APPLICATION OF SUMMIT SAUGATUCK LLC TO WESTPORT CONSERVATION COMMISSION AND FLOOD AND EROSION CONTROL BOARD FOR REGULATED ACTIVITY PERMIT AND WATERWAY PROTECTION LINE ORDINANCE APPROVAL, HIAWATHA LANE AND HIAWATHA LANE EXTENSION

May 14, 2018

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TABLE OF CONTENTS
May 14, 2018

SUBMITTED SEPARATELY

"The Village at Saugatuck," Application for Inland Wetlands Regulated Activity Permit and Waterway Protection Line Ordinance Approval," dated May 7, 2018 consisting of 19 Sheets, prepared by Divney Tung Schwalbe, Redniss & Mead, Inc., and Lewis Associates; seven full-size sets plus ten sets reduced to 11 x 17 plus one electronic CD copy

Application fee of $6,680

Applicant's Procedural Compliance (three copies to Town staff)

1. Fee calculation per A. Mozian, May 1, 2018
2. Applicant's notice letter to abutting property owners, mailed May 14, 2018
3. List of abutting property owners, updated May 3, 2018 (copy of Schedule B)
4. Certificate of mailing (Post Office Form 3877), May 14, 2018
5. Two copies, 8 1/2 x 11, Assessor's Map of subject properties and adjacent property owners
6. Applicant's notice letter to City of Norwalk Inland Wetland Agency, May 14, 2018, via Certified Mail, Return Receipt Requested (per Westport Wetlands Regulations § 9.8.1(a))

SHIPMAN & GOODWIN LLP®
COUNSELORS AT LAW

Timothy S. Hollister
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May 14, 2018

HAND DELIVERY

Ms. Patricia Shea, Chair,
and Members
Conservation Commission
Town of Westport
110 Myrtle Avenue
Westport CT, 06880

Ms. Alicia Mozian
Conservation Director
Town of Westport
110 Myrtle Avenue
Westport CT, 06880

Re: Application of Summit Saugatuck LLC for Regulated Activity Permit and Waterway Protection Line Approval, Hiawatha Lane and Hiawatha Lane Extension

Dear Chair Shea, Commission Members, and Ms. Mozian:

On behalf of our client Summit Saugatuck LLC ("Summit"), we are submitting this application to the Westport Conservation Commission and Flood and Erosion Control Board for a regulated activity permit and waterway protection line approval in connection with a proposed multi-family residential redevelopment to be called "The Village at Saugatuck," located adjacent Hiawatha Lane and Hiawatha Lane Extension; on so-called Parcels "A" and "B"; and the road bed of Hiawatha Lane and Hiawatha Lane Extension from the Westport – Norwalk border to its intersection with Davenport Avenue.

This application package consists of the following:

1. Transmittal letter from Shipman & Goodwin, May 14, 2018;

2. Overview letter from Shipman & Goodwin, May 14, 2018;

3. Wetlands application forms and Schedules, including Flood and Erosion Control Board application;

4. Owner authorizations of agents; verification of applicant authorization and Town staff inspection rights;

5. Department of Energy and Environmental Protection Activity Reporting form;

6. Wetlands Delineation Report, March 11, 2016 and Wetlands Functions and Values Report, June 12, 2016, prepared by Pietras Environmental Group, LLC;

7. Supplemental Wetland and Watercourse Delineation, September 15, 2017, prepared by William Kenney Associates LLC;

8. Upland Review Area Diagram, May 7, 2018, prepared by Divney Tung Schwalbe;

9. Proposed Conservation Easement illustration, May 7, 2018, prepared by Divney Tung Schwalbe;

10. Conservation Commission approval of wetland boundary amendment, February 21, 2018;

11. Wetlands and Watercourse Assessment, May 10, 2018, prepared by William Kenney Associates LLC;

12. Stormwater Management Report, May 7, 2018, prepared by Divney Tung Schwalbe;

13. Utility Report, May 7, 2018, prepared by Divney Tung Schwalbe; and

14. Letter to Conservation Director Alicia Mozian, May 1, 2018, regarding peer review procedures.

Submitted separately are seven full-size sets plus ten sets reduced to 11 x 17 plus one electronic CD copy of "The Village at Saugatuck," dated May 7, 2018, 19 Sheets, prepared by Divney Tung Schwalbe, and the application fee of $6,680.

It should be noted that, although no residential construction activity is proposed in Norwalk, a small portion of one lot (47) straddles the Westport – Norwalk border; the subject properties contain wetlands within 500 feet of Norwalk; and the subject property has an emergency access easement through the Norden Place multi-family residential community in Norwalk. Thus, the applicant has sent notice via Certified Mail, Return Receipt Requested, on the same day as this filing, as required by § 9.8.1(a) of the Westport Inland Wetlands

Regulations, a letter to the Norwalk Inland Wetland Agency. Under § 9.8.1(b) of the Westport Inland Wetlands Regulations, the Conservation Commission must issue its own notice by Certified Mail within seven days of receipt of this application.

Also submitted separately are **three copies** of the applicant's Procedural Compliance, as follows:

1. Fee calculation per A. Mozian, May 1, 2018;

2. Applicant's notice letter to abutting property owners, mailed May 14, 2018;

3. List of abutting property owners, updated May 3, 2018 (copy of Schedule B);

4. Certificate of mailing (Post Office Form 3877), May 14, 2018;

5. Two copies, 8 1/2 x 11, Assessor's Map of subject properties and adjacent property owners; and

6. Applicant's notice letter to City of Norwalk Inland Wetland Agency, May 14, 2018, via Certified Mail, Return Receipt Requested (per Westport Wetlands Regulations § 9.8.1(a)).

If the Commission or staff would like additional copies or additional information, please let us know. We look forward to presenting this application to the Commission.

Very truly yours,

Timothy S. Hollister

TSH:ekf
Attachments

c: Summit Saugatuck LLC (w/ att.)
William Kenny Associates LLC (w/ att.)
Divney Tung Schwalbe (w/ att.)
Redniss & Mead, Inc. (w/att.)

SHIPMAN & GOODWIN LLP®
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Re: Application of Summit Saugatuck LLC for Regulated Activity Permit and Waterway Protection Line Ordinance Approval, Hiawatha Lane and Hiawatha Lane Extension

Dear Chair Shea, Commission Members, and Ms. Mozian:

On behalf of our client Summit Saugatuck LLC ("Summit"), we are submitting this application to the Westport Conservation Commission for a regulated activity permit in connection with a proposed multi-family residential redevelopment to be called "The Village at Saugatuck." Hiawatha Lane and Hiawatha Lane Extension.

In summary, regarding this application:

- the land to be redeveloped is located between Interstate 95 and the Metro North Railroad, and thus the area's wetlands and intermittent streams have been substantially disturbed in the past;

- the redevelopment plan will not involve any direct disturbance of a wetland or watercourse;

- the redevelopment plan complies with § 7.3 of Westport's Wetlands Regulations regarding setbacks;[1]

- the only regulated activity within the § 7.3 review areas are a private sewer force main pump station control panel (16 square feet) and associated emergency generator (72 square feet);

- the wetlands boundaries shown on the site plan and used to establish setbacks were confirmed with and approved by the Conservation Commission on February 21, 2018;

- not only will the redevelopment not adversely impact any function or value of a wetland or watercourse, but through installation of stormwater management best practices (a/k/a, a "treatment train"), the redevelopment will improve water quality and environmental conditions in the area; and

- the redevelopment plan proposes a 2.8 acre conservation easement, encompassing appropriately 30 percent of the 8.8 acres.

Subject Properties

The properties proposed for redevelopment are located between Interstate 95 and the Metro North Railroad tracks. The area has been developed with single-family homes, multi-family residential uses, and commercial uses, and thus has been substantially developed and disturbed in the past. In fact, one parcel adjacent to the proposed redevelopment, a lot still owned by the Connecticut Department of Transportation, was used until the 1980's as a paved support area for I-95 toll booths. What was, at one time, a wetland system south of the subject properties has been bisected by the railroad tracks. Within the wetlands south of the subject properties, a substantial amount of debris has accumulated, and lack of maintenance of stormwater structures and outlets in the vicinity of the railroad tracks has caused ponding and siltation near the tracks. Environmentally, the area has long been disturbed and fragmented.

[1] It should be noted that the term "buffer" was eliminated from the State's wetlands law in 2004, and so-called "no build" setbacks from wetlands, regardless of impact or non-impact, are contrary to General Statutes § 22a-41(b) and case law regarding when a wetlands commission may deny permission to construct (the Commission must have substantial evidence of an actual, adverse impact on a function or value of a wetland or watercourse). Nonetheless, the applicant's site plan complies with the specified "setbacks."

The land to be redeveloped as apartments consists of ten existing residential lots, fronting on Hiawatha Lane or Hiawatha Lane Extension, eight of which contain single-family homes. Summit owns, is the contract purchaser of, or has an option to purchase, Hiawatha Lane Lots 28, 36, 38, 39, 41-45, and 47, and Parcels A and B.[2] The residential lots range in size from 0.35 to 0.82 acres. The subject property also includes two undeveloped parcels, labeled Parcels A and B on the submitted survey (Parcel B is south of Lots 43, 45, and 47 and Lot A is west of Lot 44), and the approximately 450 foot long section of Hiawatha Lane that currently provides access to the developed lots (reaching from the Norwalk / Westport boundary to the intersection of Hiawatha Lane with Davenport Avenue). Parcel A is 0.16 acres, Parcel B is 2.85 acres, and the section of Hiawatha Lane is approximately 0.42 acres. The lots / parcels that Summit owns or controls total 8.82 acres. However, Summit's lots are not contiguous; Parcels 36 and 28 are located approximately 80 feet northeast from Parcel 38, and are separated by the parcel still owned by the Connecticut Department of Transportation. Parcel A abuts the City of Norwalk, and the northwest corner of Lot 47 is located in Norwalk. Directly west of the subject properties, in Norwalk, is the AvalonBay Norden Place apartment development.

The subject properties are located within Westport's public sewer service district, and there is ample capacity at the Town's sewage treatment plant and in the existing sewer line in Davenport Avenue for 187 units. Summit's proposed redevelopment also includes extension of a sewer line that currently ends on Davenport Avenue near its intersection with Hiawatha Lane. It should be noted that Davenport Avenue is a public street but Hiawatha Lane and Hiawatha Lane Extension in this area are private streets, and thus the sewer extension is regarded as an extension of a public sewer onto private property.[3] The sewer will be extended within the Town's right-of-way; then along Summit's easement rights in or ownership of Hiawatha Lane; and then under a north-south culvert at the Davenport Avenue / Hiawatha Lane intersection that channels an intermittent stream and the bed of Hiawatha Lane, to reach the area of the proposed residential buildings. On May 7, 2018, a Superior Court judge issued a decision ordering the Westport Board of Selectmen, acting as the Water Pollution Control Authority, to grant Summit the sewer extension shown on the plans being filed with this package.

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[2] Parcels A and B have been referred to at times in consultant reports or assessment records as Parcels 4 and 5. To the west of Summit's properties is the Norden Place apartment complex, owned by Avalon Norden Place, LLC and Norwalk Center, LLC. Summit has a recorded emergency access easement through Norden Place, *see* Vol. 6364, Pages 253-261 of the Norwalk Land Records.

[3] The sewer to be installed will consist of a gravity system that will be installed on the site and in the roadway in front of 24 Hiawatha lane; will flow by gravity to a private pump station near the southeast corner of the proposed four buildings; and then will be pumped in a private force main to the Davenport Avenue public system.

The properties owned or controlled by Summit present an opportunity for "transit-oriented" development, because the Saugatuck Metro North train station is a seven-to-ten minute walk to the east.

Proposed Redevelopment

As shown on the submitted plans, Summit proposes a 187-unit multi-family rental development, with New England town green architecture, presented in five buildings, four of which (Buildings A-B-C-D) will contain flank a center courtyard. The four-buildings and courtyard will be located above (and will serve as a "green roof" for) one level of underground parking which will be accessed at grade on the south side of the development. Building E will be located on what are now Lots 36 and 28. In a separate application process to the Town, Summit will propose pedestrian improvements to the Town right-of-way area directly west of Saugatuck Avenue and the train station, so as to enhance the ability of tenants and existing area residents to walk to the train station.

The development will be served by an existing water main and energy (natural gas) utilities.

Wetlands And Watercourses Delineations

The site's wetlands and watercourses have been delineated and their functions and values assessed by two qualified soils scientists, Thomas Pietras and William Kenny. Mr. Pietras first delineated the boundaries in March 2016, and he then prepared an analysis of wetlands functions and values in June 2016 (Tab 6 of this package). Mr. Kenny then did a supplemental wetlands line analysis, covering Hiawatha Lane itself to its intersection with Davenport Avenue, in September 2017 (Tab 7), and has prepared a final overall analysis of the redevelopment plan on wetlands and watercourses in his report (Tab 11). At the direction of Town staff, Summit applied for a wetland boundary amendment, which was granted on February 21, 2018. Summit's delineation of wetlands and watercourses is more extensive than shown on the Town's current GIS map, and thus the results of Summit's soils delineation and function / values assessment are the baseline for this application. The applicant has complied with the two conditions of the February 2018 approval.

The proposed redevelopment area in general and the location of the discrete regulated activities in particular are not within an aquifer protection zone, water supply watershed, or groundwater recharge area. There are no vernal pools on the subject property, or state or federally-listed endangered species or species of special concern. There are no tidal wetlands on or near the redevelopment site.

The reports of Mr. Pietras and Mr. Kenny delineate three areas wetlands soils or intermittent flow or ponding. The first is the area around the north-south culvert that crosses Davenport Avenue, in the vicinity of 24 and 27 Hiawatha Lane / Davenport Avenue. The intermittent watercourse has fringe wetlands. The second is a forested swamp located at the south end of existing Lots 39, 41, and 43, and Parcel B of Summit's properties. This swamp is influenced in part by flow from the above-referenced Davenport Avenue culvert, which conveys flow to an outlet on Lot 29 Hiawatha Lane (which Summit does not own) and then to the rear of Lots 33 and 37, which Summit also does not own. The third area is shrub-sapling swamp and forested swamp located on Parcel B (a/k/a Parcel 4). Again, no development or disturbance is proposed in any of these wetland areas, and in fact the swamp areas will be within a Conservation Easement, discussed below.

Regulated Activities And Impact Assessment

The term "upland review area" is intended and understood here to mean the area located between the wetlands boundary as confirmed by the Conservation Commission on February 21, 2018, and the outer limit of the various review area listed in § 7.3 of the Wetlands Regulations. "Regulated activity" refers to any proposed disturbance or construction occurring within the respective § 7.3 review area setbacks. Nonetheless, the applicant understands that the Commission staff, and any peer review will examine the proposed non-regulated activity (disturbance or construction beyond the distances specified in § 7.3) for evidence of any impact on the function of a wetland or watercourse. All of these activities are illustrated on the map at Tab 8 of this package.

There will be no disturbance and therefore no direct impact on any wetland or watercourse. The only regulated activity is the installation of an emergency generator (72 square feet of disturbance) and an electronic control panel (16 square feet) (for a private sewer force main) that will be installed within the 30 to 75 foot § 7.3 review area for multi-family residence "power generators." The wetlands protected by supplemental plantings on the graded slope between the pump station and wetlands.

Non-regulated construction activities are proposed as follows on the south side of the redevelopment:

- 0 to 20 feet from wetlands: wetland planting, demarcation signs on 4' x 4' x 4" wooden posts along the wetland boundary 50 feet on center.

- 20 to 30 feet from wetlands: approximately 4,795 square feet of disturbance for land grading and stormwater measures:

  - 74 square feet of riprap for an emergency overflow from Stormwater Basin BB-2;

- 34 square feet of riprap for a stormwater pipe outlet;
- 45 square feet of riprap for an emergency overflow from Stormwater Basin BB-4;
- one end section for a stormwater pipe outlet; and
- five feet of HDPE stormwater pipe.

- 30 to 75 feet from wetlands: approximately 35,362 square feet of total disturbance in this area:
  - 440 feet of concrete curbs;
  - 270 feet of stormwater pipes;
  - two catch basins;
  - three stormwater manholes;
  - 640 square feet of below grade infiltration system;
  - 270 feet of sanitary sewer pipes;
  - two sanitary manholes;
  - one sewer wetwell;
  - one sewer valve box;
  - 14,305 square feet of asphalt pavement; and
  - 770 square feet of concrete pavement.

The development will add 2.75 acres of impervious surface within the 8.8 acre total parcel, but the stormwater engineering (Tab 12) will ensure that stormwater runoff from the development will not cause any impacts to a wetland or watercourse. *See* Tab 11. Specifically, through a combination of subsurface infiltration chambers, isolator rows, infiltration basins, dry wells, rain gardens, green roof, and catch basin inserts, stormwater quality in the area will be improved. Environmental conditions in the area and water quality within the Parcel B wetlands will also be improved through removal of debris, cleaning and maintenance of stormwater structures and outlets, and installation of the stormwater treatment train in an area of commercial

uses, public and private streets single-family homes that currently have no stormwater renovation structures, equipment, techniques, or maintenance. The Stormwater Report demonstrates compliance with the Connecticut DEEP Stormwater Manual and Low Impact Design Addendum, the State's Erosion and Sedimentation Control Guidelines, and Westport's Stormwater Management Regulation.

It should be noted that there are no underground oil tanks located at the single-family homes at 28, 36, 38, 39, 41-45, or 47 Hiawatha Lane, and the applicant agrees if it obtains approvals for multi-family residential construction, to remove all above-ground tanks in compliance with Westport Health Department requirements.

Feasible And Prudent Alternative Requirement

Because the site plan completely avoids any direct disturbance to a wetland, and the proposed regulated activities will not adversely impact a substantial function of a wetland or watercourse, the "no feasible and prudent alternative" to a wetlands impact requirement of General Statutes § 22a-41b and Westport Inland Wetlands Regulations § 5.1 are satisfied.

Waterway Protection Line Ordinance ("WPLO")

In its February 21, 2018 approval of the wetland boundary, the Conservation Commission (Tab 10 of this package, § 7.3) made a finding that "The WPLO boundary will be 15 feet from the wetland boundary. The outlet of this wetland system is Indian Brook."

The redevelopment plan proposes to extend the sewer that currently terminates in Davenport Avenue, west for a distance of 1,600 feet. Near the intersection of Davenport Avenue and Hiawatha Lane, the sewer extension will tunnel under an existing north-south culvert that carries a small intermittent watercourse. In addition to being a regulated activity, it appears that a small portion of this work will come within the waterway protection line. As a result, the applicant has completed Schedule D of the Commission's application form, demonstrating no impacts of the type stated in the WPLO ordinance. A cross section depicting the work is part of the submitted plan set.[4]

[4] Sections 30-80 to 30-97 of the Town's ordinances state regulations for "Waterway Protection," and define "waterway" in a way that essentially mirrors the state statutory definition of "watercourse." However, § 30-95 of this WPLO ordinance provides for review and possible veto of Flood and Erosion Control Board actions or decisions by Westport's Representative Town Meeting. Respectfully, it is the applicant's analysis that the WPLO ordinance in general and its RTM review provisions are not authorized by state law, and in fact establish a system that

Mitigation / Conservation Easement

The applicant proposes to impose a Conservation Easement on 2.8 acres as illustrated at Tab 9 of this package and Sheet SP-0.1 of the site plan. The applicant will utilize the Town's standard form of conservation easement, or a customized version acceptable to the Town Attorney, but at a minimum the easement will focus on control of invasive plant species. Signage or markers will be posted at regular intervals and changes of direction along the northern boundary of the easement area, which runs generally east – west.

Regulatory Compliance

At Tab 16 of this package, the applicant has compiled a "Regulatory Compliance Chart," which in the left column lists the criteria (§§ 5.0, 5.1, 6.0 to 6.6, and 10.1) stated in the Westport Inland Wetlands Regulations for issuance of a permit, and the right column summarizes compliance and/or directs the Commission to where, within the application package, the compliance is demonstrated.[5]

Other "Schedule A" Information Items

1. The applicant agrees that after approvals, existing septic systems will be abandoned in compliance with Westport Health Department requirements.

_____ (continued)

violates the state's regulatory system for construction involving wetlands or watercourses. The applicant reserves its right to challenge the legality of the WPLO ordinance if necessary.

[5] Though not relevant to this application, it should be noted that the Town's Wetlands Regulations are contrary to state law, and also internally contradictory, with respect to impacts on wildlife and wildlife habitat. For example, § 6.4(a) appears to require a finding that "critical habitat areas, such as habitats of rare and endangered floral and faunal species shall be preserved"; and § 6.4(c) states that, "Breeding, nesting and/or feeding habitats of wildlife will not be significantly altered." These criteria, to the extent they require stand-along findings, are inconsistent with General Statutes § 22a-41(a)(2) and § 10.2 of the Wetlands Regulations, which provide that a wetlands commission may not deny a regulated activity in any area outside wetlands on the basis of effect on aquatic, plant, or animal life "unless such activity will likely impact or affect the physical characteristics of such wetland or watercourse." In other words, to deny a wetlands permit for an activity in an upland review area or upland, a commission must have substantial evidence not of an impact on wildlife *per se*, but that the regulated activity will have a substantial adverse impact on a physical characteristic of a wetland or watercourse, which in turn could have an adverse impact on aquatic, plant, or animal life within the wetland or watercourse.

2. Test pits, overseen by Town of Westport staff, were conducted in April 2018, and the results are stated in the Stormwater Report at Tab 12 of this package.

3. All proposed construction will occur above the 100 year flood zone. (The FEMA flood zone extends to Elevation 11.)

4. Trees above eight inches caliper have been surveyed and are on the plans.

5. There are no private drinking water wells on any of the subject properties.

6. Existing drainage is shown on the survey.

7. A cut and fill analysis is included in the Stormwater Report.

8. Phasing of construction, including erosion and sediment control, stockpiles, and dewatering, are presented on the Plan Sheets.

9. A plan for inspection and maintenance of stormwater control and water quality structures appears in the plan set.

Conclusion

This application, between the narrative package and the development plans, follows the established protocol for wetlands permit applications:

1. Explanation of existing soil conditions.

2. Explanation of wetlands and watercourses on the subject properties and their existing functions and values.

3. Proposed construction activity.

4. Identification of what construction activity requires a wetlands permit due to being in a wetland or watercourse, in an upland review area, or having a likely impact on a function of a wetland or watercourse.

5. Identification of impacts of proposed, regulated construction activity on existing wetlands or watercourse functions or values.

6. Assessment of whether any impact constitutes a substantial adverse impact on a wetland or watercourse.

7. If there is such an impact, can the Commission make a finding that there is no feasible or prudent alternative to the adverse impact, or can the impact be mitigated?

This application package demonstrates, and a peer review will confirm, that the proposed construction activity will not cause any substantial adverse impact to a function of a wetland or watercourse, and in fact will improve water quality in the vicinity of the subject properties, and thus the application meets the criteria for approval.

We look forward to presenting this application to the Commission.

Very truly yours,

Timothy S. Hollister

TSH:ekf

c: Summit Saugatuck LLC
William Kenny Associates LLC
Divney Tung Schwalbe
Redniss & Mead, Inc.

SUBMIT TO:
Westport Conservation Department
Town Hall – Room 205
110 Myrtle Avenue
Westport, CT 06880
Phone: 203-341-1170
Fax: 203-341-1088

FOR OFFICE USE ONLY
File#: _____
Date Filed: _____
Class: _____
Fee: $ _____
Date Rec'd: _____
☐ **Cash** ☐ **Check #** _____
Final Inspection Y / N
As-Built Required Y / N

APPLICATION
WESTPORT CONSERVATION DEPARTMENT

PROJECT LOCATION: See Exhibit A attached hereto

ASSESSOR'S MAP # _____ TAX LOT # _____ ZONING DISTRICT _____

APPLICANT OR AGENT		OWNER
Summit Saugatuck LLC	NAME	See Exhibit A attached hereto
55 Station Street	ADDRESS	
Southport, CT 06890		
	(H) PHONE (H)	
203-354-1500	(W) PHONE (W)	
	E-MAIL	

EXISTING CONDITIONS (Describe existing property and structures): _____

PROJECT DESCRIPTION/PURPOSE (Describe the proposed activity): _____

I hereby depose and say that all statements contained herein and all exhibits attached hereto are true and binding to the best of my knowledge:

Timothy S. Hollister, authorized agent — 5-11-18
(Signature of Applicant) (Date)

The act of applying to the Conservation Commission and/or Department implies consent to the proposed activity, and grants permission to the Conservation Commission/Department and its agents to inspect the property herein described for the purpose of resource inventory, impact analysis, and compliance investigation at any time beginning on the date of the application filing, and extending through the pendency of any permit issued, or in the event of permit denial, for the purpose of compliance control.

Timothy S. Hollister, authorized agent — 5-11-18
(Signature of Property Owner) (Date)

FOR DEPARTMENT USE ONLY

1. DEPARTMENT FINDINGS:
After preliminary review by department staff, the following areas, resources and levels of environmental licensure have been identified:

☐ Wetland(s) / Watercourse(s), section: _____
☐ Non-regulated Activity ☐ Permit Required ☐ **FEE $** _____

☐ Wetland / Watercourse Setback(s), section: _____
☐ Non-regulated Activity ☐ Permit Required ☐ **FEE $** _____

☐ Waterway Protection Line(s), section: _____
☐ Non-regulated Activity ☐ Permit Required ☐ **FEE $** _____

☐ Staff Site Inspection for Determination of Wetland Boundary
☐ Administrative Review ☐ Conservation Commission Review ☐ **FEE $** _____

☐ Sediment & Erosion Control Inspection Fee
☐ **FEE $** _____

CONSERVATION CERTIFICATE OF COMPLIANCE FEE $ _____

STATE FEE $ _____

NOTICE FEE $ _____

TOTAL FEE DUE $ _____

The application has been classified as requiring the following ruling:
☐ DECLARATORY ☐ SUMMARY ☐ PLENARY

Public Hearing of the application by the Conservation Commission: ☐ is not required.
☐ is scheduled for _____.

Westport/Weston Health District Approval: _____ Public Sewer: Yes / No
Engineering Dept. review required: Yes/No Date Approved _____
Comments: _____

2. REQUEST FOR ADDITIONAL INFORMATION:
Please submit the information referenced in the attached schedule(s) by 4:00 p.m. on the _____ day of _____, 200___ .

Schedule(s): ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Other: _____

3. RESTRICTION, CONDITIONS AND LIMITATIONS:
This review is valid for a period of six (6) months from the date of review, shown below, and is subject to the following data/plan(s)/stipulation(s): _____

Reviewed by: _____ _____
(Conservation Department Staff Signature) (Date)

TOWN OF WESTPORT

SCHEDULE A CONSERVATION APPLICATION CHECKLIST Appl. #_____

PROJECT ADDRESS: Hiawatha Lane

A Site Plan, Plot Plan, or other type of surveyed property map or plan of A-2 Survey and known scale must be submitted for permit review. **A separate survey map of existing conditions will be required for all submissions.** The plan must be drawn and signed by a licensed surveyor, professional engineer, professional landscape architect, or professional architect, who must be registered with the State of Connecticut.

If the property is not connected to sanitary sewer, all submittals that include a house, any house addition, deck, swimming pool or repair, replacement or installation of a new septic system, requires verification of approval by Health Department prior to issuance of permit from the Conservation Department.

Applicant/agent to contact Jim Kousidis, Public Works Dept, for WPL applications for any further information that may be required by the Flood & Erosion Control Board (phone #341-1151).

Form has been completed with staff during a pre-application meeting on 4/30/18.

ADMINISTRATIVE REQUIREMENTS	YES	N/A
✱ 1. Fee schedule: _____ (fee schedule form to be completed by staff)		
2. Authorization from property owner	✓	
3. Health Department approvals List: septic abandonment / research detention basin fence necessitated		
4. Completion of Schedule B	✓	
5. 8 1/2" by 11" copy of Assessor Map with property outlined and adjacent neighbors indicated	✓	
6. Neighbor Notice letter filled out for application and addressed to abutting property owners in Schedule B. One copy of the letter **must** be submitted with the application packet. 7. Flood & Erosion Control Board Hearing Date: _____ Conservation Commission Hearing Date: _____	✓	
8. Certificate of Mailing for neighbor letter using Postal Service Form #3877 taking neighbor letters to Post Office. **Must be submitted with application packet.**	✓	
9. Completion of Schedule C		
10. Completion of Schedule D		
11. Completion of Schedule E		✓
12. Notification of Dept. of Health by applicant		✓
13. Notification of water company by applicant		✓
14. Notification of abutting municipality IWW agency	✓	
15. Copies of application with associated plans: 9 collated sets of IWW applications_____ 15 collated sets of WPL applications_____ 15 collated sets of IWW,WPL applications ✓		

Revision date: 5/18/07
Forms: New Schedule A

ADMINISTRATIVE REQUIREMENTS	YES	N/A
EXISTING ENVIRONMENTAL CONDITIONS & REGULATED AREAS		
Existing conditions A-2 survey		
16. Wetland/Watercourse boundary	✓	
17. Wetland/Watercourse setback	✓	
18. Wetland/Watercourse 20' non-disturbance buffer	✓	
19. Waterway	✓	
20. 25 year and/or 100 year floodplain boundary	✓	
21. WPLO boundary	✓	
22. Mean High Water Line		✓
23. Tidal Wetlands boundary (as applicable)		✓
24. Biological evaluation	✓	
25. Soils report already done		✓
26. Water Quality Testing (as requested by staff)		
27. Seasonal high groundwater levels (To be obtained during months December-June[1]) done in March	✓	
28. Existing Tree trunks and drip line elevations (8" cal at dbh and greater, 4' from the ground, where activities are proposed within or in close proximity to regulated areas. Smaller sized vegetation may be required to be shown at the discretion of staff)	✓	
EXISTING STRUCTURES & USES	**YES**	**N/A**
1. Lot acreage and total coverage tabulation (include impervious and pervious areas SF)	✓	
2. Existing streets abutting property	✓	
3. Neighbors adjacent to property	✓	
4. Existing catchbasins and other subsurface drainage appurtenances	✓	
5. Stormwater discharge location	✓	
6. Existing septic system location	✓	
7. Existing sewer lateral location		✓
8. Existing well location		✓
9. Existing development (house, driveway, etc)	✓	
10. Existing topography	✓	

[1] *Percolation test data taken for septic system can be used to satisfy this requirement, unless otherwise required by staff. Testing dates are usually between December 1st and June 30th but are subject to change by the Westport/Weston Health District.*

Need Stormwater GP as condition

PROPOSED STRUCTURES & USES	YES	N/A
1. Residence/pool/swimming pool	✓	
2. Deck/Patio/addition/shed	✓	
3. Other structural element (list) New Pump Station in	metal case	
4. Proposed grading (fill and excavation areas)	✓	
5. Stockpile locations Need volume & material	to be excavated & filled	
6. Proposed landscaping (natural, native species—used for biofiltration)		
7. Catchbasins/other subsurface drainage appurtenances	✓	
8. Stormwater discharge outlet locations	✓	
9. Clearing limit line	✓	
10. Proposed limit of disturbance for construction and for project completion Need more substantial fencing	✓	
11. Septic system (new, alteration or repair)		✓
12. Vegetation removal within regulated areas invasive plant removal	✓	
13. Cross sections for structures within WPLO (includes building elevation drawings to confirm FEMA compliance.)	✓ sewer crossing	
14. Demolition (note location of existing UST) (10 houses being demolished)	✓	
15. Proposed total coverage tabulation (include impervious and pervious SF)	✓	
16. Proposed irrigation systems in regulated areas (if applicable) above ext deck (temporary soaker hoses)	✓	
PROPOSED MITIGATION	**YES**	**N/A**
1. Silt fence/haybales, mud-tracking pad (adding construction fencing)	✓	
2. Check dams		✓
3. Detention basin	✓	
4. Tree protection measures		✓
5. Tree relocation		✓
6. Planting Plan within regulated areas to include the following: a) area of planting with associated symbols b) planting details c) plant list with native species (Latin and common name) sizes, spacing and quantities d) "no mow" areas	✓	
7. Permanent demarcation of project limits CEA posts every 50 ft	✓	

Hiawatha Lane
Westport, CT

Subject Property Addresses

Owners	Property Address	Assessor Map #	Lot #
Saugatuck Summit LLC	Hiawatha Lane	A05	4
Saugatuck Summit LLC	47 Hiawatha Lane	A05	2
David H. Ogilvy	45 Hiawatha Lane	A05	1
Saugatuck Summit LLC	Hiawatha Lane	A05	5
Frank P. Bottone	44 Hiawatha Lane	A05	6
Hannelore Walsh	43 Hiawatha Lane	B05	57
Saugatuck Summit LLC	42 Hiawatha Lane	B05	59
Saugatuck Summit LLC	41 Hiawatha Lane	B05	56
Estate of Crystal Christensen	39 Hiawatha Lane	B05	55
Saugatuck Summit LLC	38 Hiawatha Lane	B05	60
Saugatuck Summit LLC	36 Hiawatha Lane	B05	61
Anne M. Mantia	28 Hiawatha Lane	B05	62

NOTES:

1. Parcels "4" and "5," undeveloped parcels located, are sometimes referred to on maps as Parcels "A" and "B," respectively.

2. The proposed sewer extension, as well as vehicular access to the proposed redevelopment, will occur within the right-of-way of Hiawatha Lane, a private street which Summit Saugatuck owns in fee or owns an easement. A small part of the sewer extension will occur within the right-of-way of Davenport Avenue, a public street. The abutting properties to the sewer extension that are not owned by or under contract or option to Summit Saugatuck are Lots 24, 26, 27, 33, and 37 Hiawatha Lane. No residential construction, including sewer extension work, will occur on any of these lots.

3. Part of Lot 47 is located in Norwalk and thus adjacent properties in Norwalk are included in the abutters list.

Fill out on your computer, print and bring to Conservation

TOWN OF WESTPORT

SCHEDULE B ADJACENT OWNERS **APP #** _____

Due by 4:00 p.m. on _____

1. Please submit names, Assessor Map, lot number and mailing addresses of adjacent property owner(s) and owner(s) across the street from the project site. You may obtain this information from the Tax Assessor's Office, Room 104:

☑ **CHECK HERE IF THE SUBJECT PROPERTY FALLS WITHIN 500' OF A TOWN BORDER**

NAMES	ASSESSOR'S MAP	LOT NUMBER	MAILING ADDRESS
See Exhibit A, Subject Properties, attached and Abutters List, attached			

2. Submit one (1) 8 ½" by 11" photocopy of the appropriate assessor's map (1" to 200' scale) on which the property being considered in the application is identified. The names of all adjacent property owners must be written in or keyed to the above list of adjacent property owners. Property is to be highlighted. A photocopy of this map may be obtained from the Public Works Office, Room 210.
3. Submit required number of sets of stamped, standard-size envelopes (4 ½" by 9 ½") addressed to the above property owners and with no return address.

Note: IWW applications required one (1) set of envelopes.
WPL applications require one (1) set of envelopes.
IWW-WPL applications require two (2) sets of envelopes

Rev: 12/08/03

PROPERTIES ABUTTING
28, 36, 38, 39, 41, 42, 43, 44, 45, AND 47 HIAWATHA LANE; PARCELS "A" AND "B" (LOCATED SOUTH OF LOTS 43-45-47); AND ROAD BED OF HIAWATHA LANE FROM WESTPORT-NORWALK LINE TO WESTERN END OF DAVENPORT AVENUE

WESTPORT AND NORWALK, CONNECTICUT

AS OF MAY 3, 2018

MAP / BLOCK / LOT / UNIT	PROPERTY ADDRESS	OWNER NAME AND MAILING ADDRESS
B05 / / 063 / 000 /	26 Hiawatha Lane	Richard D. Heise 26 Hiawatha Lane Westport, CT 06880
B05 / / 047 / 000 /	27 Hiawatha Lane	Leslie Ogilvy 27 Hiawatha Lane Westport, CT 06880
B05 / / 048 / 000 /	29 Hiawatha Lane	Selma Miriam 29 Hiawatha Lane Westport, CT 06880
B05 / / 049 / 000 /	31 Hiawatha Lane	31 Hiawatha LLC c/o Ralph J. DeMattio P.O. Box 2236 Westport, CT 06880
B05 / / 050 / 000 /	33 Hiawatha Lane	33 Hiawatha LLC 35B Hiawatha Lane Westport, CT 06880
B05 / / 054 / 000 /	37 Hiawatha Lane	Christopher Gazzelli 37 Hiawatha Lane Westport, CT 06880

MAP / BLOCK / LOT / UNIT	PROPERTY ADDRESS	OWNER NAME AND MAILING ADDRESS
A05 / / 004 / 000 /	Hiawatha Lane	Summit Saugatuck LLC c/o Grossman Companies Inc. 859 Willard Street Quincy, MA 02169
State of Connecticut Properties Abutting I-95	State of Connecticut Properties Abutting I-95	State of Connecticut Department of Transportation 2800 Berlin Turnpike Newington, CT 06111
B05 / / 016 / 000 /	Saugatuck Avenue	Town of Westport RR PK Lot – Thompson Lot 110 Myrtle Avenue Westport, CT 06880
B05 / / 065 / 000 /	22 Hiawatha Lane	Kalonji & Glorie Diyoka 22 Hiawatha Lane Westport, CT 06880
B05 / / 064 / 000 /	24 Hiawatha Lane	Kenneth R. & Joanne C. Sosnoski 24 Hiawatha Lane Westport, CT 06880
B04 / / 007 / 000 /	Saugatuck Avenue	Aspetuck Land Trust Inc. A/K/A Eno Marsh Preserve 18 Cold Spring Road Easton, CT 06612
B05 / / 041 / 000 /	2 Heritage Court	Qian Yang 2 Heritage Court Westport, CT 06880
B05 / / 037 / 000 /	25 Davenport Avenue	Rodica Brune 4 Hillcrest Lane Old Greenwich, CT 06870
B05 / / 075 / 000 /	28 Davenport Avenue	Joseph A. Palmieri, Jr. 118 Burr Court Bridgeport, CT 06605

MAP / BLOCK / LOT / UNIT	PROPERTY ADDRESS	OWNER NAME AND MAILING ADDRESS
B05 / / 076 / 000 /	26 Davenport Avenue	Albert Boera 26 Davenport Avenue Westport, CT 06880

PROPERTIES IN NORWALK, CONNECTICUT

5-17-40-0 *	5 Tilton Street	Thomas F. & Sandra Forlano 6 Tilton Street Norwalk, CT 06851-4409
3-17-144-0 **	8 Norden Place	Avalon Norden Place LLC c/o Avalonbay Communities Inc. / Tax Dept. 671 N. Glebe Road, #800 Arlington, VA 22203
5-17-61-0 ***	25 Lois Street	25 Lois Street LLC 195 North Avenue Westport, CT 06880

* Abuts 47 Hiawatha Lane
** Abuts 47 Hiawatha Lane
*** Abuts 44 Hiawatha Lane

TOWN OF WESTPORT

SCHEDULE C—WETLANDS / WATERCOURSES **APP #**_____

Due by 4:00 p.m. on _____

1. Pursuant to Section 9.6.2 relating to Soil Sample Data – the applicant/agent is to submit copy of a report by a "soil scientist" duly qualified in accordance with standards set by the U.S. Civil Service Commission, showing soil sample data, soil classifications, and a surveyed delineation of wetland soils as flagged by the scientist, including flag numbers (as requested by agency).

2. Pursuant to Section 9.6.3 relating to Biological Evaluations – the applicant/agent is to submit a list and evaluation of the plant and animal life that may be found within, depend upon, or use the wetlands and watercourses (as requested by agency).

3. Describe the anticipated impacts to wetlands and watercourses that may occur as the result of that portion of your proposal that may be located in wetlands, watercourses or their setbacks.

   All improvements are located outside the limits of the wetlands and the majority of the improvements are located outside the setbacks to the wetlands and watercourses. Refer to the Wetland and Watercourse Assessment prepared by William Kenny Associates for further information. A comprehensive sediment and erosion control plan for during construction has been prepared to limit the impacts.

4. Describe the mitigation that is being proposed as part of your application in order to minimize disturbance and pollution of wetlands and watercourses, maintain or improve water quality, and prevent destruction of or enhance the natural habitats and functions of the wetlands and watercourses.

   To improve the quality of any stormwater runoff post construction, a comprehensive drainage system has been designed to include catch basins with deep sumps and inserts to collect sediments and oils, infiltration systems, rain gardens, surface stormwater basins. Landscaping is proposed to act as a buffer between the proposed development and the wetlands.

5. List the alternatives to the proposed application that were considered and the reason for their abandonment.

TOWN OF WESTPORT

SCHEDULE D—WATERWAY PROTECTION LINES **APP#_____**

Due by 4:00 p.m. on_____.

1. Explain/submit information showing why/how the proposed activity as located within Waterway Protection Lines will not cause flooding, drainage, erosion and/or related conditions hazardous to life and property and will not have an adverse impact upon the flood-carrying and water-storage capacity of the town's waterways, including but not limited to the impact upon flood heights, hydrological energy flow, maintenance of essential and natural patterns of water circulation, drainage and basin configuration and maintenance of fresh- and saltwater exchange through the placement of culverts, tide gates or other drainage flood-control structures. *(Sec. 148-8 of the Waterway Protection Line Ordinance)*

   There is minimal work proposed within the limits of the WPLO line and is limited to the installation of the sanitary sewer force main just west of the intersection of Hiawatha Lane Extension and Davenport Avenue. The work to install the sewer line is limited to within the roadway and sediment and erosion control measures have been included on the plans. As the watercourse is routed through two culverts under the road, the installation of the sewer line will not have an adverse impact on the flood carrying capacity or the water storage capacity of the waterway.

2. Explain/submit information showing why/how the proposed activity as located within the Waterway Protection Lines will not cause water pollution, erosion and/or environmentally related hazards to life and property and will not have an adverse impact on the preservation of the natural resources and ecosystems of the waterway, including but not limited to impact on ground or surface water, aquifers, plant and aquatic life, nutrient exchange and supply, thermal energy flow, natural pollution filtration and decomposition, habitat diversity, viability and productivity and natural rates and processes or erosion and sedimentation. *(Sec. 148-9 of the Waterway Protection Line Ordinance)*

   The proposed work within the WPLO line is occurring in areas that have already be disturbed as it is the existing roadway. The installation of the sewer line below the roadway will not adversely impact the preservation of natural resources and the ecosystem of the waterway.

3. Other:

TOWN OF WESTPORT

SCHEDULE E—AQUIFERS **FILE #_____**

Due by 4:00 p.m. on _____.

1. Please list all the "potentially hazardous uses" as referenced in Section IV of the Aquifer Protection Regulations that are being proposed as part of the application, and identify those uses that are primary activities and those that are secondary activities.

2. Discuss the manner by which the potentially hazardous use may come into contact with the ground or surface water, or the aquifer protection area, and the methods and "best management practices" proposed as part of the application to mitigate impacts, rehabilitate, improve or protect groundwater.

3. Other:

SUMMIT SAUGATUCK LLC

55 Station Street
Southport, CT 06890

May 16, 2018

Ms. Patricia Shea, Chair,
and Commission Members
Conservation Commission
Town of Westport
110 Myrtle Avenue
Room 205
Westport, CT 06880

Ms. Alicia Mozian
Conservation Director
Conservation Department
Town of Westport
110 Myrtle Avenue
Room 205
Westport, CT 06880

Re: Application of Summit Saugatuck LLC for Regulated Activity Permit and Waterway Protection Line Ordinance Approval, Lots 28, 36, 38, 39, 41-45, and 47 Hiawatha Lane and Hiawatha Lane Extension, and Parcels "A" and "B"

Dear Chair Shea, Commission Members, and Ms. Mozian:

As Manager of Summit Saugatuck LLC, I authorize William Kenny of William Kenney Associates, LLC and Attorney Timothy Hollister of Shipman & Goodwin LLP to act as agents of Summit Saugatuck LLC with respect to an application to the Westport Conservation Commission for a regulated activity permit and waterway protection line ordinance approval.

An Affidavit on behalf of Summit Saugatuck LLC regarding its ownership or contract purchaser status and rights, as to the parcels involved in the application, is attached.

Very truly yours,
SUMMIT SAUGATUCK LLC

Jacob Grossman, Manager
Duly Authorized

Attachment

5504874 / s6

APPLICATION OF SUMMIT SAUGATUCK LLC FOR REGULATED ACTIVITY PERMIT AND WATERWAY PROTECTION LINE ORDINANCE APPROVAL, LOTS 28, 36, 38, 39, 41-45, AND 47 HIAWATHA LANE AND HIAWATHA LANE EXTENSION, AND PARCELS "A" AND "B"

AFFIDAVIT OF JACOB M. GROSSMAN

I, JACOB M. GROSSMAN, being duly sworn, depose and state as follows:

1. I am over the age of 18 and believe in the obligations of an oath.

2. I am a resident of Dover, Massachusetts.

3. I am the President of The Grossman Companies, Inc., which is the Manager of Summit Saugatuck LLC.

4. As set forth in deeds recorded on the Westport Land Records, as of the date of this Affidavit, Summit Saugatuck is the owner of lots known as 36, 38, 39, 41, 42, and 47 Hiawatha Lane and Parcels A and B.

5. As of the date of this Affidavit, Summit Saugatuck is the contract purchaser of lots known as 28, 43, 44, and 45 Hiawatha Lane, and as to each of these lots, by contract is authorized to make application to the Westport Conservation Commission and to grant the Commission, and its employees and agents, access to these properties for inspection and verification purposes.

JACOB M. GROSSMAN

Subscribed and sworn to before
me this 10th day of May, 2018.

Patricia A. Scanlan
Notary Public / My Commission Expires:
9-26-19

PATRICIA A. SCANLAN
Notary Public
Commonwealth of Massachusetts
My Commission expires on September 26, 2019

5504874 / s7

Connecticut Department of
ENERGY & ENVIRONMENTAL PROTECTION

GIS CODE #: ____ ____ ____ ____ ____ ____ ____ ____ ____
For DEEP Use Only

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:
DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106
Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

1. DATE ACTION WAS TAKEN: year: _____ month: _____
2. ACTION TAKEN (see instructions, only use one code): _____
3. WAS A PUBLIC HEARING HELD (check one)? yes ☐ no ☐
4. NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:
   (print name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

5. TOWN IN WHICH THE ACTION IS OCCURRING (print name): Westport
   does this project cross municipal boundaries (check one)? yes ☐ no ■
   if yes, list the other town(s) in which the action is occurring (print name(s)): _____, _____
6. LOCATION (see instructions for information): USGS quad name: Norwalk or number: 114
   subregional drainage basin number: 7000
7. NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Summit Saugatuck LLC
8. NAME & ADDRESS / LOCATION OF PROJECT SITE (print information): Hiawatha Lane
   briefly describe the action/project/activity (check and print information): temporary ☐ permanent ■ description:
   Development of a multi-family buildings
9. ACTIVITY *PURPOSE* CODE (see instructions, only use one code): C
10. ACTIVITY *TYPE* CODE(S) (see instructions for codes): 2, 9, 10, 12
11. WETLAND / WATERCOURSE AREA ALTERED (must provide acres or linear feet):
    wetlands: 0.0 acres open water body: 0.0 acres stream: 0.0 linear feet
12. UPLAND AREA ALTERED (must provide acres): 0.002 acres
13. AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 0.0 acres

DATE RECEIVED:

PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO

PIETRAS ENVIRONMENTAL GROUP, LLC

WETLANDS FUNCTIONS AND VALUES REPORT

Date: June 12, 2016 PEG JOB#: 2016-81

Prepared for: Summit Development, LLC
55 Station Street
Southport, CT 06890

Project & Location: Proposed multi-family residential development, Hiawatha Lane, Westport,

Introduction

The project area is located in the southwestern portion of the Town of Westport and is bounded by Interstate 95 to the north and Amtrak/Metro North Railroad to the south (refer to Figures 1 and 2). The municipal boundary with the City of Norwalk lies to the west. The project area consists of ten single family residential properties on Hiawatha Lane (House #'s 28, 36, 38, 39, 41, 42, 43, 44, 45 & 47) plus two vacant parcels (Parcels 4 & 5). The combined residential properties and undeveloped parcels total 5.3+/- acres in size. The proposed project is for the construction of a multifamily residential development that will include two buildings.

Brief Description of Existing Features

The ten existing, single family properties range in size from 0.35 to 0.81 acres, while the two undeveloped parcels are 0.16 and 2.85 acres in size. Most of the lands surrounding the single family houses are maintained in grassed lawn with scattered trees and shrubs. The southern portions of House #s' 39, 41 and 43 plus a large portion of Parcel 4 are wooded. A State of CT Property is situated to the north of House #'s 38, 32 & 44 and to the west of House # 36. Formerly, this State property contained building and asphalt parking associated with I-95 toll booths. The toll booths were taken out in the late 1980's. These State lands are presently vacant and covered with a mix of grassed field with scattered white pines, patches of briar and some woodland.

Topographic features of the lands in the project area include short sections of steep slopes and a broad area of flatlands in the southern portion of Parcel 4. Most of the lands on the subject properties are gently to moderately sloping with grades falling generally to the south. Elevations range from 32 feet at northeastern corner of 28 Hiawatha Lane to just below 10 feet in the broad flatlands on Parcel 4.

According to the State of Connecticut Surficial Materials Map, the project area contains glacial meltwater deposits that were mapped as containing sand and gravel (sg). Glacial meltwater deposits (stratified layers) consists of layers of well-sorted to poorly sorted gravel, sand, silt and clay laid down by flowing meltwater in glacial streams and lakes which occupied the valleys and lowlands of Connecticut during the retreat of the last glacial ice sheet. The sand and gravel map unit is composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent gravel particles and 50 to 75 percent sand particles.

Identification and Descriptions of Wetlands and Watercourses

An investigation for wetland identification was conducted in March 8, 2016 by Pietras Environmental Group, LLC. Wetlands are present on the southern portions of House #s' 39, 41 and 43 plus a large portion of Parcel 4 (refer to Figure 3). A copy of the Wetland Delineation Report is presented in Appendix I. Wetland soil map units that were identified on the subject properties include Raypol silt loam (12) and Scarboro muck (15). The Raypol silt

15 Briarwood Lane
Wallingford, CT 06492
203-314-6636

EMAILTom@pietrasenvironmentalgroup.com
WEB SITE pietrasenvironmetalgroup.com

loam is a deep, poorly drained, friable, loamy textured soil that developed over sandy and gravelly, glacial outwash. A water table is typically present within a foot of the surface from late fall through mid-spring. The Scarboro muck is a deep, very poorly drained soil with a thin (less than 15 inches thick) mucky surface that is underlain by sandy and gravelly, glacial outwash. This soil is subject to shallow (0 to 6 inches) seasonal ponding. The seasonal water table typically remains within six inches of the surface. On March 8, 2016 much of the Scarboro soil map unit identified on Parcel 4 contained shallow inundation that in places exceeded a foot deep. The wetlands on Parcel 4 may contain areas of deeper muck (greater than 15 inches thick).

An intermittent watercourse discharges into the wetlands from a culvert which is located on the eastern side of 39 Hiawatha Lane. The watercourse flows in a southwesterly to westerly direction through the wetlands which are located on the southern portions of 39, 41 and 43 Hiawatha Lane and eventually into the broad wetlands on Parcel 4 which were inundated on 3/18/2016. The watercourse had moderate flow on 3/18/2016 within the wetlands located at 39, 41 & 42 Hiawatha Lane. A second intermittent watercourse channel is located in the far southern portion of 39 Hiawatha Lane and intersects with the first intermittent watercourse. The second watercourse extends onto property at 37 Hiawatha Lane where it connects with a larger brook. There was minimal flow in the second intermittent watercourse on 3/18/2016. The Town of Westport GIS Map shows a small pond, or inundated area, in the southern portion of 39 Hiawatha Lane within the delineated wetlands. There is evidence of a former, very shallow pond which has been silted-in. The intermittent watercourse which discharges from the culvert at 39 Hiawatha Lane passes through the former pond which presently supports young forested swamp vegetation.

Thomas W. Pietras, Professional Soil Scientist and Wetland Scientist, conducted an inspection on May 10, 2016 for the purpose of inventorying the wetlands and gathering information on their features. The wetlands on the subject property can be classed as: (1) forested swamp and (2) shrub-sapling swamp/forested swamp complex. Forested swamps are characterized by woody vegetation that is 6 meters (20 feet) tall or taller. Shrub-sapling swamp, also referred to as scrub shrub wetlands, are dominated by woody vegetation less than 6 meters tall and are often referred to as shrub swamps. The locations of the wetland and upland vegetative communities within the project area are shown in Figures 4 and 5. Vegetative inventories were conducted in both the wetlands and uplands and these are presented in Appendix II.

The wetlands in the southern portions of 39, 41 and 43 support forested swamp with a dense woody understory. The forested swamp on these lots is approximately 1 acre in size. Trees include red maple, American elm, catalpa and pin oak. The woody shrub understory and woody vines are moderately dense and the more common plants include spicebush, sweet pepperbush, winterberry, arrowwood viburnum, elderberry, multiflora rose, burning bush, greenbriar, poison ivy and oriental bittersweet. Herbaceous plants include skunk cabbage, jewelweed, smartweed, trout lily, lesser celandine, violet, tussock sedge, cinnamon fern, aster, iris, wood nettle, jack-in-the-pulpit, water-plantain and wood reed grass.

The shrub-sapling swamp/forested swamp complex on Parcel 4 contains a dense growth of young trees, shrubs and herbaceous plants. The size of the swamp complex is approximately two acres. A portion of the swamp complex extends off-site to the west onto lands in the City of Norwalk. The swamp was historically connected with a much larger wetland which has been divided by the railroad tracks. A several acre forested wetland is located on the southern side of the railroad tracks. Trees, shrubs and woody vines in the shrub-sapling swamp/forested swamp on Parcel 4 include red maple, black gum, alder, ironwood, sweet pepperbush, pussy willow, highbush blueberry, spicebush, swamp azalea, greenbriar and grapevine. Herbaceous plants include tussock sedge, sensitive fern, purple loosestrife, sensitive fern, royal fern, skunk cabbage, bur-reed, waterweed, water plantain, bulrush, wood reed grass and smartweed.

Large portions of the shrub-sapling swamp/forested swamp on Parcel 4 were inundated during the wetlands investigation conducted on 3/18/2016. On May 10, 2016 the depth of inundation and extent of the inundated area in the wetlands had diminished considerably since the initial wetlands investigation. Water depth was generally less than 12 inches in the swamp. Soils in the swamp were mucky and very soft. A further investigation of the swamp on Parcel 4 was conducted on May 16, 2016 and the extent of inundation had

continued to noticeably diminish. It was estimated that the depth of inundation had dropped by a foot since the initial investigation on 3/18/2016 and the overall areal extent of inundation in the swamp had dropped by nearly half.

Drainage from the swamp on Parcel 4 discharges into a culvert that extends under the railroad tracks. The culvert is located very near to the Westport/Norwalk town line at the base of the railroad embankment. It appears that the culvert is situated on lands that lie off-site within the City of Norwalk. The inlet for the railroad culvert is substantially blocked with woody debris and leaves. The blockage may be a factor that led to the extensive inundation within the swamp which was observed on 3/18/2016. In addition, in close proximity to the culvert there is a watercourse that flows in an easterly direction and discharges into the southwestern portion of the shrub-sapling swamp/forested swamp. Drainage passing through the culvert under the railroad passes into the larger wetland which is located on the southern side of the railroad tracks. The watercourse flows in a southerly direction through the large off-site wetlands and approximately one mile from the railroad tracks discharges into a tidal cove which is situated adjacent to Duck Pond Road.

The U.S. Fish and Wildlife Service National Wetlands Map (NWI) provides an inventory of wetland resources on a national basis. For the project area the NWI Map identifies a scrub-shrub (PSS) wetland in the southwestern portion of Parcel 4 (refer to Figure 6). The NWI Map also provides an approximate illustration of the off-site forested wetlands (PFO) which are located across the tracks to the south of the subject properties, as well an off-site brook which is located to the east of House #39.

On May 10, 2016 the inundated portions of the swamp on Parcel 4 were investigated for amphibians and reptiles. A dip net was used to sample the waters and identify any species. No obligate vernal pool species were found. In Connecticut obligate vernal pool species are listed as fairy shrimp, wood frog, spotted salamander, blue-spotted salamander, Jefferson salamander, marbled salamander and eastern spadefoot toad. Mosquito larvae, snails and finger-nail clams were common in the dip net samples. Only one tadpole was caught from the shallow inundation and it was identified as an American toad. A green frog was observed within the intermittent watercourse in the forested swamp located in the southern portion of 41 Hiawatha Lane. Waterfowl, including two pairs of mallard ducks and a family of Canada geese were observed in the swamp on May 10 and 16, 2016. Avian species, including yellow-winged blackbirds, were also seen in the swamp.

Functional Values of Wetlands and Watercourses

The assessment of the wetland functions was conducted based on a utilization of the concepts provided by current literature available, including Method for the Evaluation of Inland Wetlands in Connecticut: A Watershed Approach. CT DEP Bulletin N. 9 and USACOE, 1995, Highway Methodology Workbook, Wetland Functions and Values: A Descriptive Approach, New England Division. Best professional judgment was also utilized in the assessment. Each of the three distinct wetland classes identified on or immediately adjacent to the subject property were assessed for 13 functional values. Table One presents of a summary of the 13 functional values identified in each of the three wetland classes.

I. **Forested swamp situated on the southern portions of 39, 41 & 43 Hiawatha Lane**

1-Groundwater recharge/discharge: The ability of the wetland to provide groundwater recharge or groundwater discharge especially in association with an aquifer.
>The forested swamp is located on nearly level terrain and is underlain by sand and gravel soil materials. An intermittent watercourse discharges into the forested swamp. The forested swamp provides moderate functions for groundwater recharge.

2-Floodflow alteration: This function concerns the ability of the wetland to reduce flood damage by retaining storm water following significant precipitation and then slowly releasing the stormwaters.

> An intermittent watercourse flows through the forested swamp which is on level to gently sloping terrain. The swamp provide potential storage areas for detaining storm water runoff following large storm events and has moderate value for this function.

3-Fish and shellfish habitat: This function is associated with fish and shellfish habitat within watercourses that are contained within certain wetlands.
>The watercourse flowing through the forested swamp is small in size and intermittent. The watercourse does not provide finfish or shellfish habitat.

4-Sediment/toxicant retention: This function is associated with the ability of the wetland to reduce or prevent degradation of water quality through the entrapment of sediments, toxicants or pathogens in storm water runoff or other waters draining through the wetland.
>The forested swamp is situated on a gently sloping to nearly level terrain, contains poorly drained and very poorly drained soils with either mucky or mucky mineral soils, contains intermittent watercourses and has a relatively dense woody understory and dense herbaceous vegetative cover. The watercourse carries drainage from a highway and from residentially developed properties. These features are favorable for providing sediment/toxicant removal functions.

5-Nutrient removal/retention/transformation: This function qualifies the ability of the wetland to filter out nutrients that may be contained in storm water runoff.
>As similar to the factors cited for sediment/toxicant removal, the forested swamp is situated on a gently sloping to nearly level terrain, contains poorly drained and very poorly drained soils with either mucky or mucky mineral soils, contains intermittent watercourses and has a relatively dense woody understory and dense herbaceous vegetative cover. The watercourse carries drainage from a highway and from residentially developed properties. These features are favorable for the wetland to function in nutrient removal/retention/transformation.

6-Production export: This function concerns the ability of the wetland to produce food for humans or other living organisms.
>The forested swamp wetlands contain maturing woodlands which include a dense woody understory. Many of the shrubs are berry producing. The swamp produce a variety of food sources which are utilized by wildlife.

7-Sediment/shoreline stabilization: This function is associated with the ability of the wetland to provide stabilization to streambanks and shorelines against erosion.
>The two water courses in the forested swamp are small in size, have gentle gradients and are contained within small channels. There is evidence that the intermittent watercourse discharging from the culvert at 39 Hiawatha Lane carries relatively significant flows during large storm events. A considerable component of the larger storm flow likely comes from highway storm water runoff. The dense vegetation in the forested swamp contributes to maintaining the channels and preventing channel erosion.

8-Wildlife habitat: The ability of the wetland provide habitat for various types and populations of animals typically associated with wetlands and wetland buffers.
>The forested swamp contains a relatively dense woody understory and dense herbaceous layer which provide cover, food sources and nesting sites for wildlife. The intermittent watercourse provides a water source. A patch of upland forest is located on a knoll in the northwestern corner of Parcel 4 which borders to the forested swamp. The presence of a residential neighborhood to the north and the railroad on the south reduce the overall wildlife habitat value. The forested swamp wetlands was determined to provide moderate wildlife habitat.

9-Recreation: This function is associated with the ability of the wetland to provide recreational uses, including hiking, boating, fishing and hunting.
>The forested swamp wetlands provides limited opportunities for hunting and passive recreation, including hiking.

10-Educational/scientific value: This value measures the ability of the wetland to serve as an outdoor classroom or as a site for scientific study.
>The forested swamp provides for some educational/scientific value, but to a limited degree.

11-Uniqueness/Heritage: These functions are related to the ability of the wetland to serve as an important archeological site, provide habitat for endangered species, or contain either unique vegetative communities or landforms.
>The forested swamp does not appear to provide for any special uniqueness or heritage values.

12-Visual quality aesthetics: This value considers the visual and aesthetic qualities of the wetland.
>The forested swamp lies between a single family residential neighborhood and railroad tracks. During the growing season the forest vegetation provides a dense natural screening which serves to provide a valuable, visual and acoustic, wooded buffer between the residences and railroad.

13-Endangered species habitat: This value considers the ability of the wetland to provide habitat for threatened or endangered species.
> The CT DEEP Natural Diversity Data Base Map for Westport was reviewed online (Map dated September 2015). According to the DEEP map there are no records of State or Federal Listed Species & Significant Natural Communities identified in the forested swamp, nor in any portion of the project area subject properties. Furthermore, no State listed species were identified on any of the subject properties during the 2016 investigations.

II. Shrub-sapling swamp and forested swamp situated on Parcel 4

1-Groundwater recharge/discharge: The ability of the wetland to provide groundwater recharge or groundwater discharge especially in association with an aquifer.
>The swamp complex is relatively large in size (2+/- acres), is located on nearly level to level terrain and is underlain by sand and gravel soil materials. Watercourses discharge into the swamp at both the eastern and western sides. Large portions of the swamp are subject to periods of shallow inundation. The swamp complex provides moderate to moderate high functions for groundwater recharge.

2-Floodflow alteration: This function concerns the ability of the wetland to reduce flood damage by retaining storm water following significant precipitation and then slowly releasing the stormwaters.
> Two watercourses flow into the swamp complex. An intermittent watercourse flows in a westerly direction through the forested swamp located in the southern portions of House #'s 39, 41 & 43 and enters into the swamp complex. A second watercourse is located off-site on lands in the City of Norwalk and flows in an easterly direction into the swamp complex. The watercourse discharging from the culvert at 39 Hiawatha Lane and flowing into the swamp complex from the east shows evidence of carrying periodic large volumes. The swamp is relatively broad in area, lies on very gently sloping to level terrain and is subject to periods of shallow inundation. The culvert outlet at the railroad embankment is partially blocked and only allows for restricted outflow. The swamp provides a relatively large area detaining storm water runoff following large storm events and has moderate-high value for this function.

3-Fish and shellfish habitat: This function is associated with fish and shellfish habitat within watercourses that are contained within certain wetlands.
>The watercourse flowing through the forested swamp is small in size and intermittent. The watercourse does not provide finfish habitat. The shallow inundation within the swamp does provide for habitat for some aquatic organisms, including snail and finger nail clams.

4-Sediment/toxicant retention: This function is associated with the ability of the wetland to reduce or prevent degradation of water quality through the entrapment of sediments, toxicants or pathogens in storm water runoff or other waters draining through the wetland.

>The swamp is situated on a very gently sloping to level terrain; contains very poorly drained, mucky soils; is fed by two watercourses; and has a dense woody understory and herbaceous vegetative cover. The easterly watercourse carries drainage from a highway and from residentially developed properties. These features are favorable for providing sediment/toxicant removal functions.

5-Nutrient removal/retention/transformation: This function qualifies the ability of the wetland to filter out nutrients that may be contained in storm water runoff.
>As similar to the factors cited for sediment/toxicant removal, the swamp complex is situated on a very gently sloping to level terrain, contains very poorly drained mucky soils, is fed by two watercourses and has a relatively dense woody understory and herbaceous vegetative cover. The easterly watercourse carries drainage from a highway and from residentially developed properties. These features are favorable for the wetland to function in nutrient removal/retention/transformation.

6-Production export: This function concerns the ability of the wetland to produce food for humans or other living organisms.
>The swamp complex contains a dense community of saplings and shrubs with herbaceous growth. Many of the shrubs are berry producing. The swamp produce a variety of food sources which are utilized by wildlife.

7-Sediment/shoreline stabilization: This function is associated with the ability of the wetland to provide stabilization to streambanks and shorelines against erosion.
>The water course flowing into the swamp complex from the east has a broad and very shallow channel. As the watercourse discharges into the shallow inundated swamp the watercourse channel becomes poorly defined. The dense vegetation in the flat swamp subject to periodic erosion minimize the opportunity for any channel erosion to occur.

8-Wildlife habitat: The ability of the wetland provide habitat for various types and populations of animals typically associated with wetlands and wetland buffers.
>The swamp complex contains both a dense woody shrub/sapling understory and dense herbaceous layer which provide cover, food sources and nesting sites for wildlife. Extensive areas of periodic, shallow inundation characterize the swamp. Much of the herbaceous growth in the swamp is delayed due to early spring, shallow inundation. The swamp complex is bordered by forested swamp to the east, by a patch of upland forest located on a knoll in the northwestern corner of Parcel 4, pioneer woody and herbaceous growth on fill soils located on the southwestern portion of Parcel 4 and by a mix of woodlands and fields that are located to the west and southwest of the swamp on lands in the City of Norwalk. The swamp complex provides moderate-high quality wildlife habitat for a range of species, including reptile, amphibian, waterfowl, avian species and mammals.

9-Recreation: This function is associated with the ability of the wetland to provide recreational uses, including hiking, boating, fishing and hunting.
>The swamp complex wetlands provides limited opportunities for hunting and passive recreation, including hiking.

10-Educational/scientific value: This value measures the ability of the wetland to serve as an outdoor classroom or as a site for scientific study.
>The swamp complex provides for some educational/scientific value, but to a limited degree. The lands are privately owned and bordered by a railroad.

11-Uniqueness/Heritage: These functions are related to the ability of the wetland to serve as an important archeological site, provide habitat for endangered species, or contain either unique vegetative communities or landforms.
>The forested swamp does not appear to provide for any special uniqueness or heritage values.

12-Visual quality aesthetics: This value considers the visual and aesthetic qualities of the wetland.
>The shrub-sapling swamp/forested swamp complex is dominate by shrub and sapling plants with a dense herbaceous growth and is associated with seasonal, shallow inundation. These components provide for moderate aesthetic values.

13-Endangered species habitat: This value considers the ability of the wetland to provide habitat for threatened or endangered species.
> The CT DEEP Natural Diversity Data Base Map for Westport was reviewed online (Map dated September 2015). According to the DEEP map there are no records of State or Federal Listed Species & Significant Natural Communities identified in the forested swamp, nor in any portion of the project area subject properties. Furthermore, no State listed species were identified on any of the subject properties during the 2016 investigations.

Table One. Summary of functional values of wetlands and watercourses

Functional Value	Forested swamp on 39, 41 & 43 Hiawatha Lane	Shrub-sapling swamp & forested swamp complex on Parcel 4
1-Groundwater recharge/discharge	moderate	moderate to moderate-high
2-Floodflow alteration	moderate	moderate-high
3-Fish and shellfish habitat	none	low
4-Sediment/toxicant retention	moderate	moderate-high
5-Nutrient Removal	moderate	moderate-high
6-Production export	moderate	moderate-high
7-Sediment/shoreline stabilization	low-moderate	low
8-Wildlife habitat	moderate	moderate-high
9-Recreation	low	low-moderate
10-Educational/scientific value	low	moderate
11-Uniqueness/Heritage	low	low-moderate
12-Visual quality aesthetics	moderate	moderate
13-Endangered species habitat	no listed species	no listed species

Respectfully submitted,

PIETRAS ENVIRONMENTAL GROUP, LLC

Thomas W. Pietras

Thomas W. Pietras
Professional Wetland Scientist and Soil Scientist

REFERENCES

Adamus, P.R., E.J. Clairain, Jr., R.D. Smith, and R.E. Young. 1987. Wetland Evaluation Technique (WT), Vol. 2. Methodology. U.S. Army Eng. Waterways Exp. Stn. Draft Tech. Rep. Y-87. 206 pp.

Amma, Alan, Editor, "Method for the Evaluation of Inland Wetlands in Connecticut," DEP Bulletin No. 9, Hartford, CT. August 1990.

Stone, J.R., J.P. Schafer, E. H. London & W.B. Thompon, Surficial Materials Map of CT. 1992. U.S. Geological Survey.

U.S. Army Corps of Engineers (USACOE), New England Division. 1995. The Highway Methodology Workbook. Wetland Functions and Values, a Descriptive Approach.

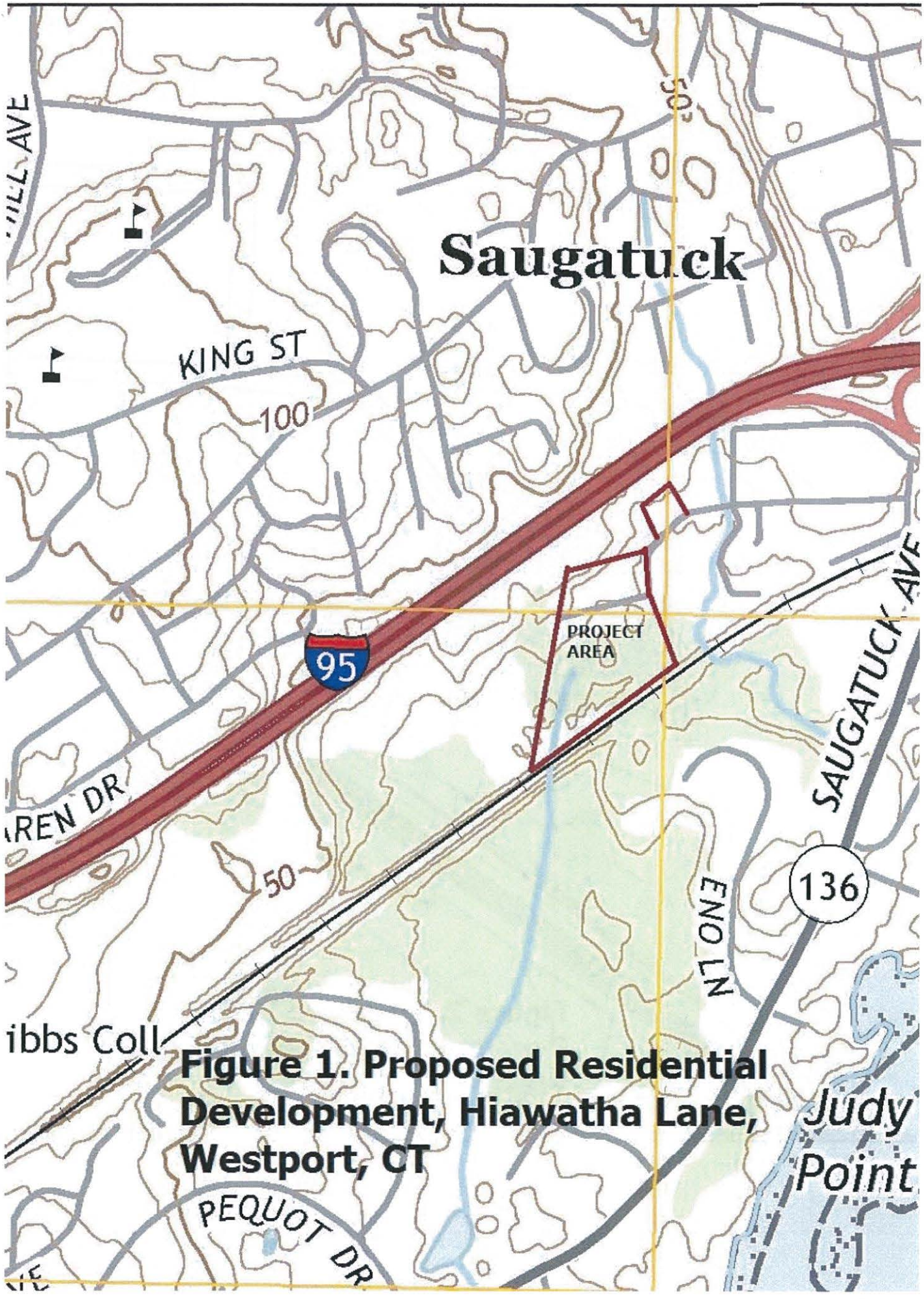

Figure 1. Proposed Residential Development, Hiawatha Lane, Westport, CT

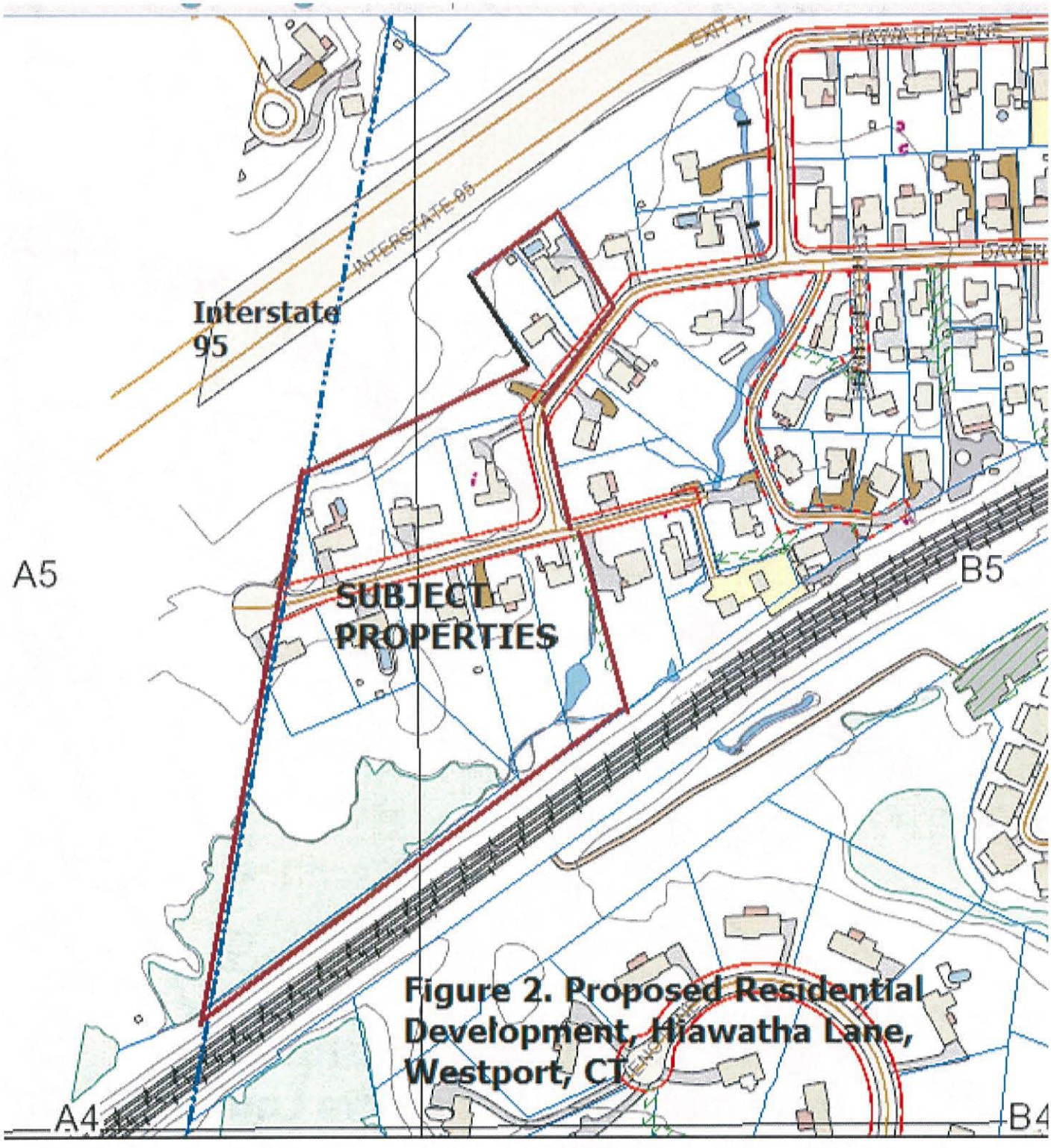

Figure 2. Proposed Residential Development, Hiawatha Lane, Westport, CT

39, 41, 43,45,47 Hiawatha Lane

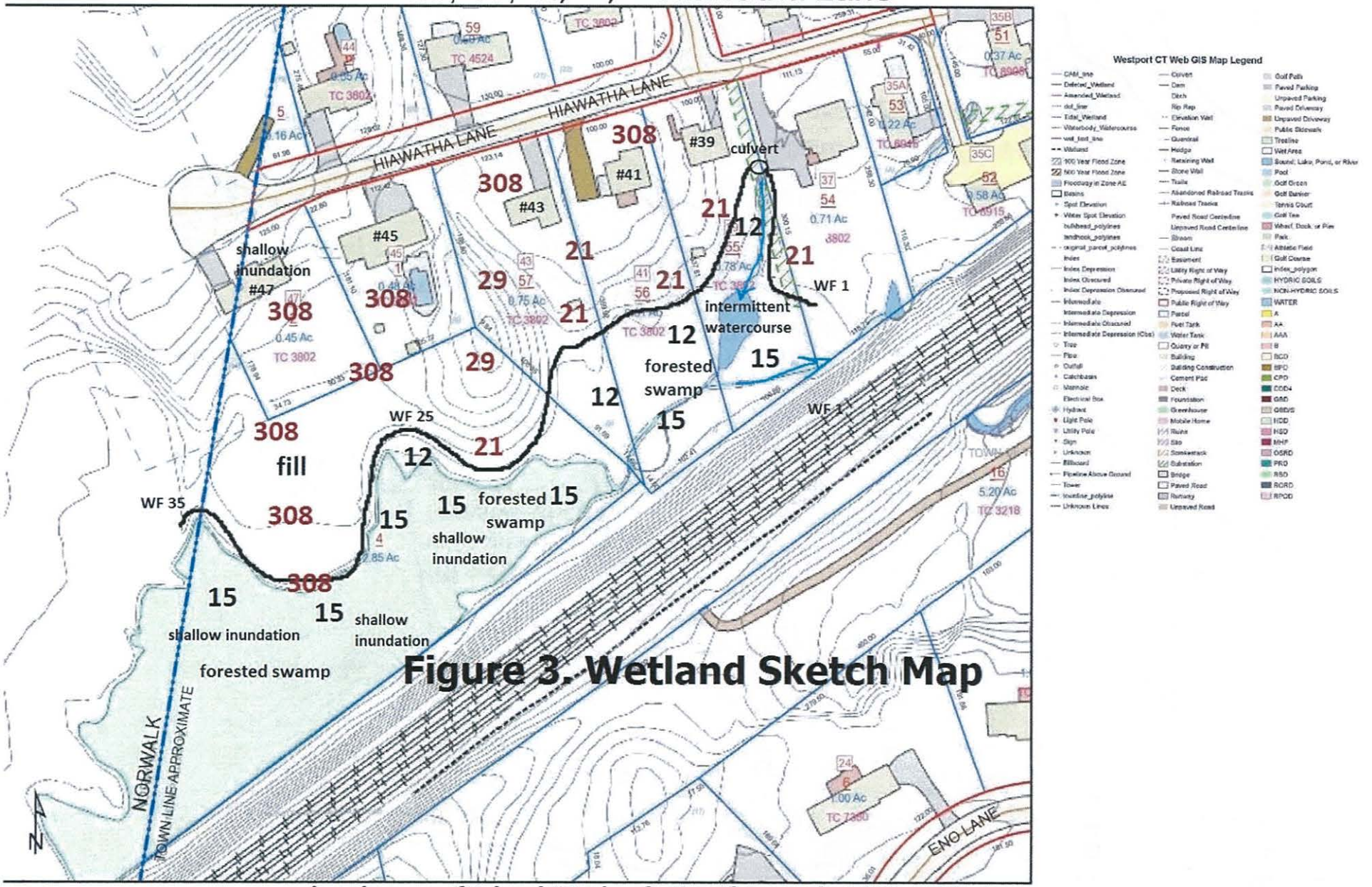

Figure 3. Wetland Sketch Map

1 inch = 142 feet

sketch map of Inland Wetlands & soil types field identified on March 8, 2016 Thomas W. Pietras, Soil Scientist

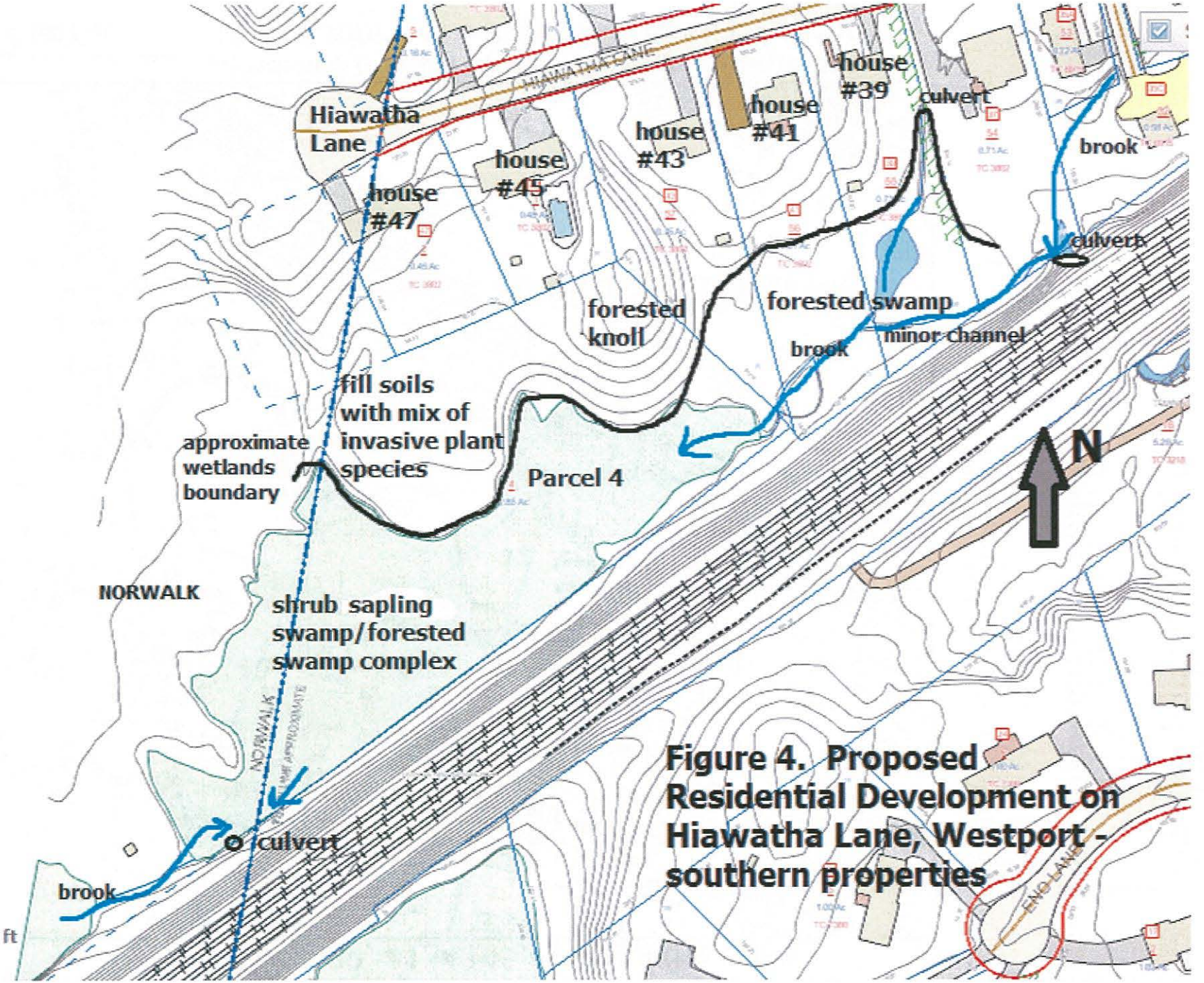

Figure 4. Proposed Residential Development on Hiawatha Lane, Westport - southern properties

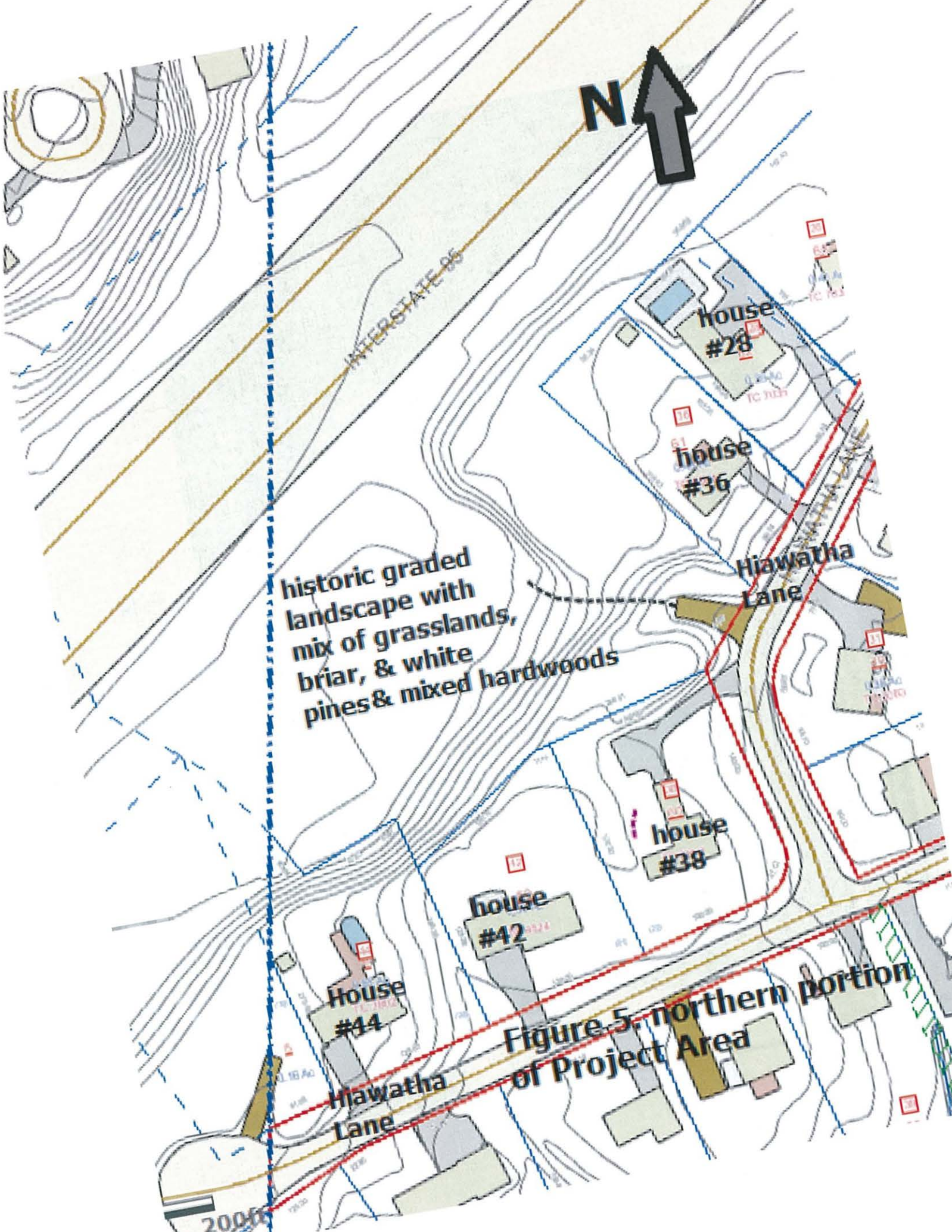

Figure 5. northern portion of Project Area

U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI Map for Hiwatha LN & vicinity

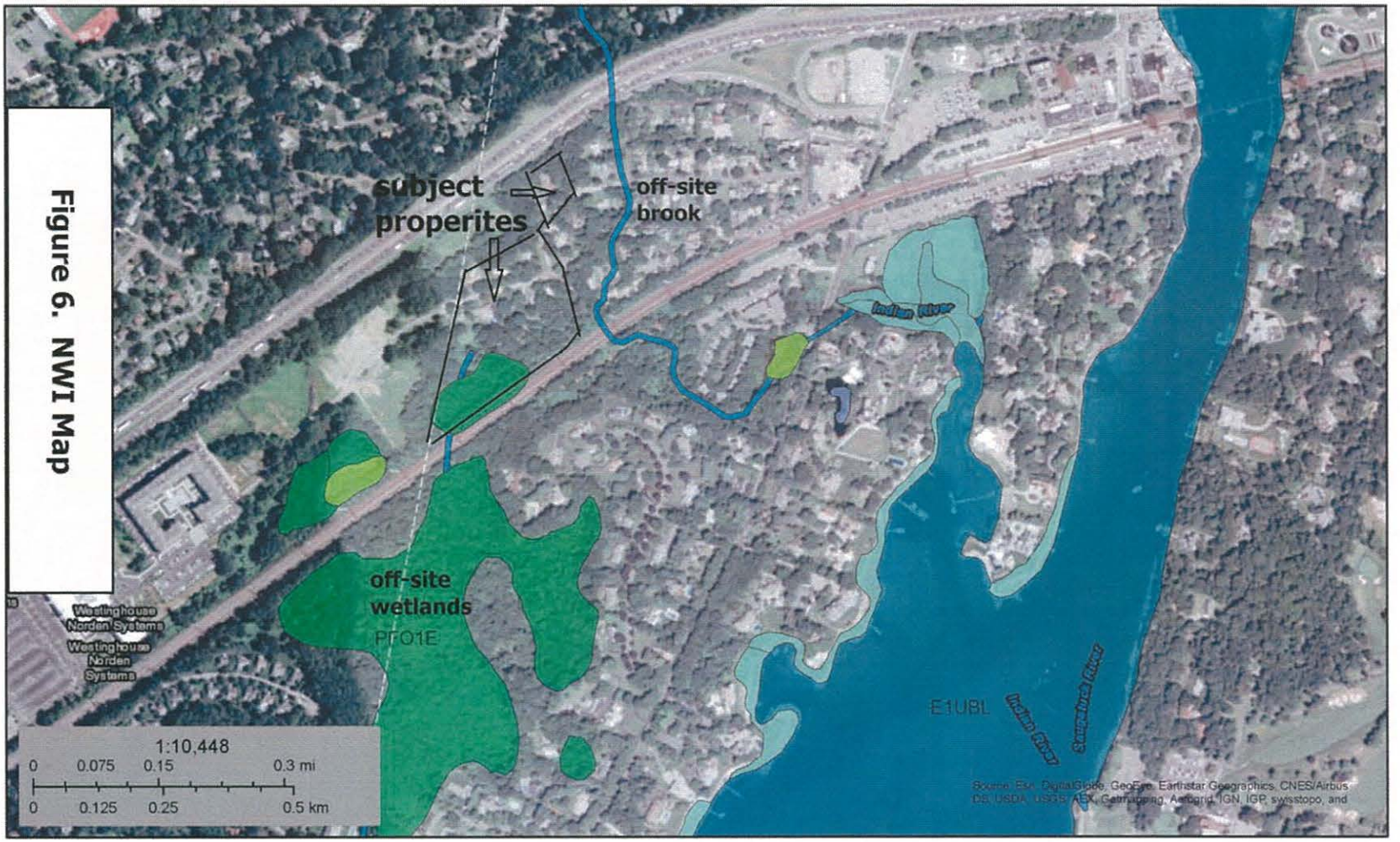

Figure 6. NWI Map

June 12, 2016

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

APPENDIX I. WETLAND DELINEATION REPORT FOR SUBJECT PROPERTIES ON HIAWATHA LANE, WESTPORT, CT PREPARED BY PIETRAS ENVIRONMENTAL GROUP, LLC DATED MARCH 8, 2016

PIETRAS ENVIRONMENTAL GROUP, LLC

WETLAND DELINEATION REPORT

Date: March 11, 2016

PEG JOB#: 2016-38

Prepared for: Lewis Associates
260 Main Street
Monroe, CT 06468

Project Location: Properties on Hiawatha Lane, Westport, CT
House lots 28, 36, 38, 39, 41, 42, 43, 44, 45 & 47
Undeveloped parcel numbers 4 & 5

Report Maps: Town of Westport GIS Maps

Inspection Date: March 8, 2016

Field Conditions: weather: partly sunny, 50's soil moisture: moist to saturated
Winter features: snow depth: none frost depth: none

Legislative Definitions of Wetlands and Watercourses in CT (General Statutes, Chptr 440, Sec. 22a-28 to 22a-45)
Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and which may grow or be capable of growing some, but not necessarily all of the following:" (includes plant list) sec. 22a-29(2).

Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15).

Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which area contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section 22a-38(16).

Regulated Wetlands and Watercourses Identified:

Inland Wetlands: **yes** Watercourses: **XX** river: brook: lake: pond:
Tidal Wetlands: **no** intermittent watercourse: **XX**
Wetland boundary flag #'s: **1 thru 35**

Local Regulated Upland Review Area: From Wetlands: 20 to 100 feet From Watercourses: 20 to 100 feet

All established wetlands boundary lines are subject to change until officially adopted by local and state agencies.

Thomas W. Pietras

Thomas W. Pietras, Professional Wetland and Soil Scientist

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Thomas W. Pietras, Professional Wetland and Soil Scientist, conducted a site inspection to the subject properties on March 8, 2016. The project area includes ten single family residential parcels and two vacant parcels. The residentially developed properties range in size from 0.35 to 0.81 acres, while the two undeveloped parcels are 0.16 and 2.85 acres in size. Most of the lands surrounding the single family houses are maintained in grassed lawn with scattered trees and shrubs. The southern portion of the house lot numbers 39, 41 and 43 plus a large portion of Parcel 4 are wooded. An intermittent watercourse drains from a culvert that is located to the southeast of the house at 39 Hiawatha Lane. The watercourse flows in a southerly direction into a forested swamp.

A spade and auger were used to dig test holes on the property. The classification system of the National Cooperative Soil Survey and the USDA Natural Resources Conservation Service was utilized for identification of soil drainage classes and soil types. The soil types identified on the property were assigned soil map numbers according to the State of Connecticut Soil Legend. Locations of soil types identified are shown on a sketch map that is included with this report. Inland wetlands are regulated by CT General Statutes, Chapter 440, Sections 22a-36 to 22a-45. The State defines wetlands as land consisting of any of the soil types designated as poorly drained, very poorly drained, alluvial and floodplain by the National Cooperative Soil Survey. The boundaries of the wetlands identified on the property were delineated with consecutively numbered, survey tapes. Approximate location of the wetlands are also shown on the soil and wetland sketch map. Brief descriptions of the soil mapping units are included in this report. Additional information about the soils identified on the property can be found in the Soil Survey of the State of Connecticut (www.nrcs.usda.gov.ct.soilsurvey).

Wetlands, identified as poorly Raypol silt loam (12) and very poorly drained Scarboro muck (15), are present in the southern portions of house lot numbers 39, 41 & 43 plus Parcel 4. The wetlands support forested swamp vegetation. On March 8, 2016 shallow inundation was present within the wetlands which are situated on Parcel 4.

Respectfully submitted,

PIETRAS ENVIRONMENTAL GROUP, LLC

Thomas W. Pietras

Thomas W. Pietras
Professional Wetland Scientist and Soil Scientist

BRIEF DESCRIPTIONS OF SOIL MAP UNITS IDENTIFIED

WETLAND SOILS

12 Raypol silt loam (Aeric Endoaquepts)- This is a deep, poorly drained, friable, loamy textured soil that developed over sandy and gravelly, glacial outwash. Raypol soils occur in drainage ways and depressions within valleys, outwash plains and terraces. A water table is typically present within a foot of the surface from late fall through mid-spring.

15 Scarboro muck (Histic Humaquepts) - This is a deep, very poorly drained soil with a thin (less than 15 inches thick) mucky surface that is underlain by sandy and gravelly, glacial outwash. Scarboro soils occur in drainage ways and depressions within valleys, outwash plains and terraces. This soil is subject to shallow (0 to 6 inches) seasonal ponding. The seasonal water table typically remains within six inches of the surface.

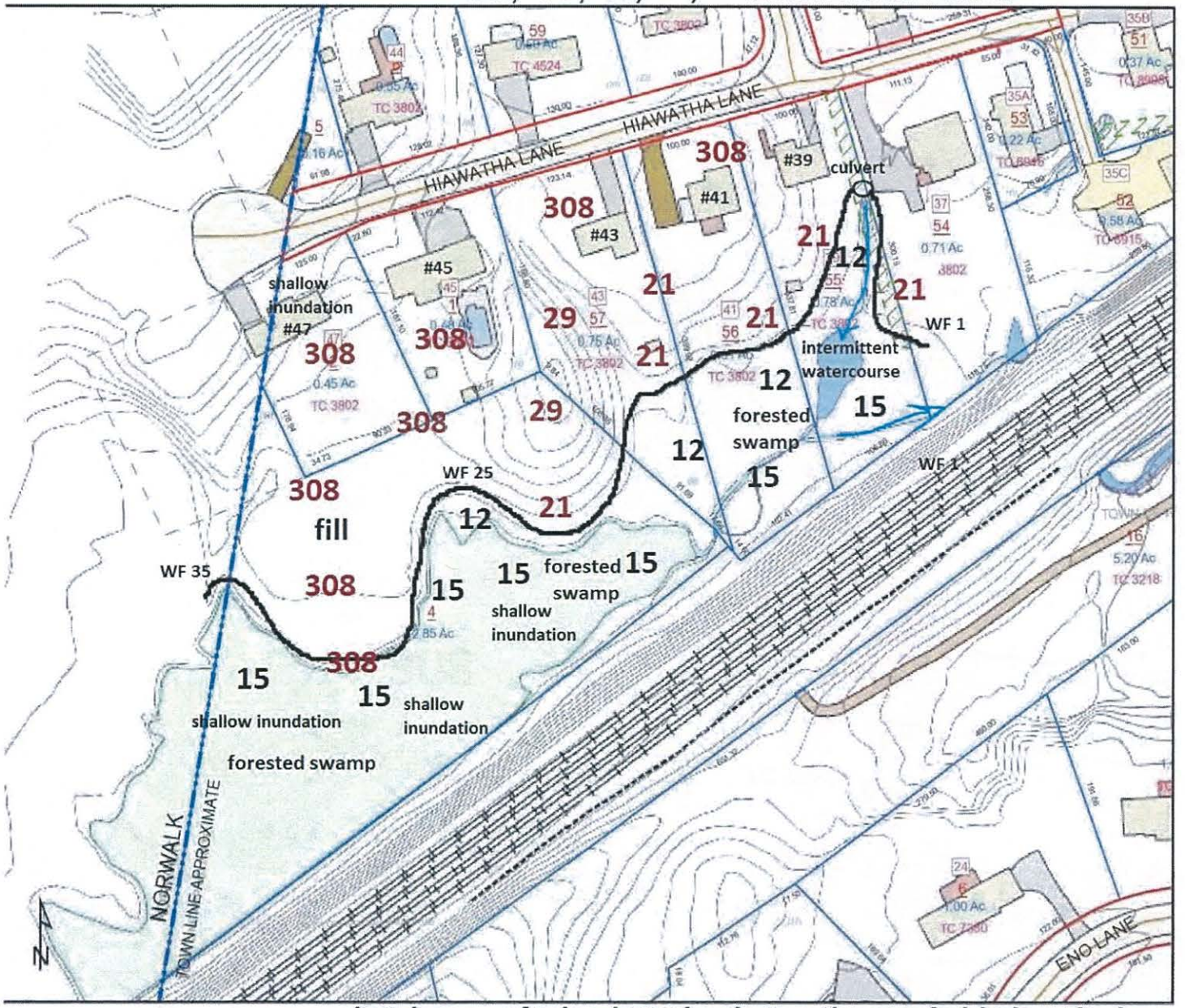
NON-WETLAND SOILS

21 Ninigret and Tisbury soils (Aquic Dystrudepts) – These are deep, moderately well drained, friable, coarse-loamy and loamy textured soils that developed over sandy and gravelly, glacial outwash derived from schist, gneiss and granite. Outwash soils occur in valleys, outwash plains and terraces. A seasonal water table is present between 18 and 30 inches of the surface.

29 Agawam fine sandy loam (Typic Dystrudepts) – This is a deep, well drained, friable, coarse-loamy textured soil that developed over sandy and gravelly, glacial outwash derived principally from schist, gneiss and granite. Outwash soils occur in valleys, outwash plains and terraces. The water table is generally greater than five feet below the surface.

308 Udorthents, smoothed - This is a well drained to moderately well drained, disturbed soil area that has had two or more feet of the original soil surface altered by filling, excavation or grading activities. Udorthents, smoothed soils commonly occur on leveled land and fill landforms.

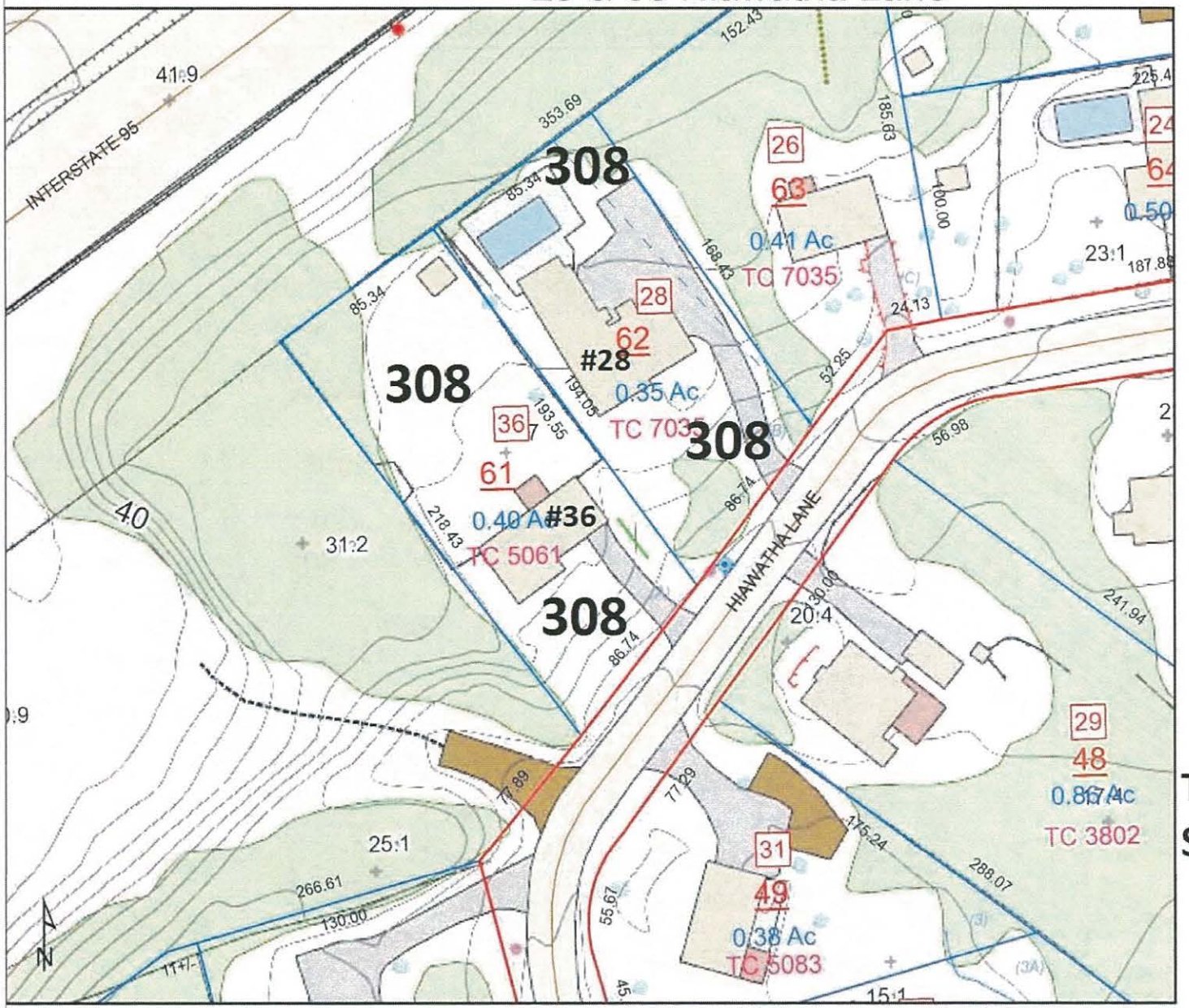
39, 41, 43,45,47 Hiawatha Lane



1 inch = 142 feet

sketch map of Inland Wetlands & soil types field identified on March 8, 2016 Thomas W. Pietras, Soil Scientist

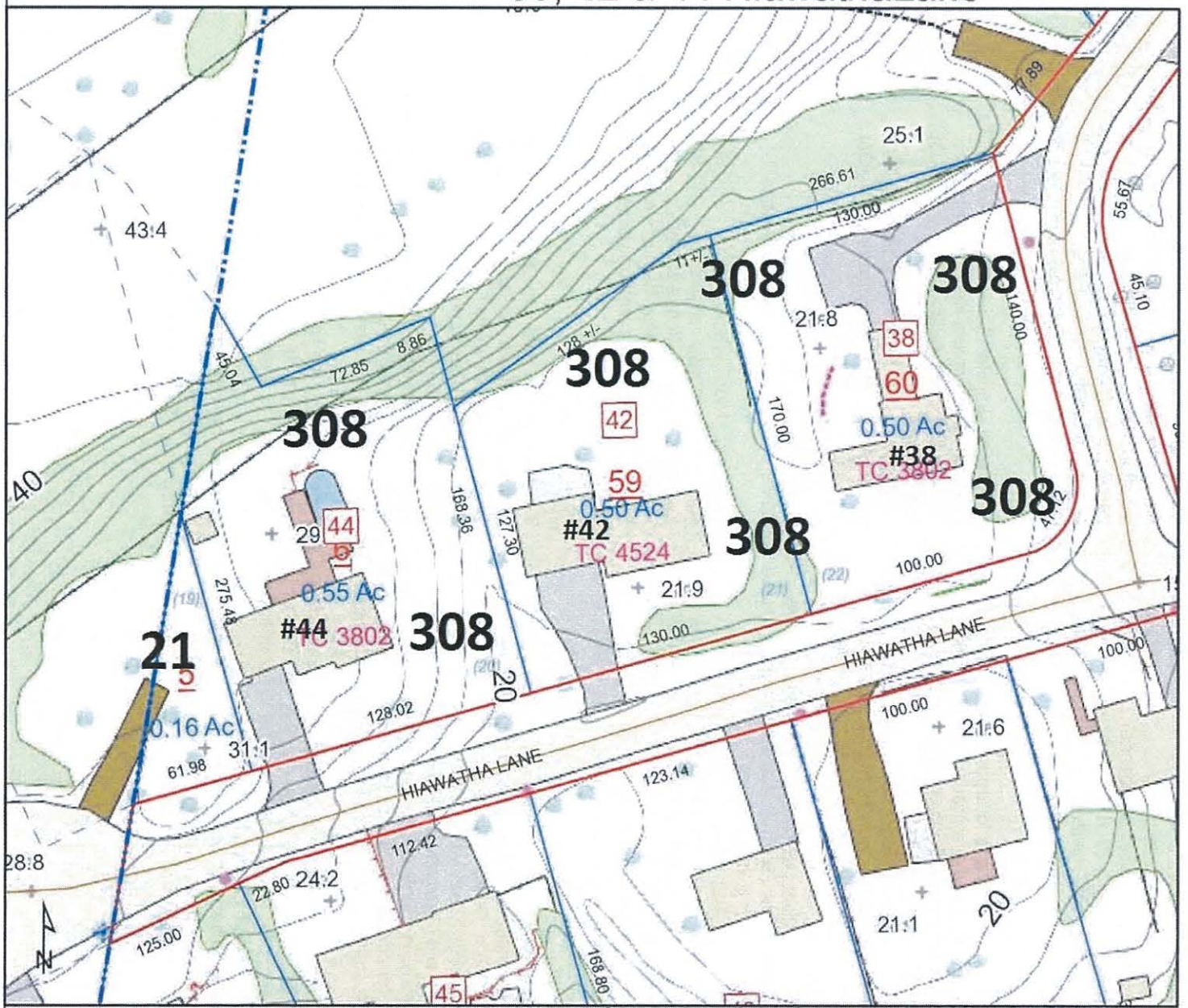
28 & 36 Hiawatha Lane



soils map field identified on March 8, 2016

Thomas W. Pietras
Soil Scientist

38, 42 & 44 HiawathaLane



1 inch = 71 feet

38, 42 & 44 Hiawatha Lane Sketch map of soil types field identified on 3/8/2016 Thomas W. Pietras, Soil Scientist

APPENDIX II. PLANT INVENTORY FOR WETLANDS AND BORDERING UPLAND SOILS. PROPOSED RESIDENTIAL DEVELOPMENT ON HIAWATHA LANE, WESTPORT, CT

1-Forested swamp in southern portions of House #'s 39, 41 & 43 and southeastern portion of Parcel 4

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Tree Layer			
Red maple (Acer rubrum)	FAC	American elm (Ulmus Americana)	FACW
Catalpa (Catalpa speciosa)	FACU	Pin oak (Quercus palustris)	FACW
Shrub Layer & Woody Vines			
Spicebush (Lindera benzoin)	FACW	Sweet pepperbush (Clethra alnifolia)	FAC
Winterberry (Ilex verticillata)	FACW	Arrrorwood viburnum (Viburnum recognitum)	FACW
Elderberry (Sambucus canadensis)	FACW	Multiflora rose (Rosa multiflora)**	FACU
Japanese barberry (Berberis thunbergii)**	FACU	Burning bush (Euonymus purpureus)**	FACU
European privet (Ligustrum vulgare)**	FACU	Greenbriar (Smilax rotundifolia)	FAC
Poison ivy (Toxicodendron radicans)	FAC	Oriental bittersweet (Celastrus orbiculata)**	UPL
Herb Layer			
Skunk cabbage (Symplocarpus foetidus)	OBL	Jewelweed (Impaties capensis)	FACW
Water smartweed (Persicaria amphibia)	OBL	Trout lilly (Erythronium americanum)	NI
Lesser celandine (Ficaria verna)**	FACW	Tussock sedge (Carex stricta)	OBL
Violet (Viola sp.)	-	Iris (Iris sp.)	-
False nettle (Boehmerica cylindrica)	OBL	Jack-in-the-pulpit (Arisaema triphyllum)	FAC
Wood reed grass (Cinna latifolia)	FACW	Water plantain (Alisima subcordatum)	OBL
Blackberry (Rubus allegheaniensis)	FACU		

2-Shrub-sapling swamp/Forested swamp Complex in southern portion of Parcel 4

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red maple (Acer rubrum)	FAC	Black gum (Nyssa sylvatica)	FAC
Speckled alder (Alnus incana)	FACW	Ironwood (Carpensis caroliniana)	FAC
Pussy willow (Salix discolor)	FACW	Sweet pepperbush (Clethra alnifolia)	FAC
Winterberry (Ilex verticillata)	FACW	Highbush blueberry (Vaccinum corymbosum)	FACW
Spicebush (Lindera benzoin)	FACW	Swamp azalea (Rhododendron viscosum)	FACW
Greenbriar (Smilax rotundifolia)	FAC	Grapevine (Vitus sp.)	-
Herb Layer			
Skunk cabbage (Symplocarpus foetidus)	OBL	Purple loosestrife (Lythrum salicaria)**	OBL
Water smartweed (Persicaria amphibia)	OBL	Tussock sedge (Carex stricta)	OBL
Royal fern (Osmunda regalis)	OBL	Duckweed (Lemna minor)	OBL
Fox sedge (Carex vulpinoidea)	OBL	Fringed sedge (Carex crinite)	OBL
Burr-reed (Sparganium americanum)	OBL	Iris (Iris sp.)	-
Common waterweed (Elodea canadensi)	OBL	Marsh mermaid-weed (Proserpinica palustris)	OBL
Water plantain (Alisima subcordatum)	OBL	Wood reed grass (Cinna latifolia)	FACW
Soft-stem bulrush (Schoenoplectus tabernaemonta)	OBL	Cinnamon fern (Osmunda cinnamomea)	FACW

3-Forested knoll on well drained glacial outwash soil (Uplands) located in the NE corner of Parcel 4 and in the southern portions of House #'s 43 & 45 – Contains large trees (to 36 inch dbh)

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red oak (Quercus rubra)	FACU	American beech (Fagus americana)	FACU
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Black birch (Betula lenta)	FACU	Greenbriar (Smilax rotundifolia)	FAC

Herb Layer
Wild lilly of the valley (Maianthemum canadense) FAC Pennsylvania sedge (Carex pensylvanica) NI
Garlic mustard (Allaria petiolate)** FACU

4-Mix of field & woody plants growing on fill soils located in northern portion of Parcel 4 & the southern portion of House #47. Vegetation is dominated by invasive plant species.

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red oak (Quercus rubra)	FACU	Norway maple (Acer platanoides)**	UPL
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Gray birch (Betula popufolia)	FAC	Flowering dogwood (Cornus florida)	FACU
American elm (Ulmus americana)	FACW	Multiflora rose (Rosa multiflora)**	FACU
Japanese barberry (Berberis thunbergii)**	FACU	Burning bush (Euonymus purpureus)**	FACU
European privet (Ligustrum vulgare)**	FACU	Spicebush (Lindera benzoin)	FACW
Burning bush (Euonymus purpureus)**	FACU	Grapevine (Vitus sp.)	-
Greenbriar (Smilax rotundifolia)	FAC	Poison ivy (Toxicodendron radicans)	FAC
Oriental bittersweet (Celastrus orbiculata)**	UPL		
Herb layer			
Japanese knotweed (Fallopia japonica)	FAC	Garlic mustard (Allaria petiolate)**	FACU
Wine raspberry (Rubus phoenicolasius)**	FACU	Field grasses	-
Wood fern (Dryopteris marginalis)	FACU	Coltsfoot (Tussilago farfara)**	FACU
Stinging nettle (Urtica dioica)	FAC	urac diorca False	

5-State of CT Property situated to the north of House #'s 38, 32 & 44 and to the west of House # 36. This property was formerly used for the I-95 Toll Booth facility and now contains a mix of old field with white pines, briar and woodland.

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
White pine (Pinus strobus)	FACU	Sassafras (Sassafras albidum)	FACU
Red oak (Quercus rubra)	FACU	Norway maple (Acer platanoides)**	UPL
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Black cherry (Prunus serotine)	FACU	Multiflora rose (Rosa multiflora)**	FACU
Burning bush (Euonymus purpureus)**	FACU	Poison ivy (Toxicodendron radicans)	FAC
Oriental bittersweet (Celastrus orbiculata)**	UPL		
Herb Layer			
Garlic mustard (Allaria petiolate)**	FACU	Wine raspberry (Rubus phoenicolasius)**	FACU
Field grasses	-	Wood fern (Dryopteris marginalis)	FACU
Coltsfoot (Tussilago farfara)**	FACU		

*State of Connecticut-National Wetland Plant List, U.S. Army Corps of Engineers

OBL	Obligate wetland	Almost always is a hydrophyte, rarely in uplands
FACW	Facultative Wetland	Usually is a hydrophyte but occasionally found in uplands
FAC	Facultative	Commonly occurs as either a hydrophyte or non-hydrophyte
FACU	Facultative Upland	Occasionally is a hydrophyte but usually occurs in uplands
UPL	Upland	

** = Invasive Plant Atlas of New England (IPANE) listed invasive

WILLIAM KENNY
ASSOCIATES LLC

SOIL SCIENCE
ECOLOGICAL SERVICES
LAND USE PLANNING
LANDSCAPE ARCHITECTURE

September 15, 2017

Mr. Timothy S. Hollister, Esq.
Shipman & Goodwin LLP
One Constitution Plaza
Hartford, CT 06103

Re: Wetland and Watercourse Delineation
Hiawatha Lane, Westport, Connecticut

Dear Mr. Hollister:

As requested, we investigated land along and beside a portion of Hiawatha Land and Davenport Avenue to determine the presence or absence of wetlands and/or watercourses, to demarcate (flag) the boundaries of wetlands and watercourses identified, and to identify onsite soil types. This letter includes the methods and results of our investigation, which we completed today, September 15, 2017. In summary, one inland wetland and watercourse system was identified and delineated. The system, which is located west of the intersection of Hiawatha Land and Davenport Avenue, is a short segment of Indian River with a narrow fringe of wetlands.

Regulatory Definitions

The Inland Wetlands and Watercourses Act (Connecticut General Statutes §22a-38) defines inland wetlands as "land, including submerged land...which consists of any soil types designated as poorly drained, very poorly drained, alluvial, and floodplain." Watercourses are defined in the act as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." The Act defines Intermittent Watercourses as having a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

The Tidal Wetlands Act (Connecticut General Statutes §22a-28) defines wetlands as those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or

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formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing hydrophytic vegetation as identified in the Statutes.

Methodology

A second order soil survey in accordance with the principles and practices noted in the USDA publication *Soil Survey Manual* (1993) was completed at the subject site. The classification system of the National Cooperative Soil Survey was used in this investigation. Soil map units identified at the project site generally correspond to those included in the *Soil Survey of the State of Connecticut* (USDA 2005).

Wetland determinations were completed based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land (e.g. a pond). Soil types were identified by observation of soil morphology (soil texture, color, structure, etc.). To observe the morphology of the property's soils, test pits and/or borings (maximum depth of two feet) were completed at the site.

Tidal wetland determinations were completed based on the presence of a predominance of tidal wetland vegetation and physical markings or water laid deposits resulting from tidal action.

Intermittent watercourse determinations were made based on the presence of a defined permanent channel and bank and the occurrence of two or more of the following characteristics: A) evidence of scour or deposits of recent alluvium or detritus, B) the presence of standing or flowing water for a duration longer than a particular storm incident, and C) the presence of hydrophytic vegetation.

Wetland boundaries were demarcated (flagged) with pink surveyor's tape (hung from vegetation) or small flags (on wire stakes) labeled "William Kenny Associates" that are generally spaced a maximum of every 50 feet. Complete boundaries are located along the lines that connect these sequentially numbered flags. The wetland boundaries are subject to change until adopted by local, state, or federal regulatory agencies.

Results

The investigation area includes land along and beside a portion of Hiawatha Land and Davenport Avenue in Westport, Connecticut. The investigation was limited to the area shown on the attached map. Land-use improvements include an asphalt road and small portions of numerous residential driveways. The vegetative cover in the investigation area is lawn with other ornamentals and some shade trees. On the day of the review, the sky was clear and air temperatures were in the 80's ° F.

One inland wetland and watercourse system was identified and delineated. The system, which is located west of the intersection of Hiawatha Land and Davenport Avenue, is a short segment of Indian River with a narrow fringe of wetlands. Hiawatha Lane bisects the system west to east. Wetland soils are primarily poorly drained silt loam that formed from glacial outwash deposits. The approximate locations of the systems are shown on the attached map. The boundaries of the systems were marked at the site with flags numbered 1 to 5 and 10 to 14.

Three soil map units were identified in the investigation area (two wetland and one upland). Each map unit represents a specific area on the landscape and consists of one or more soils for which the unit is named. Other soils (inclusions that are generally too small to be delineated separately) may account for 10 to 15 percent of each map unit. The mapped units are identified in the following table by name and symbol and typical characteristics (parent material, drainage class, high water table, depth to bedrock, and slope). These characteristics are generally the primary characteristics to be considered in land use planning and management. A description of each characteristic and their land use implications follows the table. A complete description of each soil map unit can be found in the *Soil Survey of the State of Connecticut* (USDA 2005), and at *http://soils.usda.gov/technical/classification/osd/index.html.* On the day of the review, the upland soil was dry to moist and the wetland soil was moist to saturated.

Map Unit Sym.	Map Unit Name	Parent Material	Slope (%)	Drainage Class	High Water Table Depth (ft)	High Water Table Kind	High Water Table Mos.	Depth To Bedrock (in)
	Upland Soil							
306	Udorthents -	Excavated or Filled Soil (>2 feet)	0-45	Well Drained to Somewhat Poorly Drained	1.5->6.0	Apparent	Nov-May	>60
	Urban Land Complex	Pavement & structures account for 85% or more of the area. Additional investigations required to determine characteristics						
	Wetland Soil							
1	Aquents	Excavated or Filled Soil (>2 feet)	0-3	Poorly Drained	0.0-1.5	Apparent	Nov-May	>60
12	Raypol silt loam	Glacial Outwash	0-3	Poorly Drained	0.0-1.0	Apparent	Nov-May	>60

Parent material is the unconsolidated organic and mineral material in which soil forms. Soil inherits characteristics, such as mineralogy and texture, from its parent material. Glacial till is unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice. Glacial outwash consists of gravel, sand, and silt, which are commonly stratified and deposited by glacial melt water. Alluvium is material such as sand, silt, or clay, deposited on land by streams. Organic deposits consist of decomposed plant and animal parts.

A soil's texture affects the ease of digging, filling, and compacting and the permeability of a soil. Generally sand and gravel soils, such as outwash soils, have higher permeability rates than most glacial till soils. Soil permeability affects the cost to design and construct subsurface sanitary disposal facilities and, if too slow or too fast, may preclude their use. Outwash soils are generally excellent sources of natural aggregates (sand and gravel) suitable for commercial use, such as construction sub base material. Organic layers in soils can cause movement of structural footings. Compacted glacial till layers make excavating more difficult and may preclude the use of subsurface sanitary disposal systems or increase their design and construction costs if fill material is required.

Generally, soils with steeper slopes increase construction costs, increase the potential for erosion and sedimentation impacts, and reduce the feasibility of locating subsurface sanitary disposal facilities.

Drainage class refers to the frequency and duration of periods of soil saturation or partial saturation during soil formation. Seven classes of natural drainage classes exist. They range from excessively drained, where water is removed from the soil very rapidly, to very poorly drained, where water is removed so slowly that free water remains at or near the soil surface during most of the growing season. Soil drainage affects the type and growth of plants found in an area. When landscaping or gardening, drainage class information can be used to assure that proposed plants are adapted to existing drainage conditions or that necessary alterations to drainage conditions (irrigation or drainage systems) are provided to assure plant survival.

High water table is the highest level of a saturated zone in the soil in most years. The water table can affect the timing of excavations; the ease of excavating, constructing, and grading; and the supporting capacity of the soil. Shallow water tables may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

The depth to bedrock refers to the depth to fixed rock. Bedrock depth affects the ease and cost of construction, such as digging, filling, compacting, and planting. Shallow depth bedrock may preclude the use of subsurface sanitary disposal systems or increase design and construction costs if fill material is required.

Conclusions

Today, we investigated portions of Hiawatha Lane and Davenport Avenue in Westport, Connecticut and identified and delineated one inland wetland and watercourse system. Thank you for the opportunity to assist you. If you should have any questions or comments, please do not hesitate to contact us.

Sincerely,

William L. Kenny, PWS, PLA
Soil Scientist

Enclosure

Ref. No. 3631

SOIL LEGEND:

UPLAND:
306 UDORTHENTS-URBAN LAND COMPLEX

WETLAND:
1 AQUENTS
12 RAYPOL SILT LOAM

WILLIAM KENNY
ASSOCIATES LLC

SOIL SCIENCE
ECOLOGICAL SERVICES
LAND USE PLANNING
LANDSCAPE ARCHITECTURE

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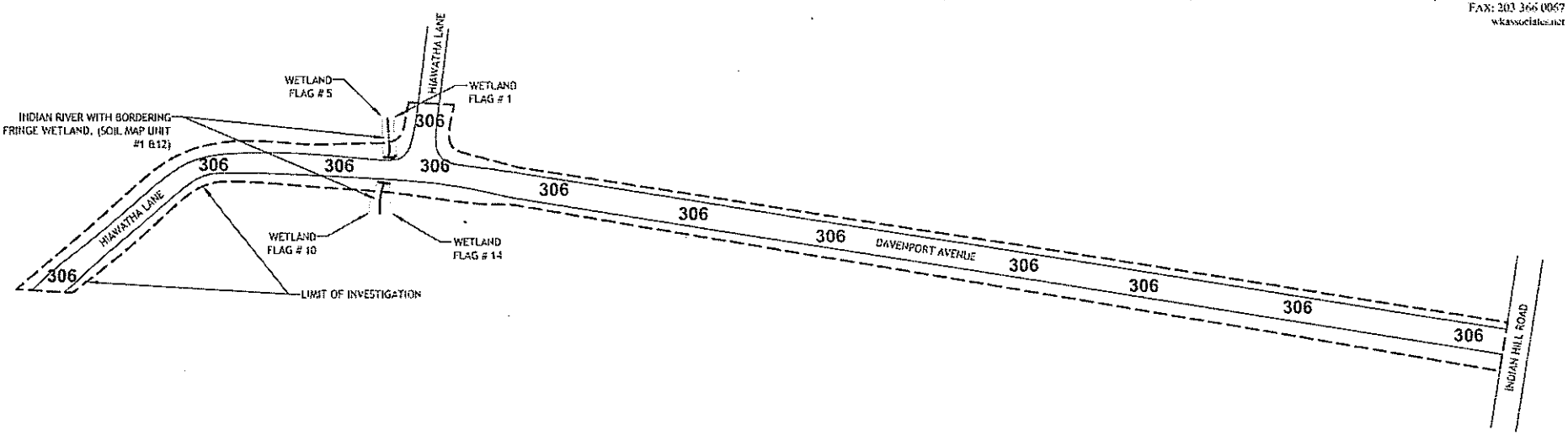


NOTES:
- *INFORMATION SHOWN ON THIS DRAWING, INCLUDING THE WETLAND BOUNDARY, IS APPROXIMATE. THE BOUNDARY IS NOT A SURVEYED REPRESENTATION OF WHAT WAS FIELD MARKED (FLAGGED).*
- *WETLAND AND SOIL INFORMATION PROVIDED BY WILLIAM KENNY ASSOC. OTHER INFORMATION TAKEN FROM A DRAWING PREPARED BY REDNISS & MEAD, INC.*
- *306, 1 AND 12 ARE SOIL MAPPING UNIT SYMBOLS. SEE WETLAND DELINEATION REPORT FOR THE SOIL MAP UNIT NAMES AND ADDITIONAL RELATED INFORMATION.*

I CERTIFY THAT THIS WETLAND MAP SUBSTANTIALLY REPRESENTS THE SOILS AND WETLANDS MAPPED IN THE FIELD

WILLIAM L. KENNY, SOIL SCIENTIST

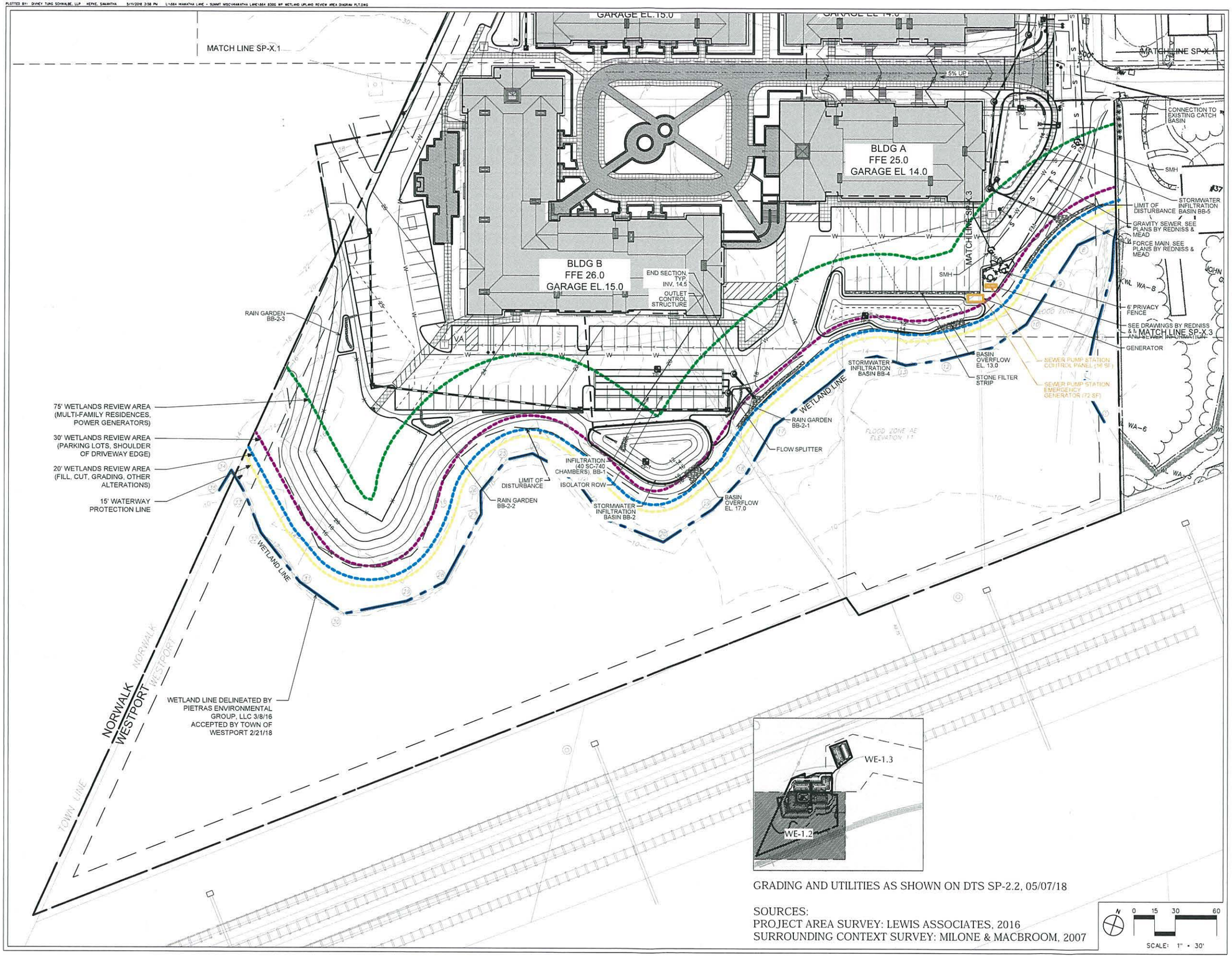
WETLAND & WATERCOURSE MAP

HIAWATHA LANE
WESTPORT, CONNECTICUT

SCALE: NOT TO SCALE
DATE: SEPTEMEBR 15, 2017

Ref. No. 3631

NORTH



THE VILLAGE AT SAUGATUCK

TOWN OF WESTPORT, CONNECTICUT

SUMMIT SAUGATUCK LLC
55 Station Street
Southport, CT 06890

PLANNER, CIVIL ENGINEER, LANDSCAPE ARCHITECT:
DIVNEY • TUNG • SCHWALBE
Intelligent Land Use
Divney Tung Schwalbe, LLP
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White Plains, NY 10601
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F: 914.428.0017

ARCHITECT:
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8 Knight Street, Suite 204
Norwalk, CT 06851

SURVEYOR:
LEWIS ASSOCIATES
260 Main Street
Monroe, CT 06468

SANITARY ENGINEER:
REDNISS & MEAD
22 First Street
Stamford, CT 06905

ATTORNEY:
SHIPMAN & GOODWIN LLP
One Constitution Plaza
Hartford, CT 06103

WETLAND CONSULTANT:
WILLIAM KENNY ASSOCIATES LLC
195 Tunxis Hill Road
Fairfield, CT 06825

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUE

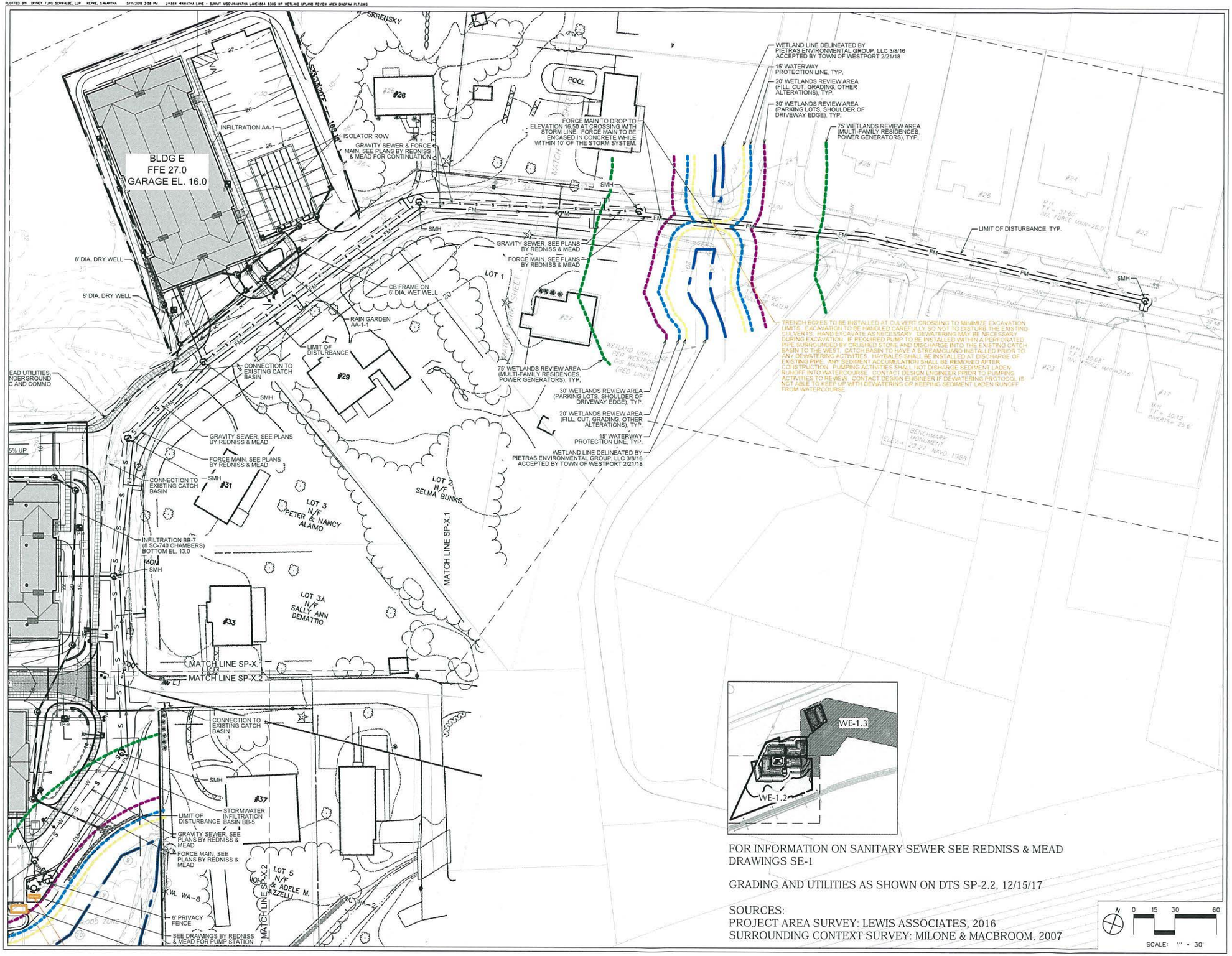
DRAWING TITLE:

WETLAND (UPLAND) REVIEW AREA DIAGRAM

DRAWN BY:	CHECKED BY:
MJS	AVT
PROJECT NO.	DATE:
664	05/07/18

DRAWING NO.

WE-1.2



FOR INFORMATION ON SANITARY SEWER SEE REDNISS & MEAD DRAWINGS SE-1

GRADING AND UTILITIES AS SHOWN ON DTS SP-2.2, 12/15/17

SOURCES:
PROJECT AREA SURVEY: LEWIS ASSOCIATES, 2016
SURROUNDING CONTEXT SURVEY: MILONE & MACBROOM, 2007

N 0 15 30 60
SCALE: 1" = 30'

THE VILLAGE AT SAUGATUCK

TOWN OF WESTPORT, CONNECTICUT

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Fairfield, CT 06825

REVISIONS

NO.	DATE	ISSUE

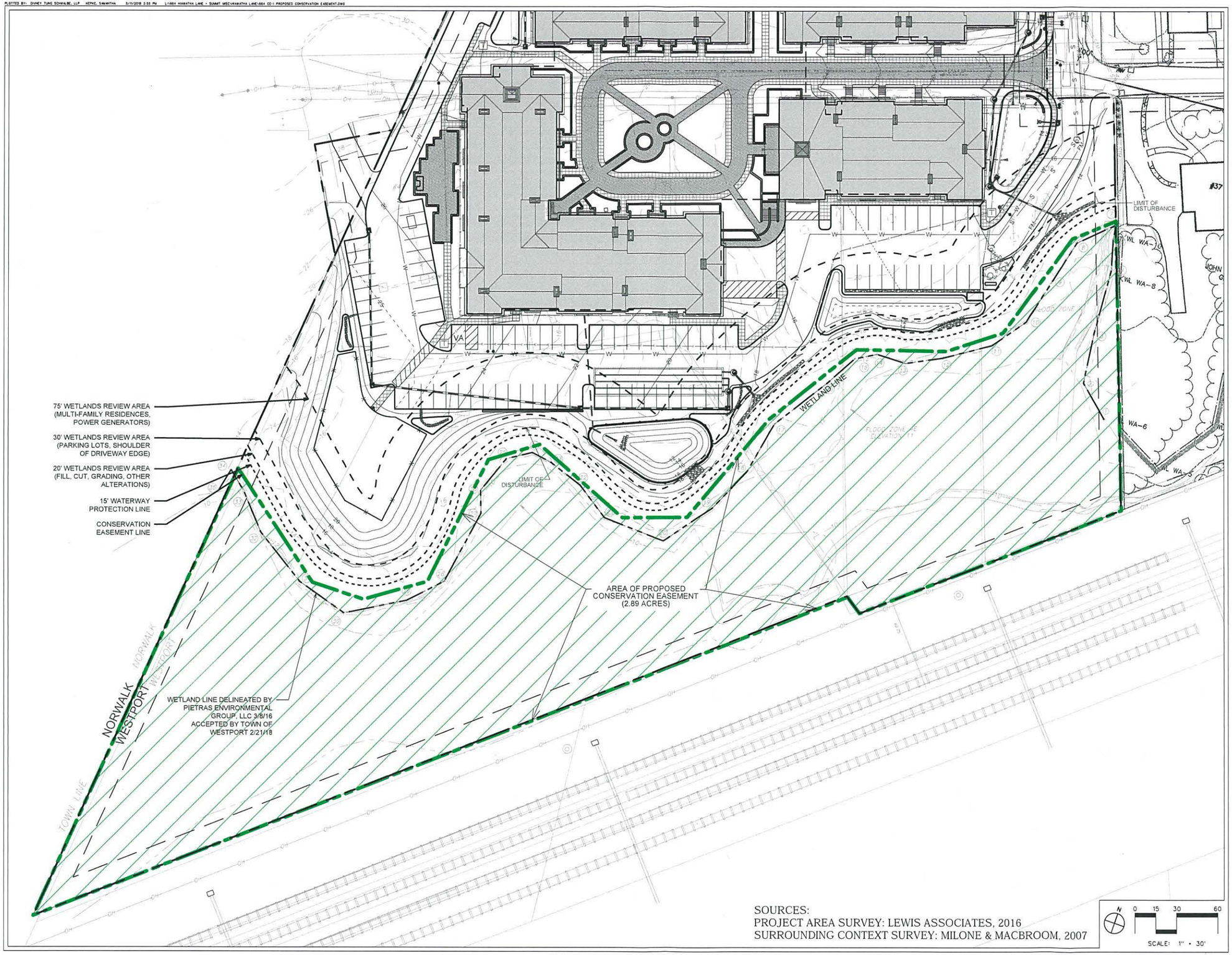
DRAWING TITLE:

WETLAND (UPLAND) REVIEW AREA DIAGRAM

DRAWN BY:	CHECKED BY:
MJS	AVT
PROJECT NO.	DATE:
664	05/07/18

DRAWING NO.

WE-1.3



SOURCES:
PROJECT AREA SURVEY: LEWIS ASSOCIATES, 2016
SURROUNDING CONTEXT SURVEY: MILONE & MACBROOM, 2007

THE VILLAGE AT SAUGATUCK

TOWN OF WESTPORT, CONNECTICUT

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WETLAND CONSULTANT:
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Fairfield, CT 06825

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	ISSUE

DRAWING TITLE:

PROPOSED CONSERVATION EASEMENT

DRAWN BY: SBK	CHECKED BY: AVT
PROJECT NO.: 664	DATE: 05/07/18

DRAWING NO.

CE-1

WESTPORT, CONNECTICUT
CONSERVATION COMMISSION
TOWN HALL - 110 MYRTLE AVENUE
WESTPORT, CONNECTICUT 06880
(203) 341-1170 • FAX (203) 341-1088

February 22, 2018

Felix Charney
c/o Summit Saugatuck LLC
55 Station Street
Southport, CT 06890

RE: Application #IWW/M 10540-18
Hiawatha Lane

To whom it may concern:

This letter serves to confirm that at its February 21, 2018 meeting, the Westport Conservation Commission approved application #IWW/M 10540-18 to amend wetland maps #A 5 and B 5.

A copy of the Commission's findings, resolution and conditions of approval are enclosed for your use.

If you have any questions please do not hesitate to call our office.

Sincerely,

Patricia Shea

Patricia Shea
Conservation Commission Chairperson

cc: file

CERTIFIED MAIL

Findings
Hiawatha Lane
#IWW/M 10540-18

1. **Application Request:**
Applicant is requesting an amendment for wetland boundary maps #A 5 and B 5.
The project area consists of ten single family residential properties on Hiawatha Lane (House # 28, 36, 38, 39, 41, 42, 43, 44, 45 & 47) plus two vacant parcels (Parcel 4 & 5)

2. **Soil Scientists for the Applicant:**
William Kenny of William Kenny Associates LLC and Thomas Pietras of Pietras Environment Group, LLC

3. **Soil Scientist for the Town of Westport:**
Eric Davison of Davison Environmental

4. **Plan reviewed:**
"Existing Conditions Plan Topographic Survey of Properties Located on Hiawatha Lane, Westport, Connecticut Prepared for Summit Saugatuck LLC", (2 sheets), Scale: 1'= 30', dated March 17, 2016 and last revised to January 3, 2018, prepared by Lewis Associates

5. **Property Description**
The ten existing, single family properties range in size from 0.35 to 0.81 acres, while the two undeveloped parcels are 0.16 and 2.85 acres in size. Most of the lands surrounding the single family houses are maintained in grassed lawn with scattered trees and shrubs. The southern portions of House #38, 32 & 44 plus a large portion of Parcel 4 are wooded. A State of CT Property is situated to the north of House # 38, 32 & 44 and to the west of House #36. Formerly, this State property contained building and asphalt parking associated with I-95 toll booths. The toll booths were taken out in the late 1980"s. These State lands are presently vacant and covered with a mix of grassed field with grades falling generally to the south. Elevations range from 32 feet at the northeastern corner of 28 Hiawatha Lane to just below 10 feet in the vroad flatlands on Parcel 4.

6. **Wetlands Description**
Wetland soils are present on the southern portions of House #'s 39, 41 and 43 plus a large portion of Parcel 4.

Soil report Summary- prepared by Tom Pietras on March 8, 2016 describes the following wetland soils occurring on the property:

Raypol silt loam (12): The Raypol silt loam is a deep, poorly drained, friable loamy textured soil that developed over sandy and gravelly, glacial outwash. A water table is typically present within a foot of the surface from late fall through mid-spring.
Scarboro muck (15): this soil is a deep, very poorly drained soil with a thin (less than 15 inches) mucky surface that is underlain by sandy and gravelly, glacial poutwash. This soil is subject to shallow (0 to 6 inches) seasonal ponding. The seasonal water table typically remains within six inches of the surface. On March 8, 2016, much of the Scarboro soil map unit identified on Parcel 4 contained shallow inundation that in places exceeded a foot deep. The wetlands on Parcel 4 may contain areas of deeper muck.

An intermittent watercourse discharges into the wetlands from a culvert which is located on the eastern side of 39 Hiawatha Lane. The watercourse flows in a southwesterly to westerly direction through the wetlands which are located on the southern portions of 39, 41 and 43 Hiawatha Lane and eventually into the broad wetlands on Parcel 4. A second intermittent watercourse channel is located in the far southern portion of 39 Hiawatha Lane and intersects with the first intermittent watercourse. The second watercourse extends onto property at 37 Hiawatha Lane where it connects with a larger brook. The Town of Westport

GIS map shows a small pond, or inundated area, in the southern portion of 39 Hiawatha Lane within the delineated wetlands. There is evidence of a former, very shallow pond which has been silted-in. The intermittent watercourse which discharges from the culvert at 39 Hiawatha Lane passes through the former pond which presently supports young forested swamp vegetation.

According to the State of Connecticut Surficial Materials Map, the project area contains glacial meltwater deposits that were mapped as containing sand and gravel. Glacial meltwater deposits consist of layers of well-sorted to poorly sorted gravel, sand, silt and clay laid down by flowing meltwater in glacial streams and lakes which occupied the valleys and lowlands of Connecticut during the retreat of the last glacial ice sheet. The sand and gravel map unit is composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent particles and 50 to 75 percent sand particles.

7. Property Description and Facts Relative to the Map Amendment application:

a. The property is serviced by public water and on-site septic systems for the existing residences.
b. The property is not located within the aquifer protection zone nor a groundwater recharge area.
c. Property is outside the Coastal Area Management zones.
d. The Town of Westport Wetlands Inventory prepared by Flaherty, Giavara Associates describes this system as a streamside floodplain with a wooded swamp and watercourse. A portion of the perimeter of this wetland system does contain tidal marsh vegetation. The perimeter of the wetland is developed residentially. There is evidence of water ponds temporarily within the wetland system.
e. The WPLO boundary will be 15' from the wetland boundary. The outlet of this wetland system is Indian Brook.
f. Landscape position is a backslope. Land surface shape is linear/linear.

8. The Town of Westport retained the services of Eric Davison of Davison Environmental to review the proposed wetland boundary. Concurrence was reached by the three participating soil scientists. The Commission finds that the wetland boundary will be amended to reflect the flagging of Tom Pietras of Pietras Environmental Group and William Kenny of William Kenny Associates.

Resolution
Application #IWW/M-10540-18
24, 27, 28, 36, 38, 39, 41, 42, 43, 44, 45, 47, Lot A05004 and Lot A05005 Hiawatha Lane

In accordance with Section 8.0 of the Regulations for the Protection and Preservation of Wetlands and Watercourses of Westport, and on the basis of the evidence of record, the Conservation Commission resolves to **APPROVE** Application **#IWW/M-10540-18** by Summit Saugatuck LLC to amend the wetland boundary on Maps #A05 and B05 on the properties located on Hiawatha Lane as referenced above with the following conditions:

1. Conformance to the plan entitled: "Existing Conditions Plan Topographic Survey of Properties Located on Hiawatha Lane, Westport, Connecticut Prepared for Summit Saugatuck LLC" (2 Sheets), Scale: 1'= 30', dated March 17, 2016 and last revised to January 3, 2018, prepared by Lewis Associates

2. An electronic file of the above referenced plan in a format acceptable to the Town Engineer must be submitted to the Conservation Department before permits for any further activity will be authorized.

3. This is a conditional approval. Each and every condition is an integral part of the Commission decision. Should any of the conditions, on appeal from this decision, be found to be void or of no legal effect, then this conditional approval is likewise void.

Motion: Porter
Second: Shea
Ayes: Perlman, Davis, Lobdell, Shea, Bancroft, Porter
Nayes: 0
Votes: 6:0:0

WILLIAM KENNY
ASSOCIATES LLC

SOIL SCIENCE
ECOLOGICAL SERVICES
LAND USE PLANNING
LANDSCAPE ARCHITECTURE

May 10, 2018

Mr. Timothy S. Hollister, Esq.
Shipman & Goodwin LLP
One Constitution Plaza
Hartford, CT 06103

Re: Wetland and Watercourse Assessment
Multi-Family Residential Redevelopment, Hiawatha Lane, Westport, Connecticut

Dear Mr. Hollister:

William Kenny Associates LLC (WKA) investigated the approximate 8.8-acre development site at Hiawatha Lane in Westport, Connecticut to inventory and assess existing and proposed conditions of wetlands and watercourses related to the construction of a multi-family residential development. The following letter includes the methods and results of this investigation. A field investigation and wetland delineation were conducted on April 12 and September 15, 2017, respectively. Surveys were conducted on foot and observations were made while walking systematically through wetlands, watercourses and buffer areas. Existing and proposed conditions were also assessed based in part on a review of the following:

- The topography survey prepared by Lewis Associates and last revised January 3, 2018.
- Site design drawings prepared by Divney Tung Schwalbe LLP and dated May 7, 2018.
- *Stormwater Management Report* and *Utility Report* prepared by Divney Tung Schwalbe, LLP, dated May 7, 2018.
- *Wetlands Functions And Values Report* prepared by Pietras Environmental Group, LLC, dated June 12, 2016.
- *Site Development Plan Depicting Hiawatha Lane Sanitary* prepared by Redniss & Mead, dated May 7, 2018.

In summary, the proposed residential redevelopment is not expected to have adverse impacts to wetlands or watercourses on or off the site. The proposed project has been designed to avoid direct and indirect adverse impacts to wetlands and watercourses. Direct adverse impacts will be avoided, as no wetland or watercourse areas will be eliminated or degraded to

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complete the development. Indirect adverse impacts will be avoided by managing the quality and quantity of stormwater runoff before it enters wetlands and watercourses on and off the property. According to the stormwater report, the development complies with the Westport Drainage Design Standards for water quality, flow and volume. The applicant also proposes to enhance wetlands through the removal of construction debris and other residential bulky waste, the control of invasive vegetation and the installation and maintenance of native vegetation. Lastly, the applicant has agreed to manage the proposed ornamental landscape in accordance with the Northeast Organic Farming Association (NOFA) Standards for Organic Care.

Existing Conditions

The approximate 8.8-acre development site is located along the western end of Hiawatha Lane in Westport, Connecticut and is comprised of ten developed, single-family properties and two undeveloped parcels. The primary vegetative cover north and immediately south of Hiawatha Lane in the proposed development area is primarily lawn with ornamentals and shade trees. The site slopes from north to south, rising from elevation 10 in the southern portion of Parcel B to elevation 32 in the northeastern corner of 28 Hiawatha Lane. As such, surface and subsurface water flows from north to south before draining into two relatively large inland wetland and watercourse systems.

Two wetland and watercourse systems were identified, delineated and ecologically assessed by Pietras Environmental Group, LLC, on March 8 and March 16, 2016. The systems, which are located along the southern site boundary, are a forested swamp and a shrub-sapling swamp and forested swamp complex. An intermittent watercourse extends and flows northeast to southwest beginning from a culvert on the eastern project site boundary and terminating in the eastern-most portion of the shrub-sapling swamp and forested swamp complex due to the absence of a defined channel. The water flowing into the systems from the culvert is primarily untreated stormwater runoff collected by catch basins along Hiawatha Lane. In addition to oil and grease, runoff accumulates other pollutants, such as sediment, heavy metals and nutrients, from paved driving surfaces, which, left untreated, are then deposited into the wetland and watercourse system. This sediment load deposited over decades has the potential to cause wetlands to become dryer, which seems to have already happened at the site. Both the Town of Westport GIS map and the survey prepared by Lewis Associates, indicate the presence of a small pond where the forest swamp is located. While there historically may have been a pond, only areas of shallow water with tussock sedge and skunk cabbage were observed at the time of our investigation. Apparently, sediment conveyed by stormwater runoff deposited in and over time eliminated the pond. Lastly, significant construction debris was present in and adjacent to the shrub-sapling swamp/forested swamp complex. Organic landscape debris and other residential bulky waste were present in and adjacent to the forested swamp.

A third wetland system was identified and delineated by William Kenny Associates, LLC on September 15, 2017, who conducted a wetland survey within the right-of-way along Davenport Road and the northeastern portion of Hiawatha Lane. The system, which is located immediately west of the Hiawatha Lane and Davenport Avenue intersection, is a short segment of Indian River with a narrow fringe of bordering wetland. The watercourse extends and flows north to south underneath Hiawatha Lane through concrete culverts.

Proposed Conditions

The proposed redevelopment includes the construction of five multi-family residential buildings with subsurface parking, a playground and recreation area, a courtyard, walkways, paved drives, asphalt parking areas and a stormwater management system. The site will be serviced by public sanitary sewer and public water supply main. Moreover, the applicant proposes to install a new sewer line with sanitary manholes and other related improvements along approximately 1,600 linear feet of Hiawatha Lane and Davenport Avenue, within the transportation right-of-way.

The proposed development will increase the onsite impervious surface coverage by approximately 2.8 acres. As such, a stormwater management system will be installed and maintained to comply with the Westport Drainage Design Standards for water quality, flow and volume. The consulting engineer has designed this stormwater management system to treat the first inch of runoff from added impervious surfaces via infiltration to the ground and to reduce the peak runoff rates for the 1-, 2-, 10- and 25-year storm events to less than the predevelopment discharge rates. The proposed stormwater management system includes three subsurface recharge chamber systems, three open water quality basins, two infiltration trenches, six rain gardens and deep sump catch basins with hooded outlets. Moreover, an approximate 11,000 square foot green roof will be installed above the parking garage and will consist of plantings and lawn with an associated roof drain system. The existing homes and paved areas within the project site generally have no formal stormwater management systems for treating stormwater runoff, recharging groundwater or controlling downstream flooding.

This development also includes habitat enhancements in the wetland buffer. It includes the removal of existing improvements, construction debris and other trash, invasive vegetation and the installation of native trees, shrubs and groundcovers. This will improve the ability of the wetland to support an abundance and diversity of wildlife and will improve the ability of the buffer to filter and treat stormwater runoff. Furthermore, the maintenance of ornamental landscapes in accordance with NOFA Standards for Organic Care will mitigate excess nutrients and toxins from entering the wetland and watercourse systems and will improve soil biodiversity and stormwater infiltration.

Potential Impacts and Mitigation

Land development has the potential to cause short- and long-term impacts to wetlands and watercourses. The proposed multi-family residential redevelopment has been designed to avoid short- or long-term adverse impacts from activities such as vegetation clearing, soil filling, excavation or pollution of stormwater.

There will be no direct long-term adverse impacts to wetlands or watercourses on or off the site as no activities are proposed within wetland and watercourse systems.

In the short-term, wetlands can be indirectly impacted from sediment-laden stormwater from construction activities. To prevent this short-term impact, erosion and sedimentation control measures will be installed and maintained by the contractor and inspected by a qualified and approved site monitor. With short-term sedimentation controls such as silt fences, haybales and sediment traps, it is not likely that there will be short-term adverse impacts from erosion and sedimentation. The erosion and sediment control measures will be installed and maintained in accordance with the *2004 Connecticut Guidelines for Soil Erosion and Sediment Control.* Limiting the size of areas of soil disturbance and maintenance of temporary measures will be critical to ensure the effectiveness of the proposed soil erosion and sedimentation control measures.

In the long-term, the potential exists for wetlands to be indirectly impacted by stormwater discharge from proposed impervious surfaces and changes in the ecological cover type of a site. To avoid this long-term adverse impact, mitigation measures are proposed. A stormwater management system will be installed and maintained to treat the stormwater from impervious areas, to recharge groundwater and control downstream flooding. Measures have been designed to treat runoff generated from the first inch of rainfall for added impervious surfaces up to and including the 25-year storm event. Moreover, discharge rates will be reduced to values lower than predevelopment rates as a result of the development. Stormwater flowing from impervious surfaces will drain into hooded deep sump catch basins, which will help remove oil and grease and sediment. Runoff will then drain into recharge chambers that will infiltrate the stormwater into the surrounding soils or water quality basins, which will further remove pollutants from runoff. Runoff from the remaining impervious surfaces will flow to the stormwater basins and rain gardens and treated via infiltration into the surrounding soils. Rainwater that lands on the proposed parking garage green roof will be treated and detained by passing through the green roof vegetated medium into a roof drain system. Excess stormwater from the green roof will flow to either the subsurface recharge chambers to the north or the stormwater basin to the south for infiltration and further treatment.

The removal of construction debris, trash and invasive vegetation and the installation of native enhancement plantings in the wetland buffer areas will improve the ability of the buffers

to support an abundance and diversity of wildlife and will improve the buffer's ability to filter and treat stormwater before it enters the wetland. Adhering to NOFA standards in regards to the ornamental landscape maintenance will further mitigate potential adverse impacts to wetland and watercourse water quality by reducing potential stormwater runoff pollutant loads.

Wetlands Functions and Values: Existing versus Proposed Conditions

A comparison of the ecological attributes of the existing wetland conditions and the proposed wetland conditions was completed by conducting an evaluation within the context of typical wetland functions and values as established by the U.S. Army Corps of Engineers in the publication *"The Highway Methodology Workbook Supplement: Wetland Functions and Values A Descriptive Approach"*. As presented in this publication, wetland functions are those self-sustaining properties of a wetland that exist in absence of society, while wetland values are benefits that derive from either one or more functions and the physical characteristics associated with a wetland.

The comparison of the existing and proposed wetland conditions revealed that the proposed project offers comparable or improved functions and values when compared to the existing conditions. The evaluation is presented below (Table 2), and compared the potential for the wetland to continue performing recognized wetland functions and contributing to wetland values under the proposed wetland conditions while using the existing conditions as baseline.

Table One: Forested Swamp Functional Assessment

WETLAND FUNCTIONS	RELATIVE CAPACITY TO PERFORM FUNCTION EXTG	PROP	FUNCTIONAL DETAILS
Groundwater Recharge/ Groundwater Discharge	MODERATE	MODERATE	**Unchanged** - The capacity of the wetland and watercourse to influence the amount of water moving from ground water to surface water and surface water to ground water will not be measurably altered with the proposed site plan.
Floodflow Alteration	MODERATE	MODERATE	**Unchanged** - The capacity of the wetland and watercourse to alter flood flow will not be measurably altered with the proposed site plan.
Fish and Shellfish Habitat	NONE	NONE	NOT APPLICABLE
Sediment/ Toxicant Retention	MODERATE	MODERATE	**Unchanged** - The capacity of the wetland and watercourse to retain sediment and toxicants will not be measurably altered with the proposed site plan.
Nutrient Removal	MODERATE	MODERATE	**Unchanged** - The capacity of the wetland and watercourse to remove, retain or transform nutrients will not be measurably altered with the proposed site plan.
Production	MODERATE	MODERATE	**Unchanged** - The capacity of the wetland and

Export			*watercourse to export production will not be measurably altered with the proposed site plan.*
Sediment/ Shoreline Stabilization	***LOW-MODERATE***	***LOW-MODERATE***	***Unchanged** - The capacity of the wetland and watercourse to stabilize sediment and shorelines will not be measurably altered with the proposed site plan.*
Wildlife Habitat	***MODERATE***	***MODERATE***	***Slightly Improved** - The capacity of the wetland and watercourse to provide wildlife habitat will be improved slightly as the wetland buffer areas will be cleaned of debris and vegetated with native plantings that will benefit wildlife using the wetlands.*
Recreation	***LOW***	***LOW***	***Unchanged** - Recreation opportunities will not be altered with the proposed site plan.*
Education/ Scientific Value	***LOW***	***LOW***	***Unchanged** - Education/scientific values will not be altered with the proposed site plan.*
Uniqueness/ Heritage	***LOW***	***LOW***	***Unchanged** - The uniqueness and heritage of the onsite wetlands will not be altered with the proposed site plan.*
Visual Quality/ Aesthetics	***MODERATE***	***MODERATE***	***Unchanged** - The visual quality and aesthetics of the onsite wetlands will not be altered with the proposed site plan.*
Endangered Species	***NO LISTED SPECIES***	***NO LISTED SPECIES***	***Unchanged** - Threatened/endangered species wetland habitat will not be altered with the proposed site plan.*

Table Two: Shrub-Sapling Swamp & Forested Swamp Complex Functional Assessment

WETLAND FUNCTIONS	*RELATIVE CAPACITY TO PERFORM FUNCTION*		*FUNCTIONAL DETAILS*
	EXTG	*PROP*	
Groundwater Recharge/ Groundwater Discharge	***MODERATE***	***MODERATE***	***Unchanged** - The capacity of the wetland and watercourse to influence the amount of water moving from ground water to surface water and surface water to ground water will not be measurably altered with the proposed site plan.*
Floodflow Alteration	***MODERATE-HIGH***	***MODERATE-HIGH***	***Unchanged** - The capacity of the wetland and watercourse to alter flood flow will not be measurably altered with the proposed site plan.*
Fish and Shellfish Habitat	***NONE***	***NONE***	***NOT APPLICABLE***
Sediment/ Toxicant Retention	***MODERATE-HIGH***	***MODERATE-HIGH***	***Unchanged** - The capacity of the wetland and watercourse to retain sediment and toxicants will not be measurably altered with the proposed site plan.*
Nutrient Removal	***MODERATE-HIGH***	***MODERATE-HIGH***	***Unchanged** - The capacity of the wetland and watercourse to remove, retain or transform nutrients will not be measurably altered with the proposed site plan.*

Production Export	*MODERATE-HIGH*	*MODERATE-HIGH*	***Unchanged** - The capacity of the wetland and watercourse to export production will not be measurably altered with the proposed site plan.*
Sediment/ Shoreline Stabilization	*LOW*	*LOW*	***Unchanged** - The capacity of the wetland and watercourse to stabilize sediment and shorelines will not be measurably altered with the proposed site plan.*
Wildlife Habitat	*MODERATE-HIGH*	*MODERATE-HIGH*	***Slightly Improved** - The capacity of the wetland and watercourse to provide wildlife habitat will be improved slightly as the wetland buffer areas will be cleaned of debris and vegetated with native plantings that will benefit wildlife using the wetlands.*
Recreation	*LOW-MODERATE*	*LOW-MODERATE*	***Unchanged** - Recreation opportunities will not be altered with the proposed site plan.*
Education/ Scientific Value	*MODERATE*	*MODERATE*	***Unchanged** - Education/scientific values will not be altered with the proposed site plan.*
Uniqueness/ Heritage	*LOW-MODERATE*	*LOW-MODERATE*	***Unchanged** - The uniqueness and heritage of the onsite wetlands will not be altered with the proposed site plan.*
Visual Quality/ Aesthetics	*MODERATE*	*MODERATE*	***Unchanged** - The visual quality and aesthetics of the onsite wetlands will not be altered with the proposed site plan.*
Endangered Species	*NO LISTED SPECIES*	*NO LISTED SPECIES*	*NOT APPLICABLE*

Table Three: Indian River and Fringe Wetland

WETLAND FUNCTIONS	*RELATIVE CAPACITY TO PERFORM FUNCTION*		*FUNCTIONAL DETAILS*
	EXTG	*PROP*	
Groundwater Recharge/ Groundwater Discharge	*MODERATE*	*MODERATE*	***Unchanged** - The capacity of the watercourse and fringe wetland to influence the amount of water moving from ground water to surface water and surface water to ground water will not be measurably altered with the proposed site plan.*
Floodflow Alteration	*LOW*	*LOW*	***Unchanged** - The capacity of the watercourse and fringe wetland to alter flood flow will not be measurably altered with the proposed site plan.*
Fish and Shellfish Habitat	*NONE*	*NONE*	*NOT APPLICABLE*
Sediment/ Toxicant Retention	*LOW*	*LOW*	***Unchanged** - The capacity of the watercourse and fringe wetland to retain sediment and toxicants will not be measurably altered with the proposed site plan.*
Nutrient Removal	*LOW*	*LOW*	***Unchanged** - The capacity of the watercourse and fringe wetland to remove, retain or transform nutrients will not be measurably altered with the*

			proposed site plan.
Production Export	***MODERATE-HIGH***	***MODERATE-HIGH***	***Unchanged** - The capacity of the watercourse and fringe wetland to export production will not be measurably altered with the proposed site plan.*
Sediment/ Shoreline Stabilization	***LOW***	***LOW***	***Unchanged** - The capacity of watercourse and fringe wetland to stabilize sediment and shorelines will not be measurably altered with the proposed site plan.*
Wildlife Habitat	***MODERATE***	***MODERATE***	***Unchanged** - The capacity of the watercourse and fringe wetland to provide wildlife habitat will be improved slightly as the wetland buffer areas not be measurably altered with the proposed site plan.*
Recreation	***LOW***	***LOW***	***Unchanged** - Recreation opportunities will not be altered with the proposed site plan.*
Education/ Scientific Value	***LOW***	***LOW***	***Unchanged** - Education/scientific values will not be altered with the proposed site plan.*
Uniqueness/ Heritage	***LOW***	***LOW***	***Unchanged** - The uniqueness and heritage of the watercourse and fringe wetland will not be altered with the proposed site plan.*
Visual Quality/ Aesthetics	***MODERATE***	***MODERATE***	***Unchanged** - The visual quality and aesthetics of the watercourse and fringe wetland will not be altered with the proposed site plan.*
Endangered Species	***LOW***	***LOW***	***Unchanged** - Endangered species' populations and habitat will not be altered with proposed site plan.*

Conclusions

In summary, we find that the proposed multi-family residential redevelopment located at the approximate 8.8-acre project site at Hiawatha Lane will not cause adverse impacts to wetlands or watercourses on or off the site. The proposed improvements have been designed to avoid direct and indirect adverse impacts to wetlands and watercourses. Direct adverse impacts are being avoided as no activities are proposed within wetlands or watercourses. Indirect adverse impacts are also avoided, as stormwater management measures are proposed during and after construction to control the quality and quantity of stormwater runoff and long-term property management plans are proposed to enhance and create native habitat in the wetland buffers.

Thank you for your consideration of this information. If you should have any questions or comments, please do not hesitate to contact us at (203) 366-0588.

Sincerely,

William L. Kenny, PWS, PLA
Principal

Timothy F. Veit
Ecologist

Ref. No. 3631

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THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

STORMWATER MANAGEMENT REPORT

Prepared for:

Summit Saugatuck, LLC
55 Station Street
Southport, CT 06890

Prepared by:

Divney Tung Schwalbe, LLP
One North Broadway, Suite 1407
White Plains, NY 10601

May 7, 2018

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

STORMWATER MANAGEMENT REPORT

TABLE OF CONTENTS

Stormwater Management Plan

I. Project Summary

The Village at Saugatuck is the redevelopment of existing residential lots. The existing site includes ten (10) single family homes. Under the proposed plans the existing structures will be demolished. The two (2) lots to the north will be combined to form a new 0.75-acre parcel. The eight (8) developed lots and two (2) undeveloped lots to the south will be combined to form an 8.07-acre parcel. The north lot will have a 3-story multi-family residential building with below ground and at grade parking. The south lot will have (3) 3-story and (1) 4-story multi-family residential buildings with a connecting underground parking garage.

The redevelopment will result in a net export of soil material from the site. A summary of the cut and fill quantities as well as a figure showing the approximate cut and fill depths is included in the Appendix.

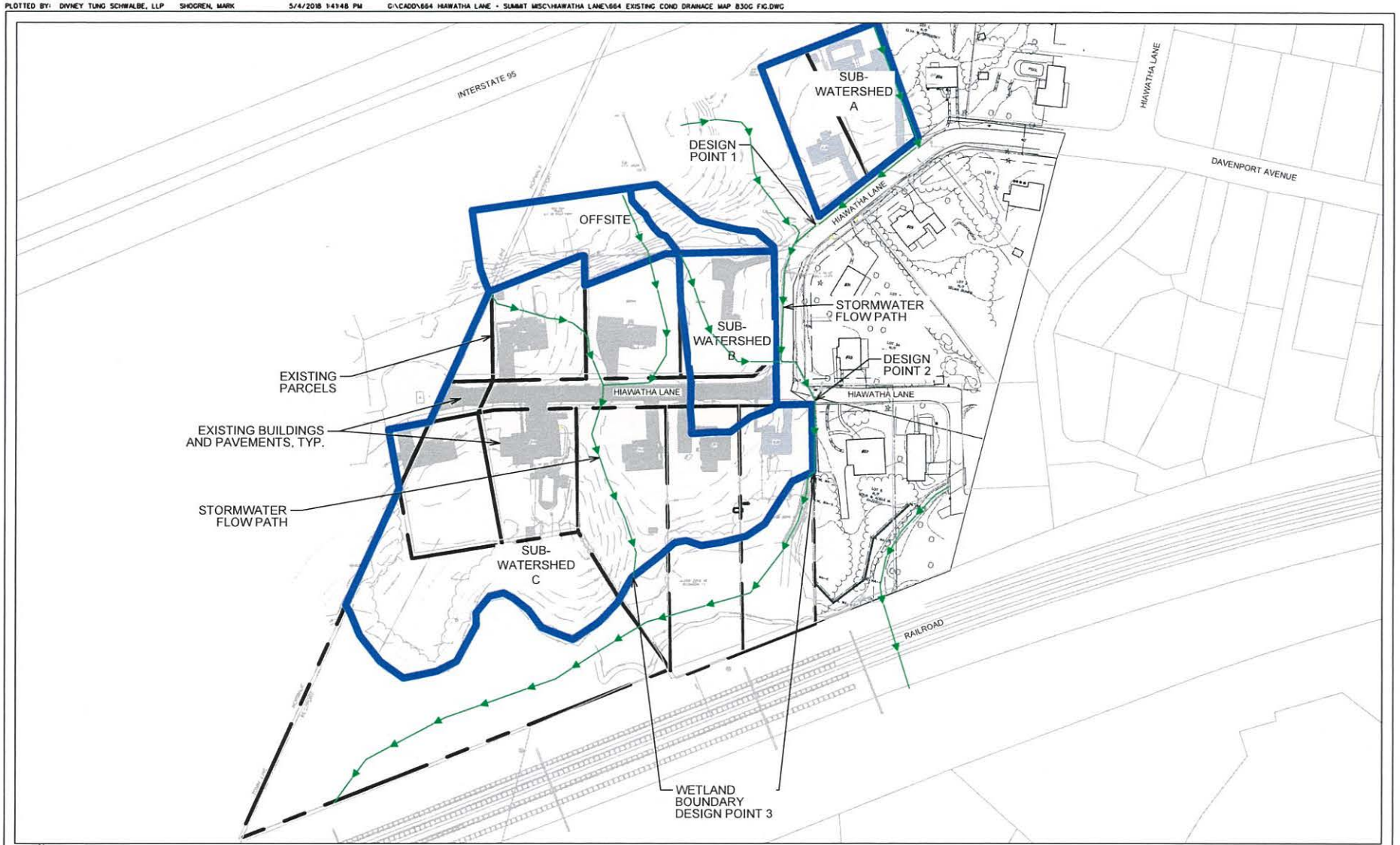
The on-site impervious coverage will increase from approximately 1.1 acres to 3.9 acres under the proposed redevelopment. A stormwater management strategy has been developed in accordance with the 2006 Westport Drainage Design Standards and the 2004 Connecticut Stormwater Quality Manual that includes infiltrating the first inch of stormwater runoff from added impervious areas and managing runoff rates so that peak runoff rates are at or below the pre-development meadow conditions for storms up to the 25-year storm event.

The method used for estimating peak discharge shall be as per the document released by the Engineering Division of the U.S. Department of Agriculture Soil Conservation Service titled "Urban Hydrology for Small Watersheds", Technical Release No. 55, dated June 1986, Type III Storm Distribution. This criterion governs the data that is input into the software, namely the Bentley PondPack v10.1 computer program. Summaries of the models under existing and proposed conditions are provided in the Appendix.

The site redevelopment plan has been prepared in accordance with the CT DEEP Stormwater Manual and LID Addendum, the State's Erosion and Sediment Control Guidelines, and the Town of Westport's regulations, standards and best practices for stormwater management. The stormwater measures if constructed in accordance with the site redevelopment plan should not cause adverse impacts on the subject, neighboring, and downstream properties.

II. Existing Conditions

The redevelopment site is located between Interstate-95 to the north and MetroNorth Rail Road to the south, to the west is Avalon East, Norwalk, and single family residential houses are to the east. The site drains from north to south to an on-site wetland. An existing storm sewer system is located along Hiawatha Lane. The storm system includes a series of catch basins connected with 15-inch diameter pipes. The system discharges approximately 2 feet east of the eastern property line (Hiawatha Lane #39). From the discharge point the water is channeled into the wetland. A Wetland Delineation Report has been prepared by Pietras Environmental Group, LLC. A copy of the report is in the Appendix of this report. Additionally, William Kenny Associates LLC, has prepared a Wetland and Watercourse Assessment letter included with the Application for Inlands Wetland Regulated Activity Permit and Waterway Protection Line Ordinance Approval. The wetland is included in the 100-year flood zone up to elevation 11 feet. Stormwater runoff continues to the southwest corner of the site, crossing the rail road through a storm pipe and is routed through a series of pipes, open channels and ponds to the Saugatuck River. For analysis, the existing site was divided into three (3) sub-watersheds, sub-watershed A for the northern properties, sub-watershed B for the southern properties which drain to storm sewer located within Hiawatha Lane, and sub-watershed C for the southern properties which drain directly into the wetland. See Figure No. 1, Existing Stormwater Conditions and Table No. 1 Existing Drainage Conditions for additional information.



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EXISTING DRAINAGE CONDITIONS

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

FIGURE NO. 1
5/7/18

TABLE NO. 1

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

EXISTING DRAINAGE CONDITIONS

WATERSHED/ SUBBASIN ID	AREA (AC)					(1) I (%)	(2) R_v	(3) CN	(4) Ia	(5) Tc (HRS)	DESIGN POINT #
	IMPERVIOUS			PERVIOUS	TOTAL AREA						
	Roof	Pavement	IMP. TOTAL								
A	0.08	0.11	0.19	0.56	0.75	25.3	0.28	70	0.8	0.20	1
B	0.04	0.11	0.15	0.52	0.67	22.4	0.25	69	0.9	0.24	2
C	0.31	0.43	0.74	3.92	4.66	15.9	0.20	67	1.0	0.32	3
TOTAL AREA	0.43	0.65	1.08	5.00	**6.08**	**17.8**		78			

1. I=Percent Impervious, (Impervious Area/Total Area)*100%
2. R_v = 0.05+0.009(I), Minimum Rv=0.2
3. CN=Curve Number, 98 Impervious, 61 Open Space (good) Condition. For Pre-development "meadow condition" CN=58
4. Ia = Initial Abstraction = 200/CN - 2
5. Tc=Time of Concentration

The curve numbers (CN) for the existing conditions were calculated on Table No. 1. For analysis the CN for "meadow" conditions was used for the entire site. The calculations for the times of concentration (Tc) are included in the appendix.

Three types of soil have been identified on the site, ninigret and tisbury, agamwam fine sandy loam, and udorthents, smoothed. The wetland delineation and soil descriptions are provided in the Wetland Delineation Report prepared by Pietras Environmental Group, LLC. Test pits and percolation tests were conducted on November 17 and 18, 2016 near the location of the proposed stormwater measures. The results of the tests are summarized on the following table.

Test #	1	2	3	4	5
Location/Lot	Parcel B	Parcel B	41 Hiawatha	42 Hiawatha	36 Hiawatha
Elevation	18	23	18	21	21
Soil Classification [1]	Ninigret and Tisbury	Agawam fine sandy loam	Ninigret and Tisbury	Udorthents, smoothed	Udorthents, smoothed
Test Depth (ft)	8	8	8	8	8
Groundwater Depth, Initial (ft)	7.5	n/a	n/a	7.5	7
Groundwater Depth, Final (ft)	7	n/a	n/a	7	6.5
Average Percolation Rate (min/in)	1.5	0.9	2.3	15.9	10

[1] Wetland Delineation Report for Subject Properties on Hiawatha Lane, Westport, Connecticut. Prepared by Pietras Environmental Group, LLC, March 8, 2016.

Additional soil tests were conducted by Redniss & Mead on April 4, 2018. These tests were witnessed by the Town of Westport Engineering Department. The results of the tests are summarized on the following table, with additional information provided in the appendix. The findings of the April 2018 tests were used for determining the restrictive layer and percolation rate for the stormwater practices designs. Ledge rock was not encountered in any of the test pits.

Test Pit #	Lot #	SWM	Roots	Mottling	Water	Hole Depth	Top Elevation	Restricted El.	Perc. Rate
			(in)	(in)	(in)	(in)	(ft)	(ft)	(in/hr)
1	36	DW-1	n/a	n/a	70	79	22	16.2	21.0
2	36	DW-2	42	54	65	71	22	17.5	5.25
3	36	INF-AA-1	36	n/a	n/a	106	27	n/a	5.25
4	38	INF-BB-7	36	11	64	72	17	16.1	n/a
5	42	INF-BB-3	40	n/a	61	61	21	15.9	8.25
6	B	INF-BB-1	36	n/a	n/a	96	23	n/a	10.5
7	B	Basin BB-2	47	n/a	84	89	18	11.0	10.5
8	41	Basin BB-4	55	n/a	90	93	18	10.5	13.5
9	39	Basin BB-5	41	n/a	65	74	18	12.6	3.0

III. Proposed Conditions

The stormwater strategy for the project is to continue to drain the site in a similar manner as under existing conditions, managing the flows such that the peak runoff rates do not exceed the pre-development "meadow" runoff rates. Three (3) open stormwater basins, three (4) underground infiltration systems, two (2) infiltration trenches, and six (6) rain gardens are proposed to infiltrate and detain the stormwater runoff. Additionally, approximately 11,000 square feet of the building will have a green roof. The green roof will be a combination of lawn and planted areas above the parking garage. The stormwater measures have been designed to hold at least the first one inch of runoff from impervious areas and to reduce discharge rates for larger storm events to less than the pre-development "meadow" state.

The north parcel has been divided into three (3) sub-watersheds for analysis.

Sub-watershed AA-1 includes the new building and parking lot. Runoff from this sub-watershed will be directed to an underground infiltration system.

Sub-watershed AA-2 includes the southern portion of the parcel adjacent to Hiawatha Lane. Runoff from the driveway will be directed to a rain garden and an infiltration trench.

Sub-watershed AA-3 includes the western sloped portion of the building roof and adjacent yard. Runoff from this sub-watershed will be directed to dry-well infiltration system.

Stormwater discharge from these three (3) sub-watersheds will be directed to an existing catch basin located in Hiawatha Lane. The discharge rates to the catch basin will be less than or equal to the pre-development meadow condition peak discharge rates for storm frequencies up to 25years.

The south parcel has been divided into eight (8) sub-watersheds for analysis.

Sub-watershed BB-1 includes the southwest parking lots. Runoff from this sub-watershed will be directed to an underground infiltration system. Portions of the parking lot will also drain through three (3) rain gardens. Excess runoff from the infiltration systems will be directed to the on-site wetland. The discharge point will include a level spreader sized to keep the maximum water depth under ½" for the 25-year storm to minimize down-gradient erosion.

Sub-watershed BB-2 includes the Building B. Runoff from this sub-watershed will be directed to an at grade infiltration basin. Excess runoff from the infiltration systems will be directed to the on-site wetland. The overflow for the basin has been sized to keep the maximum water depth under ½" for the 25-year storm to minimize down-gradient erosion.

Sub-watershed BB-3 includes Building C and part of Building D and the north parking lots. Runoff from this sub-watershed will be directed to two (2) rain gardens and an underground infiltration system. Excess runoff from the infiltration systems will be directed via storm pipes around the buildings to the on-site wetland. Runoff from sub-watersheds BB-5 and BB-7 will routed together to a single discharge point. The discharge point will include a level spreader sized to keep the maximum water depth under ½" for the 25-year storm to minimize down-gradient erosion.

Sub-watershed BB-4 includes the southeast parking lot. Runoff from this sub-watershed will be directed to an infiltration basin. Excess runoff from the infiltration basin will be directed to the on-site wetland. The overflow for the basin has been sized to keep the maximum water depth under ½" for the 25-year storm to minimize down-gradient erosion.

Sub-watershed BB-5 includes Building A, part of Building D, and the driveway up to the green roof. Runoff from this sub-watershed will be directed to an infiltration basin. Excess runoff from the infiltration basin will be directed via storm pipes to the on-site wetland.

Sub-watershed BB-6 includes areas around the perimeter of the south parcel that will not be directed to infiltration systems. Much of this area will be undisturbed and improved with wetland buffer planting.

Sub-watershed BB-7 includes the entrance driveway north of Building D. Runoff from this sub-watershed will be directed to a trench drain. Runoff from the trench drain will be directed via storm pipes to the on-site wetland.

Sub-watershed BB-8 includes area between Building D and Hiawatha Lane. This area will drain to the existing storm sewer within Hiawatha Lane.

See Figure No. 2, Proposed Stormwater Conditions and Table No. 2 Proposed Drainage Conditions for additional information.

The curve numbers (CN) for the proposed conditions were calculated on Table No. 2. The calculations for the times of concentration (Tc) are included in the appendix. For the re-developed portions of the site, the minimum Tc of 5-minutes, 0.833 hours, was used.

To account for groundwater picked up by the building footing drains, a constant flow of 0.01 cfs was added to sub-watershed AA-2 for Building E. This footing drain will connect directly to the storm sewer in Hiawatha Lane. The 0.01 cfs flow results in a slight increase in runoff from the pre-development meadow conditions for the 1- and 2-year storms. This increase is within the capacity of the storm pipes, and is less than the flow rates under existing conditions. For larger storm events there is a net decrease in runoff rates. A constant flow of 0.04 cfs was added to sub-watershed BB-7 for Buildings A, B, C, and D. The footing drain will be routed to a level spreader and the peak discharge rates will be less than under predevelopment meadow conditions.

Stormwater runoff from the parking lots and driveways will be directed to catch basins with inserts for pre-treatment prior to entering the underground infiltration system. The first flush will enter the infiltration system in the "isolator row". The isolator row includes a lined filter fabric bottom that facilities removing accumulated sediment. The underground infiltration system will be a StormTech SC-740 or approved equal. An information sheet on the StormTech system is provided in the Appendix. The infiltration system includes a level gravel pad, the open bottomed chambers, gravel located between and around the chambers and 6-inches minimum of gravel above the chambers. The number of chambers was calculated such that a minimum of 1-inch of stormwater runoff from the contributing area could be stored in the gravel pad and up to 18-inches deep in the chambers, without any infiltration occurring. The percolation tests show that the infiltration measures will drain completely within 24 hours of the end of the storm. The

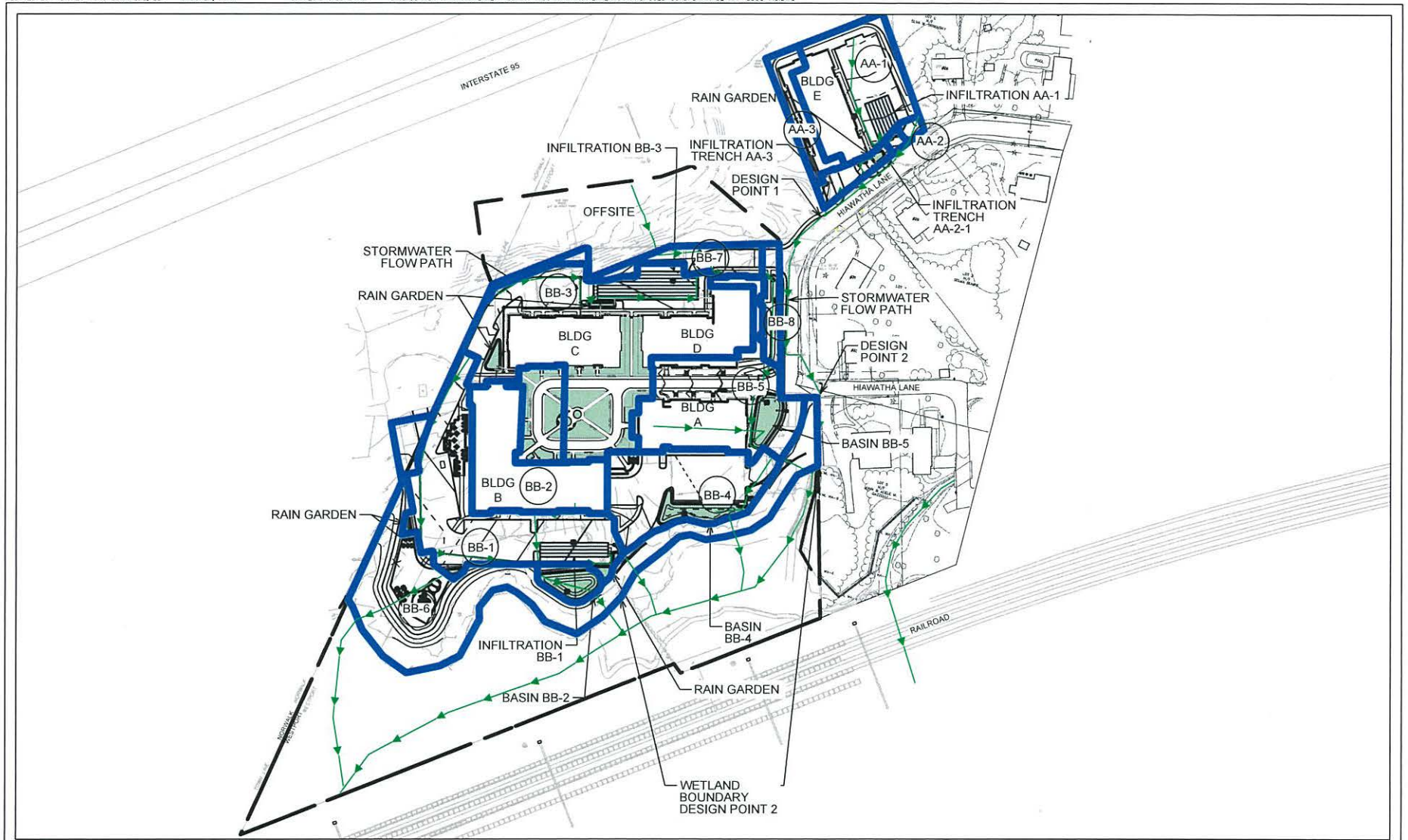
number of chambers and total storage volume for each system is summarized in the table below.

System ID	Chambers	Storage Volume (cf)
AA-1	49	3,964
BB-1	52	4,313
BB-3	131	10,323
Total	222	18,600

The current Extreme Precipitation Tables prepared by the Northeast Regional Climate Center and the Westport Drainage Design Standards were used with Type III 24 hour storms in PondPack to model the pre-development and proposed stormwater conditions. The calculated peak flow rates for pre-development and proposed conditions are shown on Table No. 3 Stormwater Quantity Design Flow Summary. The PondPack summary is provided in the Appendix of this report.

The property owner will be responsible for maintaining the stormwater improvements. The Operations & Maintenance Plan is located in the Appendix.

PLOTTED BY: DIVNEY TUNG SCHWALBE, LLP SHOGREN, MARK 5/7/2018 11:33:13 AM C:\CADD\664 HIAWATHA LANE - SUMMIT MISC\HIAWATHA LANE\664 PROPOSED COND DRAINAGE MAP 830G FIG.DWG



PROPOSED DRAINAGE CONDITIONS

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

FIGURE NO. 2
5/7/18

TABLE NO. 2

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

REDEVELOPED DRAINAGE CONDITIONS

WATERSHED/ SUBBASIN ID	AREA (AC)							(1) I	(2) R_v	(3) CN	(4) Ia	(5) Tc	DESIGN POINT #
	IMPERVIOUS					PERVIOUS	TOTAL AREA						
	Roof	Green Roof Pavement	Green Roof Landscape	Pavement	IMP. TOTAL			(%)				(HRS)	
AA-1	0.20			0.20	0.40	0.12	0.51	77.1	0.74	90	0.23	0.08	1
AA-2	0.00			0.03	0.03	0.06	0.09	32.5	0.34	73	0.74	0.08	1
AA-2-1	0.00			0.01	0.01	0.00	0.01	100.0	0.95	98	0.04	0.08	1
AA-3	0.06			0.00	0.06	0.07	0.13	46.7	0.47	78	0.55	0.00	1
BB-1	0.00			0.61	0.61	0.15	0.76	79.8	0.77	91	0.21	0.08	3
BB-2	0.45	0.11	0.08	0.00	0.64	0.07	0.71	90.0	0.86	92	0.18	0.08	3
BB-3	0.50	0.11	0.15	0.41	1.16	0.20	1.37	85.1	0.82	90	0.22	0.08	3
BB-4	0.00			0.36	0.36	0.15	0.51	71.2	0.69	87	0.29	0.08	3
BB-5	0.33			0.16	0.49	0.16	0.65	75.5	0.73	89	0.25	0.08	3
BB-6	0.00			0.01	0.01	1.07	1.08	0.9	0.20	61	1.26	0.18	3
BB-7	0.00			0.06	0.06	0.11	0.18	35.4	0.37	74	0.70	0.08	3
BB-8	0.00			0.02	0.02	0.07	0.09	24.7	0.27	70	0.85	0.08	2
TOTAL AREA	1.53	0.22	0.23	1.79	3.86	2.22	6.08	63.4		92			

1. I=Percent Impervious, (Impervious Area/Total Area)*100%
2. R_v = 0.05+0.009(I), Minimum Rv=0.2
3. CN=Curve Number. Impervious = 98, Pervious = 61, Landscape Green Roof = 75
4. Ia = Initial Abstraction = 200/CN - 2
5. Tc=Time of Concentration, See Table No. 5 for calculations, 5 minute Tc used for developed areas.
6. AA-2 includes an estimated 0.01 base flow from building footing drains
7. BB-7 includes an estimated 0.04 cfs base flow from building footing drains

TABLE NO. 3

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

STORMWATER QUANTITY DESIGN FLOW SUMMARY

DESIGN POINT NO.		Tributary Sub-basins	1-YEAR SW Flow (CFS)	2-YEAR SW Flow (CFS)	10-YEAR SW Flow (CFS)	25-YEAR SW Flow (CFS)
Rain Depth Westport, Connecticut (in) [1]			2.85	3.50	5.10	6.40
1	Meadow	A	0.07	0.19	0.73	1.28
	Redeveloped	AA-1, AA-2, AA-3	0.08	0.20	0.58	1.20
	Delta		0.01	0.01	-0.15	-0.08
			14%	5%	-21%	-6%
2	Meadow	A & B	0.12	0.36	1.35	2.36
	Redeveloped	AA-1, AA-2, AA-3 & BB-8	0.13	0.27	0.78	1.33
	Delta		0.01	-0.09	-0.57	-1.03
			8%	-25%	-42%	-44%
3	Meadow	A, B & C	0.50	1.40	5.16	9.09
	Redeveloped	AA-1, AA-2, AA-3, BB-1, BB-2, BB-3, BB-4, BB-5, BB-6, BB-7 & BB-8	0.42	1.01	3.17	7.74
	Delta		-0.08	-0.39	-1.99	-1.35
			-16%	-28%	-39%	-15%

(1) Northeast Regional Climate Center, 11/30/16,
Town of Westport rainfall depth used for 2-year and 25-year storm

(2) AA-2 includes an estimated 0.01 base flow from building footing drains

(3) BB-7 includes an estimated 0.04 cfs base flow from building footing drains

IV. Appendix

Appendix A
Soil Tests – November 17-18, 2016

DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

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Donna M. Maiello, ASLA, RLA

Jason E. Bajor, ASLA, RLA
Cosimo Reale, CPESC
Mark J. Shogren, P.E.
Matthew N. Steinberg, AICP

MEMORANDUM

TO: David Walsh

DATE: November 21, 2016

FROM: Mark J. Shogren, P.E.

RE: Soil Tests
Hiawatha Lane
Westport, Connecticut

Summary:
Deep hole tests and percolation tests were conducted at five (5) locations along Hiawatha Lane in Westport Connecticut on November 17 and 18, 2016. The purpose of the test was to evaluate the potential use of stormwater management measures. The deep hole tests were excavated using a rubber tread backhoe to a depth of eight (8) feet. For the percolation test, a total of nine (9) four (4) foot deep holes were dug with the excavator. From the bottom of these holes, an approximate 6-inch to 12-inch diameter hole was hand dug to a depth of two (2) feet. In these holes falling head percolation tests were conducted in accordance with the Westport Drainage Design Standards and the Connecticut State Health Code procedures. The location of the test pits and percolation tests are shown on the attached sketches.

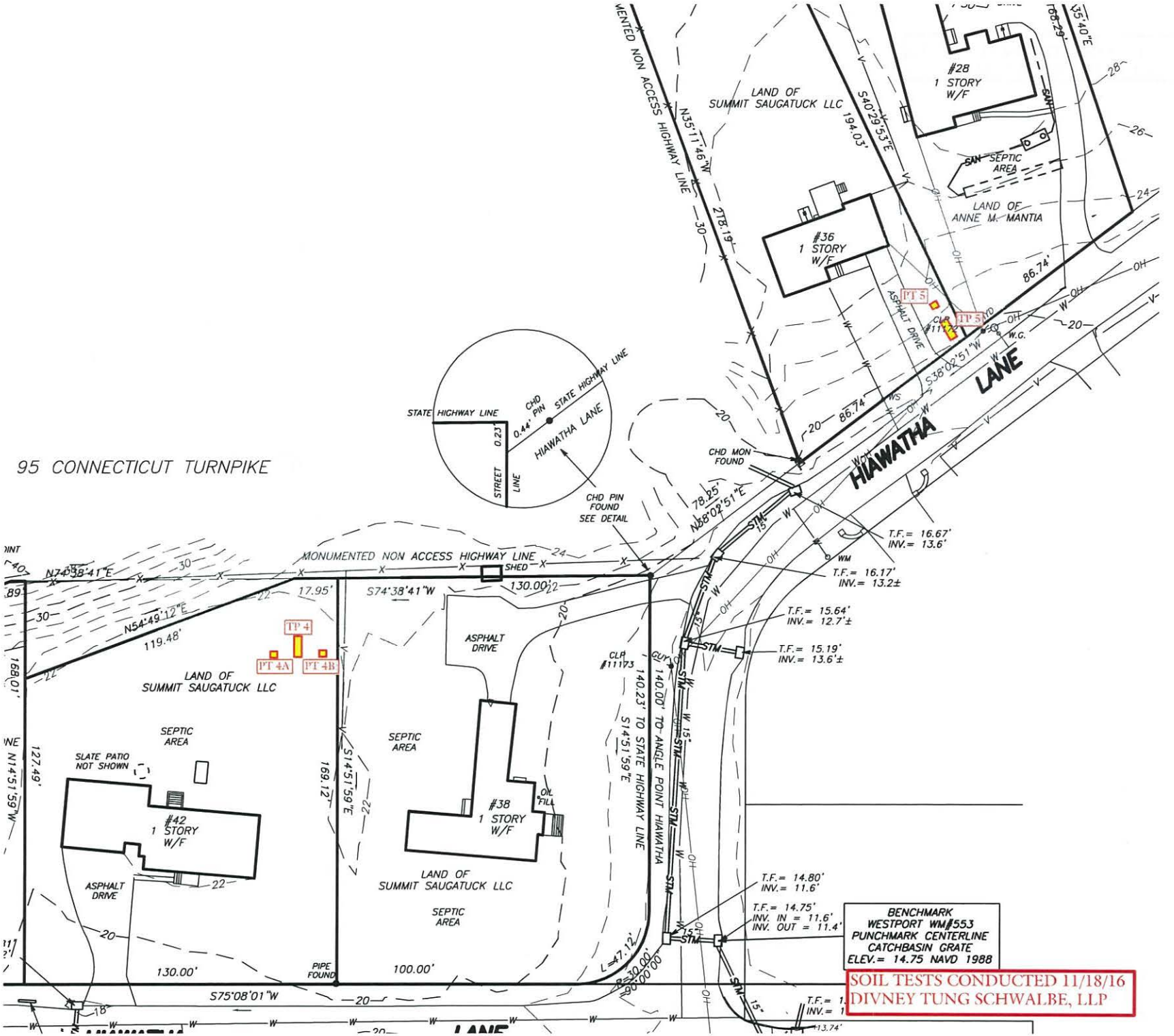
Findings:
The results of the test hole and percolation tests are summarized below.

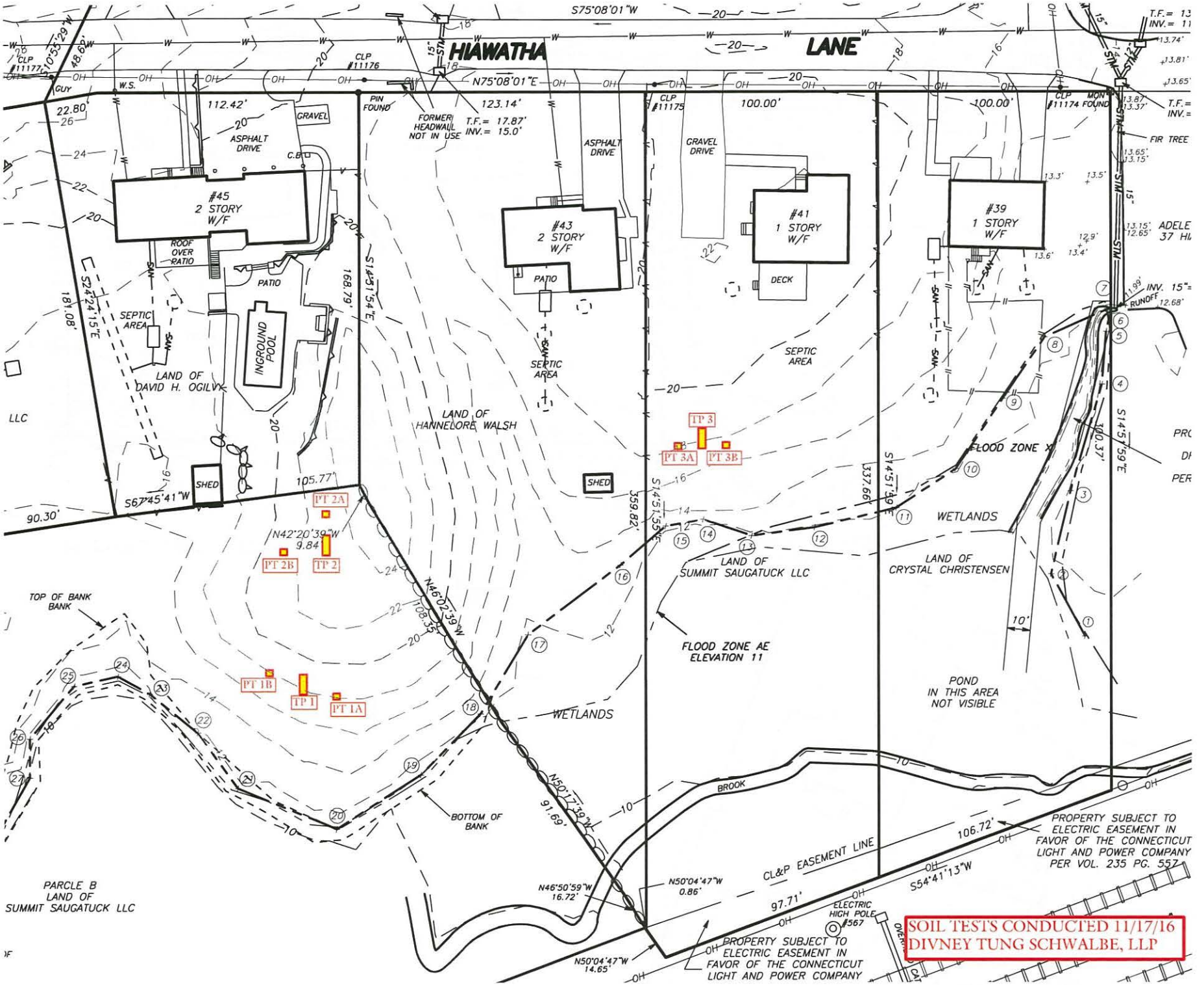
Test #	1	2	3	4	5
Location/Lot	Parcel B	Parcel B	41 Hiawatha	41 Hiawatha	36 Hiawatha
Elevation	18	23	18	21	21
Soil Classification [1]	Ninigret and Tisbury	Agawam fine sandy loam	Ninigret and Tisbury	Udorthents, smoothed	Udorthents, smoothed
Test Depth (ft)	8	8	8	8	8
Groundwater Depth, Initial (ft)	7.5	n/a	n/a	7.5	7
Groundwater Depth, Final (ft)	7	n/a	n/a	7	6.5
Average Percolation Rate (min/in)	1.5	0.9	2.3	15.9	10

[1] Wetland Delineation Report for Subject Properties on Hiawatha Lane, Westport, Connecticut. Prepared by Pietras Environmental Group, LLC, March 8, 2016.

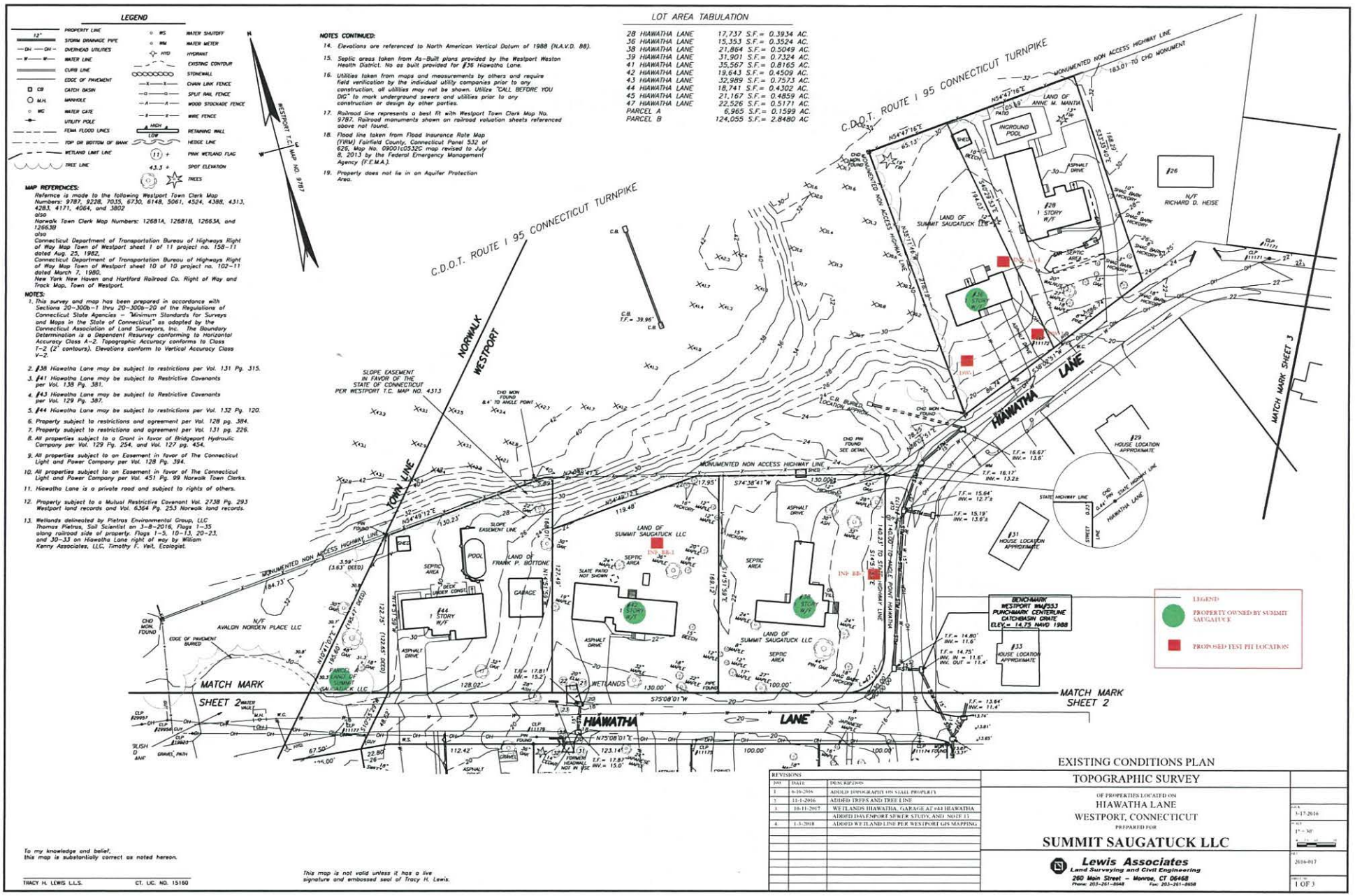
Conclusion:

The soils are well draining and bedrock was not encountered within eight (8) feet of existing grades. The depth to groundwater will be a limiting factor of the design of infiltration practices. Additionally, the infiltration practices will need to be above the 100-year flood zone elevation of 11 feet.


95 CONNECTICUT TURNPIKE
MONUMENTED NON ACCESS HIGHWAY LINE
N74°38'41"E
130.00'
S74°38'41"W
17.95'
N54°49'12"E
119.48'
168.01'
127.49'
N14°51'59"W
169.12'
S14°51'59"E
140.23' TO STATE HIGHWAY LINE
140.00' TO ANGLE POINT HIAWATHA
L=47.12'
R=30.00'
90°00'00"
130.00'
100.00'
S75°08'01"W
PIPE FOUND
LAND OF SUMMIT SAUGATUCK LLC
SEPTIC AREA
ASPHALT DRIVE
SLATE PATIO NOT SHOWN
#42 1 STORY W/F
#38 1 STORY W/F
#28 1 STORY W/F
#36 1 STORY W/F
LAND OF ANNE M. MANTIA
SEPTIC AREA
ASPHALT DRIVE
N35°11'46"W 278.19'
S40°29'53"E 194.03'
S35°40"E
86.74'
S38°02'51"W
N88°02'51"E
78.25'
HIAWATHA LANE
STATE HIGHWAY LINE
CHD PIN
0.44'
0.23'
STREET LINE
CHD MON FOUND
CHD PIN FOUND SEE DETAIL
SHED
CLR #11173
OIL FILL
GUY
W.G.
WM
STM
OH
W
V
T.F.= 16.67'
INV.= 13.6'
T.F.= 16.17'
INV.= 13.2±
T.F.= 15.64'
INV.= 12.7'±
T.F.= 15.19'
INV.= 13.6'±
T.F.= 14.80'
INV.= 11.6'
T.F.= 14.75'
INV. IN = 11.6'
INV. OUT = 11.4'
BENCHMARK
WESTPORT WM#553
PUNCHMARK CENTERLINE
CATCHBASIN GRATE
ELEV.= 14.75 NAVD 1988
TP 4
TP 4A
TP 4B
TP 5
TP 5A
PT 5
SOIL TESTS CONDUCTED 11/18/16
DIVNEY TUNG SCHWALBE, LLP


HIAWATHA LANE
S75°08'01"W
N75°08'01"E
#45 2 STORY W/F
#43 2 STORY W/F
#41 1 STORY W/F
#39 1 STORY W/F
ASPHALT DRIVE
GRAVEL DRIVE
GRAVEL
PATIO
DECK
ROOF OVER RATIO
SEPTIC AREA
INGROUND POOL
SHED
LAND OF DAVID H. OGILVY
LAND OF HANNELORE WALSH
LAND OF SUMMIT SAUGATUCK LLC
LAND OF CRYSTAL CHRISTENSEN
WETLANDS
FLOOD ZONE X
FLOOD ZONE AE ELEVATION 11
POND IN THIS AREA NOT VISIBLE
TOP OF BANK
BOTTOM OF BANK
BROOK
PIN FOUND
FORMER HEADWALL NOT IN USE T.F.= 17.87' INV.= 15.0'
CLP #11177
CLP #11176
CLP #11175
CLP #11174 FOUND
MON FOUND
GUY
W.S.
FIR TREE
ADELE
37 HI
INV. 15"
RUNOFF
PT 1A
PT 1B
TP 1
PT 2A
PT 2B
TP 2
TP 3
PT 3A
PT 3B
S24°24'15"E 181.08'
S67°45'41"W 90.30'
S14°51'54"E 168.79'
S14°51'59"E 359.82'
S14°51'59"E 337.66'
S14°51'59"E 100.37'
N42°20'39"W 9.84
N46°02'39"W 108.35'
N50°12'39"W 91.69'
N46°50'59"W 16.72'
N50°04'47"W 0.86'
N50°04'47"W 14.65'
S54°41'13"W 97.71'
106.72'
105.77'
123.14'
112.42'
100.00'
100.00'
22.80'
48.6'
S10°55'29"W
CL&P EASEMENT LINE
PROPERTY SUBJECT TO ELECTRIC EASEMENT IN FAVOR OF THE CONNECTICUT LIGHT AND POWER COMPANY PER VOL. 235 PG. 557
PROPERTY SUBJECT TO ELECTRIC EASEMENT IN FAVOR OF THE CONNECTICUT LIGHT AND POWER COMPANY
ELECTRIC HIGH POLE #567
PARCLE B LAND OF SUMMIT SAUGATUCK LLC
SOIL TESTS CONDUCTED 11/17/16
DIVNEY TUNG SCHWALBE, LLP

Appendix B
Soil Tests – April 4-5, 2018



MAP REFERENCES:

Reference is made to the following Westport Town Clerk Map Numbers: 9787, 9228, 7035, 6730, 6148, 5061, 4524, 4388, 4313, 4283, 4171, 4064, and 3802
also
Norwalk Town Clerk Map Numbers: 12681A, 12681B, 12663A, and 12663B
also
Connecticut Department of Transportation Bureau of Highways Right of Way Map Town of Westport sheet 1 of 11 project no. 158-11 dated Aug. 25, 1982.
Connecticut Department of Transportation Bureau of Highways Right of Way Map Town of Westport sheet 10 of 10 project no. 102-11 dated March 7, 1980.
New York New Haven and Hartford Railroad Co. Right of Way and Track Map, Town of Westport.

NOTES:

1. This survey and map has been prepared in accordance with Sections 20-300b-1 thru 20-300b-20 of the Regulations of Connecticut State Agencies – "Minimum Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. The Boundary Determination is a Dependent Resurvey conforming to Horizontal Accuracy Class A-2. Topographic Accuracy conforms to Class T-2 (2' contours). Elevations conform to Vertical Accuracy Class V-2.
2. #38 Hiawatha Lane may be subject to restrictions per Vol. 131 Pg. 315.
3. #41 Hiawatha Lane may be subject to Restrictive Covenants per Vol. 138 Pg. 381.
4. #43 Hiawatha Lane may be subject to Restrictive Covenants per Vol. 129 Pg. 387.
5. #44 Hiawatha Lane may be subject to restrictions per Vol. 132 Pg. 120.
6. Property subject to restrictions and agreement per Vol. 128 pg. 384.
7. Property subject to restrictions and agreement per Vol. 131 pg. 226.
8. All properties subject to a Grant in favor of Bridgeport Hydraulic Company per Vol. 129 Pg. 254, and Vol. 127 pg. 454.
9. All properties subject to an Easement in favor of The Connecticut Light and Power Company per Vol. 128 Pg. 394.
10. All properties subject to an Easement in favor of The Connecticut Light and Power Company per Vol. 451 Pg. 99 Norwalk Town Clerks.
11. Hiawatha Lane is a private road and subject to rights of others.
12. Property subject to a Mutual Restrictive Covenant Vol. 2738 Pg. 293 Westport land records and Vol. 6364 Pg. 253 Norwalk land records.
13. Wetlands delineated by Pietras Environmental Group, LLC Thomas Pietras, Soil Scientist on 3-8-2016; Flags 1-35 along railroad side of property. Flags 1-5, 10-13, 20-23, and 30-33 on Hiawatha Lane right of way by William Kenny Associates, LLC, Timothy F. Vet, Ecologist.

NOTES CONTINUED:

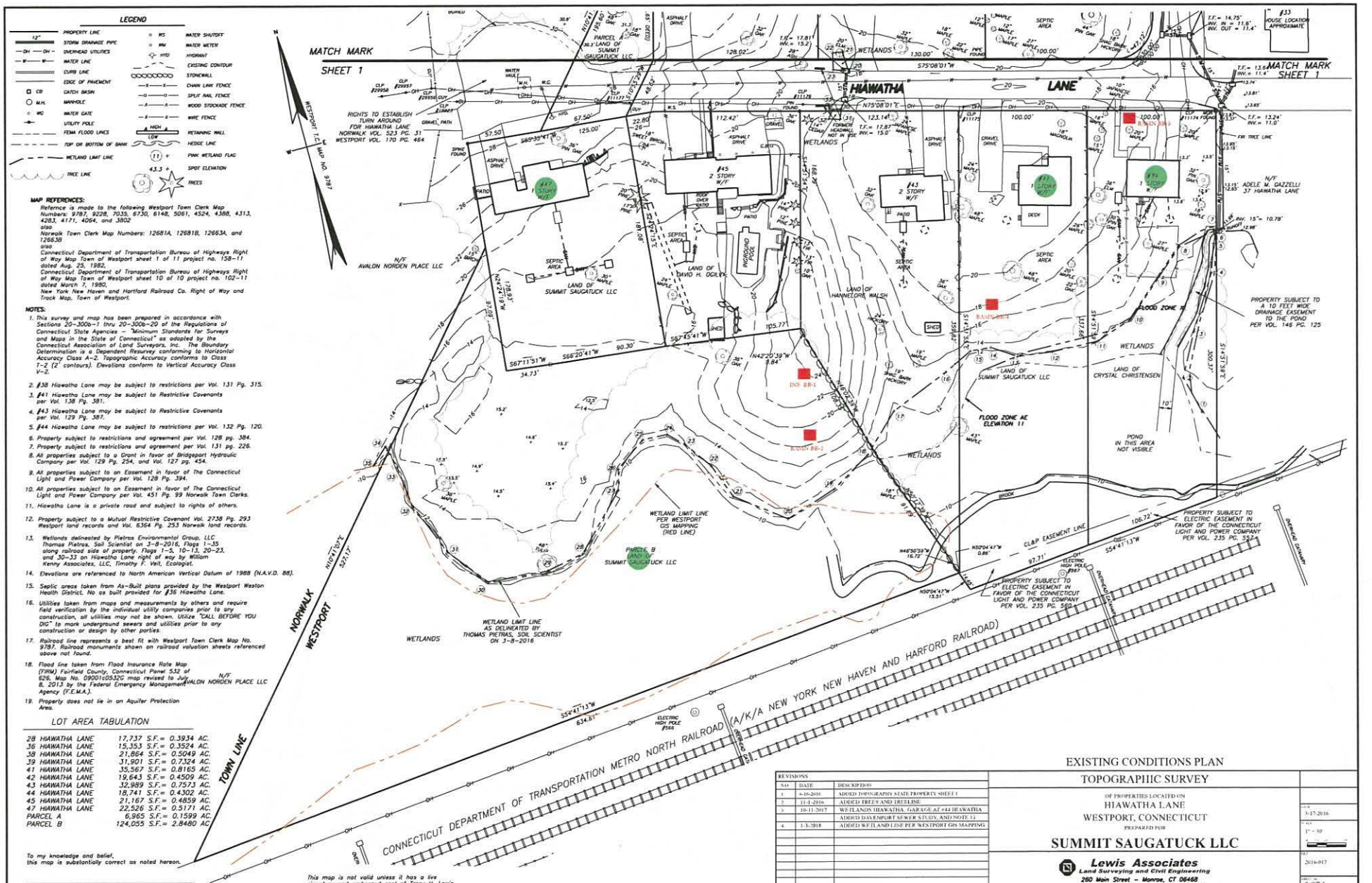
14. Elevations are referenced to North American Vertical Datum of 1988 (N.A.V.D. 88).
15. Septic areas taken from As-Built plans provided by the Westport Weston Health District. No as built provided for #36 Hiawatha Lane.
16. Utilities taken from maps and measurements by others and require field verification by the individual utility companies prior to any construction, all utilities may not be shown. Utilize "CALL BEFORE YOU DIG" to mark underground sewers and utilities prior to any construction or design by other parties.
17. Railroad line represents a best fit with Westport Town Clerk Map No. 9787. Railroad monuments shown on railroad valuation sheets referenced above not found.
18. Flood line taken from Flood Insurance Rate Map (FIRM) Fairfield County, Connecticut Panel 532 of 626, Map No. 09001c0532G map revised to July 8, 2013 by the Federal Emergency Management Agency (F.E.M.A.).
19. Property does not lie in an Aquifer Protection Area.

To my knowledge and belief, this map is substantially correct as noted hereon.

TRACY H. LEWIS L.L.S. CT. LIC. NO. 15150

This map is not valid unless it has a live signature and embossed seal of Tracy H. Lewis.

REVISIONS		
NO	DATE	DESCRIPTION
1	8-10-2016	ADDED TOPOGRAPHY ON STALL PROPERTY
2	11-1-2016	ADDED TREES AND TREE LINE
3	10-11-2017	WETLANDS HIAWATHA, GARAGE AT #44 HIAWATHA
5	1-3-2018	ADDED DAVENPORT SEWER STUDY, AND NOTE 13
6	1-3-2018	ADDED WETLAND LINE PER WESTPORT GIS MAPPING



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19. Property does not lie in an Aquifer Protection Area.

LOT AREA TABULATION

28 HIAWATHA LANE	17,737 S.F.=	0.3934 AC.
36 HIAWATHA LANE	15,353 S.F.=	0.3524 AC.
38 HIAWATHA LANE	21,864 S.F.=	0.5049 AC.
39 HIAWATHA LANE	31,901 S.F.=	0.7324 AC.
41 HIAWATHA LANE	35,567 S.F.=	0.8165 AC.
42 HIAWATHA LANE	19,643 S.F.=	0.4509 AC.
43 HIAWATHA LANE	32,989 S.F.=	0.7573 AC.
44 HIAWATHA LANE	18,741 S.F.=	0.4302 AC.
45 HIAWATHA LANE	21,167 S.F.=	0.4859 AC.
47 HIAWATHA LANE	22,526 S.F.=	0.5171 AC.
PARCEL A	6,965 S.F.=	0.1599 AC.
PARCEL B	124,055 S.F.=	2.8480 AC.

To my knowledge and belief, this map is substantially correct as noted hereon.

TRACY H. LEWIS L.L.S. CT. LIC. NO. 15160

This map is not valid unless it has a live signature and embossed seal of Tracy H. Lewis.

REVISIONS		
NO	DATE	DESCRIPTION
1	6-16-2016	ADDED TOPOGRAPHY STATE PROPERTY SHEET 1
2	11-1-2016	ADDED TREES AND TREELINE
3	10-11-2017	WETLANDS HIAWATHA, GARAGE AT #44 HIAWATHA
		ADDED DAVENPORT SEWER STUDY, AND NOTE 13
4	1-3-2018	ADDED WETLAND LINE PER WESTPORT GIS MAPPING

EXISTING CONDITIONS PLAN

TOPOGRAPHIIC SURVEY

OF PROPERTIES LOCATED ON
HIAWATHA LANE
WESTPORT, CONNECTICUT
PREPARED FOR
SUMMIT SAUGATUCK LLC

Lewis Associates
Land Surveying and Civil Engineering
280 Main Street - Monroe, CT 06468
Phone: 203-261-6048 Fax: 203-261-6058

DATE: 3-17-2016
SCALE: 1" = 30'
JOB NO.: 2016-017
SHEET NO.: 2 OF 3

Hiawatha Lane Test pits 4/4/18

LOT 36

TP #1 SW side prop - DW #1

0 - 10 Topsoil + Brown Loam

10 - 79 Bank Run Gravel

LEDGE - None H2O - 70

ROOTS - None MOTTLES - None

TP #2 SE SIDE PROP - DW #2

0 - 23 Fill

23 - 28 OTS

28 - 34 Dk Brown Loam

34 - 71 Orange Brown Silty Loam w/ mottles

Ledge - None H2O - 65

Roots - 42 Mottles - 54

TP3 N OF House AA-1

0 - 4 Topsoil

4 - 14 Dark Brown Loam

14 - 36 Orange Brown Silty Loam

36 - 106 Bank Run Gravel

LEDGE - None H2O - None

ROOTS - 36 Mottles - None

Lot 38 TP#4 BB-7

0 - 11 Fill

11 - 28 Gray Fine Sandy Silt w/ Mottles

28 - 36 OTS

36 - 72 Gray Fine Sand + Silt w/ mottles

Ledge - None H_2O - 64

Roots - 36 Mottling - 11

Lot 42 TP#5 BB-3

0 - 12 Topsoil

12 - 27 Orange Brown Silty Loam

27 - 61 Bank Run Gravel

Ledge - None H_2O 61

Roots - 40 Mottles - None

LOT B TP6 BB-1

0 - 6 Topsoil

6 - 36 Orange Brown Silty Loam

36 - 96 Bank Run Gravel

Ledge - None H_2O - None

Roots - 36 Mottles - None

LOT B TP7 BB-2

0 - 4 Topsoil

4 - 33 Orange Brown Silty Loam

33 - 89 Bank Run Gravel

Ledge - None H_2O - 84

Roots - 47 Mottles - None

LOT 41 TP8 BB-4

0 - 18 Topsoil / Fill

18 - 26 OTS

26 - 33 Orange Brown Silty Loam

33 - 93 Bank run gravel

Ledge - none H_2O - 90

Roots - 55 Mottles - None

Lot 39 TP9 BB-5

0 - 27 Topsoil / Fill

27 - 41 Orange Brown Silty Loam

41 - 74 Bank run gravel

Ledge - none H_2O - 65

Roots - 41 Mottles - none

Sub-surface Soil Investigation Percolation Test

Project:	Project #: RAM 7435	Date: 4/5/18
Location: Hiawatha Lane	By: TM	Sanitarian:

WEST SIDE LOT 36

Hole ID:		1
Depth:		21 1/2
Diameter:		20"
Presoak Time:		yesterday
Time	Reading	Increment Drop
9:20	18 2/16	one more bucket
		—
9:30	13 11/16	
9:35	17 12/16	4 1/16
9:40	20 9/16	2 13/16
9:45	23 6/16	2 13/16
9:50	15 1/16	—
9:55	18 11/16	2 13/16
10:00	22 2/16	3 4/16
10:05	11 7/16	—
10:10	14 10/16	3 3/16
10:15	17 6/16	2 12/16
10:20	19 7/16	2 1/16
10:25	21 3/16	1 12/16
		—
Minimum Uniform Drop: 1 12/16 Inches in 5 Minutes		
Percolation Rate: 1" Drop in 2.9 Minutes		

21 in/hr

EAST SIDE LOT 36

Hole ID:		2
Depth:		27"
Diameter:		15"
Presoak Time:		yesterday
Time	Reading	Increment Drop
9:22	12 1/16	—
9:27	14	1 8/16
9:32	15	1
9:37	15 15/16	15/16
9:42	16 14/16	15/16
9:47	17 10/16	12/16
9:52	18 4/16	10/16
9:57	19 13/16	9/16
10:02	19 6/16	9/16
10:07	19 14/16	8/16
10:12	20 6/16	8/16
10:17	20 13/16	7/16
10:22	21 4/16	9/16
10:27	21 11/16	7/16
Minimum Uniform Drop: 7/16 Inches in 5 Minutes		
Percolation Rate: 1" Drop in 11.4 Minutes		

5.25 in/hr

2 buckets

REDNISS & MEAD

Sub-surface Soil Investigation Percolation Test

Project:	Project #: RAM 7435	Date: 4/5/18
Location: Hiawatha Lane	By: TM	Sanitarian:

FRONT YARD LOT 39

Hole ID:		3
Depth:		30
Diameter:		11
Presoak Time:		9:00
Time	**Reading**	**Increment Drop**
11:30	15"	—
11:35	19 4/16	4 4/16
11:40	20 1/16	13/16
11:45	20 12/16	11/16
11:50	21 1/16	5/16
11:55	21 5/16	4/16
12:00	21 9/16	4/16
12:05	21 13/16	4/16
12:10	22 1/16	4/16
12:15	22 5/16	4/16
Minimum Uniform Drop: 4/16 Inches in 5 Minutes		
Percolation Rate: 1" Drop in 20 Minutes		

3 in/hr

REAR YARD LOT 42

Hole ID:		4
Depth:		32
Diameter:		12
Presoak Time:		9:00
Time	**Reading**	**Increment Drop**
11:32	9 9/16	—
11:37	11 12/16	2 3/16
11:42	13 14/16	2 2/16
11:47	15 6/16	1 8/16
11:52	16 14/16	1 8/16
11:57	18 5/16	1 8/16
12:02	19 8/16	1 2/16
12:07	20 6/16	14/16
12:12	21 3/16	13/16
12:17	22 2/16	13/16
12:22	22 14/16	12/16
12:27	23 10/16	12/16
12:32	24 5/16	11/16
12:37	25	11/16
12:42	25 11/16	11/16
Minimum Uniform Drop: 11/16 Inches in 5 Minutes		
Percolation Rate: 1" Drop in 7.3 Minutes		

8.25 in/hr

REDNISS & MEAD

Sub-surface Soil Investigation Percolation Test

Project:	Project #: R+M 7435	Date: 4/5/18
Location: HIAWATHA LANE	By: TM	Sanitarian:

REAR YARD LOT 41

Hole ID:	5
Depth:	30
Diameter:	13
Presoak Time:	9:00

Time	Reading	Increment Drop
1:00	14 3/16	—
1:05	17 15/16	3 13/16
1:10	20 12/16	2 13/16
1:15	22 13/16	2 1/16
1:20	24 6/16	1 9/16
1:25	25 9/16	1 3/16
1:30	26 9/16	1
1:35	12 13/16	—
1:40	16 3/16	3 6/16
1:45	18 3/16	2
1:50	20 3/16	2
1:55	21 15/16	1 12/16
2:00	23 6/16	1 7/16
2:05	24 6/16	1 4/16
2:10	25 12/16	1 2/16
2:15	26 14/16	1 2/16

Minimum Uniform Drop:
12/16 Inches in 5 Minutes

Percolation Rate:
1" Drop in 4.4 Minutes

13.5 in/hr

NORTHEAST CORNER PARCEL B

Hole ID:	6
Depth:	29
Diameter:	11
Presoak Time:	9:00

Time	Reading	Increment Drop
1:03	9 5/16	—
1:08	12 12/16	3 7/16
1:13	14 13/16	2 1/16
1:18	16 6/16	1 9/16
1:23	17 13/16	1 7/16
1:28	19 1/16	1 4/16
1:33	20 5/16	1 4/16
1:38	21 6/16	1 1/16
1:43	22 6/16	1
1:48	23 6/16	1
1:53	24 5/16	15/16
1:58	25 4/16	15/16
2:03	26 2/16	14/16
2:08	27	14/16
2:13	27 14/16	14/16

Minimum Uniform Drop:
14/16 Inches in 5 Minutes

Percolation Rate:
1" Drop in 5.7 Minutes

10.5 in/hr

REDNISS & MEAD

Appendix C
Stormwater Calculations

APPENDIX TABLE NO. 4

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

EXISTING TIME OF CONCENTRATION (OR TRAVEL TIME)

				WATERSHED/ SUBBASIN ID		
				A	B	C
SHEET FLOW						
1.	Surface Description (See Table Below) [1]			6	6	6
2.	Mannings Roughness Coefficient	n		0.24	0.24	0.24
3.	Flow Length (Total L≤100FT)	L	ft	100	100	100
4.	2-YR 24-HR Rainfall [2]	P_2	in	3.50	3.50	3.50
5.	Land Slope	s	ft/ft	0.03	0.02	0.05
6.	Travel Time $Tt = (0.007(nL)^{0.8})/(P_2^{0.5} * s^{0.4})$	T_t	hr	0.19	0.23	0.16
SHALLOW CONCENTRATED FLOW						
7.	Surface Description (paved or unpaved)			unpaved	unpaved	unpaved
8.	Flow Length	L	ft	60	125	120
9.	Watercourse Slope	s	ft/ft	0.10	0.07	0.07
10.	Average Velocity [3]	V	ft/s	5.0	4.2	4.2
11.	$Tt = L / 3600V$	T_t	hr	0.00	0.01	0.01
CHANNEL FLOW						
12.	Cross Sectional Flow Area	a	ft^2	0.41	1.23	0.50
13.	Wetted Perimeter	p_w	ft	3.05	3.93	2.00
14.	Hydraulic Radius, $r = a/p_w$	r	ft	0.13	0.31	0.25
15.	Channel Slope	s	ft/ft	0.025	0.01	0.02
16.	Manning's Roughness Coefficient [4]	n		0.011	0.011	0.150
17.	Velocity = $(1.49r^{2/3}s^{1/2})/n$	V	ft/s	5.62	6.24	0.56
18.	Flow Length	L	ft	160	80	300
19.	$Tt = L / 3600V$	T_t	hr	0.01	0.00	0.15
TOTAL WATERSHED Tc		T_c	hr	0.20	0.24	0.32

	ROUGHNESS COEFFICIENTS (Manning's n) FOR SHEET FLOW [1]	
1	Smooth (conc, asphalt, gravel, bare soil)	0.011
2	Fallow (no residue)	0.05
3	Cultivated Soils, Residue Cover ≤ 20%	0.06
4	Cultivated Soils, Residue Cover > 20%	0.17
5	Short Grass Prairie	0.15
6	Dense Grass	0.24
7	Bermuda Grass	0.41
8	Range (natural)	0.13
9	Woods (light)	0.4

1 Table 3-1. - Roughness coefficients (Manning's n) for SHEET FLOW, TR-55 Urban Hydrology for Small Watersheds, page 3-3.
2 Town of Westport rainfall depth used for 2-year and 25-year storm
3 Figure 3-1. - Average velocities for estimating travel time for shallow concentrated flow, TR-55 Urban Hydrology forSmall Watersheds, page 3-2.
4 Roughness coefficients (Manning's n) for CHANNEL FLOW. See Handbook of Hydraulics or equal.

APPENDIX TABLE NO. 5

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

DEVELOPED TIME OF CONCENTRATION (OR TRAVEL TIME)

				WATERSHED/ SUBBASIN ID
				BB-6
SHEET FLOW				
1.	Surface Description (See Table Below) [1]			6
2.	Mannings Roughness Coefficient	n		0.24
3.	Flow Length (Total L≤100FT)	L	ft	80
4.	2-YR 24-HR Rainfall [2]	P_2	in	3.50
5.	Land Slope	s	ft/ft	0.03
6.	Travel Time			
	$Tt = (0.007(nL)^{0.8})/(P_2^{0.5} * s^{0.4})$	T_t	hr	0.17
SHALLOW CONCENTRATED FLOW				
7.	Surface Description (paved or unpaved)			unpaved
8.	Flow Length	L	ft	40
9.	Watercourse Slope	s	ft/ft	0.20
10.	Average Velocity [3]	V	ft/s	7.00
11.	Tt = L / 3600V	T_t	hr	0.00
CHANNEL FLOW				
12.	Cross Sectional Flow Area	a	ft^2	0
13.	Wetted Perimeter	p_w	ft	0
14.	Hydraulic Radius, r = a/p_w	r	ft	0
15.	Channel Slope	s	ft/ft	0.00
16.	Manning's Roughness Coefficient [4]	n		0
17.	Velocity = $(1.49r^{2/3}s^{1/2})/n$	V	ft/s	0.00
18.	Flow Length	L	ft	0
19.	Tt = L / 3600V	T_t	hr	0.00
TOTAL WATERSHED Tc		T_c	hr	**0.18**

ROUGHNESS COEFFICIENTS (Manning's n) FOR SHEET FLOW [1]		
1	Smooth (conc, asphalt, gravel, bare soil)	0.011
2	Fallow (no residue)	0.05
3	Cultivated Soils, Residue Cover ≤ 20%	0.06
4	Cultivated Soils, Residue Cover > 20%	0.17
5	Short Grass Prairie	0.15
6	Dense Grass	0.24
7	Bermuda Grass	0.41
8	Range (natural)	0.13
9	Woods (light & dense)	0.4

1 Table 3-1. - Roughness coefficients (Manning's n) for SHEET FLOW, TR-55 Urban Hydrology for Small Watersheds, page 3-3.
2 Town of Westport rainfall depth used for 2-year and 25-year storm
3 Figure 3-1. - Average velocities for estimating travel time for shallow concentrated flow, TR-55 Urban Hydrology forSmall Watersheds, page 3-2.
4 Roughness coefficients (Manning's n) for CHANNEL FLOW. See Handbook of Hydraulics or equal.
5 The minimum time of concentration of 5 minutes was used for developed watersheds.

APPENDIX TABLE NO. 6

THE VILLAGE AT SAUGATUCK
WESTPORT CONNECTICUT

Connecticut DEP Stormwater Calcluations

1. Water Quality Volume
   a. Compute Volumetric Runoff Coefficient, R
      R = 0.05+0.009(I)

I	63	Percent Impervious
R	0.62	Runoff Coefficient

   b. Compute Water Quality Volume, WQV
      WQV = (1")(R)(A)/12

A	6.08	Acres
WQV	**0.31**	**ac-ft**

2. Groundwater Recharge Volume
   a. Read Runoff Depth to be Recharged, D

D	0.25 in	(B Soils)

   b. Compute Net Increase in Site Impervious

Ipro	63	percent
Iex	18	percent
I	45	percent

   c. Compute Groundwater Recharge Volume, GRV
      GRV = (D)(A)(I)/12

GRV	**0.057**	**ac-ft**
	2,496	cf

3. Westport Requirement
   Store 1" of Runoff from New Impervious Surfaces

Ipro	3.86 ac	
Iex	0 ac	(Pre-development meadow condtions)
I	3.86 ac	Increase in Impervious Cover
Vol=	1"*3.86ac*1'/12"	
Vol=	**0.32**	**ac-ft**

APPENDIX TABLE NO. 7

THE VILLAGE AT SAUGATUCK
WESTPORT CONNECTICUT

Stormwater Measures Provided Summary Table

	Water Quality Volume (1 Inch in) ac-ft	Water Quality Flow (1 Inch in) cfs	Groundwater Recharge Volume (Storage Below Discharge) ac-ft	Runoff Capture Volume (Total Storage Volume) ac-ft	Peak Runoff Attenuation (25-Year) cfs
AA-1 Infiltration	0.012	0.14	0.062	0.091	0.88
AA-1-1 Rain Garden	0.002		0.002	0.002	
AA-2-1 Infiltration Trench	0.001	0.01	0.001	0.001	0.07
AA-3 Infiltration Trench	0.000	0.00	0.001	0.002	0.45
BB-1 Infiltration	0.023	0.28	0.075	0.096	1.94
BB-2 Basin	0.024	0.30	0.120	0.183	0.19
BB-2-1 Rain Garden	0.006		0.006	0.006	
BB-2-2 Rain Garden	0.003		0.003	0.003	
BB-2-3 Rain Garden	0.002		0.002	0.002	
BB-3 Infiltration	0.037	0.45	0.111	0.237	1.04
BB-3-1 Rain Garden	0.006		0.006	0.006	
BB-3-2 Rain Garden	0.003		0.003	0.003	
BB-4 Basin	0.090	0.11	0.048	0.087	0.61
BB-5 Basin	0.015	0.18	0.028	0.095	1.59
Total Provided	**0.223**	**1.47**	**0.467**	**0.813**	**6.77**

APPENDIX TABLE NO. 8

THE VILLAGE AT SAUGATUCK
WESTPORT CONNECTICUT

Green Infrastructure Summary

CT DEP Minimum Required Groundwater Recharge Volume:
2,496 cf

Westport 1" Runoff Storage Requirement:
1 Inch Runoff
3.86 ac impervious
14,012 cf

Measure	Quantity	Infiltration Storage Volume (Storage Below Discharge) cf	Total Storage Volume Provided cf
Rain Gardens	6	903	903
Infiltration Trench	2	101	144
Infiltration Chambers	3	10,803	18,469
Stormwater Basins	3	8,538	15,899
Total	14	**20,344**	**35,415**
		(0.45 ac-ft)	**(0.78 ac-ft)**

The Westport 1" Runoff Storage requirement of 14,012 cf is met with the 20,344 cf of storage provided below the discharge. The minimum CT DEP storage of groundwater recharge volume is also met.

Additional Green Infrasturcture Measures that do not include a storage volume are summarized below.

Measure	Area sf
Green Roof	11,000
Wetland Buffer Planting	27,000
Total	**38,000**

APPENDIX TABLE NO. 9

THE VILLAGE AT SAUGATUCK
WESTPORT CONNECTICUT

Westport and Connecticut DEP Stormwater Compliance Summary

Requirement			Proposed[4]		
Code	Description	Quantity[1]	Quantity	Stormwater Measures	Calculation Method
Conecticut[2]					
2004 CSQM, 7.5.1 Groundwater Recharge Volume	Groundwater Recharge Volume - Infiltrate 0.25" runoff due to increase in impervious Cover	0.057 ac-ft (min.)	0.47 ac-ft	Infiltration Chambers, Dry Wells, Infiltration Basins, Rain Gardens	Combined volume of stormwater measures below outlet
2004 CSQM, 7.6.2 Conveyance Protection	Conveyance Protection - Reduce Peak Flow to Less than Pre-devlopment Condition for 10-Year Storm[3]	5.16 cfs (max.)	3.17 cfs	Infiltration Chambers, Dry Wells, Infiltration Basins	PondPack calculated peak runoff rate for 10-year storm
2004 CSQM, 7.6.3 Peak Runoff Attenuation	Peak Runoff Attenuation - Reduce Peak Flow to Less than Pre-devlopment Condition for 25-Year Storm[3]	9.09 cfs (max.)	7.74 cfs	Infiltration Chambers, Dry Wells, Infiltration Basins	PondPack calculated peak runoff rate for 25-year storm
Westport					
Westport Drainage Design Standards, 9/1/2006. Engineered Systems #4.	Stormwater Storage - Store 1" of Runoff from Impervious Surfaces Below Outlet	0.32 ac-ft (min.)	0.47 ac-ft	Infiltration Chambers, Dry Wells, Infiltration Basins, Rain Gardens	Combined storage volume of stormwater measures below outlet

(1) Minimimum or maximum required for this site. See Table No. 6 for calculations.
(2) 2004 Connecticut Stormwater Quality Manual
(3) For pre-development runoff rates the Westport "Meadow Conditions" were used.
(4) Calculations for the entire site. For discharge rates at each design point see Table No. 3.

APPENDIX TABLE NO. 10

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

LEVEL SPREADER / BASIN OVERFLOW CALCULATIONS

	Wier		Water			
Outlet ID	Length	Elevation	Elevation	Depth	Qpeak25	Velocity
	(ft)	(ft)	(ft)	(in)	(cfs)	(ft/s)
BB-1 Level	70	14.60	14.64	0.48	1.94	0.69
BB-2 Basin	8	17.00	17.02	0.24	0.19	1.19
BB-3 Level	70	13.50	13.54	0.48	2.21	0.79
BB-4 Basin	20	13.25	13.29	0.48	0.61	0.76

Appendix D
Extreme Precipitation Tables

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Connecticut
Location	
Longitude	73.381 degrees West
Latitude	41.117 degrees North
Elevation	Unknown/Unavailable
Date/Time	Wed, 30 Nov 2016 09:12:09 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.51	0.63	0.83	1.04	1.30	**1yr**	0.90	1.22	1.49	1.85	2.30	2.85	3.18	**1yr**	2.52	3.06	3.49	4.21	4.89	**1yr**
2yr	0.40	0.61	0.76	1.01	1.27	1.59	**2yr**	1.09	1.49	1.83	2.26	2.79	3.45	3.83	**2yr**	3.05	3.69	4.23	5.04	5.69	**2yr**
5yr	0.47	0.73	0.91	1.22	1.56	1.98	**5yr**	1.35	1.84	2.29	2.84	3.50	4.31	4.84	**5yr**	3.81	4.66	5.38	6.32	7.09	**5yr**
10yr	0.52	0.82	1.04	1.41	1.83	2.34	**10yr**	1.58	2.17	2.71	3.37	4.16	5.10	5.78	**10yr**	4.51	5.56	6.45	7.51	8.39	**10yr**
25yr	0.61	0.97	1.23	1.70	2.27	2.92	**25yr**	1.96	2.70	3.40	4.24	5.23	6.37	7.31	**25yr**	5.64	7.03	8.22	9.43	10.46	**25yr**
50yr	0.69	1.10	1.41	1.98	2.66	3.46	**50yr**	2.30	3.18	4.03	5.04	6.20	7.55	8.73	**50yr**	6.68	8.39	9.87	11.21	12.37	**50yr**
100yr	0.78	1.26	1.62	2.30	3.14	4.10	**100yr**	2.71	3.76	4.79	5.99	7.36	8.94	10.43	**100yr**	7.91	10.03	11.87	13.32	14.64	**100yr**
200yr	0.88	1.44	1.86	2.67	3.69	4.86	**200yr**	3.19	4.44	5.70	7.12	8.75	10.60	12.46	**200yr**	9.38	11.99	14.28	15.84	17.32	**200yr**
500yr	1.05	1.73	2.26	3.28	4.60	6.09	**500yr**	3.97	5.54	7.15	8.95	10.98	13.28	15.79	**500yr**	11.75	15.18	18.24	19.91	21.65	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.41	0.49	0.67	0.82	1.01	**1yr**	0.71	0.99	1.32	1.65	2.03	2.43	2.81	**1yr**	2.15	2.70	2.93	3.71	4.32	**1yr**
2yr	0.38	0.59	0.73	0.99	1.22	1.48	**2yr**	1.05	1.44	1.70	2.18	2.73	3.35	3.71	**2yr**	2.96	3.57	4.08	4.86	5.54	**2yr**
5yr	0.43	0.66	0.82	1.13	1.44	1.74	**5yr**	1.24	1.71	1.99	2.58	3.24	3.99	4.47	**5yr**	3.53	4.30	4.94	5.76	6.47	**5yr**
10yr	0.47	0.72	0.89	1.25	1.62	1.98	**10yr**	1.39	1.93	2.24	2.94	3.69	4.52	5.16	**10yr**	4.00	4.96	5.71	6.52	7.27	**10yr**
25yr	0.52	0.79	0.99	1.41	1.85	2.32	**25yr**	1.60	2.27	2.62	3.48	4.39	5.28	6.26	**25yr**	4.68	6.02	6.96	7.62	8.36	**25yr**
50yr	0.56	0.85	1.06	1.53	2.06	2.61	**50yr**	1.78	2.55	2.97	3.96	5.02	5.93	7.26	**50yr**	5.25	6.98	8.15	8.59	9.24	**50yr**
100yr	0.61	0.92	1.15	1.66	2.28	2.93	**100yr**	1.97	2.87	3.34	4.52	5.72	6.65	8.45	**100yr**	5.89	8.13	9.57	9.69	10.27	**100yr**
200yr	0.66	0.99	1.26	1.82	2.54	3.29	**200yr**	2.19	3.22	3.76	5.16	6.56	7.41	9.88	**200yr**	6.56	9.50	11.30	10.92	11.33	**200yr**
500yr	0.73	1.09	1.40	2.04	2.90	3.83	**500yr**	2.50	3.74	4.39	6.17	7.86	8.60	12.19	**500yr**	7.61	11.72	14.19	12.72	13.09	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.56	0.69	0.92	1.14	1.38	**1yr**	0.98	1.35	1.59	2.05	2.54	3.11	3.53	**1yr**	2.75	3.40	3.85	4.70	5.20	**1yr**
2yr	0.42	0.65	0.80	1.08	1.34	1.58	**2yr**	1.15	1.55	1.81	2.32	2.90	3.67	3.99	**2yr**	3.25	3.84	4.41	5.31	5.95	**2yr**
5yr	0.51	0.79	0.98	1.34	1.71	2.04	**5yr**	1.47	2.00	2.36	3.01	3.73	4.61	5.30	**5yr**	4.08	5.10	5.85	6.91	7.69	**5yr**
10yr	0.61	0.93	1.16	1.62	2.09	2.48	**10yr**	1.80	2.43	2.89	3.66	4.52	5.57	6.54	**10yr**	4.93	6.29	7.29	8.51	9.42	**10yr**
25yr	0.78	1.18	1.47	2.10	2.76	3.24	**25yr**	2.38	3.17	3.79	4.76	5.83	7.22	8.62	**25yr**	6.39	8.29	9.68	11.24	12.29	**25yr**
50yr	0.93	1.42	1.76	2.54	3.41	3.96	**50yr**	2.95	3.88	4.67	5.81	7.08	8.80	10.61	**50yr**	7.79	10.21	11.97	13.88	15.02	**50yr**
100yr	1.13	1.70	2.13	3.08	4.22	4.86	**100yr**	3.64	4.75	5.75	7.11	8.63	10.71	13.04	**100yr**	9.48	12.54	14.78	17.12	18.37	**100yr**
200yr	1.36	2.05	2.60	3.76	5.25	5.96	**200yr**	4.53	5.82	7.08	8.68	10.50	13.04	16.03	**200yr**	11.54	15.41	18.19	21.14	22.52	**200yr**
500yr	1.77	2.63	3.38	4.91	6.99	7.83	**500yr**	6.03	7.65	9.35	11.32	13.60	16.96	21.02	**500yr**	15.01	20.21	23.94	27.95	29.47	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Appendix E
Infiltration Chambers

Project:

Chamber Model -	SC-740	
Units -	Imperial	Click Here for Metric
	AA-1	
Number of chambers -	49	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	17.00	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	6	in
Area of system -	1845	sf Min. Area - 1656 sf min. area

StormTech
Detention • Retention • Water Quality
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☑ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Total Chamber (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch & St (cubic feet)	Cumulative Chamber (cubic feet)	Elevation (feet)
42	0.00	0.00	61.50	61.50	3933.95	20.50
41	0.00	0.00	61.50	61.50	3872.45	20.42
40	0.00	0.00	61.50	61.50	3810.95	20.33
39	0.00	0.00	61.50	61.50	3749.45	20.25
38	0.00	0.00	61.50	61.50	3687.95	20.17
37	0.00	0.00	61.50	61.50	3626.45	20.08
36	0.05	2.69	60.42	63.12	3564.95	20.00
35	0.16	7.98	58.31	66.29	3501.84	19.92
34	0.28	13.82	55.97	69.79	3435.55	19.83
33	0.60	29.59	49.66	79.26	3365.76	19.75
32	0.80	39.28	45.79	85.07	3286.50	19.67
31	0.95	46.58	42.87	89.45	3201.43	19.58
30	1.07	52.65	40.44	93.09	3111.98	19.50
29	1.18	57.84	38.36	96.21	3018.89	19.42
28	1.27	62.02	36.69	98.71	2922.69	19.33
27	1.36	66.40	34.94	101.34	2823.97	19.25
26	1.45	71.25	33.00	104.25	2722.64	19.17
25	1.52	74.71	31.62	106.33	2618.39	19.08
24	1.58	77.53	30.49	108.02	2512.06	19.00
23	1.64	80.47	29.31	109.78	2404.04	18.92
22	1.70	83.28	28.19	111.47	2294.26	18.83
21	1.75	85.89	27.14	113.04	2182.79	18.75
20	1.80	88.34	26.16	114.50	2069.75	18.67
19	1.85	90.89	25.14	116.04	1955.25	18.58
18	1.89	92.76	24.40	117.16	1839.22	18.50
17	1.93	94.77	23.59	118.36	1722.06	18.42
16	1.97	96.77	22.79	119.56	1603.70	18.33
15	2.01	98.49	22.11	120.59	1484.13	18.25
14	2.04	100.20	21.42	121.62	1363.54	18.17
13	2.07	101.67	20.83	122.50	1241.92	18.08
12	2.10	103.14	20.24	123.38	1119.42	18.00
11	2.13	104.46	19.72	124.17	996.03	17.92
10	2.15	105.54	19.28	124.82	871.86	17.83
9	2.18	106.68	18.83	125.51	747.03	17.75
8	2.20	107.72	18.41	126.13	621.53	17.67
7	2.21	108.16	18.24	126.40	495.40	17.58
6	0.00	0.00	61.50	61.50	369.00	17.50
5	0.00	0.00	61.50	61.50	307.50	17.42
4	0.00	0.00	61.50	61.50	246.00	17.33
3	0.00	0.00	61.50	61.50	184.50	17.25
2	0.00	0.00	61.50	61.50	123.00	17.17
1	0.00	0.00	61.50	61.50	61.50	17.08

Pond Pack Entry Data

Depth (feet	*Elevation*	*Area (feet2)*
0.00	17.00	738.00
0.08		738.00
0.17		738.00
0.25		738.00
0.33		738.00
0.42		738.00
0.50	17.50	738.00
0.58	17.58	1516.74
0.67		1513.58
0.75		1506.07
0.83		1497.88
0.92		1490.10
1.00	18.00	1480.61
1.08		1470.05
1.17		1459.47
1.25		1447.10
1.33		1434.78
1.42		1420.32
1.50	18.50	1405.88
1.58		1392.44
1.67		1374.03
1.75		1356.43
1.83		1337.59
1.92		1317.40
2.00	19.00	1296.24
2.08		1275.92
2.17		1251.01
2.25		1216.05
2.33		1184.52
2.42		1154.48
2.50	19.50	1117.09
2.58		1073.40
2.67		1020.84
2.75		951.08
2.83		837.47
2.92		795.48
3.00	20.00	757.40
3.08		738.00
3.17		738.00
3.25		738.00
3.33		738.00
3.42		738.00
3.50	20.50	738.00

Project:

Chamber Model -	SC-740	
Units -	Imperial	Click Here for Metric
	BB-1	
Number of chambers -	52	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	14.00	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	6	in
Area of system -	1927	sf Min. Area - 1758 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Total Chamber (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch & St (cubic feet)	Cumulative Chamber (cubic feet)	Elevation (feet)
42	0.00	0.00	64.23	64.23	4131.47	17.50
41	0.00	0.00	64.23	64.23	4067.23	17.42
40	0.00	0.00	64.23	64.23	4003.00	17.33
39	0.00	0.00	64.23	64.23	3938.77	17.25
38	0.00	0.00	64.23	64.23	3874.53	17.17
37	0.00	0.00	64.23	64.23	3810.30	17.08
36	0.05	2.86	63.09	65.95	3746.07	17.00
35	0.16	8.47	60.84	69.32	3680.12	16.92
34	0.28	14.66	58.37	73.03	3610.80	16.83
33	0.60	31.41	51.67	83.08	3537.77	16.75
32	0.80	41.69	47.56	89.25	3454.69	16.67
31	0.95	49.43	44.46	93.89	3365.45	16.58
30	1.07	55.87	41.88	97.76	3271.55	16.50
29	1.18	61.39	39.68	101.06	3173.79	16.42
28	1.27	65.81	37.91	103.72	3072.73	16.33
27	1.36	70.46	36.05	106.51	2969.01	16.25
26	1.45	75.61	33.99	109.60	2862.50	16.17
25	1.52	79.29	32.52	111.80	2752.90	16.08
24	1.58	82.28	31.32	113.60	2641.09	16.00
23	1.64	85.40	30.07	115.47	2527.49	15.92
22	1.70	88.37	28.88	117.26	2412.02	15.83
21	1.75	91.15	27.77	118.92	2294.76	15.75
20	1.80	93.75	26.73	120.48	2175.83	15.67
19	1.85	96.46	25.65	122.11	2055.35	15.58
18	1.89	98.44	24.86	123.30	1933.24	15.50
17	1.93	100.57	24.01	124.57	1809.95	15.42
16	1.97	102.70	23.15	125.85	1685.37	15.33
15	2.01	104.52	22.43	126.94	1559.52	15.25
14	2.04	106.34	21.70	128.04	1432.58	15.17
13	2.07	107.90	21.07	128.97	1304.54	15.08
12	2.10	109.46	20.45	129.91	1175.57	15.00
11	2.13	110.85	19.89	130.75	1045.66	14.92
10	2.15	112.00	19.43	131.43	914.92	14.83
9	2.18	113.21	18.95	132.16	783.48	14.75
8	2.20	114.31	18.51	132.82	651.32	14.67
7	2.21	114.78	18.32	133.10	518.50	14.58
6	0.00	0.00	64.23	64.23	385.40	14.50
5	0.00	0.00	64.23	64.23	321.17	14.42
4	0.00	0.00	64.23	64.23	256.93	14.33
3	0.00	0.00	64.23	64.23	192.70	14.25
2	0.00	0.00	64.23	64.23	128.47	14.17
1	0.00	0.00	64.23	64.23	64.23	14.08

Pond Pack Entry Data

Depth (feet	Elevation	Area (feet2)
0.00	14.00	770.80
0.08		770.80
0.17		770.80
0.25		770.80
0.33		770.80
0.42		770.80
0.50	14.50	770.80
0.58	14.58	1597.22
0.67		1593.86
0.75		1585.89
0.83		1577.20
0.92		1568.94
1.00	15.00	1558.88
1.08		1547.67
1.17		1536.44
1.25		1523.31
1.33		1510.24
1.42		1494.89
1.50	15.50	1479.57
1.58		1465.31
1.67		1445.77
1.75		1427.10
1.83		1407.10
1.92		1385.67
2.00	16.00	1363.22
2.08		1341.66
2.17		1315.21
2.25		1278.12
2.33		1244.66
2.42		1212.78
2.50	16.50	1173.10
2.58		1126.73
2.67		1070.96
2.75		996.92
2.83		876.36
2.92		831.80
3.00	17.00	791.39
3.08		770.80
3.17		770.80
3.25		770.80
3.33		770.80
3.42		770.80
3.50	17.50	770.80

Project:

Chamber Model -	SC-740	
Units -	Imperial	Click Here for Metric
	BB-3	
Number of chambers -	131	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	17.00	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	6	in
Area of system -	4641	sf Min. Area - 4428 sf min. area

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☑ Include Perimeter Stone in Calculations

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Total Chamber (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch & St (cubic feet)	Cumulative Chamber (cubic feet)	Elevation (feet)
42	0.00	0.00	154.70	154.70	10109.14	20.50
41	0.00	0.00	154.70	154.70	9954.44	20.42
40	0.00	0.00	154.70	154.70	9799.74	20.33
39	0.00	0.00	154.70	154.70	9645.04	20.25
38	0.00	0.00	154.70	154.70	9490.34	20.17
37	0.00	0.00	154.70	154.70	9335.64	20.08
36	0.05	7.20	151.82	159.02	9180.94	20.00
35	0.16	21.34	146.16	167.51	9021.91	19.92
34	0.28	36.93	139.93	176.86	8854.41	19.83
33	0.60	79.12	123.05	202.17	8677.55	19.75
32	0.80	105.02	112.69	217.71	8475.38	19.67
31	0.95	124.54	104.88	229.42	8257.66	19.58
30	1.07	140.76	98.40	239.16	8028.24	19.50
29	1.18	154.64	92.84	247.49	7789.08	19.42
28	1.27	165.80	88.38	254.18	7541.60	19.33
27	1.36	177.51	83.70	261.20	7287.41	19.25
26	1.45	190.49	78.51	268.99	7026.21	19.17
25	1.52	199.74	74.80	274.54	6757.22	19.08
24	1.58	207.28	71.79	279.07	6482.67	19.00
23	1.64	215.14	68.64	283.78	6203.60	18.92
22	1.70	222.64	65.65	288.28	5919.82	18.83
21	1.75	229.63	62.85	292.48	5631.54	18.75
20	1.80	236.17	60.23	296.40	5339.06	18.67
19	1.85	243.00	57.50	300.50	5042.66	18.58
18	1.89	247.99	55.50	303.50	4742.15	18.50
17	1.93	253.35	53.36	306.71	4438.66	18.42
16	1.97	258.72	51.21	309.93	4131.94	18.33
15	2.01	263.30	49.38	312.68	3822.01	18.25
14	2.04	267.89	47.54	315.44	3509.33	18.17
13	2.07	271.82	45.97	317.79	3193.89	18.08
12	2.10	275.74	44.40	320.15	2876.10	18.00
11	2.13	279.27	42.99	322.26	2555.96	17.92
10	2.15	282.15	41.84	323.99	2233.70	17.83
9	2.18	285.19	40.62	325.82	1909.70	17.75
8	2.20	287.98	39.51	327.49	1583.89	17.67
7	2.21	289.16	39.04	328.20	1256.40	17.58
6	0.00	0.00	154.70	154.70	928.20	17.50
5	0.00	0.00	154.70	154.70	773.50	17.42
4	0.00	0.00	154.70	154.70	618.80	17.33
3	0.00	0.00	154.70	154.70	464.10	17.25
2	0.00	0.00	154.70	154.70	309.40	17.17
1	0.00	0.00	154.70	154.70	154.70	17.08

Pond Pack Entry Data

Depth (feet	*Elevation*	*Area (feet2)*
0.00	17.00	1856.40
0.08		1856.40
0.17		1856.40
0.25		1856.40
0.33		1856.40
0.42		1856.40
0.50	17.50	1856.40
0.58	17.58	3938.35
0.67		3929.89
0.75		3909.80
0.83		3887.92
0.92		3867.11
1.00	18.00	3841.75
1.08		3813.50
1.17		3785.24
1.25		3752.16
1.33		3719.22
1.42		3680.55
1.50	18.50	3641.96
1.58		3606.04
1.67		3556.81
1.75		3509.76
1.83		3459.38
1.92		3405.40
2.00	19.00	3348.85
2.08		3294.52
2.17		3227.91
2.25		3134.45
2.33		3050.17
2.42		2969.84
2.50	19.50	2869.88
2.58		2753.07
2.67		2612.58
2.75		2426.06
2.83		2122.33
2.92		2010.07
3.00	20.00	1908.27
3.08		1856.40
3.17		1856.40
3.25		1856.40
3.33		1856.40
3.42		1856.40
3.50	20.50	1856.40

StormTech SC-740 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management℠

StormTech SC-740 Chamber
(not to scale)

Nominal Chamber Specifications

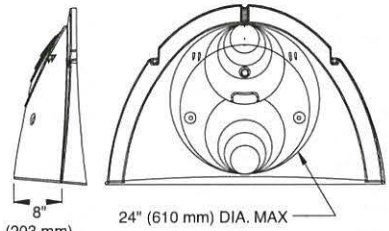
Size (L x W x H)
85.4" x 51.0" x 30.0"
(2170 x 1295 x 762 mm)

Chamber Storage
45.9 ft³ (1.30 m³)

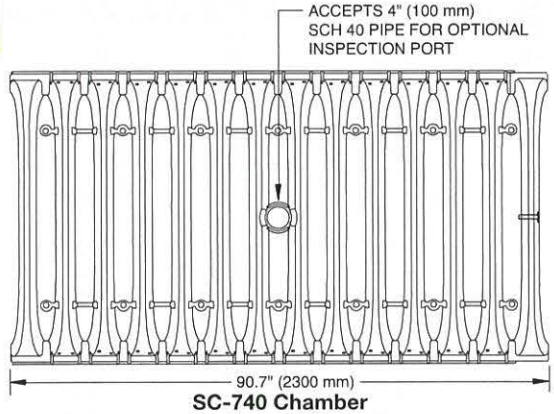
Minimum Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

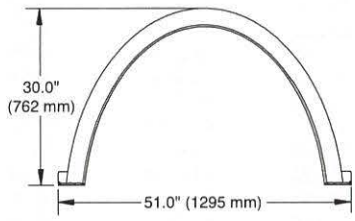
Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

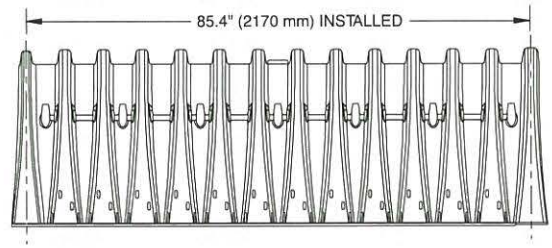


SC-740 End Cap

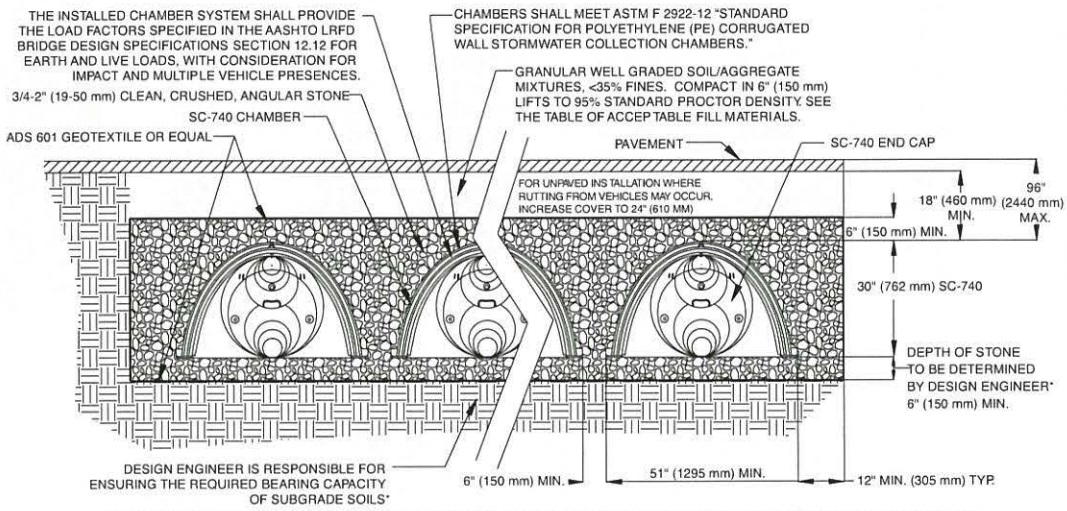


SC-740 Chamber





Typical Cross Section Detail
(not to scale)



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

MADE IN THE U.S.A.

SC-740 Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (152 mm) Stone Base Under the Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage Ft³ (m³)	Total System Cumulative Storage Ft³ (m³)
42 (1067)	45.90 (1.300)	74.90 (2.121)
41 (1041)	45.90 (1.300)	73.77 (2.089)
40 (1016)	Stone 45.90 (1.300)	72.64 (2.057)
39 (991)	Cover 45.90 (1.300)	71.52 (2.025)
38 (965)	45.90 (1.300)	70.39 (1.993)
37 (948)	45.90 (1.300)	69.26 (1.961)
36 (914)	45.90 (1.300)	68.14 (1.929)
35 (889)	45.85 (1.298)	66.98 (1.897)
34 (864)	45.69 (1.294)	65.75 (1.862)
33 (838)	45.41 (1.286)	64.46 (1.825)
32 (813)	44.81 (1.269)	62.97 (1.783)
31 (787)	44.01 (1.246)	61.36 (1.737)
30 (762)	43.06 (1.219)	59.66 (1.689)
29 (737)	41.98 (1.189)	57.89 (1.639)
28 (711)	40.80 (1.155)	56.05 (1.587)
27 (686)	39.54 (1.120)	54.17 (1.534)
26 (660)	38.18 (1.081)	52.23 (1.479)
25 (635)	36.74 (1.040)	50.23 (1.422)
24 (610)	35.22 (0.977)	48.19 (1.365)
23 (584)	33.64 (0.953)	46.11 (1.306)
22 (559)	31.99 (0.906)	44.00 (1.246)
21 (533)	30.29 (0.858)	41.85 (1.185)
20 (508)	28.54 (0.808)	39.67 (1.123)
19 (483)	26.74 (0.757)	37.47 (1.061)
18 (457)	24.89 (0.705)	35.23 (0.997)
17 (432)	23.00 (0.651)	32.96 (0.939)
16 (406)	21.06 (0.596)	30.68 (0.869)
15 (381)	19.09 (0.541)	28.36 (0.803)
14 (356)	17.08 (0.484)	26.03 (0.737)
13 (330)	15.04 (0.426)	23.68 (0.670)
12 (305)	12.97 (0.367)	21.31 (0.608)
11 (279)	10.87 (0.309)	18.92 (0.535)
10 (254)	8.74 (0.247)	16.51 (0.468)
9 (229)	6.58 (0.186)	14.09 (0.399)
8 (203)	4.41 (0.125)	11.66 (0.330)
7 (178)	2.21 (0.063)	9.21 (0.264)
6 (152)	0	6.76 (0.191)
5 (127)	0	5.63 (0.160)
4 (102)	Stone Foundation 0	4.51 (0.125)
3 (76)	0	3.38 (0.095)
2 (51)	0	2.25 (0.064)
1 (25)	0	1.13 (0.032)

Note: Add 1.13 cu. ft. (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber

	Bare Chamber Storage	Chamber and Stone Stone Foundation Depth in. (mm)		
	ft³ (m³)	6 (150)	12 (305)	18 (460)
StormTech SC-740	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Storage volumes are in cubic feet per chamber. Assumes 40% porosity for the stone plus the chamber volume.

Amount of Stone Per Chamber

	Stone Foundation Depth		
ENGLISH TONS (CUBIC YARDS)	6"	12"	18"
StormTech SC-740	3.8 (2.8 yd³)	4.6 (3.3 yd³)	5.5 (3.9 yd³)
METRIC KILOGRAMS (METER³)	**150 mm**	**305 mm**	**460 mm**
StormTech SC-740	3450 (2.1 m³)	4170 (2.5 m³)	4490 (3.0 m³)

Note: Assumes 6" (150 mm) of stone above, and between chambers.

Volume of Excavation Per Chamber

	Stone Foundation Depth		
	6" (150 mm)	12" (305 mm)	18" (460 mm)
StormTech SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Volumes are in cubic yards (cubic meters) per chamber. Assumes 6" (150 mm) of separation between chamber rows and 18" (460 mm) of cover. The volume of excavation will vary as the depth of the cover increases.

STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and endplates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and endplates are collectively referred to as the "Products."

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.

(C) **THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANT-ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. **UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.**

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

(F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech's written installation instructions.

(G) **THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLECT; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH'S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. THIS LIMITED WARRANTY REPRESENTS STORMTECH'S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.**

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Appendix F-1
PondPack Modeling – Meadow Conditions

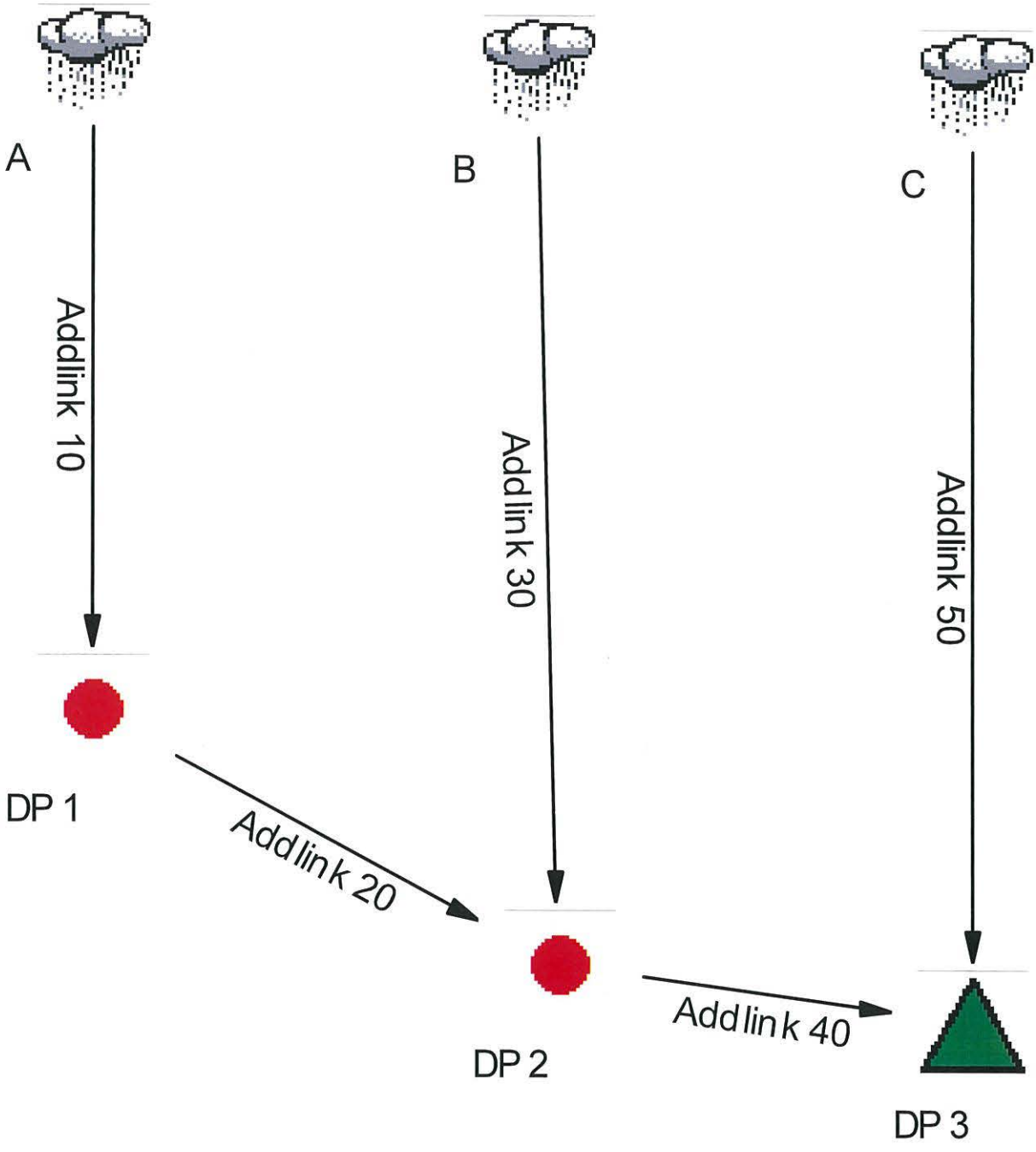

A
B
C
Addlink 10
Addlink 30
Addlink 50
DP 1
Addlink 20
DP 2
Addlink 40
DP 3

Table of Contents

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Westport 2016

Return Event	Total Depth in	Rainfall Type	RNF ID
1	2.8500	Synthetic Curve	TypeIII 24hr
2	3.5000	Synthetic Curve	TypeIII 24hr
10	5.1000	Synthetic Curve	TypeIII 24hr
25	6.4000	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
A	AREA	1	.014		12.3500	.07		
A	AREA	2	.028		12.2500	.19		
A	AREA	10	.076		12.2000	.73		
A	AREA	25	.126		12.1500	1.28		
B	AREA	1	.013		12.3500	.05		
B	AREA	2	.025		12.2500	.16		
B	AREA	10	.068		12.2000	.62		
B	AREA	25	.112		12.2000	1.10		
C	AREA	1	.088		12.5000	.38		
C	AREA	2	.176		12.3500	1.06		
C	AREA	10	.475		12.2500	3.89		
C	AREA	25	.781		12.2500	6.90		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
DP 1	JCT	1	.014		12.3500	.07		
DP 1	JCT	2	.028		12.2500	.19		
DP 1	JCT	10	.076		12.2000	.73		
DP 1	JCT	25	.126		12.1500	1.28		
DP 2	JCT	1	.027		12.4000	.12		
DP 2	JCT	2	.054		12.2500	.36		
DP 2	JCT	10	.145		12.2000	1.35		
DP 2	JCT	25	.238		12.2000	2.36		
*DP 3	JCT	1	.115		12.4500	.50		
*DP 3	JCT	2	.230		12.3500	1.40		
*DP 3	JCT	10	.620		12.2500	5.16		
*DP 3	JCT	25	1.019		12.2500	9.09		

Title... Project Date: 5/2/2018
Project Engineer: mshogren
Project Title: The Village at Suagatuck
Project Comments:
Assumed Pre-development Conditions of all meadow.
Westport, Connecticut

DESIGN STORMS SUMMARY

Design Storm File,ID = Westport 2016

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.8500 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.1000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 25

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 25 yr
Total Rainfall Depth= 6.4000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .2000 hrs

Total Tc: .2000 hrs

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .2400 hrs

==========
Total Tc: .2400 hrs
==========

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .3200 hrs

==========
Total Tc: .3200 hrs
==========

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	58	.750			58.00
COMPOSITE AREA & WEIGHTED CN --->		.750			58.00 (58)

RUNOFF CURVE NUMBER DATA

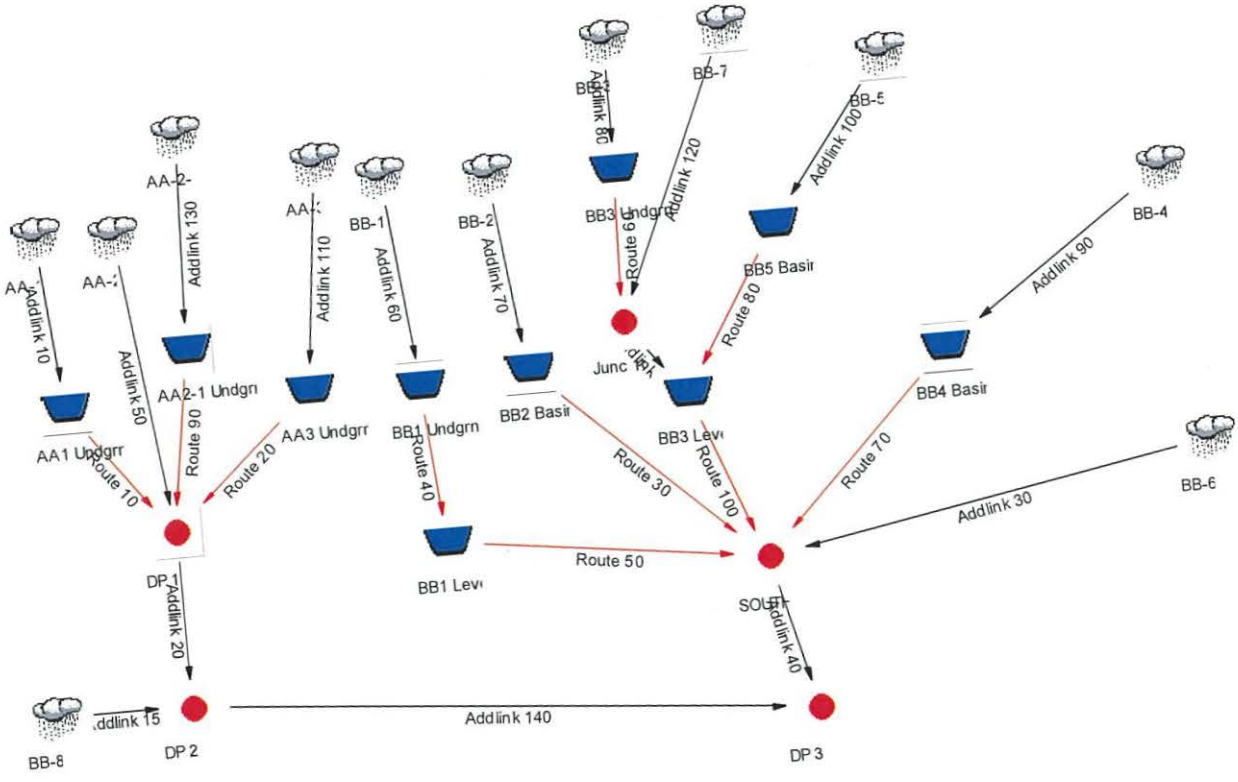
Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	58	.670			58.00
COMPOSITE AREA & WEIGHTED CN --->		.670			58.00 (58)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	58	4.660			58.00
COMPOSITE AREA & WEIGHTED CN --->		4.660			58.00 (58)

Index of Starting Page Numbers for ID Names

Appendix F-2
PondPack Modeling – Proposed Conditions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BB1 Undgrn
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BB3 Undgrn
BB5 Basir
BB4 Basir
BB1 Levi
Route 10
Route 90
Route 20
Route 40
Route 30
Route 100
Route 80
Route 70
Route 50
DP 1
DP 2
DP 3

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Westport 2016

Return Event	Total Depth in	Rainfall Type	RNF ID
1	2.8500	Synthetic Curve	TypeIII 24hr
2	3.5000	Synthetic Curve	TypeIII 24hr
10	5.1000	Synthetic Curve	TypeIII 24hr
25	6.4000	Synthetic Curve	TypeIII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AA-1	AREA	1	.079		12.1000	.96		
AA-1	AREA	2	.104		12.1000	1.26		
AA-1	AREA	10	.169		12.1000	1.99		
AA-1	AREA	25	.223		12.1000	2.57		
AA-2	AREA	1	.026		12.0900	.08		
AA-2	AREA	2	.029		12.1000	.12		
AA-2	AREA	10	.037		12.1000	.23		
AA-2	AREA	25	.045		12.1000	.33		
AA-2-1	AREA	1	.002		12.0200	.03		
AA-2-1	AREA	2	.003		12.0400	.04		
AA-2-1	AREA	10	.005		12.0200	.06		
AA-2-1	AREA	25	.007		12.0300	.07		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AA-3	AREA	1	.011		12.1100	.14		
AA-3	AREA	2	.016		12.1000	.20		
AA-3	AREA	10	.030		12.1000	.37		
AA-3	AREA	25	.042		12.1000	.52		
AA1 UNDGRND IN	POND	1	.079		12.1000	.96		
AA1 UNDGRND IN	POND	2	.104		12.1000	1.26		
AA1 UNDGRND IN	POND	10	.169		12.1000	1.99		
AA1 UNDGRND IN	POND	25	.223		12.1000	2.57		
AA1 UNDGRND OUT	POND	1	.000		6.8000	.00	18.02	.026
AA1 UNDGRND OUT	POND	2	.000		5.9000	.00	18.38	.039
AA1 UNDGRND OUT	POND	10	.010		12.6300	.12	19.47	.071
AA1 UNDGRND OUT	POND	25	.045		12.3400	.88	19.85	.080
AA2-1 UNDGRNDIN	POND	1	.002		12.0200	.03		
AA2-1 UNDGRNDIN	POND	2	.003		12.0400	.04		
AA2-1 UNDGRNDIN	POND	10	.005		12.0200	.06		
AA2-1 UNDGRNDIN	POND	25	.007		12.0300	.07		
AA2-1 UNDGRNDOUT	POND	1	.000		8.3700	.00	19.46	.001
AA2-1 UNDGRNDOUT	POND	2	.000		7.6500	.00	19.87	.001
AA2-1 UNDGRNDOUT	POND	10	.001		12.1200	.05	20.01	.001
AA2-1 UNDGRNDOUT	POND	25	.001		12.0500	.07	20.02	.001
AA3 UNDGRND IN	POND	1	.011		12.1100	.14		
AA3 UNDGRND IN	POND	2	.016		12.1000	.20		
AA3 UNDGRND IN	POND	10	.030		12.1000	.37		
AA3 UNDGRND IN	POND	25	.042		12.1000	.52		
AA3 UNDGRND OUT	POND	1	.000		10.6300	.00	20.07	.001
AA3 UNDGRND OUT	POND	2	.001		12.1600	.10	20.72	.002
AA3 UNDGRND OUT	POND	10	.007		12.1000	.31	20.77	.002
AA3 UNDGRND OUT	POND	25	.013		12.1000	.45	20.80	.002

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB-1	AREA	1	.123		12.1000	1.50		
BB-1	AREA	2	.162		12.1000	1.94		
BB-1	AREA	10	.260		12.1000	3.02		
BB-1	AREA	25	.341		12.1000	3.89		
BB-2	AREA	1	.120		12.1000	1.44		
BB-2	AREA	2	.156		12.1000	1.86		
BB-2	AREA	10	.248		12.1000	2.86		
BB-2	AREA	25	.324		12.1000	3.67		
BB-3	AREA	1	.211		12.1000	2.58		
BB-3	AREA	2	.279		12.1000	3.37		
BB-3	AREA	10	.453		12.1000	5.32		
BB-3	AREA	25	.597		12.1000	6.89		
BB-4	AREA	1	.068		12.1000	.84		
BB-4	AREA	2	.092		12.1000	1.13		
BB-4	AREA	10	.154		12.1000	1.86		
BB-4	AREA	25	.207		12.1000	2.44		
BB-5	AREA	1	.095		12.1000	1.17		
BB-5	AREA	2	.127		12.1000	1.54		
BB-5	AREA	10	.208		12.1000	2.46		
BB-5	AREA	25	.275		12.1000	3.20		
BB-6	AREA	1	.028		12.2400	.17		
BB-6	AREA	2	.051		12.1700	.43		
BB-6	AREA	10	.128		12.1600	1.33		
BB-6	AREA	25	.204		12.1500	2.22		
BB-7	AREA	1	.092	LR	12.1000	.18		
BB-7	AREA	2	.098	LR	12.1000	.26		
BB-7	AREA	10	.116	LR	12.1000	.49		
BB-7	AREA	25	.131	LR	12.1000	.68		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB-8		AREA	1	.005		12.1000	.05		
BB-8		AREA	2	.007		12.1100	.09		
BB-8		AREA	10	.016		12.1000	.20		
BB-8		AREA	25	.023		12.1000	.29		
BB1 LEVEL	IN	POND	1	.000		.0100	.00		
BB1 LEVEL	IN	POND	2	.000		.0100	.00		
BB1 LEVEL	IN	POND	10	.028		12.4200	.71		
BB1 LEVEL	IN	POND	25	.076		12.2200	1.94		
BB1 LEVEL	OUT	POND	1	.000		.0100	.00	14.50	.000
BB1 LEVEL	OUT	POND	2	.000		.0100	.00	14.50	.000
BB1 LEVEL	OUT	POND	10	.028		12.4300	.72	14.61	.000
BB1 LEVEL	OUT	POND	25	.076		12.2300	1.94	14.64	.000
BB1 UNDGRND	IN	POND	1	.123		12.1000	1.50		
BB1 UNDGRND	IN	POND	2	.162		12.1000	1.94		
BB1 UNDGRND	IN	POND	10	.260		12.1000	3.02		
BB1 UNDGRND	IN	POND	25	.341		12.1000	3.89		
BB1 UNDGRND	OUT	POND	1	.000		6.2100	.00	15.19	.034
BB1 UNDGRND	OUT	POND	2	.000		5.3000	.00	15.68	.051
BB1 UNDGRND	OUT	POND	10	.028		12.4200	.71	17.04	.087
BB1 UNDGRND	OUT	POND	25	.076		12.2200	1.94	17.45	.095
BB2 BASIN	IN	POND	1	.120		12.1000	1.44		
BB2 BASIN	IN	POND	2	.156		12.1000	1.86		
BB2 BASIN	IN	POND	10	.248		12.1000	2.86		
BB2 BASIN	IN	POND	25	.324		12.1000	3.67		
BB2 BASIN	OUT	POND	1	.000		5.6900	.00	14.38	.041
BB2 BASIN	OUT	POND	2	.000		4.8300	.00	14.97	.057
BB2 BASIN	OUT	POND	10	.000		3.5200	.00	16.20	.099
BB2 BASIN	OUT	POND	25	.002		12.5400	.19	17.02	.133

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB3 LEVEL IN	POND	1	.099	LR	12.1000	.18		
BB3 LEVEL IN	POND	2	.123	LR	12.4000	.45		
BB3 LEVEL IN	POND	10	.209	LR	12.1300	1.14		
BB3 LEVEL IN	POND	25	.349	LR	12.4300	2.21		
BB3 LEVEL OUT	POND	1	.098		12.1000	.18	13.50	.000
BB3 LEVEL OUT	POND	2	.123		12.4000	.45	13.51	.000
BB3 LEVEL OUT	POND	10	.209		12.1300	1.13	13.52	.000
BB3 LEVEL OUT	POND	25	.349		12.4300	2.21	13.54	.000
BB3 UNDGRND IN	POND	1	.211		12.1000	2.58		
BB3 UNDGRND IN	POND	2	.279		12.1000	3.37		
BB3 UNDGRND IN	POND	10	.453		12.1000	5.32		
BB3 UNDGRND IN	POND	25	.597		12.1000	6.89		
BB3 UNDGRND OUT	POND	1	.000		6.5700	.00	17.87	.055
BB3 UNDGRND OUT	POND	2	.000		5.6700	.00	18.19	.084
BB3 UNDGRND OUT	POND	10	.014		12.5100	.10	19.15	.163
BB3 UNDGRND OUT	POND	25	.088		12.5100	1.04	20.12	.220
BB4 BASIN IN	POND	1	.068		12.1000	.84		
BB4 BASIN IN	POND	2	.092		12.1000	1.13		
BB4 BASIN IN	POND	10	.154		12.1000	1.86		
BB4 BASIN IN	POND	25	.207		12.1000	2.44		
BB4 BASIN OUT	POND	1	.000		7.9900	.00	12.11	.012
BB4 BASIN OUT	POND	2	.000		7.1000	.00	12.38	.020
BB4 BASIN OUT	POND	10	.000		5.4500	.00	13.01	.041
BB4 BASIN OUT	POND	25	.010		12.2500	.61	13.29	.053
BB5 BASIN IN	POND	1	.095		12.1000	1.17		
BB5 BASIN IN	POND	2	.127		12.1000	1.54		
BB5 BASIN IN	POND	10	.208		12.1000	2.46		
BB5 BASIN IN	POND	25	.275		12.1000	3.20		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
BB5 BASIN	OUT POND	1	.007		12.5400	.08	14.69	.037
BB5 BASIN	OUT POND	2	.025		12.4200	.33	14.91	.046
BB5 BASIN	OUT POND	10	.080		12.3300	.79	15.45	.069
BB5 BASIN	OUT POND	25	.129		12.2300	1.59	15.83	.087
DP 1	JCT	1	.026		12.0900	.08		
DP 1	JCT	2	.030		12.1600	.20		
DP 1	JCT	10	.055		12.1100	.58		
DP 1	JCT	25	.104		12.3200	1.20		
DP 2	JCT	1	.030		12.1000	.13		
DP 2	JCT	2	.037		12.1600	.27		
DP 2	JCT	10	.070		12.1100	.78		
DP 2	JCT	25	.128		12.3200	1.33		
*DP 3	JCT	1	.157		12.1300	.42		
*DP 3	JCT	2	.212		12.1600	1.01		
*DP 3	JCT	10	.436		12.1300	3.17		
*DP 3	JCT	25	.768		12.2300	7.74		
JUNC 10	JCT	1	.092	LR	12.1000	.18		
JUNC 10	JCT	2	.098	LR	12.1000	.26		
JUNC 10	JCT	10	.130	LR	12.1000	.49		
JUNC 10	JCT	25	.220	LR	12.5000	1.23		
SOUTH	JCT	1	.126		12.4100	.31		
SOUTH	JCT	2	.174		12.3100	.80		
SOUTH	JCT	10	.365		12.3700	2.59		
SOUTH	JCT	25	.641		12.2300	6.56		

Title... Project Date: 10/28/2016
Project Engineer: mshogren
Project Title: Hiawatha
Project Comments:
Westport, Connecticut

DESIGN STORMS SUMMARY

Design Storm File,ID = Westport 2016

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.8500 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.1000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 25

Data Type, File, ID = Synthetic Storm TypeIII 24hr
Storm Frequency = 25 yr
Total Rainfall Depth= 6.4000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time: .0833 hrs

Total Tc: .0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time: .0833 hrs

Total Tc: .0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.1800 hrs
Total Tc:	.1800 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

TIME OF CONCENTRATION CALCULATOR

Segment #1: Tc: User Defined

Segment #1 Time:	.0833 hrs
Total Tc:	.0833 hrs

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	73	.089			73.00
COMPOSITE AREA & WEIGHTED CN --->		.089			73.00 (73)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	90	.511			90.00
COMPOSITE AREA & WEIGHTED CN --->		.511			90.00 (90)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	98	.014			98.00
COMPOSITE AREA & WEIGHTED CN --->		.014			98.00 (98)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	78	.129			78.00
COMPOSITE AREA & WEIGHTED CN --->		.129			78.00 (78)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	92	.712			92.00
COMPOSITE AREA & WEIGHTED CN --->		.712			92.00 (92)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	91	.764			91.00
COMPOSITE AREA & WEIGHTED CN --->		.764			91.00 (91)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	87	.506			87.00
COMPOSITE AREA & WEIGHTED CN --->		.506			87.00 (87)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	90	1.368			90.00
COMPOSITE AREA & WEIGHTED CN --->		1.368			90.00 (90)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	61	1.076			61.00
COMPOSITE AREA & WEIGHTED CN --->		1.076			61.00 (61)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
	89	.645			89.00
COMPOSITE AREA & WEIGHTED CN --->		.645			89.00 (89)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	70	.089			70.00
COMPOSITE AREA & WEIGHTED CN --->		.089			70.00 (70)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
	74	.175			74.00
COMPOSITE AREA & WEIGHTED CN --->		.175			74.00 (74)

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
18.50	-----	75	0	.000	.000
21.00	-----	75	225	.004	.004

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
17.00	-----	736	0	.000	.000
17.49	-----	736	2214	.008	.008
17.50	-----	1517	3313	.000	.009
18.00	-----	1481	4497	.017	.026
18.50	-----	1406	4330	.017	.042
19.00	-----	1296	4052	.016	.058
19.50	-----	1117	3616	.014	.072
20.00	-----	757	2794	.011	.082
20.50	-----	736	2242	.009	.091

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
19.20	-----	140	0	.000	.000
21.20	-----	140	420	.006	.006

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

VOLUME COMPLETELY FILLED WITH MATERIAL
(Adjust Volumes for Voids)

Void Spaces = 40.00000 %

HW Elv, ft	Total, ac-ft	Adjusted,ac-ft
18.50	.000	.000
21.00	.004	.002

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
14.50	-----	105	0	.000	.000
14.70	-----	105	315	.000	.000

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

VOLUME COMPLETELY FILLED WITH MATERIAL
(Adjust Volumes for Voids)

Void Spaces = 40.00000 %

HW Elv, ft	Total, ac-ft	Adjusted,ac-ft
19.20	.000	.000
21.20	.006	.003

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
12.00	-----	487	0	.000	.000
14.00	-----	949	2116	.032	.032
16.00	-----	1629	3821	.058	.091
18.00	-----	2410	6020	.092	.183

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
14.00	-----	771	0	.000	.000
14.49	-----	771	2313	.009	.009
14.50	-----	1597	3478	.000	.009
15.00	-----	1559	4734	.018	.027
15.50	-----	1480	4558	.017	.044
16.00	-----	1363	4263	.016	.061
16.50	-----	1173	3800	.015	.075
17.00	-----	791	2927	.011	.087
17.50	-----	771	2343	.009	.096

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
17.00	-----	1896	0	.000	.000
17.49	-----	1896	5688	.021	.021
17.50	-----	3978	8620	.001	.022
18.00	-----	3882	11790	.045	.067
18.50	-----	3682	11345	.043	.111
19.00	-----	3389	10603	.041	.151
19.50	-----	2910	9439	.036	.187
20.00	-----	1948	7239	.028	.215
20.50	-----	1896	5766	.022	.237

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
13.40	-----	105	0	.000	.000
13.60	-----	105	315	.000	.000

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
11.50	-----	600	0	.000	.000
12.00	-----	1080	2485	.010	.010
14.00	-----	2380	5063	.077	.087

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
13.60	-----	1182	0	.000	.000
14.00	-----	1466	3964	.012	.012
16.00	-----	2171	5421	.083	.095

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

OUTLET STRUCTURE INPUT DATA

Structure ID = CO
Structure Type = Culvert-Circular

No. Barrels	=	1
Barrel Diameter	=	1.0000 ft
Upstream Invert	=	19.25 ft
Dnstream Invert	=	19.25 ft
Horiz. Length	=	5.00 ft
Barrel Length	=	5.00 ft
Barrel Slope	=	.00000 ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.5000	(forward entrance loss)
Kb	=	.031274	(per ft of full flow)
Kr	=	.5000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1
Inlet Control K	=	.0098
Inlet Control M	=	2.0000
Inlet Control c	=	.03980
Inlet Control Y	=	.6700
T1 ratio (HW/D)	=	1.160
T2 ratio (HW/D)	=	1.307
Slope Factor	=	-.500

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...
At T1 Elev = 20.41 ft ---> Flow = 2.75 cfs
At T2 Elev = 20.56 ft ---> Flow = 3.14 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 17.00 ft
Increment = .10 ft
Max. Elev.= 20.50 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Culvert-Circular	CO	--->	TW	19.250	20.500

TW SETUP, DS Channel

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 18.50 ft
Increment = .10 ft
Max. Elev.= 21.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular TW SETUP, DS Channel	WO	--->	TW	20.000	21.000

OUTLET STRUCTURE INPUT DATA

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 19.20 ft
Increment = .10 ft
Max. Elev.= 21.20 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	W0	--->	TW	20.700	21.200
TW SETUP, DS Channel					

OUTLET STRUCTURE INPUT DATA

Structure ID = W0
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 20.00 ft
Weir Length = 4.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 14.00 ft
Increment = .10 ft
Max. Elev.= 17.50 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Culvert-Circular	C0	--->	TW	16.500	17.500
TW SETUP, DS Channel					

CUTLET STRUCTURE INPUT DATA

Structure ID = W0
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 20.70 ft
Weir Length = 4.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

OUTLET STRUCTURE INPUT DATA

Structure ID = CO
Structure Type = Culvert-Circular

No. Barrels	=	1	
Barrel Diameter	=	1.0000	ft
Upstream Invert	=	16.50	ft
Dnstream Invert	=	16.50	ft
Horiz. Length	=	6.00	ft
Barrel Length	=	6.00	ft
Barrel Slope	=	.00000	ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.5000	(forward entrance loss)
Kb	=	.031274	(per ft of full flow)
Kr	=	.5000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1	
Inlet Control K	=	.0098	
Inlet Control M	=	2.0000	
Inlet Control c	=	.03980	
Inlet Control Y	=	.6700	
T1 ratio (HW/D)	=	1.150	
T2 ratio (HW/D)	=	1.307	
Slope Factor	=	-.500	

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...
At T1 Elev = 17.56 ft ---> Flow = 2.75 cfs
At T2 Elev = 17.81 ft ---> Flow = 3.14 cfs

OUTLET STRUCTURE INPUT DATA

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations	=	40	
Min. TW tolerance	=	.01	ft
Max. TW tolerance	=	.01	ft
Min. HW tolerance	=	.01	ft
Max. HW tolerance	=	.01	ft
Min. Q tolerance	=	.00	cfs
Max. Q tolerance	=	.00	cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 12.00 ft
Increment = .10 ft
Max. Elev.= 18.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	W0	--->	TW	17.000	18.000
TW SETUP, DS Channel					

OUTLET STRUCTURE INPUT DATA

Structure ID = W0
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 17.00 ft
Weir Length = 8.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

OUTLET STRUCTURE INPUT DATA

Structure ID = C0
Structure Type = Culvert-Circular

No. Barrels	=	1
Barrel Diameter	=	.2500 ft
Upstream Invert	=	18.50 ft
Dnstream Invert	=	18.50 ft
Horiz. Length	=	22.00 ft
Barrel Length	=	22.00 ft
Barrel Slope	=	.00000 ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.5000	(forward entrance loss)
Kb	=	.198575	(per ft of full flow)
Kr	=	.5000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1
Inlet Control K	=	.0098
Inlet Control M	=	2.0000
Inlet Control c	=	.03980
Inlet Control Y	=	.6700
T1 ratio (HW/D)	=	1.160
T2 ratio (HW/D)	=	1.307
Slope Factor	=	-.500

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...
At T1 Elev = 18.79 ft ---> Flow = .09 cfs
At T2 Elev = 18.83 ft ---> Flow = .10 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 17.00 ft
Increment = .10 ft
Max. Elev.= 20.50 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Culvert-Circular	C0	--->	TW	18.500	20.500
Culvert-Circular	C1	--->	TW	19.500	20.500

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

Structure ID = C1
Structure Type = Culvert-Circular

No. Barrels	=	1	
Barrel Diameter	=	1.0000	ft
Upstream Invert	=	19.50	ft
Dnstream Invert	=	19.50	ft
Horiz. Length	=	22.00	ft
Barrel Length	=	22.00	ft
Barrel Slope	=	.00000	ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.5000	(forward entrance loss)
Kb	=	.031274	(per ft of full flow)
Kr	=	.5000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1	
Inlet Control K	=	.0098	
Inlet Control M	=	2.0000	
Inlet Control c	=	.03980	
Inlet Control Y	=	.6700	
T1 ratio (HW/D)	=	1.150	
T2 ratio (HW/D)	=	1.307	
Slope Factor	=	-.500	

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...
At T1 Elev = 20.66 ft ---> Flow = 2.75 cfs
At T2 Elev = 20.81 ft ---> Flow = 3.14 cfs

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations	=	40	
Min. TW tolerance	=	.01	ft
Max. TW tolerance	=	.01	ft
Min. HW tolerance	=	.01	ft
Max. HW tolerance	=	.01	ft
Min. Q tolerance	=	.00	cfs
Max. Q tolerance	=	.00	cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.	=	11.50 ft
Increment	=	.10 ft
Max. Elev.	=	14.00 ft

OUTLET CONNECTIVITY

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	W0	--->	TW	13.250	14.000
TW SETUP, DS Channel					

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 13.60 ft
Increment = .10 ft
Max. Elev.= 16.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Orifice-Circular	OO	--->	TW	14.500	16.000
Weir-Rectangular	WO	--->	TW	15.750	16.000

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

Structure ID = WO
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 13.25 ft
Weir Length = 20.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

OUTLET STRUCTURE INPUT DATA

Structure ID = OO
Structure Type = Orifice-Circular

# of Openings	=	1
Invert Elev.	=	14.50 ft
Diameter	=	.5000 ft
Orifice Coeff.	=	.600

Structure ID = WO
Structure Type = Weir-Rectangular

# of Openings	=	1
Crest Elev.	=	15.75 ft
Weir Length	=	8.00 ft
Weir Coeff.	=	3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations	=	40
Min. TW tolerance	=	.01 ft
Max. TW tolerance	=	.01 ft
Min. HW tolerance	=	.01 ft
Max. HW tolerance	=	.01 ft
Min. Q tolerance	=	.00 cfs
Max. Q tolerance	=	.00 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.	= 14.50 ft
Increment	= .05 ft
Max. Elev.	= 14.70 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	WO	--->	TW	14.600	14.700
TW SETUP, DS Channel					

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 13.40 ft
Increment = .05 ft
Max. Elev.= 13.60 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	El, ft	E2, ft
Weir-Rectangular	W0	--->	TW	13.500	13.600
TW SETUP, DS Channel					

OUTLET STRUCTURE INPUT DATA

Structure ID = W0
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 14.50 ft
Weir Length = 70.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

Index of Starting Page Numbers for ID Names

CUTLET STRUCTURE INPUT DATA

Structure ID = W0
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 13.50 ft
Weir Length = 70.00 ft
Weir Coeff. = 3.300000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 40
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .00 cfs
Max. Q tolerance = .00 cfs

Appendix G
Operations and Maintenance Plan

Operations and Maintenance Plan

The Village at Saugatuck
May 8, 2018

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the proposed stormwater components installed at *The Village at Saugatuck* are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. Once every five years the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins & Drainage Inlets:

    a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction. Oil absorbent pillows shall be removed and replaced as needed.
    b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
    c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
    d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
    e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
    f. Accumulated sediments shall be removed at which time they are within 12 inches of the invert of the outlet pipe.
    g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Manholes:

a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
b. Manholes shall be inspected and repaired on an annual basis.
c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Stormwater Control Structures:

a. All control structures (orifice, weir, etc.) shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs shall be performed.
b. For the first year, control structures (orifice, weir, etc.) shall be inspected on a quarterly basis.
c. Any accumulated debris shall be removed and any repairs made to the control structures (orifice, weir, etc.) as required.
d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
e. Accumulated debris shall be removed and repairs made as required.
f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

4. Infiltration Systems (Including Isolator Rows):

a. All infiltrators shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
b. For the first year, the infiltrators shall be inspected on a quarterly basis.
c. Any accumulated debris within the infiltrators shall be removed and any repairs made to the units as required
d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
e. Accumulated debris within the units shall be removed and repairs made as required.
f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

5. Infiltration Basins and Rain Gardens:

a. All infiltration basins and rain gardens shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
b. For the first year, they shall be inspected on a quarterly basis.
c. Any accumulated sediment and debris shall be removed and any repairs made as required
d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.

e. Accumulated sediment and debris shall be removed and repairs made as required.

6. Green Roof:

a. Clear drainage outlets upon the completion of construction.
b. Weed unwanted plants and clear drainage structures twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.

7. Roof Gutters:

a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.

Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater system shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Appendix H
Cut and Fill Estimate

Cut and Fill Summary

The Village at Saugatuck
May 8, 2018

Excavation on the site is required to construct the proposed buildings and parking lots. Due to the placement of parking beneath the buildings, more cuts will be required than under more traditional construction. Figure No. C-1 Cut and Fill Depths provides a grid of the approximate cut or fill from existing grades to proposed finished grades. Overall there are more cuts than fills required for the redevelopment. The Cut and Fill Volumes table summarizes the amount of cut and fill required and the volume of material that will be exported from or imported into the site. Based on test pits conducted, there is no rock excavation or blasting expected.

During construction the contractor will:

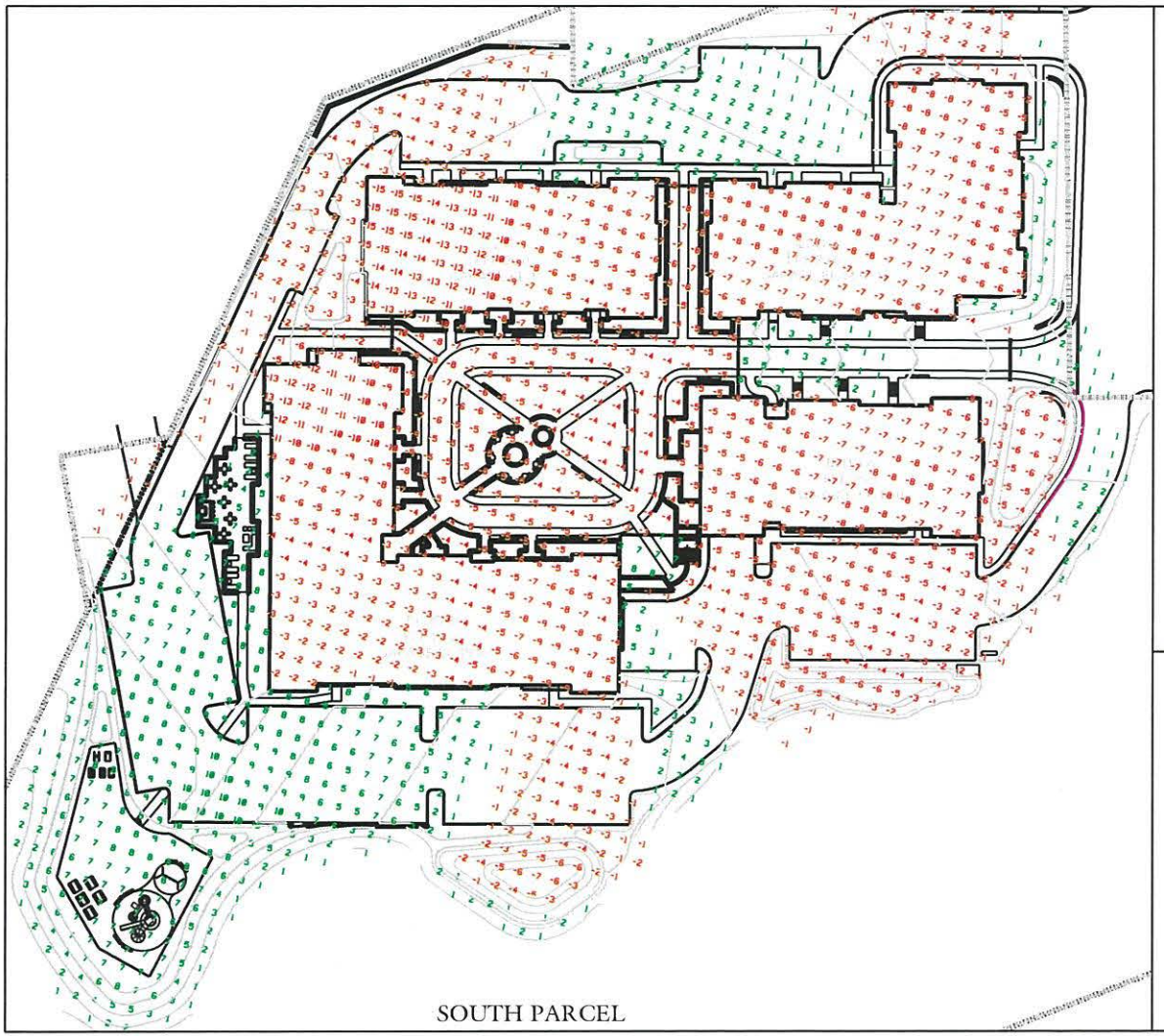
1. Demolish and remove pavements and building foundations from the site
2. Strip the top soil. Stockpile topsoil for later use and export excess material.
3. Excavation, moving suitable soil materials from areas of cut to areas of fill
4. Export, in areas of deep cuts (Buildings B, C, and E) material will be excavated directly into trucks to remove excess material from the site.

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

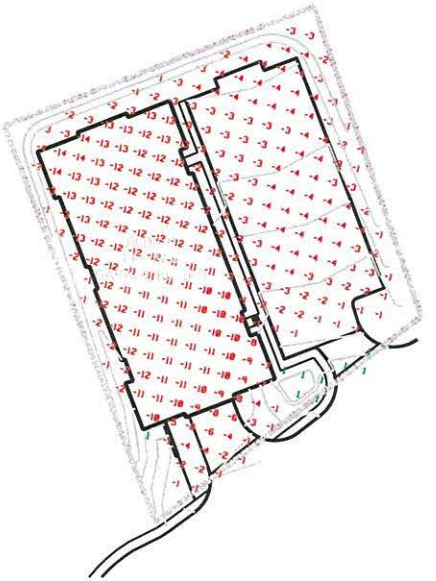
CUT AND FILL VOLUMES

South Parcel	North Parcel	Total		
23,999	6,356	30,355	cy	Net Cut From Existing to Finished Grades[1]
5,421	807	6,227	cy	Additional Cut for Pavement and Building Foundations[3]
865	239	1,104	cy	Additional Cut for Infiltration Systems
30,284	**7,402**	**37,686**	cy	**Total Cut Required**
(11,067)	(23)	(11,090)	cy	Net Fill From Existing to Finished Grades[1]
(718)	(153)	(871)	cy	Additional Fill for Removed Pavements and Buildings[2]
(11,785)	**(176)**	**(11,961)**	cy	**Total Fill Required**
Total				
18,499	7,226	25,725	cy	Excess Soil to be exported
718	153	871	cy	Existing Concrete and Asphalt to be exported
6,285	1,046	7,331	cy	Stone, Concrete and Asphalt to be imported
Garage Cut				
21,375	4,915	26,290	cy	Cut Required for Garages beneath the Buildings

Notes
1. Cut and Fill calculation comparing existing grades to proposed grades
2. Estimated 6" of asphalt or concrete to be remove under all impervious areas.
3. Estimated 12" of asphalt, concrete, or stone to be installed all impervious areas.



SOUTH PARCEL



NORTH PARCEL

LEGEND
- CUT DEPTH
- FILL DEPTH

N 0 30 60 90

DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

CUT AND FILL DEPTHS

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

FIGURE: C-1
MAY 7, 2018

Appendix I
Wetland Delineation Report

PIETRAS ENVIRONMENTAL GROUP, LLC

WETLAND DELINEATION REPORT

Date: March 11, 2016

PEG JOB#: 2016-38

Prepared for: Lewis Associates
260 Main Street
Monroe, CT 06468

Project Location: Properties on Hiawatha Lane, Westport, CT
House lots 28, 36, 38, 39, 41, 42, 43, 44, 45 & 47
Undeveloped parcel numbers 4 & 5

Report Maps: Town of Westport GIS Maps

Inspection Date: March 8, 2016

Field Conditions: weather: partly sunny, 50's soil moisture: moist to saturated
Winter features: snow depth: none frost depth: none

Legislative Definitions of Wetlands and Watercourses in CT (General Statutes, Chptr 440, Sec. 22a-28 to 22a-45)
Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and which may grow or be capable of growing some, but not necessarily all of the following:" (includes plant list) sec. 22a-29(2).

Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15).

Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which area contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section 22a-38(16).

Regulated Wetlands and Watercourses Identified:

Inland Wetlands: **yes** Watercourses: **XX** river: brook: lake: pond:
Tidal Wetlands: **no** intermittent watercourse: **XX**
Wetland boundary flag #'s: **1 thru 35**

Local Regulated Upland Review Area: From Wetlands: 20 to 100 feet From Watercourses: 20 to 100 feet

All established wetlands boundary lines are subject to change until officially adopted by local and state agencies.

Thomas W. Pietras

Thomas W. Pietras, Professional Wetland and Soil Scientist

15 Briarwood Lane
Wallingford, CT 06492
203-314-6636

EMAIL Tom@pietrasenvironmentalgroup.com
WEB SITE pietrasenvironmentalgroup.com

Thomas W. Pietras, Professional Wetland and Soil Scientist, conducted a site inspection to the subject properties on March 8, 2016. The project area includes ten single family residential parcels and two vacant parcels. The residentially developed properties range in size from 0.35 to 0.81 acres, while the two undeveloped parcels are 0.16 and 2.85 acres in size. Most of the lands surrounding the single family houses are maintained in grassed lawn with scattered trees and shrubs. The southern portion of the house lot numbers 39, 41 and 43 plus a large portion of Parcel 4 are wooded. An intermittent watercourse drains from a culvert that is located to the southeast of the house at 39 Hiawatha Lane. The watercourse flows in a southerly direction into a forested swamp.

A spade and auger were used to dig test holes on the property. The classification system of the National Cooperative Soil Survey and the USDA Natural Resources Conservation Service was utilized for identification of soil drainage classes and soil types. The soil types identified on the property were assigned soil map numbers according to the State of Connecticut Soil Legend. Locations of soil types identified are shown on a sketch map that is included with this report. Inland wetlands are regulated by CT General Statutes, Chapter 440, Sections 22a-36 to 22a-45. The State defines wetlands as land consisting of any of the soil types designated as poorly drained, very poorly drained, alluvial and floodplain by the National Cooperative Soil Survey. The boundaries of the wetlands identified on the property were delineated with consecutively numbered, survey tapes. Approximate location of the wetlands are also shown on the soil and wetland sketch map. Brief descriptions of the soil mapping units are included in this report. Additional information about the soils identified on the property can be found in the Soil Survey of the State of Connecticut (www.nrcs.usda.gov.ct.soilsurvey).

Wetlands, identified as poorly Raypol silt loam (12) and very poorly drained Scarboro muck (15), are present in the southern portions of house lot numbers 39, 41 & 43 plus Parcel 4. The wetlands support forested swamp vegetation. On March 8, 2016 shallow inundation was present within the wetlands which are situated on Parcel 4.

Respectfully submitted,

PIETRAS ENVIRONMENTAL GROUP, LLC

Thomas W. Pietras

Thomas W. Pietras
Professional Wetland Scientist and Soil Scientist

BRIEF DESCRIPTIONS OF SOIL MAP UNITS IDENTIFIED

WETLAND SOILS

12 Raypol silt loam (Aeric Endoaquepts)- This is a deep, poorly drained, friable, loamy textured soil that developed over sandy and gravelly, glacial outwash. Raypol soils occur in drainage ways and depressions within valleys, outwash plains and terraces. A water table is typically present within a foot of the surface from late fall through mid-spring.

15 Scarboro muck (Histic Humaquepts) - This is a deep, very poorly drained soil with a thin (less than 15 inches thick) mucky surface that is underlain by sandy and gravelly, glacial outwash. Scarboro soils occur in drainage ways and depressions within valleys, outwash plains and terraces. This soil is subject to shallow (0 to 6 inches) seasonal ponding. The seasonal water table typically remains within six inches of the surface.

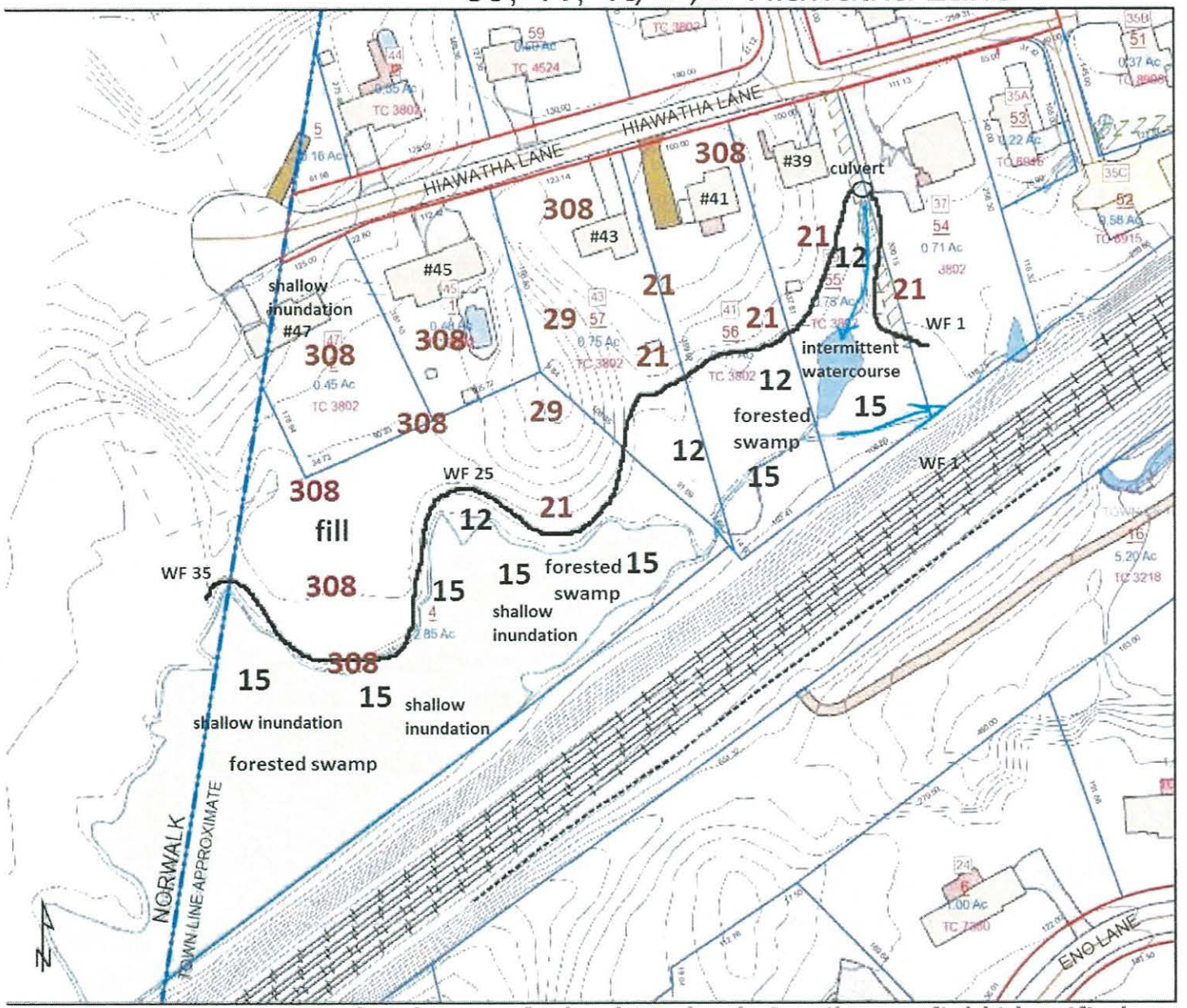
NON-WETLAND SOILS

21 Ninigret and Tisbury soils (Aquic Dystrudepts) – These are deep, moderately well drained, friable, coarse-loamy and loamy textured soils that developed over sandy and gravelly, glacial outwash derived from schist, gneiss and granite. Outwash soils occur in valleys, outwash plains and terraces. A seasonal water table is present between 18 and 30 inches of the surface.

29 Agawam fine sandy loam (Typic Dystrudepts) – This is a deep, well drained, friable, coarse-loamy textured soil that developed over sandy and gravelly, glacial outwash derived principally from schist, gneiss and granite. Outwash soils occur in valleys, outwash plains and terraces. The water table is generally greater than five feet below the surface.

308 Udorthents, smoothed - This is a well drained to moderately well drained, disturbed soil area that has had two or more feet of the original soil surface altered by filling, excavation or grading activities. Udorthents, smoothed soils commonly occur on leveled land and fill landforms.

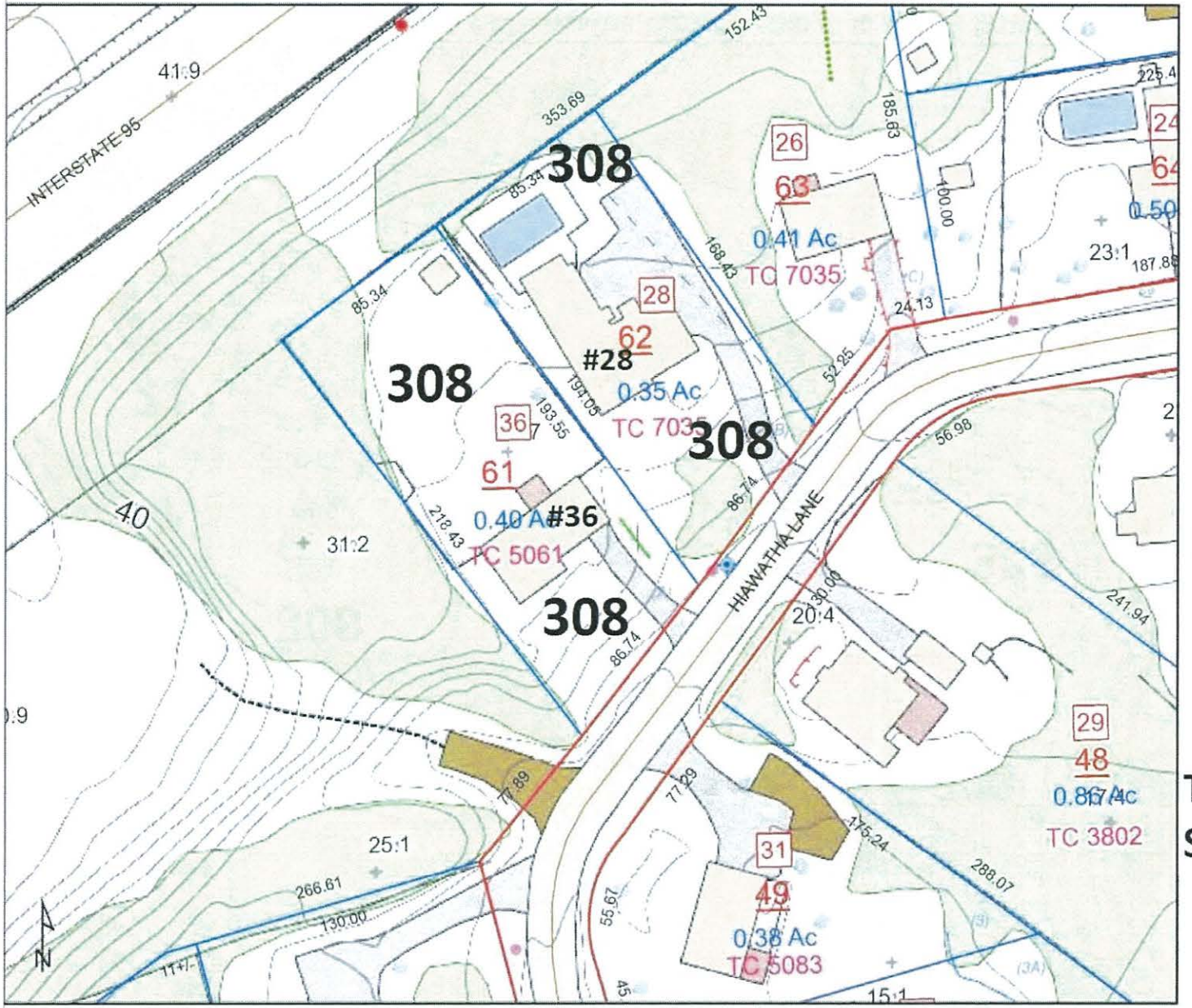
39, 41, 43,45,47 Hiawatha Lane



1 inch = 142 feet

sketch map of Inland Wetlands & soil types field identified on March 8, 2016 Thomas W. Pietras, Soil Scientist

28 & 36 Hiawatha Lane

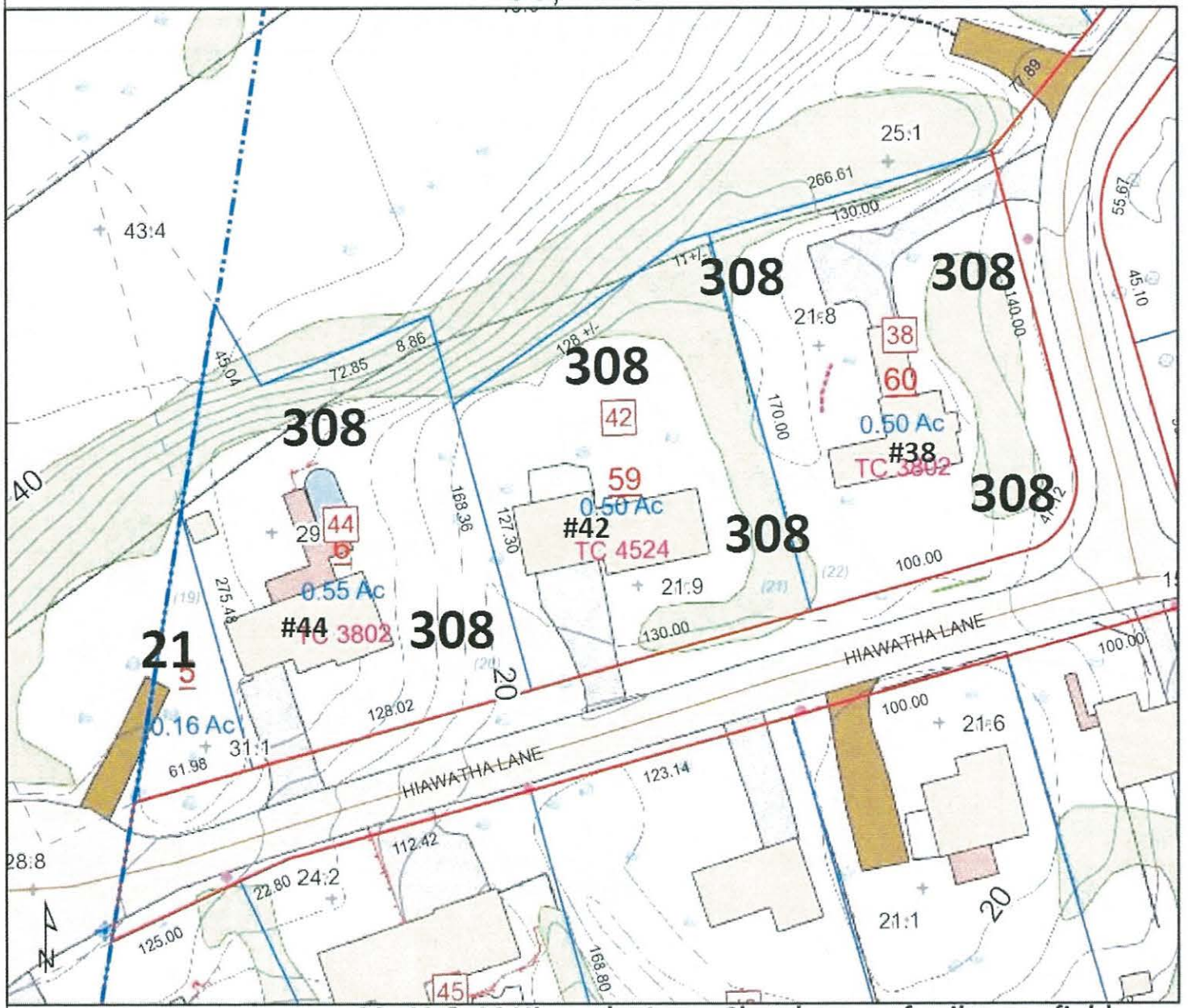


Thomas W. Pietras
Soil Scientist

soils map field identified on March 8, 2016

1 inch = 71 feet

38, 42 & 44 HiawathaLane



1 inch = 71 feet

38, 42 & 44 Hiawatha Lane Sketch map of soil types field identified on 3/8/2016 Thomas W. Pietras, Soil Scientist

APPENDIX II. PLANT INVENTORY FOR WETLANDS AND BORDERING UPLAND SOILS. PROPOSED RESIDENTIAL DEVELOPMENT ON HIAWATHA LANE, WESTPORT, CT

1-Forested swamp in southern portions of House #'s 39, 41 & 43 and southeastern portion of Parcel 4

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Tree Layer			
Red maple (Acer rubrum)	FAC	American elm (Ulmus Americana)	FACW
Catalpa (Catalpa speciosa)	FACU	Pin oak (Quercus palustris)	FACW
Shrub Layer & Woody Vines			
Spicebush (Lindera benzoin)	FACW	Sweet pepperbush (Clethra alnifolia)	FAC
Winterberry (Ilex verticillata)	FACW	Arrrorwood viburnum (Viburnum recognitum)	FACW
Elderberry (Sambucus canadensis)	FACW	Multiflora rose (Rosa multiflora)**	FACU
Japanese barberry (Berberis thunbergii)**	FACU	Burning bush (Euonymus purpureus)**	FACU
European privet (Ligustrum vulgare)**	FACU	Greenbriar (Smilax rotundifolia)	FAC
Poison ivy (Toxicodendron radicans)	FAC	Oriental bittersweet (Celastrus orbiculata)**	UPL
Herb Layer			
Skunk cabbage (Symplocarpus foetidus)	OBL	Jewelweed (Impaties capensis)	FACW
Water smartweed (Persicaria amphibia)	OBL	Trout lilly (Erythronium americanum)	NI
Lesser celandine (Ficaria verna)**	FACW	Tussock sedge (Carex stricta)	OBL
Violet (Viola sp.)	-	Iris (Iris sp.)	-
False nettle (Boehmerica cylindrica)	OBL	Jack-in-the-pulpit (Arisaema triphyllum)	FAC
Wood reed grass (Cinna latifolia)	FACW	Water plantain (Alisima subcordatum)	OBL
Blackberry (Rubus allegheaniensis)	FACU		

2-Shrub-sapling swamp/Forested swamp Complex in southern portion of Parcel 4

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red maple (Acer rubrum)	FAC	Black gum (Nyssa sylvatica)	FAC
Speckled alder (Alnus incana)	FACW	Ironwood (Carpensis caroliniana)	FAC
Pussy willow (Salix discolor)	FACW	Sweet pepperbush (Clethra alnifolia)	FAC
Winterberry (Ilex verticillata)	FACW	Highbush blueberry (Vaccinum corymbosum)	FACW
Spicebush (Lindera benzoin)	FACW	Swamp azalea (Rhododendron viscosum)	FACW
Greenbriar (Smilax rotundifolia)	FAC	Grapevine (Vitus sp.)	-
Herb Layer			
Skunk cabbage (Symplocarpus foetidus)	OBL	Purple loosestrife (Lythrum salicaria)**	OBL
Water smartweed (Persicaria amphibia)	OBL	Tussock sedge (Carex stricta)	OBL
Royal fern (Osmunda regalis)	OBL	Duckweed (Lemna minor)	OBL
Fox sedge (Carex vulpinoidea)	OBL	Fringed sedge (Carex crinite)	OBL
Burr-reed (Sparganium americanum)	OBL	Iris (Iris sp.)	-
Common waterweed (Elodea canadensi)	OBL	Marsh mermaid-weed (Proserpinica palustris)	OBL
Water plantain (Alisima subcordatum)	OBL	Wood reed grass (Cinna latifolia)	FACW
Soft-stem bulrush (Schoenoplectus tabernaemonta)	OBL	Cinnamon fern (Osmunda cinnamomea)	FACW

3-Forested knoll on well drained glacial outwash soil (Uplands) located in the NE corner of Parcel 4 and in the southern portions of House #'s 43 & 45 – Contains large trees (to 36 inch dbh)

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red oak (Quercus rubra)	FACU	American beech (Fagus americana)	FACU
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Black birch (Betula lenta)	FACU	Greenbriar (Smilax rotundifolia)	FAC

Herb Layer

Wild lilly of the valley (Maianthemum canadense)	FAC	Pennsylvania sedge (Carex pensylvanica)	NI
Garlic mustard (Allaria petiolate)**	FACU		

4-Mix of field & woody plants growing on fill soils located in northern portion of Parcel 4 & the southern portion of House #47. Vegetation is dominated by invasive plant species.

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
Red oak (Quercus rubra)	FACU	Norway maple (Acer platanoides)**	UPL
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Gray birch (Betula popufolia)	FAC	Flowering dogwood (Cornus florida)	FACU
American elm (Ulmus americana)	FACW	Multiflora rose (Rosa multiflora)**	FACU
Japanese barberry (Berberis thunbergii)**	FACU	Burning bush (Euonymus purpureus)**	FACU
European privet (Ligustrum vulgare)**	FACU	Spicebush (Lindera benzoin)	FACW
Burning bush (Euonymus purpureus)**	FACU	Grapevine (Vitus sp.)	-
Greenbriar (Smilax rotundifolia)	FAC	Poison ivy (Toxicodendron radicans)	FAC
Oriental bittersweet (Celastrus orbiculata)**	UPL		
Herb layer			
Japanese knotweed (Fallopia japonica)	FAC	Garlic mustard (Allaria petiolate)**	FACU
Wine raspberry (Rubus phoenicolasius)**	FACU	Field grasses	-
Wood fern (Dryopteris marginalis)	FACU	Coltsfoot (Tussilago farfara)**	FACU
Stinging nettle (Urtica dioica)	FAC	urac diorca False	

5-State of CT Property situated to the north of House #'s 38, 32 & 44 and to the west of House # 36. This property was formerly used for the I-95 Toll Booth facility and now contains a mix of old field with white pines, briar and woodland.

Common Name (Scientific Name) & Wetland Indicator Status*		Listed Invasive Species**	
Trees, Shrubs & Woody Vines			
White pine (Pinus strobus)	FACU	Sassafras (Sassafras albidum)	FACU
Red oak (Quercus rubra)	FACU	Norway maple (Acer platanoides)**	UPL
Red maple (Acer rubrum)	FAC	Sugar maple (Acer saccharum)	FACU
Black cherry (Prunus serotine)	FACU	Multiflora rose (Rosa multiflora)**	FACU
Burning bush (Euonymus purpureus)**	FACU	Poison ivy (Toxicodendron radicans)	FAC
Oriental bittersweet (Celastrus orbiculata)**	UPL		
Herb Layer			
Garlic mustard (Allaria petiolate)**	FACU	Wine raspberry (Rubus phoenicolasius)**	FACU
Field grasses	-	Wood fern (Dryopteris marginalis)	FACU
Coltsfoot (Tussilago farfara)**	FACU		

*State of Connecticut-National Wetland Plant List, U.S. Army Corps of Engineers

OBL	Obligate wetland	Almost always is a hydrophyte, rarely in uplands
FACW	Facultative Wetland	Usually is a hydrophyte but occasionally found in uplands
FAC	Facultative	Commonly occurs as either a hydrophyte or non-hydrophyte
FACU	Facultative Upland	Occasionally is a hydrophyte but usually occurs in uplands
UPL	Upland	

** = Invasive Plant Atlas of New England (IPANE) listed invasive

DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

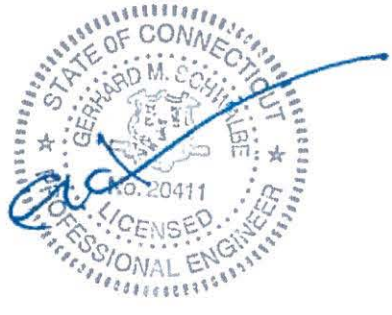
UTILITY REPORT

Prepared for:

Summit Saugatuck, LLC
55 Station Street
Southport, CT 06890

Prepared by:

Divney Tung Schwalbe, LLP
One North Broadway, Suite 1407
White Plains, NY 10601



May 7, 2018

THE VILLAGE AT SAUGATUCK
WESTPORT, CONNECTICUT

UTILITY REPORT

TABLE OF CONTENTS

The Village at Saugatuck
Westport, Connecticut

Redevelopment Summary

The Village at Saugatuck is the redevelopment of existing residential lots. The redevelopment site is located between Interstate-95 to the north and MetroNorth Rail Road to the south, to the west is Avalon East, Norwalk, and single family residential houses are to the east. The existing site includes ten (10) single family homes. Under the proposed plans the existing structures will be demolished. The two (2) lots to the north will be combined to form a new 0.75-acre parcel. The eight (8) developed lots and two (2) undeveloped lots to the south will be combined to form an 8.07-acre parcel. The north lot will have a 3-story multi-family residential building with below ground and at grade parking. The south lot will have one 4-story and three 3-story multi-family residential buildings with a connecting underground parking garage. There will be a total of 187 housing units, including 4 studios, 90 one-bedroom, and 93 two-bedroom.

Utility Report

I. Sanitary Sewer

A. Existing Conditions

There are currently 10 single family homes on the redevelopment site that are served by individual septic systems. The closest public sewer is located approximately 1,600 feet away on Davenport Avenue. The Davenport Avenue sewer line is a gravity sanitary sewer line which flows to the Riverside Avenue Pump Station in the vicinity of Ferry Street. The force main from the pump station delivers the sewage to the Westport Sewage Treatment Plant. The sewage plant has an average daily flow of 1.04 MGD and a maximum daily flow of 1.58 MGD and a total capacity of 3.3 MGD[1].

B. Proposed Conditions

The sanitary sewer report and design has been prepared by Redniss & Mead and has been submitted as separate application.

[1] Westport W.P.C.F., daily flow summary, September to November 2014.

II. Water

A. Existing Conditions

Aquarion Water Company of Connecticut owns and maintains the existing water main in Hiawatha Lane. Individual water service laterals and meters serve each of the 10 existing homes. An 8-inch water main with hydrants is located within Hiawatha Lane and extends west to an adjacent parcel where it serves a residential development.

B. Proposed Conditions

The existing water main up to House # 39 will remain. The section of water main from house #39 to house #47 will be removed and a new 8-inch water main will be routed through the new driveway and parking lots south of the proposed buildings. The new water main is proposed to connect to the existing main at the two ends where the existing main will be removed. The new main will be dedicated to Aquarion Water Company of Connecticut. The new buildings will have separate fire and domestic water laterals. See Table No. 1, Water Demand Estimate and drawings SP-2.1 and 2.2 Grading and Utility Plans for additional information.

THE VILLAGE AT SUAGATUCK
WESTPORT, CONNECTICUT

Date: 11/8/17
By: MJS
Issue No. 1
Rev.

Table No. 1
WATER DEMAND ESTIMATE

USE	WATER HYDRAULIC LOADING RATE[1]	QUANTITY	WATER DEMAND (gpd)
1. Existing Conditions			
a. 3 Bedroom Homes	150 gpd/bedroom	10	**4,500**
2. Proposed Conditions			
b. Apartment, 2 Bedroom	150 gpd/bedroom	93	27,900
c. Apartment, 1 Bedroom	150 gpd/bedroom	90	13,500
d. Apartment, Studio	150 gpd/room	4	600
		TOTAL	**42,000**
		Peaking Factor	2
		Peak Day (gpd)	**71,400**
		Average (gpm)	29.2
		Peaking Factor	4
		Peak Demand (gpm)	**117**

[1] Connecticut Department of Public Health.

III. Electric

A. Existing Conditions

Electrical service to the site is provided by overhead wire by Eversource.

B. Proposed Conditions

Eversource will continue to provide power to the redevelopment site. The utility company will review the proposed electrical demand to determine if any improvements are required to the existing system. From the overhead system along Hiawatha Lane, new underground feeders will provide power to the buildings.

IV. Natural Gas

A. Existing Conditions

Southern Connecticut Gas Company is provider of natural gas in Westport. There is currently no gas services to the site.

B. Proposed Conditions

It is intended to extend a gas main to the site from Saugatuck Avenue or as determined by Southern Connecticut Gas Company.

V. Telephone/Cable Television

Cable and telephone providers in the area include Frontier Communications and Cablevision of Connecticut.

SHIPMAN & GOODWIN LLP®
COUNSELORS AT LAW

Timothy S. Hollister
Phone: (860) 251-5601
Fax: (860) 251-5318
thollister@goodwin.com

May 2, 2018

Ms. Alicia Mozian
Conservation Director
Town of Westport
110 Myrtle Avenue
Room 205
Westport, CT 06880

Re: Application of Summit Saugatuck LLC for Regulated Activity Permit, Hiawatha Lane and Hiawatha Lane Extension; Peer Review Procedure

Dear Ms. Mozian:

This letter is submitted to the Conservation Commission and your office in connection with the above-captioned application, which will be filed within several days of this letter. The purpose of this letter is to clarify the Commission's "peer review" procedure and the applicant's rights and expectations regarding that review. Please understand that each item in this letter is the result of actual, and in some cases unfortunate, experience with a peer review in other towns.

With regard to the peer review and fee authorized by § 9.1.6 of the Westport Inland Wetlands Regulations, the applicant will provide the 150 percent fee, but makes the following requests:

1. Your office will identify to us in advance any consultant that the Commission proposes to retain, so that we can verify that the person or firm has the necessary qualifications to conduct the peer review, and has no conflicts of interest or bias with regard to the applicant, its team, or the proposed redevelopment. A list of the applicant's development team is attached.

2. We request the opportunity to be apprised of each consultant's proposed scope of work and fee estimate before the commencement of work.

3. We request that each consultant be provided a copy of this letter, be apprised of the public hearing schedule, and confirm availability to produce a complete report in a timely manner, as explained below.

4. We request that each consultant be instructed to reach out to the applicant's consultants directly, by phone, e-mail, or face-to-face meeting; and to ask questions and clarify facts, plans, or information, rather than assuming, guessing, or writing memos asking questions or requesting additional information that could be provided much more quickly by direct request.

5. Because each consultant is being retained as an independent third-party, we request that each report or communication with Town staff or the Commission be copied to the applicant team (engineers Andy Tung and David Ginter, soils scientist Bill Kenny, and our office).

6. We request that each consultant report or submission (initial, reply, or supplement) be produced electronically to the applicant simultaneously with transmission to the Commission, and transmitted at least three business days prior to the public hearing at which the report will be presented.

7. We request that each consultant not make a presentation to a meeting of any town agency other than the Conservation Commission or Flood Control Board without the applicant being notified of that meeting.

Finally, we are concerned with § 9.6 of the Inland Wetlands Regulations, which states that, "All information requested by the Commission for review shall be submitted to the Conservation Department Office at least twenty-one (21) days before the Commission meeting at which the information is scheduled to be reviewed." The applicant has complied with this timeframe with respect to its initial filing of its application. However, this regulation cannot be imposed with respect to replies or supplemental submissions once the public hearing and peer review process begin. Denying an applicant the right to reply to, supplement, or discuss information submitted to the Commission office unless it is filed in writing three weeks before a public hearing would be contrary to fundamental procedural fairness and procedural due process, as well as the applicant's right to petition a government agency.

Please understand that this letter is a set of requests that arise from problems that have been encountered in other towns with peer reviews and we hope to avoid here. Each request is consistent with a fair and reasonable peer review process. These are requests intended to clarify procedures that are not spelled out in the Regulations. If the Commission, your office, or the consultant objects to or does not intend to comply with any request, we ask for written notification, and an explanation. The applicant intends to work with the Commission and its staff and consultants to ensure a thorough but fair peer review process.

Thank you for your attention.

Very truly yours,

Timothy S. Hollister

TSH:ekf
Attachment

c: Mary Young (myoung@westportct.gov), Planning and Zoning Director, Town of Westport
Felix Charney (fcharney@summitdevelopment.com), Summit Saugatuck LLC
Jake Grossman (jake@grossmanco.com), Summit Saugatuck LLC
William L. Kenny (wkenny@wkassociates.net), William Kenny Associates LLC
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David R. Ginter (d.ginter@rednissmead.com), Redniss & Mead, Inc.

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One Constitution Plaza
Hartford, CT 06103-1919
(860) 251-5000

SUBMIT TO:
Westport Conservation Department
Town Hall – Room 205
110 Myrtle Avenue
Westport, CT 06880
Phone: 203-341-1170
Fax: 203-341-1088

FOR OFFICE USE ONLY
File#: ~~WPL~~ WPL-10659-18
Date Filed:
Class: Plenary
Fee: $ N/A already paid
Date Rec'd:
☐ Cash ☐ Check # N/A
Final Inspection (Y) / N
As-Built Required (Y) / N

RECEIVED
AUG 08 2018
TOWN OF WESTPORT
CONSERVATION DEPARTMENT

APPLICATION
WESTPORT CONSERVATION DEPARTMENT

PROJECT LOCATION: See Exhibit A attached hereto and Lots 28, 34, 38, 39, 41, 42, 43, 44, 45, 47 Hiawatha Lane and Lots A5/4 & A5/5

ASSESSOR'S MAP # A5, B5 TAX LOT # A5/4 | B5/57 ZONING DISTRICT Res. B

2	59
1	56
5	55
6	60, 61, 62

APPLICANT OR AGENT		OWNER
Summit Saugatuck LLC	NAME	See Exhibit A attached hereto
55 Station Street	ADDRESS	
Southport, CT 06890		
	(H) PHONE (H)	
203-354-1500	(W) PHONE (W)	
	E-MAIL	

EXISTING CONDITIONS (Describe existing property and structures): 10 single family residences and 2 vacant lots

PROJECT DESCRIPTION/PURPOSE (Describe the proposed activity): 187 units 8-30g application located w/ 5 new bldgs w/ ~~above ent~~ below and at-grade parking and related drainage and sewage appurtenances

I hereby depose and say that all statements contained herein and all exhibits attached hereto are true and binding to the best of my knowledge:

Timothy S. Hollister, authorized agent — 5-11-18 Resubmitted 8-6-18
(Signature of Applicant) (Date)

The act of applying to the Conservation Commission and/or Department implies consent to the proposed activity, and grants permission to the Conservation Commission/Department and its agents to inspect the property herein described for the purpose of resource inventory, impact analysis, and compliance investigation at any time beginning on the date of the application filing, and extending through the pendency of any permit issued, or in the event of permit denial, for the purpose of compliance control.

Timothy S. Hollister, authorized agent — 5-11-18 Resubmitted 8-16-18
(Signature of Property Owner) (Date)

Resubm. Hed 8-6-18

TOWN OF WESTPORT

SCHEDULE D—WATERWAY PROTECTION LINES **APP#_____**

Due by 4:00 p.m. on_____.

1. Explain/submit information showing why/how the proposed activity as located within Waterway Protection Lines will not cause flooding, drainage, erosion and/or related conditions hazardous to life and property and will not have an adverse impact upon the flood-carrying and water-storage capacity of the town's waterways, including but not limited to the impact upon flood heights, hydrological energy flow, maintenance of essential and natural patterns of water circulation, drainage and basin configuration and maintenance of fresh- and saltwater exchange through the placement of culverts, tide gates or other drainage flood-control structures. *(Sec. 148-8 of the Waterway Protection Line Ordinance)*

   There is minimal work proposed within the limits of the WPLO line and is limited to the installation of the sanitary sewer force main just west of the intersection of Hiawatha Lane Extension and Davenport Avenue. The work to install the sewer line is limited to within the roadway and sediment and erosion control measures have been included on the plans. As the watercourse is routed through two culverts under the road, the installation of the sewer line will not have an adverse impact on the flood carrying capacity or the water storage capacity of the waterway.

2. Explain/submit information showing why/how the proposed activity as located within the Waterway Protection Lines will not cause water pollution, erosion and/or environmentally related hazards to life and property and will not have an adverse impact on the preservation of the natural resources and ecosystems of the waterway, including but not limited to impact on ground or surface water, aquifers, plant and aquatic life, nutrient exchange and supply, thermal energy flow, natural pollution filtration and decomposition, habitat diversity, viability and productivity and natural rates and processes or erosion and sedimentation. *(Sec. 148-9 of the Waterway Protection Line Ordinance)*

   The proposed work within the WPLO line is occurring in areas that have already be disturbed as it is the existing roadway. The installation of the sewer line below the roadway will not adversely impact the preservation of natural resources and the ecosystem of the waterway.

3. Other: