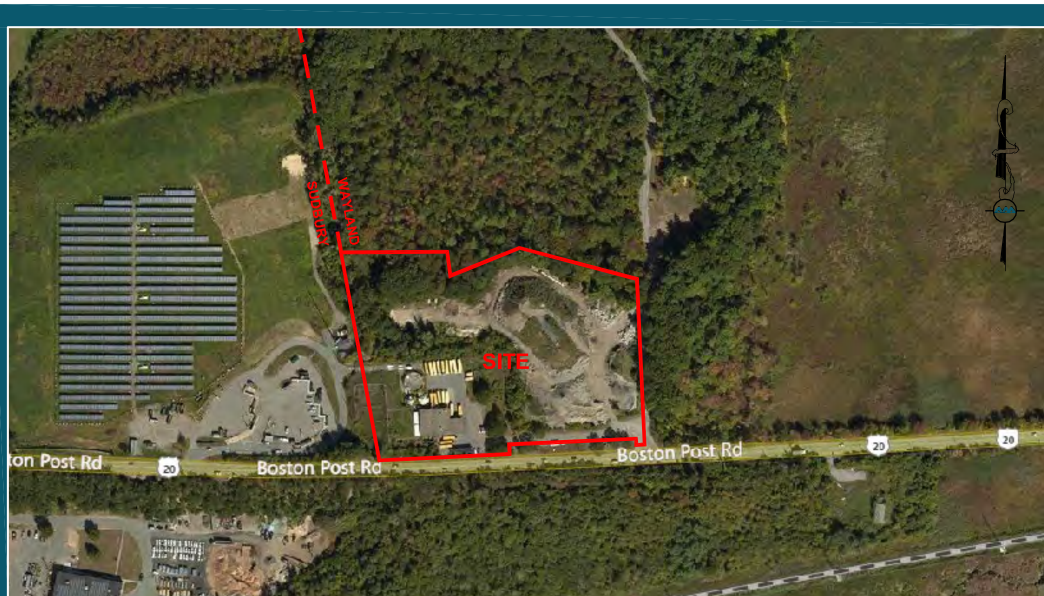
ALLEN & MAJOR ASSOCIATES, INC.

SITE LOCUS SCALE: 1"=500'



ALTA at RIVER'S EDGE
490 BOSTON POST ROAD

WAYLAND, MASSACHUSETTS

ENVIRONMENTAL NOTIFICATION FORM

DATE PREPARED:
DECEMBER 2, 2019

APPLICANT:
WP EAST ACQUISITIONS, LLC.
91 HARTWELL AVENUE
LEXINGTON, MA 02421

OWNER:
THE TOWN OF WAYLAND
41 COCHITUATE ROAD
WAYLAND, MA 01778

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
100 COMMERCE WAY, SUITE 5
WOBURN, MASSACHUSETTS 01801

SITE ENGINEER/LAND SURVEYOR:
ALLEN & MAJOR ASSOCIATES, INC.
100 COMMERCE WAY, SUITE 5
WOBURN, MASSACHUSETTS 01801

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

LANDSCAPE ARCHITECT:
COPLEY WOLFF DESIGN GROUP, INC.
10 POST OFFICE SQUARE
BOSTON, MA 02109

TRAFFIC ENGINEER:
THE ENGINEERING CORP
146 DASCOMB ROAD
ANDOVER, MA 01810

GEOTECHNICAL ENGINEER:
HALEY & ALDRICH, INC.
465 MEDFORD STREET, SUITE 2200
BOSTON, MA 02129

ENVIRONMENTAL ENGINEER:
THE VERTEX COMPANIES, INC.
400 LIBBEY PARKWAY
WEYMOUTH, MA. 02189

A&M PROJECT NO.: 1670-09A

ALLEN & MAJOR
ASSOCIATES, INC.

TABLE OF CONTENTS

SECTION 1.0 – ENVIRONMENTAL NOTIFICATION FORM (ENF)

Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office

Environmental Notification Form

For Office Use Only

EEA#: ____________________

MEPA Analyst: ______________

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: **ALTA at River's Edge**			
Street Address: **490 Boston Post Road (MA Route 20)**			
Municipality: **Wayland**		Watershed: **SuAsCo**	
Universal Transverse Mercator Coordinates: **303840.70 Easting, 4692911.58 Northing**		Latitude: **42°21'49.464"N** Longitude: **71°22'55.632"W**	
Estimated commencement date: **June 2020**		Estimated completion date: **January 2022**	
Project Type: **Multi-family**		Status of project design: **50** %complete	
Proponent: **Town of Wayland/WP East Acquisitions, LLC**			
Street Address: **41 Cochituate Road/91 Hartwell Avenue**			
Municipality: **Wayland/Lexington**		State: **MA**	Zip Code: **01778/02421**
Name of Contact Person: **Carlton M. Quinn, PE**			
Firm/Agency: **Allen & Major Associates, Inc.**		Street Address: **100 Commerce Way**	
Municipality: **Woburn**		State: **MA**	Zip Code: **01801**
Phone: **781-935-6889**	Fax: **781-935-2896**		E-mail: **cquinn@ Allenmajor.com**

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☐Yes ☒No

If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:

a Single EIR? (see 301 CMR 11.06(8)) ☐Yes ☐No
a Special Review Procedure? (see 301CMR 11.09) ☐Yes ☐No
a Waiver of mandatory EIR? (see 301 CMR 11.11) ☐Yes ☐No
a Phase I Waiver? (see 301 CMR 11.11) ☐Yes ☐No
(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)

Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)?
Transportation Review Thresholds: 301 CMR 11.03(6)(b)(14) – Generation of 1,000 or more new ADT on roadways providing access to a single location and construction of 150 or more new parking spaces at a single location.

301 CMR 11.03(6)(b)(15) – Construction of 300 or more new parking spaces at a single location.

Which State Agency Permits will the project require?
MA DOT State Highway Access Permit & MassDEP Groundwater Discharge Permit

Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres:
The project will be privately financed.

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	8.25 acres +/-		
New acres of land altered		8.25 acres +/-	
Acres of impervious area	1.24 acres +/-	2.99 acres +/-	4.23 acres +/-
Square feet of new bordering vegetated wetlands alteration		N/A	
Square feet of new other wetland alteration		N/A	
Acres of new non-water dependent use of tidelands or waterways		N/A	
STRUCTURES			
Gross square footage	11,000+/- S.F.	349,200+/- S.F.	360,200+/- S.F.
Number of housing units	N/A	218 Units	218 Units
Maximum height (feet)	1 Story at 21' +/-	3 Stories at 31.59' +/-	4 Stories at 52.58' +/-
TRANSPORTATION			
Vehicle trips per day	34	+ 1,038	1,072
Parking spaces	15	+ 329	344
WASTEWATER			
Water Use (Gallons per day)	0	44,748	44,748
Water withdrawal (GPD)	0	0	0
Wastewater generation/treatment (GPD)	0	37,290	37,290
Length of water mains (miles)	0	0.38	0.38
Length of sewer mains (miles)	0	0.06	0.06

Has this project been filed with MEPA before?
☐ Yes (EEA #__________) ☒No

Has any project on this site been filed with MEPA before?
☒ Yes ☐No **(EEA # 7471 – December 12, 1988 "490 Boston Post Road – Wayland/Sudbury Septage Treatment Facility). Project proponent was the Road Commissioners. Although a MEPA filing was submitted in 1988, some sources have indicated the project may have been constructed in approximately 1983. Use of the site for septage treatment was abandoned in 2009.**

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Describe the existing conditions and land uses on the project site:

The 8.25± acre project site is located at 490 Boston Post Road, Wayland, MA, Route 20 (Town of Wayland Assessor's Parcel 22-006) in the Town of Wayland, Massachusetts. The existing site is owned by the Town of Wayland and was formerly used by the Town as a septic treatment facility. It is currently used by the Town for school bus parking, material harvesting (sand and gravel pit) and police shooting/firing range. Surrounding land uses include a transfer station for the Town of Sudbury to the west; conservation land to the north, east, and south; and industrial use to the southwest.

Describe the proposed project and its programmatic and physical elements:

The proposed project (ALTA at River's Edge) is a multi-family residential development. The proponent is working with the Town of Wayland in the development of the project. The Town added an article to their Town Zoning Bylaws with the purpose of increasing the supply of housing in the town, of which a minimum of 25 percent of the units shall be affordable units and a minimum of 25 percent will be age-restricted units (55 and over).

The proposed project consists of three buildings that vary between three to four stories. There are parking garages beneath and site amenities such as a pool and fitness area. The project will also include internal access drives, improved site utilities and stormwater drainage, landscaping, and associated site elements. Vehicular access to the site will be provided by two driveways from an access drive that is immediately adjacent to Boston Post Road (MA Route 20). Onsite, there is a total of 344 proposed parking spaces, of which 180 spaces will be garage parking under the proposed buildings and the remaining will be surface parking. See Section 4 for copies of the proposed site design plans.

The proposed improvements will result in approximately 4.23 acres of impervious surface. During and after construction, access to the site will be from the access road located off of Boston Post Road, lessening the direct impact on Boston Post Road traffic. Construction activities will take approximately 19 months and will be in compliance with federal, state, and local requirements.

As the project designs are further developed, a comprehensive landscape plan will be designed. The landscape plan will be both practical and enhance the aesthetics of the site. A variety of native, hardy, multi-seasonal interest trees, shrubs and perennials will be utilized throughout the site. These plantings will provide shade within the parking areas, walkways and seating areas and buffering from adjacent roadways and land uses. In addition, the proposed landscape design will establish a pleasant sense of place throughout all seasons.

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative:

As part of an effort to evaluate available housing in Wayland, the Town analyzed their properties with more than one acre of land to determine their suitability. The Town also developed a Local Housing Program with DHCD in an effort to use their suitable land to develop more affordable housing units. As part of this effort, the Town of Wayland added an article to their Zoning Bylaws limiting the use of the property located at 490 Boston Post Road (MA Route 20). The purpose of the article "is to increase the supply of housing in the Town of Wayland that is available to and affordable by low-income and moderate-income households." The article established the River's Edge Housing Overlay District (REHOD) on the project parcels in order to promote the construction of a residential use. As such and in partnership with the Town, the proponent is seeking approval from the Town for a multi-family residential development. The existing site is uniquely suited to accommodate the project due to its size, buildable land outside of on-site resource areas, and within the zoning overlay district.

As part of evaluating the Town Master Plan and usability of sites in Wayland, the Town of Wayland Real Asset Planning Committee established a Site Considerations document that lists available Town properties and how to best use the land. The Town determined the site at 490 Boston Post Road would be best suited for development of housing units. Other potential sites owned by the Town were eliminated from consideration due to size, zoning, or unsuitable land or materials on site.

The Zoning Article establishing the REHOD stipulated a lower density of 190 units versus the preferred alternative of 218 units. The lower density multi-family residential of the 190 units was analyzed by the proponent. Due to rising costs of materials over the past few years, the estimated cost of construction has risen while the project has been in the design phase, making the development economically unfeasible if the project were to proceed at 190 units. Increasing the unit count from 190 to 218 helps to mitigate the impact of the project costs, driving the cost per unit lower and increasing the net income generating and ultimately resulting in higher tax revenue for the Town of Wayland. The site was also evaluated for single home housing units, but due to unsuitable topography and the required removal of approximately 50,000 cubic yards of material on site, the Town determined a lower density development would be cost prohibitive.

The No-Build alternative assumes that the proposed development does not occur. This fails to address the pressing local and regional need for housing that will be advanced by completion of the project. Under this alternative, the site would remain largely unused, outside of storage for the Town of Wayland. Stormwater runoff into on-site and adjacent resource areas would be left unmitigated, as no drainage system currently exists on site.

NOTE: *The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.*

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

Site and Off-Site Mitigation Measures

- **The Applicant is working with the Town and MassDOT to provide enhanced pedestrian accommodations along / across Boston Post Road to a future Town-sponsored multi-use path and rail trail project. The Applicant has committed to contribute funding for the design and installation of a pedestrian crosswalk with accessible ramps across Boston Post Road at the DPW Transfer Station Access Roadway.**
- **The Applicant should provide signage and pavement markings to delineate travel within the on-site parking field to improve site circulation. This should include the installation of a stop-sign and stop-line along the DPW Transfer Station Access Roadway at Boston Post Road.**
- **The Applicant is coordinating with the Town to provide pavement markings along the DPW Transfer Station Access Roadway between Boston Post Road and the site's drive aisle to potentially provide a left-turn lane and a right-turn lane.**
- **The Applicant, in coordination with the Town and MassDOT, will evaluate traffic signal timing modifications and optimizations at the intersection of Boston Post Road / Cochituate Road post-occupancy based on future traffic demands.**

Transportation Demand Management Measures

Transportation Coordinator (TC) or Transportation Management Office (TMO) - A Transportation Coordinator (TC) or Transportation Management Office (TMO) will be provided and will assume responsibility for managing rideshare and carpool programs, as well as distributing information to residents to encourage alternative means of transportation. The TC or TMO will be responsible for posting and distributing announcements, holding promotional events to encourage rideshare, bicycling, and walking, and monitoring the TDM program. This role may be filled by an on-site employee or by outside means such as direct membership in the MetroWest / 495 Transportation Management Association (TMA).

MetroWest TMA - The Proponent is discussing opportunities for potential membership or work with the association. Opportunities for coordination with MetroWest / 495 TMA may include a consistent rideshare / carpooling program.

Public Transportation Shelter and Amenities – The site will include a dedicated bus stop with proposed 18'x9' bus shelter. The stop will be serviced by the Wayland Council of Aging (COA) shuttle, school buses, and other potential public transportation services.

Ride Sharing Pick-up & Drop-Off – The site will include dedicated parking spaces for ride sharing pick-up and drop-off to allow for a reduction in overall parking space quantity as illustrated in the Site Development Plans.

Transit Maps and Schedules – Public Transportation schedules and maps for all nearby routes will be provided to residents and posted within each residential building and at the bus shelter location.

Electric Vehicle Charging Stations – The Proponent has committed to install charging stations for electric vehicles within the site with a minimum 12 spaces (3.5 percent of site parking supply). In addition, the Proponent will provide infrastructure for an additional 36 spaces (14.0 percent of site parking supply) for future expansion of the system as demand warrants. Directional signage will be implemented to direct drivers toward these electric vehicle charging stations. Charging station parking will be located strategically in convenient locations near entryways to promote usage.

Podium Parking – The site has been designed to provide a majority of the parking below the residential buildings in order to limit the amount of impervious area on-site and to allow for an increase in open space for recreational use by the residents.

Pedestrian Friendly Development - The proposed River's Edge Development will create a pedestrian-friendly area. A network of sidewalks will establish pedestrian-friendly connections between the residential buildings, Amenity spaces, courtyards and US Route 20. The sidewalks will be designed to encourage walking. Trees and landscaping treatments will create aesthetically-pleasing and pedestrian-friendly areas.

Bicycle Parking – Each building will be provided with a secure bicycle storage room and a fix-it station for maintenance as illustrated in the Site Development Plans. Bicycle racks encourage residents to ride bicycles to/from the Site by allowing them a secure place to store bicycles.

Bicycle Path Connections - The Applicant is working with the Town and MassDOT to provide enhanced pedestrian accommodations along / across Boston Post Road to a future Town-sponsored multi-use path and rail trail project. The Applicant has committed to contribute funding for the design and installation of a pedestrian crosswalk with accessible ramps across Boston Post Road at the DPW Transfer Station Access Roadway.

Site Accessories - Several accessory uses will be provided at the Site to assist in reducing vehicular demand, which include: multiple resident amenity spaces, a business center, fitness center, event lawn, outdoor pool area, resident garden area, grill stations and multiple social spaces located around the site.

Promotional Events and Activities - The TC or TMO will be responsible for organizing promotional events and activities to encourage rideshare and alternative transportation means. For example, the TC or TMO may hold monthly drawings for participants in the carpool program. Drawings would be held on a random basis and all residents who carpooled, used public transportation, walked, or bicycled to work that day will be entered into the drawing. These drawings would encourage those who carpool, use public transportation, walk, or bicycle to do so more often while encouraging participation among those who do not currently travel in these manners. In addition, the TC or TMO will distribute brochures to all new residents and post posters and bulletins on various subjects from carpooling to the rideshare program throughout the Site.

If the project is proposed to be constructed in phases, please describe each phase:
N/A

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?

☐Yes (Specify_____________________________________)

☒No

if yes, does the ACEC have an approved Resource Management Plan? ___ Yes ___ No;

If yes, describe how the project complies with this plan.

____

Will there be stormwater runoff or discharge to the designated ACEC? ___ Yes **X** No;

If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.

____

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/priority_habitat/priority_habitat_home.htm)

☐Yes (Specify_____________________________________) ☒No

HISTORICAL /ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

☐Yes (Specify_____________________________________) ☒No

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? ☐Yes (Specify_____________________________________) ☐No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? ___Yes **X** No;

if yes, identify the ORW and its location. ____

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? **X** Yes ___No; if yes, identify the water body and pollutant(s) causing the impairment: **Sudbury River; E. Coli & Mercury in Fish Tissue**

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? **X** Yes ___No

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:

The existing site has a limited stormwater management system. Two catch basins capture runoff from the access drive while the remainder of the site is unmitigated. For the proposed condition, stormwater will be greatly improved over existing conditions. The attached Stormwater Report will show by means of narrative, calculations, and exhibits that there is no increase in peak rate of runoff from the site at each of the study points for all design storm events. The stormwater management system (SMS) incorporates structural and non-structural Best Management Practices to provide stormwater quality treatment and conveyance. The performance standards of the Massachusetts Stormwater Management Policy have been implemented as part of the overall stormwater management plan for the proposed improvements. The goal of these standards is to improve water quality and protect the waters

of the Commonwealth from adverse impacts due to development. The performance standards are met by implementing appropriate Best Management Practices (BMPs) as outlined in the MassDEP Stormwater Management Handbook, volumes one and two. BMPS implemented in the design include: parking area and street sweeping, catch basins with deep sumps (48" minimum sump) and hoods, stormwater infiltration systems, and water quality inlets (Contech CDS or approved equal). See the Stormwater Report for a detailed analysis.

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? Yes _**X**__ No ___ ; if yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome classification):
The project site is considered an open site.
Release Tracking Number: 3-0034474, Clean Up Phase II
The release was addressed by characterizing the site for ACM and removing approximately 2,000 cubic yards of comingled soil and ACM under a Non-Traditional Asbestos Work Plan in December 2018

Is there an Activity and Use Limitation (AUL) on any portion of the project site? Yes ___ No _**X**__; if yes, describe which portion of the site and how the project will be consistent with the AUL: _____________________.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN? Yes _**X**__ No _ __ ; if yes, please describe:
During soil characterization activities of the approximate 32,000-cubic yard stockpile conducted in February and March 2019, several semi-volatile organic compounds (SVOCs) and metals were detected at concentrations that exceed Massachusetts Contingency Plan (MCP) RCS-1 Reportable Concentrations.

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood:
The site contractor for the project has not been engaged as of this filing. The contractor will be encouraged to reuse any demolition materials to the maximum extent feasible. The existing site has a few abandoned septage treatment tanks and sheds that may not immediately lend themselves to reuse.

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Will your project disturb asbestos containing materials? Yes _**X**__ No _ __ ;
if yes, please consult state asbestos requirements at http://mass.gov/MassDEP/air/asbhom01.htm

Describe anti-idling and other measures to limit emissions from construction equipment:
The contractor will be prohibited from allowing idling vehicles during construction. Only construction vehicles warming up or engaged in activity will be on.

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? Yes ___ No _**X**__ ;
if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the "outstandingly remarkable" resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River?
Yes ___ No ___ ; if yes, specify name of river and designation: _____________;
if yes, will the project will result in any impacts to any of the designated "outstandingly remarkable" resources of the Wild and Scenic River or the stated purposes of a Scenic River.
Yes ___ No ___ ;
if yes,describe the potential impacts to one or more of the "outstandingly remarkable" resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.
2. U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.
3.. Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.
4 Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources and/or districts.
5. Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).
6. List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).
7. List of municipal and federal permits and reviews required by the project, as applicable.

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1) ___ Yes _**X**_ No; if yes, specify each threshold:

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings	0.25 ac	+1.62 ac	1.87 ac
Internal roadways	0.27 ac	-0.02 ac	0.25 ac
Parking and other paved areas	0.67 ac	+1.39 ac	2.06 ac
Other altered areas	2.41 ac	-2.36 ac	0.05 ac
Undeveloped areas	4.65 ac	-0.63 ac	4.02 ac
Total: Project Site Acreage	8.25 ac	0.00 ac	8.25 ac

B. Has any part of the project site been in active agricultural use in the last five years? ___ Yes _**X**__ No; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?

C. Is any part of the project site currently or proposed to be in active forestry use? ___ Yes _**X**__ No; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? ___ Yes _**X**__ No; if yes, describe:

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? ___ Yes_**X**__ No; if yes, does the project involve the release or modification of such restriction? ___ Yes ___ No; if yes, describe:

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? ___ Yes __**X**_ No; if yes, describe:

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? Yes ___ No _**X**_; if yes, describe:

III. Consistency

A. Identify the current municipal comprehensive land use plan
Title: Wayland Town Master Plan Date: August 2004

B. Describe the project's consistency with that plan with regard to:

1) economic development:
The proposed project will provide both affordable housing and senior housing for a community that's housing supply is in need of housing opportunities that meet the town's demographic mix.

2) adequacy of infrastructure:
The project will provide adequate vehicular and pedestrian access with ADA compliant walkways to the project, as well as improve stormwater management infrastructure.

3) open space impacts:
The proposed provides approximately 48% of landscape area and undisturbed resource area, consistent with other developments of similar use.

4) compatibility with adjacent land uses:
The proposed project is located adjacent to resource areas/conservation land and a transfer station for the Town of Sudbury. Although the development is not of the same use, the layout and setback from the roadway and adjacent transfer station make it compatible with the surrounding areas.

C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: **Metropolitan Area Planning Council**

Title: **MetroFuture Regional Plan** Date: **May 2008**

D. Describe the project's consistency with that plan with regard to:

1) economic development:
The proposed project will provide both affordable housing and senior housing for a region that's housing supply is in need of housing opportunities that meet the region's demographic mix.

2) adequacy of infrastructure:
The project will provide adequate vehicular and pedestrian access with ADA compliant walkways to the project, as well as improve stormwater management infrastructure.

3) open space impacts:
The proposed provides approximately 48% of landscape area and undisturbed resource area, consistent with other developments of similar use.

RARE SPECIES SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ___ Yes _**X**_ No; if yes, specify, in quantitative terms:

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

B. Does the project require any state permits related to **rare species or habitat**? ___ Yes _**X**_ No

C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes _**X**__ No.

D. If you answered "No" to <u>all</u> questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to <u>either</u> question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No. If yes,

1. Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? ___Yes ___No; if yes, have you received a determination as to whether the project will result in the “take” of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission.

2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts

3. Which rare species are known to occur within the Priority or Estimated Habitat?

4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___ Yes ___ No

4. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___ Yes ___ No

B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? _**X**__ Yes ___ No; if yes, specify which permit: **MA DEP Notice of Intent**

C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? _**X**__ Yes ___ No; if yes, has a Notice of Intent been filed? _**X**__ Yes ___ No; if yes, list the date and MassDEP file number: **322-0942** ; if yes, has a local Order of Conditions been issued? ___ Yes _**X**__ No; Was the Order of Conditions appealed? ___ Yes _**X**__ No. Will the project require a Variance from the Wetlands regulations? ___ Yes _**X**__ No.

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site:

No proposed permanent or temporary impacts to wetland resource areas are proposed. A natural 30' buffer is proposed to be maintained from the wetland line.

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Coastal Wetlands	Area (square feet) or Length (linear feet)	Temporary or Permanent Impact?
Land Under the Ocean	0	0
Designated Port Areas	0	0
Coastal Beaches	0	0
Coastal Dunes	0	0
Barrier Beaches	0	0
Coastal Banks	0	0
Rocky Intertidal Shores	0	0
Salt Marshes	0	0
Land Under Salt Ponds	0	0
Land Containing Shellfish	0	0
Fish Runs	0	0
Land Subject to Coastal Storm Flowage	0	0
Inland Wetlands		
Bank (lf)	0	0
Bordering Vegetated Wetlands	971 LF	0
Isolated Vegetated Wetlands	0	0
Land under Water	0	0
Isolated Land Subject to Flooding	0	0
Bordering Land Subject to Flooding	942 LF	0
Riverfront Area	0	0

D. Is any part of the project:

1. proposed as a **limited project**? ___ Yes _**X**__ No; if yes, what is the area (in sf)?____
2. the construction or alteration of a **dam**? ___ Yes _**X**__ No; if yes, describe:
3. fill or structure in a **velocity zone** or **regulatory floodway**? ___ Yes _**X**__ No
4. dredging or disposal of dredged material? ___ Yes _**X**__ No; if yes, describe the volume of dredged material and the proposed disposal site:
5. a discharge to an **Outstanding Resource Water (ORW)** or an **Area of Critical Environmental Concern (ACEC)**? ___ Yes _**X**__ No
6. subject to a wetlands restriction order? ___ Yes _**X**__ No; if yes, identify the area (in sf):
7. located in buffer zones? _**X**__Yes ___No; if yes, how much (in sf) _**58,067 S.F.**

E. Will the project:

1. be subject to a local wetlands ordinance or bylaw? _**X**__ Yes ___ No
2. alter any federally-protected wetlands not regulated under state law? ___ Yes _**X**_ No; if yes, what is the area (sf)?

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? ___ Yes _**X**_ No; if yes, is there a current Chapter 91 License or Permit affecting the project site? ___ Yes ___ No; if yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands:

B. Does the project require a new or modified license or permit under M.G.L.c.91? ___ Yes _**X**_ No; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current ___ Change ___ Total ___
If yes, how many square feet of solid fill or pile-supported structures (in sf)?

C. For non-water-dependent use projects, indicate the following:
Area of filled tidelands on the site:___**N/A**________________
Area of filled tidelands covered by buildings:__**N/A**___________
For portions of site on filled tidelands, list ground floor uses and area of each use:
__**N/A**____________
Does the project include new non-water-dependent uses located over flowed tidelands?
Yes ___ No _**X**__
Height of building on filled tidelands___**N/A**______________

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

D. Is the project located on landlocked tidelands? ___ Yes _**X**_ No; if yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ___Yes _**X**_ No; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

F. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? ___ Yes _**X**__ No;
(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)

G. Does the project include dredging? ___ Yes _**X**__ No; if yes, answer the following questions:
What type of dredging? Improvement ___ Maintenance ___ Both ____
What is the proposed dredge volume, in cubic yards (cys) _________
What is the proposed dredge footprint ____length (ft) ___width (ft)____depth (ft);
Will dredging impact the following resource areas?
Intertidal Yes__ No__; if yes, ___ sq ft
Outstanding Resource Waters Yes__ No__; if yes, ___ sq ft
Other resource area (i.e. shellfish beds, eel grass beds) Yes__ No__; if yes __ sq ft
If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?
If no to any of the above, what information or documentation was used to support this determination?
Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.
Sediment Characterization
Existing gradation analysis results? __Yes ___No: if yes, provide results.
Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___Yes ____No; if yes, provide results.
Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment ___
Unconfined Ocean Disposal ___
Confined Disposal:
Confined Aquatic Disposal (CAD) ___
Confined Disposal Facility (CDF) ___
Landfill Reuse in accordance with COMM-97-001 ___
Shoreline Placement ___
Upland Material Reuse____
In-State landfill disposal____
Out-of-state landfill disposal ____
(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:
A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? ___ Yes _**X**__ No; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:

B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes _**X**__ No; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **water supply**? ___ Yes _**X**_ No; if yes, specify which permit:

C. If you answered "No" to <u>both</u> questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to <u>either</u> question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Municipal or regional water supply	________	________	________
Withdrawal from groundwater	________	________	________
Withdrawal from surface water	________	________	________
Interbasin transfer	________	________	________

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. ______________

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? _____Will the project require an increase in that withdrawal? ___Yes ___No; if yes, then how much of an increase (gpd)? ____________________

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___No. If yes, describe existing and proposed water supply facilities at the project site:

	Permitted Flow	Existing Avg Daily Flow	Project Flow	Total
Capacity of water supply well(s) (gpd)	_______	________	________	________
Capacity of water treatment plant (gpd)	_______	________	________	________

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? ___ Yes ___ No
2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **wastewater**? _**X**_ Yes __ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	Existing	Change	Total
Discharge of sanitary wastewater	0	37,380 gpd	37,380 gpd
Discharge of industrial wastewater	0	0	0
TOTAL	0	37,380 gpd	37,380 gpd

	Existing	Change	Total
Discharge to groundwater	0	37,380 gpd	37,380 gpd
Discharge to outstanding resource water	0	0	0
Discharge to surface water	0	0	0
Discharge to municipal or regional wastewater facility	0	0	0
TOTAL	0	37,380 gpd	37,380 gpd

B. Is the existing collection system at or near its capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows: **NOT APPLICABLE**

C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows: **NOT APPLICABLE**

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes __**X**_ No; if yes, describe as follows:

Please note as described above, the project is proposing a wastewater facility. There is a historic use of a wastewater facility associated with this site that ceased its operations in 2009. The proponent has answered No because there is currently no wastewater treatment or disposal associated with the site and by "new" it assumed that the question references a replacement facility, which this is not.

	Permitted	Existing Avg Daily Flow	Project Flow	Total
Wastewater treatment plant capacity (in gallons per day)				

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new? **NOT REQUIRED**

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___ Yes _**X**_ No

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___ Yes _**X**_ No; if yes, what is the capacity (tons per day):

It is understood by the proponent that this question is asking if sewage sludge is going to be stored and processed onsite or are we reusing the wastewater. The answer is "NO" because the sludge will be hauled offsite for processing and we are not doing reuse for this project.

	Existing	Change	Total
Storage	________	________	________
Treatment	________	________	________
Processing	________	________	________
Combustion	________	________	________
Disposal	________	________	________

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

As the proposed residential complex is being constructed new, all the proposed plumbing fixtures will meet the current version of the plumbing code and will be low flow, thereby conserving water to the greatest extent practical. Because the proposed WRRF is a new private facility and will not be connected to the municipal collection and treatment system, no infiltration and inflow measures are required or necessary

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

Wastewater generated from the site would be treated and disposed of via an on-site water resource recovery facility with subsurface land disposal. It is anticipated that wastewater generated from the proposed development would be consistent with a residential strength wastewater. The proposed development would be expected to generate approximately 21,000 gallons per day (gpd) of sewage on an average day, with a maximum day sewage generation of approximately 37,380 gallons (per MassDEP technical documents on actual flow vs. maximum day Title 5 design flows).

These sewage estimates were calculated using the anticipated development's full build out schedule in concert with system sewage flow design criteria established by 310 CMR 15.000, Title 5. Since the total calculated design flow for the site exceeds 10,000 gpd, the project will require a Groundwater Discharge Permit. While the design flow for the site has been established using 310 CMR 15.000, Title 5, the proposed development would utilize low flow plumbing fixtures in an effort to reduce overall water consumption.

The sewage collection system shall consist of gravity sewers from the proposed buildings. All sewage flow will be collected in a solids/trash trap pretreatment tank system at the treatment facility location at the rear of the site. The sewage collection system and water resource recovery facility tanks will be tested for water tightness prior to being placed into service in accordance with project specifications.

The proposed water resource recovery facility will employ an aerobic biological process to accomplish treatment and therefore has the potential to produce an effluent far superior to that provided by a conventional subsurface sewage disposal system. Aerobic biological treatment processes are capable of removing substantially greater amounts of Biochemical Oxygen Demand (BOD) and Total Suspended Solid (TSS) than a conventional subsurface sewage disposal system.

Additionally, the treatment process is also capable of nitrifying the ammonia-nitrogen present in the wastewater to nitrate-nitrogen, which can subsequently be removed through an anoxic denitrification process. Disinfection at such facilities provides significant reductions in the number of pathogenic organisms in the wastewater prior to discharge to the environment. As currently proposed, the on-site water resource recovery facility would utilize a Sequencing Batch Reactor (SBR) wastewater treatment technology in order to reduce these wastewater constituents to below the anticipated Groundwater Discharge Permit levels.

The SBR process is a modified activated sludge treatment process, which combines a conventional activated sludge treatment process in a single tank batch process that completes all the major steps of biological wastewater treatment in a single reactor vessel. For small facilities, this configuration allows for multiple treatment units to be combined into one basin, reducing capital costs, facility footprint, and treatment complexity. The high level of operator control and regulatory acceptance has led to more use, proven reliability, and a better understanding of the long term concerns with life cycle costs associated with SBR system performance and maintenance.

One of the primary attributes of the SBR treatment system is that this variation of the activated sludge process provides an enormous degree of flexibility in the design variations available to meet the requirements of specific waste treatment applications. Due to this flexibility and other inherent advantages, SBR systems are employed more frequently in a variety of process design situations with residential, municipal and industrial wastewater treatment applications. Furthermore, SBR's are capable of producing an extremely high quality effluent while operating over a wide range of hydraulic and organic loadings. The biological growth providing waste treatment develops in response to the imparted load and the SBR can contain a very high level of solids and organisms within the system because of the dual tank system, and the settle and decant process, which traps biological solids in the system and recycles them for additional treatment, therefore, the treatment level achieved is typically excellent. During periods of low hydraulic or organic loading, the biological growth can be concentrated and maintained within the reactor by reducing the frequency of sludge wasting. However, as the flow (or organic load) is increased, the organisms begin to proliferate and a larger percent can remain in the system and be used for high levels of treatment. Therefore, sludge wasting from an SBR system is typically

much less than in conventional activated sludge systems. Thus, the system is quickly able to adjust to the strength and volume of the influent wastewater stream.

In addition to removing organic matter, SBR treatment systems are also capable of oxidizing influent nitrogen typically present in the reduced ammonia-nitrogen and organic nitrogen forms. Recovery facilities equipped with anoxic treatment removal process have proven capable of further treating the oxidized wastewater, performing a treatment step referred to as denitrification. This process releases nitrogen to the atmosphere as nitrogen gas, enabling the treatment facilities to comply with the stringent Total Nitrogen and Nitrate-Nitrogen limitations, which will be included in the site's Ground Water Discharge Permit.
A number of safety factors will be incorporated into the design of this system. First, design calculations for the size of each unit operation will include industry standard safety factors to account for variations in flows and waste strength. This facility will be configured with two SBR reactor basins, each sized to treat the average day flow anticipated. This will allow for redundancy in the main process while also providing the operator with increased flexibility on treatment times because there will be a second reactor used in treatment at all times.

High water level switches activating both audible and visual alarms will be provided to alert the operator of a potential problem. Additionally, an electronic auto-dialer telephone paging system will be installed to provide the operator with notice of an alarm. All pumps in the system will have a duplicate unit plumbed and wired to automatically start should the primary pump malfunction. Any pump malfunction will also activate the alarm system. A spare parts inventory will be maintained to minimize the downtime of any unit due to a malfunction.

The recovery facility will be connected to a standby generator of sufficient size to provide enough electricity to operate the entire WRRF's pumps, treatment processes and lighting. The generator system will be equipped with an automatic transfer switch to activate the standby generator in the event of a prolonged power outage. The main control panel will be equipped with a sequential starter to prevent an overload of the circuitry upon transfer to the alternate electric source.

Treated effluent disposal will be accomplished using a subsurface effluent disposal system consisting of gravity fed chambers in a trench format located in the areas of most permeable soils at the site. Based on loading rates established by field infiltration (percolation) tests, the leaching facility has a capacity of 37,380 gallons.

The area designated for on-site effluent disposal was determined after extensive field testing of the soils and hydraulic conditions of the site. The field testing program included soil evaluations, percolation tests, borings, and monitoring well installations and testing to determine soil types, groundwater levels, groundwater flow direction and the in-situ permeability of the soil.

The project proponent, as part of the permitting for the project, is required to obtain a MassDEP Groundwater Discharge Permit in order to meet the Commonwealth of Massachusetts Groundwater Discharge Permit Program requirements associated with the design of the sewage collection system, water resource recovery facility, and subsurface effluent disposal system. The

permitting of the treatment works is under the purview of MassDEP and Wayland Board of Health, as the Town has a local Bylaw. As part of the permitting process, the proponent will prepare a design report, drawings and specifications for review and approval by State and local agencies. However, since the proposed discharge will be subsurface, permitting associated with the US E.P.A. National Pollution Discharge Elimination System (NPDES) permit program for a surface water discharge is not required.

Through the design, permitting, operation and maintenance process of the water resource recovery facility, the proponent will be required to meet all regulatory treatment, reporting and compliance standards set forth by MassDEP and the Wayland Board of Health. The proposed resource facility will be designed, installed, operated and maintained, under the supervision of the proponent, to meet all applicable standards. Specifically, the Groundwater Discharge Permit, issued by the MassDEP, will set forth minimum monitoring requirements for influent and effluent wastewater, as well as the monitoring wells to be installed up-gradient of and downgradient from the subsurface effluent disposal systems. The Groundwater Discharge Permit requires that the results of the sampling periods be submitted to the MassDEP on a monthly basis for compliance monitoring.

The permitted treatment facility will be operated by a Certified Plant Operator in accordance with the requirements in "Rules and Regulations for Certification of Operators of Wastewater Treatment Facilities" (257 CMR 2.00). The Permittee bears the ultimate responsibility of providing the proper operation and maintenance of the facilities in accordance with "Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges" (314 CMR 12.00).

The treatment system operations will receive regular supervision and maintenance from trained and skilled personnel. Regulations require that a licensed operator be present at the facility at least two hours per day, five days per week, to perform operational supervision and routine maintenance. A monthly inspection report must be submitted to the MassDEP and the Town of Wayland detailing the performance of the water resource recovery facility as well as the daily flows and any groundwater sampling results. An annual compliance fee is submitted to the MassDEP to cover the expense of the Department's independent compliance inspection.

In order to sustain both the short and long term operating condition of the water resource recovery facility, the MassDEP requires that a Capital Reserve Escrow Account be established. The account funding amount is determined by the MassDEP in order to address the immediate replacement/repair as well as the long term replacement of normal wear items. This account is typically required to be in place and funded prior to the start-up of the facility. As a means for the MassDEP and Town of Wayland to monitor this reserve funding information, the Owner is required to submit an annual financial report by May 1st of each year for the previous year. This report contains all of the previous year's financial transactions for the facility, summarizes the account balance and disbursements, and provides a summary of operation and maintenance expenses.

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan: **NOT REQUIRED**

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? _**X**__ Yes ___ No; if yes, specify, in quantitative terms:

301 CMR 11.03(6)(b)(14) – Generation of 1,000 or more new ADT on roadways providing access to a single location and construction of 150 or more new parking spaces at a single location.

301 CMR 11.03(6)(b)(15) – Construction of 300 or more new parking spaces at a single location.

B. Does the project require any state permits related to **state-controlled roadways**? _**X**__ Yes ___ No; if yes, specify which permit: **MASSDOT State Highway Access Permit**

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	Existing	Change	Total
Number of parking spaces	15	+ 329	344
Number of vehicle trips per day	34*	+ 1,038	1,072
ITE Land Use Code(s):	151/170	221,252	221,252

*** From Peak Hour Traffic Counts**

B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
1. US Route 20	18,295	+910*	19,205
2.			
3.			

*** US Route 20, east of site driveway (85% of trip generation)**

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

State Highway Layout Mitigation

The Applicant is working with the Town and MassDOT to provide enhanced pedestrian accommodations along / across Boston Post Road to a future Town-sponsored multi-use path and rail trail project. The Applicant has committed to contribute funding for the design and installation of a pedestrian crosswalk with accessible ramps across Boston Post Road at the DPW Transfer Station Access Roadway.

The Applicant is providing signage and pavement markings to delineate travel within the on-site parking field to improve site circulation. This should include the installation of a stop-sign and stop-line along the DPW Transfer Station Access Roadway at Boston Post Road.

The Applicant is coordinating with the Town to provide pavement markings along the DPW Transfer Station Access Roadway between Boston Post Road and the site's drive aisle to potentially provide a left-turn lane and a right-turn lane.

The Applicant, in coordination with the Town and MassDOT, will evaluate traffic signal timing modifications and optimizations at the intersection of Boston Post Road / Cochituate Road post-occupancy based on future traffic demands.

D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

<u>Public Transportation</u> - The site will include a dedicated bus stop with proposed 18'x9' bus shelter. The stop will be serviced by the Wayland Council of Aging (COA) shuttle, school buses, and other potential public transportation services. Public Transportation schedules and maps for all nearby routes will be provided to residents and posted within each residential building and at the bus shelter location.

<u>Ride Sharing Pick-up & Drop-Off</u> – The site will include dedicated parking spaces for ride sharing pick-up and drop-off to allow for a reduction in overall parking space quantity as illustrated in the Site Development Plans.

<u>Pedestrian & Bicycle</u> - The Applicant is working with the Town and MassDOT to provide enhanced pedestrian accommodations along / across Boston Post Road to a future Town-sponsored multi-use path and rail trail project. The Applicant has committed to contribute funding for the design and installation of a pedestrian crosswalk with accessible ramps across Boston Post Road at the DPW Transfer Station Access Roadway.

<u>Pedestrian</u> - The Proponent will construct a network of sidewalks with enhanced streetscape connecting between the residential buildings, on-site amenities, and to provide connection to Boston Post Road (US Route 20) and the aforementioned Town-sponsored multi-use path and rail trail project. All new sidewalks, crosswalks, and curb ramps will be constructed to meet current Americans with Disabilities Act (ADA) and Massachusetts Architectural Access Board (MAAB) guidelines. The sidewalks will be designed to encourage walking. Trees and landscaping treatments will create aesthetically-pleasing and pedestrian-friendly areas.

<u>Bicycle</u> – Each building will be provided with a secure bicycle storage room and a fix-it station for maintenance as illustrated in the Site Development Plans. Bicycle racks encourage residents to ride bicycles to/from the Site by allowing them a secure place to store bicycles.

E. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? __**X**__ Yes ____ No; if yes, describe if and how will the project will participate in the TMA:

The MetroWest / 495 TMA is a non-profit transportation and environmental organization working to address transportation issues within the MetroWest region of Massachusetts. The MetroWest / 495 TMA's goals are to reduce traffic congestion, reduce vehicle emissions, improve air quality, and enhance multi-modal access by promoting and advocating for transportation options that support environmental/sustainability goals and promote business and municipal economic development objectives.

The Proponent is discussing opportunities for potential membership, or work with, the association. Opportunities for coordination with MetroWest / 495 TMA may include a consistent rideshare / carpooling program.

F. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ____ Yes __**X**__ No; if yes, generally describe:
G. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

Boston Post Road (US Route 20) along the site frontage is under the jurisdiction of MassDOT. Throughout the permitting and design process, the Proponent will continue to meet with MassDOT and the Town, as well as conform to both the Town and MassDOT in their design processes. The Proponent is also committed to design and permit on-site transportation and driveway components through the Town of Wayland Zoning Ordinances and Site Plan Review Regulations.

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **roadways or other transportation facilities**? ___ Yes _**X**__ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

B. Will the project involve any

1. Alteration of bank or terrain (in linear feet)? ____________
2. Cutting of living public shade trees (number)? ____________
3. Elimination of stone wall (in linear feet)? ____________

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))?
___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **energy**? ___ Yes _**X**__ No; if yes, specify which permit:

C. If you answered "No" to <u>both</u> questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to <u>either</u> question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)	________	________	________
Length of fuel line (in miles)	________	________	________
Length of transmission lines (in miles)	________	________	________
Capacity of transmission lines (in kilovolts)	________	________	________

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)?
2. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes ___No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

The Applicant has been working closely with the Town of Wayland Planning Board, Zoning Board, Design Review Board and the Energy and Climate Committee to provide an energy efficient building and have incorporated the following items into the design:

<u>STRETCH CODE</u>

Massachusetts utilizes the 2015 IECC (International Energy Conservation Code) which is the most stringent in the nation. The project will be designed to meet the Massachusetts Stretch Code requirements for energy efficiency (adopted by Wayland in 2010) which is 10% more efficient than the 2015 IECC. The project will meet NGBS Silver (National Green Building Standard) which requires 3rd party verification for: Grade 1 Insulation installation, Air sealing, Blower door testing and duct testing for air sealing

<u>HEATING & COOLING</u>

The heating and cooling system for the apartments will be individual vertical fan-coil air handling units (Aquatherm) with energy efficient motors and seven-day programmable thermostats that will help reduce the demands on utilities. Per the 2015 IECC, all apartments will have fresh air intake ducted directly from the exterior. All units will utilize MERV 8 air filters. Each apartment will be provided with a gas-fired hot water heaters producing hot water for the plumbing fixtures and the fan-coil. The heaters will be 90%+ efficient.

WATER: HOT WATER
All residential units will have a high efficiency (93%+/-) tankless hot water heater that provides hot water on demand only when needed by the resident

WATER: PLUMBING FIXURES
Low flow/flush Water Sense plumbing fixtures are specified as 1.28 GMP for toilets, 1.0 GPM for lavatory faucets, 1.5 kitchen faucets and 1.5 shower heads for a reduction in water usage of 30% compared to the baseline.

LIGHTING
Almost all of the building will be equipped with high efficiency LED lighting in the apartments, common areas, garages and exterior site lighting. Occupancy sensors will be installed in all common areas and back of house spaces to reduce energy consumption when the spaces are not occupied. We strategically lamp the apartments to limit the need for residents to provide additional lighting that may not be LED.

APPLIANCES
Residential appliances that qualify are specified as ENERGY STAR . There are no ENERGY STAR certified ovens, ranges, range hoods, or microwave ovens.

RADON MITIGATION:
We will provide a Radon mitigation system in each building with a 15 mil. Class A vapor barrier vented to the roof.

EV STATIONS
We have doubled the total number EV charging stations from (24) to (48) which represents 14% of the 344 parking spaces on site. Of that total, (12) EV charging stations will be provided at occupancy with conduit to install (36) future spaces.

BICYCLE STORAGE
Each building will be provided with a bicycle storage room and a fix-it station for maintenance. There is capacity for 137 bicycles in the rooms and the ability to add wall mounted racks in front of the parking spaces if additional spaces are needed after occupancy.

WINDOWS
Operable, Low E insulated glass windows are provided in each unit with a U-value = .29+/-, SHGC = .31+/- and VT = .55+/-. Standard glazing can have a U value of .48.

ROOF:
The roof is a 'bathtub' style roof with a pitched roof at the perimeter and a recessed flat roof in the middle to hide the rooftop condensing equipment. A high albedo white roof will be specified at the flat portion of the roof to reflect sunlight and absorb less heat than a standard black roof surface.

SOLAR PANELS & GREEN ENERGY
Rooftop area is limited due to the pitched roof required to hide the condensing units per the River’s Edge RFP. We have had discussions with multiple local Solar Energy companies and have a plan to provide (100) solar panels located on the west facing pitched roof areas which would produce approximately 40,000kw/hrs per year. We will engage a solar consultant during the design phase to design a plan to maximize solar capacity on the site.

LANDSCAPE:

Many existing trees and understory plants along the perimeter of the site, including along Route 20, will remain and additional trees and shrubs will be added to these edges to provide additional screening and habitat. Turf grass will be added in key areas adjacent to buildings and parking, including a large lawn at the courtyard between buildings one and two. Native trees, shrubs, and perennials will be planted in mulched beds around the foundations of buildings and behind retaining walls. Small areas for vegetable and herb gardens for resident use will also be designated within the courtyards. The landscaped areas at the perimeter of the buildings and courtyards will have irrigation but we will not irrigate the sides and rear of the site to blend in with the natural surroundings and vegetation.

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ___ Yes _**X**__ No; if yes, specify which permit:

C. If you answered "No" to <u>both</u> questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to <u>either</u> question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes ___ No; if yes, describe existing and proposed emissions (in tons per day) of:

	Existing	Change	Total
Particulate matter	________	________	________
Carbon monoxide	________	________	________
Sulfur dioxide	________	________	________
Volatile organic compounds	________	________	________
Oxides of nitrogen	________	________	________
Lead	________	________	________
Any hazardous air pollutant	________	________	________
Carbon dioxide	________	________	________

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes _**X**__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **solid and hazardous waste**? ___ Yes _**X**__ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	Existing	Change	Total
Storage	________	________	________
Treatment, processing	________	________	________
Combustion	________	________	________
Disposal	________	________	________

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	Existing	Change	Total
Storage	________	________	________
Recycling	________	________	________
Treatment	________	________	________
Disposal	________	________	________

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos?
___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? ___ Yes _**X**__ No; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ____Yes __**X**__ No; if yes, attach correspondence

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes _**X**__ No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes ___ No; if yes, please describe:

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes _**X**__ No; if yes, does the project involve the destruction of all or any part of such archaeological site? ___ Yes ___ No; if yes, please describe:

D. If you answered "No" to all parts of both questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

   (Name) Wayland Town Crier (Date) 12/5/19

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:

James Lambert	
Date Signature of Responsible Officer or Proponent	Date Signature of person preparing ENF (if different from above)
Jim Lambert	Carlton M. Quinn, P.E.
Name (print or type)	Name (print or type)
WP East Acquisitions, LLC	Allen & Major Associates, Inc.
Firm/Agency	Firm/Agency
91 Hartwell Avenue	100 Commerce Way, Suite 5
Street	Street
Lexington, MA 02421	Woburn, MA 01801
Municipality/State/Zip	Municipality/State/Zip
(781)541-5821	(781) 935-6889
Phone	Phone

SECTION 2.0 – NOTIFICATIONS

ALLEN & MAJOR
ASSOCIATES, INC.
100 Commerce Way
P.O. Box 2118
Woburn, MA 01888-0118
Tel: (781) 935-6889
Fax:(781) 935-2896

Environmental Notification Form Distribution List

This Environmental Notification Form is being distributed to the following regulatory agencies and other reviewers in accordance with the requirements of the Massachusetts Environmental Policy Act (MEPA) regulations, 310 CMR 11.16.

Two (2) Copies To:
Secretary Richard K. Sullivan, Jr.
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge Street, 9th Floor, Suite 900
Boston, MA 02114

One (1) Copy Each To:
Department of Environmental Protection
Commissioner's Office
One Winter Street
Boston, MA 02108

Department of Environmental Protection
Northeast Regional Office
Attn: MEPA Coordinator
205B Lowell Street
Wilmington, MA 01887

Massachusetts Department of Transportation
Public/Private Development Unit
10 Park Plaza
Boston, MA 02116

Massachusetts Department of Transportation
District #3
Attn: MEPA Coordinator
403 Belmont Street
Worcester, MA 01604

Massachusetts Historical Commission
The MA Archives Building
220 Morrissey Boulevard
Boston, MA 02125

Metropolitan Area Planning Council
60 Temple Place, 6th floor
Boston, MA 02111

Wayland Planning Department
41 Cochituate Road
Wayland, MA 01778

Wayland Conservation Commission
41 Cochituate Road
Wayland, MA 01778

Wayland Board of Selectmen
41 Cochituate Road
Wayland, MA 01778

Wayland Health Department
41 Cochituate Road
Wayland, MA 01778

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs

MEPA Office

100 Cambridge St., Suite 900
Boston, MA 02114
Telephone 617-626-1020

The following should be completed and submitted to a local newspaper:

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: ALTA at River's Edge

LOCATION: 490 Boston Post Road, Wayland, MA

PROPONENT: Town of Wayland/WP East Acquisitions, LLC

The undersigned is submitting an Environmental Notification Form ("ENF") to the Secretary of Energy & Environmental Affairs on or before December 02, 2019

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62I). Copies of the ENF may be obtained from:

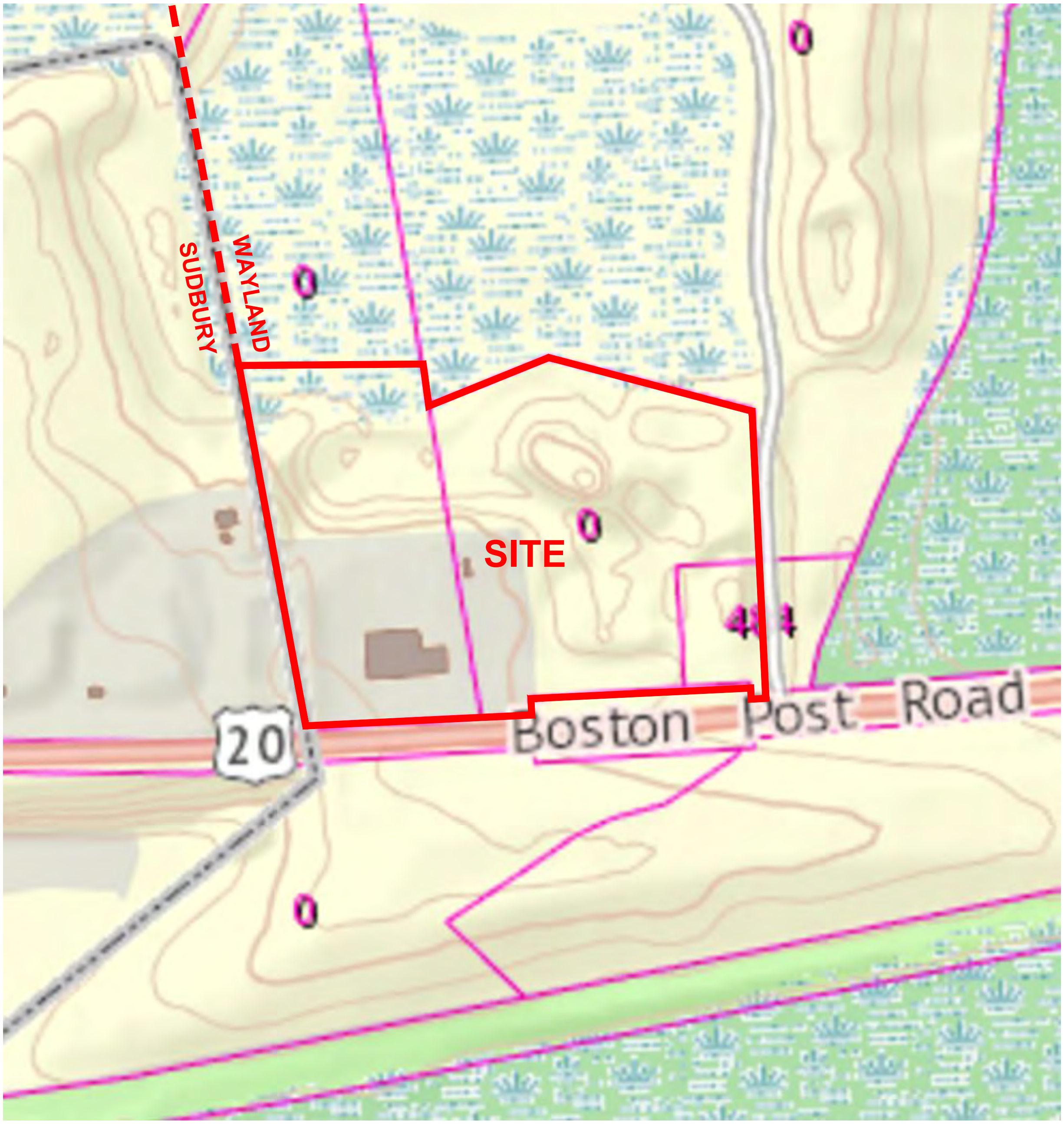
Carlton M. Quinn, PE
Allen & Major Associates, Inc.
100 Commerce Way, Suite 5
Woburn, MA 01801
781-935-6889

Copies of the ENF are also being sent to the Conservation Commission and Planning Board of Town of Wayland **where they may be inspected.**

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, will receive public comments on the project for 20 days, and will then decide, within ten days, if an environmental Impact Report is needed. A site visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should write to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By___WP East Acquisitions, LLC

SECTION 3.0 - EXHIBITS



PREPARED BY:

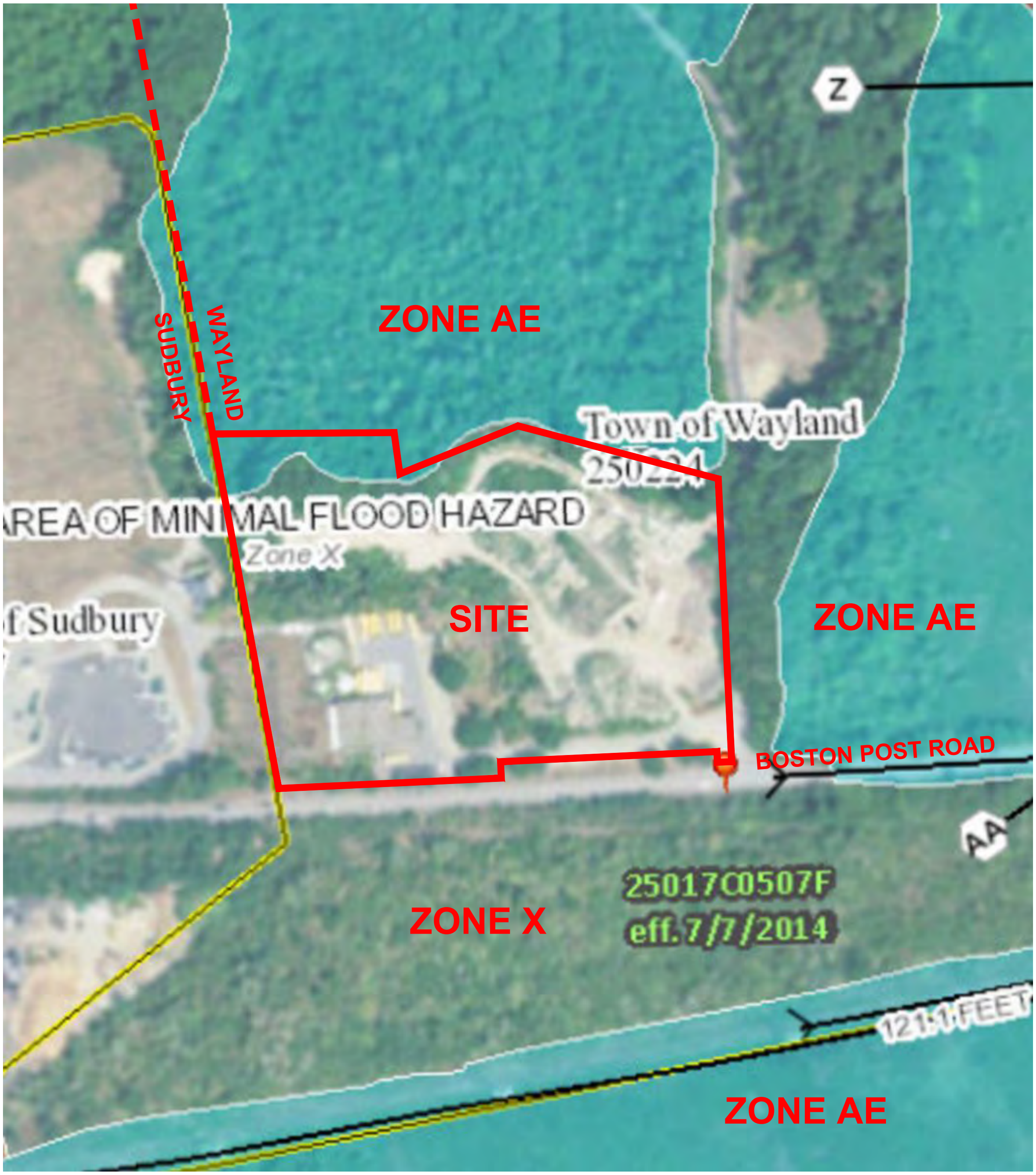
ALLEN & MAJOR ASSOCIATES, INC.
civil & structural engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

USGS SITE LOCUS MAP

PROJECT NO.	1670-09A	DATE:	NOVEMBER 22, 2019
SCALE:	1"=250'	DWG. NAME:	C-1670-09A
DESIGNED BY:	BES	CHECKED BY:	CMQ

SHEET No.
EXH-1



FEMA FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, MASSACHUSETTS
MAP NUMBERS: 25017C0507F
JULY 7, 2014

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
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WOBURN MA 01801
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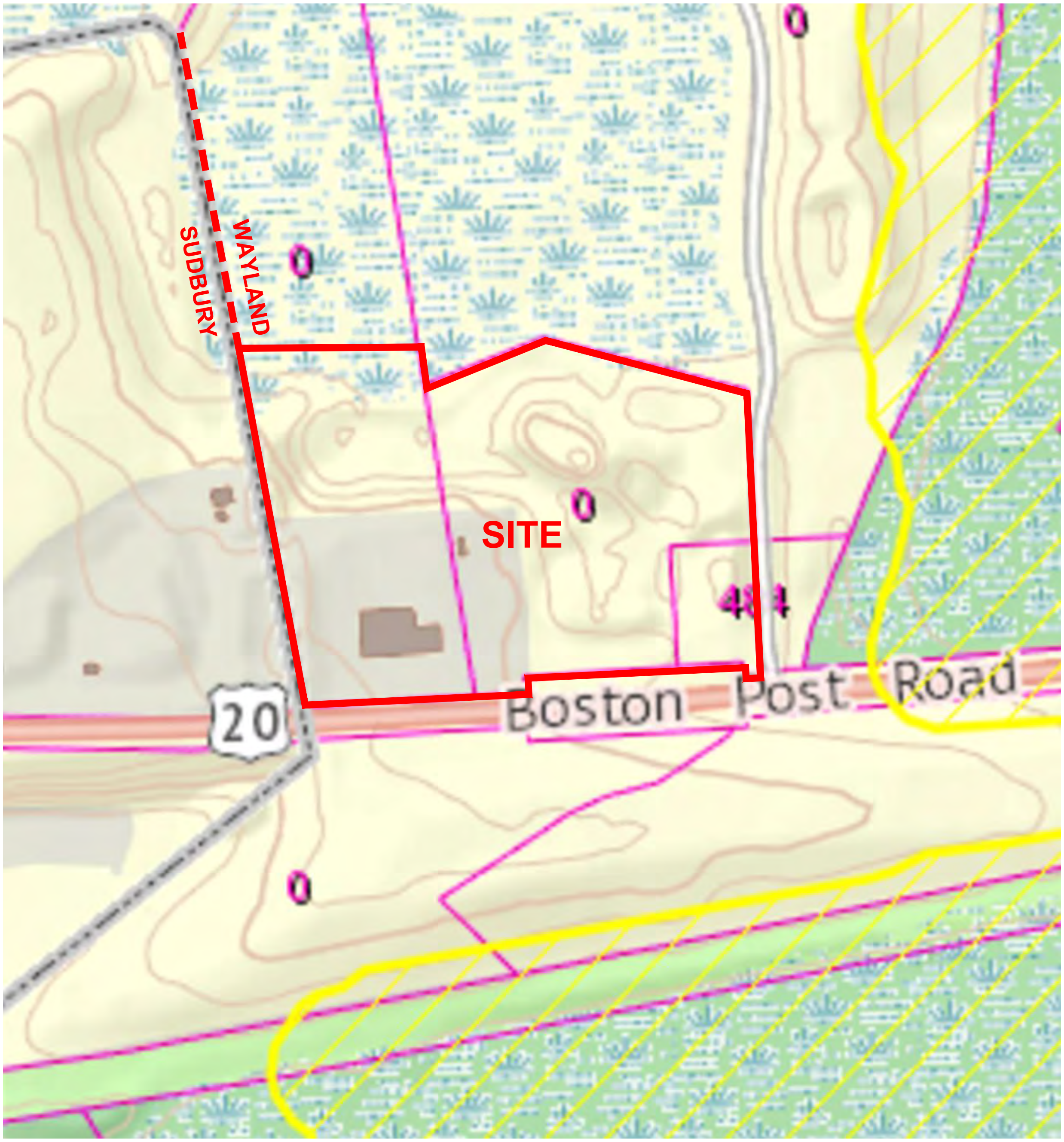
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

FEMA FIRM MAP			
PROJECT NO.	1670-09A	DATE:	NOVEMBER 22, 2019
SCALE:	1"=250'	DWG. NAME:	C-1670-09A
DESIGNED BY:	BES	CHECKED BY:	CMQ

SHEET No.
EXH-2



NO NHESP PRIORITY HABITATS ON-SITE.
NHESP HABITAT PH-1463 LOCATED ON ADJACENT PROPERTIES.

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
civil & structural engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

NHESP PRIORITY HABITATS

PROJECT NO. 1670-09A	DATE: NOVEMBER 22, 2019
SCALE: 1"=250'	DWG. NAME: C-1670-09A
DESIGNED BY: BES	CHECKED BY: CMQ

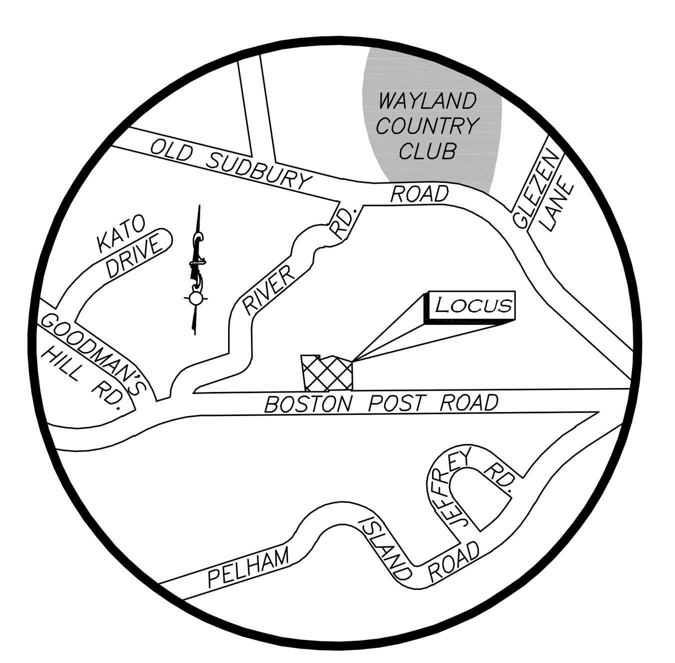
SHEET No.
EXH-3

SECTION 4.0 - APPENDIX

LIST OF MUNICIPAL, STATE, & FEDERAL PERMITS AND APPROVALS

Agency	Permit/Approval	Status
Wayland Conservation Department	Notice of Intent & Local Application Chapter 194	Filed - Awaiting approval
Wayland Planning Department	Site Plan Review and Approval Application	Filed - Awaiting approval
Wayland Zoning Board of Appeals	Application for Hearing for Zoning Variance	Filed - Awaiting approval
Massachusetts Department of Transportation	State Highway Access Permit	To be filed
Massachusetts Department of Environmental Protection	Groundwater Discharge Permit	To be filed
US Environmental Protection Agency	National Pollution Discharge Elimination System (NPDES) – General Permit for Construction	To be filed
	EPA – NPDES – Notice of Intent	To be filed
	EPA – NPDES – Construction Pollution Prevention Plan	To be filed

SECTION 4.2 – SITE DEVELOPMENT PLANS



LOCUS MAP
(NOT TO SCALE)

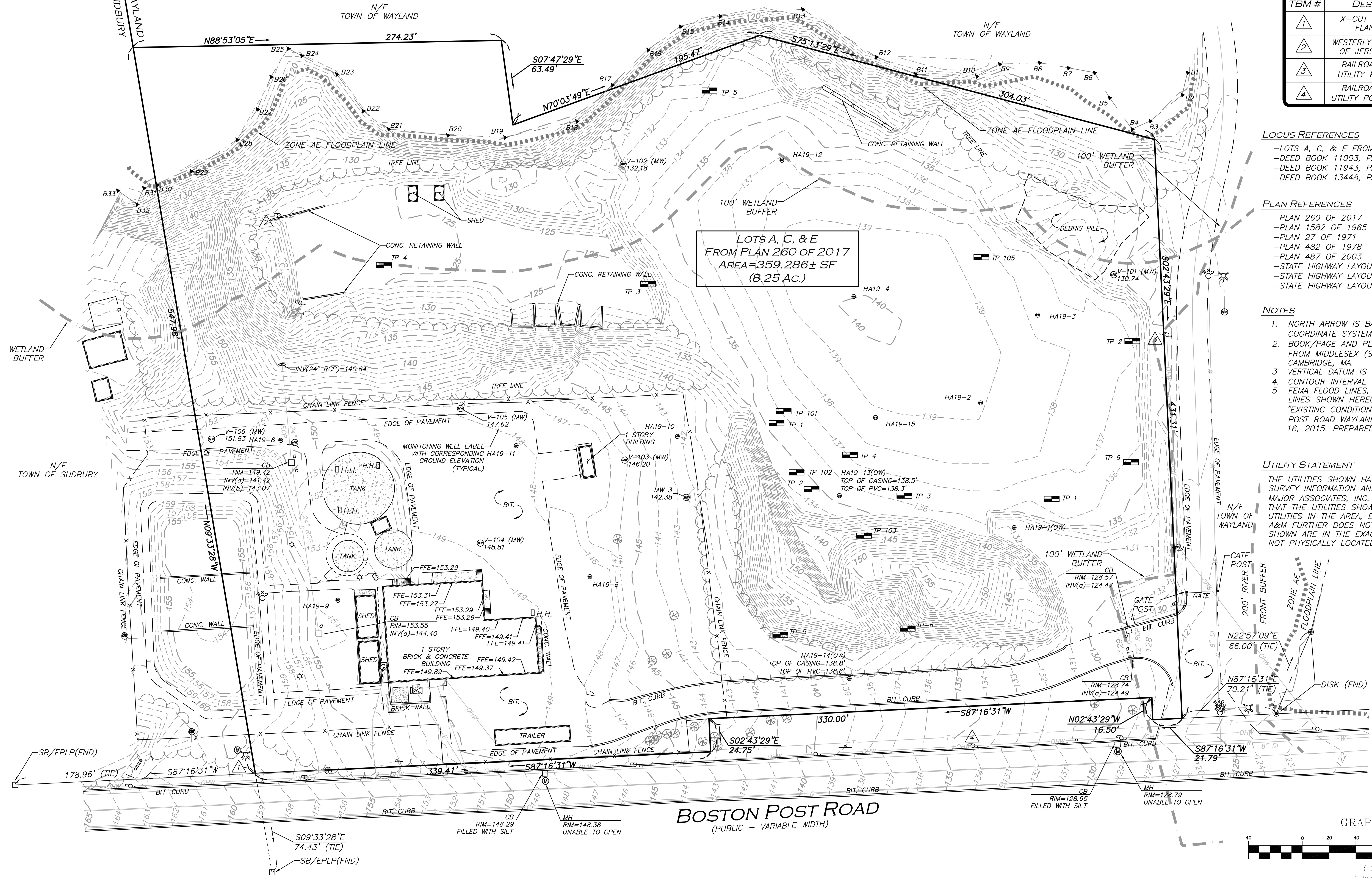
LEGEND

DISK		WATER GATE		BUILDING OVERHANG		GAS LINE	
STONE BOUND (SB)		INVERT (INV)		WETLAND		ELECTRIC LINE	
DRAIN MANHOLE (DMH)		LIGHT		1' CONTOUR	—131—	TELEPHONE LINE	
SEWER MANHOLE (SMH)		TREE		5' CONTOUR	—135—	OVERHEAD WIRES	
ELECTRIC MANHOLE (EMH)		SIGN		PROPERTY LINE		FINISHED FLOOR ELEVATION	FFE
MISC. MANHOLE (MH)		SIGN		ABUTTERS LINE		BITUMINOUS	BIT.
TELEPHONE MANHOLE (TMH)		TRANSFORMER		TOWN LINE		CONCRETE	CONC.
WATER MANHOLE (WMH)		MONITOR WELL		TREE LINE		REINFORCED CONCRETE PIPE	RCP
CATCH BASIN (CB)		WETLAND FLAG	A31	EDGE OF PAVEMENT		ESCUTCHEON PIN IN LEAD PLUG	EPLP
UTILITY POLE		HAND HOLE	H.H.	CURB		STONE BOUND W/EPLP	SB/EPLP
UTILITY POLE W/RISER		GAS METER		STOCKADE FENCE		FOUND	FND
GUY WIRE		CONCRETE		CHAIN LINK FENCE		NOW OR FORMERLY	N/F
FIRE HYDRANT		WETLAND AREA		WATER LINE		BOOK	BK.
GAS GATE		BUILDING		DRAIN LINE		PAGE	PG.

FOR REGISTRY USE ONLY

BENCHMARK SUMMARY

TBM #	DESCRIPTION	ELEV.
1	X-CUT ON HYDRANT FLANGE BOLT	116.23
2	WESTERLY TOP CORNER OF JERSEY BARRIER	127.81
3	RAILROAD SPIKE IN UTILITY POLE (NO #)	131.93
4	RAILROAD SPIKE IN UTILITY POLE #276/110	135.95



LOCUS REFERENCES

- –LOTS A, C, & E FROM PLAN 260 OF 2017
- –DEED BOOK 11003, PAGE 389
- –DEED BOOK 11943, PAGE 420
- –DEED BOOK 13448, PAGE 394

PLAN REFERENCES

- –PLAN 260 OF 2017
- –PLAN 1582 OF 1965
- –PLAN 27 OF 1971
- –PLAN 482 OF 1978
- –PLAN 487 OF 2003
- –STATE HIGHWAY LAYOUT# 493
- –STATE HIGHWAY LAYOUT# 840
- –STATE HIGHWAY LAYOUT# 1857

NOTES

1. NORTH ARROW IS BASED ON MASSACHUSETTS GRID COORDINATE SYSTEM (MAINLAND ZONE) (NAD 83).
2. BOOK/PAGE AND PLAN REFERENCES ARE TAKEN FROM MIDDLESEX (SOUTH) REGISTRY OF DEEDS IN CAMBRIDGE, MA.
3. VERTICAL DATUM IS NAVD 88.
4. CONTOUR INTERVAL IS ONE FOOT (1').
5. FEMA FLOOD LINES, WETLAND FLAGS AND WETLAND LINES SHOWN HEREON TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS SURVEY 484–490 BOSTON POST ROAD WAYLAND, MASSACHUSETTS". DATED JULY 16, 2015. PREPARED BY WSP SELLS.

UTILITY STATEMENT

THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. ALLEN & MAJOR ASSOCIATES, INC. (A&M) MAKES NO GUARANTEE THAT THE UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. A&M FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. A&M HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

N:\PROJECTS\1670-09A\SURVEY\DRAWINGS\CURRENT\S-1670-09A-EC.DWG
FB# 1734 PG. 1

WE HEREBY CERTIFY THAT:

THIS PLAN IS THE RESULT OF AN ACTUAL ON THE GROUND SURVEY PERFORMED ON OR BETWEEN MARCH 27, 2019 AND MAY 9, 2019.

THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS DATED JANUARY 1, 1976 AND REVISED JANUARY 12, 1988.

ACCORDING TO DEEDS AND PLANS OF RECORD, THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIP, AND THE LINES OF THE STREETS OR WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS AND WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR THE DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

THE ABOVE CERTIFICATION IS INTENDED TO MEET REGISTRY OF DEEDS REQUIREMENTS FOR THE RECORDING OF PLANS AND IS NOT A CERTIFICATION TO THE TITLE OR OWNERSHIP OF THE PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE SHOWN ACCORDING TO CURRENT TOWN OF WAYLAND AND TOWN OF SUDBURY ASSESSOR'S INFORMATION.

THE ABOVE IS CERTIFIED TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF.

ALLEN & MAJOR ASSOCIATES, INC.

ISSUED FOR REVIEW
NOVEMBER 11, 2019

PROFESSIONAL LAND SURVEYOR FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
1.	11/11/19	ACCESS ROAD GATE ADDED

APPLICANT\OWNER:
WP EAST ACQUISITIONS, LLC
91 HARTWELL AVENUE – 3RD FLOOR
LEXINGTON, MA 02421

PROJECT:
490 BOSTON POST ROAD
WAYLAND, MA

PROJECT NO.	1670-09A	DATE:	06/17/19
SCALE:	1" = 40'	DWG. NAME:	S-1670-09A-EC
DRAFTED BY:	COB/KAC	CHECKED BY:	NJL

PREPARED BY:

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civil & structural engineering ◆ land surveying
environmental consulting ◆ landscape architecture
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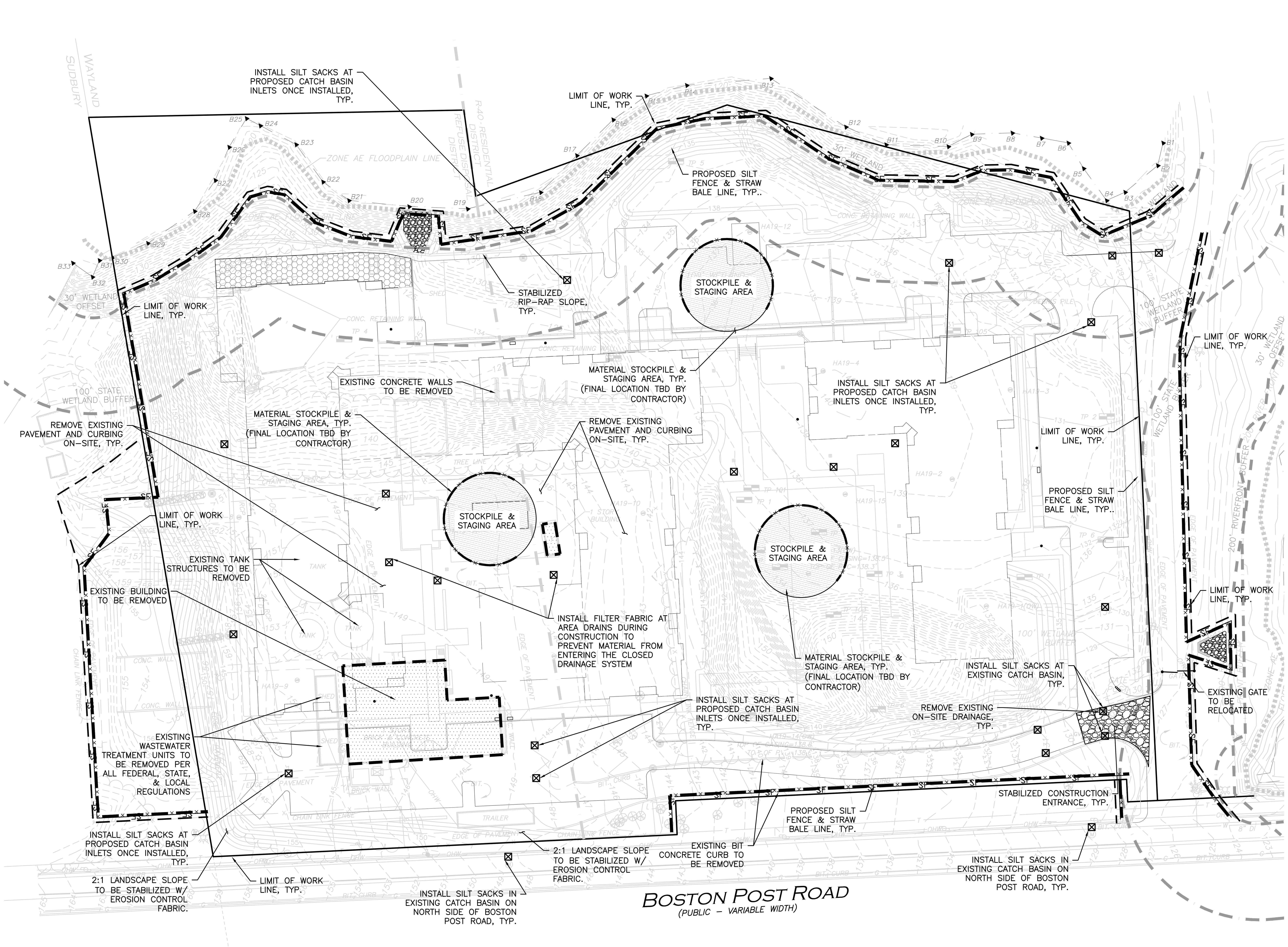
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: EXISTING CONDITIONS

SHEET No. V-101



LEGEND

SILT FENCE
TUBULAR BARRIER
EROSION CONTROL FABRIC
CATCH BASIN FILTER
STONE CHECK DAM
STABILIZED ENTRANCE
TURBIDITY CURTAIN
STOCKPILE/STAGING AREA
AREA TO BE REMOVED
TREE PROTECTION
LIMIT OF WORK LINE

NOTES:

1. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. IT'S INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
3. ALTHOUGH CERTAIN ITEMS HAVE BEEN NOTED ON THIS DRAWING FOR DEMOLITION, NO ATTEMPT HAS BEEN MADE TO DELINEATE EACH AND EVERY ITEM THAT REQUIRES DEMOLITION FOR THE COMPLETION OF THE PROJECT. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL NECESSARY DEMOLITION WORK TO COMPLETE THE PROJECT. ALLEN & MAJOR ASSOCIATES, INC. IS NOT RESPONSIBLE FOR SITE DEMOLITION ITEMS NOT SHOWN ON THE SURVEY, OR SPECIFICALLY NOTED. THE DEMOLITION NOTES AND ARROWS ON THIS PLAN ARE TYPICAL AND DO NOT REFLECT QUANTITY.
4. FINAL LOCATIONS OF ALL EROSION CONTROL MEASURED THROUGHOUT CONSTRUCTION SHALL BE COORDINATED WITH THE TOWN OF WAYLAND CONSERVATION DEPARTMENT AND DEPARTMENT OF PUBLIC WORKS (DPW).

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

COMMONWEALTH OF MASSACHUSETTS
CARLTON M. QUINN
CIVIL
No.49923
REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
E.	11/12/2019	REVISED PER TOWN COMMENTS
D.	10/18/2019	REVISED PER TOWN COMMENTS
C.	10/10/2019	REVISED PER TOWN COMMENTS
B.	09/27/2019	REVISED PER TOWN COMMENTS
A.	07/03/2019	ISSUED FOR NOTICE OF INTENT

APPLICANT\OWNER:

WP EAST ACQUISITIONS, LLC.
91 HARTWELL AVENUE
LEXINGTON, MA 02421

PROJECT:

ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

PROJECT NO.	1670-09A	DATE:	06-20-2019
SCALE:	1" =40'	DWG. NAME:	1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil & structural engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

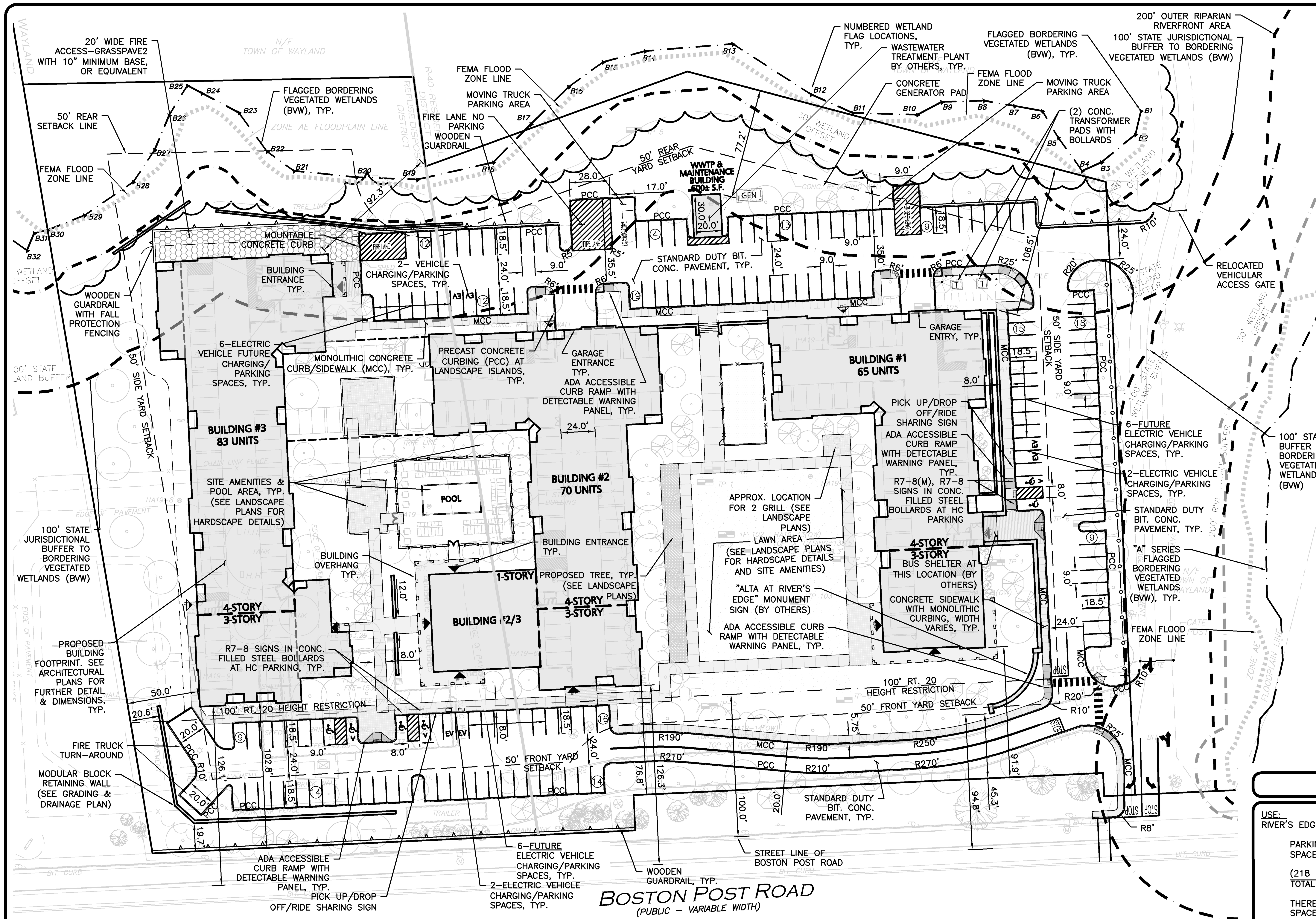
DRAWING TITLE:

DEMOLITION &
EROSION CONTROL PLAN

SHEET No.

C-101

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_DEMO & EROSION CONTROL.DWG



LEGEND

PROP. PROPERTY LINE	
SIGN	
BOLLARD	
BUILDING	
BUILDING ARCHITECTURE	
CURB	
RETAINING WALL	
PARKING STRIPING	
TRAFFIC ARROWS	
HEAVY DUTY CONCRETE	
SIDEWALK	
ADA ACCESSIBLE RAMP	
ADA DET. WARNING SURFACE	
SETBACK LINE	
PARKING COUNT	10
TREE LINE	
TRANSFORMER	T
MONOLITHIC CURBING	MONO.
PRECAST CONC. CURB	PCC

NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
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3. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE TOWN OF WAYLAND DEPARTMENT OF PUBLIC WORKS AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES.

   DIGSAFE: 1-800-344-7233
   WAYLAND DEPT. OF PUBLIC WORKS: (508) 358-3672
4. SEE THE ABBREVIATIONS AND NOTES PLAN AND DETAILS FOR FURTHER INFORMATION.
5. ALL CURBING RADII SHALL BE 3' UNLESS OTHERWISE NOTED. ALL RADII AND DIMENSIONS MEASURED AT FACE OF CURB.
6. ALL ADA RAMPS ARE TO BE CONCRETE UNLESS SPECIFIED OTHERWISE.
7. EXISTING CONDITIONS BASE PLAN TAKEN FROM AN EXISTING CONDITIONS BASE PLAN ENTITLED "EXISTING CONDITIONS", PREPARED BY ALLEN & MAJOR ASSOCIATES, INC., ORIGINAL SCALE 1"=40', DATED MAY 8, 2019.
8. RIVERFRONT FLAGGINGS (RA SERIES) AND A&B SERIES WETLANDS FLAGGINGS TAKEN FROM A PLAN ENTITLED "EXSITING CONDITIONS SURVEY – 484-490 BOSTON POST ROAD – WAYLAND, MASSACHUSETTS," PREPARED BY WSP SELLS DATED JULY 16, 2015, SCALE 1"=60'.
9. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL BE COORDINATED WITH THE WAYLAND DPW AND SHALL CONFIRM TO THE LATEST MUTCD STANDARDS.

PARKING SUMMARY CHART

USE:
RIVER'S EDGE HOUSING OVERLAY DISTRICT (REHOD)

PARKING SPACES SHALL BE PROVIDED AT A MINIMUM RATIO OF 1.25 PARKING SPACES PER DWELLING UNIT(1)

(218 UNITS TOTAL) * (1.25 SPACES/UNITS) =273 SPACES
TOTAL OFF-STREET PARKING REQUIREMENT =273 SPACES

THEREFORE, 273 PARKING SPACES ARE REQUIRED AT A MINIMUM RATIO OF 1.25 SPACES PER 1 DWELLING UNIT.

344 TOTAL PARKING SPACES ARE CURRENTLY PROPOSED, INCLUDING 180 SPACES WITHIN THE PODIUM PARKING AREAS AND 164 SURFACE PARKING STALLS, FOR A PROPOSED PARKING RATIO OF 1.58 SPACES PER 1 DWELLING UNIT.

1.58 > 1.25, THEREFORE PROPOSED PARKING COUNT MEETS/EXCEEDS MINIMUM REQUIRED.

ADA REQUIRED: THERE ARE BETWEEN 301 AND 400 TOTAL PARKING SPACES REQUIRING 8 ACCESSIBLE STALLS PER ADA REGULATIONS AND 2 OF THEM TO BE VAN ACCESSIBLE.

ADA PROVIDED: 12 ADA ACCESSIBLE SPACES, 6 OF WHICH SHALL BE VAN ACCESSIBLE

SURFACE PARKING		STRUCTURED PARKING		TOTAL PARKING	
STANDARD SPACES	ACCESSIBLE SPACES	STANDARD SPACES	ACCESSIBLE SPACES	TOTAL PROVIDED	TOTAL REQUIRED
158	6	174	6(2)	344	273

PARKING NOTES:

(1) ...AND MAXIMUM OF 15 PARKING SPACES FOR ANY ACCESSORY CAFE OR DINER IN ADDITION TO SAID DWELLING UNIT PARKING SPACES. IF OVER 50% OF THE TOTAL NUMBER OF DWELLING UNITS ARE AGE RESTRICTED AS SET FORTH IN § 198-2506.6 BELOW, PARKING MAY BE PROVIDED AT A MINIMUM OF 0.50 PARKING SPACE PER AGE-RESTRICTED DWELLING UNIT.
(2) INCLUDES 3 VAN ACCESSIBLE PARKING STALLS WITHIN STRUCTURED PODIUM PARKING.

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LAND USAGE TABLE - RESIDENTIAL ZONE (R40) & REFUSE DISPOSAL DISTRICT (REF) WITH RIVER'S EDGE HOUSING OVERLAY DISTRICT (REHOD)

ITEM	EXISTING	PROPOSED	REQUIRED/ALLOWED
MINIMUM LOT AREA	359,286± S.F.	359,286± S.F.	40,000 S.F.
MAXIMUM LOT COVERAGE (1)	3.8% ±	24.6%±(4) (8)	20%
MINIMUM FRONTAGE	691.2± FT	691.2± FT	180 FEET
MINIMUM BUILDING SETBACK (2)	12.1± FT	50.0± FT	50 FT
MINIMUM FRONT YARD (4)	12.1± FT	19.7 FT (8)	30 FT (5)
MIN. R.O.W. CENTER LINE SETBACK	84.7 FT	94.8 FT	55 FT (6)
MINIMUM REAR YARD (4)	23.7± FT	73.0 FT	30 FT (6)
MINIMUM SIDE YARD (4)	87.9± FT	20.6 FT (8)	75 FT (7)
MAXIMUM BUILDING HEIGHT (3)	21± FT	52'-7" (8)	45 FT
MAXIMUM BUILDING HEIGHT (3)	21± FT	51'-11"	58 FT
MAXIMUM BUILDING SIZE	13,757± GSF	56,366± GSF	150,000 GSF
MINIMUM PARKING AREA INTERIOR LANDSCAPING	TBD	10.0%	10%
MAXIMUM NUMBER OF DWELLING UNITS	N/A	218 (8)	190

LAND USAGE TABLE NOTES:

(1) 704.4 – IN ALL ZONING DISTRICTS, THE PERCENTAGE OF A LOT THAT MAY BE COVERED BY ANY BUILDING OR STRUCTURE SHALL MEET THE REQUIREMENTS IN §198-801, TABLE OF DIMENSIONAL REQUIREMENTS.
(2) 2505.1 – MINIMUM BUILDING SETBACK FROM THE RIVER'S EDGE HOUSING OVERLAY DEVELOPMENT (REHOD) PERIMETER BOUNDARY SHALL BE 50 FEET.
(3) 2505.2 – MAXIMUM BUILDING HEIGHT OF ANY BUILDING OR PORTION THEREOF LOCATED LESS THAN 100 FEET FROM A PUBLIC WAY BOSTON POST ROAD/ROUTE 20 SHALL NOT EXCEED 35 FEET IN HEIGHT. MAXIMUM BUILDING HEIGHT SHALL NOT EXCEED 45 FEET FOR THE REMAINDER OF THE SITE, WITH THE EXCEPTION THAT THE MAXIMUM HEIGHT FOR THE NORTHWEST QUADRANT OF THE SITE SHALL BE 58 FEET IN HEIGHT FOR THIS QUADRANT ONLY. HEIGHT SHALL BE AS DEFINED IN §198-701.1.2. HEIGHT SHALL BE MEASURED FROM THE AVERAGE GRADE OF THE LAND WHERE AVERAGE GRADE SHALL BE DETERMINED BY THE GRADE OF THE LAND IMMEDIATELY ADJACENT TO THE THREE SIDES OF THE BUILDING WHICH DO NOT FACE NORTH, TO REDUCE GRADING ON THE NORTH-FACING SIDES NEAR WETLANDS, AND TO ENCOURAGE UNDERGROUND PARKING IN THESE AREAS. ON THESE NORTH-FACING FACADES ONLY, NOT MORE THAN SIX FEET OF A PARKING LEVEL MAY BE EXPOSED AND ALLOW NATURAL VENTILATION AS LONG AS THIS FACADE AREA IS SCREENED AND BUFFERED WITH LANDSCAPE.
(4) FRONT, SIDE, AND REAR YARDS SHALL BE SPACE EXTENDING BETWEEN THE LOT LINE OF A GIVEN YARD AND THE NEAREST POINT OF THE BUILDING OR STRUCTURE. NOTE: STRUCTURES INCLUDE RETAINING WALLS.
(5) MINIMUM DIMENSION NOTED INDICATES REQUIREMENTS FOR BOTH R-40 RESIDENTIAL DISTRICT AND REFUSE DISPOSAL DISTRICT.
(6) MINIMUM DIMENSION NOTED INDICATED REQUIREMENTS FOR R-40 RESIDENTIAL DISTRICT ONLY.
(7) MINIMUM DIMENSION NOTED INDICATES REQUIREMENTS FOR REFUSE DISPOSAL DISTRICT ONLY.
(8) RELIEF FROM TOWN OF WAYLAND ZONING BYLAWS REQUIRED.

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_LAYOUT & MATERIALS.DWG

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

COMMONWEALTH OF MASSACHUSETTS
CARLTON M. QUINN
CIVIL
No.49923
REGISTERED
PROFESSIONAL ENGINEER

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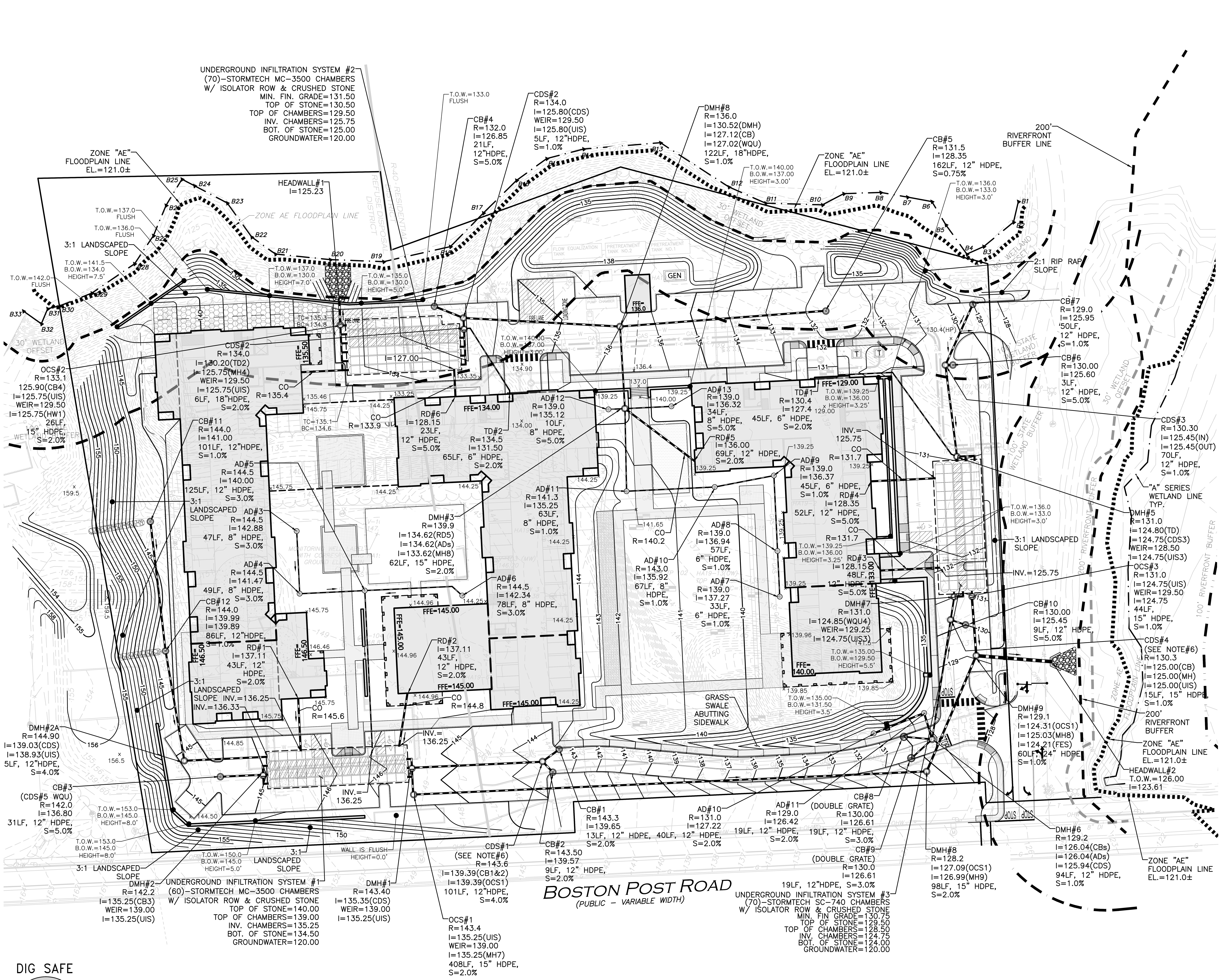
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
LAYOUT & MATERIALS PLAN	C-102



LEGEND

DRAIN MANHOLE	
CATCH BASIN	
CATCH BASIN - DOUBLE GRATE	
DRAIN MANHOLE W/ WEIR	
AREA DRAIN	
CLEANOUT	
SPOT GRADE	×148.00
DRAIN LINE	
5' CONTOUR	200
1' CONTOUR	198
INFILTRATION SYSTEM	
INFILTRATION CHAMBERS	
ISOLATOR ROW	

NOTES:

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3. PIPE DIMENSIONS ARE MEASURED FROM THE INSIDE FACE OF THE STRUCTURE.
4. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES. DIGSAFE: 1-888-344-7233
5. ANY ROOF DRAINAGE PIPE LOCATED WITHIN 10' OF THE BUILDING FOUNDATION SHALL BE CAST IRON PIPE PER MA PLUMBING CODE.
6. ALL "CDS" STRUCTURES HAVE BEEN SIZED USING THE WATER QUALITY FLOW RATE PER MASS STORMWATER HANDBOOK AND SHALL BE CONTECH CDS2015-4-C OR APPROVED EQUIVALENT.
7. GROUNDWATER ELEVATIONS ARE ASSUMPTIONS BASED ON INFORMATION PROVIDED IN A GEOTECHNICAL REPORT DATED MAY 2019 BY HALEY ALDRICH. TEST PITS SHALL BE CONDUCTED BY A SOIL EVALUATOR LICENSED IN THE STATE OF MASSACHUSETTS TO VERIFY THE ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (ESHGWT) PRIOR TO THE INSTALLATION OF THE INFILTRATION FIELDS.

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_GRADING & DRAINAGE.DWG

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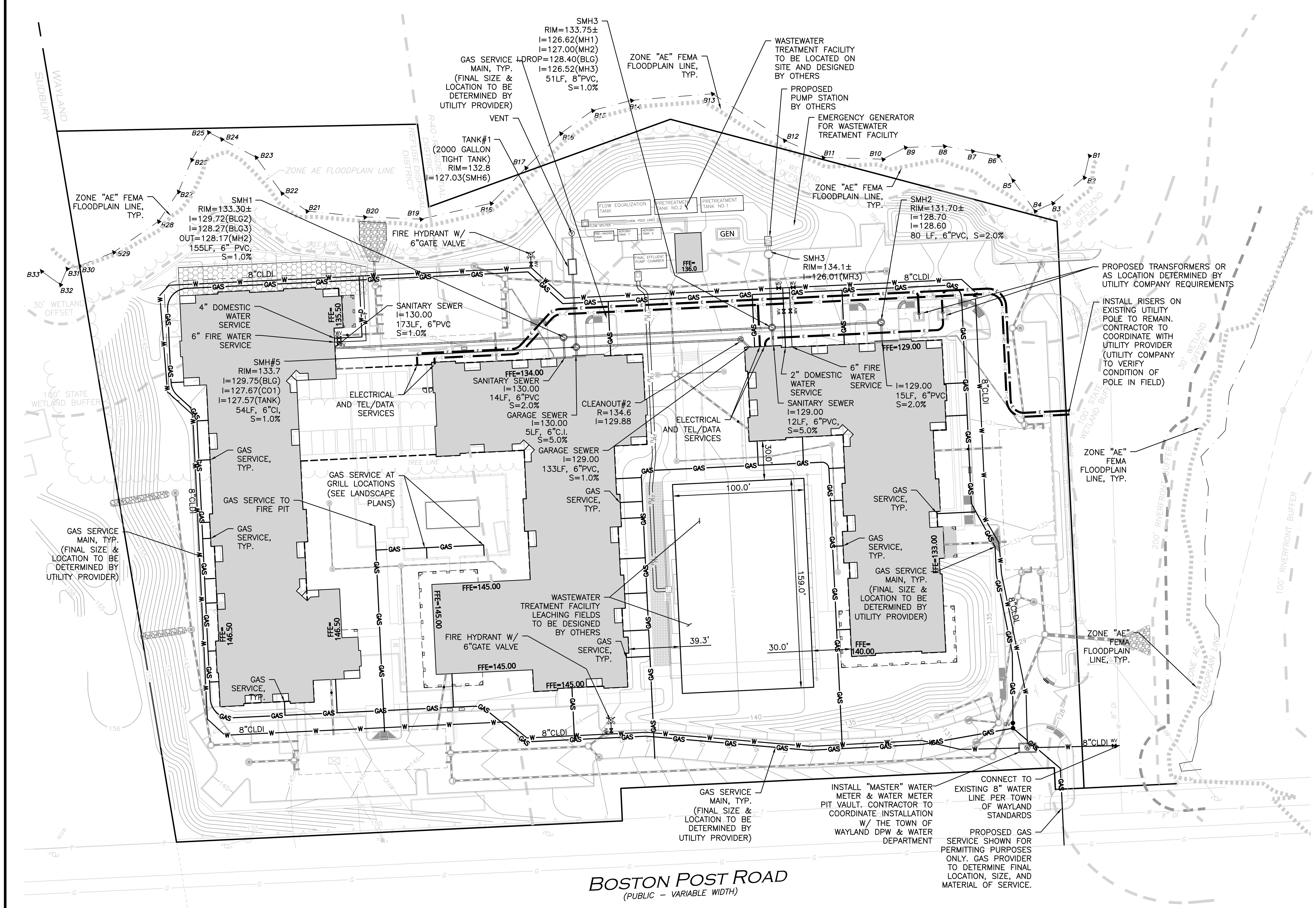
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
GRADING & DRAINAGE PLAN	C-103



LEGEND

SEWER MANHOLE	
SEWER CLEANOUT	
SEWER VENT	
SEWER LINE	
WATER LINE	W
WATER VALVE	WV
HYDRANT	
WATER LINE REDUCER	
GAS LINE	GAS
GAS VALVE	GV
OVER HEAD WIRE	OHW
UTILITY POLE	
HAND HOLE	HH
ELECTRICAL CONDUIT	E

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3. ALL C.L.D.I. WATER PIPE SHALL BE CLASS 52.
4. GAS AND ELECTRIC SERVICE SIZE AND LOCATION SHALL BE DETERMINED BY SERVICE PROVIDER.
5. FIRE & DOMESTIC WATER SERVICE SIZE & LOCATION TO BE CONFIRMED BY MEP ENGINEER.
6. THE PROPOSED IRRIGATION SYSTEM FOR THE DEVELOPMENT SHALL BE SUBMITTED TO WATER DEPARTMENT FOR APPROVAL PRIOR TO CONSTRUCTION.
7. HYDRANTS ARE TO BE INSTALLED PRIOR TO ANY COMBUSTIBLE MATERIALS BEING ON SITE.
8. PRIOR TO SUBMITTING FOR A BUILDING PERMIT, APPLICANT TO CONFIRM FINAL LOCATIONS OF FIRE DEPARTMENT CONNECTIONS WITH THE WAYLAND FIRE DEPARTMENT.
9. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE TOWN OF WAYLAND DEPARTMENT OF PUBLIC WORKS AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES.

DIGSAFE:	1-888-344-7233
WAYLAND DPW:	508-358-3672
WAYLAND WATER DEPT.:	508-358-3699

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1-888-344-7233

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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: UTILITIES PLAN

SHEET No. C-104

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_UTILITIES.DWG

SECTION 5.0 – TRAFFIC IMPACT ASSESSMENT

146 Dascomb Road
Andover, MA 01810
978.794.1792
TheEngineeringCorp.com
Create | Design | Innovate

MEMORANDUM

TO: Mark Seck, CFA
Wood Partners, LLC
91 Hartnell Avenue
Lexington, Massachusetts, 02421

DATE: September 18, 2019

FROM: Samuel W. Gregorio, PE, PTOE, RSP_1
Senior Design Engineer

PROJECT NO.: T0923

RE: Alta at River's Edge – 490 Boston Post Road – Wayland, MA
Traffic Impact Assessment

INTRODUCTION

TEC, Inc. (TEC) has been retained by Wood Partners, LLC (the "Applicant") to prepare a Traffic Impact Assessment (TIA) associated with a proposed Alta at River's Edge development (the "Project") to be located at 490 Boston Post Road (US Route 20) in Wayland, Massachusetts. The site was formerly used by the Town of Wayland as a septic treatment facility and is currently utilized by the Town of Wayland for bus parking. The Town recently issued a warrant article allowing for the development of up to 220 residential apartment units, of which a minimum of 25 percent will be age-restricted units and 25 percent will be affordable housing units.

The Project proposes to construct 218 residential apartment units within the 8.24-acre parcel; including 65 age-restricted units. The property will feature residential amenities, such as a fitness center, resident lounge, business center/work stations, and two interior courtyards featuring a pool, outdoor fireplace, and dining areas. The additional amenities will be resident-centric and therefore will not add additional traffic to the facility. Access and egress for the site will be provided via a modified driveway to the existing access roadway which currently serves the DPW Transfer Station along Boston Post Road, which is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT).

TEC has evaluated the traffic operations for the site driveways and study area intersections under existing and future conditions. The future year planning horizon examines traffic operations under existing conditions (2019), as well as a 7-year design horizon (2026) for traffic-volume projections, which includes an evaluation of the no-build conditions (without the proposed project) and build conditions (with site traffic added). These conditions are compared to determine what, if any, additional off-site mitigation is necessary to provide reasonable traffic operations in the area after the project is complete.

As the Project's driveway directly accesses State Highway Layout (SHLO) along Boston Post Road and requires a change-in-use, the project is subject to a Permit to Access State Highway from the MassDOT – District 3 office.

EXISTING CONDITIONS

The study area was selected to contain the major roadways and intersections providing local access to the project site. The following intersections were included in the study area:

1. Boston Post Road (US Route 20) / Site Driveway
2. Boston Post Road (US Route 20) / Pelham Island Road
3. Boston Post Road (US Route 20) / Cochituate Road (Route 27/126)
4. Cochituate Road (Route 27/126) / Millbrook Road / Pelham Island Road

The study area intersections are shown graphically in Figure 1.

Geometry

A comprehensive field inventory of existing traffic conditions at the study area intersections was conducted by TEC staff in August 2019 to obtain information related to intersection geometry and lane usage. The field investigation consisted of an inventory of existing roadway geometrics, operating characteristics, and safety characteristics. A description of the existing roadway and intersection inventory is provided below.

Roadways

Boston Post Road (US Route 20)

Boston Post Road, signed as US Route 20, is a two-lane, east-west principal arterial roadway under the jurisdiction of MassDOT. Boston Post Road provides regional connection between Marlborough to the west and Waltham to the east, generally paralleling Interstate 90 (Massachusetts Turnpike) by approximately 3-miles. Boston Post Road is generally 30-feet wide in the vicinity of the project area with one travel lane in each direction and directional flow separated by a marked centerline. The posted speed limit along Boston Post Road varies between 35-45 miles per hour (mph). Immediately adjacent to the DPW Transfer Station Access Roadway, the posted speed is 45 mph. Through most of the corridor, no formal pedestrian or bicycle accommodations are present. Land uses along the roadway include retail, commercial, and residential uses.

Intersections

Boston Post Road (Route 20) / Site Driveway

The DPW Transfer Station Access Roadway, herein referred to as the "Site Driveway", intersects Boston Post Road to form a three-legged unsignalized intersection. The Site Driveway consists of a single general-purpose travel lane which combines traffic from the DPW Transfer Station and the school bus parking lot. The Site Driveway southbound approach is under an assumed stop-control; however, no stop-sign or stop-line is present at the intersection. Stop-signs and stop-lines are present at the internal intersection approximately 50-feet to the north for both the DPW Transfer Station Access Roadway and the school bus parking approaches. Both the Boston Post Road eastbound and westbound approaches are free-flowing and are separated by a marked centerline. There are no sidewalk or crosswalks provided at the intersection.

Alta at River's Edge - Wayland, MA
Traffic Impact Assessment

Study Area Intersections:
1. Boston Post Road (Route 20) / Site Driveway
2. Boston Post Road (Route 20) / (Pelham Island Road)
3. Boston Post Road (Route 20) / Cochituate Road (Route 27/126)
4. Cochituate Road (Route 27/126) / Millbrook Road / Pelham Island

Figure 1

Project Location Map & Study Area Intersections

TEC The Engineering Corp

TEC, Inc.
146 Dascomb Road
Andover, MA 01810

Boston Post Road (US Route 20) / Pelham Island Road

Pelham Island Road intersects with Boston Post Road to create a four-legged, unsignalized, skewed intersection. Both the Pelham Island Road northbound and southbound approaches consist of single general-purpose travel lanes under STOP-control and are slightly offset to create two separate T-intersections. Pelham Island Road, north of the intersection, operates with one-way flow southbound. Directional flow along Pelham Island Road northbound is unmarked. The Boston Post Road eastbound approach consists of a single general-purpose travel lane while the westbound approach consists of two general-purpose travel lanes which merge at the intersection to result in a single lane. The Boston Post Road eastbound and westbound approaches are free-flowing with directional flow separated by a marked centerline. Sidewalks are provided along the northerly and southerly edges of Boston Post Road west of the intersection, along the southerly side of Boston Post Road east of the intersection, and the westerly side of Pelham Island Road. There are no crosswalks provided at this intersection.

Boston Post Road (US Route 20) / Cochituate Road (Route 27/126)

Cochituate Road, signed as State Route 27 and 126, intersects Boston Post Road to form a four-way, fully-actuated signalized intersection. The Cochituate Road northbound and southbound approaches both consist of an exclusive left-turn lane as well as a shared through/right-turn lane. The Boston Post Road eastbound and westbound approaches both consist of an exclusive left-turn lane, a through-only lane, and a shared through/right-turn lane. Directional flow along each intersection approach is separated by a marked centerline. Sidewalks are provided on both sides of Cochituate Road north of the intersection but only continue on the west side of Cochituate Road south of the intersection. Sidewalks are also provided along the southerly side of Boston Post Road through the intersection. Crosswalks are striped across all four intersection approaches.

Cochituate Road (Route 27/126) / Millbrook Road / Pelham Island Road

Cochituate Road intersects Millbrook Road and Pelham Island Road to form a four-legged, unsignalized intersection. The Pelham Island Road westbound approach consists of single general-purpose travel lanes under STOP-control with directional flow separated by a marked centerline. Pelham Island Road, west of the intersection, operates with one-way flow westbound. The Cochituate Road southbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The Cochituate Road northbound approach consists of a single general-purpose travel lane. Both the Cochituate Road northbound and southbound approaches are free-flowing with directional flow separated by a marked centerline. Sidewalks are provided along both sides of Cochituate Road and along the north side of Pelham Island Road. There are crosswalks along the north, east, and west sides of the intersection.

Existing Bicycle Accommodations

Designated bicycle accommodations are not provided along the study area roadways in the vicinity of the project. Bicycle detection markings are present at the signalized intersection of Boston Post Road / Cochituate Road.

Public Transportation

The proposed Alta at River's Edge project site is not located in close proximity to existing public transportation services. The MetroWest Regional Transit Authority (MWRTA) runs bus routes into the Town of Wayland; however, the bus routes only travel as far north of Cochituate Center.

Existing Traffic Volumes

In order to establish existing traffic-volume conditions at the study area intersections, manual Turning Movement Counts (TMCs) were conducted at the study area intersections during the weekday morning (7:00 AM – 9:00 AM) and weekday evening (4:00 PM – 6:00 PM) peak periods on Wednesday, August 28, 2019 while area schools were in regular session. Note that the date represents the first day of school for Wayland Public Schools. TEC recognizes that the traffic count date occurs before Labor Day weekend; however, the presence of Wayland Public Schools in session and the nature of US Route 20 as a major commuter arterial suggests that traffic volumes as counted are not expected to be marginally different from counts conducted in September post-Labor Day. A detailed summary of the turning movement counts, partitioned into 15-minute intervals, is provided within Attachment A.

In addition, Automatic Traffic Recorder (ATR) counts were conducted along Boston Post Road, east of the site driveway, from Wednesday, August 28, 2019 through Thursday, August 29. 2019 concurrently with the TMCs to gather daily traffic-volume data, vehicle speeds, and vehicle classifications during a continuous 48-hour time period. A summary of the Weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR data, partitioned into one-hour intervals, is provided within Attachment B.

Table 1 – Existing Weekday Traffic Volume Summary

Location	Weekday Traffic Volume[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume[b]	K Factor[c]	Directional Distribution[d]	Traffic Volume	K Factor	Directional Distribution
Boston Post Road, east of Site Driveway	18,295	1,259	6.9	60.6% EB	1,426	7.8	56.8% WB

[a] Daily traffic expressed in vehicles per day
[b] Hourly traffic expressed in vehicles per hour
[c] Percent of daily traffic volumes which occurs during the peak hour
[d] Percent of peak-hour volume in the predominant direction of travel

Boston Post Road carries approximately 18,300 vehicles per day (vpd) on an average weekday. Directional distribution along the roadway is more prominent in the commuter direction to/from Interstate 95 / Route 128 to the east. Speed data indicates that the average speed and 85th percentile speed along Boston Post Road is 45 miles per hour (mph) and 49 mph in the eastbound direction, respectively, and 43 mph and 48 mph in the westbound direction, respectively. During the nighttime hours when free-flow conditions are experienced, the 85th percentile speed was in the 50-55 mph range.

Seasonal Adjustment

In accordance with MassDOT standards, traffic volumes are typically adjusted to average-month conditions. Within the vicinity of project, there is currently no MassDOT permanent count station with month-to-month continuous data available to provide a precise overview of month-to-month fluctuations in traffic volumes. To account for seasonal adjustment, TEC utilized MassDOT's weekday seasonal and axle correction factors as published in 2017 (most recent publication). The factors provide a month-to-month overview of traffic volumes statewide by roadway functional classification and land (urban vs. rural) type. For principal arterials within an urban setting, traffic volumes in the month of August are 7.5 percent higher (factor of 0.93 of average month) than average-month conditions. Therefore, the August 2019 traffic volumes were unadjusted to reflect a conservative condition. The compiled seasonal adjustment data is provided in Attachment C. The resulting 2019 Existing weekday morning and weekday evening, peak-hour traffic-volume networks are illustrated in Figure 2.

Safety Analysis

Crash History Analysis

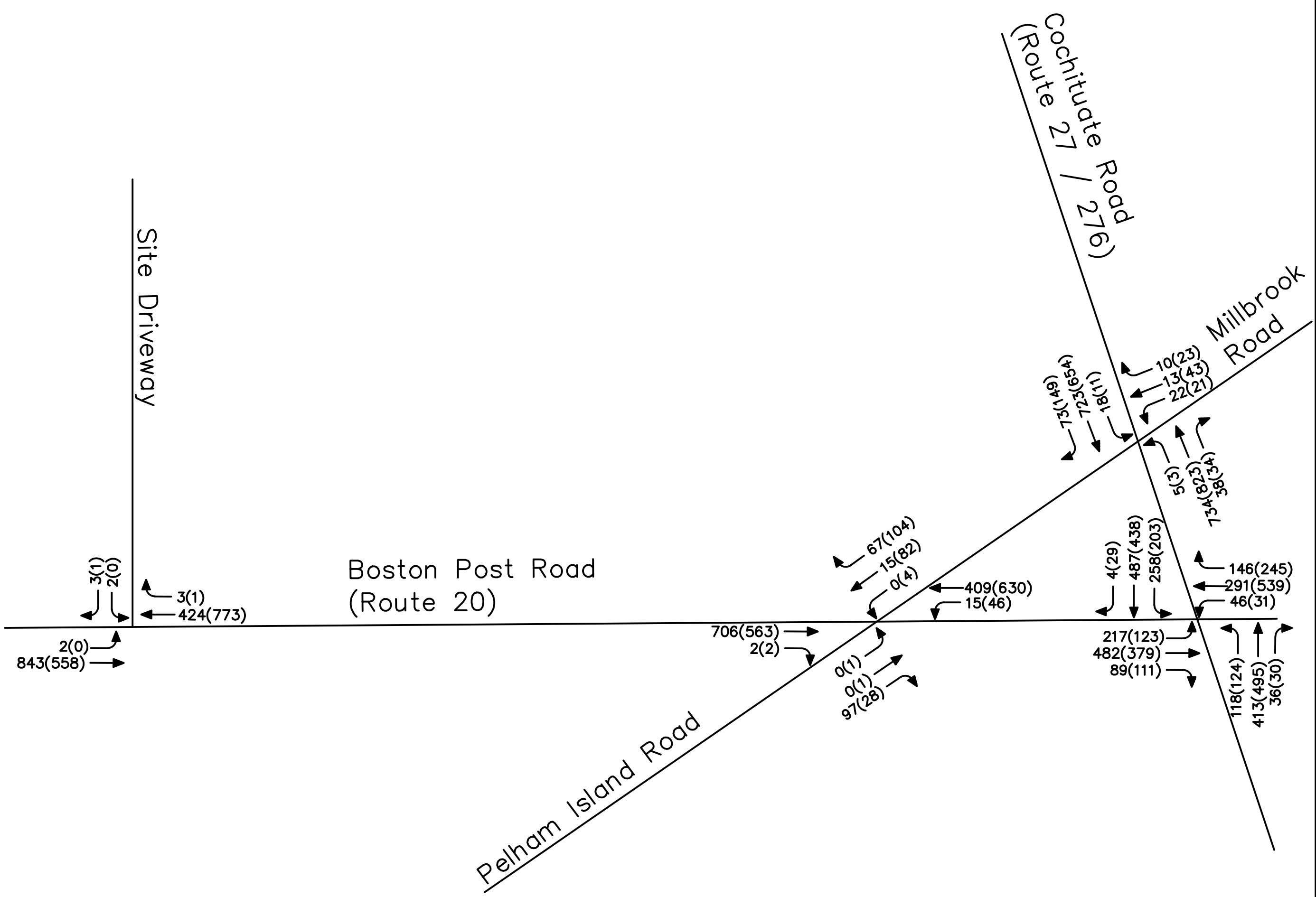
Crash data for the study area intersections was compiled and analyzed for the most recent consecutive three-year period (2015-2017) on file from MassDOT and the Massachusetts Registry of Motor Vehicles (RMV). The motor vehicle crash data was reviewed to determine if any crash trends exist within the study area. A summary of the vehicle crash data and intersection crash rates are provided in Table 2.

Crash Rate Worksheets

In addition to examining the number of collisions at the study area intersections, a crash rate was calculated to compare occurrence of collisions to the volume of traffic passing through the intersection. The crash rate per million entering vehicles (MEV) was calculated using the weekday evening peak hour volumes from the TMCs and a default K-factor obtained from MassDOT. The crash rates at each of the study area intersections were compared to the statewide and district-wide averages published by MassDOT in June 2018 to determine the significance of the crash occurrence. The statewide average for unsignalized intersections is 0.57, and the District 3 average for unsignalized intersections is 0.61. The statewide average for signalized intersections is 0.78, and the District 3 average for signalized intersections is 0.89. A compilation of the MEV rate calculation worksheets and detailed crash data are provided in Attachment D.

Collision Data Summary

The intersection of Boston Post Road / Cochituate Road experienced fourteen (14) crashes per year over the three-year study period. The crash rate for this intersection is significantly higher than the statewide and District 3 averages for signalized intersections. An overwhelming majority (30 of 42) of the crashes were rear-ends which is most-likely the result of the peak-hour congestion experienced at the intersection. This factor is further established by half (21 of 42) of the reported crashes occurring during the morning and evening commuter peak periods. Only six (6) of the reported crashes resulted in non-fatal injuries.



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 2

2019 Existing Conditions Weekday Morning, Weekday Evening Peak Hour Traffic Volumes

The Engineering Corp

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Andover, MA 01810

Table 2 – Intersection Crash History Summary

Parameter		Route 20 at Pelham Island Road	Route 20 at Cochituate Road	Cochituate Road at Millbrook Road at Pelham Island Road
Crash Year	2015	1	18	8
	2016	1	14	7
	2017	5	10	8
	TOTAL	*7*	*42*	*23*
Average Annual		*2.33*	*14.00*	*7.67*
Rate per MEV		*0.34*	*1.09*	*0.93*
Manner of Collision	Angle	0	6	13
	Rear-end	3	30	4
	Sideswipe	4	2	4
	Single Vehicle	0	3	2
	Head-On	0	0	0
	Ped / Bike	0	0	0
	Not Reported	0	1	0
	TOTAL	*7*	*42*	*23*
Road Surface Conditions	Dry	6	32	19
	Wet	1	7	4
	Snow / Ice	0	2	0
	Other / Unknown	0	1	0
	TOTAL	*7*	*42*	*23*
Injury Status (Crash Severity)	Prop Damage	6	35	20
	Non-Fatal Injury	1	6	3
	Fatal Injury	0	0	0
	Not Reported	0	1	0
	TOTAL	*7*	*42*	*23*
Day of Week	Monday-Friday	7	32	19
	Saturday-Sunday	0	10	4
	TOTAL	*7*	*42*	*23*
Time of Day	6:00AM-9:00AM	3	7	2
	9:00AM-3:00PM	0	15	11
	3:00PM-6:00PM	4	14	8
	6:00PM-6:00AM	0	6	2
	TOTAL	*7*	*42*	*23*

The intersection of Cochituate Road / Pelham Island Road / Millbrook Road experienced more than seven (7) crashes per year over the three-year study period. The crash rate for this intersection is significantly higher than the statewide and District 3 averages for unsignalized intersections. Due to the intersection's proximity to the signalized intersection of Boston Post Road / Cochituate Road, it is likely that many of the crashes that occurred at this location are generally related to the downstream traffic signal. Thirteen (13) of the crashes at this location were angled crashes which may be the result of vehicles attempting turning movements at the intersection and being blocked by queued traffic from the traffic signal or being conflict by vehicles at free-flow exiting the traffic signal. Approximately half (11 of 23) of the crashes at this location occurred during the mid-day hours which may suggest that higher speeds than that of the peak hour congestion may be contributing to crashes. Similar to the signalized intersection, a low number (3 of 23) of the crashes resulted in non-fatal injuries.

The intersections of Boston Post Road / Site Driveway and Boston Post Road / Pelham Island Road experienced less than 3 crashes per year which indicated no apparent crash trends.

Sight Distance Measurements

TEC measured the available sight distances at the site driveway / DPW Transfer Station Access Road along Boston Post Road. The available sight lines were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5-feet to an object height of 2-feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching the driveway or intersection.

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5-feet to an object height of 3.5-feet and is measured from a distance 14.5-feet beyond the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents an acceptable speed reduction for approaching vehicles. The ISD, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

> *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."*

Tables 3 and 4 provide a summary of the available SSD and ISD at the intersection, respectively.

Table 3 – Existing Stopping Sight Distance Measurements

Approach / Direction	Operating Speed [a]	AASHTO Recommended Minimum	Measured Stopping Sight Distance
Site Driveway at Boston Post Road:			
Boston Post Road eastbound	49 MPH	440 FT	>800 FT
Boston Post Road westbound	48 MPH	375 FT	>800 FT

[a] Operating speeds calculated as 85th percentile speed from ATR counts in August 2019
[b] Assumes 4% grade along Boston Post Road

Table 4 – Existing Intersection Sight Distance Measurements

Approach / Direction	Operating Speed [a]	AASHTO Recommended Minimum	Measured Intersection Sight Distance
Site Driveway at Boston Post Road:			
East of Driveway	48 MPH	375 FT	>800 FT
West of Driveway	49 MPH	440 FT	>800 FT

[a] Operating speeds calculated as 85th percentile speed from ATR counts in August 2019

As shown in Tables 3 and 4, the ISD and SSD at the intersection of Boston Post Road / Site Driveway are in excess of AASHTO minimum recommendations based on the measured speed along the Boston Post Road. Note that vegetation along the northerly side of Boston Post Road, east of the site driveway, may be more prevalent in the future with standard growth. As vegetation moves closer to the roadway edge, the sight line to the east may be obstructed to distances shorter than AASHTO minimums. As this is MassDOT right-of-way, it is recommended that the Applicant collaborate with the Town and MassDOT to maintain the vegetation to maximize the sight lines and maintain a minimum ISD post-occupancy. In addition, the Applicant should minimize new vegetation within the site along the Boston Post Road right-of-way, west of the site driveway, to maintain sight lines to the west. All site related signage should be kept out of the minimum sight triangle in this direction.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2026, which reflects a 7-year planning horizon in accordance with MassDOT standards for TIA. The traffic conditions for the year 2026, under No-Build conditions, were developed to document the operating conditions independent of the proposed project, including all existing traffic, new traffic resulting from background growth, and traffic from specific developments in the vicinity of the site. Anticipated site-generated traffic volumes for the proposed school were superimposed upon the No-Build traffic networks to reflect the Build conditions with the proposed project.

Background Traffic Growth

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

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

To provide a conservative analysis framework, both procedures were considered.

General Background Growth

Traffic-volume data compiled by MassDOT from temporary count stations and historic traffic counts in Concord[1], Framingham[2], and Newton[3] along principal arterial roadways within the vicinity of the project were reviewed in order to determine traffic growth trends. Based on the MassDOT traffic volume data, traffic volumes in the area have been increasing at a rate of 0.33 percent per year since 2016. Therefore, to provide a conservative analysis scenario, a 0.5 percent per year compounded annual background traffic growth rate was used to account for potential future traffic growth external to the study area and presently unforeseen development. Count station data have been included in Attachment E.

Specific Development by Others

TEC coordinated with the Town of Wayland Planning Department to identify nearby private / public development projects in the vicinity of the study area that are either in the planning process or were recently approved but not yet occupied. Based on these discussions there are several private or public development projects in the vicinity; however, there were no developments that are expected to add new or change traffic volumes through the study area.

Many of the developments as identified by the Town include small sub-division development or developments that would contribute minimal traffic to the study area. It is assumed that this traffic would be incorporated into the background growth rate as previously noted. Other more prominent projects, such as the Carroll School development or the 150 Main Street project are distant from the study area where other route choice opportunities are present. Along Boston Post Road, the Town identified the Cascade Residential Development project at 130 Boston Post Road. As a residential development, the project would contribute a majority of traffic to/from the east and not generally effect the study area for the low number of units associated with the project.

Reoccupancy of Wayland Village

The Town Planning Department indicated that 30,000 square feet (SF) of retail space is currently vacant in the Wayland Village retail plaza located at 305 Boston Post Road. Much of the square footage is vacant once Whole Foods relocated its supermarket. Although vacant, much of the plaza could be reoccupied by a similar land use with minimal Town permitting. To assess the impact of additional traffic from the site that would not be represented in the August 2019 traffic counts, TEC estimated site generated traffic for the 30,000 SF of vacant space based on standard trip rates published in the Institute of Transportation Engineers (ITE) publication *Trip Generation,*

[1] Massachusetts Count Station 4003 – Concord – Route 62 – at Acton T.L.
[2] Massachusetts Count Station 4924 – Framingham – Route 135 - East of Route 126
[3] Massachusetts Count Station 6726 – Newton – Route 16 – West of Interstate 95

10th Edition for Land Use Code (LUC) 820 – Shopping Center. The trips were distributed along the traffic network based on existing traffic patterns. The resulting Reoccupancy of Vacant Space weekday morning and weekday evening, peak-hour traffic-volume networks are illustrated in Figure 3.

No-Build Traffic Volumes

The 2026 No-Build weekday morning and weekday evening peak-hour traffic-volume networks were developed by applying the 0.5 percent per year compounded annual background traffic growth rate to the 2019 Existing Conditions peak-hour traffic volumes over the 7-year design horizon and adding traffic generated by the reoccupancy of vacant space at the Wayland Village retail plaza. The resulting 2026 No-Build weekday morning and weekday evening peak-hour traffic-volume networks are illustrated in Figure 4.

Site Generated Traffic

The Project proposes to construct 218 residential apartment units within the 8.24-acre parcel; including 65 age-restricted units. The property will feature residential amenities, such as a fitness center, resident lounge, business center/work stations, and two interior courtyards featuring a pool, outdoor fireplace, and dining areas. The additional amenities will be resident-centric and therefore will not add additional traffic to the facility. Access and egress for the site will be provided via a modified driveway to the existing access roadway which currently serves the DPW Transfer Station along Boston Post Road.

TEC estimated the site-generated traffic based on industry standard trip rates published in the ITE publication, *Trip Generation, 10th Edition and 10th Edition* for LUC 221 – Multifamily Housing (Mid-Rise) and LUC 252 – Senior Adult Housing Attached.

As shown in Table 5, the proposed Alta at River's Edge is anticipated to generate approximately 1072 new vehicle trips during the average weekday, with 70 new vehicle trips (20 entering and 50 exiting) during the weekday morning peak hour and 84 new vehicle trips (50 entering and 34 exiting) during the weekday evening peak hour. Trip generation worksheets are provided in Attachment F.

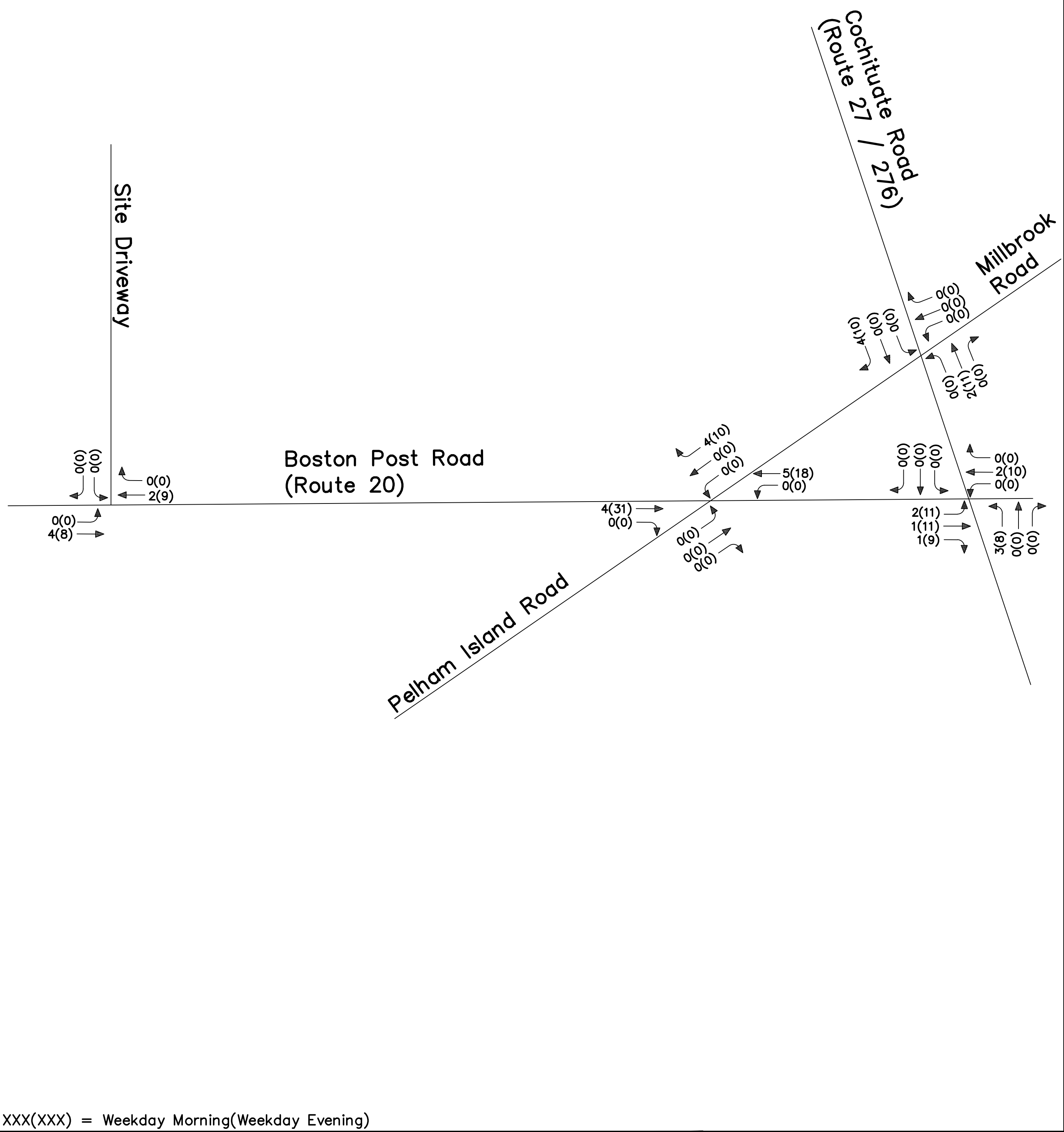

Figure 3

Re-occupancy of Wayland Village
Weekday Morning, Weekday Evening
Peak Hour Traffic Volumes

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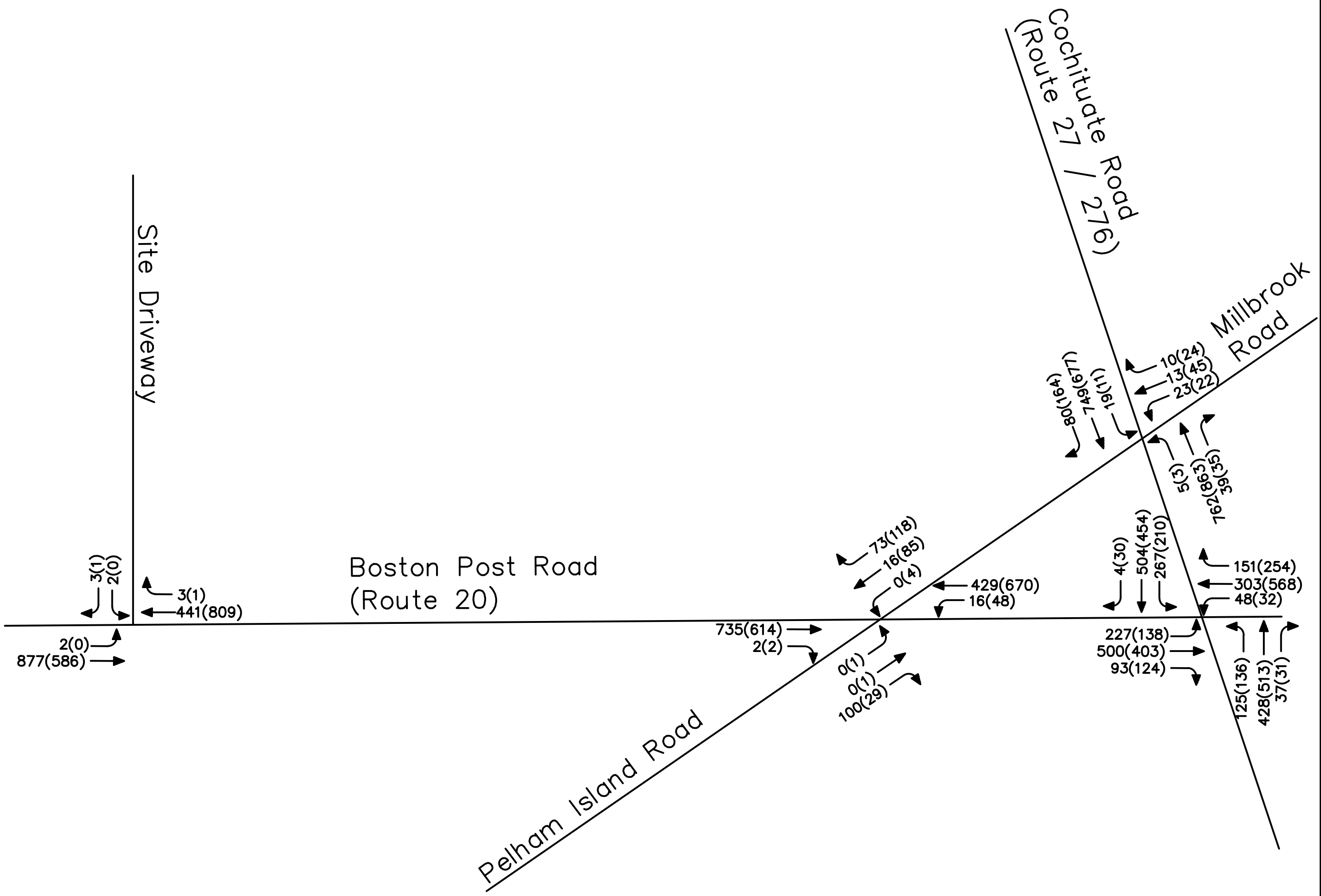

XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 4

2026 No-Build Conditions Weekday Morning, Weekday Evening Peak Hour Traffic Volumes

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Table 5 - Trip Generation Summary

Time Period / Direction	LUC 221 Multifamily Housing	LUC 252 Senior Adult Housing	Total New Trips
Weekday Daily	832	240	**1072**
Weekday Morning Peak Hour			
Enter	15	5	**20**
Exit	41	9	**50**
Total	56	14	**70**
Weekday Evening Peak Hour			
Enter	41	9	**50**
Exit	27	7	**34**
Total	68	16	**87**

Trip Distribution

The distribution of both the age-restricted and multi-family residential site-generated traffic volumes was based on gravity models using 2009-2013 U.S. Census Bureau Journey-to-Work/Home data for the Town of Wayland. The residential distribution models the commutes of residents from Wayland to the top 24 workforce cities and towns, which represent approximately 90 percent of total Wayland residents. The top 90 percent of workforce communities generally allow for an approximation of overall distribution of traffic. Additional communities at this level each contribute less than 0.60% of the Wayland residents each which is deemed to not change the distribution of traffic calculations significantly.

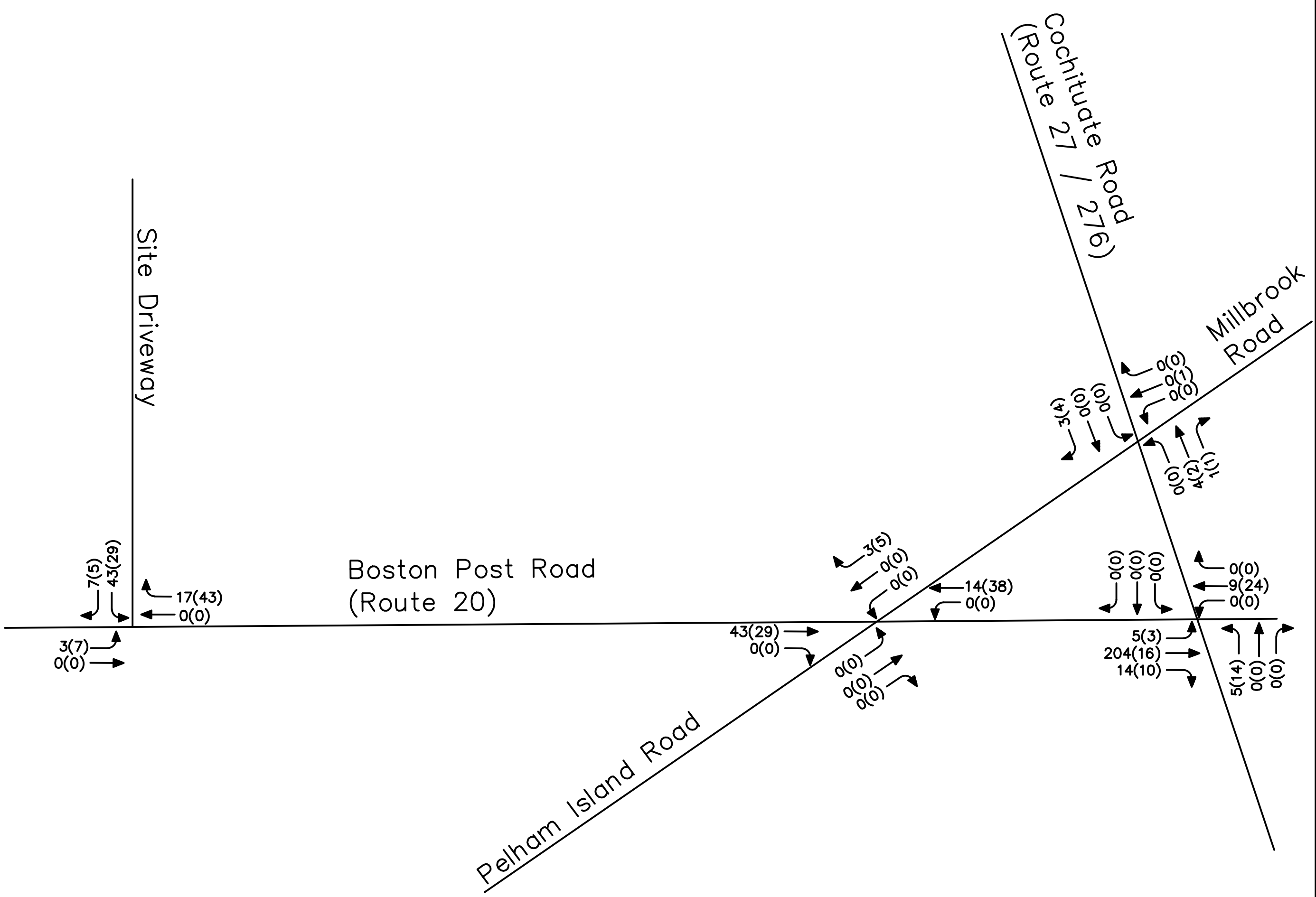
The resulting primary trip distributions are shown in Table 6. The Net Site-Generated Trip Assignment traffic-volume network is graphically depicted in Figure 5 for the weekday morning and weekday evening peak hours. Trip distribution gravity model information is provided in Attachment G.

Table 6 – Trip Distribution Summary

Direction	All Time Periods
Route 20 to/from East	48%
Route 20 to/from West	15%
Route 27/126 to/from South	28%
Route 27/126 to/from North	7%
Millbrook Road to/from East	2%
Total	**100%**

2026 Build Traffic Volumes

The 2026 Build Condition traffic-volume networks consist of the 2026 No-Build traffic-volumes with the addition of the site-generated traffic for the proposed Alta at River's Edge development. The resulting 2026 Build weekday morning, weekday dismissal, and weekday evening peak-hour traffic-volume networks are presented in Figure 6.



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 5

Site Generated Weekday Morning, Weekday Evening Peak Hour Traffic Volumes

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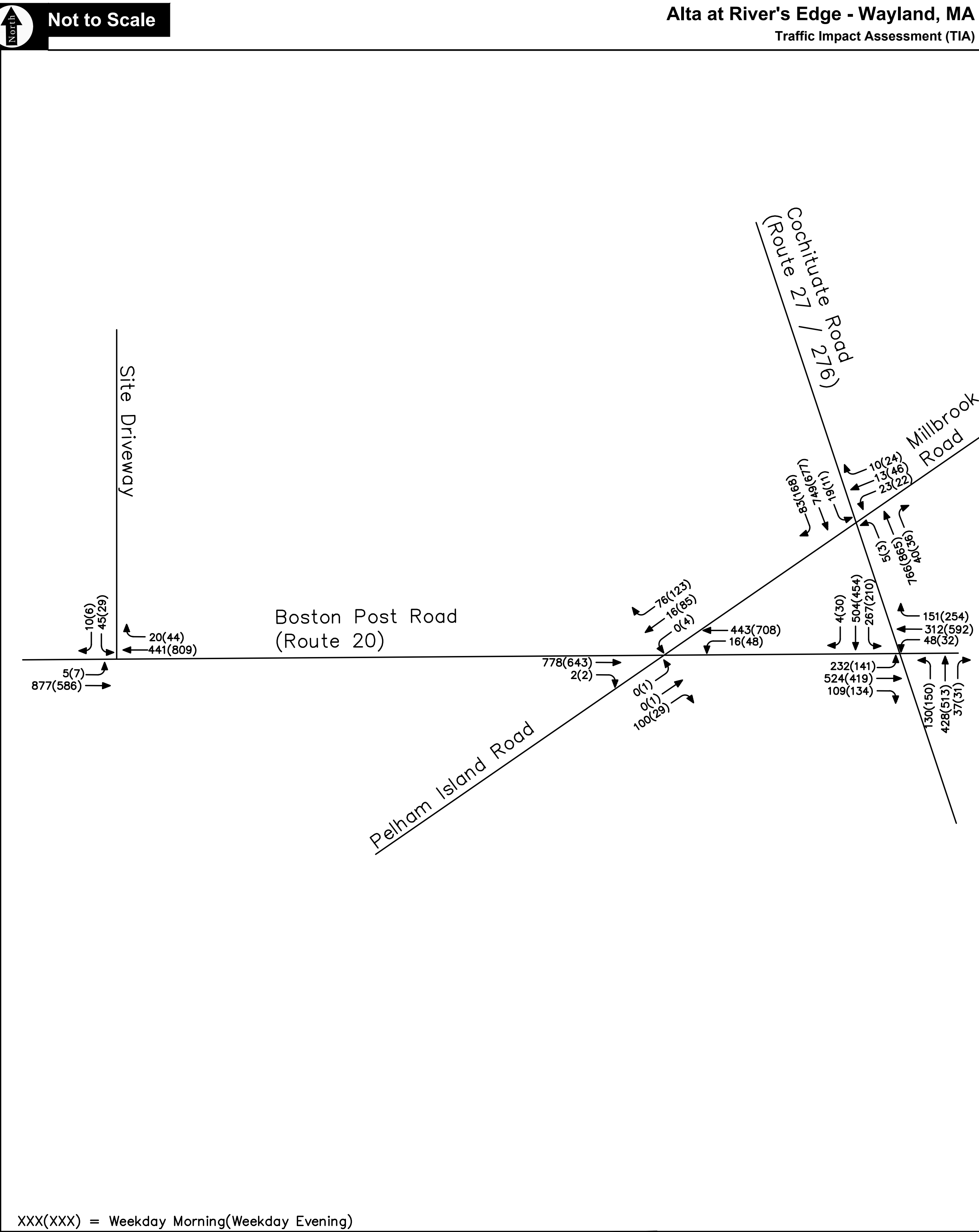

Figure 6

2026 Build Conditions Weekday Morning, Weekday Evening Peak Hour Traffic Volumes

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TEC, Inc.
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LEFT-TURN LANE WARRANTS

A left-turn lane warrant analysis was conducted for the intersection of Boston Post Road / Site Driveway using hourly traffic volumes based on TMCs conducted in August 2019. The potential left-turn lane along Boston Post Road eastbound was analyzed under unsignalized intersection conditions.

The *MassHighway Project Development and Design Guide*[4] defines left-turn lane volume warrants at unsignalized and signalized intersections based on the Transportation Research Board's (TRB) publication, the *Highway Capacity Manual (HCM) 2010*[5]. The criteria are based on the operating speed of the roadway (45 mph posted), the opposing volume, and the percent of left-turning vehicles for the advancing vehicle volume. Based on the unsignalized operating conditions on Boston Post Road, the traffic volumes do not warrant the construction of a left-turn lane on the Boston Post Road eastbound approach. An excerpt from the *MassHighway Project Development and Design Guide* noting the criteria for the introduction of a left-turn lane by traffic volume is provided in Attachment H.

CAPACITY AND QUEUE ANALYSIS

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

Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.[6] The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

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[4] *MassHighway Project Development and Design Guide*, MassHighway (now Massachusetts Department of Transportation (MassDOT) – Highway Division); Boston, Massachusetts, 2006

[5] *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington, DC; 2016

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

Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro 9.0™ intersection capacity analysis software which is also based upon the methodology and procedures presented in the *HCM 2010*. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six (6) seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five (5) percent of the time; or approximately three (3) minutes out of 60 minutes during the peak one hour of the day. During the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length.

PARAMETERS FOR TRAFFIC IMPACT ANALYSIS

Unsignalized Intersections

The levels of service of two-way stop-controlled unsignalized intersections are determined by application of a procedure described in the *HCM 2010*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop signs. Control delay includes the effects of initial deceleration delay approaching a stop sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *HCM 2010*. Table 7 summarizes the relationship between level of service and average control delay.

Table 7 – Level-of-Service Criteria for Unsignalized Intersections [a]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (seconds per vehicle)	Description
A	F	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

[a] Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010; page 17-2

Signalized Intersections

LOS for signalized intersections is calculated using the operational analysis methodology of the *HCM 2010*. This method assesses the effects of signal type, timing, phasing, progression; vehicle mix; and geometrics on delay. LOS designations are based on the criterion of control or signal delay per vehicle. Control or signal delay can be related to driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay.

Table 8 summarizes the relationship between LOS and control delay. The tabulated control delay criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 8 – Level-of-Service Criteria for Signalized Intersections[a]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (seconds per vehicle)	Description
A	F	≤10.0	LOS A describes operations with very low control delay; most vehicles do not stop at all.
B	F	10.1 to 20.0	LOS B describes operations with relatively low control delay. However, more vehicles stop than LOS A.
C	F	20.1 to 35.0	LOS C describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	F	35.1 to 55.0	LOS D describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable, whereby motorists are not able to get through the signal on one cycle.
E	F	55.1 to 80.0	LOS E describes operations with high control delay values. Individual cycle failures are frequent occurrences.
F	F	>80.0	LOS F describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

[a] Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010

Intersection Capacity and Queue Analysis Results

Level-of-service and queue analyses were conducted for 2019 Existing Conditions, 2026 No-Build Conditions, 2026 Build Conditions, and 2026 Build with Mitigation conditions for the intersections within the study area. The results of the intersection capacity and queue analysis are summarized in Table 9. The detailed intersection capacity and queue analysis worksheets are provided in Attachment I.

Boston Post Road / Site Driveway

The Site Driveway approach (DPW Transfer Station Access Roadway) is anticipated to operate at LOS E during the 2026 Build conditions. Although the levels of service are elevated over No-Build conditions, the additional delay will be contained within the site along the DPW Transfer

Station Access Roadway. Mainline movements at this intersection are anticipated to operate at acceptable levels of service (LOS B or better). All approaches at the intersection will experience volume-to-capacity (V/C) ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site.

Although queues are not expected to extend more than one (1) vehicle along the DPW Transfer Station Access Roadway, the Applicant should collaborate with the Town to re-stripe the access roadway to provide separate left-turn and right-turn lanes to minimize the potential queue along the roadway between Boston Post Road and the driveway into the site.

Boston Post Road / Pelham Island Road

Both the Pelham Island Road northbound and southbound approaches are anticipated to operate at elevated levels-of-service during the weekday evening peak hour under 2026 Build conditions. Although the delay on each approach does increase, the LOS is typical of unsignalized side-street approaches along arterials. This level of delay on the side-street approach is not expected to be experienced in a real-world scenario as the Synchro traffic analysis does not consider gaps created by the upstream signalized intersection with Cochituate Road. This signalized location will likely create significant gaps in mainline traffic that will allow for vehicles to egress the site in a timely manner. There is no feasible means to mitigate beyond conditions reported.

Boston Post Road / Cochituate Road

All movements at the intersection of Boston Post Road / Cochituate Road are anticipated to operate at acceptable levels-of-service (LOS D or better) during the 2026 Build conditions. In addition, V/C ratios are anticipated to be well below 1.0 which indicates that the intersection can accommodate the additional demand created by the site. Understanding that queuing does occur at this location, the Applicant will work with MassDOT and the Town post-occupancy to evaluate modifications and optimizations to traffic signal timings at the intersection based on future traffic demands. TEC has provided a Build with Mitigation scenario which slightly modifies the traffic signal timings within the coordination stream along Cochituate Road.

Cochituate Road / Pelham Island Road / Millbrook Road

Under both 2026 No-Build and Build conditions, the Millbrook Road westbound approach is anticipated to operate at an elevated level-of-service during both the weekday morning and weekday evening peak hours. The additional site generated trips from the project are not expected to increase the delay on the movement be more than 3 seconds per vehicle or increase queuing by more than one second per vehicle. All approaches at the intersection will experience V/C ratios well below 1.00 which indicates that the intersection can accommodate the additional demand created by the site. There is no feasible means to mitigate beyond conditions reported.

Table 9 – Intersection Capacity and Queue Analysis Summary

	2019 Existing				2026 No-Build				2026 Build				2026 Build Mitigation			
Intersection / Lane Group	**V/C[a]**	**Delay[b]**	**LOS[c]**	**Queue[d]**	**V/C**	**Delay**	**LOS**	**Queue**	**V/C**	**Delay**	**LOS**	**Queue**	**V/C**	**Delay**	**LOS**	**Queue**
Boston Post Road / Site Driveway																
Weekday Morning																
Boston Post Road EB	0.01	10.1	B	<25	0.01	10.2	B	<25	0.01	8.5	A	<25				
Site Driveway SB	0.06	23.0	C	<25	0.06	24.3	C	<25	0.38	40.1	E	40				
Weekday Evening														No Mitigation Proposed		
Boston Post Road EB	0.01	0.0	A	<25	0.01	0.0	A	<25	0.01	10.3	B	<25				
Site Driveway SB	0.01	16.0	C	<25	0.01	16.7	C	<25	0.32	48.9	E	33				
Boston Post Road / Pelham Island Road																
Weekday Morning																
Boston Post Road WB	0.02	9.5	A	<25	0.02	9.7	A	<25	0.03	9.9	A	<25				
Pelham Island Road NB	0.31	18.8	C	33	0.33	19.9	C	35	0.35	21.5	C	40				
Pelham Island Road SB	0.30	18.2	C	30	0.34	19.7	C	38	0.37	20.9	C	40				
Weekday Evening														No Mitigation Proposed		
Boston Post Road WB	0.05	8.9	A	<25	0.06	9.1	A	<25	0.06	9.2	A	<25				
Pelham Island Road NB	0.16	18.4	C	<25	0.22	24.1	C	<25	0.32	36.1	E	33				
Pelham Island Road SB	1.00	109.7	F	228	1.21	180.2	F	305	1.34	231.5	F	350				
Boston Post Road / Cochituate Road																
Weekday Morning																
Boston Post Road EBL	0.76	37.2	D	78/150	0.80	41.5	D	82/167	0.83	44.7	D	85/179	0.88	54.3	D	89/198
Boston Post Road EBT/R	0.75	36.7	D	150/235	0.78	38.3	D	157/249	0.83	42.6	D	170/273	0.89	52.9	D	190/295
Boston Post Road WBL	0.21	25.0	C	<25/36	0.23	24.9	C	<25/37	0.24	25.1	C	<25/37	0.26	26.3	C	<25/39
Boston Post Road WBT/R	0.72	35.6	D	108/158	0.74	36.6	D	114/165	0.75	37.1	D	116/168	0.82	44.7	D	121/188
Cochituate Road NBL	0.44	19.0	B	35/70	0.49	19.8	B	37/82	0.51	20.0	B	38/89	0.48	47.9	B	23/89
Cochituate Road NBT/R	0.79	34.4	C	224/401	0.83	37.1	D	235/421	0.83	37.4	D	235/421	0.82	19.1	D	231/410
Cochituate Road SBL	0.83	37.5	D	113/263	0.89	49.0	D	117/269	0.90	49.7	D	116/268	0.83	35.5	D	103/254
Cochituate Road SBT/R	0.79	33.0	C	248/443	0.83	36.4	D	261/462	0.84	37.3	D	261/462	0.80	33.2	C	250/442
Overall Intersection	**0.68**	34.7	**C**	**-**	**0.72**	**37.9**	**D**	**-**	**0.72**	**31.5**	**D**	**-**	**0.67**	**39.3**	**D**	**-**
Weekday Evening																
Boston Post Road EBL	0.59	31.9	C	52/122	0.67	35.7	D	59/155	0.72	39.1	D	58/160	0.72	39.1	D	58/160
Boston Post Road EBT/R	0.50	30.4	C	148/204	0.53	30.5	C	162/221	0.54	30.4	C	165/223	0.54	30.4	C	165/223
Boston Post Road WBL	0.12	26.3	C	<25/32	0.12	26.0	C	<25/33	0.13	25.0	C	12/31	0.13	25.0	C	<25/31
Boston Post Road WBT/R	0.92	59.9	E	267/390	0.94	64.2	E	284/418	0.91	54.7	D	282/401	0.91	54.7	D	282/401
Cochituate Road NBL	0.40	20.9	C	43/78	0.46	22.0	C	48/84	0.53	24.1	C	56/115	0.53	23.7	C	56/115
Cochituate Road NBT/R	0.79	37.3	D	312/493	0.84	41.1	D	328/522	0.90	50.7	D	351/570	0.88	46.5	D	345/558
Cochituate Road SBL	0.72	31.6	C	74/210	0.80	41.5	D	92/241	0.79	38.7	D	84/226	0.81	40.8	D	85/238
Cochituate Road SBT/R	0.69	32.0	C	262/385	0.74	34.9	C	275/402	0.75	36.2	D	284/448	0.75	36.2	D	284/448
Overall Intersection	**0.62**	**40.3**	**D**	**-**	**0.66**	**43.6**	**D**	**-**	**0.66**	**37.4**	**D**	**-**	**0.66**	**37.1**	**D**	**-**
Cochituate Road / Pelham Island Road / Millbrook Road																
Weekday Morning																
Millbrook Road WB	0.45	54.8	F	50	0.51	65.1	F	58	0.51	66.0	F	58				
Cochituate Road NB	0.01	9.5	A	<25	0.01	9.7	A	<25	0.01	9.7	A	<25				
Cochituate Road SB	0.02	9.6	A	<25	0.03	9.7	A	<25	0.03	9.7	A	<25				
Weekday Morning														No Mitigation Proposed		
Millbrook Road WB	0.61	54.0	F	83	0.70	69.5	F	103	0.72	71.6	F	105				
Cochituate Road NB	0.01	9.5	A	<25	0.01	9.6	A	<25	0.01	9.6	A	<25				
Cochituate Road SB	0.02	9.7	A	<25	0.02	9.9	A	<25	0.02	9.9	A	<25				

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service,
[d] $50^{th}/95^{th}$ Percentile Queue [95^{th} Percentile Queue only for unsignalized intersections]

PARKING

The Town of Wayland does not have a residential parking requirement outlined within its Zoning Bylaw. The Applicant is proposing to provide 354 parking spaces for the 218 apartment units, at a ratio of 1.62 spaces per unit. The ITE publication, *Parking Generation, 5th Edition* for LUC 221 – Multifamily Housing (Mid-Rise) and LUC 252 – Senior Adult Housing recommends 196 parking spaces for 153 apartment units, and 40 parking spaces for 65 apartment units; respectively. This would provide a ratio of 1.08 spaces per unit, or 236 total parking spaces. The parking supply proposed will be adequate to support the projected demand for the residential units.

CONCLUSIONS AND RECOMMENDATIONS

TEC has examined the potential traffic impacts associated with the proposed Alta at River's Edge development, located at 490 Boston Post Road in Wayland, Massachusetts on the study area roadways and intersections. The following is a summary of the results and conclusions of this effort:

- The Project proposes to construct 218 residential apartment units within the 8.24-acre parcel; including 65 age-restricted units. The property will feature residential amenities, such as a fitness center, resident lounge, business center/work stations, and two interior courtyards featuring a pool, outdoor fireplace, and dining areas. The additional amenities will be resident-centric and therefore will not add additional traffic to the facility.
- Access and egress for the site will be provided via a modified driveway to the existing access roadway which currently serves the DPW Transfer Station along Boston Post Road.
- As the Project's driveway directly accesses State Highway Layout (SHLO) along Boston Post Road and requires a change-in-use, the project is subject to a Permit to Access State Highway from the MassDOT – District 3 office.
- The intersection sight distance (ISD) and stopping sight distance (SSD) at the intersection of Boston Post Road / Site Driveway are in excess of AASHTO minimum recommendations based on the measured speed along the Boston Post Road.
- The Applicant should collaborate with the Town and MassDOT to maintain the vegetation to maximize the sight lines and maintain a minimum ISD post-occupancy. In addition, the Applicant should minimize new vegetation within the site along the Boston Post Road right-of-way, west of the site driveway, to maintain sight lines to the west. All site related signage should be kept out of the minimum sight triangle in this direction.

- The proposed Alta at River's Edge development is anticipated to generate approximately 1072 new vehicle trips during the average weekday, with 70 new vehicle trips (20 entering and 50 exiting) during the weekday morning peak hour and 87 new vehicle trips (50 entering and 34 exiting) during the weekday evening peak hour.
- Based on MassDOT industry standard calculations, a left-turn lane along Boston Post Road eastbound is not warranted at the site driveway location.
- The Site Driveway approach (DPW Transfer Station Access Roadway) is anticipated to operate at LOS E during the 2026 Build conditions at the intersection with Boston Post Road. Although the levels of service are elevated over No-Build conditions, the additional delay will be contained within the site along the DPW Transfer Station Access Roadway. Mainline movements at this intersection are anticipated to operate at acceptable levels of service (LOS B or better).
- Both the Pelham Island Road northbound and southbound approaches are anticipated to operate at elevated levels-of-service during the weekday evening peak hour under 2026 Build conditions at its intersection with Boston Post Road. Although the delay on each approach does increase, the LOS is typical of unsignalized side-street approaches along arterials. There is no feasible means to mitigate beyond conditions reported.
- All movements at the intersection of Boston Post Road / Cochituate Road are anticipated to operate at acceptable levels-of-service (LOS D or better) during the 2026 Build conditions. In addition, V/C ratios are anticipated to be well below 1.0 which indicates that the intersection can accommodate the additional demand created by the site.
- Under both 2026 No-Build and Build conditions, the Millbrook Road westbound approach is anticipated to operate at an elevated level-of-service during both the weekday morning and weekday evening peak hours at its intersection with Pelham Island Road / Cochituate Road. The additional site generated trips from the project are not expected to increase the delay on the movement be more than 3 seconds per vehicle or increase queuing by more than one second per vehicle.
- The proposed parking supply of 354 spaces on the site is sufficient to meet the anticipated demand for the residential units as based upon national industry standards.

Off-Site Mitigation Measures

- To provide enhanced pedestrian accommodations along Boston Post Road to a future Town-sponsored multi-use path and rail trail project, the Applicant has committed to contribute funding for the design and installation of a pedestrian crosswalk with accessible ramps across Boston Post Road at the DPW Transfer Station Access Roadway.

- The Applicant should provide signage and pavement markings to delineate travel within the on-site parking field to improve site circulation. This should include the installation of a stop-sign and stop-line along the DPW Transfer Station Access Roadway at Boston Post Road.
- The Applicant should collaborate with the Town to provide striping along the DPW Transfer Station Access Roadway between Boston Post Road and the drive aisle into the site to provide a left-turn lane and a right-turn lane.
- The Applicant, in coordination with the Town and MassDOT, will evaluate traffic signal timing modifications and optimizations at the intersection of Boston Post Road / Cochituate Road post-occupancy based on future traffic demands.

In conclusion, the anticipated traffic generated by the proposed Alta at River's Edge development can be safely and efficiently accommodated within the study area corridors and intersections with the implementation off off-site mitigation as listed.

Attachment A

Turning Movement Counts (TMCs)

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	85	0	85	194	0	0	0	194	1	8	0	0	9	288
7:15 AM	0	0	0	0	0	0	0	110	0	110	223	1	0	0	224	1	0	0	0	1	335
7:30 AM	0	1	0	0	1	0	0	91	1	92	222	0	0	0	222	0	0	0	0	0	315
7:45 AM	0	0	0	0	0	0	1	123	0	124	184	1	0	0	185	0	0	0	0	0	309
Total	0	1	0	0	1	0	1	409	1	411	823	2	0	0	825	2	8	0	0	10	1247
8:00 AM	0	1	0	0	1	0	2	100	0	102	214	0	0	0	214	0	2	0	0	2	319
8:15 AM	0	0	0	0	0	0	0	113	1	114	164	0	0	0	164	0	1	0	0	1	279
8:30 AM	0	0	0	0	0	0	3	89	0	92	195	0	0	0	195	0	0	0	0	0	287
8:45 AM	0	1	0	0	1	0	13	127	0	140	204	1	1	0	206	2	0	0	0	2	349
Total	0	2	0	0	2	0	18	429	1	448	777	1	1	0	779	2	3	0	0	5	1234
Grand Total	0	3	0	0	3	0	19	838	2	859	1600	3	1	0	1604	4	11	0	0	15	2481
Approach %	0.0	100.0	0.0	0.0		0.0	2.2	97.6	0.2		99.8	0.2	0.1	0.0		26.7	73.3	0.0	0.0		
Total %	0.0	0.1	0.0	0.0	0.1	0.0	0.8	33.8	0.1	34.6	64.5	0.1	0.0	0.0	64.7	0.2	0.4	0.0	0.0	0.6	
Exiting Leg Total					3					1613					845					20	2481
Cars	0	0	0	0	0	0	0	793	2	795	1525	0	0	0	1525	2	2	0	0	4	2324
% Cars	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.6	100.0	92.5	95.3	0.0	0.0	0.0	95.1	50.0	18.2	0.0	0.0	26.7	93.7
Exiting Leg Total					0					1529					795					0	2324
Heavy Vehicles	0	3	0	0	3	0	19	45	0	64	75	3	1	0	79	2	9	0	0	11	157
% Heavy Vehicles	0.0	100.0	0.0	0.0	100.0	0.0	100.0	5.4	0.0	7.5	4.7	100.0	100.0	0.0	4.9	50.0	81.8	0.0	0.0	73.3	6.3
Exiting Leg Total					3					84					50					20	157

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	110	0	110	223	1	0	0	224	1	0	0	0	1	335
7:30 AM	0	1	0	0	1	0	0	91	1	92	222	0	0	0	222	0	0	0	0	0	315
7:45 AM	0	0	0	0	0	0	1	123	0	124	184	1	0	0	185	0	0	0	0	0	309
8:00 AM	0	1	0	0	1	0	2	100	0	102	214	0	0	0	214	0	2	0	0	2	319
Total Volume	0	2	0	0	2	0	3	424	1	428	843	2	0	0	845	1	2	0	0	3	1278
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.7	99.1	0.2		99.8	0.2	0.0	0.0		33.3	66.7	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.000	0.375	0.862	0.250	0.863	0.945	0.500	0.000	0.000	0.943	0.250	0.250	0.000	0.000	0.375	0.954
Cars	0	0	0	0	0	0	0	402	1	403	791	0	0	0	791	0	1	0	0	1	1195
Cars %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.8	100.0	94.2	93.8	0.0	0.0	0.0	93.6	0.0	50.0	0.0	0.0	33.3	93.5
Heavy Vehicles	0	2	0	0	2	0	3	22	0	25	52	2	0	0	54	1	1	0	0	2	83
Heavy Vehicles %	0.0	100.0	0.0	0.0	100.0	0.0	100.0	5.2	0.0	5.8	6.2	100.0	0.0	0.0	6.4	100.0	50.0	0.0	0.0	66.7	6.5
Cars Enter Leg	0	0	0	0	0	0	0	402	1	403	791	0	0	0	791	0	1	0	0	1	1195
Heavy Enter Leg	0	2	0	0	2	0	3	22	0	25	52	2	0	0	54	1	1	0	0	2	83
Total Entering Leg	0	2	0	0	2	0	3	424	1	428	843	2	0	0	845	1	2	0	0	3	1278
Cars Exiting Leg					0					793					402					0	1195
Heavy Exiting Leg					2					53					25					3	83
Total Exiting Leg					2					846					427					3	1278

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Cars**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	83	0	83	189	0	0	0	189	0	0	0	0	0	272
7:15 AM	0	0	0	0	0	0	0	104	0	104	208	0	0	0	208	0	0	0	0	0	312
7:30 AM	0	0	0	0	0	0	0	86	1	87	208	0	0	0	208	0	0	0	0	0	295
7:45 AM	0	0	0	0	0	0	0	117	0	117	173	0	0	0	173	0	0	0	0	0	290
Total	0	0	0	0	0	0	0	390	1	391	778	0	0	0	778	0	0	0	0	0	1169
8:00 AM	0	0	0	0	0	0	0	95	0	95	202	0	0	0	202	0	1	0	0	1	298
8:15 AM	0	0	0	0	0	0	0	103	1	104	155	0	0	0	155	0	1	0	0	1	260
8:30 AM	0	0	0	0	0	0	0	83	0	83	192	0	0	0	192	0	0	0	0	0	275
8:45 AM	0	0	0	0	0	0	0	122	0	122	198	0	0	0	198	2	0	0	0	2	322
Total	0	0	0	0	0	0	0	403	1	404	747	0	0	0	747	2	2	0	0	4	1155
Grand Total	0	0	0	0	0	0	0	793	2	795	1525	0	0	0	1525	2	2	0	0	4	2324
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	99.7	0.3		100.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.1	0.1	34.2	65.6	0.0	0.0	0.0	65.6	0.1	0.1	0.0	0.0	0.2	
Exiting Leg Total					0					1529					795					0	2324

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	104	0	104	208	0	0	0	208	0	0	0	0	0	312
7:30 AM	0	0	0	0	0	0	0	86	1	87	208	0	0	0	208	0	0	0	0	0	295
7:45 AM	0	0	0	0	0	0	0	117	0	117	173	0	0	0	173	0	0	0	0	0	290
8:00 AM	0	0	0	0	0	0	0	95	0	95	202	0	0	0	202	0	1	0	0	1	298
Total Volume	0	0	0	0	0	0	0	402	1	403	791	0	0	0	791	0	1	0	0	1	1195
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	99.8	0.2		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.859	0.250	0.861	0.951	0.000	0.000	0.000	0.951	0.000	0.250	0.000	0.000	0.250	0.958
Entering Leg	0	0	0	0	0	0	0	402	1	403	791	0	0	0	791	0	1	0	0	1	1195
Exiting Leg					0					793					402					0	1195
Total					0					1196					1193					1	2390

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	2	0	2	5	0	0	0	5	1	8	0	0	9	16
7:15 AM	0	0	0	0	0	0	0	6	0	6	15	1	0	0	16	1	0	0	0	1	23
7:30 AM	0	1	0	0	1	0	0	5	0	5	14	0	0	0	14	0	0	0	0	0	20
7:45 AM	0	0	0	0	0	0	1	6	0	7	11	1	0	0	12	0	0	0	0	0	19
Total	0	1	0	0	1	0	1	19	0	20	45	2	0	0	47	2	8	0	0	10	78
8:00 AM	0	1	0	0	1	0	2	5	0	7	12	0	0	0	12	0	1	0	0	1	21
8:15 AM	0	0	0	0	0	0	0	10	0	10	9	0	0	0	9	0	0	0	0	0	19
8:30 AM	0	0	0	0	0	0	3	6	0	9	3	0	0	0	3	0	0	0	0	0	12
8:45 AM	0	1	0	0	1	0	13	5	0	18	6	1	1	0	8	0	0	0	0	0	27
Total	0	2	0	0	2	0	18	26	0	44	30	1	1	0	32	0	1	0	0	1	79
Grand Total	0	3	0	0	3	0	19	45	0	64	75	3	1	0	79	2	9	0	0	11	157
Approach %	0.0	100.0	0.0	0.0		0.0	29.7	70.3	0.0		94.9	3.8	1.3	0.0		18.2	81.8	0.0	0.0		
Total %	0.0	1.9	0.0	0.0	1.9	0.0	12.1	28.7	0.0	40.8	47.8	1.9	0.6	0.0	50.3	1.3	5.7	0.0	0.0	7.0	
Exiting Leg Total					3					84					50					20	157
Buses	0	0	0	0	0	0	19	1	0	20	1	0	1	0	2	2	9	0	0	11	33
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.2	0.0	31.3	1.3	0.0	100.0	0.0	2.5	100.0	100.0	0.0	0.0	100.0	21.0
Exiting Leg Total					0					10					3					20	33
Single-Unit Trucks	0	3	0	0	3	0	0	35	0	35	58	3	0	0	61	0	0	0	0	0	99
% Single-Unit	0.0	100.0	0.0	0.0	100.0	0.0	0.0	77.8	0.0	54.7	77.3	100.0	0.0	0.0	77.2	0.0	0.0	0.0	0.0	0.0	63.1
Exiting Leg Total					3					58					38					0	99
Articulated Trucks	0	0	0	0	0	0	0	9	0	9	16	0	0	0	16	0	0	0	0	0	25
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	14.1	21.3	0.0	0.0	0.0	20.3	0.0	0.0	0.0	0.0	0.0	15.9
Exiting Leg Total					0					16					9					0	25

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	6	0	6	15	1	0	0	16	1	0	0	0	1	23
7:30 AM	0	1	0	0	1	0	0	5	0	5	14	0	0	0	14	0	0	0	0	0	20
7:45 AM	0	0	0	0	0	0	1	6	0	7	11	1	0	0	12	0	0	0	0	0	19
8:00 AM	0	1	0	0	1	0	2	5	0	7	12	0	0	0	12	0	1	0	0	1	21
Total Volume	0	2	0	0	2	0	3	22	0	25	52	2	0	0	54	1	1	0	0	2	83
% Approach Total	0.0	100.0	0.0	0.0		0.0	12.0	88.0	0.0		96.3	3.7	0.0	0.0		50.0	50.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.000	0.375	0.917	0.000	0.893	0.867	0.500	0.000	0.000	0.844	0.250	0.250	0.000	0.000	0.500	0.902
Buses	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	1	1	0	0	2	6
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	12.0	1.9	0.0	0.0	0.0	1.9	100.0	100.0	0.0	0.0	100.0	7.2
Single-Unit Trucks	0	2	0	0	2	0	0	19	0	19	39	2	0	0	41	0	0	0	0	0	62
Single-Unit %	0.0	100.0	0.0	0.0	100.0	0.0	0.0	86.4	0.0	76.0	75.0	100.0	0.0	0.0	75.9	0.0	0.0	0.0	0.0	0.0	74.7
Articulated Trucks	0	0	0	0	0	0	0	3	0	3	12	0	0	0	12	0	0	0	0	0	15
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	0.0	12.0	23.1	0.0	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	18.1
Buses	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	1	1	0	0	2	6
Single-Unit Trucks	0	2	0	0	2	0	0	19	0	19	39	2	0	0	41	0	0	0	0	0	62
Articulated Trucks	0	0	0	0	0	0	0	3	0	3	12	0	0	0	12	0	0	0	0	0	15
Total Entering Leg	0	2	0	0	2	0	3	22	0	25	52	2	0	0	54	1	1	0	0	2	83
Buses					0					2					1					3	6
Single-Unit Trucks					2					39					21					0	62
Articulated Trucks					0					12					3					0	15
Total Exiting Leg					2					53					25					3	83

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Buses**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	0	0	9	9
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2	8	0	0	10	12
8:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
8:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	0	0	0	0	0	14
Total	0	0	0	0	0	0	18	1	0	19	0	0	1	0	1	0	1	0	0	1	21
Grand Total	0	0	0	0	0	0	19	1	0	20	1	0	1	0	2	2	9	0	0	11	33
Approach %	0.0	0.0	0.0	0.0		0.0	95.0	5.0	0.0		50.0	0.0	50.0	0.0		18.2	81.8	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	57.6	3.0	0.0	60.6	3.0	0.0	3.0	0.0	6.1	6.1	27.3	0.0	0.0	33.3	
Exiting Leg Total					0					10					3					20	33

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
8:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	0	0	0	0	0	14
Total Volume	0	0	0	0	0	0	18	1	0	19	0	0	1	0	1	0	1	0	0	1	21
% Approach Total	0.0	0.0	0.0	0.0		0.0	94.7	5.3	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.346	0.250	0.000	0.365	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.375
Entering Leg	0	0	0	0	0	0	18	1	0	19	0	0	1	0	1	0	1	0	0	1	21
Exiting Leg					0					1					1					19	21
Total					0					20					2					20	42

PDI File #:	**197134 A**
Location:	**N: 484 Boston Post Road NW: School Bus Lot**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100   Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	2	0	2	5	0	0	0	5	0	0	0	0	0	7
7:15 AM	0	0	0	0	0	0	0	6	0	6	8	1	0	0	9	0	0	0	0	0	15
7:30 AM	0	1	0	0	1	0	0	4	0	4	11	0	0	0	11	0	0	0	0	0	16
7:45 AM	0	0	0	0	0	0	0	5	0	5	11	1	0	0	12	0	0	0	0	0	17
Total	0	1	0	0	1	0	0	17	0	17	35	2	0	0	37	0	0	0	0	0	55
8:00 AM	0	1	0	0	1	0	0	4	0	4	9	0	0	0	9	0	0	0	0	0	14
8:15 AM	0	0	0	0	0	0	0	8	0	8	7	0	0	0	7	0	0	0	0	0	15
8:30 AM	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
8:45 AM	0	1	0	0	1	0	0	3	0	3	4	1	0	0	5	0	0	0	0	0	9
Total	0	2	0	0	2	0	0	18	0	18	23	1	0	0	24	0	0	0	0	0	44
Grand Total	0	3	0	0	3	0	0	35	0	35	58	3	0	0	61	0	0	0	0	0	99
Approach %	0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		95.1	4.9	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	3.0	0.0	0.0	3.0	0.0	0.0	35.4	0.0	35.4	58.6	3.0	0.0	0.0	61.6	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					3					58					38					0	99

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	6	0	6	8	1	0	0	9	0	0	0	0	0	15
7:30 AM	0	1	0	0	1	0	0	4	0	4	11	0	0	0	11	0	0	0	0	0	16
7:45 AM	0	0	0	0	0	0	0	5	0	5	11	1	0	0	12	0	0	0	0	0	17
8:00 AM	0	1	0	0	1	0	0	4	0	4	9	0	0	0	9	0	0	0	0	0	14
Total Volume	0	2	0	0	2	0	0	19	0	19	39	2	0	0	41	0	0	0	0	0	62
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		95.1	4.9	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.792	0.000	0.792	0.886	0.500	0.000	0.000	0.854	0.000	0.000	0.000	0.000	0.000	0.912
Entering Leg	0	2	0	0	2	0	0	19	0	19	39	2	0	0	41	0	0	0	0	0	62
Exiting Leg					2					39					21					0	62
Total					4					58					62					0	124

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Articulated Trucks**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	6
7:30 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	2	0	2	9	0	0	0	9	0	0	0	0	0	11
8:00 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	4
8:15 AM	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	2	0	2	2	0	0	0	2	0	0	0	0	0	4
Total	0	0	0	0	0	0	0	7	0	7	7	0	0	0	7	0	0	0	0	0	14
Grand Total	0	0	0	0	0	0	0	9	0	9	16	0	0	0	16	0	0	0	0	0	25
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	36.0	64.0	0.0	0.0	0.0	64.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					16					9					0	25

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	6
7:30 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	0	3	0	3	12	0	0	0	12	0	0	0	0	0	15
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.750	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.625
Entering Leg	0	0	0	0	0	0	0	3	0	3	12	0	0	0	12	0	0	0	0	0	15
Exiting Leg					0					12					3					0	15
Total					0					15					15					0	30

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Right	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Right	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
7:00 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	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 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	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							2							0	2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Right	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Right	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
7:00 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	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 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	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Exiting Leg							0							0							2							0	2
Total							0							2							2							0	4

PDI File #: **197134 A**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 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	0	0	0	0
7:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	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	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	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 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	0	0	0	0
7:45 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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #:	**197134 AA**
Location:	**N: 484 Boston Post Road NW: School Bus Lot**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**4:00 PM**
End Time:	**6:00 PM**
Class:	

PRECISION
DATA
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	198	0	198	110	0	0	0	110	2	0	0	0	2	310
4:15 PM	0	0	0	0	0	0	0	212	0	212	106	0	0	0	106	0	0	0	0	0	318
4:30 PM	0	0	0	0	0	0	0	180	0	180	118	0	0	1	119	0	0	0	0	0	299
4:45 PM	0	0	0	0	0	0	0	231	0	231	147	0	0	0	147	0	0	0	0	0	378
Total	0	0	0	0	0	0	0	821	0	821	481	0	0	1	482	2	0	0	0	2	1305
5:00 PM	0	0	0	0	0	0	1	173	0	174	138	0	0	0	138	0	0	0	0	0	312
5:15 PM	0	0	0	0	0	0	0	189	1	190	155	0	0	0	155	1	0	0	0	1	346
5:30 PM	0	0	0	0	0	0	0	166	0	166	127	0	0	0	127	0	0	0	0	0	293
5:45 PM	0	0	0	0	0	0	2	199	0	201	131	0	0	0	131	0	1	0	0	1	333
Total	0	0	0	0	0	0	3	727	1	731	551	0	0	0	551	1	1	0	0	2	1284
Grand Total	0	0	0	0	0	0	3	1548	1	1552	1032	0	0	1	1033	3	1	0	0	4	2589
Approach %	0.0	0.0	0.0	0.0		0.0	0.2	99.7	0.1		99.9	0.0	0.0	0.1		75.0	25.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.1	59.8	0.0	59.9	39.9	0.0	0.0	0.0	39.9	0.1	0.0	0.0	0.0	0.2	
Exiting Leg Total					0					1034					1552					3	2589
Cars	0	0	0	0	0	0	0	1513	1	1514	1010	0	0	1	1011	3	1	0	0	4	2529
% Cars	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.7	100.0	97.6	97.9	0.0	0.0	100.0	97.9	100.0	100.0	0.0	0.0	100.0	97.7
Exiting Leg Total					0					1012					1517					0	2529
Heavy Vehicles	0	0	0	0	0	0	3	35	0	38	22	0	0	0	22	0	0	0	0	0	60
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.3	0.0	2.4	2.1	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	2.3
Exiting Leg Total					0					22					35					3	60

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	0	180	0	180	118	0	0	1	119	0	0	0	0	0	299
4:45 PM	0	0	0	0	0	0	0	231	0	231	147	0	0	0	147	0	0	0	0	0	378
5:00 PM	0	0	0	0	0	0	1	173	0	174	138	0	0	0	138	0	0	0	0	0	312
5:15 PM	0	0	0	0	0	0	0	189	1	190	155	0	0	0	155	1	0	0	0	1	346
Total Volume	0	0	0	0	0	0	1	773	1	775	558	0	0	1	559	1	0	0	0	1	1335
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.1	99.7	0.1		99.8	0.0	0.0	0.2		100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.837	0.250	0.839	0.900	0.000	0.000	0.250	0.902	0.250	0.000	0.000	0.000	0.250	0.883
Cars	0	0	0	0	0	0	0	755	1	756	550	0	0	1	551	1	0	0	0	1	1308
Cars %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.7	100.0	97.5	98.6	0.0	0.0	100.0	98.6	100.0	0.0	0.0	0.0	100.0	98.0
Heavy Vehicles	0	0	0	0	0	0	1	18	0	19	8	0	0	0	8	0	0	0	0	0	27
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.3	0.0	2.5	1.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	2.0
Cars Enter Leg	0	0	0	0	0	0	0	755	1	756	550	0	0	1	551	1	0	0	0	1	1308
Heavy Enter Leg	0	0	0	0	0	0	1	18	0	19	8	0	0	0	8	0	0	0	0	0	27
Total Entering Leg	0	0	0	0	0	0	1	773	1	775	558	0	0	1	559	1	0	0	0	1	1335
Cars Exiting Leg					0					551					757					0	1308
Heavy Exiting Leg					0					8					18					1	27
Total Exiting Leg					0					559					775					1	1335

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Cars**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	190	0	190	105	0	0	0	105	2	0	0	0	2	297
4:15 PM	0	0	0	0	0	0	0	209	0	209	103	0	0	0	103	0	0	0	0	0	312
4:30 PM	0	0	0	0	0	0	0	172	0	172	115	0	0	1	116	0	0	0	0	0	288
4:45 PM	0	0	0	0	0	0	0	229	0	229	146	0	0	0	146	0	0	0	0	0	375
Total	0	0	0	0	0	0	0	800	0	800	469	0	0	1	470	2	0	0	0	2	1272
5:00 PM	0	0	0	0	0	0	0	168	0	168	134	0	0	0	134	0	0	0	0	0	302
5:15 PM	0	0	0	0	0	0	0	186	1	187	155	0	0	0	155	1	0	0	0	1	343
5:30 PM	0	0	0	0	0	0	0	162	0	162	125	0	0	0	125	0	0	0	0	0	287
5:45 PM	0	0	0	0	0	0	0	197	0	197	127	0	0	0	127	0	1	0	0	1	325
Total	0	0	0	0	0	0	0	713	1	714	541	0	0	0	541	1	1	0	0	2	1257
Grand Total	0	0	0	0	0	0	0	1513	1	1514	1010	0	0	1	1011	3	1	0	0	4	2529
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	99.9	0.1		99.9	0.0	0.0	0.1		75.0	25.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.8	0.0	59.9	39.9	0.0	0.0	0.0	40.0	0.1	0.0	0.0	0.0	0.2	
Exiting Leg Total					0					1012					1517					0	2529

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:30 PM	0	0	0	0	0	0	0	172	0	172	115	0	0	1	116	0	0	0	0	0	288
4:45 PM	0	0	0	0	0	0	0	229	0	229	146	0	0	0	146	0	0	0	0	0	375
5:00 PM	0	0	0	0	0	0	0	168	0	168	134	0	0	0	134	0	0	0	0	0	302
5:15 PM	0	0	0	0	0	0	0	186	1	187	155	0	0	0	155	1	0	0	0	1	343
Total Volume	0	0	0	0	0	0	0	755	1	756	550	0	0	1	551	1	0	0	0	1	1308
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	99.9	0.1		99.8	0.0	0.0	0.2		100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.824	0.250	0.825	0.887	0.000	0.000	0.250	0.889	0.250	0.000	0.000	0.000	0.250	0.872
Entering Leg	0	0	0	0	0	0	0	755	1	756	550	0	0	1	551	1	0	0	0	1	1308
Exiting Leg					0					551					757					0	1308
Total					0					1307					1308					1	2616

PDI File #:	**197134 AA**
Location:	**N: 484 Boston Post Road NW: School Bus Lot**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**4:00 PM**
End Time:	**6:00 PM**
Class:	**Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

PRECISION
DATA
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	8	0	8	5	0	0	0	5	0	0	0	0	0	13
4:15 PM	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	8	0	8	3	0	0	0	3	0	0	0	0	0	11
4:45 PM	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	21	0	21	12	0	0	0	12	0	0	0	0	0	33
5:00 PM	0	0	0	0	0	0	1	5	0	6	4	0	0	0	4	0	0	0	0	0	10
5:15 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
5:45 PM	0	0	0	0	0	0	2	2	0	4	4	0	0	0	4	0	0	0	0	0	8
Total	0	0	0	0	0	0	3	14	0	17	10	0	0	0	10	0	0	0	0	0	27
Grand Total	0	0	0	0	0	0	3	35	0	38	22	0	0	0	22	0	0	0	0	0	60
Approach %	0.0	0.0	0.0	0.0		0.0	7.9	92.1	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	5.0	58.3	0.0	63.3	36.7	0.0	0.0	0.0	36.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					22					35					3	60
Buses	0	0	0	0	0	0	3	1	0	4	2	0	0	0	2	0	0	0	0	0	6
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2.9	0.0	10.5	9.1	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	10.0
Exiting Leg Total					0					2					1					3	6
Single-Unit Trucks	0	0	0	0	0	0	0	27	0	27	15	0	0	0	15	0	0	0	0	0	42
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	77.1	0.0	71.1	68.2	0.0	0.0	0.0	68.2	0.0	0.0	0.0	0.0	0.0	70.0
Exiting Leg Total					0					15					27					0	42
Articulated Trucks	0	0	0	0	0	0	0	7	0	7	5	0	0	0	5	0	0	0	0	0	12
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	18.4	22.7	0.0	0.0	0.0	22.7	0.0	0.0	0.0	0.0	0.0	20.0
Exiting Leg Total					0					5					7					0	12

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	8	0	8	5	0	0	0	5	0	0	0	0	0	13
4:15 PM	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	8	0	8	3	0	0	0	3	0	0	0	0	0	11
4:45 PM	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	3
Total Volume	0	0	0	0	0	0	0	21	0	21	12	0	0	0	12	0	0	0	0	0	33
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.656	0.000	0.656	0.600	0.000	0.000	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.635
Buses	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	4.8	8.3	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	6.1
Single-Unit Trucks	0	0	0	0	0	0	0	16	0	16	9	0	0	0	9	0	0	0	0	0	25
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.2	0.0	76.2	75.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	0.0	75.8
Articulated Trucks	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	0.0	19.0	16.7	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	18.2
Buses	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
Single-Unit Trucks	0	0	0	0	0	0	0	16	0	16	9	0	0	0	9	0	0	0	0	0	25
Articulated Trucks	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
Total Entering Leg	0	0	0	0	0	0	0	21	0	21	12	0	0	0	12	0	0	0	0	0	33
Buses					0					1					1					0	2
Single-Unit Trucks					0					9					16					0	25
Articulated Trucks					0					2					4					0	6
Total Exiting Leg					0					12					21					0	33

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	0	0	0	0	4
Grand Total	0	0	0	0	0	0	3	1	0	4	2	0	0	0	2	0	0	0	0	0	6
Approach %	0.0	0.0	0.0	0.0		0.0	75.0	25.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	16.7	0.0	66.7	33.3	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					2					1					3	6

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
5:00 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	0	0	0	0	4
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.375	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	0	0	0	0	4
Exiting Leg					0					1					0					3	4
Total					0					4					1					3	8

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	7	0	7	3	0	0	0	3	0	0	0	0	0	10
4:15 PM	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
4:45 PM	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	16	0	16	9	0	0	0	9	0	0	0	0	0	25
5:00 PM	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
5:15 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	3	0	3	1	0	0	0	1	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	4
Total	0	0	0	0	0	0	0	11	0	11	6	0	0	0	6	0	0	0	0	0	17
Grand Total	0	0	0	0	0	0	0	27	0	27	15	0	0	0	15	0	0	0	0	0	42
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.3	0.0	64.3	35.7	0.0	0.0	0.0	35.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					15					27					0	42

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	7	0	7	3	0	0	0	3	0	0	0	0	0	10
4:15 PM	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
4:30 PM	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
4:45 PM	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	3
Total Volume	0	0	0	0	0	0	0	16	0	16	9	0	0	0	9	0	0	0	0	0	25
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.571	0.000	0.571	0.750	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.625
Entering Leg	0	0	0	0	0	0	0	16	0	16	9	0	0	0	9	0	0	0	0	0	25
Exiting Leg					0					9					16					0	25
Total					0					25					25					0	50

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	3	0	3	1	0	0	0	1	0	0	0	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
5:00 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	3	0	3	3	0	0	0	3	0	0	0	0	0	6
Grand Total	0	0	0	0	0	0	0	7	0	7	5	0	0	0	5	0	0	0	0	0	12
Approach %	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.3	0.0	58.3	41.7	0.0	0.0	0.0	41.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					0					5					7					0	12

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	484 Boston Post Road					Boston Post Road (Route 20)					Boston Post Road (Route 20)					School Bus Lot					
	from North					from East					from West					from Northwest					
	Hard Righ	Right	Left	U-Turn	Total	Right	Bear Righ	Thru	U-Turn	Total	Thru	Left	Hard Left	U-Turn	Total	Hard Righ	Bear Left	Hard Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	3	0	3	1	0	0	0	1	0	0	0	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
% Approach Total	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.333	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	0	0	0	0	0	0	4	0	4	2	0	0	0	2	0	0	0	0	0	6
Exiting Leg					0					2					4					0	6
Total					0					6					6					0	12

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Bicycles (on Roadway and Crosswalks)**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 AA**
Location: **N: 484 Boston Post Road NW: School Bus Lot**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	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	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	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	484 Boston Post Road							Boston Post Road (Route 20)							Boston Post Road (Route 20)							School Bus Lot							
	from North							from East							from West							from Northwest							
	Hard Righ	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Bear Righ	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	Hard Left	U-Turn	CW-NB	CW-SB	Total	Hard Righ	Bear Left	Hard Left	U-Turn	CW-NEB	CW-SWB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars and Heavy Vehicles (Combined)**

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	10	5	0	0	15	0	81	4	0	85	14	0	0	0	14	0	198	0	0	198	312
7:15 AM	11	7	0	0	18	0	107	6	0	113	25	0	2	0	27	0	184	0	0	184	342
7:30 AM	18	9	0	0	27	0	73	8	0	81	32	0	0	0	32	0	185	0	0	185	325
7:45 AM	18	5	0	0	23	0	100	6	0	106	31	0	0	0	31	0	182	0	0	182	342
Total	57	26	0	0	83	0	361	24	0	385	102	0	2	0	104	0	749	0	0	749	1321
8:00 AM	13	4	0	0	17	0	95	2	0	97	29	0	0	0	29	0	181	0	0	181	324
8:15 AM	20	1	0	0	21	0	104	3	0	107	23	0	0	0	23	1	150	0	0	151	302
8:30 AM	12	3	0	0	15	0	90	9	0	99	21	0	0	0	21	0	170	0	0	170	305
8:45 AM	22	7	0	0	29	0	120	1	0	121	24	0	0	0	24	1	205	0	0	206	380
Total	67	15	0	0	82	0	409	15	0	424	97	0	0	0	97	2	706	0	0	708	1311
Grand Total	124	41	0	0	165	0	770	39	0	809	199	0	2	0	201	2	1455	0	0	1457	2632
Approach %	75.2	24.8	0.0	0.0		0.0	95.2	4.8	0.0		99.0	0.0	1.0	0.0		0.1	99.9	0.0	0.0		
Total %	4.7	1.6	0.0	0.0	6.3	0.0	29.3	1.5	0.0	30.7	7.6	0.0	0.1	0.0	7.6	0.1	55.3	0.0	0.0	55.4	
Exiting Leg Total					0					1654					82					896	2632
Cars	114	40	0	0	154	0	705	38	0	743	197	0	2	0	199	2	1354	0	0	1356	2452
% Cars	91.9	97.6	0.0	0.0	93.3	0.0	91.6	97.4	0.0	91.8	99.0	0.0	100.0	0.0	99.0	100.0	93.1	0.0	0.0	93.1	93.2
Exiting Leg Total					0					1551					80					821	2452
Heavy Vehicles	10	1	0	0	11	0	65	1	0	66	2	0	0	0	2	0	101	0	0	101	180
% Heavy Vehicles	8.1	2.4	0.0	0.0	6.7	0.0	8.4	2.6	0.0	8.2	1.0	0.0	0.0	0.0	1.0	0.0	6.9	0.0	0.0	6.9	6.8
Exiting Leg Total					0					103					2					75	180

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	11	7	0	0	18	0	107	6	0	113	25	0	2	0	27	0	184	0	0	184	342
7:30 AM	18	9	0	0	27	0	73	8	0	81	32	0	0	0	32	0	185	0	0	185	325
7:45 AM	18	5	0	0	23	0	100	6	0	106	31	0	0	0	31	0	182	0	0	182	342
8:00 AM	13	4	0	0	17	0	95	2	0	97	29	0	0	0	29	0	181	0	0	181	324
Total Volume	60	25	0	0	85	0	375	22	0	397	117	0	2	0	119	0	732	0	0	732	1333
% Approach Total	70.6	29.4	0.0	0.0		0.0	94.5	5.5	0.0		98.3	0.0	1.7	0.0		0.0	100.0	0.0	0.0		
PHF	0.833	0.694	0.000	0.000	0.787	0.000	0.876	0.688	0.000	0.878	0.914	0.000	0.250	0.000	0.930	0.000	0.989	0.000	0.000	0.989	0.974
Cars	54	24	0	0	78	0	352	21	0	373	116	0	2	0	118	0	671	0	0	671	1240
Cars %	90.0	96.0	0.0	0.0	91.8	0.0	93.9	95.5	0.0	94.0	99.1	0.0	100.0	0.0	99.2	0.0	91.7	0.0	0.0	91.7	93.0
Heavy Vehicles	6	1	0	0	7	0	23	1	0	24	1	0	0	0	1	0	61	0	0	61	93
Heavy Vehicles %	10.0	4.0	0.0	0.0	8.2	0.0	6.1	4.5	0.0	6.0	0.9	0.0	0.0	0.0	0.8	0.0	8.3	0.0	0.0	8.3	7.0
Cars Enter Leg	54	24	0	0	78	0	352	21	0	373	116	0	2	0	118	0	671	0	0	671	1240
Heavy Enter Leg	6	1	0	0	7	0	23	1	0	24	1	0	0	0	1	0	61	0	0	61	93
Total Entering Leg	60	25	0	0	85	0	375	22	0	397	117	0	2	0	119	0	732	0	0	732	1333
Cars Exiting Leg					0					787					45					408	1240
Heavy Exiting Leg					0					62					2					29	93
Total Exiting Leg					0					849					47					437	1333

PDI File #:	**197134 B**
Location:	**N: Pelham Island Road S: Pelham Island Road**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	**Cars**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	9	5	0	0	14	0	75	4	0	79	14	0	0	0	14	0	179	0	0	179	286
7:15 AM	8	7	0	0	15	0	100	6	0	106	25	0	2	0	27	0	169	0	0	169	317
7:30 AM	18	9	0	0	27	0	68	8	0	76	31	0	0	0	31	0	173	0	0	173	307
7:45 AM	16	4	0	0	20	0	97	5	0	102	31	0	0	0	31	0	164	0	0	164	317
Total	51	25	0	0	76	0	340	23	0	363	101	0	2	0	103	0	685	0	0	685	1227
8:00 AM	12	4	0	0	16	0	87	2	0	89	29	0	0	0	29	0	165	0	0	165	299
8:15 AM	18	1	0	0	19	0	99	3	0	102	23	0	0	0	23	1	140	0	0	141	285
8:30 AM	11	3	0	0	14	0	81	9	0	90	21	0	0	0	21	0	165	0	0	165	290
8:45 AM	22	7	0	0	29	0	98	1	0	99	23	0	0	0	23	1	199	0	0	200	351
Total	63	15	0	0	78	0	365	15	0	380	96	0	0	0	96	2	669	0	0	671	1225
Grand Total	114	40	0	0	154	0	705	38	0	743	197	0	2	0	199	2	1354	0	0	1356	2452
Approach %	74.0	26.0	0.0	0.0		0.0	94.9	5.1	0.0		99.0	0.0	1.0	0.0		0.1	99.9	0.0	0.0		
Total %	4.6	1.6	0.0	0.0	6.3	0.0	28.8	1.5	0.0	30.3	8.0	0.0	0.1	0.0	8.1	0.1	55.2	0.0	0.0	55.3	
Exiting Leg Total					0					1551					80					821	2452

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	8	7	0	0	15	0	100	6	0	106	25	0	2	0	27	0	169	0	0	169	317
7:30 AM	18	9	0	0	27	0	68	8	0	76	31	0	0	0	31	0	173	0	0	173	307
7:45 AM	16	4	0	0	20	0	97	5	0	102	31	0	0	0	31	0	164	0	0	164	317
8:00 AM	12	4	0	0	16	0	87	2	0	89	29	0	0	0	29	0	165	0	0	165	299
Total Volume	54	24	0	0	78	0	352	21	0	373	116	0	2	0	118	0	671	0	0	671	1240
% Approach Total	69.2	30.8	0.0	0.0		0.0	94.4	5.6	0.0		98.3	0.0	1.7	0.0		0.0	100.0	0.0	0.0		
PHF	0.750	0.667	0.000	0.000	0.722	0.000	0.880	0.656	0.000	0.880	0.935	0.000	0.250	0.000	0.952	0.000	0.970	0.000	0.000	0.970	0.978
Entering Leg	54	24	0	0	78	0	352	21	0	373	116	0	2	0	118	0	671	0	0	671	1240
Exiting Leg					0					787					45					408	1240
Total					78					1160					163					1079	2480

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	19	0	0	19	26
7:15 AM	3	0	0	0	3	0	7	0	0	7	0	0	0	0	0	0	15	0	0	15	25
7:30 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	12	0	0	12	18
7:45 AM	2	1	0	0	3	0	3	1	0	4	0	0	0	0	0	0	18	0	0	18	25
Total	6	1	0	0	7	0	21	1	0	22	1	0	0	0	1	0	64	0	0	64	94
8:00 AM	1	0	0	0	1	0	8	0	0	8	0	0	0	0	0	0	16	0	0	16	25
8:15 AM	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	17
8:30 AM	1	0	0	0	1	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	15
8:45 AM	0	0	0	0	0	0	22	0	0	22	1	0	0	0	1	0	6	0	0	6	29
Total	4	0	0	0	4	0	44	0	0	44	1	0	0	0	1	0	37	0	0	37	86
Grand Total	10	1	0	0	11	0	65	1	0	66	2	0	0	0	2	0	101	0	0	101	180
Approach %	90.9	9.1	0.0	0.0		0.0	98.5	1.5	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	5.6	0.6	0.0	0.0	6.1	0.0	36.1	0.6	0.0	36.7	1.1	0.0	0.0	0.0	1.1	0.0	56.1	0.0	0.0	56.1	
Exiting Leg Total					0					103					2					75	180
Buses	3	1	0	0	4	0	19	1	0	20	1	0	0	0	1	0	9	0	0	9	34
% Buses	30.0	100.0	0.0	0.0	36.4	0.0	29.2	100.0	0.0	30.3	50.0	0.0	0.0	0.0	50.0	0.0	8.9	0.0	0.0	8.9	18.9
Exiting Leg Total					0					10					2					22	34
Single-Unit Trucks	6	0	0	0	6	0	35	0	0	35	1	0	0	0	1	0	71	0	0	71	113
% Single-Unit	60.0	0.0	0.0	0.0	54.5	0.0	53.8	0.0	0.0	53.0	50.0	0.0	0.0	0.0	50.0	0.0	70.3	0.0	0.0	70.3	62.8
Exiting Leg Total					0					72					0					41	113
Articulated Trucks	1	0	0	0	1	0	11	0	0	11	0	0	0	0	0	0	21	0	0	21	33
% Articulated	10.0	0.0	0.0	0.0	9.1	0.0	16.9	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.0	20.8	18.3
Exiting Leg Total					0					21					0					12	33

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	19	0	0	19	26
7:15 AM	3	0	0	0	3	0	7	0	0	7	0	0	0	0	0	0	15	0	0	15	25
7:30 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	12	0	0	12	18
7:45 AM	2	1	0	0	3	0	3	1	0	4	0	0	0	0	0	0	18	0	0	18	25
Total Volume	6	1	0	0	7	0	21	1	0	22	1	0	0	0	1	0	64	0	0	64	94
% Approach Total	85.7	14.3	0.0	0.0		0.0	95.5	4.5	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.500	0.250	0.000	0.000	0.583	0.000	0.750	0.250	0.000	0.786	0.250	0.000	0.000	0.000	0.250	0.000	0.842	0.000	0.000	0.842	0.904
Buses	2	1	0	0	3	0	0	1	0	1	1	0	0	0	1	0	8	0	0	8	13
Buses %	33.3	100.0	0.0	0.0	42.9	0.0	0.0	100.0	0.0	4.5	100.0	0.0	0.0	0.0	100.0	0.0	12.5	0.0	0.0	12.5	13.8
Single-Unit Trucks	3	0	0	0	3	0	17	0	0	17	0	0	0	0	0	0	40	0	0	40	60
Single-Unit %	50.0	0.0	0.0	0.0	42.9	0.0	81.0	0.0	0.0	77.3	0.0	0.0	0.0	0.0	0.0	0.0	62.5	0.0	0.0	62.5	63.8
Articulated Trucks	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	0	0	16	21
Articulated %	16.7	0.0	0.0	0.0	14.3	0.0	19.0	0.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	22.3
Buses	2	1	0	0	3	0	0	1	0	1	1	0	0	0	1	0	8	0	0	8	13
Single-Unit Trucks	3	0	0	0	3	0	17	0	0	17	0	0	0	0	0	0	40	0	0	40	60
Articulated Trucks	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	0	0	16	21
Total Entering Leg	6	1	0	0	7	0	21	1	0	22	1	0	0	0	1	0	64	0	0	64	94
Buses					0					9					2					2	13
Single-Unit Trucks					0					40					0					20	60
Articulated Trucks					0					16					0					5	21
Total Exiting Leg					0					65					2					27	94

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Pelham Island Road from North					Boston Post Road (Route 20) from East					Pelham Island Road from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
7:45 AM	2	1	0	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	4
Total	2	1	0	0	3	0	0	1	0	1	1	0	0	0	1	0	8	0	0	8	13
8:00 AM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	3
8:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	14
Total	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	1	0	0	1	21
Grand Total	3	1	0	0	4	0	19	1	0	20	1	0	0	0	1	0	9	0	0	9	34
Approach %	75.0	25.0	0.0	0.0		0.0	95.0	5.0	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	8.8	2.9	0.0	0.0	11.8	0.0	55.9	2.9	0.0	58.8	2.9	0.0	0.0	0.0	2.9	0.0	26.5	0.0	0.0	26.5	
Exiting Leg Total					0					10					2					22	34

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Pelham Island Road from North					Boston Post Road (Route 20) from East					Pelham Island Road from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	3
8:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	14
Total Volume	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	1	0	0	1	21
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.339	0.000	0.000	0.339	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.375
Entering Leg	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	1	0	0	1	21
Exiting Leg					0					1					0					20	21
Total					1					20					0					21	42

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	16
7:15 AM	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	0	9	0	0	9	16
7:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	14	0	0	14	17
Total	3	0	0	0	3	0	17	0	0	17	0	0	0	0	0	0	40	0	0	40	60
8:00 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	13	0	0	13	20
8:15 AM	2	0	0	0	2	0	2	0	0	2	0	0	0	0	0	0	9	0	0	9	13
8:30 AM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	10
8:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	4	0	0	4	10
Total	3	0	0	0	3	0	18	0	0	18	1	0	0	0	1	0	31	0	0	31	53
Grand Total	6	0	0	0	6	0	35	0	0	35	1	0	0	0	1	0	71	0	0	71	113
Approach %	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	5.3	0.0	0.0	0.0	5.3	0.0	31.0	0.0	0.0	31.0	0.9	0.0	0.0	0.0	0.9	0.0	62.8	0.0	0.0	62.8	
Exiting Leg Total					0					72					0					41	113

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	2	0	0	0	2	0	5	0	0	5	0	0	0	0	0	0	9	0	0	9	16
7:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	14	0	0	14	17
8:00 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	13	0	0	13	20
Total Volume	2	0	0	0	2	0	18	0	0	18	0	0	0	0	0	0	44	0	0	44	64
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.643	0.000	0.000	0.643	0.000	0.000	0.000	0.000	0.000	0.000	0.786	0.000	0.000	0.786	0.800
Entering Leg	2	0	0	0	2	0	18	0	0	18	0	0	0	0	0	0	44	0	0	44	64
Exiting Leg					0					44					0					20	64
Total					2					62					0					64	128

PDI File #:	**197134 B**
Location:	**N: Pelham Island Road S: Pelham Island Road**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:15 AM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	9
7:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
Total	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	0	0	16	21
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
8:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
Total	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
Grand Total	1	0	0	0	1	0	11	0	0	11	0	0	0	0	0	0	21	0	0	21	33
Approach %	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	3.0	0.0	0.0	0.0	3.0	0.0	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	63.6	0.0	0.0	63.6	
Exiting Leg Total					0					21					0					12	33

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:15 AM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	9
7:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
Total Volume	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	0	0	16	21
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.000	0.000	0.667	0.583
Entering Leg	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	0	0	16	21
Exiting Leg					0					16					0					5	21
Total					1					20					0					21	42

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 AM	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3
Total	2	1	0	0	0	0	3	0	2	1	0	0	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	7
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 AM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 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	0	0	0	0
Total	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	2	2	0	0	0	0	4	0	2	1	0	0	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	8
Approach %	50.0	50.0	0.0	0.0	0.0	0.0		0.0	66.7	33.3	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	25.0	25.0	0.0	0.0	0.0	0.0	50.0	0.0	25.0	12.5	0.0	0.0	0.0	37.5	12.5	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							1							3							4	8

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 AM	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3
Total Volume	2	1	0	0	0	0	3	0	2	1	0	0	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	7
% Approach Total	66.7	33.3	0.0	0.0	0.0	0.0		0.0	66.7	33.3	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.500	0.250	0.000	0.000	0.000	0.000	0.750	0.000	0.500	0.250	0.000	0.000	0.000	0.750	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.583
Entering Leg	2	1	0	0	0	0	3	0	2	1	0	0	0	3	1	0	0	0	0	0	1	0	0	0	0	0	0	0	7
Exiting Leg							0							1							2							4	7
Total							3							4							3							4	14

PDI File #: **197134 B**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Pelham Island Road from North							Boston Post Road (Route 20) from East							Pelham Island Road from South							Boston Post Road (Route 20) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 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	0	0	0	0
7:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	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	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	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Pelham Island Road from North							Boston Post Road (Route 20) from East							Pelham Island Road from South							Boston Post Road (Route 20) from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 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	0	0	0	0
7:45 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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	32	11	1	0	44	0	164	11	0	175	6	0	0	0	6	0	112	0	0	112	337
4:15 PM	34	12	2	0	48	0	163	5	0	168	14	1	1	0	16	0	115	0	0	115	347
4:30 PM	29	8	1	0	38	0	154	8	0	162	5	0	0	0	5	1	127	0	0	128	333
4:45 PM	33	17	0	0	50	0	179	6	0	185	2	0	0	0	2	0	140	0	0	140	377
Total	128	48	4	0	180	0	660	30	0	690	27	1	1	0	29	1	494	0	0	495	1394
5:00 PM	20	29	0	0	49	0	153	7	0	160	12	0	1	0	13	1	147	0	0	148	370
5:15 PM	30	23	1	0	54	1	151	15	0	167	9	1	0	0	10	1	135	0	0	136	367
5:30 PM	21	13	3	0	37	0	147	18	0	165	5	0	0	0	5	0	141	0	0	141	348
5:45 PM	27	20	10	0	57	0	170	24	0	194	7	0	0	0	7	3	131	0	0	134	392
Total	98	85	14	0	197	1	621	64	0	686	33	1	1	0	35	5	554	0	0	559	1477
Grand Total	226	133	18	0	377	1	1281	94	0	1376	60	2	2	0	64	6	1048	0	0	1054	2871
Approach %	59.9	35.3	4.8	0.0		0.1	93.1	6.8	0.0		93.8	3.1	3.1	0.0		0.6	99.4	0.0	0.0		
Total %	7.9	4.6	0.6	0.0	13.1	0.0	44.6	3.3	0.0	47.9	2.1	0.1	0.1	0.0	2.2	0.2	36.5	0.0	0.0	36.7	
Exiting Leg Total					3					1126					233					1509	2871
Cars	224	133	17	0	374	1	1238	91	0	1330	60	2	2	0	64	6	1026	0	0	1032	2800
% Cars	99.1	100.0	94.4	0.0	99.2	100.0	96.6	96.8	0.0	96.7	100.0	100.0	100.0	0.0	100.0	100.0	97.9	0.0	0.0	97.9	97.5
Exiting Leg Total					3					1103					230					1464	2800
Heavy Vehicles	2	0	1	0	3	0	43	3	0	46	0	0	0	0	0	0	22	0	0	22	71
% Heavy Vehicles	0.9	0.0	5.6	0.0	0.8	0.0	3.4	3.2	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1	2.5
Exiting Leg Total					0					23					3					45	71

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	20	29	0	0	49	0	153	7	0	160	12	0	1	0	13	1	147	0	0	148	370
5:15 PM	30	23	1	0	54	1	151	15	0	167	9	1	0	0	10	1	135	0	0	136	367
5:30 PM	21	13	3	0	37	0	147	18	0	165	5	0	0	0	5	0	141	0	0	141	348
5:45 PM	27	20	10	0	57	0	170	24	0	194	7	0	0	0	7	3	131	0	0	134	392
Total Volume	98	85	14	0	197	1	621	64	0	686	33	1	1	0	35	5	554	0	0	559	1477
% Approach Total	49.7	43.1	7.1	0.0		0.1	90.5	9.3	0.0		94.3	2.9	2.9	0.0		0.9	99.1	0.0	0.0		
PHF	0.817	0.733	0.350	0.000	0.864	0.250	0.913	0.667	0.000	0.884	0.688	0.250	0.250	0.000	0.673	0.417	0.942	0.000	0.000	0.944	0.942
Cars	98	85	13	0	196	1	604	62	0	667	33	1	1	0	35	5	544	0	0	549	1447
Cars %	100.0	100.0	92.9	0.0	99.5	100.0	97.3	96.9	0.0	97.2	100.0	100.0	100.0	0.0	100.0	100.0	98.2	0.0	0.0	98.2	98.0
Heavy Vehicles	0	0	1	0	1	0	17	2	0	19	0	0	0	0	0	0	10	0	0	10	30
Heavy Vehicles %	0.0	0.0	7.1	0.0	0.5	0.0	2.7	3.1	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	2.0
Cars Enter Leg	98	85	13	0	196	1	604	62	0	667	33	1	1	0	35	5	544	0	0	549	1447
Heavy Enter Leg	0	0	1	0	1	0	17	2	0	19	0	0	0	0	0	0	10	0	0	10	30
Total Entering Leg	98	85	14	0	197	1	621	64	0	686	33	1	1	0	35	5	554	0	0	559	1477
Cars Exiting Leg					2					590					152					703	1447
Heavy Exiting Leg					0					11					2					17	30
Total Exiting Leg					2					601					154					720	1477

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	32	11	1	0	44	0	154	10	0	164	6	0	0	0	6	0	109	0	0	109	323
4:15 PM	33	12	2	0	47	0	160	5	0	165	14	1	1	0	16	0	112	0	0	112	340
4:30 PM	28	8	1	0	37	0	147	8	0	155	5	0	0	0	5	1	123	0	0	124	321
4:45 PM	33	17	0	0	50	0	173	6	0	179	2	0	0	0	2	0	138	0	0	138	369
Total	126	48	4	0	178	0	634	29	0	663	27	1	1	0	29	1	482	0	0	483	1353
5:00 PM	20	29	0	0	49	0	148	7	0	155	12	0	1	0	13	1	143	0	0	144	361
5:15 PM	30	23	1	0	54	1	148	14	0	163	9	1	0	0	10	1	133	0	0	134	361
5:30 PM	21	13	3	0	37	0	142	17	0	159	5	0	0	0	5	0	141	0	0	141	342
5:45 PM	27	20	9	0	56	0	166	24	0	190	7	0	0	0	7	3	127	0	0	130	383
Total	98	85	13	0	196	1	604	62	0	667	33	1	1	0	35	5	544	0	0	549	1447
Grand Total	224	133	17	0	374	1	1238	91	0	1330	60	2	2	0	64	6	1026	0	0	1032	2800
Approach %	59.9	35.6	4.5	0.0		0.1	93.1	6.8	0.0		93.8	3.1	3.1	0.0		0.6	99.4	0.0	0.0		
Total %	8.0	4.8	0.6	0.0	13.4	0.0	44.2	3.3	0.0	47.5	2.1	0.1	0.1	0.0	2.3	0.2	36.6	0.0	0.0	36.9	
Exiting Leg Total					3					1103					230					1464	2800

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	20	29	0	0	49	0	148	7	0	155	12	0	1	0	13	1	143	0	0	144	361
5:15 PM	30	23	1	0	54	1	148	14	0	163	9	1	0	0	10	1	133	0	0	134	361
5:30 PM	21	13	3	0	37	0	142	17	0	159	5	0	0	0	5	0	141	0	0	141	342
5:45 PM	27	20	9	0	56	0	166	24	0	190	7	0	0	0	7	3	127	0	0	130	383
Total Volume	98	85	13	0	196	1	604	62	0	667	33	1	1	0	35	5	544	0	0	549	1447
% Approach Total	50.0	43.4	6.6	0.0		0.1	90.6	9.3	0.0		94.3	2.9	2.9	0.0		0.9	99.1	0.0	0.0		
PHF	0.817	0.733	0.361	0.000	0.875	0.250	0.910	0.646	0.000	0.878	0.688	0.250	0.250	0.000	0.673	0.417	0.951	0.000	0.000	0.953	0.945
Entering Leg	98	85	13	0	196	1	604	62	0	667	33	1	1	0	35	5	544	0	0	549	1447
Exiting Leg					2					590					152					703	1447
Total					198					1257					187					1252	2894

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	3	0	0	3	14
4:15 PM	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	7
4:30 PM	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	12
4:45 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	8
Total	2	0	0	0	2	0	26	1	0	27	0	0	0	0	0	0	12	0	0	12	41
5:00 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	9
5:15 PM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	2	0	0	2	6
5:30 PM	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	6
5:45 PM	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	9
Total	0	0	1	0	1	0	17	2	0	19	0	0	0	0	0	0	10	0	0	10	30
Grand Total	2	0	1	0	3	0	43	3	0	46	0	0	0	0	0	0	22	0	0	22	71
Approach %	66.7	0.0	33.3	0.0		0.0	93.5	6.5	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	2.8	0.0	1.4	0.0	4.2	0.0	60.6	4.2	0.0	64.8	0.0	0.0	0.0	0.0	0.0	0.0	31.0	0.0	0.0	31.0	
Exiting Leg Total					0					23					3					45	71
Buses	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	7
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	9.3	33.3	0.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	9.1	9.9
Exiting Leg Total					0					2					1					4	7
Single-Unit Trucks	2	0	1	0	3	0	30	2	0	32	0	0	0	0	0	0	15	0	0	15	50
% Single-Unit	100.0	0.0	100.0	0.0	100.0	0.0	69.8	66.7	0.0	69.6	0.0	0.0	0.0	0.0	0.0	0.0	68.2	0.0	0.0	68.2	70.4
Exiting Leg Total					0					16					2					32	50
Articulated Trucks	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	20.9	0.0	0.0	19.6	0.0	0.0	0.0	0.0	0.0	0.0	22.7	0.0	0.0	22.7	19.7
Exiting Leg Total					0					5					0					9	14

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	3	0	0	3	14
4:15 PM	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	7
4:30 PM	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	12
4:45 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	8
Total Volume	2	0	0	0	2	0	26	1	0	27	0	0	0	0	0	0	12	0	0	12	41
% Approach Total	100.0	0.0	0.0	0.0		0.0	96.3	3.7	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.500	0.000	0.000	0.000	0.500	0.000	0.650	0.250	0.000	0.614	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.732
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	8.3	4.9
Single-Unit Trucks	2	0	0	0	2	0	19	1	0	20	0	0	0	0	0	0	11	0	0	11	33
Single-Unit %	100.0	0.0	0.0	0.0	100.0	0.0	73.1	100.0	0.0	74.1	0.0	0.0	0.0	0.0	0.0	0.0	91.7	0.0	0.0	91.7	80.5
Articulated Trucks	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	23.1	0.0	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Single-Unit Trucks	2	0	0	0	2	0	19	1	0	20	0	0	0	0	0	0	11	0	0	11	33
Articulated Trucks	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Total Entering Leg	2	0	0	0	2	0	26	1	0	27	0	0	0	0	0	0	12	0	0	12	41
Buses					0					1					0					1	2
Single-Unit Trucks					0					11					1					21	33
Articulated Trucks					0					0					0					6	6
Total Exiting Leg					0					12					1					28	41

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Buses**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	5
Grand Total	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	7
Approach %	0.0	0.0	0.0	0.0		0.0	80.0	20.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	57.1	14.3	0.0	71.4	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	28.6	
Exiting Leg Total					0					2					1					4	7

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	5
% Approach Total	0.0	0.0	0.0	0.0		0.0	75.0	25.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.625
Entering Leg	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	5
Exiting Leg					0					1					1					3	5
Total					0					5					1					4	10

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Single-Unit Trucks**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	3	0	0	3	14
4:15 PM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	5
4:30 PM	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	8
4:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
Total	2	0	0	0	2	0	19	1	0	20	0	0	0	0	0	0	11	0	0	11	33
5:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
5:15 PM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	4
5:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	4
Total	0	0	1	0	1	0	11	1	0	12	0	0	0	0	0	0	4	0	0	4	17
Grand Total	2	0	1	0	3	0	30	2	0	32	0	0	0	0	0	0	15	0	0	15	50
Approach %	66.7	0.0	33.3	0.0		0.0	93.8	6.3	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	4.0	0.0	2.0	0.0	6.0	0.0	60.0	4.0	0.0	64.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Exiting Leg Total					0					16					2					32	50

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Pelham Island Road					Boston Post Road (Route 20)					Pelham Island Road					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	3	0	0	3	14
4:15 PM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	5
4:30 PM	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	8
4:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
Total Volume	2	0	0	0	2	0	19	1	0	20	0	0	0	0	0	0	11	0	0	11	33
% Approach Total	100.0	0.0	0.0	0.0		0.0	95.0	5.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.500	0.000	0.000	0.000	0.500	0.000	0.475	0.250	0.000	0.455	0.000	0.000	0.000	0.000	0.000	0.000	0.688	0.000	0.000	0.688	0.589
Entering Leg	2	0	0	0	2	0	19	1	0	20	0	0	0	0	0	0	11	0	0	11	33
Exiting Leg					0					11					1					21	33
Total					2					31					1					32	66

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Articulated Trucks**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Pelham Island Road from North					Boston Post Road (Route 20) from East					Pelham Island Road from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	6
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
Grand Total	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	64.3	0.0	0.0	64.3	0.0	0.0	0.0	0.0	0.0	0.0	35.7	0.0	0.0	35.7	
Exiting Leg Total					0					5					0					9	14

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Pelham Island Road from North					Boston Post Road (Route 20) from East					Pelham Island Road from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total Volume	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	2	0	0	2	9
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.000	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.750
Entering Leg	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	2	0	0	2	9
Exiting Leg					0					2					0					7	9
Total					0					9					0					9	18

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 BB**
Location: **N: Pelham Island Road S: Pelham Island Road**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	1	2	4
4:30 PM	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	0	0	0	0
4:45 PM	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	0	1	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	1	2	3	6
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	1	0	1	1
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	1	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	2	2	4	7
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	66.7	33.3		0	0	0	0	50	50		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.6	14.3	42.9	0	0	0	0	28.6	28.6	57.1	
Exiting Leg Total							0							0							3							4	7

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Pelham Island Road							Boston Post Road (Route 20)							Pelham Island Road							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	1	2	4
4:30 PM	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	0	0	0	0
4:45 PM	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	0	1	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	1	2	3	6
% Approach 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		0.0	0.0	0.0	0.0	66.7	33.3		0.0	0.0	0.0	0.0	33.3	66.7		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.250	0.375	0.000	0.000	0.000	0.000	0.250	0.500	0.375	0.375
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	1	2	3	6
Exiting Leg							0							0							3							3	6
Total							0							0							6							6	12

PDI File #: **197134 C**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	88	46	0	135	45	74	7	0	126	5	89	6	0	100	24	106	82	0	212	573
7:15 AM	2	100	44	0	146	52	81	6	0	139	5	97	24	0	126	19	109	75	0	203	614
7:30 AM	0	101	57	0	158	40	68	8	0	116	5	81	13	0	99	27	119	84	0	230	603
7:45 AM	1	120	37	0	158	49	78	15	0	142	6	134	20	0	160	15	111	73	0	199	659
Total	4	409	184	0	597	186	301	36	0	523	21	401	63	0	485	85	445	314	0	844	2449
8:00 AM	1	133	72	0	206	34	74	21	0	129	7	117	20	0	144	26	110	61	0	197	676
8:15 AM	1	133	64	0	198	36	77	15	0	128	7	87	24	0	118	22	121	56	0	199	643
8:30 AM	1	105	50	0	156	37	70	3	0	110	11	103	27	0	141	24	120	40	0	184	591
8:45 AM	1	116	72	0	189	39	70	7	0	116	11	106	47	0	164	17	131	60	0	208	677
Total	4	487	258	0	749	146	291	46	0	483	36	413	118	0	567	89	482	217	0	788	2587
Grand Total	8	896	442	0	1346	332	592	82	0	1006	57	814	181	0	1052	174	927	531	0	1632	5036
Approach %	0.6	66.6	32.8	0.0		33.0	58.8	8.2	0.0		5.4	77.4	17.2	0.0		10.7	56.8	32.5	0.0		
Total %	0.2	17.8	8.8	0.0	26.7	6.6	11.8	1.6	0.0	20.0	1.1	16.2	3.6	0.0	20.9	3.5	18.4	10.5	0.0	32.4	
Exiting Leg Total					1677					1426					1152					781	5036
Cars	8	857	422	0	1287	312	552	78	0	942	49	775	154	0	978	149	893	516	0	1558	4765
% Cars	100.0	95.6	95.5	0.0	95.6	94.0	93.2	95.1	0.0	93.6	86.0	95.2	85.1	0.0	93.0	85.6	96.3	97.2	0.0	95.5	94.6
Exiting Leg Total					1603					1364					1084					714	4765
Heavy Vehicles	0	39	20	0	59	20	40	4	0	64	8	39	27	0	74	25	34	15	0	74	271
% Heavy Vehicles	0.0	4.4	4.5	0.0	4.4	6.0	6.8	4.9	0.0	6.4	14.0	4.8	14.9	0.0	7.0	14.4	3.7	2.8	0.0	4.5	5.4
Exiting Leg Total					74					62					68					67	271

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	1	133	72	0	206	34	74	21	0	129	7	117	20	0	144	26	110	61	0	197	676
8:15 AM	1	133	64	0	198	36	77	15	0	128	7	87	24	0	118	22	121	56	0	199	643
8:30 AM	1	105	50	0	156	37	70	3	0	110	11	103	27	0	141	24	120	40	0	184	591
8:45 AM	1	116	72	0	189	39	70	7	0	116	11	106	47	0	164	17	131	60	0	208	677
Total Volume	4	487	258	0	749	146	291	46	0	483	36	413	118	0	567	89	482	217	0	788	2587
% Approach Total	0.5	65.0	34.4	0.0		30.2	60.2	9.5	0.0		6.3	72.8	20.8	0.0		11.3	61.2	27.5	0.0		
PHF	1.000	0.915	0.896	0.000	0.909	0.936	0.945	0.548	0.000	0.936	0.818	0.882	0.628	0.000	0.864	0.856	0.920	0.889	0.000	0.947	0.955
Cars	4	471	246	0	721	139	271	43	0	453	33	389	95	0	517	78	466	213	0	757	2448
Cars %	100.0	96.7	95.3	0.0	96.3	95.2	93.1	93.5	0.0	93.8	91.7	94.2	80.5	0.0	91.2	87.6	96.7	98.2	0.0	96.1	94.6
Heavy Vehicles	0	16	12	0	28	7	20	3	0	30	3	24	23	0	50	11	16	4	0	31	139
Heavy Vehicles %	0.0	3.3	4.7	0.0	3.7	4.8	6.9	6.5	0.0	6.2	8.3	5.8	19.5	0.0	8.8	12.4	3.3	1.8	0.0	3.9	5.4
Cars Enter Leg	4	471	246	0	721	139	271	43	0	453	33	389	95	0	517	78	466	213	0	757	2448
Heavy Enter Leg	0	16	12	0	28	7	20	3	0	30	3	24	23	0	50	11	16	4	0	31	139
Total Entering Leg	4	487	258	0	749	146	291	46	0	483	36	413	118	0	567	89	482	217	0	788	2587
Cars Exiting Leg					741					745					592					370	2448
Heavy Exiting Leg					35					31					30					43	139
Total Exiting Leg					776					776					622					413	2587

PDI File #:	**197134 C**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	83	45	0	129	41	70	7	0	118	4	86	6	0	96	13	102	78	0	193	536
7:15 AM	2	95	41	0	138	47	77	6	0	130	5	94	21	0	120	18	104	72	0	194	582
7:30 AM	0	96	55	0	151	38	63	8	0	109	4	79	12	0	95	26	115	82	0	223	578
7:45 AM	1	112	35	0	148	47	71	14	0	132	3	127	20	0	150	14	106	71	0	191	621
Total	4	386	176	0	566	173	281	35	0	489	16	386	59	0	461	71	427	303	0	801	2317
8:00 AM	1	128	67	0	196	31	70	21	0	122	6	112	17	0	135	20	104	59	0	183	636
8:15 AM	1	126	60	0	187	35	73	14	0	122	7	82	22	0	111	20	115	54	0	189	609
8:30 AM	1	103	48	0	152	36	65	2	0	103	9	100	24	0	133	23	118	40	0	181	569
8:45 AM	1	114	71	0	186	37	63	6	0	106	11	95	32	0	138	15	129	60	0	204	634
Total	4	471	246	0	721	139	271	43	0	453	33	389	95	0	517	78	466	213	0	757	2448
Grand Total	8	857	422	0	1287	312	552	78	0	942	49	775	154	0	978	149	893	516	0	1558	4765
Approach %	0.6	66.6	32.8	0.0		33.1	58.6	8.3	0.0		5.0	79.2	15.7	0.0		9.6	57.3	33.1	0.0		
Total %	0.2	18.0	8.9	0.0	27.0	6.5	11.6	1.6	0.0	19.8	1.0	16.3	3.2	0.0	20.5	3.1	18.7	10.8	0.0	32.7	
Exiting Leg Total					1603					1364					1084					714	4765

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	1	128	67	0	196	31	70	21	0	122	6	112	17	0	135	20	104	59	0	183	636
8:15 AM	1	126	60	0	187	35	73	14	0	122	7	82	22	0	111	20	115	54	0	189	609
8:30 AM	1	103	48	0	152	36	65	2	0	103	9	100	24	0	133	23	118	40	0	181	569
8:45 AM	1	114	71	0	186	37	63	6	0	106	11	95	32	0	138	15	129	60	0	204	634
Total Volume	4	471	246	0	721	139	271	43	0	453	33	389	95	0	517	78	466	213	0	757	2448
% Approach Total	0.6	65.3	34.1	0.0		30.7	59.8	9.5	0.0		6.4	75.2	18.4	0.0		10.3	61.6	28.1	0.0		
PHF	1.000	0.920	0.866	0.000	0.920	0.939	0.928	0.512	0.000	0.928	0.750	0.868	0.742	0.000	0.937	0.848	0.903	0.888	0.000	0.928	0.962
Entering Leg	4	471	246	0	721	139	271	43	0	453	33	389	95	0	517	78	466	213	0	757	2448
Exiting Leg					741					745					592					370	2448
Total					1462					1198					1109					1127	4896

PDI File #:	**197134 C**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126,**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	5	1	0	6	4	4	0	0	8	1	3	0	0	4	11	4	4	0	19	37
7:15 AM	0	5	3	0	8	5	4	0	0	9	0	3	3	0	6	1	5	3	0	9	32
7:30 AM	0	5	2	0	7	2	5	0	0	7	1	2	1	0	4	1	4	2	0	7	25
7:45 AM	0	8	2	0	10	2	7	1	0	10	3	7	0	0	10	1	5	2	0	8	38
Total	0	23	8	0	31	13	20	1	0	34	5	15	4	0	24	14	18	11	0	43	132
8:00 AM	0	5	5	0	10	3	4	0	0	7	1	5	3	0	9	6	6	2	0	14	40
8:15 AM	0	7	4	0	11	1	4	1	0	6	0	5	2	0	7	2	6	2	0	10	34
8:30 AM	0	2	2	0	4	1	5	1	0	7	2	3	3	0	8	1	2	0	0	3	22
8:45 AM	0	2	1	0	3	2	7	1	0	10	0	11	15	0	26	2	2	0	0	4	43
Total	0	16	12	0	28	7	20	3	0	30	3	24	23	0	50	11	16	4	0	31	139
Grand Total	0	39	20	0	59	20	40	4	0	64	8	39	27	0	74	25	34	15	0	74	271
Approach %	0.0	66.1	33.9	0.0		31.3	62.5	6.3	0.0		10.8	52.7	36.5	0.0		33.8	45.9	20.3	0.0		
Total %	0.0	14.4	7.4	0.0	21.8	7.4	14.8	1.5	0.0	23.6	3.0	14.4	10.0	0.0	27.3	9.2	12.5	5.5	0.0	27.3	
Exiting Leg Total					74					62					68					67	271
Buses	0	4	2	0	6	6	2	1	0	9	1	2	18	0	21	5	3	4	0	12	48
% Buses	0.0	10.3	10.0	0.0	10.2	30.0	5.0	25.0	0.0	14.1	12.5	5.1	66.7	0.0	28.4	20.0	8.8	26.7	0.0	16.2	17.7
Exiting Leg Total					12					6					10					20	48
Single-Unit Trucks	0	30	13	0	43	11	28	3	0	42	6	32	8	0	46	17	22	9	0	48	179
% Single-Unit	0.0	76.9	65.0	0.0	72.9	55.0	70.0	75.0	0.0	65.6	75.0	82.1	29.6	0.0	62.2	68.0	64.7	60.0	0.0	64.9	66.1
Exiting Leg Total					52					41					50					36	179
Articulated Trucks	0	5	5	0	10	3	10	0	0	13	1	5	1	0	7	3	9	2	0	14	44
% Articulated	0.0	12.8	25.0	0.0	16.9	15.0	25.0	0.0	0.0	20.3	12.5	12.8	3.7	0.0	9.5	12.0	26.5	13.3	0.0	18.9	16.2
Exiting Leg Total					10					15					8					11	44

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	5	5	0	10	3	4	0	0	7	1	5	3	0	9	6	6	2	0	14	40
8:15 AM	0	7	4	0	11	1	4	1	0	6	0	5	2	0	7	2	6	2	0	10	34
8:30 AM	0	2	2	0	4	1	5	1	0	7	2	3	3	0	8	1	2	0	0	3	22
8:45 AM	0	2	1	0	3	2	7	1	0	10	0	11	15	0	26	2	2	0	0	4	43
Total Volume	0	16	12	0	28	7	20	3	0	30	3	24	23	0	50	11	16	4	0	31	139
% Approach Total	0.0	57.1	42.9	0.0		23.3	66.7	10.0	0.0		6.0	48.0	46.0	0.0		35.5	51.6	12.9	0.0		
PHF	0.000	0.571	0.600	0.000	0.636	0.583	0.714	0.750	0.000	0.750	0.375	0.545	0.383	0.000	0.481	0.458	0.667	0.500	0.000	0.554	0.808
Buses	0	4	2	0	6	1	1	1	0	3	0	0	18	0	18	1	0	0	0	1	28
Buses %	0.0	25.0	16.7	0.0	21.4	14.3	5.0	33.3	0.0	10.0	0.0	0.0	78.3	0.0	36.0	9.1	0.0	0.0	0.0	3.2	20.1
Single-Unit Trucks	0	9	6	0	15	4	12	2	0	18	3	21	5	0	29	9	11	4	0	24	86
Single-Unit %	0.0	56.3	50.0	0.0	53.6	57.1	60.0	66.7	0.0	60.0	100.0	87.5	21.7	0.0	58.0	81.8	68.8	100.0	0.0	77.4	61.9
Articulated Trucks	0	3	4	0	7	2	7	0	0	9	0	3	0	0	3	1	5	0	0	6	25
Articulated %	0.0	18.8	33.3	0.0	25.0	28.6	35.0	0.0	0.0	30.0	0.0	12.5	0.0	0.0	6.0	9.1	31.3	0.0	0.0	19.4	18.0
Buses	0	4	2	0	6	1	1	1	0	3	0	0	18	0	18	1	0	0	0	1	28
Single-Unit Trucks	0	9	6	0	15	4	12	2	0	18	3	21	5	0	29	9	11	4	0	24	86
Articulated Trucks	0	3	4	0	7	2	7	0	0	9	0	3	0	0	3	1	5	0	0	6	25
Total Entering Leg	0	16	12	0	28	7	20	3	0	30	3	24	23	0	50	11	16	4	0	31	139
Buses					1					2					6					19	28
Single-Unit Trucks					29					20					20					17	86
Articulated Trucks					5					9					4					7	25
Total Exiting Leg					35					31					30					43	139

PDI File #: **197134 C**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Buses**

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4	2	3	0	9	10
7:15 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	2	4
7:45 AM	0	0	0	0	0	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0	4
Total	0	0	0	0	0	5	1	0	0	6	1	2	0	0	3	4	3	4	0	11	20
8:00 AM	0	1	2	0	3	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	6
8:15 AM	0	2	0	0	2	0	1	1	0	2	0	0	1	0	1	0	0	0	0	0	5
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	0	0	0	0	0	14
Total	0	4	2	0	6	1	1	1	0	3	0	0	18	0	18	1	0	0	0	1	28
Grand Total	0	4	2	0	6	6	2	1	0	9	1	2	18	0	21	5	3	4	0	12	48
Approach %	0.0	66.7	33.3	0.0		66.7	22.2	11.1	0.0		4.8	9.5	85.7	0.0		41.7	25.0	33.3	0.0		
Total %	0.0	8.3	4.2	0.0	12.5	12.5	4.2	2.1	0.0	18.8	2.1	4.2	37.5	0.0	43.8	10.4	6.3	8.3	0.0	25.0	
Exiting Leg Total					12					6					10					20	48

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	1	2	0	3	1	0	0	0	1	0	0	1	0	1	1	0	0	0	1	6
8:15 AM	0	2	0	0	2	0	1	1	0	2	0	0	1	0	1	0	0	0	0	0	5
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	0	0	0	0	0	14
Total Volume	0	4	2	0	6	1	1	1	0	3	0	0	18	0	18	1	0	0	0	1	28
% Approach Total	0.0	66.7	33.3	0.0		33.3	33.3	33.3	0.0		0.0	0.0	100.0	0.0		100.0	0.0	0.0	0.0		
PHF	0.000	0.500	0.250	0.000	0.500	0.250	0.250	0.250	0.000	0.375	0.000	0.000	0.321	0.000	0.321	0.250	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	4	2	0	6	1	1	1	0	3	0	0	18	0	18	1	0	0	0	1	28
Exiting Leg					1					2					6					19	28
Total					7					5					24					20	56

PDI File #: **197134 C**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/27)**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	5	1	0	6	3	4	0	0	7	1	2	0	0	3	7	1	1	0	9	25
7:15 AM	0	5	3	0	8	3	3	0	0	6	0	3	2	0	5	1	3	2	0	6	25
7:30 AM	0	3	2	0	5	1	3	0	0	4	0	1	1	0	2	0	2	1	0	3	14
7:45 AM	0	8	1	0	9	0	6	1	0	7	2	5	0	0	7	0	5	1	0	6	29
Total	0	21	7	0	28	7	16	1	0	24	3	11	3	0	17	8	11	5	0	24	93
8:00 AM	0	3	2	0	5	2	4	0	0	6	1	5	2	0	8	5	3	2	0	10	29
8:15 AM	0	3	2	0	5	1	2	0	0	3	0	5	1	0	6	1	5	2	0	8	22
8:30 AM	0	1	1	0	2	0	2	1	0	3	2	2	1	0	5	1	2	0	0	3	13
8:45 AM	0	2	1	0	3	1	4	1	0	6	0	9	1	0	10	2	1	0	0	3	22
Total	0	9	6	0	15	4	12	2	0	18	3	21	5	0	29	9	11	4	0	24	86
Grand Total	0	30	13	0	43	11	28	3	0	42	6	32	8	0	46	17	22	9	0	48	179
Approach %	0.0	69.8	30.2	0.0		26.2	66.7	7.1	0.0		13.0	69.6	17.4	0.0		35.4	45.8	18.8	0.0		
Total %	0.0	16.8	7.3	0.0	24.0	6.1	15.6	1.7	0.0	23.5	3.4	17.9	4.5	0.0	25.7	9.5	12.3	5.0	0.0	26.8	
Exiting Leg Total					52					41					50					36	179

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	5	3	0	8	3	3	0	0	6	0	3	2	0	5	1	3	2	0	6	25
7:30 AM	0	3	2	0	5	1	3	0	0	4	0	1	1	0	2	0	2	1	0	3	14
7:45 AM	0	8	1	0	9	0	6	1	0	7	2	5	0	0	7	0	5	1	0	6	29
8:00 AM	0	3	2	0	5	2	4	0	0	6	1	5	2	0	8	5	3	2	0	10	29
Total Volume	0	19	8	0	27	6	16	1	0	23	3	14	5	0	22	6	13	6	0	25	97
% Approach Total	0.0	70.4	29.6	0.0		26.1	69.6	4.3	0.0		13.6	63.6	22.7	0.0		24.0	52.0	24.0	0.0		
PHF	0.000	0.594	0.667	0.000	0.750	0.500	0.667	0.250	0.000	0.821	0.375	0.700	0.625	0.000	0.688	0.300	0.650	0.750	0.000	0.625	0.836
Entering Leg	0	19	8	0	27	6	16	1	0	23	3	14	5	0	22	6	13	6	0	25	97
Exiting Leg					26					24					26					21	97
Total					53					47					48					46	194

PDI File #: **197134 C**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126,**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Articulated Trucks**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Cochituate Road (Route 126/27) from North					Boston Post Road (Route 20) from East					Cochituate Road (Route 126/27) from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	2	1	0	3	5
7:30 AM	0	2	0	0	2	0	2	0	0	2	1	0	0	0	1	1	1	0	0	2	7
7:45 AM	0	0	1	0	1	1	0	0	0	1	0	1	0	0	1	1	0	1	0	2	5
Total	0	2	1	0	3	1	3	0	0	4	1	2	1	0	4	2	4	2	0	8	19
8:00 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	5
8:15 AM	0	2	2	0	4	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	7
8:30 AM	0	0	1	0	1	1	3	0	0	4	0	1	0	0	1	0	0	0	0	0	6
8:45 AM	0	0	0	0	0	1	3	0	0	4	0	2	0	0	2	0	1	0	0	1	7
Total	0	3	4	0	7	2	7	0	0	9	0	3	0	0	3	1	5	0	0	6	25
Grand Total	0	5	5	0	10	3	10	0	0	13	1	5	1	0	7	3	9	2	0	14	44
Approach %	0.0	50.0	50.0	0.0		23.1	76.9	0.0	0.0		14.3	71.4	14.3	0.0		21.4	64.3	14.3	0.0		
Total %	0.0	11.4	11.4	0.0	22.7	6.8	22.7	0.0	0.0	29.5	2.3	11.4	2.3	0.0	15.9	6.8	20.5	4.5	0.0	31.8	
Exiting Leg Total					10					15					8					11	44

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Cochituate Road (Route 126/27) from North					Boston Post Road (Route 20) from East					Cochituate Road (Route 126/27) from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	5
8:15 AM	0	2	2	0	4	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	7
8:30 AM	0	0	1	0	1	1	3	0	0	4	0	1	0	0	1	0	0	0	0	0	6
8:45 AM	0	0	0	0	0	1	3	0	0	4	0	2	0	0	2	0	1	0	0	1	7
Total Volume	0	3	4	0	7	2	7	0	0	9	0	3	0	0	3	1	5	0	0	6	25
% Approach Total	0.0	42.9	57.1	0.0		22.2	77.8	0.0	0.0		0.0	100.0	0.0	0.0		16.7	83.3	0.0	0.0		
PHF	0.000	0.375	0.500	0.000	0.438	0.500	0.583	0.000	0.000	0.563	0.000	0.375	0.000	0.000	0.375	0.250	0.417	0.000	0.000	0.500	0.893
Entering Leg	0	3	4	0	7	2	7	0	0	9	0	3	0	0	3	1	5	0	0	6	25
Exiting Leg					5					9					4					7	25
Total					12					18					7					13	50

PDI File #:	**197134 C**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
7:45 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	0	1	1	1
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	1	0	0	0	1	0	0	0	0	0	1	1	4
8:00 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	0	0	0	1	0	1	0	0	1	0	2	0	0	1	0	0	0	1	0	0	0	0	0	1	1	5
Approach %	100.0	0.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	0.0	50.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		
Total %	20.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	20.0	0.0	0.0	20.0	0.0	40.0	0.0	0.0	20.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	
Exiting Leg Total							0							1							0							4	5

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
7:45 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	0	1	1	1
8:00 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	0	0	0	1	0	1	0	0	1	0	2	0	0	1	0	0	0	1	0	0	0	0	0	1	1	5
% Approach Total	100.0	0.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	0.0	50.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		
PHF	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.625
Entering Leg	1	0	0	0	0	0	1	0	1	0	0	1	0	2	0	0	1	0	0	0	1	0	0	0	0	0	1	1	5
Exiting Leg							0							1							0							4	5
Total							1							3							1							5	10

PDI File #: **197134 C**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0	0	0	0	0	0		0	0	0	0	100	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							1							0							0	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg							0							1							0							0	1
Total							0							2							0							0	2

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126,**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	5	108	49	0	162	57	124	5	0	186	4	117	42	0	163	29	79	28	0	136	647
4:15 PM	3	119	55	0	177	45	132	3	0	180	11	108	32	0	151	24	76	28	0	128	636
4:30 PM	7	116	52	0	175	68	124	7	0	199	7	101	31	1	140	25	100	28	0	153	667
4:45 PM	7	110	48	0	165	64	147	7	0	218	7	111	32	0	150	31	87	31	0	149	682
Total	22	453	204	0	679	234	527	22	0	783	29	437	137	1	604	109	342	115	0	566	2632
5:00 PM	9	96	49	0	154	55	122	7	0	184	6	128	33	0	167	27	91	37	0	155	660
5:15 PM	5	112	58	0	175	58	135	5	0	198	10	127	34	0	171	22	106	28	0	156	700
5:30 PM	8	120	48	0	176	68	135	12	0	215	7	129	25	0	161	31	95	27	0	153	705
5:45 PM	9	114	48	0	171	50	156	6	0	212	7	120	30	0	157	19	94	26	0	139	679
Total	31	442	203	0	676	231	548	30	0	809	30	504	122	0	656	99	386	118	0	603	2744
Grand Total	53	895	407	0	1355	465	1075	52	0	1592	59	941	259	1	1260	208	728	233	0	1169	5376
Approach %	3.9	66.1	30.0	0.0		29.2	67.5	3.3	0.0		4.7	74.7	20.6	0.1		17.8	62.3	19.9	0.0		
Total %	1.0	16.6	7.6	0.0	25.2	8.6	20.0	1.0	0.0	29.6	1.1	17.5	4.8	0.0	23.4	3.9	13.5	4.3	0.0	21.7	
Exiting Leg Total					1639					1194					1156					1387	5376
Cars	51	886	393	0	1330	444	1052	50	0	1546	57	932	246	1	1236	202	712	232	0	1146	5258
% Cars	96.2	99.0	96.6	0.0	98.2	95.5	97.9	96.2	0.0	97.1	96.6	99.0	95.0	100.0	98.1	97.1	97.8	99.6	0.0	98.0	97.8
Exiting Leg Total					1608					1162					1139					1349	5258
Heavy Vehicles	2	9	14	0	25	21	23	2	0	46	2	9	13	0	24	6	16	1	0	23	118
% Heavy Vehicles	3.8	1.0	3.4	0.0	1.8	4.5	2.1	3.8	0.0	2.9	3.4	1.0	5.0	0.0	1.9	2.9	2.2	0.4	0.0	2.0	2.2
Exiting Leg Total					31					32					17					38	118

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	7	110	48	0	165	64	147	7	0	218	7	111	32	0	150	31	87	31	0	149	682
5:00 PM	9	96	49	0	154	55	122	7	0	184	6	128	33	0	167	27	91	37	0	155	660
5:15 PM	5	112	58	0	175	58	135	5	0	198	10	127	34	0	171	22	106	28	0	156	700
5:30 PM	8	120	48	0	176	68	135	12	0	215	7	129	25	0	161	31	95	27	0	153	705
Total Volume	29	438	203	0	670	245	539	31	0	815	30	495	124	0	649	111	379	123	0	613	2747
% Approach Total	4.3	65.4	30.3	0.0		30.1	66.1	3.8	0.0		4.6	76.3	19.1	0.0		18.1	61.8	20.1	0.0		
PHF	0.806	0.913	0.875	0.000	0.952	0.901	0.917	0.646	0.000	0.935	0.750	0.959	0.912	0.000	0.949	0.895	0.894	0.831	0.000	0.982	0.974
Cars	28	436	201	0	665	237	532	29	0	798	30	490	117	0	637	106	375	123	0	604	2704
Cars %	96.6	99.5	99.0	0.0	99.3	96.7	98.7	93.5	0.0	97.9	100.0	99.0	94.4	0.0	98.2	95.5	98.9	100.0	0.0	98.5	98.4
Heavy Vehicles	1	2	2	0	5	8	7	2	0	17	0	5	7	0	12	5	4	0	0	9	43
Heavy Vehicles %	3.4	0.5	1.0	0.0	0.7	3.3	1.3	6.5	0.0	2.1	0.0	1.0	5.6	0.0	1.8	4.5	1.1	0.0	0.0	1.5	1.6
Cars Enter Leg	28	436	201	0	665	237	532	29	0	798	30	490	117	0	637	106	375	123	0	604	2704
Heavy Enter Leg	1	2	2	0	5	8	7	2	0	17	0	5	7	0	12	5	4	0	0	9	43
Total Entering Leg	29	438	203	0	670	245	539	31	0	815	30	495	124	0	649	111	379	123	0	613	2747
Cars Exiting Leg					850					606					571					677	2704
Heavy Exiting Leg					13					6					9					15	43
Total Exiting Leg					863					612					580					692	2747

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Cars**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	4	105	44	0	153	49	117	5	0	171	3	115	40	0	158	29	77	28	0	134	616
4:15 PM	3	118	53	0	174	43	131	3	0	177	10	108	31	0	149	24	73	28	0	125	625
4:30 PM	7	115	48	0	170	66	118	7	0	191	7	100	30	1	138	24	96	28	0	148	647
4:45 PM	6	109	46	0	161	63	147	7	0	217	7	109	30	0	146	29	87	31	0	147	671
Total	20	447	191	0	658	221	513	22	0	756	27	432	131	1	591	106	333	115	0	554	2559
5:00 PM	9	96	49	0	154	54	121	5	0	180	6	127	30	0	163	25	88	37	0	150	647
5:15 PM	5	111	58	0	174	57	131	5	0	193	10	126	34	0	170	21	105	28	0	154	691
5:30 PM	8	120	48	0	176	63	133	12	0	208	7	128	23	0	158	31	95	27	0	153	695
5:45 PM	9	112	47	0	168	49	154	6	0	209	7	119	28	0	154	19	91	25	0	135	666
Total	31	439	202	0	672	223	539	28	0	790	30	500	115	0	645	96	379	117	0	592	2699
Grand Total	51	886	393	0	1330	444	1052	50	0	1546	57	932	246	1	1236	202	712	232	0	1146	5258
Approach %	3.8	66.6	29.5	0.0		28.7	68.0	3.2	0.0		4.6	75.4	19.9	0.1		17.6	62.1	20.2	0.0		
Total %	1.0	16.9	7.5	0.0	25.3	8.4	20.0	1.0	0.0	29.4	1.1	17.7	4.7	0.0	23.5	3.8	13.5	4.4	0.0	21.8	
Exiting Leg Total					1608					1162					1139					1349	5258

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	6	109	46	0	161	63	147	7	0	217	7	109	30	0	146	29	87	31	0	147	671
5:00 PM	9	96	49	0	154	54	121	5	0	180	6	127	30	0	163	25	88	37	0	150	647
5:15 PM	5	111	58	0	174	57	131	5	0	193	10	126	34	0	170	21	105	28	0	154	691
5:30 PM	8	120	48	0	176	63	133	12	0	208	7	128	23	0	158	31	95	27	0	153	695
Total Volume	28	436	201	0	665	237	532	29	0	798	30	490	117	0	637	106	375	123	0	604	2704
% Approach Total	4.2	65.6	30.2	0.0		29.7	66.7	3.6	0.0		4.7	76.9	18.4	0.0		17.5	62.1	20.4	0.0		
PHF	0.778	0.908	0.866	0.000	0.945	0.940	0.905	0.604	0.000	0.919	0.750	0.957	0.860	0.000	0.937	0.855	0.893	0.831	0.000	0.981	0.973
Entering Leg	28	436	201	0	665	237	532	29	0	798	30	490	117	0	637	106	375	123	0	604	2704
Exiting Leg					850					606					571					677	2704
Total					1515					1404					1208					1281	5408

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	Cochituate Road (Route 126/27) from North					Boston Post Road (Route 20) from East					Cochituate Road (Route 126/27) from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	1	3	5	0	9	8	7	0	0	15	1	2	2	0	5	0	2	0	0	2	31
4:15 PM	0	1	2	0	3	2	1	0	0	3	1	0	1	0	2	0	3	0	0	3	11
4:30 PM	0	1	4	0	5	2	6	0	0	8	0	1	1	0	2	1	4	0	0	5	20
4:45 PM	1	1	2	0	4	1	0	0	0	1	0	2	2	0	4	2	0	0	0	2	11
Total	2	6	13	0	21	13	14	0	0	27	2	5	6	0	13	3	9	0	0	12	73
5:00 PM	0	0	0	0	0	1	1	2	0	4	0	1	3	0	4	2	3	0	0	5	13
5:15 PM	0	1	0	0	1	1	4	0	0	5	0	1	0	0	1	1	1	0	0	2	9
5:30 PM	0	0	0	0	0	5	2	0	0	7	0	1	2	0	3	0	0	0	0	0	10
5:45 PM	0	2	1	0	3	1	2	0	0	3	0	1	2	0	3	0	3	1	0	4	13
Total	0	3	1	0	4	8	9	2	0	19	0	4	7	0	11	3	7	1	0	11	45
Grand Total	2	9	14	0	25	21	23	2	0	46	2	9	13	0	24	6	16	1	0	23	118
Approach %	8.0	36.0	56.0	0.0		45.7	50.0	4.3	0.0		8.3	37.5	54.2	0.0		26.1	69.6	4.3	0.0		
Total %	1.7	7.6	11.9	0.0	21.2	17.8	19.5	1.7	0.0	39.0	1.7	7.6	11.0	0.0	20.3	5.1	13.6	0.8	0.0	19.5	
Exiting Leg Total					31					32					17					38	118
Buses	0	0	3	0	3	1	3	0	0	4	1	0	1	0	2	0	2	0	0	2	11
% Buses	0.0	0.0	21.4	0.0	12.0	4.8	13.0	0.0	0.0	8.7	50.0	0.0	7.7	0.0	8.3	0.0	12.5	0.0	0.0	8.7	9.3
Exiting Leg Total					1					6					0					4	11
Single-Unit Trucks	2	9	7	0	18	16	15	1	0	32	0	8	8	0	16	5	11	1	0	17	83
% Single-Unit	100.0	100.0	50.0	0.0	72.0	76.2	65.2	50.0	0.0	69.6	0.0	88.9	61.5	0.0	66.7	83.3	68.8	100.0	0.0	73.9	70.3
Exiting Leg Total					25					18					15					25	83
Articulated Trucks	0	0	4	0	4	4	5	1	0	10	1	1	4	0	6	1	3	0	0	4	24
% Articulated	0.0	0.0	28.6	0.0	16.0	19.0	21.7	50.0	0.0	21.7	50.0	11.1	30.8	0.0	25.0	16.7	18.8	0.0	0.0	17.4	20.3
Exiting Leg Total					5					8					2					9	24

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27) from North					Boston Post Road (Route 20) from East					Cochituate Road (Route 126/27) from South					Boston Post Road (Route 20) from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	1	3	5	0	9	8	7	0	0	15	1	2	2	0	5	0	2	0	0	2	31
4:15 PM	0	1	2	0	3	2	1	0	0	3	1	0	1	0	2	0	3	0	0	3	11
4:30 PM	0	1	4	0	5	2	6	0	0	8	0	1	1	0	2	1	4	0	0	5	20
4:45 PM	1	1	2	0	4	1	0	0	0	1	0	2	2	0	4	2	0	0	0	2	11
Total Volume	2	6	13	0	21	13	14	0	0	27	2	5	6	0	13	3	9	0	0	12	73
% Approach Total	9.5	28.6	61.9	0.0		48.1	51.9	0.0	0.0		15.4	38.5	46.2	0.0		25.0	75.0	0.0	0.0		
PHF	0.500	0.500	0.650	0.000	0.583	0.406	0.500	0.000	0.000	0.450	0.500	0.625	0.750	0.000	0.650	0.375	0.563	0.000	0.000	0.600	0.589
Buses	0	0	2	0	2	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	5
Buses %	0.0	0.0	15.4	0.0	9.5	0.0	7.1	0.0	0.0	3.7	50.0	0.0	0.0	0.0	7.7	0.0	11.1	0.0	0.0	8.3	6.8
Single-Unit Trucks	2	6	7	0	15	10	9	0	0	19	0	5	4	0	9	3	8	0	0	11	54
Single-Unit %	100.0	100.0	53.8	0.0	71.4	76.9	64.3	0.0	0.0	70.4	0.0	100.0	66.7	0.0	69.2	100.0	88.9	0.0	0.0	91.7	74.0
Articulated Trucks	0	0	4	0	4	3	4	0	0	7	1	0	2	0	3	0	0	0	0	0	14
Articulated %	0.0	0.0	30.8	0.0	19.0	23.1	28.6	0.0	0.0	25.9	50.0	0.0	33.3	0.0	23.1	0.0	0.0	0.0	0.0	0.0	19.2
Buses	0	0	2	0	2	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	5
Single-Unit Trucks	2	6	7	0	15	10	9	0	0	19	0	5	4	0	9	3	8	0	0	11	54
Articulated Trucks	0	0	4	0	4	3	4	0	0	7	1	0	2	0	3	0	0	0	0	0	14
Total Entering Leg	2	6	13	0	21	13	14	0	0	27	2	5	6	0	13	3	9	0	0	12	73
Buses					0					4					0					1	5
Single-Unit Trucks					15					15					9					15	54
Articulated Trucks					3					5					0					6	14
Total Exiting Leg					18					24					9					22	73

PDI File #:	**197134 CC**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location:	**E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**4:00 PM**
End Time:	**6:00 PM**
Class:	

PRECISION
DATA
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
4:30 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	2	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	5
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	3
Total	0	0	1	0	1	1	2	0	0	3	0	0	1	0	1	0	1	0	0	1	6
Grand Total	0	0	3	0	3	1	3	0	0	4	1	0	1	0	2	0	2	0	0	2	11
Approach %	0.0	0.0	100.0	0.0		25.0	75.0	0.0	0.0		50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	27.3	0.0	27.3	9.1	27.3	0.0	0.0	36.4	9.1	0.0	9.1	0.0	18.2	0.0	18.2	0.0	0.0	18.2	
Exiting Leg Total					1					6					0					4	11

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	3
Total Volume	0	0	1	0	1	1	2	0	0	3	0	0	1	0	1	0	1	0	0	1	6
% Approach Total	0.0	0.0	100.0	0.0		33.3	66.7	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.250	0.000	0.250	0.250	0.500	0.000	0.000	0.750	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.250	0.500
Entering Leg	0	0	1	0	1	1	2	0	0	3	0	0	1	0	1	0	1	0	0	1	6
Exiting Leg					1					2					0					3	6
Total					2					5					1					4	12

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	1	3	2	0	6	7	6	0	0	13	0	2	2	0	4	0	2	0	0	2	25
4:15 PM	0	1	2	0	3	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	7
4:30 PM	0	1	2	0	3	2	2	0	0	4	0	1	1	0	2	1	4	0	0	5	14
4:45 PM	1	1	1	0	3	0	0	0	0	0	0	2	1	0	3	2	0	0	0	2	8
Total	2	6	7	0	15	10	9	0	0	19	0	5	4	0	9	3	8	0	0	11	54
5:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	2	0	2	1	2	0	0	3	6
5:15 PM	0	1	0	0	1	1	4	0	0	5	0	1	0	0	1	1	0	0	0	1	8
5:30 PM	0	0	0	0	0	4	2	0	0	6	0	1	1	0	2	0	0	0	0	0	8
5:45 PM	0	2	0	0	2	1	0	0	0	1	0	1	1	0	2	0	1	1	0	2	7
Total	0	3	0	0	3	6	6	1	0	13	0	3	4	0	7	2	3	1	0	6	29
Grand Total	2	9	7	0	18	16	15	1	0	32	0	8	8	0	16	5	11	1	0	17	83
Approach %	11.1	50.0	38.9	0.0		50.0	46.9	3.1	0.0		0.0	50.0	50.0	0.0		29.4	64.7	5.9	0.0		
Total %	2.4	10.8	8.4	0.0	21.7	19.3	18.1	1.2	0.0	38.6	0.0	9.6	9.6	0.0	19.3	6.0	13.3	1.2	0.0	20.5	
Exiting Leg Total					25					18					15					25	83

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	1	3	2	0	6	7	6	0	0	13	0	2	2	0	4	0	2	0	0	2	25
4:15 PM	0	1	2	0	3	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	7
4:30 PM	0	1	2	0	3	2	2	0	0	4	0	1	1	0	2	1	4	0	0	5	14
4:45 PM	1	1	1	0	3	0	0	0	0	0	0	2	1	0	3	2	0	0	0	2	8
Total Volume	2	6	7	0	15	10	9	0	0	19	0	5	4	0	9	3	8	0	0	11	54
% Approach Total	13.3	40.0	46.7	0.0		52.6	47.4	0.0	0.0		0.0	55.6	44.4	0.0		27.3	72.7	0.0	0.0		
PHF	0.500	0.500	0.875	0.000	0.625	0.357	0.375	0.000	0.000	0.365	0.000	0.625	0.500	0.000	0.563	0.375	0.500	0.000	0.000	0.550	0.540
Entering Leg	2	6	7	0	15	10	9	0	0	19	0	5	4	0	9	3	8	0	0	11	54
Exiting Leg					15					15					9					15	54
Total					30					34					18					26	108

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	2	0	2	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	5
4:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	2
4:30 PM	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	3
Total	0	0	4	0	4	3	4	0	0	7	1	0	2	0	3	0	0	0	0	0	14
5:00 PM	0	0	0	0	0	1	0	1	0	2	0	1	1	0	2	1	1	0	0	2	6
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	1	1	1	0	3	0	1	2	0	3	1	3	0	0	4	10
Grand Total	0	0	4	0	4	4	5	1	0	10	1	1	4	0	6	1	3	0	0	4	24
Approach %	0.0	0.0	100.0	0.0		40.0	50.0	10.0	0.0		16.7	16.7	66.7	0.0		25.0	75.0	0.0	0.0		
Total %	0.0	0.0	16.7	0.0	16.7	16.7	20.8	4.2	0.0	41.7	4.2	4.2	16.7	0.0	25.0	4.2	12.5	0.0	0.0	16.7	
Exiting Leg Total					5					8					2					9	24

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					Cochituate Road (Route 126/27)					Boston Post Road (Route 20)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	2
4:30 PM	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	1	0	1	0	2	0	1	1	0	2	1	1	0	0	2	6
Total Volume	0	0	2	0	2	3	3	1	0	7	0	1	3	0	4	1	1	0	0	2	15
% Approach Total	0.0	0.0	100.0	0.0		42.9	42.9	14.3	0.0		0.0	25.0	75.0	0.0		50.0	50.0	0.0	0.0		
PHF	0.000	0.000	0.500	0.000	0.500	0.750	0.250	0.250	0.000	0.583	0.000	0.250	0.750	0.000	0.500	0.250	0.250	0.000	0.000	0.250	0.625
Entering Leg	0	0	2	0	2	3	3	1	0	7	0	1	3	0	4	1	1	0	0	2	15
Exiting Leg					4					3					2					6	15
Total					6					10					6					8	30

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	3
5:45 PM	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	0	0	0	0
Total	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	3
Grand Total	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	3
Approach %	100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		50.0	0.0	0.0	0.0	0.0	50.0		
Total %	33.3	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	33.3	66.7	
Exiting Leg Total							0							0							1							2	3

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 CC**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Boston Post Road (Route 20) W: Boston Post Road (Route 20)**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	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	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	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							Cochituate Road (Route 126/27)							Boston Post Road (Route 20)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **197134 D**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	12	129	11	0	152	1	1	4	0	6	18	196	0	0	214	0	0	1	0	1	373
7:15 AM	12	141	20	0	173	5	3	6	0	14	16	207	0	0	223	0	0	0	0	0	410
7:30 AM	22	160	18	0	200	2	0	1	0	3	14	192	0	0	206	0	0	0	0	0	409
7:45 AM	19	153	11	0	183	6	3	3	0	12	10	246	1	0	257	0	0	0	0	0	452
Total	65	583	60	0	708	14	7	14	0	35	58	841	1	0	900	0	0	1	0	1	1644
8:00 AM	15	197	4	0	216	5	2	7	0	14	7	203	1	0	211	0	0	0	0	0	441
8:15 AM	21	188	6	1	216	2	3	8	0	13	6	174	0	0	180	0	0	0	0	0	409
8:30 AM	11	154	3	0	168	1	4	4	0	9	12	166	2	0	180	0	0	0	0	0	357
8:45 AM	26	184	5	0	215	2	4	3	0	9	13	191	2	0	206	0	0	0	0	0	430
Total	73	723	18	1	815	10	13	22	0	45	38	734	5	0	777	0	0	0	0	0	1637
Grand Total	138	1306	78	1	1523	24	20	36	0	80	96	1575	6	0	1677	0	0	1	0	1	3281
Approach %	9.1	85.8	5.1	0.1		30.0	25.0	45.0	0.0		5.7	93.9	0.4	0.0		0.0	0.0	100.0	0.0		
Total %	4.2	39.8	2.4	0.0	46.4	0.7	0.6	1.1	0.0	2.4	2.9	48.0	0.2	0.0	51.1	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					1601					174					1342					164	3281
Cars	132	1247	77	1	1457	22	17	34	0	73	91	1507	6	0	1604	0	0	1	0	1	3135
% Cars	95.7	95.5	98.7	100.0	95.7	91.7	85.0	94.4	0.0	91.3	94.8	95.7	100.0	0.0	95.6	0.0	0.0	100.0	0.0	100.0	95.6
Exiting Leg Total					1531					168					1281					155	3135
Heavy Vehicles	6	59	1	0	66	2	3	2	0	7	5	68	0	0	73	0	0	0	0	0	146
% Heavy Vehicles	4.3	4.5	1.3	0.0	4.3	8.3	15.0	5.6	0.0	8.8	5.2	4.3	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	4.4
Exiting Leg Total					70					6					61					9	146

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	12	141	20	0	173	5	3	6	0	14	16	207	0	0	223	0	0	0	0	0	410
7:30 AM	22	160	18	0	200	2	0	1	0	3	14	192	0	0	206	0	0	0	0	0	409
7:45 AM	19	153	11	0	183	6	3	3	0	12	10	246	1	0	257	0	0	0	0	0	452
8:00 AM	15	197	4	0	216	5	2	7	0	14	7	203	1	0	211	0	0	0	0	0	441
Total Volume	68	651	53	0	772	18	8	17	0	43	47	848	2	0	897	0	0	0	0	0	1712
% Approach Total	8.8	84.3	6.9	0.0		41.9	18.6	39.5	0.0		5.2	94.5	0.2	0.0		0.0	0.0	0.0	0.0		
PHF	0.773	0.826	0.663	0.000	0.894	0.750	0.667	0.607	0.000	0.768	0.734	0.862	0.500	0.000	0.873	0.000	0.000	0.000	0.000	0.000	0.947
Cars	65	614	53	0	732	16	5	15	0	36	42	812	2	0	856	0	0	0	0	0	1624
Cars %	95.6	94.3	100.0	0.0	94.8	88.9	62.5	88.2	0.0	83.7	89.4	95.8	100.0	0.0	95.4	0.0	0.0	0.0	0.0	0.0	94.9
Heavy Vehicles	3	37	0	0	40	2	3	2	0	7	5	36	0	0	41	0	0	0	0	0	88
Heavy Vehicles %	4.4	5.7	0.0	0.0	5.2	11.1	37.5	11.8	0.0	16.3	10.6	4.2	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	5.1
Cars Enter Leg	65	614	53	0	732	16	5	15	0	36	42	812	2	0	856	0	0	0	0	0	1624
Heavy Enter Leg	3	37	0	0	40	2	3	2	0	7	5	36	0	0	41	0	0	0	0	0	88
Total Entering Leg	68	651	53	0	772	18	8	17	0	43	47	848	2	0	897	0	0	0	0	0	1712
Cars Exiting Leg					828					95					629					72	1624
Heavy Exiting Leg					38					5					39					6	88
Total Exiting Leg					866					100					668					78	1712

PDI File #: **197134 D**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars

	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	11	123	10	0	144	1	1	4	0	6	18	188	0	0	206	0	0	1	0	1	357
7:15 AM	10	133	20	0	163	4	2	6	0	12	15	196	0	0	211	0	0	0	0	0	386
7:30 AM	22	153	18	0	193	2	0	1	0	3	11	189	0	0	200	0	0	0	0	0	396
7:45 AM	19	140	11	0	170	5	1	3	0	9	9	234	1	0	244	0	0	0	0	0	423
Total	62	549	59	0	670	12	4	14	0	30	53	807	1	0	861	0	0	1	0	1	1562
8:00 AM	14	188	4	0	206	5	2	5	0	12	7	193	1	0	201	0	0	0	0	0	419
8:15 AM	20	179	6	1	206	2	3	8	0	13	6	166	0	0	172	0	0	0	0	0	391
8:30 AM	10	150	3	0	163	1	4	4	0	9	12	163	2	0	177	0	0	0	0	0	349
8:45 AM	26	181	5	0	212	2	4	3	0	9	13	178	2	0	193	0	0	0	0	0	414
Total	70	698	18	1	787	10	13	20	0	43	38	700	5	0	743	0	0	0	0	0	1573
Grand Total	132	1247	77	1	1457	22	17	34	0	73	91	1507	6	0	1604	0	0	1	0	1	3135
Approach %	9.1	85.6	5.3	0.1		30.1	23.3	46.6	0.0		5.7	94.0	0.4	0.0		0.0	0.0	100.0	0.0		
Total %	4.2	39.8	2.5	0.0	46.5	0.7	0.5	1.1	0.0	2.3	2.9	48.1	0.2	0.0	51.2	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					1531					168					1281					155	3135

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	22	153	18	0	193	2	0	1	0	3	11	189	0	0	200	0	0	0	0	0	396
7:45 AM	19	140	11	0	170	5	1	3	0	9	9	234	1	0	244	0	0	0	0	0	423
8:00 AM	14	188	4	0	206	5	2	5	0	12	7	193	1	0	201	0	0	0	0	0	419
8:15 AM	20	179	6	1	206	2	3	8	0	13	6	166	0	0	172	0	0	0	0	0	391
Total Volume	75	660	39	1	775	14	6	17	0	37	33	782	2	0	817	0	0	0	0	0	1629
% Approach Total	9.7	85.2	5.0	0.1		37.8	16.2	45.9	0.0		4.0	95.7	0.2	0.0		0.0	0.0	0.0	0.0		
PHF	0.852	0.878	0.542	0.250	0.941	0.700	0.500	0.531	0.000	0.712	0.750	0.835	0.500	0.000	0.837	0.000	0.000	0.000	0.000	0.000	0.963
Entering Leg	75	660	39	1	775	14	6	17	0	37	33	782	2	0	817	0	0	0	0	0	1629
Exiting Leg					797					72					677					83	1629
Total					1572					109					1494					83	3258

PDI File #:	**197134 D**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location:	**E: Millbrook Road W: Pelham Island Road**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	**Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	6	1	0	8	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	16
7:15 AM	2	8	0	0	10	1	1	0	0	2	1	11	0	0	12	0	0	0	0	0	24
7:30 AM	0	7	0	0	7	0	0	0	0	0	3	3	0	0	6	0	0	0	0	0	13
7:45 AM	0	13	0	0	13	1	2	0	0	3	1	12	0	0	13	0	0	0	0	0	29
Total	3	34	1	0	38	2	3	0	0	5	5	34	0	0	39	0	0	0	0	0	82
8:00 AM	1	9	0	0	10	0	0	2	0	2	0	10	0	0	10	0	0	0	0	0	22
8:15 AM	1	9	0	0	10	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	18
8:30 AM	1	4	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	8
8:45 AM	0	3	0	0	3	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	16
Total	3	25	0	0	28	0	0	2	0	2	0	34	0	0	34	0	0	0	0	0	64
Grand Total	6	59	1	0	66	2	3	2	0	7	5	68	0	0	73	0	0	0	0	0	146
Approach %	9.1	89.4	1.5	0.0		28.6	42.9	28.6	0.0		6.8	93.2	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	4.1	40.4	0.7	0.0	45.2	1.4	2.1	1.4	0.0	4.8	3.4	46.6	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					70					6					61					9	146
Buses	1	4	0	0	5	1	2	2	0	5	3	9	0	0	12	0	0	0	0	0	22
% Buses	16.7	6.8	0.0	0.0	7.6	50.0	66.7	100.0	0.0	71.4	60.0	13.2	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	15.1
Exiting Leg Total					10					3					6					3	22
Single-Unit Trucks	4	45	0	0	49	1	1	0	0	2	2	47	0	0	49	0	0	0	0	0	100
% Single-Unit	66.7	76.3	0.0	0.0	74.2	50.0	33.3	0.0	0.0	28.6	40.0	69.1	0.0	0.0	67.1	0.0	0.0	0.0	0.0	0.0	68.5
Exiting Leg Total					48					2					45					5	100
Articulated Trucks	1	10	1	0	12	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	24
% Articulated	16.7	16.9	100.0	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	17.6	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0	16.4
Exiting Leg Total					12					1					10					1	24

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	2	8	0	0	10	1	1	0	0	2	1	11	0	0	12	0	0	0	0	0	24
7:30 AM	0	7	0	0	7	0	0	0	0	0	3	3	0	0	6	0	0	0	0	0	13
7:45 AM	0	13	0	0	13	1	2	0	0	3	1	12	0	0	13	0	0	0	0	0	29
8:00 AM	1	9	0	0	10	0	0	2	0	2	0	10	0	0	10	0	0	0	0	0	22
Total Volume	3	37	0	0	40	2	3	2	0	7	5	36	0	0	41	0	0	0	0	0	88
% Approach Total	7.5	92.5	0.0	0.0		28.6	42.9	28.6	0.0		12.2	87.8	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.375	0.712	0.000	0.000	0.769	0.500	0.375	0.250	0.000	0.583	0.417	0.750	0.000	0.000	0.788	0.000	0.000	0.000	0.000	0.000	0.759
Buses	1	1	0	0	2	1	2	2	0	5	3	5	0	0	8	0	0	0	0	0	15
Buses %	33.3	2.7	0.0	0.0	5.0	50.0	66.7	100.0	0.0	71.4	60.0	13.9	0.0	0.0	19.5	0.0	0.0	0.0	0.0	0.0	17.0
Single-Unit Trucks	1	29	0	0	30	1	1	0	0	2	2	25	0	0	27	0	0	0	0	0	59
Single-Unit %	33.3	78.4	0.0	0.0	75.0	50.0	33.3	0.0	0.0	28.6	40.0	69.4	0.0	0.0	65.9	0.0	0.0	0.0	0.0	0.0	67.0
Articulated Trucks	1	7	0	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14
Articulated %	33.3	18.9	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	14.6	0.0	0.0	0.0	0.0	0.0	15.9
Buses	1	1	0	0	2	1	2	2	0	5	3	5	0	0	8	0	0	0	0	0	15
Single-Unit Trucks	1	29	0	0	30	1	1	0	0	2	2	25	0	0	27	0	0	0	0	0	59
Articulated Trucks	1	7	0	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14
Total Entering Leg	3	37	0	0	40	2	3	2	0	7	5	36	0	0	41	0	0	0	0	0	88
Buses					6					3					3					3	15
Single-Unit Trucks					26					2					29					2	59
Articulated Trucks					6					0					7					1	14
Total Exiting Leg					38					5					39					6	88

PDI File #:	**197134 D**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location:	**E: Millbrook Road W: Pelham Island Road**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
7:45 AM	0	1	0	0	1	1	2	0	0	3	1	1	0	0	2	0	0	0	0	0	6
Total	0	1	0	0	1	1	2	0	0	3	3	8	0	0	11	0	0	0	0	0	15
8:00 AM	1	0	0	0	1	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	4
8:15 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	3	0	0	4	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	7
Grand Total	1	4	0	0	5	1	2	2	0	5	3	9	0	0	12	0	0	0	0	0	22
Approach %	20.0	80.0	0.0	0.0		20.0	40.0	40.0	0.0		25.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	4.5	18.2	0.0	0.0	22.7	4.5	9.1	9.1	0.0	22.7	13.6	40.9	0.0	0.0	54.5	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					10					3					6					3	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3
7:45 AM	0	1	0	0	1	1	2	0	0	3	1	1	0	0	2	0	0	0	0	0	6
Total Volume	0	1	0	0	1	1	2	0	0	3	3	8	0	0	11	0	0	0	0	0	15
% Approach Total	0.0	100.0	0.0	0.0		33.3	66.7	0.0	0.0		27.3	72.7	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.250	0.375	0.500	0.000	0.000	0.688	0.000	0.000	0.000	0.000	0.000	0.625
Entering Leg	0	1	0	0	1	1	2	0	0	3	3	8	0	0	11	0	0	0	0	0	15
Exiting Leg					9					3					1					2	15
Total					10					6					12					2	30

PDI File #: **197134 D**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126,**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	1	6	0	0	7	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	10
7:15 AM	1	7	0	0	8	1	1	0	0	2	1	8	0	0	9	0	0	0	0	0	19
7:30 AM	0	5	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	8
7:45 AM	0	11	0	0	11	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	17
Total	2	29	0	0	31	1	1	0	0	2	2	19	0	0	21	0	0	0	0	0	54
8:00 AM	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
8:15 AM	1	5	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14
8:30 AM	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
8:45 AM	0	3	0	0	3	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	12
Total	2	16	0	0	18	0	0	0	0	0	0	28	0	0	28	0	0	0	0	0	46
Grand Total	4	45	0	0	49	1	1	0	0	2	2	47	0	0	49	0	0	0	0	0	100
Approach %	8.2	91.8	0.0	0.0		50.0	50.0	0.0	0.0		4.1	95.9	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	4.0	45.0	0.0	0.0	49.0	1.0	1.0	0.0	0.0	2.0	2.0	47.0	0.0	0.0	49.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					48					2					45					5	100

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	7	0	0	8	1	1	0	0	2	1	8	0	0	9	0	0	0	0	0	19
7:30 AM	0	5	0	0	5	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	8
7:45 AM	0	11	0	0	11	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	17
8:00 AM	0	6	0	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
Total Volume	1	29	0	0	30	1	1	0	0	2	2	25	0	0	27	0	0	0	0	0	59
% Approach Total	3.3	96.7	0.0	0.0		50.0	50.0	0.0	0.0		7.4	92.6	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.250	0.659	0.000	0.000	0.682	0.250	0.250	0.000	0.000	0.250	0.500	0.694	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.776
Entering Leg	1	29	0	0	30	1	1	0	0	2	2	25	0	0	27	0	0	0	0	0	59
Exiting Leg					26					2					29					2	59
Total					56					4					56					2	118

PDI File #: 197134 D
Location: N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/
Location: E: Millbrook Road W: Pelham Island Road
City, State: Wayland, MA
Client: TEC/L.Oltman
Site Code: P2019
Count Date: Wednesday, August 28, 2019
Start Time: 7:00 AM
End Time: 9:00 AM
Class:

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
7:15 AM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
7:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
Total	1	4	1	0	6	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	13
8:00 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
Total	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	11
Grand Total	1	10	1	0	12	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	24
Approach %	8.3	83.3	8.3	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	4.2	41.7	4.2	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					12					1					10					1	24

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
7:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
8:00 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	1	7	0	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14
% Approach Total	12.5	87.5	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.250	0.583	0.000	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000	0.583
Entering Leg	1	7	0	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14
Exiting Leg					6					0					7					1	14
Total					14					0					13					1	28

PDI File #: **197134 D**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 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	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 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	0	2	2	2
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3
Grand Total	0	0	0	0	0	0	0	0	1	0	0	2	0	3	0	0	0	0	0	0	0	0	1	0	0	0	2	3	6
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	33.3	0.0	0.0	66.7	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	33.3	0.0	0.0	0.0	66.7		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	33.3	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	33.3	50.0	
Exiting Leg Total							0							3							0							3	6

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:30 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	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 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	0	2	2	2
Total Volume	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	2	3	5
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	50.0	0.0	0.0	50.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	33.3	0.0	0.0	0.0	66.7		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.375	0.625
Entering Leg	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	2	3	5
Exiting Leg							0							2							0							3	5
Total							0							4							0							6	10

PDI File #: **197134 D**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 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	0	0	0	0
8:15 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	0	0	0	0
8:30 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	0	0	0	0
8:45 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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0	0	0	0	0	0		0	0	0	0	100	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							1							0							0	1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 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	0	0	0	0
7:15 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	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg							0							1							0							0	1
Total							0							2							0							0	2

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/27)**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	44	159	2	0	205	5	1	2	0	8	12	189	1	0	202	0	0	0	0	0	415
4:15 PM	37	174	1	0	212	6	5	4	0	15	10	171	2	0	183	0	0	0	0	0	410
4:30 PM	34	172	3	0	209	9	2	3	0	14	8	184	4	0	196	0	0	0	0	0	419
4:45 PM	45	159	2	0	206	7	8	4	0	19	11	194	0	0	205	0	0	0	0	0	430
Total	160	664	8	0	832	27	16	13	0	56	41	738	7	0	786	0	0	0	0	0	1674
5:00 PM	39	152	2	0	193	5	12	5	0	22	4	213	2	0	219	0	0	0	0	0	434
5:15 PM	37	166	6	0	209	3	15	8	0	26	12	201	1	0	214	0	0	0	0	0	449
5:30 PM	28	177	1	0	206	8	8	4	0	20	7	215	0	0	222	0	0	0	0	0	448
5:45 PM	36	163	2	1	202	7	11	7	0	25	5	193	1	0	199	0	0	0	0	0	426
Total	140	658	11	1	810	23	46	24	0	93	28	822	4	0	854	0	0	0	0	0	1757
Grand Total	300	1322	19	1	1642	50	62	37	0	149	69	1560	11	0	1640	0	0	0	0	0	3431
Approach %	18.3	80.5	1.2	0.1		33.6	41.6	24.8	0.0		4.2	95.1	0.7	0.0		0.0	0.0	0.0	0.0		
Total %	8.7	38.5	0.6	0.0	47.9	1.5	1.8	1.1	0.0	4.3	2.0	45.5	0.3	0.0	47.8	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					1611					88					1359					373	3431
Cars	299	1299	18	1	1617	50	62	37	0	149	69	1532	11	0	1612	0	0	0	0	0	3378
% Cars	99.7	98.3	94.7	100.0	98.5	100.0	100.0	100.0	0.0	100.0	100.0	98.2	100.0	0.0	98.3	0.0	0.0	0.0	0.0	0.0	98.5
Exiting Leg Total					1583					87					1336					372	3378
Heavy Vehicles	1	23	1	0	25	0	0	0	0	0	0	28	0	0	28	0	0	0	0	0	53
% Heavy Vehicles	0.3	1.7	5.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	1.5
Exiting Leg Total					28					1					23					1	53

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	45	159	2	0	206	7	8	4	0	19	11	194	0	0	205	0	0	0	0	0	430
5:00 PM	39	152	2	0	193	5	12	5	0	22	4	213	2	0	219	0	0	0	0	0	434
5:15 PM	37	166	6	0	209	3	15	8	0	26	12	201	1	0	214	0	0	0	0	0	449
5:30 PM	28	177	1	0	206	8	8	4	0	20	7	215	0	0	222	0	0	0	0	0	448
Total Volume	149	654	11	0	814	23	43	21	0	87	34	823	3	0	860	0	0	0	0	0	1761
% Approach Total	18.3	80.3	1.4	0.0		26.4	49.4	24.1	0.0		4.0	95.7	0.3	0.0		0.0	0.0	0.0	0.0		
PHF	0.828	0.924	0.458	0.000	0.974	0.719	0.717	0.656	0.000	0.837	0.708	0.957	0.375	0.000	0.968	0.000	0.000	0.000	0.000	0.000	0.981
Cars	149	649	11	0	809	23	43	21	0	87	34	813	3	0	850	0	0	0	0	0	1746
Cars %	100.0	99.2	100.0	0.0	99.4	100.0	100.0	100.0	0.0	100.0	100.0	98.8	100.0	0.0	98.8	0.0	0.0	0.0	0.0	0.0	99.1
Heavy Vehicles	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	15
Heavy Vehicles %	0.0	0.8	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.9
Cars Enter Leg	149	649	11	0	809	23	43	21	0	87	34	813	3	0	850	0	0	0	0	0	1746
Heavy Enter Leg	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	15
Total Entering Leg	149	654	11	0	814	23	43	21	0	87	34	823	3	0	860	0	0	0	0	0	1761
Cars Exiting Leg					836					45					670					195	1746
Heavy Exiting Leg					10					0					5					0	15
Total Exiting Leg					846					45					675					195	1761

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Cars**

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	44	151	2	0	197	5	1	2	0	8	12	180	1	0	193	0	0	0	0	0	398
4:15 PM	36	171	1	0	208	6	5	4	0	15	10	169	2	0	181	0	0	0	0	0	404
4:30 PM	34	168	2	0	204	9	2	3	0	14	8	181	4	0	193	0	0	0	0	0	411
4:45 PM	45	155	2	0	202	7	8	4	0	19	11	193	0	0	204	0	0	0	0	0	425
Total	159	645	7	0	811	27	16	13	0	56	41	723	7	0	771	0	0	0	0	0	1638
5:00 PM	39	152	2	0	193	5	12	5	0	22	4	211	2	0	217	0	0	0	0	0	432
5:15 PM	37	165	6	0	208	3	15	8	0	26	12	199	1	0	212	0	0	0	0	0	446
5:30 PM	28	177	1	0	206	8	8	4	0	20	7	210	0	0	217	0	0	0	0	0	443
5:45 PM	36	160	2	1	199	7	11	7	0	25	5	189	1	0	195	0	0	0	0	0	419
Total	140	654	11	1	806	23	46	24	0	93	28	809	4	0	841	0	0	0	0	0	1740
Grand Total	299	1299	18	1	1617	50	62	37	0	149	69	1532	11	0	1612	0	0	0	0	0	3378
Approach %	18.5	80.3	1.1	0.1		33.6	41.6	24.8	0.0		4.3	95.0	0.7	0.0		0.0	0.0	0.0	0.0		
Total %	8.9	38.5	0.5	0.0	47.9	1.5	1.8	1.1	0.0	4.4	2.0	45.4	0.3	0.0	47.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					1583					87					1336					372	3378

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	45	155	2	0	202	7	8	4	0	19	11	193	0	0	204	0	0	0	0	0	425
5:00 PM	39	152	2	0	193	5	12	5	0	22	4	211	2	0	217	0	0	0	0	0	432
5:15 PM	37	165	6	0	208	3	15	8	0	26	12	199	1	0	212	0	0	0	0	0	446
5:30 PM	28	177	1	0	206	8	8	4	0	20	7	210	0	0	217	0	0	0	0	0	443
Total Volume	149	649	11	0	809	23	43	21	0	87	34	813	3	0	850	0	0	0	0	0	1746
% Approach Total	18.4	80.2	1.4	0.0		26.4	49.4	24.1	0.0		4.0	95.6	0.4	0.0		0.0	0.0	0.0	0.0		
PHF	0.828	0.917	0.458	0.000	0.972	0.719	0.717	0.656	0.000	0.837	0.708	0.963	0.375	0.000	0.979	0.000	0.000	0.000	0.000	0.000	0.979
Entering Leg	149	649	11	0	809	23	43	21	0	87	34	813	3	0	850	0	0	0	0	0	1746
Exiting Leg					836					45					670					195	1746
Total					1645					132					1520					195	3492

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/27)**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	8	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	17
4:15 PM	1	3	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
4:30 PM	0	4	1	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	8
4:45 PM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Total	1	19	1	0	21	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	36
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	5
5:45 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
Total	0	4	0	0	4	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	17
Grand Total	1	23	1	0	25	0	0	0	0	0	0	28	0	0	28	0	0	0	0	0	53
Approach %	4.0	92.0	4.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	1.9	43.4	1.9	0.0	47.2	0.0	0.0	0.0	0.0	0.0	0.0	52.8	0.0	0.0	52.8	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					28					1					23					1	53
Buses	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% Buses	0.0	8.7	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	5.7
Exiting Leg Total					1					0					2					0	3
Single-Unit Trucks	1	17	1	0	19	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	42
% Single-Unit	100.0	73.9	100.0	0.0	76.0	0.0	0.0	0.0	0.0	0.0	0.0	82.1	0.0	0.0	82.1	0.0	0.0	0.0	0.0	0.0	79.2
Exiting Leg Total					23					1					17					1	42
Articulated Trucks	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
% Articulated	0.0	17.4	0.0	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	15.1
Exiting Leg Total					4					0					4					0	8

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	8	0	0	8	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	17
4:15 PM	1	3	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
4:30 PM	0	4	1	0	5	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	8
4:45 PM	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Total Volume	1	19	1	0	21	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	36
% Approach Total	4.8	90.5	4.8	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.250	0.594	0.250	0.000	0.656	0.000	0.000	0.000	0.000	0.000	0.000	0.417	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.529
Buses	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Buses %	0.0	5.3	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
Single-Unit Trucks	1	14	1	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
Single-Unit %	100.0	73.7	100.0	0.0	76.2	0.0	0.0	0.0	0.0	0.0	0.0	86.7	0.0	0.0	86.7	0.0	0.0	0.0	0.0	0.0	80.6
Articulated Trucks	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
Articulated %	0.0	21.1	0.0	0.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.3	0.0	0.0	0.0	0.0	0.0	16.7
Buses	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Single-Unit Trucks	1	14	1	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
Articulated Trucks	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
Total Entering Leg	1	19	1	0	21	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	36
Buses					0					0					1					0	1
Single-Unit Trucks					13					1					14					1	29
Articulated Trucks					2					0					4					0	6
Total Exiting Leg					15					1					19					1	36

PDI File #:	**197134 DD**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location:	**E: Millbrook Road W: Pelham Island Road**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**4:00 PM**
End Time:	**6:00 PM**
Class:	**Buses**

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Grand Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Approach %	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	66.7	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					1					0					2					0	3

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Cochituate Road (Route 126/27)					Millbrook Road					Cochituate Road (Route 126/27)					Pelham Island Road					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Exiting Leg					1					0					1					0	2
Total					2					0					2					0	4

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126/**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class: **Single-Unit Trucks**

	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14
4:15 PM	1	3	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
4:30 PM	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
4:45 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
Total	1	14	1	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
5:45 PM	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
Total	0	3	0	0	3	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	13
Grand Total	1	17	1	0	19	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	42
Approach %	5.3	89.5	5.3	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	2.4	40.5	2.4	0.0	45.2	0.0	0.0	0.0	0.0	0.0	0.0	54.8	0.0	0.0	54.8	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					23					1					17					1	42

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	14
4:15 PM	1	3	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
4:30 PM	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
4:45 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
Total Volume	1	14	1	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
% Approach Total	6.3	87.5	6.3	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.250	0.583	0.250	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.406	0.000	0.000	0.406	0.000	0.000	0.000	0.000	0.000	0.518
Entering Leg	1	14	1	0	16	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	29
Exiting Leg					13					1					14					1	29
Total					29					1					27					1	58

PDI File #:	**197134 DD**
Location:	**N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 126**
Location:	**E: Millbrook Road W: Pelham Island Road**
City, State:	**Wayland, MA**
Client:	**TEC/L.Oltman**
Site Code:	**P2019**
Count Date:	**Wednesday, August 28, 2019**
Start Time:	**4:00 PM**
End Time:	**6:00 PM**
Class:	

PRECISION
DATA
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Grand Total	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
Approach %	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total					4					0					4					0	8

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27) from North					Millbrook Road from East					Cochituate Road (Route 126/27) from South					Pelham Island Road from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
% Approach Total	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	6
Exiting Leg					2					0					4					0	6
Total					6					0					6					0	12

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Bicycles (on Roadway and Crosswalks)

	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	1	1	1
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	
Exiting Leg Total							0							0							0							1	1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM

	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	1	1	1
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.250
Entering Leg	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	0	1	1	1
Exiting Leg							0							0							0							1	1
Total							0							0							0							2	2

PDI File #: **197134 DD**
Location: **N: Cochituate Road (Route 126/27) S: Cochituate Road (Route 12**
Location: **E: Millbrook Road W: Pelham Island Road**
City, State: **Wayland, MA**
Client: **TEC/L.Oltman**
Site Code: **P2019**
Count Date: **Wednesday, August 28, 2019**
Start Time: **4:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Pedestrians

	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	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	0	0	0	0
5:15 PM	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	0	0	0	0
5:30 PM	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	0	0	0	0
5:45 PM	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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	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	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	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Cochituate Road (Route 126/27)							Millbrook Road							Cochituate Road (Route 126/27)							Pelham Island Road							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	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	0	0	0	0
4:15 PM	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	0	0	0	0
4:30 PM	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	0	0	0	0
4:45 PM	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	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach 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		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	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	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

<u>Attachment B</u>

Automatic Traffic Recorder (ATRs) Counts

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197134 A Class
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axl Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/28/19	0	19	2	0	0	0	0	0	0	0	0	0	0	21
01:00	0	9	0	1	1	0	0	0	0	0	0	0	0	11
02:00	0	8	1	1	1	0	0	0	0	0	0	0	0	11
03:00	0	9	2	0	3	1	0	0	3	0	0	0	0	18
04:00	0	45	7	0	5	0	0	0	1	0	0	0	0	58
05:00	6	193	45	8	27	2	0	0	2	0	0	0	0	283
06:00	1	492	139	13	61	5	1	3	2	1	0	0	0	718
07:00	0	614	130	13	65	2	0	8	1	0	0	0	0	833
08:00	3	583	118	4	45	5	0	9	2	0	0	0	0	769
09:00	1	488	103	4	49	5	0	4	9	0	0	0	0	663
10:00	0	412	84	5	42	4	1	6	2	1	0	0	0	557
11:00	1	364	99	10	32	7	0	3	3	0	0	0	0	519
12 PM	1	405	109	20	45	6	0	8	4	0	0	0	0	598
13:00	3	404	115	8	39	4	0	5	2	0	0	0	0	580
14:00	4	366	104	7	47	3	0	6	5	0	0	0	0	542
15:00	1	325	96	7	30	5	0	5	1	0	0	0	0	470
16:00	2	372	77	5	17	8	0	1	1	0	0	0	0	483
17:00	1	436	68	0	27	6	0	1	2	0	0	0	0	541
18:00	1	392	43	1	12	1	0	1	1	0	0	0	0	452
19:00	1	225	27	0	4	1	0	0	1	0	0	0	0	259
20:00	0	186	20	0	4	0	0	1	0	0	0	0	0	211
21:00	0	131	17	0	10	0	0	0	1	0	0	0	0	159
22:00	0	57	10	0	4	0	0	0	0	0	0	0	0	71
23:00	0	32	2	1	0	0	0	0	0	0	0	0	0	35
Total	26	6567	1418	108	570	65	2	61	43	2	0	0	0	8862
Percent	0.3%	74.1%	16.0%	1.2%	6.4%	0.7%	0.0%	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	06:00	06:00	07:00	11:00	06:00	08:00	09:00	06:00				07:00
Vol.	6	614	139	13	65	7	1	9	9	1				833
PM Peak	14:00	17:00	13:00	12:00	14:00	16:00		12:00	14:00					12:00
Vol.	4	436	115	20	47	8		8	5					598

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
D A T A
INDUSTRIES, LLC

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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197134 A Class
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/29/19	0	20	1	0	0	0	0	0	0	0	0	0	0	21
01:00	0	5	2	2	1	0	0	0	0	0	0	0	0	10
02:00	0	6	0	1	1	0	0	0	0	0	0	0	0	8
03:00	0	10	2	0	1	1	0	0	2	0	0	0	0	16
04:00	0	37	11	2	9	0	0	0	1	0	0	0	0	60
05:00	2	177	58	2	26	3	0	0	2	0	0	0	0	270
06:00	1	407	194	14	99	1	0	8	5	0	0	0	0	729
07:00	1	440	254	17	114	1	0	15	4	0	0	0	0	846
08:00	0	415	220	9	67	4	0	11	2	1	0	0	0	729
09:00	0	416	122	7	46	4	0	6	1	0	0	0	0	602
10:00	3	357	115	8	52	6	0	5	1	0	0	0	0	547
11:00	5	359	126	5	53	5	1	9	1	1	0	0	0	565
12 PM	1	386	127	7	46	2	2	2	3	0	0	0	0	576
13:00	1	388	121	13	57	4	0	11	1	1	0	0	0	597
14:00	0	386	110	14	39	5	0	7	4	1	0	0	0	566
15:00	3	355	113	6	29	6	0	5	0	0	0	0	0	517
16:00	1	359	106	7	35	0	0	0	1	0	0	0	0	509
17:00	1	441	112	4	23	4	0	3	0	0	0	0	0	588
18:00	1	349	88	0	21	0	0	0	1	0	0	0	0	460
19:00	1	284	69	1	5	1	0	2	0	0	0	0	0	363
20:00	2	192	49	0	11	1	0	0	0	0	0	0	0	255
21:00	2	136	36	0	9	2	0	0	1	0	0	0	0	186
22:00	0	80	13	0	4	0	0	0	0	0	0	0	0	97
23:00	0	33	12	0	3	0	0	1	0	0	0	0	0	49
Total	25	6038	2061	119	751	50	3	85	30	4	0	0	0	9166
Percent	0.3%	65.9%	22.5%	1.3%	8.2%	0.5%	0.0%	0.9%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	07:00	07:00	10:00	11:00	07:00	06:00	08:00				07:00
Vol.	5	440	254	17	114	6	1	15	5	1				846
PM Peak	15:00	17:00	12:00	14:00	13:00	15:00	12:00	13:00	14:00	13:00				13:00
Vol.	3	441	127	14	57	6	2	11	4	1				597

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
D A T A
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197134 A Class
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/28/1 9	0	29	1	0	1	0	0	0	0	0	0	0	0	31
01:00	0	14	2	0	1	0	0	0	0	0	0	0	0	17
02:00	0	6	3	0	0	0	0	0	1	0	0	0	0	10
03:00	0	15	3	0	3	0	0	1	0	0	0	0	0	22
04:00	0	20	5	0	0	0	0	2	0	0	0	0	0	27
05:00	0	86	12	2	5	3	0	0	2	0	0	0	0	110
06:00	2	237	33	4	11	3	0	0	0	0	0	0	0	290
07:00	1	328	39	5	19	4	0	3	0	0	0	0	0	399
08:00	1	342	56	17	14	6	0	3	0	1	0	0	0	440
09:00	1	323	49	5	14	3	0	3	1	0	0	0	0	399
10:00	0	363	67	6	31	5	1	3	2	0	0	0	0	478
11:00	1	415	63	5	16	4	1	5	2	0	0	0	0	512
12 PM	3	479	70	9	17	3	0	3	3	0	0	0	0	587
13:00	3	477	86	4	15	5	0	4	2	0	0	0	0	596
14:00	1	513	69	3	21	2	0	2	0	0	0	0	0	611
15:00	3	580	114	19	21	1	0	5	2	0	0	0	0	745
16:00	3	684	97	1	22	2	0	3	1	0	0	0	0	813
17:00	1	637	68	1	18	1	0	1	1	0	0	0	0	728
18:00	2	669	47	2	10	3	0	2	0	0	0	0	0	735
19:00	1	470	41	0	3	0	0	0	1	0	0	0	0	516
20:00	0	273	27	0	0	0	0	1	0	0	0	0	0	301
21:00	0	175	16	0	2	0	0	0	0	1	0	0	0	194
22:00	0	128	14	0	0	0	0	1	0	0	0	0	0	143
23:00	0	74	7	0	1	0	0	0	0	0	0	0	0	82
Total	23	7337	989	83	245	45	2	42	18	2	0	0	0	8786
Percent	0.3%	83.5%	11.3%	0.9%	2.8%	0.5%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	10:00	08:00	10:00	08:00	10:00	11:00	05:00	08:00				11:00
Vol.	2	415	67	17	31	6	1	5	2	1				512
PM Peak	12:00	16:00	15:00	15:00	16:00	13:00		15:00	12:00	21:00				16:00
Vol.	3	684	114	19	22	5		5	3	1				813

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
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Email: datarequests@pdillc.com

197134 A Class
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/29/19	0	24	4	0	0	0	0	0	0	0	0	0	0	28
01:00	0	12	1	0	1	0	0	0	0	0	0	0	0	14
02:00	1	9	2	1	2	0	0	0	0	0	0	0	0	15
03:00	0	12	4	0	0	1	0	0	0	0	0	0	0	17
04:00	0	22	4	1	2	1	0	0	2	0	0	0	0	32
05:00	0	88	14	1	2	0	0	1	1	0	0	0	0	107
06:00	2	178	50	7	17	5	0	2	1	0	0	0	0	262
07:00	2	323	47	6	20	0	0	1	0	0	0	0	0	399
08:00	2	352	72	19	18	4	0	4	2	0	0	0	0	473
09:00	0	368	59	9	22	4	0	1	2	0	0	0	0	465
10:00	0	367	77	7	18	4	0	4	0	0	0	0	0	477
11:00	1	442	87	12	21	4	0	6	4	0	0	0	0	577
12 PM	1	489	83	6	18	4	1	3	5	0	0	0	0	610
13:00	0	470	71	4	12	1	2	3	2	0	0	0	0	565
14:00	1	518	85	2	16	5	0	2	3	0	0	0	0	632
15:00	2	592	79	7	19	1	1	4	1	0	0	0	0	706
16:00	4	677	95	15	20	2	0	3	3	0	0	0	0	819
17:00	7	680	77	1	18	0	0	4	1	0	0	0	0	788
18:00	0	591	74	2	20	6	0	3	0	0	0	0	0	696
19:00	4	483	70	2	12	0	0	2	1	0	0	0	0	574
20:00	3	305	35	0	6	0	0	0	1	0	0	0	0	350
21:00	0	219	23	0	5	0	0	0	0	0	0	0	0	247
22:00	0	142	23	0	3	0	0	0	2	0	0	0	0	170
23:00	0	88	14	1	1	0	0	1	1	0	0	0	0	106
Total	30	7451	1150	103	273	42	4	44	32	0	0	0	0	9129
Percent	0.3%	81.6%	12.6%	1.1%	3.0%	0.5%	0.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	08:00	09:00	06:00		11:00	11:00					11:00
Vol.	2	442	87	19	22	5		6	4					577
PM Peak	17:00	17:00	16:00	16:00	16:00	18:00	13:00	15:00	12:00					16:00
Vol.	7	680	95	15	20	6	2	4	5					819

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
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PRECISION
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Email: datarequests@pdillc.com

197134 A Speed
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/28/ 19	0	0	0	0	0	1	7	6	6	1	0	0	0	21	52	47
01:00	0	0	0	0	0	2	3	2	3	1	0	0	0	11	52	46
02:00	0	0	0	0	0	0	0	5	4	1	**1**	0	0	11	55	51
03:00	0	0	0	0	0	2	6	8	0	2	0	0	0	18	48	45
04:00	0	0	0	0	0	1	12	27	16	2	0	0	0	58	51	48
05:00	0	0	0	0	6	48	51	127	41	**8**	1	0	**1**	283	49	45
06:00	0	0	0	0	9	73	**362**	227	41	5	1	0	0	718	47	44
07:00	0	0	0	0	**13**	**118**	352	285	**61**	3	1	0	0	**833**	47	44
08:00	0	0	**3**	**3**	2	80	333	**294**	53	0	0	0	1	769	47	44
09:00	0	0	0	0	4	93	296	221	44	5	0	0	0	663	47	44
10:00	0	0	0	0	5	64	246	200	41	0	0	0	1	557	47	44
11:00	0	0	0	0	4	56	211	192	51	5	0	0	0	519	48	44
12 PM	0	0	0	1	4	66	**248**	**237**	42	0	0	0	0	**598**	47	44
13:00	0	0	0	0	5	72	237	218	**45**	3	0	0	0	580	48	44
14:00	0	0	0	0	2	63	228	200	39	**9**	**1**	0	0	542	48	44
15:00	0	0	0	0	12	86	213	136	19	4	0	0	0	470	47	43
16:00	0	0	**1**	0	19	121	205	118	14	5	0	0	0	483	46	42
17:00	1	0	0	0	18	**176**	224	102	18	2	0	0	0	541	46	41
18:00	**4**	**3**	1	0	**30**	106	170	117	16	4	1	0	0	452	47	41
19:00	0	0	0	0	4	38	112	84	14	6	1	0	0	259	47	44
20:00	0	0	0	0	7	37	84	68	14	1	0	0	0	211	47	43
21:00	0	0	0	0	10	34	49	49	15	1	0	**1**	0	159	48	43
22:00	0	0	0	**2**	6	14	24	15	9	1	0	0	0	71	48	42
23:00	0	0	0	1	5	13	9	7	0	0	0	0	0	35	45	39
Total	5	3	5	7	165	1364	3682	2945	606	69	7	1	3	8862		
%	0.1%	0.0%	0.1%	0.1%	1.9%	15.4%	41.5%	33.2%	6.8%	0.8%	0.1%	0.0%	0.0%			
AM Peak			08:00	08:00	07:00	07:00	06:00	08:00	07:00	05:00	02:00		05:00	07:00		
Vol.			3	3	13	118	362	294	61	8	1		1	833		
PM Peak	18:00	18:00	16:00	22:00	18:00	17:00	12:00	12:00	13:00	14:00	14:00	21:00		12:00		
Vol.	4	3	1	2	30	176	248	237	45	9	1	1		598		

Stats		
	15th Percentile :	38 MPH
	50th Percentile :	42 MPH
	85th Percentile :	47 MPH
	95th Percentile :	50 MPH
	Mean Speed(Average) :	43 MPH
	10 MPH Pace Speed :	40-49 MPH
	Number in Pace :	6627
	Percent in Pace :	74.8%
	Number of Vehicles > 45 MPH :	3042
	Percent of Vehicles > 45 MPH :	34.3%

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197134 A Speed
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/29/ 19	0	0	**1**	1	0	3	4	11	1	0	0	0	0	21	48	43
01:00	0	0	0	0	0	0	3	4	1	1	1	0	0	10	56	49
02:00	0	0	0	0	0	1	3	2	2	0	0	0	0	8	51	45
03:00	0	0	0	0	0	1	6	3	4	1	1	0	0	16	53	47
04:00	0	0	0	0	0	4	13	26	16	1	0	0	0	60	51	47
05:00	0	0	0	0	0	38	110	88	28	4	0	**2**	0	270	48	44
06:00	0	0	0	0	1	28	234	**369**	89	8	0	0	0	729	48	46
07:00	0	0	1	**11**	**7**	**62**	**333**	328	94	9	1	0	0	**846**	48	45
08:00	0	0	0	0	0	39	197	343	**130**	**16**	**3**	1	0	729	50	46
09:00	0	0	0	0	0	45	242	245	62	7	1	0	0	602	48	45
10:00	0	0	0	0	1	39	209	213	77	7	1	0	0	547	49	45
11:00	0	0	0	0	2	57	215	230	54	5	2	0	0	565	48	45
12 PM	0	0	0	0	1	67	213	211	67	16	1	0	0	576	48	45
13:00	0	0	0	**5**	**23**	**134**	194	193	42	6	0	0	0	**597**	47	43
14:00	0	0	0	0	5	73	**232**	182	63	10	0	**1**	0	566	48	44
15:00	0	0	0	0	2	21	170	**230**	85	8	1	0	0	517	49	46
16:00	0	0	0	0	1	46	126	228	84	**21**	2	0	**1**	509	50	46
17:00	**1**	0	**9**	5	13	41	154	219	**130**	15	1	0	0	588	51	45
18:00	0	0	0	0	0	24	153	198	77	6	2	0	0	460	50	46
19:00	0	0	0	1	2	23	129	149	52	5	2	0	0	363	49	45
20:00	0	0	0	0	2	25	109	90	26	3	0	0	0	255	48	44
21:00	0	0	0	0	0	13	67	78	21	4	**3**	0	0	186	49	46
22:00	0	0	0	0	0	10	22	33	28	4	0	0	0	97	52	47
23:00	0	0	0	0	0	2	10	22	10	2	2	0	1	49	52	48
Total	1	0	11	23	60	796	3148	3695	1243	159	24	4	2	9166		
%	0.0%	0.0%	0.1%	0.3%	0.7%	8.7%	34.3%	40.3%	13.6%	1.7%	0.3%	0.0%	0.0%			
AM Peak			00:00	07:00	07:00	07:00	07:00	06:00	08:00	08:00	08:00	05:00		07:00		
Vol.			1	11	7	62	333	369	130	16	3	2		846		
PM Peak	17:00		17:00	13:00	13:00	13:00	14:00	15:00	17:00	16:00	21:00	14:00	16:00	13:00		
Vol.	1		9	5	23	134	232	230	130	21	3	1	1	597		

Stats

15th Percentile :	39 MPH
50th Percentile :	44 MPH
85th Percentile :	49 MPH
95th Percentile :	52 MPH
Mean Speed(Average) :	45 MPH
10 MPH Pace Speed :	40-49 MPH
Number in Pace :	6843
Percent in Pace :	74.7%
Number of Vehicles > 45 MPH :	4388
Percent of Vehicles > 45 MPH :	47.9%

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197134 A Speed
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/28/ 19	0	0	0	0	0	1	13	9	7	1	0	0	0	31	51	46
01:00	0	0	0	0	0	4	3	7	3	0	0	0	0	17	49	45
02:00	0	0	0	0	0	0	2	6	2	0	0	0	0	10	50	47
03:00	0	0	0	0	1	3	6	8	4	0	0	0	0	22	49	45
04:00	0	0	0	0	0	2	8	11	5	1	0	0	0	27	50	46
05:00	0	0	0	0	0	9	32	49	15	3	2	0	0	110	50	46
06:00	0	**1**	0	**1**	0	12	89	124	56	2	**4**	0	**1**	290	50	46
07:00	0	0	0	0	1	25	119	**183**	**61**	**8**	1	**1**	0	399	49	46
08:00	0	1	**1**	1	12	61	169	156	32	6	1	0	0	440	48	44
09:00	**1**	0	0	0	7	36	147	164	35	8	0	1	0	399	48	45
10:00	0	0	0	0	2	63	**215**	160	33	5	0	0	0	478	47	44
11:00	0	0	0	0	**22**	**100**	200	158	29	3	0	0	0	**512**	47	43
12 PM	0	0	0	3	22	141	265	124	26	**4**	2	0	0	587	46	42
13:00	0	0	0	0	15	154	220	**173**	28	4	1	0	**1**	596	47	43
14:00	0	0	0	0	22	157	251	152	22	3	**3**	**1**	0	611	46	42
15:00	0	0	0	12	58	230	293	120	28	4	0	0	0	745	45	41
16:00	0	0	0	1	60	**282**	**303**	141	26	0	0	0	0	**813**	45	41
17:00	0	**2**	**6**	12	**114**	239	234	104	15	2	0	0	0	728	44	39
18:00	0	0	3	**15**	62	172	293	151	**36**	3	0	0	0	735	46	41
19:00	0	0	0	0	16	110	213	141	33	2	1	0	0	516	47	43
20:00	0	0	0	0	14	57	140	71	14	4	0	1	0	301	47	43
21:00	0	0	0	0	9	65	72	40	8	0	0	0	0	194	46	41
22:00	0	0	0	2	17	48	51	20	4	1	0	0	0	143	44	40
23:00	0	0	0	0	1	25	29	20	7	0	0	0	0	82	47	42
Total	1	4	10	47	455	1996	3367	2292	529	64	15	4	2	8786		
%	0.0%	0.0%	0.1%	0.5%	5.2%	22.7%	38.3%	26.1%	6.0%	0.7%	0.2%	0.0%	0.0%			
AM Peak	09:00	06:00	08:00	06:00	11:00	11:00	10:00	07:00	07:00	07:00	06:00	07:00	06:00	11:00		
Vol.	1	1	1	1	22	100	215	183	61	8	4	1	1	512		
PM Peak		17:00	17:00	18:00	17:00	16:00	16:00	13:00	18:00	12:00	14:00	14:00	13:00	16:00		
Vol.		2	6	15	114	282	303	173	36	4	3	1	1	813		

Stats		
	15th Percentile :	36 MPH
	50th Percentile :	41 MPH
	85th Percentile :	47 MPH
	95th Percentile :	50 MPH
	Mean Speed(Average) :	42 MPH
	10 MPH Pace Speed :	40-49 MPH
	Number in Pace :	5659
	Percent in Pace :	64.4%
	Number of Vehicles > 45 MPH :	2448
	Percent of Vehicles > 45 MPH :	27.9%

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197134 A Speed
Site Code: P2019
Date Start: 28-Aug-19
Date End: 29-Aug-19

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/29/19	0	0	0	0	0	2	16	6	3	0	1	0	0	28	48	44
01:00	0	0	0	0	0	1	6	5	2	0	0	0	0	14	48	45
02:00	0	0	0	0	0	4	5	4	1	0	1	0	0	15	48	44
03:00	0	0	0	0	0	3	5	6	2	1	0	0	0	17	50	45
04:00	0	0	0	0	0	1	13	14	2	2	0	0	0	32	48	46
05:00	0	0	0	0	1	13	45	42	5	1	0	0	0	107	47	44
06:00	0	0	0	0	3	22	97	85	39	13	**3**	0	0	262	51	46
07:00	0	0	0	0	4	26	153	146	49	**18**	2	**1**	0	399	50	45
08:00	0	0	0	**1**	13	44	178	151	**65**	17	3	1	0	473	50	45
09:00	0	0	0	1	10	100	176	137	35	2	3	0	**1**	465	47	43
10:00	0	0	0	0	2	69	214	150	37	5	0	0	0	477	48	44
11:00	0	0	0	1	**33**	**106**	**232**	**162**	35	5	2	1	0	**577**	47	43
12 PM	0	0	0	0	15	108	235	197	48	6	1	0	0	610	48	43
13:00	0	0	0	20	**83**	157	182	100	20	3	0	0	0	565	45	40
14:00	0	1	0	13	46	105	258	162	43	4	0	0	0	632	47	42
15:00	0	0	0	4	30	151	282	193	36	7	2	**1**	0	706	47	43
16:00	1	0	0	6	40	118	**343**	**228**	**68**	**11**	**4**	0	0	**819**	48	43
17:00	**14**	**16**	**37**	**36**	56	**164**	275	157	27	4	2	0	0	788	46	39
18:00	0	0	0	0	14	153	278	193	51	7	0	0	0	696	47	43
19:00	0	0	0	0	10	111	262	151	34	5	1	0	0	574	47	43
20:00	0	0	0	1	9	51	162	104	18	3	2	0	0	350	47	43
21:00	0	0	0	0	4	37	107	70	25	4	0	0	0	247	48	44
22:00	0	0	0	0	7	19	55	57	28	3	1	0	0	170	50	45
23:00	0	0	0	0	0	6	19	47	28	5	0	1	0	106	52	48
Total	15	17	37	83	380	1571	3598	2567	701	126	28	5	1	9129		
%	0.2%	0.2%	0.4%	0.9%	4.2%	17.2%	39.4%	28.1%	7.7%	1.4%	0.3%	0.1%	0.0%			
AM Peak				08:00	11:00	11:00	11:00	11:00	08:00	07:00	06:00	07:00	09:00	11:00		
Vol.				1	33	106	232	162	65	18	3	1	1	577		
PM Peak	17:00	17:00	17:00	17:00	13:00	17:00	16:00	16:00	16:00	16:00	16:00	15:00		16:00		
Vol.	14	16	37	36	83	164	343	228	68	11	4	1		819		

Stats		
	15th Percentile :	36 MPH
	50th Percentile :	42 MPH
	85th Percentile :	48 MPH
	95th Percentile :	51 MPH
	Mean Speed(Average) :	43 MPH
	10 MPH Pace Speed :	40-49 MPH
	Number in Pace :	6165
	Percent in Pace :	67.5%
	Number of Vehicles > 45 MPH :	2915
	Percent of Vehicles > 45 MPH :	31.9%

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
City, State: Wayland, MA
Client: TEC/ E. Oltman

PRECISION
D A T A
INDUSTRIES, LLC
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197134 A Volume
Site Code: P2019
Date Start: 08/28/19
Date End: 08/29/19

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		08/28/19 Wed	
12:00	3		164		11		134		14		298			
12:15	4		127		2		170		6		297			
12:30	3		148		8		128		11		276			
12:45	11	21	159	598	10	31	155	587	21	52	314	1185		
01:00	8		163		8		119		16		282			
01:15	1		160		3		165		4		325			
01:30	1		126		4		167		5		293			
01:45	1	11	131	580	2	17	145	596	3	28	276	1176		
02:00	3		167		3		153		6		320			
02:15	7		129		3		153		10		282			
02:30	1		137		2		140		3		277			
02:45	0	11	109	542	2	10	165	611	2	21	274	1153		
03:00	2		123		3		171		5		294			
03:15	10		121		7		185		17		306			
03:30	3		96		6		181		9		277			
03:45	3	18	130	470	6	22	208	745	9	40	338	1215		
04:00	6		114		5		197		11		311			
04:15	11		102		2		209		13		311			
04:30	18		122		10		179		28		301			
04:45	23	58	145	483	10	27	228	813	33	85	373	1296		
05:00	29		135		12		175		41		310			
05:15	38		148		33		189		71		337			
05:30	100		130		32		165		132		295			
05:45	116	283	128	541	33	110	199	728	149	393	327	1269		
06:00	163		139		48		174		211		313			
06:15	196		115		71		185		267		300			
06:30	176		100		72		181		248		281			
06:45	183	718	98	452	99	290	195	735	282	1008	293	1187		
07:00	202		72		81		180		283		252			
07:15	221		66		104		125		325		191			
07:30	223		68		93		110		316		178			
07:45	187	833	53	259	121	399	101	516	308	1232	154	775		
08:00	212		79		101		76		313		155			
08:15	168		47		110		77		278		124			
08:30	190		44		94		72		284		116			
08:45	199	769	41	211	135	440	76	301	334	1209	117	512		
09:00	183		43		107		58		290		101			
09:15	187		40		94		45		281		85			
09:30	157		44		98		53		255		97			
09:45	136	663	32	159	100	399	38	194	236	1062	70	353		
10:00	140		22		103		36		243		58			
10:15	139		16		125		35		264		51			
10:30	147		14		124		42		271		56			
10:45	131	557	19	71	126	478	30	143	257	1035	49	214		
11:00	121		13		128		27		249		40			
11:15	157		5		117		27		274		32			
11:30	131		9		140		19		271		28			
11:45	110	519	8	35	127	512	9	82	237	1031	17	117		
Total	4461		4401		2735		6051		7196		10452			
Percent	62.0%		42.1%		38.0%		57.9%							
Day Total		8862				8786				17648				
Peak	07:15	-	00:30	-	11:00	-	04:00	-	07:15	-	04:30	-	-	-
Vol.	843	-	630	-	512	-	813	-	1262	-	1321	-	-	-
P.H.F.	0.945		0.966		0.914		0.891		0.971		0.885			

Boston Post Road (Route 20)
east of 484 Boston Post Road site Driveway
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197134 A Volume
Site Code: P2019
Date Start: 08/28/19
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Start	EB				WB				Combined				08/29/19	
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu	
12:00	4		152		10		136		14		288			
12:15	4		136		8		152		12		288			
12:30	5		140		5		161		10		301			
12:45	8	21	148	576	5	28	161	610	13	49	309	1186		
01:00	0		145		2		138		2		283			
01:15	3		149		4		145		7		294			
01:30	3		159		3		144		6		303			
01:45	4	10	144	597	5	14	138	565	9	24	282	1162		
02:00	4		147		3		163		7		310			
02:15	3		134		7		173		10		307			
02:30	1		152		3		127		4		279			
02:45	0	8	133	566	2	15	169	632	2	23	302	1198		
03:00	4		134		0		172		4		306			
03:15	5		133		2		182		7		315			
03:30	3		131		5		185		8		316			
03:45	4	16	119	517	10	17	167	706	14	33	286	1223		
04:00	5		140		6		205		11		345			
04:15	8		99		7		204		15		303			
04:30	19		129		7		188		26		317			
04:45	28	60	141	509	12	32	222	819	40	92	363	1328		
05:00	28		174		11		188		39		362			
05:15	45		153		19		230		64		383			
05:30	69		137		43		181		112		318			
05:45	128	270	124	588	34	107	189	788	162	377	313	1376		
06:00	167		118		48		145		215		263			
06:15	205		116		37		204		242		320			
06:30	171		118		82		171		253		289			
06:45	186	729	108	460	95	262	176	696	281	991	284	1156		
07:00	200		111		82		155		282		266			
07:15	237		93		98		161		335		254			
07:30	216		74		113		139		329		213			
07:45	193	846	85	363	106	399	119	574	299	1245	204	937		
08:00	168		74		128		90		296		164			
08:15	170		66		110		104		280		170			
08:30	194		61		101		70		295		131			
08:45	197	729	54	255	134	473	86	350	331	1202	140	605		
09:00	179		54		118		82		297		136			
09:15	138		48		123		60		261		108			
09:30	140		41		124		56		264		97			
09:45	145	602	43	186	100	465	49	247	245	1067	92	433		
10:00	128		29		111		48		239		77			
10:15	136		26		106		38		242		64			
10:30	139		21		136		52		275		73			
10:45	144	547	21	97	124	477	32	170	268	1024	53	267		
11:00	119		11		143		41		262		52			
11:15	135		23		145		31		280		54			
11:30	167		8		130		18		297		26			
11:45	144	565	7	49	159	577	16	106	303	1142	23	155		
Total	4403		4763		2866		6263		7269		11026			
Percent	60.6%		43.2%		39.4%		56.8%							
Day Total		9166				9129				18295				
Peak	07:00	-	04:45	-	11:00	-	04:30	-	07:15	-	04:45	-	-	-
Vol.	846	-	605	-	577	-	828	-	1259	-	1426	-	-	-
P.H.F.	0.892		0.869		0.907		0.900		0.940		0.931			

<u>Attachment C</u>

Seasonal Adjustment Data

Massachusetts Highway Department
Statewide Traffic Data Collection
2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
R4-R7	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
U1-Boston	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
U1-Essex	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
U1-Southeast	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
U1-West	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
U1-Worcester	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
U2	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
U3	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
U4-U7	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
Rec - East	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

Attachment D

Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wayland COUNT DATE : Aug-19

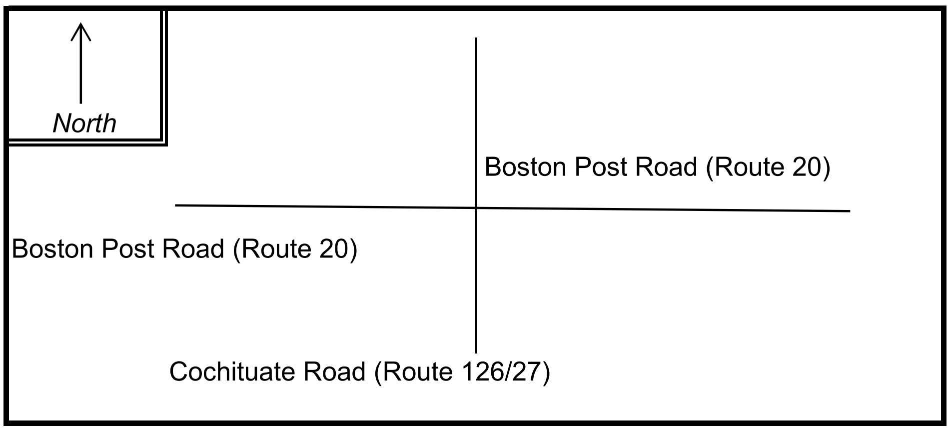
DISTRICT : 3 UNSIGNALIZED : NO SIGNALIZED : YES

~ INTERSECTION DATA ~

MAJOR STREET : Boston Post Road (Route 20)

MINOR STREET(S) : Cochituate Road (Route 126/27)

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	613	815	649	670		2,747

" K " FACTOR : **0.078** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **35,263**

TOTAL # OF CRASHES : 42 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **14.00**

CRASH RATE CALCULATION : **1.09** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : "K" Factor from Boston Post Road ATR

Project Title & Date: T0923 - Alta at River's Edge

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wayland COUNT DATE : Aug-19

DISTRICT : 3 UNSIGNALIZED : **YES** SIGNALIZED : NO

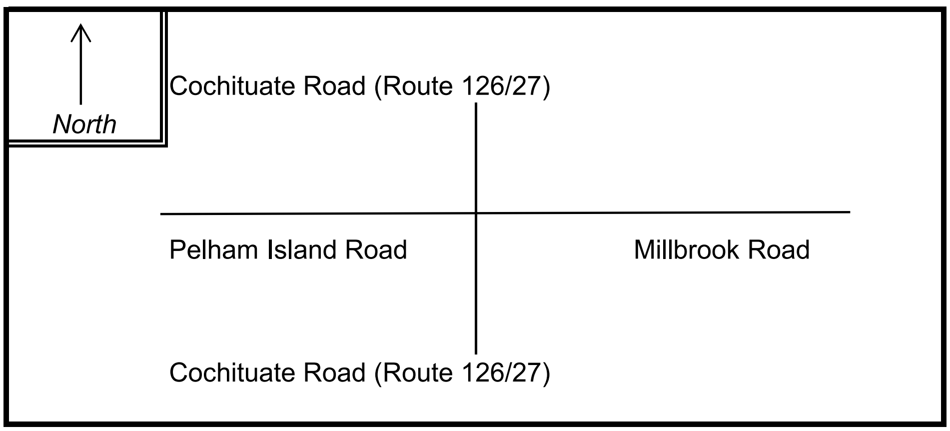
~ INTERSECTION DATA ~

MAJOR STREET : Cochituate Road (Route 126/27)

MINOR STREET(S) : Millbrook Road

Pelham Island Road

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	0	87	860	814		1,761

" K " FACTOR : **0.078** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **22,606**

TOTAL # OF CRASHES : 23 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **7.67**

CRASH RATE CALCULATION : **0.93** RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : "K" Factor from Boston Post Road ATR

Project Title & Date: T0923 - Alta at River's Edge

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wayland   COUNT DATE : Aug-19

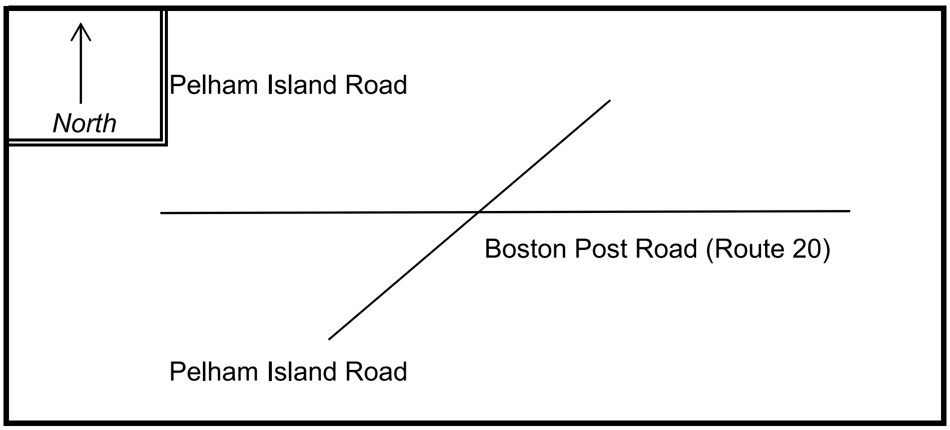
DISTRICT : 3   UNSIGNALIZED : **YES**   SIGNALIZED : NO

~ INTERSECTION DATA ~

MAJOR STREET : Boston Post Road (Route 20)

MINOR STREET(S) : Pelham Island Road

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	559	686	35	197		**1,477**

" K " FACTOR : **0.078**   INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **18,960**

TOTAL # OF CRASHES : 7   # OF YEARS : 3   AVERAGE # OF CRASHES PER YEAR (**A**) : **2.33**

CRASH RATE CALCULATION : **0.34** $\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : "K" Factor from Boston Post Road ATR

Project Title & Date: T0923 - Alta at River's Edge

Crash History
Cochituate Road / Pelham Island Road / Millbrook Road
01/01/2015 - 12/31/2017

City Town Name	Crash Date	Crash Severity	Crash Time	# of Vehicles	Driver Contributing	Light Conditions	Manner of Collision	Road Surface	Weather Conditions
WAYLAND	05/12/2015	Property damage only	4:51 PM	2	D1: (No improper driving) / D2: (Inattention),(Failure to keep in proper lane or running off road)	Daylight	Sideswipe, same direction	Dry	Cloudy
WAYLAND	06/11/2015	Property damage only	5:48 PM	2		Daylight	Angle	Dry	Clear
WAYLAND	06/28/2015	Property damage only	11:03 PM	1	D1: (Failure to keep in proper lane or running off road)	Dark - lighted roadway	Single vehicle crash	Wet	Clear
WAYLAND	06/19/2015	Non-fatal injury	11:39 AM	2	D1: (Illness)	Daylight	Rear-end	Dry	Clear
WAYLAND	10/09/2015	Property damage only	8:48 AM	1	D1: (No improper driving)	Daylight	Sideswipe, opposite direction	Dry	Clear/Clear
WAYLAND	10/29/2015	Property damage only	9:50 AM	1	D1: (No improper driving)	Daylight	Angle	Wet	Rain
WAYLAND	12/01/2015	Property damage only	9:56 AM	2	D2: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	11/08/2015	Property damage only	12:39 PM	2	D1: (Inattention)	Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	01/09/2016	Property damage only	9:31 AM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Wet	Rain
WAYLAND	01/05/2016	Property damage only	1:44 PM	2	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Dry	Clear
WAYLAND	03/09/2016	Property damage only	2:45 PM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Dry	Clear
WAYLAND	03/08/2016	Property damage only	3:14 PM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Dry	Clear
WAYLAND	07/11/2016	Property damage only	3:19 PM	3	D1: (No improper driving) / D2: (No improper driving) / D3: (Followed too closely)	Daylight	Rear-end	Dry	Cloudy
WAYLAND	10/06/2016	Property damage only	6:54 PM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Dark - lighted roadway	Angle	Dry	Clear
WAYLAND	11/21/2016	Property damage only	2:23 PM	2	D1: (Visibility obstructed) / D2: (No improper driving)	Daylight	Angle	Dry	Clear
WAYLAND	03/24/2017	Property damage only	4:36 PM	2	D1: (Unknown) / D2: (No improper driving),(No improper driving)	Daylight	Angle	Wet	Cloudy/Cloudy
WAYLAND	05/04/2017	Property damage only	3:40 PM	2	D1: (No improper driving) / D2: (Unknown)	Daylight	Angle	Dry	Clear/Clear
WAYLAND	05/18/2017	Property damage only	12:37 PM	2	D1: (No improper driving),(No improper driving) / D2: (No improper driving),(No improper driving)	Daylight	Angle	Dry	Clear/Other
WAYLAND	09/27/2017	Non-fatal injury	5:47 PM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Sideswipe, opposite direction	Dry	Clear/Clear
WAYLAND	09/24/2017	Property damage only	12:50 PM	2	D1: (No improper driving) / D2: (Visibility obstructed)	Daylight	Angle	Dry	Clear
WAYLAND	12/14/2017	Property damage only	8:13 AM	1	D1: (No improper driving)	Dark - lighted roadway	Single vehicle crash	Dry	Clear
WAYLAND	07/26/2017	Property damage only	12:27 PM	2	D1: (No improper driving) / D2: (Visibility obstructed),(Disregarded traffic signs, signals, road markings)	Daylight	Angle	Dry	Clear
WAYLAND	07/10/2017	Non-fatal injury	5:01 PM	2	D1: (Exceeded authorized speed limit) / D2: (No improper driving),(No improper driving)	Daylight	Angle	Dry	Clear/Clear

Crash History
Boston Post Road / Cochituate Road
01/01/2015 - 12/31/2017

City Town Name	Crash Date	Crash Severity	Crash Time	# of Vehicles	Driver Contributing	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions
WAYLAND	01/17/2015	Non-fatal injury	7:31 PM	2	D1: (No improper driving),(No improper driving) / D2: (Followed too closely),(Failed to yield right of way)	Dark - lighted roadway	Single vehicle crash	Snow	Clear/Clear
WAYLAND	01/26/2015	Property damage only	1:12 PM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	Cloudy
WAYLAND	02/20/2015	Property damage only	12:45 PM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	03/24/2015	Property damage only	10:21 AM	3		Daylight	Rear-end	Dry	Clear
WAYLAND	03/24/2015	Property damage only	11:19 AM	2	D1: (Failed to yield right of way) / D2: (Unknown)	Daylight	Angle	Dry	Clear
WAYLAND	03/23/2015	Property damage only	7:01 PM	2	D1: (No improper driving) / D2: (Inattention),(Distracted)	Dark - lighted roadway	Rear-end	Dry	Clear
WAYLAND	05/22/2015	Property damage only	8:40 AM	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	05/20/2015	Property damage only	10:38 AM	3	D1: (Inattention) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Rear-end	Not reported	Clear
WAYLAND	04/19/2015	Property damage only	4:49 PM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	06/04/2015	Property damage only	2:31 PM	2		Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	06/04/2015	Property damage only	3:20 PM	2	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Rear-end	Dry	Clear
WAYLAND	08/24/2015	Property damage only	7:44 AM	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	09/15/2015	Non-fatal injury	1:22 PM	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	09/26/2015	Non-fatal injury	5:09 PM	2	D1: (No improper driving),(No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Dry	Clear
WAYLAND	09/16/2015	Property damage only	3:07 PM	2	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Rear-end	Dry	Clear
WAYLAND	08/04/2015	Property damage only	7:24 PM	2	D1: (No improper driving),(No improper driving) / D2: (Other improper action)	Daylight	Rear-end	Dry	Clear
WAYLAND	12/01/2015	Property damage only	4:37 PM	2	D1: (No improper driving),(No improper driving) / D2: (Followed too closely),(Inattention)	Dark - lighted roadway	Rear-end	Dry	Clear/Cloudy
WAYLAND	11/29/2015	Non-fatal injury	12:39 AM	1	D1: (Exceeded authorized speed limit),(Over-correcting/over-steering)	Dark - lighted roadway	Single vehicle crash	Wet	Cloudy
WAYLAND	02/06/2016	Property damage only	9:06 AM	2		Daylight	Rear-end	Wet	Clear
WAYLAND	04/18/2016	Property damage only	6:57 AM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	04/07/2016	Property damage only	3:47 PM	2	D1: (Disregarded traffic signs, signals, road markings) / D2: (No improper driving)	Daylight	Angle	Wet	Rain
WAYLAND	06/05/2016	Property damage only	10:59 AM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Wet	Rain
WAYLAND	07/28/2016	Unknown	3:55 PM	1	D1: (Operating vehicle in erratic, reckless, careless, negligent or aggressive manner),(Failure to keep in proper lane or running off road)	Dark - lighted roadway	Single vehicle crash	Dry	Clear/Other
WAYLAND	08/22/2016	Property damage only	9:49 AM	2	D2: (No improper driving)	Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	08/05/2016	Property damage only	7:04 AM	3	D1: (Followed too closely) / D3: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	09/30/2016	Property damage only	5:26 PM	2	D1: (Over-correcting/over-steering),(Failure to keep in proper lane or running off road) / D2: (No improper driving)	Dusk	Sideswipe, opposite direction	Wet	Rain/Cloudy
WAYLAND	09/30/2016	Property damage only	5:36 PM	2	D1: (Inattention) / D2: (No improper driving)	Dusk	Unknown	Wet	Rain/Cloudy
WAYLAND	10/10/2016	Property damage only	3:01 PM	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	Cloudy
WAYLAND	10/26/2016	Non-fatal injury	5:53 PM	2	D1: (Inattention) / D2: (No improper driving)	Dusk	Rear-end	Dry	Clear
WAYLAND	10/25/2016	Property damage only	7:20 AM	2	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Dry	Clear

Crash History
Boston Post Road / Cochituate Road
01/01/2015 - 12/31/2017

City Town Name	Crash Date	Crash Severity	Crash Time	# of Vehicles	Driver Contributing	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions
WAYLAND	11/17/2016	Property damage only	5:45 PM	2	D1: (Inattention) / D2: (No improper driving)	Dusk	Rear-end	Dry	Clear
WAYLAND	11/08/2016	Property damage only	10:53 AM	3	D1: (No improper driving) / D2: (No improper driving) / D3: (Followed too closely),(Inattention)	Daylight	Rear-end	Dry	Clear
WAYLAND	02/28/2017	Property damage only	10:17 AM	3	D1: (Other improper action) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	06/16/2017	Property damage only	8:12 AM	2	D1: (No improper driving),(No improper driving) / D2: (Other improper action)	Daylight	Angle	Dry	Clear/Clear
WAYLAND	06/22/2017	Property damage only	3:24 PM	2	D1: (Failure to keep in proper lane or running off road) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Dry	Clear
WAYLAND	09/26/2017	Property damage only	5:10 AM	2	D1: (Inattention) / D2: (No improper driving)	Dark - lighted roadway	Angle	Dry	Clear
WAYLAND	10/22/2017	Property damage only	1:27 PM	2	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Rear-end	Dry	Clear
WAYLAND	10/16/2017	Non-fatal injury	8:27 AM	2	D1: (No improper driving) / D2: (Inattention)	Daylight	Rear-end	Dry	Cloudy
WAYLAND	11/16/2017	Property damage only	1:11 PM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Wet	Rain
WAYLAND	11/11/2017	Property damage only	4:04 PM	2	D1: (No improper driving) / D2: (Followed too closely)	Dusk	Rear-end	Dry	Clear
WAYLAND	11/05/2017	Property damage only	2:37 PM	3	D1: (Distracted),(Followed too closely) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Rear-end	Dry	Clear
WAYLAND	12/09/2017	Property damage only	7:58 PM	3	D1: (No improper driving),(No improper driving) / D2: (No improper driving),(No improper driving) / D3: (Driving too fast for conditions)	Dark - lighted roadway	Rear-end	Snow	Snow/Snow

Crash History
Boston Post Road / Pelham Island Road
01/01/2015 - 12/31/2017

City Town Name	Crash Date	Crash Severity	Crash Time	# of Vehicles	Driver Contributing	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions
WAYLAND	09/04/2015	Non-fatal injury	7:35 AM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	Clear/Clear
WAYLAND	12/07/2016	Property damage only	5:10 PM	2	D1: (No improper driving) / D2: (Followed too closely),(Inattention)	Dark - lighted roadway	Rear-end	Dry	Cloudy
WAYLAND	01/05/2017	Property damage only	4:14 PM	2	D1: (No improper driving),(No improper driving) / D2: (No improper driving),(No improper driving)	Daylight	Sideswipe, same direction	Dry	Cloudy/Other
WAYLAND	01/02/2017	Property damage only	3:55 PM	2	D1: (No improper driving),(No improper driving) / D2: (No improper driving),(No improper driving)	Dusk	Sideswipe, same direction	Dry	Clear/Clear
WAYLAND	03/29/2017	Property damage only	5:59 PM	2	D1: (Inattention) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Dry	Clear
WAYLAND	04/27/2017	Property damage only	7:37 AM	3	D1: (Followed too closely) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Rear-end	Wet	Cloudy
WAYLAND	10/18/2017	Property damage only	7:07 AM	2	D1: (Unknown)	Daylight	Sideswipe, same direction	Dry	Clear

Attachment E

General Background Growth

Average Daily Traffic Summary Table

Project: Alta at River's Edge - Wayland, Massachusetts
Date: September 5, 2019
Analyst: TEC, Inc. / Justin Wadsworth
Source: MassDOT Temporary Count Stations

STA.	TOWN	ROUTE/STREET	LOCATION	2016	2017	2018	Amb. Growth
4003	CONCORD	RTE. 62	AT ACTON T.L.	12595	11945	12372	-0.79%
4924	FRAMINGHAM	RTE. 135	EAST OF RTE. 126	14393	14551	14755	1.25%
6726	NEWTON	RTE. 16	WEST OF RTE. I-95	21259	21493	21482	0.52%
							0.33%

Assume 0.50% Ambient Growth.

Attachment F

Site Trip Generation

Trip Generation Estimate

Project:	T0923 - Alta at Rivers Edge - Wayland, MA
Date:	September 17, 2019
Analyst:	TEC, Inc. / Justin Wadsworth
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 221 Multifamily Housing (Mid-Rise)

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	153
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 5.44 * (X)
T = 5.44 * 153
T = **832** vehicle trips
with 50% entering (416 vpd) and with 50% exiting (416 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.36 * (X)
T = 0.36 * 153
T = **56** vehicle trips
with 26% entering (15 vpd) and with 74% exiting (41 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.44 * (X)
T = 0.44 * 153
T = **68** vehicle trips
with 61% entering (41 vpd) and with 39% exiting (27 vpd)

AVERAGE SATURDAY DAILY

T = 4.91 * (X)
T = 4.91 * 153
T = **752** vehicle trips
with 50% entering (376 vpd) and with 50% exiting (376 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.44 * (X)
T = 0.44 * 153
T = **68** vehicle trips
with 49% entering (33 vpd) and with 51% exiting (35 vpd)

TEC
The Engineering Corp

Trip Generation Estimate

Project:	T0923 - Alta at Rivers Edge - Wayland, MA
Date:	September 17, 2019
Analyst:	TEC, Inc. / Justin Wadsworth
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 221 Multifamily Housing (Mid-Rise)

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	153
Curve Method:	Fitted

Average Weekday Daily

T =	5.45	*	(X)	+	-1.75					
T =	5.45	*	153	+	-1.75					
T =	**832**	vehicle trips								
with	50%	entering (	416	vpd) and with	50%	exiting (	416	vpd)		

Weekday Morning Peak Hour

Ln(T) =	0.98	*	Ln(X)	+	-0.98			
Ln(T) =	0.98	*	5.03	+	-0.98			
T =	**52**	vehicle trips						
with	26%	entering (	14	vpd) and with	74%	exiting (	38	vpd)

Weekday Evening Peak Hour

Ln(T) =	0.96	*	Ln(X)	+	-0.63			
Ln(T) =	0.96	*	5.03	+	-0.63			
T =	**67**	vehicle trips						
with	61%	entering (	41	vpd) and with	39%	exiting (	26	vpd)

Average Saturday Daily

T =	3.04	*	(X)	+	417.11			
T =	3.04	*	153	+	417.11			
T =	**882**	vehicle trips						
with	50%	entering (	441	vpd) and with	50%	exiting (	441	vpd)

Saturday Midday Peak Hour

T =	0.42	*	(X)	+	6.73			
T =	0.42	*	153	+	6.73			
T =	**71**	vehicle trips						
with	49%	entering (	35	vpd) and with	51%	exiting (	36	vpd)

TEC
The Engineering Corp

Trip Generation Estimate

Project:	Alta at Rivers Edge - Wayland, MA
Date:	September 17, 2019
Analyst:	TEC, Inc. / Justin Wadsworth
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 252 Senior Adult Housing - Attached

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	65
Curve Method:	Average

AVERAGE WEEKDAY DAILY

T = 3.70 * (X)
T = 3.70 * 65.00
T = **240** vehicle trips
with 50% entering (120 vpd) and with 50% exiting (120 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.20 * (X)
T = 0.20 * 65.00
T = **14** vehicle trips
with 35% entering (5 vpd) and with 65% exiting (9 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.26 * (X)
T = 0.26 * 65.00
T = **16** vehicle trips
with 55% entering (9 vpd) and with 45% exiting (7 vpd)

AVERAGE SATURDAY DAILY

T = 3.23 * (X)
T = 3.23 * 65.00
T = **210** vehicle trips
with 50% entering (105 vpd) and with 50% exiting (105 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.33 * (X)
T = 0.33 * 65.00
T = **22** vehicle trips
with 62% entering (14 vpd) and with 38% exiting (8 vpd)

AVERAGE SUNDAY DAILY

T = 3.14 * (X)
T = 3.14 * 65.00
T = **204** vehicle trips
with 50% entering (102 vpd) and with 50% exiting (102 vpd)

SUNDAY MIDDAY PEAK HOUR

T = 0.36 * (X)
T = 0.36 * 65.00
T = **24** vehicle trips
with 64% entering (15 vpd) and with 36% exiting (9 vpd)

Trip Generation Estimate

Project:	Alta at Rivers Edge - Wayland, MA
Date:	September 17, 2019
Analyst:	TEC, Inc. / Justin Wadsworth
Source:	Institute of Transportation Engineers - Trip Generation, 10th Edition

ITE Land Use Code (LUC): 252 Senior Adult Housing - Attached

Average Vehicle Trips Ends vs:	Dwelling Units
Independent Variable (X):	65
Curve Method:	Fitted

AVERAGE WEEKDAY DAILY

T = 4.02 * (X) + -25.37
T = 4.02 * 65.00 + -25.37
T = **236** vehicle trips
with 50% entering (118 vpd) and with 50% exiting (118 vpd)

WEEKDAY MORNING PEAK HOUR

T = 0.20 * (X) + -0.18
T = 0.20 * 65.00 + -0.18
T = **12** vehicle trips
with 35% entering (4 vpd) and with 65% exiting (8 vpd)

WEEKDAY EVENING PEAK HOUR

T = 0.24 * (X) + 2.26
T = 0.24 * 65.00 + 2.26
T = **18** vehicle trips
with 55% entering (10 vpd) and with 45% exiting (8 vpd)

AVERAGE SATURDAY DAILY

T = 3.97 * (X) + -60.09
T = 3.97 * 65.00 + -60.09
T = **198** vehicle trips
with 50% entering (99 vpd) and with 50% exiting (99 vpd)

SATURDAY MIDDAY PEAK HOUR

T = 0.35 * (X) + -1.67
T = 0.35 * 65.00 + -1.67
T = **22** vehicle trips
with 62% entering (14 vpd) and with 38% exiting (8 vpd)

AVERAGE SUNDAY DAILY

T = 3.50 * (X) + -29.08
T = 3.50 * 65.00 + -29.08
T = **198** vehicle trips
with 50% entering (99 vpd) and with 50% exiting (99 vpd)

SUNDAY MIDDAY PEAK HOUR

T = 0.30 * (X) + 5.02
T = 0.30 * 65.00 + 5.02
T = **24** vehicle trips
with 64% entering (15 vpd) and with 36% exiting (9 vpd)

Attachment G

Site Trip Distribution

Trip Distribution Gravity Model

Project: T0923 - Alta at Rivers Edge - Wayland, MA
Date: September 5, 2019
Analyst: TEC, Inc. / Justin Wadsworth
Source: United States Census Bureau, 5-Year ACS, 2009-2013

					Major Route Entering / Exiting						Major Route Entering / Exiting					
Residence State-County-MCD Name	**Workplace-County-MCD Name**	**Count**	**% of Total Wayland Workers**	**% of Distributed Workforce**	Route 20 (West)	Route 20 (East)	Route 27/126 (South)	Route 27/126 (North)	Millbrook Road	Check	Route 20 (West)	Route 20 (East)	Route 27/126 (South)	Route 27/126 (North)	Millbrook Road	Check
Wayland Town Middlesex Co. MA	Wayland Town Middlesex Co. MA	1,432	23.49%	25.92%	10%	10%	50%	20%	10%	100%	3%	3%	13%	5%	3%	26%
Wayland Town Middlesex Co. MA	Boston City Suffolk Co. MA	996	16.34%	18.03%		100%				100%	0%	18%	0%	0%	0%	18%
Wayland Town Middlesex Co. MA	Framingham Town Middlesex Co. MA	479	7.86%	8.67%	50%		50%			100%	4%	0%	4%	0%	0%	9%
Wayland Town Middlesex Co. MA	Natick Town Middlesex Co. MA	336	5.51%	6.08%			100%			100%	0%	0%	6%	0%	0%	6%
Wayland Town Middlesex Co. MA	Waltham Town Middlesex Co. MA	295	4.84%	5.34%		100%				100%	0%	5%	0%	0%	0%	5%
Wayland Town Middlesex Co. MA	Newton City Middlesex Co. MA	279	4.58%	5.05%		100%				100%	0%	5%	0%	0%	0%	5%
Wayland Town Middlesex Co. MA	Cambridge City Middlesex Co. MA	246	4.04%	4.45%		100%				100%	0%	4%	0%	0%	0%	4%
Wayland Town Middlesex Co. MA	Wellesley Town Norfolk Co. MA	185	3.03%	3.35%		50%	50%			100%	0%	2%	2%	0%	0%	3%
Wayland Town Middlesex Co. MA	Sudbury Town Middlesex Co. MA	149	2.44%	2.70%	100%					100%	3%	0%	0%	0%	0%	3%
Wayland Town Middlesex Co. MA	Worcester City Worcester Co. MA	141	2.31%	2.55%	25%		50%	25%		100%	1%	0%	1%	1%	0%	3%
Wayland Town Middlesex Co. MA	Marlborough City Middlesex Co. MA	138	2.26%	2.50%	100%					100%	2%	0%	0%	0%	0%	2%
Wayland Town Middlesex Co. MA	Lexington Town Middlesex Co. MA	100	1.64%	1.81%		100%				100%	0%	2%	0%	0%	0%	2%
Wayland Town Middlesex Co. MA	Weston Town Middlesex Co. MA	92	1.51%	1.67%		50%	25%	25%		100%	0%	1%	0%	0%	0%	2%
Wayland Town Middlesex Co. MA	Watertown City Middlesex Co. MA	86	1.41%	1.56%		100%				100%	0%	2%	0%	0%	0%	2%
Wayland Town Middlesex Co. MA	Malden City Middlesex Co. MA	81	1.33%	1.47%		100%				100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Needham Town Norfolk Co. MA	66	1.08%	1.19%		100%				100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Southborough Town Worcester Co. MA	62	1.02%	1.12%	75%		25%			100%	1%	0%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Burlington Town Middlesex Co. MA	61	1.00%	1.10%		100%				100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Hopkinton Town Middlesex Co. MA	59	0.97%	1.07%	50%		50%			100%	1%	0%	1%	0%	0%	1%
Wayland Town Middlesex Co. MA	Brookline Town Norfolk Co. MA	58	0.95%	1.05%		100%				100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Norwood Town Norfolk Co. MA	57	0.94%	1.03%		100%				100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Bedford Town Middlesex Co. MA	48	0.79%	0.87%		67%		33%		100%	0%	1%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Westborough Town Worcester Co. MA	40	0.66%	0.72%	50%		50%			100%	0%	0%	0%	0%	0%	1%
Wayland Town Middlesex Co. MA	Andover Town Essex Co. MA	38	0.62%	0.69%		75%		25%		100%	0%	1%	0%	0%	0%	1%
TOTAL		**6096**	**90.62%**	**100.00%**							**14.5%**	**48.3%**	**27.9%**	**6.7%**	**2.6%**	**100.0%**
										Say	**15%**	**48%**	**28%**	**7%**	**2%**	**100%**

Attachment H

Left-Turn Lane Warrants

Left-Turn Lane Volume Warrants

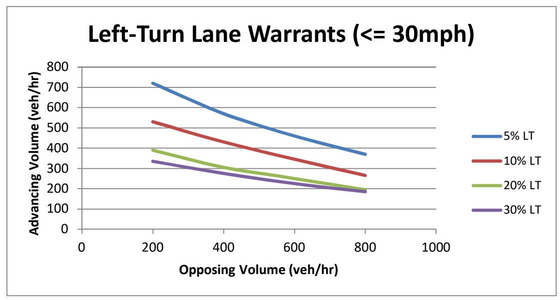
Project: T0923 - Alta at River's Edge - Wayland, MA
Date: September 9, 2019
Analyst: TEC Inc. / Justin Wadsworth

Roadway Speed = 45

Operating Speed	Opposing Volume	Advancing Motor Vehicle Volumes (veh/hr) 5% LT	10% LT	20% LT	30% LT
30 mph or less	800	370	265	195	185
	600	460	345	250	225
	400	570	430	305	275
	200	720	530	390	335
40 mph	800	330	240	180	160
	600	410	305	225	200
	400	510	380	275	245
	200	640	470	350	305
	100	720	515	390	340
50 mph	800	280	210	165	135
	600	350	260	195	170
	400	430	320	240	210
	200	550	400	300	270
	100	615	445	335	295
60 mph	800	230	170	125	115
	600	290	210	160	140
	400	365	270	200	175
	200	450	330	250	215
	100	505	370	275	240

Boston Post Road (Route 20) @ Site Driveway
2027 FUTURE YEAR DATA INPUT

Time	Advancing Route 20 EB LT	Route 20 EB	% Left Turns	Opposing Route 20 WB	Warranted
6-7 AM			#DIV/0!		#DIV/0!
7-8 AM	5	877	0.6%	441	**NO**
8-9 AM			#DIV/0!		#DIV/0!
9-10 AM			#DIV/0!		#DIV/0!
10-11 AM			#DIV/0!		#DIV/0!
11-12 PM			#DIV/0!		#DIV/0!
12-1 PM			#DIV/0!		#DIV/0!
1-2 PM			#DIV/0!		#DIV/0!
2-3 PM			#DIV/0!		#DIV/0!
3-4 PM			#DIV/0!		#DIV/0!
4-5 PM	7	586	1.2%	809	**NO**
5-6 PM			#DIV/0!		#DIV/0!



5% LT y = 0.0004x^2 - 0.955x + 895
10% LT y = 0.0001x^2 - 0.565x + 637.5
20% LT y = 0.0002x^2 - 0.5075x + 482.5
30% LT y = 0.0001x^2 - 0.375x + 405

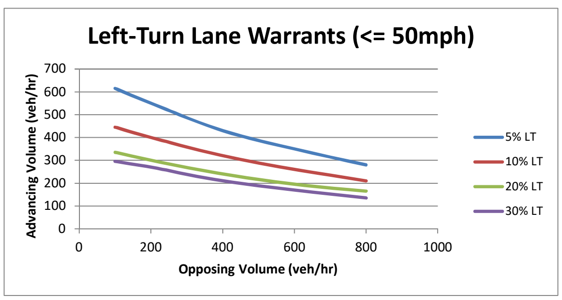
Signalized Intersections:

Left-Turn Lane Configuration	Minimum Turn Volume
Single exclusive left-turn lane	100 veh/hr
Dual exclusive left-turn lane	300 veh/hr

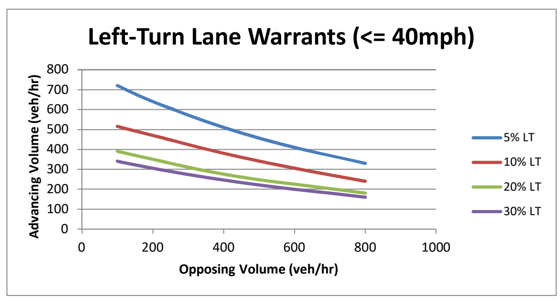
Source: Massachusetts Highway Department Design Manual, 2006 Edition, Exhibit 6-23
Source: AASHTO A Policy on Geometric Design of Highways and Streets, 2011 6th Edition, Table 9-23

Boston Post Road (Route 20) @ Site Driveway

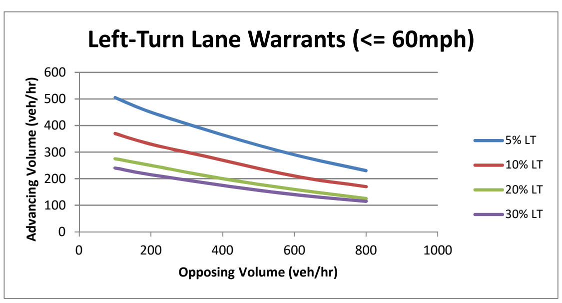
Left-Turn Lane Warranted? Signalized **NO**
Unsignalized **NO**



5% LT y = 0.0003x^2 - 0.7581x + 687.65
10% LT y = 0.0002x^2 - 0.5068x + 493.54
20% LT y = 0.0002x^2 - 0.4095x + 374.26
30% LT y = 0.0001x^2 - 0.3425x + 329.9



5% LT y = 0.0003x^2 - 0.8622x + 800.98
10% LT y = 0.0001x^2 - 0.5196x +566.57
20% LT y = 0.0002x^2 - 0.4669x + 434.85
30% LT y = 0.0001x^2 - 0.3784x + 375.77



5% LT y = 0002x^2 -0.5581x + 557.15
10% LT y = 0001x^2 - 0.4108x + 408.87
20% LT y = 00008x^2 - 0.2912x + 303.8
30% LT y = 0001x^2 - 0.2682x + 265.46

Roadway Speeds
20
25
30
35
40
45
50
55
60
65

<u>Attachment I</u>

Capacity and Queue Analysis

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	843	424	3	2	3
Future Volume (vph)	2	843	424	3	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.94	0.94	0.86	0.86	0.42	0.42
Heavy Vehicles (%)	100%	6%	5%	100%	50%	100%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection						
Int Delay, s/veh	0.2					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	843	424	3	2	3
Future Vol, veh/h	2	843	424	3	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	86	86	42	42
Heavy Vehicles, %	100	6	5	100	50	100
Mvmt Flow	2	897	493	3	5	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	496	0	-	0	1396	495
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	901	-
Critical Hdwy	5.1	-	-	-	6.9	7.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	3.1	-	-	-	3.95	4.2
Pot Cap-1 Maneuver	707	-	-	-	123	419
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	328	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	707	-	-	-	122	419
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	328	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	23
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	707	-	-	-	212
HCM Lane V/C Ratio	0.003	-	-	-	0.056
HCM Control Delay (s)	10.1	0	-	-	23
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2: Pelham Island Road & Boston Post Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	706	2	15	409	0	0	0	97	0	15	67
Future Volume (vph)	0	706	2	15	409	0	0	0	97	0	15	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.84	0.84	0.84	0.71	0.71	0.71
Heavy Vehicles (%)	0%	5%	0%	0%	11%	0%	0%	0%	1%	0%	0%	6%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

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	0	706	2	15	409	0	0	0	97	0	15	67
Future Vol, veh/h	0	706	2	15	409	0	0	0	97	0	15	67
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	88	88	88	84	84	84	71	71	71
Heavy Vehicles, %	0	5	0	0	11	0	0	0	1	0	0	6
Mvmt Flow	0	821	2	17	465	0	0	0	115	0	21	94

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	823	0	0	1379	1321	822	1379	1322	465
Stage 1	-	-	-	-	-	-	822	822	-	499	499	-
Stage 2	-	-	-	-	-	-	557	499	-	880	823	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.21	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.309	3.5	4	3.354
Pot Cap-1 Maneuver	0	-	-	816	-	0	123	158	375	123	158	589
Stage 1	0	-	-	-	-	0	371	391	-	557	547	-
Stage 2	0	-	-	-	-	0	518	547	-	345	391	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	816	-	-	91	154	375	83	154	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	154	-	83	154	-
Stage 1	-	-	-	-	-	-	371	391	-	557	532	-
Stage 2	-	-	-	-	-	-	406	532	-	239	391	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	18.8	18.2
HCM LOS			C	C

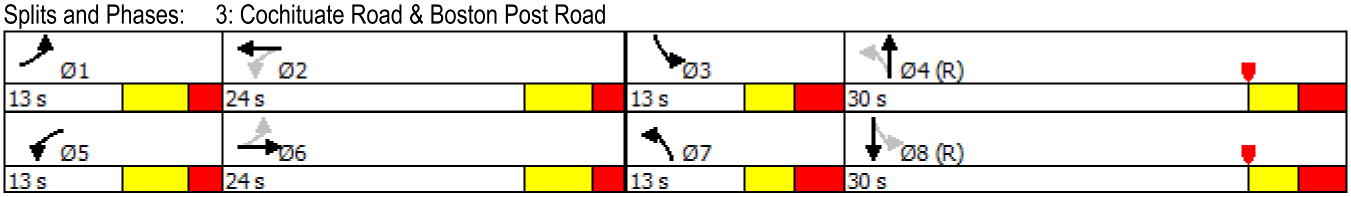
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	375	-	-	816	-	388
HCM Lane V/C Ratio	0.308	-	-	0.021	-	0.298
HCM Control Delay (s)	18.8	-	-	9.5	0	18.2
HCM Lane LOS	C	-	-	A	A	C
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-	1.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	482	89	46	291	146	118	413	36	258	487	4
Future Volume (vph)	217	482	89	46	291	146	118	413	36	258	487	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	12%	7%	7%	5%	19%	6%	8%	5%	3%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	24.0		13.0	24.0		13.0	30.0		13.0	30.0	
Total Split (%)	16.3%	30.0%		16.3%	30.0%		16.3%	37.5%		16.3%	37.5%	
Maximum Green (s)	7.0	18.0		7.0	18.0		7.0	24.0		7.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	226	595	48	455	123	468	269	511
v/c Ratio	0.79	0.70	0.19	0.72	0.56	0.91	0.99	0.81
Control Delay	42.9	33.4	18.0	36.6	23.8	52.5	75.5	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	33.4	18.0	36.6	23.8	52.5	75.5	38.9
Queue Length 50th (ft)	78	150	15	108	35	224	~113	248
Queue Length 95th (ft)	#150	#235	36	158	#70	#401	#263	#443
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	285	844	253	701	220	512	273	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.70	0.19	0.65	0.56	0.91	0.99	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	217	482	89	46	291	146	118	413	36	258	487	4
Future Volume (veh/h)	217	482	89	46	291	146	118	413	36	258	487	4
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1820	1900	1776	1787	1900	1597	1790	1900	1810	1845	1900
Adj Flow Rate, veh/h	226	502	93	48	303	152	123	430	38	269	507	4
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	3	7	7	7	19	6	6	5	3	3
Cap, veh/h	299	665	123	225	419	206	277	543	48	326	640	5
Arrive On Green	0.09	0.23	0.23	0.05	0.19	0.19	0.07	0.34	0.34	0.09	0.35	0.35
Sat Flow, veh/h	1774	2916	538	1691	2210	1083	1521	1621	143	1723	1828	14
Grp Volume(v), veh/h	226	297	298	48	231	224	123	0	468	269	0	511
Grp Sat Flow(s),veh/h/ln	1774	1729	1725	1691	1698	1596	1521	0	1764	1723	0	1843
Q Serve(g_s), s	7.0	12.8	12.9	1.8	10.2	10.6	4.2	0.0	19.2	7.0	0.0	19.9
Cycle Q Clear(g_c), s	7.0	12.8	12.9	1.8	10.2	10.6	4.2	0.0	19.2	7.0	0.0	19.9
Prop In Lane	1.00		0.31	1.00		0.68	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	299	394	393	225	322	303	277	0	591	326	0	646
V/C Ratio(X)	0.76	0.75	0.76	0.21	0.72	0.74	0.44	0.00	0.79	0.83	0.00	0.79
Avail Cap(c_a), veh/h	299	394	393	290	382	359	300	0	591	326	0	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	28.8	28.8	24.5	30.4	30.5	17.9	0.0	24.1	21.8	0.0	23.4
Incr Delay (d2), s/veh	10.5	7.9	8.3	0.5	5.2	6.6	1.1	0.0	10.4	15.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	7.0	7.0	0.8	5.2	5.2	1.8	0.0	11.1	4.0	0.0	11.8
LnGrp Delay(d),s/veh	37.2	36.7	37.1	25.0	35.6	37.1	19.0	0.0	34.4	37.5	0.0	33.0
LnGrp LOS	D	D	D	C	D	D	B		C	D		C
Approach Vol, veh/h		821			503			591			780	
Approach Delay, s/veh		37.0			35.2			31.2			34.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	21.2	13.0	32.8	9.9	24.2	11.8	34.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	24.0	7.0	18.0	7.0	24.0
Max Q Clear Time (g_c+I1), s	9.0	12.6	9.0	21.2	3.8	14.9	6.2	21.9
Green Ext Time (p_c), s	0.0	2.6	0.0	1.6	0.0	1.8	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	13	10	5	734	38	18	723	73
Future Volume (vph)	0	0	0	22	13	10	5	734	38	18	723	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	0%	5%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	22	13	10	5	734	38	18	723	73
Future Vol, veh/h	0	0	0	22	13	10	5	734	38	18	723	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	92	92	92	94	94	94
Heavy Vehicles, %	0	0	0	9	0	0	0	5	0	0	3	4
Mvmt Flow	0	0	0	28	16	13	5	798	41	19	769	78

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1675	1714	819	847	0	0	839	0	0
Stage 1	829	829	-	-	-	-	-	-	-
Stage 2	846	885	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.49	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	101	91	379	799	-	-	804	-	-
Stage 1	417	388	-	-	-	-	-	-	-
Stage 2	409	366	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	97	0	379	799	-	-	804	-	-
Mov Cap-2 Maneuver	97	0	-	-	-	-	-	-	-
Stage 1	412	0	-	-	-	-	-	-	-
Stage 2	399	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	54.8	0.1	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	799	-	-	126	804	-	-
HCM Lane V/C Ratio	0.007	-	-	0.446	0.024	-	-
HCM Control Delay (s)	9.5	-	-	54.8	9.6	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2	0.1	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	558	773	1	0	1
Future Volume (vph)	0	558	773	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.90	0.90	0.84	0.84	0.25	0.25
Heavy Vehicles (%)	0%	1%	2%	100%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	558	773	1	0	1
Future Vol, veh/h	0	558	773	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	84	84	25	25
Heavy Vehicles, %	0	1	2	100	0	0
Mvmt Flow	0	620	920	1	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	921	0	-	0	1541	921
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	750	-	-	-	128	331
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	750	-	-	-	128	331
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	540	-

Approach	EB		WB		SB
HCM Control Delay, s	0		0		16
HCM LOS					C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	750	-	-	-	331
HCM Lane V/C Ratio	-	-	-	-	0.012
HCM Control Delay (s)	0	-	-	-	16
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	563	2	46	630	0	1	1	28	4	82	104
Future Volume (vph)	0	563	2	46	630	0	1	1	28	4	82	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.58	0.58	0.58	0.88	0.88	0.88
Heavy Vehicles (%)	0%	1%	0%	4%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	15.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	563	2	46	630	0	1	1	28	4	82	104
Future Vol, veh/h	0	563	2	46	630	0	1	1	28	4	82	104
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	58	58	58	88	88	88
Heavy Vehicles, %	0	1	0	4	3	0	0	0	0	0	0	0
Mvmt Flow	0	593	2	50	685	0	2	2	48	5	93	118

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	595	0	0	1485	1379	594	1404	1380	685
Stage 1	-	-	-	-	-	-	594	594	-	785	785	-
Stage 2	-	-	-	-	-	-	891	785	-	619	595	-
Critical Hdwy	-	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	0	-	-	972	-	0	104	146	509	118	146	452
Stage 1	0	-	-	-	-	0	495	496	-	389	407	-
Stage 2	0	-	-	-	-	0	340	407	-	480	496	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	972	-	-	32	134	509	99	134	452
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	134	-	99	134	-
Stage 1	-	-	-	-	-	-	495	496	-	389	373	-
Stage 2	-	-	-	-	-	-	173	373	-	433	496	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	18.4	109.7
HCM LOS			C	F

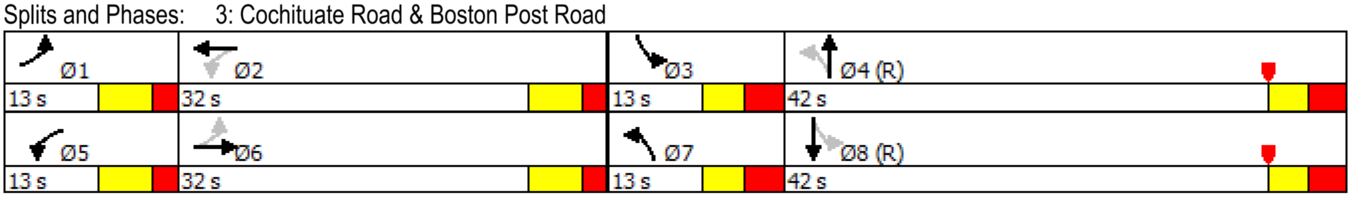
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	320	-	-	972	-	215
HCM Lane V/C Ratio	0.162	-	-	0.051	-	1.004
HCM Control Delay (s)	18.4	-	-	8.9	0	109.7
HCM Lane LOS	C	-	-	A	A	F
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-	9.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	379	111	31	539	245	124	495	30	203	438	29
Future Volume (vph)	123	379	111	31	539	245	124	495	30	203	438	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	5%	6%	1%	3%	6%	1%	0%	1%	0%	3%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	32.0		13.0	32.0		13.0	42.0		13.0	42.0	
Total Split (%)	13.0%	32.0%		13.0%	32.0%		13.0%	42.0%		13.0%	42.0%	
Maximum Green (s)	7.0	26.0		7.0	26.0		7.0	36.0		7.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	505	32	809	128	541	209	482
v/c Ratio	0.68	0.51	0.11	0.95	0.51	0.83	0.95	0.73
Control Delay	41.6	31.7	20.3	58.4	22.0	42.3	70.5	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	31.7	20.3	58.4	22.0	42.3	70.5	35.5
Queue Length 50th (ft)	52	148	12	267	43	312	74	262
Queue Length 95th (ft)	#122	204	32	#390	78	#493	#210	385
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	186	993	292	850	254	649	220	657
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51	0.11	0.95	0.50	0.83	0.95	0.73

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	379	111	31	539	245	124	495	30	203	438	29
Future Volume (veh/h)	123	379	111	31	539	245	124	495	30	203	438	29
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1865	1900	1792	1870	1900	1792	1882	1900	1881	1896	1900
Adj Flow Rate, veh/h	127	391	114	32	556	253	128	510	31	209	452	30
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	6	1	1	6	1	1	1	0	0
Cap, veh/h	214	777	224	274	603	274	318	645	39	292	656	44
Arrive On Green	0.07	0.29	0.29	0.04	0.25	0.25	0.06	0.37	0.37	0.07	0.37	0.37
Sat Flow, veh/h	1810	2701	777	1707	2376	1079	1707	1757	107	1792	1759	117
Grp Volume(v), veh/h	127	255	250	32	415	394	128	0	541	209	0	482
Grp Sat Flow(s),veh/h/ln	1810	1771	1707	1707	1776	1679	1707	0	1863	1792	0	1876
Q Serve(g_s), s	5.1	12.0	12.2	1.4	22.8	22.9	4.6	0.0	25.9	7.0	0.0	21.7
Cycle Q Clear(g_c), s	5.1	12.0	12.2	1.4	22.8	22.9	4.6	0.0	25.9	7.0	0.0	21.7
Prop In Lane	1.00		0.46	1.00		0.64	1.00		0.06	1.00		0.06
Lane Grp Cap(c), veh/h	214	509	491	274	451	426	318	0	684	292	0	699
V/C Ratio(X)	0.59	0.50	0.51	0.12	0.92	0.92	0.40	0.00	0.79	0.72	0.00	0.69
Avail Cap(c_a), veh/h	216	509	491	333	462	437	328	0	684	292	0	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	29.6	29.7	26.2	36.3	36.4	20.1	0.0	28.2	23.5	0.0	26.5
Incr Delay (d2), s/veh	4.2	0.8	0.9	0.2	23.6	25.0	0.8	0.0	9.1	8.2	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.0	5.9	0.6	14.1	13.6	2.2	0.0	14.9	2.8	0.0	12.3
LnGrp Delay(d),s/veh	31.9	30.4	30.6	26.3	59.9	61.4	20.9	0.0	37.3	31.6	0.0	32.0
LnGrp LOS	C	C	C	C	E	E	C		D	C		C
Approach Vol, veh/h		632			841			669			691	
Approach Delay, s/veh		30.8			59.3			34.2			31.9	
Approach LOS		C			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	31.4	13.0	42.7	9.5	34.8	12.4	43.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	26.0	7.0	36.0	7.0	26.0	7.0	36.0
Max Q Clear Time (g_c+I1), s	7.1	24.9	9.0	27.9	3.4	14.2	6.6	23.7
Green Ext Time (p_c), s	0.0	0.5	0.0	4.0	0.0	6.4	0.0	5.3

Intersection Summary			
HCM 2010 Ctrl Delay			40.3
HCM 2010 LOS			D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	21	43	23	3	823	34	11	654	149
Future Volume (vph)	0	0	0	21	43	23	3	823	34	11	654	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection												
Int Delay, s/veh	3.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	21	43	23	3	823	34	11	654	149
Future Vol, veh/h	0	0	0	21	43	23	3	823	34	11	654	149
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	0	0	0	25	51	27	3	848	35	11	674	154

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1645	1722	866	828	0	0	883	0	0
Stage 1	872	872	-	-	-	-	-	-	-
Stage 2	773	850	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	111	90	356	812	-	-	775	-	-
Stage 1	412	371	-	-	-	-	-	-	-
Stage 2	459	380	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	109	0	356	812	-	-	775	-	-
Mov Cap-2 Maneuver	109	0	-	-	-	-	-	-	-
Stage 1	409	0	-	-	-	-	-	-	-
Stage 2	453	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	54	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	812	-	-	171	775	-	-
HCM Lane V/C Ratio	0.004	-	-	0.606	0.015	-	-
HCM Control Delay (s)	9.5	-	-	54	9.7	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.3	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	877	441	3	2	3
Future Volume (vph)	2	877	441	3	2	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.94	0.94	0.86	0.86	0.42	0.42
Heavy Vehicles (%)	100%	6%	5%	100%	50%	100%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	0.2					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	877	441	3	2	3
Future Vol, veh/h	2	877	441	3	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	86	86	42	42
Heavy Vehicles, %	100	6	5	100	50	100
Mvmt Flow	2	933	513	3	5	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	516	0	-	0	1452	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	937	-
Critical Hdwy	5.1	-	-	-	6.9	7.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	3.1	-	-	-	3.95	4.2
Pot Cap-1 Maneuver	692	-	-	-	113	407
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	314	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	692	-	-	-	112	407
Mov Cap-2 Maneuver	-	-	-	-	112	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	314	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	692	-	-	-	198
HCM Lane V/C Ratio	0.003	-	-	-	0.06
HCM Control Delay (s)	10.2	0	-	-	24.3
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	735	2	16	429	0	0	0	100	0	16	73
Future Volume (vph)	0	735	2	16	429	0	0	0	100	0	16	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.84	0.84	0.84	0.71	0.71	0.71
Heavy Vehicles (%)	0%	5%	0%	0%	11%	0%	0%	0%	1%	0%	0%	6%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	735	2	16	429	0	0	0	100	0	16	73
Future Vol, veh/h	0	735	2	16	429	0	0	0	100	0	16	73
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	88	88	88	84	84	84	71	71	71
Heavy Vehicles, %	0	5	0	0	11	0	0	0	1	0	0	6
Mvmt Flow	0	855	2	18	488	0	0	0	119	0	23	103

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	857	0	0	1443	1380	856	1440	1381	488
Stage 1	-	-	-	-	-	-	856	856	-	524	524	-
Stage 2	-	-	-	-	-	-	587	524	-	916	857	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.21	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.309	3.5	4	3.354
Pot Cap-1 Maneuver	0	-	-	792	-	0	111	146	359	112	145	572
Stage 1	0	-	-	-	-	0	355	377	-	540	533	-
Stage 2	0	-	-	-	-	0	499	533	-	329	377	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	792	-	-	78	141	359	73	141	572
Mov Cap-2 Maneuver	-	-	-	-	-	-	78	141	-	73	141	-
Stage 1	-	-	-	-	-	-	355	377	-	540	516	-
Stage 2	-	-	-	-	-	-	379	516	-	220	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	19.9	19.7
HCM LOS			C	C

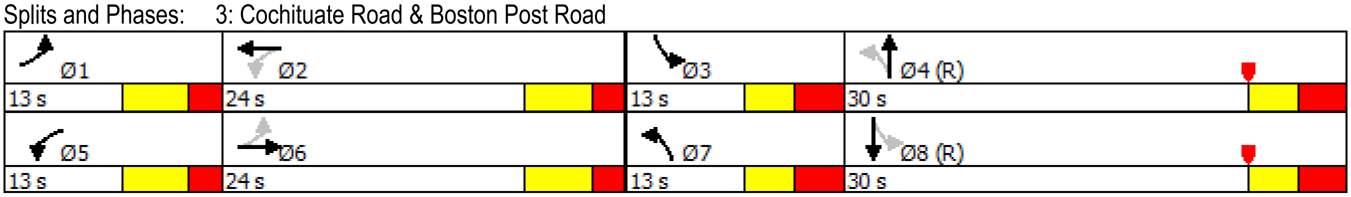
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	359	-	-	792	-	369
HCM Lane V/C Ratio	0.332	-	-	0.023	-	0.34
HCM Control Delay (s)	19.9	-	-	9.7	0	19.7
HCM Lane LOS	C	-	-	A	A	C
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-	1.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	227	500	93	48	303	151	125	428	37	267	504	4
Future Volume (vph)	227	500	93	48	303	151	125	428	37	267	504	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	12%	7%	7%	5%	19%	6%	8%	5%	3%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	24.0		13.0	24.0		13.0	30.0		13.0	30.0	
Total Split (%)	16.3%	30.0%		16.3%	30.0%		16.3%	37.5%		16.3%	37.5%	
Maximum Green (s)	7.0	18.0		7.0	18.0		7.0	24.0		7.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	236	618	50	473	130	485	278	529
v/c Ratio	0.84	0.73	0.21	0.74	0.60	0.95	1.01	0.93
Control Delay	48.9	34.2	18.2	37.3	26.1	58.4	81.3	54.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	34.2	18.2	37.3	26.1	58.4	81.3	54.4
Queue Length 50th (ft)	82	157	15	114	37	235	~117	261
Queue Length 95th (ft)	#167	#249	37	165	#82	#421	#269	#462
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	281	849	248	701	219	512	275	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.73	0.20	0.67	0.59	0.95	1.01	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	227	500	93	48	303	151	125	428	37	267	504	4
Future Volume (veh/h)	227	500	93	48	303	151	125	428	37	267	504	4
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1820	1900	1776	1787	1900	1597	1790	1900	1810	1845	1900
Adj Flow Rate, veh/h	236	521	97	50	316	157	130	446	39	278	525	4
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	3	7	7	7	19	6	6	5	3	3
Cap, veh/h	295	668	124	221	426	207	265	540	47	311	630	5
Arrive On Green	0.09	0.23	0.23	0.05	0.19	0.19	0.08	0.33	0.33	0.09	0.34	0.34
Sat Flow, veh/h	1774	2913	540	1691	2217	1078	1521	1623	142	1723	1829	14
Grp Volume(v), veh/h	236	308	310	50	240	233	130	0	485	278	0	529
Grp Sat Flow(s),veh/h/ln	1774	1729	1724	1691	1697	1597	1521	0	1765	1723	0	1843
Q Serve(g_s), s	7.0	13.4	13.5	1.8	10.7	11.0	4.4	0.0	20.2	7.0	0.0	21.1
Cycle Q Clear(g_c), s	7.0	13.4	13.5	1.8	10.7	11.0	4.4	0.0	20.2	7.0	0.0	21.1
Prop In Lane	1.00		0.31	1.00		0.67	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	295	397	396	221	326	307	265	0	587	311	0	634
V/C Ratio(X)	0.80	0.78	0.78	0.23	0.74	0.76	0.49	0.00	0.83	0.89	0.00	0.83
Avail Cap(c_a), veh/h	295	397	396	284	382	359	283	0	587	311	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.1	28.9	29.0	24.4	30.4	30.6	18.4	0.0	24.6	22.9	0.0	24.1
Incr Delay (d2), s/veh	14.4	9.4	9.8	0.5	6.1	7.7	1.4	0.0	12.5	26.1	0.0	12.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	7.4	7.4	0.9	5.6	5.5	1.9	0.0	11.9	5.0	0.0	12.9
LnGrp Delay(d),s/veh	41.5	38.3	38.8	24.9	36.6	38.2	19.8	0.0	37.1	49.0	0.0	36.4
LnGrp LOS	D	D	D	C	D	D	B		D	D		D
Approach Vol, veh/h		854			523			615			807	
Approach Delay, s/veh		39.4			36.2			33.4			40.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	21.4	13.0	32.6	10.0	24.4	12.1	33.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	24.0	7.0	18.0	7.0	24.0
Max Q Clear Time (g_c+I1), s	9.0	13.0	9.0	22.2	3.8	15.5	6.4	23.1
Green Ext Time (p_c), s	0.0	2.4	0.0	1.1	0.0	1.6	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	37.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	23	13	10	5	762	39	19	749	80
Future Volume (vph)	0	0	0	23	13	10	5	762	39	19	749	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	0%	5%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	23	13	10	5	762	39	19	749	80
Future Vol, veh/h	0	0	0	23	13	10	5	762	39	19	749	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	92	92	92	94	94	94
Heavy Vehicles, %	0	0	0	9	0	0	0	5	0	0	3	4
Mvmt Flow	0	0	0	29	16	13	5	828	42	20	797	85

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1739	1781	849	882	0	0	870	0	0
Stage 1	859	859	-	-	-	-	-	-	-
Stage 2	880	922	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.49	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	92	83	364	775	-	-	783	-	-
Stage 1	403	376	-	-	-	-	-	-	-
Stage 2	394	352	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	88	0	364	775	-	-	783	-	-
Mov Cap-2 Maneuver	88	0	-	-	-	-	-	-	-
Stage 1	398	0	-	-	-	-	-	-	-
Stage 2	384	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	65.1	0.1	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	775	-	-	114	783	-	-
HCM Lane V/C Ratio	0.007	-	-	0.504	0.026	-	-
HCM Control Delay (s)	9.7	-	-	65.1	9.7	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.3	0.1	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	586	809	1	0	1
Future Volume (vph)	0	586	809	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.90	0.90	0.84	0.84	0.25	0.25
Heavy Vehicles (%)	0%	1%	2%	100%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	586	809	1	0	1
Future Vol, veh/h	0	586	809	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	84	84	25	25
Heavy Vehicles, %	0	1	2	100	0	0
Mvmt Flow	0	651	963	1	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	964	0	-	0	1615	964
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	651	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	722	-	-	-	115	312
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	523	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	722	-	-	-	115	312
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	523	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	722	-	-	-	312
HCM Lane V/C Ratio	-	-	-	-	0.013
HCM Control Delay (s)	0	-	-	-	16.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	614	2	48	670	0	1	1	29	4	85	118
Future Volume (vph)	0	614	2	48	670	0	1	1	29	4	85	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.58	0.58	0.58	0.88	0.88	0.88
Heavy Vehicles (%)	0%	1%	0%	4%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	25.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	614	2	48	670	0	1	1	29	4	85	118
Future Vol, veh/h	0	614	2	48	670	0	1	1	29	4	85	118
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	58	58	58	88	88	88
Heavy Vehicles, %	0	1	0	4	3	0	0	0	0	0	0	0
Mvmt Flow	0	646	2	52	728	0	2	2	50	5	97	134

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	648	0	0	1595	1479	647	1505	1480	728
Stage 1	-	-	-	-	-	-	647	647	-	832	832	-
Stage 2	-	-	-	-	-	-	948	832	-	673	648	-
Critical Hdwy	-	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	0	-	-	928	-	0	87	127	475	101	127	427
Stage 1	0	-	-	-	-	0	463	470	-	366	387	-
Stage 2	0	-	-	-	-	0	316	387	-	448	469	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	928	-	-	17	115	475	83	115	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	17	115	-	83	115	-
Stage 1	-	-	-	-	-	-	463	470	-	366	351	-
Stage 2	-	-	-	-	-	-	142	351	-	399	469	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	24.1	180.2
HCM LOS			C	F

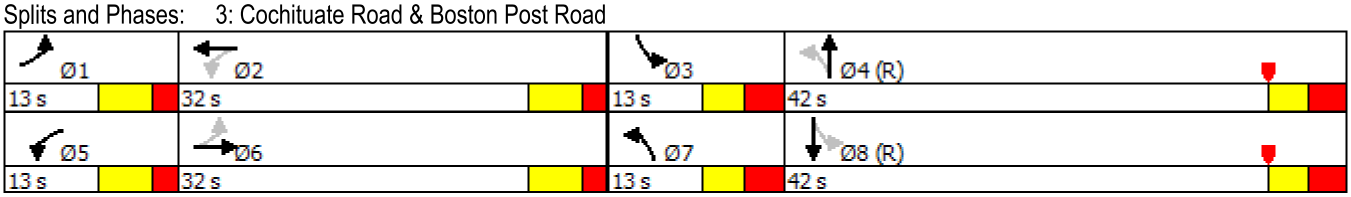
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	241	-	-	928	-	195
HCM Lane V/C Ratio	0.222	-	-	0.056	-	1.206
HCM Control Delay (s)	24.1	-	-	9.1	0	180.2
HCM Lane LOS	C	-	-	A	A	F
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-	12.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↱		↰	↱	
Traffic Volume (vph)	138	403	124	32	568	254	136	513	31	210	454	30
Future Volume (vph)	138	403	124	32	568	254	136	513	31	210	454	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	5%	6%	1%	3%	6%	1%	0%	1%	0%	3%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	32.0		13.0	32.0		13.0	42.0		13.0	42.0	
Total Split (%)	13.0%	32.0%		13.0%	32.0%		13.0%	42.0%		13.0%	42.0%	
Maximum Green (s)	7.0	26.0		7.0	26.0		7.0	36.0		7.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	543	33	848	140	561	216	499
v/c Ratio	0.78	0.55	0.12	1.00	0.58	0.86	1.05	0.76
Control Delay	52.1	32.4	20.4	67.9	25.4	45.2	100.3	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	32.4	20.4	67.9	25.4	45.2	100.3	36.9
Queue Length 50th (ft)	59	162	13	284	48	328	~92	275
Queue Length 95th (ft)	#155	221	33	#418	84	#522	#241	402
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	182	991	278	851	241	649	205	656
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.55	0.12	1.00	0.58	0.86	1.05	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	403	124	32	568	254	136	513	31	210	454	30
Future Volume (veh/h)	138	403	124	32	568	254	136	513	31	210	454	30
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1864	1900	1792	1870	1900	1792	1882	1900	1881	1896	1900
Adj Flow Rate, veh/h	142	415	128	33	586	262	140	529	32	216	468	31
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	6	1	1	6	1	1	1	0	0
Cap, veh/h	211	782	238	267	621	278	302	633	38	269	634	42
Arrive On Green	0.07	0.29	0.29	0.04	0.26	0.26	0.07	0.36	0.36	0.07	0.36	0.36
Sat Flow, veh/h	1810	2660	811	1707	2390	1067	1707	1757	106	1792	1759	117
Grp Volume(v), veh/h	142	275	268	33	435	413	140	0	561	216	0	499
Grp Sat Flow(s),veh/h/ln	1810	1771	1700	1707	1776	1681	1707	0	1863	1792	0	1876
Q Serve(g_s), s	5.7	13.0	13.2	1.4	24.0	24.1	5.1	0.0	27.6	7.0	0.0	23.2
Cycle Q Clear(g_c), s	5.7	13.0	13.2	1.4	24.0	24.1	5.1	0.0	27.6	7.0	0.0	23.2
Prop In Lane	1.00		0.48	1.00		0.63	1.00		0.06	1.00		0.06
Lane Grp Cap(c), veh/h	211	521	500	267	462	437	302	0	671	269	0	676
V/C Ratio(X)	0.67	0.53	0.54	0.12	0.94	0.94	0.46	0.00	0.84	0.80	0.00	0.74
Avail Cap(c_a), veh/h	211	521	500	325	462	437	302	0	671	269	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	29.5	29.6	25.8	36.3	36.3	20.9	0.0	29.3	25.7	0.0	27.9
Incr Delay (d2), s/veh	8.0	1.0	1.1	0.2	27.9	29.3	1.1	0.0	11.8	15.8	0.0	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	6.5	6.3	0.7	15.3	14.7	2.5	0.0	16.4	3.7	0.0	13.2
LnGrp Delay(d),s/veh	35.7	30.5	30.7	26.0	64.2	65.6	22.0	0.0	41.1	41.5	0.0	34.9
LnGrp LOS	D	C	C	C	E	E	C		D	D		C
Approach Vol, veh/h		685			881			701			715	
Approach Delay, s/veh		31.7			63.4			37.3			36.9	
Approach LOS		C			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	32.0	13.0	42.0	9.6	35.4	13.0	42.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	26.0	7.0	36.0	7.0	26.0	7.0	36.0
Max Q Clear Time (g_c+I1), s	7.7	26.1	9.0	29.6	3.4	15.2	7.1	25.2
Green Ext Time (p_c), s	0.0	0.0	0.0	3.5	0.0	6.3	0.0	5.1

Intersection Summary		
HCM 2010 Ctrl Delay		43.6
HCM 2010 LOS		D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	45	24	3	863	35	11	677	164
Future Volume (vph)	0	0	0	22	45	24	3	863	35	11	677	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	22	45	24	3	863	35	11	677	164
Future Vol, veh/h	0	0	0	22	45	24	3	863	35	11	677	164
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	0	0	0	26	54	29	3	890	36	11	698	169

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1719	1803	908	867	0	0	926	0	0
Stage 1	914	914	-	-	-	-	-	-	-
Stage 2	805	889	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	100	80	336	785	-	-	746	-	-
Stage 1	394	355	-	-	-	-	-	-	-
Stage 2	443	364	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	98	0	336	785	-	-	746	-	-
Mov Cap-2 Maneuver	98	0	-	-	-	-	-	-	-
Stage 1	391	0	-	-	-	-	-	-	-
Stage 2	436	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	69.5	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	785	-	-	155	746	-	-
HCM Lane V/C Ratio	0.004	-	-	0.699	0.015	-	-
HCM Control Delay (s)	9.6	-	-	69.5	9.9	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.1	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	877	441	20	45	10
Future Volume (vph)	5	877	441	20	45	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.94	0.94	0.86	0.86	0.90	0.90
Heavy Vehicles (%)	2%	6%	5%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	877	441	20	45	10
Future Vol, veh/h	5	877	441	20	45	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	86	86	90	90
Heavy Vehicles, %	2	6	5	2	2	2
Mvmt Flow	5	933	513	23	50	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	536	0	-	0	1468	525
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	943	-
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	1032	-	-	-	141	552
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	379	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1032	-	-	-	140	552
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	587	-
Stage 2	-	-	-	-	379	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	40.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1032	-	-	-	162
HCM Lane V/C Ratio	0.005	-	-	-	0.377
HCM Control Delay (s)	8.5	0	-	-	40.1
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	778	2	16	443	0	0	0	100	0	16	76
Future Volume (vph)	0	778	2	16	443	0	0	0	100	0	16	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.86	0.86	0.86	0.88	0.88	0.88	0.84	0.84	0.84	0.71	0.71	0.71
Heavy Vehicles (%)	0%	5%	0%	0%	11%	0%	0%	0%	1%	0%	0%	6%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	778	2	16	443	0	0	0	100	0	16	76
Future Vol, veh/h	0	778	2	16	443	0	0	0	100	0	16	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	88	88	88	84	84	84	71	71	71
Heavy Vehicles, %	0	5	0	0	11	0	0	0	1	0	0	6
Mvmt Flow	0	905	2	18	503	0	0	0	119	0	23	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	907	0	0	1510	1445	906	1505	1446	503
Stage 1	-	-	-	-	-	-	906	906	-	539	539	-
Stage 2	-	-	-	-	-	-	604	539	-	966	907	-
Critical Hdwy	-	-	-	4.1	-	-	7.1	6.5	6.21	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.2	-	-	3.5	4	3.309	3.5	4	3.354
Pot Cap-1 Maneuver	0	-	-	759	-	0	100	133	336	101	133	561
Stage 1	0	-	-	-	-	0	333	358	-	530	525	-
Stage 2	0	-	-	-	-	0	489	525	-	309	357	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	759	-	-	68	129	336	64	129	561
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	129	-	64	129	-
Stage 1	-	-	-	-	-	-	333	358	-	530	508	-
Stage 2	-	-	-	-	-	-	366	508	-	200	357	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	21.5	20.9
HCM LOS			C	C

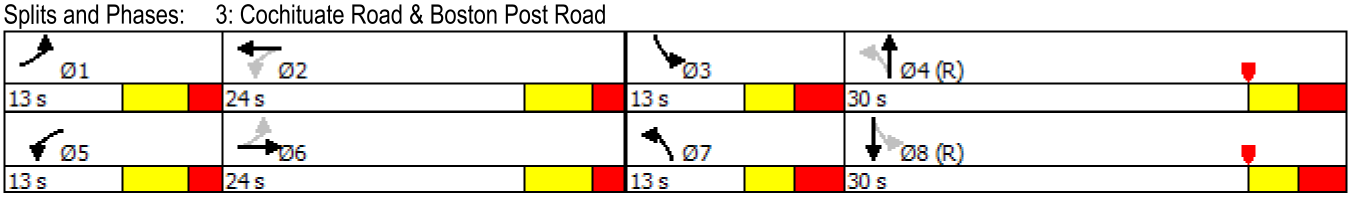
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	336	-	-	759	-	355
HCM Lane V/C Ratio	0.354	-	-	0.024	-	0.365
HCM Control Delay (s)	21.5	-	-	9.9	0	20.9
HCM Lane LOS	C	-	-	A	A	C
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-	1.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	524	107	48	312	151	130	428	37	267	504	4
Future Volume (vph)	232	524	107	48	312	151	130	428	37	267	504	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	12%	7%	7%	5%	19%	6%	8%	5%	3%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	24.0		13.0	24.0		13.0	30.0		13.0	30.0	
Total Split (%)	16.3%	30.0%		16.3%	30.0%		16.3%	37.5%		16.3%	37.5%	
Maximum Green (s)	7.0	18.0		7.0	18.0		7.0	24.0		7.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	242	657	50	482	135	485	278	529
v/c Ratio	0.87	0.77	0.22	0.75	0.62	0.95	1.01	0.94
Control Delay	53.6	36.3	18.4	37.7	27.2	58.4	82.1	55.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	36.3	18.4	37.7	27.2	58.4	82.1	55.6
Queue Length 50th (ft)	85	170	15	116	38	235	~116	261
Queue Length 95th (ft)	#179	#273	37	168	#89	#421	#268	#462
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	278	850	237	702	220	512	274	562
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.77	0.21	0.69	0.61	0.95	1.01	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	524	107	48	312	151	130	428	37	267	504	4
Future Volume (veh/h)	232	524	107	48	312	151	130	428	37	267	504	4
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1818	1900	1776	1787	1900	1597	1790	1900	1810	1845	1900
Adj Flow Rate, veh/h	242	546	111	50	325	157	135	446	39	278	525	4
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	3	7	7	7	19	6	6	5	3	3
Cap, veh/h	293	659	134	211	432	205	266	538	47	310	623	5
Arrive On Green	0.09	0.23	0.23	0.05	0.19	0.19	0.08	0.33	0.33	0.09	0.34	0.34
Sat Flow, veh/h	1774	2863	580	1691	2238	1059	1521	1623	142	1723	1829	14
Grp Volume(v), veh/h	242	329	328	50	245	237	135	0	485	278	0	529
Grp Sat Flow(s),veh/h/ln	1774	1727	1715	1691	1697	1600	1521	0	1765	1723	0	1843
Q Serve(g_s), s	7.0	14.5	14.6	1.8	10.9	11.2	4.6	0.0	20.3	7.0	0.0	21.2
Cycle Q Clear(g_c), s	7.0	14.5	14.6	1.8	10.9	11.2	4.6	0.0	20.3	7.0	0.0	21.2
Prop In Lane	1.00		0.34	1.00		0.66	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	293	398	395	211	328	309	266	0	586	310	0	628
V/C Ratio(X)	0.83	0.83	0.83	0.24	0.75	0.77	0.51	0.00	0.83	0.90	0.00	0.84
Avail Cap(c_a), veh/h	293	398	395	273	382	360	279	0	586	310	0	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.4	29.3	29.3	24.5	30.4	30.6	18.5	0.0	24.6	22.9	0.0	24.4
Incr Delay (d2), s/veh	17.3	13.3	13.9	0.6	6.7	8.3	1.5	0.0	12.7	26.8	0.0	13.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	8.3	8.4	0.9	5.7	5.7	2.0	0.0	11.9	5.1	0.0	13.0
LnGrp Delay(d),s/veh	44.7	42.6	43.2	25.1	37.1	38.8	20.0	0.0	37.4	49.7	0.0	37.3
LnGrp LOS	D	D	D	C	D	D	B		D	D		D
Approach Vol, veh/h		899			532			620			807	
Approach Delay, s/veh		43.4			36.8			33.6			41.6	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	21.5	13.0	32.5	10.0	24.4	12.3	33.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	24.0	7.0	18.0	7.0	24.0
Max Q Clear Time (g_c+I1), s	9.0	13.2	9.0	22.3	3.8	16.6	6.6	23.2
Green Ext Time (p_c), s	0.0	2.2	0.0	1.1	0.0	0.9	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	23	13	10	5	766	40	19	749	83
Future Volume (vph)	0	0	0	23	13	10	5	766	40	19	749	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.92	0.92	0.92	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	0%	5%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	23	13	10	5	766	40	19	749	83
Future Vol, veh/h	0	0	0	23	13	10	5	766	40	19	749	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	92	92	92	94	94	94
Heavy Vehicles, %	0	0	0	9	0	0	0	5	0	0	3	4
Mvmt Flow	0	0	0	29	16	13	5	833	43	20	797	88

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1746	1790	855	885	0	0	876	0	0
Stage 1	865	865	-	-	-	-	-	-	-
Stage 2	881	925	-	-	-	-	-	-	-
Critical Hdwy	6.49	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.49	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.49	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	91	82	361	773	-	-	779	-	-
Stage 1	401	374	-	-	-	-	-	-	-
Stage 2	394	351	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	87	0	361	773	-	-	779	-	-
Mov Cap-2 Maneuver	87	0	-	-	-	-	-	-	-
Stage 1	396	0	-	-	-	-	-	-	-
Stage 2	384	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	66	0.1	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	773	-	-	113	779	-	-
HCM Lane V/C Ratio	0.007	-	-	0.509	0.026	-	-
HCM Control Delay (s)	9.7	-	-	66	9.7	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.3	0.1	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	586	809	44	29	6
Future Volume (vph)	7	586	809	44	29	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	5200		1000	
Travel Time (s)		22.7	118.2		22.7	
Confl. Bikes (#/hr)				2		
Peak Hour Factor	0.90	0.90	0.84	0.84	0.92	0.92
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection						
Int Delay, s/veh	1.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	586	809	44	29	6
Future Vol, veh/h	7	586	809	44	29	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	84	84	92	92
Heavy Vehicles, %	2	1	2	2	2	2
Mvmt Flow	8	651	963	52	32	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1015	0	-	0	1656	989
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	667	-
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	683	-	-	-	108	299
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	510	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	683	-	-	-	106	299
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	48.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	683	-	-	-	119
HCM Lane V/C Ratio	0.011	-	-	-	0.32
HCM Control Delay (s)	10.3	0	-	-	48.9
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	643	2	48	703	0	1	1	29	4	85	123
Future Volume (vph)	0	643	2	48	703	0	1	1	29	4	85	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	16	16	16
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		5200			400			804			447	
Travel Time (s)		118.2			9.1			18.3			10.2	
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.58	0.58	0.58	0.88	0.88	0.88
Heavy Vehicles (%)	0%	1%	0%	4%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	32.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	643	2	48	703	0	1	1	29	4	85	123
Future Vol, veh/h	0	643	2	48	703	0	1	1	29	4	85	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	58	58	58	88	88	88
Heavy Vehicles, %	0	1	0	4	3	0	0	0	0	0	0	0
Mvmt Flow	0	677	2	52	764	0	2	2	50	5	97	140

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	679	0	0	1665	1546	678	1572	1547	764
Stage 1	-	-	-	-	-	-	678	678	-	868	868	-
Stage 2	-	-	-	-	-	-	987	868	-	704	679	-
Critical Hdwy	-	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	0	-	-	904	-	0	78	116	456	90	115	407
Stage 1	0	-	-	-	-	0	445	455	-	350	372	-
Stage 2	0	-	-	-	-	0	300	372	-	431	454	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	904	-	-	9	104	456	73	104	407
Mov Cap-2 Maneuver	-	-	-	-	-	-	9	104	-	73	104	-
Stage 1	-	-	-	-	-	-	445	455	-	350	335	-
Stage 2	-	-	-	-	-	-	126	335	-	382	454	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	36.1	231.5
HCM LOS			E	F

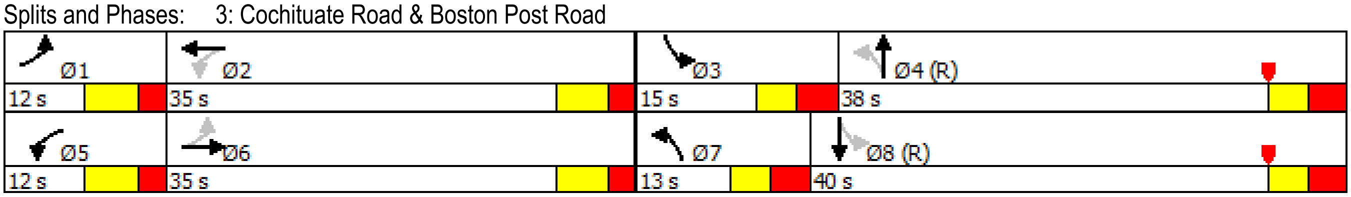
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	168	-	-	904	-	181
HCM Lane V/C Ratio	0.318	-	-	0.058	-	1.331
HCM Control Delay (s)	36.1	-	-	9.2	0	231.5
HCM Lane LOS	E	-	-	A	A	F
HCM 95th %tile Q(veh)	1.3	-	-	0.2	-	14

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	419	134	32	592	254	150	513	31	210	454	30
Future Volume (vph)	141	419	134	32	592	254	150	513	31	210	454	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	5%	6%	1%	3%	6%	1%	0%	1%	0%	3%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	12.0	35.0		12.0	35.0		13.0	38.0		15.0	40.0	
Total Split (%)	12.0%	35.0%		12.0%	35.0%		13.0%	38.0%		15.0%	40.0%	
Maximum Green (s)	6.0	29.0		6.0	29.0		7.0	32.0		9.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	570	33	872	155	561	216	499
v/c Ratio	0.84	0.54	0.12	0.92	0.70	0.97	0.91	0.80
Control Delay	60.6	30.3	19.1	51.1	36.2	66.6	62.7	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	30.3	19.1	51.1	36.2	66.6	62.7	41.2
Queue Length 50th (ft)	58	165	12	282	56	351	84	284
Queue Length 95th (ft)	#160	223	31	#401	#115	#570	#226	#448
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	173	1064	273	951	220	576	237	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.54	0.12	0.92	0.70	0.97	0.91	0.80

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	419	134	32	592	254	150	513	31	210	454	30
Future Volume (veh/h)	141	419	134	32	592	254	150	513	31	210	454	30
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1792	1870	1900	1792	1882	1900	1881	1896	1900
Adj Flow Rate, veh/h	145	432	138	33	610	262	155	529	32	216	468	31
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	6	1	1	6	1	1	1	0	0
Cap, veh/h	202	792	250	264	670	288	294	586	35	273	622	41
Arrive On Green	0.06	0.30	0.30	0.04	0.28	0.28	0.07	0.33	0.33	0.09	0.35	0.35
Sat Flow, veh/h	1810	2633	832	1707	2423	1040	1707	1757	106	1792	1759	117
Grp Volume(v), veh/h	145	289	281	33	447	425	155	0	561	216	0	499
Grp Sat Flow(s),veh/h/ln	1810	1770	1695	1707	1777	1687	1707	0	1863	1792	0	1876
Q Serve(g_s), s	5.8	13.6	13.9	1.4	24.3	24.4	6.0	0.0	28.7	7.9	0.0	23.4
Cycle Q Clear(g_c), s	5.8	13.6	13.9	1.4	24.3	24.4	6.0	0.0	28.7	7.9	0.0	23.4
Prop In Lane	1.00		0.49	1.00		0.62	1.00		0.06	1.00		0.06
Lane Grp Cap(c), veh/h	202	532	510	264	492	467	294	0	621	273	0	663
V/C Ratio(X)	0.72	0.54	0.55	0.13	0.91	0.91	0.53	0.00	0.90	0.79	0.00	0.75
Avail Cap(c_a), veh/h	202	532	510	305	515	489	294	0	621	273	0	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	29.2	29.3	24.8	35.0	35.0	22.4	0.0	31.8	24.0	0.0	28.5
Incr Delay (d2), s/veh	11.6	1.1	1.3	0.2	19.7	20.6	1.8	0.0	18.9	14.7	0.0	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.8	6.7	0.6	14.6	14.0	2.9	0.0	17.9	5.0	0.0	13.5
LnGrp Delay(d),s/veh	39.1	30.4	30.6	25.0	54.7	55.6	24.1	0.0	50.7	38.7	0.0	36.2
LnGrp LOS	D	C	C	C	D	E	C		D	D		D
Approach Vol, veh/h		715			905			716			715	
Approach Delay, s/veh		32.2			54.0			44.9			37.0	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	33.7	15.0	39.3	9.6	36.1	13.0	41.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	29.0	9.0	32.0	6.0	29.0	7.0	34.0
Max Q Clear Time (g_c+I1), s	7.8	26.4	9.9	30.7	3.4	15.9	8.0	25.4
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	7.4	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	42.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	22	46	24	3	865	36	11	677	168
Future Volume (vph)	0	0	0	22	46	24	3	865	36	11	677	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	13	13	13	11	11	11
Storage Length (ft)	0		0	0		0	0		0	200		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		447			858			200			1300	
Travel Time (s)		10.2			19.5			4.5			29.5	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	22	46	24	3	865	36	11	677	168
Future Vol, veh/h	0	0	0	22	46	24	3	865	36	11	677	168
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	200	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	0	0	0	26	55	29	3	892	37	11	698	173

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1724	1810	911	871	0	0	929	0	0
Stage 1	917	917	-	-	-	-	-	-	-
Stage 2	807	893	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	99	80	335	783	-	-	744	-	-
Stage 1	393	354	-	-	-	-	-	-	-
Stage 2	442	363	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	97	0	335	783	-	-	744	-	-
Mov Cap-2 Maneuver	97	0	-	-	-	-	-	-	-
Stage 1	390	0	-	-	-	-	-	-	-
Stage 2	435	0	-	-	-	-	-	-	-

Approach	WB			NB			SB
HCM Control Delay, s	71.6			0			0.1
HCM LOS	F						

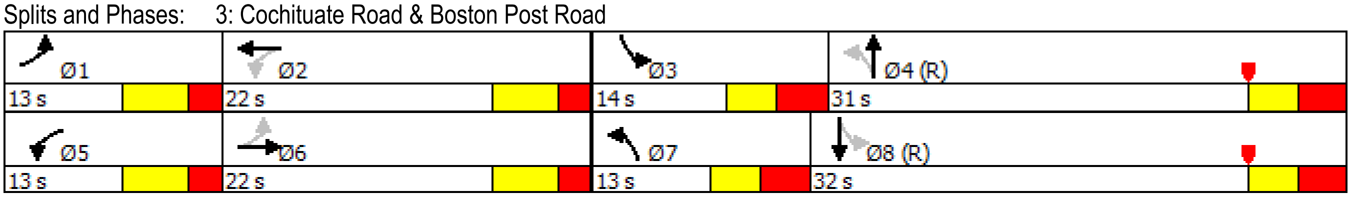
Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	783	-	-	154	744	-	-
HCM Lane V/C Ratio	0.004	-	-	0.711	0.015	-	-
HCM Control Delay (s)	9.6	-	-	71.6	9.9	-	-
HCM Lane LOS	A	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	524	107	48	312	151	130	428	37	267	504	4
Future Volume (vph)	232	524	107	48	312	151	130	428	37	267	504	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	12%	7%	7%	5%	19%	6%	8%	5%	3%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	13.0	22.0		13.0	22.0		13.0	31.0		14.0	32.0	
Total Split (%)	16.3%	27.5%		16.3%	27.5%		16.3%	38.8%		17.5%	40.0%	
Maximum Green (s)	7.0	16.0		7.0	16.0		7.0	25.0		8.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	242	657	50	482	135	485	278	529
v/c Ratio	0.91	0.81	0.23	0.80	0.63	0.91	1.01	0.89
Control Delay	62.5	40.7	19.8	42.5	27.7	50.3	78.7	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	40.7	19.8	42.5	27.7	50.3	78.7	45.7
Queue Length 50th (ft)	89	~190	16	121	36	231	~103	250
Queue Length 95th (ft)	#198	#295	39	#188	#89	#410	#254	#442
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	266	807	227	624	214	534	276	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.81	0.22	0.77	0.63	0.91	1.01	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	524	107	48	312	151	130	428	37	267	504	4
Future Volume (veh/h)	232	524	107	48	312	151	130	428	37	267	504	4
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1818	1900	1776	1787	1900	1597	1790	1900	1810	1845	1900
Adj Flow Rate, veh/h	242	546	111	50	325	157	135	446	39	278	525	4
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	3	3	7	7	7	19	6	6	5	3	3
Cap, veh/h	276	612	124	196	396	187	283	545	48	336	654	5
Arrive On Green	0.09	0.21	0.21	0.05	0.18	0.18	0.08	0.34	0.34	0.10	0.36	0.36
Sat Flow, veh/h	1774	2863	580	1691	2238	1059	1521	1623	142	1723	1829	14
Grp Volume(v), veh/h	242	329	328	50	245	237	135	0	485	278	0	529
Grp Sat Flow(s),veh/h/ln	1774	1727	1715	1691	1697	1600	1521	0	1765	1723	0	1843
Q Serve(g_s), s	7.0	14.8	14.9	1.9	11.1	11.5	4.6	0.0	20.1	8.0	0.0	20.7
Cycle Q Clear(g_c), s	7.0	14.8	14.9	1.9	11.1	11.5	4.6	0.0	20.1	8.0	0.0	20.7
Prop In Lane	1.00		0.34	1.00		0.66	1.00		0.08	1.00		0.01
Lane Grp Cap(c), veh/h	276	369	367	196	300	283	283	0	592	336	0	659
V/C Ratio(X)	0.88	0.89	0.89	0.26	0.82	0.84	0.48	0.00	0.82	0.83	0.00	0.80
Avail Cap(c_a), veh/h	276	369	367	259	339	320	297	0	592	336	0	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	30.5	30.6	25.6	31.7	31.8	17.8	0.0	24.3	20.0	0.0	23.2
Incr Delay (d2), s/veh	25.8	22.3	23.3	0.7	13.0	16.1	1.3	0.0	12.0	15.5	0.0	10.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.3	9.4	0.9	6.3	6.3	2.0	0.0	11.7	3.7	0.0	12.3
LnGrp Delay(d),s/veh	54.3	52.9	53.9	26.3	44.7	47.9	19.1	0.0	36.3	35.5	0.0	33.2
LnGrp LOS	D	D	D	C	D	D	B		D	D		C
Approach Vol, veh/h		899			532			620			807	
Approach Delay, s/veh		53.6			44.4			32.5			34.0	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	20.1	14.0	32.9	10.0	23.1	12.3	34.6
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	16.0	8.0	25.0	7.0	16.0	7.0	26.0
Max Q Clear Time (g_c+I1), s	9.0	13.5	10.0	22.1	3.9	16.9	6.6	22.7
Green Ext Time (p_c), s	0.0	0.7	0.0	1.7	0.0	0.0	0.0	1.9

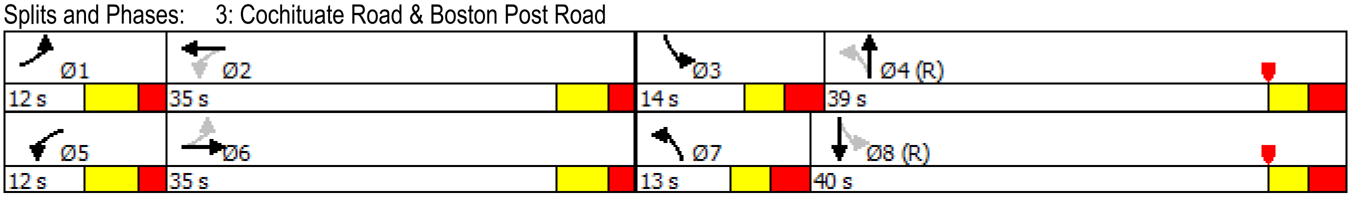
Intersection Summary		
HCM 2010 Ctrl Delay		41.8
HCM 2010 LOS		D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	419	134	32	592	254	150	513	31	210	454	30
Future Volume (vph)	141	419	134	32	592	254	150	513	31	210	454	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	11	11	11	11	11	11	11	11
Storage Length (ft)	230		100	215		250	315		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		400			2000			1000			200	
Travel Time (s)		9.1			45.5			22.7			4.5	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	5%	6%	1%	3%	6%	1%	0%	1%	0%	3%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		12.0	13.0		12.0	13.0	
Total Split (s)	12.0	35.0		12.0	35.0		13.0	39.0		14.0	40.0	
Total Split (%)	12.0%	35.0%		12.0%	35.0%		13.0%	39.0%		14.0%	40.0%	
Maximum Green (s)	6.0	29.0		6.0	29.0		7.0	33.0		8.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Cochituate Road & Boston Post Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	570	33	872	155	561	216	499
v/c Ratio	0.84	0.54	0.12	0.92	0.70	0.94	0.98	0.80
Control Delay	60.6	30.3	19.1	51.1	36.0	59.4	80.5	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	30.3	19.1	51.1	36.0	59.4	80.5	41.2
Queue Length 50th (ft)	58	165	12	282	56	345	85	284
Queue Length 95th (ft)	#160	223	31	#401	#115	#558	#238	#448
Internal Link Dist (ft)		320		1920		920		120
Turn Bay Length (ft)	230		215		315			
Base Capacity (vph)	173	1064	273	951	220	594	220	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.54	0.12	0.92	0.70	0.94	0.98	0.80

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↱		↰	↱	
Traffic Volume (veh/h)	141	419	134	32	592	254	150	513	31	210	454	30
Future Volume (veh/h)	141	419	134	32	592	254	150	513	31	210	454	30
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1792	1870	1900	1792	1882	1900	1881	1896	1900
Adj Flow Rate, veh/h	145	432	138	33	610	262	155	529	32	216	468	31
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	6	1	1	6	1	1	1	0	0
Cap, veh/h	202	792	250	264	670	288	294	603	36	267	622	41
Arrive On Green	0.06	0.30	0.30	0.04	0.28	0.28	0.07	0.34	0.34	0.08	0.35	0.35
Sat Flow, veh/h	1810	2633	832	1707	2423	1040	1707	1757	106	1792	1759	117
Grp Volume(v), veh/h	145	289	281	33	447	425	155	0	561	216	0	499
Grp Sat Flow(s),veh/h/ln	1810	1770	1695	1707	1777	1687	1707	0	1863	1792	0	1876
Q Serve(g_s), s	5.8	13.6	13.9	1.4	24.3	24.4	5.9	0.0	28.3	7.9	0.0	23.4
Cycle Q Clear(g_c), s	5.8	13.6	13.9	1.4	24.3	24.4	5.9	0.0	28.3	7.9	0.0	23.4
Prop In Lane	1.00		0.49	1.00		0.62	1.00		0.06	1.00		0.06
Lane Grp Cap(c), veh/h	202	532	510	264	492	467	294	0	640	267	0	663
V/C Ratio(X)	0.72	0.54	0.55	0.13	0.91	0.91	0.53	0.00	0.88	0.81	0.00	0.75
Avail Cap(c_a), veh/h	202	532	510	305	515	489	294	0	640	267	0	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	29.2	29.3	24.8	35.0	35.0	22.0	0.0	30.8	24.1	0.0	28.5
Incr Delay (d2), s/veh	11.6	1.1	1.3	0.2	19.7	20.6	1.8	0.0	15.6	16.7	0.0	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.8	6.7	0.6	14.6	14.0	2.9	0.0	17.3	5.1	0.0	13.5
LnGrp Delay(d),s/veh	39.1	30.4	30.6	25.0	54.7	55.6	23.7	0.0	46.5	40.8	0.0	36.2
LnGrp LOS	D	C	C	C	D	E	C		D	D		D
Approach Vol, veh/h		715			905			716			715	
Approach Delay, s/veh		32.2			54.0			41.6			37.6	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	33.7	14.0	40.3	9.6	36.1	13.0	41.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	29.0	8.0	33.0	6.0	29.0	7.0	34.0
Max Q Clear Time (g_c+I1), s	7.8	26.4	9.9	30.3	3.4	15.9	7.9	25.4
Green Ext Time (p_c), s	0.0	1.3	0.0	1.7	0.0	7.4	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	42.1
HCM 2010 LOS	D

SECTION 6.0 – DRAINAGE REPORT

ALLEN & MAJOR
ASSOCIATES, INC.

SITE LOCUS
NOT TO SCALE

ALTA at RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MASSACHUSETTS
DRAINAGE REPORT

PREPARED: JUNE 20, 2019

REVISED: NOVEMBER 12, 2019

CLIENT:
WP EAST ACQUISITIONS, LLC.
91 HARTWELL AVENUE
LEXINGTON, MA 02421

PREPARED BY:
ALLEN & MAJOR ASSOCIATES, INC.
100 COMMERCE WAY, SUITE #5
WOBURN, MASSACHUSETTS, 01801

11.12.19

COMMONWEALTH OF MASSACHUSETTS
CARLTON M.
QUINN
CIVIL
No.49923
REGISTERED
PROFESSIONAL ENGINEER

A&M PROJECT NO. : 1670-09A

DRAINAGE REPORT

ALTA AT RIVER'S EDGE
#490 BOSTON POST ROAD
WAYLAND, MA

PROPONENT:

WP EAST ACQUISITIONS, LLC
91 HARTWELL AVENUE
LEXINGTON, MA 02421

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
100 COMMERCE WAY, SUITE 5
WOBURN, MA 01801

ISSUED: JUNE 20, 2019

REVISED: NOVEMBER 12, 2019

A&M PROJECT #1670-09A

Section 1.0

Section 2.0

Section 3.0

Section 4.0

Section 5.0

Section 6.0

INTRODUCTION

The purpose of this drainage report is to provide an overview of the proposed stormwater management system (SMS) for the multi-family residential development located at #490 Boston Post Road (MA Route 20) in Wayland, MA. The report will show by means of narrative, calculations and exhibits that the proposed stormwater management system will meet or exceed the 10 Massachusetts Department of Environment Protection (DEP) stormwater standards.

The proposed site development includes three (3) three- and four-story multi-family residential apartment buildings with parking garages beneath, off-street surface parking, utilities, drainage and associated site-work. A proposed driveway will provide access to the site from an existing access drive immediately adjacent to Boston Post Road (MA Route 20). The project will be serviced by municipal water and an on-site wastewater treatment plant with associated leach field.

The SMS incorporates structural and non-structural Best Management Practices (BMPs) to provide stormwater peak flow mitigation, quality treatment, and conveyance. The SMS includes deep-sump, hooded catch basins, drain manholes, hydrodynamic separators, underground infiltration ponds equipped with isolator rows, outlet protection, concrete headwalls with rip-rap lined aprons, and a long-term Operation and Maintenance Plan.

SITE CATEGORIZATION FOR STORMWATER REGULATIONS

The proposed project at #490 Boston Post Road is considered a new development under the DEP Stormwater Management Standards due to the net increase in impervious area. A new development project is required to meet the ten (10) Stormwater Standards within the MA DEP Stormwater Handbook. Standards 1, 8, 9 and 10 must always be fully met.

SITE LOCATION AND ACCESS

The subject parcel is located at #490 Boston Post Road, along the western edge of the Town of Wayland, and directly abuts the Town of Sudbury. The parcel is 8.25+/- acres and is identified on the Town of Wayland Assessor's database as Map 22, Lots 003 (portion, 006, and 007 (portion). Wayland is located in Middlesex County and is approximately 20 miles west of the City of Boston. The site is located approximately 2.0 miles southeast on Middlesex Turnpike from the intersection at Concord Road. Exhibit 1 shows the location of the property on Boston Post Road.

The parcel is abutted by Boston Post Road (MA Route 20) to the south of the property; an undeveloped lot owned by the Town of Wayland to the north and east (0 Boston Post Road); and the Town of Sudbury to the west. The northern portion of the property contains bordering vegetated wetlands.

EXISTING SITE CONDITIONS

The site currently includes a 7,000± square-foot (SF) one-story brick and concrete building, a loading dock, a paved parking lot, several circular storage tanks, and multiple outbuildings including sheds. A portion of the site was previously used as a refuse facility. The parcel has two (2) access points, from an unnamed access road which connects to Boston Post Road, as well as an unnmaed access road which connects to an adjacnet property to the west located in the Town of Sudbury.

The site topography slopes varies significanitly over the site, due to its use as a refuse facility as well as a gun range. Some existing slopes are relatively steep, with multiple localized high points throughout the site. Elevations range from El. 160± at the southwest corner of the site along Boston Post Road to a low point of approximately El. 117± abutting the wetlands near the northerly property line. The main building on the subject parcel is at elevation 149.5±, with a four-foot high loading dock to the rear at approximately El. 153.3±. There is a landscaped buffer area along the southern, eastern, and northern property lines consisting of trees and grass, and a bordering vegetated wetland area to the north.

The majority of the site (notated as Watershed E-1 in the HydroCAD model and existing watershed plan) flows to the northern wetland area (notated as Study Point #1 in the HydroCAD model and existing watershed plan) with the exception of Watershed E-2 which flows to the southeastern corner of the site, notated as Study Point #2.

WATERSHED

The subject property is located within the SuAsCo Watershed. The SuAsCo Watershed is one of the 27 major watersheds in Massachusetts. SuAsCo stands for the Sudbury, Assabet, and Concord Rivers. The SuAsCo Watershed is the land area surrounding these three rivers. Any rain falling within the SuAsCo watershed eventually drains into the Sudbury, Assabet or Concord rivers. The SuAsCo Watershed is a 377-square mile area encompassing, partially or wholly, 36 Massachusetts towns and cities. The SuAsCo Watershed is not protected under the Watershed Protection Act and has no associated land use restrictions.

EXISTING SOIL CONDITIONS

The on-site soils were identified using the USDA Natural Resources Conservation Services (NRCS) Soil Survey for Middlesex County. The sites soil types and corresponding Hydrologic Soil Groups (HSG) include:

- 51A (HSG-B/D) - Swansea Muck
- 253D (HSG-A) - Hinckley Loamy Sand
- 652 (Assumed HSG-B) - Udorthents, Refuse Substratum
- 656 (Assumed HSG-B) - Udorthents-Urban Land Complex

Urban land consists of areas where the soil has been altered or obscured by buildings, or paved areas; neither Urban land nor Udorthents are assigned a hydrologic soil group (HSG). Based on a textural analysis of the in-situ soils and a geotechnical report dated May 2019 by Haley & Aldrich, the site was assumed to have a conservative HSG of "B". The report states that the site is comprised mostly of poorly-graded, glaciofluvial deposits mainly consisting of sand and gravel.

There is adequate separation between the infiltration systems and the seasonal high groundwater table of four (4) feet. A copy of the soil mapping is included in the Appendix of this report.

FEMA FLOODPLAIN/ENVIRONMENTAL DUE DILIGENCE

The Flood Insurance Rate Map (FIRM) (Map Number 25017C0507F) for the Town of Wayland dated July 7, 2014 indicates that the parcel lies within the FEMA Zone X as well as FEMA Zone AE. The FEMA Zone X in this area is defined as "areas determined to be outside the 0.2% annual chance floodplain." The FEMA Zone AE in this area is defined as a "special flood hazard area" with a Base Flood Elevation (BFE). See the appendix of this report for a copy of the FEMA FIRM.

ENVIRONMENTALLY SENSITIVE ZONES

The Commonwealth of Massachusetts asserts control over numerous protected and regulated areas including: Areas of Critical Environmental Concern (ACEC); Outstanding Resource Waters (ORWs); areas protected under the Wetlands Protection Act and the Rivers Protection Act, as well as Priority and Protected Habitat for rare and endangered species. The subject property is located within the 100' of a bordering vegetated wetland and within 200' of the Sudbury River as illustrated on the site development plans. A Notice of Intent is required.

DRAINAGE ANALYSIS METHODOLOGY

A peak rate of runoff will be determined using techniques and data found in the following:

1. Urban Hydrology for Small Watersheds – Technical Release 55 by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.

2. HydroCAD© Stormwater Modeling System by HydroCAD Software Solutions LLC, version 10.00, 2013. The HydroCAD program was used to generate the runoff hydrographs for the watershed areas, to determine discharge/stage/storage characteristics for the stormwater BMPs, to perform drainage routing and to combine the results of the runoff hydrographs. HydroCAD uses the TR-20 methodology of the SCS Unit Hydrograph procedure (SCS-UH).

3. Soil Survey of Middlesex County Massachusetts by United States Department of Agriculture, NRCS. Soil types and boundaries were obtained from this reference.

4. National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10, Version 3-point precipitation frequency estimates for Wayland, Massachusetts. The 2-year, 10-year, and 100-year storm events were taken from this website per Wayland Conservation Commission (see Appendix).

PROPOSED CONDITIONS - PEAK RATE OF RUNOFF

The storm water runoff analysis of the existing and proposed conditions includes an estimate of the peak rate of runoff from various rainfall events. Peak runoff rates were developed using TR-55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the analysis has been prepared in accordance with the MA DEP and the Town of Wayland requirements and standard engineering practices. The peak rate of runoff has been estimated for each watershed during the 1-inch, 2-year, 10-year, and 100-year storm events, per Chapter 194 Submittal Requirements for the Town of Wayland.

Proposed underground infiltration ponds receive stormwater directly from the proposed roof and pretreated site areas. Infiltration Ponds provide recharge for building roofs as well as paved surface parking areas. Paved areas will require pretreatment which is provided by catch basins equipped with deep sumps and hoods, ConTech CDS-2015-4-C hydrodynamic separators, and Stormtech isolator rows. Outlet control structures with weirs and orifices act as overflow devices and control flows during high-intensity storm events. All infiltration systems ultimately discharge to the abutting wetlands, located to the north and east of the project site.

All proposed infiltration systems provide the minimum required four (4) feet of separation between the Estimated Seasonal High-Water Table (ESHWT); therefore, a mounding analysis is not required.

The stormwater runoff model shows that the proposed site development reduces the rate of runoff during all storm events at the identified points of analysis. Stormwater models show that the volume of water discharging to the abutting wetlands will be reduced in the 1-inch and 2-year event but will increase for the 10-year and 100-year events. The following tables provide a summary of the estimated peak flow rate and discharge volume at each Study Point during each of the design storm events. The HydroCAD worksheets are included in Section 4 of this report.

PEAK FLOW RATES SUMMARY TABLE

STUDY POINT #1 (Flow to northern wetlands)

Runoff Flow	0.5"	1"	2-Yr	10-Yr	25-Yr	100-Yr
Existing (CFS)	0.00	0.00	2.18	5.59	7.99	11.84
Proposed (CFS)	0.00	0.00	0.76	4.78	7.33	11.69
REDUCTION	0.00	0.00	1.42	0.81	0.66	0.15

STUDY POINT #2 (Off-site flow to southeast corner)

Runoff Flow	0.5"	1"	2-Yr	10-Yr	25-Yr	100-Yr
Existing (CFS)	0.00	0.01	3.57	8.19	11.33	16.29
Proposed (CFS)	0.00	0.00	0.91	7.04	10.32	16.21
REDUCTION	0.00	0.01	2.66	1.15	1.01	0.08

PEAK VOLUMES SUMMARY TABLE

STUDY POINT #1 (Flow to northern wetlands)

Runoff Volume	0.5"	1"	2-Yr	10-Yr	25-Yr	100-Yr
Existing (CFS)	0.00	66	7,823	18,575	26,256	38,811
Proposed (CFS)	0.00	0.00	5,450	20,071	30,786	48,607
DELTA	0.00	-66	-2,373	+1,496	+4,530	+9,796

STUDY POINT #2 (Off-site flow to southeast corner)

Runoff Volume	0.5"	1"	2-Yr	10-Yr	25-Yr	100-Yr
Existing (CFS)	0.00	346	13,112	28,986	40,014	57,768
Proposed (CFS)	0.00	74	8,242	32,038	48,861	75,947
DELTA	0.00	-272	-4,870	+3,052	+8,847	0.22

MA DEP STORMWATER PERFORMANCE STANDARDS

The MA DEP Stormwater Management Policy was developed to improve water quality by implementing performance standards for storm water management. The intent is to implement the stormwater management standards through the review of Notice of Intent filings by the issuing authority (Conservation Commission or DEP). The following section outlines how the proposed Stormwater Management System meets the standards set forth by the Policy.

BMP's implemented in the design include:

- Deep-sump, hooded catch basins
- Trench Drains
- Hydro-dynamic (Proprietary) separators
- Underground infiltration systems
- Isolator row
- Specific maintenance schedule

Stormwater Best Management Practices have been incorporated into the design of the project to mitigate the anticipated pollutant loading. An Operations and Maintenance Plan has been developed for the project, which addresses the long-term maintenance requirements of the proposed system.

Temporary erosion and sedimentation controls will be incorporated into the construction phase of the project. These temporary controls may include straw bale and/or silt fence barriers, inlet sediment traps, diversion channels, slope stabilization, and stabilized construction entrances.

The Massachusetts Department of Environmental Protection has established ten (10) Stormwater Management Standards. A project that meets or exceeds the standards is presumed to satisfy the regulatory requirements regarding stormwater management. The Standards are enumerated below as well as descriptions and supporting calculations as to how the Project will comply with the Standards:

1. *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

The proposed development will not introduce any new stormwater conveyances (e.g. outfalls) that discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

For computations demonstrating discharges are adequately treated please see computations for Standard 4 through Standard 6. Additionally, all outfalls have been designed to provide standard Rip Rap outfalls as calculated in Section 6.11.

2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

The proposed development will be designed so that the post-development peak discharge rates do not exceed the pre-development peak discharge rates. See the peak flow rate table, above.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

The existing annual recharge for the site will be approximated in the developed condition. Subsurface infiltration chambers will be designed to meet this requirement. All Infiltration Systems were designed using the Static Method per the MA DEP Stormwater Management Standards, Volume 3, Chapter 1. See Section 6.9 for water quality/recharge calculations for the project site.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:*

    a. *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
    b. *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*

c. *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

The proposed stormwater management system will be designed so that the 80% TSS removal standard will be met for each drainage area. Standard #4 is met when structural stormwater best management practices are sized to capture and treat the required water quality volume and pretreatment is provided in accordance with the Massachusetts Stormwater Handbook. Standard #4 also requires that suitable source control measures are identified in the Long-Term Pollution Prevention Plan.

Additionally, because discharge is from land uses with higher potential pollutant loads, the proposed stormwater management system will be designed so that prior to each discharge to an infiltration structure, the 44% TSS removal standard will be met using some combination of the following: deep-sump, hooded catch basins, proprietary separators, and isolator rows.

The water quality volume for the site development will be captured and treated using proprietary separators and infiltration systems equipped with isolator rows. All systems will be sized to meet the water quality flow rate for the 1" storm event. See DEP Calculations in the appendix of this report for water quality flow rate and volume calculations.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

The proposed development may be considered a source of higher potential pollutant loads because the proposed parking area is considered a high-intensity parking area (over 1,000 vehicle trips per day). Pre-treatment and source reduction are provided to the maximum extent practicable. The drainage system will be designed to treat 1" water quality volume and provide 44% TSS removal prior to discharge to an infiltration device. The SMS will be designed with hydrodynamic separators, deep-sump & hooded catch basins, and infiltration chambers equipped with isolator rows to provide 44% TSS removal prior to recharge.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department*

to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

The proposed project is not located within a critical area.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

The proposed project is considered a new development project under the Stormwater Management Handbook guidelines as there is an increase in the amount of impervious area.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction and land disturbance activities will be developed. The proponent will prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of construction activities that will result in the disturbance of one acre of land or more.

9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

A Long-Term Operation and Maintenance (O&M) Plan has been developed for the proposed stormwater management system and is included within this document. See Section 2.0 of this report.

10. *All illicit discharges to the stormwater management system are prohibited.*

There are no expected illicit discharges to the stormwater management system. The Applicant has submitted an Illicit Discharge Compliance Statement with this report. See

Section 6.12 of the Appendix.

See the next page for the Mass DEP Stormwater Checklist.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

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[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
CARLTON M.
QUINN
CIVIL
No 49923
REGISTERED
PROFESSIONAL ENGINEER

11.12.19

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of “country drainage” versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☒ Other (describe): Underground Infiltration Systems (Chambers); Isolator row; Water quality unit

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:
- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

  ☐ is within the Zone II or Interim Wellhead Protection Area

  ☐ is near or to other critical areas

  ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

  ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½” or 1” Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

- ☐ The project is ***not*** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - ☒ Name of the stormwater management system owners;
  - ☒ Party responsible for operation and maintenance;
  - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
  - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
  - ☒ Description and delineation of public safety features;
  - ☒ Estimated operation and maintenance budget; and
  - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

OPERATION AND MAINTENANCE PLAN

In accordance with the standards set forth by the Stormwater Management Policy issued by the Department of Environmental Protection (DEP), Allen & Major Associates, Inc. (A&M) has prepared the following Operation and Maintenance plan for the ALTA at Rivers Edge project located at #490 Boston Post Road.

This plan is broken into two major sections. The first section describes construction-related erosion and sedimentation controls. The second section is devoted to a post-development operation and maintenance plan. An operation and maintenance schedule is included with this report.

Stormwater Management System Owner: WP East Acquisitions, LLC
91 Hartwell Avenue, 3rd Floor
Lexington, MA 02421

Emergency Contact Information:

- WP East Acquisitions, LLC
  c/o David Moore Phone (978) 369-8111
- Allen & Major Associates, Inc. (Site Civil Engineer) Phone (781) 935-6889
- Wayland Public Works Phone (508) 358-3672
- Wayland Fire Department (business line) Phone (508) 358-4747

INTRODUCTION

The stormwater management system (SMS) for this project is owned by WP East Acquisitions, LLC; and shall be legally responsible for long-term operation and maintenance for this SMS as outlined in this Operation and Maintenance (O&M) Plan. Should ownership of the SMS change the succeeding owner will be presented with this O&M Plan and supporting attachments at or before legal conveyance of ownership and will assume the obligations of the O&M Plan.

In the event that the SMS will be operated and maintained by an entity other than that listed in this document, the applicant shall provide a plan and easement deed that provides a right of access for the legal entity to be able to perform said operation and maintenance functions. In the event the SMS will serve multiple lots/owners, the applicant shall also provide a copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the entire SMS.

DEMOLITION & CONSRUCTION MAINTENANCE PLAN

1. Call Digsafe: 1-888-344-7233

2. Contact the Town of Wayland at least three (3) days prior to start of demolition and/or construction activities.

3. Install Erosion Control measures as shown on the Plans prepared by A&M. The Town of Wayland shall review the installation of straw bales and silt fencing prior to the start of any site demotion work. Install Construction fencing if determined to be necessary at the commencement of construction.

4. Install construction entrances & straw bales and silt fence at the locations shown on the Erosion Control Plan prepared by A&M.

5. Site access shall be achieved only from the designated construction entrances.

6. Cut and clear trees in construction areas only (within the limit of work; see plans).

7. Stockpiles of materials subject to erosion shall be stabilized with erosion control matting or temporary seeding whenever practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

8. Install silt sacks and straw bales around each drain inlet prior to any demolition and or construction activities.

9. All erosion control measures shall be inspected weekly and after every rainfall event. Records of these inspections shall be kept on site for review.

10. All erosion control measures shall be maintained, repaired or replaced as required or at the direction of the owner's engineer or the Town of Wayland.

11. Sediment accumulation up-gradient of the straw bales, silt fence, and stone check dams greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.

12. If it appears that sediment is exiting the site, silt sacks shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sack replaced if torn or damaged.

13. Install stone check dams on site during construction as needed. Refer to the erosion

control details. Temporary sediment basins combined with stone check dams shall be installed on site during construction to control and collect runoff from upland areas of this site during demolition and construction activities.

14. The contractor shall comply with the Sedimentation and Erosion Control Notes as shown on the Site Development Plans and Specifications.

15. The stabilized construction entrances shall be inspected weekly and records of inspections kept. The entrances shall be maintained by adding additional clean, angular, durable stone to remove the soil from the construction vehicle's tires when exiting the site. If soil is still leaving the site via the construction vehicle tires, adjacent roadways shall be kept clean by street sweeping.

16. Dust pollution shall be controlled using on-site water trucks and or an approved soil stabilization product.

17. During demolition and construction activities Status Reports on compliance with this O&M Document shall be submitted weekly. The report shall document any deficiencies and corrective actions taken by the applicant.

POST CONSRUCTION MAINTENANCE PLAN

The SMS shall be inspected immediately after construction. A maintenance log will be kept (i.e. report) summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department staff and a copy provided to the department upon request.

Inspection and Maintenance Frequency and Corrective Measures:

The following areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments, trash, and debris. In any and all cases, operations, inspections, and maintenance activities shall utilize best practical measures to avoid and minimize impacts to wetland resource areas outside the foot print of the SMS.

Attached is an Grading and Drainage Plan (C-103) illustrating the location of the following SMS components that will require continuing inspections as outlined in this document:

- Deep Sump Catch Basins (10)
- Proprietary Separators (5)
- Subsurface Infiltration Systems (3)
- Outlet Control Structures (3)
- Snow Storage (as outlined on plan)

Monthly Post Construction Inspection (First three months only)

- **Sub-surface Infiltration Systems:**

Inspect the Infiltration system after all rainfalls greater than 1" to ensure that the system is draining within 72 hours. Repair as required.

Quarterly Inspections (specifically after foliage and snow season)

Deep Sump Catch Basins:
Inspect catch basins to ensure that the catch basins are working in their intended fashion and that they are free of debris. Structures will be skimmed of floatable debris at each inspection and sediment will be removed at a minimum once per year (typically after snow season) or when sediment has accumulated to within 2 feet of the outlet invert. If the basin outlet is designed with a hood to trap floatable materials (i.e. Snout), check to ensure watertight seal is working.

Proprietary Separators:
Separators shall be operated in strict accordance with manufacturer's recommend practices. Available manufacturer specific O&M plans attached as Appendix. Separators shall be inspected to ensure that they are working in their intended fashion and that they are free of debris. Structures shall be cleaned with a vacuum truck at least once annually (typically after snow season) or when sediment has accumulated to a depth of six inches (6"), whichever is more frequent.

Sediment Forebay:
Inspect the Sediment Forebay for accumulations of sediment. The forebay shall be cleaned at least once annually (typically after snow season) or when sediment has accumulated to a depth of one and a half inches (1.5"), whichever is more frequent.

Sub-surface Infiltration Systems:
The sub-surface structures will be inspected 24 hours or several days after large rain events (greater than 1.5"), to look for ponded water. Inspection can be accomplished by using the observation well, inspection port, and/or access structure for underground chamber systems.

Semi-Annual Inspection (specifically after foliage & snow season)

Isolator rows:
Inspect Isolator row by using inspection port and/or access structure. Remove any accumulated sediment as needed when average depths reach 1" with a vacuum truck or per the manufactures recommendation.

Culverts:
Inspect culverts to ensure that the culverts are working in their intended fashion and that they are free of debris. Remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit and to repair any erosion damage at the culvert's inlet and outlet.

Vegetated Areas:
Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

Roadways and Parking Surfaces:
Sweep paved areas as soon as possible after snow melt and no less than four times annually. Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping.

Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

Level Spreaders, Check Dams, Rip-Rap:
These accessories will be inspected for erosion, debris accumulation, and unwanted vegetation. Erosion will be stabilized and sediment, debris, and woody vegetation will be removed.

LANDSCAPE MANAGEMENT PLAN

It should be recognized that this is a general guideline towards achieving high quality and well-groomed landscaped areas. The grounds staff / landscape contractor must recognize the shortcomings of a general maintenance program such as this, and modify and/or augment it based on weekly, monthly, and yearly observations. In order to assure the highest quality conditions, the staff must also recognize and appreciate the need to be aware of the constantly changing conditions of the landscaping and be able to respond to them on a proactive basis.

Additional care must be taken in landscape areas that are functioning as BMP drainage structures. These areas have been specifically designed to treat and convey stormwater and shall be maintained as such. These areas include the Bioretention Areas, Gravel Infiltration Swale, Grassed Filter Strips, Sediment Forebay and Detention Basin and are illustrated on the attached Operation and Maintenance Plan (OM-1)

Fertilizer

Maintenance practices should be aimed at reducing environmental, mechanical and pest stresses to promote healthy and vigorous growth. When necessary, pest outbreaks should be treated with the most sensitive control measure available. Synthetic chemical controls should be used only as a last resort to organic and biological control methods. Fertilizer, synthetic chemical controls and pest management applications (when necessary) should be performed only by licensed applicators in accordance with the manufacturer's label instructions when environmental conditions are conducive to controlled product application.

Only slow-release organic fertilizers should be used in the landscaped areas to limit the amount of nutrients that could enter downstream resource areas. Fertilization of developed areas on site will be performed within manufacturers labeling instructions. Additionally, the fertilizer will include a slow release element and be Phosphorous free.

Suggested Aeration Program

In-season aeration of lawn areas is good cultural practice, and is recommended whenever feasible. It should be accomplished with a solid thin tine aeration method to reduce disruption to the use of the area. The depth of solid tine aeration is similar to core type, but should be performed when the soil is somewhat drier for a greater overall effect.

Depending on the intensity of use, it can be expected that all landscaped lawn areas will need aeration to reduce compaction at least once per year. The first operation should occur in late May following the spring season. Methods of reducing compaction will vary based on the nature of the compaction. Compaction on newly established landscaped areas is generally limited to the top 2-3" and can be alleviated using hollow core or thin tine aeration methods.

The spring aeration should consist of two passes at opposite directions with 1/4" hollow core tines penetrating 3-5" into the soil profile. Aeration should occur when the soil is moist but not saturated. The cores should be shattered in place and dragged or swept back into the turf to control thatch. If desired the cores may also be removed and the area top-dressed with sand or sandy loam. If the area drains on average too slowly, the topdressing should contain a higher percentage of sand. If it is draining on average too quickly, the top dressing should contain a higher percentage of soil and organic matter.

Landscape Maintenance Program Practices:

Lawn

- Mow a minimum of once a week in spring, to a height of 2" to 2 1/2" high. Mowing should be frequent enough so that no more than 1/3 of grass blade is removed at each mowing. The top growth supports the roots; the shorter the grass is cut, the less the roots will grow. Short cutting also dries out the soil and encourages weeds to germinate.
- Mow approximately once every two weeks from July 1st to August 15th depending on lawn growth.
- Mow on a ten-day cycle in fall, when growth is stimulated by cooler nights and increased moisture.
- Do not remove grass clippings after mowing. (Except in Drainage BMP's)
- Keep mower blades sharp to prevent ragged cuts on grass leaves, which cause a brownish appearance and increase the chance for disease to enter a leaf.
- Supplemental irrigation of lawn areas should provide 1" of water per week in two watering's per week—when no natural rainfall has occurred.

Shrubs

- Mulch not more than 3" depth with shredded pine or fir bark.
- Hand pruning shall be performed annually based on the natural growth characteristics of each species to keep plants from overgrowing walks and windows. NO SHEARING OF SHRUBS IS PERMITTED. Typically, pruning of each variety shall be immediately after blooming.
- Fertilize with ½ lb. slow-release fertilizer (see above section on Fertilizer) every second year.
- Hand prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub. Never mechanically shear evergreen shrubs.

Trees

- Provide aftercare for new tree plantings for the first three years.
- Do not fertilize trees, it artificially stimulates them (unless tree health warrants).
- Water once a week for the first year; twice a month the second, once a month the third year.
- Prune trees on a four-year cycle.

Grassland Management Protocol

During the first three growing seasons, the native grasslands should mowed one or two times with a sickle bar mower to suppress weed species. The blade shall be set between 5"-10" as directed. If weed growth is not rampant, the first mowing should be done in mid-July. More than one mowing may be necessary over the course of the first and second growing season if extensive weed growth is evident. During the third year of growth, one mowing shall be performed in late July. No rotary mowers shall be used. All cuttings should be removed and disposed of away from the planted area until the grassland habitat is fully established.

No fertilizers shall be used after planting. The low nitrogen available from the soil is an important factor in suppressing many potential invasive species from establishing in the grassland restoration areas.

Herbicides shall only be used where non-grass herbaceous species comprise more than 30 percent of vegetative cover based as determined from monitoring. Appropriate broad-leaf herbicides should be used only according to their directions.
Supplemental Seeding shall be done in areas where the primary seeding has not been successful as directed by the monitor.

Maintenance Phase
By the fourth growing season, the planted grasslands should be reaching maturity. At this time, half of the grassland habitat area should be mown annually in mid- August to maintain the grassland habitat, limiting the opportunity for shrubs and late-blooming forbs to spread, and allowing the grasses time to recover before dormancy.

Management of Deicing Chemicals and Snow
Snow shall not be plowed towards any area protected by the Massachusetts Wetlands Protection Act. Additionally, it is prohibited to dump snow into the bioretention swales, or gravel swales. Snow shall only be stockpiled on site within the snow storage areas depicted on the Snow Storage plan. If the stockpiles of snow do not fit within the designated areas, then snow will be disposed off-site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according to the Massachusetts DEP, Bureau of Resource Protection – Snow Disposal Guideline #BRPG01-0, governing the proper disposal of snow. It will be the responsibility of the snow removal contractor to follow these guidelines and all applicable laws and regulations. A copy of the MA DEP Snow Disposal Guideline #BRPG01-01 has been included at the end of Section 2 for reference.

The sites maintenance staff (or its designee) will be responsible for the clearing of the sidewalk and building entrances. The site may be required to use a de-icing agent such as potassium chloride (or approved equal) to maintain a safe walking surface; however, these are to be used at the minimum amount practicable. The de-icing agent for the walkways and building entrances will be kept within the storage rooms located within the buildings. De-icing agents will not be stored outside and shall not be used within 100 feet of the bordering vegetated wetlands.

Spill Prevention and Response
Sources of potential spill hazards include vehicle fluids, liquid fuels, pesticides, paints, solvents, and liquid cleaning products. The majority of the spill hazards would likely occur within the building and would not enter the stormwater drainage system. However, there are spill hazards from vehicle fluids or liquid fuels located outside of the buildings. These exterior spill hazards have the potential to enter the stormwater drainage system and are to be addressed as follows:

1. Spill Hazards of pesticides, paints, and solvents shall be remediated using the Manufacturers' recommended spill cleanup protocol.
2. Vehicle fluids and liquid fuel spill shall be remediated according to the local and state regulations governing fuel spills.
3. The owner shall have the following equipment and materials on hand to address a spill clean-up: brooms, dust pans, mops, rags, gloves, absorptive material, sand, sawdust, plastic and metal trash containers.
4. All spills shall be cleaned up immediately after discovery
5. Spills of toxic or hazardous material shall be reported, regardless of size, to the Massachusetts Department of Environmental Protection at 888-304-1133.
6. Should a spill occur, the pollution prevention plan will be adjusted to include measures to prevent another spill of a similar nature. A description of the spill, along with the causes and cleanup measures will be included in the updated pollution prevention plan.

Pet Waste Management
Pet waste stations will be provided on site. Ultimately, it will be the responsibility of the pet owner to clean any waste and discard it in the provided stations.

OPERATION & MAINTENANCE PLAN SCHEDULE

Project: ALTA at River's Edge
Address: 490 Boston Post Road
Wayland, MA

ty Responsible for O & M Plan: WP East Acquisitions, LLC.
Address: 91 Hartwell Avenue
3rd Floor
Lexington, MA 02421
Phone: (978)-369-8111

Date: 5/31/2017
Revised: ------

Structure or Task	Maintenance Activity	Schedule/Notes	Annual Maintenance Cost	Inspection Performed	
				Date:	By:
Street Sweeping	Sweep, power broom or vacuum paved areas.	Sweep paved areas as needed, but not less than four times annually.	$2,000		
		Submit information that confirms that all street sweepings have been disposed in accordance with state and local requirements			
Deep Sump Catch Basins(s)	Clam shell or vacuum sumps	Inspect at least twice annually. Clean when sediment is within 2.5 feet of the outlet invert.	$500		
		Submit information that confirms that all catch basin sediments have been disposed in accordance with state and local requirements			
Storm Water Management System					
Proprietary Separators	See the ConTECH Maintenance package for the inspection and cleaning procedure.	Inspect at least four times annually as well as following storms exceeding 1" of rainfall. Devices shall be cleaned at leaast once annually or when sediment reaches 6 inches of depth whichever is more frequent. See also note #1 below.	$250		
		Submit information that confirms that all water quality inlets sediments have been disposed in accordance with state and local requirements			
Subsurface Infiltration Systems	Inspect to ensure it is draining properly.	Perform every other month as well as after every storm event over 1/2". See also note #1 below.	$500		
	Inspect isolator row using inspection ports and remove any accumulated sediment when average depth reaches 1" per the manufacturers recommendation.	On a semi-annual basis.			
Outlet Control Structure(s)	Vacuum.	Periodic cleaning of Outlet Control Structures as needed.	$50		
Mosquito Control	CB management targeted larviciding treatment to CB's and all storm drains to control mosquitoes in their aquatic stages.	Surveillance is a non chemical inspection method that involves classification of mosquito breeding sites, larval presents, and survey.	$100		
Snow Storage	Debris shall be cleared from the site and properly disposed of at the end of the snow season, but shall be cleared no later than May 15.	Avoid dumping snow removal over catch basins, in detention ponds, sediment forebays, rivers, wetlands, and flood plain. It is also prohibited to dump snow in the bioretention basins or gravel swales. (See Site Plan for appropriate locations)	$500		

Note #1 - During the first year of operation, all of the BMP's shall be inspected during and after large storm events to ensure they are functioning properly. The subsurface infiltration systems should be fully drained within 72 hours after a rain event. If they are not drained within this time period, the systems shall be evaluated and corrective actions should be implemented.

Snow Disposal Guidance

Effective Date: March 8, 2001

Guideline No. BRPG01-01

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: BRP Snow Disposal Guideline BRPG97-1 issued 12/19/97, and all previous snow disposal guidance

Approved by: Glenn Haas, Assistant Commissioner for Resource Protection

A to Z Quick Links

Water Resources Index

PURPOSE: To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are acceptable to the Department of Environmental Protection, Bureau of Resource Protection.

APPLICABILITY: These Guidelines are issued by the Bureau of Resource Protection on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to public agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While we are all aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything we do on the land has the potential to impact our water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter.

RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

1. SITE SELECTION

The key to selecting effective snow disposal sites is to locate them adjacent to or on pervious surfaces in upland areas away from water resources and wells. At these locations, the snow meltwater can filter in to the soil, leaving behind sand and debris which can be removed in the springtime. The following areas should be avoided:

- Avoid dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
- Do not dump snow within a Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies.
- Avoid dumping snow on MassDEP-designated high and medium-yield aquifers where it may contaminate groundwater (see the next page for information on ordering maps from MassGIS showing the locations of aquifers, Zone II's, and IWPAs in your community).
- Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.

- Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Site Selection Procedures

1. It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:
2. Estimate how much snow disposal capacity is needed for the season so that an adequate number of disposal sites can be selected and prepared.
3. Identify sites that could potentially be used for snow disposal such as municipal open space (e.g., parking lots or parks).
4. Sites located in upland locations that are not likely to impact sensitive environmental resources should be selected first.
5. If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

MassGIS Maps of Open Space and Water Resources

If local maps do not show the information you need to select appropriate snow disposal sites, you may order maps from MassGIS (Massachusetts Geographic Information System) which show publicly owned open spaces and approximate locations of sensitive environmental resources (locations should be field-verified where possible). Different coverages or map themes depicting sensitive environmental resources are available from MassGIS on the map you order. At a minimum, you should order the Priority Resources Map. The Priority Resources Map includes aquifers, public water supplies, MassDEP-approved Zone II's, Interim Wellhead Protection Areas, Wetlands, Open Space, Areas of Critical Environmental Concern, NHESP Wetlands Habitats, MassDEP Permitted Solid Waste facilities, Surface Water Protection areas (Zone A's) and base map features. The cost of this map is $25.00. Other coverages or map themes you may consider, depending on the location of your city or town, include Outstanding Resource Waters and MassDEP Eelgrass Resources. These are available at $25.00 each, with each map theme being depicted on a separate map. Maps should be ordered from MassGIS . Maps may also be ordered by fax at 617-626-1249 (order form available from the MassGIS web site) or mail. For further information, contact MassGIS at 617-626-1189.

2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- To filter pollutants out of the meltwater, a 50-foot vegetative buffer strip should be maintained during the growth season between the disposal site and adjacent waterbodies.
- Debris should be cleared from the site prior to using the site for snow disposal.
- Debris should be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.

3. EMERGENCY SNOW DISPOSAL

As mentioned earlier, it is important to estimate the amount of snow disposal capacity you will need so that an adequate number of upland disposal sites can be selected and prepared.

If despite your planning, upland disposal sites have been exhausted, snow may be disposed of near waterbodies. A vegetated buffer of at least 50 feet should still be maintained between the site and the waterbody in these situations. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, disposal of snow that is not obviously contaminated with road salt, sand, and other pollutants may be allowed in certain waterbodies under certain conditions. In these dire situations, notify your Conservation Commission and the appropriate MassDEP Regional Service Center before disposing of snow in a waterbody.

Use the following guidelines in these emergency situations:

- Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
- Do not dispose of snow in saltmarshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
- Do not dispose of snow where trucks may cause shoreline damage or erosion.
- Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local

ordinances and bylaws.

FOR MORE INFORMATION

If you need more information, contact one of MassDEP's Regional Service Centers:

Northeast Regional Office, Wilmington, 978-694-3200
Southeast Regional Office, Lakeville, 508-946-2714
Central Regional Office, Worcester, 508-792-7683
Western Regional Office, Springfield, 413-755-2214

or

Call Thomas Maguire of DEP's Bureau of Resource Protection in Boston at 617-292-5602.

Chapter 5
Miscellaneous Stormwater Topics

Mosquito Control in Stormwater Management Practices

Both aboveground and underground stormwater BMPs have the potential to serve as mosquito breeding areas. Good design, proper operation and maintenance and treatment with larvicides can minimize this potential.

EPA recommends that stormwater treatment practices dewater within 3 days (72 hours) to reduce the number of mosquitoes that mature to adults, since the aquatic stage of many mosquito species is 7 to 10 days. Massachusetts has had a 72-hour dewatering rule in its Stormwater Management Standards since 1996. The 2008 technical specifications for BMPs set forth in Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook also concur with this practice by requiring that all stormwater practices designed to drain do so within 72 hours.

Some stormwater practices are designed to include permanent wet pools. These practices – if maintained properly – can limit mosquito breeding by providing habitat for mosquito predators. Additional measures that can be taken to reduce mosquito populations include increasing water circulation, attracting mosquito predators by adding suitable habitat, and applying larvicides.

The Massachusetts State Reclamation and Mosquito Control Board (SRMCB), through the Massachusetts Mosquito Control Districts, can undertake further mosquito control actions specifically for the purpose of mosquito control pursuant to Massachusetts General Law Chapter 252. The Mosquito Control Board, http://www.mass.gov/agr/mosquito/, describes mosquito control methods and is in the process of developing guidance documents that describe Best Management Practices for mosquito control projects.

The SRMCB and Mosquito Control Districts are not responsible for operating and maintaining stormwater BMPs to reduce mosquito populations. The owners of property that construct the stormwater BMPs or municipalities that "accept" them through local subdivision approval are responsible for their maintenance.[1] The SRMCB is composed of officials from MassDEP, Department of Agricultural Resources, and Department of Conservation and Recreation. The nine (9) Mosquito Control Districts overseen by the SRMCB are located throughout Massachusetts, covering 176 municipalities.

Construction Period Best Management Practices for Mosquito Control

To minimize mosquito breeding during construction, it is essential that the following actions be taken to minimize the creation of standing pools by taking the following actions:

- ***Minimize Land Disturbance:*** Minimizing land disturbance reduces the likelihood of mosquito breeding by reducing silt in runoff that will cause construction period controls to clog and retain standing pools of water for more than 72 hours.
- ***Catch Basin inlets:*** Inspect and refresh filter fabric, hay bales, filter socks or stone dams on a regular basis to ensure that any stormwater ponded at the inlet drains within 8 hours after precipitation stops. Shorter periods may be necessary to avoid hydroplaning in roads

[1] MassDEP and MassHighway understand that the numerous stormwater BMPs along state highways pose a unique challenge. To address this challenge, the 2004 MassHighway Stormwater Handbook will provide additional information on appropriate operation and maintenance practices for mosquito control when the Handbook is revised to reflect the 2008 changes to the Stormwater Management Standards..

caused by water ponded at the catch basin inlet. Treat catch basin sumps with larvicides such as *Bacillus sphaericus* (*Bs*) using a licensed pesticide applicator.

- ***Check Dams:*** If temporary check dams are used during the construction period to lag peak rate of runoff or pond runoff for exfiltration, inspect and repair the check dams on a regular basis to ensure that any stormwater ponded behind the check dam drains within 72 hours.
- ***Design construction period sediment traps*** to dewater within 72 hours after precipitation. Because these traps are subject to high silt loads and tend to clog, treat them with the larvicide *Bs* after it rains from June through October, until the first frost occurs.
- ***Construction period open conveyances:*** When temporary manmade ditches are used for channelizing construction period runoff, inspect them on a regular basis to remove any accumulated sediment to restore flow capacity to the temporary ditch.
- ***Revegetating Disturbed Surfaces:*** Revegetating disturbed surfaces reduces sediment in runoff that will cause construction period controls to clog and retain standing pools of water for greater than 72 hours.
- ***Sediment fences/hay bale barriers:*** When inspections find standing pools of water beyond the 24-hour period after a storm, take action to restore barrier to its normal function.

<u>Post-Construction Stormwater Treatment Practices</u>

- Mosquito control begins with the environmentally sensitive site design. Environmentally sensitive site design that minimizes impervious surfaces reduces the amount of stormwater runoff. Disconnecting runoff using the LID Site Design credits outlined in the Massachusetts Stormwater Handbook reduces the amount of stormwater that must be conveyed to a treatment practice. Utilizing green roofs minimizes runoff from smaller storms. Storage media must be designed to dewater within 72 hours after precipitation.
- Mosquito control continues with the selection of structural stormwater BMPs that are unlikely to become breeding grounds for mosquitoes, such as:
  - ***Bioretention Areas/Rain Gardens/Sand Filter:*** These practices tend not to result in mosquito breeding. If any level spreaders, weirs or sediment forebays are used as part of the design, inspect them and correct them as necessary to prevent standing pools of water for more than 72 hours.
  - ***Infiltration Trenches:*** This practice tends not to result in mosquito breeding. If any level spreaders, weirs, or sediment forebays are used as part of the design, inspect them and correct them as necessary to prevent standing pools of water for more than 72 hours.
- Another mosquito control strategy is to select BMPs that can become habitats for mosquito predators, such as:
  - ***Constructed Stormwater Wetlands:*** Habitat features can be incorporated in constructed stormwater wetlands to attract dragonflies, amphibians, turtles, birds, bats, and other natural predators of mosquitoes.
  - ***Wet Basins:*** Wet basins can be designed to incorporate fish habitat features, such as deep pools. Introduce fish in consultation with Massachusetts Division of Fisheries and Wildlife. Vegetation within wet basins designed as fish habitat must be properly managed to ensure that vegetation does not overtake the habitat. Proper design to ensure that no low circulation or "dead" zones are created may reduce the potential for mosquito breeding. Introducing bubblers may increase water circulation in the wet basin.

Effective mosquito controls require proponents to design structural BMPs to prevent ponding and facilitate maintenance and, if necessary, the application of larvicides. Examples of such design practices include the following:

- ***Basins:*** Provide perimeter access around wet basins, extended dry detention basins and dry detention basins for both larviciding and routine maintenance. Control vegetation to ensure that access pathways stay open.
- ***BMPs without a permanent pool of water:*** All structural BMPs that do not rely on a permanent pool of water must drain and completely dewater within 72 hours after precipitation. This includes dry detention basins, extended dry detention basins, infiltration basins, and dry water quality swales. Use underdrains at extended dry detention basins to drain the small pools that form due to accumulation of silts. Wallace indicates that extended dry extended detention basins may breed more mosquitoes than wet basins. It is, therefore, imperative to design outlets from extended dry detention basins to completely dewater within the 72-hour period.
- ***Energy Dissipators and Flow Spreaders:*** Currier and Moeller, 2000 indicate that shallow recesses in energy dissipators and flow spreaders trap water where mosquitoes breed. Set the riprap in grout to reduce the shallow recesses and minimize mosquito breeding.
- ***Outlet control structures:*** Debris trapped in small orifices or on trash racks of outlet control structures such as multiple stage outlet risers may clog the orifices or the trash rack, causing a standing pool of water. Optimize the orifice size or trash rack mesh size to provide required peak rate attenuation/water quality detention/retention time while minimizing clogging.
- ***Rain Barrels and Cisterns:*** Seal lids to reduce the likelihood of mosquitoes laying eggs in standing water. Install mosquito netting over inlets. The cistern system should be designed to ensure that all collected water is drained into it within 72 hours.
- ***Subsurface Structures, Deep Sump Catch Basins, Oil Grit Separators, and Leaching Catch Basins:*** Seal all manhole covers to reduce likelihood of mosquitoes laying eggs in standing water. Install mosquito netting over the outlet (CALTRANS 2004).

The Operation and Maintenance Plan should provide for mosquito prevention and control.

- ***Check dams:*** Inspect permanent check dams on the schedule set forth in the O&M Plan. Inspect check dams 72 hours after storms for standing water ponding behind the dam. Take corrective action if standing water is found.
- ***Cisterns:*** Apply *Bs* larvicide in the cistern if any evidence of mosquitoes is found. The Operation and Maintenance Plan shall specify how often larvicides should be applied to waters in the cistern.
- ***Water quality swales:*** Remove and properly dispose of any accumulated sediment as scheduled in the Operation and Maintenance Plan.
- ***Larvicide Treatment:*** The Operation and Maintenance Plan must include measures to minimize mosquito breeding, including larviciding.
- The party identified in the Operation and Maintenance Plan as responsible for maintenance shall see that larvicides are applied as necessary to the following stormwater treatment practices: catch basins, oil/grit separators, wet basins, wet water quality swales, dry extended detention basins, infiltration basins, and constructed stormwater wetlands. The Operation and Maintenance Plan must ensure that all larvicides are applied by a licensed pesticide applicator and in compliance with all pesticide label requirements.
- The Operation and Maintenance Plan should identify the appropriate larvicide and the time and method of application. For example, *Bacillus sphaericus (Bs*), the preferred

larvicide for stormwater BMPs, should be hand-broadcast.[2] Alternatively, Altosid, a Methopren product, may be used. Because some practices are designed to dewater between storms, such as dry extended detention and infiltration basins, the Operation and Maintenance Plan should provide that larviciding must be conducted during or immediately after wet weather, when the detention or infiltration basin has a standing pool of water, unless a product is used that can withstand extended dry periods.

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[2] *Bacillus thuringienis israelensis* or *Bti* is usually applied by helicopter to wetlands and floodplains

CONTECH®
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CDS Guide
Operation, Design, Performance and Maintenance

CDS®

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs (1416 L/s). Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs (28.3 to 8495 L/s). The pollutant removal capacity of the CDS system has been proven in lab and field testing.

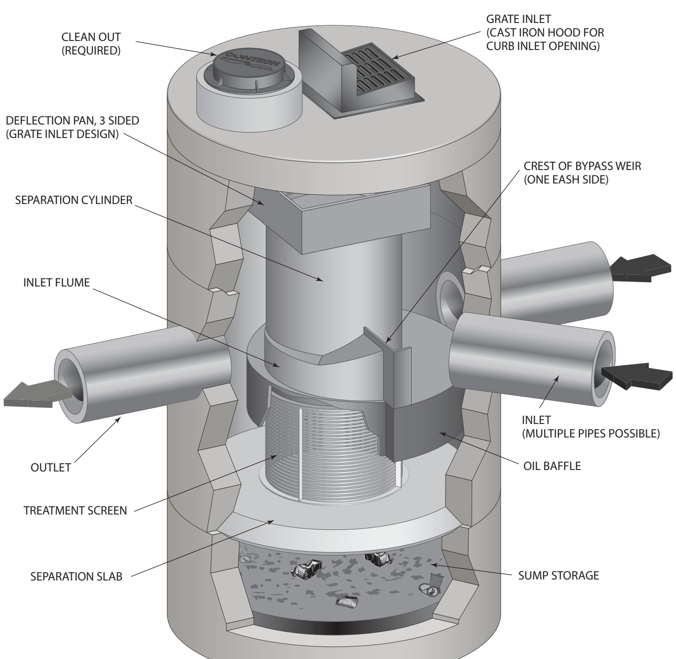
Operation Overview

Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the flow. All flows up to the system's treatment design capacity enter the separation chamber and are treated.

Swirl concentration and screen deflection force floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During the flow events exceeding the treatment design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants are retained in the separation cylinder.



Design Basics

There are three primary methods of sizing a CDS system. The Water Quality Flow Rate Method determines which model size provides the desired removal efficiency at a given flow rate for a defined particle size. The Rational Rainfall Method™ or the and Probabilistic Method is used when a specific removal efficiency of the net annual sediment load is required.

Typically in the Unites States, CDS systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for a gradation with an average particle size (d50) of 125 microns (μm). For some regulatory environments, CDS systems can also be designed to achieve an 80% annual solids load reduction based on an average particle size (d50) of 75 microns (μm) or 50 microns (μm).

Water Quality Flow Rate Method

In some cases, regulations require that a specific treatment rate, often referred to as the water quality design flow (WQQ), be treated. This WQQ represents the peak flow rate from either an event with a specific recurrence interval, e.g. the six-month storm, or a water quality depth, e.g. 1/2-inch (13 mm) of rainfall.

The CDS is designed to treat all flows up to the WQQ. At influent rates higher than the WQQ, the diversion weir will direct most flow exceeding the WQQ around the separation chamber. This allows removal efficiency to remain relatively constant in the separation chamber and eliminates the risk of washout during bypass flows regardless of influent flow rates.

Treatment flow rates are defined as the rate at which the CDS will remove a specific gradation of sediment at a specific removal efficiency. Therefore the treatment flow rate is variable, based on the gradation and removal efficiency specified by the design engineer.

Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.

Short duration rain gauge records from across the United States and Canada were analyzed to determine the percent of the total annual rainfall that fell at a range of intensities. US stations' depths were totaled every 15 minutes, or hourly, and recorded in 0.01-inch increments. Depths were recorded hourly with 1-mm resolution at Canadian stations. One trend was consistent at all sites; the vast majority of precipitation fell at low intensities and high intensity storms contributed relatively little to the total annual depth.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Rainfall Method. Since most sites are relatively small and highly impervious, the Rational Rainfall Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS system are determined. Performance efficiency curve determined from full scale laboratory tests on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Probabilistic Rational Method

The Probabilistic Rational Method is a sizing program Contech developed to estimate a net annual sediment load reduction for a particular CDS model based on site size, site runoff coefficient, regional rainfall intensity distribution, and anticipated pollutant characteristics.

The Probabilistic Method is an extension of the Rational Method used to estimate peak discharge rates generated by storm events of varying statistical return frequencies (e.g. 2-year storm event). Under the Rational Method, an adjustment factor is used to adjust the runoff coefficient estimated for the 10-year event, correlating a known hydrologic parameter with the target storm event. The rainfall intensities vary depending on the return frequency of the storm event under consideration. In general, these two frequency dependent parameters (rainfall intensity and runoff coefficient) increase as the return frequency increases while the drainage area remains constant.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Method. Since most sites are relatively small and highly impervious, the Rational Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS are determined. Performance efficiency curve on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Treatment Flow Rate

The inlet throat area is sized to ensure that the WQQ passes through the separation chamber at a water surface elevation equal to the crest of the diversion weir. The diversion weir bypasses excessive flows around the separation chamber, thus preventing re-suspension or re-entrainment of previously captured particles.

Hydraulic Capacity

The hydraulic capacity of a CDS system is determined by the length and height of the diversion weir and by the maximum allowable head in the system. Typical configurations allow hydraulic capacities of up to ten times the treatment flow rate. The crest of the diversion weir may be lowered and the inlet throat may be widened to increase the capacity of the system at a given water surface elevation. The unit is designed to meet project specific hydraulic requirements.

Performance

Full-Scale Laboratory Test Results

A full-scale CDS system (Model CDS2020-5B) was tested at the facility of University of Florida, Gainesville, FL. This CDS unit was evaluated under controlled laboratory conditions of influent flow rate and addition of sediment.

Two different gradations of silica sand material (UF Sediment & OK-110) were used in the CDS performance evaluation. The particle size distributions (PSDs) of the test materials were analyzed using standard method "Gradation ASTM D-422 "Standard Test Method for Particle-Size Analysis of Soils" by a certified laboratory.

UF Sediment is a mixture of three different products produced by the U.S. Silica Company: "Sil-Co-Sil 106", "#1 DRY" and "20/40 Oil Frac". Particle size distribution analysis shows that the UF Sediment has a very fine gradation (d50 = 20 to 30 μm) covering a wide size range (Coefficient of Uniformity, C averaged at 10.6). In comparison with the hypothetical TSS gradation specified in the NJDEP (New Jersey Department of Environmental Protection) and NJCAT (New Jersey Corporation for Advanced Technology) protocol for lab testing, the UF Sediment covers a similar range of particle size but with a finer d50 (d50 for NJDEP is approximately 50 μm) (NJDEP, 2003).

The OK-110 silica sand is a commercial product of U.S. Silica Sand. The particle size distribution analysis of this material, also included in Figure 1, shows that 99.9% of the OK-110 sand is finer than 250 microns, with a mean particle size (d50) of 106 microns. The PSDs for the test material are shown in Figure 1.

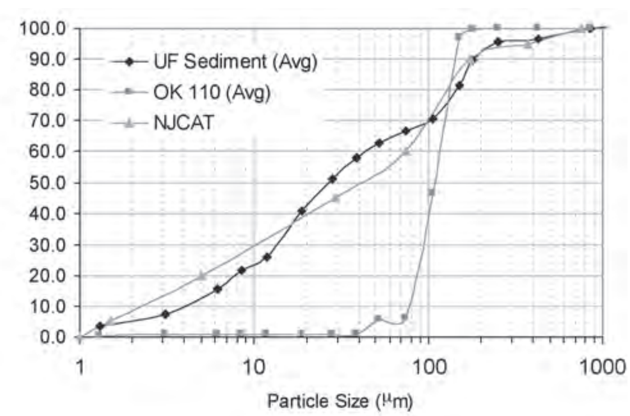


Figure 1. Particle size distributions

Tests were conducted to quantify the performance of a specific CDS unit (1.1 cfs (31.3-L/s) design capacity) at various flow rates, ranging from 1% up to 125% of the treatment design capacity of the unit, using the 2400 micron screen. All tests were conducted with controlled influent concentrations of approximately 200 mg/L. Effluent samples were taken at equal time intervals across the entire duration of each test run. These samples were then processed with a Dekaport Cone sample splitter to obtain representative sub-samples for Suspended Sediment Concentration (SSC) testing using ASTM D3977-97 "Standard Test Methods for Determining Sediment Concentration in Water Samples", and particle size distribution analysis.

Results and Modeling

Based on the data from the University of Florida, a performance model was developed for the CDS system. A regression analysis was used to develop a fitting curve representative of the scattered data points at various design flow rates. This model, which demonstrated good agreement with the laboratory data, can then be used to predict CDS system performance with respect to SSC removal for any particle size gradation, assuming the particles are inorganic sandy-silt. Figure 2 shows CDS predictive performance for two typical particle size gradations (NJCAT gradation and OK-110 sand) as a function of operating rate.

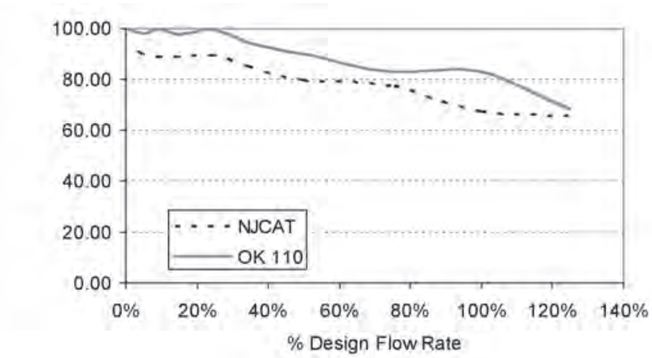


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

Many regulatory jurisdictions set a performance standard for hydrodynamic devices by stating that the devices shall be capable of achieving an 80% removal efficiency for particles having a mean particle size (d50) of 125 microns (e.g. Washington State Department of Ecology — WASDOE - 2008). The model can be used to calculate the expected performance of such a PSD (shown in Figure 3). The model indicates (Figure 4) that the CDS system with 2400 micron screen achieves approximately 80% removal at the design (100%) flow rate, for this particle size distribution (d50 = 125 μm).

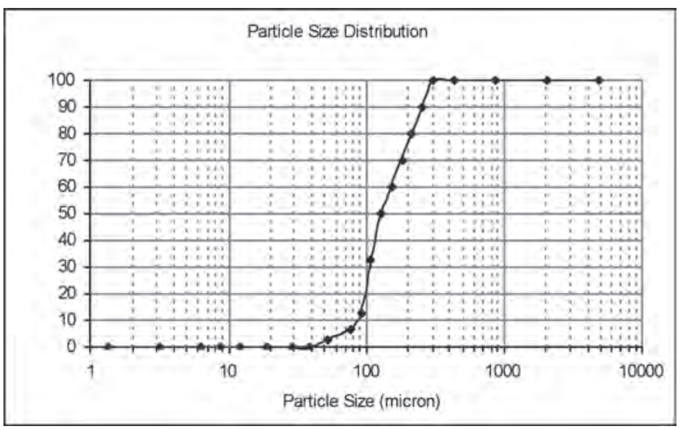


Figure 3. WASDOE PSD

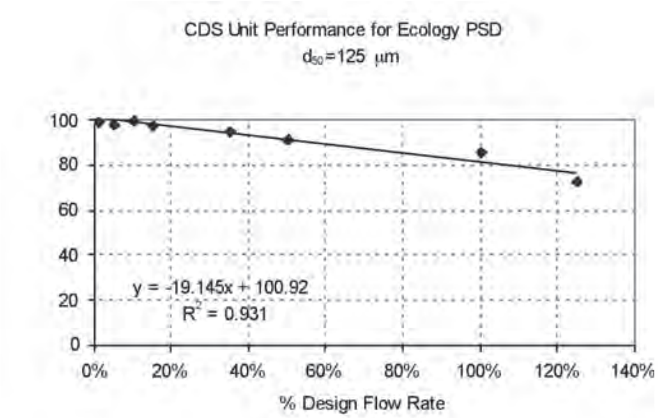


Figure 4. Modeled performance for WASDOE PSD.

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified

during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

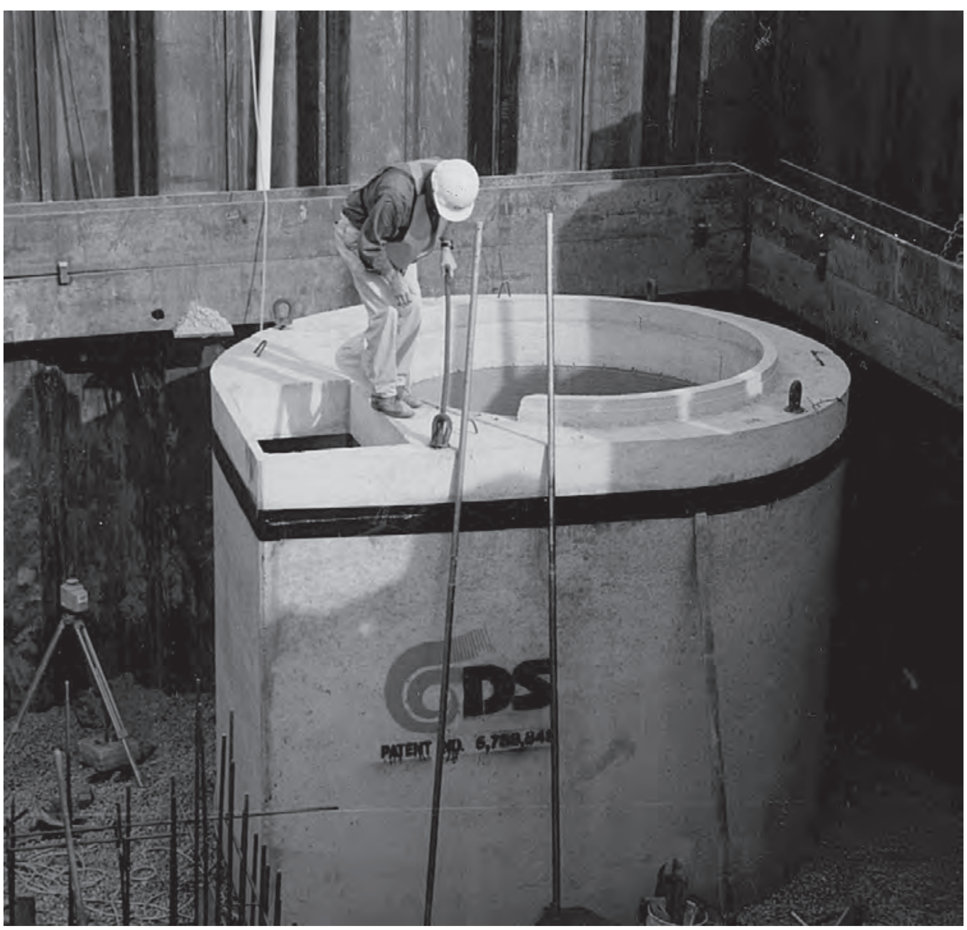
In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be cleaned to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Note: To avoid underestimating the volume of sediment in the chamber, carefully lower the measuring device to the top of the sediment pile. Finer silty particles at the top of the pile may be more difficult to feel with a measuring stick. These finer particles typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.



CDS Inspection & Maintenance Log

CDS Model: ______________________ Location: ______________________

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile**.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Support

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

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Subsurface Stormwater Management℠

Isolator™ Row O&M Manual

StormTech® Chamber System for Stormwater Management

1.0 The Isolator™ Row

1.1 INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patent pending technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

1.2 THE ISOLATOR™ ROW

The Isolator Row is a row of StormTech chambers, either SC-740 or SC-310 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

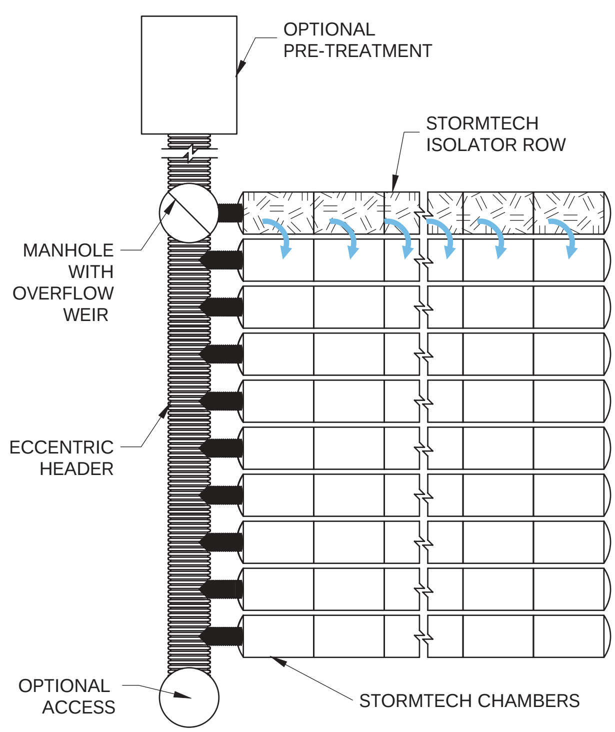
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber.

The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

StormTech Isolator Row with Overflow Spillway
(not to scale)



2.1 INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

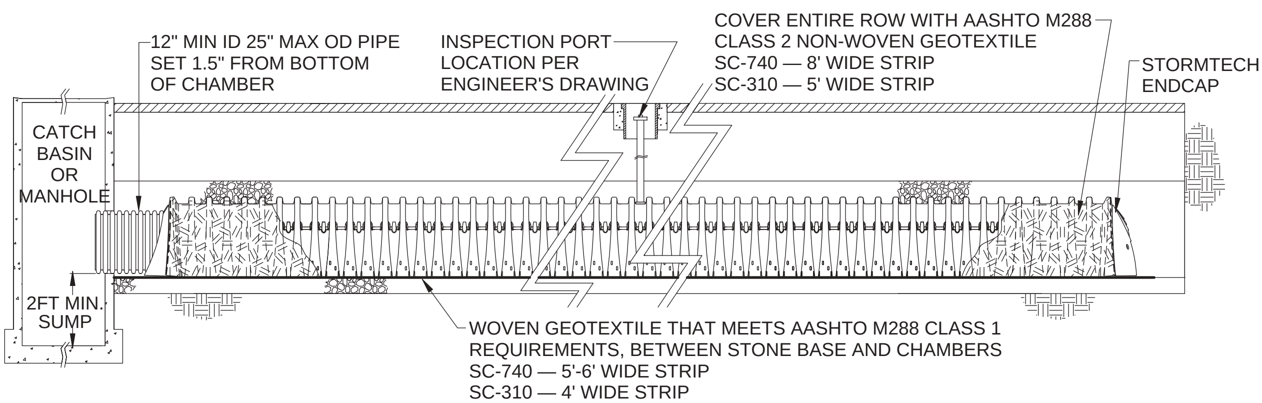
2.2 MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)

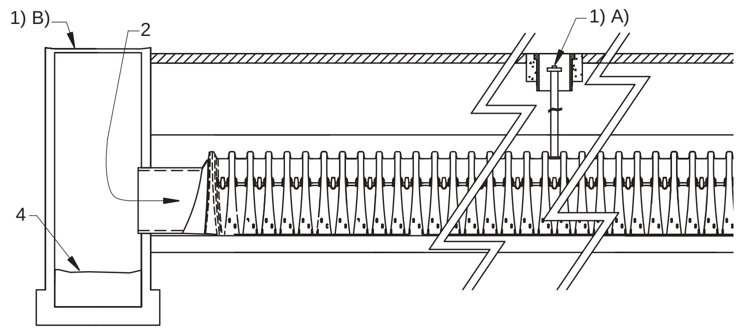
Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)



3.0 Isolator Row Step By Step Maintenance Procedures

StormTech Isolator Row (not to scale)



Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.

iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows

i. Remove cover from manhole at upstream end of Isolator Row

ii. Using a flashlight, inspect down Isolator Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until backflush water is clean

C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system

Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1) - (2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/01	6.3 ft.	none		New installation. Fixed point is CI frame at grade	djm
9/24/01		6.2	0.1 ft.	Some grit felt	sm
6/20/03		5.8	0.5 ft.	Mucky feel, debris visible in manhole and in Isolator row, maintenance due	rv
7/7/03	6.3 ft.		0	System jetted and vacuumed	djm

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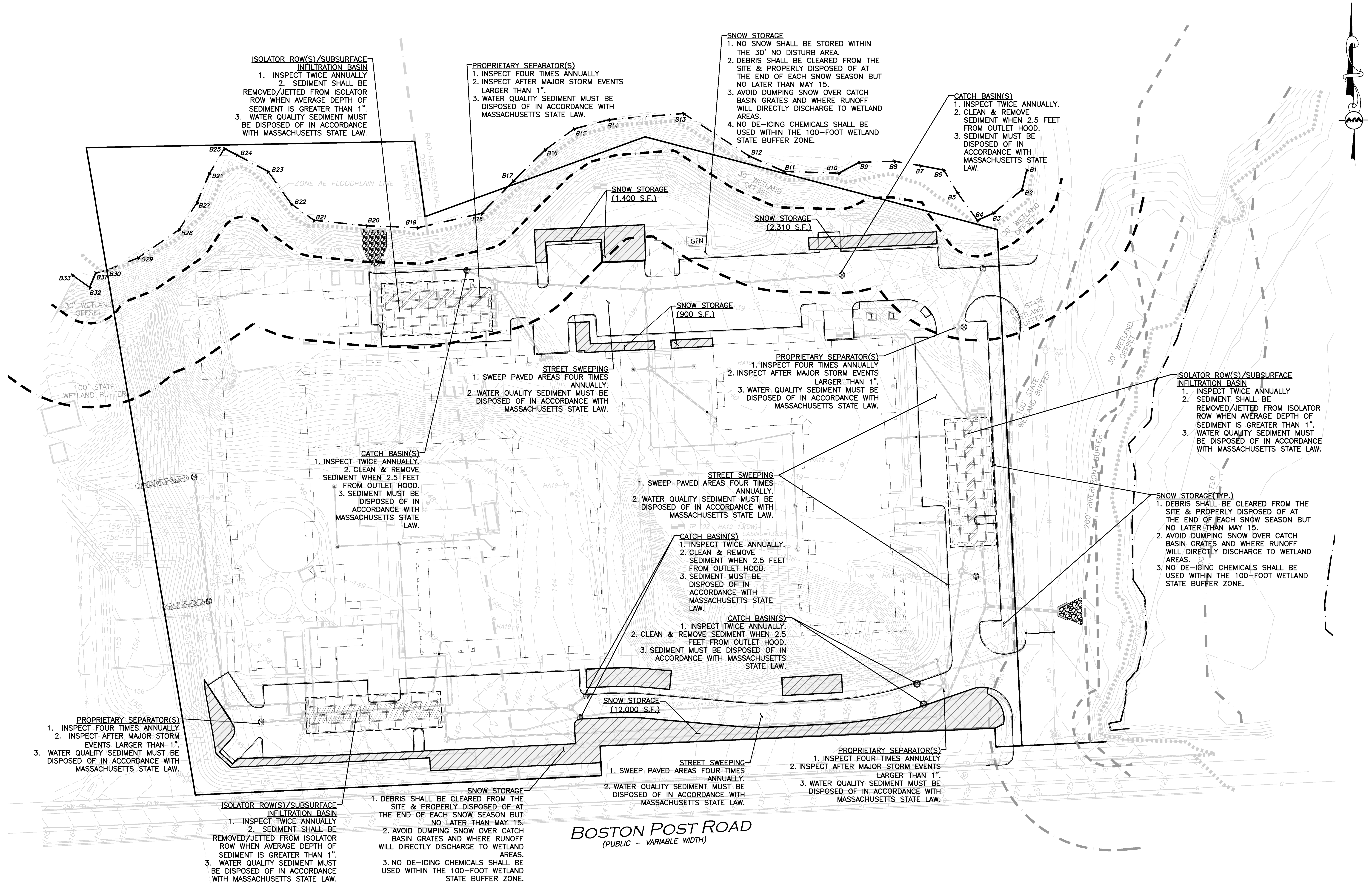
Subsurface Stormwater Management℠

20 Beaver Road, Suite 104 | Wethersfield | Connecticut | 06109

860.529.8188 | 888.892.2694 | fax 866.328.8401 | www.stormtech.com



NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
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3. ALL "CDS" STRUCTURES HAVE BEEN SIZED USING THE WATER QUALITY FLOW RATE PER MASS STORMWATER HANDBOOK AND SHALL BE CONTECH CDS2015-4-C OR APPROVED EQUIVALENT.
4. DURING THE FIRST YEAR OF OPERATION, ALL OF THE BMP'S SHALL BE INSPECTED DURING AND AFTER LARGE STORM EVENTS TO ENSURE THEY ARE FUNCTIONING PROPERLY. THE SUBSURFACE INFILTRATION SYSTEM SHOULD BE FULLY DRAINED WITHIN 72" OF THE RAIN EVENT.
5. SUBSURFACE INFILTRATION BASIN OUTLET CONTROL STRUCTURES SHALL BE INSPECTED AND CLEANED AS NEEDED.
6. LEVEL SPREADERS & RIP-RAP SHALL BE VISUALLY INSPECTED FOR EROSION, DEBRIS ACCUMULATION, AND UNWANTED VEGETATION. ANY EROSION SHALL BE STABILIZED AND SEDIMENT, DEBRIS, AND WOODY VEGETATION SHALL BE REMOVED.

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_OPERATION & MAINTENANCE.DWG

OPERATION & MAINTENANCE
NOVEMBER 12, 2019

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
E.	11/12/2019	REVISED PER TOWN COMMENTS
D.	10/18/2019	REVISED PER TOWN COMMENTS
C.	10/10/2019	REVISED PER TOWN COMMENTS
B.	09/27/2019	REVISED PER TOWN COMMENTS
A.	07/03/2019	ISSUED FOR NOTICE OF INTENT

APPLICANT\OWNER:
WP EAST ACQUISITIONS, LLC.
91 HARTWELL AVENUE
LEXINGTON, MA 02421

PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

PROJECT NO.	1670-09A	DATE:	06-20-2019
SCALE:	1" =40'	DWG. NAME:	1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

PREPARED BY:
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environmental consulting ◆ landscape architecture
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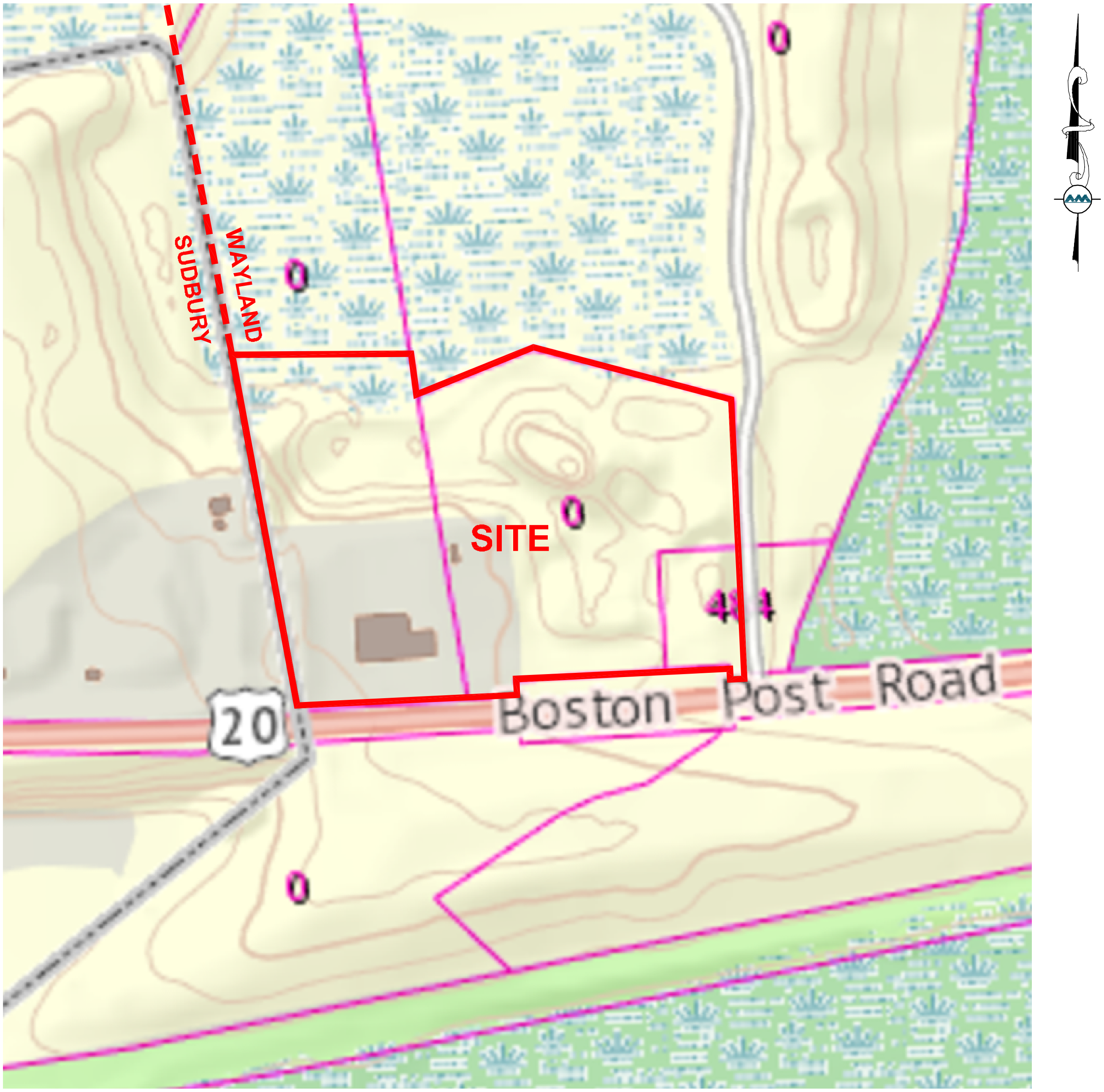
TEL: (781) 935-6889
FAX: (781) 935-2896
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE: OPERATION & MAINTENANCE PLAN
SHEET No. O&M



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PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

USGS SITE LOCUS MAP

PROJECT NO. 1670-09A	DATE: NOVEMBER 12, 2019
SCALE: 1"=250'	DWG. NAME: C-1670-09A
DESIGNED BY: SJL	CHECKED BY: CMQ

SHEET No.
EXH-1

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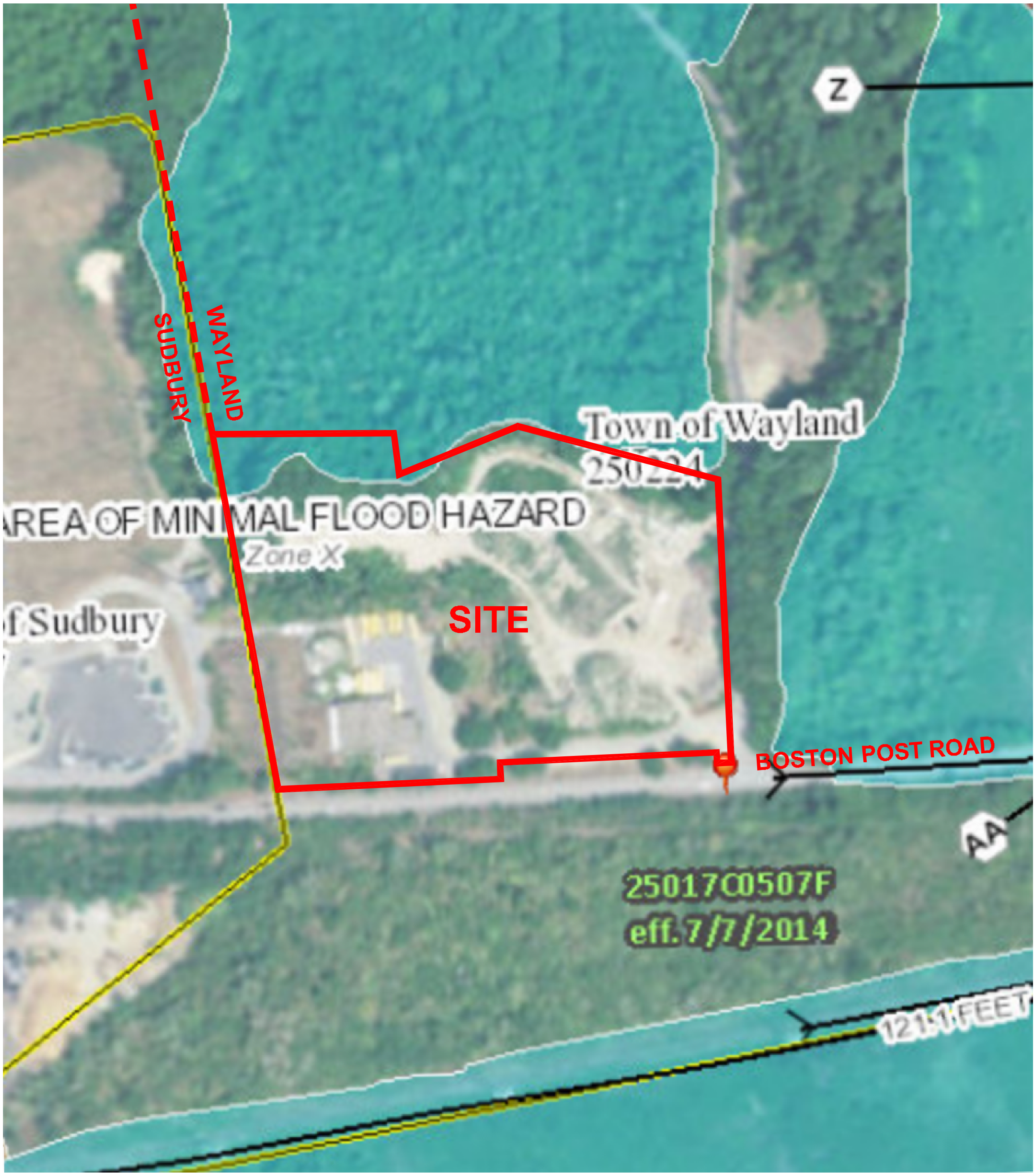
PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

AERIAL PHOTO

PROJECT NO. 1670-09A	DATE: NOVEMBER 12, 2019
SCALE: 1"=250'	DWG. NAME: C-1670-09A
DESIGNED BY: SJL	CHECKED BY: CMQ

SHEET No.
EXH-2



FEMA FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, MASSACHUSETTS
MAP NUMBERS: 25017C0507F
JULY 7, 2014

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PROJECT:
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490 BOSTON POST ROAD
WAYLAND, MA

FEMA FIRM MAP

PROJECT NO. 1670-09A	DATE: NOVEMBER 12, 2019
SCALE: 1"=250'	DWG. NAME: C-1670-09A
DESIGNED BY: SJL	CHECKED BY: CMQ

SHEET No.
EXH-3

LEGEND

- Shrub Swamp
- Tidal Flat
- Wooded Swamp Coniferous
- Wooded Swamp Deciduous
- Wooded Swamp Mixed Trees

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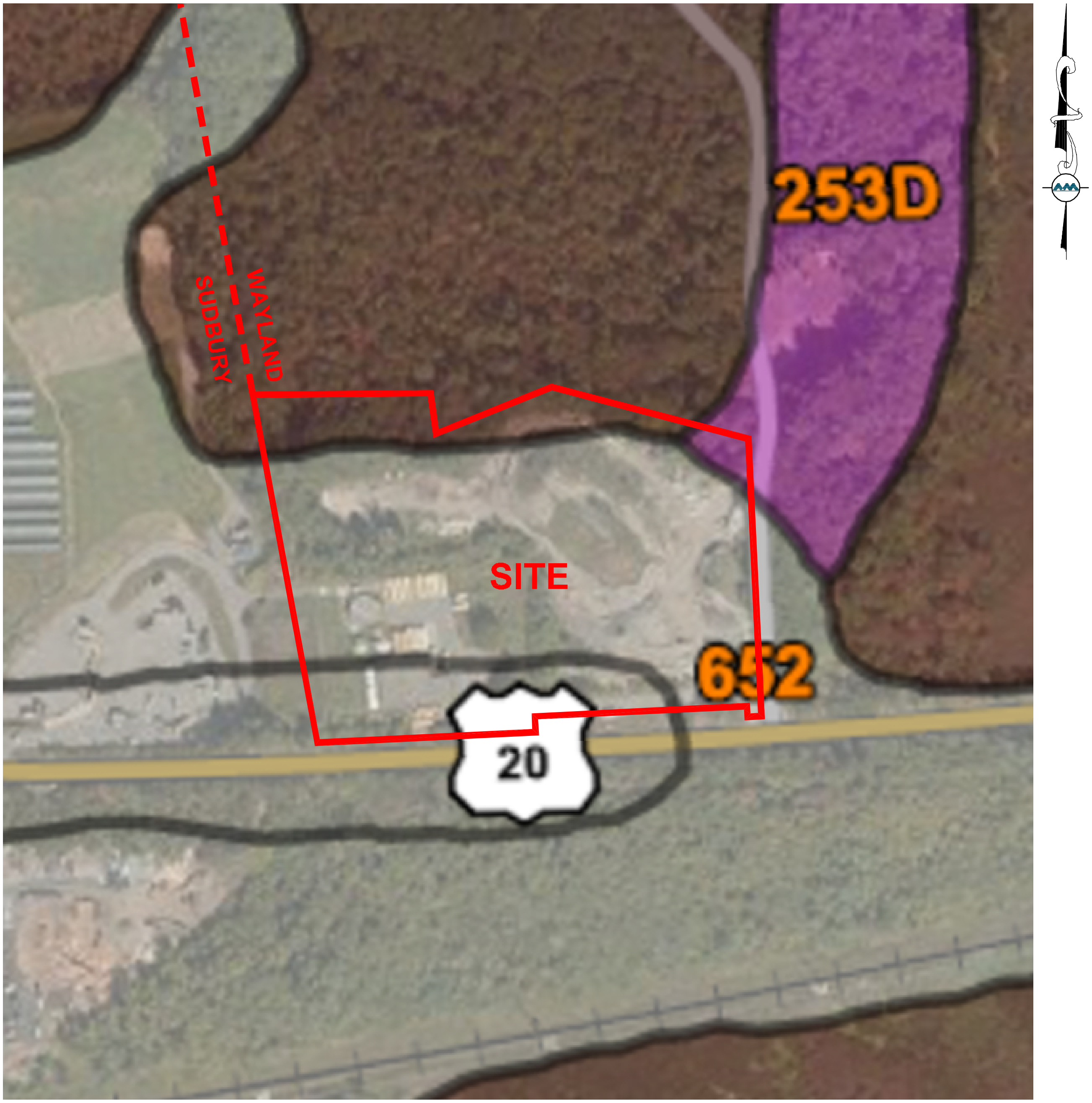
PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

MASS DEP WETLANDS

PROJECT NO.	1670-09A	DATE:	NOVEMBER 12, 2019
SCALE:	1"=250'	DWG. NAME:	C-1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

SHEET No.
EXH-4



LEGEND:

51A: SWANSEA MUCK (HSG B/D)
253D: HINCKLEY LOAMY SAND; (HSG A)
652: UDORTHENTS; REFUSE SUBSTRATUM (ASSUMED HSG C)
656: UDORTHENTS-URBAN LAND COMPLEX (ASSUMED HSG C)

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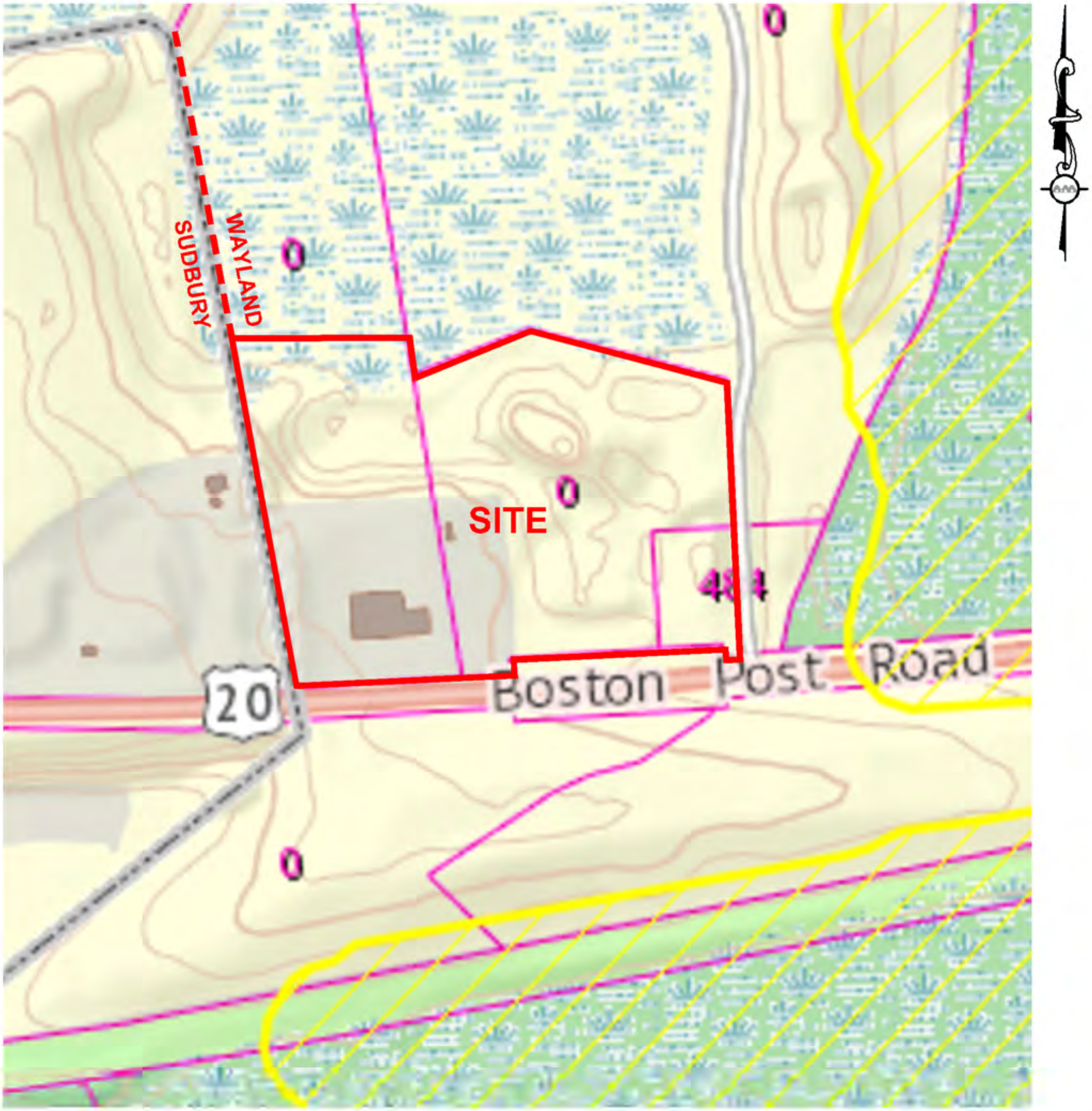
PROJECT:
ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

SOILS MAP

PROJECT NO.	1670-09A	DATE:	NOVEMBER 12, 2019
SCALE:	1"=250'	DWG. NAME:	C-1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

SHEET No.
EXH-5



NO NHESP PRIORITY HABITATS ON-SITE.
NHESP HABITAT PH-1463 LOCATED ON ADJACENT PROPERTIES.

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PROJECT: ALTA AT RIVER'S EDGE, 490 BOSTON POST ROAD, WAYLAND, MA	NHESP PRIORITY HABITATS
PROJECT NO. 1670-09A	DATE: NOVEMBER 12, 2019
SCALE: NOT TO SCALE	DWG. NAME: C-1670-09A
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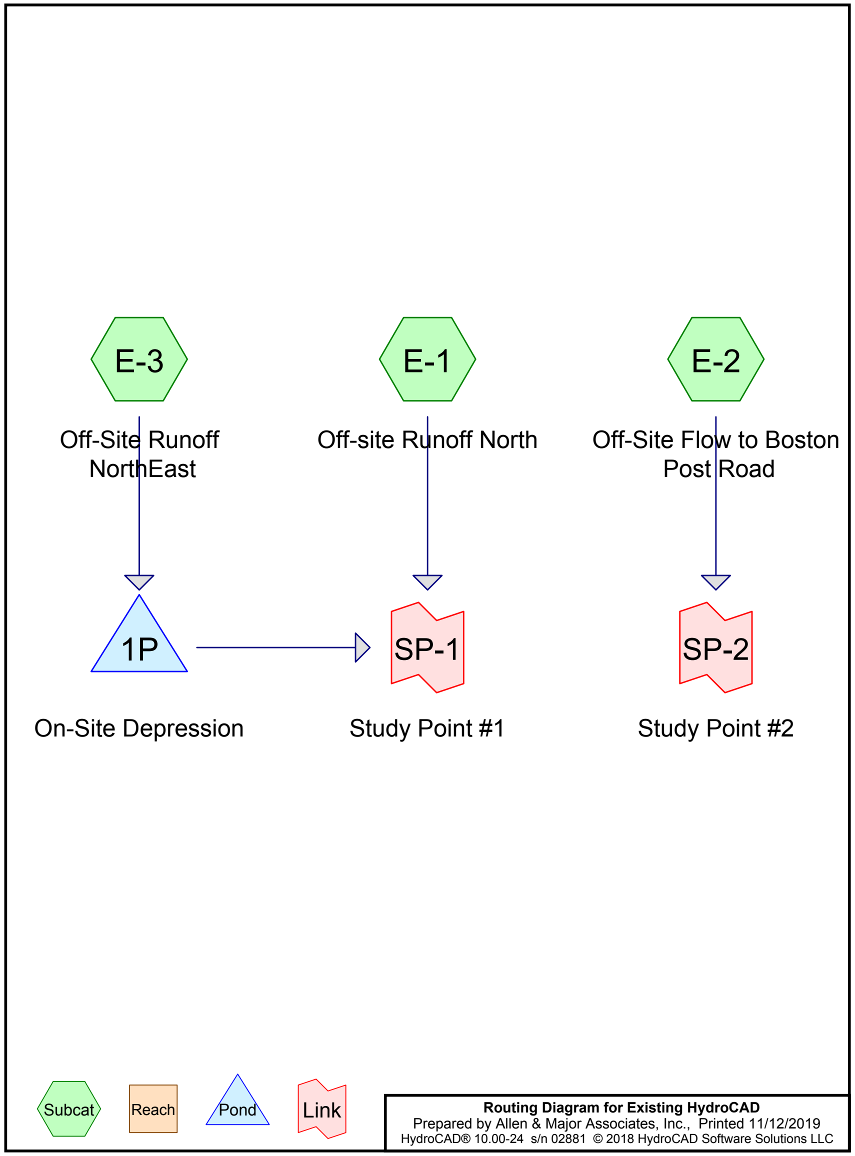


Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
73,706	61	>75% Grass cover, Good, HSG B (E-1, E-2, E-3)
163,142	85	Gravel roads, HSG B (E-1, E-2, E-3)
10,637	98	Paved parking, HSG B (E-3)
34,321	98	Unconnected pavement, HSG B (E-2)
6,474	30	Woods, Good, HSG A (E-1)
72,517	55	Woods, Good, HSG B (E-1, E-2, E-3)
360,797	75	TOTAL AREA

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
6,474	HSG A	E-1
354,323	HSG B	E-1, E-2, E-3
0	HSG C	
0	HSG D	
0	Other	
360,797		TOTAL AREA

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	73,706	0	0	0	73,706	>75% Grass cover, Good	E-1, E-2, E-3
0	163,142	0	0	0	163,142	Gravel roads	E-1, E-2, E-3
0	10,637	0	0	0	10,637	Paved parking	E-3
0	34,321	0	0	0	34,321	Unconnected pavement	E-2
6,474	72,517	0	0	0	78,991	Woods, Good	E-1, E-2, E-3
6,474	354,323	0	0	0	360,797	TOTAL AREA	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	E-1	0.00	0.00	204.0	0.0180	0.011	24.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North — Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=371' Tc=7.3 min CN=71 Runoff=0.00 cfs 0 cf

Subcatchment E-2: Off-Site Flow to Boston Post Road — Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=0.00"
Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=0.00 cfs 0 cf

Subcatchment E-3: Off-Site Runoff NorthEast — Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=74 Runoff=0.00 cfs 0 cf

Pond 1P: On-Site Depression — Peak Elev=125.00' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Link SP-1: Study Point #1 — Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link SP-2: Study Point #2 — Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 360,797 sf Runoff Volume = 0 cf Average Runoff Depth = 0.00"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

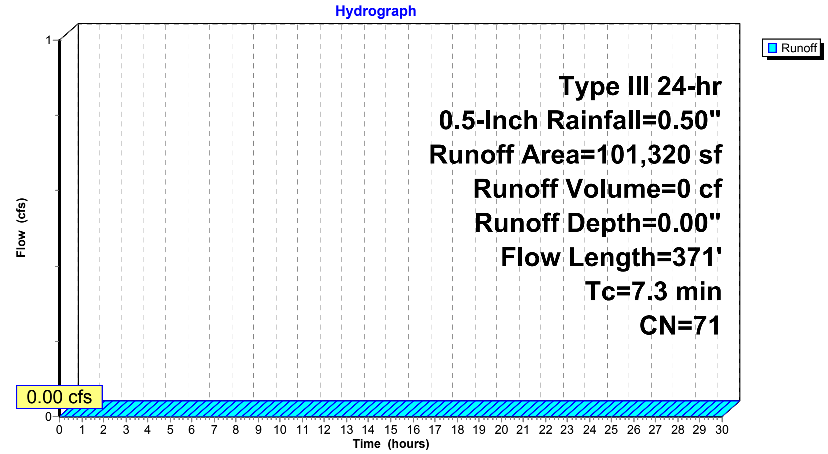
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5-Inch Rainfall=0.50"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

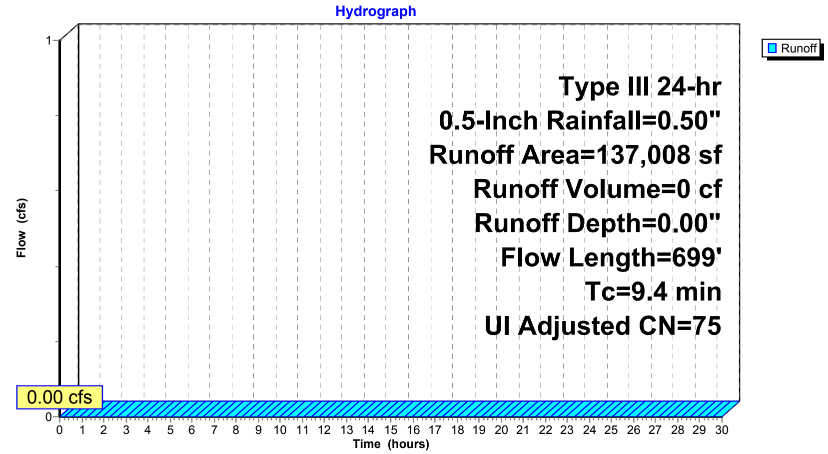
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5-Inch Rainfall=0.50"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

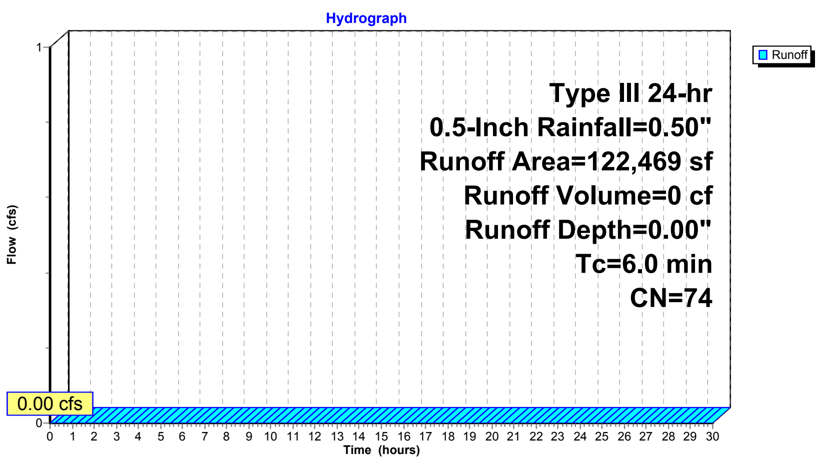
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5-Inch Rainfall=0.50"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 0.00" for 0.5-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.00' @ 0.00 hrs Surf.Area= 5,573 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

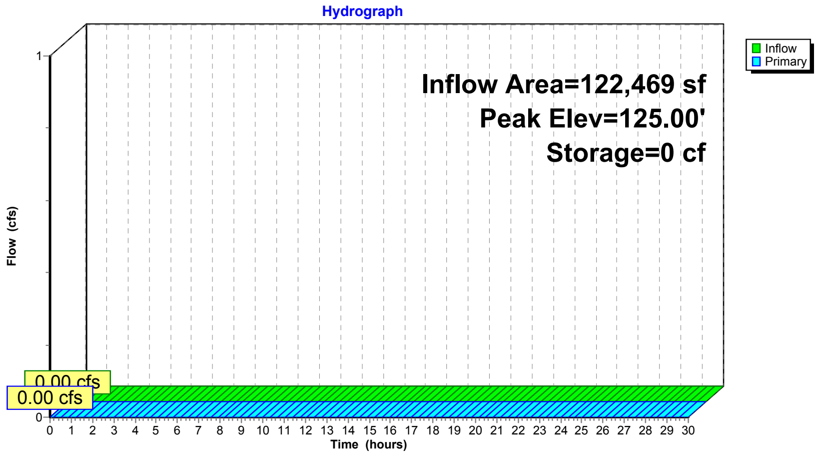
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

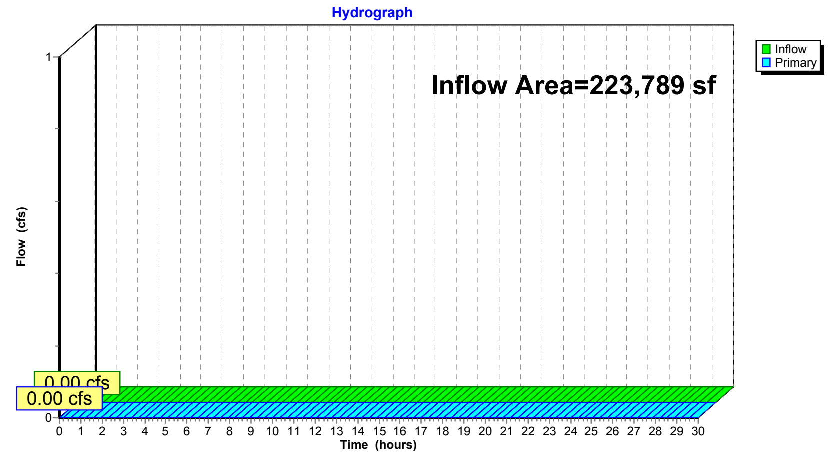


Summary for Link SP-1: Study Point #1

Inflow Area =	223,789 sf,	4.75% Impervious,	Inflow Depth = 0.00"	for 0.5-Inch event	
Inflow =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

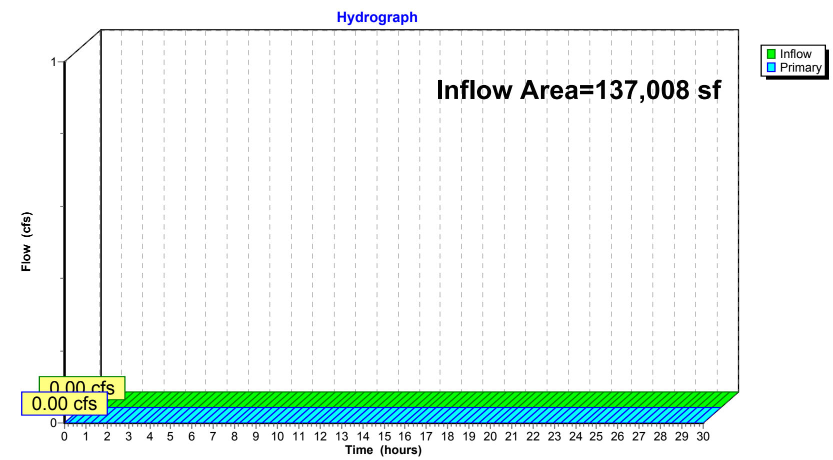


Summary for Link SP-2: Study Point #2

Inflow Area = 137,008 sf, 25.05% Impervious, Inflow Depth = 0.00" for 0.5-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North — Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=371' Tc=7.3 min CN=71 Runoff=0.00 cfs 66 cf

Subcatchment E-2: Off-Site Flow to Boston Post Road — Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=0.03"
Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=0.01 cfs 346 cf

Subcatchment E-3: Off-Site Runoff NorthEast — Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=0.02"
Tc=6.0 min CN=74 Runoff=0.01 cfs 237 cf

Pond 1P: On-Site Depression — Peak Elev=125.04' Storage=235 cf Inflow=0.01 cfs 237 cf
Outflow=0.00 cfs 0 cf

Link SP-1: Study Point #1 — Inflow=0.00 cfs 66 cf
Primary=0.00 cfs 66 cf

Link SP-2: Study Point #2 — Inflow=0.01 cfs 346 cf
Primary=0.01 cfs 346 cf

Total Runoff Area = 360,797 sf Runoff Volume = 649 cf Average Runoff Depth = 0.02"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

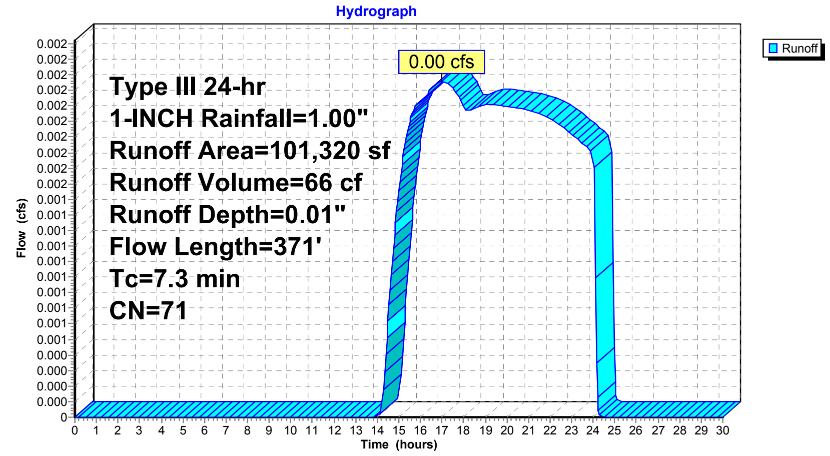
Runoff = 0.00 cfs @ 17.00 hrs, Volume= 66 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

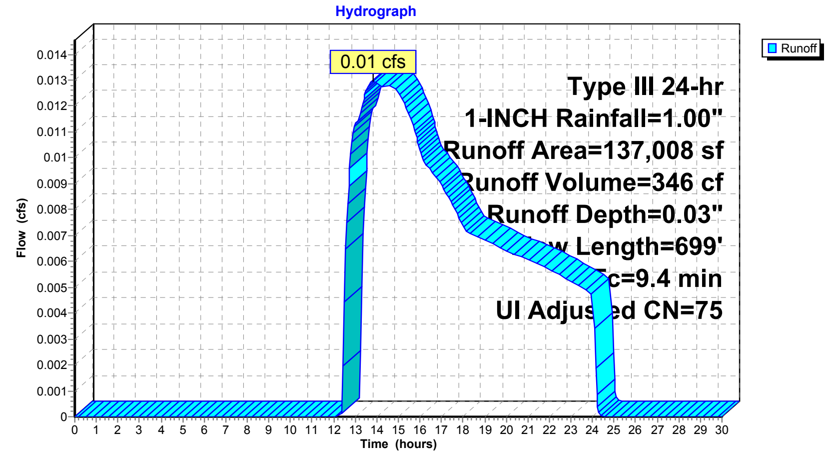
Runoff = 0.01 cfs @ 13.82 hrs, Volume= 346 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

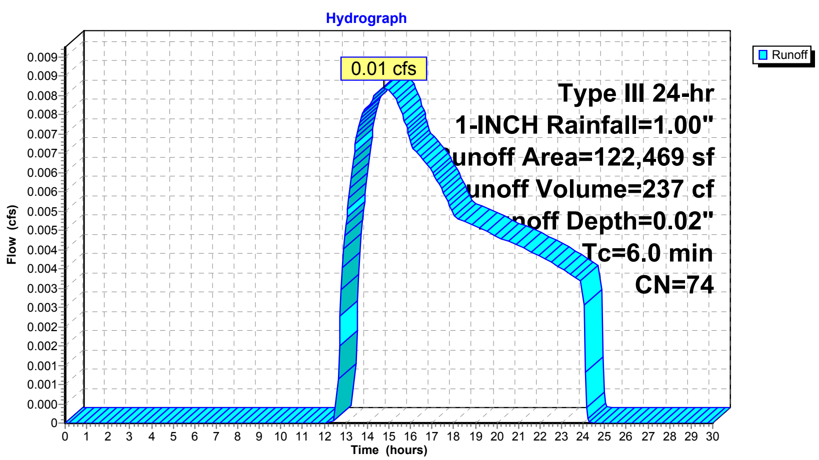
Runoff = 0.01 cfs @ 14.78 hrs, Volume= 237 cf, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 0.02" for 1-INCH event
Inflow = 0.01 cfs @ 14.78 hrs, Volume= 237 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.04' @ 24.40 hrs Surf.Area= 5,910 sf Storage= 235 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

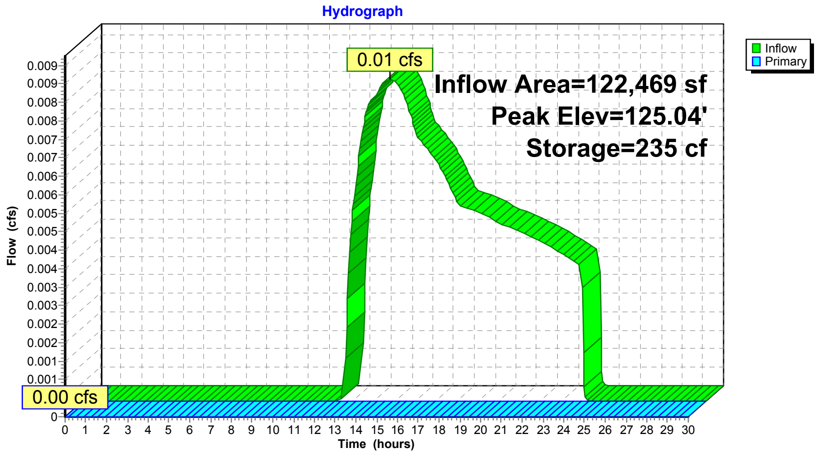
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

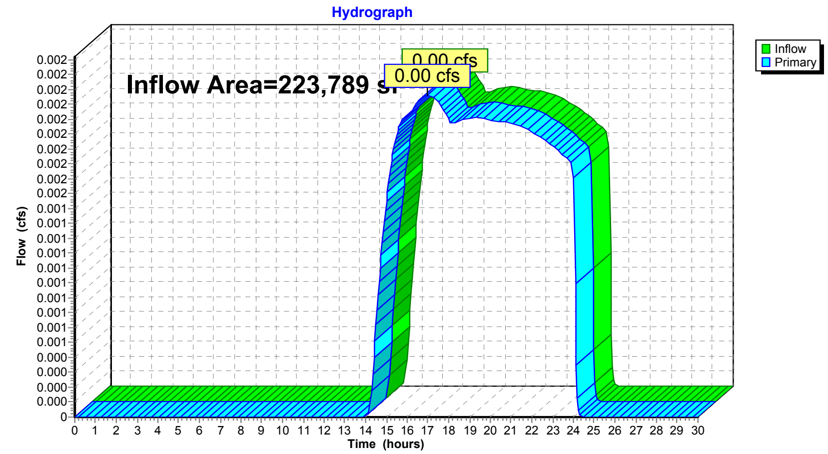


Summary for Link SP-1: Study Point #1

Inflow Area =	223,789 sf, 4.75% Impervious, Inflow Depth = 0.00"	for 1-INCH event
Inflow =	0.00 cfs @ 17.00 hrs, Volume=	66 cf
Primary =	0.00 cfs @ 17.00 hrs, Volume=	66 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

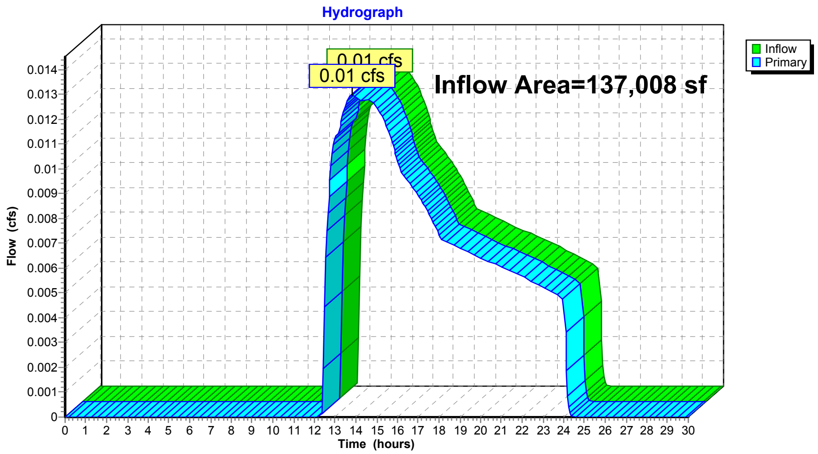


Summary for Link SP-2: Study Point #2

Inflow Area =	137,008 sf, 25.05% Impervious, Inflow Depth = 0.03" for 1-INCH event	
Inflow =	0.01 cfs @ 13.82 hrs, Volume=	346 cf
Primary =	0.01 cfs @ 13.82 hrs, Volume=	346 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North — Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=0.93"
Flow Length=371' Tc=7.3 min CN=71 Runoff=2.18 cfs 7,823 cf

Subcatchment E-2: Off-Site Flow to Boston Post Road — Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=1.15"
Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=3.57 cfs 13,112 cf

Subcatchment E-3: Off-Site Runoff NorthEast — Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=74 Runoff=3.37 cfs 11,130 cf

Pond 1P: On-Site Depression — Peak Elev=126.03' Storage=11,129 cf Inflow=3.37 cfs 11,130 cf
Outflow=0.00 cfs 0 cf

Link SP-1: Study Point #1 — Inflow=2.18 cfs 7,823 cf
Primary=2.18 cfs 7,823 cf

Link SP-2: Study Point #2 — Inflow=3.57 cfs 13,112 cf
Primary=3.57 cfs 13,112 cf

Total Runoff Area = 360,797 sf Runoff Volume = 32,066 cf Average Runoff Depth = 1.07"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

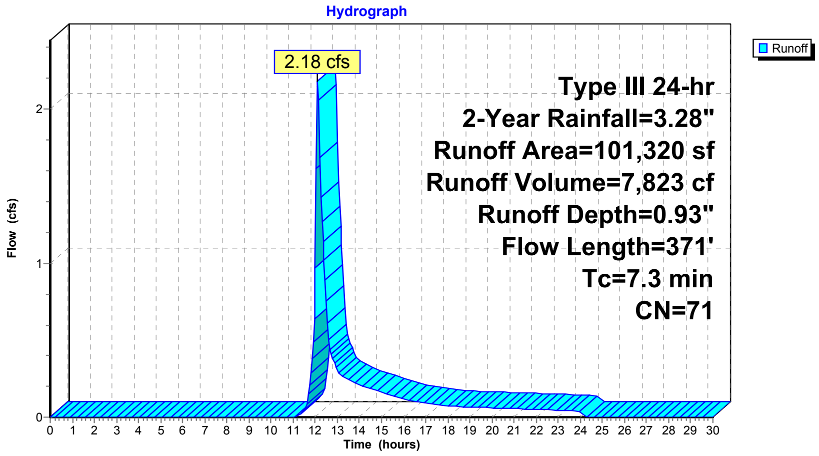
Runoff = 2.18 cfs @ 12.12 hrs, Volume= 7,823 cf, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

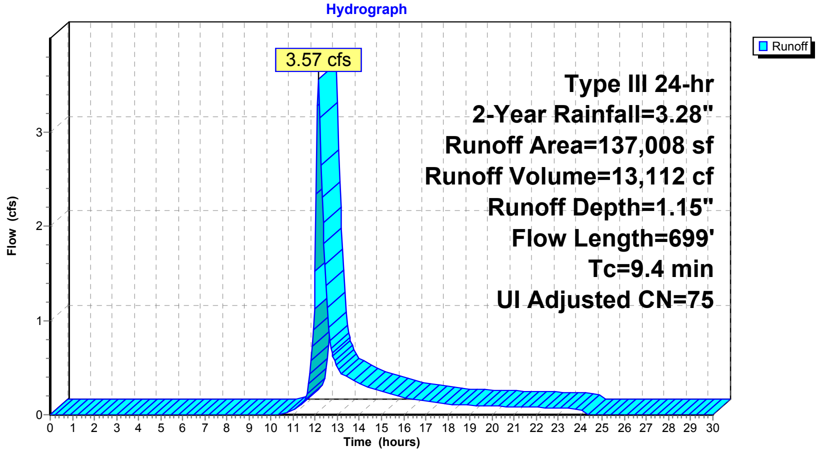
Runoff = 3.57 cfs @ 12.15 hrs, Volume= 13,112 cf, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

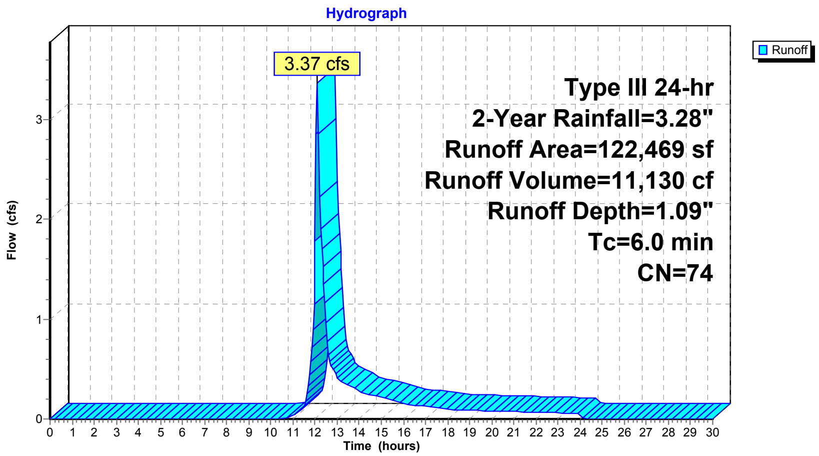
Runoff = 3.37 cfs @ 12.10 hrs, Volume= 11,130 cf, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 1.09" for 2-Year event
Inflow = 3.37 cfs @ 12.10 hrs, Volume= 11,130 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.03' @ 24.40 hrs Surf.Area= 16,720 sf Storage= 11,129 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

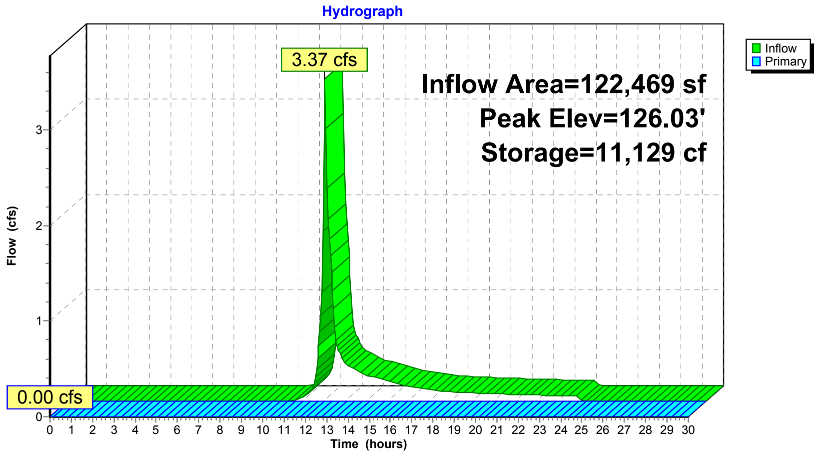
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

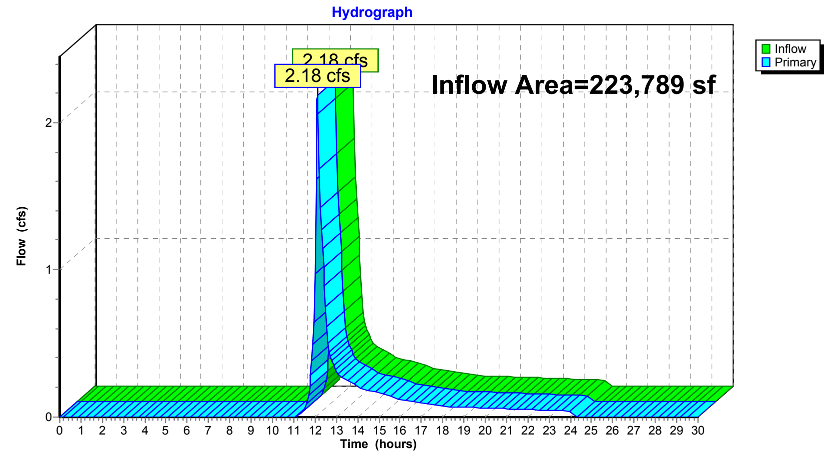


Summary for Link SP-1: Study Point #1

Inflow Area = 223,789 sf, 4.75% Impervious, Inflow Depth = 0.42" for 2-Year event
Inflow = 2.18 cfs @ 12.12 hrs, Volume= 7,823 cf
Primary = 2.18 cfs @ 12.12 hrs, Volume= 7,823 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

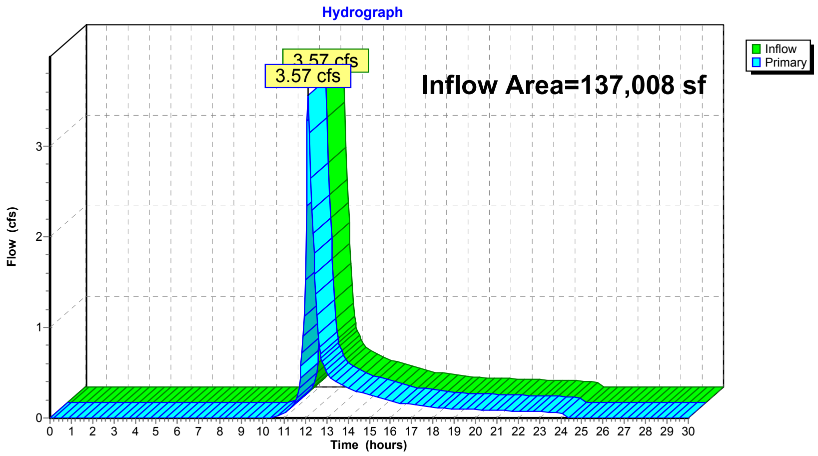


Summary for Link SP-2: Study Point #2

Inflow Area = 137,008 sf, 25.05% Impervious, Inflow Depth = 1.15" for 2-Year event
Inflow = 3.57 cfs @ 12.15 hrs, Volume= 13,112 cf
Primary = 3.57 cfs @ 12.15 hrs, Volume= 13,112 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North
Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=2.20"
Flow Length=371' Tc=7.3 min CN=71 Runoff=5.59 cfs 18,575 cf

Subcatchment E-2: Off-Site Flow to Boston Post Road
Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=2.54"
Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=8.19 cfs 28,986 cf

Subcatchment E-3: Off-Site Runoff NorthEast
Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=74 Runoff=7.90 cfs 25,028 cf

Pond 1P: On-Site Depression
Peak Elev=126.81' Storage=25,027 cf Inflow=7.90 cfs 25,028 cf
Outflow=0.00 cfs 0 cf

Link SP-1: Study Point #1
Inflow=5.59 cfs 18,575 cf
Primary=5.59 cfs 18,575 cf

Link SP-2: Study Point #2
Inflow=8.19 cfs 28,986 cf
Primary=8.19 cfs 28,986 cf

Total Runoff Area = 360,797 sf Runoff Volume = 72,589 cf Average Runoff Depth = 2.41"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

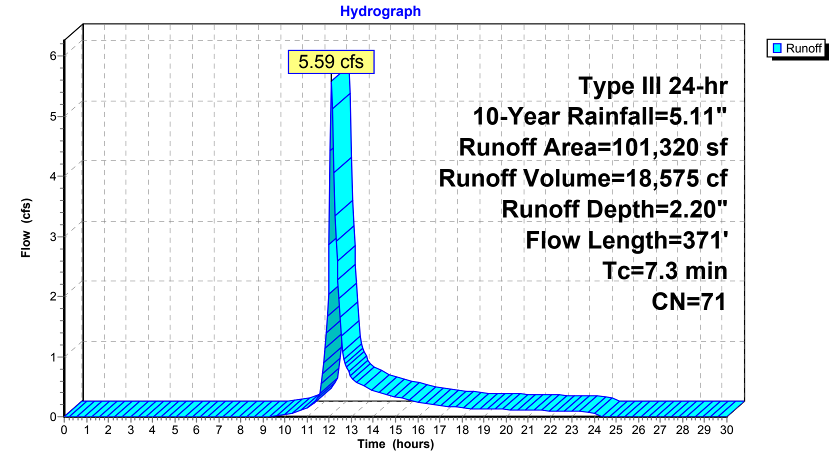
Runoff = 5.59 cfs @ 12.11 hrs, Volume= 18,575 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

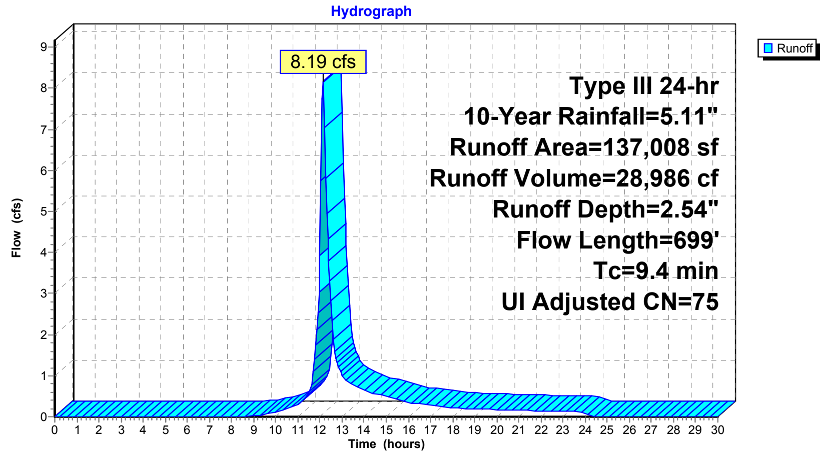
Runoff = 8.19 cfs @ 12.14 hrs, Volume= 28,986 cf, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

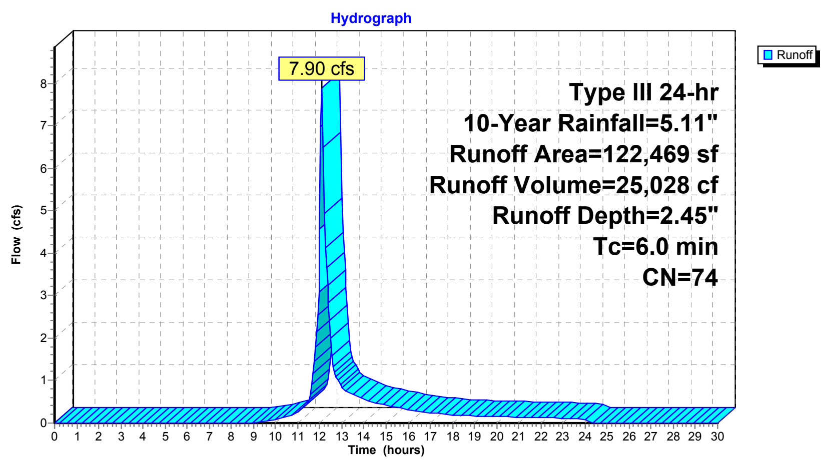
Runoff = 7.90 cfs @ 12.09 hrs, Volume= 25,028 cf, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 2.45" for 10-Year event
Inflow = 7.90 cfs @ 12.09 hrs, Volume= 25,028 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.81' @ 24.40 hrs Surf.Area= 18,928 sf Storage= 25,027 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

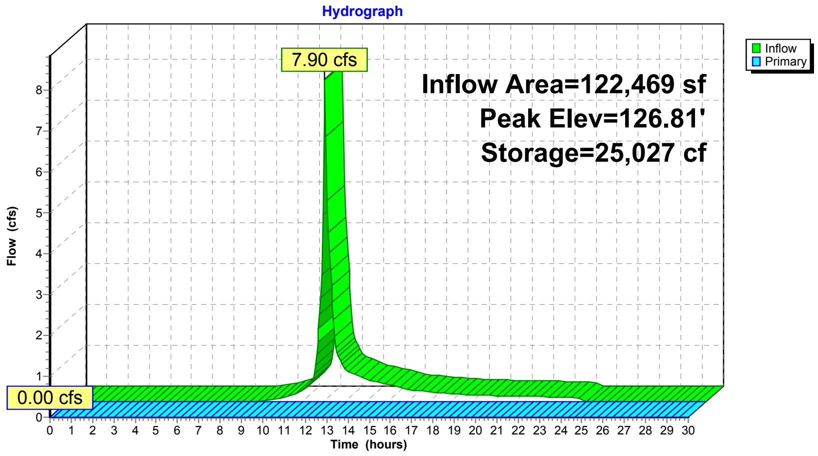
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

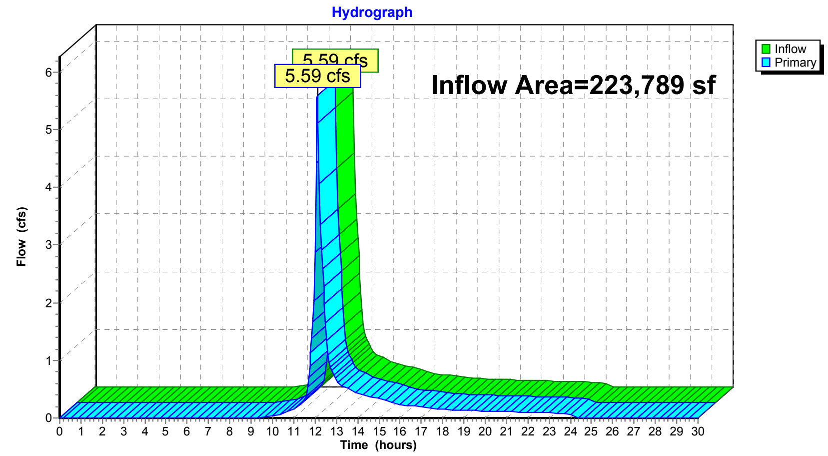


Summary for Link SP-1: Study Point #1

Inflow Area = 223,789 sf, 4.75% Impervious, Inflow Depth = 1.00" for 10-Year event
Inflow = 5.59 cfs @ 12.11 hrs, Volume= 18,575 cf
Primary = 5.59 cfs @ 12.11 hrs, Volume= 18,575 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

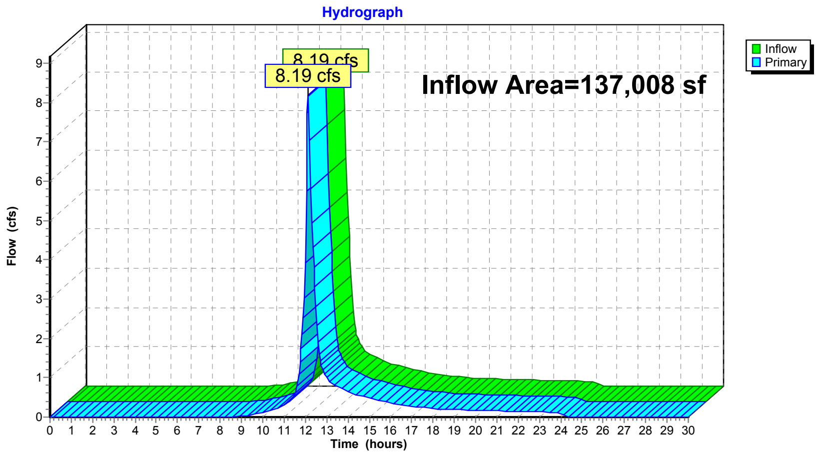


Summary for Link SP-2: Study Point #2

Inflow Area = 137,008 sf, 25.05% Impervious, Inflow Depth = 2.54" for 10-Year event
Inflow = 8.19 cfs @ 12.14 hrs, Volume= 28,986 cf
Primary = 8.19 cfs @ 12.14 hrs, Volume= 28,986 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North — Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=3.11"
Flow Length=371' Tc=7.3 min CN=71 Runoff=7.99 cfs 26,256 cf

Subcatchment E-2: Off-Site Flow to Boston Post Road — Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=3.50"
Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=11.33 cfs 40,014 cf

Subcatchment E-3: Off-Site Runoff NorthEast — Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=3.40"
Tc=6.0 min CN=74 Runoff=11.00 cfs 34,748 cf

Pond 1P: On-Site Depression — Peak Elev=127.31' Storage=34,747 cf Inflow=11.00 cfs 34,748 cf
Outflow=0.00 cfs 0 cf

Link SP-1: Study Point #1 — Inflow=7.99 cfs 26,256 cf
Primary=7.99 cfs 26,256 cf

Link SP-2: Study Point #2 — Inflow=11.33 cfs 40,014 cf
Primary=11.33 cfs 40,014 cf

Total Runoff Area = 360,797 sf Runoff Volume = 101,018 cf Average Runoff Depth = 3.36"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

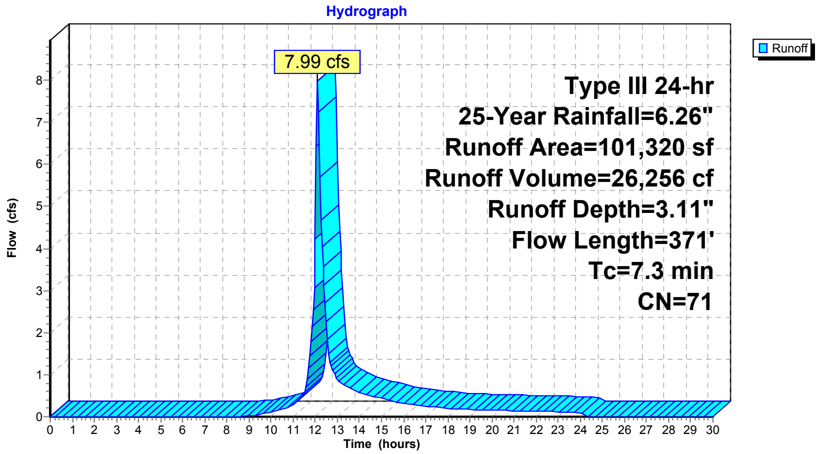
Runoff = 7.99 cfs @ 12.11 hrs, Volume= 26,256 cf, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

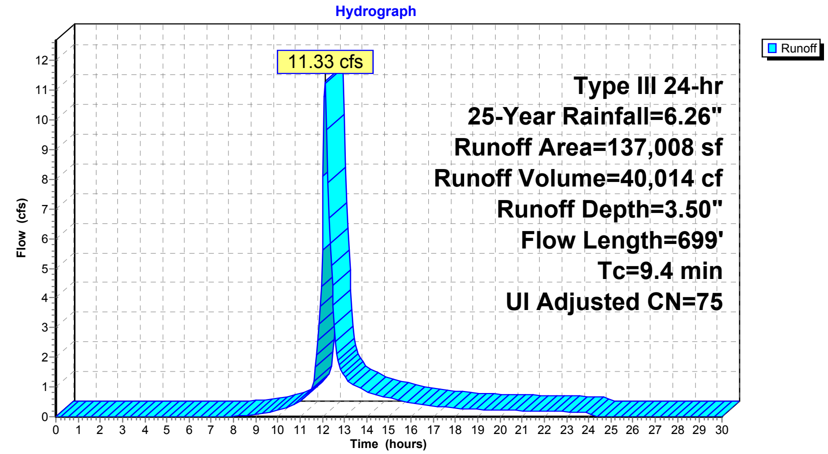
Runoff = 11.33 cfs @ 12.14 hrs, Volume= 40,014 cf, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

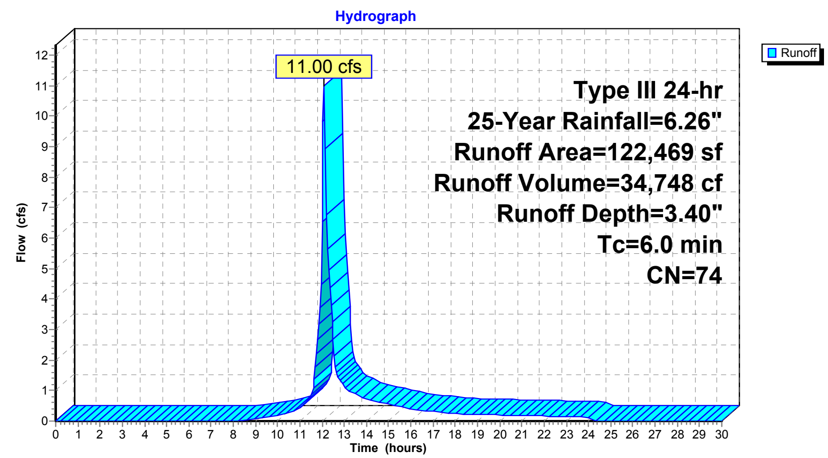
Runoff = 11.00 cfs @ 12.09 hrs, Volume= 34,748 cf, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 3.40" for 25-Year event
Inflow = 11.00 cfs @ 12.09 hrs, Volume= 34,748 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.31' @ 24.40 hrs Surf.Area= 20,394 sf Storage= 34,747 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

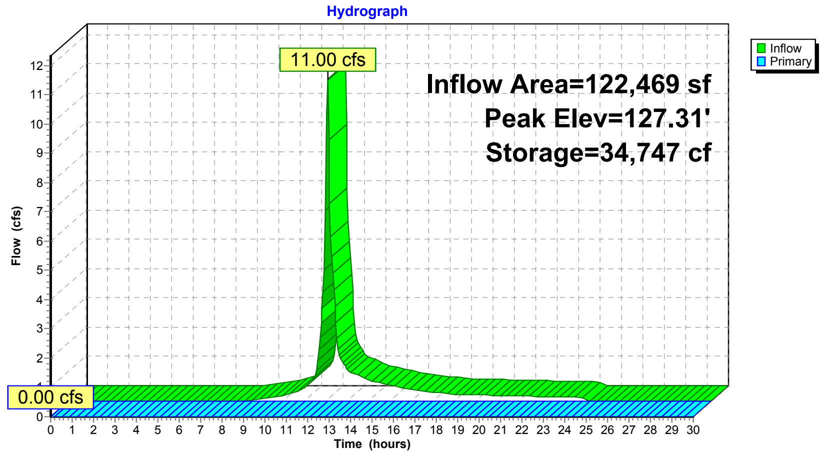
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

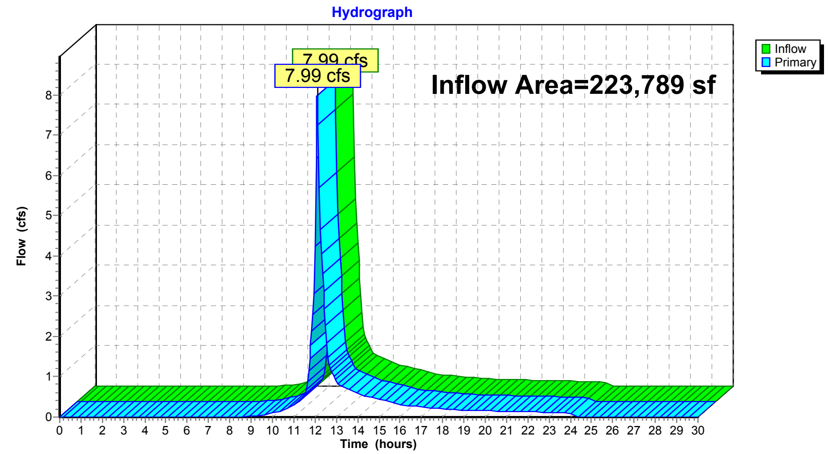


Summary for Link SP-1: Study Point #1

Inflow Area =	223,789 sf,	4.75% Impervious,	Inflow Depth = 1.41"	for 25-Year event
Inflow =	7.99 cfs @	12.11 hrs, Volume=	26,256 cf	
Primary =	7.99 cfs @	12.11 hrs, Volume=	26,256 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

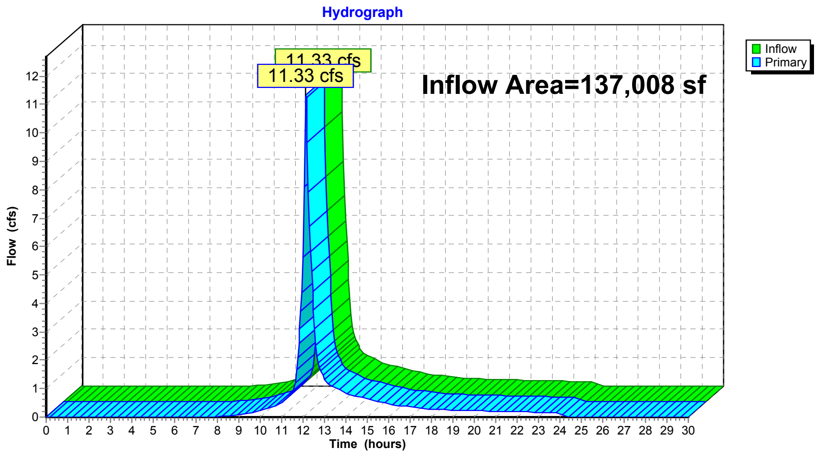


Summary for Link SP-2: Study Point #2

Inflow Area = 137,008 sf, 25.05% Impervious, Inflow Depth = 3.50" for 25-Year event
Inflow = 11.33 cfs @ 12.14 hrs, Volume= 40,014 cf
Primary = 11.33 cfs @ 12.14 hrs, Volume= 40,014 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment E-1: Off-site Runoff North	Runoff Area=101,320 sf 0.00% Impervious Runoff Depth=4.60" Flow Length=371' Tc=7.3 min CN=71 Runoff=11.84 cfs 38,811 cf
Subcatchment E-2: Off-Site Flow to Boston Post Road	Runoff Area=137,008 sf 25.05% Impervious Runoff Depth=5.06" Flow Length=699' Tc=9.4 min UI Adjusted CN=75 Runoff=16.29 cfs 57,768 cf
Subcatchment E-3: Off-Site Runoff NorthEast	Runoff Area=122,469 sf 8.69% Impervious Runoff Depth=4.94" Tc=6.0 min CN=74 Runoff=15.92 cfs 50,453 cf
Pond 1P: On-Site Depression	Peak Elev=128.04' Storage=50,452 cf Inflow=15.92 cfs 50,453 cf Outflow=0.00 cfs 0 cf
Link SP-1: Study Point #1	Inflow=11.84 cfs 38,811 cf Primary=11.84 cfs 38,811 cf
Link SP-2: Study Point #2	Inflow=16.29 cfs 57,768 cf Primary=16.29 cfs 57,768 cf

Total Runoff Area = 360,797 sf Runoff Volume = 147,032 cf Average Runoff Depth = 4.89"
87.54% Pervious = 315,839 sf 12.46% Impervious = 44,958 sf

Summary for Subcatchment E-1: Off-site Runoff North

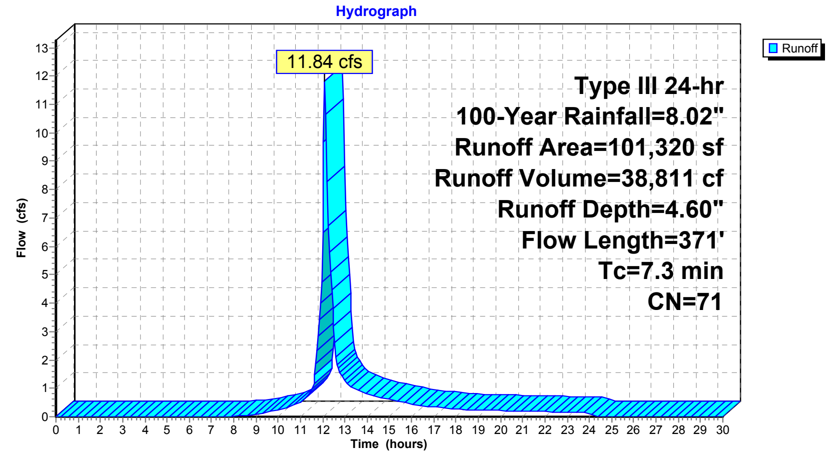
Runoff = 11.84 cfs @ 12.11 hrs, Volume= 38,811 cf, Depth= 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
58,652	85	Gravel roads, HSG B
1,799	61	>75% Grass cover, Good, HSG B
6,474	30	Woods, Good, HSG A
34,395	55	Woods, Good, HSG B
101,320	71	Weighted Average
101,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.0200	0.15		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.16"
0.4	42	0.0700	1.85		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
0.0	6	0.0200	2.87		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.8	47	0.0200	0.99		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
0.3	204	0.0180	11.42	35.87	Pipe Channel, E-F 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
0.1	22	0.4500	3.35		Shallow Concentrated Flow, F-G Woodland Kv= 5.0 fps
7.3	371	Total			

Subcatchment E-1: Off-site Runoff North



Summary for Subcatchment E-2: Off-Site Flow to Boston Post Road

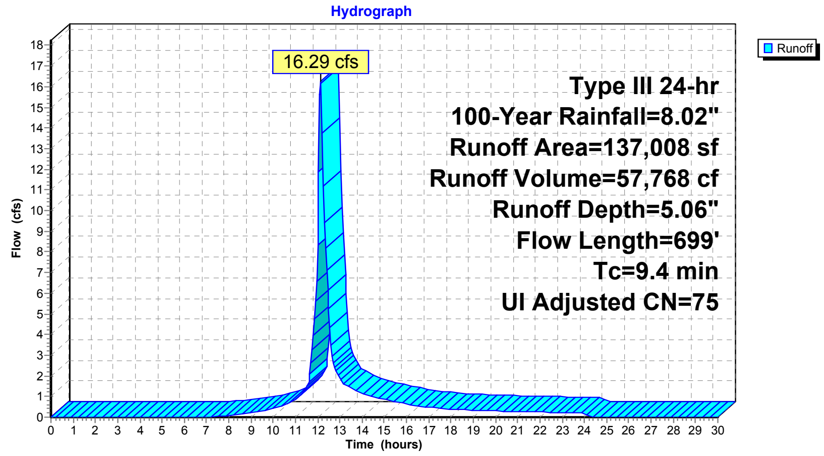
Runoff = 16.29 cfs @ 12.13 hrs, Volume= 57,768 cf, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Adj	Description
34,321	98		Unconnected pavement, HSG B
46,464	85		Gravel roads, HSG B
48,445	61		>75% Grass cover, Good, HSG B
7,778	55		Woods, Good, HSG B
137,008	78	75	Weighted Average, UI Adjusted
102,687			74.95% Pervious Area
34,321			25.05% Impervious Area
34,321			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0450	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
1.2	98	0.0690	1.31		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	551	0.0420	4.16		Shallow Concentrated Flow, Paved Kv= 20.3 fps
9.4	699	Total			

Subcatchment E-2: Off-Site Flow to Boston Post Road



Summary for Subcatchment E-3: Off-Site Runoff NorthEast

Tc of 4.6 rounds to minimum of 5.0. Use Tc = 5.0 mimutes for E-2.

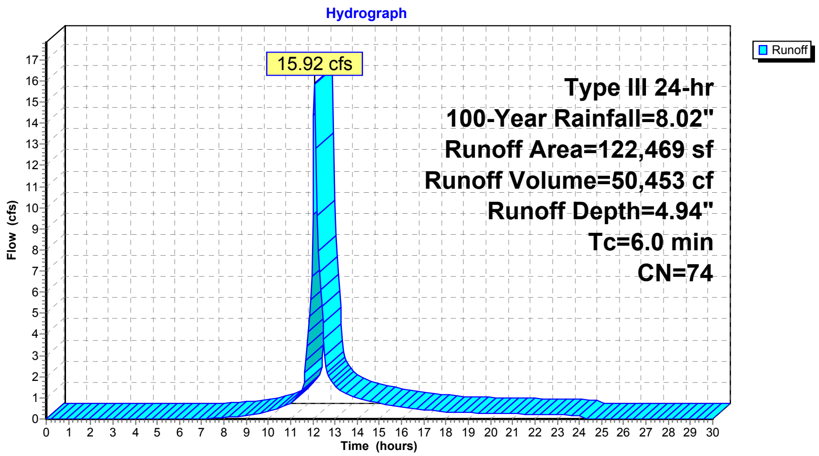
Runoff = 15.92 cfs @ 12.09 hrs, Volume= 50,453 cf, Depth= 4.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
10,637	98	Paved parking, HSG B
58,026	85	Gravel roads, HSG B
23,462	61	>75% Grass cover, Good, HSG B
30,344	55	Woods, Good, HSG B
122,469	74	Weighted Average
111,832		91.31% Pervious Area
10,637		8.69% Impervious Area

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

Subcatchment E-3: Off-Site Runoff NorthEast



Summary for Pond 1P: On-Site Depression

Inflow Area = 122,469 sf, 8.69% Impervious, Inflow Depth = 4.94" for 100-Year event
Inflow = 15.92 cfs @ 12.09 hrs, Volume= 50,453 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.04' @ 24.40 hrs Surf.Area= 22,685 sf Storage= 50,452 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

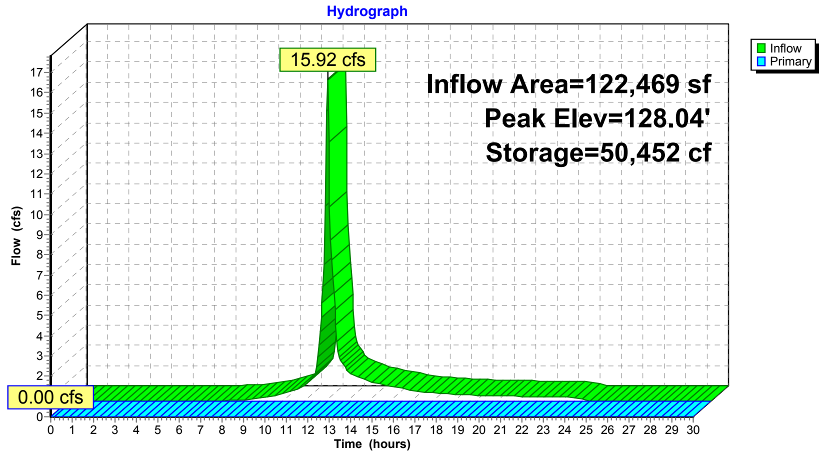
Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	74,276 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
125.00	5,573	547.9	0	0	5,573
126.00	16,635	762.0	10,612	10,612	27,900
127.00	19,483	823.9	18,040	28,652	35,752
128.00	22,540	960.8	20,993	49,645	55,215
129.00	26,782	825.3	24,631	74,276	74,495

Device	Routing	Invert	Outlet Devices
#1	Primary	129.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 73.00 113.50

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└1=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 1P: On-Site Depression

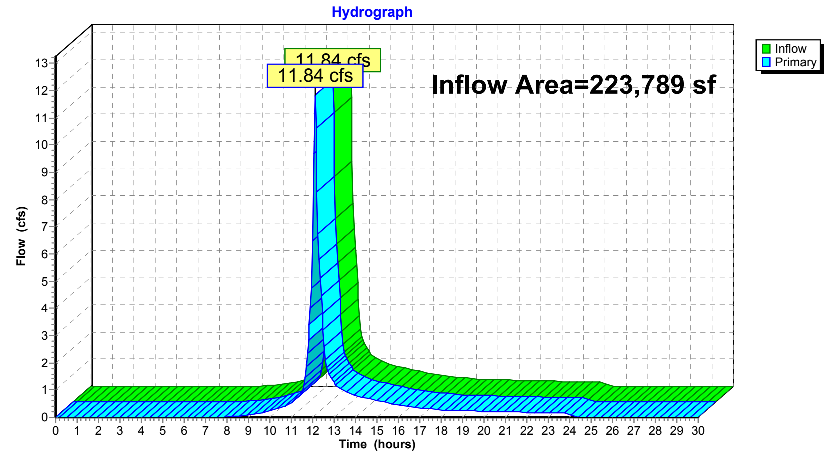


Summary for Link SP-1: Study Point #1

Inflow Area = 223,789 sf, 4.75% Impervious, Inflow Depth = 2.08" for 100-Year event
Inflow = 11.84 cfs @ 12.11 hrs, Volume= 38,811 cf
Primary = 11.84 cfs @ 12.11 hrs, Volume= 38,811 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

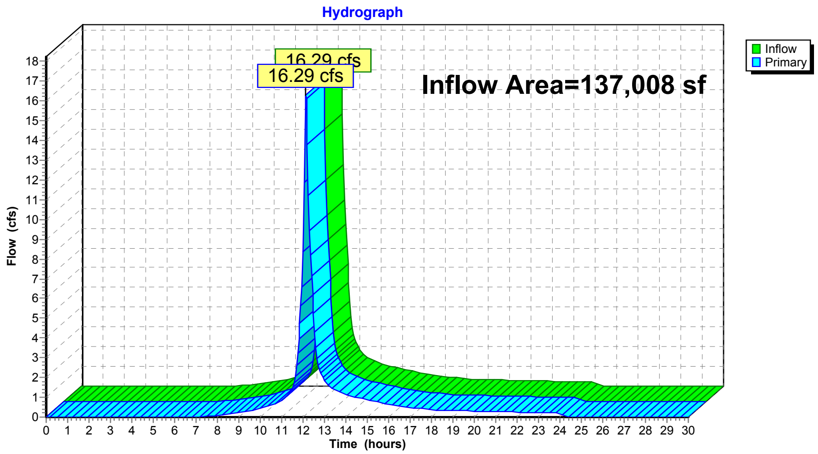


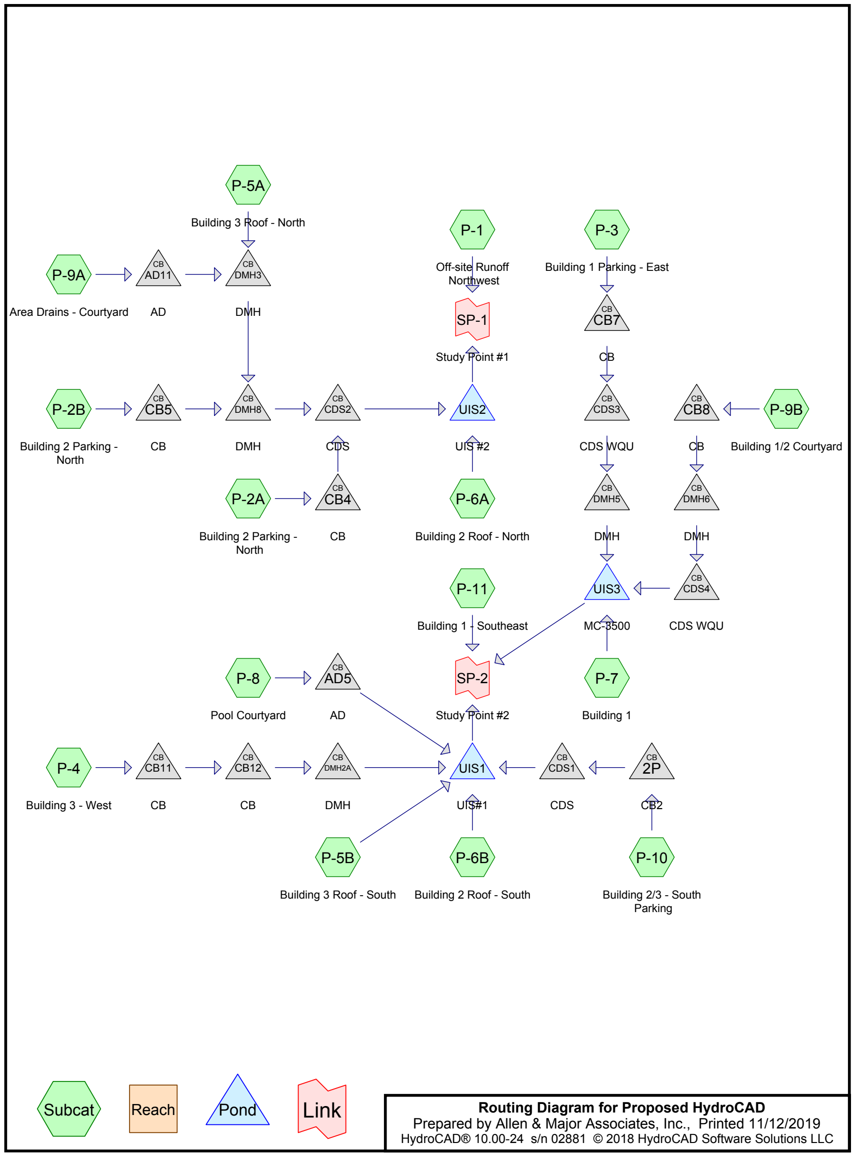
Summary for Link SP-2: Study Point #2

Inflow Area = 137,008 sf, 25.05% Impervious, Inflow Depth = 5.06" for 100-Year event
Inflow = 16.29 cfs @ 12.13 hrs, Volume= 57,768 cf
Primary = 16.29 cfs @ 12.13 hrs, Volume= 57,768 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2





Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
3,360	39	>75% Grass cover, Good, HSG A (P-1)
145,593	61	>75% Grass cover, Good, HSG B (P-1, P-10, P-11, P-2A, P-2B, P-3, P-4, P-8, P-9A, P-9B)
55,231	98	Paved parking, HSG B (P-10, P-11, P-2A, P-2B)
122,666	98	Unconnected pavement, HSG B (P-3, P-5A, P-5B, P-6A, P-6B, P-7, P-8, P-9A, P-9B)
33,947	55	Woods, Good, HSG B (P-1)
360,797	78	TOTAL AREA

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
3,360	HSG A	P-1
357,437	HSG B	P-1, P-10, P-11, P-2A, P-2B, P-3, P-4, P-5A, P-5B, P-6A, P-6B, P-7, P-8, P-9A, P-9B
0	HSG C	
0	HSG D	
0	Other	
360,797		TOTAL AREA

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
3,360	145,593	0	0	0	148,953	>75% Grass cover, Good	P-1, P-10, P-11, P-2A, P-2B, P-3, P-4, P-8, P-9A, P-9B
0	55,231	0	0	0	55,231	Paved parking	P-10, P-11, P-2A, P-2B
0	122,666	0	0	0	122,666	Unconnected pavement	P-3, P-5A, P-5B, P-6A, P-6B, P-7, P-8, P-9A, P-9B
0	33,947	0	0	0	33,947	Woods, Good	P-1
3,360	357,437	0	0	0	360,797	TOTAL AREA	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	139.57	139.39	9.0	0.0200	0.013	12.0	0.0	0.0
2	AD11	135.25	134.62	63.0	0.0100	0.013	8.0	0.0	0.0
3	AD5	140.00	136.25	125.0	0.0300	0.013	12.0	0.0	0.0
4	CB11	141.00	139.99	101.0	0.0100	0.013	12.0	0.0	0.0
5	CB12	139.89	139.03	86.0	0.0100	0.013	12.0	0.0	0.0
6	CB4	126.85	125.80	21.0	0.0500	0.013	12.0	0.0	0.0
7	CB5	128.35	127.12	162.0	0.0076	0.013	12.0	0.0	0.0
8	CB7	125.95	125.45	50.0	0.0100	0.013	12.0	0.0	0.0
9	CB8	126.61	126.04	19.0	0.0300	0.013	12.0	0.0	0.0
10	CDS1	139.39	135.35	101.0	0.0400	0.013	12.0	0.0	0.0
11	CDS2	125.80	125.75	5.0	0.0100	0.013	12.0	0.0	0.0
12	CDS3	125.45	124.75	70.0	0.0100	0.013	12.0	0.0	0.0
13	CDS4	125.00	124.85	15.0	0.0100	0.013	15.0	0.0	0.0
14	DMH2A	137.30	136.65	65.0	0.0100	0.013	12.0	0.0	0.0
15	DMH3	133.62	130.52	62.0	0.0500	0.013	15.0	0.0	0.0
16	DMH5	124.80	124.75	5.0	0.0100	0.013	12.0	0.0	0.0
17	DMH6	125.94	125.00	94.0	0.0100	0.013	12.0	0.0	0.0
18	DMH8	127.02	125.80	122.0	0.0100	0.013	18.0	0.0	0.0
19	UIS1	135.25	127.09	408.0	0.0200	0.013	15.0	0.0	0.0
20	UIS2	125.75	125.23	26.0	0.0200	0.013	15.0	0.0	0.0
21	UIS3	124.75	124.31	44.0	0.0100	0.013	15.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest — Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=56 Runoff=0.00 cfs 0 cf

Subcatchment P-10: Building 2/3 - South Parking — Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=81 Runoff=0.00 cfs 1 cf

Subcatchment P-11: Building 1 - Southeast — Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=79 Runoff=0.00 cfs 0 cf

Subcatchment P-2A: Building 2 Parking - North — Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=0.04"
Tc=6.0 min CN=89 Runoff=0.01 cfs 87 cf

Subcatchment P-2B: Building 2 Parking - North — Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=85 Runoff=0.00 cfs 19 cf

Subcatchment P-3: Building 1 Parking - East — Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=0.02"
Tc=6.0 min CN=86 Runoff=0.00 cfs 37 cf

Subcatchment P-4: Building 3 - West — Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=322' Tc=8.6 min CN=61 Runoff=0.00 cfs 0 cf

Subcatchment P-5A: Building 3 Roof - North — Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=98 Runoff=0.11 cfs 352 cf

Subcatchment P-5B: Building 3 Roof - South — Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=98 Runoff=0.12 cfs 372 cf

Subcatchment P-6A: Building 2 Roof - North — Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=98 Runoff=0.12 cfs 384 cf

Subcatchment P-6B: Building 2 Roof - South — Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=98 Runoff=0.12 cfs 384 cf

Subcatchment P-7: Building 1 — Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=0.32"
Tc=6.0 min CN=98 Runoff=0.19 cfs 591 cf

Subcatchment P-8: Pool Courtyard — Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=0.00"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=0.00 cfs 0 cf

Subcatchment P-9A: Area Drains - Courtyard — Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=0.00"
Tc=6.0 min UI Adjusted CN=64 Runoff=0.00 cfs 0 cf

Subcatchment P-9B: Building 1/2 Courtyard — Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=0.00"
Flow Length=317' Tc=12.7 min CN=72 Runoff=0.00 cfs 0 cf

Pond 2P: CB2 — Peak Elev=139.57' Inflow=0.00 cfs 1 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=0.00 cfs 1 cf

Pond AD11: AD	Peak Elev=135.25' Inflow=0.00 cfs 0 cf 8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond AD5: AD	Peak Elev=140.00' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=0.00 cfs 0 cf
Pond CB11: CB	Peak Elev=141.00' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond CB12: CB	Peak Elev=139.89' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond CB4: CB	Peak Elev=126.90' Inflow=0.01 cfs 87 cf 12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=0.01 cfs 87 cf
Pond CB5: CB	Peak Elev=128.37' Inflow=0.00 cfs 19 cf 12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=0.00 cfs 19 cf
Pond CB7: CB	Peak Elev=125.97' Inflow=0.00 cfs 37 cf 12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.00 cfs 37 cf
Pond CB8: CB	Peak Elev=126.61' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=0.00 cfs 0 cf
Pond CDS1: CDS	Peak Elev=139.39' Inflow=0.00 cfs 1 cf 12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=0.00 cfs 1 cf
Pond CDS2: CDS	Peak Elev=126.00' Inflow=0.12 cfs 458 cf 12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.12 cfs 458 cf
Pond CDS3: CDS WQU	Peak Elev=125.47' Inflow=0.00 cfs 37 cf 12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=0.00 cfs 37 cf
Pond CDS4: CDS WQU	Peak Elev=125.00' Inflow=0.00 cfs 0 cf 15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond DMH2A: DMH	Peak Elev=137.30' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond DMH3: DMH	Peak Elev=133.79' Inflow=0.11 cfs 352 cf 15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=0.11 cfs 352 cf
Pond DMH5: DMH	Peak Elev=124.82' Inflow=0.00 cfs 37 cf 12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.00 cfs 37 cf
Pond DMH6: DMH	Peak Elev=125.94' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond DMH8: DMH	Peak Elev=127.18' Inflow=0.11 cfs 371 cf 18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=0.11 cfs 371 cf

Pond UIS1: UIS#1	Peak Elev=134.61' Storage=142 cf Inflow=0.24 cfs 757 cf Discarded=0.09 cfs 757 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 757 cf
Pond UIS2: UIS #2	Peak Elev=125.09' Storage=144 cf Inflow=0.24 cfs 842 cf Discarded=0.11 cfs 842 cf Primary=0.00 cfs 0 cf Outflow=0.11 cfs 842 cf
Pond UIS3: MC-3500	Peak Elev=124.06' Storage=90 cf Inflow=0.19 cfs 628 cf Discarded=0.11 cfs 628 cf Primary=0.00 cfs 0 cf Outflow=0.11 cfs 628 cf
Link SP-1: Study Point #1	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf
Link SP-2: Study Point #2	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf

Total Runoff Area = 360,797 sf Runoff Volume = 2,227 cf Average Runoff Depth = 0.07"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

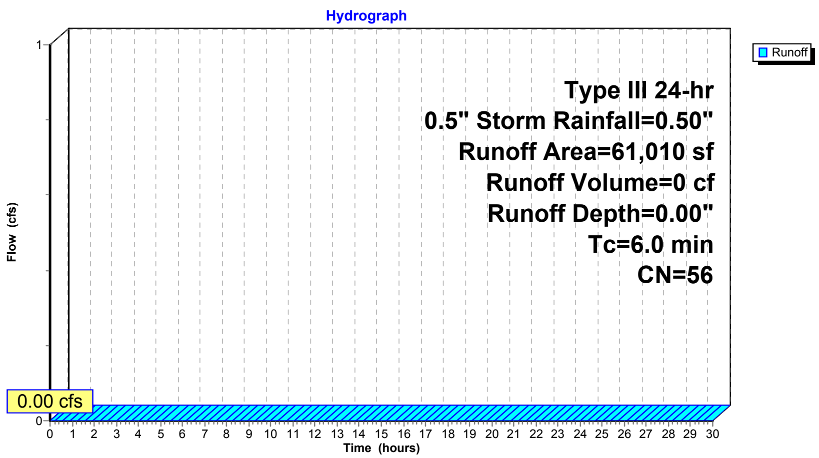
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

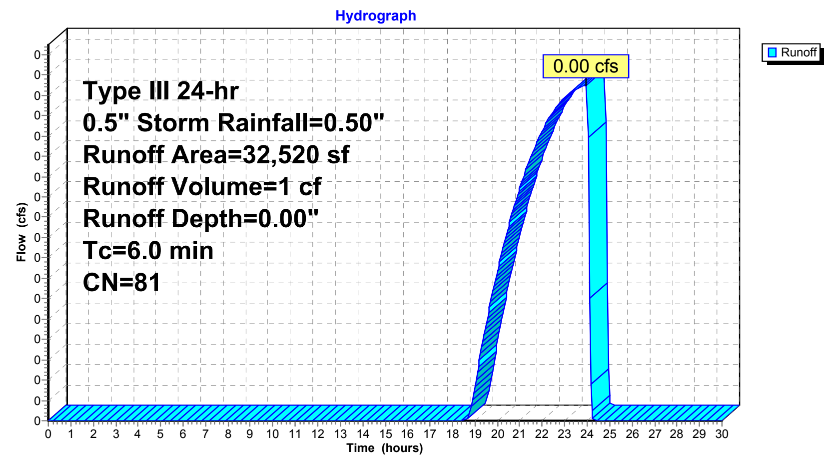
Runoff = 0.00 cfs @ 23.95 hrs, Volume= 1 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

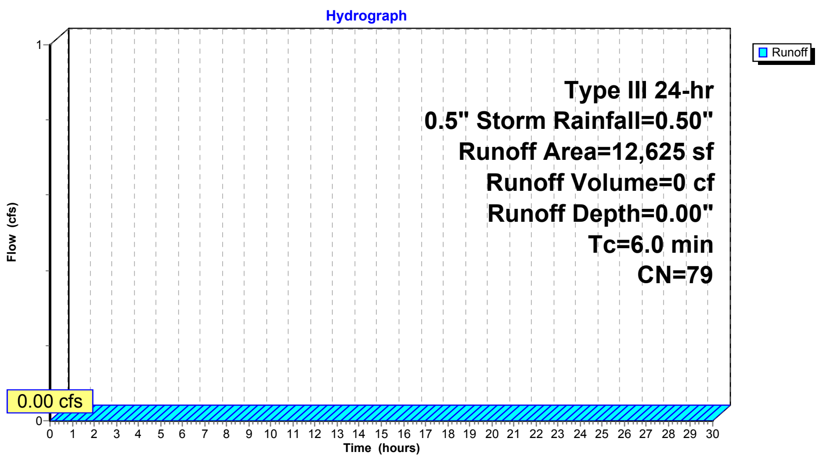
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

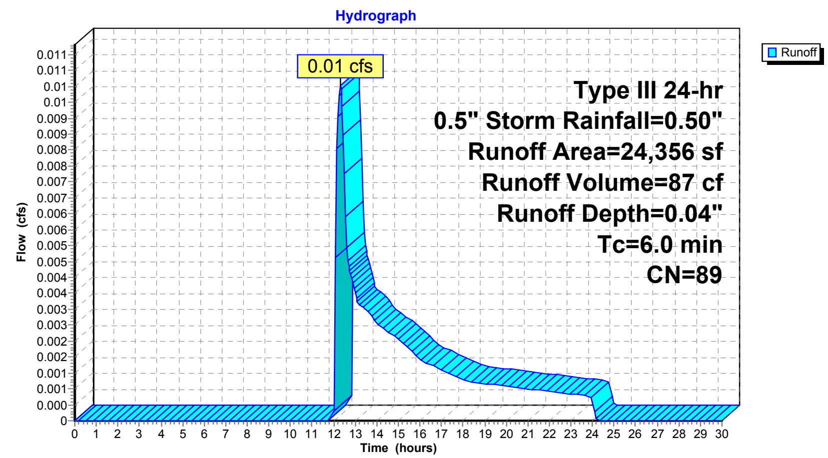
Runoff = 0.01 cfs @ 12.31 hrs, Volume= 87 cf, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

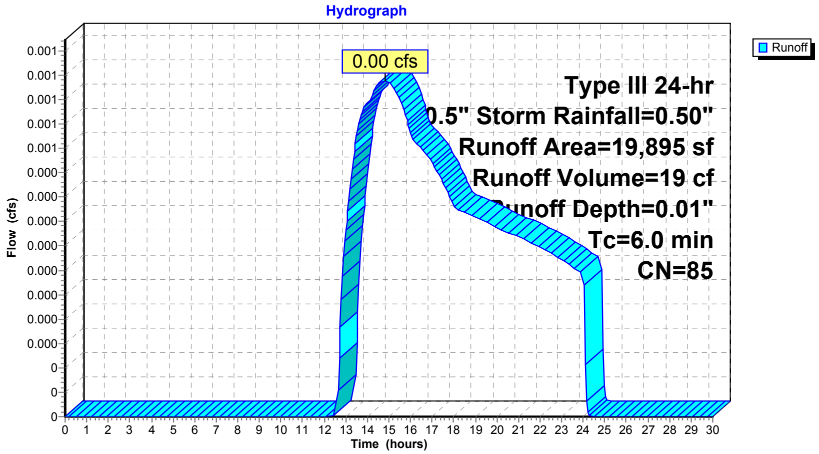
Runoff = 0.00 cfs @ 14.80 hrs, Volume= 19 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

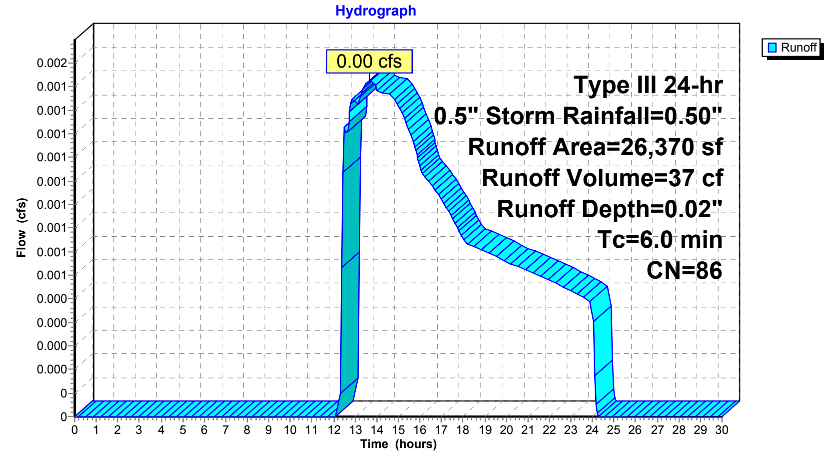
Runoff = 0.00 cfs @ 13.67 hrs, Volume= 37 cf, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

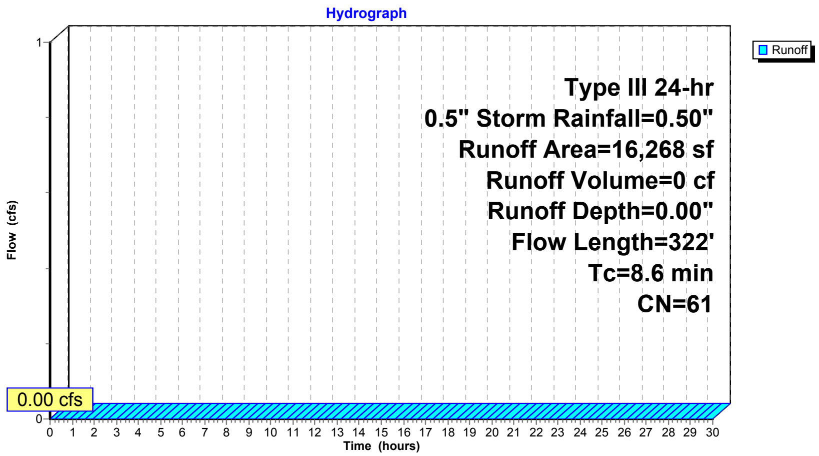
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

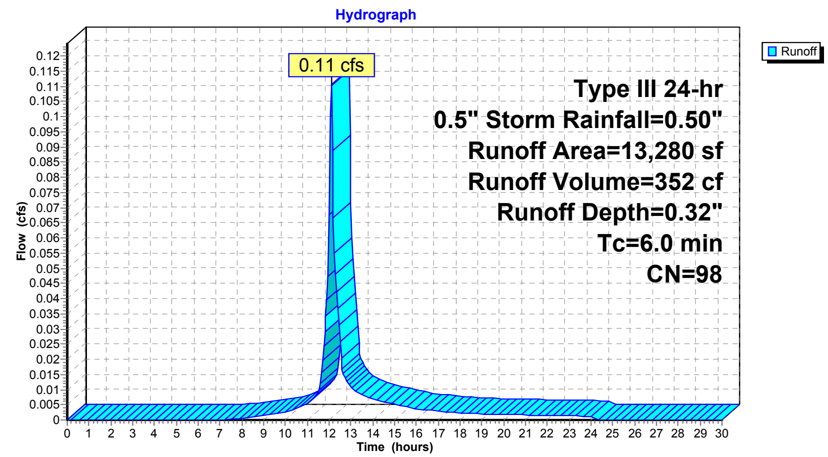
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 352 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

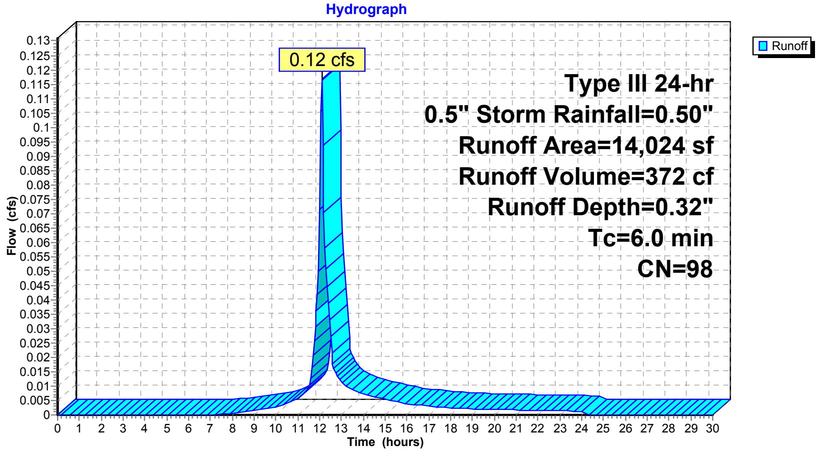
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 372 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

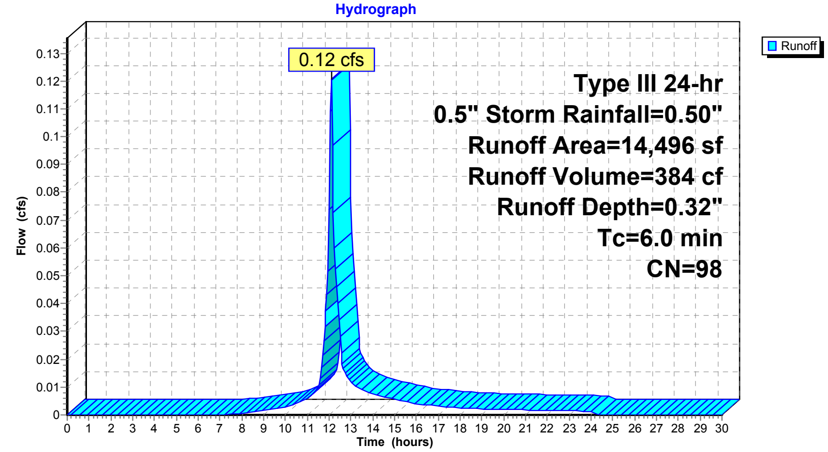
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 384 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

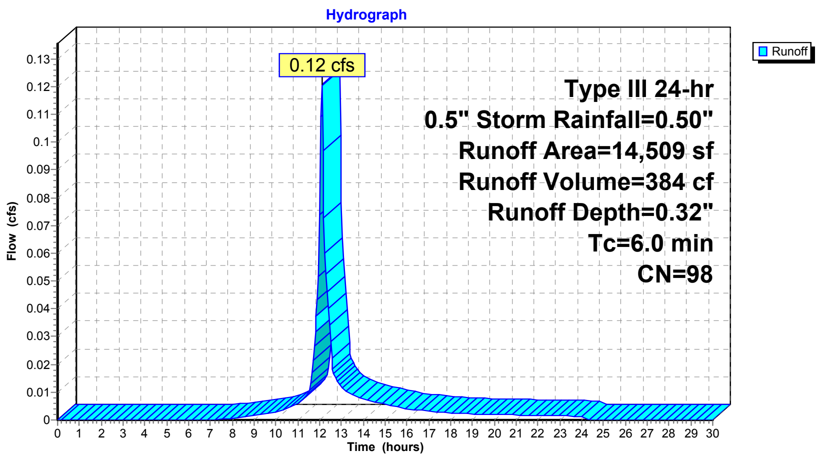
Runoff = 0.12 cfs @ 12.09 hrs, Volume= 384 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

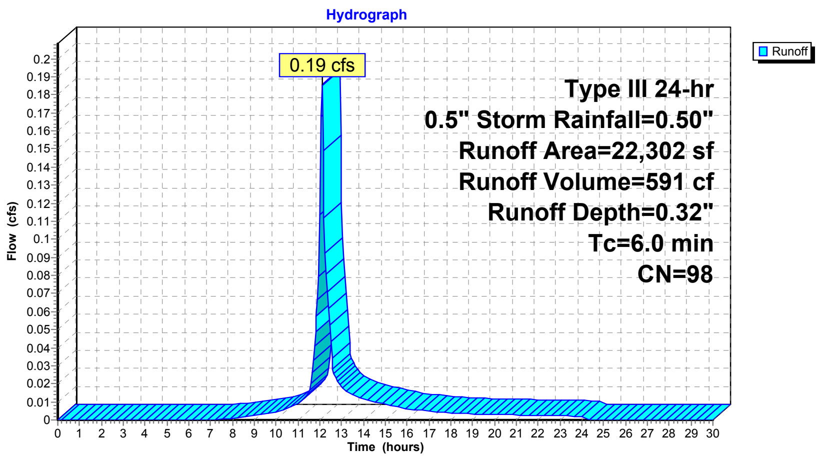
Runoff = 0.19 cfs @ 12.09 hrs, Volume= 591 cf, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

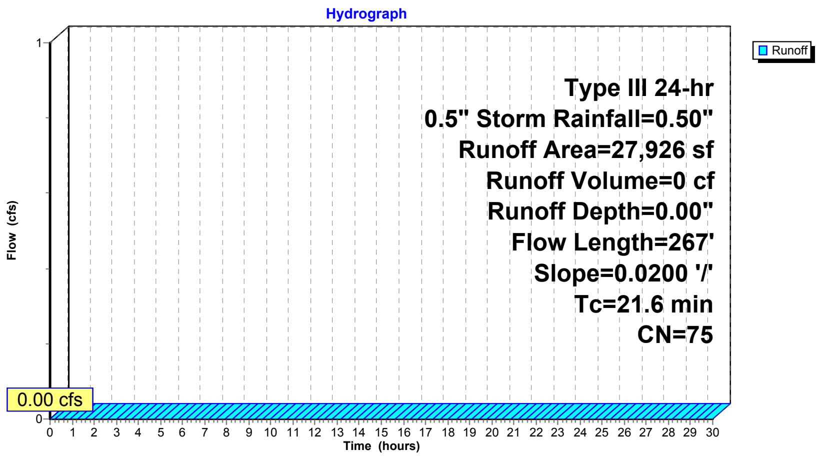
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

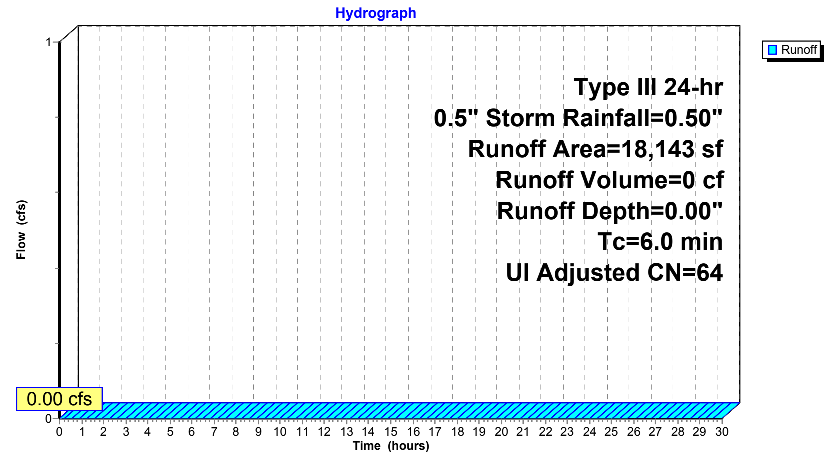
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

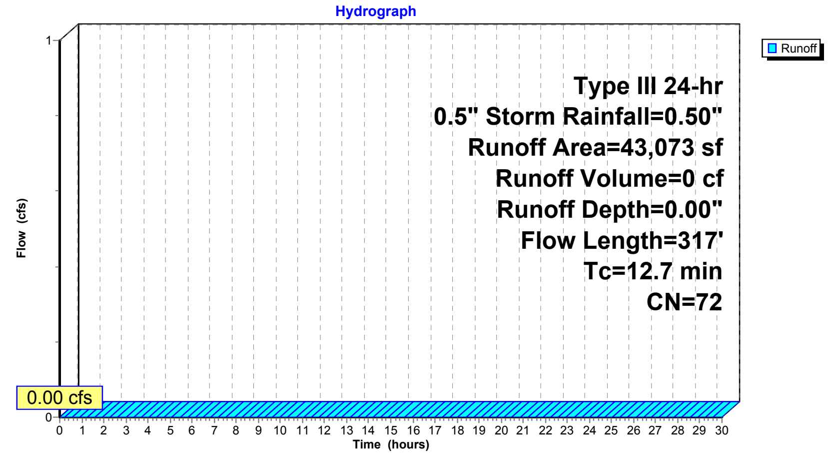
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5" Storm Rainfall=0.50"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

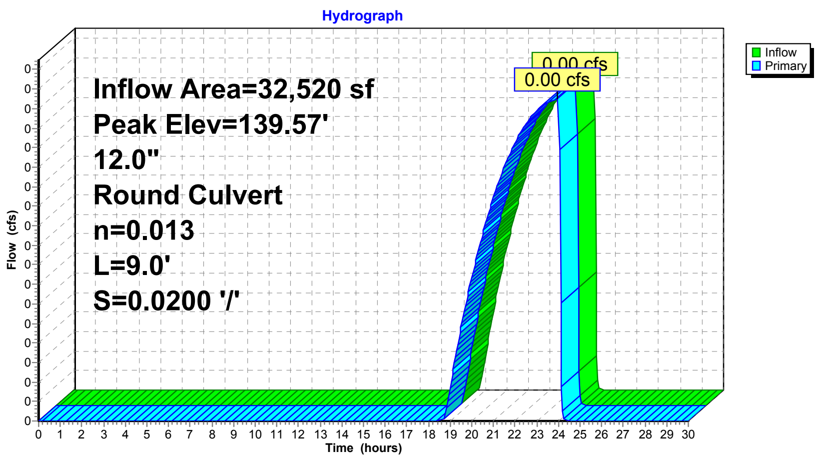
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 1 cf
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 23.95 hrs, Volume= 1 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.57' @ 23.95 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 23.95 hrs HW=139.57' (Free Discharge)
└─1=Culvert (Barrel Controls 0.00 cfs @ 0.07 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

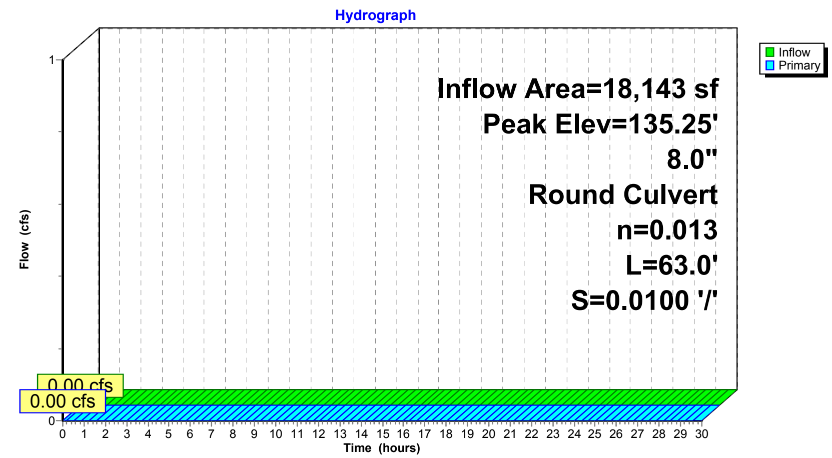
Inflow Area = 18,143 sf, 16.94% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 135.25' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.25' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond AD11: AD



Summary for Pond AD5: AD

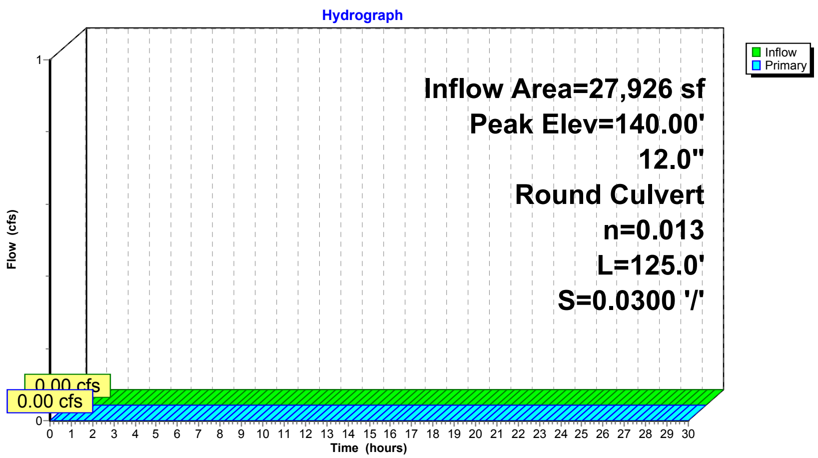
Inflow Area = 27,926 sf, 36.53% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.00' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond AD5: AD



Summary for Pond CB11: CB

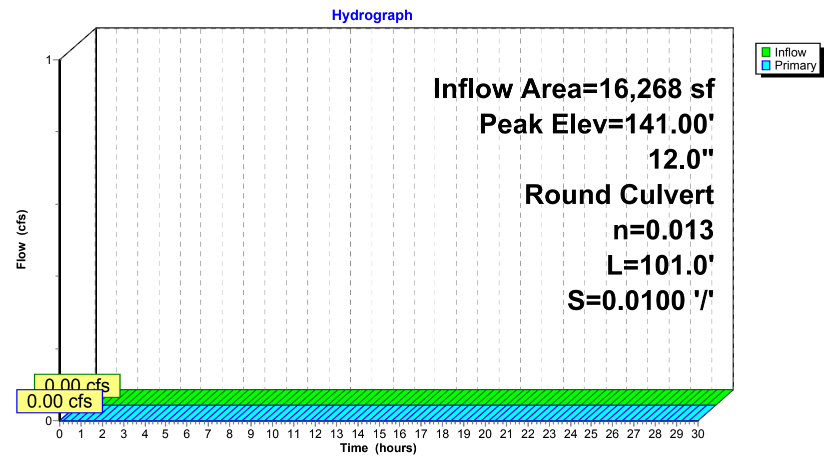
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.00' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond CB11: CB



Summary for Pond CB12: CB

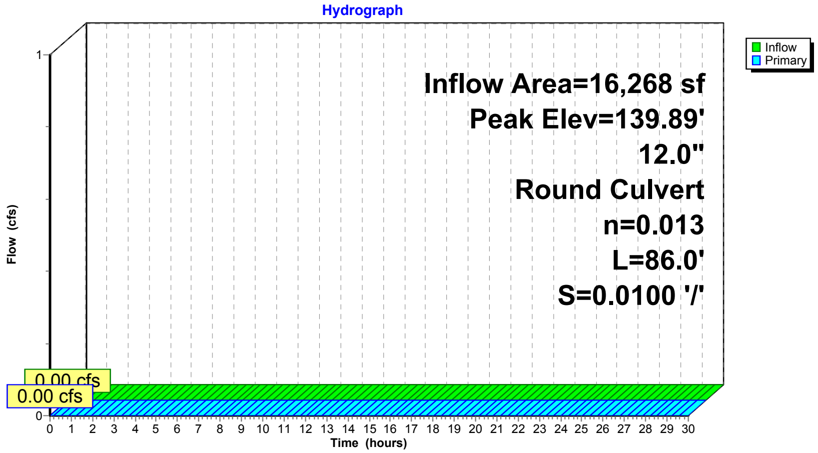
Inflow Area =	16,268 sf,	0.00% Impervious, Inflow Depth = 0.00"	for 0.5" Storm event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf
Outflow =	0.00 cfs @	0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min
Primary =	0.00 cfs @	0.00 hrs, Volume=	0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.89' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.89' (Free Discharge)
└1=Culvert (Controls 0.00 cfs)

Pond CB12: CB



Summary for Pond CB4: CB

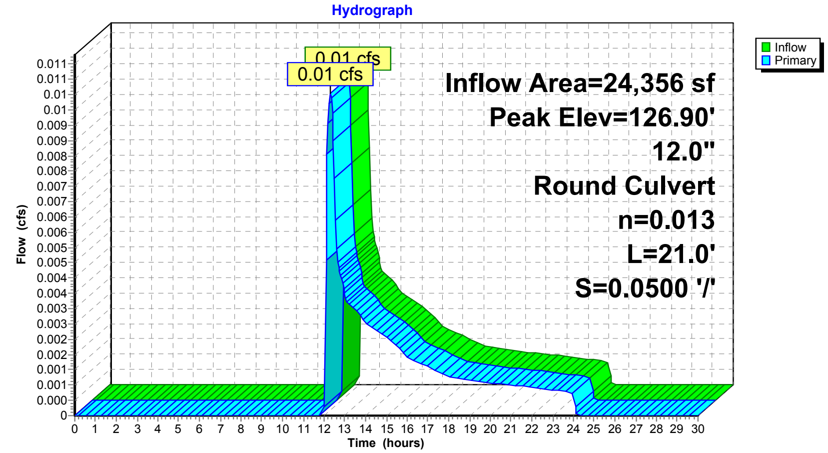
Inflow Area =	24,356 sf,	75.32% Impervious, Inflow Depth = 0.04"	for 0.5" Storm event
Inflow =	0.01 cfs @	12.31 hrs, Volume=	87 cf
Outflow =	0.01 cfs @	12.31 hrs, Volume=	87 cf, Atten= 0%, Lag= 0.0 min
Primary =	0.01 cfs @	12.31 hrs, Volume=	87 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.90' @ 12.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.31 hrs HW=126.90' (Free Discharge)
└1=Culvert (Inlet Controls 0.01 cfs @ 0.63 fps)

Pond CB4: CB



Summary for Pond CB5: CB

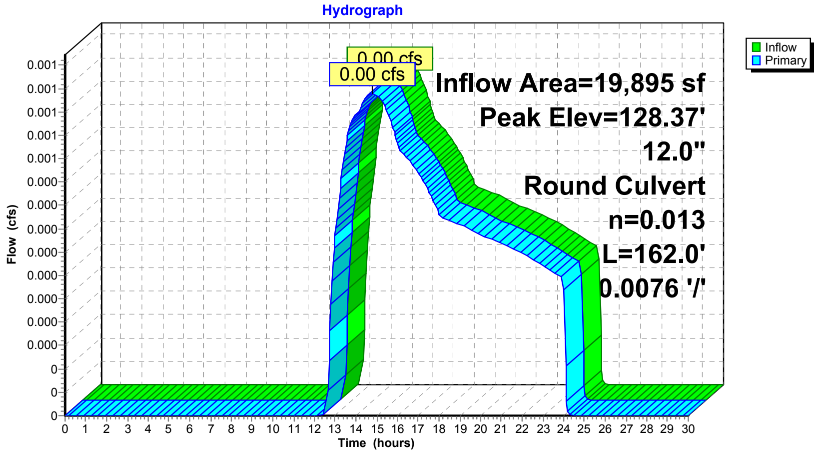
Inflow Area = 19,895 sf, 64.33% Impervious, Inflow Depth = 0.01" for 0.5" Storm event
Inflow = 0.00 cfs @ 14.80 hrs, Volume= 19 cf
Outflow = 0.00 cfs @ 14.80 hrs, Volume= 19 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 14.80 hrs, Volume= 19 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.37' @ 14.80 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 14.80 hrs HW=128.37' (Free Discharge)
└─1=Culvert (Barrel Controls 0.00 cfs @ 0.38 fps)

Pond CB5: CB



Summary for Pond CB7: CB

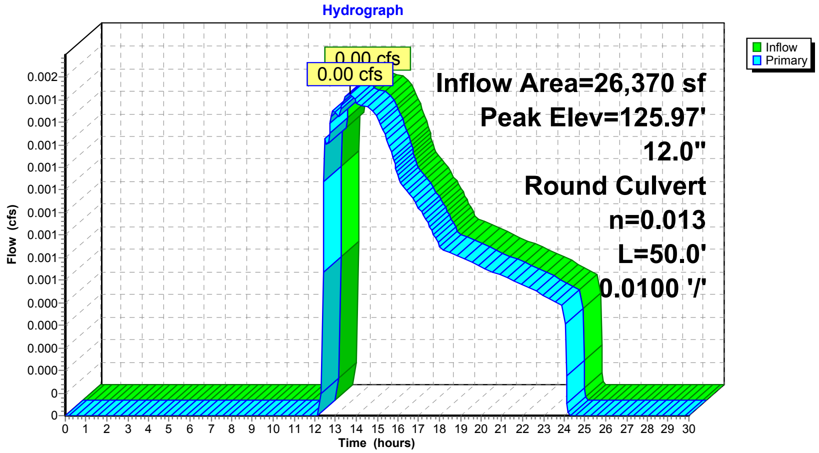
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 0.02" for 0.5" Storm event
Inflow = 0.00 cfs @ 13.67 hrs, Volume= 37 cf
Outflow = 0.00 cfs @ 13.67 hrs, Volume= 37 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 13.67 hrs, Volume= 37 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.97' @ 13.67 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 13.67 hrs HW=125.97' (Free Discharge)
└─1=Culvert (Barrel Controls 0.00 cfs @ 0.54 fps)

Pond CB7: CB



Summary for Pond CB8: CB

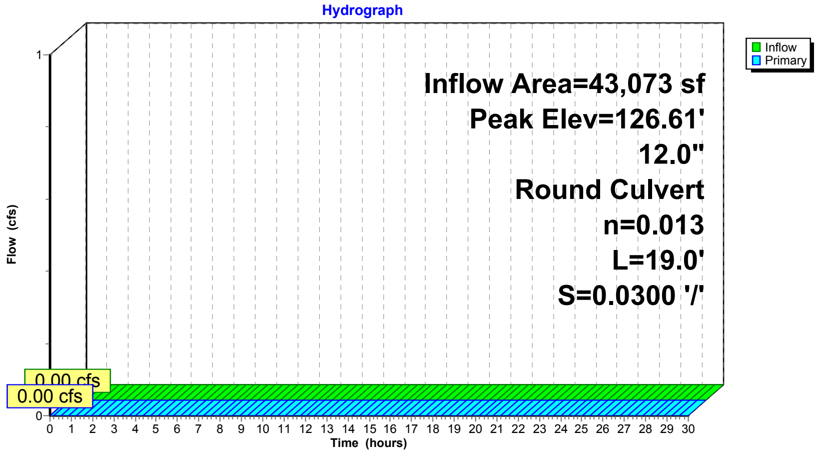
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.61' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=126.61' (Free Discharge)
└1=Culvert (Controls 0.00 cfs)

Pond CB8: CB



Summary for Pond CDS1: CDS

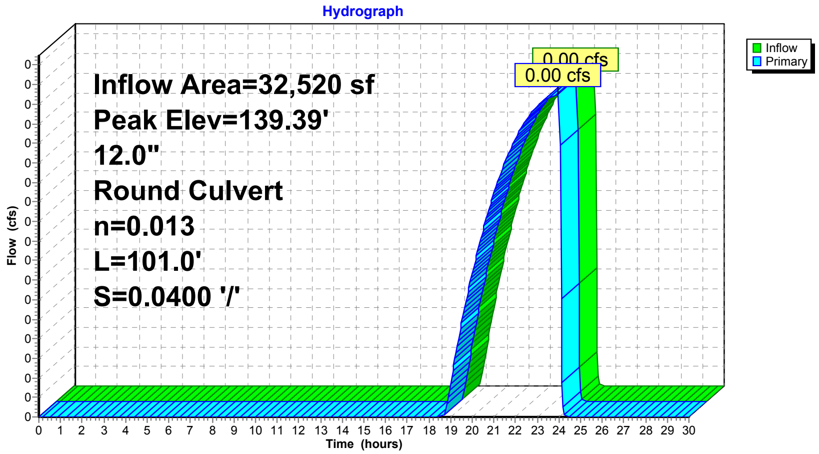
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 1 cf
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 23.95 hrs, Volume= 1 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.39' @ 23.95 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 23.95 hrs HW=139.39' (Free Discharge)
└1=Culvert (Barrel Controls 0.00 cfs @ 0.09 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

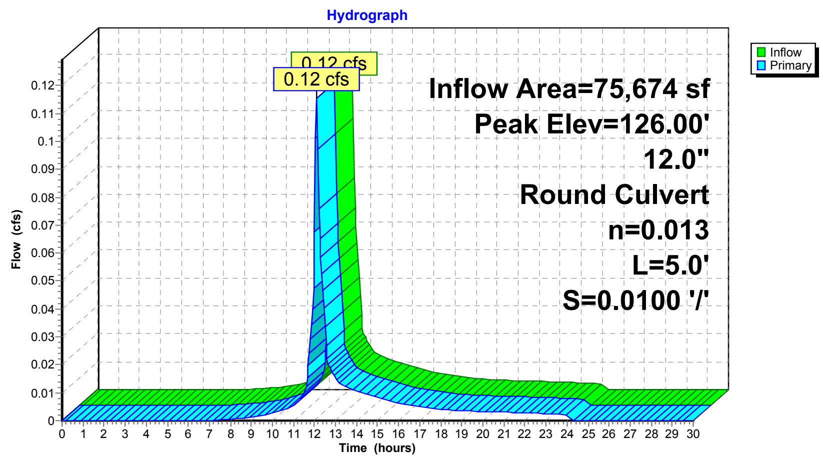
Inflow Area = 75,674 sf, 62.77% Impervious, Inflow Depth = 0.07" for 0.5" Storm event
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 458 cf
Outflow = 0.12 cfs @ 12.10 hrs, Volume= 458 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.10 hrs, Volume= 458 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.00' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.10 hrs HW=126.00' (Free Discharge)
└1=Culvert (Barrel Controls 0.11 cfs @ 1.60 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

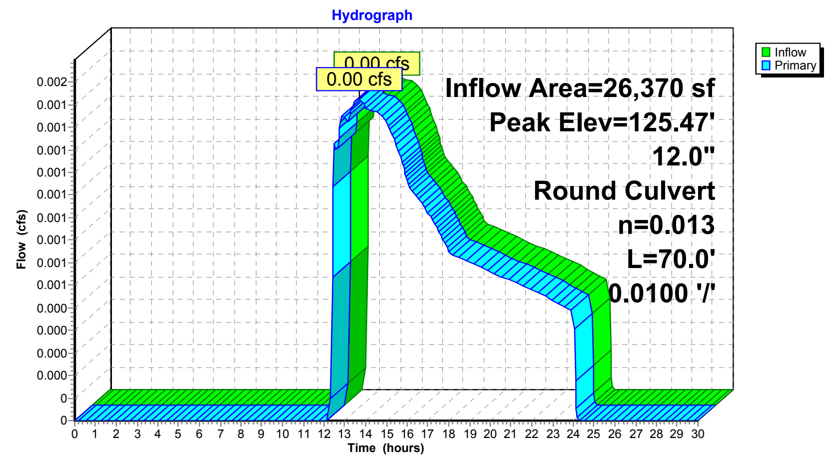
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 0.02" for 0.5" Storm event
Inflow = 0.00 cfs @ 13.67 hrs, Volume= 37 cf
Outflow = 0.00 cfs @ 13.67 hrs, Volume= 37 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 13.67 hrs, Volume= 37 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.47' @ 13.67 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 13.67 hrs HW=125.47' (Free Discharge)
└1=Culvert (Barrel Controls 0.00 cfs @ 0.54 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

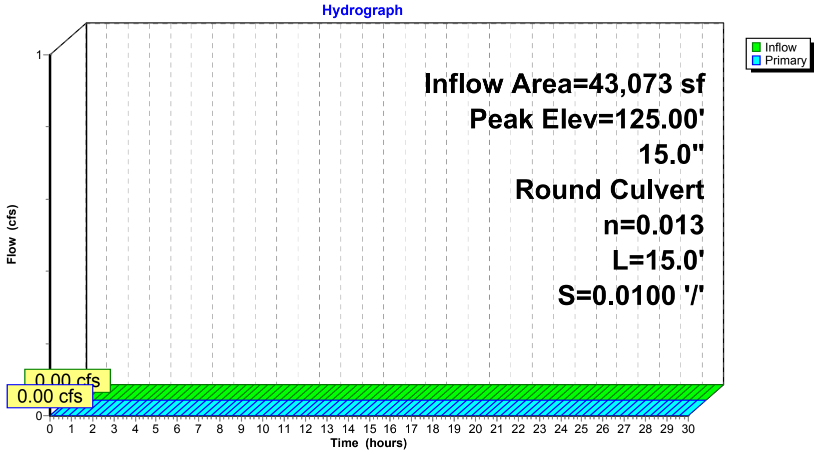
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

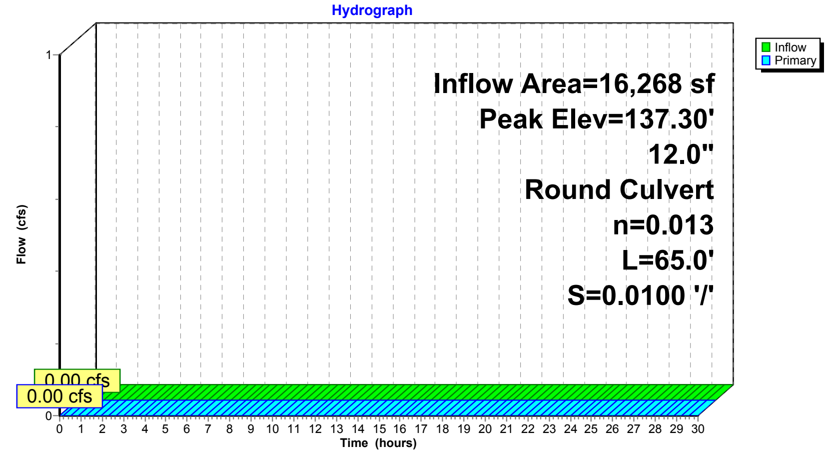
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.30' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.30' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond DMH2A: DMH



Summary for Pond DMH3: DMH

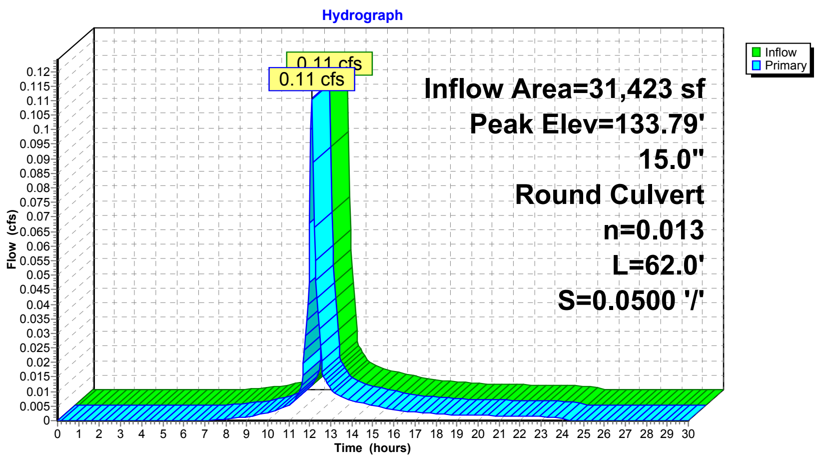
Inflow Area =	31,423 sf, 52.04% Impervious,	Inflow Depth = 0.13" for 0.5" Storm event	
Inflow =	0.11 cfs @ 12.09 hrs,	Volume=	352 cf
Outflow =	0.11 cfs @ 12.09 hrs,	Volume=	352 cf, Atten= 0%, Lag= 0.0 min
Primary =	0.11 cfs @ 12.09 hrs,	Volume=	352 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 133.79' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=133.79' (Free Discharge)
└1=Culvert (Inlet Controls 0.11 cfs @ 1.10 fps)

Pond DMH3: DMH



Summary for Pond DMH5: DMH

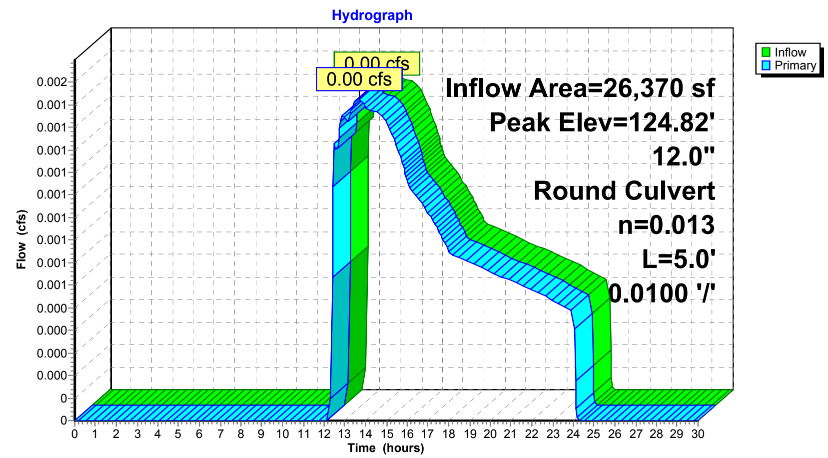
Inflow Area =	26,370 sf, 67.15% Impervious,	Inflow Depth = 0.02" for 0.5" Storm event	
Inflow =	0.00 cfs @ 13.67 hrs,	Volume=	37 cf
Outflow =	0.00 cfs @ 13.67 hrs,	Volume=	37 cf, Atten= 0%, Lag= 0.0 min
Primary =	0.00 cfs @ 13.67 hrs,	Volume=	37 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 124.82' @ 13.67 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 13.67 hrs HW=124.82' (Free Discharge)
└1=Culvert (Barrel Controls 0.00 cfs @ 0.53 fps)

Pond DMH5: DMH



Summary for Pond DMH6: DMH

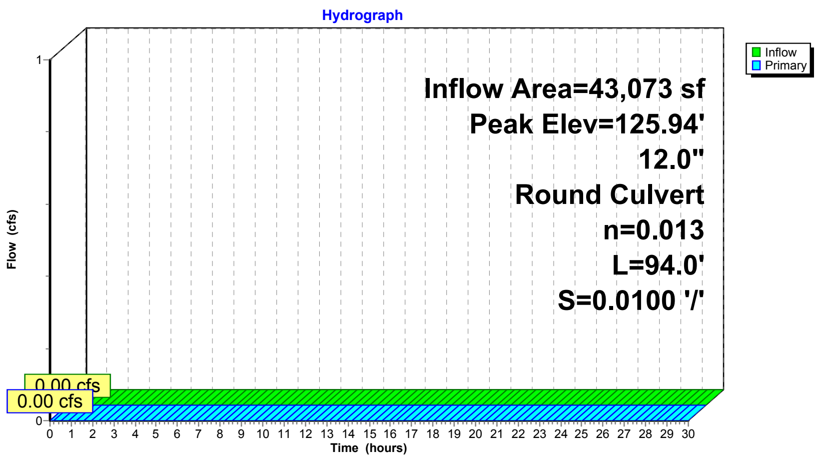
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.94' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.94' (Free Discharge)
└1=Culvert (Controls 0.00 cfs)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

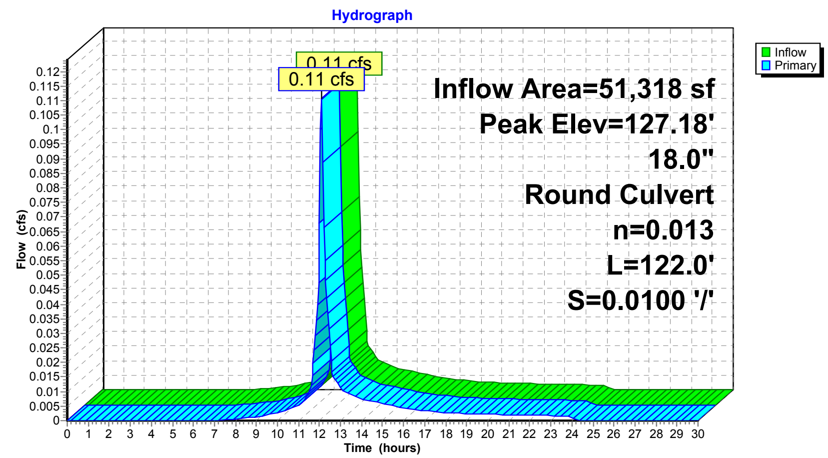
Inflow Area = 51,318 sf, 56.81% Impervious, Inflow Depth = 0.09" for 0.5" Storm event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 371 cf
Outflow = 0.11 cfs @ 12.09 hrs, Volume= 371 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.09 hrs, Volume= 371 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.18' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=127.18' (Free Discharge)
└1=Culvert (Inlet Controls 0.11 cfs @ 1.07 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

```
Inflow Area =      105,247 sf,  53.77% Impervious,  Inflow Depth =   0.09"    for  0.5" Storm event
Inflow      =      0.24 cfs @  12.09 hrs,  Volume=             757 cf
Outflow     =      0.09 cfs @  12.10 hrs,  Volume=             757 cf,  Atten= 60%,  Lag= 0.5 min
Discarded  =      0.09 cfs @  12.10 hrs,  Volume=             757 cf
Primary     =      0.00 cfs @   0.00 hrs,  Volume=               0 cf
```

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.61' @ 12.34 hrs Surf.Area= 3,388 sf Storage= 142 cf

Plug-Flow detention time= 15.7 min calculated for 756 cf (100% of inflow)
Center-of-Mass det. time= 15.7 min (829.7 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A
			18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			60 Chambers in 4 Rows
			Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00
			Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 12.10 hrs HW=134.57' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.50' (Free Discharge)
└─1=15" HDPE (Controls 0.00 cfs)
  ├─2=13" Orifice (Controls 0.00 cfs)
  └─4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

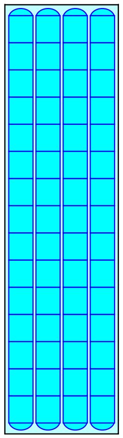
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

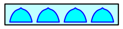
60 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

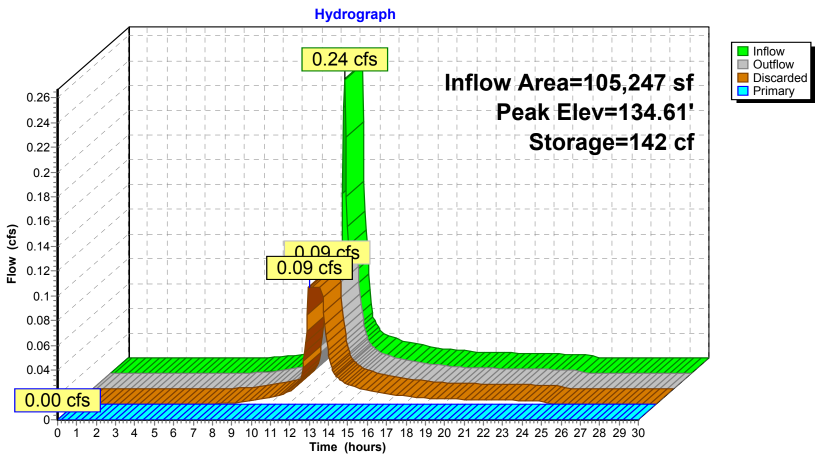
Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone





Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 0.11" for 0.5" Storm event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 842 cf
Outflow = 0.11 cfs @ 12.15 hrs, Volume= 842 cf, Atten= 54%, Lag= 3.4 min
Discarded = 0.11 cfs @ 12.15 hrs, Volume= 842 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 125.09' @ 12.31 hrs Surf.Area= 3,934 sf Storage= 144 cf

Plug-Flow detention time= 18.1 min calculated for 840 cf (100% of inflow)
Center-of-Mass det. time= 18.0 min (850.8 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 12.15 hrs HW=125.08' (Free Discharge)
└2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└1=15" HDPE (Controls 0.00 cfs)
  └3=13" Orifice (Controls 0.00 cfs)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

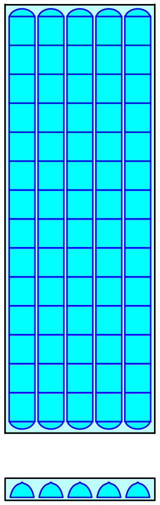
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

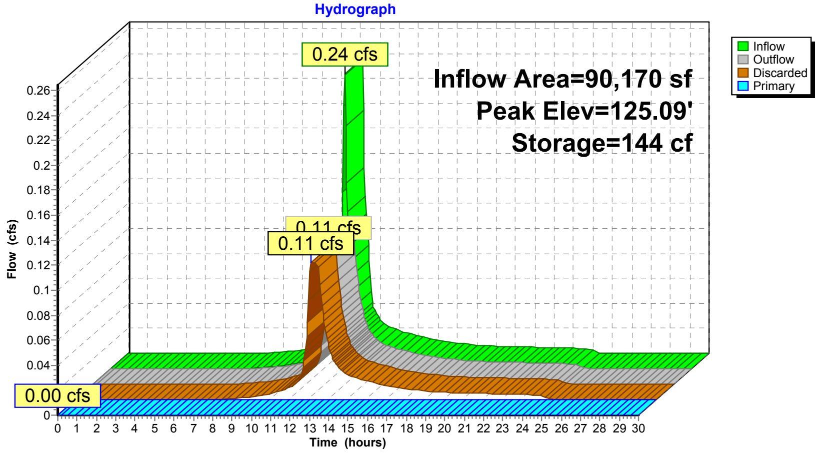
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area = 91,745 sf, 57.86% Impervious, Inflow Depth = 0.08" for 0.5" Storm event
Inflow = 0.19 cfs @ 12.09 hrs, Volume= 628 cf
Outflow = 0.11 cfs @ 12.23 hrs, Volume= 628 cf, Atten= 41%, Lag= 8.0 min
Discarded = 0.11 cfs @ 12.23 hrs, Volume= 628 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 124.06' @ 12.21 hrs Surf.Area= 3,934 sf Storage= 90 cf

Plug-Flow detention time= 13.4 min calculated for 628 cf (100% of inflow)
Center-of-Mass det. time= 13.2 min (839.0 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A
			21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			70 Chambers in 5 Rows
			Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 12.23 hrs HW=124.06' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.00' (Free Discharge)
└1=15" HDPE (Controls 0.00 cfs)
  └2=12" Orifice (Controls 0.00 cfs)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

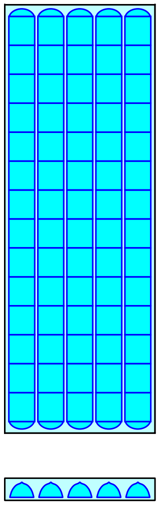
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

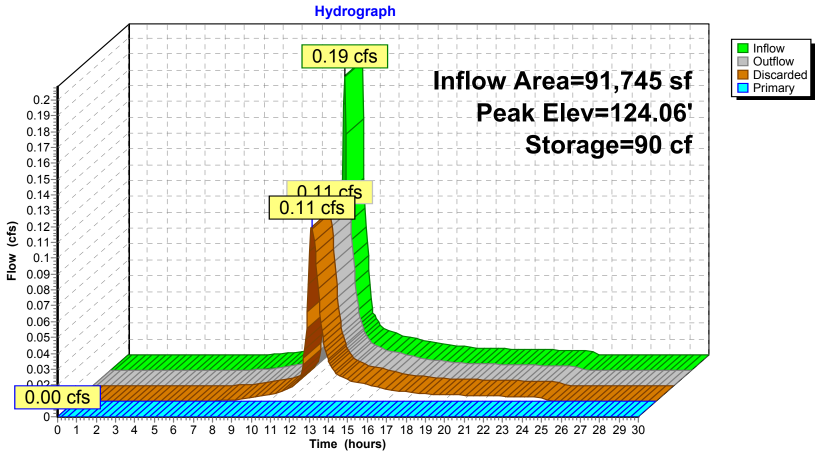
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS3: MC-3500

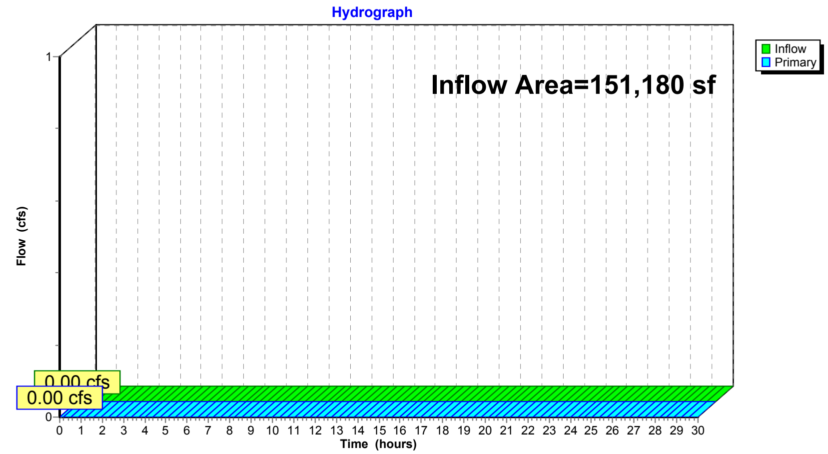


Summary for Link SP-1: Study Point #1

Inflow Area = 151,180 sf, 41.01% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

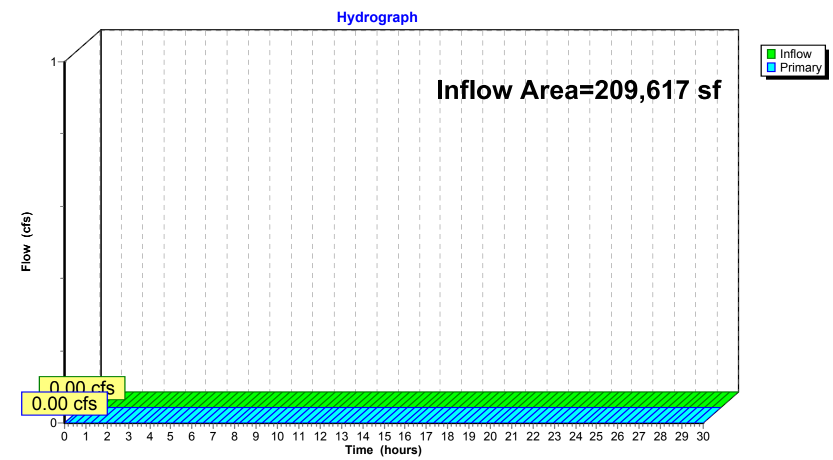


Summary for Link SP-2: Study Point #2

Inflow Area = 209,617 sf, 55.29% Impervious, Inflow Depth = 0.00" for 0.5" Storm event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest — Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=56 Runoff=0.00 cfs 0 cf

Subcatchment P-10: Building 2/3 - South Parking — Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=81 Runoff=0.03 cfs 266 cf

Subcatchment P-11: Building 1 - Southeast — Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=0.07"
Tc=6.0 min CN=79 Runoff=0.01 cfs 74 cf

Subcatchment P-2A: Building 2 Parking - North — Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=89 Runoff=0.17 cfs 578 cf

Subcatchment P-2B: Building 2 Parking - North — Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=0.17"
Tc=6.0 min CN=85 Runoff=0.07 cfs 288 cf

Subcatchment P-3: Building 1 Parking - East — Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=0.20"
Tc=6.0 min CN=86 Runoff=0.11 cfs 434 cf

Subcatchment P-4: Building 3 - West — Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=322' Tc=8.6 min CN=61 Runoff=0.00 cfs 0 cf

Subcatchment P-5A: Building 3 Roof - North — Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.27 cfs 875 cf

Subcatchment P-5B: Building 3 Roof - South — Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.28 cfs 924 cf

Subcatchment P-6A: Building 2 Roof - North — Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.29 cfs 955 cf

Subcatchment P-6B: Building 2 Roof - South — Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.29 cfs 956 cf

Subcatchment P-7: Building 1 — Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.45 cfs 1,470 cf

Subcatchment P-8: Pool Courtyard — Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=0.03"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=0.00 cfs 71 cf

Subcatchment P-9A: Area Drains - Courtyard — Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=0.00"
Tc=6.0 min UI Adjusted CN=64 Runoff=0.00 cfs 0 cf

Subcatchment P-9B: Building 1/2 Courtyard — Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=0.01"
Flow Length=317' Tc=12.7 min CN=72 Runoff=0.00 cfs 43 cf

Pond 2P: CB2 — Peak Elev=139.67' Inflow=0.03 cfs 266 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=0.03 cfs 266 cf

Pond AD11: AD	Peak Elev=135.25' Inflow=0.00 cfs 0 cf 8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond AD5: AD	Peak Elev=140.03' Inflow=0.00 cfs 71 cf 12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=0.00 cfs 71 cf
Pond CB11: CB	Peak Elev=141.00' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond CB12: CB	Peak Elev=139.89' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond CB4: CB	Peak Elev=127.08' Inflow=0.17 cfs 578 cf 12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=0.17 cfs 578 cf
Pond CB5: CB	Peak Elev=128.49' Inflow=0.07 cfs 288 cf 12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=0.07 cfs 288 cf
Pond CB7: CB	Peak Elev=126.13' Inflow=0.11 cfs 434 cf 12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=0.11 cfs 434 cf
Pond CB8: CB	Peak Elev=126.63' Inflow=0.00 cfs 43 cf 12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=0.00 cfs 43 cf
Pond CDS1: CDS	Peak Elev=139.49' Inflow=0.03 cfs 266 cf 12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=0.03 cfs 266 cf
Pond CDS2: CDS	Peak Elev=126.24' Inflow=0.50 cfs 1,741 cf 12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.50 cfs 1,741 cf
Pond CDS3: CDS WQU	Peak Elev=125.63' Inflow=0.11 cfs 434 cf 12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=0.11 cfs 434 cf
Pond CDS4: CDS WQU	Peak Elev=125.02' Inflow=0.00 cfs 43 cf 15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.00 cfs 43 cf
Pond DMH2A: DMH	Peak Elev=137.30' Inflow=0.00 cfs 0 cf 12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=0.00 cfs 0 cf
Pond DMH3: DMH	Peak Elev=133.89' Inflow=0.27 cfs 875 cf 15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=0.27 cfs 875 cf
Pond DMH5: DMH	Peak Elev=124.99' Inflow=0.11 cfs 434 cf 12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.11 cfs 434 cf
Pond DMH6: DMH	Peak Elev=125.96' Inflow=0.00 cfs 43 cf 12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=0.00 cfs 43 cf
Pond DMH8: DMH	Peak Elev=127.30' Inflow=0.33 cfs 1,163 cf 18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=0.33 cfs 1,163 cf

Pond UIS1: UIS#1	Peak Elev=134.97' Storage=635 cf Inflow=0.59 cfs 2,217 cf Discarded=0.09 cfs 2,217 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 2,217 cf
Pond UIS2: UIS #2	Peak Elev=125.55' Storage=869 cf Inflow=0.79 cfs 2,697 cf Discarded=0.11 cfs 2,697 cf Primary=0.00 cfs 0 cf Outflow=0.11 cfs 2,697 cf
Pond UIS3: MC-3500	Peak Elev=124.33' Storage=512 cf Inflow=0.55 cfs 1,947 cf Discarded=0.11 cfs 1,947 cf Primary=0.00 cfs 0 cf Outflow=0.11 cfs 1,947 cf
Link SP-1: Study Point #1	Inflow=0.00 cfs 0 cf Primary=0.00 cfs 0 cf
Link SP-2: Study Point #2	Inflow=0.01 cfs 74 cf Primary=0.01 cfs 74 cf

Total Runoff Area = 360,797 sf Runoff Volume = 6,934 cf Average Runoff Depth = 0.23"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

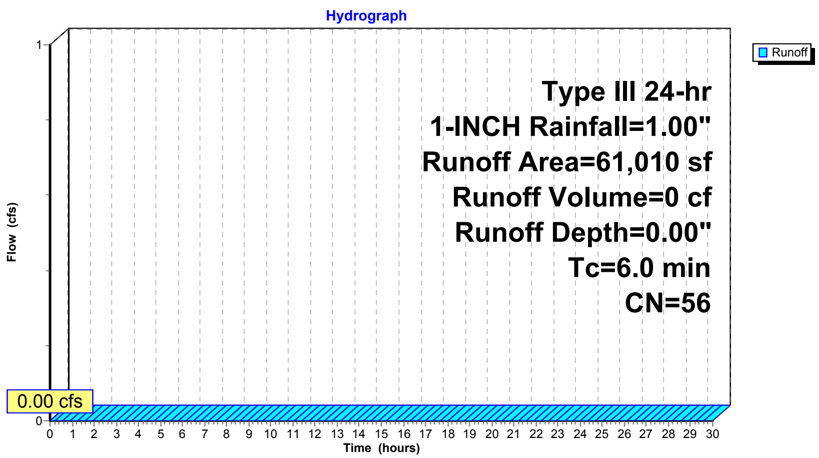
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

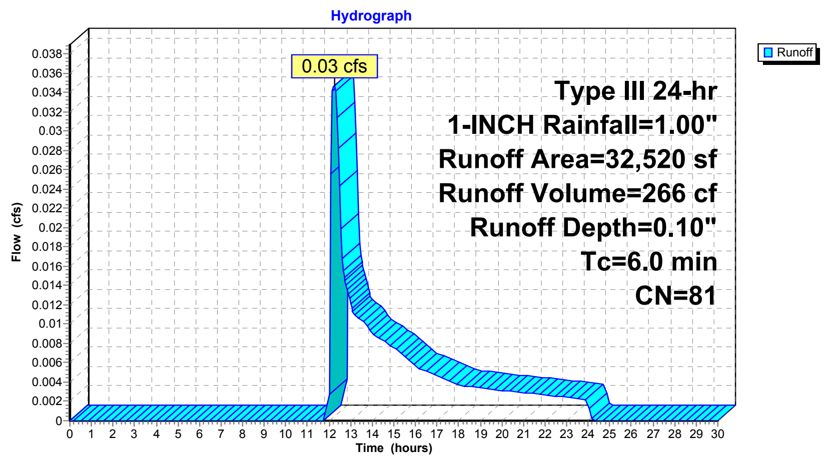
Runoff = 0.03 cfs @ 12.27 hrs, Volume= 266 cf, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

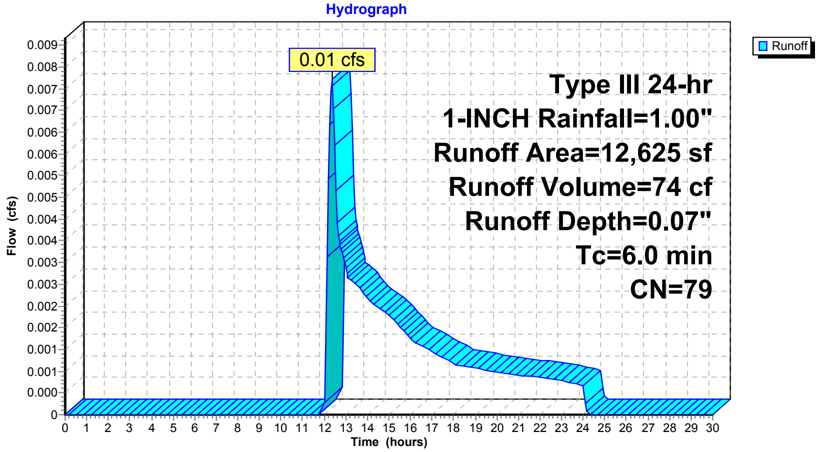
Runoff = 0.01 cfs @ 12.36 hrs, Volume= 74 cf, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

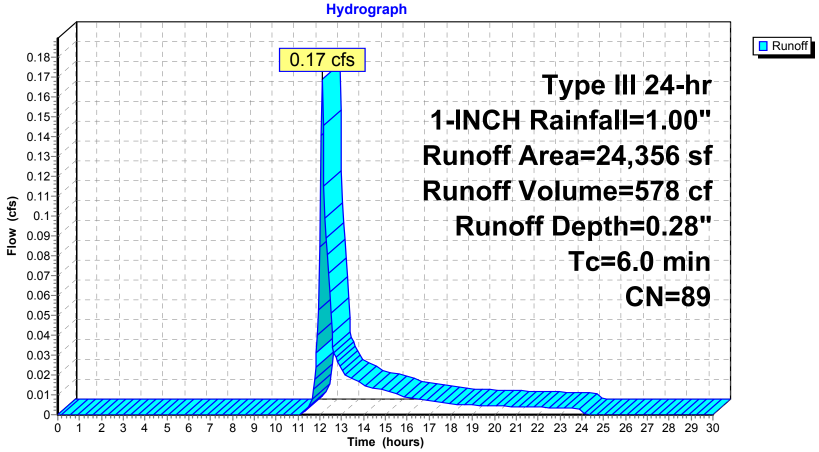
Runoff = 0.17 cfs @ 12.10 hrs, Volume= 578 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

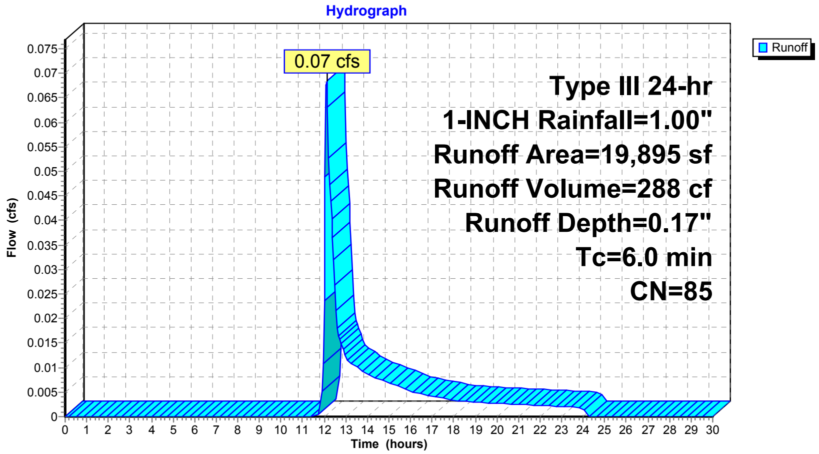
Runoff = 0.07 cfs @ 12.12 hrs, Volume= 288 cf, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

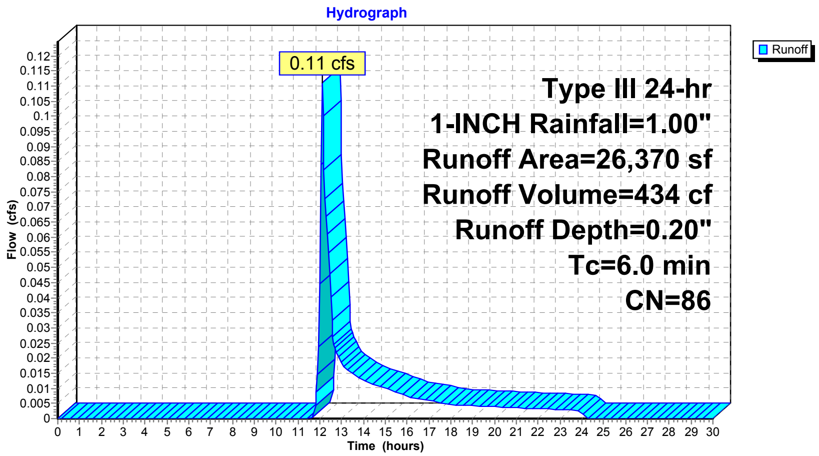
Runoff = 0.11 cfs @ 12.11 hrs, Volume= 434 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

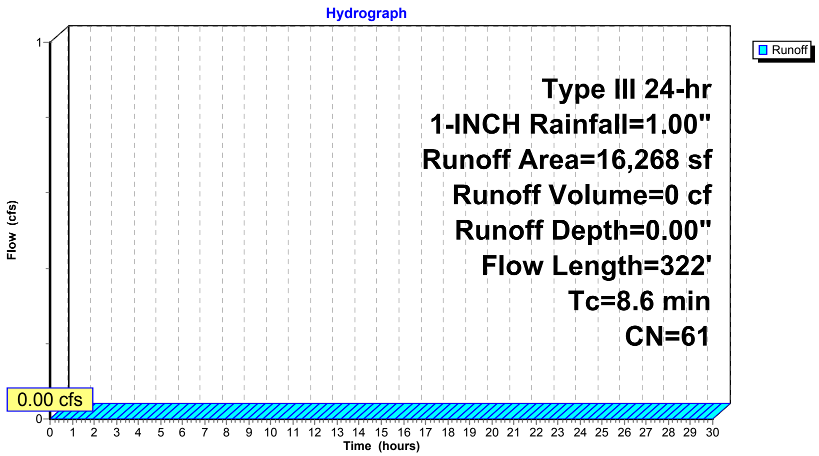
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

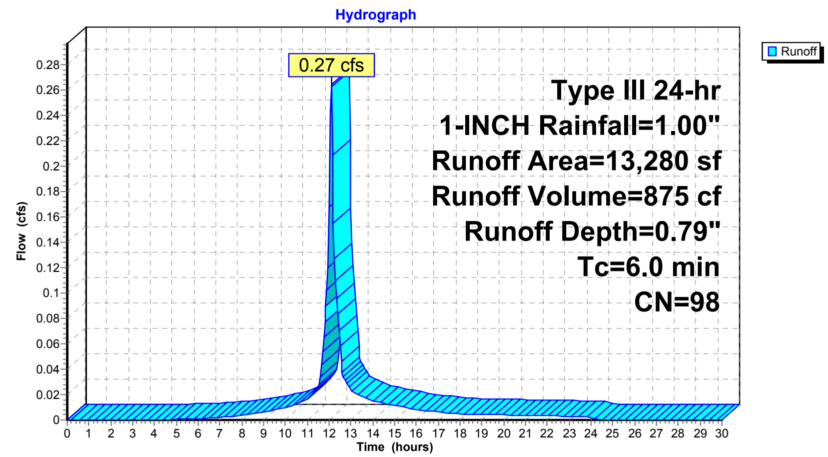
Runoff = 0.27 cfs @ 12.09 hrs, Volume= 875 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

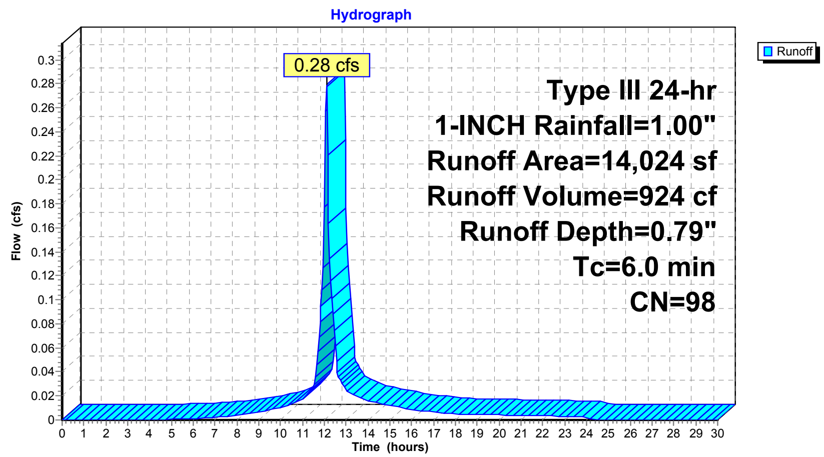
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 924 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

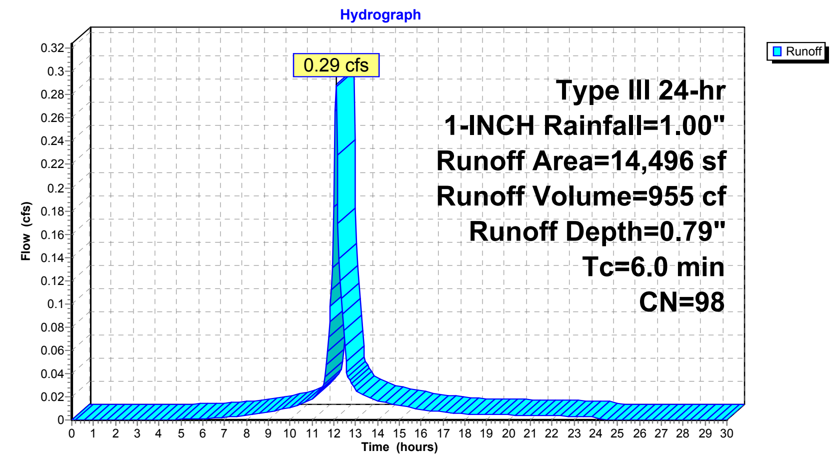
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 955 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

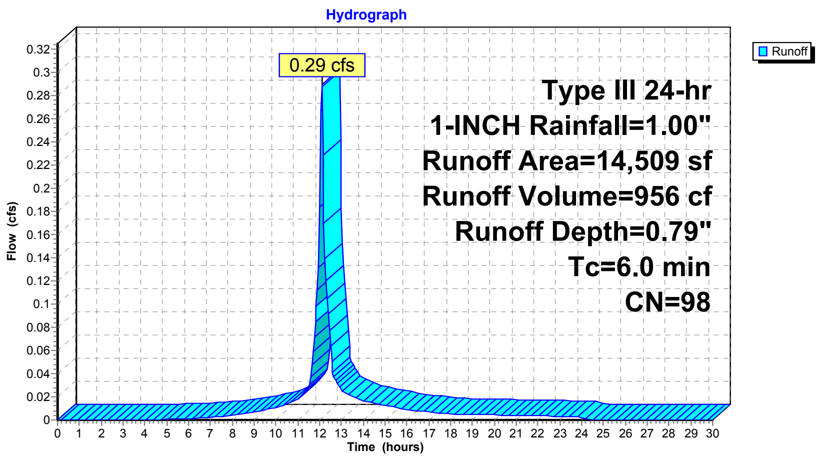
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 956 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

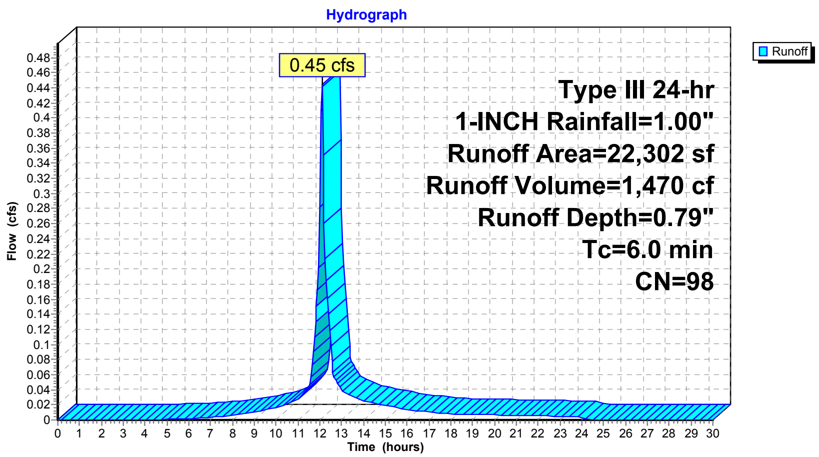
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 1,470 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

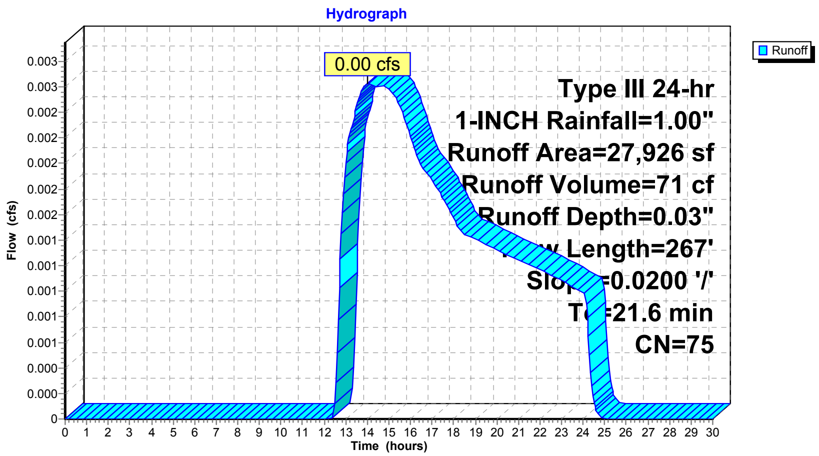
Runoff = 0.00 cfs @ 14.01 hrs, Volume= 71 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

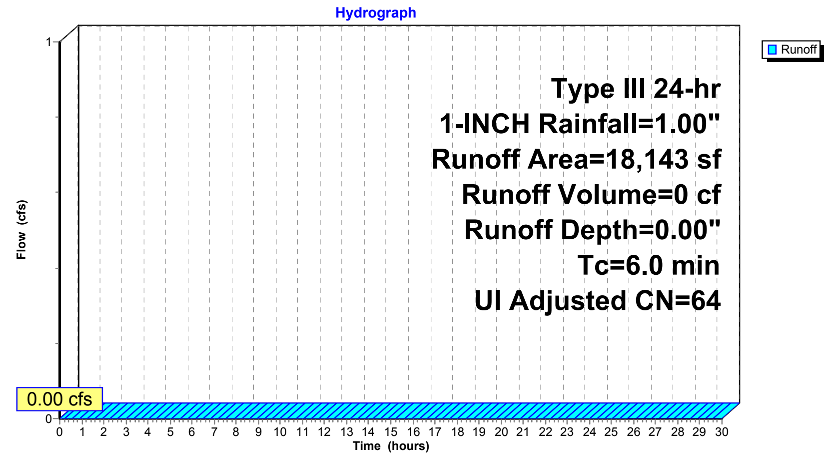
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

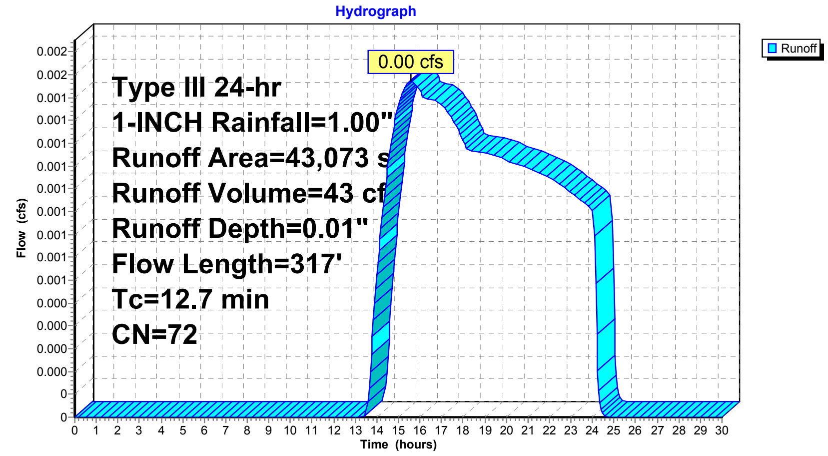
Runoff = 0.00 cfs @ 15.60 hrs, Volume= 43 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-INCH Rainfall=1.00"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

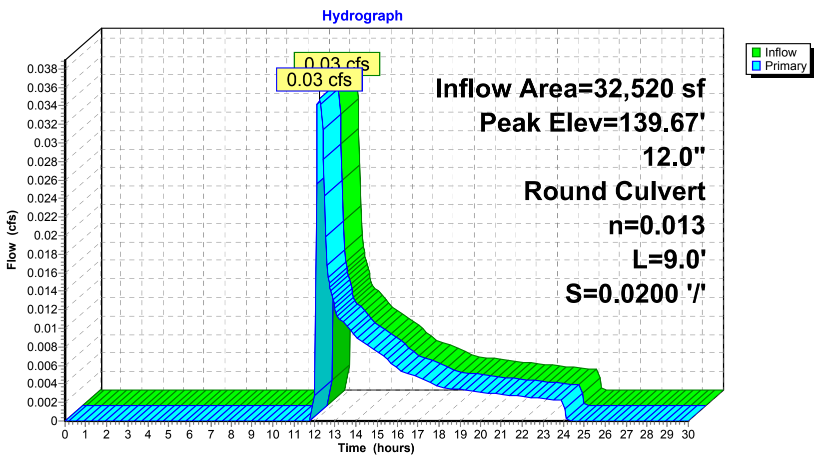
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 0.10" for 1-INCH event
Inflow = 0.03 cfs @ 12.27 hrs, Volume= 266 cf
Outflow = 0.03 cfs @ 12.27 hrs, Volume= 266 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.03 cfs @ 12.27 hrs, Volume= 266 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.67' @ 12.27 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.03 cfs @ 12.27 hrs HW=139.67' (Free Discharge)
└─1=Culvert (Inlet Controls 0.03 cfs @ 0.84 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

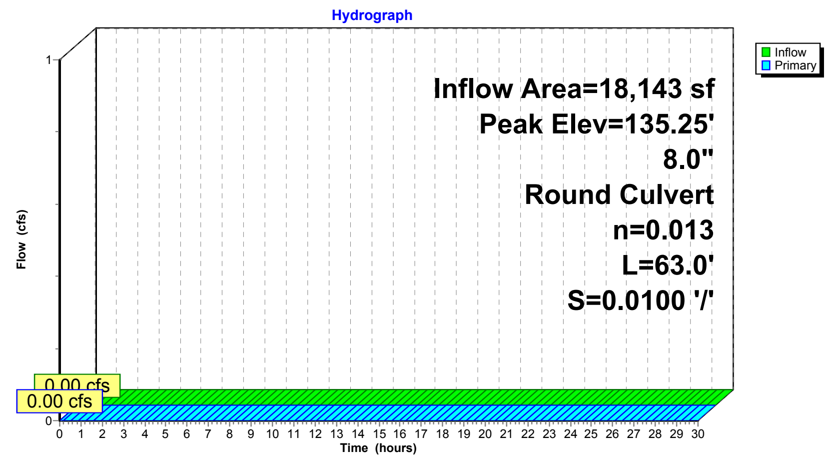
Inflow Area = 18,143 sf, 16.94% Impervious, Inflow Depth = 0.00" for 1-INCH event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 135.25' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.25' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond AD11: AD



Summary for Pond AD5: AD

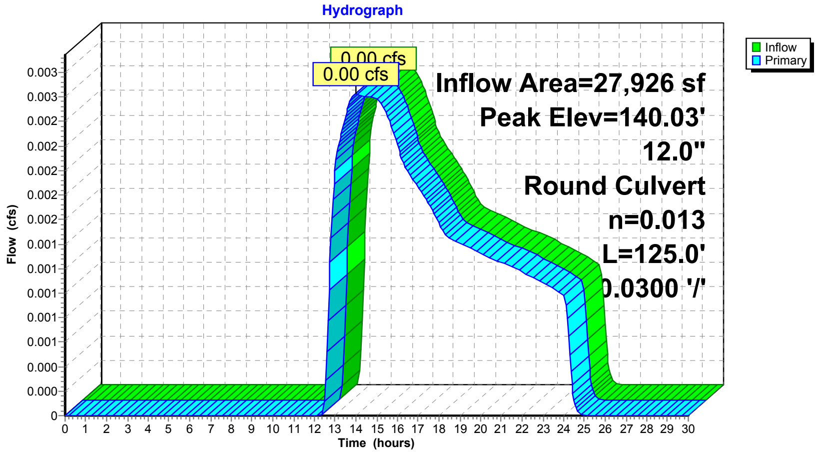
Inflow Area = 27,926 sf, 36.53% Impervious, Inflow Depth = 0.03" for 1-INCH event
Inflow = 0.00 cfs @ 14.01 hrs, Volume= 71 cf
Outflow = 0.00 cfs @ 14.01 hrs, Volume= 71 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 14.01 hrs, Volume= 71 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.03' @ 14.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 14.01 hrs HW=140.03' (Free Discharge)
└1=Culvert (Inlet Controls 0.00 cfs @ 0.44 fps)

Pond AD5: AD



Summary for Pond CB11: CB

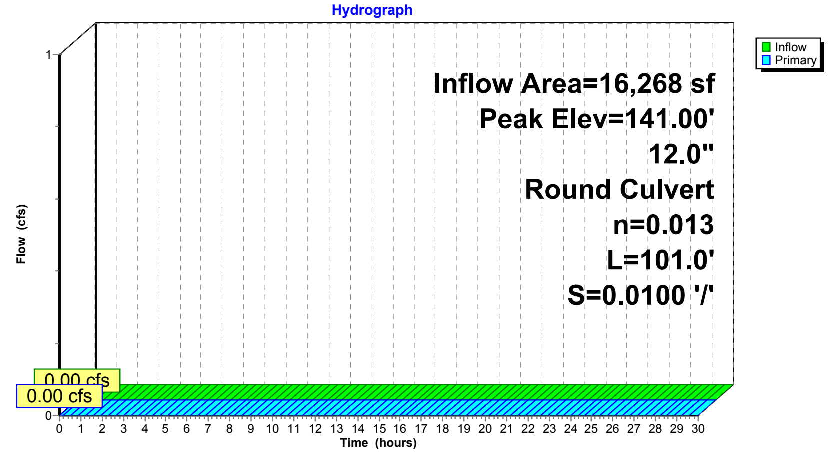
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-INCH event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=141.00' (Free Discharge)
└1=Culvert (Controls 0.00 cfs)

Pond CB11: CB



Summary for Pond CB12: CB

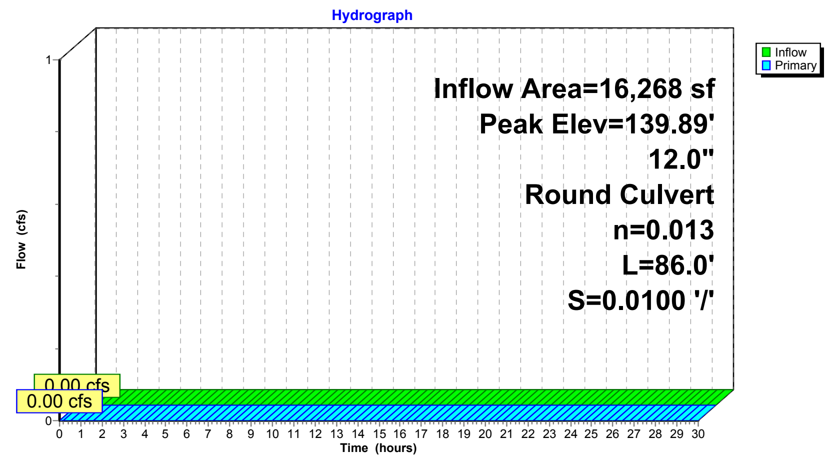
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-INCH event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.89' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=139.89' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond CB12: CB



Summary for Pond CB4: CB

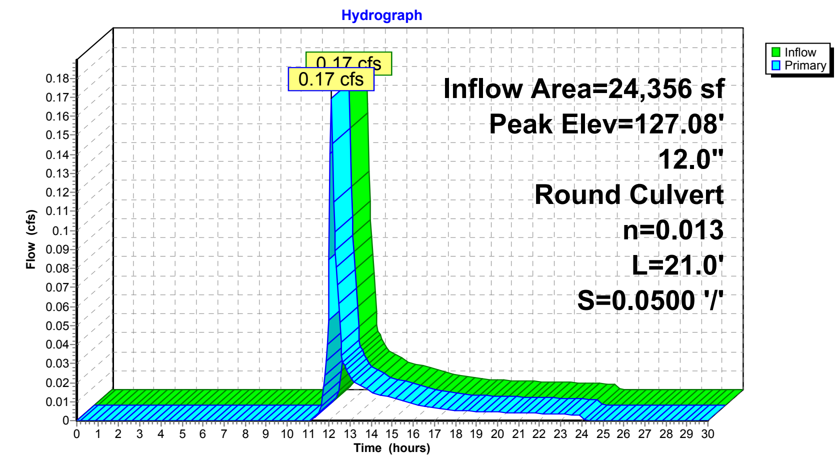
Inflow Area = 24,356 sf, 75.32% Impervious, Inflow Depth = 0.28" for 1-INCH event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 578 cf
Outflow = 0.17 cfs @ 12.10 hrs, Volume= 578 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.10 hrs, Volume= 578 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.08' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.17 cfs @ 12.10 hrs HW=127.07' (Free Discharge)
└─1=Culvert (Inlet Controls 0.17 cfs @ 1.27 fps)

Pond CB4: CB



Summary for Pond CB5: CB

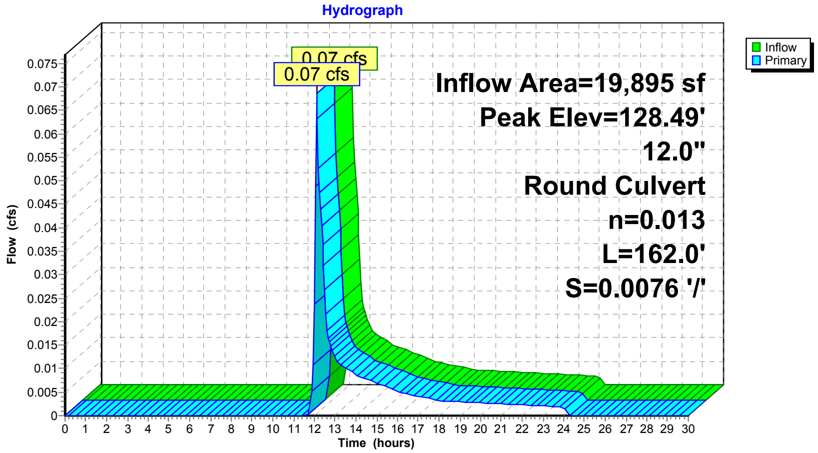
Inflow Area =	19,895 sf, 64.33% Impervious, Inflow Depth = 0.17" for 1-INCH event			
Inflow =	0.07 cfs @	12.12 hrs, Volume=	288 cf	
Outflow =	0.07 cfs @	12.12 hrs, Volume=	288 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.07 cfs @	12.12 hrs, Volume=	288 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.49' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 12.12 hrs HW=128.49' (Free Discharge)
└1=Culvert (Inlet Controls 0.07 cfs @ 1.00 fps)

Pond CB5: CB



Summary for Pond CB7: CB

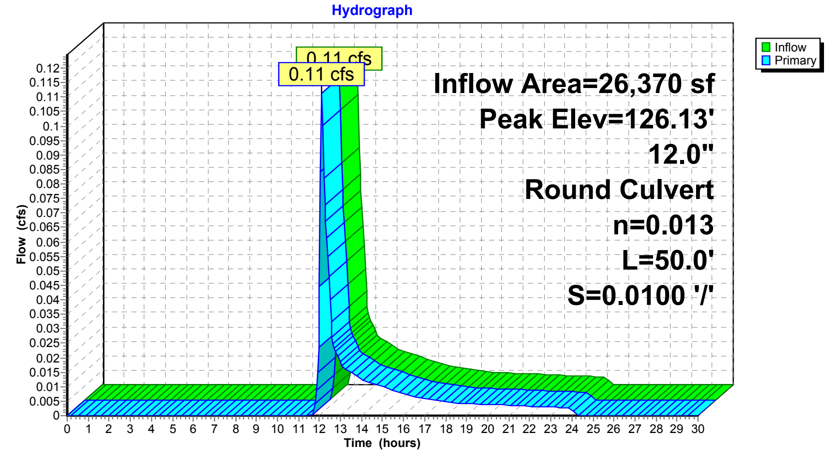
Inflow Area =	26,370 sf, 67.15% Impervious, Inflow Depth = 0.20" for 1-INCH event			
Inflow =	0.11 cfs @	12.11 hrs, Volume=	434 cf	
Outflow =	0.11 cfs @	12.11 hrs, Volume=	434 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.11 cfs @	12.11 hrs, Volume=	434 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.13' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.11 hrs HW=126.13' (Free Discharge)
└1=Culvert (Inlet Controls 0.11 cfs @ 1.14 fps)

Pond CB7: CB



Summary for Pond CB8: CB

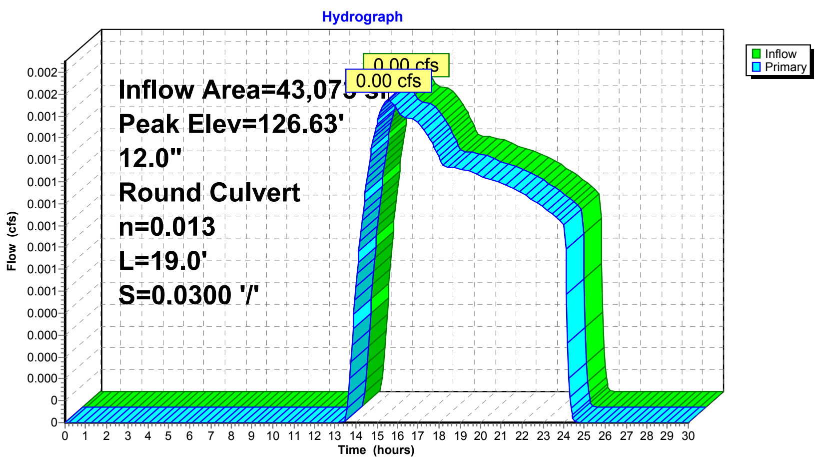
Inflow Area =	43,073 sf,	30.35% Impervious,	Inflow Depth = 0.01"	for 1-INCH event	
Inflow =	0.00 cfs @	15.60 hrs,	Volume=	43 cf	
Outflow =	0.00 cfs @	15.60 hrs,	Volume=	43 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.00 cfs @	15.60 hrs,	Volume=	43 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.63' @ 15.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.60 hrs HW=126.63' (Free Discharge)
└─1=Culvert (Inlet Controls 0.00 cfs @ 0.38 fps)

Pond CB8: CB



Summary for Pond CDS1: CDS

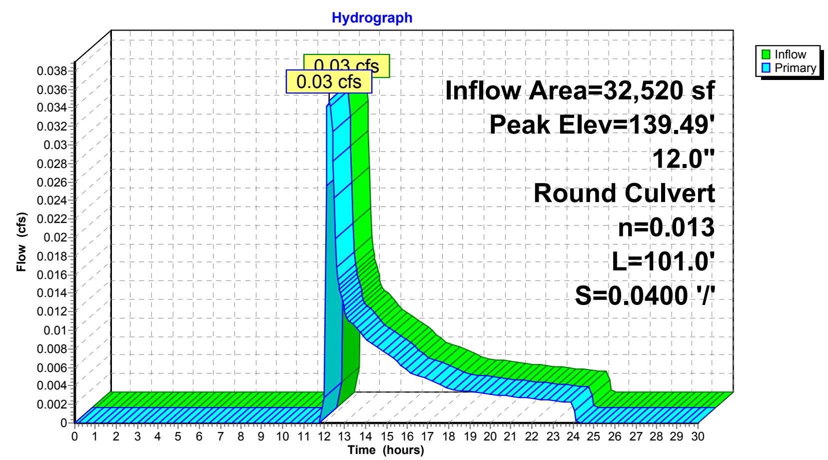
Inflow Area =	32,520 sf,	54.92% Impervious,	Inflow Depth = 0.10"	for 1-INCH event	
Inflow =	0.03 cfs @	12.27 hrs,	Volume=	266 cf	
Outflow =	0.03 cfs @	12.27 hrs,	Volume=	266 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.03 cfs @	12.27 hrs,	Volume=	266 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 139.49' @ 12.27 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.03 cfs @ 12.27 hrs HW=139.49' (Free Discharge)
└─1=Culvert (Inlet Controls 0.03 cfs @ 0.84 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

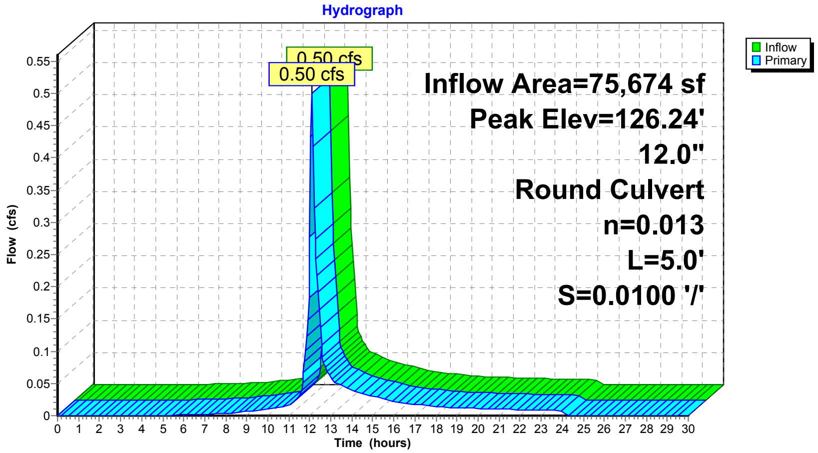
Inflow Area = 75,674 sf, 62.77% Impervious, Inflow Depth = 0.28" for 1-INCH event
Inflow = 0.50 cfs @ 12.10 hrs, Volume= 1,741 cf
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 1,741 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.10 hrs, Volume= 1,741 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.24' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.10 hrs HW=126.24' (Free Discharge)
└1=Culvert (Barrel Controls 0.50 cfs @ 2.20 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

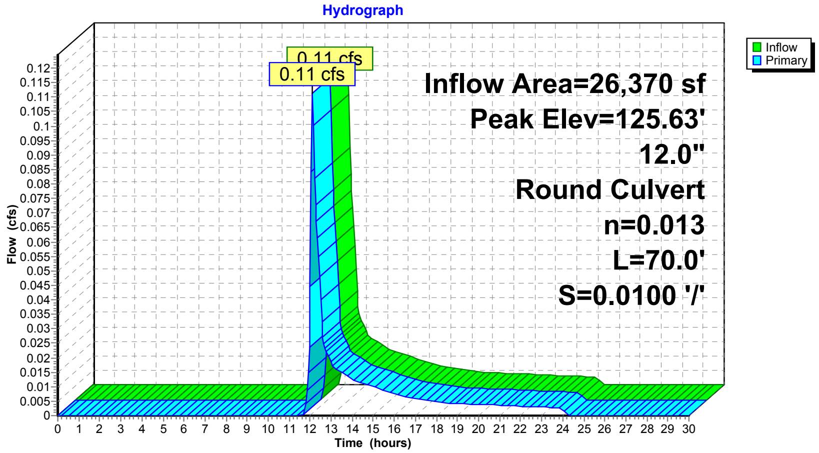
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 0.20" for 1-INCH event
Inflow = 0.11 cfs @ 12.11 hrs, Volume= 434 cf
Outflow = 0.11 cfs @ 12.11 hrs, Volume= 434 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.11 hrs, Volume= 434 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.63' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.11 hrs HW=125.63' (Free Discharge)
└1=Culvert (Inlet Controls 0.11 cfs @ 1.14 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

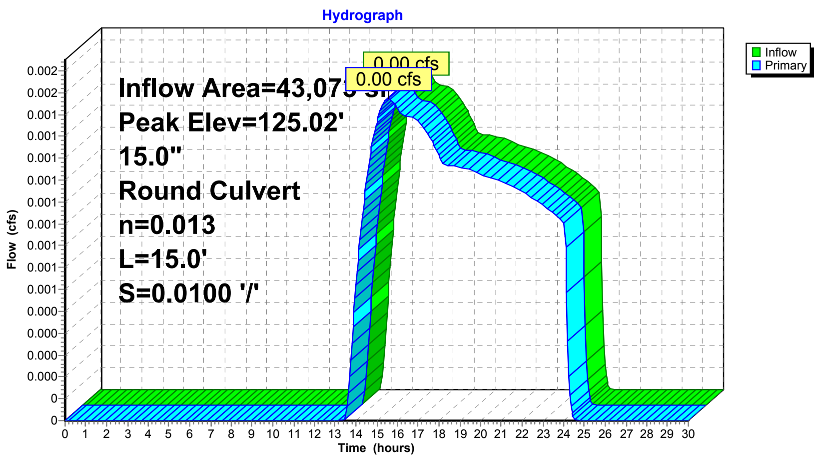
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 0.01" for 1-INCH event	
Inflow =	0.00 cfs @ 15.60 hrs, Volume=	43 cf	
Outflow =	0.00 cfs @ 15.60 hrs, Volume=	43 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.00 cfs @ 15.60 hrs, Volume=	43 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.02' @ 15.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 15.60 hrs HW=125.02' (Free Discharge)
└─1=Culvert (Barrel Controls 0.00 cfs @ 0.51 fps)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

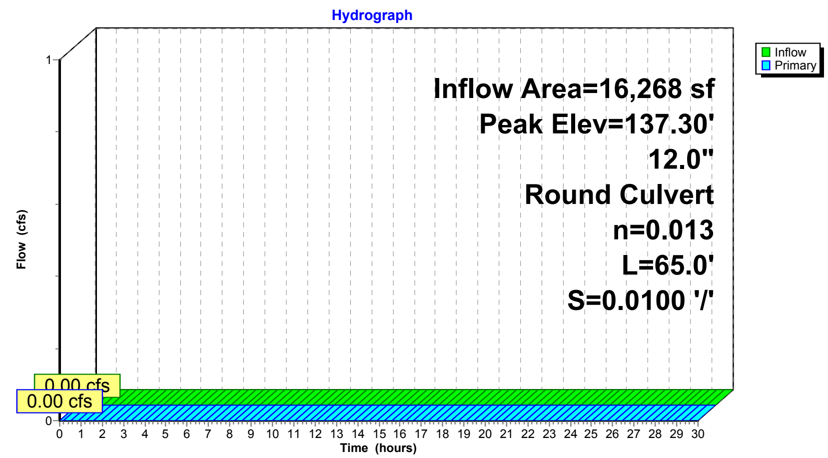
Inflow Area =	16,268 sf, 0.00% Impervious,	Inflow Depth = 0.00" for 1-INCH event	
Inflow =	0.00 cfs @ 0.00 hrs, Volume=	0 cf	
Outflow =	0.00 cfs @ 0.00 hrs, Volume=	0 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.30' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.30' (Free Discharge)
└─1=Culvert (Controls 0.00 cfs)

Pond DMH2A: DMH



Summary for Pond DMH3: DMH

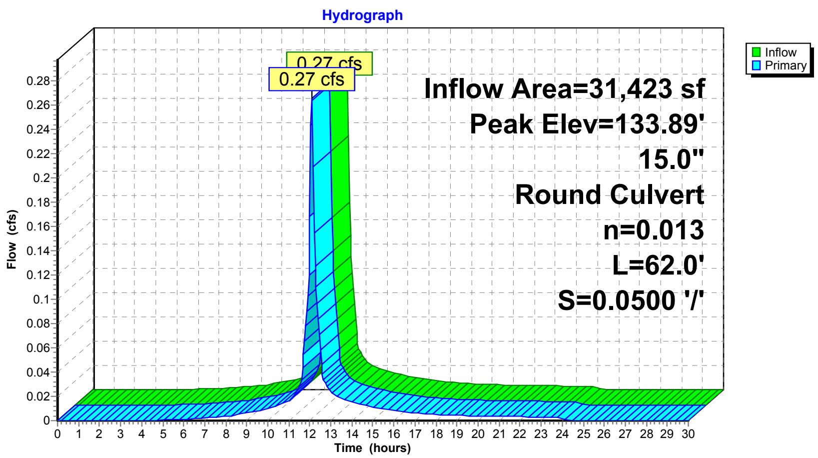
Inflow Area =	31,423 sf, 52.04% Impervious,	Inflow Depth = 0.33"	for 1-INCH event	
Inflow =	0.27 cfs @	12.09 hrs, Volume=	875 cf	
Outflow =	0.27 cfs @	12.09 hrs, Volume=	875 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.27 cfs @	12.09 hrs, Volume=	875 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 133.89' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.26 cfs @ 12.09 hrs HW=133.88' (Free Discharge)
└─1=Culvert (Inlet Controls 0.26 cfs @ 1.38 fps)

Pond DMH3: DMH



Summary for Pond DMH5: DMH

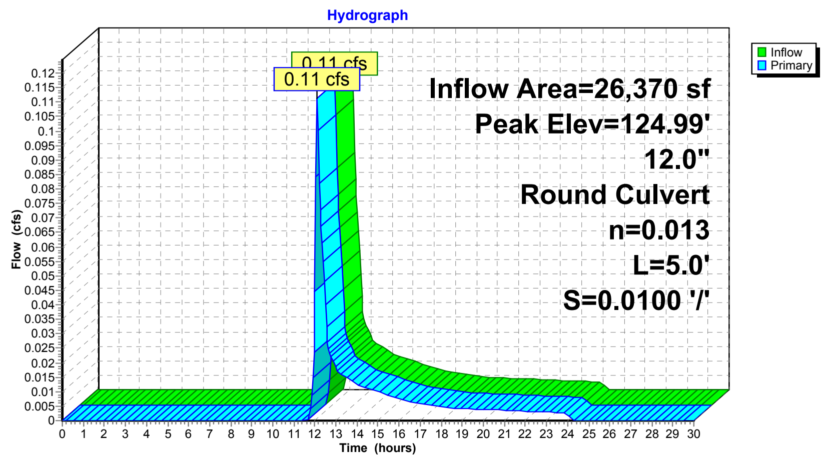
Inflow Area =	26,370 sf, 67.15% Impervious,	Inflow Depth = 0.20"	for 1-INCH event	
Inflow =	0.11 cfs @	12.11 hrs, Volume=	434 cf	
Outflow =	0.11 cfs @	12.11 hrs, Volume=	434 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.11 cfs @	12.11 hrs, Volume=	434 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 124.99' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.11 hrs HW=124.99' (Free Discharge)
└─1=Culvert (Barrel Controls 0.11 cfs @ 1.58 fps)

Pond DMH5: DMH



Summary for Pond DMH6: DMH

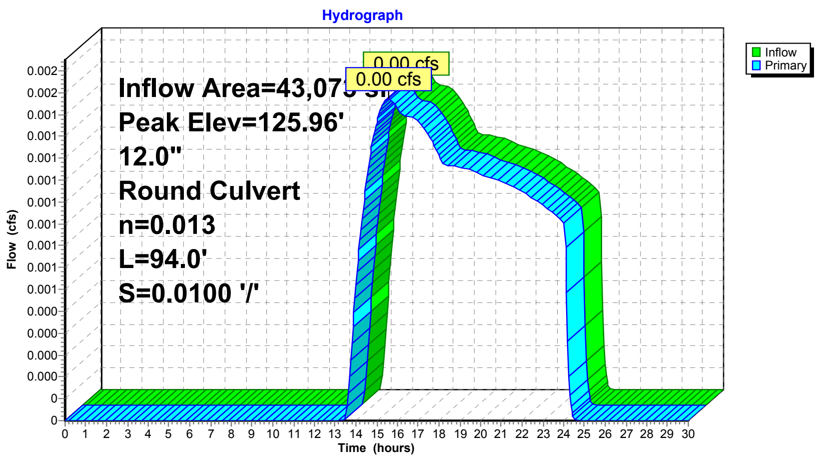
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 0.01" for 1-INCH event
Inflow = 0.00 cfs @ 15.60 hrs, Volume= 43 cf
Outflow = 0.00 cfs @ 15.60 hrs, Volume= 43 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.60 hrs, Volume= 43 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.96' @ 15.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.60 hrs HW=125.96' (Free Discharge)
└─1=Culvert (Barrel Controls 0.00 cfs @ 0.54 fps)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

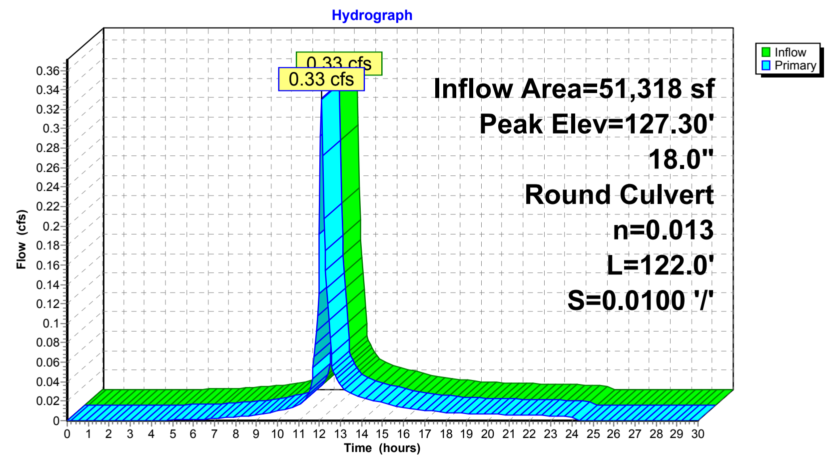
Inflow Area = 51,318 sf, 56.81% Impervious, Inflow Depth = 0.27" for 1-INCH event
Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,163 cf
Outflow = 0.33 cfs @ 12.09 hrs, Volume= 1,163 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.33 cfs @ 12.09 hrs, Volume= 1,163 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.33 cfs @ 12.09 hrs HW=127.30' (Free Discharge)
└─1=Culvert (Inlet Controls 0.33 cfs @ 1.42 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

Inflow Area =	105,247 sf, 53.77% Impervious,	Inflow Depth = 0.25"	for 1-INCH event	
Inflow =	0.59 cfs @ 12.09 hrs,	Volume=	2,217 cf	
Outflow =	0.09 cfs @ 11.80 hrs,	Volume=	2,217 cf,	Atten= 84%, Lag= 0.0 min
Discarded =	0.09 cfs @ 11.80 hrs,	Volume=	2,217 cf	
Primary =	0.00 cfs @ 0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.97' @ 12.62 hrs Surf.Area= 3,388 sf Storage= 635 cf

Plug-Flow detention time= 48.9 min calculated for 2,217 cf (100% of inflow)
Center-of-Mass det. time= 48.7 min (863.0 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A 18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 60 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 11.80 hrs HW=134.56' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=134.50' (Free Discharge)
└─1=15" HDPE (Controls 0.00 cfs)
  ├─2=13" Orifice (Controls 0.00 cfs)
  └─4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

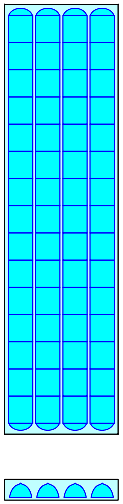
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

60 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

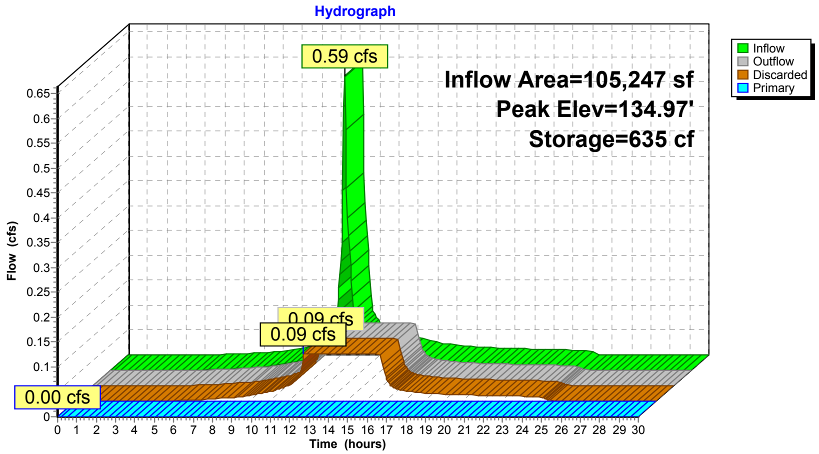
18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone



Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 0.36" for 1-INCH event
Inflow = 0.79 cfs @ 12.09 hrs, Volume= 2,697 cf
Outflow = 0.11 cfs @ 11.85 hrs, Volume= 2,697 cf, Atten= 86%, Lag= 0.0 min
Discarded = 0.11 cfs @ 11.85 hrs, Volume= 2,697 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 125.55' @ 12.72 hrs Surf.Area= 3,934 sf Storage= 869 cf

Plug-Flow detention time= 63.0 min calculated for 2,692 cf (100% of inflow)
Center-of-Mass det. time= 63.0 min (880.4 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 11.85 hrs HW=125.07' (Free Discharge)
└2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└1=15" HDPE (Controls 0.00 cfs)
 └3=13" Orifice (Controls 0.00 cfs)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

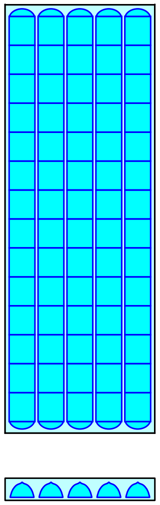
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

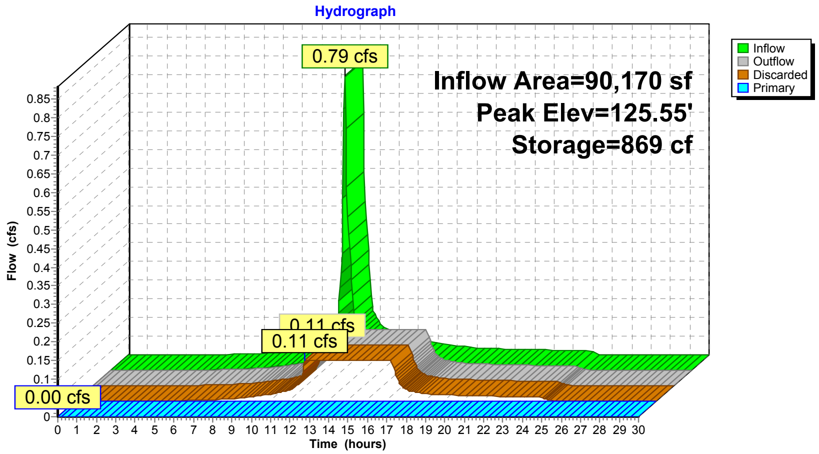
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area =	91,745 sf, 57.86% Impervious,	Inflow Depth = 0.25"	for 1-INCH event
Inflow =	0.55 cfs @ 12.09 hrs,	Volume=	1,947 cf
Outflow =	0.11 cfs @ 11.95 hrs,	Volume=	1,947 cf, Atten= 80%, Lag= 0.0 min
Discarded =	0.11 cfs @ 11.95 hrs,	Volume=	1,947 cf
Primary =	0.00 cfs @ 0.00 hrs,	Volume=	0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 124.33' @ 12.55 hrs Surf.Area= 3,934 sf Storage= 512 cf

Plug-Flow detention time= 33.3 min calculated for 1,947 cf (100% of inflow)
Center-of-Mass det. time= 33.1 min (851.7 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 11.95 hrs HW=124.07' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=124.00' (Free Discharge)
└─1=15" HDPE (Controls 0.00 cfs)
  └─2=12" Orifice (Controls 0.00 cfs)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

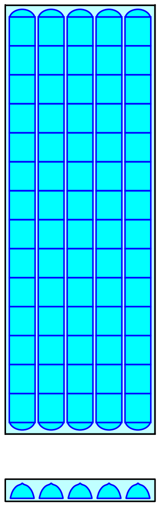
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

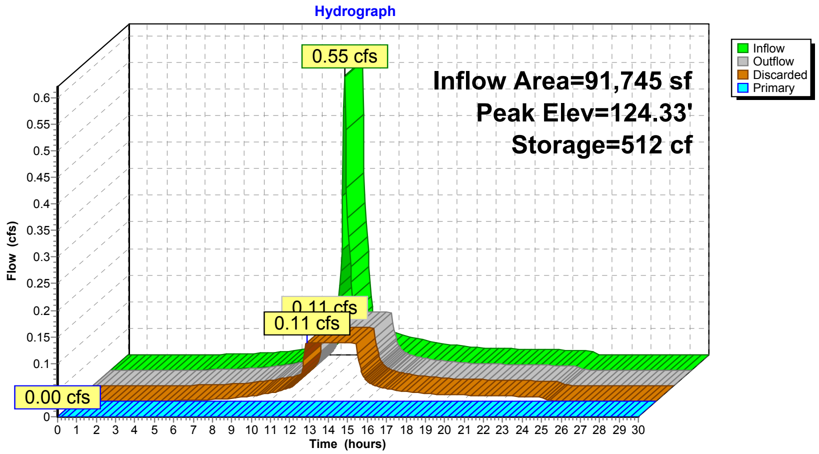
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS3: MC-3500

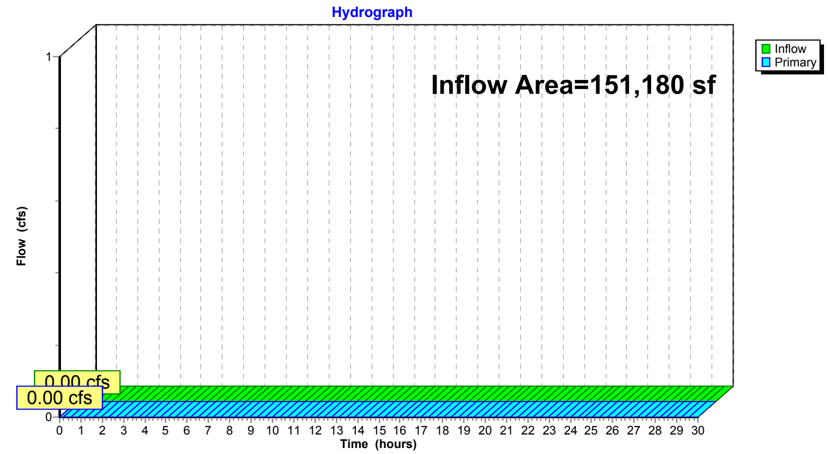


Summary for Link SP-1: Study Point #1

Inflow Area = 151,180 sf, 41.01% Impervious, Inflow Depth = 0.00" for 1-INCH event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

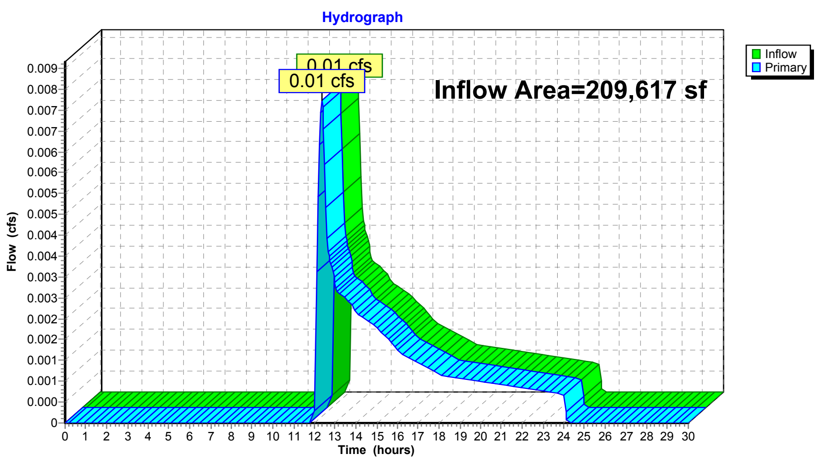


Summary for Link SP-2: Study Point #2

Inflow Area = 209,617 sf, 55.29% Impervious, Inflow Depth = 0.00" for 1-INCH event
Inflow = 0.01 cfs @ 12.36 hrs, Volume= 74 cf
Primary = 0.01 cfs @ 12.36 hrs, Volume= 74 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest — Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=56 Runoff=0.20 cfs 1,552 cf

Subcatchment P-10: Building 2/3 - South Parking — Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=81 Runoff=1.31 cfs 4,152 cf

Subcatchment P-11: Building 1 - Southeast — Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=79 Runoff=0.46 cfs 1,470 cf

Subcatchment P-2A: Building 2 Parking - North — Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=2.15"
Tc=6.0 min CN=89 Runoff=1.37 cfs 4,373 cf

Subcatchment P-2B: Building 2 Parking - North — Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=1.83"
Tc=6.0 min CN=85 Runoff=0.96 cfs 3,028 cf

Subcatchment P-3: Building 1 Parking - East — Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=1.90"
Tc=6.0 min CN=86 Runoff=1.32 cfs 4,186 cf

Subcatchment P-4: Building 3 - West — Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=0.48"
Flow Length=322' Tc=8.6 min CN=61 Runoff=0.12 cfs 647 cf

Subcatchment P-5A: Building 3 Roof - North — Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=98 Runoff=0.95 cfs 3,372 cf

Subcatchment P-5B: Building 3 Roof - South — Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=98 Runoff=1.00 cfs 3,561 cf

Subcatchment P-6A: Building 2 Roof - North — Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=98 Runoff=1.04 cfs 3,681 cf

Subcatchment P-6B: Building 2 Roof - South — Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=98 Runoff=1.04 cfs 3,684 cf

Subcatchment P-7: Building 1 — Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=98 Runoff=1.59 cfs 5,663 cf

Subcatchment P-8: Pool Courtyard — Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=1.15"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=0.54 cfs 2,673 cf

Subcatchment P-9A: Area Drains - Courtyard — Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=0.60"
Tc=6.0 min UI Adjusted CN=64 Runoff=0.22 cfs 902 cf

Subcatchment P-9B: Building 1/2 Courtyard — Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=0.98"
Flow Length=317' Tc=12.7 min CN=72 Runoff=0.84 cfs 3,516 cf

Pond 2P: CB2 — Peak Elev=140.27' Inflow=1.31 cfs 4,152 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=1.31 cfs 4,152 cf

Pond AD11: AD — Peak Elev=135.55' Inflow=0.22 cfs 902 cf
8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=0.22 cfs 902 cf

Pond AD5: AD — Peak Elev=140.42' Inflow=0.54 cfs 2,673 cf
12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=0.54 cfs 2,673 cf

Pond CB11: CB — Peak Elev=141.19' Inflow=0.12 cfs 647 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=0.12 cfs 647 cf

Pond CB12: CB — Peak Elev=140.08' Inflow=0.12 cfs 647 cf
12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=0.12 cfs 647 cf

Pond CB4: CB — Peak Elev=127.57' Inflow=1.37 cfs 4,373 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=1.37 cfs 4,373 cf

Pond CB5: CB — Peak Elev=128.93' Inflow=0.96 cfs 3,028 cf
12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=0.96 cfs 3,028 cf

Pond CB7: CB — Peak Elev=126.65' Inflow=1.32 cfs 4,186 cf
12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=1.32 cfs 4,186 cf

Pond CB8: CB — Peak Elev=127.14' Inflow=0.84 cfs 3,516 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=0.84 cfs 3,516 cf

Pond CDS1: CDS — Peak Elev=140.09' Inflow=1.31 cfs 4,152 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=1.31 cfs 4,152 cf

Pond CDS2: CDS — Peak Elev=127.67' Inflow=3.49 cfs 11,676 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.49 cfs 11,676 cf

Pond CDS3: CDS WQU — Peak Elev=126.15' Inflow=1.32 cfs 4,186 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=1.32 cfs 4,186 cf

Pond CDS4: CDS WQU — Peak Elev=125.50' Inflow=0.84 cfs 3,516 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.84 cfs 3,516 cf

Pond DMH2A: DMH — Peak Elev=137.49' Inflow=0.12 cfs 647 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=0.12 cfs 647 cf

Pond DMH3: DMH — Peak Elev=134.21' Inflow=1.16 cfs 4,275 cf
15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=1.16 cfs 4,275 cf

Pond DMH5: DMH — Peak Elev=125.58' Inflow=1.32 cfs 4,186 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.32 cfs 4,186 cf

Pond DMH6: DMH — Peak Elev=126.47' Inflow=0.84 cfs 3,516 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=0.84 cfs 3,516 cf

Pond DMH8: DMH — Peak Elev=127.78' Inflow=2.12 cfs 7,302 cf
18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=2.12 cfs 7,302 cf

Pond UIS1: UIS#1 — Peak Elev=137.04' Storage=5,972 cf Inflow=3.68 cfs 14,717 cf
Discarded=0.09 cfs 7,738 cf Primary=0.78 cfs 4,537 cf Outflow=0.88 cfs 12,275 cf

Pond UIS2: UIS #2 — Peak Elev=127.49' Storage=6,847 cf Inflow=4.53 cfs 15,357 cf
Discarded=0.11 cfs 8,958 cf Primary=0.65 cfs 3,899 cf Outflow=0.76 cfs 12,856 cf

Pond UIS3: MC-3500 — Peak Elev=126.33' Storage=6,336 cf Inflow=3.52 cfs 13,366 cf
Discarded=0.11 cfs 8,686 cf Primary=0.23 cfs 2,235 cf Outflow=0.34 cfs 10,921 cf

Link SP-1: Study Point #1 — Inflow=0.76 cfs 5,450 cf
Primary=0.76 cfs 5,450 cf

Link SP-2: Study Point #2 — Inflow=0.91 cfs 8,242 cf
Primary=0.91 cfs 8,242 cf

Total Runoff Area = 360,797 sf Runoff Volume = 46,461 cf Average Runoff Depth = 1.55"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

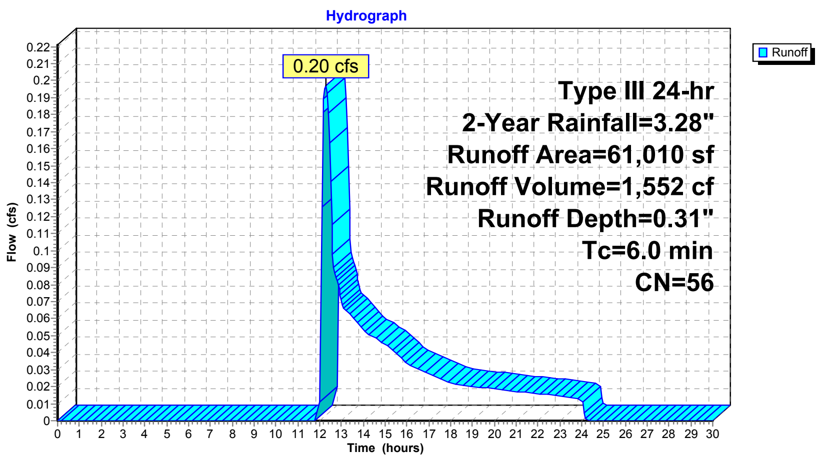
Runoff = 0.20 cfs @ 12.29 hrs, Volume= 1,552 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

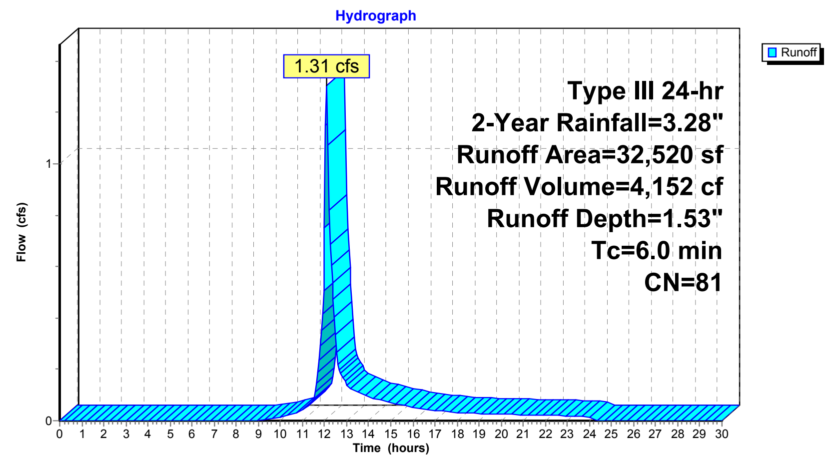
Runoff = 1.31 cfs @ 12.09 hrs, Volume= 4,152 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

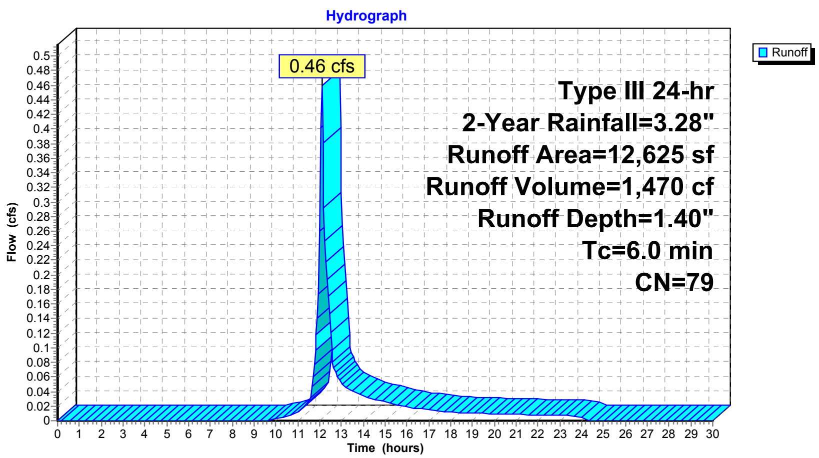
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 1,470 cf, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

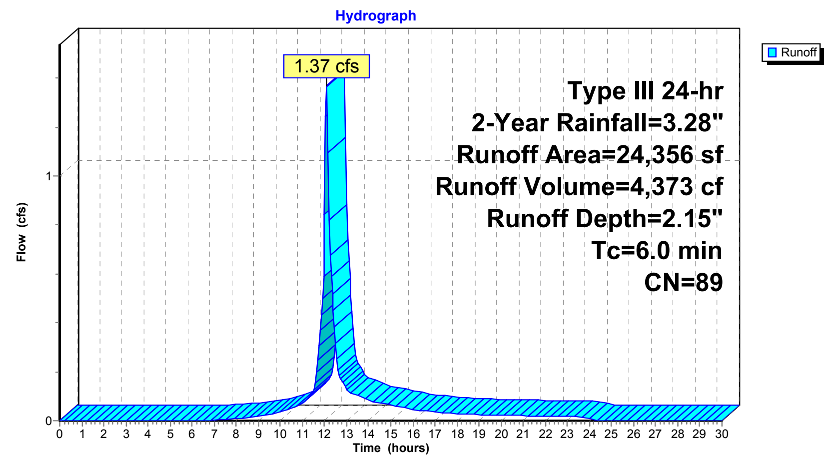
Runoff = 1.37 cfs @ 12.09 hrs, Volume= 4,373 cf, Depth= 2.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

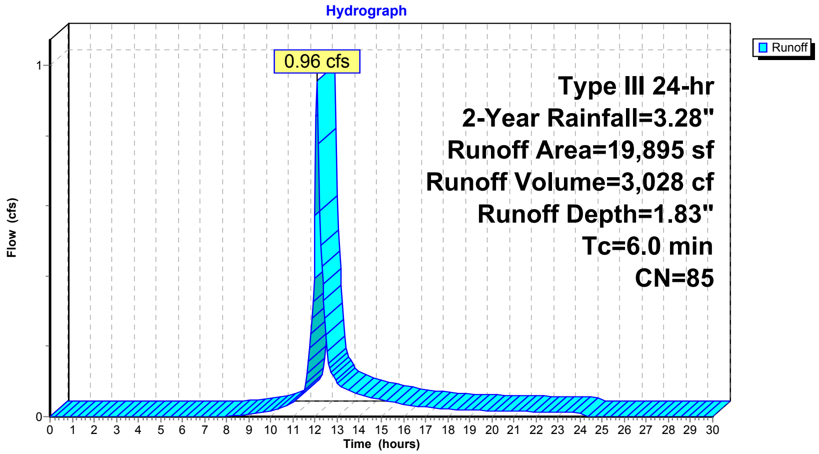
Runoff = 0.96 cfs @ 12.09 hrs, Volume= 3,028 cf, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

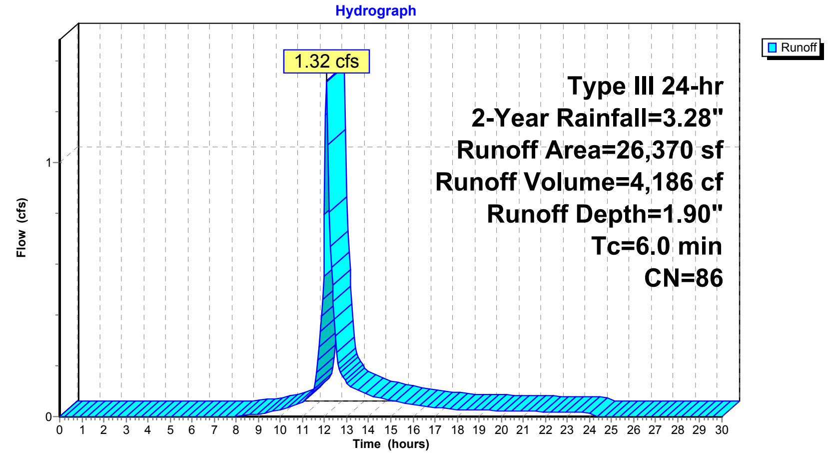
Runoff = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

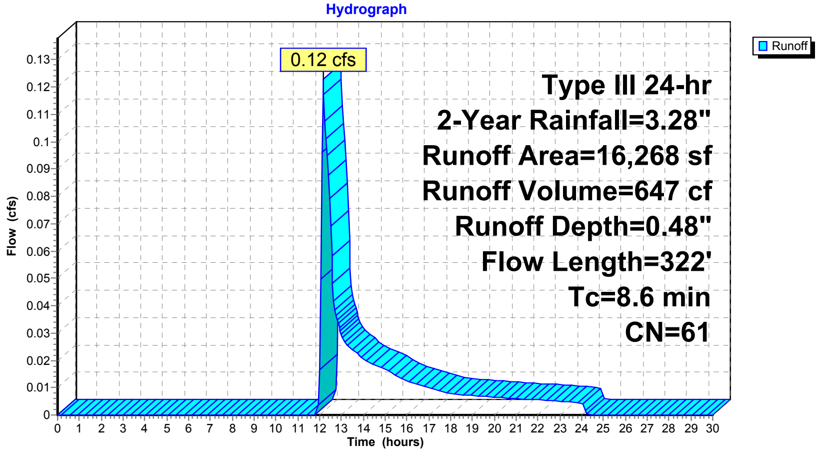
Runoff = 0.12 cfs @ 12.17 hrs, Volume= 647 cf, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

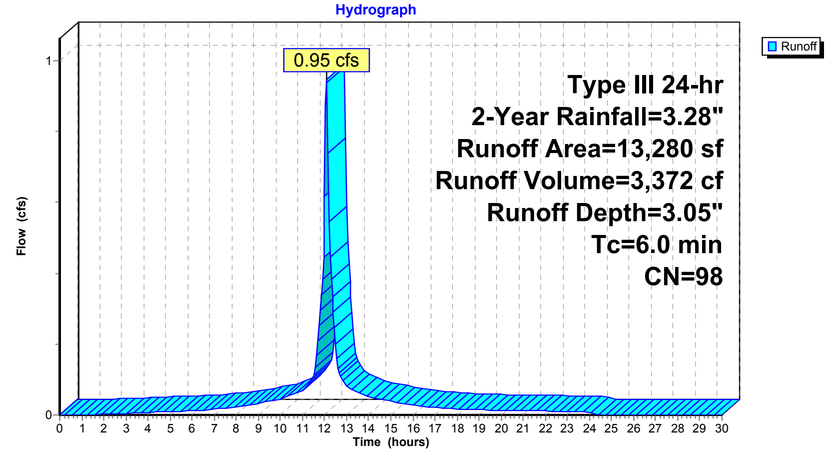
Runoff = 0.95 cfs @ 12.09 hrs, Volume= 3,372 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

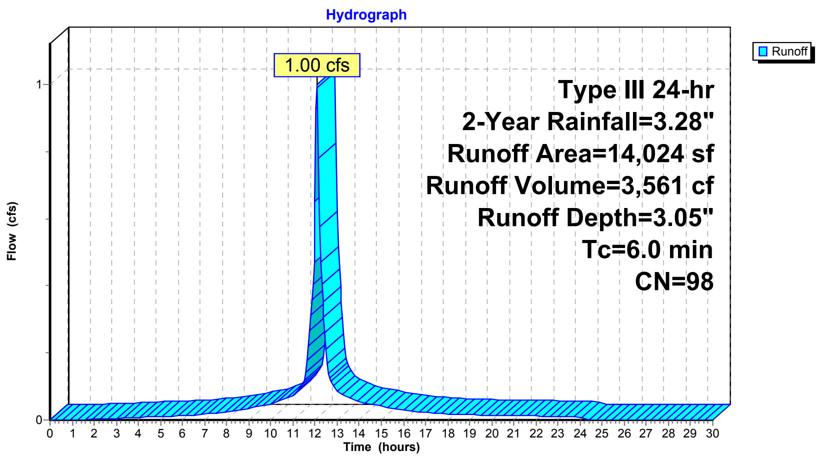
Runoff = 1.00 cfs @ 12.09 hrs, Volume= 3,561 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

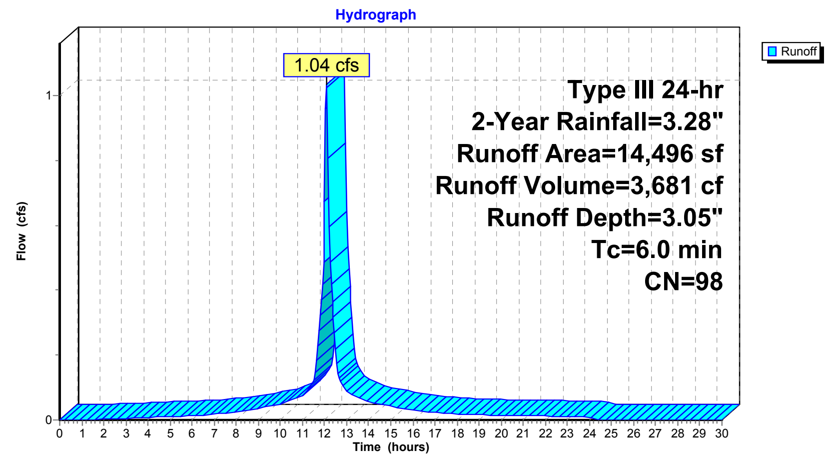
Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,681 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

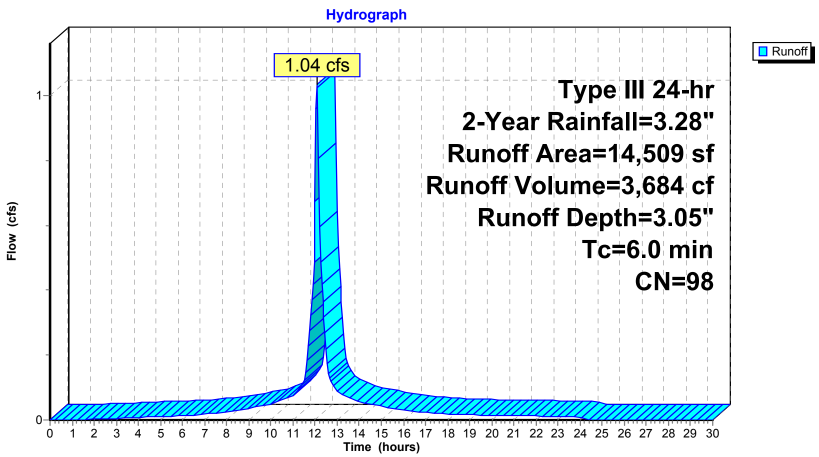
Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,684 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

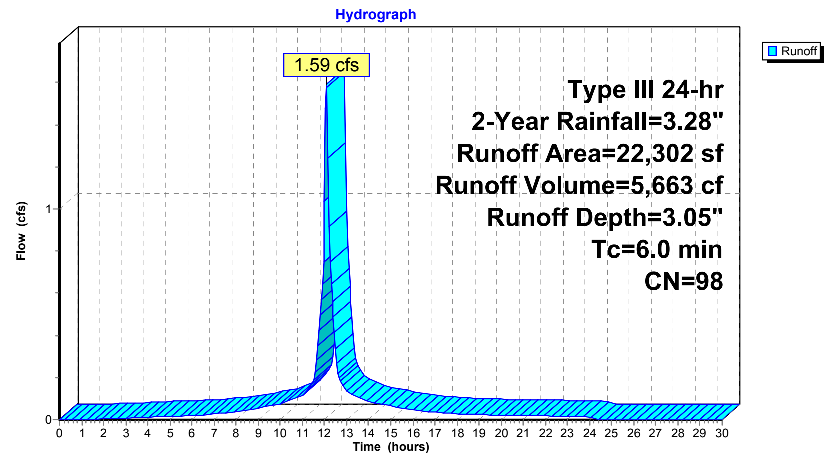
Runoff = 1.59 cfs @ 12.09 hrs, Volume= 5,663 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

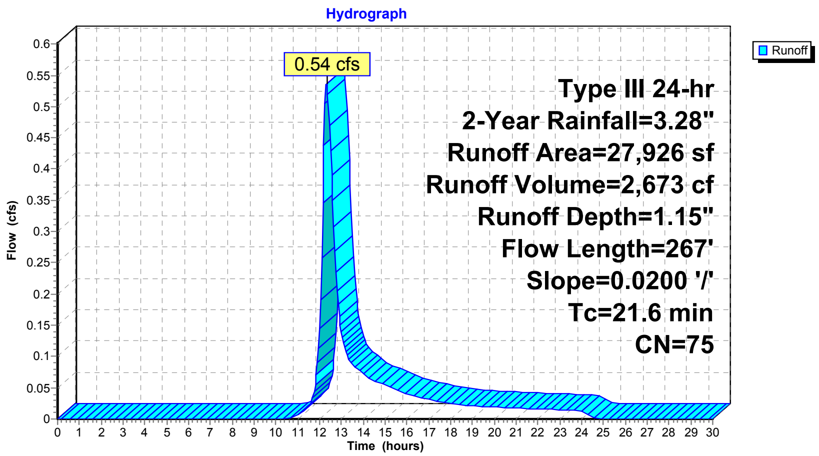
Runoff = 0.54 cfs @ 12.32 hrs, Volume= 2,673 cf, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

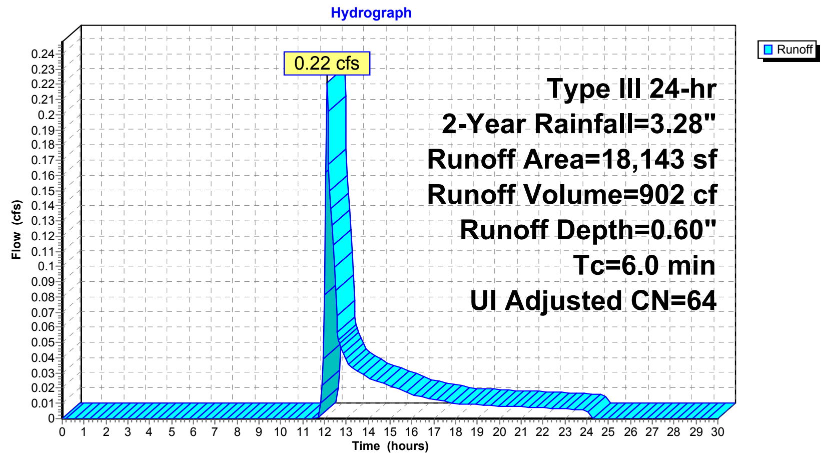
Runoff = 0.22 cfs @ 12.11 hrs, Volume= 902 cf, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

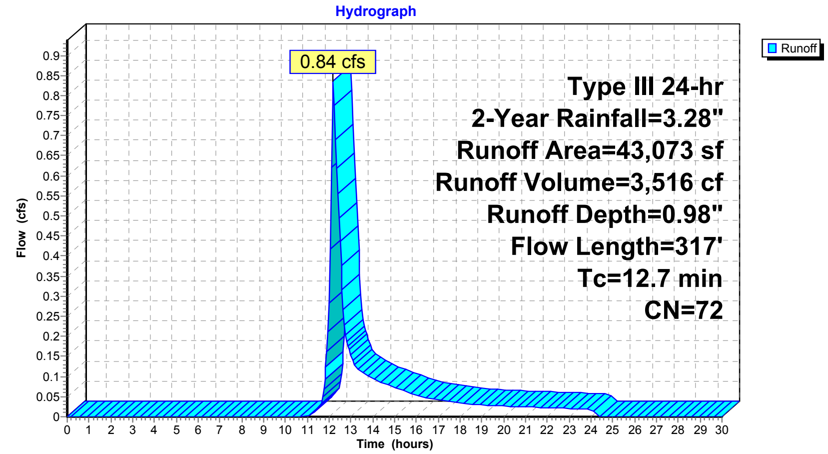
Runoff = 0.84 cfs @ 12.20 hrs, Volume= 3,516 cf, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.28"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

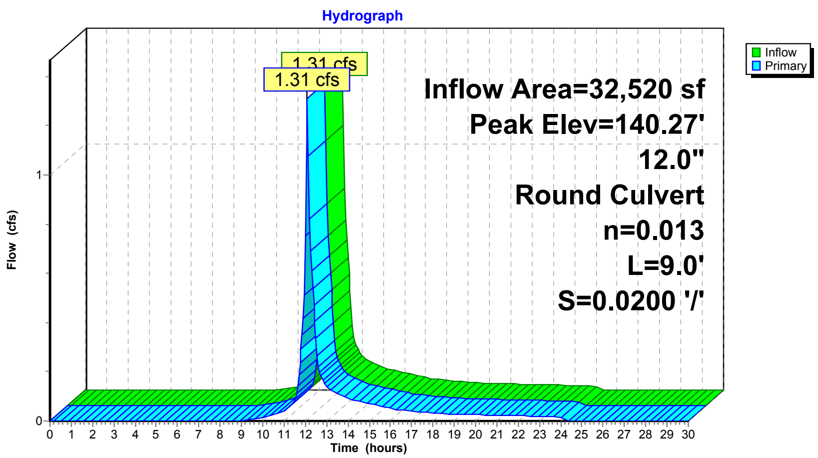
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 1.53" for 2-Year event
Inflow = 1.31 cfs @ 12.09 hrs, Volume= 4,152 cf
Outflow = 1.31 cfs @ 12.09 hrs, Volume= 4,152 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.31 cfs @ 12.09 hrs, Volume= 4,152 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.27' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.09 hrs HW=140.26' (Free Discharge)
└─1=Culvert (Inlet Controls 1.29 cfs @ 2.23 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

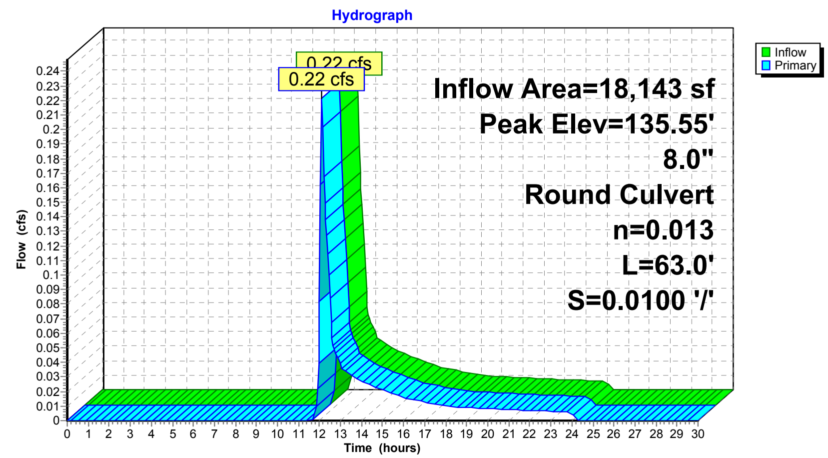
Inflow Area = 18,143 sf, 16.94% Impervious, Inflow Depth = 0.60" for 2-Year event
Inflow = 0.22 cfs @ 12.11 hrs, Volume= 902 cf
Outflow = 0.22 cfs @ 12.11 hrs, Volume= 902 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.11 hrs, Volume= 902 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 135.55' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.21 cfs @ 12.11 hrs HW=135.54' (Free Discharge)
└─1=Culvert (Inlet Controls 0.21 cfs @ 1.45 fps)

Pond AD11: AD



Summary for Pond AD5: AD

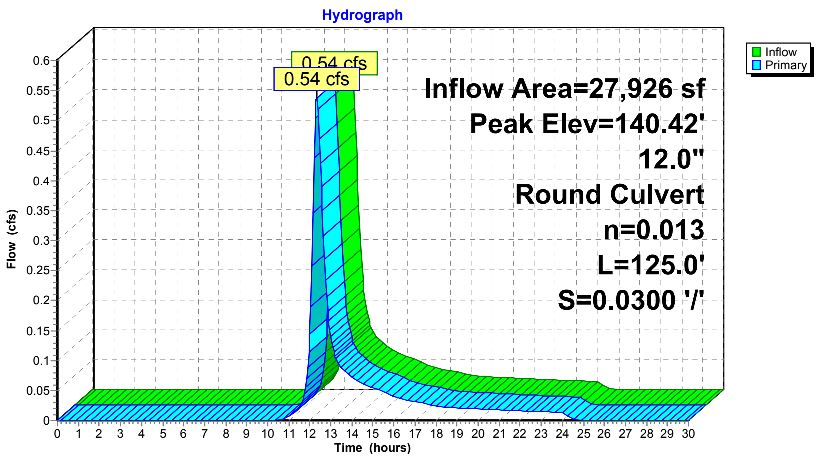
Inflow Area = 27,926 sf, 36.53% Impervious, Inflow Depth = 1.15" for 2-Year event
Inflow = 0.54 cfs @ 12.32 hrs, Volume= 2,673 cf
Outflow = 0.54 cfs @ 12.32 hrs, Volume= 2,673 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.54 cfs @ 12.32 hrs, Volume= 2,673 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.42' @ 12.32 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.53 cfs @ 12.32 hrs HW=140.42' (Free Discharge)
└1=Culvert (Inlet Controls 0.53 cfs @ 1.73 fps)

Pond AD5: AD



Summary for Pond CB11: CB

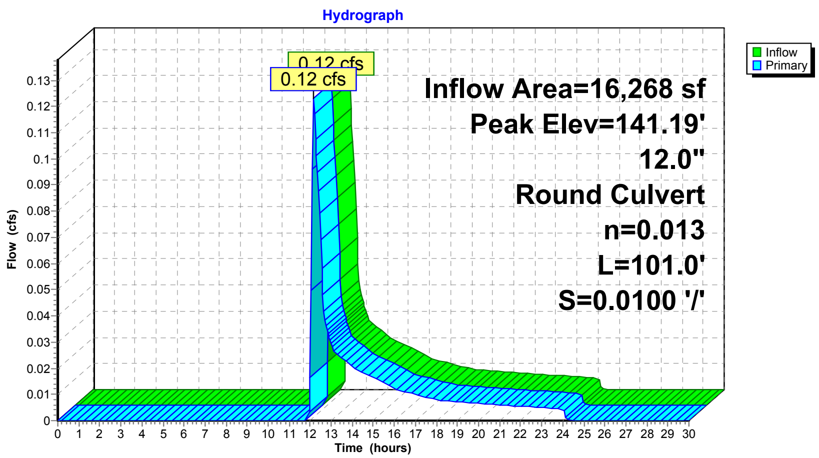
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.48" for 2-Year event
Inflow = 0.12 cfs @ 12.17 hrs, Volume= 647 cf
Outflow = 0.12 cfs @ 12.17 hrs, Volume= 647 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.17 hrs, Volume= 647 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.19' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 12.17 hrs HW=141.19' (Free Discharge)
└1=Culvert (Inlet Controls 0.12 cfs @ 1.17 fps)

Pond CB11: CB



Summary for Pond CB12: CB

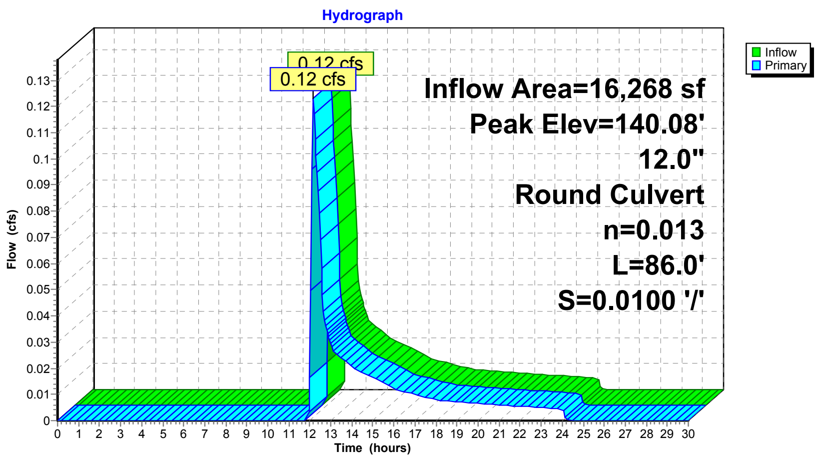
Inflow Area =	16,268 sf,	0.00% Impervious,	Inflow Depth = 0.48"	for 2-Year event
Inflow =	0.12 cfs @	12.17 hrs, Volume=	647 cf	
Outflow =	0.12 cfs @	12.17 hrs, Volume=	647 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.12 cfs @	12.17 hrs, Volume=	647 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.08' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 12.17 hrs HW=140.08' (Free Discharge)
└─1=Culvert (Inlet Controls 0.12 cfs @ 1.17 fps)

Pond CB12: CB



Summary for Pond CB4: CB

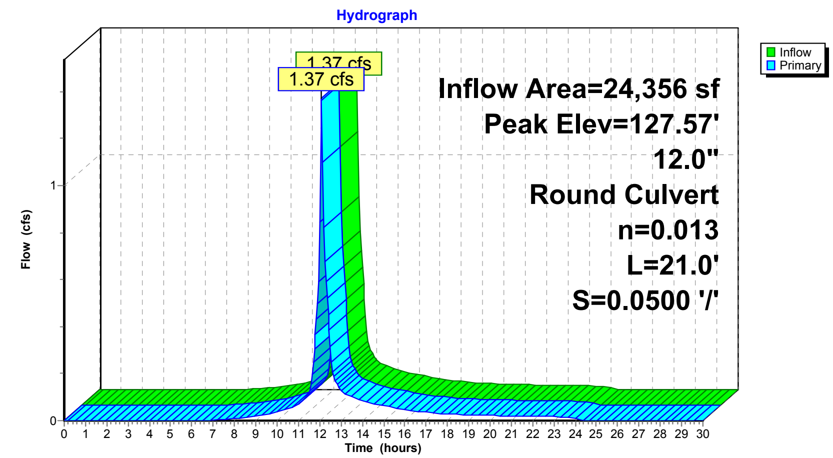
Inflow Area =	24,356 sf,	75.32% Impervious,	Inflow Depth = 2.15"	for 2-Year event
Inflow =	1.37 cfs @	12.09 hrs, Volume=	4,373 cf	
Outflow =	1.37 cfs @	12.09 hrs, Volume=	4,373 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.37 cfs @	12.09 hrs, Volume=	4,373 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.57' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.34 cfs @ 12.09 hrs HW=127.56' (Free Discharge)
└─1=Culvert (Inlet Controls 1.34 cfs @ 2.26 fps)

Pond CB4: CB



Summary for Pond CB5: CB

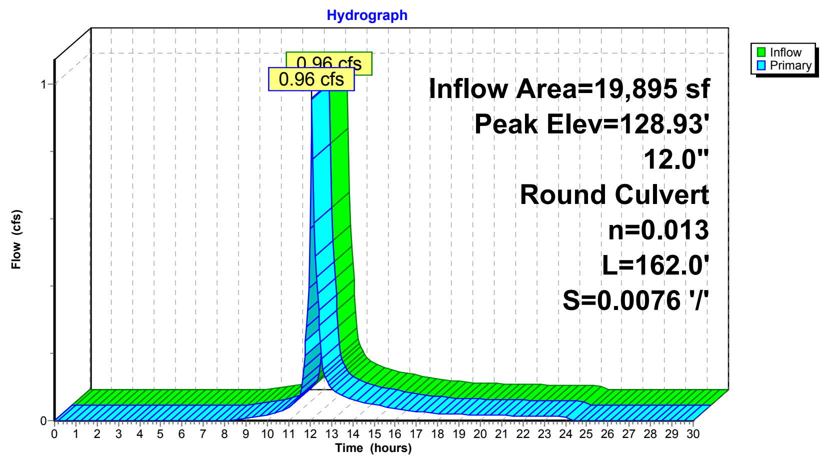
Inflow Area = 19,895 sf, 64.33% Impervious, Inflow Depth = 1.83" for 2-Year event
Inflow = 0.96 cfs @ 12.09 hrs, Volume= 3,028 cf
Outflow = 0.96 cfs @ 12.09 hrs, Volume= 3,028 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.96 cfs @ 12.09 hrs, Volume= 3,028 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.93' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.09 hrs HW=128.92' (Free Discharge)
└1=Culvert (Inlet Controls 0.94 cfs @ 2.03 fps)

Pond CB5: CB



Summary for Pond CB7: CB

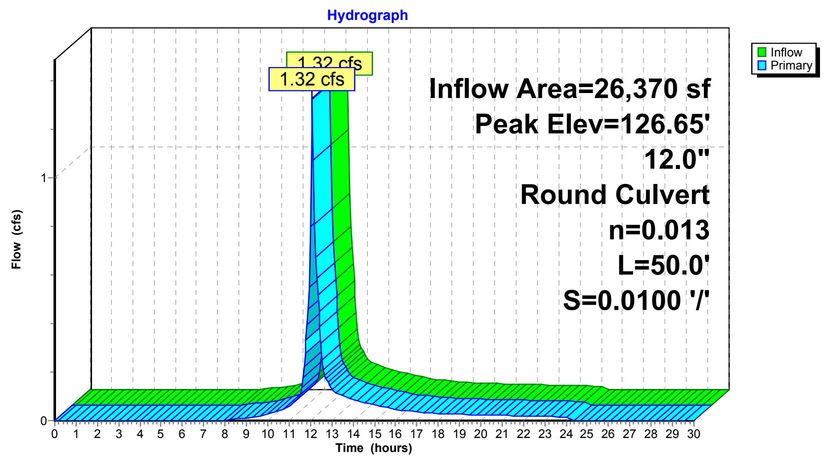
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf
Outflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.65' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.09 hrs HW=126.64' (Free Discharge)
└1=Culvert (Inlet Controls 1.30 cfs @ 2.24 fps)

Pond CB7: CB



Summary for Pond CB8: CB

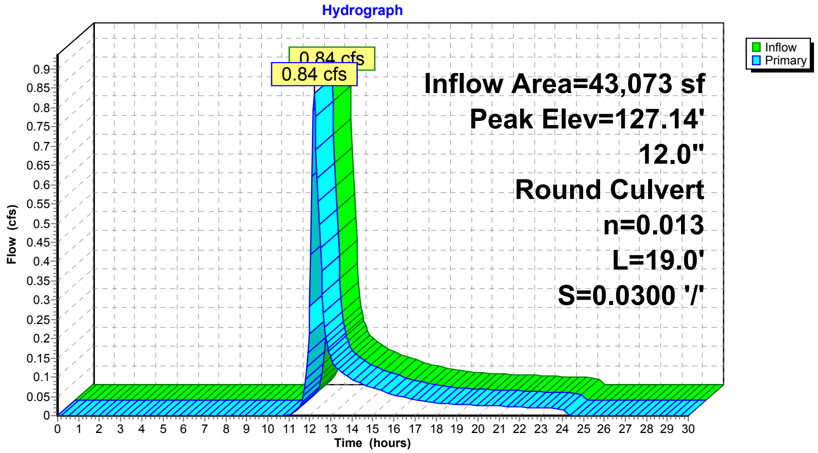
Inflow Area =	43,073 sf,	30.35% Impervious,	Inflow Depth = 0.98"	for 2-Year event
Inflow =	0.84 cfs @	12.20 hrs, Volume=	3,516 cf	
Outflow =	0.84 cfs @	12.20 hrs, Volume=	3,516 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.84 cfs @	12.20 hrs, Volume=	3,516 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.14' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.20 hrs HW=127.14' (Free Discharge)
└1=Culvert (Inlet Controls 0.83 cfs @ 1.96 fps)

Pond CB8: CB



Summary for Pond CDS1: CDS

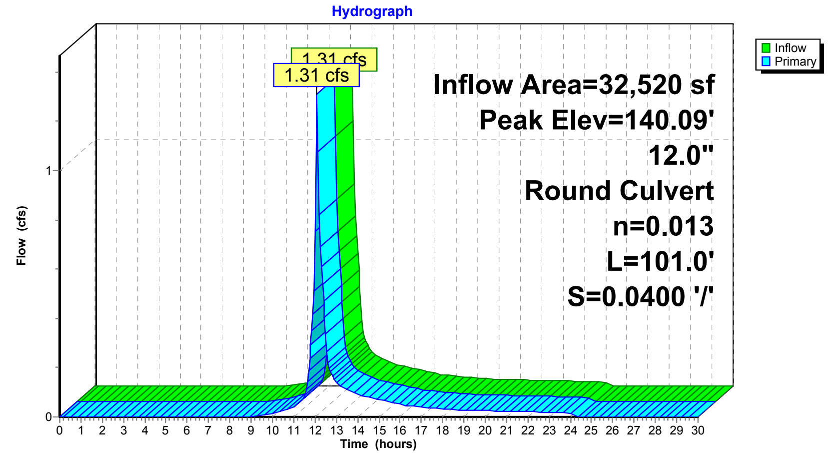
Inflow Area =	32,520 sf,	54.92% Impervious,	Inflow Depth = 1.53"	for 2-Year event
Inflow =	1.31 cfs @	12.09 hrs, Volume=	4,152 cf	
Outflow =	1.31 cfs @	12.09 hrs, Volume=	4,152 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.31 cfs @	12.09 hrs, Volume=	4,152 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.09' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.09 hrs HW=140.08' (Free Discharge)
└1=Culvert (Inlet Controls 1.29 cfs @ 2.23 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

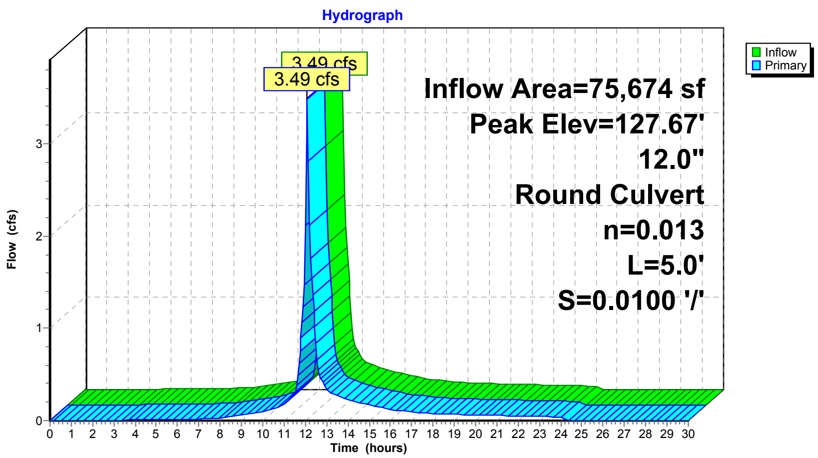
Inflow Area = 75,674 sf, 62.77% Impervious, Inflow Depth = 1.85" for 2-Year event
Inflow = 3.49 cfs @ 12.09 hrs, Volume= 11,676 cf
Outflow = 3.49 cfs @ 12.09 hrs, Volume= 11,676 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.09 hrs, Volume= 11,676 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.67' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.43 cfs @ 12.09 hrs HW=127.62' (Free Discharge)
└1=Culvert (Inlet Controls 3.43 cfs @ 4.36 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

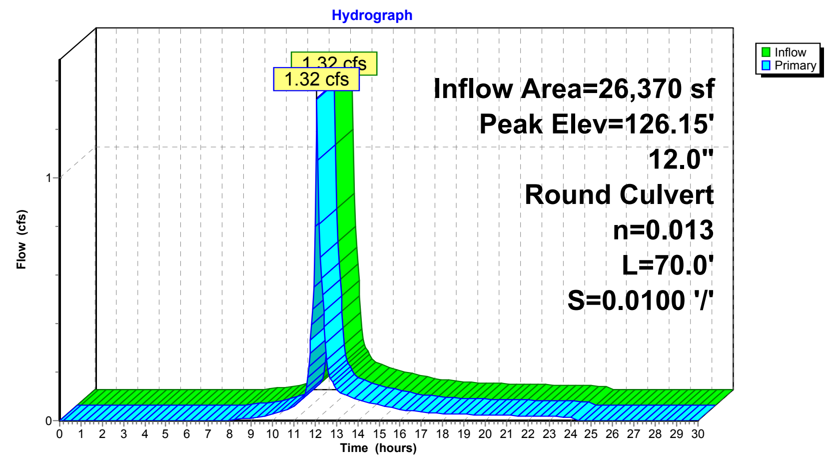
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf
Outflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.15' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.09 hrs HW=126.14' (Free Discharge)
└1=Culvert (Inlet Controls 1.30 cfs @ 2.24 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

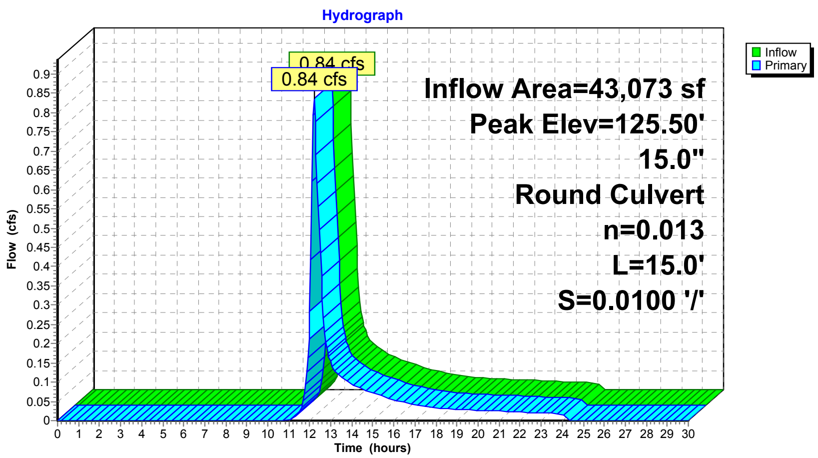
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 0.98" for 2-Year event
Inflow = 0.84 cfs @ 12.20 hrs, Volume= 3,516 cf
Outflow = 0.84 cfs @ 12.20 hrs, Volume= 3,516 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.20 hrs, Volume= 3,516 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.50' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.83 cfs @ 12.20 hrs HW=125.50' (Free Discharge)
└─1=Culvert (Barrel Controls 0.83 cfs @ 2.68 fps)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

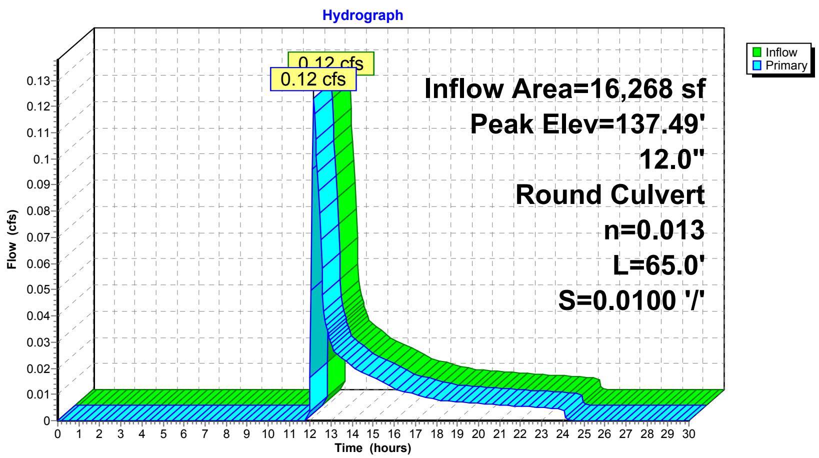
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 0.48" for 2-Year event
Inflow = 0.12 cfs @ 12.17 hrs, Volume= 647 cf
Outflow = 0.12 cfs @ 12.17 hrs, Volume= 647 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.17 hrs, Volume= 647 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.49' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 12.17 hrs HW=137.49' (Free Discharge)
└─1=Culvert (Inlet Controls 0.12 cfs @ 1.17 fps)

Pond DMH2A: DMH



Summary for Pond DMH3: DMH

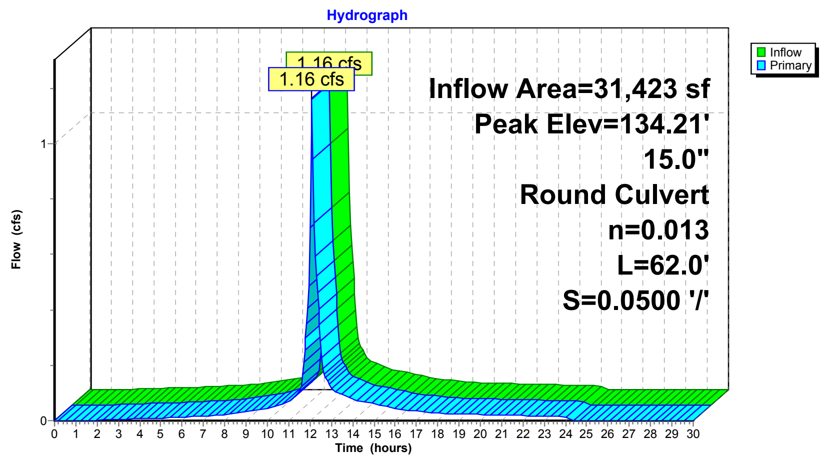
Inflow Area = 31,423 sf, 52.04% Impervious, Inflow Depth = 1.63" for 2-Year event
Inflow = 1.16 cfs @ 12.09 hrs, Volume= 4,275 cf
Outflow = 1.16 cfs @ 12.09 hrs, Volume= 4,275 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.16 cfs @ 12.09 hrs, Volume= 4,275 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.21' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=134.20' (Free Discharge)
└1=Culvert (Inlet Controls 1.14 cfs @ 2.05 fps)

Pond DMH3: DMH



Summary for Pond DMH5: DMH

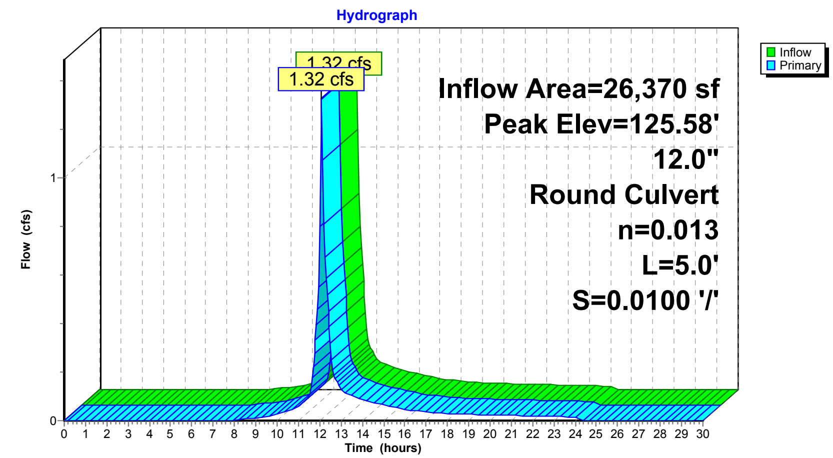
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 1.90" for 2-Year event
Inflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf
Outflow = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.09 hrs, Volume= 4,186 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.58' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.30 cfs @ 12.09 hrs HW=125.57' (Free Discharge)
└1=Culvert (Barrel Controls 1.30 cfs @ 2.77 fps)

Pond DMH5: DMH



Summary for Pond DMH6: DMH

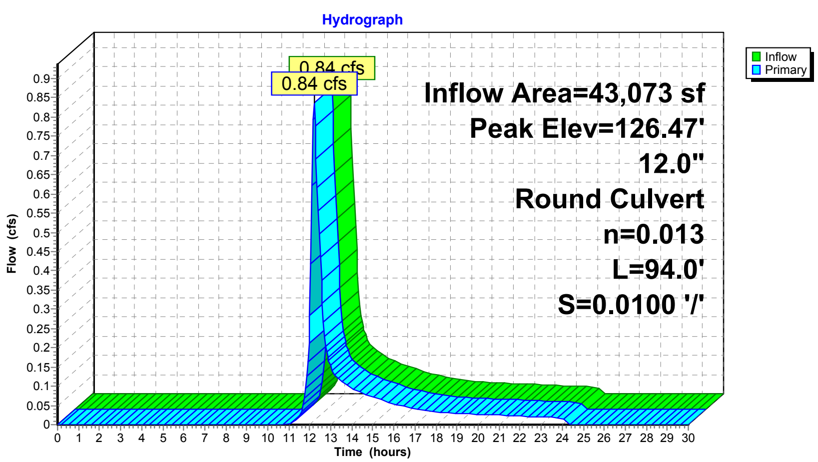
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 0.98" for 2-Year event	
Inflow =	0.84 cfs @ 12.20 hrs, Volume=	3,516 cf	
Outflow =	0.84 cfs @ 12.20 hrs, Volume=	3,516 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.84 cfs @ 12.20 hrs, Volume=	3,516 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.47' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.20 hrs HW=126.47' (Free Discharge)
└─1=Culvert (Inlet Controls 0.83 cfs @ 1.96 fps)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

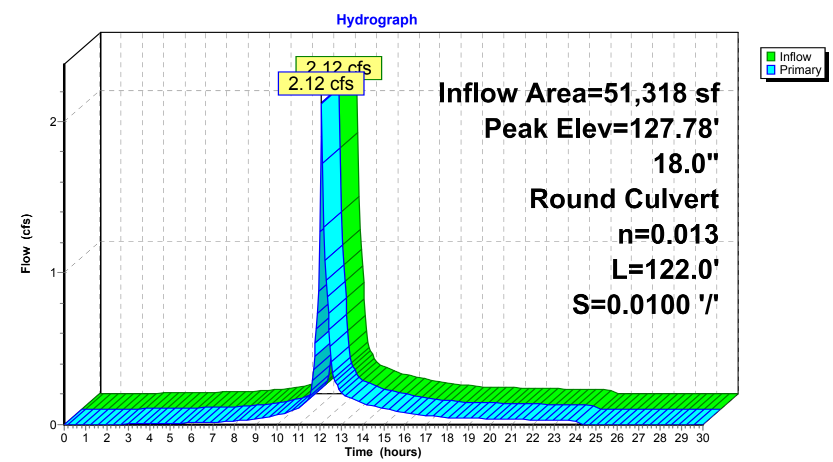
Inflow Area =	51,318 sf, 56.81% Impervious,	Inflow Depth = 1.71" for 2-Year event	
Inflow =	2.12 cfs @ 12.09 hrs, Volume=	7,302 cf	
Outflow =	2.12 cfs @ 12.09 hrs, Volume=	7,302 cf,	Atten= 0%, Lag= 0.0 min
Primary =	2.12 cfs @ 12.09 hrs, Volume=	7,302 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.78' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.08 cfs @ 12.09 hrs HW=127.78' (Free Discharge)
└─1=Culvert (Inlet Controls 2.08 cfs @ 2.34 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

Inflow Area =	105,247 sf, 53.77% Impervious,	Inflow Depth = 1.68"	for 2-Year event
Inflow =	3.68 cfs @ 12.10 hrs,	Volume= 14,717 cf	
Outflow =	0.88 cfs @ 12.62 hrs,	Volume= 12,275 cf,	Atten= 76%, Lag= 31.2 min
Discarded =	0.09 cfs @ 9.90 hrs,	Volume= 7,738 cf	
Primary =	0.78 cfs @ 12.62 hrs,	Volume= 4,537 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.04' @ 12.62 hrs Surf.Area= 3,388 sf Storage= 5,972 cf

Plug-Flow detention time= 276.4 min calculated for 12,275 cf (83% of inflow)
Center-of-Mass det. time= 204.3 min (1,011.4 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A 18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 60 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 9.90 hrs HW=134.56' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.78 cfs @ 12.62 hrs HW=137.04' (Free Discharge)
└1=15" HDPE (Passes 0.78 cfs of 5.02 cfs potential flow)
  ├2=13" Orifice (Orifice Controls 0.78 cfs @ 2.25 fps)
  └4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

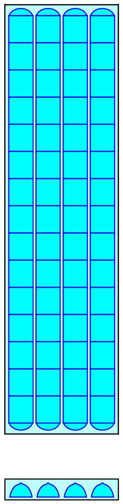
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

60 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

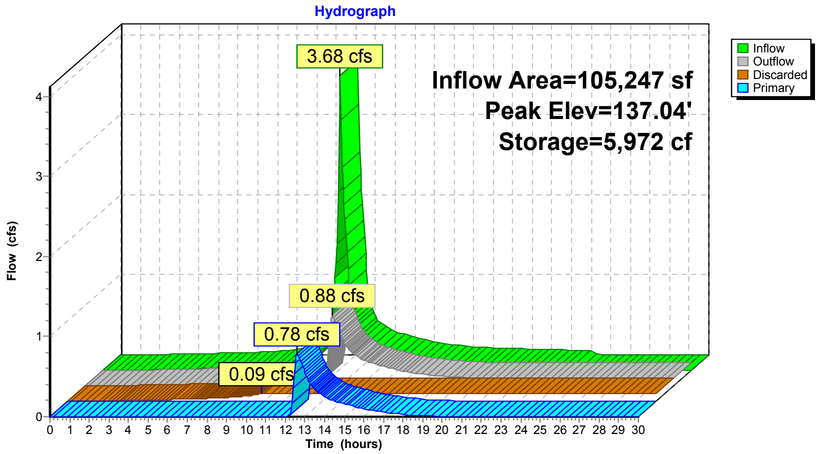
18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone



Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 2.04" for 2-Year event
Inflow = 4.53 cfs @ 12.09 hrs, Volume= 15,357 cf
Outflow = 0.76 cfs @ 12.58 hrs, Volume= 12,856 cf, Atten= 83%, Lag= 29.1 min
Discarded = 0.11 cfs @ 11.75 hrs, Volume= 8,958 cf
Primary = 0.65 cfs @ 12.58 hrs, Volume= 3,899 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 127.49' @ 12.58 hrs Surf.Area= 3,946 sf Storage= 6,847 cf

Plug-Flow detention time= 306.2 min calculated for 12,835 cf (84% of inflow)
Center-of-Mass det. time= 237.6 min (1,030.9 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 11.75 hrs HW=125.79' (Free Discharge)
└2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.65 cfs @ 12.58 hrs HW=127.49' (Free Discharge)
└1=15" HDPE (Passes 0.65 cfs of 4.93 cfs potential flow)
 └3=13" Orifice (Orifice Controls 0.65 cfs @ 2.14 fps)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

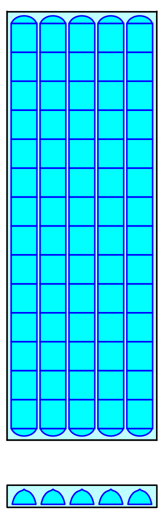
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

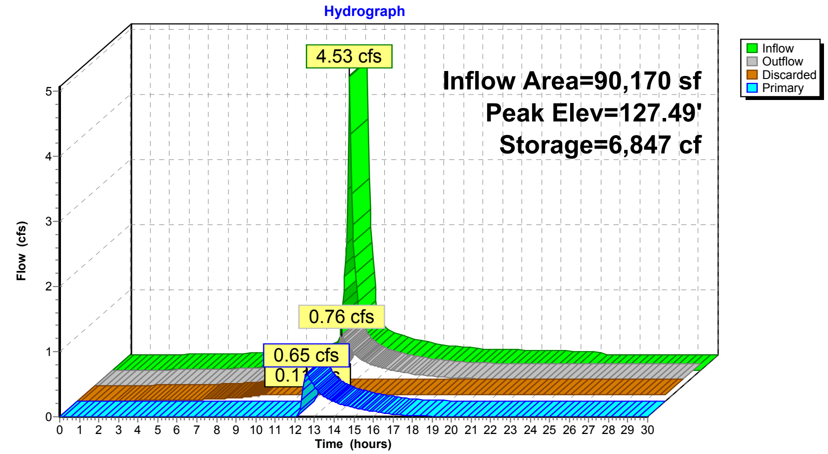
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area =	91,745 sf, 57.86% Impervious,	Inflow Depth = 1.75" for 2-Year event	
Inflow =	3.52 cfs @ 12.10 hrs,	Volume=	13,366 cf
Outflow =	0.34 cfs @ 13.34 hrs,	Volume=	10,921 cf, Atten= 90%, Lag= 74.4 min
Discarded =	0.11 cfs @ 10.40 hrs,	Volume=	8,686 cf
Primary =	0.23 cfs @ 13.34 hrs,	Volume=	2,235 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.33' @ 13.34 hrs Surf.Area= 3,934 sf Storage= 6,336 cf

Plug-Flow detention time= 349.2 min calculated for 10,921 cf (82% of inflow)
Center-of-Mass det. time= 273.0 min (1,080.3 - 807.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 10.40 hrs HW=124.06' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.23 cfs @ 13.34 hrs HW=126.33' (Free Discharge)
└1=15" HDPE (Passes 0.23 cfs of 4.57 cfs potential flow)
  └2=12" Orifice (Orifice Controls 0.23 cfs @ 1.65 fps)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

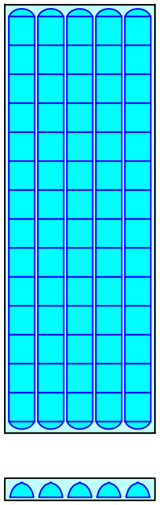
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

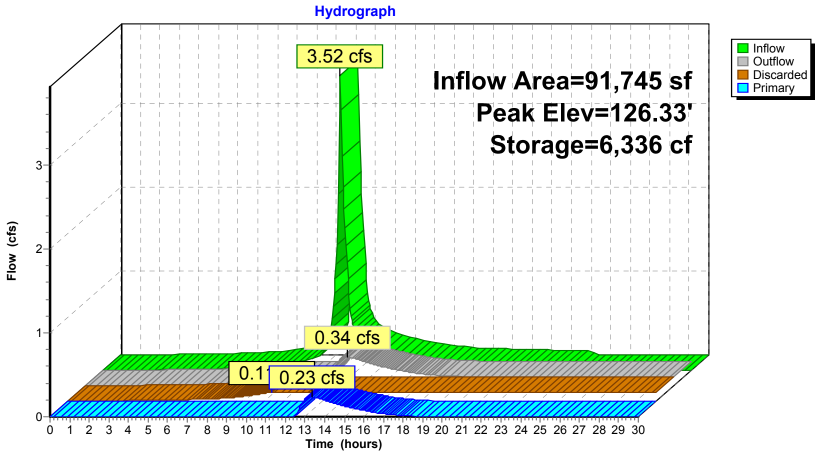
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS3: MC-3500

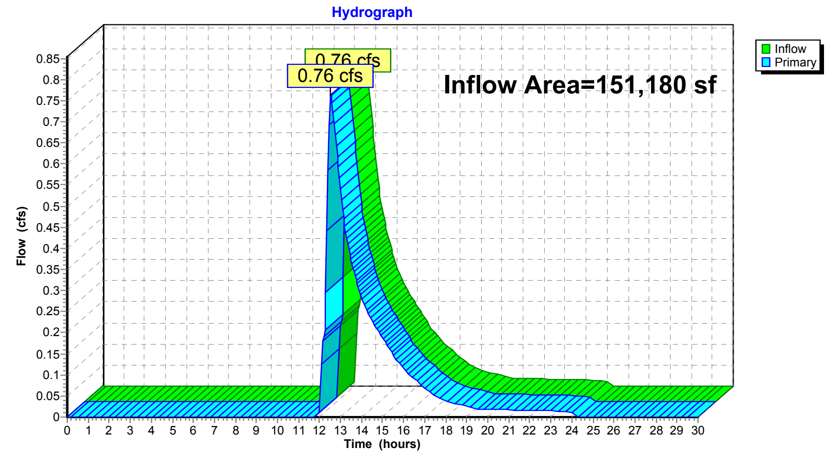


Summary for Link SP-1: Study Point #1

Inflow Area =	151,180 sf, 41.01% Impervious, Inflow Depth = 0.43"	for 2-Year event
Inflow =	0.76 cfs @ 12.54 hrs, Volume=	5,450 cf
Primary =	0.76 cfs @ 12.54 hrs, Volume=	5,450 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

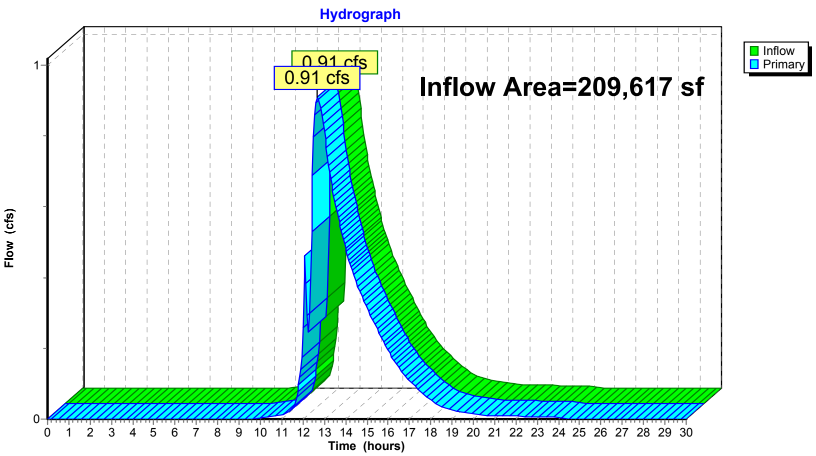


Summary for Link SP-2: Study Point #2

Inflow Area = 209,617 sf, 55.29% Impervious, Inflow Depth = 0.47" for 2-Year event
Inflow = 0.91 cfs @ 12.69 hrs, Volume= 8,242 cf
Primary = 0.91 cfs @ 12.69 hrs, Volume= 8,242 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest
Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=56 Runoff=1.49 cfs 5,586 cf

Subcatchment P-10: Building 2/3 - South Parking
Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=3.08"
Tc=6.0 min CN=81 Runoff=2.64 cfs 8,354 cf

Subcatchment P-11: Building 1 - Southeast
Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=2.90"
Tc=6.0 min CN=79 Runoff=0.96 cfs 3,047 cf

Subcatchment P-2A: Building 2 Parking - North
Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=89 Runoff=2.41 cfs 7,870 cf

Subcatchment P-2B: Building 2 Parking - North
Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=85 Runoff=1.80 cfs 5,753 cf

Subcatchment P-3: Building 1 Parking - East
Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=86 Runoff=2.44 cfs 7,845 cf

Subcatchment P-4: Building 3 - West
Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=1.44"
Flow Length=322' Tc=8.6 min CN=61 Runoff=0.51 cfs 1,946 cf

Subcatchment P-5A: Building 3 Roof - North
Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=98 Runoff=1.49 cfs 5,393 cf

Subcatchment P-5B: Building 3 Roof - South
Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=98 Runoff=1.57 cfs 5,695 cf

Subcatchment P-6A: Building 2 Roof - North
Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=98 Runoff=1.62 cfs 5,887 cf

Subcatchment P-6B: Building 2 Roof - South
Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=98 Runoff=1.63 cfs 5,892 cf

Subcatchment P-7: Building 1
Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=4.87"
Tc=6.0 min CN=98 Runoff=2.50 cfs 9,056 cf

Subcatchment P-8: Pool Courtyard
Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=2.54"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=1.24 cfs 5,908 cf

Subcatchment P-9A: Area Drains - Courtyard
Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=1.65"
Tc=6.0 min UI Adjusted CN=64 Runoff=0.75 cfs 2,498 cf

Subcatchment P-9B: Building 1/2 Courtyard
Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=2.28"
Flow Length=317' Tc=12.7 min CN=72 Runoff=2.08 cfs 8,194 cf

Pond 2P: CB2
Peak Elev=140.85' Inflow=2.64 cfs 8,354 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=2.64 cfs 8,354 cf

Pond AD11: AD
Peak Elev=135.90' Inflow=0.75 cfs 2,498 cf
8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=0.75 cfs 2,498 cf

Pond AD5: AD
Peak Elev=140.67' Inflow=1.24 cfs 5,908 cf
12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=1.24 cfs 5,908 cf

Pond CB11: CB
Peak Elev=141.41' Inflow=0.51 cfs 1,946 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=0.51 cfs 1,946 cf

Pond CB12: CB
Peak Elev=140.30' Inflow=0.51 cfs 1,946 cf
12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=0.51 cfs 1,946 cf

Pond CB4: CB
Peak Elev=128.00' Inflow=2.41 cfs 7,870 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=2.41 cfs 7,870 cf

Pond CB5: CB
Peak Elev=129.21' Inflow=1.80 cfs 5,753 cf
12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=1.80 cfs 5,753 cf

Pond CB7: CB
Peak Elev=127.12' Inflow=2.44 cfs 7,845 cf
12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=2.44 cfs 7,845 cf

Pond CB8: CB
Peak Elev=127.59' Inflow=2.08 cfs 8,194 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=2.08 cfs 8,194 cf

Pond CDS1: CDS
Peak Elev=140.67' Inflow=2.64 cfs 8,354 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=2.64 cfs 8,354 cf

Pond CDS2: CDS
Peak Elev=130.95' Inflow=6.44 cfs 21,514 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=6.44 cfs 21,514 cf

Pond CDS3: CDS WQU
Peak Elev=126.62' Inflow=2.44 cfs 7,845 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=2.44 cfs 7,845 cf

Pond CDS4: CDS WQU
Peak Elev=125.86' Inflow=2.08 cfs 8,194 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=2.08 cfs 8,194 cf

Pond DMH2A: DMH
Peak Elev=137.71' Inflow=0.51 cfs 1,946 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=0.51 cfs 1,946 cf

Pond DMH3: DMH
Peak Elev=134.48' Inflow=2.24 cfs 7,891 cf
15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=2.24 cfs 7,891 cf

Pond DMH5: DMH
Peak Elev=125.98' Inflow=2.44 cfs 7,845 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=2.44 cfs 7,845 cf

Pond DMH6: DMH
Peak Elev=126.92' Inflow=2.08 cfs 8,194 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=2.08 cfs 8,194 cf

Pond DMH8: DMH
Peak Elev=128.14' Inflow=4.03 cfs 13,644 cf
18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=4.03 cfs 13,644 cf

Pond UIS1: UIS#1
Peak Elev=137.90' Storage=8,085 cf Inflow=6.96 cfs 27,795 cf
Discarded=0.09 cfs 8,340 cf Primary=3.85 cfs 16,515 cf Outflow=3.95 cfs 24,855 cf

Pond UIS2: UIS #2
Peak Elev=128.37' Storage=9,379 cf Inflow=8.07 cfs 27,400 cf
Discarded=0.11 cfs 9,674 cf Primary=3.79 cfs 14,485 cf Outflow=3.90 cfs 24,159 cf

Pond UIS3: MC-3500
Peak Elev=127.16' Storage=8,773 cf Inflow=6.57 cfs 25,095 cf
Discarded=0.11 cfs 9,366 cf Primary=2.83 cfs 12,476 cf Outflow=2.94 cfs 21,841 cf

Link SP-1: Study Point #1
Inflow=4.78 cfs 20,071 cf
Primary=4.78 cfs 20,071 cf

Link SP-2: Study Point #2
Inflow=7.04 cfs 32,038 cf
Primary=7.04 cfs 32,038 cf

Total Runoff Area = 360,797 sf Runoff Volume = 88,925 cf Average Runoff Depth = 2.96"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

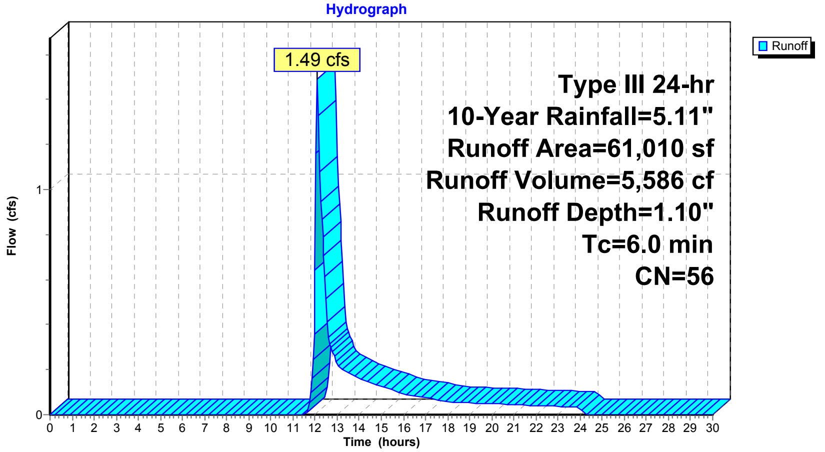
Runoff = 1.49 cfs @ 12.11 hrs, Volume= 5,586 cf, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

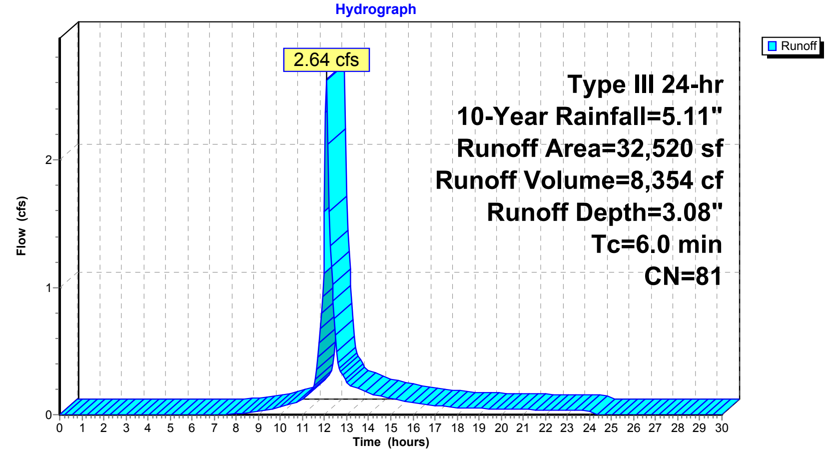
Runoff = 2.64 cfs @ 12.09 hrs, Volume= 8,354 cf, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

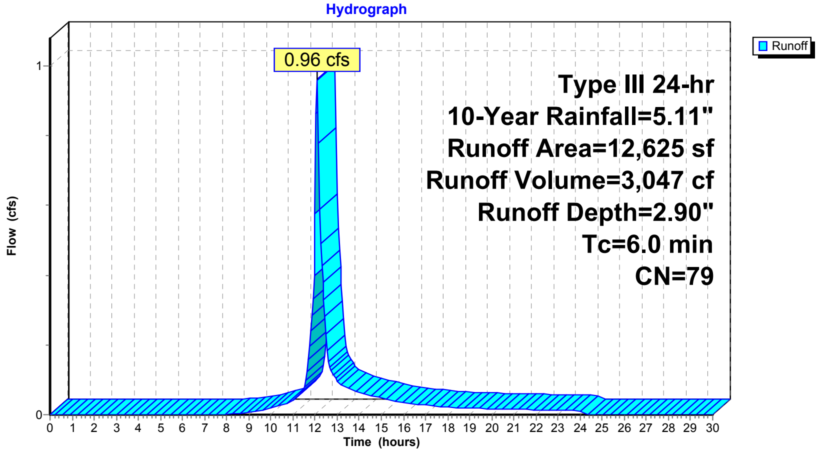
Runoff = 0.96 cfs @ 12.09 hrs, Volume= 3,047 cf, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

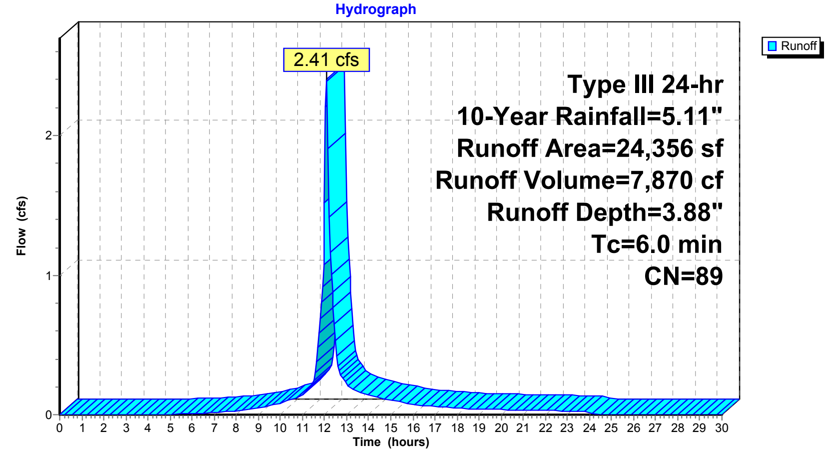
Runoff = 2.41 cfs @ 12.09 hrs, Volume= 7,870 cf, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

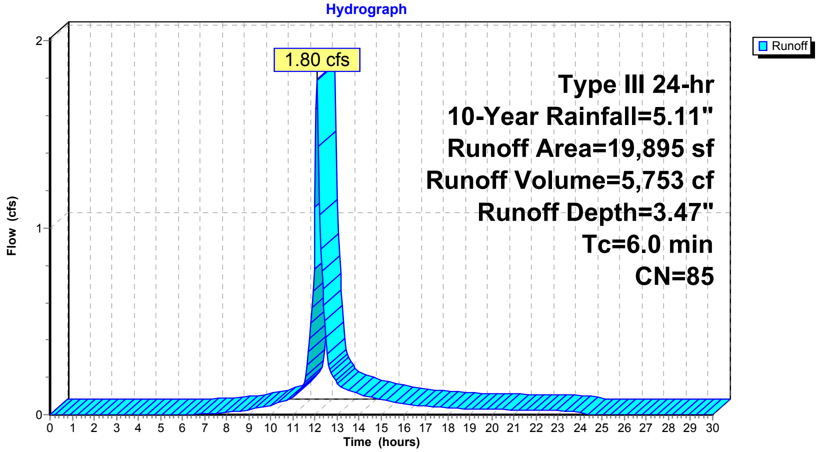
Runoff = 1.80 cfs @ 12.09 hrs, Volume= 5,753 cf, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

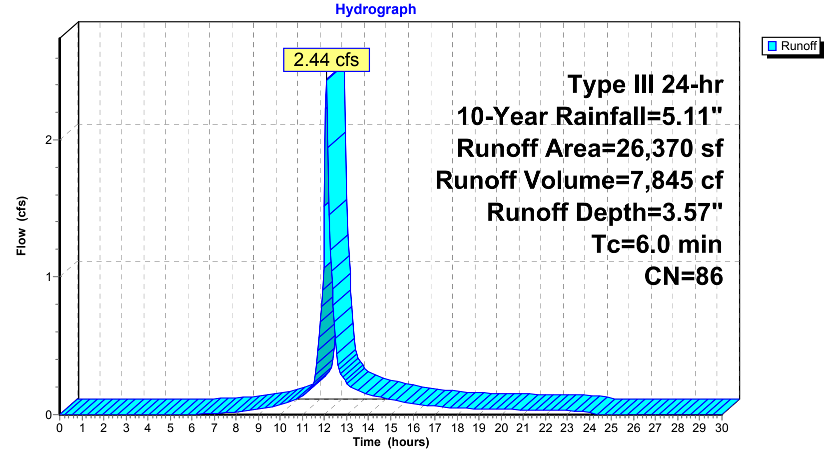
Runoff = 2.44 cfs @ 12.09 hrs, Volume= 7,845 cf, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

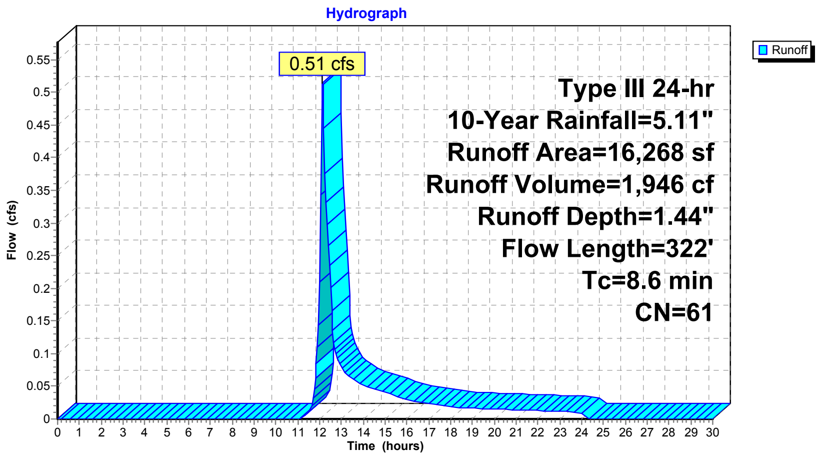
Runoff = 0.51 cfs @ 12.14 hrs, Volume= 1,946 cf, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

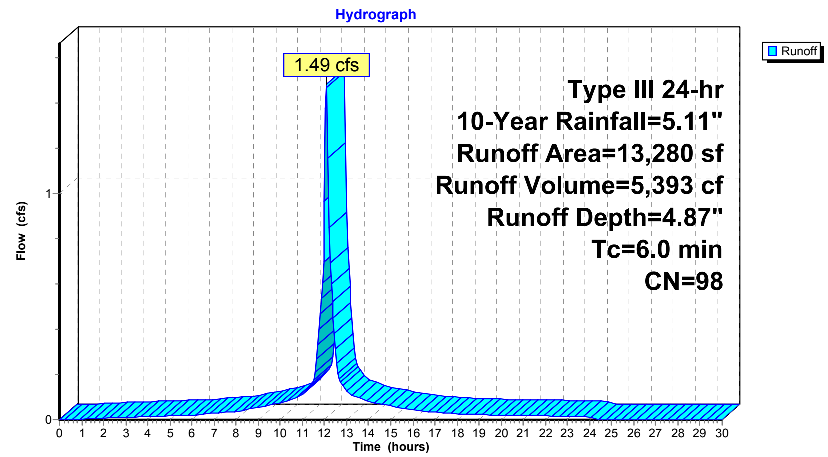
Runoff = 1.49 cfs @ 12.09 hrs, Volume= 5,393 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

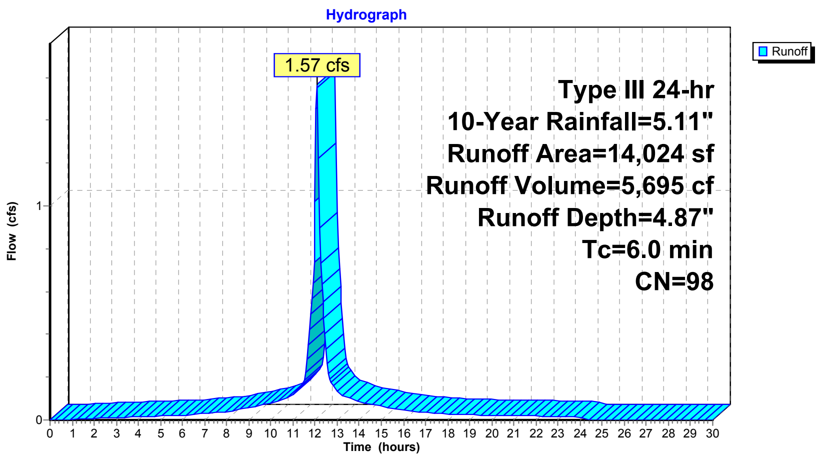
Runoff = 1.57 cfs @ 12.09 hrs, Volume= 5,695 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

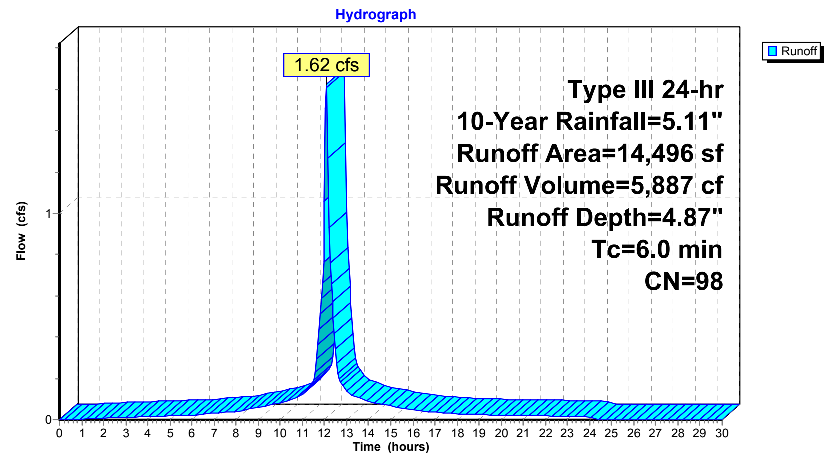
Runoff = 1.62 cfs @ 12.09 hrs, Volume= 5,887 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

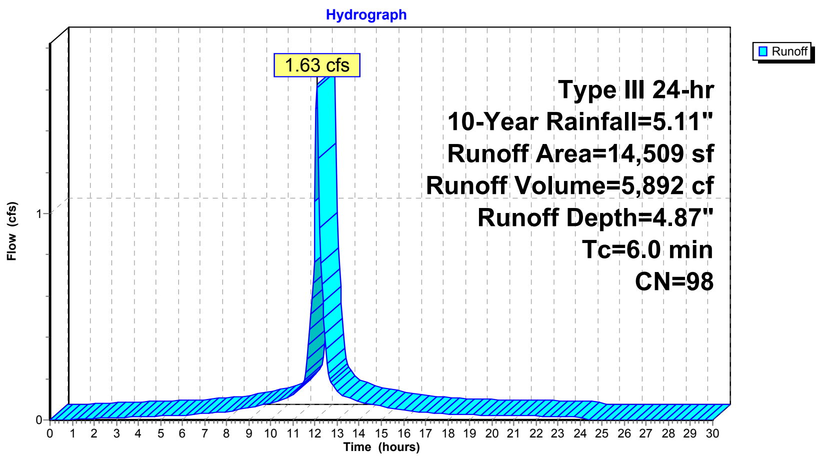
Runoff = 1.63 cfs @ 12.09 hrs, Volume= 5,892 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

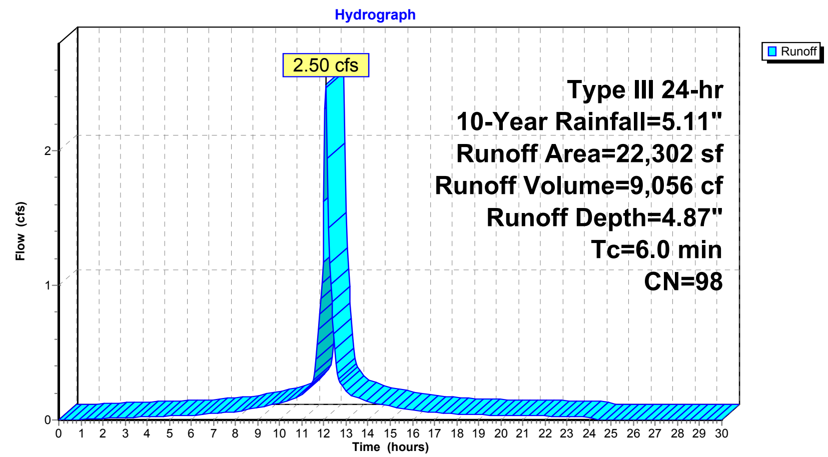
Runoff = 2.50 cfs @ 12.09 hrs, Volume= 9,056 cf, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

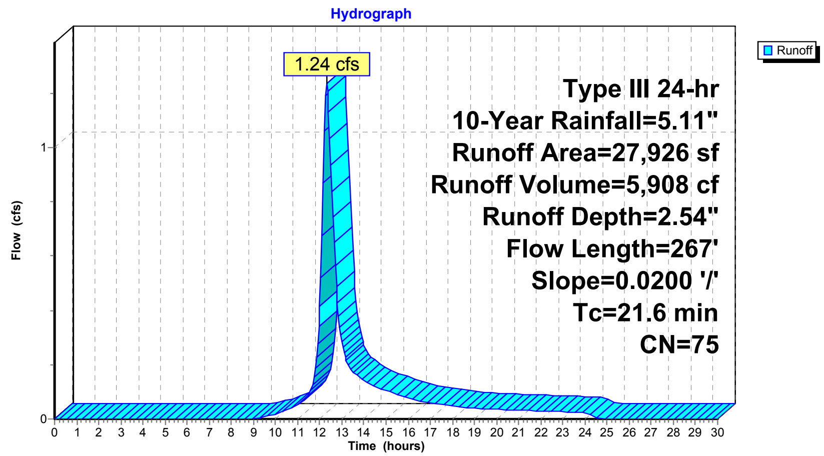
Runoff = 1.24 cfs @ 12.31 hrs, Volume= 5,908 cf, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

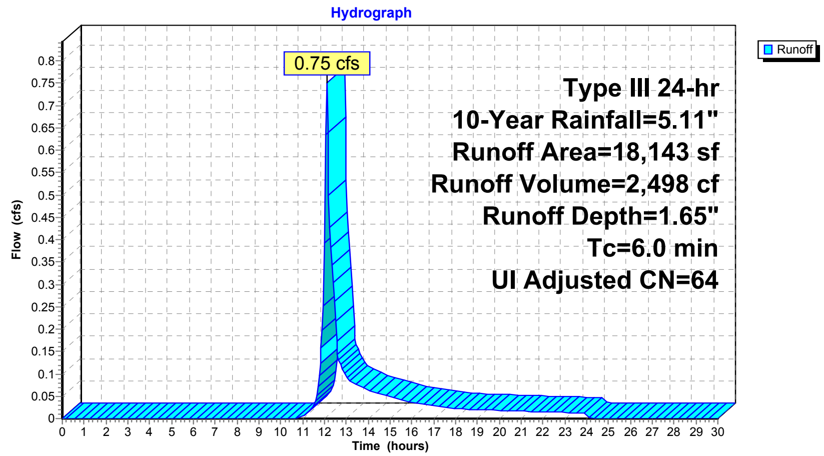
Runoff = 0.75 cfs @ 12.10 hrs, Volume= 2,498 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

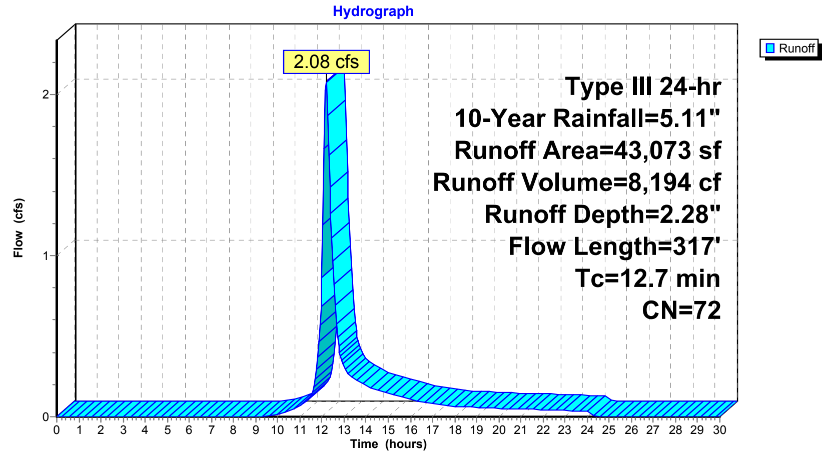
Runoff = 2.08 cfs @ 12.18 hrs, Volume= 8,194 cf, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.11"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

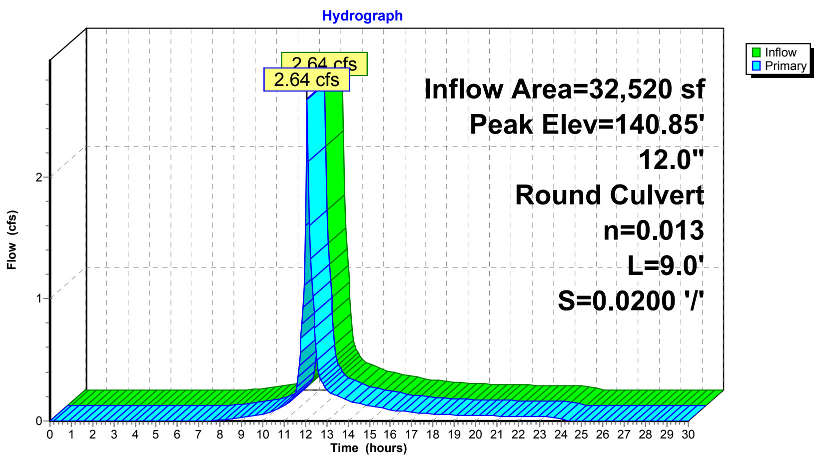
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 3.08" for 10-Year event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 8,354 cf
Outflow = 2.64 cfs @ 12.09 hrs, Volume= 8,354 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.64 cfs @ 12.09 hrs, Volume= 8,354 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.85' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.59 cfs @ 12.09 hrs HW=140.82' (Free Discharge)
└─1=Culvert (Inlet Controls 2.59 cfs @ 3.30 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

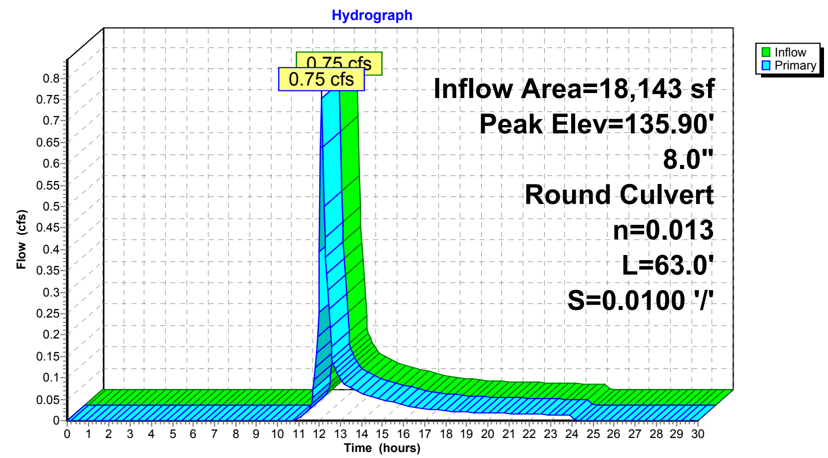
Inflow Area = 18,143 sf, 16.94% Impervious, Inflow Depth = 1.65" for 10-Year event
Inflow = 0.75 cfs @ 12.10 hrs, Volume= 2,498 cf
Outflow = 0.75 cfs @ 12.10 hrs, Volume= 2,498 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.10 hrs, Volume= 2,498 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 135.90' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.75 cfs @ 12.10 hrs HW=135.90' (Free Discharge)
└─1=Culvert (Inlet Controls 0.75 cfs @ 2.17 fps)

Pond AD11: AD



Summary for Pond AD5: AD

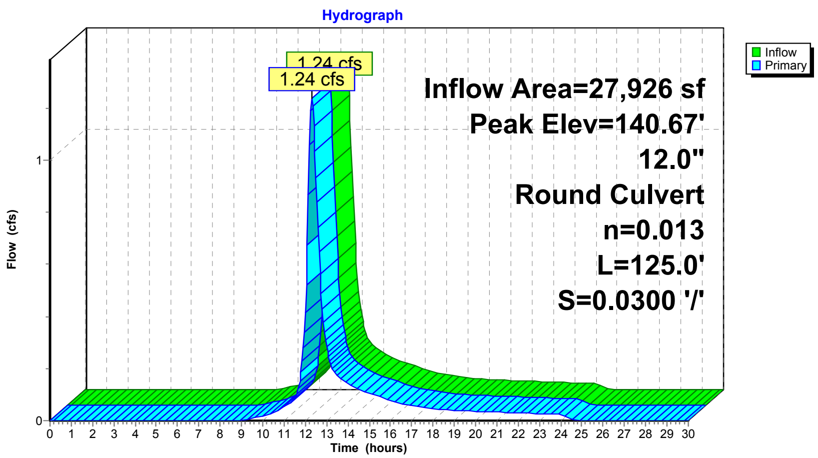
Inflow Area =	27,926 sf,	36.53% Impervious,	Inflow Depth = 2.54"	for 10-Year event
Inflow =	1.24 cfs @	12.31 hrs, Volume=	5,908 cf	
Outflow =	1.24 cfs @	12.31 hrs, Volume=	5,908 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.24 cfs @	12.31 hrs, Volume=	5,908 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.67' @ 12.31 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.23 cfs @ 12.31 hrs HW=140.67' (Free Discharge)
└1=Culvert (Inlet Controls 1.23 cfs @ 2.20 fps)

Pond AD5: AD



Summary for Pond CB11: CB

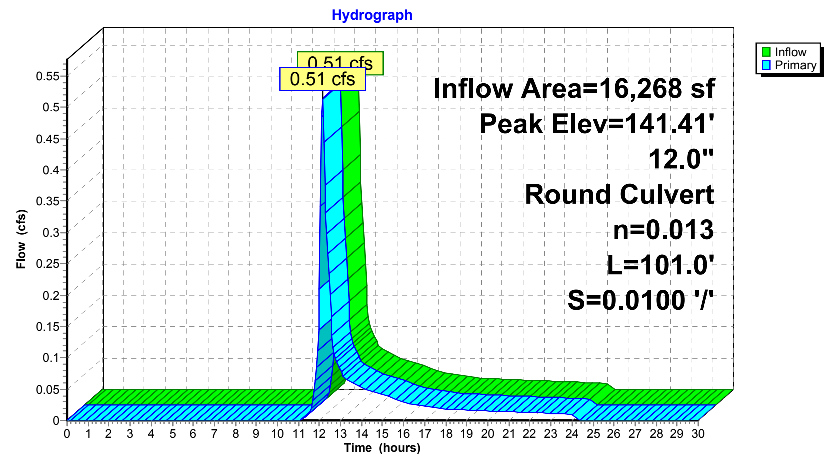
Inflow Area =	16,268 sf,	0.00% Impervious,	Inflow Depth = 1.44"	for 10-Year event
Inflow =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf	
Outflow =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.41' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.14 hrs HW=141.40' (Free Discharge)
└1=Culvert (Inlet Controls 0.51 cfs @ 1.71 fps)

Pond CB11: CB



Summary for Pond CB12: CB

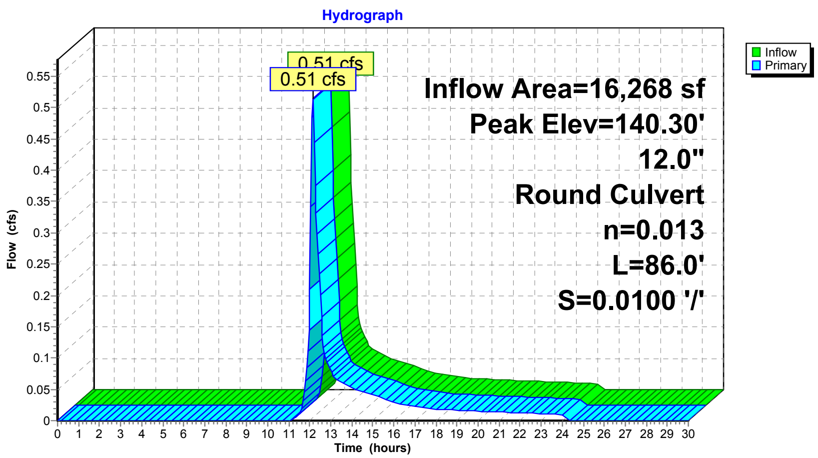
Inflow Area =	16,268 sf,	0.00% Impervious,	Inflow Depth = 1.44"	for 10-Year event
Inflow =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf	
Outflow =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.51 cfs @	12.14 hrs, Volume=	1,946 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.30' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.14 hrs HW=140.29' (Free Discharge)
└1=Culvert (Inlet Controls 0.51 cfs @ 1.71 fps)

Pond CB12: CB



Summary for Pond CB4: CB

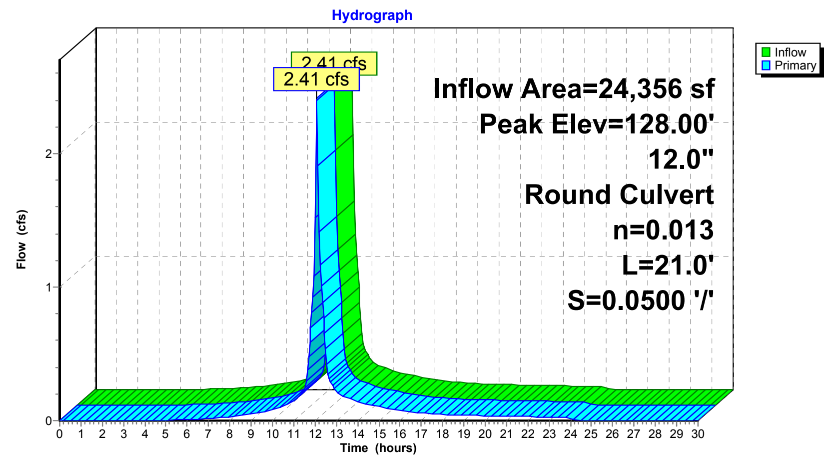
Inflow Area =	24,356 sf,	75.32% Impervious,	Inflow Depth = 3.88"	for 10-Year event
Inflow =	2.41 cfs @	12.09 hrs, Volume=	7,870 cf	
Outflow =	2.41 cfs @	12.09 hrs, Volume=	7,870 cf, Atten= 0%, Lag= 0.0 min	
Primary =	2.41 cfs @	12.09 hrs, Volume=	7,870 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.00' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.35 cfs @ 12.09 hrs HW=127.97' (Free Discharge)
└1=Culvert (Inlet Controls 2.35 cfs @ 3.00 fps)

Pond CB4: CB



Summary for Pond CB5: CB

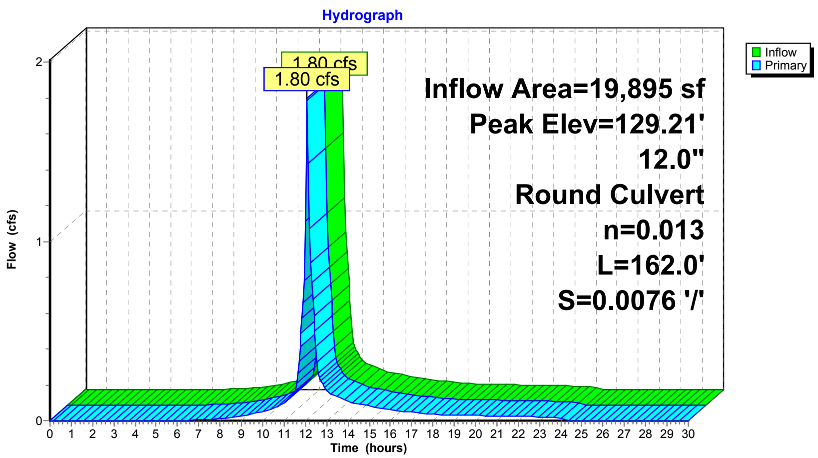
Inflow Area =	19,895 sf,	64.33% Impervious,	Inflow Depth = 3.47"	for 10-Year event		
Inflow =	1.80 cfs @	12.09 hrs,	Volume=	5,753 cf		
Outflow =	1.80 cfs @	12.09 hrs,	Volume=	5,753 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	1.80 cfs @	12.09 hrs,	Volume=	5,753 cf		

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.21' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.76 cfs @ 12.09 hrs HW=129.20' (Free Discharge)
└─1=Culvert (Inlet Controls 1.76 cfs @ 2.48 fps)

Pond CB5: CB



Summary for Pond CB7: CB

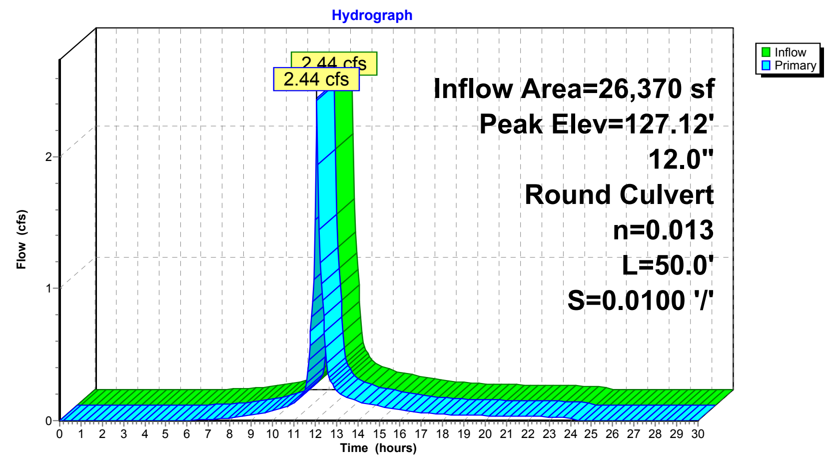
Inflow Area =	26,370 sf,	67.15% Impervious,	Inflow Depth = 3.57"	for 10-Year event		
Inflow =	2.44 cfs @	12.09 hrs,	Volume=	7,845 cf		
Outflow =	2.44 cfs @	12.09 hrs,	Volume=	7,845 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	2.44 cfs @	12.09 hrs,	Volume=	7,845 cf		

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.12' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.09 hrs HW=127.09' (Free Discharge)
└─1=Culvert (Inlet Controls 2.39 cfs @ 3.04 fps)

Pond CB7: CB



Summary for Pond CB8: CB

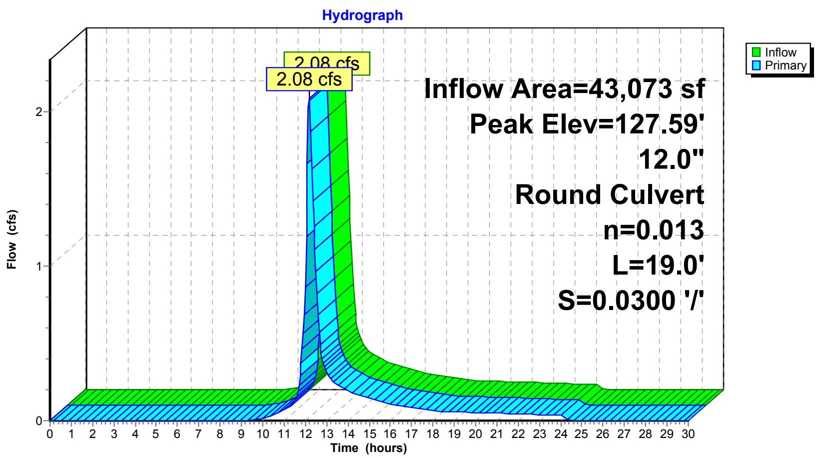
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 2.28"	for 10-Year event	
Inflow =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf	
Outflow =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf,	Atten= 0%, Lag= 0.0 min
Primary =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.59' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.06 cfs @ 12.18 hrs HW=127.58' (Free Discharge)
└─1=Culvert (Inlet Controls 2.06 cfs @ 2.64 fps)

Pond CB8: CB



Summary for Pond CDS1: CDS

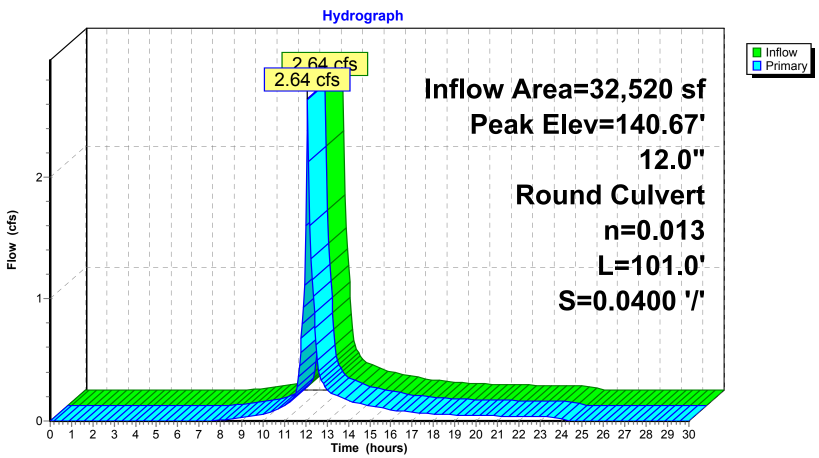
Inflow Area =	32,520 sf, 54.92% Impervious,	Inflow Depth = 3.08"	for 10-Year event	
Inflow =	2.64 cfs @	12.09 hrs, Volume=	8,354 cf	
Outflow =	2.64 cfs @	12.09 hrs, Volume=	8,354 cf,	Atten= 0%, Lag= 0.0 min
Primary =	2.64 cfs @	12.09 hrs, Volume=	8,354 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.67' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.59 cfs @ 12.09 hrs HW=140.64' (Free Discharge)
└─1=Culvert (Inlet Controls 2.59 cfs @ 3.30 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

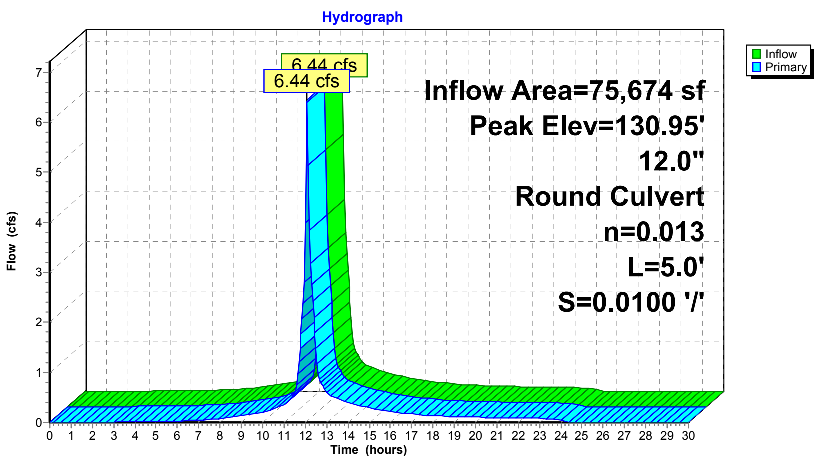
Inflow Area =	75,674 sf, 62.77% Impervious, Inflow Depth = 3.41" for 10-Year event		
Inflow =	6.44 cfs @ 12.09 hrs, Volume=	21,514 cf	
Outflow =	6.44 cfs @ 12.09 hrs, Volume=	21,514 cf, Atten= 0%, Lag= 0.0 min	
Primary =	6.44 cfs @ 12.09 hrs, Volume=	21,514 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 130.95' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.30 cfs @ 12.09 hrs HW=130.76' (Free Discharge)
└─1=Culvert (Inlet Controls 6.30 cfs @ 8.02 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

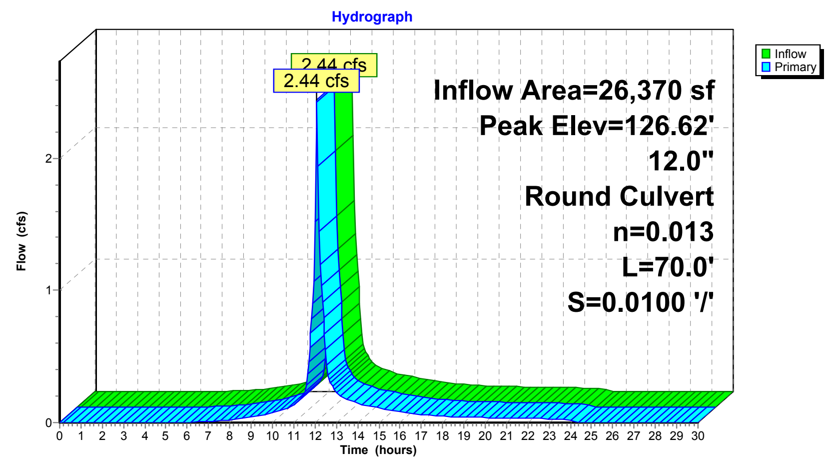
Inflow Area =	26,370 sf, 67.15% Impervious, Inflow Depth = 3.57" for 10-Year event		
Inflow =	2.44 cfs @ 12.09 hrs, Volume=	7,845 cf	
Outflow =	2.44 cfs @ 12.09 hrs, Volume=	7,845 cf, Atten= 0%, Lag= 0.0 min	
Primary =	2.44 cfs @ 12.09 hrs, Volume=	7,845 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.62' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.09 hrs HW=126.59' (Free Discharge)
└─1=Culvert (Inlet Controls 2.39 cfs @ 3.04 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

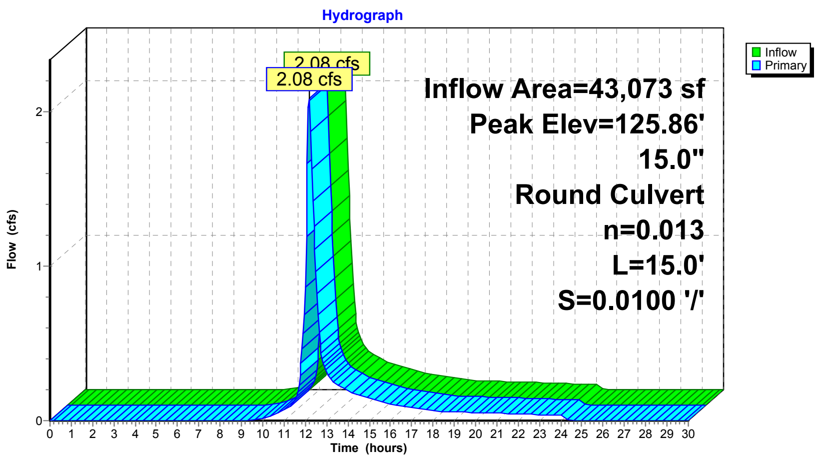
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 2.28" for 10-Year event
Inflow = 2.08 cfs @ 12.18 hrs, Volume= 8,194 cf
Outflow = 2.08 cfs @ 12.18 hrs, Volume= 8,194 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.08 cfs @ 12.18 hrs, Volume= 8,194 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.86' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.06 cfs @ 12.18 hrs HW=125.86' (Free Discharge)
└1=Culvert (Barrel Controls 2.06 cfs @ 3.23 fps)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

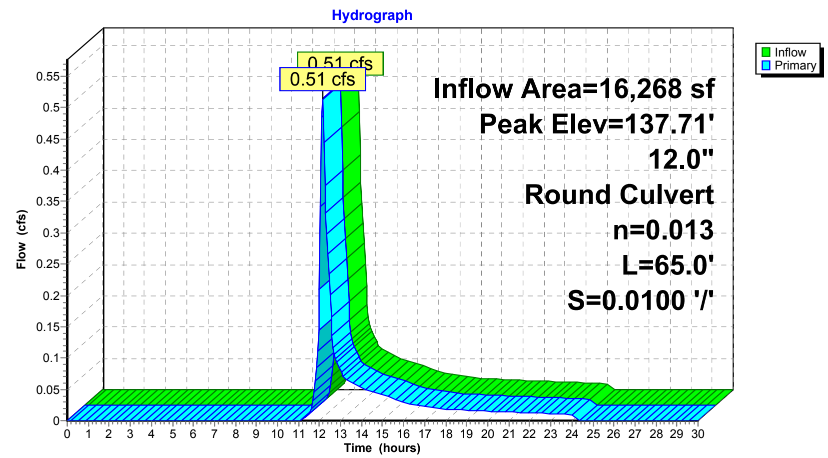
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 1.44" for 10-Year event
Inflow = 0.51 cfs @ 12.14 hrs, Volume= 1,946 cf
Outflow = 0.51 cfs @ 12.14 hrs, Volume= 1,946 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.51 cfs @ 12.14 hrs, Volume= 1,946 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.71' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.14 hrs HW=137.70' (Free Discharge)
└1=Culvert (Inlet Controls 0.51 cfs @ 1.71 fps)

Pond DMH2A: DMH



Summary for Pond DMH3: DMH

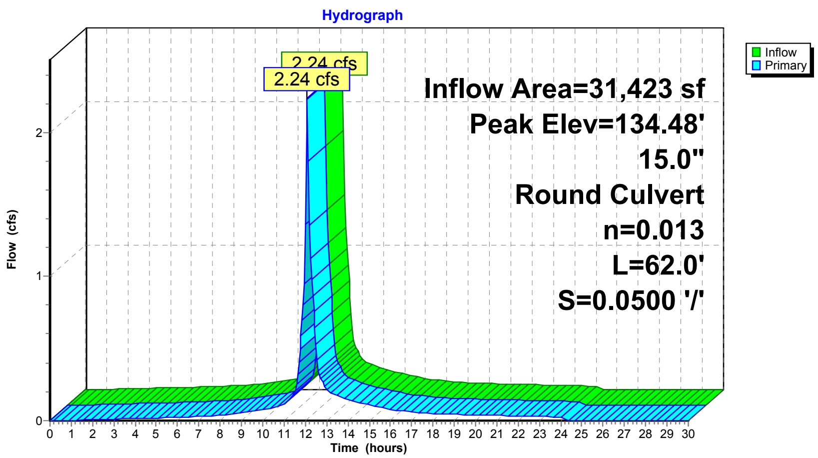
Inflow Area = 31,423 sf, 52.04% Impervious, Inflow Depth = 3.01" for 10-Year event
Inflow = 2.24 cfs @ 12.09 hrs, Volume= 7,891 cf
Outflow = 2.24 cfs @ 12.09 hrs, Volume= 7,891 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.24 cfs @ 12.09 hrs, Volume= 7,891 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.48' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.19 cfs @ 12.09 hrs HW=134.47' (Free Discharge)
└1=Culvert (Inlet Controls 2.19 cfs @ 2.47 fps)

Pond DMH3: DMH



Summary for Pond DMH5: DMH

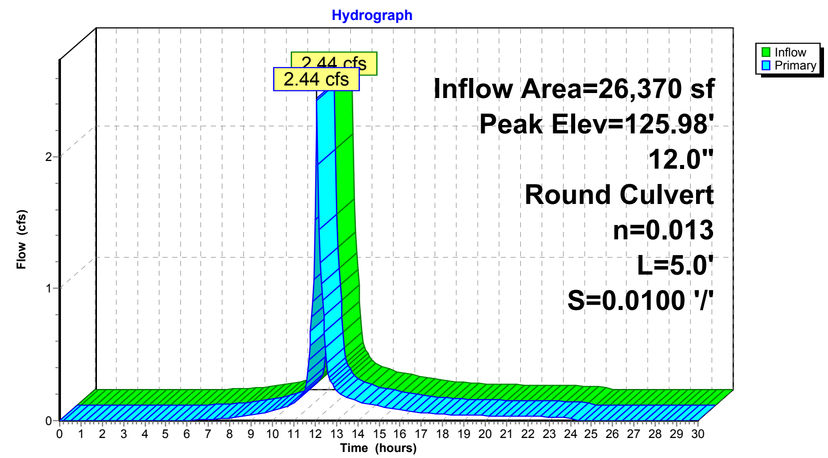
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 3.57" for 10-Year event
Inflow = 2.44 cfs @ 12.09 hrs, Volume= 7,845 cf
Outflow = 2.44 cfs @ 12.09 hrs, Volume= 7,845 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.44 cfs @ 12.09 hrs, Volume= 7,845 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 125.98' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.09 hrs HW=125.96' (Free Discharge)
└1=Culvert (Barrel Controls 2.39 cfs @ 3.29 fps)

Pond DMH5: DMH



Summary for Pond DMH6: DMH

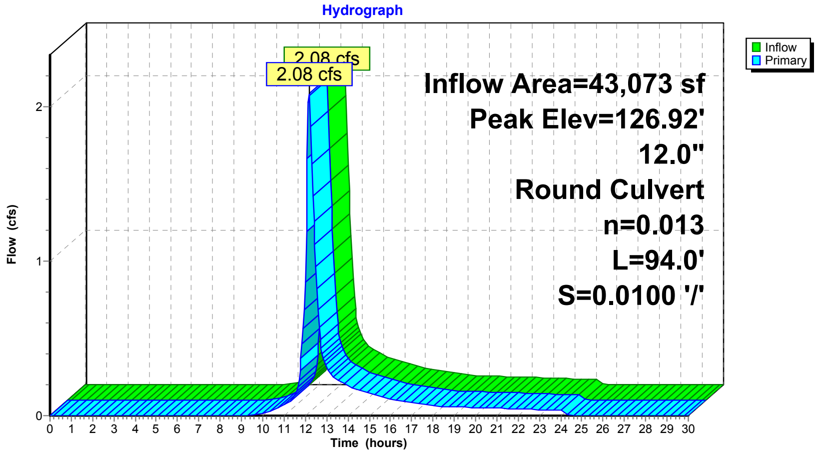
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 2.28"	for 10-Year event	
Inflow =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf	
Outflow =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf,	Atten= 0%, Lag= 0.0 min
Primary =	2.08 cfs @	12.18 hrs, Volume=	8,194 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.92' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.06 cfs @ 12.18 hrs HW=126.91' (Free Discharge)
└1=Culvert (Inlet Controls 2.06 cfs @ 2.64 fps)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

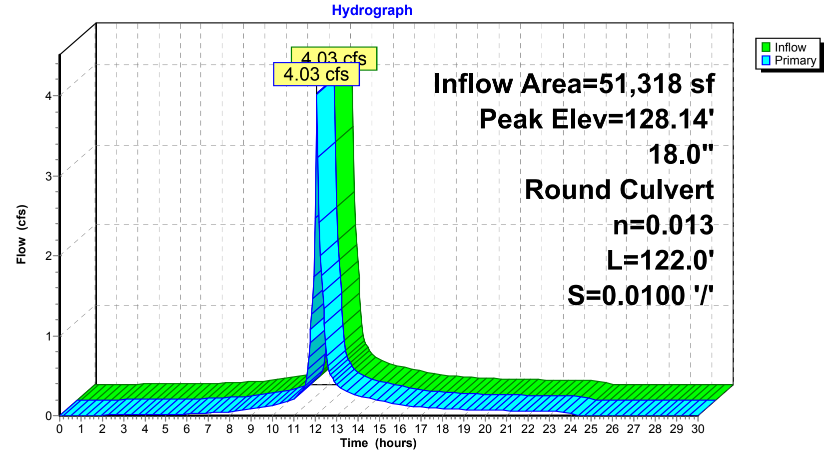
Inflow Area =	51,318 sf, 56.81% Impervious,	Inflow Depth = 3.19"	for 10-Year event	
Inflow =	4.03 cfs @	12.09 hrs, Volume=	13,644 cf	
Outflow =	4.03 cfs @	12.09 hrs, Volume=	13,644 cf,	Atten= 0%, Lag= 0.0 min
Primary =	4.03 cfs @	12.09 hrs, Volume=	13,644 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.14' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.95 cfs @ 12.09 hrs HW=128.13' (Free Discharge)
└1=Culvert (Inlet Controls 3.95 cfs @ 2.83 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

Inflow Area = 105,247 sf, 53.77% Impervious, Inflow Depth = 3.17" for 10-Year event
Inflow = 6.96 cfs @ 12.10 hrs, Volume= 27,795 cf
Outflow = 3.95 cfs @ 12.31 hrs, Volume= 24,855 cf, Atten= 43%, Lag= 12.9 min
Discarded = 0.09 cfs @ 8.40 hrs, Volume= 8,340 cf
Primary = 3.85 cfs @ 12.31 hrs, Volume= 16,515 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.90' @ 12.31 hrs Surf.Area= 3,388 sf Storage= 8,085 cf

Plug-Flow detention time= 156.8 min calculated for 24,814 cf (89% of inflow)
Center-of-Mass det. time= 105.6 min (904.6 - 799.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A 18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 60 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 8.40 hrs HW=134.56' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.85 cfs @ 12.31 hrs HW=137.89' (Free Discharge)
└─1=15" HDPE (Passes 3.85 cfs of 6.63 cfs potential flow)
  ├─2=13" Orifice (Orifice Controls 3.85 cfs @ 4.17 fps)
  └─4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

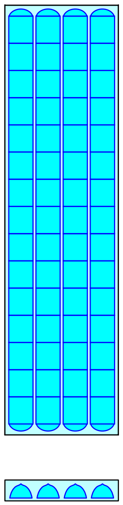
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

60 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

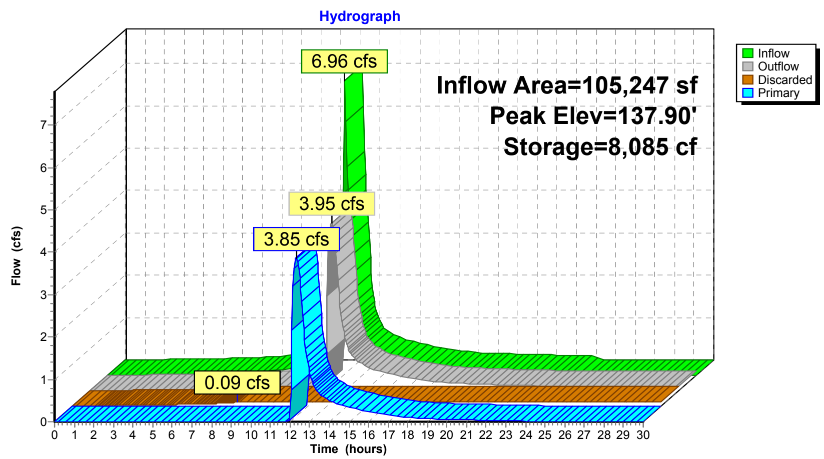
18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone



Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 3.65" for 10-Year event
Inflow = 8.07 cfs @ 12.09 hrs, Volume= 27,400 cf
Outflow = 3.90 cfs @ 12.26 hrs, Volume= 24,159 cf, Atten= 52%, Lag= 10.2 min
Discarded = 0.11 cfs @ 10.60 hrs, Volume= 9,674 cf
Primary = 3.79 cfs @ 12.26 hrs, Volume= 14,485 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 128.37' @ 12.26 hrs Surf.Area= 3,946 sf Storage= 9,379 cf

Plug-Flow detention time= 183.6 min calculated for 24,119 cf (88% of inflow)
Center-of-Mass det. time= 128.6 min (912.3 - 783.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 10.60 hrs HW=125.75' (Free Discharge)
└2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=3.78 cfs @ 12.26 hrs HW=128.37' (Free Discharge)
└1=15" HDPE (Passes 3.78 cfs of 6.59 cfs potential flow)
  └3=13" Orifice (Orifice Controls 3.78 cfs @ 4.10 fps)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

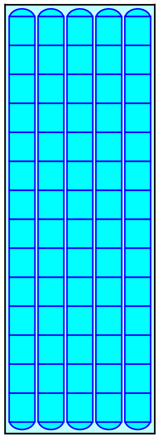
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

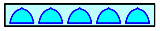
70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

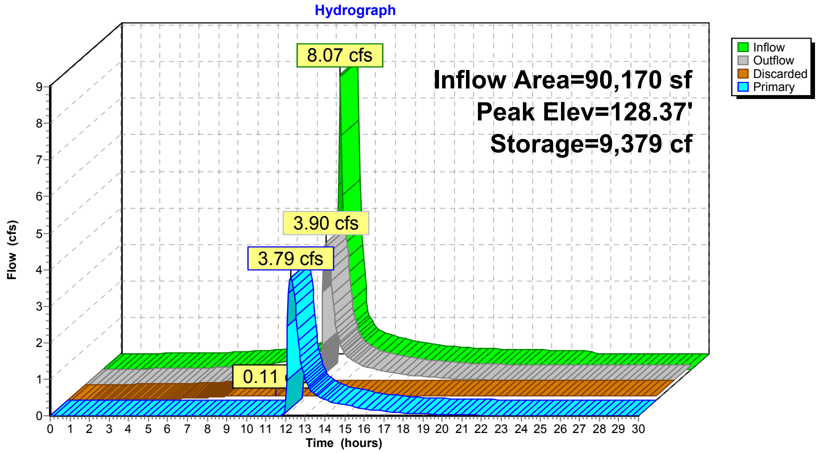
Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone





Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area =	91,745 sf, 57.86% Impervious, Inflow Depth = 3.28"	for 10-Year event
Inflow =	6.57 cfs @ 12.10 hrs, Volume=	25,095 cf
Outflow =	2.94 cfs @ 12.39 hrs, Volume=	21,841 cf, Atten= 55%, Lag= 16.9 min
Discarded =	0.11 cfs @ 8.85 hrs, Volume=	9,366 cf
Primary =	2.83 cfs @ 12.39 hrs, Volume=	12,476 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.16' @ 12.39 hrs Surf.Area= 3,934 sf Storage= 8,773 cf

Plug-Flow detention time= 195.9 min calculated for 21,805 cf (87% of inflow)
Center-of-Mass det. time= 136.9 min (934.7 - 797.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A
			21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			70 Chambers in 5 Rows
			Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 8.85 hrs HW=124.06' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=2.83 cfs @ 12.39 hrs HW=127.16' (Free Discharge)
└1=15" HDPE (Passes 2.83 cfs of 6.23 cfs potential flow)
  └2=12" Orifice (Orifice Controls 2.83 cfs @ 3.60 fps)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

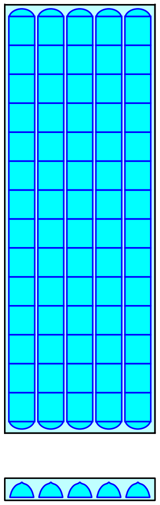
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

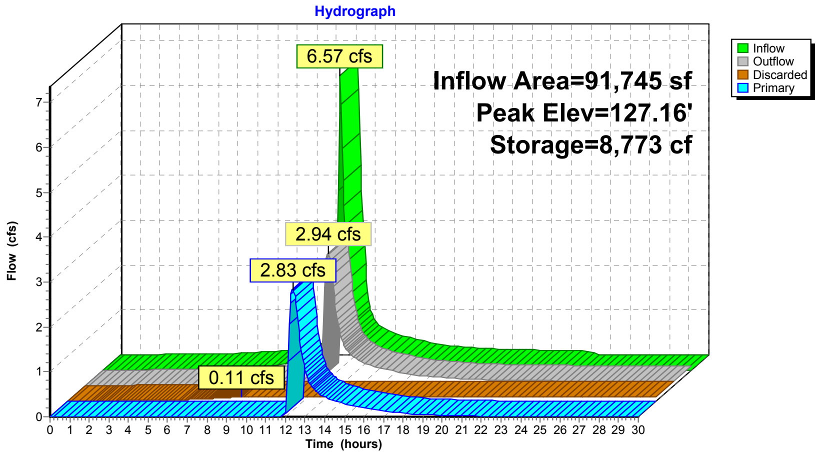
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS3: MC-3500

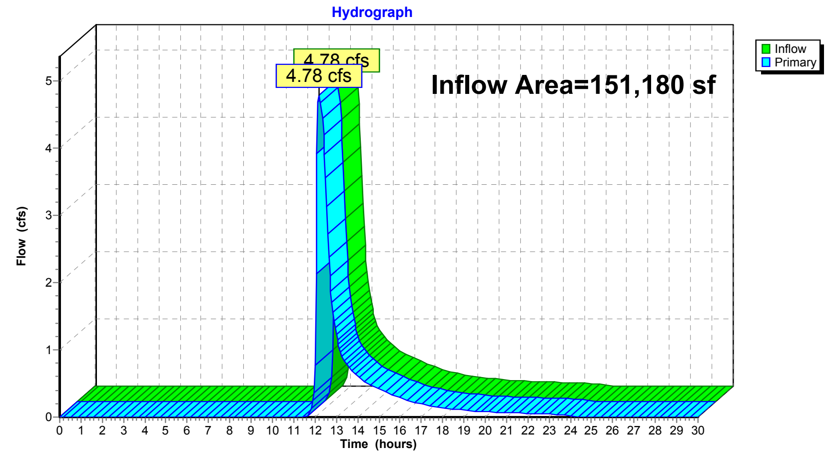


Summary for Link SP-1: Study Point #1

Inflow Area = 151,180 sf, 41.01% Impervious, Inflow Depth = 1.59" for 10-Year event
Inflow = 4.78 cfs @ 12.21 hrs, Volume= 20,071 cf
Primary = 4.78 cfs @ 12.21 hrs, Volume= 20,071 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

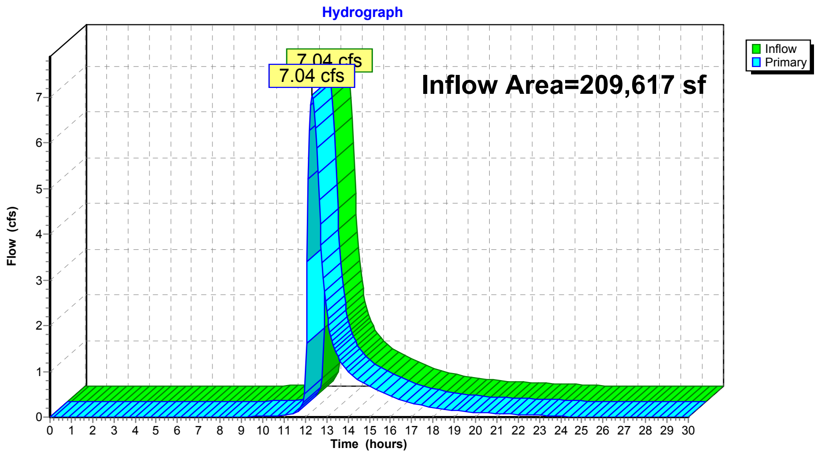


Summary for Link SP-2: Study Point #2

Inflow Area = 209,617 sf, 55.29% Impervious, Inflow Depth = 1.83" for 10-Year event
Inflow = 7.04 cfs @ 12.33 hrs, Volume= 32,038 cf
Primary = 7.04 cfs @ 12.33 hrs, Volume= 32,038 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest
Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=1.75"
Tc=6.0 min CN=56 Runoff=2.60 cfs 8,909 cf

Subcatchment P-10: Building 2/3 - South Parking
Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=4.12"
Tc=6.0 min CN=81 Runoff=3.50 cfs 11,169 cf

Subcatchment P-11: Building 1 - Southeast
Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=3.91"
Tc=6.0 min CN=79 Runoff=1.30 cfs 4,116 cf

Subcatchment P-2A: Building 2 Parking - North
Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=4.99"
Tc=6.0 min CN=89 Runoff=3.06 cfs 10,123 cf

Subcatchment P-2B: Building 2 Parking - North
Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=4.55"
Tc=6.0 min CN=85 Runoff=2.33 cfs 7,541 cf

Subcatchment P-3: Building 1 Parking - East
Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=86 Runoff=3.15 cfs 10,234 cf

Subcatchment P-4: Building 3 - West
Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=2.18"
Flow Length=322' Tc=8.6 min CN=61 Runoff=0.82 cfs 2,957 cf

Subcatchment P-5A: Building 3 Roof - North
Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=98 Runoff=1.83 cfs 6,664 cf

Subcatchment P-5B: Building 3 Roof - South
Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=98 Runoff=1.93 cfs 7,037 cf

Subcatchment P-6A: Building 2 Roof - North
Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=98 Runoff=1.99 cfs 7,274 cf

Subcatchment P-6B: Building 2 Roof - South
Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=98 Runoff=2.00 cfs 7,281 cf

Subcatchment P-7: Building 1
Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=98 Runoff=3.07 cfs 11,191 cf

Subcatchment P-8: Pool Courtyard
Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=3.50"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=1.72 cfs 8,156 cf

Subcatchment P-9A: Area Drains - Courtyard
Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=2.45"
Tc=6.0 min UI Adjusted CN=64 Runoff=1.15 cfs 3,705 cf

Subcatchment P-9B: Building 1/2 Courtyard
Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=3.21"
Flow Length=317' Tc=12.7 min CN=72 Runoff=2.95 cfs 11,512 cf

Pond 2P: CB2
Peak Elev=141.44' Inflow=3.50 cfs 11,169 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=3.50 cfs 11,169 cf

Pond AD11: AD
Peak Elev=136.33' Inflow=1.15 cfs 3,705 cf
8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=1.15 cfs 3,705 cf

Pond AD5: AD
Peak Elev=140.83' Inflow=1.72 cfs 8,156 cf
12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=1.72 cfs 8,156 cf

Pond CB11: CB
Peak Elev=141.53' Inflow=0.82 cfs 2,957 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=0.82 cfs 2,957 cf

Pond CB12: CB
Peak Elev=140.42' Inflow=0.82 cfs 2,957 cf
12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=0.82 cfs 2,957 cf

Pond CB4: CB
Peak Elev=128.40' Inflow=3.06 cfs 10,123 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=3.06 cfs 10,123 cf

Pond CB5: CB
Peak Elev=129.46' Inflow=2.33 cfs 7,541 cf
12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=2.33 cfs 7,541 cf

Pond CB7: CB
Peak Elev=127.56' Inflow=3.15 cfs 10,234 cf
12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=3.15 cfs 10,234 cf

Pond CB8: CB
Peak Elev=128.09' Inflow=2.95 cfs 11,512 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=2.95 cfs 11,512 cf

Pond CDS1: CDS
Peak Elev=141.26' Inflow=3.50 cfs 11,169 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=3.50 cfs 11,169 cf

Pond CDS2: CDS
Peak Elev=134.12' Inflow=8.36 cfs 28,033 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=8.36 cfs 28,033 cf

Pond CDS3: CDS WQU
Peak Elev=127.06' Inflow=3.15 cfs 10,234 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=3.15 cfs 10,234 cf

Pond CDS4: CDS WQU
Peak Elev=126.08' Inflow=2.95 cfs 11,512 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=2.95 cfs 11,512 cf

Pond DMH2A: DMH
Peak Elev=137.83' Inflow=0.82 cfs 2,957 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=0.82 cfs 2,957 cf

Pond DMH3: DMH
Peak Elev=134.65' Inflow=2.97 cfs 10,369 cf
15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=2.97 cfs 10,369 cf

Pond DMH5: DMH
Peak Elev=126.41' Inflow=3.15 cfs 10,234 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.15 cfs 10,234 cf

Pond DMH6: DMH
Peak Elev=127.42' Inflow=2.95 cfs 11,512 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=2.95 cfs 11,512 cf

Pond DMH8: DMH
Peak Elev=128.38' Inflow=5.30 cfs 17,910 cf
18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=5.30 cfs 17,910 cf

Pond UIS1: UIS#1
Peak Elev=138.67' Storage=9,647 cf Inflow=9.13 cfs 36,600 cf
Discarded=0.09 cfs 8,639 cf Primary=5.49 cfs 24,937 cf Outflow=5.58 cfs 33,576 cf

Pond UIS2: UIS #2
Peak Elev=129.12' Storage=11,171 cf Inflow=10.35 cfs 35,307 cf
Discarded=0.11 cfs 10,022 cf Primary=5.39 cfs 21,877 cf Outflow=5.50 cfs 31,899 cf

Pond UIS3: MC-3500
Peak Elev=127.89' Storage=10,641 cf Inflow=8.57 cfs 32,937 cf
Discarded=0.11 cfs 9,703 cf Primary=4.29 cfs 19,807 cf Outflow=4.40 cfs 29,510 cf

Link SP-1: Study Point #1
Inflow=7.33 cfs 30,786 cf
Primary=7.33 cfs 30,786 cf

Link SP-2: Study Point #2
Inflow=10.32 cfs 48,861 cf
Primary=10.32 cfs 48,861 cf

Total Runoff Area = 360,797 sf Runoff Volume = 117,869 cf Average Runoff Depth = 3.92"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

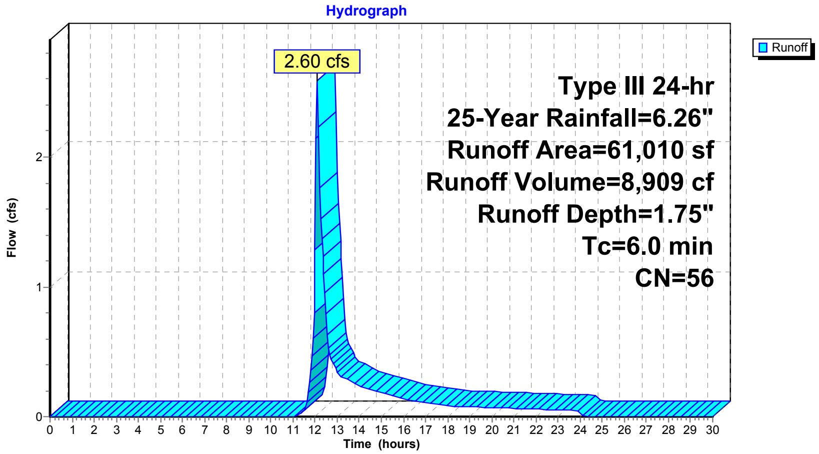
Runoff = 2.60 cfs @ 12.10 hrs, Volume= 8,909 cf, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

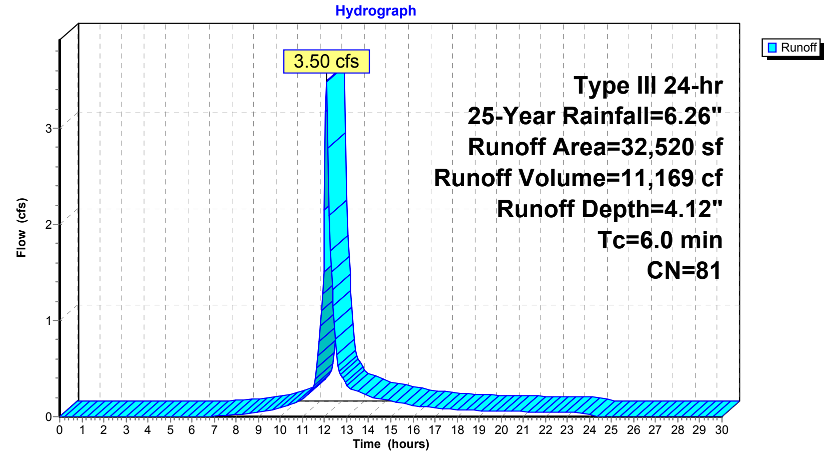
Runoff = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

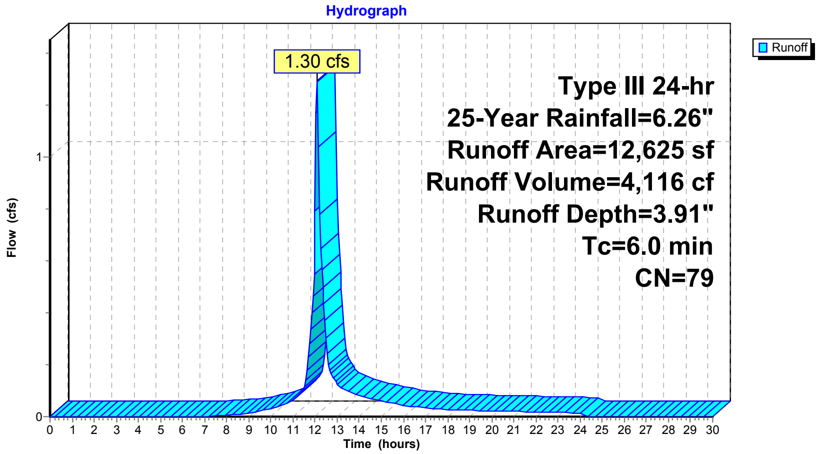
Runoff = 1.30 cfs @ 12.09 hrs, Volume= 4,116 cf, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

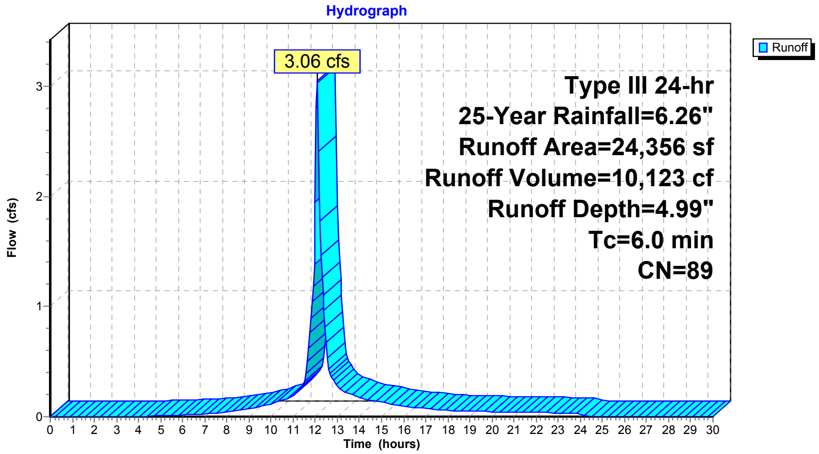
Runoff = 3.06 cfs @ 12.09 hrs, Volume= 10,123 cf, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

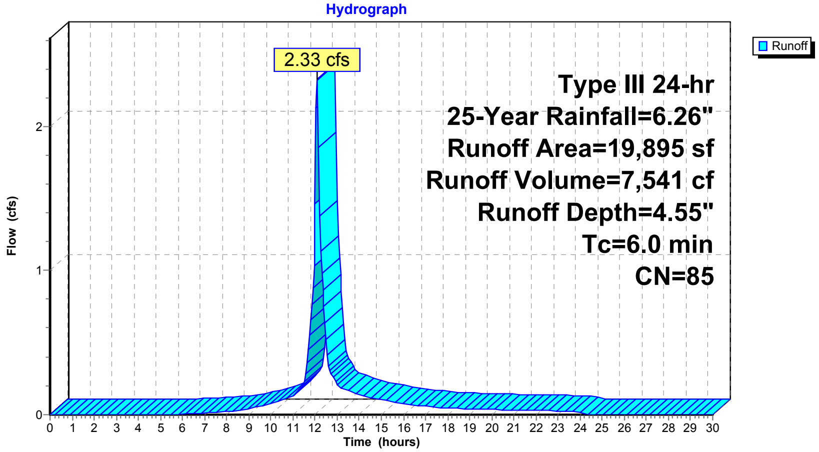
Runoff = 2.33 cfs @ 12.09 hrs, Volume= 7,541 cf, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

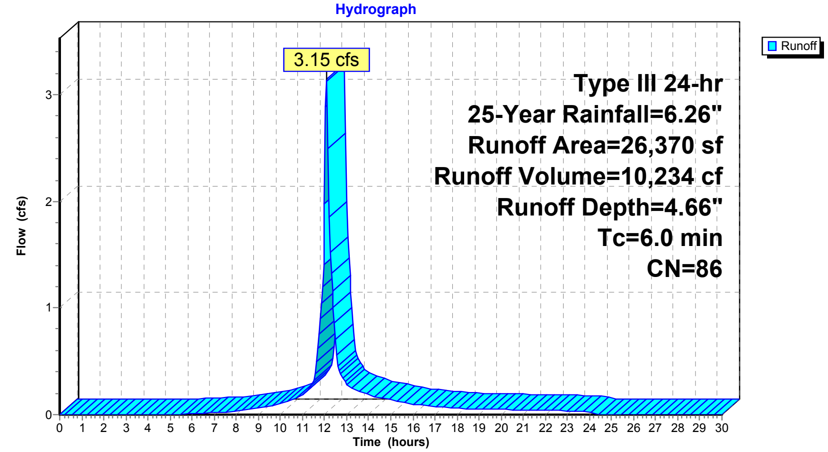
Runoff = 3.15 cfs @ 12.09 hrs, Volume= 10,234 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

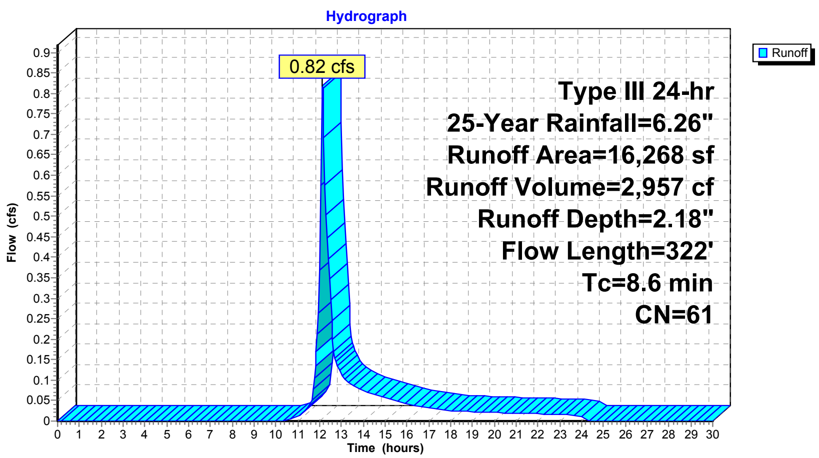
Runoff = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

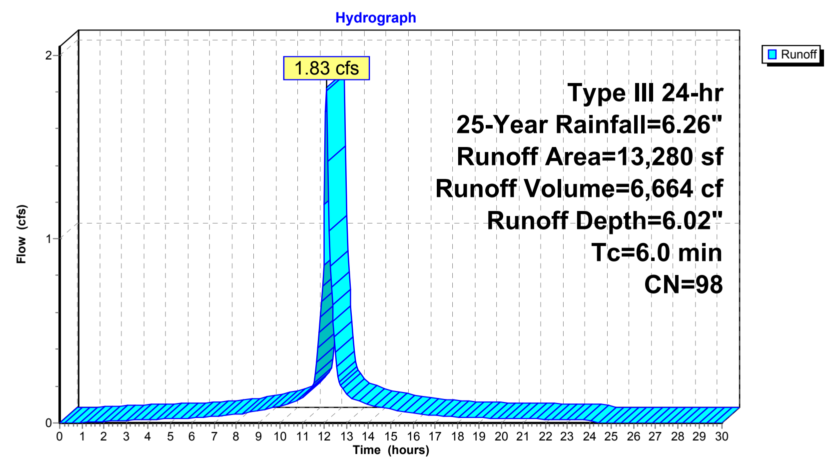
Runoff = 1.83 cfs @ 12.09 hrs, Volume= 6,664 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

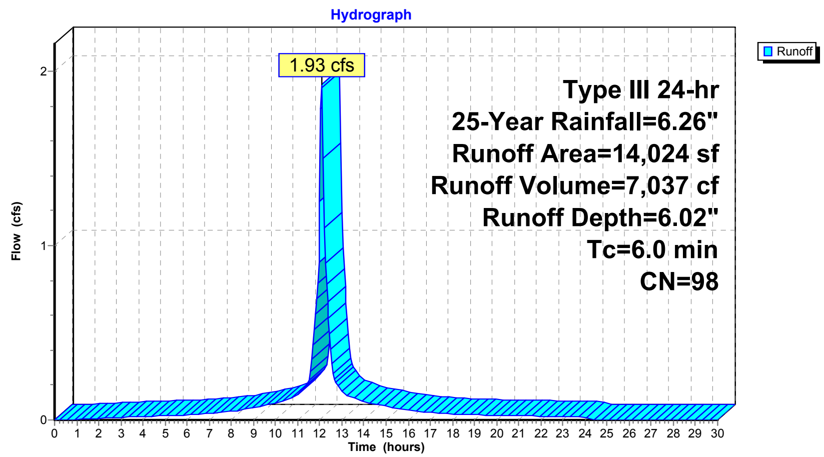
Runoff = 1.93 cfs @ 12.09 hrs, Volume= 7,037 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

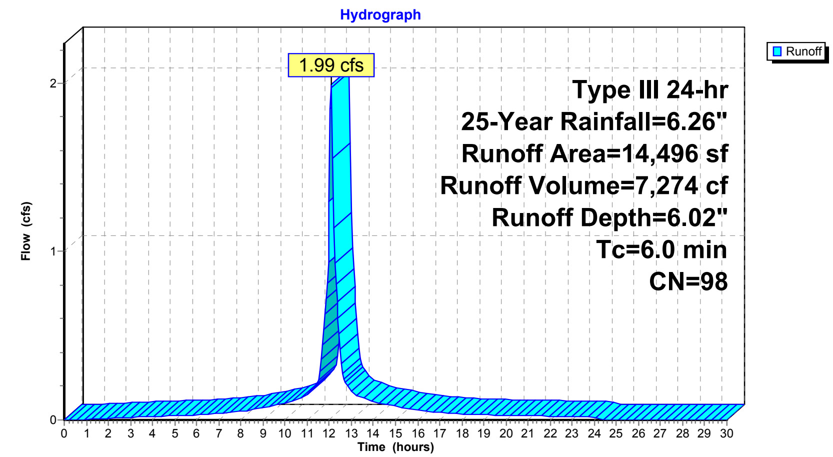
Runoff = 1.99 cfs @ 12.09 hrs, Volume= 7,274 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

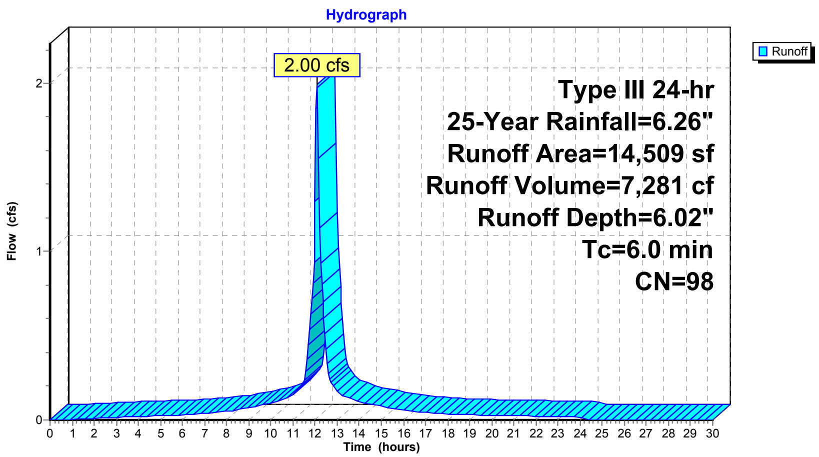
Runoff = 2.00 cfs @ 12.09 hrs, Volume= 7,281 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

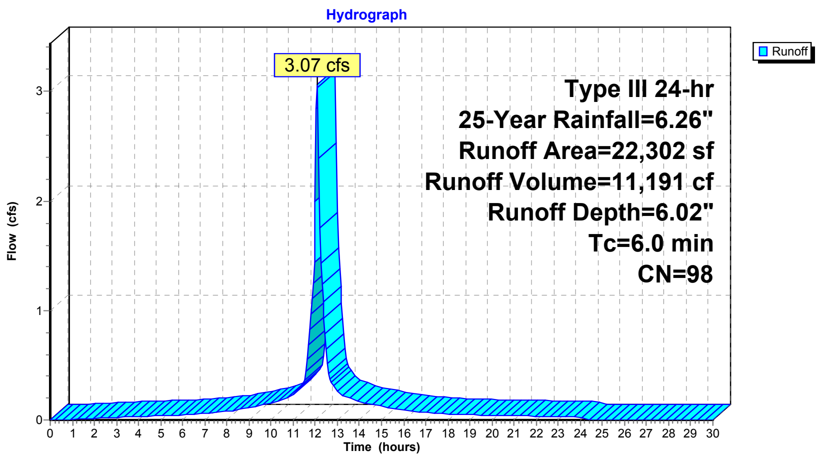
Runoff = 3.07 cfs @ 12.09 hrs, Volume= 11,191 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

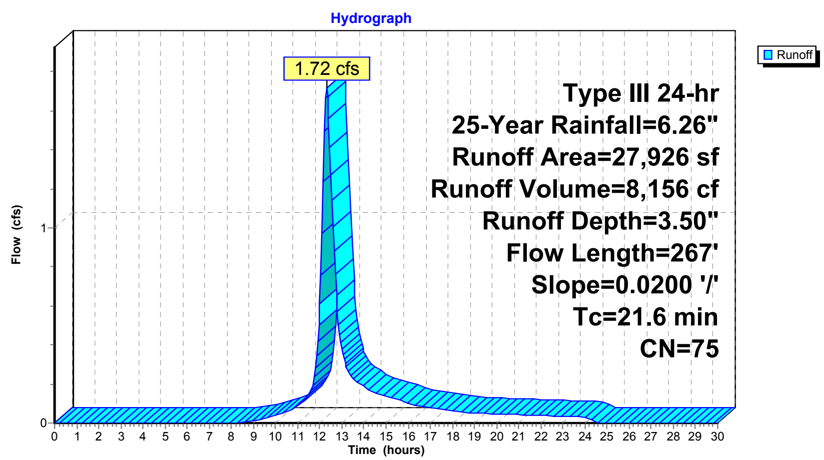
Runoff = 1.72 cfs @ 12.30 hrs, Volume= 8,156 cf, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

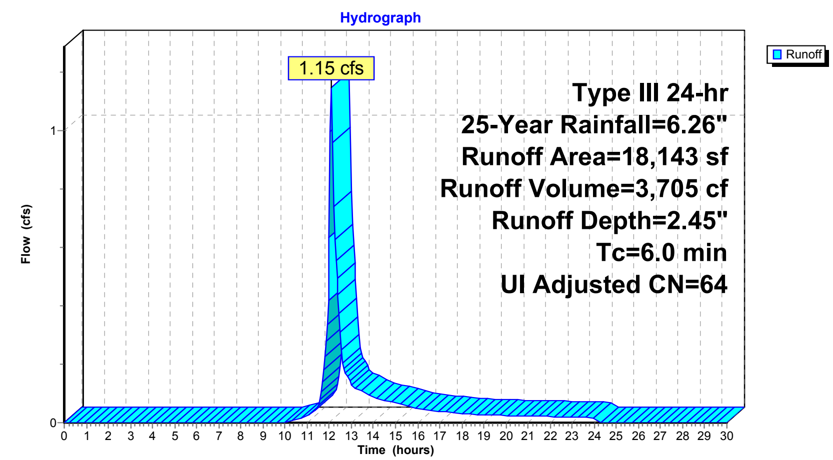
Runoff = 1.15 cfs @ 12.10 hrs, Volume= 3,705 cf, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

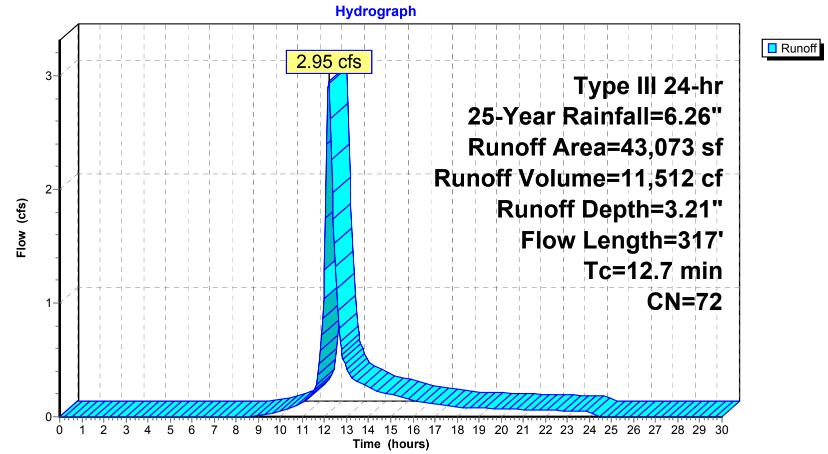
Runoff = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.26"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

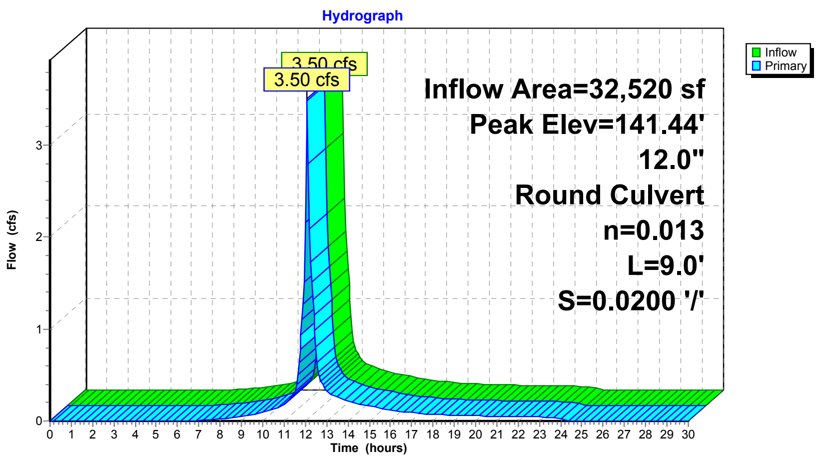
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 4.12" for 25-Year event
Inflow = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf
Outflow = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.44' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.43 cfs @ 12.09 hrs HW=141.39' (Free Discharge)
└1=Culvert (Inlet Controls 3.43 cfs @ 4.37 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

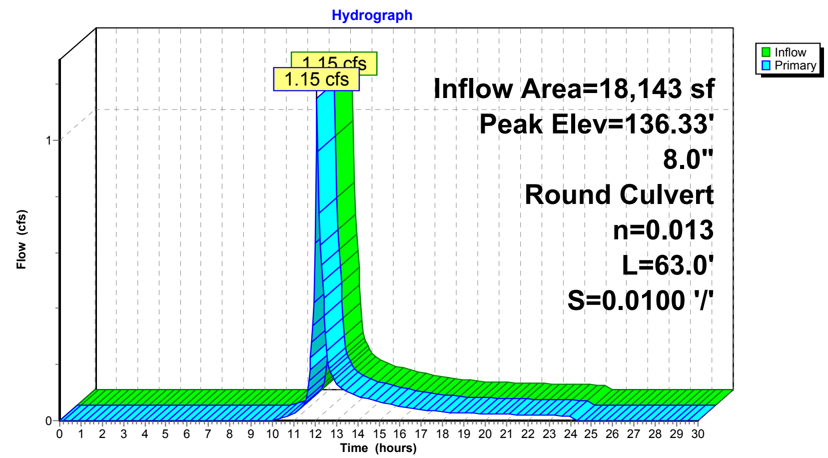
Inflow Area = 18,143 sf, 16.94% Impervious, Inflow Depth = 2.45" for 25-Year event
Inflow = 1.15 cfs @ 12.10 hrs, Volume= 3,705 cf
Outflow = 1.15 cfs @ 12.10 hrs, Volume= 3,705 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.10 hrs, Volume= 3,705 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 136.33' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.14 cfs @ 12.10 hrs HW=136.32' (Free Discharge)
└1=Culvert (Inlet Controls 1.14 cfs @ 3.27 fps)

Pond AD11: AD



Summary for Pond AD5: AD

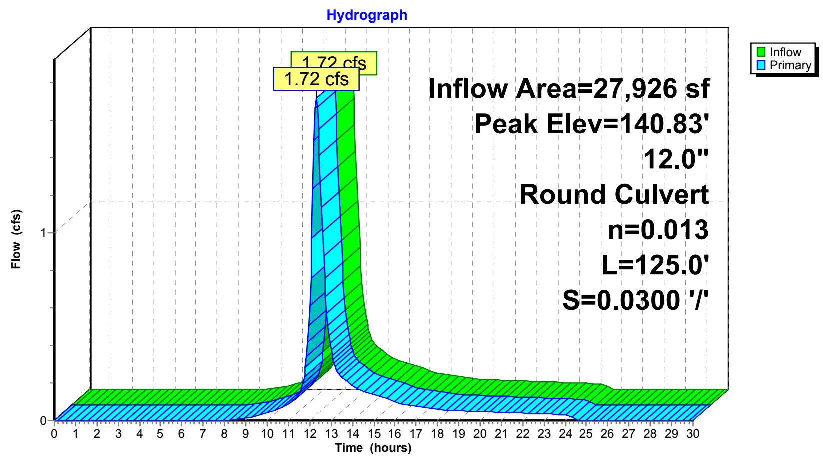
Inflow Area = 27,926 sf, 36.53% Impervious, Inflow Depth = 3.50" for 25-Year event
Inflow = 1.72 cfs @ 12.30 hrs, Volume= 8,156 cf
Outflow = 1.72 cfs @ 12.30 hrs, Volume= 8,156 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.72 cfs @ 12.30 hrs, Volume= 8,156 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.83' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.30 hrs HW=140.83' (Free Discharge)
└1=Culvert (Inlet Controls 1.71 cfs @ 2.45 fps)

Pond AD5: AD



Summary for Pond CB11: CB

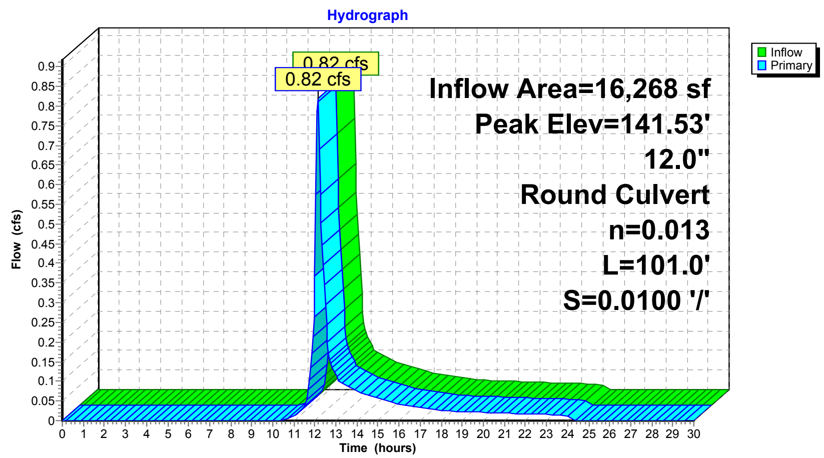
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 2.18" for 25-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf
Outflow = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.53' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.13 hrs HW=141.52' (Free Discharge)
└1=Culvert (Inlet Controls 0.80 cfs @ 1.94 fps)

Pond CB11: CB



Summary for Pond CB12: CB

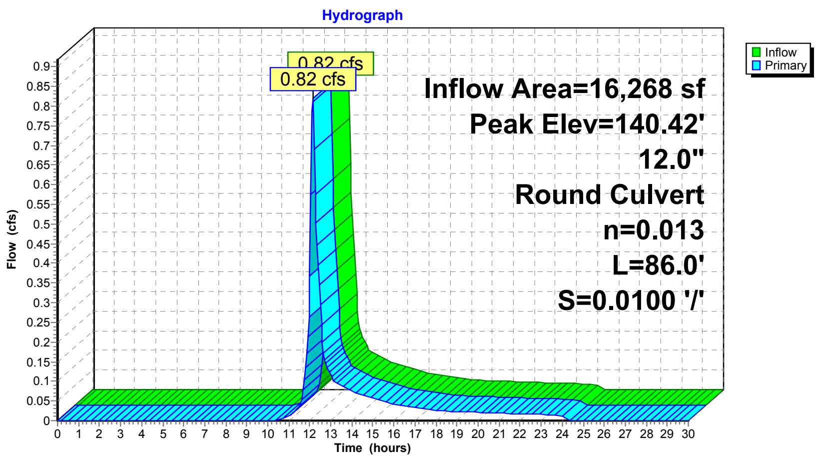
Inflow Area =	16,268 sf,	0.00% Impervious, Inflow Depth = 2.18"	for 25-Year event
Inflow =	0.82 cfs @	12.13 hrs, Volume=	2,957 cf
Outflow =	0.82 cfs @	12.13 hrs, Volume=	2,957 cf, Atten= 0%, Lag= 0.0 min
Primary =	0.82 cfs @	12.13 hrs, Volume=	2,957 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.42' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.13 hrs HW=140.41' (Free Discharge)
└─1=Culvert (Inlet Controls 0.80 cfs @ 1.94 fps)

Pond CB12: CB



Summary for Pond CB4: CB

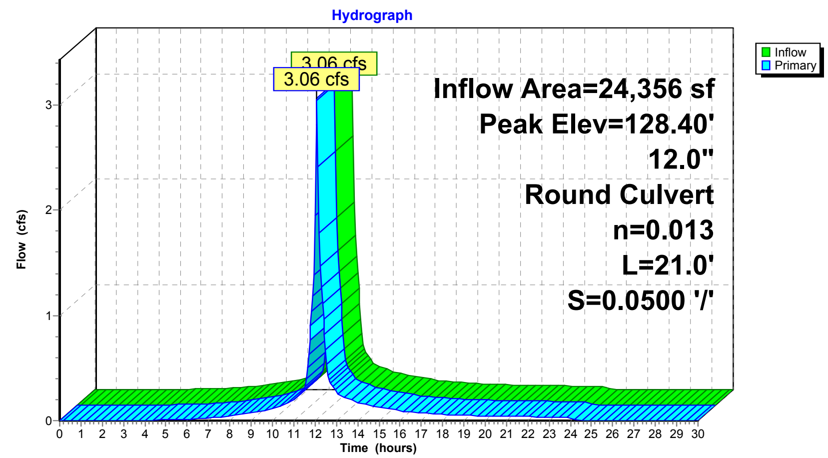
Inflow Area =	24,356 sf,	75.32% Impervious, Inflow Depth = 4.99"	for 25-Year event
Inflow =	3.06 cfs @	12.09 hrs, Volume=	10,123 cf
Outflow =	3.06 cfs @	12.09 hrs, Volume=	10,123 cf, Atten= 0%, Lag= 0.0 min
Primary =	3.06 cfs @	12.09 hrs, Volume=	10,123 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.40' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.98 cfs @ 12.09 hrs HW=128.35' (Free Discharge)
└─1=Culvert (Inlet Controls 2.98 cfs @ 3.80 fps)

Pond CB4: CB



Summary for Pond CB5: CB

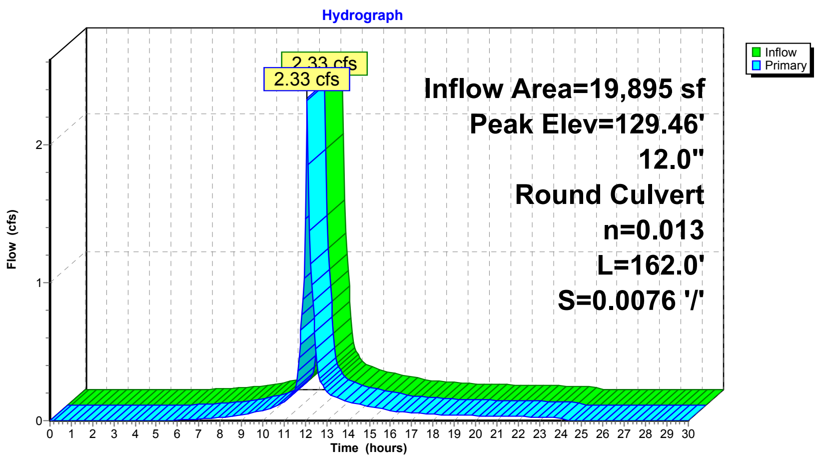
Inflow Area =	19,895 sf, 64.33% Impervious,	Inflow Depth = 4.55" for 25-Year event		
Inflow =	2.33 cfs @	12.09 hrs, Volume=	7,541 cf	
Outflow =	2.33 cfs @	12.09 hrs, Volume=	7,541 cf,	Atten= 0%, Lag= 0.0 min
Primary =	2.33 cfs @	12.09 hrs, Volume=	7,541 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.46' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.28 cfs @ 12.09 hrs HW=129.43' (Free Discharge)
└1=Culvert (Inlet Controls 2.28 cfs @ 2.90 fps)

Pond CB5: CB



Summary for Pond CB7: CB

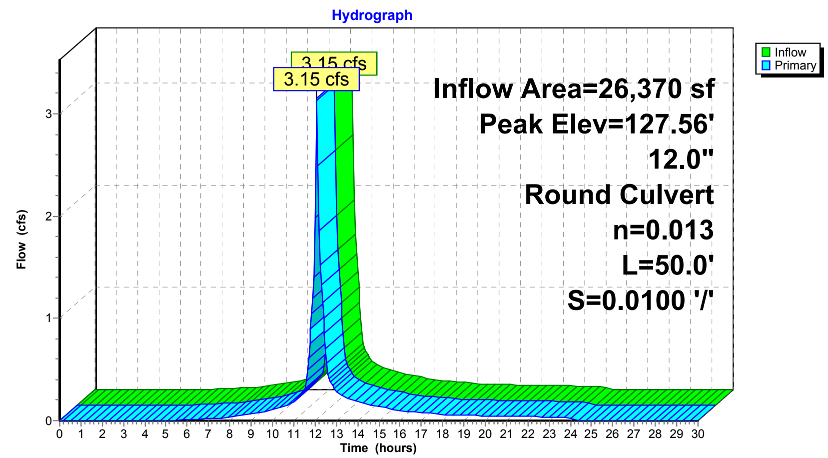
Inflow Area =	26,370 sf, 67.15% Impervious,	Inflow Depth = 4.66" for 25-Year event		
Inflow =	3.15 cfs @	12.09 hrs, Volume=	10,234 cf	
Outflow =	3.15 cfs @	12.09 hrs, Volume=	10,234 cf,	Atten= 0%, Lag= 0.0 min
Primary =	3.15 cfs @	12.09 hrs, Volume=	10,234 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.56' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.09 hrs HW=127.51' (Free Discharge)
└1=Culvert (Inlet Controls 3.07 cfs @ 3.91 fps)

Pond CB7: CB



Summary for Pond CB8: CB

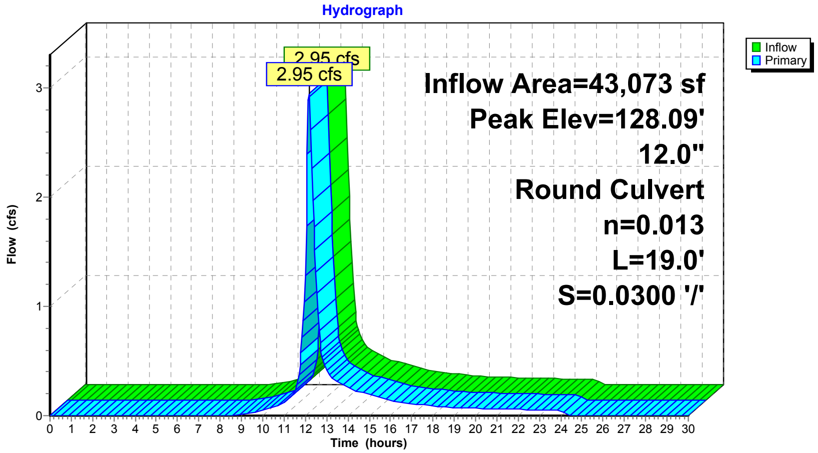
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf
Outflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.09' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.91 cfs @ 12.18 hrs HW=128.06' (Free Discharge)
└─1=Culvert (Inlet Controls 2.91 cfs @ 3.71 fps)

Pond CB8: CB



Summary for Pond CDS1: CDS

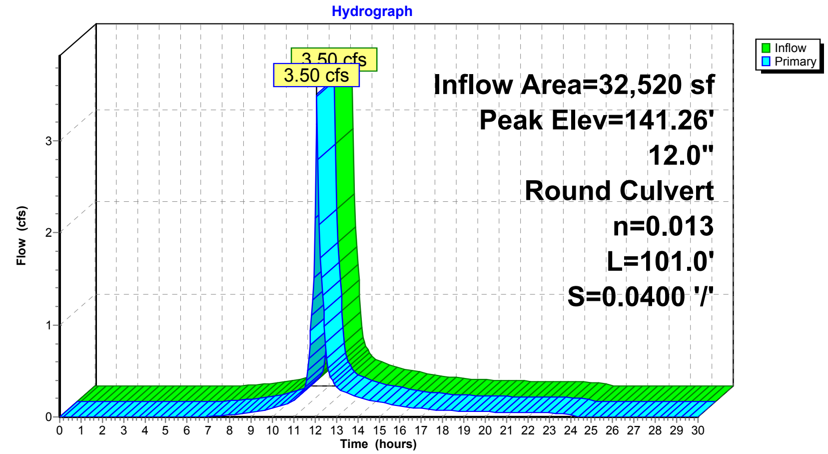
Inflow Area = 32,520 sf, 54.92% Impervious, Inflow Depth = 4.12" for 25-Year event
Inflow = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf
Outflow = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.50 cfs @ 12.09 hrs, Volume= 11,169 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.26' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.43 cfs @ 12.09 hrs HW=141.21' (Free Discharge)
└─1=Culvert (Inlet Controls 3.43 cfs @ 4.37 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

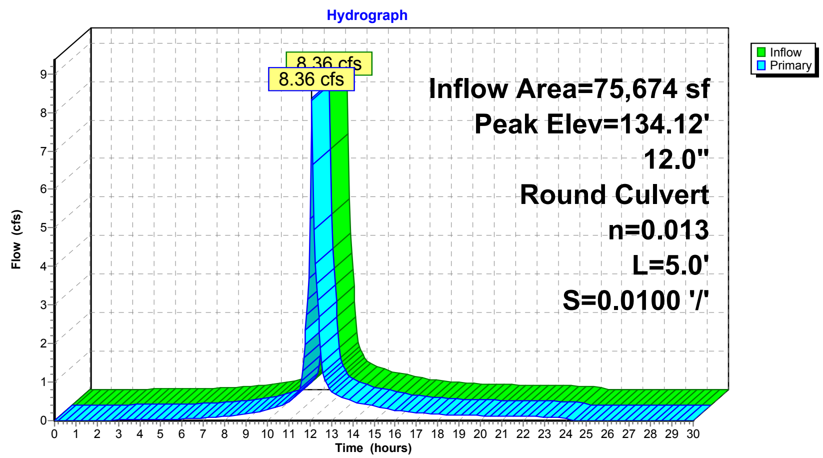
Inflow Area =	75,674 sf, 62.77% Impervious, Inflow Depth = 4.45" for 25-Year event	
Inflow =	8.36 cfs @ 12.09 hrs, Volume=	28,033 cf
Outflow =	8.36 cfs @ 12.09 hrs, Volume=	28,033 cf, Atten= 0%, Lag= 0.0 min
Primary =	8.36 cfs @ 12.09 hrs, Volume=	28,033 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.12' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=8.17 cfs @ 12.09 hrs HW=133.79' (Free Discharge)
└─1=Culvert (Inlet Controls 8.17 cfs @ 10.40 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

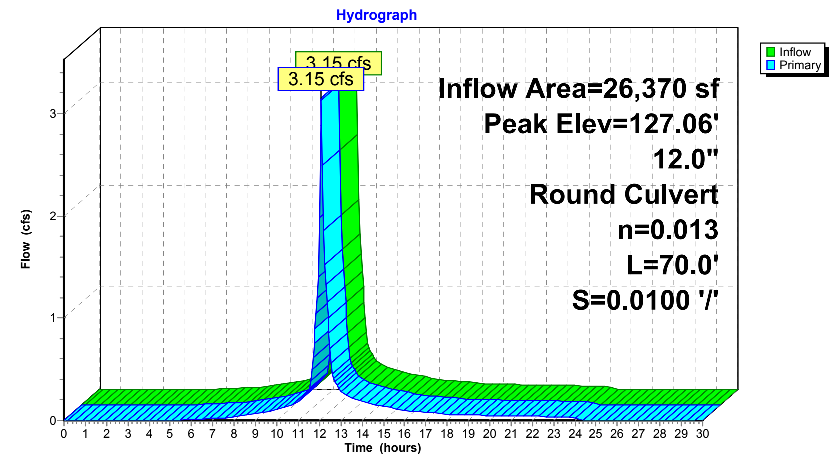
Inflow Area =	26,370 sf, 67.15% Impervious, Inflow Depth = 4.66" for 25-Year event	
Inflow =	3.15 cfs @ 12.09 hrs, Volume=	10,234 cf
Outflow =	3.15 cfs @ 12.09 hrs, Volume=	10,234 cf, Atten= 0%, Lag= 0.0 min
Primary =	3.15 cfs @ 12.09 hrs, Volume=	10,234 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.06' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.09 hrs HW=127.01' (Free Discharge)
└─1=Culvert (Inlet Controls 3.07 cfs @ 3.91 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

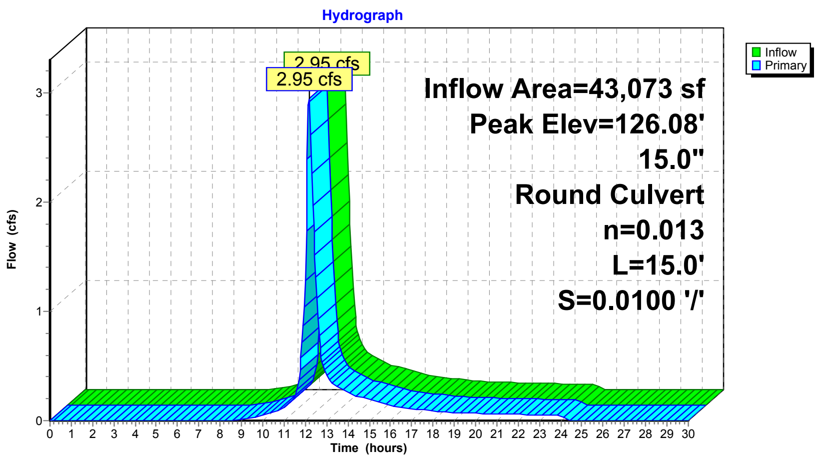
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf
Outflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.08' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.91 cfs @ 12.18 hrs HW=126.07' (Free Discharge)
└1=Culvert (Barrel Controls 2.91 cfs @ 3.50 fps)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

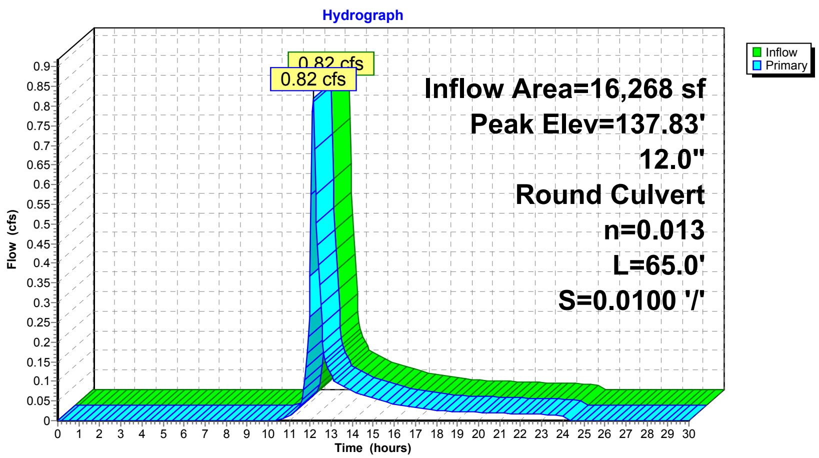
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 2.18" for 25-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf
Outflow = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.13 hrs, Volume= 2,957 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.83' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.13 hrs HW=137.82' (Free Discharge)
└1=Culvert (Inlet Controls 0.80 cfs @ 1.94 fps)

Pond DMH2A: DMH



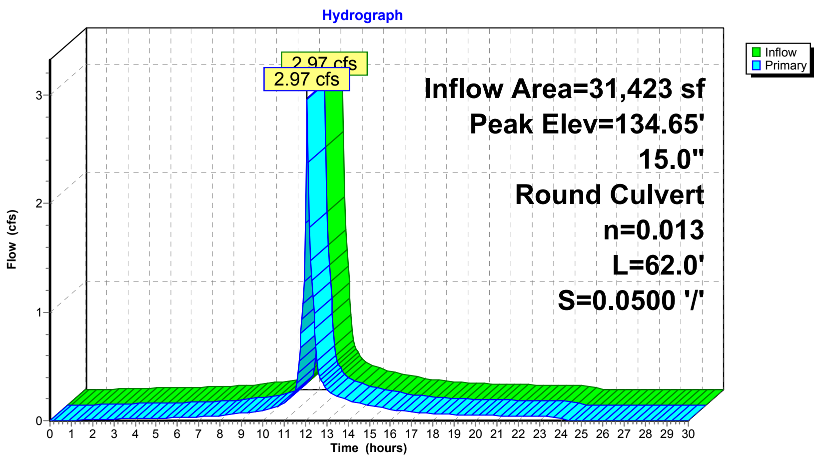
Summary for Pond DMH3: DMH

Inflow Area = 31,423 sf, 52.04% Impervious, Inflow Depth = 3.96" for 25-Year event
Inflow = 2.97 cfs @ 12.09 hrs, Volume= 10,369 cf
Outflow = 2.97 cfs @ 12.09 hrs, Volume= 10,369 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.97 cfs @ 12.09 hrs, Volume= 10,369 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 134.65' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.91 cfs @ 12.09 hrs HW=134.64' (Free Discharge)
└1=Culvert (Inlet Controls 2.91 cfs @ 2.71 fps)



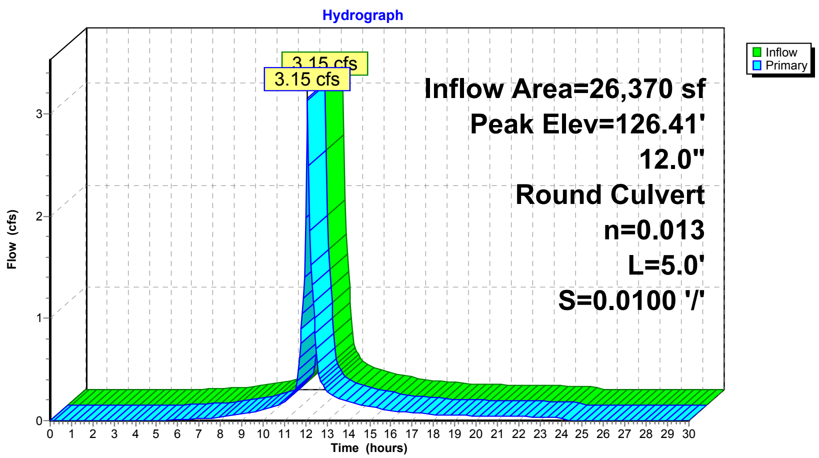
Summary for Pond DMH5: DMH

Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 4.66" for 25-Year event
Inflow = 3.15 cfs @ 12.09 hrs, Volume= 10,234 cf
Outflow = 3.15 cfs @ 12.09 hrs, Volume= 10,234 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.15 cfs @ 12.09 hrs, Volume= 10,234 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.41' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.09 hrs HW=126.36' (Free Discharge)
└1=Culvert (Inlet Controls 3.07 cfs @ 3.91 fps)



Summary for Pond DMH6: DMH

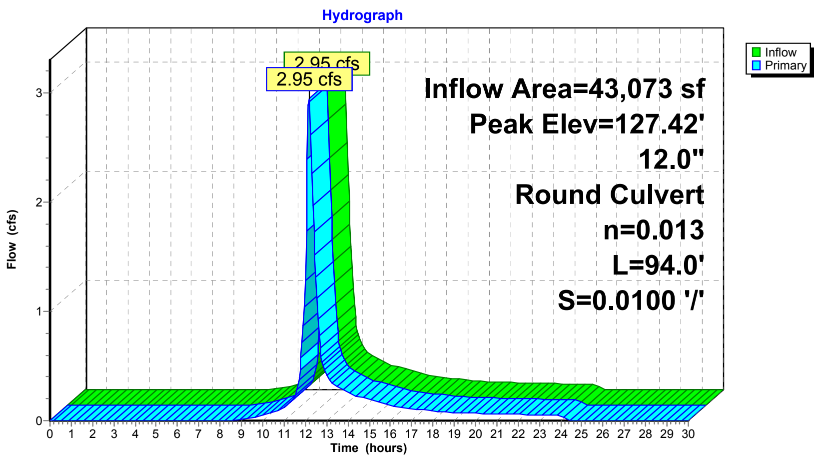
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf
Outflow = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.18 hrs, Volume= 11,512 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.42' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.91 cfs @ 12.18 hrs HW=127.39' (Free Discharge)
└1=Culvert (Inlet Controls 2.91 cfs @ 3.71 fps)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

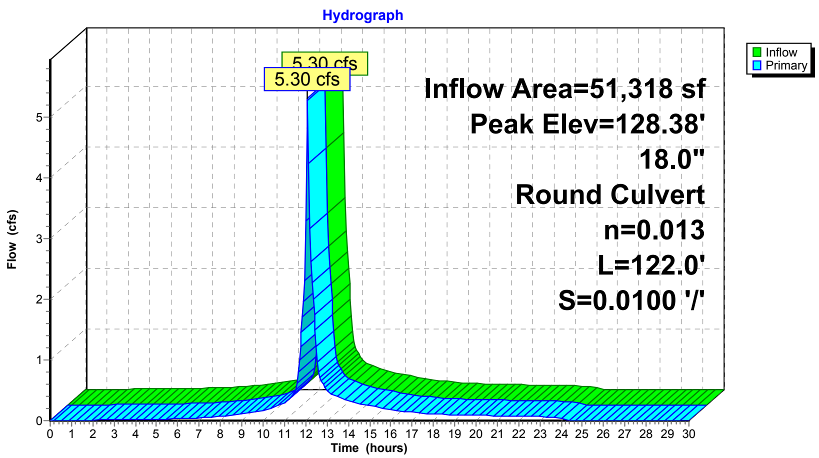
Inflow Area = 51,318 sf, 56.81% Impervious, Inflow Depth = 4.19" for 25-Year event
Inflow = 5.30 cfs @ 12.09 hrs, Volume= 17,910 cf
Outflow = 5.30 cfs @ 12.09 hrs, Volume= 17,910 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.30 cfs @ 12.09 hrs, Volume= 17,910 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.38' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.19 cfs @ 12.09 hrs HW=128.36' (Free Discharge)
└1=Culvert (Inlet Controls 5.19 cfs @ 3.11 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

Inflow Area =	105,247 sf, 53.77% Impervious,	Inflow Depth = 4.17"	for 25-Year event
Inflow =	9.13 cfs @ 12.10 hrs,	Volume= 36,600 cf	
Outflow =	5.58 cfs @ 12.27 hrs,	Volume= 33,576 cf,	Atten= 39%, Lag= 10.6 min
Discarded =	0.09 cfs @ 7.55 hrs,	Volume= 8,639 cf	
Primary =	5.49 cfs @ 12.27 hrs,	Volume= 24,937 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 138.67' @ 12.27 hrs Surf.Area= 3,388 sf Storage= 9,647 cf

Plug-Flow detention time= 127.0 min calculated for 33,520 cf (92% of inflow)
Center-of-Mass det. time= 84.8 min (879.6 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A 18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 60 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 7.55 hrs HW=134.56' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=5.47 cfs @ 12.27 hrs HW=138.66' (Free Discharge)
└─1=15" HDPE (Passes 5.47 cfs of 7.79 cfs potential flow)
  ├─2=13" Orifice (Orifice Controls 5.47 cfs @ 5.94 fps)
  └─4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

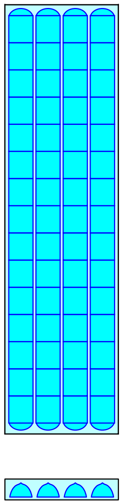
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

60 Chambers x 110.0 cf + 14.9 cf of Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

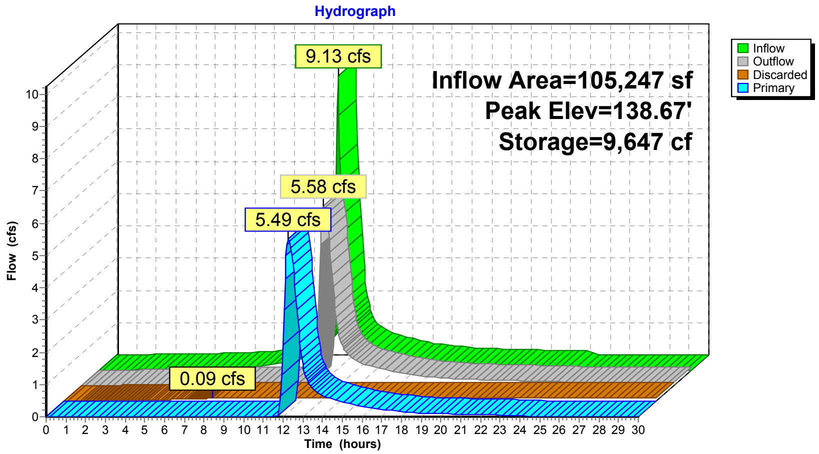
18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone



Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 4.70" for 25-Year event
Inflow = 10.35 cfs @ 12.09 hrs, Volume= 35,307 cf
Outflow = 5.50 cfs @ 12.23 hrs, Volume= 31,899 cf, Atten= 47%, Lag= 8.3 min
Discarded = 0.11 cfs @ 9.90 hrs, Volume= 10,022 cf
Primary = 5.39 cfs @ 12.23 hrs, Volume= 21,877 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 129.12' @ 12.23 hrs Surf.Area= 3,946 sf Storage= 11,171 cf

Plug-Flow detention time= 151.3 min calculated for 31,846 cf (90% of inflow)
Center-of-Mass det. time= 103.8 min (883.2 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 9.90 hrs HW=125.75' (Free Discharge)
└─2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=5.38 cfs @ 12.23 hrs HW=129.11' (Free Discharge)
└─1=15" HDPE (Passes 5.38 cfs of 7.71 cfs potential flow)
  └─3=13" Orifice (Orifice Controls 5.38 cfs @ 5.83 fps)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

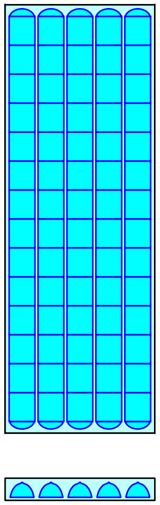
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

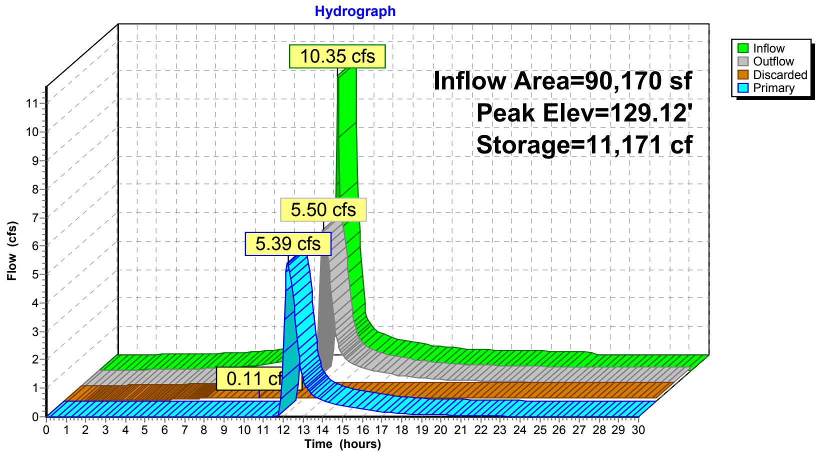
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area =	91,745 sf, 57.86% Impervious,	Inflow Depth = 4.31" for 25-Year event	
Inflow =	8.57 cfs @ 12.10 hrs, Volume=	32,937 cf	
Outflow =	4.40 cfs @ 12.34 hrs, Volume=	29,510 cf,	Atten= 49%, Lag= 13.9 min
Discarded =	0.11 cfs @ 8.20 hrs, Volume=	9,703 cf	
Primary =	4.29 cfs @ 12.34 hrs, Volume=	19,807 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.89' @ 12.34 hrs Surf.Area= 3,934 sf Storage= 10,641 cf

Plug-Flow detention time= 158.5 min calculated for 29,510 cf (90% of inflow)
Center-of-Mass det. time= 107.3 min (900.5 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 8.20 hrs HW=124.06' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=4.29 cfs @ 12.34 hrs HW=127.89' (Free Discharge)
└1=15" HDPE (Passes 4.29 cfs of 7.39 cfs potential flow)
  └2=12" Orifice (Orifice Controls 4.29 cfs @ 5.46 fps)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

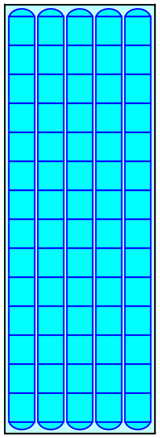
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

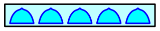
70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

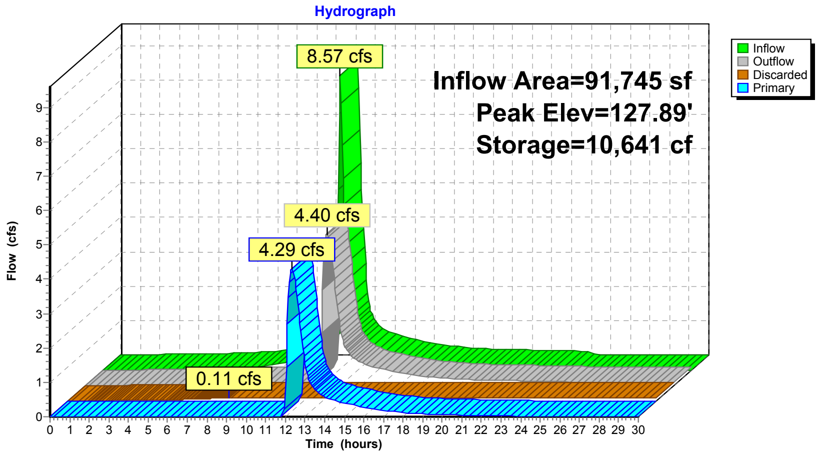
Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone





Pond UIS3: MC-3500

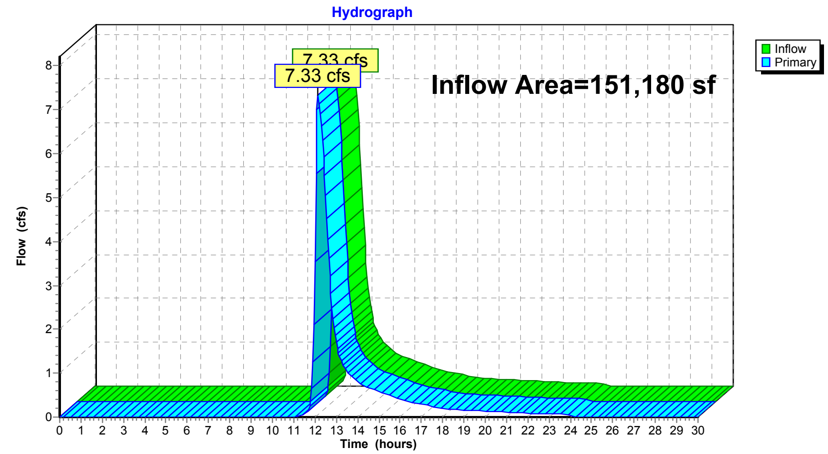


Summary for Link SP-1: Study Point #1

Inflow Area =	151,180 sf, 41.01% Impervious, Inflow Depth = 2.44" for 25-Year event	
Inflow =	7.33 cfs @ 12.16 hrs, Volume=	30,786 cf
Primary =	7.33 cfs @ 12.16 hrs, Volume=	30,786 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

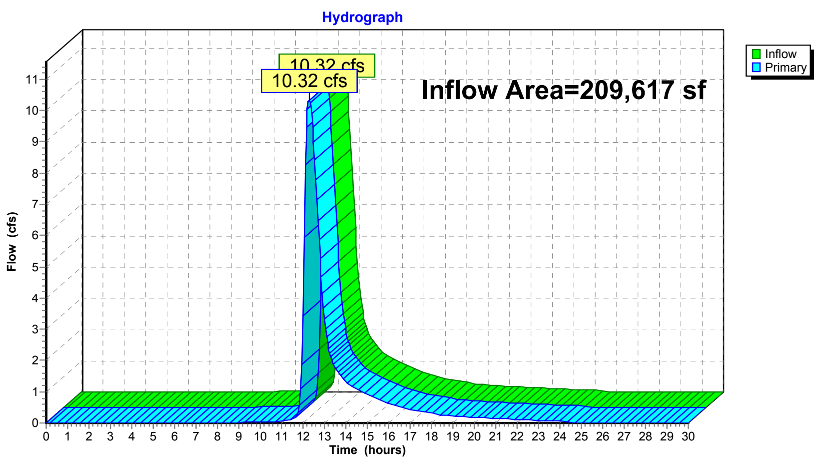


Summary for Link SP-2: Study Point #2

Inflow Area =	209,617 sf, 55.29% Impervious,	Inflow Depth = 2.80"	for 25-Year event	
Inflow =	10.32 cfs @	12.28 hrs, Volume=	48,861 cf	
Primary =	10.32 cfs @	12.28 hrs, Volume=	48,861 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1: Off-site Runoff Northwest
Runoff Area=61,010 sf 0.00% Impervious Runoff Depth=2.91"
Tc=6.0 min CN=56 Runoff=4.54 cfs 14,779 cf

Subcatchment P-10: Building 2/3 - South Parking
Runoff Area=32,520 sf 54.92% Impervious Runoff Depth=5.76"
Tc=6.0 min CN=81 Runoff=4.84 cfs 15,613 cf

Subcatchment P-11: Building 1 - Southeast
Runoff Area=12,625 sf 49.31% Impervious Runoff Depth=5.53"
Tc=6.0 min CN=79 Runoff=1.81 cfs 5,814 cf

Subcatchment P-2A: Building 2 Parking - North
Runoff Area=24,356 sf 75.32% Impervious Runoff Depth=6.71"
Tc=6.0 min CN=89 Runoff=4.04 cfs 13,612 cf

Subcatchment P-2B: Building 2 Parking - North
Runoff Area=19,895 sf 64.33% Impervious Runoff Depth=6.23"
Tc=6.0 min CN=85 Runoff=3.14 cfs 10,333 cf

Subcatchment P-3: Building 1 Parking - East
Runoff Area=26,370 sf 67.15% Impervious Runoff Depth=6.35"
Tc=6.0 min CN=86 Runoff=4.22 cfs 13,956 cf

Subcatchment P-4: Building 3 - West
Runoff Area=16,268 sf 0.00% Impervious Runoff Depth=3.46"
Flow Length=322' Tc=8.6 min CN=61 Runoff=1.34 cfs 4,691 cf

Subcatchment P-5A: Building 3 Roof - North
Runoff Area=13,280 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=2.34 cfs 8,610 cf

Subcatchment P-5B: Building 3 Roof - South
Runoff Area=14,024 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=2.48 cfs 9,092 cf

Subcatchment P-6A: Building 2 Roof - North
Runoff Area=14,496 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=2.56 cfs 9,398 cf

Subcatchment P-6B: Building 2 Roof - South
Runoff Area=14,509 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=2.56 cfs 9,407 cf

Subcatchment P-7: Building 1
Runoff Area=22,302 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=3.94 cfs 14,459 cf

Subcatchment P-8: Pool Courtyard
Runoff Area=27,926 sf 36.53% Impervious Runoff Depth=5.06"
Flow Length=267' Slope=0.0200 '/' Tc=21.6 min CN=75 Runoff=2.47 cfs 11,775 cf

Subcatchment P-9A: Area Drains - Courtyard
Runoff Area=18,143 sf 16.94% Impervious Runoff Depth=3.80"
Tc=6.0 min UI Adjusted CN=64 Runoff=1.81 cfs 5,741 cf

Subcatchment P-9B: Building 1/2 Courtyard
Runoff Area=43,073 sf 30.35% Impervious Runoff Depth=4.71"
Flow Length=317' Tc=12.7 min CN=72 Runoff=4.35 cfs 16,913 cf

Pond 2P: CB2
Peak Elev=142.69' Inflow=4.84 cfs 15,613 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0200 '/' Outflow=4.84 cfs 15,613 cf

Pond AD11: AD
Peak Elev=137.50' Inflow=1.81 cfs 5,741 cf
8.0" Round Culvert n=0.013 L=63.0' S=0.0100 '/' Outflow=1.81 cfs 5,741 cf

Pond AD5: AD
Peak Elev=141.19' Inflow=2.47 cfs 11,775 cf
12.0" Round Culvert n=0.013 L=125.0' S=0.0300 '/' Outflow=2.47 cfs 11,775 cf

Pond CB11: CB
Peak Elev=141.71' Inflow=1.34 cfs 4,691 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0100 '/' Outflow=1.34 cfs 4,691 cf

Pond CB12: CB
Peak Elev=140.60' Inflow=1.34 cfs 4,691 cf
12.0" Round Culvert n=0.013 L=86.0' S=0.0100 '/' Outflow=1.34 cfs 4,691 cf

Pond CB4: CB
Peak Elev=129.18' Inflow=4.04 cfs 13,612 cf
12.0" Round Culvert n=0.013 L=21.0' S=0.0500 '/' Outflow=4.04 cfs 13,612 cf

Pond CB5: CB
Peak Elev=129.96' Inflow=3.14 cfs 10,333 cf
12.0" Round Culvert n=0.013 L=162.0' S=0.0076 '/' Outflow=3.14 cfs 10,333 cf

Pond CB7: CB
Peak Elev=128.45' Inflow=4.22 cfs 13,956 cf
12.0" Round Culvert n=0.013 L=50.0' S=0.0100 '/' Outflow=4.22 cfs 13,956 cf

Pond CB8: CB
Peak Elev=129.22' Inflow=4.35 cfs 16,913 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0300 '/' Outflow=4.35 cfs 16,913 cf

Pond CDS1: CDS
Peak Elev=142.51' Inflow=4.84 cfs 15,613 cf
12.0" Round Culvert n=0.013 L=101.0' S=0.0400 '/' Outflow=4.84 cfs 15,613 cf

Pond CDS2: CDS
Peak Elev=140.69' Inflow=11.34 cfs 38,296 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=11.34 cfs 38,296 cf

Pond CDS3: CDS WQU
Peak Elev=127.95' Inflow=4.22 cfs 13,956 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0100 '/' Outflow=4.22 cfs 13,956 cf

Pond CDS4: CDS WQU
Peak Elev=126.49' Inflow=4.35 cfs 16,913 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=4.35 cfs 16,913 cf

Pond DMH2A: DMH
Peak Elev=138.01' Inflow=1.34 cfs 4,691 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0100 '/' Outflow=1.34 cfs 4,691 cf

Pond DMH3: DMH
Peak Elev=135.04' Inflow=4.15 cfs 14,351 cf
15.0" Round Culvert n=0.013 L=62.0' S=0.0500 '/' Outflow=4.15 cfs 14,351 cf

Pond DMH5: DMH
Peak Elev=127.30' Inflow=4.22 cfs 13,956 cf
12.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=4.22 cfs 13,956 cf

Pond DMH6: DMH
Peak Elev=128.55' Inflow=4.35 cfs 16,913 cf
12.0" Round Culvert n=0.013 L=94.0' S=0.0100 '/' Outflow=4.35 cfs 16,913 cf

Pond DMH8: DMH
Peak Elev=128.95' Inflow=7.30 cfs 24,684 cf
18.0" Round Culvert n=0.013 L=122.0' S=0.0100 '/' Outflow=7.30 cfs 24,684 cf

Pond UIS1: UIS#1
Peak Elev=140.02' Storage=11,484 cf Inflow=12.54 cfs 50,577 cf
Discarded=0.09 cfs 9,005 cf Primary=9.01 cfs 38,478 cf Outflow=9.11 cfs 47,483 cf

Pond UIS2: UIS #2
Peak Elev=131.46' Storage=13,433 cf Inflow=13.90 cfs 47,694 cf
Discarded=0.11 cfs 10,451 cf Primary=8.67 cfs 33,828 cf Outflow=8.78 cfs 44,279 cf

Pond UIS3: MC-3500
Peak Elev=129.49' Storage=13,349 cf Inflow=11.69 cfs 45,329 cf
Discarded=0.11 cfs 10,126 cf Primary=6.43 cfs 31,655 cf Outflow=6.54 cfs 41,781 cf

Link SP-1: Study Point #1
Inflow=11.69 cfs 48,607 cf
Primary=11.69 cfs 48,607 cf

Link SP-2: Study Point #2
Inflow=16.21 cfs 75,947 cf
Primary=16.21 cfs 75,947 cf

Total Runoff Area = 360,797 sf Runoff Volume = 164,194 cf Average Runoff Depth = 5.46"
50.69% Pervious = 182,900 sf 49.31% Impervious = 177,897 sf

Summary for Subcatchment P-1: Off-site Runoff Northwest

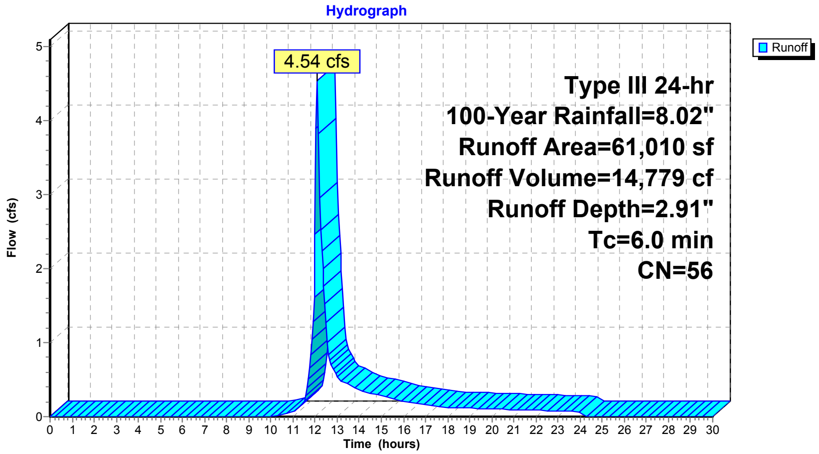
Runoff = 4.54 cfs @ 12.10 hrs, Volume= 14,779 cf, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
3,360	39	>75% Grass cover, Good, HSG A
23,703	61	>75% Grass cover, Good, HSG B
33,947	55	Woods, Good, HSG B
61,010	56	Weighted Average
61,010		100.00% Pervious Area

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

Subcatchment P-1: Off-site Runoff Northwest



Summary for Subcatchment P-10: Building 2/3 - South Parking

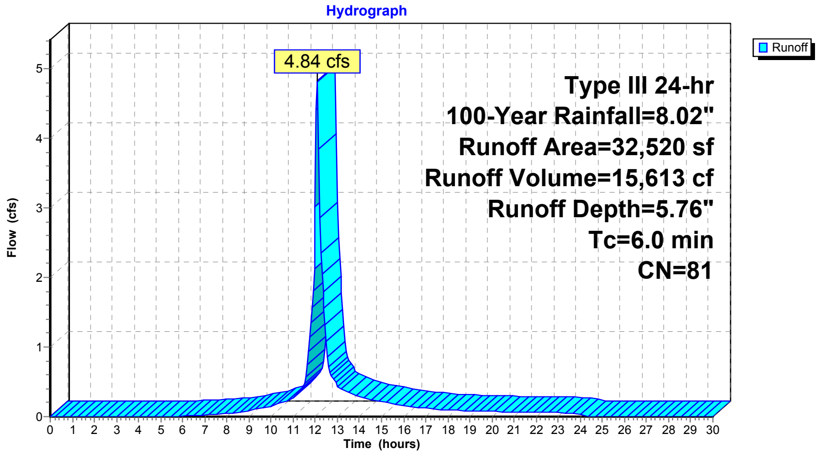
Runoff = 4.84 cfs @ 12.09 hrs, Volume= 15,613 cf, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
17,860	98	Paved parking, HSG B
14,660	61	>75% Grass cover, Good, HSG B
32,520	81	Weighted Average
14,660		45.08% Pervious Area
17,860		54.92% Impervious Area

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

Subcatchment P-10: Building 2/3 - South Parking



Summary for Subcatchment P-11: Building 1 - Southeast

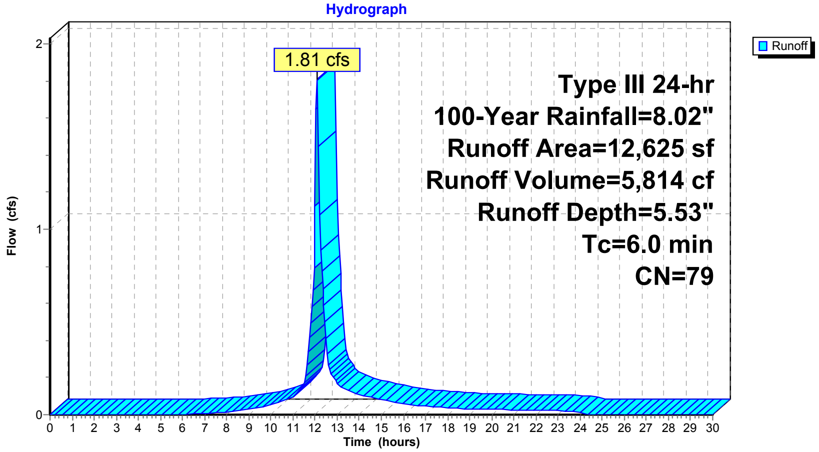
Runoff = 1.81 cfs @ 12.09 hrs, Volume= 5,814 cf, Depth= 5.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
6,226	98	Paved parking, HSG B
6,399	61	>75% Grass cover, Good, HSG B
12,625	79	Weighted Average
6,399		50.69% Pervious Area
6,226		49.31% Impervious Area

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

Subcatchment P-11: Building 1 - Southeast



Summary for Subcatchment P-2A: Building 2 Parking - North

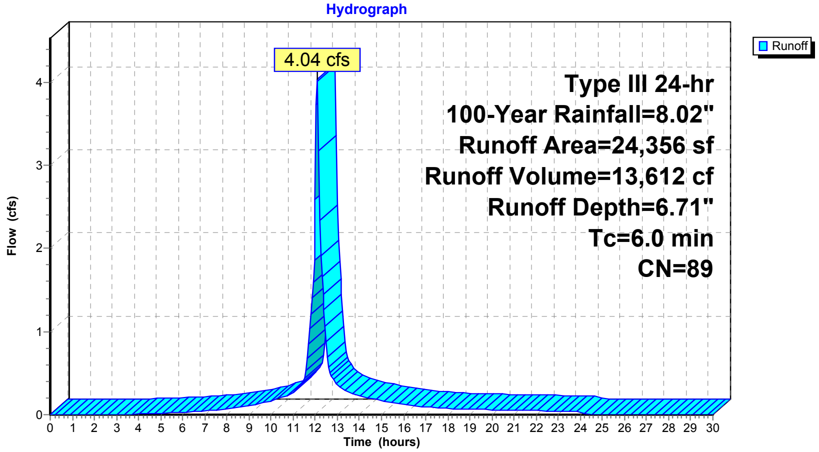
Runoff = 4.04 cfs @ 12.09 hrs, Volume= 13,612 cf, Depth= 6.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
18,346	98	Paved parking, HSG B
6,010	61	>75% Grass cover, Good, HSG B
24,356	89	Weighted Average
6,010		24.68% Pervious Area
18,346		75.32% Impervious Area

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

Subcatchment P-2A: Building 2 Parking - North



Summary for Subcatchment P-2B: Building 2 Parking - North

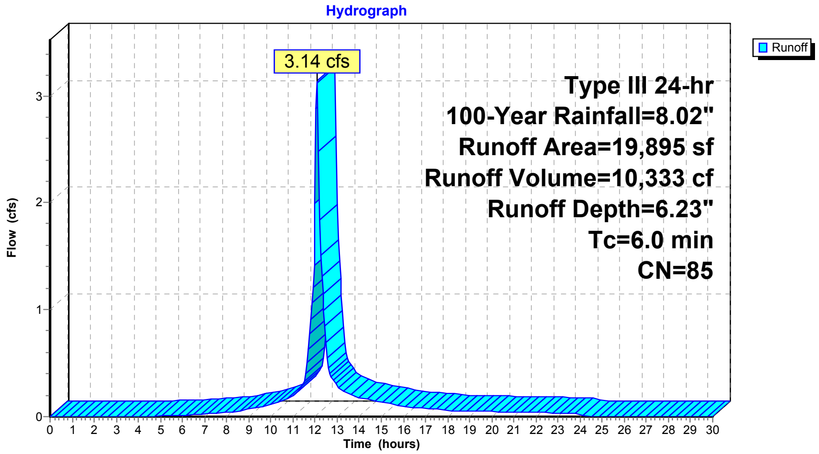
Runoff = 3.14 cfs @ 12.09 hrs, Volume= 10,333 cf, Depth= 6.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
12,799	98	Paved parking, HSG B
7,096	61	>75% Grass cover, Good, HSG B
19,895	85	Weighted Average
7,096		35.67% Pervious Area
12,799		64.33% Impervious Area

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

Subcatchment P-2B: Building 2 Parking - North



Summary for Subcatchment P-3: Building 1 Parking - East

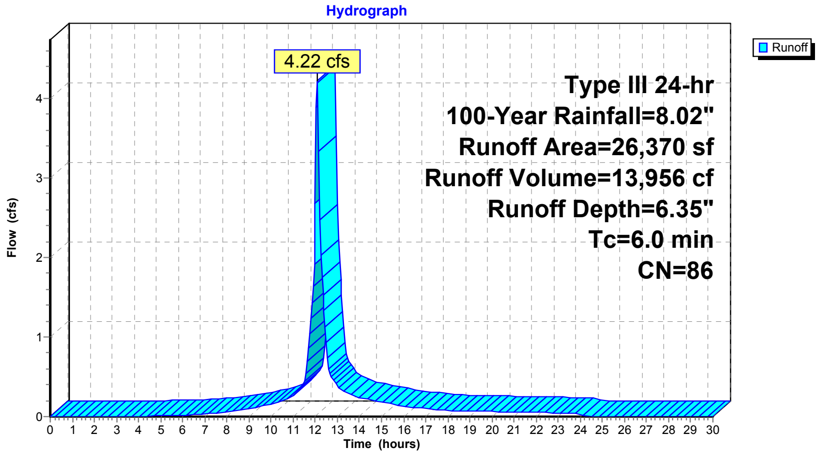
Runoff = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf, Depth= 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
17,708	98	Unconnected pavement, HSG B
8,662	61	>75% Grass cover, Good, HSG B
26,370	86	Weighted Average
8,662		32.85% Pervious Area
17,708		67.15% Impervious Area
17,708		100.00% Unconnected

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

Subcatchment P-3: Building 1 Parking - East



Summary for Subcatchment P-4: Building 3 - West

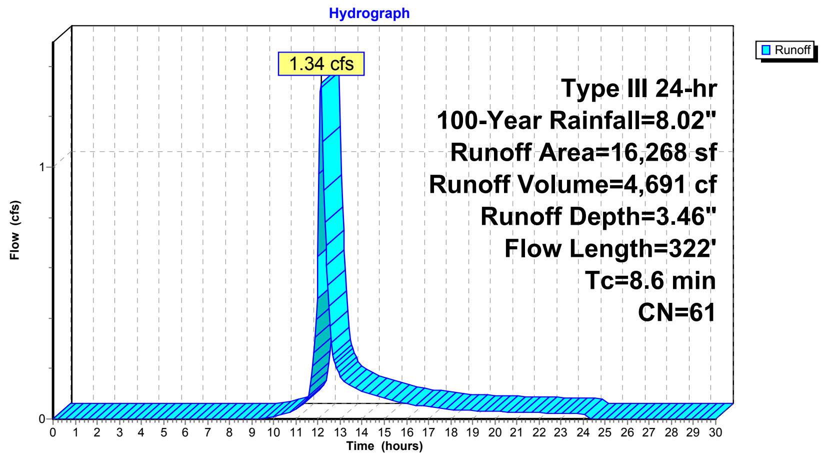
Runoff = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
0	98	Unconnected pavement, HSG B
16,268	61	>75% Grass cover, Good, HSG B
16,268	61	Weighted Average
16,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.4	272	0.0350	11.12	215.66	Trap/Vee/Rect Channel Flow, Bot.W=6.00' D=2.00' Z= 0.7 & 3.0 '/' Top.W=13.40' n= 0.030 Earth, grassed & winding
8.6	322	Total			

Subcatchment P-4: Building 3 - West



Summary for Subcatchment P-5A: Building 3 Roof - North

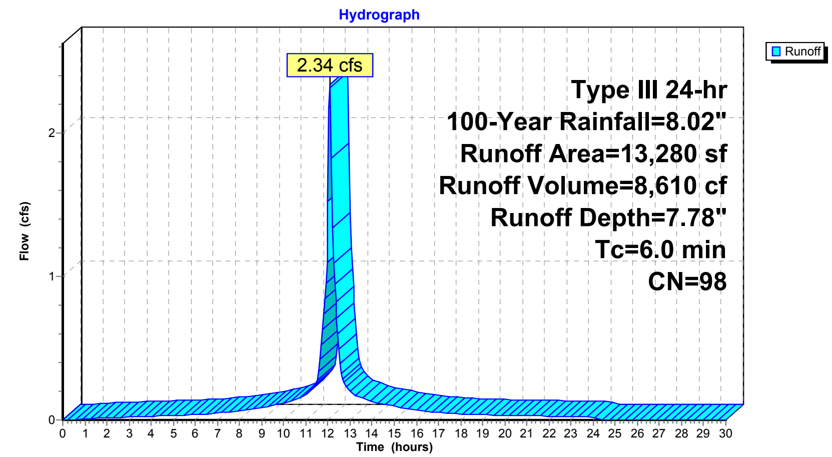
Runoff = 2.34 cfs @ 12.09 hrs, Volume= 8,610 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
13,280	98	Unconnected pavement, HSG B
13,280		100.00% Impervious Area
13,280		100.00% Unconnected

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

Subcatchment P-5A: Building 3 Roof - North



Summary for Subcatchment P-5B: Building 3 Roof - South

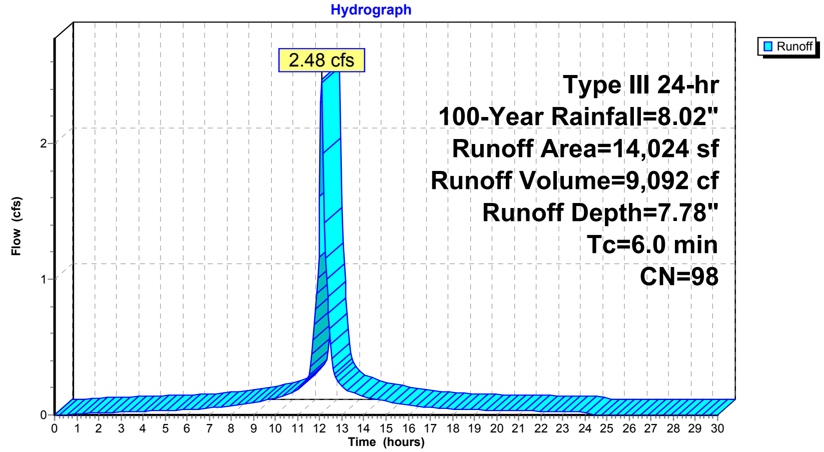
Runoff = 2.48 cfs @ 12.09 hrs, Volume= 9,092 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
14,024	98	Unconnected pavement, HSG B
14,024		100.00% Impervious Area
14,024		100.00% Unconnected

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

Subcatchment P-5B: Building 3 Roof - South



Summary for Subcatchment P-6A: Building 2 Roof - North

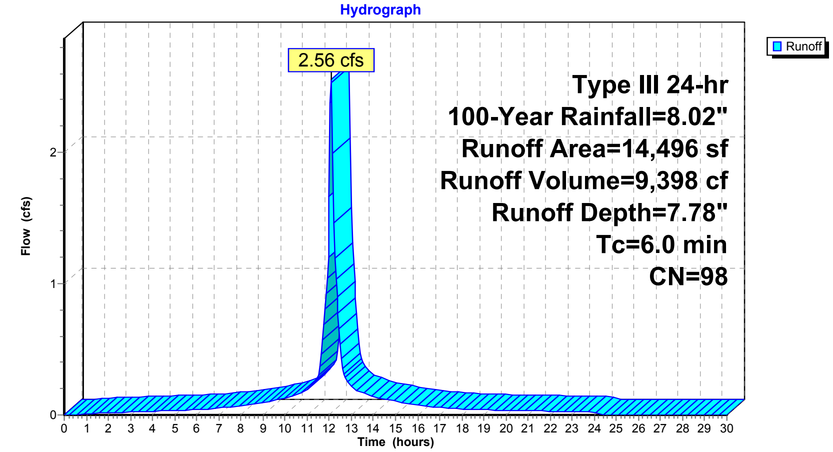
Runoff = 2.56 cfs @ 12.09 hrs, Volume= 9,398 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
14,496	98	Unconnected pavement, HSG B
14,496		100.00% Impervious Area
14,496		100.00% Unconnected

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

Subcatchment P-6A: Building 2 Roof - North



Summary for Subcatchment P-6B: Building 2 Roof - South

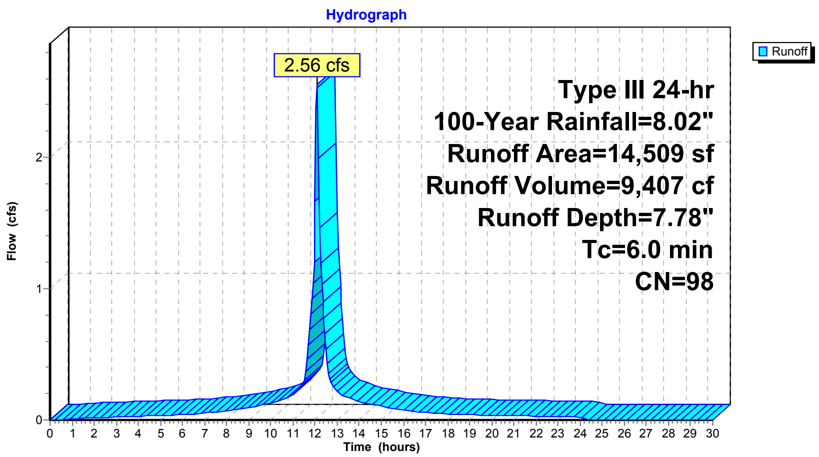
Runoff = 2.56 cfs @ 12.09 hrs, Volume= 9,407 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
14,509	98	Unconnected pavement, HSG B
14,509		100.00% Impervious Area
14,509		100.00% Unconnected

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

Subcatchment P-6B: Building 2 Roof - South



Summary for Subcatchment P-7: Building 1

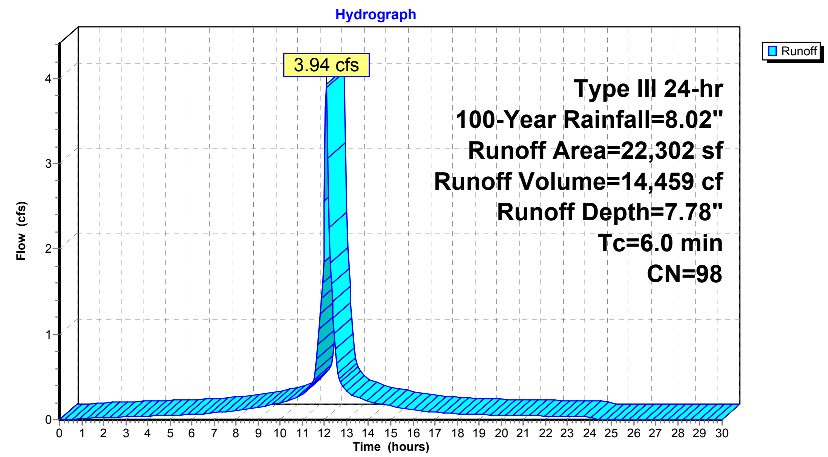
Runoff = 3.94 cfs @ 12.09 hrs, Volume= 14,459 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
22,302	98	Unconnected pavement, HSG B
22,302		100.00% Impervious Area
22,302		100.00% Unconnected

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

Subcatchment P-7: Building 1



Summary for Subcatchment P-8: Pool Courtyard

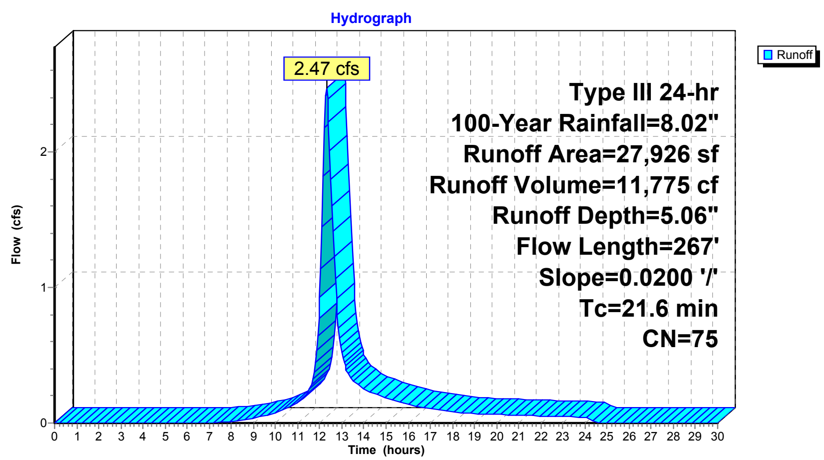
Runoff = 2.47 cfs @ 12.30 hrs, Volume= 11,775 cf, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
10,200	98	Unconnected pavement, HSG B
17,726	61	>75% Grass cover, Good, HSG B
27,926	75	Weighted Average
17,726		63.47% Pervious Area
10,200		36.53% Impervious Area
10,200		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.6	267	0.0200	0.21		Sheet Flow, Grass: Short n= 0.150 P2= 3.16"

Subcatchment P-8: Pool Courtyard



Summary for Subcatchment P-9A: Area Drains - Courtyard

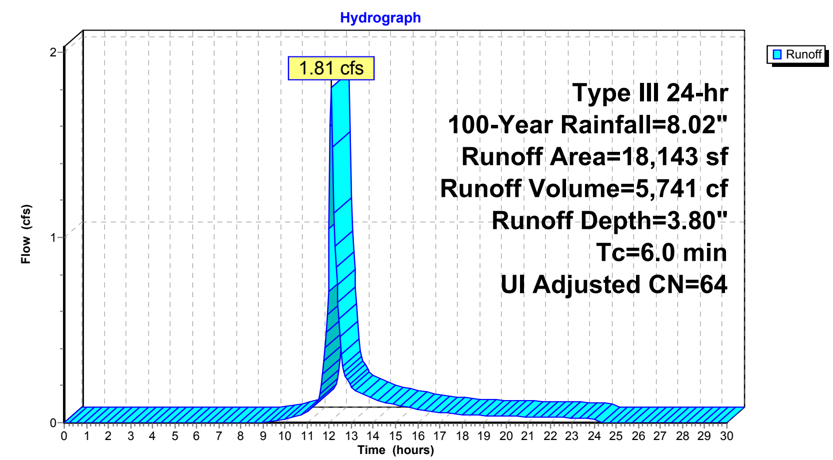
Runoff = 1.81 cfs @ 12.09 hrs, Volume= 5,741 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Adj	Description
3,074	98		Unconnected pavement, HSG B
15,069	61		>75% Grass cover, Good, HSG B
18,143	67	64	Weighted Average, UI Adjusted
15,069			83.06% Pervious Area
3,074			16.94% Impervious Area
3,074			100.00% Unconnected

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

Subcatchment P-9A: Area Drains - Courtyard



Summary for Subcatchment P-9B: Building 1/2 Courtyard

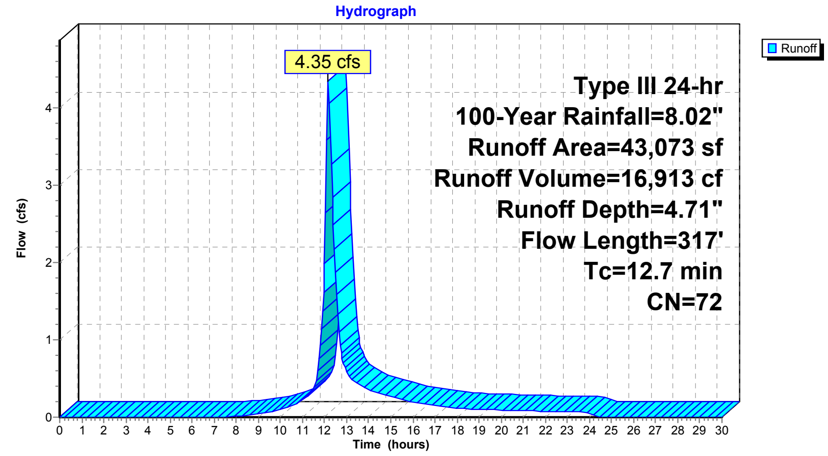
Runoff = 4.35 cfs @ 12.18 hrs, Volume= 16,913 cf, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
13,073	98	Unconnected pavement, HSG B
30,000	61	>75% Grass cover, Good, HSG B
43,073	72	Weighted Average
30,000		69.65% Pervious Area
13,073		30.35% Impervious Area
13,073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.0100	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.16"
0.9	52	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.2	29	0.1250	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	181	0.0500	4.54		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.7	317	Total			

Subcatchment P-9B: Building 1/2 Courtyard



Summary for Pond 2P: CB2

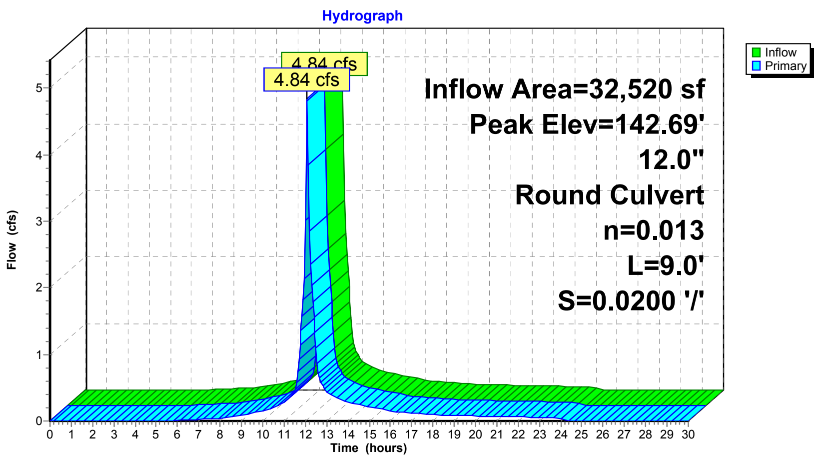
Inflow Area =	32,520 sf, 54.92% Impervious,	Inflow Depth = 5.76"	for 100-Year event	
Inflow =	4.84 cfs @	12.09 hrs, Volume=	15,613 cf	
Outflow =	4.84 cfs @	12.09 hrs, Volume=	15,613 cf, Atten= 0%, Lag= 0.0 min	
Primary =	4.84 cfs @	12.09 hrs, Volume=	15,613 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 142.69' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.57'	12.0" Round Culvert L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.57' / 139.39' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.73 cfs @ 12.09 hrs HW=142.58' (Free Discharge)
└1=Culvert (Inlet Controls 4.73 cfs @ 6.02 fps)

Pond 2P: CB2



Summary for Pond AD11: AD

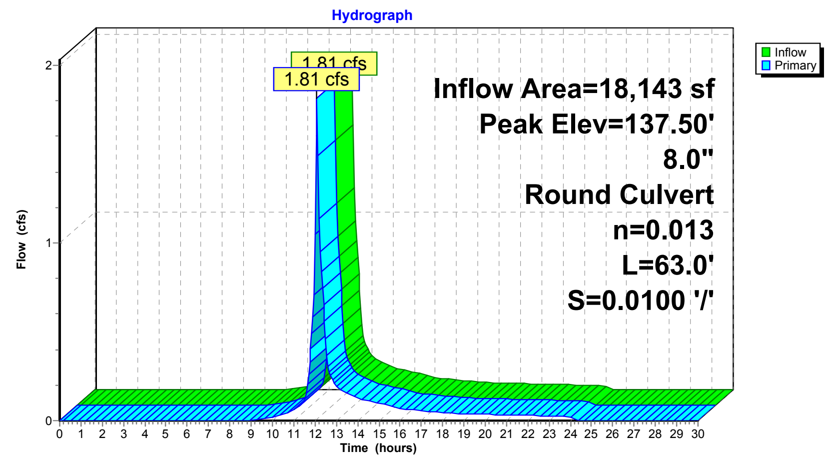
Inflow Area =	18,143 sf, 16.94% Impervious,	Inflow Depth = 3.80"	for 100-Year event	
Inflow =	1.81 cfs @	12.09 hrs, Volume=	5,741 cf	
Outflow =	1.81 cfs @	12.09 hrs, Volume=	5,741 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.81 cfs @	12.09 hrs, Volume=	5,741 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 137.50' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	8.0" Round Culvert L= 63.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 134.62' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.79 cfs @ 12.09 hrs HW=137.45' (Free Discharge)
└1=Culvert (Barrel Controls 1.79 cfs @ 5.12 fps)

Pond AD11: AD



Summary for Pond AD5: AD

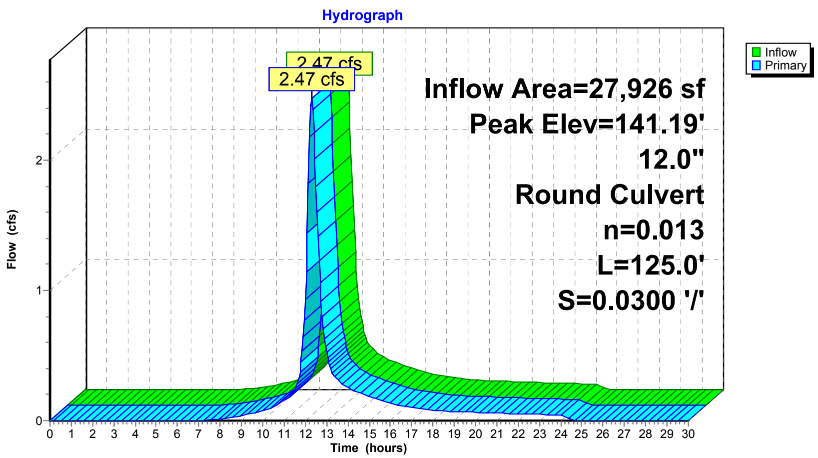
Inflow Area = 27,926 sf, 36.53% Impervious, Inflow Depth = 5.06" for 100-Year event
Inflow = 2.47 cfs @ 12.30 hrs, Volume= 11,775 cf
Outflow = 2.47 cfs @ 12.30 hrs, Volume= 11,775 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.47 cfs @ 12.30 hrs, Volume= 11,775 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.19' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	12.0" Round Culvert L= 125.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 140.00' / 136.25' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.47 cfs @ 12.30 hrs HW=141.18' (Free Discharge)
└1=Culvert (Inlet Controls 2.47 cfs @ 3.14 fps)

Pond AD5: AD



Summary for Pond CB11: CB

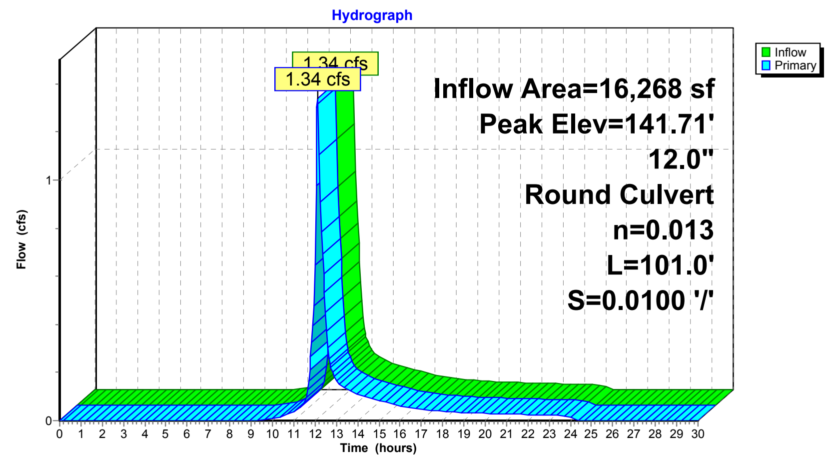
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 3.46" for 100-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf
Outflow = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 141.71' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	141.00'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 141.00' / 139.99' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.31 cfs @ 12.13 hrs HW=141.70' (Free Discharge)
└1=Culvert (Inlet Controls 1.31 cfs @ 2.24 fps)

Pond CB11: CB



Summary for Pond CB12: CB

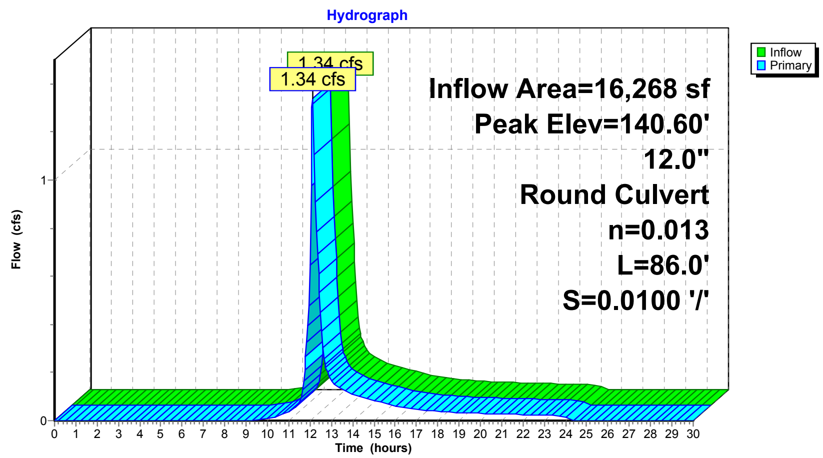
Inflow Area = 16,268 sf, 0.00% Impervious, Inflow Depth = 3.46" for 100-Year event
Inflow = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf
Outflow = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.13 hrs, Volume= 4,691 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.60' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	139.89'	12.0" Round Culvert L= 86.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.89' / 139.03' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.31 cfs @ 12.13 hrs HW=140.59' (Free Discharge)
└1=Culvert (Inlet Controls 1.31 cfs @ 2.24 fps)

Pond CB12: CB



Summary for Pond CB4: CB

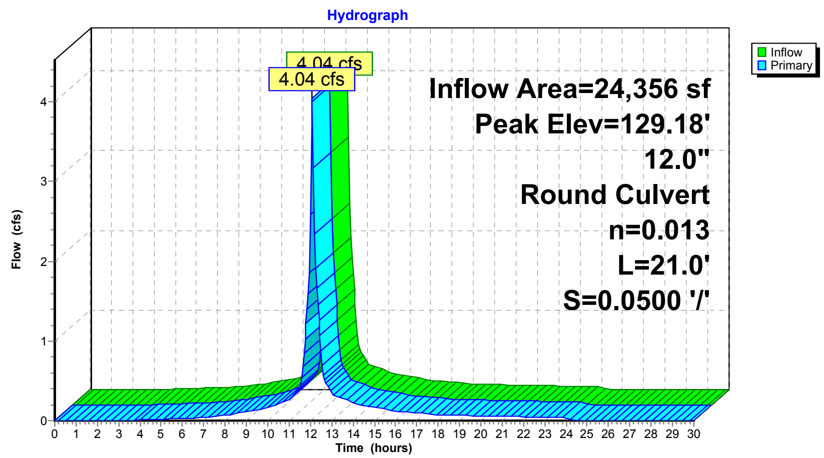
Inflow Area = 24,356 sf, 75.32% Impervious, Inflow Depth = 6.71" for 100-Year event
Inflow = 4.04 cfs @ 12.09 hrs, Volume= 13,612 cf
Outflow = 4.04 cfs @ 12.09 hrs, Volume= 13,612 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.04 cfs @ 12.09 hrs, Volume= 13,612 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.18' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.85'	12.0" Round Culvert L= 21.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.85' / 125.80' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.94 cfs @ 12.09 hrs HW=129.09' (Free Discharge)
└1=Culvert (Inlet Controls 3.94 cfs @ 5.02 fps)

Pond CB4: CB



Summary for Pond CB5: CB

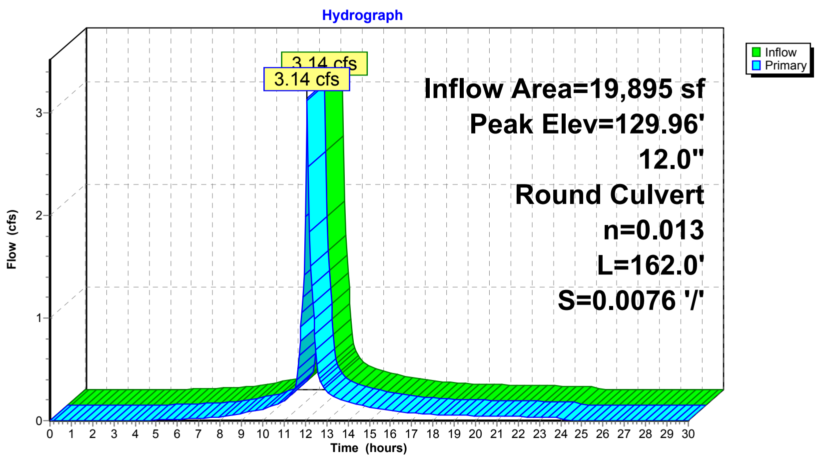
Inflow Area = 19,895 sf, 64.33% Impervious, Inflow Depth = 6.23" for 100-Year event
Inflow = 3.14 cfs @ 12.09 hrs, Volume= 10,333 cf
Outflow = 3.14 cfs @ 12.09 hrs, Volume= 10,333 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.14 cfs @ 12.09 hrs, Volume= 10,333 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.96' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	128.35'	12.0" Round Culvert L= 162.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 128.35' / 127.12' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.09 hrs HW=129.91' (Free Discharge)
└1=Culvert (Inlet Controls 3.07 cfs @ 3.91 fps)

Pond CB5: CB



Summary for Pond CB7: CB

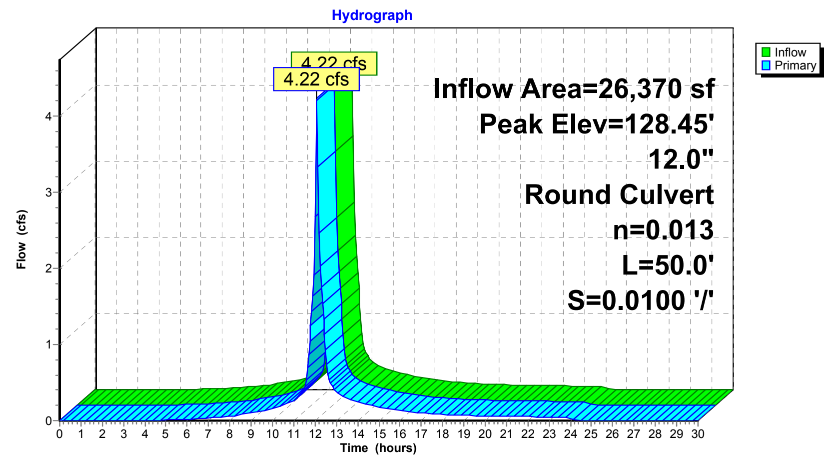
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 6.35" for 100-Year event
Inflow = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf
Outflow = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.45' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.95'	12.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.95' / 125.45' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.12 cfs @ 12.09 hrs HW=128.36' (Free Discharge)
└1=Culvert (Inlet Controls 4.12 cfs @ 5.25 fps)

Pond CB7: CB



Summary for Pond CB8: CB

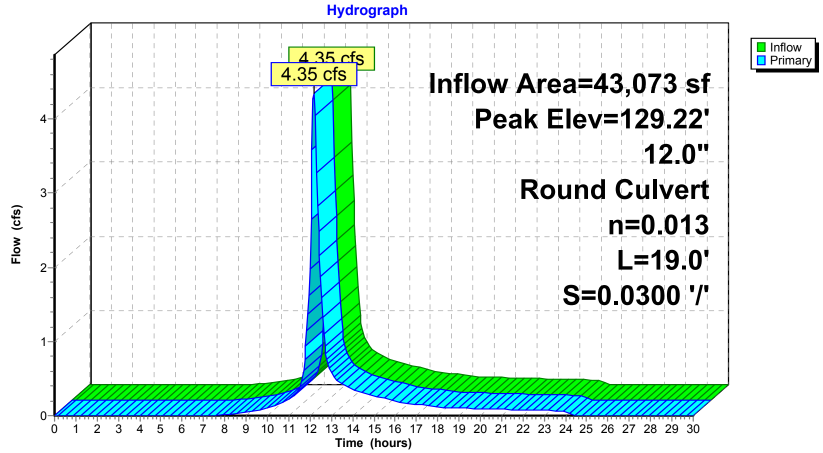
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 4.71"	for 100-Year event
Inflow =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf
Outflow =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf, Atten= 0%, Lag= 0.0 min
Primary =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.22' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	126.61'	12.0" Round Culvert L= 19.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 126.61' / 126.04' S= 0.0300 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.28 cfs @ 12.18 hrs HW=129.17' (Free Discharge)
└1=Culvert (Inlet Controls 4.28 cfs @ 5.46 fps)

Pond CB8: CB



Summary for Pond CDS1: CDS

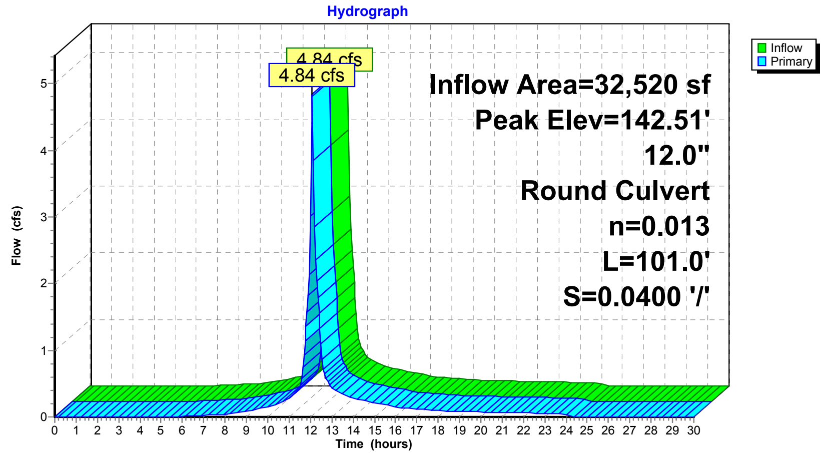
Inflow Area =	32,520 sf, 54.92% Impervious,	Inflow Depth = 5.76"	for 100-Year event
Inflow =	4.84 cfs @ 12.09 hrs,	Volume=	15,613 cf
Outflow =	4.84 cfs @ 12.09 hrs,	Volume=	15,613 cf, Atten= 0%, Lag= 0.0 min
Primary =	4.84 cfs @ 12.09 hrs,	Volume=	15,613 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 142.51' @ 12.09 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.39'	12.0" Round Culvert L= 101.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 139.39' / 135.35' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.73 cfs @ 12.09 hrs HW=142.40' (Free Discharge)
└1=Culvert (Inlet Controls 4.73 cfs @ 6.02 fps)

Pond CDS1: CDS



Summary for Pond CDS2: CDS

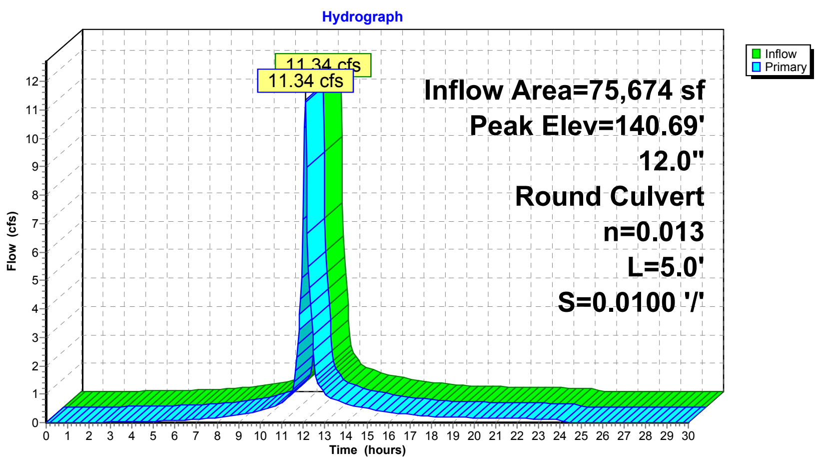
Inflow Area =	75,674 sf, 62.77% Impervious,	Inflow Depth = 6.07" for 100-Year event		
Inflow =	11.34 cfs @	12.09 hrs, Volume=	38,296 cf	
Outflow =	11.34 cfs @	12.09 hrs, Volume=	38,296 cf,	Atten= 0%, Lag= 0.0 min
Primary =	11.34 cfs @	12.09 hrs, Volume=	38,296 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.69' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.80' / 125.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=11.07 cfs @ 12.09 hrs HW=140.05' (Free Discharge)
└─1=Culvert (Inlet Controls 11.07 cfs @ 14.09 fps)

Pond CDS2: CDS



Summary for Pond CDS3: CDS WQU

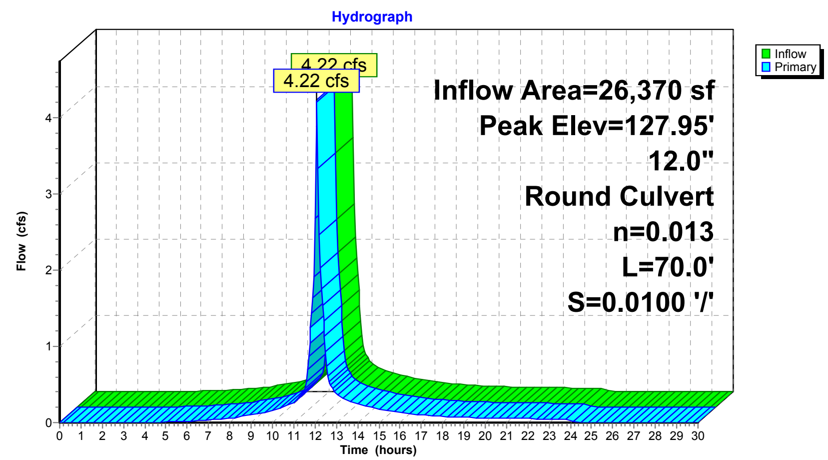
Inflow Area =	26,370 sf, 67.15% Impervious,	Inflow Depth = 6.35" for 100-Year event		
Inflow =	4.22 cfs @	12.09 hrs, Volume=	13,956 cf	
Outflow =	4.22 cfs @	12.09 hrs, Volume=	13,956 cf,	Atten= 0%, Lag= 0.0 min
Primary =	4.22 cfs @	12.09 hrs, Volume=	13,956 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.95' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.45'	12.0" Round Culvert L= 70.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.45' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.12 cfs @ 12.09 hrs HW=127.86' (Free Discharge)
└─1=Culvert (Inlet Controls 4.12 cfs @ 5.25 fps)

Pond CDS3: CDS WQU



Summary for Pond CDS4: CDS WQU

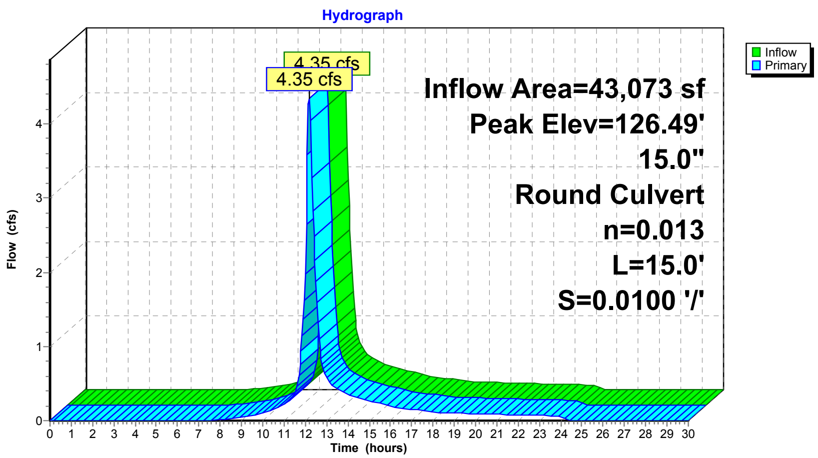
Inflow Area =	43,073 sf, 30.35% Impervious,	Inflow Depth = 4.71" for 100-Year event	
Inflow =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf
Outflow =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf, Atten= 0%, Lag= 0.0 min
Primary =	4.35 cfs @ 12.18 hrs,	Volume=	16,913 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 126.49' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.00'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.00' / 124.85' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.28 cfs @ 12.18 hrs HW=126.47' (Free Discharge)
└─1=Culvert (Inlet Controls 4.28 cfs @ 3.49 fps)

Pond CDS4: CDS WQU



Summary for Pond DMH2A: DMH

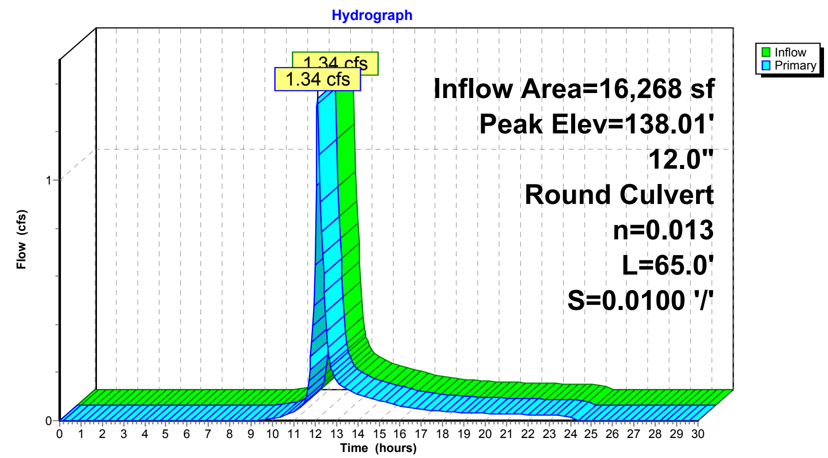
Inflow Area =	16,268 sf, 0.00% Impervious,	Inflow Depth = 3.46" for 100-Year event	
Inflow =	1.34 cfs @ 12.13 hrs,	Volume=	4,691 cf
Outflow =	1.34 cfs @ 12.13 hrs,	Volume=	4,691 cf, Atten= 0%, Lag= 0.0 min
Primary =	1.34 cfs @ 12.13 hrs,	Volume=	4,691 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 138.01' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	12.0" Round Culvert L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 137.30' / 136.65' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.31 cfs @ 12.13 hrs HW=138.00' (Free Discharge)
└─1=Culvert (Inlet Controls 1.31 cfs @ 2.24 fps)

Pond DMH2A: DMH



Summary for Pond DMH3: DMH

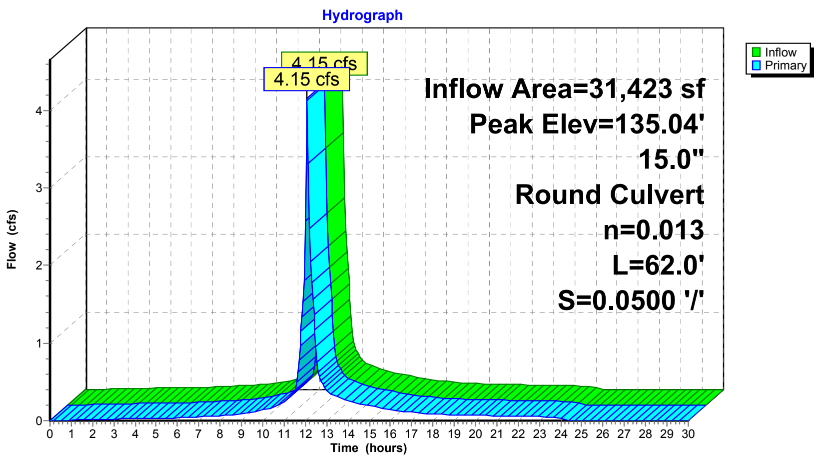
Inflow Area = 31,423 sf, 52.04% Impervious, Inflow Depth = 5.48" for 100-Year event
Inflow = 4.15 cfs @ 12.09 hrs, Volume= 14,351 cf
Outflow = 4.15 cfs @ 12.09 hrs, Volume= 14,351 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.15 cfs @ 12.09 hrs, Volume= 14,351 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 135.04' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	133.62'	15.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 133.62' / 130.52' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.06 cfs @ 12.09 hrs HW=135.00' (Free Discharge)
└─1=Culvert (Inlet Controls 4.06 cfs @ 3.31 fps)

Pond DMH3: DMH



Summary for Pond DMH5: DMH

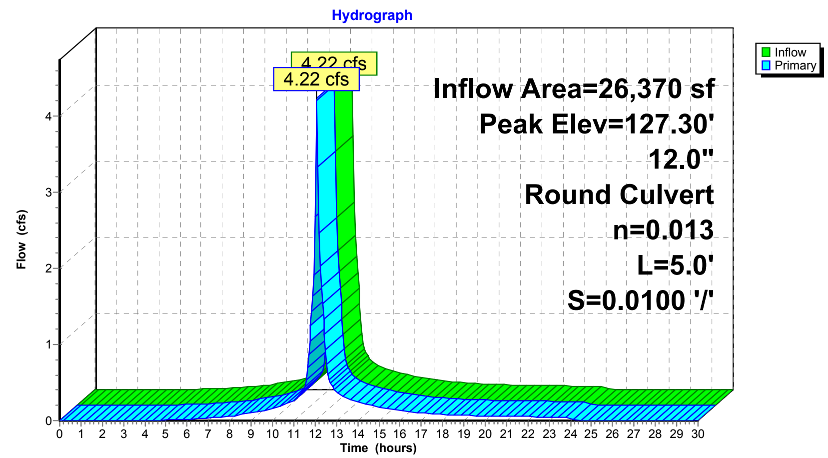
Inflow Area = 26,370 sf, 67.15% Impervious, Inflow Depth = 6.35" for 100-Year event
Inflow = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf
Outflow = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.22 cfs @ 12.09 hrs, Volume= 13,956 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 127.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	124.80'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 124.80' / 124.75' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.12 cfs @ 12.09 hrs HW=127.21' (Free Discharge)
└─1=Culvert (Inlet Controls 4.12 cfs @ 5.25 fps)

Pond DMH5: DMH



Summary for Pond DMH6: DMH

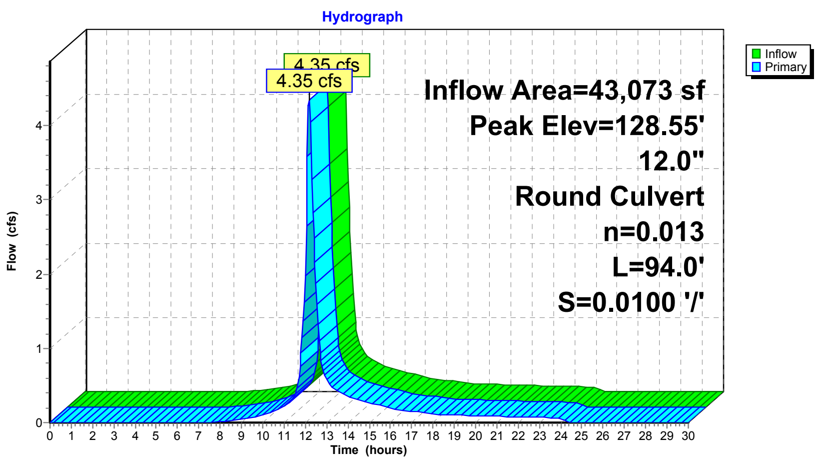
Inflow Area = 43,073 sf, 30.35% Impervious, Inflow Depth = 4.71" for 100-Year event
Inflow = 4.35 cfs @ 12.18 hrs, Volume= 16,913 cf
Outflow = 4.35 cfs @ 12.18 hrs, Volume= 16,913 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.35 cfs @ 12.18 hrs, Volume= 16,913 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.55' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	125.94'	12.0" Round Culvert L= 94.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.94' / 125.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.28 cfs @ 12.18 hrs HW=128.50' (Free Discharge)
└─1=Culvert (Inlet Controls 4.28 cfs @ 5.46 fps)

Pond DMH6: DMH



Summary for Pond DMH8: DMH

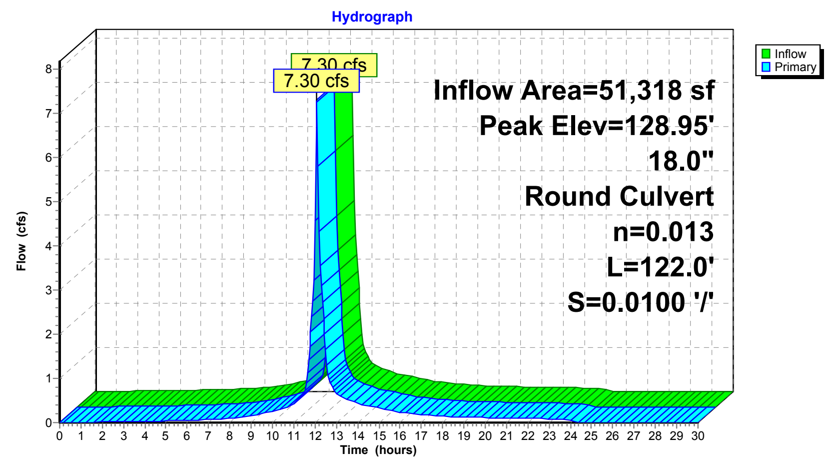
Inflow Area = 51,318 sf, 56.81% Impervious, Inflow Depth = 5.77" for 100-Year event
Inflow = 7.30 cfs @ 12.09 hrs, Volume= 24,684 cf
Outflow = 7.30 cfs @ 12.09 hrs, Volume= 24,684 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.30 cfs @ 12.09 hrs, Volume= 24,684 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 128.95' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	127.02'	18.0" Round Culvert L= 122.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 127.02' / 125.80' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.13 cfs @ 12.09 hrs HW=128.90' (Free Discharge)
└─1=Culvert (Inlet Controls 7.13 cfs @ 4.03 fps)

Pond DMH8: DMH



Summary for Pond UIS1: UIS#1

Inflow Area =	105,247 sf, 53.77% Impervious,	Inflow Depth = 5.77"	for 100-Year event
Inflow =	12.54 cfs @ 12.10 hrs,	Volume=	50,577 cf
Outflow =	9.11 cfs @ 12.22 hrs,	Volume=	47,483 cf, Atten= 27%, Lag= 7.1 min
Discarded =	0.09 cfs @ 6.50 hrs,	Volume=	9,005 cf
Primary =	9.01 cfs @ 12.22 hrs,	Volume=	38,478 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 140.02' @ 12.22 hrs Surf.Area= 3,388 sf Storage= 11,484 cf

Plug-Flow detention time= 102.0 min calculated for 47,483 cf (94% of inflow)
Center-of-Mass det. time= 68.1 min (857.7 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	134.50'	4,767 cf	29.92'W x 113.25'L x 5.50'H Field A 18,634 cf Overall - 6,716 cf Embedded = 11,918 cf x 40.0% Voids
#2A	135.25'	6,716 cf	ADS_StormTech MC-3500 d +Cap x 60 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 60 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	135.25'	15.0" Round 15" HDPE L= 408.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 135.25' / 127.09' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	136.60'	13.0" Vert. 13" Orifice C= 0.600
#3	Discarded	134.50'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#4	Device 1	139.75'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.09 cfs @ 6.50 hrs HW=134.56' (Free Discharge)
└─3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=8.78 cfs @ 12.22 hrs HW=139.99' (Free Discharge)
└─1=15" HDPE (Passes 8.78 cfs of 9.46 cfs potential flow)
  ├─2=13" Orifice (Orifice Controls 7.48 cfs @ 8.12 fps)
  └─4=Broad-Crested Rectangular Weir (Weir Controls 1.29 cfs @ 1.37 fps)

Pond UIS1: UIS#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

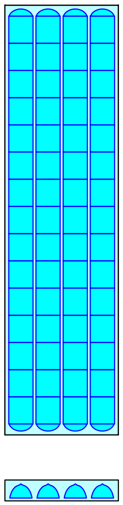
15 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 111.25' Row Length +12.0" End Stone x 2 = 113.25' Base Length
4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

60 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 4 Rows = 6,716.3 cf Chamber Storage

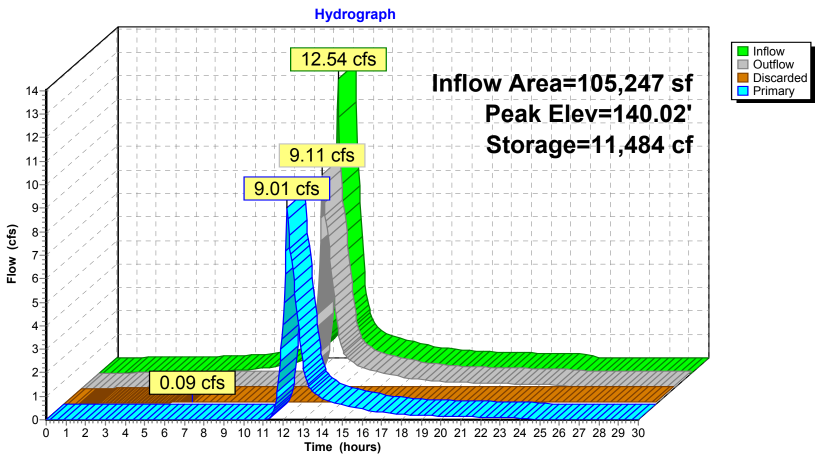
18,634.3 cf Field - 6,716.3 cf Chambers = 11,918.0 cf Stone x 40.0% Voids = 4,767.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.5 cf = 0.264 af
Overall Storage Efficiency = 61.6%
Overall System Size = 113.25' x 29.92' x 5.50'

60 Chambers
690.2 cy Field
441.4 cy Stone



Pond UIS1: UIS#1



Summary for Pond UIS2: UIS #2

Inflow Area = 90,170 sf, 68.75% Impervious, Inflow Depth = 6.35" for 100-Year event
Inflow = 13.90 cfs @ 12.09 hrs, Volume= 47,694 cf
Outflow = 8.78 cfs @ 12.20 hrs, Volume= 44,279 cf, Atten= 37%, Lag= 6.8 min
Discarded = 0.11 cfs @ 9.00 hrs, Volume= 10,451 cf
Primary = 8.67 cfs @ 12.20 hrs, Volume= 33,828 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 131.46' @ 12.20 hrs Surf.Area= 3,946 sf Storage= 13,433 cf

Plug-Flow detention time= 122.7 min calculated for 44,279 cf (93% of inflow)
Center-of-Mass det. time= 84.1 min (858.3 - 774.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	125.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A 21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	125.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 70 Chambers in 5 Rows Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	125.75'	82 cf	4.00'D x 6.50'H Vertical Cone/Cylinder
		13,443 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	125.75'	15.0" Round 15" HDPE L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 125.75' / 125.23' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Discarded	125.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area
#3	Device 1	127.10'	13.0" Vert. 13" Orifice C= 0.600

Discarded OutFlow Max=0.11 cfs @ 9.00 hrs HW=125.75' (Free Discharge)
└─2=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=8.63 cfs @ 12.20 hrs HW=131.42' (Free Discharge)
└─1=15" HDPE (Passes 8.63 cfs of 10.48 cfs potential flow)
 └─3=13" Orifice (Orifice Controls 8.63 cfs @ 9.36 fps)

Pond UIS2: UIS #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

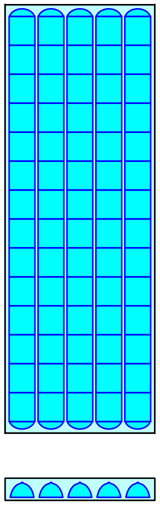
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

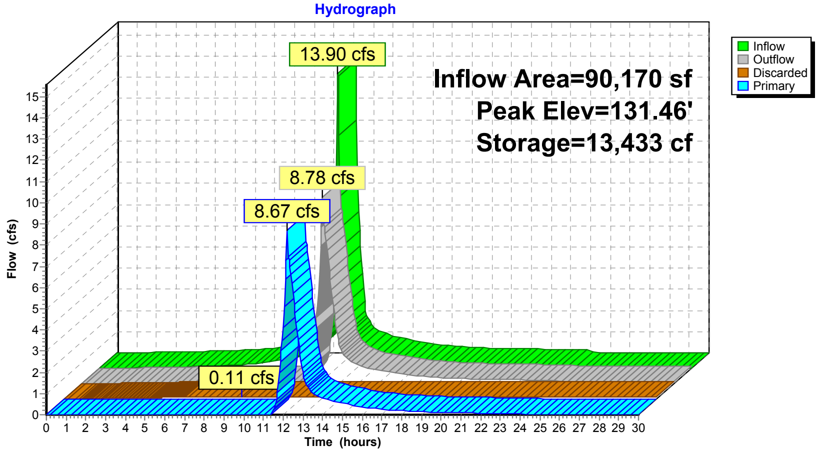
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS2: UIS #2



Summary for Pond UIS3: MC-3500

Inflow Area =	91,745 sf, 57.86% Impervious,	Inflow Depth = 5.93"	for 100-Year event	
Inflow =	11.69 cfs @	12.10 hrs, Volume=	45,329 cf	
Outflow =	6.54 cfs @	12.31 hrs, Volume=	41,781 cf,	Atten= 44%, Lag= 12.2 min
Discarded =	0.11 cfs @	7.10 hrs, Volume=	10,126 cf	
Primary =	6.43 cfs @	12.31 hrs, Volume=	31,655 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 129.49' @ 12.31 hrs Surf.Area= 3,934 sf Storage= 13,349 cf

Plug-Flow detention time= 125.5 min calculated for 41,711 cf (92% of inflow)
Center-of-Mass det. time= 85.2 min (872.6 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.00'	5,516 cf	37.08'W x 106.08'L x 5.50'H Field A
			21,636 cf Overall - 7,846 cf Embedded = 13,790 cf x 40.0% Voids
#2A	124.75'	7,846 cf	ADS_StormTech MC-3500 d +Cap x 70 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			70 Chambers in 5 Rows
			Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
		13,362 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	124.75'	15.0" Round 15" HDPE L= 44.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 124.75' / 124.31' S= 0.0100 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	126.10'	12.0" Vert. 12" Orifice C= 0.600
#3	Discarded	124.00'	1.205 in/hr Loamy Sand (1/2 Rawls Rate) over Surface area

Discarded OutFlow Max=0.11 cfs @ 7.10 hrs HW=124.06' (Free Discharge)
└3=Loamy Sand (1/2 Rawls Rate) (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=6.42 cfs @ 12.31 hrs HW=129.48' (Free Discharge)
└1=15" HDPE (Passes 6.42 cfs of 9.46 cfs potential flow)
  └2=12" Orifice (Orifice Controls 6.42 cfs @ 8.18 fps)

Pond UIS3: MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

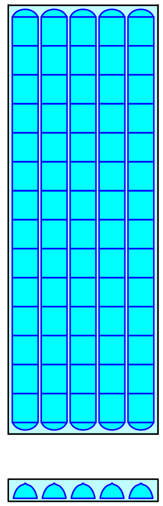
14 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 104.08' Row Length +12.0" End Stone x 2 = 106.08' Base Length
5 Rows x 77.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 37.08' Base Width
9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

70 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 5 Rows = 7,845.6 cf Chamber Storage

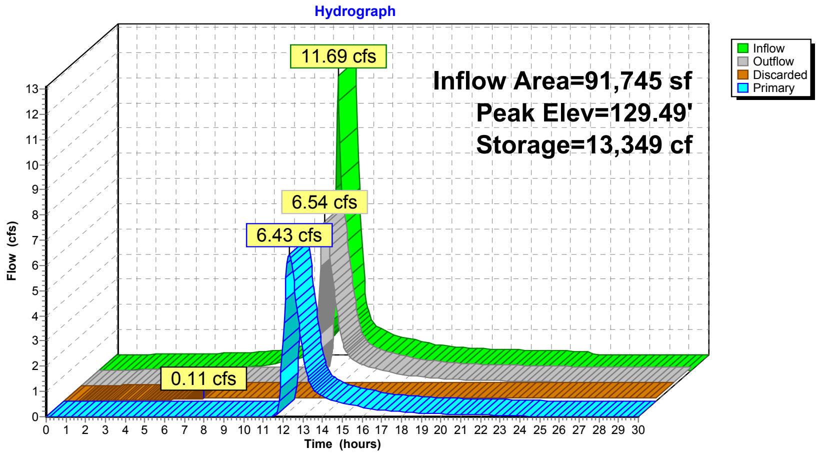
21,635.9 cf Field - 7,845.6 cf Chambers = 13,790.3 cf Stone x 40.0% Voids = 5,516.1 cf Stone Storage

Chamber Storage + Stone Storage = 13,361.7 cf = 0.307 af
Overall Storage Efficiency = 61.8%
Overall System Size = 106.08' x 37.08' x 5.50'

70 Chambers
801.3 cy Field
510.8 cy Stone



Pond UIS3: MC-3500

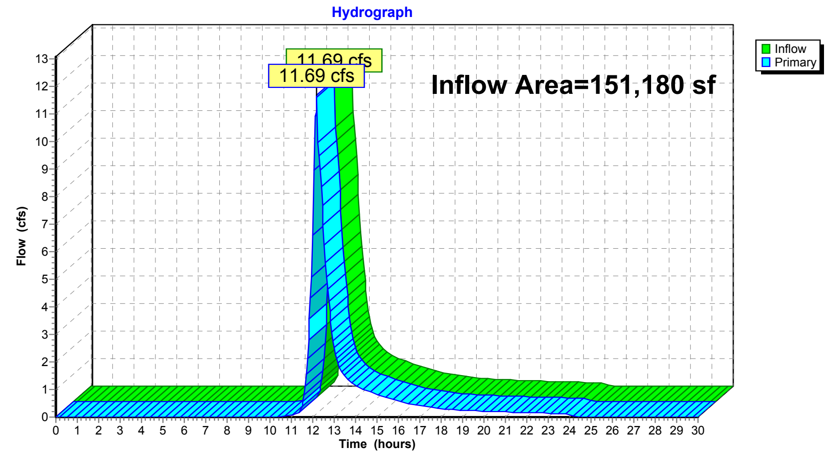


Summary for Link SP-1: Study Point #1

Inflow Area = 151,180 sf, 41.01% Impervious, Inflow Depth = 3.86" for 100-Year event
Inflow = 11.69 cfs @ 12.19 hrs, Volume= 48,607 cf
Primary = 11.69 cfs @ 12.19 hrs, Volume= 48,607 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-1: Study Point #1

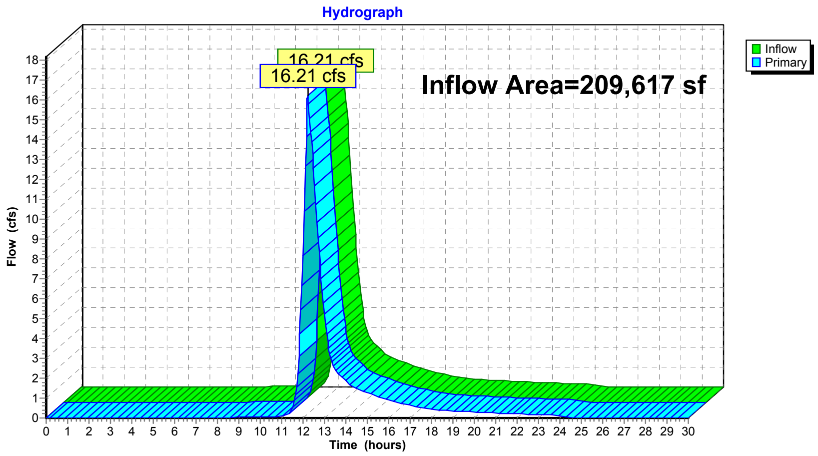


Summary for Link SP-2: Study Point #2

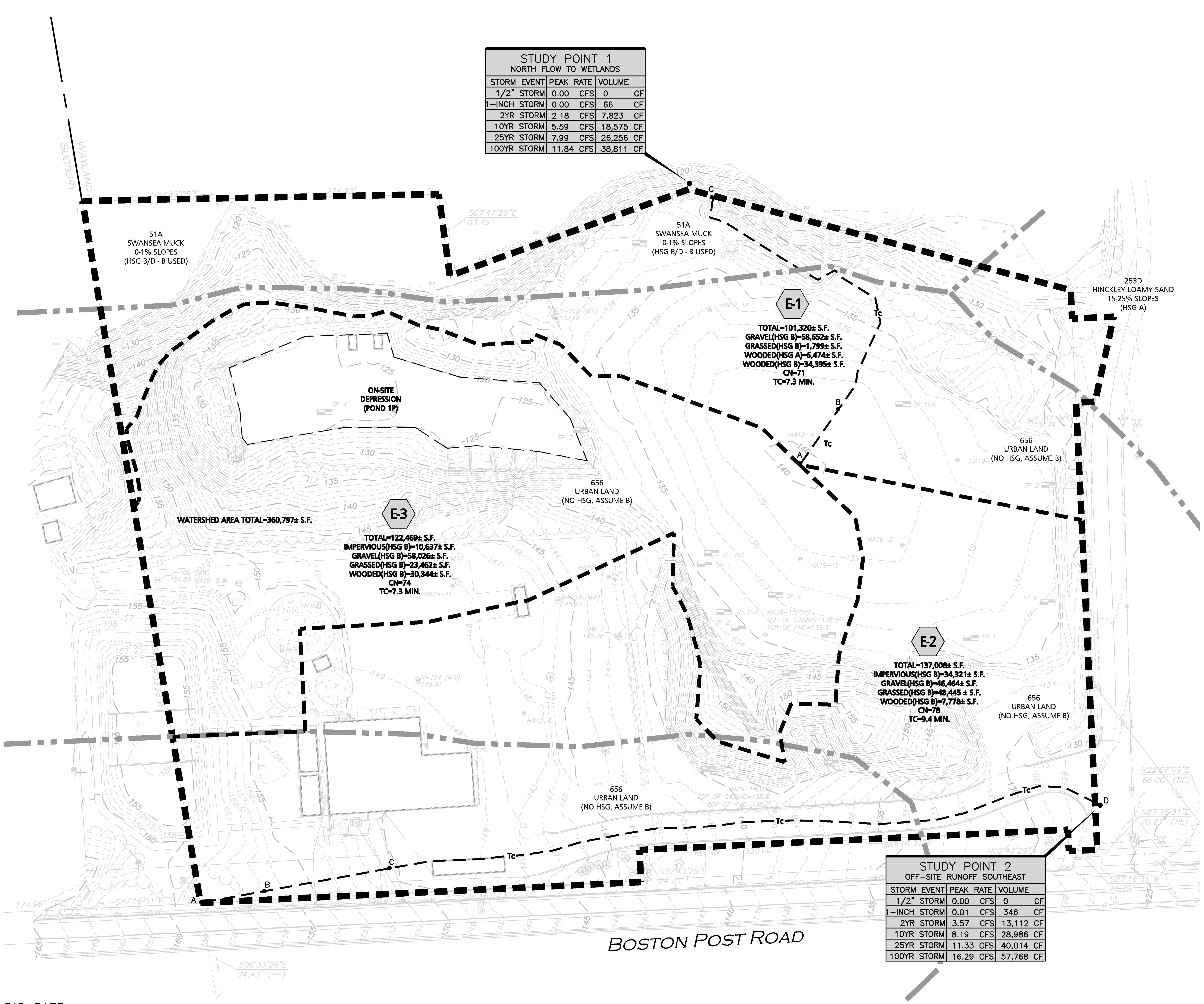
Inflow Area =	209,617 sf, 55.29% Impervious,	Inflow Depth = 4.35"	for 100-Year event
Inflow =	16.21 cfs @ 12.22 hrs, Volume=	75,947 cf	
Primary =	16.21 cfs @ 12.22 hrs, Volume=	75,947 cf, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link SP-2: Study Point #2



STUDY POINT 1 NORTH FLOW TO WETLANDS		
STORM EVENT	PEAK RATE	VOLUME
1/2" STORM	0.00 CFS	0 CF
1-INCH STORM	0.00 CFS	66 CF
2YR STORM	2.18 CFS	7,823 CF
10YR STORM	5.59 CFS	18,575 CF
25YR STORM	7.99 CFS	26,256 CF
100YR STORM	11.84 CFS	38,811 CF



STUDY POINT 2 OFF-SITE RUNOFF SOUTHEAST		
STORM EVENT	PEAK RATE	VOLUME
1/2" STORM	0.00 CFS	0 CF
1-INCH STORM	0.01 CFS	346 CF
2YR STORM	3.57 CFS	13,112 CF
10YR STORM	8.19 CFS	28,986 CF
25YR STORM	11.33 CFS	40,014 CF
100YR STORM	16.29 CFS	57,768 CF

LEGEND

EXISTING WATERSHED	
SCS SOILS BOUNDARY	
Tc FLOW PATH	A — B
SUBCATCHMENT LABEL	E-1
SUBCATCHMENT BOUNDARY	
FLOW DIRECTION	

NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
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4. ADDITIONAL SURVEY INFORMATION TAKEN FROM BASE PLAN ENTITLED "EXISTING CONDITIONS SURVEY – 484–490 BOSTON POST ROAD, WAYLAND MASSACHUSETTS" PREPARED BY WSP SELLS, PREPARED FOR TATA & HOWARD, DATED JULY 16, 2015, ORIGINAL SCALE 1"=60'.
5. ALL EXISTING AND PROPOSED COVER TYPES SHALL BE CONSIDERED "GOOD" FOR MODELING PURPOSES UNLESS OTHERWISE NOTED.
6. TOTAL SITE WATERSHED AREA IS 359,288± S.F.

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_WATERSHED-EXISTING.DWG

ISSUED FOR DRAINAGE REPORT
NOVEMBER 12, 2019

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
E.	11/12/2019	REVISED PER TOWN COMMENTS
D.	10/18/2019	REVISED PER TOWN COMMENTS
C.	10/10/2019	REVISED PER TOWN COMMENTS
B.	09/27/2019	REVISED PER TOWN COMMENTS
A.	07/03/2019	ISSUED FOR NOTICE OF INTENT

APPLICANT\OWNER:

WP EAST ACQUISITIONS, LLC.
91 HARTWELL AVENUE
LEXINGTON, MA 02421

PROJECT:

ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

PROJECT NO. 1670-09A		DATE:	06-20-2019
SCALE:	1" =40'	DWG. NAME:	1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

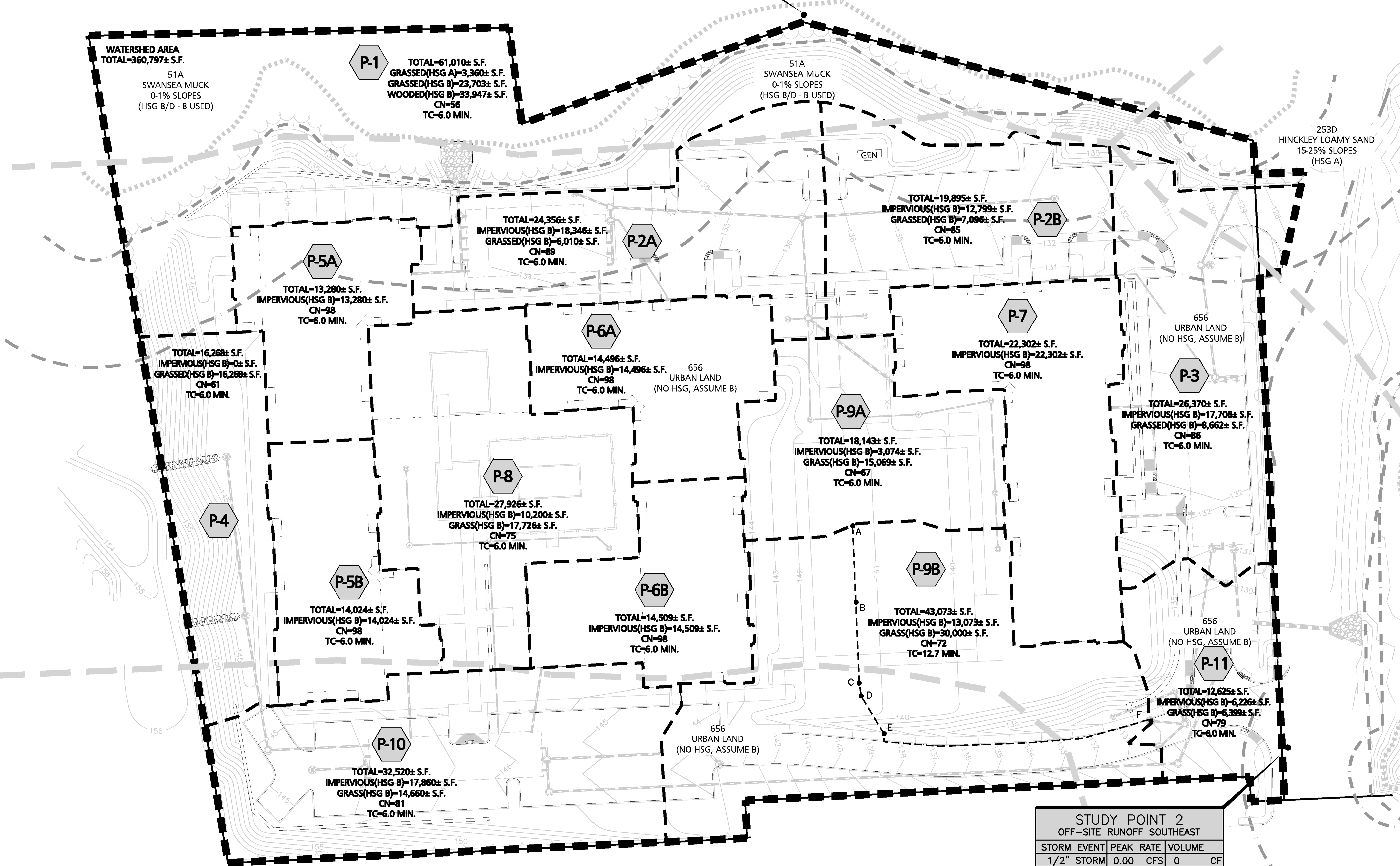
PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil & structural engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY, SUITE 5
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
EXISTING WATERSHED PLAN	EWP

STUDY POINT 1		
NORTH FLOW TO WETLANDS		
STORM EVENT	PEAK RATE	VOLUME
1/2" STORM	0.00 CFS	0 CF
1-INCH STORM	0.00 CFS	0 CF
2YR STORM	0.76 CFS	5,450 CF
10YR STORM	4.78 CFS	20,071 CF
25YR STORM	7.33 CFS	30,786 CF
100YR STORM	11.69 CFS	48,607 CF



STUDY POINT 2		
OFF-SITE RUNOFF SOUTHEAST		
STORM EVENT	PEAK RATE	VOLUME
1/2" STORM	0.00 CFS	0 CF
1-INCH STORM	0.01 CFS	74 CF
2YR STORM	0.91 CFS	8,242 CF
10YR STORM	7.04 CFS	32,038 CF
25YR STORM	10.32 CFS	48,861 CF
100YR STORM	16.21 CFS	75,947 CF

LEGEND

PROPOSED WATERSHED	
SCS SOILS BOUNDARY	
Tc FLOW PATH	A — B
SUBCATCHMENT LABEL	P-1
SUBCATCHMENT BOUNDARY	
FLOW DIRECTION	⟹

NOTES:

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1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_WATERSHED-PROPOSED.DWG

ISSUED FOR DRAINAGE REPORT
NOVEMBER 12, 2019

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

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91 HARTWELL AVENUE
LEXINGTON, MA 02421

PROJECT:

ALTA AT RIVER'S EDGE
490 BOSTON POST ROAD
WAYLAND, MA

PROJECT NO.	1670-09A	DATE:	06-20-2019
SCALE:	1"=40'	DWG. NAME:	1670-09A
DESIGNED BY:	SJL	CHECKED BY:	CMQ

PREPARED BY:

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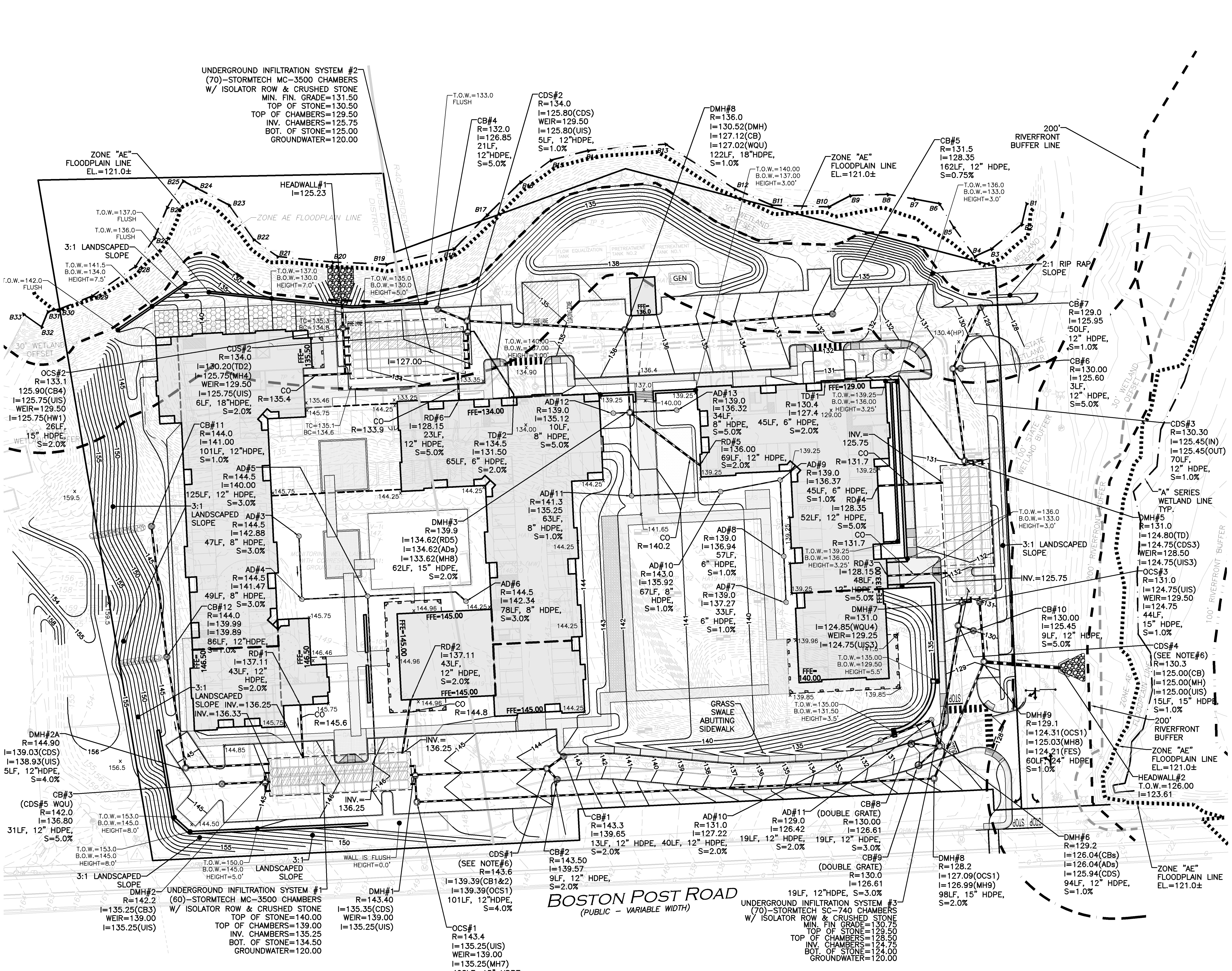
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896

WOBURN, MA ♦ LAKEVILLE, MA ♦ MANCHESTER, NH

DRAWING TITLE:	SHEET No.
PROPOSED WATERSHED PLAN	PWS-1



LEGEND

DRAIN MANHOLE	⊙
CATCH BASIN	⊙
CATCH BASIN - DOUBLE GRATE	⊖
DRAIN MANHOLE W/ WEIR	◐
AREA DRAIN	⊙
CLEANOUT	•
SPOT GRADE	×148.00
DRAIN LINE	
5' CONTOUR	200
1' CONTOUR	198
INFILTRATION SYSTEM	
INFILTRATION CHAMBERS	
ISOLATOR ROW	

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3. PIPE DIMENSIONS ARE MEASURED FROM THE INSIDE FACE OF THE STRUCTURE.
4. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES. DIGSAFE: 1-888-344-7233
5. ANY ROOF DRAINAGE PIPE LOCATED WITHIN 10' OF THE BUILDING FOUNDATION SHALL BE CAST IRON PIPE PER MA PLUMBING CODE.
6. ALL "CDS" STRUCTURES HAVE BEEN SIZED USING THE WATER QUALITY FLOW RATE PER MASS STORMWATER HANDBOOK AND SHALL BE CONTECH CDS2015-4-C OR APPROVED EQUIVALENT.
7. GROUNDWATER ELEVATIONS ARE ASSUMPTIONS BASED ON INFORMATION PROVIDED IN A GEOTECHNICAL REPORT DATED MAY 2019 BY HALEY ALDRICH. TEST PITS SHALL BE CONDUCTED BY A SOIL EVALUATOR LICENSED IN THE STATE OF MASSACHUSETTS TO VERIFY THE ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (ESHGWT) PRIOR TO THE INSTALLATION OF THE INFILTRATION FIELDS.

DIG SAFE

BEFORE YOU DIG
CALL 811 OR
1-888-DIG-SAFE
1-888-344-7233

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N:\PROJECTS\1670-09A\CIVIL\DRAWINGS\CURRENT\C-1670-09A_GRADING & DRAINAGE.DWG

ISSUED FOR DRAINAGE REPORT
NOVEMBER 12, 2019

PROFESSIONAL ENGINEER FOR
ALLEN & MAJOR ASSOCIATES, INC.

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DRAWING TITLE:	SHEET No.
GRADING & DRAINAGE PLAN	C-103

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Middlesex County, Massachusetts

April 30, 2019

Soil Map

Map Scale: 1:10,100 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 100, 200, 400, 600

Feet: 0, 450, 900, 1800, 2700

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 18, Sep 7, 2018

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

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

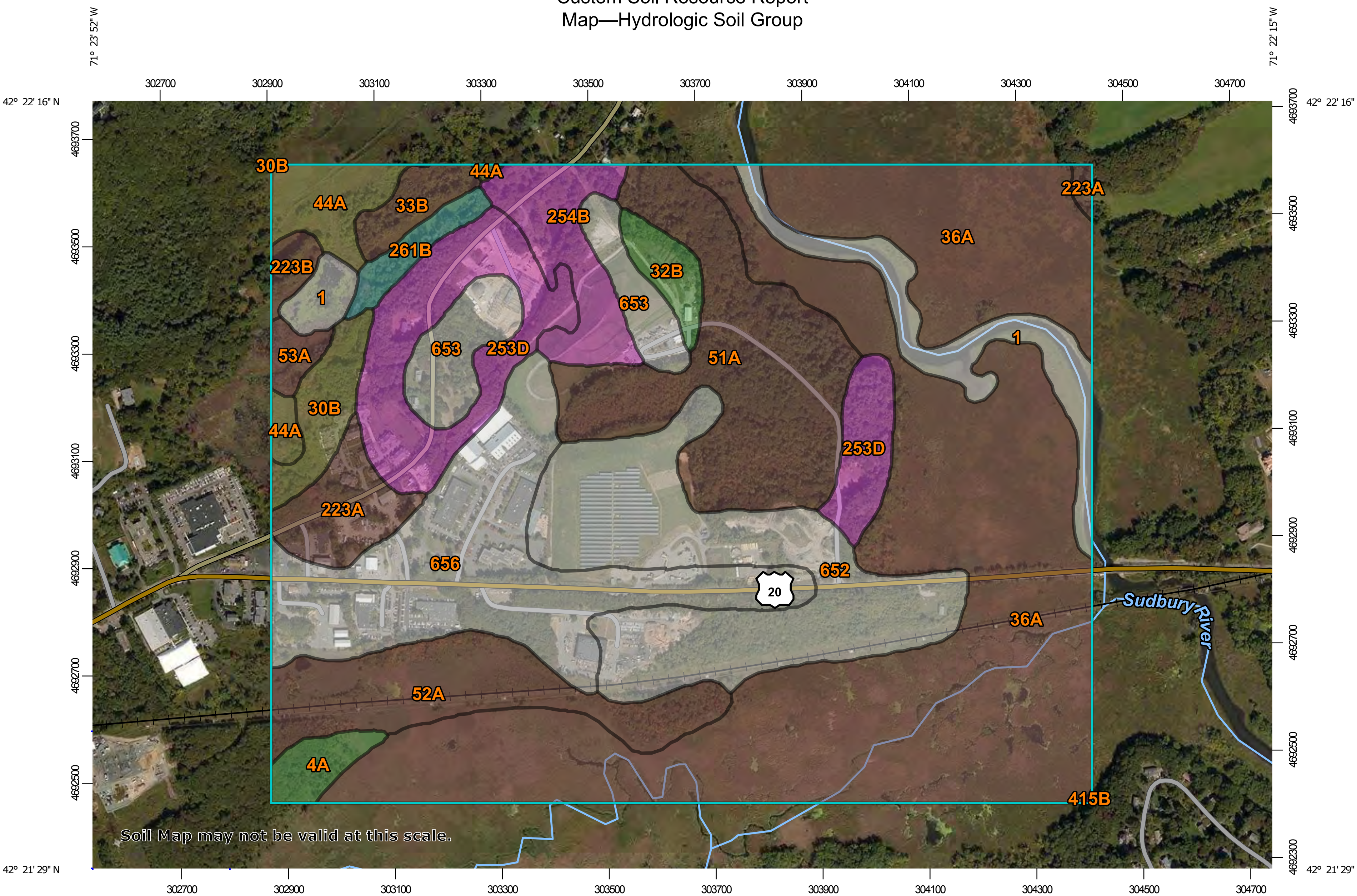
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	18.0	4.0%
4A	Rippowam fine sandy loam, 0 to 3 percent slopes	4.3	0.9%
30B	Raynham silt loam, 0 to 5 percent slopes	7.4	1.6%
32B	Wareham loamy fine sand, 0 to 5 percent slopes	4.7	1.0%
33B	Raypol silt loam, 0 to 5 percent slopes	4.9	1.1%
36A	Saco mucky silt loam, 0 to 1 percent slopes	158.7	35.0%
44A	Birdsall mucky silt loam, 0 to 1 percent slopes	9.6	2.1%
51A	Swansea muck, 0 to 1 percent slopes	42.6	9.4%
52A	Freetown muck, 0 to 1 percent slopes	24.7	5.4%
53A	Freetown muck, ponded, 0 to 1 percent slopes	2.6	0.6%
223A	Scio very fine sandy loam, 0 to 3 percent slopes	10.4	2.3%
223B	Scio very fine sandy loam, 3 to 8 percent slopes	2.4	0.5%
253D	Hinckley loamy sand, 15 to 25 percent slopes	30.1	6.6%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	13.3	2.9%
261B	Tisbury silt loam, 3 to 8 percent slopes	4.2	0.9%
415B	Narragansett silt loam, 3 to 8 percent slopes	0.0	0.0%
652	Udorthents, refuse substratum	50.9	11.2%
653	Udorthents, sandy	15.1	3.3%
656	Udorthents-Urban land complex	49.9	11.0%
Totals for Area of Interest		**453.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

Map—Hydrologic Soil Group



N

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Meters: 0, 100, 200, 400, 600

Feet: 0, 450, 900, 1800, 2700

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 18, Sep 7, 2018

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		18.0	4.0%
4A	Rippowam fine sandy loam, 0 to 3 percent slopes	A/D	4.3	0.9%
30B	Raynham silt loam, 0 to 5 percent slopes	C/D	7.4	1.6%
32B	Wareham loamy fine sand, 0 to 5 percent slopes	A/D	4.7	1.0%
33B	Raypol silt loam, 0 to 5 percent slopes	B/D	4.9	1.1%
36A	Saco mucky silt loam, 0 to 1 percent slopes	B/D	158.7	35.0%
44A	Birdsall mucky silt loam, 0 to 1 percent slopes	C/D	9.6	2.1%
51A	Swansea muck, 0 to 1 percent slopes	B/D	42.6	9.4%
52A	Freetown muck, 0 to 1 percent slopes	B/D	24.7	5.4%
53A	Freetown muck, ponded, 0 to 1 percent slopes	B/D	2.6	0.6%
223A	Scio very fine sandy loam, 0 to 3 percent slopes	B/D	10.4	2.3%
223B	Scio very fine sandy loam, 3 to 8 percent slopes	B/D	2.4	0.5%
253D	Hinckley loamy sand, 15 to 25 percent slopes	A	30.1	6.6%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	13.3	2.9%
261B	Tisbury silt loam, 3 to 8 percent slopes	C	4.2	0.9%
415B	Narragansett silt loam, 3 to 8 percent slopes	A	0.0	0.0%
652	Udorthents, refuse substratum		50.9	11.2%
653	Udorthents, sandy		15.1	3.3%
656	Udorthents-Urban land complex		49.9	11.0%
Totals for Area of Interest			**453.7**	**100.0%**

3. Site Subsurface Conditions

3.1 SOIL AND BEDROCK

The test borings typically indicated the following sequence of subsurface units:

Stratum/Subsurface Unit	Top of Stratum	Range in Thickness (ft)
Fill Soils	El. 125.0 to El. 154.5	1.6 to 17
Glaciofluvial Deposits	El. 120.2 to El. 149.5	>41

- Fill: Fill was encountered at each exploration location consisting of existing in-situ fill soils or stockpiled fill brought to the site by the Wayland DPW for storage. General descriptions of the materials are included below:
  - Existing Fill: Existing Fill soils are present above the natural, Glaciofluvial deposits at thicknesses ranging from 1.6 to 7 ft. The following explorations were performed outside the stockpile limits: TP-1 to 6; TP-101 to 103; and HA19-1, 6, 8 to 11, and 14. The Existing Fill was observed to consist of a loose to dense SAND or silty SAND with gravel and a few cobbles. Some debris was noted in the fill, including brick, wood, and asphalt pieces. Thin layers of topsoil were present at select locations above or intermixed within the Fill.
  - Stockpiled Fill: The Stockpiled Fill was located within a portion of the proposed Building 1 footprint and leaching field footprint ranging in thickness of 8 to 17 ft. Note that the stockpile was flattened in February 2019 as part of the environmental characterization program conducted by Vertex, which modified the limits of the stockpile and the site grading. The following explorations were performed within the stockpile limits: TP-105; and HA19-2 to 4, 12 to 13, and 15. The Fill was observed to consist of a loose to dense SAND or silty/clayey SAND with gravel and cobbles. Debris included brick, wood, roots, asphalt pieces, oversized concrete and construction debris.

    Results of geotechnical laboratory testing conducted on the Stockpiled Fill soils, which are included in Appendix D, indicated a maximum dry density in the range of about 133.3 to 135.2 pounds per cubic foot with an optimum moisture content in the range of about 6.4% to 6.6%. The in-situ moisture content of the Stockpiled Fill soils generally ranged from 8.9% to 14.3%, with one result at 7.7%. The laboratory data indicate that the Stockpiled Fill soils are wet of optimum and therefore will be difficult to reuse in its current state.

- Glaciofluvial Deposits: Naturally-deposited, inorganic Glaciofluvial Deposits were encountered at each exploration with the top of the deposit observed from El. 120.2 to 149.5. The Glaciofluvial Deposits were highly variable granular deposits and ranged from medium dense to very dense poorly graded to well graded SAND or SAND with gravel or medium dense to very dense, poorly graded to well graded GRAVEL with sand.

- Bedrock: Bedrock was not encountered in explorations.

3.2 GROUNDWATER

Depth to water ranged from approximately 13.8 to 34 ft below existing grades, corresponding to about El. 110 to El. 125.2, as noted in the table below. Groundwater was not encountered in the test pit excavations, except at TP-102 where water slowly entered the excavation at a depth of 12.5 ft below ground surface, corresponding to approximately El. 117.5.

A portion of the site is within the Zone AE flood plain. The existing conditions drawings indicated that base flood elevation is El. 121.

Well ID	Ground Surface Elevation (ft, NAVD 88)[1]	Date	Groundwater	
			Depth from Ground Surface (ft)[2,3]	Elevation (ft, NAVD 88)
V-101	130	1-Apr-19	14.5	115.5
		2-Apr-19	13.8	116.2
		18-Apr-19	13.8	116.2
V-102	125	1-Apr-19	15.0	110.0
		2-Apr-19	14.7	110.3
		18-Apr-19	14.7	110.3
V-103	147	1-Apr-19	30.0	117.0
		2-Apr-19	29.1	117.9
		18-Apr-19	29.1	117.9
V-104	150	1-Apr-19	32.5	117.5
		2-Apr-19	31.2	118.8
		18-Apr-19	31.2	118.8
V-105	148	1-Apr-19	31.0	117.0
		2-Apr-19	29.9	118.1
		18-Apr-19	30.3	117.7
V-106	153	1-Apr-19	34.0	119.0
		2-Apr-19	27.8	125.2
		18-Apr-19	33.8	119.2
HA19-B1(OW)	132	18-Apr-19	14.9	116.6
HA19-13 (OW)	134	9-Apr-19	17.5	116.6
		18-Apr-19	18.5	115.6
HA19-14(OW)	139	18-Apr-19	21.9	117.0

Notes:
1. Ground surface elevations at Vertex's observation wells were estimated based on drawing CP-1, prepared by Allen & Major Associates, Inc., dated 13 June 2016.
2. Readings from 1 and 2 April 2019 were provided by Vertex.
3. Readings from 18 April 2019 were collected by a Haley & Aldrich Representative.

Groundwater levels can fluctuate, as they are influenced by precipitation, snow melt, leakage into or out of utility pipes, nearby construction activities and other factors. Accordingly, groundwater levels during and following construction can differ from those reported herein.

4. Geotechnical Design Recommendations

4.1 GENERAL

Recommendations presented herein are based on the proposed building layout and site development plan as understood at the time this report was prepared. As further information is developed by design team concerning these items, the design criteria should be reviewed by Haley & Aldrich for continued applicability.

4.2 BUILDING CODE AND APPLICABILITY

Building foundations should be designed and constructed in accordance with the Massachusetts State Building Code (Building Code). Recommendations provided herein are intended to be consistent with the requirements of the 9th Edition of the Building Code.

4.3 FOUNDATION DESIGN RECOMMENDATION

4.3.1 Building Foundations

The Existing Fill and Stockpiled Fill soils (in their current state) are not considered suitable bearing materials for building foundations. The naturally deposited, inorganic Glaciofluvial Deposits represent the uppermost subsurface strata suitable for building foundation support (the bearing stratum). The recommendations below assume that the Stockpiled Fill soils have been removed from the site or relocated prior to foundation preparation activities.

Therefore, based on our evaluations, the most economical foundation is a "hybrid" foundation system approach, consisting of conventional shallow foundations bearing on a combination of natural soils, Compacted Granular Fill placed above natural soils, and existing Fill soils stiffened using ground improvement.

Based on proposed finished floor elevation at El. 132 for Building 1 and El. 134 for Building 2, the bottom of foundation elevation is planned to be at approximately El. 128 and 130, respectively.

- In Building 1, the top of suitable bearing soils is encountered up to 5 feet below planned bottom of footing elevations. Building loads can be supported on conventional, reinforced concrete spread footings bearing at normal bearing depths following the excavation and replacement of the existing Fill with Compacted Granular Fill within the zone of influence of the proposed foundations. Alternately, the Existing Fill soils could be stiffened with short ground improvement elements to allow for the construction of conventional reinforced spread footing foundations without the need for over-excavation and replacement (unless obstructions are encountered). The attached Figure 2 illustrates this building as Zone A, where over-excavation and replacement Compacted Granular Fill or ground improvement are options for bearing at normal bearing depth.

- The slab elevation at the new Wastewater Treatment Building was not provided. Based on surrounding proposed grades, the slab is estimated to be finished at El. 130 and the top of

Glaciofluvial deposits to El. 120.2. The recommendations stated above for Building 1 and Zone A are also applicable to the Wastewater Treatment Building.

- Within a large portion of Building 2, illustrated as Zone B on Figure 2, suitable bearing soils are located at or above the planned bottom of footing elevation. In these areas, building loads can be supported on conventional, reinforced concrete spread footings bearing at normal bearing depths in the natural in-organic soils. Additionally, foundations for the at-grade Clubhouse at El. 145 with a planned foundation elevation at El. 141 will be within suitable natural bearing soils. Foundations for the clubhouse will need to be stepped to avoid loading the adjacent foundation walls. The proposed pool will also be constructed within suitable natural bearing soils and can be earth supported.

- Within the north portion of Building 2, illustrated as Zone A on Figure 2, site filling is required to raise grades to proposed footing elevations. The total thickness of existing and new fill up to 9 ft below planned bottom of footing elevations. We recommend that the general grading be conducted in this area with on-site Fill soils and then the placed Fill soils be stiffened with ground improvement to allow for the construction of conventional reinforced spread footing foundations at normal bearing depths. Alternately, the existing Fill can be over-excavated (approximately 2 to 4 feet of Fill will require excavation) and replaced with compacted Granular Fill and the remainder of the site filling in this area can be conducted with Compacted Granular Fill.

The proposed site development involves significant re-grading and soil management. The most economical foundation solution is interdependent on the physical and environmental quality of the Fill and the net-balance for export/import at the site. The following recommendations outline a "hybrid" foundation system approach, consisting of conventional shallow foundations bearing on a combination of natural soils, Structural Fill placed above natural soils, and existing Fill soils stiffened using ground improvement.

4.3.2 Conventional Spread Footings

Specific recommended criteria for design of spread footings are as follows:

- Design footings using the following maximum allowable bearing pressures:

Bearing Condition	**Maximum allowable bearing pressure (Kips per square foot, ksf)**
Inorganic, naturally deposited Glaciofluvial (Zone B)	6 ksf
Compacted Granular Fill (Zone A)	5 ksf
Ground Improvement Stiffened Fill (Zone A)	5 ksf

- Design footings to have a least lateral dimension of 18 in. or greater. The maximum allowable bearing pressure noted above should be reduced proportionally for footings with widths less than 3 ft.
- Locate bottoms of footings at least 48 in. below lowest adjacent ground surface exposed to freezing, and a minimum 18 in. below the top of the adjacent ground floor slab at heated interior locations.
- The Fill Soils are unsuitable foundation bearing strata. Should these soils be encountered within the zone of influence (ZOI) beneath foundations, they should be removed in their entirety and backfilled with Compacted Granular Fill. The ZOI is defined as the zone beneath the footings and beneath imaginary lines extending from points 1 ft laterally beyond the footing outer bottom edge, and out and down on a 1H:1V slope to the top of suitable bearing materials.
- Design footings to bear below a reference line drawn upward and outward on a 1.5 horizontal to 1 vertical (1.5H:1V) slope from the bottom of adjacent utilities or other underground structures, or future planned excavations. Where possible, footing elevations and construction sequencing should be coordinated with utility elevations to allow utilities to pass through the foundation wall (rather than through or beneath the footing). Footing bearing surfaces may locally need to be lowered or stepped to achieve this criterion. Footings should be installed at depth prior to installation of shallower utilities. If pressurized pipes are to pass beneath or within 5 ft of soil-bearing foundations, the configuration should be reviewed on a case by case basis to determine if special measures are needed to protect the foundations from undermining in the event of pipeline failure.
- Tops of individual column or wall footings should be positioned a minimum of 4 in. beneath the underside of an overlying floor slab. This space should be filled with granular soil having maximum particle size of 2 in.

Gradation and placement procedures for Compacted Granular Fill are described below in the Construction Considerations section of the report.

4.3.3 Ground Improvement

Where used to stiffen existing Fill Soils, Ground improvement should consist of semi-rigid vertical elements (e.g., Aggregate Piers or equivalent) installed through unsuitable soils to create a stiffened mass suitable for footing bearing. The detailed final design and installation of ground improvement is performed by specialty subcontractors, in accordance with performance criteria established by the Owner's Geotechnical Engineer. Proposals by perspective specialty Contractors bidding the work are typically reviewed by the Geotechnical Engineer for suitability of the proposed system and compliance with the project requirements.

For preliminary design and pricing, we recommend that the same footing design criteria as described above for conventional spread footings be used to design the spread footings bearing on ground improvement.

Other ground improvement considerations are as follows:

- Ground improvement design should consider the effects of site raises-in-grade, bottom of footing elevations, post-ground improvement utility installations, temporary construction loads, and other site and building conditions.

- Testing (modulus and/or load testing) should be performed on ground improvement elements to confirm the design assumptions.

- Other details of the ground improvement including footing pad requirements (if required) should be outlined in the project specifications and specialty contractors' proposals. Detailed design submittals should be provided for the ground improvement system, for review by Haley & Aldrich.

4.3.4 Settlements

At the recommended allowable bearing pressures, we estimate that settlement of individual footings under static loading conditions, constructed as recommended herein, will not exceed about 1 in., with differential settlements between individual footings, or within a 30-ft distance along a continuous strip footing, not exceeding about 1/2-in.

4.4 LOWEST FLOORS

The lowest level floor for each of the four proposed buildings can be designed and constructed as a conventional, soil-supported, concrete slab-on-grade in accordance with the following options. For each option, concrete slabs-on-grade should bear on an 8-in. minimum thickness of Compacted Granular Fill over a properly-prepared subgrade. The selected approach will need to be coordinated with the approach opted for footing support. The assumptions presented below assume that the existing Stockpiled Fill will be removed from the site.

- <u>Existing</u>– Within Zone A of Buildings 1 and 2, undocumented Existing Fill soils will be present beneath the proposed floor subgrades. In these zones, we recommend partial over-excavation and replacement of Existing Fill soils provided the risk of some slab settlement and/or cracking is tolerable or ground improvement through these fill soils (with no over-excavation and replacement) should the risk of slab settlement and/or cracking not be tolerable. The partial over-excavation and replacement option would entail removing the Existing Fill soils to a depth of 2 ft below the proposed bottom of slab elevation and recompacting the subgrade with a minimum of 6 passes of a large vibratory roller large vibratory roller imparting at least 25,000 lbs. of dynamic force. Excavated Fill soils can be used to backfill the over-excavation provided these materials are placed and compacted in accordance with the requirements for Compacted Granular Fill discussed in this report. If the quality and/or moisture content of the excavated Fill renders the material unsuitable, Compacted Granular Fill may be used as backfill. Ground improvement, if used, would consist of aggregate piers.

- <u>Natural Glaciofluvial Deposits</u> - In Zone B, natural Glaciofluvial soils will be present at the slab elevation and are suitable for placement of the slab on grade on the 8-in. minimum thickness of Compacted Granular Fill following re-compaction of the subgrade with a minimum of 6 passes of a large vibratory roller imparting at least 25,000 lbs. of dynamic force. If localized Fill soils are encountered at the slab subgrade elevation, we recommend they be removed and replaced with Compacted Granular Fill following compaction of the subgrade.

4.5 DESIGN GROUNDWATER LEVEL

We recommend a design groundwater level at El. 121, which is coincident with the base flood elevation, be used for calculation of hydrostatic pressures on below-grade structures.

4.6 FOUNDATION DRAINAGE AND WATERPROOFING

The lowest level floors of the proposed building are planned to be finished above proposed design groundwater level, but at or below proposed adjacent finished site grades. The following are general guidelines for foundation drainage and waterproofing. The scheme for waterproofing and drainage should be revisited after completion of the leaching field design and mounding analyses.

- Permanent underslab drainage is not required since the buildings finished floors are above the design groundwater level and above the mound level based on communications from the leaching field designer.

- Given that the mound level from the leaching field is not anticipated to reach the foundation bearing level, waterproofing is not required on foundation walls adjacent to the leaching field.

- Where finished grades are less than 2 ft above adjacent floor slabs, perimeter drainage is not required.

- We recommend that perimeter drainage consist of the following:

  - Waterstops, caulking, or other seals provided at all foundation wall and wall/footing construction joints where the exterior grading immediately adjacent to the building is higher than the interior floor slab of the building;
  - A perimeter foundation drainage system consisting of a continuous loop of 6-in. diameter perforated PVC placed adjacent to the perimeter footings, laid flat or with a slight pitch (if possible) downward toward the ejection/discharge point(s). The pipe should be surrounded by a minimum thickness of 6 in. of ¾-in. crushed stone, which in turn is surrounded by 6-oz. per sq. yd. non-woven geotextile;
  - Where perimeter foundation drainage is provided, below-grade walls should be waterproofed and geocomposite drainage board should be placed against the wall, up to 12 in. below ground surface, and hydraulically connected to the perimeter drainage pipe;
  - Inverts of perimeter drainage pipes should be positioned above the bearing elevation of adjacent footings and at least 12 inches below the adjacent finished floor elevations;
  - All points in the perimeter drainage should have redundant flow paths to the ejection/discharge point(s) to on-site recharge systems;
  - Discharge from the drainage systems should be directed to at least one reliable gravity outlet. If gravity discharge is not possible, effluent should be directed to a sump system having redundant pumps and emergency backup power.
  - The drainage system piping should be provided with cleanouts.

- Surface runoff should be directed away from the buildings. In general, the ground surface within 10 ft immediately around the buildings should be sloped downward away from the structures to divert surface runoff.

NOAA Atlas 14, Volume 10, Version 3
Location name: Wayland, Massachusetts, USA*
Latitude: 42.3631°, Longitude: -71.3881°
Elevation: 158.09 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	**2**	**5**	**10**	**25**	**50**	**100**	**200**	**500**	**1000**
5-min	**0.319** (0.243-0.406)	**0.387** (0.296-0.495)	**0.499** (0.381-0.640)	**0.593** (0.449-0.765)	**0.722** (0.532-0.977)	**0.818** (0.593-1.13)	**0.920** (0.651-1.33)	**1.04** (0.697-1.53)	**1.22** (0.787-1.86)	**1.37** (0.865-2.13)
10-min	**0.451** (0.345-0.576)	**0.549** (0.419-0.701)	**0.709** (0.540-0.909)	**0.841** (0.637-1.08)	**1.02** (0.754-1.39)	**1.16** (0.840-1.61)	**1.30** (0.923-1.88)	**1.47** (0.986-2.17)	**1.72** (1.11-2.63)	**1.94** (1.23-3.02)
15-min	**0.531** (0.406-0.677)	**0.646** (0.493-0.824)	**0.834** (0.634-1.07)	**0.989** (0.749-1.27)	**1.20** (0.887-1.63)	**1.36** (0.987-1.89)	**1.53** (1.09-2.22)	**1.73** (1.16-2.55)	**2.03** (1.31-3.10)	**2.28** (1.44-3.55)
30-min	**0.724** (0.553-0.923)	**0.880** (0.672-1.12)	**1.14** (0.864-1.46)	**1.35** (1.02-1.74)	**1.64** (1.21-2.22)	**1.86** (1.35-2.58)	**2.09** (1.48-3.02)	**2.37** (1.58-3.48)	**2.77** (1.79-4.22)	**3.11** (1.97-4.84)
60-min	**0.916** (0.700-1.17)	**1.12** (0.851-1.42)	**1.44** (1.10-1.85)	**1.71** (1.30-2.20)	**2.08** (1.53-2.82)	**2.36** (1.71-3.27)	**2.65** (1.88-3.83)	**3.00** (2.01-4.41)	**3.51** (2.27-5.36)	**3.94** (2.49-6.14)
2-hr	**1.18** (0.908-1.49)	**1.44** (1.11-1.82)	**1.87** (1.43-2.37)	**2.22** (1.70-2.84)	**2.71** (2.02-3.65)	**3.07** (2.25-4.24)	**3.46** (2.48-5.00)	**3.95** (2.65-5.76)	**4.69** (3.04-7.09)	**5.33** (3.38-8.22)
3-hr	**1.36** (1.06-1.72)	**1.67** (1.29-2.10)	**2.17** (1.67-2.74)	**2.58** (1.98-3.28)	**3.15** (2.36-4.22)	**3.57** (2.63-4.91)	**4.03** (2.90-5.80)	**4.60** (3.10-6.68)	**5.49** (3.57-8.27)	**6.27** (3.99-9.62)
6-hr	**1.76** (1.37-2.19)	**2.15** (1.68-2.68)	**2.79** (2.17-3.49)	**3.31** (2.57-4.18)	**4.04** (3.05-5.37)	**4.58** (3.39-6.24)	**5.17** (3.75-7.37)	**5.90** (3.99-8.49)	**7.05** (4.60-10.5)	**8.05** (5.13-12.2)
12-hr	**2.23** (1.76-2.76)	**2.72** (2.15-3.37)	**3.53** (2.77-4.38)	**4.19** (3.27-5.24)	**5.11** (3.88-6.72)	**5.78** (4.31-7.80)	**6.52** (4.75-9.19)	**7.43** (5.05-10.6)	**8.83** (5.78-13.0)	**10.0** (6.43-15.1)
24-hr	**2.66** (2.12-3.26)	**3.28** (2.60-4.02)	**4.28** (3.39-5.26)	**5.11** (4.03-6.33)	**6.26** (4.79-8.16)	**7.10** (5.33-9.50)	**8.02** (5.88-11.2)	**9.17** (6.26-12.9)	**10.9** (7.19-16.0)	**12.5** (8.01-18.6)
2-day	**2.99** (2.40-3.63)	**3.73** (3.00-4.54)	**4.96** (3.96-6.04)	**5.97** (4.74-7.32)	**7.37** (5.69-9.55)	**8.39** (6.36-11.2)	**9.52** (7.05-13.3)	**11.0** (7.52-15.3)	**13.2** (8.73-19.2)	**15.3** (9.83-22.5)
3-day	**3.25** (2.63-3.93)	**4.05** (3.27-4.90)	**5.36** (4.31-6.51)	**6.45** (5.15-7.87)	**7.95** (6.16-10.2)	**9.04** (6.88-12.0)	**10.3** (7.63-14.2)	**11.8** (8.12-16.4)	**14.3** (9.43-20.6)	**16.5** (10.6-24.2)
4-day	**3.51** (2.84-4.22)	**4.34** (3.51-5.22)	**5.69** (4.59-6.87)	**6.81** (5.46-8.28)	**8.36** (6.50-10.7)	**9.49** (7.24-12.5)	**10.7** (8.01-14.8)	**12.3** (8.51-17.1)	**14.9** (9.85-21.4)	**17.2** (11.1-25.1)
7-day	**4.23** (3.46-5.05)	**5.09** (4.16-6.09)	**6.51** (5.29-7.80)	**7.68** (6.20-9.26)	**9.29** (7.27-11.8)	**10.5** (8.03-13.7)	**11.8** (8.80-16.1)	**13.4** (9.29-18.4)	**16.0** (10.6-22.8)	**18.3** (11.8-26.5)
10-day	**4.91** (4.03-5.84)	**5.80** (4.75-6.90)	**7.25** (5.92-8.65)	**8.45** (6.86-10.2)	**10.1** (7.93-12.8)	**11.3** (8.71-14.7)	**12.7** (9.45-17.1)	**14.3** (9.94-19.5)	**16.8** (11.2-23.8)	**19.0** (12.3-27.5)
20-day	**6.91** (5.72-8.13)	**7.87** (6.51-9.27)	**9.44** (7.77-11.2)	**10.7** (8.79-12.8)	**12.5** (9.88-15.5)	**13.9** (10.7-17.6)	**15.3** (11.3-20.1)	**16.9** (11.8-22.8)	**19.1** (12.8-26.7)	**21.0** (13.6-30.0)
30-day	**8.56** (7.13-10.0)	**9.57** (7.96-11.2)	**11.2** (9.30-13.2)	**12.6** (10.4-14.9)	**14.5** (11.5-17.8)	**16.0** (12.3-20.0)	**17.4** (12.9-22.6)	**19.0** (13.3-25.4)	**21.0** (14.1-29.2)	**22.6** (14.7-32.1)
45-day	**10.6** (8.89-12.4)	**11.7** (9.78-13.6)	**13.5** (11.2-15.7)	**14.9** (12.3-17.6)	**16.9** (13.4-20.6)	**18.5** (14.3-23.0)	**20.1** (14.8-25.6)	**21.5** (15.2-28.6)	**23.4** (15.8-32.3)	**24.7** (16.1-34.9)
60-day	**12.3** (10.4-14.3)	**13.5** (11.3-15.6)	**15.3** (12.8-17.8)	**16.9** (14.0-19.7)	**19.0** (15.1-23.0)	**20.6** (16.0-25.4)	**22.2** (16.4-28.2)	**23.7** (16.8-31.3)	**25.4** (17.2-34.9)	**26.6** (17.4-37.4)

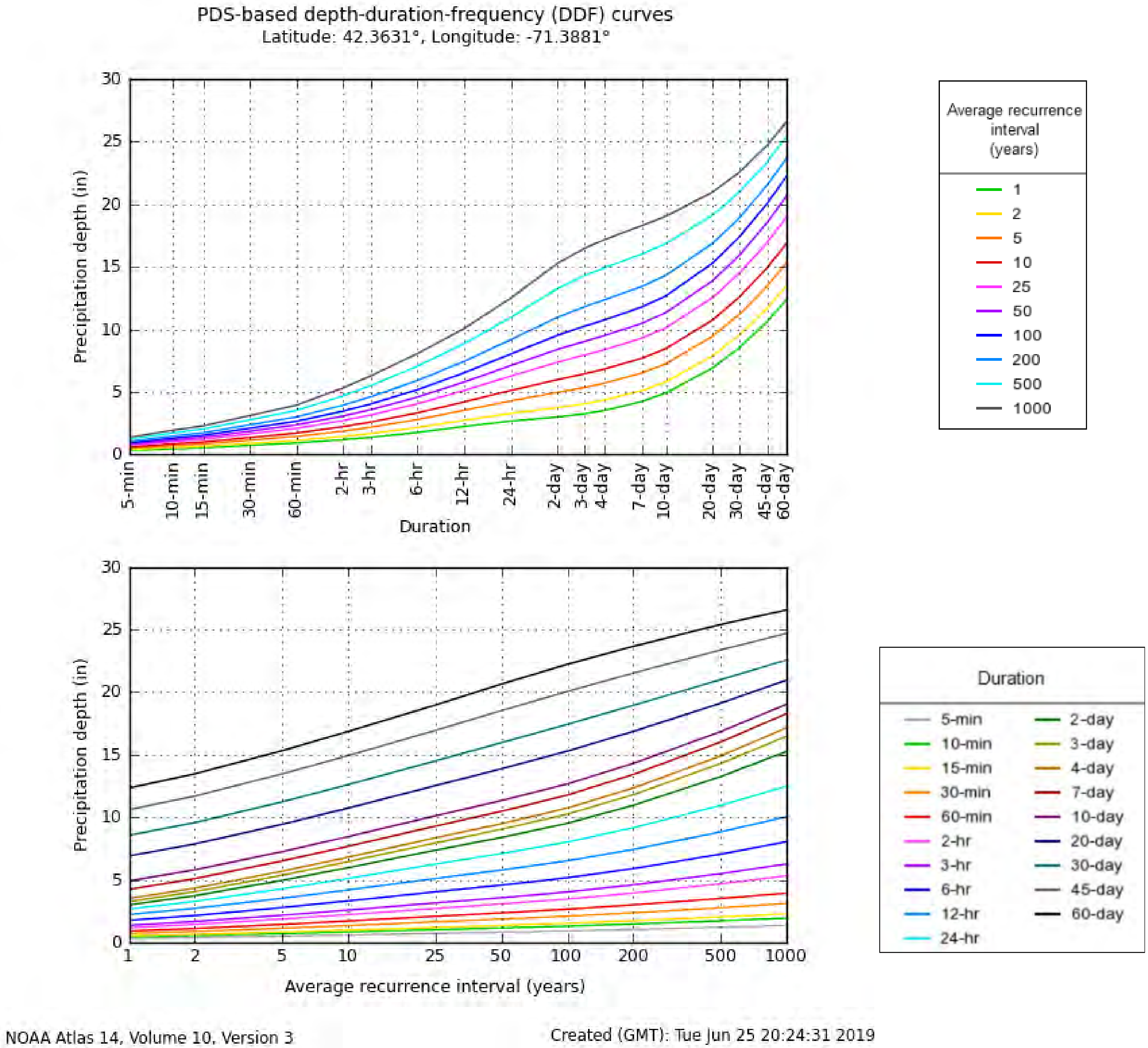
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

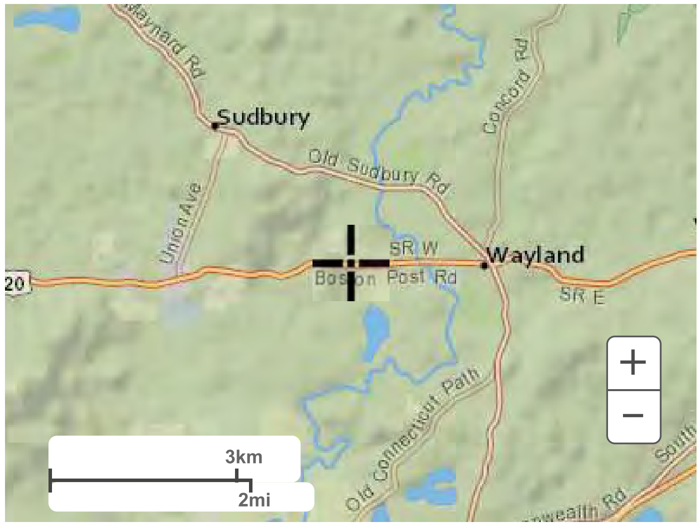
PF graphical



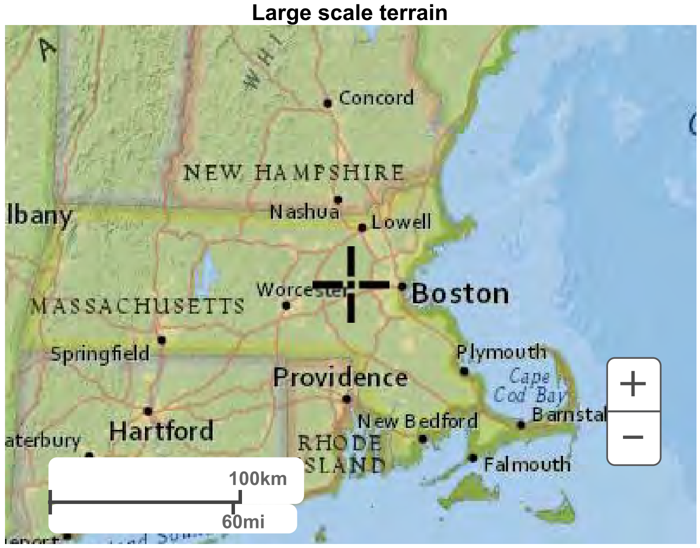
Back to Top

Maps & aerials

Small scale terrain

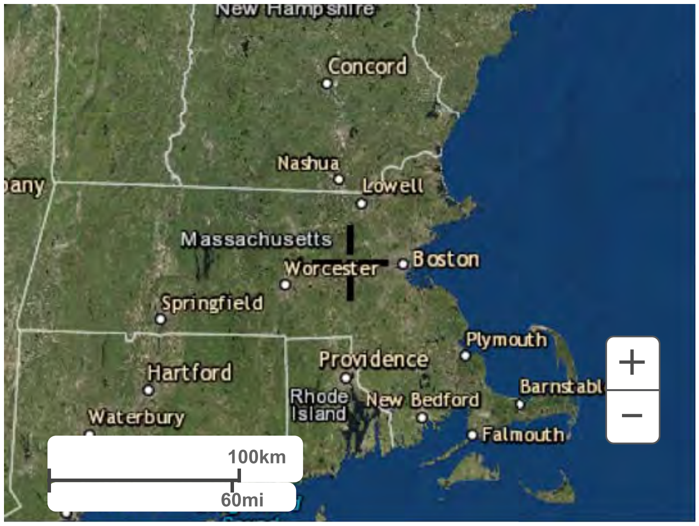


Large scale terrain



Large scale map

Large scale aerial



[Back to Top](#)

[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Manning's Roughness Coefficients ("n")

Conduit	Manning's Coefficients
Closed Conduits	
Asbestos-Cement Pipe	0.011 to 0.015
Brick	0.013 to 0.017
Cast Iron Pipe	
Cement-lined and seal-coated	0.011 to 0.015
Concrete (Monolithic)	
Smooth forms	0.012 to 0.014
Rough forms	0.015 to 0.017
Concrete Pipe	0.011 to 0.015
Corrugated-Metal Pipe (1/2 - STUL 34470 2 1/2-inch corrgtn.)	
Plain	0.022 to 0.026
Paved invert	0.018 to 0.022
Spun asphalt-lined	0.011 to 0.015
Plastic Pipe (Smooth)	0.011 to 0.015
Vitrified Clay	
Pipes	0.011 to 0.015
Liner channels	0.013 to 0.017
Open Channels	
Lined Channels	
Asphalt	0.013 to 0.017
Brick	0.012 to 0.018
Concrete	0.011 to 0.020
Rubble or riprap	0.020 to 0.035
Vegetal	0.030 to 0.040
Excavated or Dredged	
Earth, straight and uniform	0.020 to 0.030
Earth, winding, fairly uniform	0.025 to 0.040
Rock	0.030 to 0.045
Unmaintained	0.050 to 0.140
Natural Channels (minor streams, top width at flood state < 100 feet)	
Fairly regular section	0.030 to 0.070
Irregular section with pools	0.040 to 0.100

Source: Design and Construction of Sanitary and Storm Sewers, American Society of Civil Engineers and the Water Pollution Control Federation, 1969.

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
Post Office Box 029
Trenton, New Jersey 08625-029
609-633-7021 Fax: 609-984-2147
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Acting Commissioner

Derek Berg
Regulatory Manager – Stormwater
CONTECH Engineered Solutions
200 Enterprise Drive
Scarborough, ME 04074

Re: Final Certification
Continuous Deflective Separator (CDS) by CONTECH Engineered Solutions LLC

Expiration Date: December 1, 2016
TSS Removal Rate: 50%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). CONTECH Engineered Solutions LLC has requested a Final Certification for the Continuous Deflective Separator (CDS) Stormwater Treatment System.

This project falls under the July 15, 2011 "Transition for Manufactured Treatment Devices," under *C. Manufactured Treatment Devices Seeking Final Certification – In Process* which are MTDs that have commenced field testing on or before August 1, 2011.

NJDEP received the required information and signed statements by the NJCAT Technical Director and the manufacturer indicating that the requirements of the Field Testing Protocols in place at the initiation of testing have been met or exceeded. The NJCAT letter also includes a recommended certified TSS removal rate and the required maintenance plan.

The NJDEP certifies the use of the CONTECH Engineered Solutions LLC CDS Stormwater Treatment System at a TSS removal rate of 50%, subject to the following conditions:

1. The various models and associated water quality flow capacities shall be sized for the peak flow of the New Jersey Water Quality Design Storm per N.J.A.C. 7:8-5, as shown in Table 1 below.

New Jersey Treatment Rates for CDS Models Based on a Surface Area Secific Loading Rate of 25.16gpm/ft^2		
CDS Model	Manhole Diameter (ft)	Treatment Flow Rate (cfs)
CDS-4	4	0.7
CDS-5	5	1.1
CDS-6	6	1.6
CDS-8	8	2.8
CDS-10	10	4.4
CDS-12	12	6.3

2. The CDS Stormwater Treatment System can be used on-line or off-line.

3. A hydrodynamic separator, such as the CDS Stormwater Treatment System, cannot be used in series with another hydrodynamic separator to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. The maintenance plan for the sites using this device shall incorporate at a minimum, the maintenance requirements for the CDS Stormwater Treatment System shown attached.

In addition to the attached, the detailed maintenance plan must include all of the items identified in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel.

Additional information regarding the implementation of the Stormwater Management rules N.J.A.C. 7:8 are available at www.njstormwater.org. Please contact Sandra Blick of my office at (609) 633-7021 if you have any questions.

Sincerely,

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

c: Chron File
Richard Magee, NJCAT
Mark Pedersen, DLUR
Elizabeth Dragon, BNPC

CDS Maintenance

The CDS system must be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit, e.g., unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant deposition and transport may vary from year to year and regular inspections will help insure that the system is cleaned out at the appropriate time. At a minimum, inspections must be performed twice per year (i.e. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid pollutant accumulations, or in equipment washdown areas. Additionally, installations where excessive amounts of trash are expected should be inspected more frequently.

The visual inspection must ascertain that the system components are in working order and that there are no blockages or obstructions to the inlet and/or separation screen. The inspection must also identify accumulations of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick such as a stadia rod, tape measure or other measuring instrument. If sorbent material is used for enhanced removal of hydrocarbons then the level of discoloration of the sorbent material should also be identified during inspection. Sorbent material must be replaced when it is predominantly dark in color (similar to oil). It is useful and often required as part of a permit to keep a record of each inspection.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (screen/cylinder) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained behind the screen. For units possessing a sizable depth below grade (depth to pipe), a single access point allows for both sump cleanout and access behind the screen.

The CDS system must be cleaned when the level of sediment in the sump has reached a depth of 12 inches or more to avoid exceeding the maximum 24 inch sediment depth and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it must be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine if the height of the sediment pile off the bottom of the sump floor exceeds 75% (18 inches) of the total height of isolated sump.

Cleaning

Cleaning of the CDS systems should be done during dry weather conditions when no flow is entering the system. Cleanout of the CDS with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be pumped out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis must be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use adsorbent pads since they are usually less expensive to dispose of than the oil/water emulsion that may be created by vacuuming the oily layer. Trash can be netted out if you wish to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure proper safety precautions. Confined Space Entry procedures need to be followed.

Disposal of all material removed from the CDS system must be done is accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.

Title	***MA DEP Standard Calculations***	By	SJL
Project	*490 Boston Post Road*	Chk'd	CMQ
Date	June 20, 2019	Apprv'd	CMQ
Revised	November 12, 2019		

Stormwater Recharge/Water Quality Volume Table

Rv = F * Impervious Area

Rv *= Required Recharge Volume, expressed in ft^3, cubic yards or acre-feet*

F *= Target Depth Factor associated with each Hydraulic Soil Group*

Impervious Area *= pavement & rooftop area on site*

V_{WQ} *= Required Water Quality Treatment Volume (ft^3)*

D_{WQ} *= Water Quality Depth (in)*

A_{IMP} *= Impervious Area (excluding non-metal roofs)*

			Impervious Area by Soil HSG		*Recharge Required*			*Water Quality Volume Required*	
W'SHED	Area (Sq. Ft)	Landscaped	HSG B (F=.35)	HSG C (F=.25)	*F Avg. (Inches)*	*Impervious Area (Sq. Ft)*	*Rv (ft^3)*	*D_{WQ} (Inch)*	*V_{WQ}*
P-1	61,010	61,010	0	0	0.000	0	0	1.0	0
P-2A	24,356	6,010	18,346	0	0.350	18,346	535	1.0	1,529
P-2B	19,895	7,096	12,799	0	0.350	12,799	373	1.0	1,067
P-3	26,370	8,662	17,708	0	0.350	17,708	516	1.0	1,476
P-4	16,268	16,268	0	0	0.000	0	0	1.0	0
P-5A (ROOF)	13,280	0	13,280	0	0.350	13,280	387	1.0	1,107
P-5B (ROOF)	14,024	0	14,024	0	0.350	14,024	409	1.0	1,169
P-6A (ROOF)	14,496	0	14,496	0	0.350	14,496	423	1.0	1,208
P-6B (ROOF)	14,509	0	14,509	0	0.350	14,509	423	1.0	1,209
P-7 (ROOF)	22,302	0	22,302	0	0.350	22,302	650	1.0	1,859
P-8	27,926	17,726	10,200	0	0.350	10,200	298	1.0	850
P-9A	18,143	15,069	3,074	0	0.350	3,074	90	1.0	256
P-9B	43,073	30,000	13,073	0	0.350	13,073	381	1.0	1,089
P-10	32,520	14,660	17,860	0	0.350	17,860	521	1.0	1,488
P-11	12,625	6,399	6,226	0	0.350	6,226	182	1.0	519
Total	360,797	182,900	177,897	0		177,897	**5,189**		**14,825**

Title	*MA DEP Standard Calculations*	By	SJL
Project	*490 Boston Post Road*	Chk'd	CMQ
Date	June 20, 2019	Apprv'd	CMQ
Revised	November 12, 2019		

Stormwater Recharge Summary

Rv = F * Impervious Area

Rv *= Required Recharge Volume, expressed in ft^3, cubic yards or acre-feet*

F *= Target Depth Factor associated with each Hydraulic Soil Group*

	Required (cf)	Provided (cf)	
Rv =	*1,650*	*4,815*	***Underground Infiltration System #1 (P-4, P-5B, P-6B, P-8 & P-10)***
Rv =	*1,435*	*5,621*	***Underground Infiltration System #2 (P-2, P-5A, P-6A & P-9A)***
Rv =	*1,548*	*5,604*	***Underground Infiltration System #3 (P-3, P-7, & P-9B)***
Rv =	*182*	*0*	***Untreated Flows (P-1 & P-11)***
Rv =	*4,815*	*16,040*	

Water Quality Volume

V_{WQ} *= Required Water Quality Treatment Volume, expressed in ft^3*

D_{WQ} *= Water Quality Depth*

A_{IMP} *= Impervious Area (pavement & rooftop area excluding non-metal roofs)*

	Required (cf)	Provided (cf)	
V_{WQ} =	*4,715*	*4,815*	***Underground Infiltration System #1 (P-4, P-5B, P-6B, P-8 & P-10)***
V_{WQ} =	*4,101*	*5,621*	***Underground Infiltration System #2 (P-2, P-5A, P-6A & P-9A)***
V_{WQ} =	*4,424*	*5,604*	***Underground Infiltration System #3 (P-3, P-7, & P-9B)***
V_{WQ} =	*519*	*0*	***Untreated Flows (P-1 & P-11)***
V_{WQ} =	*13,758*	*16,040*	

Draindown Within 72 Hours

Time$_{drawdown}$=(Rv) (1/Design Infiltration Rate in inches per hour) (Conversion for inches to feet) (1/bottom area in feet)

Underground Infiltration System #1 (Loamy Sand - 1/2 Rawls Rate)	
Infiltration Rate (in/Hr)=	1.205
Bottom Area (ft^2) =	4,465
Infiltration Volume (ft^3) =	4,815
Time$_{drawdown}$ (Hours)=	10.74

Underground Infiltration System #2 (Loamy Sand - 1/2 Rawls Rate)	
Infiltration Rate (in/Hr)=	1.205
Bottom Area (ft^2) =	4,465
Infiltration Volume (ft^3) =	5,621
Time$_{drawdown}$ (Hours)=	12.54

Underground Infiltration System #3 (Loamy Sand - 1/2 Rawls Rate)	
Infiltration Rate (in/Hr)=	1.205
Bottom Area (ft^2) =	3,933
Infiltration Volume (ft^3) =	5,604
Time$_{drawdown}$ (Hours)=	14.19

Title	*MA DEP Standard Calculations*	By	SJL
Project	*490 Boston Post Road*	Chk'd	CMQ
Date	June 20, 2019	Apprv'd	CMQ
Revised	November 12, 2019		

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump Catch Basins	0.25	1.00	0.25	0.75
Contech Proprietary Device	0.50	0.75	0.38	0.38
Subsurface Infiltration System #2	0.80	0.38	0.30	0.08
		Total TSS Removal =	93%	

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump Catch Basins	0.25	1.00	0.25	0.75
Contech Proprietary Device	0.50	0.75	0.38	0.38
Subsurface Infiltration System #2	0.80	0.38	0.30	0.08
		Total TSS Removal =	93%	

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump Catch Basins	0.25	1.00	0.25	0.75
Contech Proprietary Device	0.50	0.75	0.38	0.38
Subsurface Infiltration System #2	0.80	0.38	0.30	0.08
		Total TSS Removal =	93%	

Title	***MA DEP Standard Calculations***	By	SJL
Project	*490 Boston Post Road*	Chk'd	CMQ
Date	June 20, 2019	Apprv'd	CMQ
Revised	November 12, 2019		

Mounding Analysis

Infiltration System	*Water Table*	*System Bottom*	*Vertical Separation*	*Attenuated System*	**Mounding Analysis Required**
1	120.00	134.50	14.5	Yes	No
2	120.00	125.00	5.0	Yes	No
3	120.00	124.00	4.00	Yes	No

Water Quality Flow Rate Calculations for Proprietary Stormwater Separators

Reference: **Massachusetts Department of Environmental Protection Wetlands Program:** Standard Method to Convert Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment

Structure Name	Total Area (Acres)	Imp. Area (Acres)	A^{IMP} (Sq. Miles)	Tc (min.)	Tc (hrs.)	WQV (inches)	qu (csm/in)
CDS #1	0.71	0.35	0.00055	6.0	0.10	1	774
CDS #2	0.87	0.55	0.00086	6.0	0.10	1	774
CDS #3	0.68	0.48	0.00075	6.0	0.10	1	774
CDS #4	0.86	0.43	0.00067	6.0	0.10	1	774

Water Quality Flow Rate = Q1 = (qu) (A) (WQV)

Structure Name	Q1 (cfs)
CDS #1	0.42
CDS #2	0.67
CDS #3	0.58
CDS #4	0.52

Computation Sheet

Title	***Pipe Sizing Table***	Minimum Slope:	0.50%	By	SJL
Project	#490 Boston Post Road, Wayland, MA	Minimum Pipe Size:	8	Chk'd	CMQ
Date	June 20, 2019	Rainfall Intensity (in/hr):	6.00 (25 year storm)	Apprv'd	CMQ
Revised	November 12, 2019	Manning's n:	0.012 HDPE/PVC		
A&M Project Number: 1670-09A		Minimum Pipe Cover:	1.86		

ALTA at River's Edge, Wayland, MA

Line						Req'd. Capac.	Pipe Size	Slope	Design Capacity		Drop	Invert Elevation		Rim Elev.	
From	To	Length	Area	wgt. *C*	*C A*	*Qd*	*D*	*s*	Q_{full}	V_{full}		Upper	Lower	Upper	Cover
Upper	Lower	(feet)	(acres)			(cfs)	(in)	(%)	(cfs)	(fps)	(feet)	(ft)	(ft)	(ft)	(ft)
CB1	CDS1	13	0.176	0.76	0.134	0.80	12	2.00%	5.5	6.95	0.26	139.65	139.39	143.30	2.53
CB2	CDS1	9	0.166	0.64	0.106	0.64	12	2.00%	5.5	6.95	0.18	139.57	139.39	143.50	2.81
CDS1	DMH1/UIS1	101				1.44	12	4.00%	7.7	9.83	4.04	139.39	135.35	143.60	3.09
RD1	UIS1	43	0.232	0.95	0.220	1.32	12	2.00%	5.5	6.95	0.86	137.11	136.25	144.20	5.96
RD2	UIS1	43	0.287	0.95	0.273	1.64	12	2.00%	5.5	6.95	0.86	137.11	136.25	144.20	5.96
CB3	DMH2	31	0.404	0.65	0.261	1.57	12	5.00%	8.6	10.99	1.55	136.80	135.25	142.00	4.07
AD5	UIS1	125	0.641	0.35	0.224	1.35	12	3.00%	6.7	8.51	3.75	140.00	136.25	144.50	3.38
CB12	DMH2A	86	0.373	0.73	0.271	1.63	12	1.00%	3.9	4.91	0.86	139.89	139.03	144.00	2.99
DMH2A	UIS1	65				1.63	12	4.00%	7.7	9.83	2.60	138.93	136.33	144.90	4.85
OCS1	DMH7	408	***(From HydroCAD 25-Year Storm)***			5.49	15	2.00%	9.9	8.06	8.16	135.25	127.09	143.40	6.78
AD11	DMH3	63	0.417	0.45	0.188	1.13	8	1.00%	1.3	3.75	0.63	135.25	134.62	143.00	6.96
AD12	DMH3	10	0.417	0.45	0.188	1.13	8	5.00%	2.9	8.39	0.50	135.12	134.62	143.00	7.09
AD13	DMH3	34	0.417	0.45	0.188	1.13	8	5.00%	2.9	8.39	1.70	136.32	134.62	143.00	5.89
RD5	DMH3	69	0.117	0.95	0.111	0.67	12	2.00%	5.5	6.95	1.38	136.00	134.62	139.25	2.13
RD6	UIS2	23	0.333	0.95	0.316	1.90	12	5.00%	8.6	10.99	1.15	128.15	127.00	134.00	4.72
DMH3	DMH8	62				5.95	12	5.00%	8.6	10.99	3.10	133.62	130.52	139.90	5.16
CB5	DMH8	162	0.326	0.83	0.270	1.62	12	0.76%	3.4	4.28	1.23	128.35	127.12	131.50	2.03
DMH8	CDS2	122				7.57	18	1.00%	11.4	6.44	1.22	127.02	125.80	136.00	7.36
CB4	CDS2	21	0.514	0.87	0.444	2.67	12	5.00%	8.6	10.99	1.05	126.85	125.80	133.00	5.03
CDS2	DMH4	5				10.24	18	1.00%	11.4	6.44	0.05	125.80	125.75	131.80	4.38
OCS2	HW1	26	(From HydroCAD 25-Year Storm)			5.39	15	2.00%	9.9	8.06	0.52	125.75	125.23	133.10	5.97
CB6	CDS3	14	0.430	0.71	0.304	1.82	12	5.00%	8.6	10.99	0.70	126.10	125.40	130.00	2.78
CB7	CDS3	62	0.064	0.95	0.061	0.37	12	1.00%	3.9	4.91	0.62	126.02	125.40	129.00	1.86
CDS3	DMH5	65				2.19	12	1.00%	3.9	4.91	0.65	125.40	124.75	130.30	3.78
RD3	UIS3	48	0.136	0.95	0.129	0.78	12	5.00%	8.6	10.99	2.40	128.15	125.75	133.00	3.72
RD4	UIS3	52	0.117	0.95	0.111	0.67	12	5.00%	8.6	10.99	2.60	128.35	125.75	133.00	3.53
CB8	DMH6	19	0.126	0.95	0.120	0.72	12	3.00%	6.7	8.51	0.57	126.61	126.04	130.00	2.27
CB9	DMH6	19	0.220	0.59	0.130	0.78	12	3.00%	6.7	8.51	0.57	126.61	126.04	130.00	2.27
AD11	DMH6	19	0.643	0.43	0.277	1.66	12	2.00%	5.5	6.95	0.38	126.42	126.04	129.00	1.46
DMH6	CDS4	94				3.16	12	1.00%	3.9	4.91	0.94	125.94	125.00	129.10	2.04
CB10	CDS4	9	0.104	0.71	0.074	0.44	12	5.00%	8.6	10.99	0.45	125.45	125.00	130.00	3.43
CDS4	DMH6	15				3.60	15	1.00%	7.0	5.70	0.15	125.00	124.85	130.30	3.93
OCS3	DMH7	44	(From HydroCAD 25-Year Storm)			4.29	18	1.00%	11.4	6.44	0.44	124.75	124.31	131.00	4.63
DMH7	HW2	60	(From HydroCAD 25-Year Storm)			9.78	24	1.00%	24.6	7.80	0.60	124.21	123.61	128.20	1.86

#490 BOSTON POST ROAD, WAYLAND, MA

Computation Sheet

By	DMR/SJL
Chk'd	CMQ
Apprv'd	CMQ

Title: ***RipRap Sizing Spreadsheet***
Project: #490 Boston Post Road, Wayland, MA
Date: June 20, 2019
Revised: November 12, 2019
A&M Project Number: 1670-09A

OUTLET	Do (ft.)	Q25 (cfs)***	Tw (ft.)	La (ft.)	Wup (ft.)	Wdn (ft.)**	d50 (ft.)*
Headwall-1	1.25	5.39	0.5	15.7	3.8	19.4	0.29
Headwall-2	2.00	4.29	0.5	16.7	6.0	22.7	0.13

Notes:
Assume 6" Tw at Outfall
Use MHD M2.02.2 Stone
Depth of Stone to be 6" or 1.5 times d50 - which ever is larger

***6" Minimum Stone Diameter**
****Apron width shall meet defined downstream channel**
****See pipe sizing spreadsheet for Q25 flows**

<u>When Tw < 0.5Do at pipe outlet</u>:
La = 1.8Q/Do^1.5 + 7Do
Wup = 3Do
Wdn = 3Do + La
d50 = (0.02Q^1.3)/(TwDo)

<u>When Tw > or = 0.5Do at pipe outlet</u>:
La = 3Q/Do^1.5 + 7Do
Wup = 3Do
Wdn = 3Do + 0.4La
d50 = (0.02Q^1.3)/(TwDo)

Where:
Tw = the tailwater depth at the outlet of the pipe or channel
Do = the diameter of the pipe or the width of channel
Q = the discharge from the pipe of channel (25 year Storm)
La = the length of apron
Wup = the upstream width of apron
Wdn = the downstream width of apron
d50 = the median stone diameter

Illicit Discharge Compliance Statement

Responsibility:

The Owner is responsible for ultimate compliance with all provisions of the Massachusetts Stormwater Management Policy, the USEPA NPDES Construction General Permit and responsible for identifying and eliminating illicit discharges (as defined by the USEPA).

OWNER NAME: WP East Acquisitions, LLC.

ADDRESS: 91 Hartwell Avenue, 3rd Floor
Lexington, MA 02421

TEL. NUMBER: (781) 541-5822

Engineer's Compliance Statement:

To the best of my knowledge, the attached plans, computations and specifications meet the requirements of Standard 10 of the Massachusetts Stormwater Handbook regarding illicit discharges to the stormwater management system and that no detectable illicit discharges exist on the site. All documents and attachments were prepared under my direction and qualified personnel properly gathered and evaluated the information submitted, to the best of my knowledge.

Included with this statement are site plans, drawn to scale, that identify the location of systems for conveying stormwater on the site and show that these systems do not allow the entry of any illicit discharges into the stormwater management system. The plans also show any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between the stormwater and wastewater systems.

For a redevelopment project (if applicable), all actions taken to identify and remove illicit discharges, including without limitation, visual screening, dye or smoke testing, and the removal of any sources of illicit discharges to the stormwater management system are documented and included with this statement.