	Dark Yellowish Brown	Sand		NCM	
10	4	I	33	Dark Grayish Brown	Silt Loam		NCM	
10	4	II	72	Dark Yellowish Brown	Sandy Loam		NCM	
10	5	I	35	Dark Grayish Brown	Silt Loam		NCM	
10	5	II	73	Dark Yellowish Brown	Sandy Loam		NCM	

Appendix IV
Report of Soils and Geomorphology Study

Report of Soils and Geomorphology Study
Conducted as an Adjunct to Phase I Archaeological Investigation,
7072 Boston Road Mixed Use Project
Town of Boston
Erie County, New York

John M. Stiteler
Soil Scientist
Newfield, New York
stitelerjohn@gmail.com

Submitted February 1, 2023

On January 13, 2022 a study of the soils and geomorphology was conducted at the site of a proposed commercial development project in the Town of Boston, Erie County, New York. The purpose of the investigation, conducted at the behest of Powers Archaeology LLC, was to determine the potential for the presence of intact, in-situ cultural material within alluvial or colluvial deposits in the area of potential effect (APE) of the proposed project area. In this report, reference is made both to the APE and to the study area. "APE" refers to the area where design plans call for cutting, filling, and other construction-related disturbance. "Study area" refers to the broader context – essentially the viewscape as seen from the proposed construction site – and includes landforms that extend outside of the APE, e.g., surrounding slopes that might contribute run-off and colluvium.

The study area is situated on the right bank of Eighteen Mile Creek in the Erie-Ontario Lowlands physiographic province. The landscape is in part a product of differential erosion of bedrock of varying resistance but is dominated by the visible evidence of glacial erosion and deposition, including large areas of glaciolacustrine deposition. The ice sheets of at least three – and probably more – episodes of continental glaciation advanced over and then receded from western New York over the course of the last 2,000,000 years (the Pleistocene epoch). The last of these ice advances, the roughly 1.5-2.0 km thick ice sheet of the Wisconsinan glaciation, covered northern New York until 11,000-12,000 years ago.

As the ice front receded north of the Buffalo area during final recession of the Wisconsinan ice sheet, glacial meltwater was impounded south of the ice front. The impounded water body is known by several names, reflecting various stages of its development. The initial stage, Glacial Lake Maumee, formed as meltwater from the wasting Huron-Erie Lobe of the Laurentide ice sheet filled low-lying terrain in what is now the western end of the Erie Basin. Ongoing recession of the Huron-Erie lobe resulted in expansion of the water body, stages of which are designated Glacial Lake Arkona and Glacial Lake Whittlesey. By around 12,500 years before present (BP) glacial ice was gone from the current study area, replaced by the sediment-rich meltwater of Glacial Lake Whittlesey. Ongoing ice recession over the next millennium opened the low-lying terrain to the northeast, resulting in the formation of Glacial Lake Iroquois in the current Lake Ontario basin. Drainage from Glacial Lake Iroquois via the ice-free St. Lawrence Valley resulted in decreased volume, forming a lake with more or less the form of modern Lake Ontario and exposing peripheral areas, including the current study area. The resultant exposed lake plain is a region of low relief,

covered by a drape of fine-textured (clay to fine sand) glaciolacustrine sediment. Incision of these sediments by streams and rivers over the course of the Holocene has produced much of the relief seen today, although some low bedrock-supported uplands are also present. Mapping of surficial geology by Cadwell and others identifies the surficial deposits of the APE and broader study area as "lsc" – lacustrine silt and clay deposited in proglacial lakes (Cadwell et al. 1989). Because the study area lies near the eastern shoreline of Glacial Lake Whittlesey, the lacustrine sediments include sand and gravel introduced to the lake by streams draining areas to the south and east, as well as gravel deposited by post-glacial streams flowing from uplands to the northeast.

The study area and the APE itself exhibit the low relief typical of a lake plain. The majority of the APE is maintained as lawn and lies adjacent to a fallow field. The highly meandering channel of Eighteen Mile Creek lies 100 m west of the APE. The channel is incised 2.0 to 2.5 m below its floodplain, which is confined largely to the left bank along this reach. Two landforms are present within the APE. The western half of the APE lies on the distal portion of a broad area shallowly incised into the glacial lakebed by ancestral Eighteen Mile Creek soon after lake drainage. This surface slopes very gently toward the channel and the distal edge, where the APE is located, lies 5 m above the channel. The eastern edge of the incised area is clearly demarcated by a riser of 1.5 to 2.0 m; the eastern half of the APE is located on this higher surface, part of the former lake plain.

Soils of the APE, as mapped by the USDA-NRCS, include Allard silt loam, 3-8% slopes in the lower western area and Varysburg gravelly loam, 3-8% slopes in the higher eastern half (Soil Survey Staff 2023).

The Allard series consists of very deep, well drained soils formed in silty alluvium or lacustrine deposits that overlie stratified sand and gravel. They are on outwash terraces and stream terraces. A typical Allard series profile consists of an Ap/Bw1/Bw2/Bw3/2C1/2C2 sequence. Thickness of the solum (combined A and B horizons) ranges from 50 to 90 cm (20 to 36 in). The horizons of the solum are generally silt loam with a gravel content of 0-5%. The 2C horizons are gravelly sand to loamy sand. The Varysburg series consists of very deep, well drained and moderately well drained soils on dissected lake plains. They are nearly level to steep soils formed in gravelly outwash material and the underlying clayey lacustrine sediments. A typical Varysburg series profile consists of an Ap/AB/(B/E)/Bt1/2Bt2/2Bt3/2C sequence. Thickness of the solum ranges from 86 to 125 cm (35 to 50 in). The horizons of the solum are gravelly to very gravelly

loam with a gravel content of 10-65%. The 2B and 2C horizons are silt and clay lake floor sediments. (All descriptions from Soil Survey Staff 2023).

Fieldwork for this study consisted of a walkover of the entire APE, followed by excavation of three bucket auger probes (AP1-AP3) and description of the resulting profiles. All probes were carried out on the lower western portion, where soils are mapped as the Allard soil series. The probes were conducted using a hand-operated auger with a 10 cm diameter bucket and were carried out to the point of auger refusal. The soil profiles of the probes were described using standard field parameters (Munsell color, texture, structure, rock fragment content, redoximorphic features, etc.). Particular attention was paid to those characteristics pertinent to archaeological potential of the study area (e.g., presence of buried stable surfaces, relative age of the sediments, depositional dynamics, etc.).

AP1 was located at the western end of the triangular APE, approximately 100 m east of the Eighteen Mile Creek channel. As noted previously, the surface there lies approximately 5 m above mean low water in the channel. The profile, to auger refusal at 70 cm (28 inches) below surface (bs) consisted of an Ap/AB/Bw1/Bw2 sequence. The Ap horizon, to 30 cm (12 inches) bs, was very dark grayish brown (10YR3/2) silt loam, free of gravel. The AB horizon, from 30-45 cm (12-18 inches) bs, was dark brown (10YR3/3) silt loam, free of gravel. The Bw1 horizon, from 45 cm to 55 cm bs (18-22 inches bs), was dark yellowish brown (10YR4/6) silt loam containing no gravel and exhibiting weak medium subangular blocky structure. The Bw2 horizon, from 55 cm bs to auger refusal on gravel at 70 cm bs (22 to 28 inches bs), was dark yellowish brown (10YR3/4) sandy loam containing 3-5% rounded fine and medium gravel.

AP2 was located approximately 100 feet NE of AP1 and approximately 150 feet from the base of the riser to the higher lake plain surface. The profile consisted of an Ap/Bw sequence to refusal on gravel at 43 cm bs. Rounded gravel was present throughout the profile, constituting 2-3% of the silt loam Ap horizon and 8-10% of the coarse silt loam Bw horizon, then increasing sharply at 43 cm bs.

AP3 was located 35 m (115 feet) south of AP2 and 35 m (115 feet) east of AP1. The profile was similar to that of AP1, consisting of an Ap/Bw1/Bw2 sequence to auger refusal on gravel at 70 cm (28 inches) bs. The Ap and Bw1 horizons were silt loam free of gravel, as seen in AP1. The 2Bw2 horizon was sandy loam containing a small amount of fine rounded gravel; gravel content in the soil increased sharply at 70 cm bs.

Interpretation and discussion – The APE for this project is situated on the incised lake plain of Glacial Lake Whittlesey, east of modern Lake Erie. The entire APE lies on sediment which settled out on the floor of the proglacial lake before its drainage. The lower western portion of the study area was downcut by ancestral Eighteen Mile Creek soon after drainage of Lake Whittlesey but within the APE the incision was relatively shallow. It appears that the ancestral stream initially moved back and forth across a relatively broad area. Over time, the lateral movement became more restricted, resulting in the greatest incision being confined to the modern meander belt-floodplain complex seen today a hundred meters west of the APE. The channel is incised to sufficient depth that overbank flooding would now reach the western part of the APE only during the most cataclysmic floods. This was probably the case for much of the Holocene. The higher eastern half of the APE has almost certainly not been inundated by floodwaters within the Holocene.

In the lower western half of the APE, a thin cap of silty to fine sandy overbank alluvium from Eighteen Mile Creek overlies gravelly glaciofluvial deposits. The low- to moderate-energy overbank alluvium of the Ap, Bw1, and Bw2 horizons (generally to 50-70 cm or 20 to 28 inches bs) appears to be of Early through Middle Holocene age and has the potential to contain prehistoric cultural material. The underlying gravelly glaciofluvial material does not have any potential to contain cultural material.

In the higher eastern half of the APE all potential for the presence of cultural material is confined to the Ap horizon, generally the upper 30 cm (12 inches) of the profile. As noted previously, soils of this area are mapped by the USDA-NRCS as Varysburg gravelly loam. The face of the riser along the western limit of this area has been graded and stripped of grass, revealing a very gravelly profile. The area mapped as the Varysburg series forms a long, linear polygon extending north and south of the APE along the western boundary of the un-incised lake plain. Concentration of gravel in this area may be the product of a high energy flow during the last stage of drainage of Lake Whittlesey, with both water and gravelly sediment being introduced to the valley bottom by the many streams draining uplands to the south and east of the study area. These gravelly sediments have been in place and stable since shortly after lake drainage at around the Pleistocene-Holocene boundary. Higher gravel content in the solum of AP2 than seen in AP1 or AP3 probably reflects its proximity to this gravel-rich area and reworking of gravel from the riser face by Eighteen Mile Creek.

John M. Stiteler

Soil scientist

Newfield, New York

February 1, 2023

References:

Cadwell, D.H. et al. 1989. Surficial Geologic Map of New York: Niagara Sheet. Map and Chart Series No. 40. New York State Museum – Geologic Survey.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture 2023. Web Soil Survey [Online WWW]. Available URL: "http://soils.usda.gov/technical/classification/osd/index.html"

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either "Yes" or "No". If the answer to the initial question is "Yes", complete the sub-questions that follow. If the answer to the initial question is "No", proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the applicant or project sponsor to verify that the information contained in Part 1is accurate and complete.

A. Project and Applicant/Sponsor Information.

Name of Action or Project: Proposed Commercial Mixed Use Project		
Project Location (describe, and attach a general location map): 7072 Boston State Road - Town of Boston - Erie County		
Brief Description of Proposed Action (include purpose or need): Construction of a proposed commercial mixed use project which includes a 5,183 sq. ft. convenience store with fuel and a Tim Horton's with an accessory drive-through facility, a 5,000 sf office building and all other proposed site improvements as depicted on the engineered plans prepared by Carmina Wood Design. The existing structure on Project Site will be demolished. The Project Site is properly zoned C-1 Local Retail Business District. The proposed action has been defined broadly to include all required discretionary approvals and permits from governmental agencies as well as all proposed site improvements. The project is an Unlisted Action pursuant to SEQRA and will not result in any potentially significant adverse environmental impacts.		
Name of Applicant/Sponsor: 7072 Boston State Road LLC c/o Christopher Wood, PE Carmina Wood Design	Telephone: 716-550-3342 E-Mail: cwood@carminawoddesign.com	
Address: 487 Main St		
City/PO: Buffalo	State: NY	Zip Code: 14203
Project Contact (if not same as sponsor; give name and title/role):	Telephone: E-Mail:	
Address:		
City/PO:	State:	Zip Code:
Property Owner (if not same as sponsor):	Telephone: E-Mail:	
Address:		
City/PO:	State:	Zip Code:

B. Government Approvals

B. Government Approvals, Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity	If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Counsel, Town Board, or Village Board of Trustees ☑Yes☐No	Town Board - Site Plan Approval & Special Use Permit	August 9, 2023 [Conceptual Plot Plan Application]
b. City, Town or Village Planning Board or Commission ☐Yes☑No		
c. City, Town or Village Zoning Board of Appeals ☐Yes☑No		
d. Other local agencies ☑Yes☐No	Building Department - Demolition Permit and Building Permit	To be determined
e. County agencies ☑Yes☐No	ECWA - backflow approval & ECDSM - sanitary sewer	To be determined
f. Regional agencies ☐Yes☐No		
g. State agencies ☑Yes☐No	NYSDOT - Highway Work Permit and NYSDEC - SPDES	To be determined
h. Federal agencies ☐Yes☐No		

i. Coastal Resources.

i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? ☐Yes☑No

ii. Is the project site located in a community with an approved Local Waterfront Revitalization Program? ☐Yes☑No

iii. Is the project site within a Coastal Erosion Hazard Area? ☐Yes☑No

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☐Yes☑No

- **If Yes,** complete sections C, F and G.
- **If No,** proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ☑Yes☐No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ☑Yes☐No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway; Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ☑Yes☐No

If Yes, identify the plan(s):

NYS Heritage Areas:West Erie Canal Corridor

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☐Yes☑No

If Yes, identify the plan(s):

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. ☑ Yes ☐ No
If Yes, what is the zoning classification(s) including any applicable overlay district?
C-1 Local Retail Business District

b. Is the use permitted or allowed by a special or conditional use permit? ☑ Yes ☐ No

c. Is a zoning change requested as part of the proposed action? ☐ Yes ☑ No
If Yes,
i. What is the proposed new zoning for the site? _____

C.4. Existing community services.

a. In what school district is the project site located? Hamburg Central School District

b. What police or other public protection forces serve the project site?
New York State Police, Erie County Sherrif

c. Which fire protection and emergency medical services serve the project site?
North Boston Company Fire Department

d. What parks serve the project site?
Chestnut Ridge Park

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)? Commercial project.

b. a. Total acreage of the site of the proposed action? 2.5 acres
b. Total acreage to be physically disturbed? 2.5 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 2.5 acres

c. Is the proposed action an expansion of an existing project or use? ☐ Yes ☑ No
i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % _____ Units: _____

d. Is the proposed action a subdivision, or does it include a subdivision? ☐ Yes ☑ No
If Yes,
i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types)
ii. Is a cluster/conservation layout proposed? ☐ Yes ☐ No
iii. Number of lots proposed? _____
iv. Minimum and maximum proposed lot sizes? Minimum _____ Maximum _____

e. Will the proposed action be constructed in multiple phases? ☐ Yes ☑ No
i. If No, anticipated period of construction: _____ months
ii. If Yes:
- Total number of phases anticipated _____
- Anticipated commencement date of phase 1 (including demolition) _____ month _____ year
- Anticipated completion date of final phase _____ month _____ year
- Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: _____

f. Does the project include new residential uses? ☐Yes ☑No

If Yes, show numbers of units proposed.

	One Family	Two Family	Three Family	Multiple Family (four or more)
Initial Phase				
At completion of all phases				

g. Does the proposed action include new non-residential construction (including expansions)? ☑Yes ☐No

If Yes,

i. Total number of structures 2

ii. Dimensions (in feet) of largest proposed structure: 20 height; 60 width; and 100 length

iii. Approximate extent of building space to be heated or cooled: 11,183 square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? ☑Yes ☐No

If Yes,

i. Purpose of the impoundment: Storm water management

ii. If a water impoundment, the principal source of the water: ☐ Ground water ☐ Surface water streams ☑Other specify: Storm water runoff

iii. If other than water, identify the type of impounded/contained liquids and their source.

N/A

iv. Approximate size of the proposed impoundment. Volume: TBD, <1 million gallons; surface area: 0.3 +/- acres

v. Dimensions of the proposed dam or impounding structure: N/A height; N/A length

vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete):

Impoundment is an excavation, a dam is not proposed

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? (Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite) ☐Yes ☑No

If Yes:

i. What is the purpose of the excavation or dredging?

ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?

- Volume (specify tons or cubic yards):
- Over what duration of time?

iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them.

iv. Will there be onsite dewatering or processing of excavated materials? ☐Yes ☐No

If yes, describe.

v. What is the total area to be dredged or excavated? acres

vi. What is the maximum area to be worked at any one time? acres

vii. What would be the maximum depth of excavation or dredging? feet

viii. Will the excavation require blasting? ☐Yes ☐No

ix. Summarize site reclamation goals and plan:

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? ☐Yes ☑No

If Yes:

i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description):

[There are not wetlands on the Project Site subject to the jurisdiction of the United States Army Corps of Engineers per the wetland investigation letter prepared by Earth Dimensions Inc. dated September 21, 2022 provided at Attachment "1".]

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

iii. Will the proposed action cause or result in disturbance to bottom sediments? ☐Yes ☐No
If Yes, describe:

iv. Will the proposed action cause or result in the destruction or removal of aquatic vegetation? ☐Yes ☐No
If Yes:

- acres of aquatic vegetation proposed to be removed:
- expected acreage of aquatic vegetation remaining after project completion:
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access):
- proposed method of plant removal:
- if chemical/herbicide treatment will be used, specify product(s):

v. Describe any proposed reclamation/mitigation following disturbance:

c. Will the proposed action use, or create a new demand for water? ☑Yes ☐No
If Yes:

i. Total anticipated water usage/demand per day: 2,100 gallons/day

ii. Will the proposed action obtain water from an existing public water supply? ☑Yes ☐No
If Yes:

- Name of district or service area: ECWA
- Does the existing public water supply have capacity to serve the proposal? ☑Yes ☐No
- Is the project site in the existing district? ☑Yes ☐No
- Is expansion of the district needed? ☐Yes ☑No
- Do existing lines serve the project site? ☑Yes ☐No

iii. Will line extension within an existing district be necessary to supply the project? ☐Yes ☑No
If Yes:

- Describe extensions or capacity expansions proposed to serve this project:
- Source(s) of supply for the district:

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☐ Yes ☑No
If, Yes:

- Applicant/sponsor for new district:
- Date application submitted or anticipated:
- Proposed source(s) of supply for new district:

v. If a public water supply will not be used, describe plans to provide water supply for the project:
N/A

vi. If water supply will be from wells (public or private), what is the maximum pumping capacity: N/A gallons/minute.

d. Will the proposed action generate liquid wastes? ☑Yes ☐No
If Yes:

i. Total anticipated liquid waste generation per day: 2,100 gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each):
sanitary sewage

iii. Will the proposed action use any existing public wastewater treatment facilities? ☑Yes ☐No
If Yes:

- Name of wastewater treatment plant to be used: Southtowns Advanced WWTP
- Name of district: ECSD 3
- Does the existing wastewater treatment plant have capacity to serve the project? ☑Yes ☐No
- Is the project site in the existing district? ☑Yes ☐No
- Is expansion of the district needed? ☐Yes ☑No

- Do existing sewer lines serve the project site? ☑Yes ☐No
- Will a line extension within an existing district be necessary to serve the project? ☐Yes ☑No

If Yes:

- Describe extensions or capacity expansions proposed to serve this project: _____

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? ☐Yes ☑No

If Yes:

- Applicant/sponsor for new district: _____
- Date application submitted or anticipated: _____
- What is the receiving water for the wastewater discharge? _____

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge or describe subsurface disposal plans):

N/A

vi. Describe any plans or designs to capture, recycle or reuse liquid waste:

None

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? ☑Yes ☐No

If Yes:

i. How much impervious surface will the project create in relation to total size of project parcel?

_____ Square feet or 1.5 acres (impervious surface)

_____ Square feet or 2.5 acres (parcel size)

ii. Describe types of new point sources. runoff from parking lots and building roofs

iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?

private on-site storm water management area designed in accrodance with NYSDEC criteria

- If to surface waters, identify receiving water bodies or wetlands: _____
- Will stormwater runoff flow to adjacent properties? ☐Yes ☑No

iv. Does the proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? ☑Yes ☐No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? ☐Yes ☑No

If Yes, identify:

i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)

ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)

iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)

g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? ☐Yes ☑No

If Yes:

i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) ☐Yes ☐No

ii. In addition to emissions as calculated in the application, the project will generate:

- _____Tons/year (short tons) of Carbon Dioxide (CO_2)
- _____Tons/year (short tons) of Nitrous Oxide (N_2O)
- _____Tons/year (short tons) of Perfluorocarbons (PFCs)
- _____Tons/year (short tons) of Sulfur Hexafluoride (SF_6)
- _____Tons/year (short tons) of Carbon Dioxide equivalent of Hydroflourocarbons (HFCs)
- _____Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? ☐Yes ☑No

If Yes:

i. Estimate methane generation in tons/year (metric): _____

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): _____

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? ☐Yes ☑No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? ☐Yes ☑No

If Yes:

i. When is the peak traffic expected (Check all that apply): ☐ Morning ☐ Evening ☐Weekend ☐ Randomly between hours of _____ to _____.

ii. For commercial activities only, projected number of truck trips/day and type (e.g., semi trailers and dump trucks): _____

iii. Parking spaces: Existing _____ Proposed _____ Net increase/decrease _____

iv. Does the proposed action include any shared use parking? ☐Yes ☐No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:

vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? ☐Yes ☐No

vii Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? ☐Yes ☐No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? ☐Yes ☐No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? ☑Yes ☐No

If Yes:

i. Estimate annual electricity demand during operation of the proposed action: _____

Typical electric usage for this type of facility

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other):

NYSEG

iii. Will the proposed action require a new, or an upgrade, to an existing substation? ☐Yes ☑No

l. Hours of operation. Answer all items which apply.

i. During Construction:

- Monday - Friday: 7am - 7pm
- Saturday: 7am - 7pm
- Sunday: none
- Holidays: none

ii. During Operations:

- Monday - Friday: 5am - 10 pm
- Saturday: 5am - 10 pm
- Sunday: 5am - 10 pm
- Holidays: varies

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? ☑ Yes ☐ No

If yes:

i. Provide details including sources, time of day and duration:

typical construction noise from equipment during hours in previous item

ii. Will the proposed action remove existing natural barriers that could act as a noise barrier or screen? ☐ Yes ☑ No

Describe:

n. Will the proposed action have outdoor lighting? ☑ Yes ☐ No

If yes:

i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:

parking lot and fuel canopy lighting, 15' mounting height directed downward and dark sky compliant, 300' +/- to nearest residence

ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? ☐ Yes ☑ No

Describe:

o. Does the proposed action have the potential to produce odors for more than one hour per day? ☐ Yes ☑ No

If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures:

p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products 185 gallons in above ground storage or any amount in underground storage? ☑ Yes ☐ No

If Yes:

i. Product(s) to be stored gasoline and diesel for retail sale

ii. Volume(s) 75,000 gal per unit time month (e.g., month, year)

iii. Generally, describe the proposed storage facilities:

underground storage tanks designed and installed per NYSDEC & other applicable standards

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? ☑ Yes ☐ No

If Yes:

i. Describe proposed treatment(s):

Routine pesticide application in accordance with local and state regulations

ii. Will the proposed action use Integrated Pest Management Practices? ☐ Yes ☑ No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? ☑ Yes ☐ No

If Yes:

i. Describe any solid waste(s) to be generated during construction or operation of the facility:

- Construction: 1000 tons per month (unit of time)
- Operation : 1000 tons per month (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:

- Construction: recycling at discretion of the contractor
- Operation: recycling per local ordiances

iii. Proposed disposal methods/facilities for solid waste generated on-site:

- Construction: NYSDEC approved C&D landfill by contractor
- Operation: NYSDEC approved landfill by commercial refuse collection company

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ☑ No

If Yes:

i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): _____

ii. Anticipated rate of disposal/processing:

- _____ Tons/month, if transfer or other non-combustion/thermal treatment, or
- _____ Tons/hour, if combustion or thermal treatment

iii. If landfill, anticipated site life: _____ years

t. Will the proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐ Yes ☑ No

If Yes:

i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: _____

ii. Generally describe processes or activities involving hazardous wastes or constituents: _____

iii. Specify amount to be handled or generated _____ tons/month

iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: _____

v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐ Yes ☐ No

If Yes: provide name and location of facility: _____

If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site

a. Existing land uses.

i. Check all uses that occur on, adjoining and near the project site.

☐ Urban ☐ Industrial ☑ Commercial ☑ Residential (suburban) ☐ Rural (non-farm)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____

ii. If mix of uses, generally describe:

b. Land uses and covertypes on the project site.

Land use or Covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces	0.10	1.5	+1.4
• Forested	0	0	0
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)	2.2	0	-2.2
• Agricultural (includes active orchards, field, greenhouse etc.)	0	0	0
• Surface water features (lakes, ponds, streams, rivers, etc.)	0	0	0
• Wetlands (freshwater or tidal)	0	0	0
• Non-vegetated (bare rock, earth or fill)	0	0	0
• Other Describe: _____	0.2	1.0	+0.8

c. Is the project site presently used by members of the community for public recreation? ☐ Yes ☑ No

i. If Yes: explain: _____

d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? ☐ Yes ☑ No

If Yes,

i. Identify Facilities:

_____

_____

e. Does the project site contain an existing dam? ☐ Yes ☑ No

If Yes:

i. Dimensions of the dam and impoundment:

- Dam height: _____ feet
- Dam length: _____ feet
- Surface area: _____ acres
- Volume impounded: _____ gallons OR acre-feet

ii. Dam's existing hazard classification: _____

iii. Provide date and summarize results of last inspection:

_____

_____

f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? ☐ Yes ☑ No

If Yes:

i. Has the facility been formally closed? ☐ Yes ☐ No

- If yes, cite sources/documentation: _____

ii. Describe the location of the project site relative to the boundaries of the solid waste management facility:

_____

_____

iii. Describe any development constraints due to the prior solid waste activities: _____

_____

g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? ☐ Yes ☑ No

If Yes:

i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred:

_____

_____

h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? ☐ Yes ☑ No

If Yes:

i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: ☐ Yes ☐ No

☐ Yes – Spills Incidents database — Provide DEC ID number(s): _____

☐ Yes – Environmental Site Remediation database — Provide DEC ID number(s): _____

☐ Neither database

ii. If site has been subject of RCRA corrective activities, describe control measures: _____

_____

_____

iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? ☐ Yes ☑ No

If yes, provide DEC ID number(s): _____

iv. If yes to (i), (ii) or (iii) above, describe current status of site(s):

_____

_____

v. Is the project site subject to an institutional control limiting property uses? ☐ Yes ☐ No

- If yes, DEC site ID number: _____
- Describe the type of institutional control (e.g., deed restriction or easement): _____
- Describe any use limitations: _____
- Describe any engineering controls: _____
- Will the project affect the institutional or engineering controls in place? ☐ Yes ☐ No
- Explain: _____

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? > 5 feet

b. Are there bedrock outcroppings on the project site? ☐ Yes ☑ No
If Yes, what proportion of the site is comprised of bedrock outcroppings? _____ %

c. Predominant soil type(s) present on project site:

Varysburg gravely loam	57 %
Allard silt loam	33 %
Rhinebeck silt loam	10 %

d. What is the average depth to the water table on the project site? Average: > 3 feet

e. Drainage status of project site soils:
☑ Well Drained: 90 % of site
☐ Moderately Well Drained: _____ % of site
☑ Poorly Drained 10 % of site

f. Approximate proportion of proposed action site with slopes:
☑ 0-10%: 100 % of site
☐ 10-15%: _____ % of site
☐ 15% or greater: _____ % of site

g. Are there any unique geologic features on the project site? ☐ Yes ☑ No
If Yes, describe: _____

h. Surface water features.

i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? ☐ Yes ☑ No

ii. Do any wetlands or other waterbodies adjoin the project site? ☑ Yes ☐ No

If Yes to either *i* or *ii*, continue. If No, skip to E.2.i.

iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? ☑ Yes ☐ No

iv. For each identified regulated wetland and waterbody on the project site, provide the following information:

- Streams: Name _____ Classification _____
- Lakes or Ponds: Name _____ Classification _____
- Wetlands: Name _____ Approximate Size _____
- Wetland No. (if regulated by DEC) _____

v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? ☐ Yes ☑ No

If yes, name of impaired water body/bodies and basis for listing as impaired: _____

i. Is the project site in a designated Floodway? ☐ Yes ☑ No

j. Is the project site in the 100-year Floodplain? ☐ Yes ☑ No

k. Is the project site in the 500-year Floodplain? ☐ Yes ☑ No

l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? ☑ Yes ☐ No
If Yes:

i. Name of aquifer: Principal Aquifer

m. Identify the predominant wildlife species that occupy or use the project site:
typical suburban wildlife such as
deer, squirrels and rabbits

n. Does the project site contain a designated significant natural community? ☐Yes ☑No
If Yes:
i. Describe the habitat/community (composition, function, and basis for designation):
ii. Source(s) of description or evaluation:
iii. Extent of community/habitat:
- Currently: _____ acres
- Following completion of project as proposed: _____ acres
- Gain or loss (indicate + or -): _____ acres

o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? ☐ Yes ☑No
If Yes:
i. Species and listing (endangered or threatened):

p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? ☐Yes ☑No
If Yes:
i. Species and listing:

q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? ☐Yes ☑No
If yes, give a brief description of how the proposed action may affect that use:

E.3. Designated Public Resources On or Near Project Site

a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? ☐Yes ☑No
If Yes, provide county plus district name/number:

b. Are agricultural lands consisting of highly productive soils present? ☐Yes ☑No
i. If Yes: acreage(s) on project site?
ii. Source(s) of soil rating(s):

c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? ☐Yes ☑No
If Yes:
i. Nature of the natural landmark: ☐ Biological Community ☐ Geological Feature
ii. Provide brief description of landmark, including values behind designation and approximate size/extent:

d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? ☐Yes ☑No
If Yes:
i. CEA name:
ii. Basis for designation:
iii. Designating agency and date:

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? ☐ Yes ☑ No

If Yes:

i. Nature of historic/archaeological resource: ☐ Archaeological Site ☐ Historic Building or District

ii. Name: _____

iii. Brief description of attributes on which listing is based:

_____

f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? ☑ Yes ☐ No

[Copy of No Impact Determination Letter issued by SHPO dated February 9, 2023 is provided at Attachment "2".]

g. Have additional archaeological or historic site(s) or resources been identified on the project site? ☐ Yes ☑ No

If Yes:

i. Describe possible resource(s): _____

ii. Basis for identification: _____

h. Is the project site within fives miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? ☑ Yes ☐ No

If Yes:

i. Identify resource: Chestnut Ridge Park

ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): Erie County Park

iii. Distance between project and resource: 2.5 miles.

i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? ☐ Yes ☑ No

If Yes:

i. Identify the name of the river and its designation: _____

ii. Is the activity consistent with development restrictions contained in 6NYCRR Part 666? ☐ Yes ☐ No

F. Additional Information

Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification

I certify that the information provided is true to the best of my knowledge.

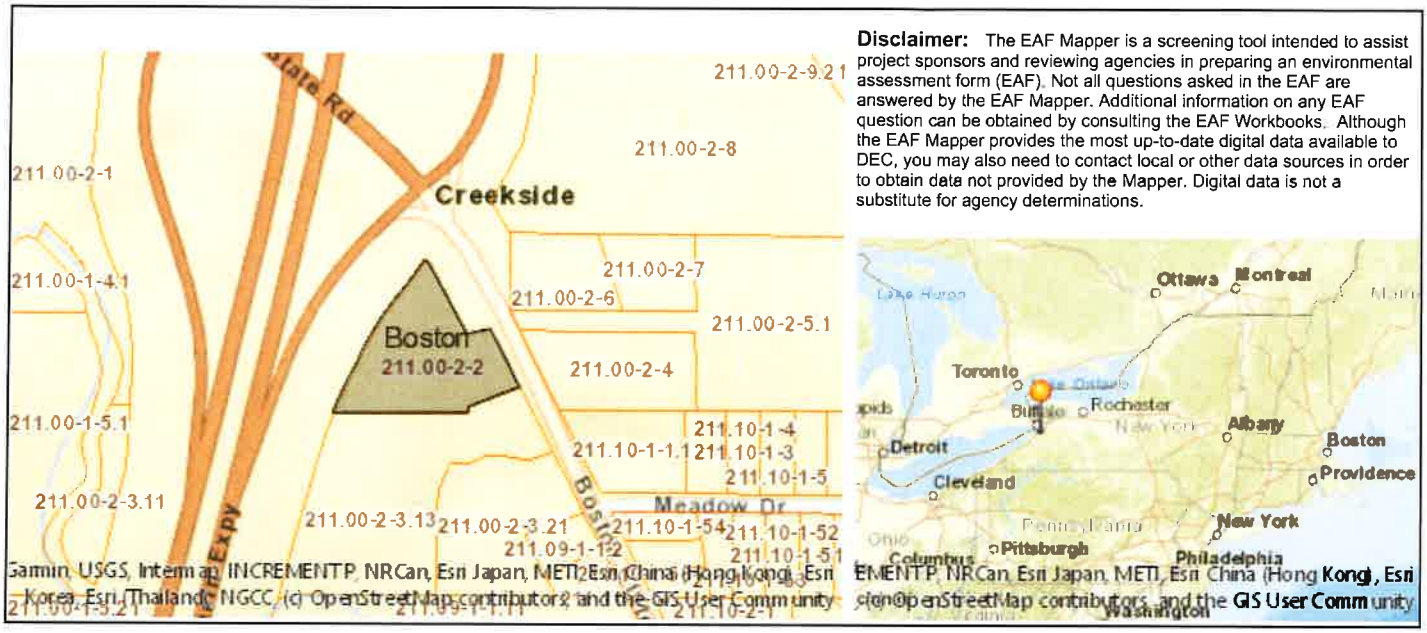
Applicant/Sponsor Name Christopher Wood, P.E. Date August 9, 2023

Signature _____ Title Project Engineer

PRINT FORM

EAF Mapper Summary Report

Wednesday, October 12, 2022 7:05 AM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Yes - Digital mapping data are not available for all Special Planning Districts. Refer to EAF Workbook.
C.2.b. [Special Planning District - Name]	NYS Heritage Areas:West Erie Canal Corridor
E.1.h [DEC Spills or Remediation Site - Potential Contamination History]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Listed]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Environmental Site Remediation Database]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.iii [Within 2,000' of DEC Remediation Site]	No
E.2.g [Unique Geologic Features]	No
E.2.h.i [Surface Water Features]	No
E.2.h.ii [Surface Water Features]	Yes
E.2.h.iii [Surface Water Features]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
E.2.h.v [Impaired Water Bodies]	No
E.2.i. [Floodway]	No
E.2.j. [100 Year Floodplain]	No
E.2.k. [500 Year Floodplain]	No
E.2.l. [Aquifers]	Yes
E.2.l. [Aquifer Names]	Principal Aquifer
E.2.n. [Natural Communities]	No

E.2.o. [Endangered or Threatened Species]	No
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	No
E.3.c. [National Natural Landmark]	No
E.3.d [Critical Environmental Area]	No
E.3.e. [National or State Register of Historic Places or State Eligible Sites]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.3.f. [Archeological Sites]	Yes
E.3.i. [Designated River Corridor]	No

Attachment 1 of Part 1 of Full Environmental Assessment Form

EARTH DIMENSIONS, INC.
* Soil & Hydrogeologic Investigations * Wetland Delineations
1091 Jamison Road, Elma NY 14059
(716) 655-1717 * Fax (716) 655-2915 www.earthdimensions.com

September 21, 2022 W1L21

Ray Miranda, President
Miranda Development
P.O. Box 312
North Boston, New York 14110

Re: Preliminary Wetland Investigation - ±2.6 acres
7072 Boston State Road (SBL# 211.00-2-2)
Town of Boston, Erie County, New York

Dear Mr. Miranda:

Earth Dimensions, Inc. (EDI) has completed a preliminary wetland investigation at the above referenced site for the purpose of identifying potential regulated wetlands and waterways. The site investigation was conducted on September 21, 2022. As indicated on the attached preliminary wetland investigation map, EDI did not identify any wetlands as defined by the U.S. Army Corps of Engineers (USACE) wetland delineation manual.

Based on this site investigation, it is our professional opinion that your project may move forward without the need for a coordination with USACE.

If you have any questions, please contact our office at (716) 655-1717 or email tsomerville@earthdimensions.com.

Very truly yours,
Earth Dimensions, Inc.

Thomas Somerville
Ecologist

Encl.

PRELIMINARY WETLANDS MAP

September 21, 2022

7072 Boston State Road

Town of Boston, Erie County, New York

Attachment 2 of Part 1 of Full Environmental Assessment

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

February 9, 2023

Paul Powers
Powers Archaeology LLC
180 Avon Road
Rochester, NY 14625

Re: DEC
Mixed-Use Development
7072 Boston State Rd, Boston, NY 14075
23PR00673

Dear Paul Powers:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources.

The OPRHP has reviewed the Phase IA/IB archaeological survey report prepared for this project (February 2023; 23SR00093). No archaeological sites were identified by the survey. Therefore, it is the opinion of the OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If you have any questions, I can be reached at Sydney.Snyder@parks.ny.gov.

Sincerely,

Sydney Snyder
Historic Preservation Specialist - Archaeology

BARRON & ASSOCIATES, P.C.
Geotechnical Consulting and Special Inspections
10440 Main Street (716) 759-7821
Clarence, NY 14031 www.barronandassociatespc.com

May 2, 2023 Job No: 23-515

Miranda Development, LLC
P.O. Box 312
North Boston, NY 14110

ATTN: Ray Miranda

RE: Geotechnical Engineering Report
Proposed Mixed-Use Development
7072 Boston State Road
Boston, NY 14075

Mr. Miranda:

This report presents the findings of the subsurface investigation program and geotechnical engineering recommendations for the above referenced project. The geographic orientation of the project site is illustrated on the U.S. Geologic Survey (USGS) site location map in Figure No. 1. The project site is illustrated in Figure No. 2, entitled "Test Boring Location Plan", which includes: the approximate location of six test borings that were drilled by Buffalo Drilling Company, Inc. (BDC); ground surface elevations; profile section lines; and additional site details.

EXPLORATION METHODS

Sampling Method: An ATV-mounted CME-75 rotary drill rig was used to drill six borings to depths ranging from approximately 25 to 50 feet below ground surface by using 2-1/4 inch inside diameter (ID), continuous flight hollow stem augers. Samples were recovered by driving a standard split-spoon sampler (2-foot long by 1-3/8 inch inside diameter) 24 inches with a 140-pound hammer falling 30 inches per blow per the American Society of Testing and Materials (ASTM) Standard D1586. The number of blows from six to 18 inches of penetration is defined as the Standard Penetration Test (SPT) N-value. Auger refusal, which may infer the top of bedrock, was not encountered at any boring location.

Any encountered groundwater conditions are documented in the field on the driller's logs for each test boring. If indicators of groundwater are observed on the sampling equipment, the depth to groundwater is also checked and measured through the hollow stem augers at the completion of the sampling efforts.

Classification: The retrieved soil and fill samples were initially logged in the field by the driller, and a portion of each sample was placed and sealed in a glass jar. The boring logs, which are included in Appendix A, were based upon the field logs and a second visual classification of recovered samples in

the laboratory by a geologist. Classification/identification of samples, as noted on the boring logs, is based on the Unified Soil Classification System (USCS) in ASTM D2487/D2488. Refer to Appendix B entitled, "Geotechnical Reference Standards", for an explanation of the terminology that is used for soil and rock descriptions.

Laboratory Testing: Laboratory soil testing was undertaken on several retrieved split spoon samples. The overall laboratory testing program consisted of the following test methods:

- Water (Moisture) Content of Soil ASTM D2216
- Liquid Limit, Plastic Limit, and Plasticity Index of Soils ASTM D4318
- Grain Size Analysis ASTM D422

Appendix C contains Table No. 1, which presents the tabulated results of the physical/soil index properties, and the associated graphical illustration of the data.

SITE AND SUBSURFACE CONDITIONS

General: The proposed site for development is located at 7072 Boston State Road, in the Town of Boston, Erie County, New York. The site sits to the east of the Pittsburgh-Buffalo Highway “Southern Expressway” (U.S. Route 219) and to the west of Boston State Road. Currently, the site is partially wooded with an existing single-family house, gazebo, shed, barn, and pond on the parcel. Details for project development includes the demolition of existing structures, and the construction of a 5,000 gross square feet (GSF) office building, as well as a 4,183 GSF convenience-store (“C-Store”) and 1,000 GSF Tim Horton’s combination facility. The construction would also include the installation of a fuel island and associated underground fuel tanks, stormwater management areas, asphalt pavement parking, a dumpster enclosure, and landscaped areas. The site topography significantly slopes, at an approximately six-percent grade, from the east to the southwest, with ground surface elevations across the boring locations varying by nearly ten feet. Boring location B-6 is the high-point at elevation 825.4 ± feet, and location B-5 being the low-point at elevation 815.8 ± feet.

Subsurface Soil Conditions:

In general, under a thin layer of topsoil, the subsurface conditions consist of a naturally-deposited loose to medium-dense brown sand that mantles natural soft to very-stiff gray clay. Sand samples were noted to contain some silt, traces-to-little gravel, traces of clay, and traces of organic matter including tree roots. The sand was noted to be moist-to-saturated and non-plastic. It is estimated that all foundation bearing elevation will reside within the sand zones. The clay was observed the remaining depths drilled.

Bedrock: N-values of greater than 100 and/or auger refusal, which are generally inferred to be top of bedrock, were not encountered at any of the borings. The depth to the top of the apparent bedrock surface is believed to approximately 65 feet or more below the ground surface. Based upon regional geology, the bedrock is expected to be the Angola and Rhinestreet Shale Member of the West Falls Group.

Groundwater: Groundwater was not encountered during subsurface exploration efforts on this lot. Readings are taken at completion of drilling efforts and, therefore, an adequate amount of time for the groundwater level to recharge to static conditions is probably not allowed. Fluctuations in the ground water level may occur due to other factors than those present during field operations. Based on the observed soil conditions, it is concluded that the static water table is lower than the planned foundation bearing elevation and no other severe soil-water conditions exist.

EARTHQUAKE/SEISMIC CONSIDERATIONS

Site Class Definition: For the given site conditions, the most applicable site definition is Site Class D, in accordance with Section 1613.2.2 of Building Code of New York State © 2020 and listed in Table 20.3-1 of Chapter 20 of American Society of Civil Engineers (ASCE) Standard 7-16.

Liquefaction Potential: For the Site Class D, the design spectral response acceleration parameters S_{DS}, at 0.2 seconds, and S_{D1}, at one second, are 0.164g and 0.070g (g = 32.2 feet/sec^2), respectively, for this part of Erie County, New York (see Appendix D). These values have a two percent probability of being exceeded in 50 years. Based upon the above conditions and an approximate magnitude 6.0 earthquake on the Richter Scale, the potential for liquefaction or settlement of Site Class D soil is considered low.

FOUNDATION DESIGN AND CONSTRUCTION RECOMMENDATIONS

General: This section will present and discuss recommendations on foundation design and construction and placement of controlled fills, and subgrade and base layer requirements for concrete floor slabs, paved parking and roadway areas. The maximum design exterior bearing wall and column loads are not expected to exceed six kips per lineal foot and 80 kips, respectively. The maximum design interior bearing column load is not expected to exceed 100 kips. The maximum live floor load is taken as 100 pounds per square foot (psf).

Site Preparation and Earthwork: General site preparation will include the demolition and complete removal of any encountered foundations and floor slabs, and removing all unsuitable surficial material

(i.e., asphalt pavement, concrete, brick, expansive slag, organic or topsoil layer, and construction and demolition-like fill) to a depth where firm, granular or cohesive fills or naturally-occurring soils are encountered. It is recommended, particularly in the location of the proposed structures, that any slag and/or cinder/ash containing material, if encountered, should be tested to determine the expansion and corrosion characteristics (where applicable for direct or potential contact with foundation elements and buried utilities) of these materials prior to their use on-site. Any rubble-like and brick fill, boulders, or wood fill in particular, if encountered, will require undercutting. The proposed building pads and any paved areas are to be proof rolled with a fully loaded ten-wheel dump truck. All encountered soft and disturbed zones should be undercut and stabilized with granular fill that is placed in compacted lifts prior to placement of additional fill materials above. Refer to Appendix E entitled "General Earthwork Specification" for definition of the fill types and gradations, recommended minimum compaction requirements for various site developments, and placement and compaction methods. The NYS Department of Transportation (NYSDOT) specification numbers for typical aggregate subbase/base course components that are included in the select granular fill category as are as follows: Item No. 304.12 (Metric) Subbase Course, Type 2 (< 2-inch maximum size), which is preferred; or Item No. 304.14 (Metric) Subbase Course, Type 4 (< 2-inch maximum size).

In addition to the existing structures, it is likely that former residential/commercial structures existed at the project site for the proposed buildings and that former footings and foundation walls may be buried. Septic tank and system locations and the abandonment conditions or practices are normally unknown. If encountered during site development, it is recommended that any tanks and systems should be properly removed/treated/remediated relative to the proposed development and under the applicable local and state regulations. The remaining cavities, from the aforementioned items, should be backfilled with select/approved granular fill that is placed in thin lifts and compacted to the minimum recommendation, as presented in this report, for the proposed development at that cavity location.

Shallow Foundation: The recommended foundation type is shallow footings. Continuous strip and spread exterior footings would bear at an elevation of four feet or lower below final exterior grade. A four-foot minimum footing depth (as required by local or New York State code) is needed to provide adequate protection from frost for exterior footings.

If required, interior footings are recommended to bear on stable, naturally deposited soils or on thin layers of thoroughly compacted (minimum of 95 percent of the maximum dry density by ASTM D1557) select/approved granular fill that is placed on an approved subgrade. If needed, a geotextile strength

and filter fabric (such as, Mirafi 600X) may be used to line the excavation bottom for the purpose of stabilizing the excavation and placement of the select/approved granular fill. Undercuts to natural deposited silty clay are recommended, to remove fill materials that are unsuitable for direct foundation bearing.

Bearing grades should be approved by a qualified inspector, during construction. Refer to Appendix D "Engineering Computations and Schematics" for more detailed information regarding undercut depth and horizontal distribution within each building footprint.

Undercut areas beneath proposed foundations must extend laterally beyond each vertically projected edge of the foundation by a minimum distance equal to one-half the total depth of the undercut or equating to a slope of two vertical to one horizontal from the bottom foundation corner. The undercuts and placement of compacted select/approved granular fill are required to ensure a suitable and more uniform bearing media for the footings, and to prevent unacceptable differential settlements.

Wall footings should have a minimum two-foot width and column footings should have a minimum three-foot width. Based on the above-described conditions, the recommended maximum net allowable foundation bearing pressure is 3,000 psf of bearing area. All footings for the proposed development are recommended to be designed near the same contact pressure.

The recommended maximum net allowable foundation bearing pressure is based on generally accepted design methods for cohesive soil conditions. Based on the provisions of the above recommendations and estimated design requirements and utilization of proper construction procedures and experienced field supervision and testing personnel, total and differential settlements are estimated to be less than one inch and three-quarters inch, respectively. Refer to Appendix D for additional foundation design and construction details.

Additional Foundation Considerations: In addition to the above, the following recommendations will provide additional assurances with regard to proper foundation construction.

a) All fill placed beneath, adjacent, or above foundations must comply with the "General Earthwork Specification", included as Appendix E.

b) Backfill of foundations with approved select granular fill must be completed prior to placement of substantial superstructure loads, except for basement walls or substructure areas that may additionally require superstructure loads and possibly internal bracing.

c) On site soils may rut and “pump” if exposed to excessive surface water and repeated construction traffic. Proper site management and fill placement operations are needed to minimize costly undercuts and subgrade repairs prior to placement of concrete slabs and asphalt pavement. It is noted that construction during wet/rainy and/or Fall and Spring conditions may require added precautions and possibly a thicker base layer to maintain a stable subgrade condition.

d) Step footings, if utilized, should have a rise to run ratio of 1:2, with a two-foot maximum rise and a four-foot minimum run between steps or as recommended by the design structural engineer.

e) The recommended at rest (rigid wall), active, and passive static earth pressure coefficients for unsaturated, select granular sandy gravel fill against an earth retaining structure/wall are 0.76, 0.24, and 2.8 (with an ultimate value of 4.2), respectively. The respective equivalent static lateral fluid pressures are recommended to be 90, 30 and 330 (with an ultimate value of 500) pounds per square foot (psf) per foot depth which are based upon a moist, compacted unit backfill weight of 120 pounds per cubic foot (pcf). The at rest value would account for the average expected compaction induced stresses and/or the potential influences of hydrostatic pressure. The static lateral fluid pressures can be directly proportioned for other unit weights.

Stabilization of Excavations: The trench/excavation sidewall stability concerns can be addressed with the Occupational Safety and Health Act (OSHA) requirements as set forth in Subpart P of 29 CFR Part 1926, Sections 1926.650 to 1926.652. In lieu of a properly designed shoring system, side slopes of the trench excavation should be one on one (vertical to horizontal distance) or flatter in cohesive soils or one on one and one-half or flatter in the granular materials, as required by OSHA.

Water must not be allowed to accumulate or pond on exposed foundation bearing grades. Surface water and groundwater from within the excavation must be either pumped, diverted or channelized by gravity flow to effectuate the construction of the proposed foundation. Pockets of localized perched groundwater may seasonally be expected to be encountered at footing and/or footing undercut bearing grades. At these locations, dewatering with surface sumps may be required to maintain stable side slopes and excavation bottom.

Concrete Interior Floor Slab(s)/Pad: For the most part and based on test results for similar soils/fills, slightly plastic cohesive natural soils/fills may be somewhat difficult to compact in a controlled manner considering the varying soil plasticity and natural moisture contents that are estimated to be at or too wet of optimum, at the time of this investigation. Excavated cohesive soil/fill types will require intensive soil conditioning, earthwork documentation/testing program, as well as additional laboratory tests prior to

approval for on-site reuse as structural fill. These soils/fills may be expected to be suitable for re-use as general fill with the implementation of uniformly applied soil conditioning (i.e., drying and blending) and compaction methods, if additional volume of soil for backfill is needed.

Excavated and approvable granular (i.e., sand or gravel and non-plastic silt and sand) soil/fill are not expected to be available in any quantity. For the most part, granular (i.e., sand or gravel) soil/fill is expected to be acceptable for on-site re-use, as general/ordinary fill without substantial reworking and/or modification, while silty fine-sized sand may first require drying and blending.

Dissimilar excavated materials should not be commingled prior to their use elsewhere on-site, unless designated for a green/vegetation area. General fill material is also recommended to be placed on prepared and approved subgrade and in accordance with previous recommendations.

A geotextile fabric (such as, Mirafi 600X or equal) that separates the subgrade and the approved/select granular base layer may be needed and is particularly recommended for sensitive cohesive/fine-grained/silty clay subgrade soil/fills. This approach will stabilize and provide a workable building pad condition with minimal required repairs.

The approved subgrades will most likely consist of stiff or better/thoroughly compacted (i.e., minimum 92 percent of the maximum dry density by ASTM D1557) cohesive fill and/or a thoroughly compacted imported select/approved granular fill. Above the approved subgrades, a minimum eight-inch thick select granular fill (i.e., number two crusher run stone or equal) layer is recommended as the base course for the proposed building concrete floor slab. The NYSDOT specification numbers for typical aggregate subbase/base course components are Item No. 304.12 (Metric) Subbase Course, Type 2 (< 2-inch maximum), which is preferred, or Item No. 304.14 (Metric) Subbase Course, Type 4 (< 2-inch maximum). This select granular base layer would be compacted to a minimum 95 percent of the maximum dry density by ASTM D1557. The floor slab for the proposed buildings are recommended to be a four-inch minimum thickness or is as determined by the design structural engineer. The floor slab reinforcement should be provided through placement of wire mesh or plastic fibers and is also as determined by the design structural engineer.

At the discretion of the design architect, a vapor barrier may be considered for use in the proposed structures. The use of a thin gravel cushion, as a capillary break, or a thin sand cushion over a vapor barrier that is placed beneath the concrete slab(s) are at the discretion of the design architect/engineer or as required by local code. Gradations of gravels that are satisfactory capillary breaks include 1 ¼-inch

or ¾-inch crushed stone or aggregate per the ASTM D2321 Types IA, IB and II with less than 5 % fines. A number two crusher run stone may also be applicable, but the gradation and material property specifications must qualify.

At the assumed final site grade and based upon the thickness and character of the underlying fill and natural soils, the subgrade modulus is recommended not to exceed 100 pounds per cubic inch (pci). A Poisson Ratio of 0.4 is recommended for design purposes. Isolation of the floor slabs from the footings-piers-columns and walls do appear to be warranted. Based upon the subgrade modulus and slab mechanical properties and thickness, the design structural engineer may accordingly adjust the granular aggregate base thickness.

Exterior Concrete Slabs-On-Grade/Pad/Parking and Roadway Facilities: The characteristics of the fill and natural soils and the known frost penetration in Western New York require that specific attention is provided to the design and construction of paved roadway and parking areas. For new pavement sections, isolated pockets of surficial silty/cohesive/fine-grained soil/fill may be encountered and may be too soft and wet in the proposed parking and roadway areas. These types of soil/fill may be adequately conditioned (i.e., dried and blended) and compacted (i.e., minimum 90 percent compaction) to support necessary construction equipment and normal pavement section. Otherwise, the removal/undercutting of the silty/cohesive/fine-grained soil/fill to a firm, approved subgrade and subsequent placement and compaction of select or approved granular fill will be required in order to accommodate the recommended pavement sections.

For new pavement sections, it is recommended that the subgrade surface is adequately graded and/or underdrains are installed to prevent water accumulation. Above the approved subgrade surface (i.e., minimum 90 percent compaction), a minimum eight-inch thick select granular layer is recommended as the base course for lightly traveled roadway and parking areas (standard duty section). A geotextile filter and strength fabric (such as, Mirafi 600X or equal) and minimum 12-inch thick base course are recommended for all truck routes and heavily traveled roadways (heavy duty section). If “pumping” of the silty/cohesive/fine-grained soil subgrade occurs or is difficult to stabilize during construction, an increase in the base thickness to that of the heavy-duty section and/or a geotextile filter and strength fabric is recommended to be placed on the prepared and approved subgrade for the standard duty section. The NYS Department of Transportation (NYSDOT) specification numbers for typical aggregate subbase/base course components are Item No. 304.12 (Metric) Subbase Course, Type 2 (< 2-inch maximum size), which is preferred, or Item No. 304.14 (Metric) Subbase Course, Type 4 (< 2-inch

maximum size). The granular aggregate base layer is recommended to be compacted to at least 95 percent of maximum dry density by ASTM D1557.

The thickness of top and binder course layers should be determined in accordance with AASHTO methods. In summary, the minimum recommended asphalt thicknesses for the heavy-duty section and standard duty section are three and one-half inches and three inches, respectively. The top and binder course layers are recommended to be designed and constructed in accordance with New York State Department of Transportation Standard Specification.

Limitations, Field Inspections and Monitoring: This report is based on the preliminary information that is provided by project representatives and the subsurface conditions that were encountered at the test boring locations. Due to the nature of the investigation method, test pit excavation will provide a greater level of delineation of the subsurface soil/fill/rock conditions than can be defined by the test boring data alone. As detailed in Appendix F "Limitations", modification regarding proposed building/structure locations and other site developments can result in changes to provided recommendations. It is recommended that the geotechnical engineer be provided the opportunity to generally review the final detailed design and contract specifications. Required earthwork and foundation construction should be done under the supervision of experienced construction personnel and in a manner consistent with proven methods. All site work should be carefully monitored and tested by experienced geotechnical personnel to assure compliance with earthwork and foundation construction specifications.

Thank you for the opportunity to assist on this project. If questions should arise, please call the undersigned at your earliest convenience.

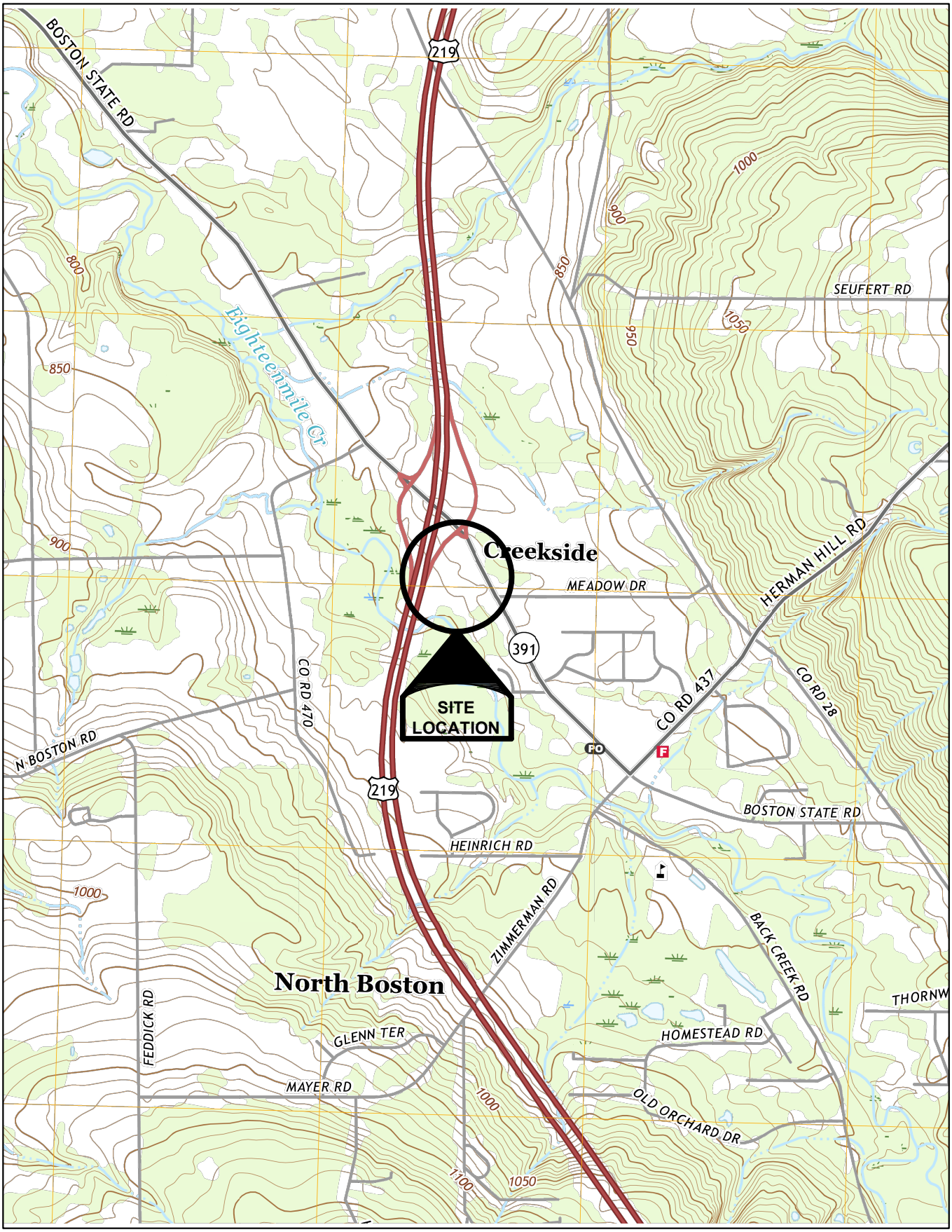
Very truly yours,
BARRON & ASSOCIATES, INC.
and
BUFFALO DRILLING COMPANY, INC.

Joseph Colletti, E.I.T.
Geotechnical Engineer

James S. Barron, P.E.
President / Geotechnical Engineer

5.3.23

www.barronandassociatespc.com



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DRAWN: DAN KASPROWICZ

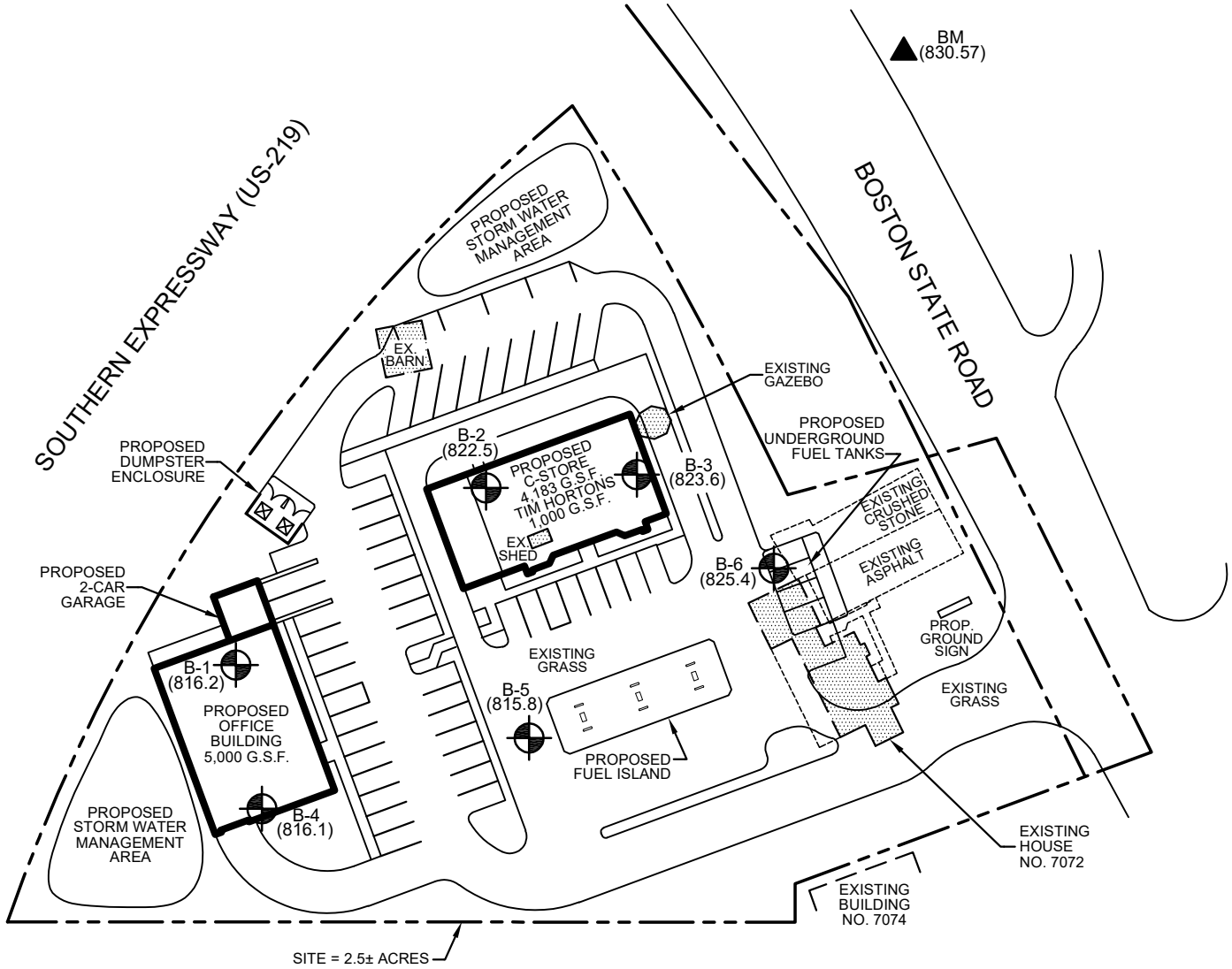
CLIENT: MIRANDA DEVELOPMENT, LLC
P.O. BOX 312
BOSTON, NEW YORK 14110

PROJECT: PROPOSED MIXED-USE DEVELOPMENT
7072 BOSTON STATE ROAD
TOWN OF BOSTON, ERIE CO., NEW YORK 14075

NEW YORK STATE SITE LOCATION

USGS SITE LOCATION PLAN
HAMBURG
2019

JOB NO.: 23-515	SCALE: N.T.S.
DATE: 2/7/2023	FIGURE NO. 1



LEGEND	
⊕ B-2	= TEST BORING & NO.
(822.5)	= GROUND SURFACE ELEVATION (FT.)
▲ BM	= BENCH MARK (TOP NUT OF FIRE HYDRANT)

NOTES:

1. BORINGS, BUILDINGS, SITE FEATURES, PROPERTY LINE LOCATIONS, AND SCALE OF DRAWING ARE APPROXIMATE.
2. BASE MAP REFERENCE, BENCH MARK ELEVATION, AND BORING LOCATIONS PROVIDED BY CARMINAWOOD DESIGN, TITLED "CONCEPT SITE PLAN - MIXED-USE DEVELOPMENT", PROJECT NO. 22.305, DWG. NO. C-100, DATED 12/15/2022.

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PROJECT: PROPOSED MIXED-USE DEVELOPMENT
7072 BOSTON STATE ROAD
TOWN OF BOSTON, ERIE CO., NEW YORK 14075

TEST BORING LOCATION PLAN

0 40 80 160

JOB NO.: 23-515	SCALE: 1" = 80'±
DATE: 2/7/2023	FIGURE NO. 2

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APPENDIX A

TEST BORING LOGS

BARRON & ASSOCIATES, P.C. &
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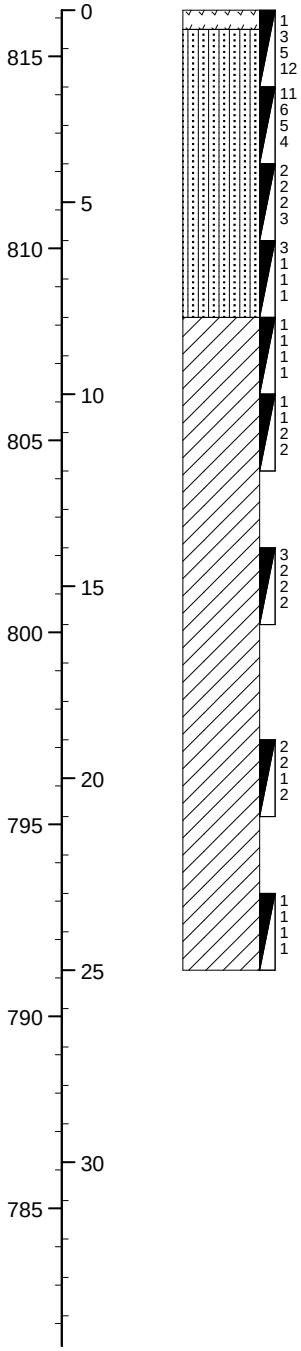
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-1

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	3/1/23	**SURFACE ELEVATION (ft.):**	816.2
DATE COMPLETED:	3/1/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
S-1 : 0.0'- 2.0'	8	30	Topsoil (6") Brown, loose f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
S-2 : 2.0'- 4.0'	11	15	...grade: m. dense
S-3 : 4.0'- 6.0'	4	20	...grade: loose
S-4 : 6.0'- 8.0'	2	15	...grade: v. loose, and Gravel, saturated
S-5 : 8.0'- 10.0'	2	70	Gray, soft CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL) (Varved)
S-6 : 10.0'- 12.0'	3	100	Same as S-5
S-7 : 14.0'- 16.0'	4	90	Same as S-5
S-8 : 19.0'- 21.0'	3	100	Same as S-5
S-9 : 23.0'- 25.0'	2	100	Same as S-5
			Depth to Bottom of Hole: 25.0 feet

Logged by: E. Zinni

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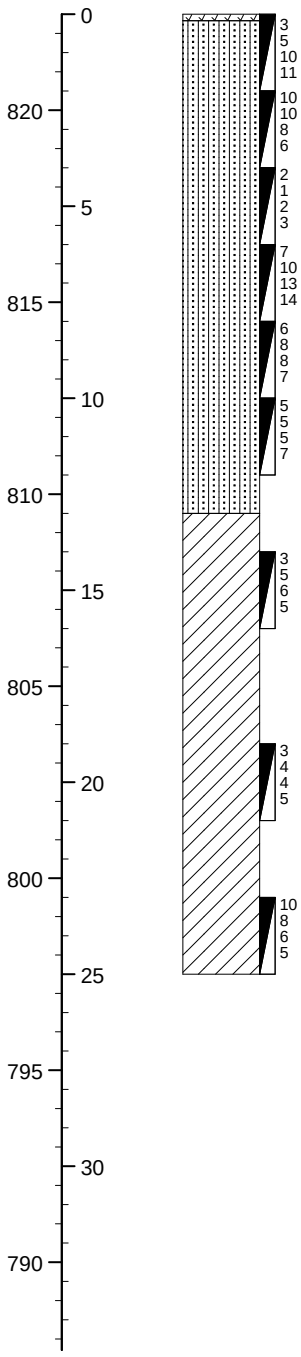
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-2

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	2/27/23	**SURFACE ELEVATION (ft.):**	822.5
DATE COMPLETED:	2/27/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
			Topsoil (2")
S-1 : 0.0'- 2.0'	15	50	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
S-2 : 2.0'- 4.0'	18	50	Same as S-1
S-3 : 4.0'- 6.0'	3	60	...grade: v. loose, saturated
S-4 : 6.0'- 8.0'	23	55	...grade: Gray, m. dense, wet
S-5 : 8.0'- 10.0'	16	90	Same as S-4
S-6 : 10.0'- 12.0'	10	90	Same as S-4
S-7 : 14.0'- 16.0'	11	80	Gray, stiff CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL) (Varved)
S-8 : 19.0'- 21.0'	8	100	Same as S-7
S-9 : 23.0'- 25.0'	14	100	Same as S-7
			Depth to Bottom of Hole: 25.0 feet

Logged by: E. Zinni

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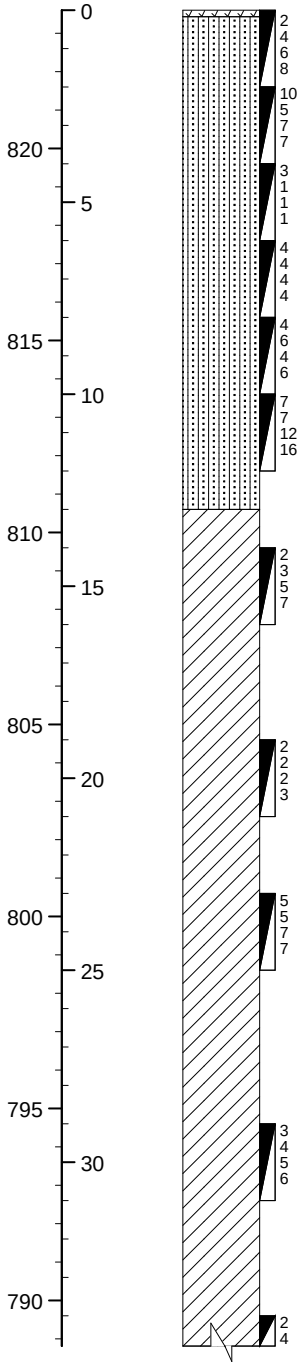
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-3

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	2/27/23	**SURFACE ELEVATION (ft.):**	823.6
DATE COMPLETED:	2/27/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Elevation/ Depth (feet)	Soil Symbols Sampler Symbols Field Test Data	Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
					Topsoil (2")
		S-1 : 0.0'- 2.0'	10	40	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
		S-2 : 2.0'- 4.0'	12	40	Same as S-1
		S-3 : 4.0'- 6.0'	2	5	...grade: v. loose, wet
		S-4 : 6.0'- 8.0'	8	50	...grade: loose, saturated
		S-5 : 8.0'- 10.0'	10	75	...grade: Gray, wet
		S-6 : 10.0'- 12.0'	19	85	...grade: m. dense
		S-7 : 14.0'- 16.0'	8	80	Gray, stiff CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL) (Varved)
		S-8 : 19.0'- 21.0'	4	100	...grade: m. stiff
		S-9 : 23.0'- 25.0'	12	100	...grade: stiff
		S-10 : 29.0'- 31.0'	9	100	Same as S-9
					Same as S-9

Logged by: E. Zinni

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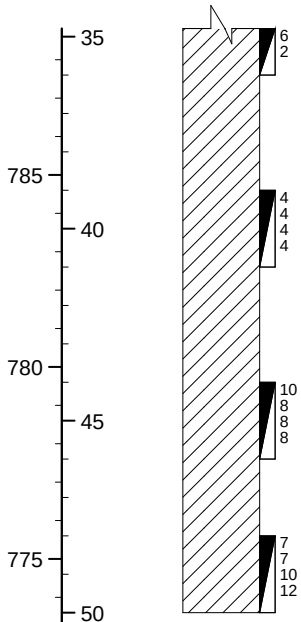
TEST BORING LOG (CONTINUATION)

JOB No.: 23-515 **BORING No.:** B-3

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075



Elevation/ Depth (feet)	Soil Symbols Sampler Symbols Field Test Data	Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
		S-11 : 34.0'- 36.0'	10	100	
		S-12 : 39.0'- 41.0'	8	80	Same as S-9
		S-13 : 44.0'- 46.0'	16	30	...grade: v. stiff
		S-14 : 48.0'- 50.0'	17	90	Same as S-13
					Depth to Bottom of Hole: 50.0 feet

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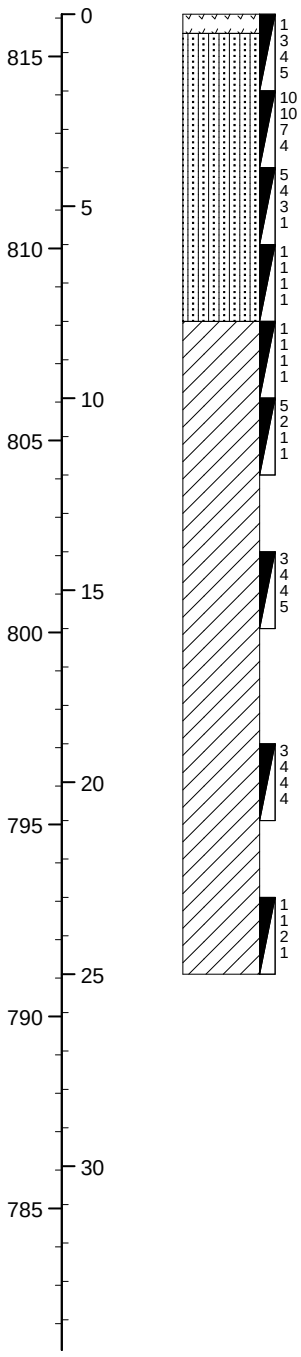
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-4

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	2/28/23	**SURFACE ELEVATION (ft.):**	816.1
DATE COMPLETED:	2/28/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
			Topsoil (6")
S-1 : 0.0'- 2.0'	7	0	Brown, loose f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
S-2 : 2.0'- 4.0'	17	50	...grade: m. dense
S-3 : 4.0'- 6.0'	7	20	...grade: loose, and Gravel, saturated
S-4 : 6.0'- 8.0'	2	10	...grade: v. loose
S-5 : 8.0'- 10.0'	2	40	Gray, soft CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL) (Varved)
S-6 : 10.0'- 12.0'	3	60	Same as S-5
S-7 : 14.0'- 16.0'	8	50	...grade: stiff
S-8 : 19.0'- 21.0'	8	100	Same as S-7
S-9 : 23.0'- 25.0'	3	100	...grade: soft
			Depth to Bottom of Hole: 25.0 feet

Logged by: E. Zinni

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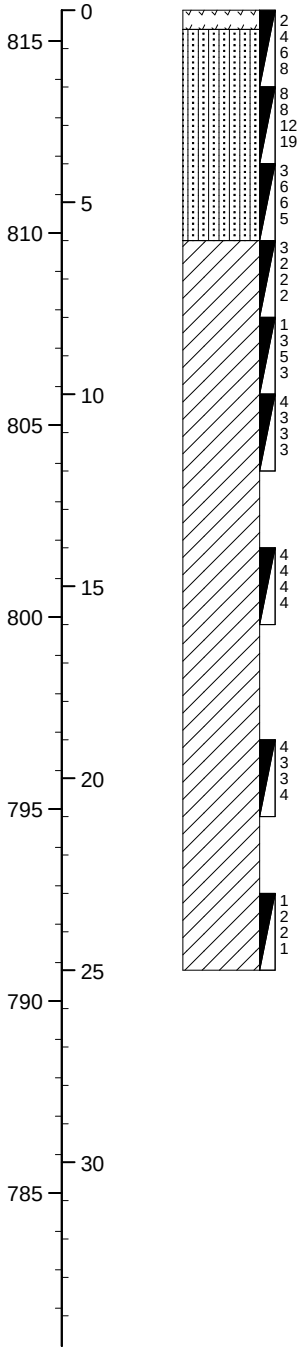
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-5

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	2/28/23	**SURFACE ELEVATION (ft.):**	815.8
DATE COMPLETED:	2/28/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
			Topsoil (6")
S-1 : 0.0'- 2.0'	10	100	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
S-2 : 2.0'- 4.0'	20	100	Same as S-1
S-3 : 4.0'- 6.0'	12	60	...grade: Dk. brown, some Gravel, saturated
S-4 : 6.0'- 8.0'	4	50	Gray, m. stiff CLAY, some Silt, little Gravel, little f/c Sand, mod. plastic, wet (CL) (Varved)
S-5 : 8.0'- 10.0'	8	50	Same as S-4
S-6 : 10.0'- 12.0'	6	70	Same as S-4
S-7 : 14.0'- 16.0'	8	50	Same as S-4
S-8 : 19.0'- 21.0'	6	90	Same as S-4
S-9 : 23.0'- 25.0'	4	100	Same as S-4
			Depth to Bottom of Hole: 25.0 feet

Logged by: E. Zinni

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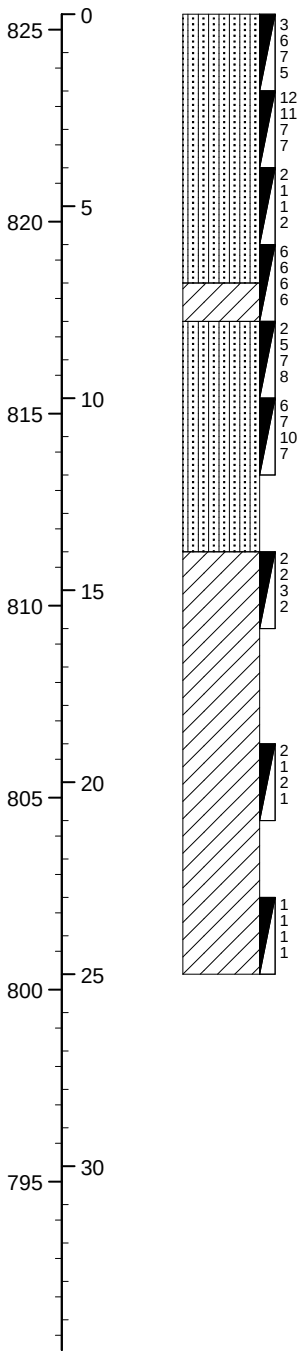
TEST BORING LOG

JOB No.: 23-515 **BORING No.:** B-6

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DRILLER:	W. Arnold	**TYPE OF DRILL RIG:**	CME-75 (ATV)
SAMPLING METHODS:	ASTM D1586	**SIZE AND TYPE OF BIT:**	2 1/4" I.D. H.S.A.
DATE STARTED:	3/1/23	**SURFACE ELEVATION (ft.):**	825.4
DATE COMPLETED:	3/1/23	**GROUNDWATER DEPTH (ft.):** (measured at completion unless indicated below)	None



Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
S-1 : 0.0'- 2.0'	13	25	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)
S-2 : 2.0'- 4.0'	18	75	Same as S-1
S-3 : 4.0'- 6.0'	2	40	...grade: v. loose, wet
S-4 : 6.0'- 8.0'	12	100	...grade: m. dense
			Gray, stiff CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL)
S-5 : 8.0'- 10.0'	12	100	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, non-plastic, wet (SM)
S-6 : 10.0'- 12.0'	17	100	Same as S-5
S-7 : 14.0'- 16.0'	5	100	Gray, m. stiff CLAY, some Silt, little f/c Sand, tr. Gravel, mod. plastic, wet (CL) (Varved)
S-8 : 19.0'- 21.0'	3	100	...grade: soft
S-9 : 23.0'- 25.0'	2	100	Same as S-8
			Depth to Bottom of Hole: 25.0 feet

Logged by: E. Zinni

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APPENDIX B

GEOTECHNICAL REFERENCE STANDARDS

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Column Header Descriptions

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BUFFALO DRILLING COMPANY, INC.
10440 MAIN STREET
CLARENCE, NEW YORK 14031
(716) 759-7821 FAX: (716) 759-7823

TEST BORING LOG

JOB No.: BORING No.:

PROJECT:

EXAMPLE

DRILLER:
SAMPLING METHODS:
DATE STARTED:
DATE COMPLETED:

TYPE OF DRILL RIG:
SIZE AND TYPE OF BIT:
SURFACE ELEVATION (ft.):
GROUNDWATER DEPTH (ft.):
(measured at completion unless indicated below)

Elevation/ Depth (feet)	Soil Symbols Sampler Symbols Field Test Data	Sample No. : Range	N-Value	% REC (RQD)	Soil and Rock Description / Remarks
100 — 0	1 1 1 2 / 6 8 11 14	S-1 : 0.0'- 2.0'	2	50	Dk. brown, soft, CLAY, some Silt, little f. Sand, tr. Gravel, tr. Roots, tr. Organic matter, mod. plastic, wet (CL)
		S-2 : 2.0'- 4.0'	19	50	Brown, m. dense f. SAND, some Silt, tr. Gravel, tr. Clay, tr. Roots, non-plastic, moist (SM)

Elevation/Depth: The depth column provides the vertical scale of the boring log in feet below ground surface.

Sample No. : Range: Disturbed samples are identified with “S” preceding the sample number. Undisturbed (Shelby-tube) samples are identified with “U” preceding the sample number. Rock core samples identified with “C” preceding the core run. The range of elevation/depth where the sample was taken is identified in one-tenth foot increments.

N-value: The Standard Penetration Test N-value, as specified by ASTM D1586, is defined as the number of blows required by a 140-pound hammer falling 30 inches, each blow, to drive a 2-in outside diameter split-spoon sampler 12 inches.

% REC (RQD): “Percent Recovery” is the length of samples recovered divided by the total length sampled. The result is numerically expressed as a percent. The Rock Quality Designation (RQD) is the total length of places >4 inches divided by the total length of core run.

Soil and Rock Description / Remarks: This column denotes the exact depth of recovery and general documentation of drilling efforts. Description and classification are based on visual inspection of samples and boring operations. The stratum lines shown on the boring logs are based upon interpretation and may not represent precise subsurface conditions. Water-level readings have been made in the drill holes at time under conditions stated on the boring logs. Fluctuations in the water level may occur due to other factors than those present the time measurement was taken. See attached sheet.

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Soil and Rock Description / Remarks: Terminology Used for Soil Description

Density Description of Granular Soil

Number of Blows per ft., N	*Relative Density*
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium
30 - 50	Dense
Over 50	Very Dense

Abbreviations Used in Soil Sample Classification

f - fine	v - very
m - medium	gr - gray
c - coarse	bn - brown
f/m - fine to medium	yel - yellow
f/c - fine to coarse	sl - slight
tr - trace	dk - dark

Consistency Description of Cohesive Soil

Number of Blows per ft., N	*Consistency*
Below 2	Very Soft
2 - 4	Soft
4 - 8	Medium
8 - 15	Stiff
15 - 30	Very Stiff
Over 30	Hard

Bedding

Parting	Less than 0.02 ft.
Band	0.02 - 0.2 ft.
Thin bed	0.2 - 0.5 ft.
Medium bed	0.5 - 1.0 ft.
Thick bed	1.0 - 2.0 ft.
Massive	Over 2.0 ft.

Grain Size

	Passing / Retained on
Boulder	LARGE / 12-in sieve
Cobble	12-in / 3-in sieve
Gravel	3-in sieve / No. 4 sieve
	No. 4 sieve / No. 10 sieve
Sand	No. 10 sieve / No. 40 sieve
	No. 40 sieve / No. 200 sieve
Silt	No. 200 sieve / 0.005 mm sieve
Clay	Smaller than 0.005 mm

Hardness

Very Soft or Plastic	Can be indented with thumb
Soft	Can be scratched with fingernail
Moderately Hard	Can be scratched with knife
Hard	Difficulty to scratch with knife
Very hard	Cannot be scratched with knife

Percentage Terminology Used in Soil Classification

Trace	0 - 10 %	Some	20 - 35 %
Little	10 - 20 %	And	35 - 50 %

Moisture

Dry	Absence of moisture, dusty, dry to the touch.
Moisture	Small quantity of moisture. Soil usually above groundwater level.
Wet	Moisture noticeable to the touch. Soil may be below groundwater level.
Saturated	Visible free water, usually soil is below groundwater level.

Plasticity

Non-plastic	An 1/8-in thread cannot be rolled at any water content.
Slight plasticity	Thread can be barley rolled.
Moderate plasticity	Thread is easy to roll and little time is required to reach the plastic limit (PL).
Plasticity	Considerable time is required to reach PL. Thread can be re-rolled several times after reaching the PL.

Crystallinity or Texture

Dense	Crystals are to small they cannot be distinguished with the naked eye.
Very Fine Crystalline	Crystals barely discernable with the naked eye.
Crystalline	Crystals are medium size, up to 1/8-in diameter.
Very Coarsely Crystalline	Crystals larger than 1/8-in diameter.

Voids

Porous	Smaller than pinhead. Their presence is indicated by the degree of absorbency.
Pitted	Pinhead size to 1/4 in. If thin walls separate the individuals pits, the core may be described as honeycomb.
Vug	1/4 inch to the diameter of the core. The upper limit will vary with core size.
Cavity	Larger than the diameter of the core.

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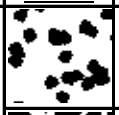
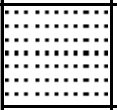
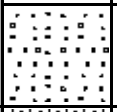
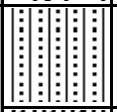
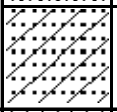
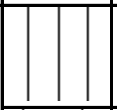
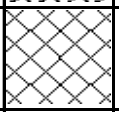
Soil Classification Chart: Unified Soil Classification System (USCS)

Major Divisions			Pattern	USCS ID	Typical Descriptions
Coarse-Grained Soils: More than 50% of material larger than No. 200 sieve	**Gravels**: More than 50% of coarse fraction larger than No. 4 sieve	Clean Gravels (little or no fines)		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		Gravels with appreciable amounts of fines		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-silt mixtures
	Sands: Less than 50% of coarse fraction larger than No. 4 sieve	Clean sands (little or no fines)		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
		Sand with appreciable amount of fines		SM	Silty sands, silt-sand mixtures
				SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils: Less than 50% of material larger than No. 200 sieve	**Silts and Clays, Low plasticity**: Liquid Limit < 50%			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays, High plasticity: Liquid Limit > 50%			MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
Highly Organic Soils				Pt	Peat, humus, swamp soils with organic contents
Miscellaneous Fill				FILL	Miscellaneous fill may belong in any division but is identified as FILL

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APPENDIX C

LABORATORY SOIL TEST RESULTS

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B&A JOB NO: 23-515
CLIENT: Miranda Development, LLC
PROJECT: Mixed-Use Development
7072 Boston State Road
Town of Boston, Erie Co., New York 14075

TABLE NO. 1
LABORATORY PHYSICAL SOIL TEST RESULTS

Boring No.	Sample No.	Depth	Moisture Content ASTM D2216	Organic Matter Content ASTM D2974	Unconfined Compressive Strength ASTM D2166	Wet Density ASTM D2166	Grain Size Analysis ASTM D422				Atterberg Limits ASTM D4318			USCS Soil Classification ASTM D2487 / ASTM D2488 *
							Gravel	Sand	Silt	Clay	LL	PL	PI	
		(ft.)	(%)	(%)	(psf)	(pcf)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(-)
B-3	S-1	0.17-2	24.7	-	-	-	-	-	-	-	-	-	-	SM
	S-2	2-4	9.5	-	-	-	-	-	-	-	-	-	-	SM
	S-3	4-6	22.9	-	-	-	-	-	-	-	-	-	-	SM
	S-4	6-8	22.8	-	-	-					-	-	-	SM
	S-5	8-10	23.2	-	-	-	3.1	60.8	26.6	9.5	-	-	-	SM
	S-6	10-12	17.4	-	-	-					-	-	-	SM
	S-7	14-16	20.7	-	-	-	-	-	-	-	-	-	-	CL
	S-8	19-21	28.8	-	-	-	-	-	-	-	33	19	14	CL
	S-9	23-25	18.6	-	-	-	-	-	-	-				CL
	S-10	29-31	22.6	-	-	-	-	-	-	-	-	-	-	CL
	S-11	34-36	22.0	-	-	-	-	-	-	-	-	-	-	CL
	S-12	39-41	36.2	-	-	-	-	-	-	-	-	-	-	CL
	S-13	44-46	11.6	-	-	-	-	-	-	-	-	-	-	CL
	S-14	48-50	18.1	-	-	-	-	-	-	-	-	-	-	CL
B-4	S-1	0.5-2	-	-	-	-	-	-	-	-	-	-	-	SM
	S-2	2-4	18.4	-	-	-	-	-	-	-	-	-	-	SM
	S-3	4-6	21.8	-	-	-	-	-	-	-	-	-	-	SM
	S-4	6-8	16.5	-	-	-	-	-	-	-	-	-	-	SM
	S-5	8-10	27.2	-	-	-	-	-	-	-	-	-	-	CL
	S-6	10-12	27.4	-	-	-	-	-	-	-	-	-	-	CL
	S-7	14-16	22.2	-	-	-	-	-	-	-	-	-	-	CL
	S-8	19-21	23.1	-	-	-	-	-	-	-	-	-	-	CL
	S-9	23-25	22.3	-	-	-	-	-	-	-	-	-	-	CL

* Soil classification based on visual identification and soil classification of adjacent samples (as applicable).

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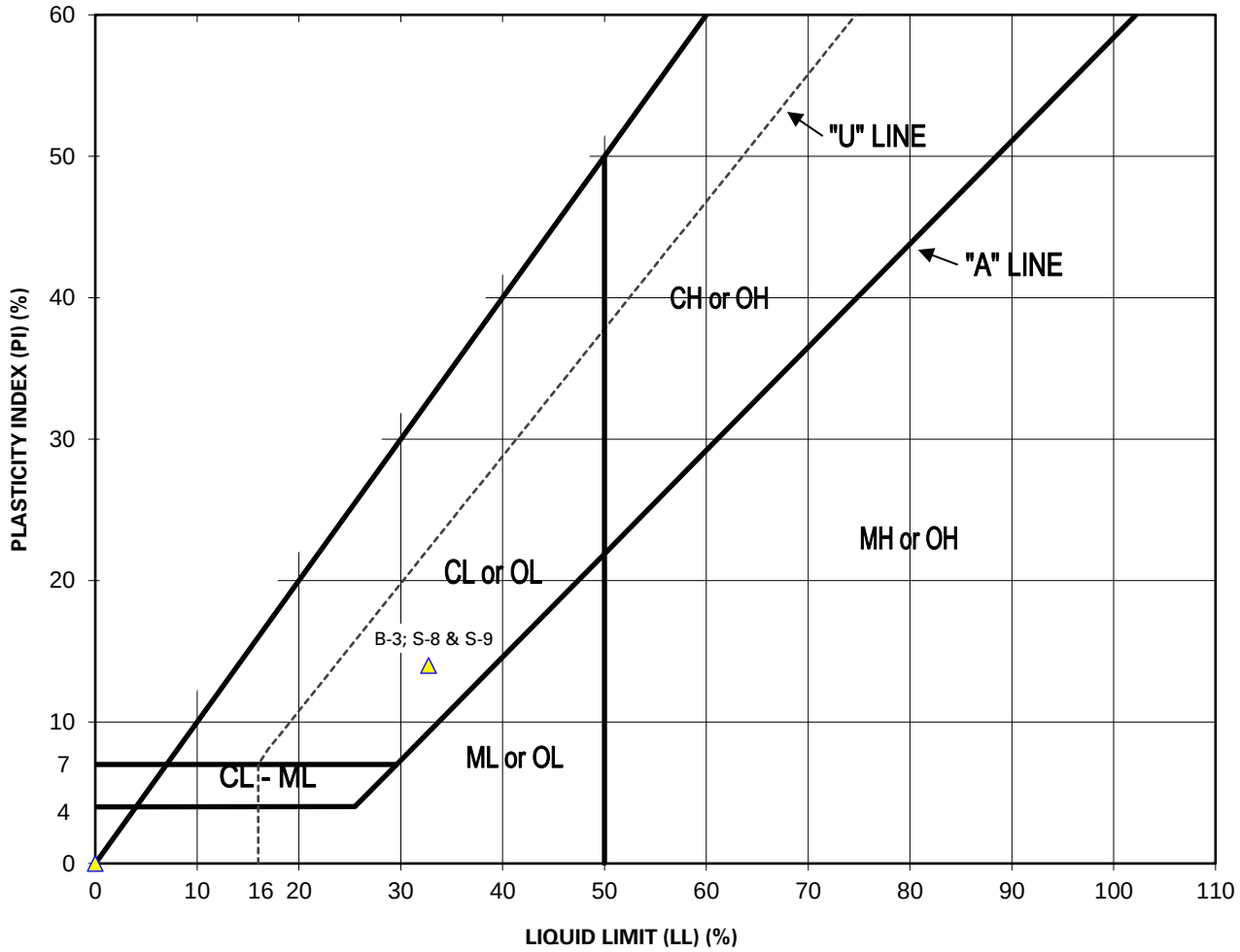
Job No: 23-515
Project: Mixed-Use Development
7072 Boston State Road
Town of Boston, Erie Co., New York 14075

Plasticity Chart

ASTM D4318 & D2487



Boring No.	Sample No.	Depth (ft.)	LL (%)	PL (%)	PI (%)
B-3	S-8 to S-9	19-25	33	19	14

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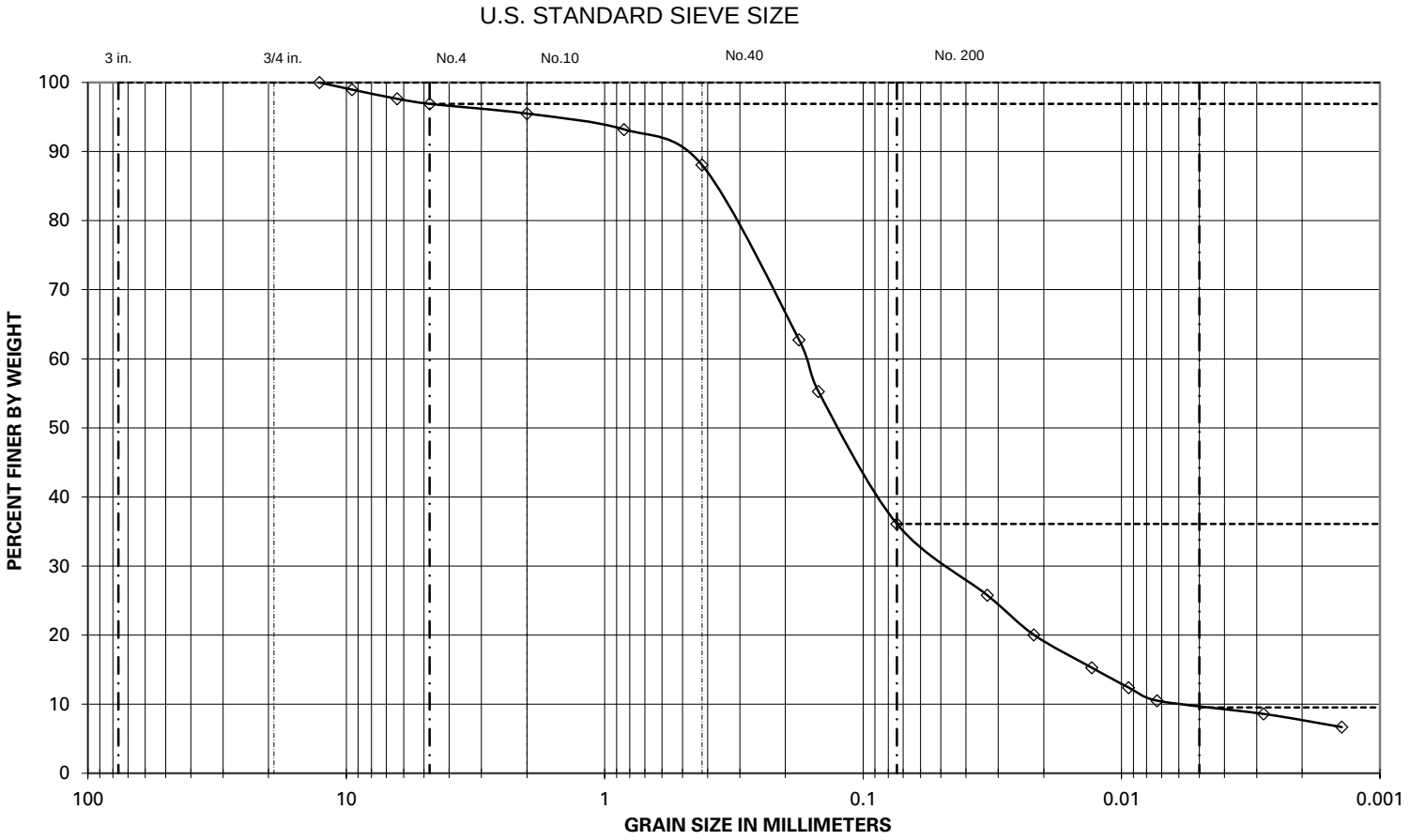
GRAIN SIZE ANALYSIS ASTM D-421/D-422

C_C= 2.54 **C_U= 30.0** **LL= NA** **PL= NA** **PI= NA** **USCS= SM**



3.1 % Gravel

D_{60}= 0.1650

60.8 % Sand

D_{30}= 0.0480

26.6 % Silt

D_{10}= 0.0055

9.5 % Clay

COBBLES	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

Date Tested: March 7, 2023 **Boring No.: B-3** **Sample No.: S-4 to S-6** **Depth: 6 to 12 ft.**

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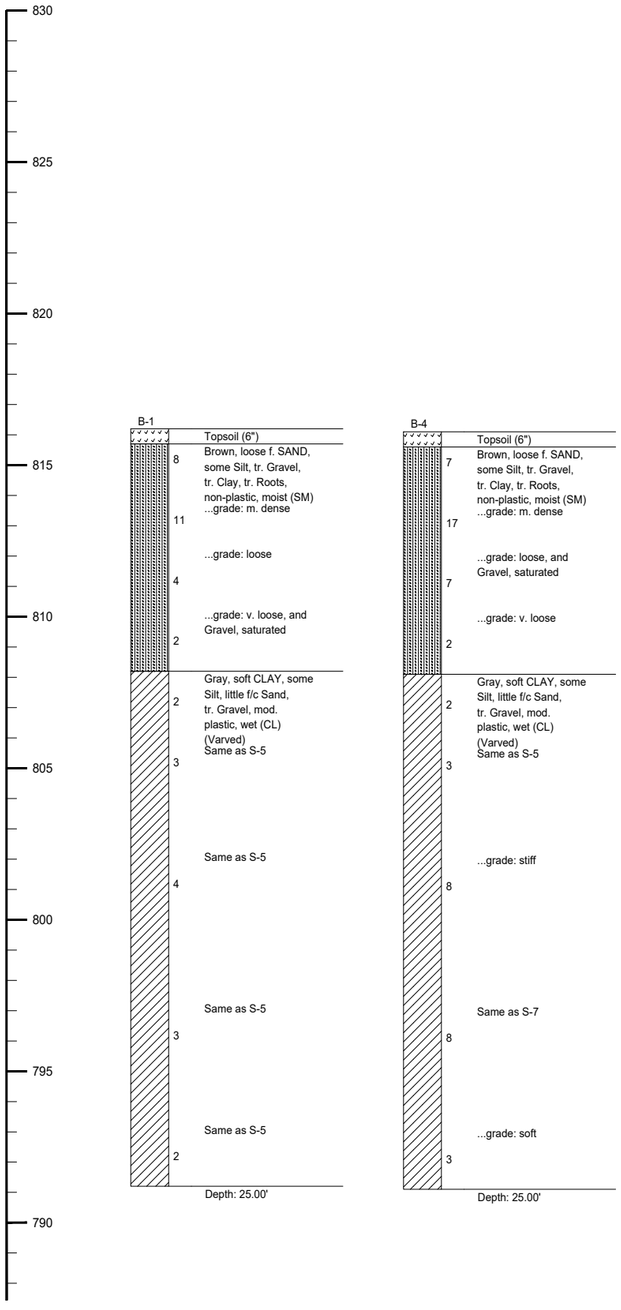
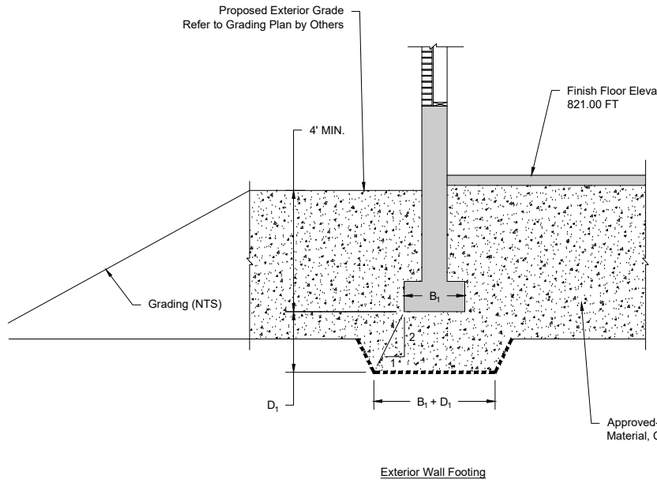
APPENDIX D

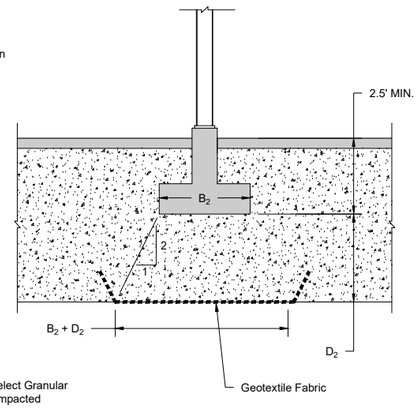
ENGINEERING COMPUTATIONS AND SCHEMATICS

"PROFILE OF BORING"





Exterior Wall Footing



Interior Column Footing

NOTES:

- Install Foundations per Architect or Structural Engineer.
- Adhere to Building Code of New York State.
- Elevations are relative to Bench Mark established in field. Please refer to Test Boring Location Plan.
- Bear footings on stable, natural, medium-dense soils (N-values greater than 10 blows) or with approved select granular fill undercut, placed in loose lifts no greater than 12 inches thick and compacted to 95% of maximum-dry density as per ASTM D1557.
- Bearing Grades should be approved by a qualified inspector, during construction.
- On Above Conditions: USE Q_{ALLOW} = 3,000 PSF

ELEVATION (feet)
830
825
820
815
810
805
800
795
790

Topsoil
Silty sand
Low plasticity clay
Boring continues

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10440 MAIN STREET, CLARENCE, NEW YORK 14031

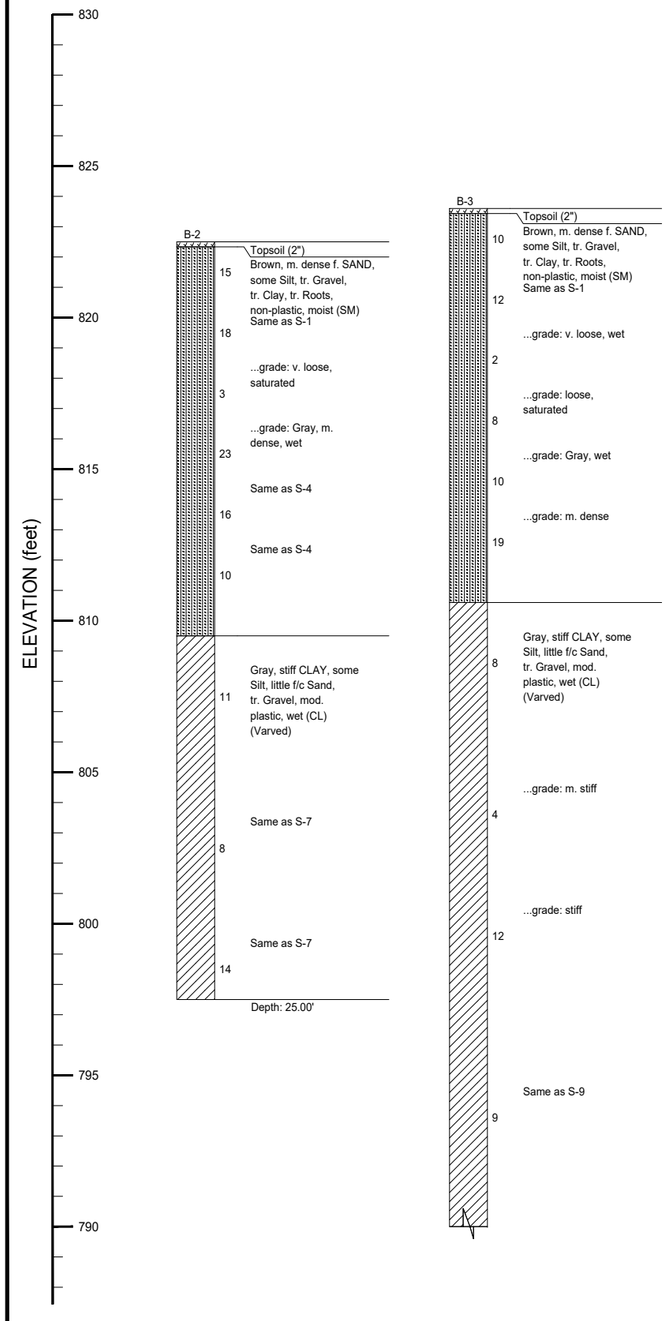
PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

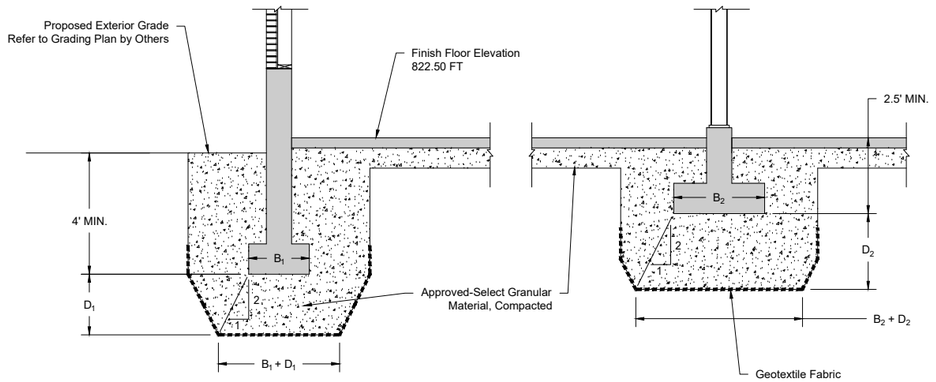
DATE: 5/2/2023
BY: J. Colletti

SCALE: 1" = 5'

JOB NO.: 23-515

"PROFILE OF BORING"





Exterior Wall Footing

Interior Column Footing

NOTES:

- Install Foundations per Architect or Structural Engineer.
- Adhere to Building Code of New York State.
- Elevations are relative to Bench Mark established in field. Please refer to Test Boring Location Plan.
- Bear footings on stable, natural, medium-dense soils (N-values greater than 10 blows) or with approved select granular fill undercut, placed in loose lifts no greater than 12 inches thick and compacted to 95% of maximum-dry density as per ASTM D1557.
- Bearing Grades should be approved by a qualified inspector, during construction.
- On Above Conditions: USE Q_{ALLOW} = 3,000 PSF

Topsoil
Silty sand
Low plasticity clay
Boring continues

BARRON & ASSOCIATES, P.C. & BUFFALO DRILLING COMPANY, INC.
10440 MAIN STREET, CLARENCE, NEW YORK 14031

PROJECT: Proposed Mixed-Use Development
7072 Boston State Road, Town of Boston, Erie Co., New York 14075

DATE: 5/2/2023
BY: J. Colletti

SCALE: 1" = 5'

JOB NO.: 23-515

7072 Boston State Rd, Boston

Latitude, Longitude: 42.6929, -78.7845

Date	3/21/2023, 10:18:46 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	0.154	MCE_R ground motion. (for 0.2 second period)
S_1	0.043	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.247	Site-modified spectral acceleration value
S_{M1}	0.104	Site-modified spectral acceleration value
S_{DS}	0.164	Numeric seismic design value at 0.2 second SA
S_{D1}	0.07	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2 second
F_v	2.4	Site amplification factor at 1.0 second
PGA	0.084	MCE_G peak ground acceleration
F_{PGA}	1.6	Site amplification factor at PGA
PGA_M	0.135	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	0.154	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.161	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.043	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.047	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.084	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.956	Mapped value of the risk coefficient at short periods
C_{R1}	0.932	Mapped value of the risk coefficient at a period of 1 s
C_V	0.7	Vertical coefficient

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B&A JOB NO.: 23-515

DATE: 03/21/23

PAGE: _____

LATERAL EARTH PRESSURE ON GENERIC BLOCK FOUNDATIONS FOR SIGNS, FREE-STANDING RETAINING WALLS, OR BELOW GRADE/BASEMENT/TANK/POOL RETAINING WALLS (Less Than 20 Feet High)

a) Porous filter media, in contact with the basement/below grade foundation wall or retaining walls, protects and is in contact with a minimum 4 inch diameter perforated drainage pipes at the footing/base of the foundation/structural wall (exterior backfill side and interior basement side) and/or weep pipes through the wall, as needed and as applicable.

b) Where recommended, a geotextile filter fabric will protect the gravel filter media from the earth backfill. Overlap unsewn seams as per the manufacturer's recommendations.

c) Waterproof earth side of wall, as is customarily provided in practice.

d) Drainage pipes are connected to an appropriately designed collector pipe, conveyance, and/or sump pump system as is applicable for the intended purpose of the wall and as customarily provided/installed in practice.

e) For potential groundwater table conditions above the top of the basement slab-on-grade condition, install continuous waterstops (with no joints in stop) at wall and floor construction joints, as is customarily provided in practice. Interior intermediate drainage pipes beneath the slab, that are spaced on-center and in both directions, do appear to be needed.

f) Assume a uniformly graded, clean coarse sand or sandy gravel backfills:

* equivalent N-value in a dense state: $(N_1)_{60}$ = 40 blows/foot
* friction angle: ϕ' = 38 degrees {Teng, pg. 12}
* average in-place densities: moist - γ_m = 120 pcf
  saturated - γ_{sat} = 132 pcf submerged - $\gamma' = (\gamma_{sat} - \gamma_w)$ = 70 pcf

g) Assume at base of wall/footing, coefficient of friction against sliding (f_s) at base of wall (Refer to Teng, pg. 320-1):

f_s = $\tan(0.58 \times \phi') = 0.40$ (AREA silty soil to silty coarse-grained soil)

h) Use equivalent fluid pressure design approach {Hough, pg. 249 and NAVFAC pg. 7-10-9}:

* at rest pressure coefficient - K_0 = $1 - \sin(\phi')$ = 0.38
* effective lateral pressure of soil - γ'_l = $K_o \times \gamma'$ = 26.6 pcf
* hydrostatic pressure - γ_w = 62.4 pcf
* equivalent fluid pressure with water level at the top of the grade at the wall - γ_{eo} = $\gamma'_l + \gamma_w$ = 89 pcf (say 90 pcf)
* equivalent fluid pressure with compaction induced lateral stress increase (W&F, pg 409) - γ_{eo} = $2 \times K_o \times \gamma_m$ = 91 pcf (say 90 pcf)
* active pressure case - K_a = $[1 - \sin(\phi')] / [1 + \sin(\phi')]$ = 0.24
  γ_{ea} = $K_a \times \gamma_m$ = 29 pcf (say 30 pcf)
* passive pressure case - K_p = $[1 + \sin(\phi')] / [1 - \sin(\phi')]$ = 4.2
  γ_{ep} = $K_p \times \gamma_m$ = 504 pcf (say 330 pcf with a F.S. = 1.5)

		Thoroughly Compacted ⇒⇒		Uniformly Graded & Clean Coarse Sand or Sandy Gravel Fill	Non-Plastic Silty Sand or Sandy Silt Fill	
USE:	Earth Pressure Coefficient	Static Active	=	0.24	0.33	
		Static At-Rest	=	0.76	1.00	
		Static Passive	=	2.80	2.00	(with F.S. = 1.5)
		Static Passive	=	4.20	3.00	(with F.S. = 1.0)
USE:	Equivalent Fluid Pressure	Static Active	=	30 pcf		
		Static At-Rest	=	90 pcf (for rigid walls)		
		Static Passive	=	330 pcf (with F.S. = 1.5)	[500 pcf with (with F.S. = 1.0)]	

[For earthquakes, structural engineer may elect to use the above Static Passive case instead of the below Earthquake Lateral Load for Non-Yielding Wall movement into the soil backfill.]

USE: Simplified Model for Earthquake Lateral Load/Ft. Wall Length @ 0.6 H_{bw} above base. Loads for Non-Yielding Wall. H_{bw} = Earth Height Behind Wall (feet)

Reduce load by 33% for Yielding Wall (active case) = (6.8 psf / foot) x H_{bw}^2 (NYS, S_{ds} = 0.25 g)

(γ_m = 120 pcf for S_{ds} value. Add to Static At Rest/ Active Pressure/Load for unsaturated backfill case) = (13.5 psf / foot) x H_{bw}^2 (NYS, S_{ds} = 0.50 g)

= (17.5 psf / foot) x H_{bw}^2 (NEern NYS, $S_{ds} \leq 0.65$ g)

[Above for Site Class C to E soils. Interpolate for other S_{ds} values.

Use 1.75 x values for walls on Class B/A rock or on rigid foundation base. (FEMA NEHRP Guidelines)]

Saturated/Liquified Soil During Earthquake = 132 pcf

(Equivalent Fluid Pressure. Add to inertial hydrodynamic pressure, not presented here.)

{For looser/denser backfills, adjust above pressures by the ratio = new density / 120 pcf or / 132 pcf (for saturated case)}

USE: Coefficient of Friction Against Sliding (f_s) = 0.45 (on compacted NYSDOT Item #304.12 or #304.14 gravels)

(use lowest f_s with no underlying weaker layers) = 0.35 (on compacted granular soil & non-plastic silt)

= 0.20 (slab-on-grade on polyethylene on granular fill)

[with a F.S. = 1.0] = 0.60/0.50 (on clean, rough, & sound bedrock/smooth bedrock)

Min. Factor of Safety Against Sliding = 1.5

[Rev.9-30-09]

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APPENDIX E

GENERAL EARTHWORK SPECIFICATIONS

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GENERAL EARTHWORK SPECIFICATIONS

1. GENERAL

1.1. SITE AND SUBSURFACE CONDITIONS

1.1.1. Overview

This specification is included as a courtesy to the clients of *Barron & Associates, PC* and addresses earthwork site preparation. Additions and modifications are necessary to create a job-specific specification. This specification may serve as a basis for the development for a technical specification under Division 31 (Earthwork) and Division 32 (Exterior Improvements).

1.1.2. Site Conditions

The site-specific conditions are described under separate cover or may be available from the OWNER.

1.1.3. Subsurface Conditions

The site-specific subsurface conditions are described under separate cover or may be available from the OWNER.

1.2. REFERENCES

1.2.1. American Standard for Testing and Measurement (ASTM)

- ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- ASTM D7928 Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis
- ASTM D1140 Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing
- ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))
- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D1883 Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils

1.2.2. Other

- 2018 International Building Code (IBC)
- 2020 Building Code of New York State
- 2020 Residential Code of New York State
- 2021 MasterSpec

1.3. DEFINITIONS

1.3.1. Unacceptable Material

Soil material containing debris, wood, scrap material, vegetation, refuse, soft unsound particles, and other organic, frozen, deleterious, or objectionable materials. Contaminated soils shall be properly documented and removed or remediated on site. If necessary, remediation procedure will be defined by the OWNER.

1.3.2. Unsuitable Material

Brown, organic topsoil and underlying soft pockets of organic silt or wet, reworked silty clay.

1.3.3. Ordinary Fill

Friable soil containing no stone greater than two-thirds loose lift thickness and no unacceptable or unsuitable materials. In general, existing random fill is expected to be acceptable for reuse as ordinary fill given proper sorting, blending, drying, and controlled placement methods.

1.3.4. Granular Fill

Ordinary fill meeting the designation of ASTM D2487 classification of GW with a maximum of 10 percent by weight passing ASTM D1140, No. 200 sieve.

1.3.5. Select Granular Fill

Clean, uncoated soil which contains no unacceptable materials and conforms to the gradation requirements defined in Table A: Select Granular Fill.

Table A: Select Granular Fill

Sieve Size	Percent Finer by Weight
⅔ of the loose lift thickness	100
No. 10	30 - 95
No. 40	10 - 70
No. 200	0 - 15

1.3.6. Sand and Gravel

Clean, hard, durable, uncoated particle of sand and gravel, free from lumps of clay, containing no unacceptable matter, and conforming to gradation requirements of Table B: Sand and Gravel.

Table B: Sand and Gravel	
Sieve Size	Percent Finer by Weight
*	100
No. 4	50 - 85
No. 10	
No. 40	10 - 35
No. 100	
No. 200	0 - 8

* Job-Specific. To be determined by the ENGINEER

1.3.7. Crushed Stone

Clean, durable, sharp-angled fragments of rock or crushed gravel stone of uniform quality, containing no unacceptable matter, free from coatings, and conforming to gradation requirements of Table C: Crushed Stone.

Table C: Crushed Stone		
Sieve Size	Percent Finer by Weight	
	¾-inch Stone	1 ¼-inch Stone
1 ½-inch		100
1 ¼-inch		85 - 100
1-inch	100	
¾-inch	90 - 100	10 - 40
⅝-inch		
½-inch	10 - 50	0 - 8
⅜-inch	0 - 20	
No. 4	0 - 5	

1.3.8. Flowable Fill

Also known as Controlled Low Strength Material – Controlled Density Fill (CLSM-CDF), this material is available under a variety of producer names (e.g., K-Krete©, M-Crete, Flash Fill©, Flowable Mortar, Unshrinkable Fill, etc.). This non-settling backfill mixture is most commonly used for its flowable characteristics, its support strength under traffic loads, and its removability at a later date. The material may be produced on-site or off-site. In either case, the producer

of such materials and the product must meet certain certification criteria. Such information is beyond the scope of this specification and will be considered on a site-specific basis.

Flowable fill may be acceptable for use as a backfill for utility trenches of other low-lying areas which require a compacted granular fill. Its use and warranty of performance is left to the CONTRACTOR in such applications.

The use of flowable fill under load-bearing structural components in place of properly placed and compacted granular fill is NOT common and is questionable. The localized use of such material may have profound effects on the performance of a foundation system. Site-specific conditions and the extent of anticipated use of flowable fill must be examined by geotechnical engineer. Cost of such consultation shall be borne by the CONTRACTOR unless specifically directed by the OWNER to seek such consultation. Without such consultation, warranty of performance for such use is left to the CONTRACTOR.

1.4. SUBMITTALS

The following submittals shall be provided in accordance with approved submittals procedures.

(1) Fill Source: Provide name and source locations of fill material.

(2) Field Test Reports: Field tests will be performed by OWNER's Representative as needed. CONTRACTOR may be required to perform such tests on proposed off-site fill materials.

(a) Fill material grain size analyses per ASTM C136, D7928, D1140, D2487

(b) Moisture/Density test results per ASTM D2216

(c) Liquid limit, plastic limit, and plasticity index per ASTM D4318

(d) Compaction/Density test results per ASTM D6938 and D1557

(3) Sample: Geotextile fabric

2. PRODUCTS

Geotextile Fabric: Mirafi 600X or equal. (Also referred to as synthetic fabric).

3. EXECUTION

3.1. PROTECTION

3.1.1. General

Manner of excavation shall minimize disturbance of underlying natural ground. If deemed necessary by the Engineer, alter construction procedures to reduce subgrade disturbance.

Excavate areas which have been excessively disturbed to firm ground and backfill with properly compacted granular fill.

3.1.2. Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.3. Trees, Shrubs, and Existing Facilities

Protect from any damage all vegetation and facilities identified to remain.

3.1.4. Utility Lines

Locate all utilities within the area of disturbance prior to the start of work. Show locations on initial plans. Protect utility lines from damage. Notify the ENGINEER immediately of damage to or an encounter with an unknown utility. Damage to utility lines are to be repaired by the CONTRACTOR at no additional cost. The CONTRACTOR shall have underground utility owners stake out utility locations prior to the start of clearing and excavation operations.

3.2. VERIFICATION OF CONDITIONS / PROOF-ROLLING

Prior to placement of the initial layer of fill over the natural ground, proof-roll the exposed natural ground above the groundwater table elevation by making two passes with a fully-loaded ten-wheel truck. Excavate unstable areas detected by this process and replace with compacted granular fill.

3.3. PREPARATION

3.3.1. Surface Preparation

Within the site limits indicated on the drawings, excavate all unsuitable material to firm natural ground in the manner specified herein. Follow a construction procedure which permits visual identification of firm natural ground. In the even that groundwater is encountered, the ENGINEER may require that the size of the open excavation be limited to that which can be handled by open pumping to allow visual inspection of the excavation bottom and the performance of backfill operations to be conducted in a dry state.

Excavation of unsuitable material shall be limited to the greater of the following:

- A distance of 5 feet beyond building lines or
- The area defined by a one-horizontal to one-vertical line sloping down from the outside bottom edge of exterior footings to firm natural ground.

3.4. PLACEMENT AND COMPACTION

3.4.1. General

Place fill in accordance with Table D: Compaction Alternatives. These alternatives are provided as minimum compaction standards only and in no way relieve the CONTRACTOR of his obligation to achieve any specified degree of compaction by whatever means may be necessary.

Grade to provide positive drainage and a smooth surface which will readily shed water. To the extent practicable, compact each layer to the specified density on the same day placed. Place fill in horizontal layers. Where horizontal layers meet a natural slope, key layer into slope by cutting a bench.

Fill that is too wet for proper compaction: Disc, harrow, or otherwise dry to proper moisture content for compaction to the required density.

Fill that is too dry for proper compaction: Uniformly apply water over the surface of the loose layer in sufficient quantity to allow compaction to the required density.

Table D: Compaction Alternatives

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness (inches)		Maximum Number of Passes	
		Below Structure and Pavements	Less-Critical Areas	Below Structure and Pavements	Less-Critical Areas
Hand operated vibratory plate of light roller in confined areas.	3	4	4	4	4
Hand operated vibratory drum rollers weighing at least 1,000 pounds in confined areas.	4	6	8	4	4
Loaded 10-wheel truck or D-8 crawler.	6	10	12	4	2
Light vibratory drum roller; Min. weight at drum 8,000lbs; Min. dynamic force 10,000lbs.	8	12	12	6	2
Minimum vibratory drum; Min. weight at drum 10,000lbs; Min. dynamic force 20,000lbs.	8	18	18	6	4

3.4.2. Dewatering

Provide adequate pumping and drainage facilities to keep excavated areas sufficiently dry of groundwater and surface run-off. Dewatering shall avoid adversely affection construction procedures or causing excessive disturbance of underlying natural ground. Drain all pumped water in such a manner as to avoid damage to adjacent property.

If requested by the ENGINEER, place a 6-inch to 12-inch layer of sand and gravel or crushed stone over the natural underlying soil to stabilize area which have been disturbed due to groundwater seepage pressures and to expedite dewatering operations. Particular attention shall be given areas under proposed foundations.

3.5. FIELD QUALITY CONTROL

3.5.1. Compaction Requirements

Allow the ENGINEER sufficient time to make necessary observations and tests. Base the degree of compaction on maximum dry density as determined by ASTM D1557. The minimum degree of compaction for placed fill shall be as indicated in Table E: Compaction Requirements.

Table E: Compaction Requirements	
Area	Minimum Degree of Compaction (%)
Below foundation.	95
Pavement and building subbase and base courses.	95
Below building slab base course and above bottom of foundation.	92
Below pavement subbase and base courses.	90
Trench backfill outside of building.	90
Trench backfill inside of building.	Refer to one of the above- listed categories
Ordinary fill within 5 feet of grade.	90
Vegetated areas below 5 feet of grade.	85

3.5.2. Testing

Site work should be monitored and tested by geotechnical ENGINEER or his representative and in accordance with requirements of the design team to assure compliance with earthwork and foundation construction specifications.

The owner will retain a geotechnical ENGINEER or his representative to perform on-site observations and testing during this phase of construction operations. The geotechnical ENGINEER or his representative will:

- Observe excavation and dewatering of building and controlled fill areas;
- Observe backfill and compaction within building and controlled fill areas;
- Laboratory test and analyze fill material; and
- Observe construction – and performing water content, gradation, and compaction tests.

On a timely basis, the CONTRACTOR will receive copies of test results submitted to the OWNER. In addition, during construction the geotechnical ENGINEER will advise the OWNER and CONTRACTOR in writing of conditions which fail to conform to the Contract Documents. The CONTRACTOR shall take immediate action to remedy indicated deficiencies.

The geotechnical ENGINEER or his representative will not supervise or direct the actual work of the CONTRACTOR or employees and representatives of the CONTRACTOR. The presence of, observations by, and testing performed by the geotechnical ENGINEER or his representatives shall not excuse the CONTRACTOR from defects discovered in the work.

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APPENDIX F

LIMITATIONS

LIMITATIONS

1. This geotechnical report is based on the data that was obtained from the subsurface explorations and on the design of the proposed mixed-use development. A geotechnical engineer, who is experienced in foundation construction and earthwork, should be engaged to review the final design and specifications in order to determine whether any change in concept may have any effect on the validity of the conclusions presented herein, and whether these conclusions have, in fact, been implemented in the design and specifications.

2. The subsurface conditions, including thickness, between the exploration locations are approximate and simplified representations of the strata and transitions. There is the possibility that variations in soil and rock conditions and boundaries will be encountered during construction. In order to permit correlation between the exploratory soil data and the actual soil conditions encountered during construction and so as to assess conformance with the plans and specifications as originally contemplated, it is recommended that a geotechnical engineer, who is experienced in foundation construction and earthwork monitoring, should be retained to perform continuous construction review during the site preparation and foundation construction operations.

3. The subsurface exploration logs and subsurface conditions may aid in estimating material quality and quantities, such as topsoil/organic matter, fills, natural soils, and rock, but are not to be relied upon as the exclusive means for bid preparation purposes. It is the responsibility of the contractor to perform any additional site examinations and explorations and to prepare an accurate bid.

4. Disclaimers:

    a. In the event that any changes in the nature, design or location of the structure are planned, the conclusions that are contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing.

    b. The geotechnical engineering report has been prepared for this project by Barron & Associates, P.C. This report is for assistance in design only and is not a sufficient basis on which to prepare an accurate bid.

    c. This report has been prepared for the exclusive use of Miranda Development, LLC and their designated design representatives, for specific application to the construction of a proposed mixed-use development at 7072 Boston State Road, in the Town of Boston, Erie County, New York and in accordance with generally accepted geotechnical engineering practice. No other warranty, expressed or implied, is made.