

Street No./ Name: _____

**TOWN OF LEDYARD
INLAND WETLANDS AND WATERCOURSES COMMISSION (IWWC)
APPLICATION FOR PERMIT (Or Commission ruling that a permit is not needed)**

Application No. 22-1188B
Receipt Date 6/7/2022

Date Submitted _____

Applicant/Agent Harry B. Heller, Agent for Mr. G. 1., LLC Owner (if different) Mr. G. 1., LLC

Address 736 Norwich-New London Turnpike, Uncasville, CT 06382 Address of Owner c/o Amy Gottesdiener, Member, 55 Trumbull Road, Waterford, CT 06385

Phones (860) 848-1248 / _____ cell Phone (508) 326-4807

- I have received information on the Army Corps of Engineers permit procedure.
- I have read and have included all the application and site plan requirements in Section 7 of the IWWC Regulations

[Signature]
 M/G. 1., LLC
 By: Harry B. Heller, its Authorized Agent Signature of Applicant/ Agent

LAND USE DEPARTMENT

JUN 07 2022

RECEIVED

Location of Property 79 Vinegar Hill Road

Tax Assessor's Map No. 94, Lot 79 Zoning District R-60*

*Open Space
Subdivision
Design

Written Description of Proposed Activity Jurisdictional determination that relocation of stormwater quality/detention basin and subsurface stormwater culvert within approved common driveway crossing are consistent with original permit granted to conduct regulated activities in conjunction with the development of the Eagles Landing Subdivision.

Proposed Erosion/ Sediment Control Measures: As depicted on subdivision plan

Total Area of Site 170.16 Acres** Total Area of Wetlands per Official Inventory Map 45 +/- acres

Amount of Fill, in Cubic Yards 110 +/- Disturbed Area, in Square Feet 1,540 +/- s.f. or in Acres _____

Area Increase/Decrease in Wetlands N/A (For Map Amendment Only*)

Soil Types from USDA Soil Survey see subdivision plan

General Description of Vegetative Cover hardwood forest

Name and Address of Adjacent Property Owners
See Attached List

Anticipated Start Date Fall 2022 Completion Date Fall 2023

List previous IWWC application #'s IW18-2

IWW Commission Disposition: IWWC Regulations; Section _____ Classification _____

Signature of Chair

FEE: _____ + \$60.00 State Fee = _____ DATE PAID _____ RECEIPT # _____

**Of which 102.25 acres has been previously conveyed to the Town of Ledyard as open space

SUBDIVISION APPLICATION OF MR. G. 1., LLC

LIST OF ABUTTING PROPERTY OWNERS

Property ID	Property Owner and Mailing Address	Property Location
94-2540-88	Mr. Scott M. Lynn Ms. Melodie A. Foster 90 Vinegar Hill Road Gales Ferry, CT 06335	88 Vinegar Hill Road
94-2540-87	Mr. Zachary Miller 87 Vinegar Hill Road Gales Ferry, CT 06335	87 Vinegar Hill Road
94-2540-80	Ms. Rosalie M. Christina 80 Vinegar Hill Road Gales Ferry, CT 06335	80 Vinegar Hill Road
94-2540-84	Mr. Jackson Bergeson 84 Vinegar Hill Road Gales Ferry, CT 06335	84 Vinegar Hill Road
94-2540-82	Mr. David Rex Yocum Mrs. Stacie Marie Yocum 82 Vinegar Hill Road Gales Ferry, CT 06335	82 Vinegar Hill Road
79-2540-73	Mr. James R. Sherrard 66 Algonquin Drive Mystic, CT 06355	73 Vinegar Hill Road
93-2540-153	Town of Ledyard 741 Colonel Ledyard Highway Ledyard, CT 06339	153 Vinegar Hill Road
94-2540-76	Mr. Andrew Bichlmeier 76 Vinegar Hill Road Gales Ferry, CT 06335	76 Vinegar Hill Road
94-2540-70	Mr. James R. Sherrard Mrs. Penelope Sherrard 66 Algonquin Drive Mystic, CT 06355	70 Vinegar Hill Road
94-2540-74	Mr. Charles Klaben 74 Vinegar Hill Road Gales Ferry, CT 06335	74 Vinegar Hill Road
109-1340800-R	Town of Ledyard 741 Colonel Ledyard Highway Ledyard, CT 06339	800R Long Cove Road

95-2540-81	Town of Ledyard 741 Colonel Ledyard Highway Ledyard, CT 06339	81 Vinegar Hill Road
94-2540-79	Mr. G. I., LLC 11 Oswegatchie Road Waterford, CT 06385	79 Vinegar Hill Road

HELLER, HELLER & McCOY

Attorneys at Law

*736 Norwich-New London Turnpike
Uncasville, Connecticut 06382*

RECEIVED

MAY 27 2022

LAND USE DEPARTMENT

*Sidney F. Heller (1903-1986)
Harry B. Heller (hheller@hellermccoy.com)
William E. McCoy (bmccoy@hellermccoy.com)*

Telephone: (860) 848-1248
Facsimile: (860) 848-4003

*Mary Gagne O'Donal (mgodonal@hellermccoy.com)
Andrew J. McCoy (amccoy@hellermccoy.com)*

May 27, 2022

Town of Ledyard Inland Wetlands and Watercourses Commission
741 Colonel Ledyard Highway
Ledyard, Connecticut 06339

Re: Eagles Landing Subdivision, 79 Vinegar Hill Road, Ledyard, Connecticut

Dear Commissioners:

On June 5, 2018, the Ledyard Inland Wetlands and Watercourses Commission granted a permit to conduct regulated activities (IW18-2) in conjunction with the development of a proposed 25 lot open space subdivision of property located at 79 Vinegar Hill Road in Ledyard, Connecticut. As a result of a dispute between the Applicant and The Connecticut Light and Power Company d/b/a Eversource Energy, the subdivision approval granted for the project was terminated in 2020 until accord could be reached between the property owner and The Connecticut Light and Power Company. This office represents Mr. G. 1., LLC, the owner of the property which was the subject of the original permit application and is the current subject of a request for a jurisdictional determination.

The dispute between our client and The Connecticut Light and Power Company has now been resolved. The resolution of that dispute requires a minor redesign of the project infrastructure. As depicted on Sheet 8 of 15 of the originally approved subdivision plan, stormwater collected from the closed drainage system in Marty's Way was transmitted to a proposed stormwater quality/detention basin located within the limits of The Connecticut Light and Power Company transmission line easement adjacent immediately westerly of Wetland Flags 35-38 with a discharge of the renovated stormwater to the adjacent wetland system. In conjunction with the original subdivision approval, the Town of Ledyard Inland Wetlands and Watercourses Commission granted a permit for the construction of the stormwater quality/detention basin in the location delineated on Sheet 8 of 15 of the original subdivision plan and further granted a permit for regulated activities between Wetland Flags 34-35 and 11-13 in order to provide for a common driveway (with underground utilities) to access Lots 13 and 15 located easterly of the wetland system. The 2018 approval further granted a permit to construct a shared driveway to access Lots 25 and 27 in an upland review area adjacent southerly of Wetland Flags 23-25.

Z:\Mr. G. 1., LLC\Wetlands\ltr.Town re Submission.docx

The reconfigured infrastructure design for the project requires the relocation of the stormwater quality/detention basin to an area located easterly of the wetland system which bisects Lot 13. The relocated basin is now adjacent southerly to Wetland Flags 5-8 as depicted on the subdivision plan. In conjunction therewith, the stormwater culvert will be extended easterly within the limits of the common driveway providing access to proposed Lots 13 and 15. This will not result in any additional disturbance due to the fact that underground culverts for electric, telephone and cable television were already approved for installation within the limits of the common driveway.

The Applicant therefore hereby submits an application to the Town of Ledyard Inland Wetlands and Watercourses Commission for a jurisdictional determination that no additional permits are required in order to implement the redesign of the stormwater drainage system for the project; or, in the alternative, a determination that the relocation does not result in a significant impact activity and that a permit be issued for the redesigned infrastructure for the project.

This application is being submitted to the Town of Ledyard Inland Wetlands and Watercourses Commission together with a simultaneous application to the Town of Ledyard Planning and Zoning Commission for subdivision approval for the Eagles Landing Subdivision (which was originally approved by the Planning and Zoning Commission in 2019).

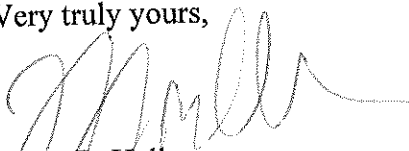
Submitted herewith and constituting the application to the Town of Ledyard Inland Wetlands and Watercourses Commission are the following:

1. Original and six (6) copies of the completed Town of Ledyard Inland Wetlands and Watercourses Commission Application for Permit with the List of Abutting Property Owners attached thereto.
2. Authorization executed by the Applicant, Mr. G. 1., LLC, thereby authorizing the law firm of Heller, Heller & McCoy and the land surveying-planning-engineering firm of Dieter & Gardner, Inc. to represent its interests in all proceedings before the Town of Ledyard Inland Wetlands and Watercourses Commission with respect to the instant application.
3. Five (5) prints of the subdivision plan entitled "Plan Showing Eagles Landing An Open Space Subdivision Property of Mr G 1 LLC 79 Vinegar Hill Road Ledyard, Connecticut Scales as Shown June 2022 Sheets 1 of 15 to 15 of 15 Dieter & Gardner Land Surveyors – Planners P.O. Box 335 1641 Route 12 Gales Ferry, CT. 06335 (860) 464-7455 Fax (860) 464-5028 Email: dieter.gardner@yahoo.com".
4. Statewide Inland Wetlands and Watercourses Activity Reporting Form.

5. Five (5) copies of the Soils Report for the site prepared by Ian T. Cole, Professional Registered Soil Scientist/Professional Wetlands Scientist dated as of February 22, 2018.
6. Three (3) copies of the Stormwater Runoff Calculations for the project prepared by LBM Engineering, LLC.
7. A copy of a letter to the Commissioner of Public Health of the State of Connecticut of even date herewith informing the Commissioner that an application has been filed for a jurisdictional determination/permit to conduct activities in a public water supply watershed.
8. A copy of a letter to the City of Groton Department of Public Utilities of even date herewith informing the Department of Public Utilities that an application has been filed for a jurisdictional determination/permit to conduct activities in a public water supply watershed.
9. A copy of the June 5, 2018 Decision of the Ledyard Inland Wetlands and Watercourses Commission granting a permit to conduct regulated activities in conjunction with the development of the Eagles Landing Subdivision.
10. I am not enclosing any application fee with respect to this application as we are requesting a jurisdictional determination that no further permit is required in conjunction with the modification of the infrastructure design for the Eagles Landing Subdivision. In the event that a determination is made by the Ledyard Inland Wetlands and Watercourses Commission that a new permit is required, the fee will be calculated and paid at that time.

Request is hereby made that you place this matter on the Agenda of the Town of Ledyard Inland Wetlands and Watercourses Commission for its regularly scheduled meeting of July 13, 2022. Should you have any questions concerning the application or need any additional information, please feel free to contact the undersigned.

Very truly yours,



Harry B. Heller

HBH/smr
Enclosures

AUTHORIZATION

MR. G. 1., LLC, a limited liability company and the owner of property located at 79 Vinegar Hill Road, Ledyard, Connecticut, hereby authorizes the law firm of Heller, Heller & McCoy to file an application on its behalf with the Town of Ledyard Inland Wetlands and Watercourses Commission for a jurisdictional determination and/or permit application with respect to the subdivision of said real property into twenty-four (24) residential building lots, together with associated infrastructure areas in accordance with a plan entitled "Plan Showing Eagles Landing An Open Space Subdivision Property of Mr G 1 LLC 79 Vinegar Hill Road Ledyard, Connecticut Scales as Shown June, 2022 Sheets 1 of 15 to 15 of 15 Dieter & Gardner Land Surveyors – Planners P.O. Box 335 1641 Route 12 Gales Ferry, CT. 06335 (860) 464-7455 Fax (860) 464-5028 Email: dieter.gardner@snet.net".

Mr. G. 1., LLC hereby further authorizes the law firm of Heller, Heller & McCoy, the surveying firm of Dieter & Gardner, Inc. and the engineering firm of LBM Engineering, LLC to represent its interests in all proceedings before the Town of Inland Wetlands and Watercourses Commission with respect to said jurisdictional determination and/or permit application.

Dated at Waterford, Connecticut this 27th day of May, 2022.

MR. G. 1., LLC

By: *Amy Gottesdiener* (L.S.)
Amy Gottesdiener, its Member

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JUN 1 2022

LAND USE DEPARTMENT



Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete this form in accordance with the instructions on pages 2 and 3 and mail 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

- DATE ACTION WAS TAKEN: year: _____ month: _____
- ACTION TAKEN (see instructions - one code only): _____
- WAS A PUBLIC HEARING HELD (check one)? yes no
- 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

- TOWN IN WHICH THE ACTIVITY IS OCCURRING (print name): Ledyard
does this project cross municipal boundaries (check one)? yes no
if yes, list the other town(s) in which the activity is occurring (print name(s)): _____
- LOCATION (see instructions for information): USGS quad name: Uncasville, Conn. or number: 87
subregional drainage basin number: _____
- NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Mr. G. I., LLC
- NAME & ADDRESS OF ACTIVITY / PROJECT SITE (print information): 79 Vinegar Hill Road, Eagles Landing Subdivision
briefly describe the action/project/activity (check and print information): temporary permanent description: Wetland
disturbance (previously approved) in conjunction with the installation of a common driveway and relocation of stormwater quality detention basin.
- ACTIVITY PURPOSE CODE (see instructions - one code only): B
- ACTIVITY TYPE CODE(S) (see instructions for codes): 9, 12, 14, _____
- WETLAND / WATERCOURSE AREA ALTERED (see instructions for explanation, must provide acres or linear feet):
wetlands: .03 acres open water body: 0 acres stream: 0 linear feet
- UPLAND AREA ALTERED (must provide acres): 9 +/- acres
- AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 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



Ian T. Cole

Professional Registered Soil Scientist / Professional Wetland Scientist

*51 Training Hill Road
Middletown, CT 06457*

Itcole@gmail.com
860-514-5642

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FEB 22 2018

February 22, 2018

Mr. Peter Gardner L.S.
Dieter & Gardner
P.O. Box 335
Gales Ferry, CT 06335

LAND USE DEPARTMENT

RE: Wetland Delineation Services, 79 Vinegar Hill Road, Open Space Subdivision, Ledyard, Connecticut.

Dear Mr. Gardner,

At your request, I completed an investigation of approximately 30+/- acres of the subject property in search of Inland Wetlands present within the vicinity of the proposed Open Space Subdivision. The wetland survey was completed in accordance with the standards of the Natural Resources Conservation Services (NRCS) National Cooperative Soil Survey and the definitions of inland wetlands and watercourses as found in the Connecticut General Statutes, Chapter 440, Sections 22a-36 through 22a-45 as amended. Wetlands, as defined by the Statute are those soil types designated as poorly drained, very poorly drained, floodplain or alluvial in accordance with the NRCS National Cooperative Soil Survey. Such areas may also include disturbed areas that have been filled, graded or excavated and which possess an aquic (saturated) soil moisture regime.

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 are contained within, flow through or border upon the Town of Ledyard or any portion thereof not regulated pursuant to sections 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes. Intermittent watercourses are 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 duration longer than a particular storm incident, and (c) the presence of hydrophytic vegetation.

A wetland field survey was completed in February 2018 to delineate the on-site wetland and watercourse boundaries using an auger and tile spade to examine the upper 20" of the soil profile. Those areas meeting the criteria noted above were marked in the field with sequentially numbered pink wetland flagging. Random soil profiles were observed across the property to verify the presence or absence of regulated wetland soil types.

Three wetland areas were identified on the property: Wetland 1 is an isolated wetland pocket near Vinegar Hill Road (Photo 1); Wetland 2 is a drainage system that flows to the north and south through the Eversource Transmission Rights-of-Ways (ROW) (Photo 2); Wetland 3 is an isolated wetland pocket east of the ROW, in the southeast corner of the proposed development.

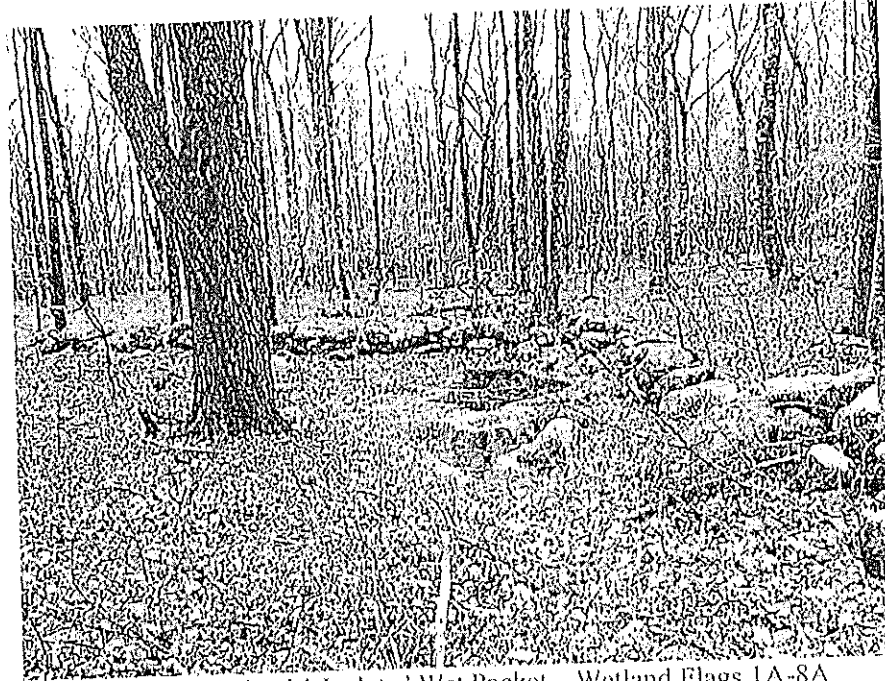


Photo 1: Wetland 1 Isolated Wet Pocket – Wetland Flags 1A-8A

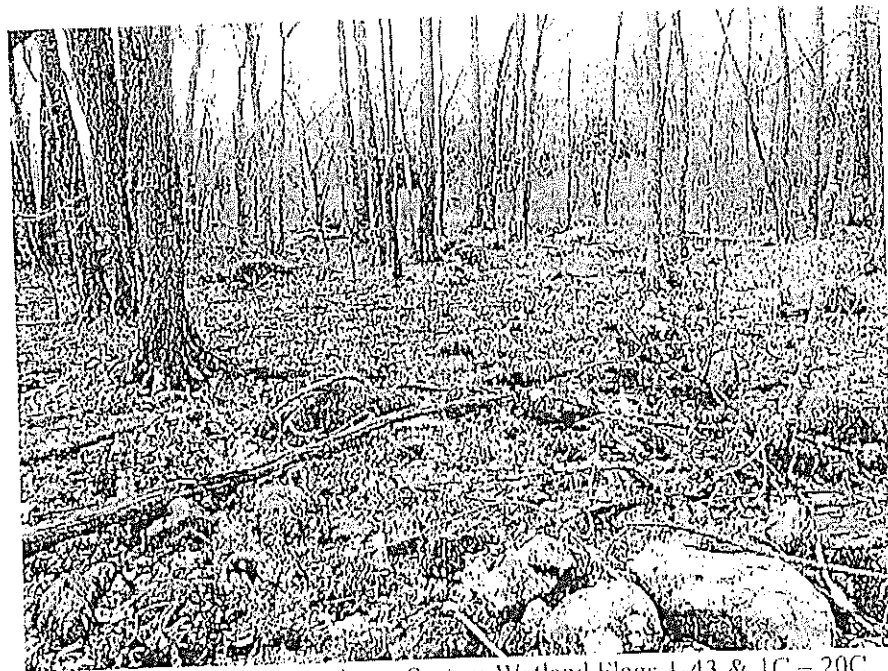


Photo 2: Wetland 2 Drainage System Wetland Flags 1-43 & 1C – 20C



Photo 3: Wetland 3 Isolated Wetland Pocket Wetland Flags 1B-17B

The soils identified on the site are a refinement of the Natural Resources Conservation Service (NRCS) New London County Soil Survey. The wetland soils are classified as Ridgebury and Leicester extremely stony fine sandy loams. Ridgebury and Leicester soils are found within drainageways and depressions on glacial till landscapes. A typical soil profile along the wetland boundary consist of approximately 2"-0" of intermediately decomposed organic material (Oi), followed by 0"-6" of a thick dark topsoil horizon (A), underlain by 6"-20" of a wet weakly developed grayish brown subsoil horizon (Bg) with few faint redoximorphic features (Common medium distinct strong brown mottles, masses) ranging from fine sandy loam to very fine sandy loam. This subsoil is underlain by a saturated sandy loam to fine sandy loam, dense gray substratum (2Cg).

According to field observations, the upland soils on the property are classified and mapped as well-drained Charlton and Chatfield fine sandy loams. It should be noted that shallow depth to bedrock in Chatfield soils can be a limiting factor for development.

Please do not hesitate to contact me at itcole@gmail.com or (860) 514-5642 if you have any questions or need any additional information.

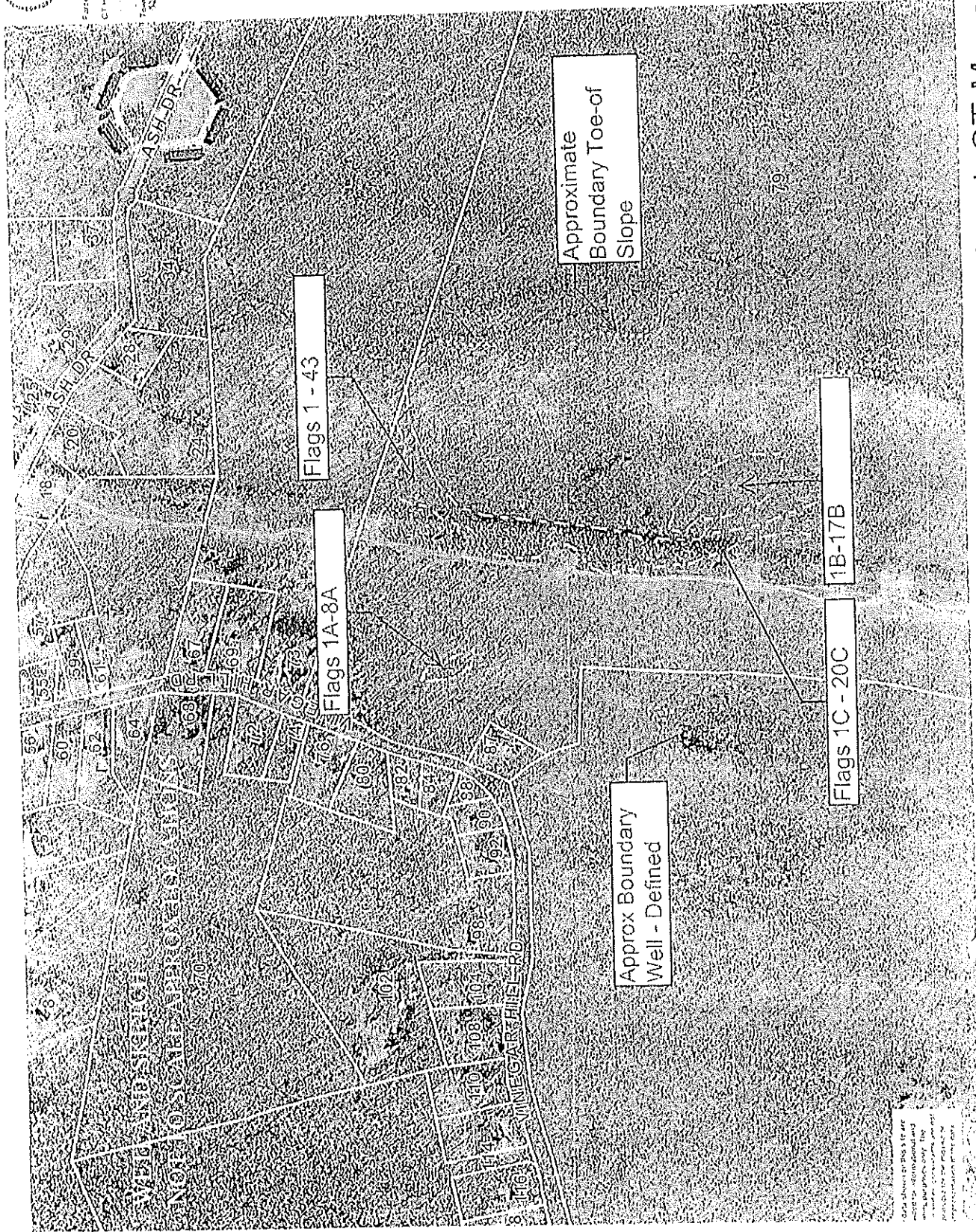
Sincerely,

Ian T. Cole
Professional Registered Soil Scientist
Professional Wetland Scientist #2006

Attachments: Wetland Sketch; Soil Survey



State of Connecticut
 Department of Transportation
 State Highway
 Town Boundary



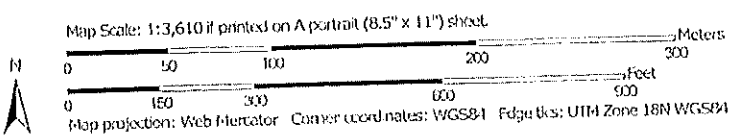
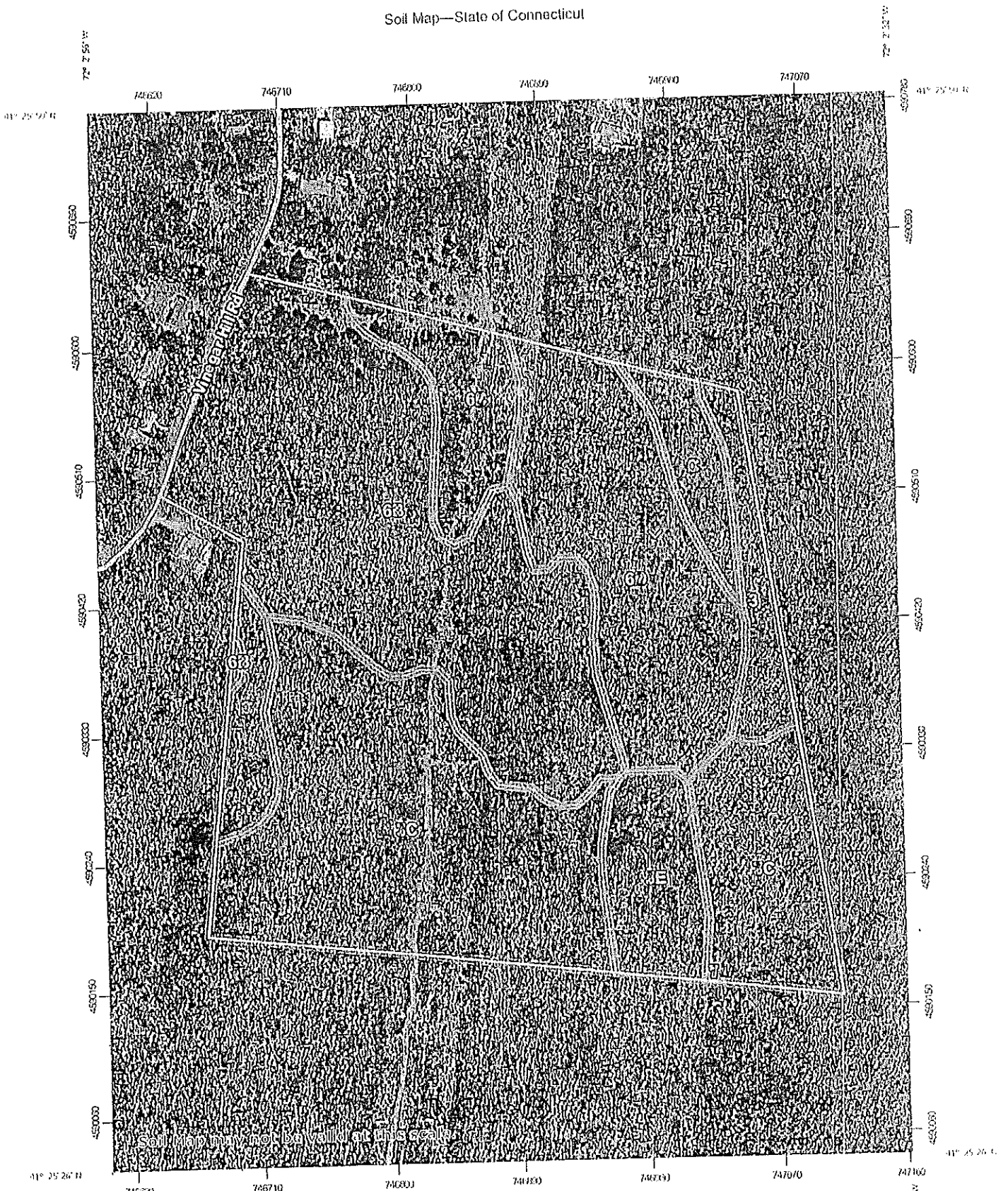
Ledyard, CT MapsOnline

Printed on 01/25/2018 at 05:24:44

1140 ft

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Soil Map—State of Connecticut



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 16, Sep 15, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 8, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

MAP LEGEND

- Area of Interest (AOI)
 - Area of Interest (AOI)
 - Soils
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Special Point Features
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot
- Water Features
 - Streams and Canals
- Transportation
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background
 - Aerial Photography
- Other Features
 - Spoil Area
 - Stony Spot
 - Very Stony Spot
 - Wet Spot
 - Other
 - Special Line Features

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	1.5	3.4%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	0.0	0.0%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	2.4	5.6%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	13.7	31.5%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	2.3	5.2%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	7.0	16.1%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	14.3	32.9%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	2.2	5.2%
Totals for Area of Interest		43.4	100.0%

LBM Engineering, LLC

P.O. Box 44, Colchester, CT 06415-0044 Phone 860-416-9809 Email info@lbmengineering.com

CIVIL ENGINEERING - LAND DEVELOPMENT - SITE PLANS - STORMWATER MANAGEMENT

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JUL 17 2018

LAND USE DEPARTMENT

**Engineering Report
For Land Use Commissions Submittals
Eagles Landing Subdivision, 79 Vinegar Hill Road, Ledyard, Connecticut**

July 6, 2018

EXISTING CONDITIONS: Reference is made to the following Plan Set: "Plan Showing Eagles Landing an Open Space Subdivision Property of Mr. G 1, LLC, 79 Vinegar Hill Road, Ledyard, Connecticut" Scales as Shown July 2018 By Dieter & Gardner, Gales Ferry, CT. The property is located on the east side of Vinegar Hill Road approximately 1,500 feet south of the intersection of Vinegar Hill Road and Ash Drive. The property is wooded. Less than one acre of the property, drains to Vinegar Hill Road via sheet flow. The remaining portion of the property drains to the north, east and south.

METHODOLOGY: The Rational Method was used for analyzing runoff rates per Part III of the Town of Ledyard's *Ordinance Regulating the Management of Stormwater Runoff*. The descending leg of the hydrographs are increased by a factor of 2.5 to provide additional stormwater volume. Intensity-Duration-Frequency (IDF) Curves were downloaded from the Northeast Regional Climate Center (NRCC) web site. Calculations are attached to this report.

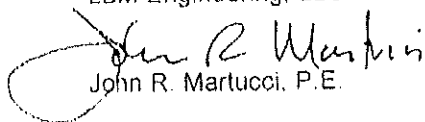
STORMWATER MANAGEMENT: The proposed development will not change the existing drainage patterns. Only 3.5 acres of the 170 acre parcel drains to the road's piped storm drain. A proposed detention/water quality basin is sized to effectively maintain the peak rates of runoff from the proposed road's drainage system for 2, 10 and 25-year rainfall events to at or below the pre-development rates. There is a slight increase in the peak rate of runoff for the 100-year event. Discharge rate from the detention/water quality basin will be further reduced as it flows over 500 feet through wetlands and underbrush. The basin is designed to drain empty after each storm. The following table provides a comparison of computed peak rates of runoff from the piped system for undeveloped land versus the developed condition:

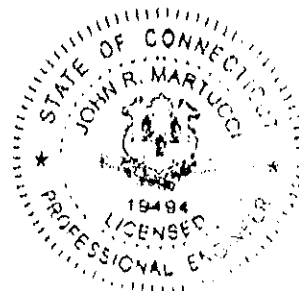
DESIGN STORM	UNDEVELOPED	DEVELOPED
2-YEAR	3.4 CFS	0.6 CFS
10-YEAR	5.1 CFS	4.1 CFS
25-YEAR	6.0 CFS	6.0 CFS
100-YEAR	7.7 CFS	8.7 CFS

WATER QUALITY: The proposed detention/water quality basin is to hold the Water Quality Volume (WQV) for 24 - 48 hours to settle out suspended solids from the proposed roadway's runoff. The CT D.E.E.P. 2004 Stormwater Quality Manual Paragraph 7.4.1 states, "In the northeastern U.S., the 90 percent rainfall event is equal to approximately one inch, which is consistent with the recommended WQV sizing criteria for Connecticut." Therefore, by treating one inch of runoff from the new road's drainage system, the proposal effectively improves the runoff from the property for 90 percent of all storm events.

CONCLUSION: The proposed development will not have adverse effects on down-gradient properties and is in keeping with the policies and goals of the Ledyard Planning and Zoning Commission.

Submitted by:
LBM Engineering, LLC


John R. Martucci, P.E.



PREPARED BY JRM	DATE PREPARED 6/2018	LBM Engineering, LLC P.O. BOX 44 COLCHESTER, CONNECTICUT 06415 TEL: (860)-416-9809 EMAIL: JOHN@LBMENGINEERING.COM	JOB NUMBER	DATE CHECKED
CHECKED BY	DATE CHECKED		CLIENT NAME	DATE PREPARED

VINEGAR HILL SUBDIVISION LEDYARD

CB1 STA 12+50 LT

ROAD $250' \times 14' = 3500 \text{ SF} = 0.08 \text{ AC}$

ROOF & DRIVE $3000 \text{ SF} \times 2.5 = 7500 \text{ SF} = 0.17 \text{ AC}$

OVERLAND 0.53 AC

WEIGHTED C = $\left[(0.25 \times 0.9) + (0.53 \times 0.3) \right] \div 0.78 = 0.49$

CB2 STA 12+50 RT

ROAD $250 \times 14' = 3500 \text{ SF} = 0.08 \text{ AC}$

DRIVEWAY APPEAL $2 \times 15' \times 15' = 450 \text{ SF} = 0.01 \text{ AC}$

OVERLANDS
WEIGHTED C = $\left[(0.09 \times 0.9) + (0.08 \times 0.3) \right] \div 0.17 = 0.62$

To WETLAND ON LOT #16

ROOF & DRIVE $(4 \times 3000) + (12 \times 160) = 0.32 \text{ AC}$

OVERLANDS (FLAT) = 2.50 AC

PREPARED BY JRM	DATE PREPARED 6/2018	LBM Engineering, LLC P.O. BOX 44 COLCHESTER, CONNECTICUT 06415 TEL (860)-415-9809 EMAIL JOHN@LBMENGINEERING.COM	JOB NUMBER	PAGE NUMBER
CHECKED BY	DATE CHECKED		CLIENT NAME	DATE PAID

VINEGAR HILL SUBDIVISIONS LETYARD

CB 3

ROAD $450' \times 14' \div 43560$ 0.14 AC

ROOF & DRIVE $[3000 + (160 \times 12)] \div 43560$ 0.11 AC

OVERLAND

0.37 AC
 $\frac{0.62 \text{ AC}}{0.62 \text{ AC}}$

$$\text{WEIGHTED } C = \left[(0.25 \times 0.9) + (0.37 \times 0.3) \right] \div 0.62 = 0.54$$

CB 4

ROAD $450 \times 14 \div 43560$ 0.14 AC

ROOF & DRIVE 3000 SF 0.07 AC

OVERLAND

0.26 AC
 $\frac{0.26 \text{ AC}}{0.47 \text{ AC}}$

$$\text{WEIGHTED } C = \left[(0.21 \times 0.9) + (0.26 \times 0.3) \right] \div 0.47 = 0.57$$

CB 5

ROAD 0.14 AC

ROOF & DRIVE $3000 + (370 \times 12) = 7440$ 0.17 AC

OVERLAND

0.69 AC
 $\frac{0.69 \text{ AC}}{1.00 \text{ AC}}$

$$\text{WEIGHTED } C = \left[(0.31 \times 0.9) + (0.69 \times 0.3) \right] \div 1 = 0.49$$

PREPARED BY JRM	DATE PREPARED 6/2018	LBM Engineering, LLC P.O. BOX 44 COLCHESTER, CONNECTICUT 06415 TEL. (860)-416-9809 EMAIL: JOHN@LBMENGINEERING.COM	JOB NUMBER	PAGE NUMBER
CHECKED BY	DATE CHECKED		CLIENT NAME	DRAW NUMBER

VINEGAR HILL SUBDIVISION LADY/ARLIS

CBG

ROAD	0.14 ac
ROOF DRIVE	0.02 ac
OVERLAND	0.05 ac
	<u>0.21 ac</u>

$$\text{WEIGHTED 'C'} = [(0.16 \times 0.9) + (0.05 \times 0.3)] \div 0.21 = 0.85$$

TOTAL AREA TO THE SYSTEM

$$P_{25} \quad 3.25 \text{ ac} \times 0.3 (\text{UNDEVELOPED}) = 6.2 = 6.0 \text{ cfs}$$

TOTAL AC

$$1.497 \div 3.25 \text{ ac} = 0.46 \text{ DEVELOPED 'C'}$$

PRE DEVELOPMENT FLOW FROM PIPED SYSTEM	Post Dev. @ VARIATION
$A \times I \times R = Q$ 2YR $3.25 \times 0.3 \times 3.5 \text{ "/math> $	2.6
10-YR $5.2 = 5.1$	4.1
25-YR $6.2 = 6.0$	6.0
100-YR $7.9 = 7.7$	8.1

1

DESIGNED BY JRM DATE 06/17/18
 CHECKED BY _____ REV _____
 DATE _____

PROJECT VINEGAR HILL SUBDIVISION
 PROJECT NO _____
 TOWN Lesford
 ROUTE _____
 LOCATION N/A

GUTTER FLOW ANALYSIS - 25 YR STORM

Inlet ID	Inlet Station and Offset	Area of Adj. Area	Length of Catchment	Time to Inlet (min)	Runoff Coefficient	Runoff Intensity (in/hr)	AC	Total A.C.	Q to Inlet (cfs)	Grade of Gutter (ft/ft)	Grade of Cross Slope (ft/ft)	Equivalent Area of Gutter (sq ft)	Channel Flow Width (ft)	Q Bypassing Inlet (cfs)	AC Bypassing Inlet	AC Exposed Catchment	Inlet Type
PROPOSED ROAD LEFT GUTTER																	
CB 1	12+50.0 LT	1.75	0.49	10	0.49	6.20	0.382	0.382	2.807	0.012	0.043	0.276	6.424	0.973	0.157	0.225	"C"
CB 5	17+10.0 LT	1.75	0.75	10	0.75	6.20	0.158	0.158	1.074	0.012	0.043	0.198	4.607	0.225	0.036	0.121	"C"
CB 4	14+50.0 LT	1.75	0.57	10	0.57	6.20	0.268	0.481	3.144	0.043	0.043						"C"
PROPOSED ROAD RIGHT GUTTER																	
CB 2	12+50.0 RT	1.75	0.62	10	0.62	6.20	0.105	0.105	0.719	0.012	0.043	0.170	3.963	0.088	0.016	0.050	"C"
CB 5	17+10.0 RT	1.75	0.49	10	0.49	6.20	0.490	0.490	3.342	0.012	0.043	0.303	7.051	1.392	0.235	0.265	"C"
CB 3	14+50.0 RT	1.75	0.54	10	0.54	6.20	0.335	0.335	2.263	0.043	0.043						"C"
NOTES																	
LOW POINT ANALYSIS																	
INLET	Q TO INLET	PERIM	C WEIR	d WEIR	WIDTH	C	ORIFICE										
CB 4	3.144	5.020	3	0.352	5.19	0.140	0.3 DEEP OK										
CB 3	2.283	5.020	3	0.284	5.61	0.078	0.3 DEEP OK										

- Notes:
1. Manning's n = 0.015 - asphalt
 2. Top 2 minutes minimum for design rainfall distribution
 3. Top 15 - 10 minutes minimum for flood areas with stormwater ponds
 4. All flow points calculated using Rational Method with 25 year storm

ORIFICE	PERIM	AREA
1	5.00	3.14
2	5.28	3.14
3	5.28	3.14
4	5.28	3.14

**STORM SEWER SYSTEM DESIGN
DRAINAGE SYSTEM**

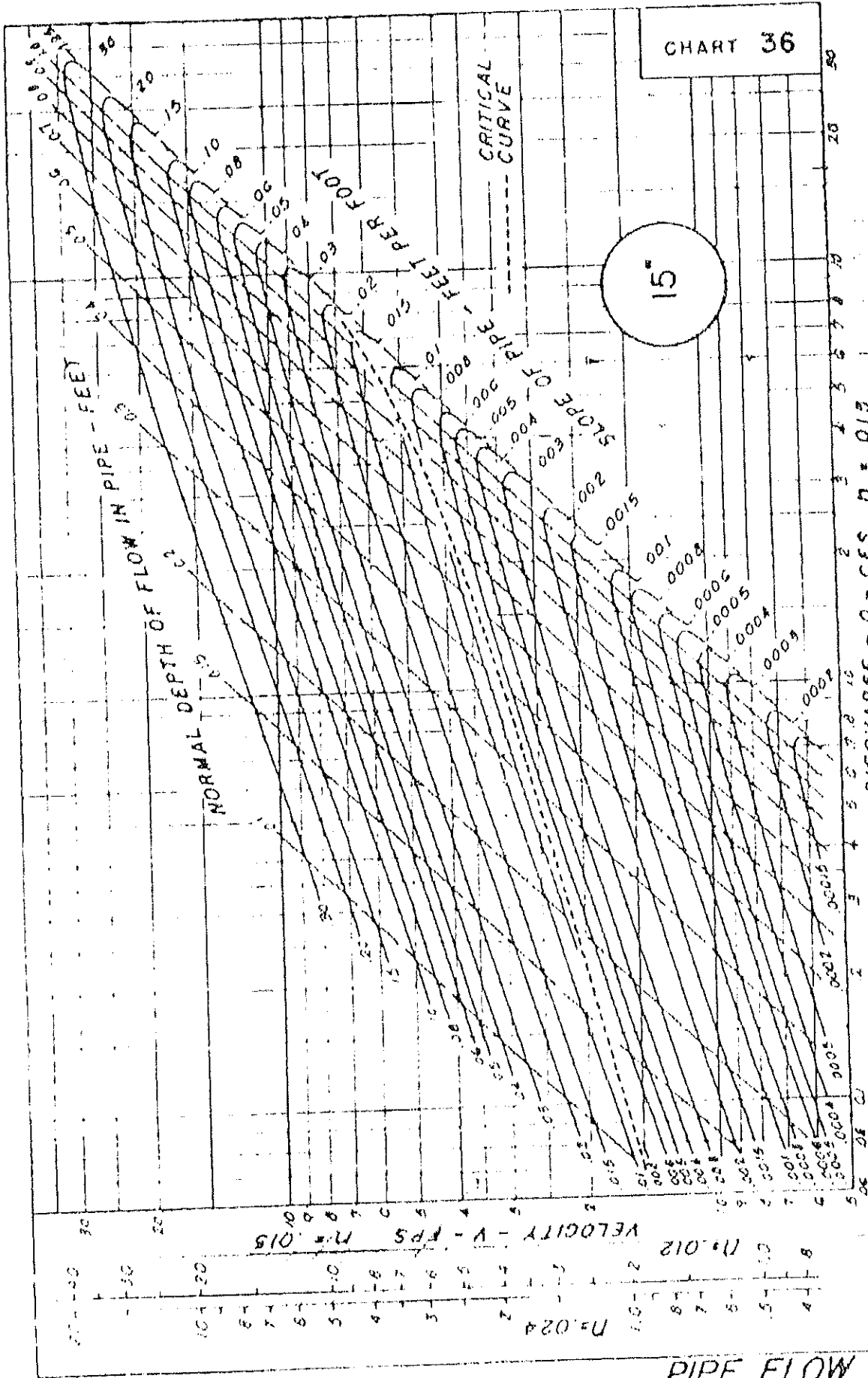
Sheet No 1 of 1

Client: VINEGAR HILL SUBDIVISION
 Project: VINEGAR HILL SUBDIVISION
 Proj. No: 25-YR
 Return Period for Design: 25-YR
 Prepared By: JRM Date: 06/17/18 Revised

Line Segment	From	To	Time to Inlet (min.)	Time in Pipe (min.)	Accumul Time (min.)	A x C Entering System	Sum of A x C in System	Rainfall Intensity R (in./hr.)	Q in System (c.f.s.)	Size (in.)	Length (ft.)	Slope (ft./ft.)	Pipe Data			Manning "n"
													Avg Vel (f.p.s.)	Full Cap. (c.f.s.)	Headwater (ft.)	
CB 1		CB 2	10	0.07	10.0	0.225	0.225	6.2	1.40	15	22	0.010	5.0	6.99	0.40	0.012
12+50.LI		12+50.RT														
CB 2		CB 3	10	0.64	10.1	0.09	0.315	6.2	1.95	15	192	0.010	5.0	6.99	0.60	0.012
12+50.RT		14+60.RT														
CB 6		CB 5	10	0.09	10.0	0.121	0.121	6.2	0.75	15	22	0.010	4.0	6.99	0.40	0.012
17+10.LI		17+10.RT														
CB 5		CB 3	10	0.69	10.1	0.265	0.366	6.2	2.39	15	250	0.010	6.0	6.99	0.50	0.012
17+10.RT		14+60.RT														
CB 3		CB 4	10	0.05	10.8	0.335	1.036	6.2	6.42	15	22	0.010	7.0	6.99	1.00	0.012
14+60.RT		14+60.IT														
CB 4		OUTLET	10	0.50	10.8	0.461	1.497	5.2	9.28	18	300	0.026	10.0	18.34	2.00	0.012
14+60.IT																

NOTE ALL PIPES ARE BELOW FULL CAPACITY

Manning's "n" for 4" pipe and 4" pipe = 0.012



PIPE FLOW CHART
15-INCH DIAMETER

DISCHARGE - Q - CFS	VELOCITY - V - FPS	SLOPE OF PIPE - FEET PER FOOT	NORMAL DEPTH OF FLOW IN PIPE - FEET
0.1	0.2	0.3	0.4
0.2	0.4	0.6	0.8
0.3	0.6	1.0	1.2
0.4	0.8	1.5	1.8
0.5	1.0	2.0	2.4
0.6	1.2	2.5	3.0
0.7	1.4	3.0	3.6
0.8	1.6	3.5	4.2
0.9	1.8	4.0	4.8
1.0	2.0	4.5	5.4
1.2	2.4	5.0	6.0
1.5	3.0	6.0	7.2
2.0	4.0	8.0	9.6
3.0	6.0	12.0	14.4
4.0	8.0	16.0	19.2
5.0	10.0	20.0	24.0
6.0	12.0	24.0	28.8
7.0	14.0	28.0	33.6
8.0	16.0	32.0	38.4
9.0	18.0	36.0	43.2
10.0	20.0	40.0	48.0



NOAA Atlas 14, Volume 10, Version 2
 Location name: Ledyard, Connecticut, USA*
 Latitude: 41.4443°, Longitude: -72.0175°
 Elevation: 304.37 ft**
 *source: FSR14laps
 **source: USGS



PPOINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Pivotal, Svetla Pavlyuk, Michael St. Laurent, Carl Trzopka, Dale Jacob, Orlan Zolotare

NOAA National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps & reports

1.04"/10 min / 6.10"/1 hr

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.341 (0.265-0.437)	0.408 (0.316-0.523)	0.517 (0.399-0.664)	0.608 (0.467-0.783)	0.732 (0.545-0.973)	0.828 (0.605-1.12)	0.924 (0.656-1.26)	1.05 (0.704-1.46)	1.21 (0.782-1.74)	1.33 (0.641-2.09)
10-min	0.483 (0.375-0.619)	0.578 (0.448-0.740)	0.732 (0.556-0.941)	0.861 (0.661-1.11)	1.04 (0.772-1.38)	1.17 (0.856-1.58)	1.31 (0.946-1.82)	1.48 (0.997-2.08)	1.71 (1.17-2.45)	1.88 (1.19-2.71)
15-min	0.569 (0.441-0.728)	0.680 (0.527-0.871)	0.862 (0.665-1.11)	1.01 (0.778-1.31)	1.22 (0.909-1.62)	1.38 (1.01-1.86)	1.54 (1.09-2.13)	1.74 (1.17-2.44)	2.01 (1.30-2.98)	2.27 (1.46-3.23)
30-min	0.802 (0.622-1.03)	0.959 (0.743-1.23)	1.21 (0.937-1.56)	1.43 (1.09-1.81)	1.72 (1.28-2.28)	1.94 (1.47-2.62)	2.17 (1.54-3.00)	2.45 (1.65-3.43)	2.83 (1.83-4.26)	3.12 (1.97-4.59)
60-min	1.04 (0.804-1.33)	1.24 (0.958-1.59)	1.57 (1.21-2.01)	1.84 (1.41-2.37)	2.21 (1.65-2.94)	2.50 (1.83-3.38)	2.79 (1.98-3.87)	3.16 (2.13-4.42)	3.65 (2.36-5.21)	4.02 (2.49-5.81)
2-hr	1.36 (1.07-1.73)	1.62 (1.27-2.06)	2.06 (1.60-2.62)	2.41 (1.87-3.08)	2.90 (2.18-3.83)	3.28 (2.43-4.39)	3.66 (2.62-5.04)	4.15 (2.80-5.76)	4.79 (3.12-6.81)	5.27 (3.37-7.43)
3-hr	1.58 (1.24-2.00)	1.88 (1.48-2.38)	2.38 (1.86-3.02)	2.79 (2.17-3.55)	3.36 (2.56-4.41)	3.80 (2.81-5.06)	4.24 (3.04-5.80)	4.80 (3.26-6.63)	5.54 (3.67-7.84)	6.10 (4.01-8.59)
6-hr	2.01 (1.59-2.51)	2.38 (1.89-2.99)	3.01 (2.37-3.77)	3.52 (2.76-4.33)	4.23 (3.21-5.50)	4.77 (3.55-6.30)	5.32 (3.84-7.22)	6.02 (4.11-8.25)	6.95 (4.56-9.76)	7.65 (5.01-10.9)
12-hr	2.48 (1.98-3.07)	2.94 (2.39-3.69)	3.69 (2.94-4.59)	4.32 (3.42-5.39)	5.18 (3.97-6.68)	5.84 (4.38-7.65)	6.51 (4.74-9.07)	7.37 (5.06-10.0)	8.50 (5.61-11.9)	9.36 (6.14-13.3)
24-hr	2.90 (2.34-3.57)	3.46 (2.79-4.25)	4.36 (3.51-5.38)	5.11 (4.09-6.33)	6.15 (4.75-7.87)	6.95 (5.26-9.03)	7.75 (5.69-10.4)	8.81 (6.09-11.9)	10.2 (6.78-14.2)	11.3 (7.50-15.5)
2-day	3.25 (2.64-3.95)	3.90 (3.18-4.75)	4.97 (4.03-6.07)	5.87 (4.73-7.19)	7.09 (5.53-9.01)	8.04 (6.13-10.4)	8.98 (6.66-12.0)	10.3 (7.15-13.8)	12.0 (8.02-16.5)	13.4 (8.64-18.6)
3-day	3.52 (2.88-4.26)	4.22 (3.46-5.12)	5.38 (4.39-6.54)	6.34 (5.14-7.73)	7.66 (6.09-9.68)	8.68 (6.66-11.2)	9.70 (7.22-12.9)	11.1 (7.76-14.3)	13.0 (8.70-17.8)	14.4 (9.41-19.7)
4-day	3.77 (3.10-4.55)	4.51 (3.71-5.45)	5.73 (4.69-6.93)	6.73 (5.49-8.19)	8.12 (6.38-10.2)	9.19 (7.07-11.8)	10.3 (7.66-13.5)	11.7 (8.71-15.6)	13.7 (9.52-18.1)	15.2 (10.22-20.2)
7-day	4.49 (3.72-5.38)	5.30 (4.49-6.35)	6.63 (5.46-7.95)	7.72 (6.33-9.31)	9.23 (7.30-11.5)	10.4 (8.09-13.2)	11.6 (8.66-15.1)	13.1 (9.22-17.3)	15.2 (10.2-20.6)	16.8 (11.0-22.1)
10-day	5.21 (4.30-6.20)	6.05 (5.03-7.21)	7.44 (6.16-8.88)	8.59 (7.07-10.3)	10.2 (8.07-12.6)	11.4 (8.83-14.3)	12.6 (9.45-16.3)	14.2 (9.99-18.6)	16.2 (11.2-21.9)	17.8 (12.2-23.4)
20-day	7.39 (6.22-8.72)	8.30 (6.97-9.80)	9.78 (8.18-11.6)	11.0 (9.15-13.1)	12.7 (10.1-15.5)	14.0 (10.9-17.4)	15.3 (11.5-19.4)	16.7 (11.9-21.7)	18.5 (12.6-24.7)	19.9 (13.7-26.1)
30-day	9.21 (7.79-10.8)	10.2 (8.58-11.9)	11.7 (9.85-13.8)	13.0 (10.9-15.4)	14.8 (11.8-17.9)	16.1 (12.6-19.8)	17.5 (13.1-21.9)	18.7 (13.4-24.2)	20.4 (13.9-27.0)	21.6 (14.3-28.9)
45-day	11.5 (9.74-13.4)	12.5 (10.6-14.5)	14.1 (11.9-16.5)	15.5 (13.0-18.2)	17.4 (14.0-20.9)	18.8 (14.7-23.9)	20.3 (15.2-25.3)	21.4 (15.3-27.5)	22.8 (15.6-30.1)	23.9 (16.1-31.4)
60-day	13.3 (11.4-15.5)	14.4 (12.3-16.7)	16.1 (13.7-18.8)	17.6 (14.8-20.6)	19.6 (15.9-23.4)	21.1 (16.6-25.5)	22.6 (17.0-27.9)	23.7 (17.3-30.3)	25.0 (17.2-33.6)	26.1 (17.4-34.9)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Members in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
 Please refer to NOAA Atlas 14 document for more information.

Back to top

PF graphical

COMPUTATIONS FOR

WATER QUALITY FLOW / WATER QUALITY VOLUME
 VINEGAR HILL RD SUBDIVISION
 LEDYARD

Project

Made By

Date

Rev

Date

IN SYSTEM TO BASIN

ConnDOT Drainage Manual Ch. 10 and Ch. 11, Appendix C

Contributing Basins	Wooded Area (acres)	Grass Area (acres)	Paved Area (acres)	Total Area (acres)
				6.2
Total	0	4.8	1.4	6.2

Equation 10-31 $WQV = (1)(R)(A)/12 =$ 0.131 acre-feet or 5,699 cubic-feet

$I = \% \text{ of Impervious Cover} =$ 23%

$R = \text{volumetric runoff coeff } 0.05 + 0.009(I) =$ 0.2532

$A = \text{site area (acres)} =$ 6.2 acres = 0.0097 miles²

$Q = \text{runoff depth (in watershed inches)} = [WQV(\text{acre-feet})] \{12(\text{inches/foot})\} / \text{drainage area (acres)}$
 $Q =$ 0.2532258

$CN = 1000 / [10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{0.5}] =$ 88.0

$P = \text{design precipitation (1" for water quality storm)} =$ 1 inch

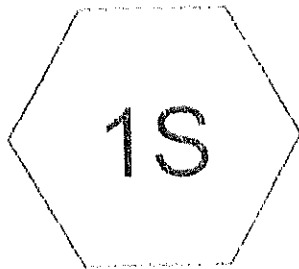
$Q = \text{runoff depth (in watershed inches)}$

$t_c =$ 10 min
 hours

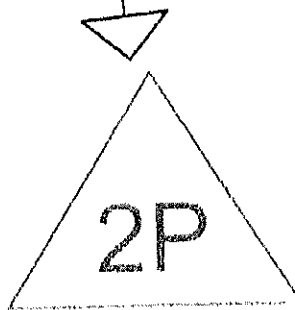
From Table 4-1, $I_a =$ $I_a/P =$ 0.273

From Exhibit 4-III, $q_u =$

$WQF = (q_u)(A)(Q) =$ 1.23 cfs



TO BASIN



WQ BASIN

Subcat

Reach

Pond

Link

Routing Diagram for VINEGAR HILL BASIN
Prepared by UBM Engineering LLC - Printed 09/22/07
HydroCAD v10.00.22 - SW09102 - 2010 HydroCAD Software - UBM

VINEGAR HILL BASIN

CT-Ledyard 2-yr Duration=10 min. Inten=3.46 in/hr

Prepared by LBM Engineering LLC

Printed 7/6/2018

HydroCAD@ 10.00-22 s/n 09192 © 2018 HydroCAD Software Solutions LLC

Page 1

Summary for Subcatchment 1S: TO BASIN

Runoff = 5.17 cfs @ 0.17 hrs. Volume= 5.469 cf Depth= 0.46"

Runoff by Rational method, Rise/Fall=1.0/2.5 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 CT-Ledyard 2-yr Duration=10 min. Inten=3.46 in/hr

Area (ac)	C	Description	Land Use
3.250	0.46	SYSTEM TO BASIN	
3.250		100.00% Pervious Area	

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

Summary for Pond 2P: WQ BASIN

Inflow Area = 141.570 sf. 0.00% Impervious. Inflow Depth = 0.46" for 2-yr event
 Inflow = 5.17 cfs @ 0.17 hrs. Volume= 5.469 cf
 Outflow = 0.59 cfs @ 0.54 hrs. Volume= 284 cf, Atten= 89%, Lag= 21.9 min
 Primary = 0.59 cfs @ 0.54 hrs. Volume= 284 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.07' @ 0.54 hrs Surf.Area= 2.287 sf Storage= 5.332 cf

Plug-Flow detention time= 33.6 min calculated for 284 cf (5% of inflow)
 Center-of-Mass det. time= 21.5 min (36.5 - 15.0)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	7.823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
274.00	1.120	0	0
276.00	1.965	3.085	3.085
277.00	2.234	2.100	5.185
278.00	3.042	2.638	7.823

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.59 cfs @ 0.54 hrs HW=277.06' (Free Discharge)
 ↑-1=Broad-Crested Rectangular Weir (Weir Controls 0.59 cfs @ 0.60 fps)

VINEGAR HILL BASIN

CT-Ledyard 10-yr Duration=10 min. Inten=5.14 in/hr

Prepared by LBM Engineering LLC

Printed 7/6/2018

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Page 2

Summary for Subcatchment 1S: TO BASIN

Runoff = 7.68 cfs @ 0.17 hrs. Volume= 3.128 cf. Depth= 0.69"

Runoff by Rational method, Rise/Fall=1.0/2.5 xTc, Time Span= 0.00-3.00 hrs. dt= 0.01 hrs
 CT-Ledyard 10-yr Duration=10 min, Inten=5.14 in/hr

Area (ac)	C	Description	Land Use
3.250	0.46	SYSTEM TO BASIN	
3.250		100.00% Pervious Area	

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

Summary for Pond 2P: WQ BASIN

Inflow Area = 141.570 sf, 0.00% Impervious, Inflow Depth = 0.69" for 10-yr event
 Inflow = 7.68 cfs @ 0.17 hrs, Volume= 8.128 cf
 Outflow = 4.14 cfs @ 0.36 hrs, Volume= 2.943 cf, Atten= 46%, Lag= 11.5 min
 Primary = 4.14 cfs @ 0.36 hrs, Volume= 2.943 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.24' @ 0.36 hrs Surf.Area= 2.425 sf Storage= 5.736 cf

Plug-Flow detention time= 18.5 min calculated for 2.943 cf (36% of inflow)
 Center-of-Mass det. time= 10.9 min (25.9 - 15.0)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	7.823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf Area (sq-ft)	Inc.Store (cubic-feet)	Cum Store (cubic-feet)
274.00	1,120	0	0
276.00	1,965	3,085	3,085
277.00	2,234	2,100	5,185
278.00	3,042	2,638	7,823

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.65 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.13 cfs @ 0.36 hrs HW=277.24' (Free Discharge)
 †-1=Broad-Crested Rectangular Weir (Weir Controls 4.13 cfs @ 1.16 fps)

VINEGAR HILL BASIN

CT-Ledyard 25-yr Duration=10 min. Inten=6.18 in/hr

Prepared by LBM Engineering LLC

Printed 7/6/2018

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Page 3

Summary for Subcatchment 1S: TO BASIN

Runoff = 9.24 cfs @ 0.17 hrs, Volume= 9,780 cf. Depth= 0.83"

Runoff by Rational method, Rise/Fall=1.0/2.5 xTc, Time Span= 0.00-3.00 hrs. dt= 0.01 hrs
 CT-Ledyard 25-yr Duration=10 min, Inten=6.18 in/hr

Area (ac)	C	Description	Land Use
3.250	0.46	SYSTEM TO BASIN	
3.250		100.00% Pervious Area	

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

Summary for Pond 2P: WQ BASIN

Inflow Area = 141,570 sf, 0.00% Impervious. Inflow Depth = 0.83" for 25-yr event
 Inflow = 9.24 cfs @ 0.17 hrs, Volume= 9,780 cf
 Outflow = 5.96 cfs @ 0.32 hrs, Volume= 4,595 cf. Atten= 36%, Lag= 8.8 min
 Primary = 5.96 cfs @ 0.32 hrs, Volume= 4,595 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-3.00 hrs. dt= 0.01 hrs
 Peak Elev= 277.30' @ 0.32 hrs Surf.Area= 2,475 sf Storage= 5,887 cf

Plug-Flow detention time= 15.4 min calculated for 4,595 cf (47% of inflow)
 Center-of-Mass det. time= 8.9 min (23.9 - 15.0)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	7,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
274.00	1,120	0	0
276.00	1,965	3,085	3,085
277.00	2,234	2,100	5,185
278.00	3,042	2,638	7,823

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=5.95 cfs @ 0.32 hrs HW=277.30' (Free Discharge)
 †1=Broad-Crested Rectangular Weir (Weir Controls 5.95 cfs @ 1.33 fps)

VINEGAR HILL BASIN

CT-Ledyard 100-yr Duration=10 min, Inten=7.80 in/hr

Prepared by LBM Engineering LLC

Printed 7/6/2018

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Page 4

Summary for Subcatchment 1S: TO BASIN

Runoff = 11.67 cfs @ 0.17 hrs, Volume= 12.343 cf, Depth= 1.05"

Runoff by Rational method, Rise/Fall=1.0/2.5 xTc, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 CT-Ledyard 100-yr Duration=10 min, Inten=7.80 in/hr

Area (ac)	C	Description	Land Use
3.250	0.46	SYSTEM TO BASIN	
3.250		100.00% Pervious Area	

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

Summary for Pond 2P: WQ BASIN

Inflow Area = 141,570 sf, 0.00% Impervious Inflow Depth = 1.05" for 100-yr event
 Inflow = 11.67 cfs @ 0.17 hrs, Volume= 12.343 cf
 Outflow = 8.69 cfs @ 0.28 hrs, Volume= 7.158 cf, Atten= 25%, Lag= 6.3 min
 Primary = 8.69 cfs @ 0.28 hrs, Volume= 7.158 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-3.00 hrs, dt= 0.01 hrs
 Peak Elev= 277.38' @ 0.28 hrs Surf.Area= 2,539 sf Storage= 6.087 cf

Plug-Flow detention time= 12.5 min calculated for 7.158 cf (58% of inflow)
 Center-of-Mass det. time= 7.1 min (22.1 - 15.0)

Volume #1	Invert	Avail.Storage	Storage Description
	274.00'	7,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
274.00	1,120	0	0
276.00	1,965	3,085	3,085
277.00	2,234	2,100	5,185
278.00	3,042	2,638	7,823

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	15.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

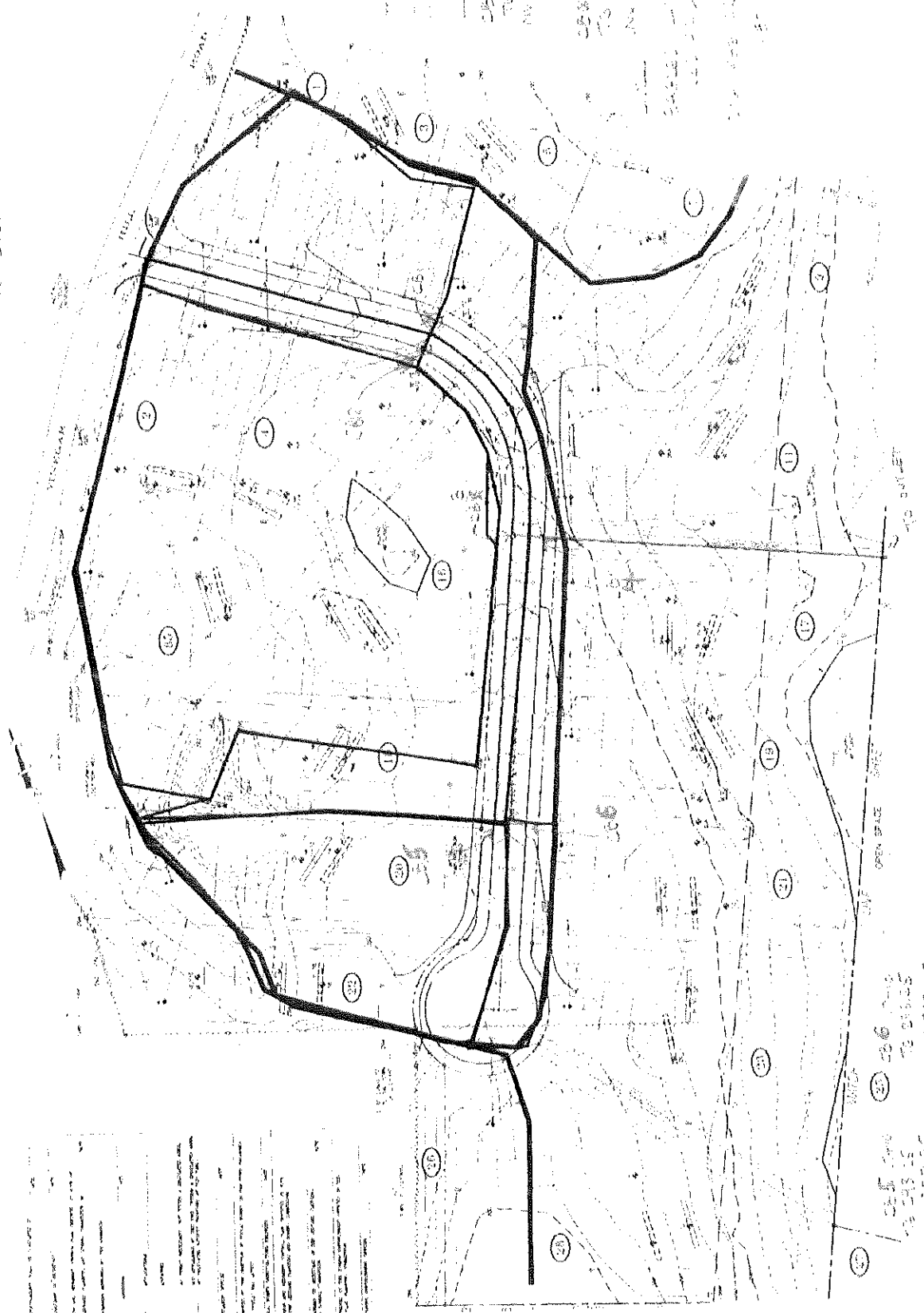
Primary OutFlow Max=8.68 cfs @ 0.28 hrs HW=277.38' (Free Discharge)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 8.68 cfs @ 1.53 fps)

DATE: 10/10/54
TO: SAC, NEW YORK
FROM: SAC, PHOENIX

RE: [Illegible]

DATE: 10/10/54
TO: SAC, NEW YORK
FROM: SAC, PHOENIX

DATE: 10/10/54
TO: SAC, NEW YORK
FROM: SAC, PHOENIX



[Illegible text block, possibly a legend or technical specifications]

DATE: 10/10/54
TO: SAC, NEW YORK
FROM: SAC, PHOENIX

HELLER, HELLER & McCOY

Attorneys at Law

736 Norwich-New London Turnpike

Uncasville, Connecticut 06382

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Telephone: (860) 848-1248
Facsimile: (860) 848-4003

May 27, 2022

RECEIVED

MAY 27 2022

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

State of Connecticut Commissioner of Public Health
410 Capitol Avenue
Hartford, Connecticut 06134

LAND USE DEPARTMENT

Re: Mr. G. 1., LLC – Application for a Permit for Jurisdictional Determination with Respect to Regulated Activities to the Town of Ledyard Inland Wetlands and Watercourses Commission with Respect to Property Located at 79 Vinegar Hill Road, Ledyard, Connecticut, Assessor's Map 94, Lot 79

Dear Commissioner:

Please be advised that this office represents Mr. G. 1., LLC, the owner of a 68 +/- acre parcel of land located at 79 Vinegar Hill Road in Ledyard, Connecticut. Our client has filed an application for a jurisdictional determination that no further permit is required with the Town of Ledyard Inland Wetlands and Watercourses Commission in conjunction with a modification of a previously approved infrastructure design for the subdivision of the subject property into twenty-four (24) residential building lots.

The land which is the subject of the application to the Town of Ledyard Inland Wetlands and Watercourses Commission is located within the watershed area of the City of Groton Department of Public Utilities. We are providing notice to the City of Groton Department of Public Utilities as well as the Commissioner of Public Health in accordance with the requirements of §8-3i of the Connecticut General Statutes.

I enclose herewith for your reference a copy of the application for a jurisdictional determination to the Town of Ledyard Inland Wetlands and Watercourses Commission as well as with a copy of our transmittal to the Ledyard Inland Wetlands and Watercourses Commission delineating the supplemental information which has been provided with the application for a

Z:\Mr. G. 1., LLC\Wetlands\ltr.CT DPH.docx

State of Connecticut Commissioner of Public Health
May 27, 2022
Page 2 of 2

jurisdictional determination. I also enclose herewith a print of Sheet 1 of 15 of the Subdivision Plan delineating the property which is proposed for residential subdivision.

Should you require further information, please feel free to contact the undersigned.

Very truly yours,

COPY

Harry B. Heller

HBH/smr
Enclosures

HELLER, HELLER & McCOY

Attorneys at Law

736 Norwich-New London Turnpike

Uncasville, Connecticut 06382

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Andrew J. McCoy (amccoy@hellermccoy.com)

Telephone: (860) 848-1248
Facsimile: (860) 848-4003

May 27, 2022

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
City of Groton Department of Public Utilities
295 Meridian Street
Groton, Connecticut 06340

RECEIVED

MAY 27 2022

LAND USE DEPARTMENT

Re: Mr. G. 1., LLC – Application for a Permit for Jurisdictional Determination with Respect to Regulated Activities to the Town of Ledyard Inland Wetlands and Watercourses Commission with Respect to Property Located at 79 Vinegar Hill Road, Ledyard, Connecticut, Assessor's Map 94, Lot 79

Gentleperson:

Please be advised that this office represents Mr. G. 1., LLC, the owner of a 68 +/- acre parcel of land situated at 79 Vinegar Hill Road in the Town of Ledyard, Connecticut. Our client has filed an application for a jurisdictional determination with the Town of Ledyard Inland Wetlands and Watercourses Commission that no further permit is required in conjunction with the subdivision of this property into twenty-four (24) building lots. A permit for this project was previously granted by the Town of Ledyard Inland Wetlands and Watercourses Commission in 2018 and the revised plan contains minor revisions to the infrastructure design for the project.

The land which is the subject of the application to the Town of Ledyard Inland Wetlands and Watercourses Commission is located within the watershed area of the City of Groton Department of Public Utilities. We are providing notice to the City of Groton Department of Public Utilities as well as the Commissioner of Public Health of the State of Connecticut in accordance with the requirements of §8-3i of the Connecticut General Statutes. A copy of this notice is also being provided contemporaneously herewith to the Commissioner of Public Health of the State of Connecticut.

City of Groton Department of Public Utilities
May 27, 2022
Page 2 of 2

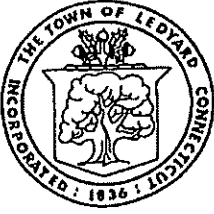
I enclose herewith for your reference a copy of the application to the Town of Ledyard Inland Wetlands and Watercourses Commission as well as a copy of our transmittal to the Ledyard Inland Wetlands and Watercourses Commission delineating the supplemental information which has been provided with the application. I also forward herewith a print of Sheet 1 of 15 of the subdivision proposal delineating the location of the proposed residential subdivision. As you can see from reviewing the subdivision proposal, a 102 +/- acre open space area has been dedicated to the Town of Ledyard, Connecticut, in perpetuity, between the development area and the lands of the City of Groton.

Should you require further information, please feel free to contact the undersigned.

Very truly yours,
COPY

Harry B. Heller

HBH/smr
Enclosures



TOWN OF LEDYARD
Inland Wetlands and Watercourses Commission
741 Colonel Ledyard Highway
Ledyard, CT 06339-1551

June 13, 2018

RECEIVED

Mr. Peter Gardner
Mr. G 1 LLC
PO Box 335
Gales Ferry, CT 06335

JUN 13 2018

LAND USE COMMISSION

RE: Application IW18-2 - 79 Vinegar Hill Rd. Subdivision of 170.16 acres into 25 building lots

Dear Mr. Gardner:

At the Inlands Wetlands and Watercourses Commission meeting held on June 5, 2018 the Ledyard IWWC rendered the following decision:

Application IW18-2 - 79 Vinegar Hill Rd. Subdivision of 170.16 acres into 25 building lots APPROVED and classified as "B" – not a significant impact to the wetlands. Stipulations are as follows:

1. Review of proposed project drainage by staff and town engineer recommended.
2. Oversight of project construction by Wetlands Enforcement Officer.
3. Submission of detail of cross section of driveway crossing for the shared driveway accessing lots 13 & 15.
4. Placement of IWWC placards at corners adjacent to the wetlands on lots 17 thru 23, and on lots 15 and 25.

Notice of this approval was published in The Day newspaper on June 12, 2018 and this will commence a 15-day appeal period. If no appeals are filed during that period, you may commence this approved activity at your earliest convenience.

If you have any questions regarding this application, please do not hesitate to contact me at Town Hall, (860) 464-3216.

Very truly yours,

Joseph M. Larkin, CZEO
Zoning & Wetlands Official