Meeting Summary Report

FEBRUARY 20, 2024 | REGULAR MEETING

Town of Stonington Planning and Zoning Commission



Town of Stonington Planning and Zoning Commission

AGENDA **REGULAR MEETING** TUESDAY, FEBRUARY 20, 2024 - 7:00 PM STONINGTON BOARD OF EDUCATION DISTRICT OFFICE **40 FIELD STREET, PAWCATUCK, CT 06379**

COMMISSIONERS

special arrangements, please

call 860.535.5095 at least 24

hours in advance of the meeting date. Reasonable accommodations will be made to assist your needs.

	1			
Charles Sneenan	1.	Call To Order – 7:00 PM		
Chairman	2.	Appoint Alternates:		
Ryan Deasy Vice Chairman		a. Ben Philbrick (Seated 9/5/23)		
Lynn Conway		b. Bennett Brissette (Seated 10/3/23)		
Secretary		c. MaryEllen Mateleska (Seated 11/21/2023)		
Gary Belke	3.	Minutes:		
Member		a. #1748 – February 6, 2024		
Andy Meek Member	4.	Public Comment:		
Rennett Brissette	5.	Correspondence:		
Alternate	6.	Reports:		
Ben Philbrick		a. Staff		
Alternate		b. Commission		
MaryEllen Mateleska		c. Zoning Enforcement and Violations		
Alternate		1. Zoning Enforcement Officer Report – Jan. 2024		
Agenda items are on file for		d. Administrative Review		
public review at the Town of Stonington Department of	7.	Old Business:		
Planning:	8.	Public Hearings:		
152 Elm Street Stonington, CT 06378 P: 860.535.5095 E: dop@stonington-ct.gov Stonington Board of Education District Office is		a. PZ2329ZC Maple Lawn Farm, LLC (Paul & Sharyne Cerullo) – Zoning Map Amendment application for an Agricultural Heritage District (AHD) Zone. Proposal consists of a Master Plan to create a campus for food, education, and events. Properties are located at 343 Wheeler Road and another unaddressed parcel on Wheeler Road, Stonington; M/B/L: 94-1-4; 86-1-4. Properties are located in the RR-80 Zone and GBR-130 Zone.		
wheelchair accessible. If you plan to attend this public meeting and you have a disability which requires		 b. PZ2322SPA & GPP Fair Housing of Connecticut, LLC (M. Ranelli) – Site Plan Application and Groundwater Protection Permit applications for an Affordable Housing Project submitted 		

Ranelli) – Site Plan Application and rdable Housing Project submitted pursuant to C.G.S. 8-30g. Proposal consists of 102 single-family housing units and associated site improvements. Properties located at 207, 215, and an unaddressed parcel on Liberty Street,

Pawcatuck; M/B/L: 16-4-12; 16-4. Property is located in the LS-5 Zone.



MEETING PROCEDURES

PUBLIC COMMENTS

Public comments are an opportunity for public participation on items not on the evening's agenda.

PUBLIC HEARINGS

Public hearings are an opportunity for public participation during the review of a development proposal.

Applicants will make an initial presentation. The public can then speak "in favor," "in opposition," or under "general comments." A signup sheet is located at the main entrance. Participants are not required to sign up, however, the list will be used to organize the order of interested speakers.

Any questions will be addressed as part of the applicant's rebuttal. Once a public hearing has been closed, neither the applicant nor the public can participate in the proceedings.

NEW SUBMITTALS

No action will be taken on these items. New submittals require routing to other Town agencies and, in some instances, may be scheduled for a public hearing at a later date.

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- 9. Future Public Hearing(s):
 - a. PZ2401SUP & CAM Precious Memories Place Inc. (Eckersley, LLC) Special Use Permit Application and Coastal Area Management Review for construction of a 1,158 SF building addition to support an additional 20 students. This application is a modification to PZ1103SUP+CAM. Property is located at 168 Greenmanville Ave, Mystic; M/B/L: 172-2-4. Property is located in the RA-40 & RM-15 zones.

Public Hearing Scheduled for 3/19/2024

- 10. New Submittal(s):
 - a. PZ2402SPA & CAM St. Edmund of Connecticut, Inc. (R. Avena, Esq.) Site Plan Application and Coastal Area Management Review for the construction of a ±6,600 SF building at St. Edmund of Connecticut on Enders Island. Proposal also includes the demolition of existing structures on campus and associated site improvements. Property is located at 1 Enders Island, Mystic; M/B/L: 178-1-1. Property is located in the RC-120 Zone.
- 11. Adjournment

The 1748th meeting of the Town of Stonington's Planning and Zoning Commission was held at the Stonington Board of Education Office, 40 Field Street, February 6, 2024. The meeting was called to order at 7:00 PM by Chairman Charles Sheehan. Also present for the meeting were MaryEllen Mateleska, Ryan Deasy, Gary Belke, Bennett Brissette, Andy Meek, Ben Philbrick, Lynn Conway. and Town Planner Clifton Iler.

Seated for the meeting were Andy Meek, Gary Belke, Charles Sheehan, Ryan Deasy, and Lynn Conway.

Minutes:

Mr. Deasy made a motion to approve the minutes of January 2, 2024, seconded by Mr. Belke. The vote was taken as 4-0-1 (Belke - approve, Sheehan - approve, Deasy - approve, Conway - approve, Meek - abstain).

Mr. Deasy made a motion to approve the minutes of January 24, 2024 with an edit that 'January 24th' be corrected to 'February 8th' as the next virtual meeting date, seconded by Mr. Belke. The vote was taken as 4-0-1 (Belke - approve, Sheehan - approve, Deasy - approve, Meek - approve, Conway - abstain)

Public Comment: None

Correspondence: None

Reports:

- a. Staff
 - 1. The Commission commented that surveys for phase 2 of the zoning rewrite will be posted and additional flyers can be found in the Planning Office at Town Hall.

b. Administrative Review

 C.G.S. 8-24 Review: Circus Lot - Request for review and report for the potential purchase of 29 Noyes Avenue (M/B/L: 1-3-1) by the Town of Stonington pursuant to C.G.S. 8-24

Mr. Iler discussed a brief historic background of this lot and it's reasoning for appearing before this Board. The Commission's role was to determine if this acquisition is consistent with the POCD. The cost of acquisition was discussed and Deborah Downie (Selectwoman) mentioned that the fair market value of the lot is not currently known.

Mr. Deasy made a motion to approve the application, seconded by Mr. Belke, all were in favor, 5-0.

Old Business:

PZ2333CAM St. Edmunds Retreat (K. Nielson)

Keith Nielson, DOCKO, Professional Engineer, spoke in length regarding the sea wall restoration. The history and deterioration of the current wall, the need for a new wall, the cost and methods being employed were all discussed. The sea wall will be constructed in sections as Mr. Neilson explained. A walkway will be built along a portion of the sea wall and there will be new planting and growth of grass. The Commission had a number of questions for Mr. Neilson regarding the process of rock splitting, where this splitting will occur, and the transportation of material and equipment to and from the site. Their splitting machine will operate from 8AM - 5PM on weekdays only. This project is compliant with the DEEP and Corps of Engineers according to Mr. Neilson. It was approximated that the project will take 8 months to complete. Per Mr. Neilson, if a storm event were to occur during construction, then equipment would have to be moved and they would be dependent on the sections of wall that are currently in place. The Commission questioned Mr. Neilson on the number of workers that will be present, the location of "stockpiled" stone, and the level of noise of the stone crusher.

Kevin Miller spoke as someone with 30 years of experience in the concrete industry and that will be working on this project. The noise from the hydraulic breaker is minimal. The crew is skilled and safe. There will not be a heavy concentration of trucks at any one given time.

The Commission commented that the plans should include details regarding the temporary bridge reinforcements that will be used, the noise issues, and the specific hours of operation.

Mr. Iler briefly discussed the town's comments, applicants' responses, and votes from the public that were overwhelmingly in support.

There was a brief discussion of rebuilding the wharf, removing and replacing the fractured concrete slab, and rebuilding the floating dock as part of the DEEP application.

Mr. Deasy made a motion to approve the application with existing stipulations and additional stipulations regarding further detail for the temporary bridge work, the work being subject to all town ordinances including noise, and the hours of operation to be restricted to 8AM - 5PM, Monday-Friday. This was seconded by Mr. Belke, all were in favor, 5-0.

PZ2334CAM Norwest Marine (K. Nielson)

Keith Nielson, DOCKO, Professional Engineer, discussed brief history of the marina and the associated site, docks, and DEEP enforcement. Among the topics discussed were the marina's need to update facilities, building a boat launch ramp, and the floating dock system. Mr. Neilson explained that the length of the ramp serves a specific purpose of allowing a car to launch a boat while only a portion of the tires are submerged in water. The Commission had a number of questions regarding the staircase access points to the docks and if they are accessible enough. Per Mr. Neilson, there is an ADA

compliance exemption that applies to this site. The Commission discussed the possibility of including a stipulation that the second (moveable) staircase should always be present.

Mr. Iler made brief comments regarding the history of use for this lot. The Commission recommended that the applicants use phasing for this project.

Mr. Deasy made a motion to approve the application with existing stipulations, including a stipulation for a phase-in plan and for any changes to be reviewed by the Town Engineer. This was seconded by Mr. Belke, all were in favor, 5-0.

PZ2335BR BG Ventures, LLC (E. Goodman)

Eric Goodman, BG Ventures, was seeking bond release.

Per Mr. Iler, the Town Engineer recommended a full release of the bond.

Mr. Deasy made a motion to approve the application, seconded by Mr. Belke, all were in favor, 5-0.

Public Hearings:

PZ2327ZC RCP Waterford II, LLC & Readco Stonington III, LLC (J. Browning)

Attorney John Casey, Robinson & Cole, explained that their intention is not to explain information that was discussed at the last meeting but to include additional information that was asked of them.

Jeremy Browning discussed his research into the possibility of including affordable housing in this project. Their intention is to apply for a program through CHFA known as 'Build for CT - Housing for Middle Income Households'. It is a financing instrument whose viability can only be determined once the project is approved. CHFA would set the pricing and determine the AMI requirements. Roughly 25 units would be deemed 'affordable' and the type of units would be up to CHFA as well. The minimum requirement is 6 years of affordable pricing; however the restriction stays in place for as long as the loan remains open. A 2% interest rate provides an incentive to not refinance. Mr. Browning confirmed that the units would count towards the town's 10% goal for affordable housing.

Atty Casey explained that no part of Stonington's regulations allows this Commission to place a stipulation on affordable housing.

Geoff Fitzgerald, Project Engineer, Bohler, explained that he was asked to incorporate storm water procedures into his model using CAM software. Mr. Fitzgerald discussed the additional storm water management tactics, displayed detailed renderings, and discussed the submitted maintenance records for the current system which indicate that it is in good shape according to Mr. Fitzgerald.

Per Mr. Iler, all town comments were in favor and there was no additional comment at that time.

Public Comment:

Carlene Donnarummo, 22 Oakwood Ave, spoke in opposition of this project. This may create a flood of applicants that want to use this zoning amendment to create multi-family housing. Mrs. Donnarummo did not believe that this project is the true intent of the NDD zone, nor does it qualify as a 'village core'.

Deborah Downie, 5 Back Acres Way, LEP, appreciated the updated stormwater management plan as well as the affordable housing intent. Mrs. Downie expressed some agreement with Mrs. Donnarummo's comments.

Ben Tamksy, 5 Edgemont St, Mystic, commented that he would like to see the Commission push harder on the idea that they 'cannot stipulate affordable housing', potentially in court if needed.

Thomas Geroulo, 23 Russell Ave, thanks the Commission and the applicants for their comments regarding the aquifer protection.

Rebuttal:

Atty Casey explained that they never intended to reach approval without meeting the groundwater protection requirements. Atty Casey did not feel it would be appropriate to test the Commission's stipulation authority over affordable housing in court. The regulations are explicit that this zone is eligible for the NDD, and there was further defense that this is an ideal location for that zoning amendment.

Mr. Iler explained and confirmed that certain areas are explicitly permissible for this zoning amendment and this lot is within one of those zones.

The Commission read from portions of the NDD regulations, discussed intent, and further supported that this project complies.

Mr. Browning discussed in further detail what the connection is between the fair market rent levels and how the 80% AMI threshold is determined.

Mr. Deasy made a motion to close the public hearing, seconded by Ms. Conway, all were in favor, 5-0. The public hearing was closed at 9:07 PM.

The Commission discussed the affordable housing at Perkins Farm to ensure that this project is treated consistently. There are differences, however, as this applicant has explored other others and the Commission can stipulate that they *apply* for that option.

There was further discussion regarding the prospect of redefining the NDD to include an affordable housing requirement, as well as the lack of authority for this Commission to enforce affordable housing as a stipulation.

Mr. Deasy made a motion to approve the project as submitted, with the additional stipulation that they agree to apply for the grant, seconded by Ms. Conway, all were in favor, 5-0.

Mr. Deasy made a motion to adjourn the meeting, all were in favor, 5-0. The meeting was adjourned at 9:15 PM.



Zoning Enforcement Officers' Report Stonington Department of Planning

January 2024

ZONING PERMIT SUMMARY

APPLICATION STATUS	January 2024	YEAR TO DATE
Received	9	9
Approved	9	9
Pending	0	0
Denied	0	0
Withdrawn	0	0

PENDING PERMITS

PERMIT ADDRESS	OWNER	RECEIVED	REQUEST	WAITING

CERTIFICATES OF ZONING COMPLIANCE

	January 2024	YEAR TO DATE
SFR CZC	2	2
Total CZCs issued	10	10

COMPLAINT SUMMARY

	January 2024	YEAR TO DATE
Received	4	66
Notice of Complaint	0	0
NOVs Issued	0	23
Citations Issued	0	0
Cease and Desist	0	4
Resolved	4	42

COMPLAINTS RECEIVED

*(D = Distressed Property)

COMPLAINT ID	RECEIVED	ADDRESS	COMPLAINT
24-001	1/8/2024	2 Old South Rd.	Distressed property; collapsed garage door, broken windows, damaged walls and roof, trash and debris, abandoned cars and boats. Overgrown shrubs/vines – Blight does not address landscaping of any kind. Broken Windows – None observed. Roof replacement – no visible issues observed. Solar Permit approved 8/23. Company [Vision Solar] filed bankruptcy on 12.28.2023 Unregistered motor vehicles – Subaru registered Toyota 4 Runner – Unregistered / No violation [ZR 4.3.G] allows for one unregistered motor vehicle. Boats are not regulated by zoning. Unless the boats were being stored for profit. All boats are owed by Reed Cypriano Garage Doors – owner stated that two doors have been ordered at Lowes. No violation
24-002	1/5/2024	7 Yacht Club Rd.	Addition of a utility shed, tennis shed and gravel parking lot without required approvals. ZON#11-030 allowed for the replacement of a existing shed 20' X 8' ZON#08-001 allowed for an 8' x 12' shed. Parking area has been historically used for parking. No violation

24-003	1/23/2024	215 Liberty St.	Weird humming noise, lights flashing, and sparks inside. Concerned about
			asbestos. Other neighbors posting on community forum – "very disruptive".
			1/25/2024 The defunct Rosalina's was having an auction to get rid of all interior
			equipment and fixtures. Generator was installed by a licensed electrician
			[Brookside] per building. No zoning violation.



Town of Stonington | Department of Planning Planning and Zoning Commission Meeting February 20, 2024

PZ2329ZC Maple Lawn Farm, LLC (Paul & Sharyne Cerullo)

Zoning Map Amendment application for an Agricultural Heritage District (AHD) Zone. Proposal consists of a Master Plan to create a campus for food, education, and events. Properties are located at 343 Wheeler Road and another unaddressed parcel on Wheeler Road, Stonington; M/B/L: 94-1-4; 86-1-4. Properties are located in the RR-80 Zone and GBR-130 Zone. **Report Prepared By:** Clifton J. Iler, AICP – Town Planner

Application Status

This application is for a Zoning Map Amendment (ZC) and requires a public hearing in accordance with <u>C.G.S. Section 8-3(c)</u>. The Commission has 65 days to open the public hearing and 35 days to conduct the public hearing once opened, as established in <u>C.G.S. Section 8-7d(a)</u>. The applicant may request one or more extensions provided the total of any such extension or extensions shall not exceed 65 days.

- Official Date of Receipt for this application was 11/21/23.
- The public hearing was opened on January 2, 2024. The public hearing was extended <u>14 days</u> to tonight's meeting.
- The public hearing, without extension, must be closed by tonight.
- A decision, without extension, must be made by 4/25/24. The applicant has <u>51 days</u> available to extend any period of the application.

Purpose

The applicant is applying for a Zoning Map Amendment (ZC) to convert the existing site located in the RR-80 and GBR-130 Zones to the Agricultural Heritage District (AHD). The AHD Floating Zone is further defined in ZR §2.4.5:

§2.4.5 – Agricultural Heritage Districts are intended to preserve Stonington's cultural landscape, ensure the continuation of agricultural industry by creating opportunities for locally produced food, protect historic agricultural character and scenic resources, maintain long-term viability and sustainability of farmland by permitting flexible economic use, and provide an alternative to the undesirable conversion of agricultural lands to residential subdivisions.

Process

The Zoning Map Amendment (ZC) application is evaluated as a **zoning** proposal, and the Commission is required to evaluate the ZC in accordance with the Stonington Zoning Regulations. In reviewing this proposal, the Commission needs to evaluate a number of elements:

- 1. Plan of Conservation and Development (POCD) Compliance
- 2. Zoning Regulation §10.5 Compliance

POCD Compliance

In the Plan of Conservation and Development (POCD), the community established the following policies:

Policy 4.1.1 – Support local farmers (including marine based agriculture) and seek ways to address some of the challenges and obstacles they face.

Policy 4.2.2 – Explore programs to encourage the preservation of farmland and shellfishing areas in Stonington.

Policy 4.2.3 – Identify important farmland and shellfishing areas and help determine ways to keep it in agriculture.

Policy 7.1.1 – *Encourage agricultural uses as a way to preserve the scenic nature of rural areas.*

Policy 7.1.2 – *When scenic roadsides are developed, preserve scenic elements through measures such as open space set-asides.*

Policy 7.2.1 – Encourage sensitive stewardship by property owners as an effective means of preserving historic resources.

Policy 9.2.4 – Promote more flexible development in rural areas of town to conserve natural resources, help preserve rural character and provide greater opportunities for greenways and walkability.

Policy 10.4.1 – *Promote economic drivers including but not limited to tourism, high value manufacturing, research and development, retirement/senior care, agriculture and marine services.*

Although the POCD is advisory in nature, the Commission is required to consult the document when reviewing zoning map and text amendment proposals.

Zoning Regulation §10.5 Compliance

10.5.3 Considerations for Approval – Factors to be considered by the Commission in approving the AHD include:

- A. That the location, uses and layout of the proposed AHD are in conformance with the intent of, and the goals and objectives contained in, the Plan of Conservation and Development.
- B. Preservation, to the maximum feasible extent, of cultural landscapes, including buildings and building elements possessing historic or architectural significance.
- C. Integration of existing, enhanced and new agricultural uses with other compatible land uses designed to promote the economic viability and sustainability of the subject property. Since each farm is unique in terms of its location and characteristics, there shall be no mandatory area ratio of agricultural use versus other use; rather, the type and placement of each proposed use shall be indicated in the Master Plan.
- D. Harmony between the various uses that are proposed for the property, compatibility with neighboring land uses and buffering between such uses, enhancement and protection of both agricultural lands and the built and human environment, enhancement and protection of natural resources including inland and tidal wetlands and watercourses, coastal resources, groundwater resources, floodplains, steep slopes and wildlife habitats, promotion of pedestrian safety, provision for adequate parking, and minimized impact of motor vehicles.
- E. Furtherance of the policies of the Coastal Management Act, as applicable.

Zoning and Context

The site is located in the RR-80 and GBR-130 Zones. As part of the Master Plan, the applicant is required to propose new bulk and use requirements for the proposed AHD Zone. Below reflects the current bulk and use requirements for the RR-80 Zone:

	<u>Required</u>	<u>Provided</u>		<u>Required</u>	<u>Provided</u>
Lot Size	80,000 SF	±679,392 SF	Building Height	30'	30'
Frontage	200'	±1,280'	Floor Area Ratio	0.10	0.02
Setbacks (F/S/R)	50'/25'/50'	98'/±279'/213'	Parking ²	74	88
Res. Buffer	50-100'	N/A	Non-Infring. Area	N/A	N/A

RR-80 Zone Bulk and Use Requirements¹

ZONING MAP



North: RR-80 Zone [Use: Undeveloped] South: RR-80 Zone [Use: Undeveloped] East: GBR-130 Zone [Use: Residential] West: RR-80 Zone [Use: Undeveloped]

¹ See Section 10.5.7 of the Zoning Regulations for AHD Design Standards.

² See Section 13.3 of the Zoning Regulations.

Site Access and Traffic

The site is accessed from Wheeler Road. The application proposes to utilize existing fields to the north of the primary structure and event space – proposing 88 parking spaces total. The application includes a traffic impact narrative which identifies no significant impact on surrounding roads and properties.

Environmental Elements

This application does not propose development within the 100 FT Upland Review Area (URA) and is not subject to review from the Inland Wetland and Watercourses Commission (IWWC). Town staff comments are captured in the Response Summary.

Utilities

The site is serviced private water and septic. Design details will be addressed through the Site Plan Application (SPA).

Waivers Requested

The following requirements and waivers are not applicable at the ZC application stage:

Item	Provided	Waiver Requested
Impact Statement	Х	
Site Plan	Х	
Architectural Elevation Drawings and Landscape Plan		N/A
Water Impact Study		N/A
Sanitary Sewer Impact Study		N/A
Site Drainage Analysis		N/A
Erosion Control Report		N/A
Traffic Impact Study		N/A
Archaeological Study		N/A
Soils Report, Test Pit Data and Mapping		N/A
Shadow Plan		N/A
3-D Model		N/A
Flood Hazard Report		N/A
School Impact Evaluation Report		N/A
Application Fee	Х	
Legal Description of Property/Site	Х	
Phasing Requirements for Projects Over 24 Dwelling Units		N/A
Written Waiver Request(s) at the Time of Application Submission		N/A

Response Summary

The application was routed to the following agencies/agents of the Town. Responses are shown below:

CONSERVATION COMMISSION - Comments below. [Dated: 12/11/23]

MOTION: It appears to the Conservation Commission that the application does not meet the intent of the AHD Zone.

 It has not been a working farm for many years, it is essentially a hobby farm, which is borne out by the poorly constructed and breezy application lacking an actual master plan, but spending lots of space on ducks, and with a supporting letter from a real estate agent with no referenced expertise in any of the aspects of the application.

- It includes the very minimum land required, leaving out other abutting lands the applicants own. A large portion of the included land is not farmed nor arable, and already has deed restrictions on it preventing development. Farming conducted at the property such as having or the cultivation of corn is not described.
- 3. Although the application seems intentionally vague, we expect that "Events" of a high profitmaking potential are really the aim here. And Events may well be a triggering word to residents in the area. Wheeler Road is a designated Scenic Road in Stonington of old-fashioned narrow construction without shoulders, and noise and light impacts will inevitably occur. A clue to potential problems is the section reading "event guidelines will require all participants to behave as good citizens and neighbors to the community."
- 4. The Commission fails to see how a presently quiet rural property, or the "heritage of the Town" is enhanced by allowing a new party location, potentially bringing light pollution and additional wear and tear to Wheeler Road.
- 5. The AHD does NOT necessarily have a connection with farmland preservation. It requires a small amount of land to comply with, and there is no restriction on the landowner applying to go back to the previous zoning regulations.
- 6. Of greater concern is the loose flexible nature of the original AHD wording. To wit:
 - 5 houses can be built within the AHD (Although no additional units are proposed by these applicants)
 - There are no maximums on attendance to events
 - There are no restrictions on number or frequency of events
 - One hundred plus car parking lots are allowed without any of the requirements of a normal commercial establishment, i.e. drainage, oil-water separators, etc.

POLICE COMMISSION - Comments below. [Dated: 12/14/23]

Paul Cerullo from Maple Lawn Farms addressed the Police Commission regarding the application to host events on the property. He noted that there is a new parking layout 350 ft well line to event area, and events on the Farm will not hold more than 200 people. Chief DelGrosso added that Paul has been very responsive. Chairman Turner added that the investment to the property is spectacular.

TOWN ENGINEER – Comments below. [Dated: 12/10/23]:

I have reviewed the plan entitled: "Maple Lawn Farm 343 Wheeler Road Stonington, Ct., Date: 11/1323" by Mercer Bertsche Vernott Architects and Zoning Text & Map Amendment application form including letters, narratives and supporting documentation and offer the following comments:

1. The report states that the site has capacity for parking without any additional "hard surfaces, asphalt, concrete or slab planned", however parking and transport for over 137 vehicles will affect the nature of the stormwater drainage. Please plan to submit (with Site Plan Application) a stormwater drainage analysis in accordance with the Town of Stonington Zoning Regulations. The stormwater analysis shall be designed to meet the criteria outlined in Section 3 of the "Town of Stonington Technical Standards for Land Development & Road Construction" including Water Quality Volumes (WQV) in accordance with the State MS4 Permit. These elements of design are

necessary to mitigate any adverse "run-off" impacts or impairments to adjacent\downgradient Town roadways and\or receiving waters, wetlands, etc. Stormwater Analysis and mitigation efforts (BMP's) to be designed by a State of Connecticut Licensed Professional Engineer.

2. Consideration of a Traffic Study for comparative analysis of the Zone change and verification of site distance at the intersection of the driveway with Wheeler Road.

In review of the aforementioned application, mapping and report, I recommend action be taken by the commission as it relates to the engineering perspective.

TOWN ENGINEER (CLA ENGINEERS, INC.) - Comments below. [Dated: 12/29/23]:

We have reviewed materials submitted for the above referenced Zoning Map Amendment and find that detail related to the requirements of Section 15.7 and 16.3.2 are missing as follows:

- 1. Section 15.7 Item A, B, C, D, G, J, K, M, N & O.
- 2. Section 16.3.2 Subsection B, C, D and E.

TOWN SANITARIAN (LEDGE LIGHT HEALTH DISTRICT) - Comments below [Dated: 12/19/23]:

I have the following questions/concerns in respect to the onsite subsurface sewage system and well:

- 1. Will the portable toilets be provided for ALL the proposed activities and events?
 - a. What or from where is their water supply?
- 2. Where will the farm to table production and cooking classes take place? In the home kitchen?
 - a. Up to how many people will be allowed to attend these classes?
- 3. What is the water source for the caterers?
 - a. Where will they dispose of their generated waste?
 - b. Where will they wash their hands? They cannot use the portable restrooms for this activity.
- 4. Where will the art classes take place?
 - a. Will there be washing of paint brushes in a common sink connected to the onsite septic system?
 - b. Up to how many people will be allowed to attend these classes?
- 5. Where will the cultural classes and seminars take place?
 - a. Will they be using the portable toilets or the onsite facilities?
- 6. LLHD is unaware that a bed and breakfast is currently in operation at this address. A review was not conducted to approve this change in use and the potential impact on the onsite septic system.

The answers to the above questions shall be provided along with a completed B100a application (enclosed) prior to an approval from Ledge Light Health District.

ZONING ENFORCEMENT OFFICER – Plans should be updated to show current 100' wetland upland review areas. [Dated 11/22/23]

FIRE DISTRICT MARSHAL (PAWCATUCK) – I have reviewed the application and gone to the site to do a walk thru with Paul. He explained his plans for the project and he meets all me expectations for access in the

case of an emergency. He has provided a water source and ample access for fire suppression. So, I fully support the project if you need anything else, please feel free to contact me. [Dated: 12/19/23]

SOUTHEASTERN CONNECTICUT COUNCIL OF GOVERNMENTS – Based a review of the material provided, I have determined that the proposed amendments are not likely to have a negative inter-municipal impact. [Dated: 12/19/23]

Town Planner Comments

The application proposes a Zoning Map Amendment (ZC) from the existing RR-80 and GBR-130 Zones to the Agricultural Heritage District (AHD). The process described earlier covers the elements of review the Commission must consider when making a decision on the proposed application. In addition to those elements required to establish the Zone, the applicant must then follow the following steps:

- 1. Establishment of District (Current)
- 4. Receive a Zoning Permit
- 2. Development of Master Plan (Current)
- 5. Receive a Building Permit

3. Development of Site Plan

At the meeting on January 2, 2024, the Commission requested additional items from the applicant, including a revised site plan, stormwater drainage updates, a revised traffic report, an acoustic plan, and sign and lighting details. The applicant provided those updates to Town staff on February 12, 2024. At the time of writing this report, Town staff has received no additional comments from its agencies/agents to include in the Response Summary.

The Department of Planning has no additional comments on the Master Plan submittal.

Recommended Stipulations

No stipulations are recommended by the Department of Planning for approval of the Zoning Map Amendment application. Specific design details will be addressed through the Site Plan Application (SPA).

Commission Action Required

The Commission is required to make a determination on the following items:

- A decision concerning consistency with the Plan of Conservation and Development (POCD)
- A decision concerning consistency with Zoning Regulation §10.5
- A decision concerning the Zoning Map Amendment (ZC) application

APPLICATION MATERIALS

PZ2329ZC ZONING MAP AMMENDMENT FOR NEW ZONE: AHD-(#) (Agriculture Heritage District)

> 343 Wheeler Road Stonington, Ct

Parcels M/B/L 94-1-4 plus 86-1-4 Divided by Wheeler Road

Revised: REV-C 2-20-24

Applicant: Paul and Sharyne Cerullo

SECTION 10.5.4.B DISTRICT ELIGIBILITY & PLAN OF CONSERVATION & DEVELOPMENT

SECTION 15.7 MASTER PLAN

SECTION 16.3.2 IMPACT STATEMENT

TOWN OF STONINGTON ZONING REGULATIONS

SECTION 10.5.4.B DISTRICT ELIGIBILITY & PLAN OF CONSERVATION & DEVELOPMENT

PZ2329ZC

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Bulk Requirements: Plan of Conservation & Development Evidence Of Continual Farm Operation for past 25 years:

Bulk Requirements:

This is an application for an AHD Zoning Map Amendment to combine two residential lots separated by a rural town road, Wheeler Road, into a single AHD. The boundary and area specifications for these properties are provided on an A-2 survey: <u>LIMITED PROPERTY</u> <u>SURVEY SHOWING EXISTING CONDITIONS 343 WHEELER ROAD & PARCEL 86-</u><u>1-4 STONINGTON, CT</u>", dated Feb 1, 2024, provided in Section 15.7.A of the Master Plan.

Lot 1. M/B/L: 94-1-4 Zone RR-80 Lot 2. M/B/L: 86-1-4 Zone GBH-130 Combined 15.60 acres (343 Wheeler Rd.) <u>21.56 acres</u> 37.16 acres

Contiguous Lots: Side by Side on Wheeler Road for 699 ft

Both lots common ownership: Paul and Sharyne Cerullo

Plan of Conservation & Development

The proposed zoning map amendment for an AHD is consistent with Section 4 - AGRICULTURE of the <u>Town of Stonington 2015 Plan of Conservation & Development</u>. The proposed lots are adjacent to an "Agricultural Land" parcel to be conserved identified on the <u>Agriculture Land Use Map</u>, page 34, see attached annotated copy of the map. An aerial photo of the parcel shown on the map is also provided that shows the farm operations on the proposed AHD are of a similar scale and character as the parcel shown on the map.

The proposed AHD zone is compatible with specific recommendations made on page 35 of the Plan of Conservation: Recommendations, 4.2 Preserve Agriculture Land, Policies:

" 4.2.2 Explore programs to encourage the preservation of farmland and shellfishing areas in Stonington"

The applicant feels the added operational flexibility provided by the AHD will greatly assist in maintaining the fiscal health of the farm and preserve historic farmlands for many generations to come.

The entire Parcel 86-1-4 has a 1988 deeded conservation area restriction that is fully compatible with the intent of the AHD and the Plan of Conservation and Development. The deeded restriction attached is from Vol 299 Page 450 of the Town Records. This restriction in part states:

"1. The Conservation Area shall, subject to the reservations hereinafter contained, be kept as open space in its natural state and be precluded from further residential development and restricted from any development which includes residential structures or buildings, paving, sewage disposal or dumping.

2. Notwithstanding the foregoing, the Declarant reserves the right, however, for themselves and all future owners of the Conservation Area to undertake such customary conservation practices as traveling on, over, upon and across the conservation area; trimming, clearing, planting and cultivating trees, shrubs, ground cover, and other natural growth; keeping, breeding and grazing livestock (such as sheep, cows, horses or goats); cultivating and harvesting hay and forage; developing paths, trails and/or pathways."

Evidence Of Continual Farm Operation for past 25 years:

The existing property is a living, functioning farm in which the current property owners have run and lived on for the last 25 years. In those 25 years we have raised and produced the following:

Sheep (wool), Boarding horses, birthing calves, raising beef cattle, chickens (eggs), breeding ducks and geese, cut flowers, jams, farm-to-table vegetables to Westerly Farmer's Market and local restaurants.

Produce: Strawberries, tomatoes, eggplant, hot peppers, sweet peppers, watermelon, butternut squash, acorn squash, sugar pumpkins, salad turnip, beets, pac choi, bok choi, lettuce mix, salad heads, microgreens, radishes, summer squash, zucchini, cucumbers, swiss chard, beans, peas, kale, kohlrabi, carrots, onions, cauliflower, basil. Corn and hay operations

Flowers: bachelor buttons, sunflowers, zinnias, dahlia, ammi, cosmos.

The prior owners were the Florence's who had a sheep farm where they raised a particular kind of sheep that were prized for their long hair. They also grew hay and published a program online: "How To Grow A Hay Crop".

Through the Connecticut Farm Bureau, which we have been a member of since purchasing the farm in 1999, and Connecticut Farm Link, we have connected with partners, i.e. Endangered and Unique Waterfowl - Duck Buddies, and Alexandra Romano - Westerly Farmers Market and Farm to Table.

1988 – 1999. Sheep and Hay Operations (prior owners)

1999-2010 Hay Operation and Boarding of Horses, chickens

The State of Connecticut changed its rules on boarding so we switched to growing corn

2011-2020 Corn for silage and fodder

2018-2023 Grass-fed beef, ducks, chickens, vegetables, flowers

2020-2023 Vegetables and flowers, chickens, endangered waterfowl, horse boarding, jams

We utilize and maintain the following equipment for our farm operations: 46 hp Kubota diesel, 26 hp Kubota diesel, Ford 2000, Kubota rear discharge mower diesel, 6 ton backhoe

diesel, 11-tone loader diesel, 450 case crawler diesel, Trailers: livestock, equipment and material, Tractor Attachments: plow, harrows, choppers, tiller, tetter and baler.

We have taken online courses with the University of Connecticut, University of Rhode Island, and Pennsylvania State. We have consulted with Cornell University on innovative ways to manage manure, and with the University of Rhode Island (who toured the farm) to suggest ways to improve pasture management, water conservation, and soil improvement for vegetables. This led to the planting of boring radishes to open up the soil and the addition of an agriculture well.

We have received a State-issued Tax Number and have had it since inception. We are required by law and have provided answers to the yearly Federal Government Survey as to land management, water usage, fertilization management, etc. We have also annually filed State and Town forms regarding our yearly farm operation.

Following are select photos of our farm operations, animals and produce taken over the years.





























TOWN OF STONINGTON ZONING REGULATIONS

SECTION 15.7

MASTER PLAN

PZ2329ZC Zoning Map Amendment For New Zone: AHD-(#) (Agriculture Heritage District)

> 343 Wheeler Road Stonington, Ct

Parcels M/B/L 94-1-4 plus 86-1-4 Divided by Wheeler Road

Revised: REV-C: 2-20-24

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- 15.7.N Public Storm Water Structures
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- **15.7.P Waterfront Properties**

15.7.A Drawings

The following drawings are provided as professional documentation of elements of the Master Plan and are referred to in discussions in the Master Plan and Impact Statements

dated 2-1-24,
Rev-C: 2-20-24,
Rev-C: 2-20-24

15.7.B Existing Site Plan

A site plan showing the existing conditions for parcels M/B/L 94-1-4 and 86-1-4 is provided in section 15.7A of this Master Plan as <u>A1.1 Site Plan – Existing</u>, Rev-C: 2-20-24. There are no structures on parcel 86-1-4. The following structures and uses are noted:

Structures:

Small Barn (farm support), 1 story, 1305 sf floor area Historic Residence, 3 story, (4) bedroom, 5095 sf floor area Large Barn 2 story, 4914 sf floor area -guest quarter #: (1) bedroom -office -garage: 2 cars + farm equipment

Floor area ratio on Parcel 96-4-1, RR-80: FAR 0.02 Front Yard: 88 ft, Side Yards: _407 ft, 241 ft, Rear Yard: 206ft

Driveways from Wheeler Road

16 ft wide asphalt driveway access to residential structures & barns 12 ft wide gravel driveway between Wheeler Road & rear fields

Uses by area (Assuming area of both parcels 37.16 acres) 77 % Farming (pasture & crops) 15% Forest & pond

8% Residential: all structures / residential parking / lawns

Wetlands:

Wetlands on Parcel 86-1-4 and the south portion of parcel 94-1-4 are used as forested pasture areas.

For the past 25 years a gravel access drive from Wheeler Road to all farm fields crosses the 100 ft upland area of the wetland on the north east corner of parcel 94-1-4. This access driveway is used by all farm trucks, live-stock trailers and machinery accessing the farm fields and for deliveries of feed, and farm supplies.

15.7.C Boundary Survey

A boundary A-2 Survey, <u>LIMITED PROPERTY SURVEY SHOWING EXISTING</u> <u>CONDITIONS 343 WHEELER ROAD & PARCEL 86-1-4 STONINGTON, CT</u>", dated Feb

1, 2024, is provided in Section 15.7A of the Master Plan

15.7.D Proposed Site Plan

A plan showing the proposed conditions for parcels M/B/L 94-1-4 and 86-1-4 is provided in section 15.7A of this Master Plan as <u>A1.2 Site Plan – Proposed</u>, Rev-C: 2-20-24. Proposed Changes:

- 1. There are no changes to the exterior appearance of the existing structures. The office in the Large Barn is to be converted to a 2 bedroom guest quarter.
- 2. A portion of the Farming area (row crops) at the rear of the property is to be converted to a 120' x 235' parking lot and field area for a tent to accommodate large group events.

3. An existing gravel access drive between Wheeler Road and the event area will be widened. <u>A1.4 Site Plan – Drainage & Utilities</u>, Rev-C: 2-20-24.

4. Driveway lighting and lighting for the parking lot will be added for large events at night. See drawing <u>A1.3 Site Plan – Sign & Lighting</u>, Rev-C: 2-20-24

Structures:

(no change) Small Barn (farm support), 1 story, 1305 sf floor area (no change) Historic Residence, 3 story, (4) bedroom 5095sf floor area (renovate) Large Barn, 2 story 4914 sf floor area

guest quarter #: (1) bedroom guest quarter #2: (2) bedroom garage: 2 cars + farm equipment

Floor area ratio for combined Parcels 94-1-4 & 86-1-4, AHD: FAR 0.007 Front Yard: 88 ft, Side Yards: 407 ft, 240 ft, Rear Yard: 206 ft

Driveways from Wheeler Road

(no change) 16 ft wide asphalt driveway access to residential structures & barns (widen) 20 ft wide gravel driveway between Wheeler Road & rear farm and event fields/parking. New 24 ft x 60 ft asphalt apron at Wheeler Road

Uses by area (Assuming area of both parcels 37.16 acres)

71% Farming (pasture & crops)

15% Forest & pond

8% Residential: all structures / residential parking / lawns

6% Event & Parking

Wetlands:

Wetlands on Parcel 86-1-4 and the south portion of parcel 94-1-4 will continue to be used as forested pasture areas.

The gravel access drive from Wheeler Road to all farm fields that crosses the 100

ft upland area of the wetland on the northeast corner of parcel 94-1-4 will be widened from 12 ft to 20 ft for two way traffic. This access driveway will continue to be used by all farm trucks, live-stock trailers and machinery accessing the farm fields and for deliveries of feed, and farm supplies. A 24 ft wide x 60 ft long asphalt apron will be constructed at the beginning of the drive at Wheeler Road. All guest traffic associated with planned events will use this driveway to access the proposed event parking area.

15.7.E Existing Conditions & Proposed Uses

Sections 15.7B and 15.7D above fully described the current structures and proposed uses for the parcels to be combined as an AHD. Drawing <u>A1.1 Site Plan – Existing</u>, Rev-C: 2-20-24 and Drawings <u>A1.2 Site Plan – Proposed</u>, Rev-C: 2-20-24 show the structures and locations. There are no changes to the structures proposed. The areas of the site dedicated to specific uses are identified.

15.7.F AHD Proposed Uses -

Farming Operations: Maple Lawn Farm farming, animal husbandry and raising unique and endangered waterfowl will continue in forest pastures, fields, fenced paddocks and produce fields on both sides of Wheeler Rd. These uses may expand to include farm produce of vegetables, eggs, and jelly.

Farm Stand / Farmers Market: Farm produce may be sold directly on site at a **Farm Stand** or on site at a **Farmers' Market**. The Farmers' Market may include sale of produce from other regional farms.

Near proposed parking lot
Paved Access Road from Wheeler Road
Proposed parking lot
Farm Stand: 7 days/wk spring/summer/fall
Farmers' Market: 1 day/wk spring/summer/fall
9am to 5pm
Owner occupied, Long or Short-Term Rental, or
Boutique Room Rental to Support Events
Owner occupied, Long or Short-Term Rental, or
Boutique Room Rental to Support Events
Owner occupied, Long or Short-Term Rental, or
Boutique Room Rental to Support Events

Note: Short-Term Rental Shall be in accordance with current and future Short-Term rental regulations of the Town of Stonington Zoning Regulations.

Events / Event Management Plan

<u>Small Events (4 - 10 + - persons)</u>: Maple Lawn Farm plans to host cultural classes, seminars, farm-to-table production and cooking classes, art workshops, and small dining events. These may include culinary arts demonstrations, arts & wellness classes, arts demonstrations, and writing seminars.

Location Of Small Events:	Various Site Locations & Historic House
Site Access:	Paved Access Road from Wheeler Road
Site Parking:	Proposed Parking Lot
Toilet Facilities:	Existing Residential Septic System
Frequency of Events:	Maximum 3 events / week
Season:	Year Round
Hours of Operation:	9am to 9pm
Site Lighting	-Lighting of Site Parking and the Access Drive will only be turned on for events extending after sunset.
	-Lighting of Site Parking and the Access Drive will be turned off at 11 pm.

<u>Group Events (10 - 50 + /- persons</u>): Maple Lawn Farm plans to occasionally host medium sized group events as well as non-profit community fundraising events at the farm so that community groups and school classes can enjoy the beautiful historic property and active farming operations. The original farmhouse, which dates to 1735 and a large barn can function as indoor spaces in case of inclement weather.

1	
Location Of Group Events:	Various Site Locations & Large Barn
Site Access:	Paved Access Road from Wheeler Road
Site Parking:	Proposed Parking Lot
Toilet Facilities:	Existing Residential Septic System
	or portable restroom as required by Ledge Light
Frequency of Events:	Weekly
Season:	Spring/Summer/Fall
Hours of Operation:	9am to 9pm
Site Lighting	-Lighting of Site Parking and the Access Drive will only be turned on for events extending after
	sunset.
	-Lighting of Site Parking and the Access Drive will be turned off at 11 pm.

Large Events: (50 – 175 max persons): Maple Lawn Farm plans to provide facility space and parking for large events like weddings, fund raisers and public/private special events. The event sizes will be limited to a maximum of 175 guests with support staff of up to 15 additional persons. Adequate outdoor space is available to the west of the large barn to accommodate a tent and catering vehicles for large events. Tent sizes can range 20' x40', 40' x 60', 40' x80'. All events would be catered. Portable, rolling restrooms would be brought in for these events. Power and water will be provided to support these vehicles and temporary facilities.

Location Of Large Events:	Tent in field
Site Access:	Paved Access Road from Wheeler Road

Site Parking:	Proposed Parking Lot (assume 1 space/3 guests + 1 space/staff = 74 spaces min: 88 spaces provided)
Toilet Facilities:	Portable Rolling Restroom
Frequency of Events:	Maximum 2 events/wk. (max 20 events/year)
Season:	Late spring, Summer, Early Fall
Hours of Operation:	10am to 10pm
Amplified Sound	-Speakers directed to NW,
	-Max 80 db @ 3 ft in front of speaker
	-Amplified sound turned off at 10pm
Catering Trucks	-Provide staging tent(s) at their discretion
	-Must clean up & leave within 48 hr of event
	-Must remove all trash and waste-water
	-Cannot drain any waste-water or waste liquids onto the site
	-Must provide handwash sink w/waste-water storage
	-Caterer to provide chemically assisted containers
	for sanitizing employee's hands and utensils.
	-Maple Lawn Farm to provide potable cold water.
Site Lighting	-Lighting of Site Parking and the Access Drive will only be turned on for events extending after sunset.
	-Lighting of Site Parking and the Access Drive will be turned off at 11 pm.

15.7.G Traffic & Parking

A traffic report has been prepared by a Professional Engineer with experience in conducting Traffic Studies. As a basis for the report we have prepared a road map illustrating all of the road connections and commercial and residential properties that can contribute to the frequency of traffic on Wheeler Road, see drawing **A1.5 Site Plan – Traffic & Parking**, Rev-C: 2-20-24 in Section 15.7A above. The maximum traffic load contributed by proposed events at Maple Lawn Farm is associated with a single Large Event (e.g. wedding) occurring on one day, with a maximum of 175 guests and 15 person support staff. It is assumed guests and staff arrive randomly over a 1 hour period and leave randomly over a 1 hour period several hours later.

The number of vehicles is calculated according to the Town of Stonington Zoning Regulations (Section 13.3.3- Zone GC-60/TC-80/MC-80) for restaurant parking: 1 vehicle / 3 guests plus 1 vehicle for each staff person. The worse-case traffic frequency entering or exiting the site is calculated to be 74 vehicles / hour.

In order to assure safety of entering and exiting the site, roadside brush has been removed to provide a 400 ft sight line to the north and 400 ft sight line to the south from the access driveway.

The existing access drive is to be widened to 24 ft (Section 13.3.6 Driveway Throat – Two Way & greater than 8 parking spaces). This will assure a vehicle turning from Wheeler Road onto the access road will always have a clear opening to safely turn off Wheeler and not create undo obstruction of Wheeler Road.

See Appendix A for Traffic Study for site use prepared by Hesketh, LLC.

15.7.H Location & availability of utilities. Septic & water et al

Utilities available for the site are shown on Drawing A1.4 Site Plan – Drainage & Utilities, Rev-C: 2-20-24, Section 15.7A.

Electric:

Electric and Cable are the only public utilities serving the site.

Water:

There is no public water utility. There are two active wells. Well #1 serves all residential requirements. A new well, 500 feet deep, Well #2, serves agricultural activities, i.e. watering crops, and will be used to support proposed events.

Septic:

There is no public sewage utility. A high-capacity septic system serves the two existing residential units (a total of 5 bedrooms) and has been reviewed by Ledge Light to serve an additional 2 bedroom for the proposed guest suite.

Small & Group Event Utilities:

For the home kitchen that houses the cooking classes there will be a max of 8 people in attendance. There are kitchen sinks for hand washing, dishware and chef's produce available in the kitchen. There is a dedicated bathroom next to the kitchen available for patrons.

Art classes with a max of 10 people in attendance are considered "plein air". There is a work sink in the barn but there will be water in buckets for rinsing brushes and retaining liquids for proper disposal.

Large group events with 10 to 50 people in attendance that are held on the property (i.e. the labyrinth, on the grounds, outdoor patios, in the colonial house or such) shall use the onsite bathroom in the main barn unless directed otherwise by Ledge Light in which case a portable restroom will be provided by the owner.

Large Event Utilities:

Large events will be required to provide portable rolling restrooms for each event. These units will be serviced by site water (well #2) and electric power. Well #2 is the water source for the caterers. Any chemically assisted containers for sanitizing employee's hands and utensils will be provided by the caterer. If a portable handwash sink is provided by the caterer, it shall retain waste-water that must be removed by the caterer. All waste-water, waste liquids and rubbish will be removed within 48 hours of event close. No waste-water or waste liquids are permitted to be disposed of on site by the caterer.

15.7.I Impact on Surrounding Residential Properties: Lighting, Acoustic Plan & Site Buffers

Lighting Impact:

The drawing **A.1.6 Site Plan – Sign & Lighting**, Rev-C: 2-20-24, section 15.7A, shows the lighting plan. There will be no light glare impact on neighboring properties. All light fixtures will be selected to be "down" lights achieved by selecting recessed LED light sources. Light sources will not be visible to neighbors. The closest neighbor is 900 ft away. From Wheeler Road the only light fixtures visible will be the street-light at the access and indirect lighting along the access driveway. Driveway lights will be widely spaced. Since there is no pedestrian travel along this driveway there is no need to fully illuminate the driveway. Parking and tent lighting will be masked from view from Wheeler road by the 5 ft stone wall, the barn and the house. See photos A1.8 Site Plan – Photos, Rev-C: 2-20-24, section 15.7A

Acoustic Impact Plan:

The drawing A.1.6 Site Plan – Acoustic Plan, Rev-C: 2-20-24, section 15.7A shows that the sound level that will be achieved at the closest neighbors is 30 db or less. This level is equivalent to hearing "whispers". To guarantee this sound level, the Event Manual states that the output of music speakers must be limited to 80 db, measured at 3 ft distance from the speaker. A monitor location and max db level is identified for owners to monitor level of sound without disturbing an on-going event.

Buffering Plan:

The drawing A1.7 Site Plan – Buffers, Rev-C: 2-20-24, section 15.7A shows 1 on site buffer that will limit headlight and visual intrusion from proposed events to residential properties across Wheeler Road

-A 25 wide buffer is proposed along Wheeler Road from the access driveway to the north property boundary. Existing native vegetation in this wetland upland area would be retained in this buffer other than trimming to maintain traffic sight lines along Wheeler Road.

-A farm designated property lies to the south and west of the planned AHD event area. No buffer is proposed. Should this property be converted to a residential property in the future they would have the option of adding a buffer on their property.

-The forested open space property owned by Stonington Acres Association lies to the north and north west of the proposed AHD event space so no buffers are required along the north property line.

15.7.J Sign plan

Plans for free hanging signs, 2.5 ft x 4 ft + 2 ft x 1 ft with overhead external lighting of the sign are shown on the site plan, see drawing A1.3 Site Plan –Sign & Lighting, Rev-C: 2-20-24, Section 15.7A above. According to the sign limitations specified in the Town of Stonington Zoning Regulations the sign will be limited to 12 square feet (Section 14.6.1 Farm Sign in Residential District).

15.7.K Plans for New Buildings

Not applicable: no new construction proposed.

15.7.L Narrative Report Describing History & Architectural Significance.

Maple Lawn Farm sits on 37 acres surrounded by over 90+ acres of open space plus additional setbacks on the south, west, and north boundaries which was at one time part of the 600+ acre historic farm property. The farm dates back to 1687 with a land grant to the Wheeler Family by John Stanton, see family photos attached. Two generations of the Wheeler family served as town historians, Judge Wheeler serving as the High Sheriff of New London County and his daughter Grace Dennison Wheeler who wrote numerous books about the area including historical writings detailing the Wheeler homestead. Maple Lawn Farm encompasses both sides of the road at 343-Wheeler Rd. The farm presently has pasture fields, fenced paddocks, produce fields with a small greenhouse, livestock, and unique and endangered waterfowl.

The original farmhouse, which dates to 1735, is still in place. Over the past ten years this house has been 100% restored in terms of structural foundation, framing, fireplaces and interior and exterior finishes. Stone steps and paving at all of the entrances have been reset and where necessary stones for the site have been used to repair patio and walkway paving. See attached historic house photos.

The stone foundation of the original barn and silo remain. Over 5,000 ft of stone walls dividing fields have been repaired and restored.

15.7.M Narrative Hazardous Materials

Not applicable: no hazardous materials utilized on site.

15.7.N Public Stormwater Structures

The drawing A.1.4 Site Plan –Drainage & Utilities, Rev-C: 2-20-24, section 15.7A shows that 3 public maintained culverts under Wheeler Road carry stormwater runoff from the watershed of the Maple Lawn Farm and properties to the north of the farm along Wheeler Road. The design and location of the access road and parking for large events was selected such that the natural drainage from existing fields would not be changed:

-the principle design feature was that no change would be made to the existing farm field contours. These fields are currently permeable grass field with a uniform pitch of approximately 3%, see GIS NAV 88 contours on drawings A1.4 and photos drawings A1.8 Site Plan – Photos, Rev-C: 2-20-24, section 15.7A.
-the parking area is to be constructed to be nearly as permeable as the existing grass field. Parking spaces and the driveways between parking spaces will remain grass.
-the access driveway from Wheeler Road will be permeable gravel with a shallow slope of 3% except for a 60 ft long apron section that connects to Wheeler Road.

The natural drainage of the proposed event field will be identical to the current grass field. The stormwater from the parking area sheet flows to the north under a stone wall to an adjacent field. The stormwater then sheet flows on the adjacent field turning east through a 40 foot wide opening, down hill to the wetlands near the labyrinth and pond, then under the stone walls to the 36" culvert under Wheeler Road. The stormwater from the field around the proposed event tent site sheet flows to the south under a stone wall to an adjacent field then down to the wetland area and one or the other of 16" culverts under Wheeler Road.
The watershed for the gravel access drive is limited to the rear yard of the house and large barn. The access drive will be slightly pitched to the north to drain any water from the house and barn rear yards to the north, i.e. the wetlands around the labyrinth and pond. As above, the stormwater in the wetlands drains under the stone wall to the 36" culvert.

The net stormwater drainage will remain essentially identical to the current stormwater drainage since there is no introduction of large impermeable surfaces or increased slopes to concentrate of increase stormwater flow.

15.7.0 3d Model

Not applicable: no new construction proposed.

15.7.P Waterfront Properties

Not applicable: not a waterfront property.

Original stone beehive oven and fireplace



HEELER HOMESTEAD 1735.

Home of Judge Richard A. Wheeler and Miss Grace Denison Wheeler. Historians

Judge Richard A. Wheeler (d. 1904) portrait hangs in the home. He was the town historian and wrote the book "The History of Stonington", served as President of the CT Historical Society, was a Representative in the General Assembly, Sherrif of NK County, President of the Bank, and Justice of the Peace and Probate Judge.



Grace Dennison Wheeler (d. 1956) portrait hangs in the home. She wrote the book "Old Homes of Stonington" which also documents the town's cemeteries and grave stones. She also wrote a memoir that details the history of the Wheeler family and homestead.

Cannonball from the War 1812 found within the walls of the hearth during renovation



Grace Wheeler's necklace found beneath the floor boards during renovation



Before Cerullo Renovation Main House side view 1999 Main House front view 1999 Barn 1999 Front door inside and outside Renovation with colonial iron ingot. REALBERTHANA New barn after 1999 Current view of main house front and side

Interior of House Keeping room floor restoration Original front door Keeping room fireplace and mantle piece featuring the many layers of paint used JA Keeping room ceiling Discovery and restoration of well Restoration of original summer kitchen with stone beehive oven

Stone walls and patio restoration, planting of pollinator gardens and installation of birdhouses.















TOWN OF STONINGTON ZONING REGULATIONS

SECTION 16.3.2

IMPACT STATEMENT

PZ2329ZC Zoning Map Amendment For New Zone: AHD-(#) (Agriculture Heritage District)

> 343 Wheeler Road Stonington, Ct

Parcels M/B/L 94-1-4 plus 86-1-4 Divided by Wheeler Road

Revised: REV-C: 2-20-24

Applicant: Paul and Sharyne Cerullo

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16.3.2.A Municipal Fiscal Impact 16.3.2.B Public Safety and Traffic 16.3.2.C Public Works

16.3.2.D Cultural, Aesthetic or Heritage

16.3.2.E Natural Resources

16.3.2.A Municipal Fiscal Impact: The municipal impact of the proposed zoning map amendment is discussed in the following letter prepared by a licensed Realtor, Sarah E Turner.

BERKSHIRE HATHAWAY HomeServices

New England Properties

February 9th, 2023

To Whom it May Concern,

Per request of the applicants Paul and Sharyne Cerullo, the following is my professional opinion on the municipal impact on the proposed master plan, for Maple Lawn Farm; including, data from 2020, CTDOT Maps, and as outlined in the ZONING REGULATIONS – TWENTY-SEVENTH EDITION.

8.8.2.1. Municipal Impact

1. Additional tax revenue will be generated for the town through the business activities proposed; as well as, by increasing revenue and supporting local businesses, with no foreseen impact on town services. Not to mention the preservation of farm land, open space, and critical local food security for the town's population. Under the current zones, the land could be developed with 6 structures but with approval of the AHD zoning the land will be preserved with no more than 5. Furthermore, "the agricultural enhancement and protection of Agricultural Heritage Districts are intended to preserve Stonington's cultural landscape, ensure the continuation of the agricultural industry by creating opportunities for locally produced food, protect the historic agricultural character and scenic resources, maintain long-term viability and sustainability of farmland by permitting flexible economic use, and provide an alternative to the undesirable conversion of agricultural lands to residential subdivisions which is exactly what the application proposes.

2. There are no additional municipal costs or burdens to the town, expected. No additional schoolaged children are expected to be added to the district, with the proposal for amendment to AHD (Architectual Historic District) forecasted. No impact to current traffic numbers and patterns are forecasted, as it is anticipated that the majority of event guests will arrive via group transportation (bus or shuttle) that is provided by local overnight guest accommodations. Those that do not utilize such group transportation will arrive, likely in groups of 2 or more, in their private vehicles. The primary routes to the applicant property on Wheeler Rd, is along existing State and Town roads, particularly Pequot Trail Rd (Route-234), and Taugwonk Rd, all of which are adequate to accommodate a maximum of 100 additional vehicle trips on event days (<50 vehicle trips to the property in advance of an event, and <50 vehicle trips from the property after an event.)

2 Wildows Levels Mottle, CT 06453 + Cells (560) all: 1667 + Officer (869) 386 + 1406 + surschetsemendelis/NErconer (2500 + 1715 - 1716 - 1700 - 1716 BERKSHIRE New England HATHAWAY Properties

2(cont.). The AADT (Annual Average Daily Traffic) of 1,100 on Pequot Trail Rd in 2020, and AADT of 8,100 Taugwonk Rd, is sufficient to handle traffic counts to and from comparable established and operating venues, Stonington Vineyards, Deans Mill Farm and Pequot Trail Golf Club. All, with similar peak hours of parking utilization, similar peak traffic volumes and times, and similar vehicular flows between throughways, as proposed by the applicant. If the Planning & Zoning Commission or the Stonington Department of Public Works think it beneficial to improve directional signage from Taugwonk Rd, to Wheeler Rd, and along Pequot Trail Rd (Route 234), to aid in wayfinding, the applicants are willing to work with the respected municipalities, Town or State, to accomplish that end result.

The current and future structures and improvements have been designed to maintain the rural and agricultural nature of the subject property, to the greatest extent possible. Any future proposed improvements will not be visible from the adjacent properties, other than by the applicant themselves, and therefore will have no immediate impact on the neighborhood, in terms, of intensity, density, or scale of use or in architectural design. The improvements made and proposed, serve to enhance the property by ensuring that the resultant uses are for safe events, guests and for food/beverage vendors, creating no negative impact(s) on neighboring properties, adequately protects the overall ecosystem, and is accessible and used for training by emergency personnel. Lastly, the proposed use will not cause any unreasonable pollution, impairment or destruction of the air, water or other natural resources.

3. No water, sewer, or school services will be impacted, as no school aged children will be added to the current services, by the proposed master plan and intended uses, as set forth in the application.

4. Ancillary services may be generated such as restaurant and catering facilities, overnight accommodations, local breweries, service industry professionals, and agricultural pathways, to name a few. The flexibility in zone AHD, will allow for the applicant to attract visitors, appeal to a larger market, enhance the experience and stay at other local attractions. Local businesses will benefit from the needs of the attendees, i.e., transportation, hotel, dining, shopping, and tourism, in turning increasing municipal revenue.

BERKSHIRE New England HATHAWAY HomeServices

Properties

5. In the farm's pre-exiting condition, "The location, uses and layout, conform with the intent of, goals and objectives contained in, the Plan of Conservation and Development. *

Should you require anything further, please feel free to contact me via the information below.

Sincerely,

Sarah E. Turner **REALTOR®** Berkshire Hathaway HomeServices New England Properties 2 Williams Ave. Mystic, CT. 06355 860.501.0551 SarahEturner@bhhsne.com

REFERENCES

Constant Accession, C.: (CGS7 stress that) 765 - 361 - Other: (Soft) 506 - 4506 (SorthEnemerichters New Constants), no

a state of a state of the A.M. S. e. State

SOUTHEASTERN CONNECTICUT COUNCIL OF GOVERNMENTS 5 Connecticut Avenue, Norwich, Connecticut 06360 (860) 889-2324/Fax: (860) 889-1222/Email: <u>office@seccog.org</u>

(Via electronic mail)

December 19, 2023

Clifton J. Iler, AICP Town Planner, Town of Stonington 152 Elm Street Stonington, CT 06378

Dear Mr. Iler:

I am writing in response to an application for a zoning map amendment for the Town of Stonington. The application was received on 11/21/2023. The application was referred to this agency pursuant to Section 8-3 of the Connecticut General Statutes.

The zoning map amendment proposes an Agricultural Heritage District (AHD) at 343 Wheeler Road and another unaddressed parcel on Wheeler Road. The application consists of a master plan to create a campus for food, education, and events.

Based a review of the material provided, I have determined that the proposed amendments are not likely to have a negative inter-municipal impact.

If you have any questions, please contact me at 860-889-2324.

Sincerely,

Thill

Nicole Haggerty, AICP Planner II nhaggerty@seccog.org

Member Municipalities:

Bozrah * Colchester * East Lyme * Franklin * Griswold * Borough of Jewett City * City of Groton * Town of Groton * Lebanon * Ledyard * Lisbon * Montville * New London * North Stonington * Norwich * Preston * Salem * Sprague * Stonington * Stonington Borough * Waterford * Windham

If language assistance is needed, please contact SCCOG at 860-889-2324, office@seccog.org. Si necesita asistencia lingüística, por favor comuníquese a 860-889-2324, office@seccog.org. 如果您需要语言帮助,请致电860-889-2324或发送电子邮件至 office@seccog.org.

16.3.2.B Public Safety and Traffic

The property is located less than 2 miles off exit 91 on Route 95 and has a long driveway which leads to ample field parking at the rear of the buildings. Wheeler Road is three miles long with approximately 18 turn-offs for homesites from the south and 14 turnoffs from the north. (see parking and traffic study in Master Plan)

16.3.2.C Public Works

Property has adequate drainage systems in effect, no impact (See drainage study in Master Plan)

Lighting will not affect any other properties as wooded buffer and topography on all sides as well as the farm occupies both sides of the road. (see Lighting Plan and Buffer Plan in Master Plan)

Parking is safe and behind buildings in the fields, (see Site Plan – Proposed in Master Plan)

There is plenty of capacity for wastewater systems and utility systems as they were designed to handle growth at Maple Lawn Farm

Two deep wells provide adequate fresh water needs for both agriculture and domestic requirements and meet all required separation distances and codes.

16.3.2.D Cultural, Aesthetic or Heritage

The main homestead building and landscape have been in place for approximately 290 years. The land was deeded to the Wheeler family in 1687.

The heritage of the town will be preserved as we continue to revive and maintain the historic homestead that was built in 1735 and documented in the historical writings of Grace Dennison Wheeler and other historical publications. Two generations of Wheelers have served as town historians and Judge Wheeler served as the High Sheriff of New London County. A dedicated space on the farm for a walking labyrinth serves to honor and describe the previous occupants of the land, which include the Pequot people, the enslaved and indentured servants, as well as the Wheeler family. In her book, Grace Wheeler's Memories, Wheeler references these occupants, all of whom were connected to, and tended, to the land over the past centuries.

This project is compatible with public views and the neighborhood as it sits off the road and is self-contained. It will allow for cultural events while keeping the quaint small-town aspect of Stonington

This project will preserve the Farmland and may prevent possible housing development.

This project will help to preserve an historic property.

This property preserves old stone walls and fields, which hold archeological significance.

The old ice pond on site was expanded with the permission of the town and provides the only water available to the fire department which occasionally holds pumping exercises for the volunteer firefighters. The pond also serves to provide water requirements for the north produce field.

16.3.2.E Natural Resources

No views will be affected.

No wetlands, aquifers, or watersheds will be impacted.

Animal and natural habitats have been maintained and improved.

Landforms have not been changed, only revitalized.

Production of various crops such as hay, corn, vegetables, and flowers will continue to be produced.

Air quality will not be affected only improved with the proposed "silvopasture".

A second deep well was drilled to provide additional water for expanded agriculture and event needs.

There are no additional hard surfaces, asphalt, concrete, or slab planned. The existing gravel roadway on the north side of the house and the asphalt circular driveway are more than adequate for both traffic patterns and the ability to handle truck and equipment loads.

Signage will be typical of American Colonial trade signage and will hang from iron hardware. Lighting will allow for safe walking and parking. We will have a lighted space appropriate for the events meeting all existing codes.

There are no additional structures planned at this time.

- ASSESSOR MAP AS:



<u>LEGEND</u>







LOT, YARD, AND BUILDING REQUIREMENTS

	343 WHEELER ROAD, STONINGTON, CT								
	MINIMUM LOT MINIMUM YARDS MAX BUILDING								
	AREA	WIDTH	FRONT	SIDE	REAR	F.A.R.	HGT		
	(ACRES)	(feet)	(feet)	(feet)	(feet)	(ratio)	(30')		
REQUIRED	35	-	500' *	-	-	-	-		
EXISTING	37.16	-	699'	393' / 279'	213'	0.007	30'		
PROPOSED	N/C	N/C	N/C	N/C / N/C	N/C	N/C	N/C		
						-			

	EXST'G FLR AREA (sq ft)	PROP FLR AREA (sq ft)	
BSMT	0	N/C	
HSE 1ST FLR	2463	N/C	
HSE 2ND FLR	1657	N/C	
HSE 3RD FLR	975	N/C	
LG BARN 1ST FLR	3141	N/C	
LG BARN 2ND FLR	1773	N/C	
SM BARN	1305	N/C	
TOTAL	11,314	11,314	

















F. A. Hesketh & Associates, Inc.

February 9, 2024

Mercer Bertsche Vernott Arcitects P.O. Box 619 Old Mystic, CT 06372

Attn: Kate Shea

RE: Traffic Impact Report Maple Lawn Farm 343 Wheeler Road Stonington, CT Our File: 24009

Dear Ms. Shea:

Pursuant to your request our office has prepared this statement outlining the trip generation potential and the possible traffic impact of a proposed wedding / event facility to be located on property at 343 Wheeler Road in the Town of Stonington, CT. The site proposed for development is shown in Figure 1. This letter presents our findings.

The proposal is to redevelop an existing agricultural land use property for use as a wedding / event facility. The facility would have a maximum capacity of 175 guests with a total of 16 employees. Events would most likely occur on Friday evenings and on the weekends. The proposed development provides a total of 74 parked vehicles. Access to the site is proposed by way of a new 24-foot wide asphalt driveway to Wheeler Road located north of the intersection of Sommers Lane.

The site proposed for development is located on the west side of Wheeler Road approximately 1,500 feet north of Sommers Lane. Wheeler Road is a town-maintained roadway that originates at an unsignalized T-intersection with Route 184 (New London

Turnpike). Route 184 is oriented in the east-west direction and operates freely and Wheeler Road approaches from the south and operates under stop sign control. Wheeler Road extends to the south, past the subject site, continuing until it terminates at an unsignalized T-intersection with Route 234 (Pequot Trail). Wheeler Road provides a single travel lane in each direction, separated by a painted double yellow centerline. There is no painted shoulder line in either direction. The roadway in the vicinity of the proposed site provides 20 feet of pavement with a single 0-foot wide travel lane in each direction. The roadway is posted at 35 miles per hour. Land use in the area is a mix of single family residential and agricultural. The Pequot Golf Club straddles the roadway a short distance north of Pequot Trail.

Route 184 (New London Turnpike) is a State maintained roadway that traverses the town of Stonington in an east/west direction from Mystic to North Stonington. In the vicinity of Wheeler Road Route 184 provides 30 feet of pavement a single travel lane and painted shoulder in each direction, separated by a painted double yellow centerline. The posted speed limit is 45 miles per hour. Land use in the area is primarily residential.

Route 234 (Pequot Trail) is a state-maintained roadway that traverses the town of Stonington in the east/west direction from Mystic to Westerly Rhode Island. In the vicinity of Wheeler Road, Route 234 provides 40 feet of pavement, a single travel lane and painted shoulder in each direction separated by a painted double yellow centerline. The posted speed limit is 35 miles per hour. Land use in the area is primarily residential.

Sommers Lane is a town-maintained roadway that traverses east/west. Sommers Lane begins at an unsignalized T-intersection. Wheeler Road is oriented in the north/south direction and Sommers Lane approaches from the east and operates under stop sign control. Sommers Lane traverses east approximately 1,600 feet until it terminates at an unsignalized T-intersection with Taugwonk Road. Sommers Lane provides 20 feet of pavement a single travel lane in each direction, separated by a painted double yellow

centerline. The posted speed limit is 30 miles per hour. Land use along the roadway is residential.

To determine the impact of the site generated on local roadways it is necessary to identify the existing traffic on local streets in the vicinity of the site. ConnDOT maintains a database of traffic counts for all state highways. Included within that database are count stations on Route 184, at the Stonington Town Line and another on Taugwonk Road north of Sommers Lane. Unfortunately there are no existing counts on Wheeler Road. The Route 184 count, taken in June 2020, during the Covid-19 epoch, indicates an average daily traffic volume of 2,700 vehicles with peak hour volumes of 203 vehicles during the a.m. peak hour (9:00 a.m.) and 288 vehicles during the p.m. peak hour (3:00 p.m.). The count is presented in Table 1.

The count conducted on Taugwonk Road, north of Sommers Lane, conducted in May 2020, during the Covid-19 epoch, indicates an average daily traffic volume of 1,100 vehicles with peak hour volumes of 85 vehicles during the morning peak hour (9:00 a.m.) and 148 vehicles during the afternoon peak hour (3:00 p.m.). The count is presented in Table 2.

Based on our observations of current traffic flows and our discussions with your office and the property owner, it is our understanding that Wheeler Road has a much lower traffic volume than any of the above referenced roadways.

Typically to estimate traffic for a proposed development we would utilize the ITE *Trip Generation* report. Unfortunately, *Trip Generation* does not include a land use for a wedding / event facility or other similar use. Therefore, we have estimated the site generated traffic based on the maximum number of guests allowed for an event. The proposed wedding / event facility will allow for a maximum of 175 guests. Assuming a vehicle occupancy rate of 3 persons per vehicle (the town requires a parking ratio of

one space per 3 attendees) a peak hour trip generation of 58 vehicles per hour, can be expected. There are also a total of 16 employees anticipated for the site. If we assume that all employees and all guests arrive and depart during the same hour that would represent a peak hour volume of 74 vehicles. We believe that this is a conservative number since at an event, with a specific starting time, employees would typically arrive long before the event to set up and most guests would likely arrive in the ½ hour period before the start time. Guests would typically depart over a two hour period as the party winds down, with perhaps 75% departing in a single hour. Employees would not leave until after most of the guests have departed.

Since the background traffic volumes from the ConnDOT counts are relatively low, and turning movement count data was not available, we have chosen to present an analysis of an un-signalized T- intersection with volumes significantly higher than the observed volumes. We have prepared an analysis with through volumes on the main roadway of 250 vehicles in each direction, with turning movement volumes of 75 vehicles for all four movements. This volume of traffic is significantly higher than the combined traffic volume that would be realized at any nearby intersection during either the entering or exiting peak hour of an event. The results indicate that the main street approaches would operate at a LOS A while the side street approach would operate at a LOS C, with an average delay of about 17 seconds per vehicle. The traffic volumes analyzed are presented in Figure 2.

Observations at the proposed site driveway location indicate that the available intersection sight distances to both the north and the south are in excess of 400 feet. The available sight distance meets the current ConnDOT criteria for an approach speed of 35 miles per hour. Wheeler Road has a posted speed limit at 35 miles per hour.

Conclusion

Based on the background traffic volumes, the anticipated site generated traffic volume for the facility, and the conservative capacity analysis as outlined in this report, it is my professional opinion that the local roadway network is capable of accommodating the traffic volumes associated with the proposed development, while providing an acceptable level of service. The proposed site driveway is properly located with respect to available sight distances, and the driveway will operate at acceptable levels of service.

We appreciate the opportunity to provide this information to you. If you require any additional information, please do not hesitate to contact our office. A representative from our office will be available to present testimony before local commissions upon your request.

Very truly yours,

F. A. Hesketh & Associate Scott F. Hesketh, P. Manager of Transportation Engineer cc: Ms. Kate Shea

T:\24009\Wheeler.2024.02.09.doc

Google Maps



Map data ©2024 1000 ft 🛏

httne://www.ronala rom/mane/@11 2001578 _71 0051180 1570antn/-tti

FIGURE 1

111

		Total	16	4	-	9	23	58	105	175	166	149	176	204													1083		
	1-Jul-20 lednesday	WB	7	-	-	2	7	25	50	86	72	79	76	100													506		
	3	EB	6	ŝ	0	4	16	33	55	89	94	70	100	104													373		
		Total	80	2	5	S	17	55	112	181	162	170	157	162	224	188	233	279	249	211	131	84	88	43	32	14	2815		
	30-Jun-20 Tuesday	WB	ю	2	4	0	4	23	58	67	92	87	77	82	121	06	130	139	146	108	69	48	48	16	18	6	1441		
		믭	5	С	~	S	13	32	54	114	70	83	80	80	103	98	103	140	103	103	62	36	40	27	14	5	1374		
		Total	2	2	2	7	26	50	105	182	155	148	164	176	211	181	250	202	226	126	89	79	60	34	29	6	2515		
	29-Jun-20 Monday	WB	-	0	-	ę	8	22	50	11	06	75	06	86	92	85	127	123	150	97	50	46	24	15	12	7	1331		
e		EB	F	2	-	4	18	28	55	105	65	73	74	06	119	96	123	79	76	29	39	33	36	19	17	2	1184	= 2,700	
LUMES Town Lir		Total	16	9	9	80	8	17	36	62	113	158	179	226	263	206	228	216	216	178	136	82	71	73	30	21	2555	gton, CT	
le 1 FIC VO ington 7 No.56	28-Jun-20 Sunday	WB	7	с	e	4	З	7	23	30	63	82	88	126	136	96	104	120	108	79	65	45	33	30	15	12	1282	n Stonin	
Tabl T TRAF at Ston Station		B	6	с	с	4	5	10	13	32	50	76	91	100	127	110	124	96	108	66	71	37	38	43	15	6	1273	tion 56 i	
connDO ute 184		Total	12	11	9	18	7	19	50	86	139	193	220	255	260	251	259	173	136	116	85	86	85	69	41	26	2603	T for Sta	
Ro	27-Jun-20 Saturday	WB	9	с	4	80	2	6	27	42	69	87	92	136	140	123	133	93	82	71	49	49	42	31	21	13	1332	2020 AD	
		EB	9	80	2	10	2	10	23	44	70	106	128	119	120	128	126	80	54	45	36	37	43	38	20	13	1271		
		Total	6	9	-	11	15	60	124	195	188	203	224	225	253	239	280	285	288	259	219	128	96	71	34	21	3434		
	6-Jun-20 Friday	WB	4	2	0	4	2	23	56	97	93	67	115	111	137	117	145	146	155	132	114	59	44	36	20	10	1719		
	2	EB	5	4	-	7	13	37	68	98	95	106	109	114	116	122	135	139	133	127	105	69	52	35	14	11	1715		
		Total															248	268	244	222	174	117	96	68	40	23	1500		
	5-Jun-20 hursday	WB															122	134	140	111	91	71	49	33	13	11	775		
	12	EB															126	134	104	111	83	46	47	35	27	12	725		
			12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	2:00	8:00	9:00	10:00	11:00	Total		

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Table 2 ConnDOT TRAFFIC VOLUMES Taugwonk Road North of Sommers Lane Station No.106

		13-May-20 Wednesday)		14-May-20 Thursday)		15-May-20 Friday	
	<u>NB</u>	<u>SB</u>	<u>Total</u>	<u>NB</u>	<u>SB</u>	<u>Total</u>	<u>NB</u>	<u>SB</u>	<u>Total</u>
12:00				0	1	1	0	2	2
1:00				1	2	3	1	1	2
2:00				1	0	1	1	0	1
3:00				1	1	2	2	0	2
4:00				4	2	6	3	3	6
5:00				9	1	10	6	1	7
6:00				27	10	37	15	7	22
7:00				30	23	53	40	13	53
8:00				39	29	68	38	21	59
9:00	35	37	72	41	44	85	31	25	56
10:00	28	41	69	33	42	75	36	36	72
11:00	33	37	70	39	47	86	34	45	79
12:00	38	49	87	54	48	102			
1:00	57	44	101	29	53	82			
2:00	50	44	94	47	53	100			
3:00	41	88	129	53	95	148			
4:00	26	77	103	38	86	124			
5:00	42	59	101	41	72	113			
6:00	56	31	87	36	28	64			
7:00	25	21	46	22	24	46			
8:00	9	9	18	9	15	24			
9:00	4	4	8	7	7	14			
10:00	1	2	3	1	1	2			
11:00	0	1	1	0	0	0			
Total	445	544	989	562	684	1246	207	154	361
		2020 AD	DT for Sta	tion 106	in Stoni	ington, C	T = 1,100)	



COMPOSITE PEAK HOUR



Appendix

Status:	OK	South	Combined	North	Class	Speed
				Contract of the second s		

STON-106 - Combined - n/s

[244]-Taugwonk Road - 1.07 mi North of Sommers Lane

Collected during COVID-19 epoch		13-May Wed	14-May Thu	15-May Fri
Town	12:00am 01:00am 02:00am 03:00am 03:00am 05:00am 05:00am 07:00am 09:00am 10:00am 11:00am 11:00am 12:00pm 01:00pm 03:00pm 03:00pm 04:00pm 05:00pm 05:00pm 06:00pm 08:00pm 09:00pm	Wed X 72 69 70 87 101 94 129 103 101 87 46 18 8 3	Thu 1 3 1 2 6 10 37 53 68 85 75 86 102 82 100 148 124 113 64 46 24 14 2	Fri 2 2 1 2 6 7 22 53 59 56 72 79 x
	Totals	1 989	1246	361

Status:	OK	South	Combined	North	Class	Speed

STON-106 - North

[244]-Taugwonk Road - 1.07 mi North of Sommers Lane

Collected during COVID-19 opech		13-May	14-May	15-May
corrected during covid is epoch		Wed	Thu	Fri
Town	12:00am		0	0
Station 106	01:00am		1	1
Logation 41 391643 -71 900187	02:00am		1	1
2015-Maior Collector 5 2015-Urban	03:00am		1	2
HPMS Section ID	04:00am		4	3
Start Report 13-May-2020 09:00AM	05:00am		9	6
End Report 15-May-2020 12:00PM	06:00am		27	15
Appualized ADT 500	07 : 00am		30	40
24 - Hour Count 557 * G4(0 92) = 512 4	08:00am	Х	39	38
Day 1 + $562 * G4(0.92) = 1029.5$	09:00am	35	41	31
UnRounded AADT $1029.5 / 2 = 514.7$	10:00am	28	33	36
OK = 2020 Wed 13-May - this report 1100	11:00am	33	39	34
OK 2017 Mon 18-Sep	12:00pm	38	54	Х
OK 2011 Mon 22-Aug	01:00pm	57	29	
OK 2008 Mon 01-Dec	02:00pm	50	47	
Dataset Details	03:00pm	41	53	
	04:00pm	26	38	
	05:00pm	42	41	
	06:00pm	56	36	
	07:00pm	25	22	
	08:00pm	9	9	
	09:00pm	4	7	
	10:00pm	1	1	
	11:00pm	0	0	
	Totals	445	562	207

Status:	OK	South	Combined	North	Class	Speed

STON-106 - South

[244]-Taugwonk Road - 1.07 mi North of Sommers Lane

Collected during COVID-19 epoch		13-May	14-May	15-May
corrected during covid-is epoch		Wed	Thu	Fri
Town	12:00am		1	2
Station 106	01:00am		2	1
Location 41, 391643, -71, 900187	02:00am		0	0
2015-Major Collector 5	03:00am		1	0
HPMS Section ID	04:00am		2	3
Start Report	05:00am		1	1
End Report	06:00am		10	7
Annualized ADT	07 : 00am		23	13
24-Hour Count $613 * G4(0.92) = 564.0$	08:00am	Х	29	21
Day $1 \dots + 684 * G4(0.92) = 1193.2$	09:00am	37	44	25
UnRounded AADT1193.2 / $2 = 596.6$	10:00am	41	42	36
OK 2020 Wed 13-May -this report1100	11:00am	37	47	45
OK 2017 Mon 18-Sep1000	12:00pm	49	48	Х
OK 2011 Mon 22-Aug1400	01:00pm	44	53	
OK 2008 Mon 01-Dec1300	02:00pm	44	53	
Dataset Details1	03:00pm	88	95	
	04:00pm	77	86	
	05:00pm	59	72	
	06:00pm	31	28	
	07:00pm	21	24	
	08:00pm	9	15	
	09:00pm	4	1	
	10:00pm	2	1	
	11:00pm	1	0	1 – 1
	Totals	544	684	154

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STON-106 - North

Marm Stonington		22-Aug	23-Aug
		Mon	Tue
Station	12:00am		9
Location 41.391643, -/1.90018/	01:00am		5
ZUIS-Major Collector S	02:00am	10	
Start Report	03:00am	4	
End Report	04:00am	7	
Axie Correction Factor	05:00am	12	
Annualized AD1	06:00am	34	
24 -Hour Count 1541 ^ G4(0.92) - 1417.7	07:00am	76	
UnRounded AADT	08:00am	77	
OK 2020 Wed 15-May	09:00am	83	
OK 2017 Mon 18-Sep	10:00am	86	
OK 2009 Map 01-Dog 1300	11:00am	92	
Dataset Details	12:00pm	104	
Dataset Details	01:00pm	111	
	02:00pm	114	
	03:00pm	133	
	04:00pm	158	
	05:00pm	166	
	06:00pm	98	
	07:00pm	65	
	08:00pm	49	
	09:00pm	24	
	10:00pm	17	
	11:00pm	7	
	Totals	1527	14


st Class

ss Speed

nSTO-056 - Combined - e/w

Route 184 - 10.45 mi At Stonington Town Line

	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul
	Thu	Fri	Sat	Sun	Mon	Tue	Wed
12:00am		9	12	16	2	8	16
01:00am		6	11	6	2	5	4
02:00am		1	6	6	2	5	1
03:00am		11	18	8	7	5	6
04:00am		15	7	8	26	17	23
05:00am		60	19	17	50	55	58
06:00am		124	50	36	105	112	105
07:00am		195	86	62	182	181	175
08:00am		188	139	113	155	162	166
09:00am		203	193	158	148	170	149
10:00am		. 224	220	179	164	157	176
11:00am		225	255	226	176	162	204
12:00pm		253	260	263	211	224	Х
01:00pm	x	239	251	206	181	188	
02:00pm	248	280	259	228	250	233	
03:00pm	268	285	173	216	202	279	
04:00pm	244	288	136	216	226	249	
05:00pm	222	259	116	178	126	211	
06:00pm	174	219	85	136	89	131	
07:00pm	117	128	86	82	79	84	
08:00pm	96	96	85	71	60	88	
09:00pm	68	71	69	73	34	43	
10:00pm	40	34	41	30	29	32	
11:00pm	23	21	26	21	9	14	
Totals	1500	3434	2603	2555	2515	2815	1083
	12:00am 01:00am 02:00am 03:00am 04:00am 05:00am 06:00am 07:00am 09:00am 10:00am 11:00am 11:00pm 01:00pm 01:00pm 03:00pm 03:00pm 04:00pm 05:00pm 06:00pm 09:00pm 10:00pm 10:00pm	25-Jun Thu 12:00am 01:00am 02:00am 03:00am 04:00am 05:00am 06:00am 07:00am 07:00am 09:00am 10:00am 11:00am 11:00am 12:00pm 01:00pm 248 03:00pm 248 03:00pm 248 03:00pm 244 05:00pm 244 05:00pm 244 05:00pm 248 03:00pm 268 04:00pm 248 03:00pm 268 04:00pm 248 03:00pm 268 04:00pm 248 03:00pm 268 04:00pm 248 03:00pm 268 04:00pm 222 06:00pm 117 08:00pm 96 09:00pm 40 11:00pm 23 Totals 1500	25-Jun26-JunThuFri12:00am901:00am602:00am1103:00am1104:00am1505:00am6006:00am12407:00am19508:00am20310:00am22512:00pm25301:00pmx22525301:00pm24803:00pm26803:00pm26804:00pm1742197:00pm07:00pm11712808:00pm9609:00pm687110:00pm403411:00pm232170tals15003434	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Status:	OK	West	Combined	East	Class	Speed
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nSTO-056 - East

Route 184 - 10.45 mi At Stonington Town Line

Collected during COVID-19 proch		25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul
corrected during covid-19 epoch		Thu	Fri	Sat	Sun	Mon	Tue	Wed
Town North Stonington	12:00am		5	6	9	1	5	9
Ctation 56	01:00am		4	8	3	2	3	3
Jacobion 41 420054 -71 902770	02:00am		1	2	3	1	1	0
Dested Greed Limit (5 MDH	03:00am		7	10	4	4	5	4
Posted Speed Limit	04:00am		13	5	5	18	13	16
	05:00am		37	10	10	28	32	33
	06:00am		68	23	13	55	54	55
	07:00am		98	44	32	105	114	89
	08:00am		95	70	50	65	70	94
	09:00am		106	106	76	73	83	70
	10:00am		109	128	91	74	80	100
	11:00am		114	119	100	90	80	104
	12:00pm		116	120	127	119	103	Х
	01:00pm	х	122	128	110	96	98	
	02:00pm	126	135	126	124	123	103	
OK = 2020 Thu 25 Jup = this report = 2700	03:00pm	134	139	80	96	79	140	
OK 2020 IIIu 25-500 -CHIS TEPOTC2700	04:00pm	104	133	54	108	76	103	
OK 2017 Tue 28-Sep	05:00pm	111	127	45	99	29	103	
OK 2009 Map 22-Sap 2900	06:00pm	83	105	36	71	39	62	
OK 2008 Mon 22-Sep	07:00pm	46	69	37	37	33	36	
Dataset Details	08:00pm	47	52	43	38	36	40	
	09:00pm	35	35	38	43	19	27	
	10:00pm	27	14	20	15	17	14	
	11:00pm	12	11	13	9	2	5	
	Totals	725	1715	1271	1273	1184	1374	577

	01/	Mast	Combined	[East	
Status:	OK	vvest	Compined	East	

Class Speed

nSTO-056 - West

Route 184 - 10.45 mi At Stonington Town Line

Collected during COVID-10 enach		25-Jun	26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul
corrected during covid-is epoch		Thu	Fri	Sat	Sun	Mon	Tue	Wed
North Stonington	12:00am		4	6	7	1	3	7
Ctation 56	01:00am		2	3	3	0	2	1
	02:00am		0	4	3	1	4	1
Dested Greed Limit (5 MDU	03:00am		4	8	4	3	0	2
Posted Speed Limit	04:00am		2	2	3	8	4	7
	05:00am		23	9	7	22	23	25
	06:00am		56	27	23	50	58	50
	07:00am		97	42	30	77	67	86
	08:00am		93	69	63	90	92	72
	09:00am		97	87	82	75	87	79
	10:00am		115	92	88	90	77	76
	11:00am		111	136	126	86	82	100
	12:00pm		137	140	136	92	121	х
Day 4 $+ 1331 \wedge G4(0.91) = 69/8.0$	01:00pm	х	117	123	96	85	90	
Day 5 + $1441 * G4(0.91) = 8289.3$	02:00pm	122	145	133	104	127	130	
UnRounded AADT	03:00pm	134	146	93	120	123	139	
OK 2020 Thu 25-Jun -this report2700	04:00pm	140	155	82	108	150	146	
OK 2017 Tue 26-Sep	05:00pm	111	132	71	79	97	108	
OK 2000 Mag 22 Gam 2000	06:00pm	91	114	49	65	50	69	
OK 2008 Mon 22-Sep	07:00pm	71	59	49	45	46	48	
Dataset Details	08:00pm	49	44	42	33	24	48	
	09:00pm	33	36	31	30	15	16	
	10:00pm	13	20	21	15	12	18	
	11:00pm	11	10	13	12	7	9	
	Totals	775	1719	1332	1282	1331	1441	506

nSTO-056 - East & West

TownNorth Stonington		26-Sep	27-Sep
Station 56		Tue	Wed
Location 41 420954 -71 892779	12:00am	8	9
2015-Minor Arterial 4 2015-Urban	01:00am	4	2
Start Report 26-Sep-2017 12:00AM	02:00am	7	8
End Poport 27-Sep-2017 11:00PM	03:00am	9	5
Axle Correction Easter None	04:00am	67	52
Appualized ADT 3000	05:00am	122	132
24 - Hour Count $3287 * CA(0.92) = 3024.0$	06:00am	169	180
24 Hour Counc 5287 G4(0.92) = 5024.0	07:00am	239	202
$\text{UnRounded ADT} \qquad 6082 \ 1 \ / \ 2 = 3041 \ 1$	08:00am	215	187
OK = 2020 Thu $25 - Jup = 2700$	09:00am	163	155
OK = 2020 Thu 25 bull	10:00am	186	163
OK 2011 Ned 03-Aug 2900	11:00am	166	176
OK 2008 Mon 22-Sep 2900	12:00pm	185	213
Dataset Details	01:00pm	200	182
Dataset Details	02:00pm	207	244
	03:00pm	280	310
	04:00pm	300	285
	05:00pm	257	271
	06:00pm	171	177
	07:00pm	123	147
	08:00pm	106	112
	09:00pm	49	60
	10:00pm	30	34
	11:00pm	24	18
	Totals	3287	3324

HCM Unsignalized Intersection Capacity Analysis 3: Wheeler Road & Route 184

		\mathbf{r}	1	-	1	1
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1 .			न	W	
Traffic Volume (veh/h)	250	75	75	250	75	75
Future Volume (Veh/h)	250	75	75	250	75	75
Sign Control	Free			Free	Stop	1300000
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (yph)	272	82	82	272	82	82
Podestrians	LIL	02	02		UL	UL.
Lane Width (ft)						
Molking Spood (ft/s)						
Percent Blockage						
Percent Diockage						
Nodion tuno	Nana			Nene		
Median type	None			None		
livedian storage ven)						
Opstream signal (tt)						
pX, platoon unblocked			054		740	242
vC, conflicting volume			354		749	313
vC1, stage 1 conf vol						
vC2, stage 2 conf vol			054		740	040
vCu, unblocked vol			354		/49	313
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		77	89
cM capacity (veh/h)			1205		354	727
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	354	354	164			
Volume Left	0	82	82			
Volume Right	82	0	82			
cSH	1700	1205	476			
Volume to Capacity	0.21	0.07	0.34			2
Queue Length 95th (ft)	0	5	38			
Control Delay (s)	0.0	2.4	16.5			
Lane LOS		A	С			
Approach Delay (s)	0.0	2.4	16.5			
Approach LOS	010		C			
Internection Cummer:						
milersection Summary			1.4			
Average Delay			4.1			(0 ·
Intersection Capacity Utiliz	ation		53.8%	IC	U Level o	of Service
Analysis Period (min)			15			

Status:	OK	East

st Combined West

Class Speed

STON-133 - Combined - e/w

Route 234 - 2.33 mi NW of Al Harvey Road

Collected during COVID-19 opach		21-May	22-May	23-May	24-May	25-May	26-May	27-May
corrected during covid-19 epoch		Thu	Fri	Sat	Sun	Mon	Tue	Wed
Term Stonington	12:00am		7	4	2	3	2	3
Station 133	01:00am		2	0	1	3	0	1
Jacobion 41 275026 -71 010613	02:00am		0	1	1	1	2	2
Location	03:00am		1	2	0	0	0	0
2122	04:00am		1	2	2	2	3	3
A.K.A	05:00am		9	5	1	7	11	7
	06:00am		20	9	7	4	21	25
	07:00am		44	22	18	16	37	53
	08:00am		65	24	27	26	51	42
	09:00am		58	47	47	37	48	Х
	10:00am	x	70	67	64	57	58	
Day 1+ $1125 \wedge G4(0.83) = 1854.7$	11:00am	66	81	60	76	70	63	
Day 2 $+ 703 \times G4(1.01) = 2564.7$	12:00pm	78	97	74	84	87	59	
Day 3 $+ 909 \wedge G4(1.21) = 3664.6$	01:00pm	67	99	69	81	89	86	
Day 4 $+$ 859 * G4(0.92) = 4454.9	02:00pm	84	106	67	89	78	86	
Day 5 $+ 938 \times G4(0.92) = 5317.8$	03:00pm	111	89	55	78	84	97	
UnRounded AADT $5317.8 / 6 = 886.3$	04:00pm	89	106	57	92	82	96	
OK 2020 Thu 21-May -this report900	05:00pm	72	88	45	68	59	87	
OK 2017 Mon 21-Aug	06:00pm	64	68	25	65	57	51	
OK 2011 Mon 22-Aug	07:00pm	33	49	26	43	44	34	
OK 2008 Tue 25-Nov	mq00:80	27	25	13	32	20	20	
Dataset Details	mq00:00	11	20	14	8	19	16	
	10:00pm	11	9	8	13	7	3	
	11:00pm	11	.11	7	10	7	7	
	Totals	724	1125	703	909	859	938	136

Status: OK East Combined	Status:	OK	East	Combined
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Class Speed

West

STON-133 - East

Route 234 - 2.33 mi NW of Al Harvey Road

Collected during COVID-10 speech		21-May	22-May	23-May	24-May	25-May	26-May	27-May
corrected during covid-is epoch		Thu	Fri	Sat	Sun	Mon	Tue	Wed
Town	12:00am		5	3	1	1	2	3
Ctation 122	01:00am		1	0	0	1	0	1
Lagation 41 275026 -71 010613	02:00am		0	1	0	0	1	1
Docation	03:00am		0	0	0	0	0	0
	04:00am		1	1	1	1	1	1
A.A.A. 2015-Major Collector 52015-Urban Start Report.	05:00am		3	1	1	4	4	2
	06:00am		3	2	2	1	6	9
	07:00am		17	9	4	6	18	21
	08:00am		29	8	10	9	27	20
	09:00am		33	25	24	19	23	х
	10:00am	х	33	33	36	33	31	
	11:00am	33	45	28	44	30	39	
	12:00pm	44	45	40	47	50	27	
	01:00pm	38	55	35	44	42	43	
	02:00pm	49	59	41	50	44	45	
	03:00pm	63	49	30	48	45	52	
	04:00pm	46	56	29	45	44	59	
OK 2020 Inu 21-May -Chis report900	05:00pm	44	42	20	43	35	50	
OK 2017 Mon 21-Aug	06:00pm	35	41	10	42	36	25	
OK 2009 Two 25 New 900	07:00pm	18	26	16	24	26	25	
OK 2008 Tue 25-Nov	08:00pm	19	16	7	23	10	12	
Dataset Details	09:00pm	5	13	7	2	14	6	
	10:00pm	4	5	3	5	1	0	
	11:00pm	6	9	2	10	2	4	
	Totals	404	586	351	506	454	500	58

		(manufacture and a second sec	Concession for the second seco	(
Status:	OK	East	Combined	West

Class Speed

STON-133 - West

Route 234 - 2.33 mi NW of Al Harvey Road

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Collected during COVID-19 epoch		21-May	22-May	23-May	24-May	25-May	26-May	27-May
corrected during covid-is epoch		Thu	Fri	Sat	Sun	Mon	Tue	Wed
TownStonington Station	12:00am		2	1	1	2	0	0
	01:00am		1	0	1	2	0	0
	02:00am		0	0	1	1	1	1
	03:00am		1	2	0	0	0	0
	04:00am		0	1	1	1	2	2
	05:00am		6	4	0	3	7	5
	06:00am		17	7	5	3	15	16
Start Report	07:00am		27	13	14	10	19	32
End Report	08:00am		36	16	17	17	24	22
Annualized Addition $472 \pm 64/(0.02) = 424/2$	09:00am		25	22	23	18	25	х
24 -Hour Count $4/2 \wedge G4(0.92) = 434.2$	10:00am	х	37	34	28	24	27	
Day 1+ $539 \times G4(0.83) = 881.6$	11:00am	33	36	32	32	40	24	
Day 2+ $352 \times 64(1.01) = 1237.1$ Day 3+ $403 \times 64(1.21) = 1724.8$ Day 4+ $405 \times 64(0.92) = 2097.4$ Day 5+ $438 \times 64(0.92) = 2500.3$ UnRounded AADT2500.3 / 6 = 416.7	12:00pm	34	52	34	37	37	32	
	01:00pm	29	44	34	37	47	43	
	02:00pm	35	47	26	39	34	41	
	03:00pm	48	40	25	30	39	45	
	04:00pm	43	50	28	47	38	37	
OK 2020 Thu 21-May -this report900	05:00pm	28	46	25	25	24	37	
OK 2017 Mon 21-Aug	06:00pm	29	27	15	23	21	26	
OK 2011 Mon 22-Aug	07:00pm	15	23	10	19	18	9	
OK 2008 Tue 25-Nov	08:00pm	8	9	6	9	10	8	
Dataset Details	09:00pm	6	7	7	6	5	10	
	10:00pm	7	4	5	8	6	3	
	11:00pm	5	2	5	0	5	3	
	Totals	320	539	352	403	405	438	78

STON-133 - East & West

Stopington		21-Aug	22-Aug
Itation 133		Mon	Tue
Logation /1 375826 -71 919613	12:00am	0	3
Locacion	01:00am	3	2
2015-Major Collector 5 2015-Urban	02:00am	0	0
2015-Major Corrector 5	03:00am	1	2
End Bonort 22-Aug-2017 12:00AM	04:00am	3	4
End Report	05:00am	11	17
2017:SION-026 AXIE COFFECTION	06:00am	32	27
$24 \text{ Hour Count} \qquad 1008 * C4 (0.03) = 037.4$	07:00am	48	60
24 - Hour Count 1008 $= 357.4$	08:00am	60	75
Un Pounded = 1057 7 / 2 * ACE(0.0705) = 050	09:00am	64	73
OK = 2020 Thu $21 - Max$	10:00am	61	68
OK = 2020 Ind 21-May	11:00am	69	59
OK 2017 Mon 21-Aug - Chis report	12:00pm	76	71
OK 2011 HON 22 Aug	01:00pm	65	68
Detaget Details	02:00pm	72	97
Dataset Details	03:00pm	87	90
	04:00pm	108	120
	05:00pm	71	86
	06:00pm	55	60
	07:00pm	62	49
	08:00pm	29	34
	09:00pm	19	16
	10:00pm	7	16
	11:00pm	5	0
	Totals	1008	1097
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Town of Stonington | Department of Planning Planning and Zoning Commission Meeting February 20, 2024

PZ2322SPA & GPP Fair Housing of Connecticut, LLC (M. Ranelli)

Site Plan Application and Groundwater Protection Permit applications for an Affordable Housing Project submitted pursuant to C.G.S. 8-30g. Proposal consists of 102 single-family housing units and associated site improvements. Properties located at 207, 215, and an unaddressed parcel on Liberty Street, Pawcatuck; M/B/L: 16-4-12; 16-4-12A; 16-4-13. Properties are located in the LS-5 Zone. **Report Prepared By:** Clifton J. Iler, AICP – Town Planner

Application Status

This application is for Site Plan Application (SPA) and a Groundwater Protection Permit (GPP). This application was submitted in accordance with <u>C.G.S. Section 8-30g</u>. <u>C.G.S. Section 8-3(g)</u> establishes the criteria and requirements for a Site Plan Application. The Commission can elect to conduct a public hearing within 65 days of receipt of the application and has 35 days to conduct the public hearing once opened, as established in <u>C.G.S. Section 8-7d(a)</u>. The applicant may request one or more extensions provided the total of any such extension or extensions shall not exceed 65 days.

- Official Date of Receipt for this application was 9/19/23.
- The public hearing was opened on 11/21/23.
- The public hearing was extended <u>56 days</u> to tonight's meeting.
- The public hearing, without extension, must be closed tonight.
- A decision, without extension, must be made by 3/21/24.
- The applicant can request an extension to any period of the application up to <u>9 days</u>.

Purpose

This application for a 102-dwelling unit attached housing project is made under the State Affordable Housing Appeals Act (C.G.S. Section 8-30g). The Act is intended to encourage the development and adequate supply of affordable housing in the State of Connecticut. This proposal consists of 102 single-family three-bedroom townhomes with parking, stormwater features, and associated site improvements. The units are accessed by internal roads which connect to Liberty Street (State Route 2).

Zoning and Context

The site is located in the LS-5 Zone. Under C.G.S. Section 8-30g, applications are permitted to deviate from the existing zoning regulations of the base zone provided they satisfy the standards established in the Act. This application is not required to conform to the bulk and use requirements for the LS-5 Zone.

ZONING MAP



North: LS-5 Zone [Use: Residential] South: RH-10 Zone [Use: Residential]; GB-130 Zone [Use: Educational] East: GB-130 Zone [Use: Open Space/ Educational]

West: RH-10 Zone [Use: Residential]

Site Access and Traffic

The site is accessed from Liberty Street (State Route 2). The project consists of an internal street network with ingress/egress points to Liberty Street at two locations. A traffic study conducted by BL Companies was provided as part of this application set. The project is subject to review by the Board of Police Commissioners and the Office of the State Traffic Administration (OSTA).

Comments on traffic flow, circulation, and other site access items are included in the Response Summary.

Environmental Elements

The site is subject to previous disturbance and development and does not contain any known hazards that require remediation. There are wooded areas with mature trees around the northern, eastern, and southern parts of the site, but no known significant environmental features on the site. The site is approximately 1,000 feet west/southwest from the Pawcatuck River and well-removed from any environmental features associated with the river.

The site is located in the Groundwater Protection Overlay District (GPOD) and requires receipt of a Groundwater Protection Permit (GPP) as part of this application. The project is required to meet the standards outlined in ZR §7.2.7 (27th Edition). The applicant proposes underground treatment and infiltration systems under the paved interior road network to treat and convey stormwater. A critical element of concern for the site will be stormwater quality and the impact of stormwater on the Pawcatuck Basin Aquifer System, a Sole Source Aquifer (SSA), and the Rhode Island Wellhead Protection Area (WHPA).

The site is not located within 100 feet of and Inland Wetland or Watercourse, therefore no Inland Wetland and Watercourses Commission (IWWC) approval is required. The site is not located in a Coastal Area Management Overlay District (CAMOD); therefore, no Coastal Area Management (CAM) approval is required.

Utilities

The site is serviced by public water and sewer. Water is serviced by Westerly Water Company and sanitary sewer is managed by the Water Pollution Control Authority (WPCA). Adequate service capacity has been verified by both agencies and is included in the Response Summary.

Electric and communication is provided via overhead utility lines along Liberty Street. The proposed development will consist of underground electric from the existing utility pole(s). Final location will be coordinated with the appropriate utility companies prior to construction.

Natural gas is located along the Liberty Street corridor. The Project Narrative states that the owner will determine if that service will be provided pending coordination with the Eversource and specific needs of the residential units. Further discussion is captured in the Response Summary and Town Planner Comments.

Waivers Requested

The following requirements and waivers are requested:

Item	Provided	Waiver Requested
Impact Statement in Accordance with Section 8.8. (ZR 6.1.2.1)	Х	
Site Plan in Accordance with Section 8.3 (ZR 6.1.2.2)	Х	
Architectural Elevation Drawings and Landscape Plan Per Section 2.6 (ZR 6.1.2.3)	Х	
Water Impact Study (ZR 6.1.2.4.1)	Х	
Sanitary Sewer Impact Study (ZR 6.1.2.4.2)	Х	
Site Drainage Analysis (ZR 6.1.2.4.3)	Х	
Erosion Control Report (ZR 6.1.2.4.4)	Х	
Traffic Impact Study (ZR 6.1.2.4.5)	Х	
Archaeological Study (ZR 6.1.2.4.6)		W
Soils Report, Test Pit Data and Mapping (ZR 6.1.2.4.8)	Х	
Shadow Plan (ZR 6.1.2.5 & ZR 7.14.2)	Х	
3-D Model for Projects Which Fall Under Criteria of Section 6.2 (ZR 6.1.2.6.1)		W
Flood Hazard Reports (ZR 6.1.2.6.2)		W
School Impact Evaluation Report (ZR 6.12.6.3)	Х	
Application Fee Per Section 8.7 (ZR 6.1.2.7)	Х	
Legal Description of Property/Site (ZR 6.1.2.8)	Х	
Phasing Requirements for Projects Over 24 Dwelling Units (ZR 6.1.2.9)	Х	
Written Waiver Request(s) at the Time of Application Submission (ZR 6.1.2.10)	Х	

Response Summary

The application was routed to the following agencies/agents of the Town. Responses are shown below:

BUILDING OFFICIAL – No comment.

POLICE COMMISSION – Excerpt from draft meeting minutes below [Dated: 11/9/23]:

"...many concerns raised by both the Commissioners, and Chief DelGrosso, which included safety for children going to and from school, adequate safety within the complex, and the amount ofc all volume on the department. The applicant, and the presenters that spoke were advised by the Police Commission to take the suggestions given and return next month."

TOWN ENGINEER – See attached memorandum from the third-party engineer, Trinkaus Engineering, LLC [Dated: 1/13/24].

WATER POLLITION CONTROL AUTHORITY - Comments below [Dated: 10/6/23]:

The WPCA has reviewed the above referenced P&Z application and offers the following:

The WPCA has no objection to the above referenced application as submitted. There is sufficient capacity in the Pawcatuck collection system and treatment facility to accommodate the proposed flows (50,850 GPD Peak and 25,425 GPD average) for this project.

Please be advised of the Rules and Regulations of the Water Pollution Control Authority, specifically Article XII, Hookups.

12.03 No sewer construction work shall begin until detailed plans and specifications have been reviewed and approved by the Director of Water Pollution Control. This shall include a plan and profile sheet. (Scale 1'' = 40' horizontal, 1'' = 4' vertical)

12.04 Plans, specifications, and construction shall conform to the Town's Technical Standards for Sanitary Sewers.

12.05 Construction shall be carried out only in the presence of an authorized representative of the Water Pollution Control Authority.

12.06 Within 30 days following completion of construction, applicant shall furnish record drawings as prescribed.

12.08 The proposed system of sewers constitutes a "community sewerage system" as defined by CGS, Sec. 7-245. As such all properties served by the system are required to be members of the Common Interest Community. As provided under CGS, Sec. 7-246f, the community must enter into an agreement with the Town of Stonington Water Pollution Control Authority that ensures the effective design, construction, and management of the system as well as ensuring that funds are available for its operation and maintenance.

12.09 All properties are subject to hook-up charges as prescribed in the section. Connection fee has been provided to the property owner and shall be paid in full or a payment plan in place before a sewer connection permit will be issued.

ZONING ENFORCEMENT OFFICER – Comments below [Dated 10/6/23]:

- 1. One hundred thirteen (113) individual garbage containers seems like the beginning of an enforcement issue. Applicant should consider multiple enclosed dumpster areas.
- 2. Centralized mailbox area should be considered.

FIRE DISTRICT MARSHAL (PAWCATUCK) - Comments below [Dated 10/11/23]:

Below is a list of concerns and requests by the Engineers of the Pawcatuck Fire District.

Issue:

- 1. No spare parking for visitors.
- 2. Not enough space to pile snow.
- 3. 4 Fire Hydrants shall be location the property.
- 4. 2 Fire Alarm pull boxes shall be installed.
- 5. Who will make repairs to lighting.
- 6. Will fire apparatus be able to maneuver the curves and corners.

Questions:

- 1. Who will maintain the property.
- 2. Who will remove snow and ice.
- 3. Where will residents' visitor's park.
- 4. If the garage is used for storage where will the tenants park.
- 5. Who will overall maintain care for the property.

Comments below based on updates provided January 11, 2024 [Dated: 1/12/24]:

7. Fire Zones shall be delimited using the Town of Stonington Fire Zone ordinance. The fire zones shall be located in front of the following units: 1-4, 15-20, 21-23, 36-49, 50-62, 63-66, 86-102.

SOLID WASTE DEPARTMENT – See attached memorandum [Dated: 1/10/24].

WATER COMPANY (WESTERLY WATER CO.) – No comment.

Town Planner Comments

This application was initially filed as a Special Use Permit application consistent with the requirements of ZR §6.3 (27th Edition) under **PZ2322SUP & GPP Fair Housing of Connecticut, LLC (M. Ranelli)**. The application was accepted by the Commission at its regular meeting on September 19, 2023. However, in consultation with the applicant and the Town's legal counsel, it was determined that the project shall be reviewed as a Site Plan Application consistent with the requirements of C.G.S. Section 8-30g. The legal opinion was attached to the report dated November 21, 2023.

This application is made under the State Affordable Housing Appeals Act (C.G.S. Section 8-30g) and is categorized as a "set-aside development" as defined in C.G.S. Section 8-30g(6). Therefore, this application requires 15% of the units to be sold or rented at prices deemed affordable for persons less than or equal to 80% of the area median income (AMI) and 15% of the units to be sold or rented at prices deemed affordable for persons less than or equal affordable for persons less than or equal to 60% AMI.

Projects considered under C.G.S. Section 8-30g are permitted to deviate from the existing zoning regulations of the base zone provided they satisfy the standards established in the Act. The Commission

therefore must review the application against the Statute and not the Stonington Zoning Regulations. In the absence of standard review criteria, the Commission is only permitted to deny such an application if: 1) the decision is necessary to protect substantial public interests in health, safety or other matters which the commission may legally consider; and 2) such public interests clearly outweigh the need for affordable housing (C.G.S. Section 8-30g(g)).

This application went before the Architectural Design Review Board (ADRB) at its regular meetings on October 16, 2023 and December 11, 2023. The ADRB did not render a decision on this application pending additional requested site plan revisions. At this time, the Department of Planning does not believe additional review by the ADRB will result in a favorable recommendation for the application due to inherent design conflicts.

The Department of Planning provided comment provided substantial commentary on this application in the report dated November 21, 2023. Following this, a revised application was submitted on January 11, 2024, and a draft report was prepared for the January 16, 2024 Commission meeting, which was subsequently canceled due to inclement weather, resulting in the project not being discussed.

The revised application set from January 11, 2024 was circulated to relevant Town agents and agencies for comments. The Town Engineer engaged Trinkaus Engineering, LLC for a third-party review, with comments relayed to the Town and applicant on January 23, 2024. Following a comprehensive review and discussion between the applicant and Town staff, a revised application set, incorporating comment responses, was provided to the Town of February 14, 2024. At the time of writing this report, Town staff has not had adequate opportunity to review the updates and validate the comment responses from the applicant.

Considering the limited time available for Town staff and the general public to review and comment on the updated application, additional time is requested to provide comprehensive commentary to the Commission. The applicant has nine (9) remaining days of extension time available to prolong the public hearing. The Commission may consent to the applicant's request to utilize this remaining time and schedule a Special Meeting before February 29, 2024. If so decided, the Commission should establish a Special Meeting date tonight.

Failure to schedule a Special Meeting would foreclose any further opportunity for the applicant to amend the application. Consequently, if Town staff does not validate and accept the revisions and comment responses, the Commission would be compelled to decide on an application deemed incomplete or unsatisfactory. This potential outcome was communicated to the applicant prior to the submission on February 14, 2024.

Should the Commission opt to conclude the public hearing tonight, Town staff requests additional time to review and report on the revisions before any final decision is reached.

Furthermore, in considering approval of the project, the Commission should look towards the existing legislation in C.G.S. Section 8-30g and the requirements for approval for a Site Plan Application in ZR §8.3. If the Commission decides to proceed with approval tonight, the recommended stipulations below address the outstanding review period requested by Town staff and associated contingencies.

If considering denial of this project, the Commission must provide sufficient evidence in the record to make such a denial, as outlined in C.G.S. Section 8-30g(g). This would require the Commission to develop objective criteria to assess public health and safety concerns and the Commission must develop findings of fact that would support such a denial.

Recommended Stipulations

Should the Commission decide to approve this application, the Department of Planning recommends the following stipulations of approval:

- 1. The applicant shall provide Town staff with a complete and final set of application materials, incorporating all revisions and responses to comments to the satisfaction of the Town Engineer and Town Planner.
- 2. Prior to the development of final plans for signature or the issuance of any permits or approvals, the applicant shall address any outstanding concerns or deficiencies identified by Town staff in review of the final application materials.
- 3. Final plans shall be reviewed to the satisfaction of the Town Engineer and Town Planner.
- 4. Final plans shall be signed by the Commission and recorded in the Town's Land Evidence Records.
- Any proposed alterations or modifications to the approved site plan as a result of comments from the Connecticut Department of Transportation (CTDOT) or the Office of the State Traffic Administration (OSTA) shall be subject to review and approval by the Town Engineer, Town Planner, and Commission, as necessary.
- 6. The applicant shall acknowledge that modifications or amendments to the approved application must receive prior approval from the Commission and/or Town staff, as applicable. The Commission reserves the right to conduct additional reviews of the application, as deemed necessary, to ensure compliance with approved plans and regulations.
- 7. The applicant shall comply with all applicable codes and regulations of the Town of Stonington, as well as any additional conditions or requirements stipulated by the Commission or Town staff.
- 8. The applicant shall be responsible for all costs associated with the review, approval, and implementation of the project, including but not limited to permit fees, inspection fees, and any required mitigation measures.
- 9. The applicant shall post an Erosion and Sedimentation Control Bond prior to the issuance of a Zoning Permit. The bond shall be either in the form of a certified check or irrevocable letter of credit meeting the requirements of ZR §8.6.3 (27th Edition). The bond amount shall be established by the Town Engineer after an estimate of the costs of installing and maintaining appropriate erosion and sedimentation control measures is provided by the applicant and approved by the Town Engineer. Work shall remain bonded for a minimum of one year from the date of Zoning Compliance.
- 10. Failure to comply with any of the stipulations outlined herein may result in the revocation of permits or approvals issued by the Commission or Town of Stonington.

Commission Action Required

The Commission is required to make a determination on the following items:

- A decision concerning the Site Plan Application (SPA)
- A decision concerning the Groundwater Protection Permit (GPP) application



TOWN OF STONINGTON

SOLID WASTE & RECYCLING DEPARTMENT 152 Elm Street • Stonington, Connecticut 06378-0352 Tel: 860 535-5099 Fax: 860 535-9261

January 10, 2024

Mr. Clifton J Iler Town Planner, Town of Stonington 152 Elm Street Stonington, CT 06378

With recent discussions involving the proposed residential development at the former Rosalini's property in Pawcatuck, I feel compelled to voice my concern along with many others. As Director of Solid Waste I have a commitment to provide waste services to the residents in a fair and equitable manner. The layout of this project, 113 three-bedroom, 2.5 bathroom townhouses on a 4.2 acre site, is not conducive to allow the benefit of weekly curbside trash and recycling collection as provided by the Town. Given the density of the development and nature of the site plan, it is my opinion that the developer is seeking to maximize his profits at the expense of the Stonington taxpayers.

According to comments made by Mr. Sergio Cherenzia speaking as an associate of Mr. Gene Arganese during a November 21, 2023 Planning and Zoning meeting, the development seeks standard trash pickup from the Town, in indoor or outdoor trash bins depending on the unit style.

I am curious to what the developer envisions for these "trash bins". Does the developer realize the containers can not be any larger than 32 gallons as the trash is collected manually and weight is a safety concern? Will residents keep these bins in their garage until collection day? What are the plans for an outdoor trash bin? Multiple residents disposing of their trash in one designated area is not acceptable unless collected in a dumpster. If in the near future the town should move to automated trucks for trash collection do these units have the ability to store and place two (2) 95-gallon trash containers at each household?

Reviewing the site plans, I have concerns about the current contracted trash hauler having the ability to maneuver his trucks up and down the narrow roadway. With the limited amount of overflow parking and the chance of cars parked in the street, the hauler should not be expected to locate the owner of the vehicle to move it nor will he return to the property later in the day.

I understand that the developer discussed the ability for a fire truck to maneuver through the subdivision effectively, but did Mr. Cherenzia take into consideration cars parked in the roadway or a contractor vehicle parked in the road? The Solid Waste department currently fields calls from residents whose roadways are blocked by contractor vehicles and their trash service is missed. The contracted hauler is not responsible to return to collect the trash. With so many households in one area, what would happen if trash service could not occur? Where would this trash be stored if the resident could not meet the hours of the transfer station? The density and congestion of the units coupled with the roadway layout would present an increased burden on the trash collection company. Certainly, questions arise for service at townhouses #88 through #99. With parking for 2 vehicles in front of each unit, these 20 parking spaces appear to effectively block the hauler's ability to load the trash directly onto the truck. Each container would have to be walked down the row of parked cars to the waiting truck, impacting the schedule and blocking the roadway for resident use. If the resident trash was placed in the roadway for pick up it would block residents wishing to leave. I see no option for curbside collection at these units. I am unsure of where the developer assumes the residents will be placing their trash containers for service. I can only assume they will be placed in the street, adding more obstacles to the hauler. Again, should the town move to automated trucks where are these units going to place their cans for pick up?

If the developer is allowed to build as proposed, it is my opinion that the Town of Stonington, the Solid Waste Department and the Stonington taxpayers could be seen as subsidizing the developer seeking to maximize his profit. The weekly curbside collection would come at no cost to the developer, whereas a dumpster and service would be an expense. Stonington residents generate 9,000 tons of waste per year, not including bulky waste or demo brought to the transfer station. This equates to the average Stonington household generating over one (1) ton of trash to be collected curbside per year. Given there are 113 households in this development one could easily estimate an increase of 113 tons of trash collected, transported and disposed of annually. The yellow bag revenue supports only a portion of the trash collection and disposal costs. It could be estimated that this projected curbside service could possibly cost the Town over \$25,000 annually just between additional units collected and tonnage disposed.

Disposal Costs	\$67.21/ton x 113 tons = \$ 7,594.73
Collection Costs	\$162/year x 113 units = <u>\$18,306.00</u>
	\$25,900.73 annually

As trash collection and disposal costs increase across the State and given the current trash crisis we are in, we can only expect very large increases to these figures in the very near future. I strongly suggest that the developer reconfigure the site plan to include dumpsters at the location to avoid issues and concerns with manual pick up and disposal and not take advantage of the Town and its programs for their own benefit.

If you have any questions, please feel free to reach out to me and we can discuss this further.

Best Regards, Jíll A Seníor

Town of Stonington

Director Solid Waste & Recycling 152 Elm Street Stonington, CT 06378 (860) 535-5099



Trinkaus Engineering, LLC 114 Hunters Ridge Road Southbury, Connecticut 06488 203-264-4558 (office) +1-203-525-5153 (mobile) E-mail: <u>strinkaus@earthlink.net</u> http://www.trinkausengineering.com

January 23, 2024

Mr. Chris Greenlaw, PE Town Engineer Town of Stonington 152 Elm Street Stonington, Connecticut 06378

> RE: Beachway Estates – Residential Development 207 & 215 Liberty Street Stonington, Connecticut

Dear Chris,

At the request of the Town of Stonington, I have prepared a third-party civil engineering review of the above referenced project. I have reviewed the following plans and documents.

Documents and Plans Reviewed:

- a) Plan set consisting of 13 sheets by Cherenzia & Associates, LTD, revised to 1/10/24.
- b) Cover letter to Town of Stonington (11 pages) by Cherenzia & Associates of 1/11/24.
- c) Project Narrative (8 pages) by Cherenzia & Associates, revised to 1/10/24.
- d) Stormwater, Erosion Control, and Operation & Maintenance Report (307 pages) revised to January 2024.
- e) Evaluation of Potential Impacts & Mitigation (34 pages) by Northeast Water Solutions, Inc. of 1/10/24.
- f) Autoturn Sketch (1 page) by Cherenzia & Associates of 1/9/24.
- g) Landscape plans (3 sheets) by BL Companies of 9/8/23.

Executive Summary:

- A. Inadequate soil testing has been performed on the site to establish valid groundwater contours, types of soils, and infiltrative capacity of the soils. Thus, it cannot be confirmed that the site is appropriate for the stormwater management system proposed by the applicant and will function as intended.
- B. This site is in the Groundwater Protection Overlay District, so there must be a high degree of treatment provided for the runoff prior to being directed into the ground. While the stormwater management will reduce TSS loads, other pollutants, particularly nitrogen and metals are not being reduced adequately which will adversely affect the groundwater on the site and potentially impact downgradient public and private wells.

- C. The modeling of the multiple stormwater management systems as a single unit is not correct as a single drainage area for post-development conditions is directed to the multiple systems which are combined in the hydrologic model. Each system must be evaluated separately for the drainage areas directed to it.
- D. The applicant uses an assumed infiltration rate of 2.41"/hour for the proposed infiltration practices and makes a factual conclusion about the functionality of the stormwater system. This is not supported by actual field data.
- E. The stormwater management system does not comply with the CT DEP 2004 Storm Water Quality Manual as discussed in the detailed comments below.
- F. The erosion control plan does not comply with the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control as discussed in the detailed comments below.
- G. The design of the site requires significant vehicular movements for residents, guests, and emergency services. The required movements are a significant safety concern in my professional opinion.

I have the following comments and concerns for consideration by the Planning and Zoning Commission and your office.

Autoturn Sketch:

- 1. The turning movement plan in the upper left of the plan sheet shows the movements on the ladder truck within the site. The outside limit of the turning movement is almost touching the corner of the parallel parking space in front of Unit #21 as well as going over the curb. If the vehicle in the parallel space is not centered in the space, the ladder truck may not be able to make this turning movement. This is not an acceptable condition and poses a safety risk.
- 2. This same turning movement also crosses the curb to the west and opposite Unit #21. The movement is located just outside the parking spaces on the west side of the driveway opposite Units #21 and #36. If someone is parking in these spaces and has not pulled all the way in, then the ladder truck does not appear capable of making the turning movement. If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.
- 3. While a note states that there are parallel spaces in front of many of the units, no parking spaces are shown. All parallel parking spaces need to be shown with a typical length and width dimensions, assuming all spaces are the same.
- 4. The parallel spaces are only 8' wide by scaling on sheet C-3. It does not appear possible that a person on the building side of the car will be able to exit the car safely if the car is 6.0' to 6.5' in width.
- 5. According to the architectural plans (11/2/23) the garages take up all the front face of the units except for the entrance door. The parallel parking will block the garage doors which may pose a safety issue for emergency crews. The Fire Marshall should be consulted on this design for public safety reasons.
- 6. According to architectural plans, the width of the garages is 16'. A typical sedan/small SUV is 6.5' in width, so two vehicles will be a combined width of 13.0'. Thus, there will be 2.0' or less between the two vehicles, and between the left side vehicle and stairway wall or the wall to the outside of the right side vehicle. It does not appear that you can open the car door and safely exit the vehicle in the garage.

- 7. No parking areas are shown at several locations in front of the buildings. What will prevent people from parking in these areas? Painted hatch areas in parking lots are often ignored by drivers.
- 8. The turning movement plan in the upper right of this sheet has many of the same issues discussed above If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.
- 9. The turning movement plan in the lower right of this sheet has many of the same issues discussed above. If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.
- 10. The turning movement plan showing the movement of a car pulling into and backing out of a garage requires a three-point turning movement at a minimum to accomplish this movement. This movement depends on drivers making precise movements in a constrained driveway area with cars in parallel spaces on one or both sides of the garage space. Making multiple turning movements to enter and exit a residential garage is less than ideal.
- 11. As the garages will hold two vehicles, are the turning movements for the car on the left or the right? If another vehicle is already in the garage will this affect the movement of the second vehicle entering the garage?
- 12. While the turning movements of backing into and then pulling out of a garage are simpler, they still require precise movements of the driver in the constrained driveway area which are also not ideal.
- 13. In both turning movements of cars entering and exiting garages can also be considered a safety issue as they do not allow for any errors in the judgement of the drivers.

Site Plan Comments:

All Plans:

- 14. Each building needs to be labelled on the site plans (i.e., Building #1, #2, etc.), also the building type A or B should be noted for coordination with the architectural plans.
- 15. The layer containing existing development on the site needs to be removed from all plans which show proposed development to increase the readability of the plans.
- 16. It appears that blasting will be necessary based upon the location of ledge outcrops on the site. No blasting plan has been prepared. With the number of single-family residences located to the north, west and south of the site, a pre-blast survey must be done. A blasting plan must be reviewed and approved by the Fire Marshall.
- 17. There is no note on the plan which requires the design engineer of record to provide inspection services and to certify that all improvements (stormwater management system, all underground utilities, pavement, sidewalks and building foundations) have been installed in compliance with the plans. Written Inspection reports and final certification shall be provided to the Town of Stonington. Along with this certification As-built drawings of these engineering improvements shall be prepared by a licensed land surveyor and provided to the Town of Stonington.

Sheet C-3:

18. The parking spaces in the internal garages need to be shown for all units with garages as well as all parallel spaces along the front of the buildings.

- 19. All parking spaces need to be numbered consequently so it is clear to the commission how many parking spaces are provided on the site. This information should be shown on this plan as well as the Autoturn Sketch plan.
- 20. Typical dimensions for all internal or external parking spaces need to be shown on this sheet.
- 21. All proposed drainage structures should be removed from this sheet.
- 22. No dumpster pad was found on the plans. Where will the dumpster pad be located? How big will the dumpster pad be? If garbage and recycling containers are located within a garage, how can they be moved outside the garage if there is only two feet or less between the vehicles. Once the garbage/recycling containers are outside the garage, where will they be placed for pick up? If placed outside the garage door, this will prevent an owner from moving their car out of the garage. Also, if the garbage and recycling containers are placed outside the garages, then the garbage truck will be forced to stop in the driveway and thus will limit the movement of other vehicles in the driveway. If they are placed away from the garage door, they will block the front door. This is not a desirable condition.
- 23. Units #75 to #85 show trash enclosures at the rear of the unit. How will unit owners move the garbage/recycling containers from the rear of the building to the driveway in front of the building as there is no sidewalk from the rear of the building to the front?
- 24. There is proposed graded slope at the east side of the building which would make the moving of garbage/recycling containers difficult, if not impossible.
- 25. Provide a turning movement plan for the movement of the garbage truck to and from the dumpster pad and for individual pick up in front of the units.
- 26. It appears that several sidewalks are proposed between several of the buildings. They need to be labeled.
- 27. Compliant ADA ramps must be shown for all sidewalk intersections with paved driveways.
- 28. It is understood that some handicap accessible units will be located in the building of units #75 to #85. What specific units will be handicap accessible?
- 29. If some units are to be handicap accessible, there needs to be handicap parking spaces, including van accessible in front of the unit(s). No handicap spaces are shown to the north of this building.
- 30. Why is there no full crosswalk shown for the sidewalk between buildings #1 and #2, and #4 and #5 across the western driveway?
- 31. Why are there no sidewalks from Buildings #6, #7, and #8 to the other sidewalks shown on the plan? With no sidewalks, residents will be forced to walk in the driveway.

Sheet C-4:

- 32. All proposed drainage structure and labels, sanitary sewer manholes and labels and outline of stormwater management systems should be removed from this sheet.
- 33. Many of the proposed contours are not labelled. Label all proposed contours on this sheet.
- 34. As there is a separate erosion control plan, remove erosion control measures from this sheet.
- 35. No areas for the stockpiling of snow are shown on this plan or any other sheet. Where will snow be stockpiled on the site?

- 36. A graded (triangular cross section) swale is shown between at the rear of building #8. What will prevent concentrated flows from occurring in this swale?
- 37. What is the purpose of this swale?

Sheet C-5:

- 38. Remove sanitary sewer information from this sheet.
- 39. Remove grading information and erosion control measures from this sheet.
- 40. Remove hatching in front of buildings to improve readability of this sheet.
- 41. Remove all sanitary sewer and erosion control information from this sheet.
- 42. What is the purpose of the drainpipe shown between buildings #2 and #3? Only two clean outs are shown near the eastern end.
- 43. What is the purpose of the drainpipe shown between buildings #4 and #5? Only two clean outs are shown near the eastern end.
- 44. Several of the pipe runs have slopes less than 1.0%. To ensure self-cleaning velocities, all drainage pipes should have a minimum pitch of 1.0%.
- 45. The drainage table for the roof drains calls out rim and inverts for the clean outs on the lines, but in most cases, the pipe connections are not located at the actual clean out and no invert information has been provided at these connection points.
- 46. It does not appear that all pipe runs for the roof drains are defined on the plan. All pipe runs between clean outs must have pipe size, length and slope defined on the plan in a clear fashion. As an example: CO-7F to CO-7E: pipe size, pipe length, pipe slope.
- 47. It is assumed that the manholes shown at the end of the Isolator Rows are for maintenance access. A person working in this manhole will be in "confined space" and must wear special gear, including breathing equipment. No safety protocols for this work have been specified on the plan.
- 48. Stormwater system E is accepting runoff from the roof of building #2 (units 21-35), but roof drains are only shown on one side of the building, how will the other side be directed to this system? The area of the roof of building #2 directed to system E must be called out on the plan. Directional arrows on all roof drain pipes would make it clear which roof drains are directed to specific stormwater systems.
- 49. Building #7 (units 86-91) are also directed to system E. It appears that some of this roof may be directed to another system. The watershed map shows the entire front half of the roof and 50% of the back half are being directed to system E which conflicts with the information shown on the grading/drainage plan for building #7. The area of the roof of building #7 directed to system E must be called out on the plan.
- 50. If the bottom of the chambers is set at 103.0' and the inverts of the pipes from DMH-2 and DMH-9 are also at 103.0', then the connecting pipe has no pitch. All drainage pipes must have a minimum pitch of 0.5% to ensure that no sediment can accumulate in the pipes. If a flow velocity is not self-cleaning at 0.5%, then the slope needs to increase as necessary to provide for a self-cleaning velocity of 2 feet per second (fps).
- 51. It appears that there are two separate components of stormwater system F. If they are not connected, they should be considered as two separate systems and not a singular system.
- 52. There is only one outlet control structure (DMH-16) for all the underground stormwater systems which depend upon the critical and accurate installation of all the StormTech units and associated piping. It is my professional opinion based upon forty years of experience that each underground system needs to have its own outlet control structure.

As noted below in the comments under the Stormwater Management Report, it is not an appropriate approach to model all these systems as one which is stated in the stormwater report.

- 53. All runoff is being directed to the Infiltration Gallery Level Spreader Outlet. No test holes have been made within the footprints of this system to confirm the soil conditions. No infiltration tests have been performed at this location.
- 54. What is the length of this system? The type of gallery is not specified on this plan.

Sheet C-6:

- 55. Remove all drainage, erosion information, sidewalks and hatching from this plan to improve readability.
- 56. No pipe sizes and slopes have been provided for the sanitary sewer.
- 57. It must be demonstrated that self-cleaning velocities will be present in all sanitary sewer lines, which is 2 fps.
- 58. Have the respective utility companies signed off on the alignment and horizontal and/or vertical separation for all the utilities?
- 59. Have the locations of the proposed hydrants been approved by the Stonington Fire Marshall?

Sheet C-7:

- 60. This erosion control needs to be split into two or more sheets. One sheet needs to show the proposed development and all erosion control measures at the same scale of all the other plans (1" = 20").
- 61. Only information which is relative to the erosion control plan should be shown to make it easy to read and follow.
- 62. All erosion control details on a separate plan with the narrative on a third plan.
- 63. The narrative shown on this plan is overly simplistic for a project such as this. The narrative must also follow the form and content found in the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control "2002 Guidelines".
- 64. A temporary sediment trap is shown on the plan. No grading is shown for the temporary sediment basin which must be provided.
- 65. According to the 2002 Guidelines vertical perforated risers are the outlet structure for a sediment basin whereas a riprap berm is used for a temporary sediment trap. What is the applicant's justification for the vertical riser for a temporary sediment trap?
- 66. No riser or discharge pipe is shown on the plan view of the temporary sediment trap.
- 67. The 2002 Guidelines (Section 5-11-25)require that calculations for wet and dry storage be done. No calculations have been provided.
- 68. The detail for the temporary sediment trap shows a discharge hose from the vertical perforated riser. Where will the hose discharge too? How will concentrated flows be reduced to non-erosive velocities at the outlet?
- 69. How will construction runoff be conveyed to the temporary sediment trap?
- 70. There are five phases discussed in the construction sequence. The description of the phasing plan does not line up with the phasing limits shown on this plan. A separate plan showing the limits of each phase with a detailed description of the work to be done in each phase must be submitted.

- 71. Two areas are shown for "staging & stockpile area on the plan. Soil stockpiles, construction trailers, equipment and material storage area need to be clearly defined within each of these areas.
- 72. The detail of the silt fence backed straw bale is not an effective erosion control perimeter measure. If the straw bale is overtopped, it can easily overwhelm the siltation fence barrier. The applicant should consider a more effective and redundant perimeter erosion control measure. Hay/straw bales are a very ineffective erosion control measure.
- 73. Each phase must erosion control measures for the work to be performed and cannot depend on the singular perimeter control measure to protect off-site areas.
- 74. The detail for the Temporary Sediment Trap Riser pipe shows perforated down to the bottom of the riser. This is not correct as it will result in the discharge of turbid runoff from the sediment trap. Only clean water is to be discharged from a temporary sediment basin or trap.
- 75. There is grading and other work proposed within the CT DOT Right of Way. Has the applicant discussed this work with CT DOT? What will happen if the CT DOT does not permit this work to be done?

Sheet C-8:

- 76. What is the horizontal separation between the water lateral and sewer lateral in the detail showing them both in the same trench?
- 77. A detail of an ADA compliant ramp needs to be provided for where the sidewalk connects to the pavement perpendicularly.
- 78. A detail for a bollard has been provided, however, no bollards have been shown on the site plan. Where will the bollards be installed?

Sheet C-9:

- 79. What is the depth of the sump for a catch basin with a hood?
- 80. Will all catch basins have a hooded outlet or only select catch basins?
- 81. The Typical Roof Drain Connection conflicts with the information shown on the Drainage Plan. This detail shows a splash pad onto the ground surface which is not reflected on the Drainage Plan. How will the roof runoff get into the drainage system if discharged through the surcharge pipe? Corrugated HDPE pipe can be prone to clogging. Piping should be either double wall, smooth interior N-12 piping for PVC pipe (ASTM D3034, Sdr. 35). The detail must reflect the actual design.

Sheet C-10:

- 82. The table called "Stormwater Treatment Data" has unconfirmed data in it. The elevations of seasonal high groundwater are not valid as discussed in the comments under the Stormwater Report.
- 83. There is a note under the "Stormwater Treatment Data" Table which states "<u>Infiltration</u> <u>Note:</u> An engineer shall conduct perc. And/or infiltration tests to verify infiltration rates of the soil prior to the construction activities. Stormwater modifications may be required based on results." This is not acceptable from an engineering standpoint. A comprehensive testing protocol consisting of deep test holes and double ring infiltration, not percolation tests must be done during the design stage to demonstrate that the current design will function as intended.

- 84. The details of the diversion weir manholes appear to have some typos on them. As an example, the detail for DMH-9 states "12" HDPE from HDS-2, Inv. 104.04". Based upon the Drainage Plan sheet, it should state "To HDS-2". All details should be checked for consistency with the information found on the Drainage Plan sheet.
- 85. There is no thickness of the weir call defined in the details.
- 86. Directional arrows should be added for all pipes into and out of these manholes to make the flow patterns clear.
- 87. Section A-A of the weir walls should be so labeled. The top of bottom of the weir wall should be clearly labeled.
- 88. Calculations which show the water surface elevation for the Water Quality Flow in the pipe to the hydrodynamic separator need to be provided to confirm the top of weir elevation.
- 89. For DHM-16, the invert of the low point of the outlet weir is called out as 103.3'. This is 0.8' higher than the invert of the 30" HDPE pipe from DMH-17 and will cause a backwater condition in this pipe. Why is the outlet invert set at 103.3'?
- 90. The detail of the Infiltration Gallery Level Spreader Outlet is not a level spreader, and the discharges will occur as concentrated flow through the sidewall knockouts on the gallery. A level spreader ensures uniform overland flow for all discharges over a level linear length.
- 91. The detail for Stormwater Treatment Train Section Stormwater Areas A-F which are infiltration practices shows an underdrain. If these systems are infiltration practices, why is the underdrain needed? Where will the underdrain be discharged? There are no invert elevations for the underdrain, please provide.
- 92. The detail for Stormwater Treatment Train Section Stormwater Areas G & H which are to be lined with an impermeable liner also show an underdrain. When and how will the underdrain be connected to the outlet system? Inverts must also be provided for these systems.

Sheet C-11:

93. The detail of the Stormtech Inlet Scour Protection simply shows a layer of woven geotextile at the top of the stone under the units. Scour protection is a system to slow flow velocities down to prevent erosion of native soils. Flow over a geotextile layer does not slow down as there is less friction to flow so the velocities are not reduced. This system will not function to slow the flow velocities down.

Landscape Plans (3 sheets):

- 94. Based upon the landscape plan, there do not appear to be any available areas for the stockpiling of snow which would not adversely affect the proposed plantings. There are no open areas with direct access to any of the internal driveways where snow could be stockpiled.
- 95. It is important to note that deicing agents will cause mortality of the trees and shrubs proposed on this plan.

Stormwater Report: General Comments on overall design:

- 96. As this site is in the Groundwater Protection Overlay District, all non-point source pollutants must be significantly reduced prior to introduction into the ground. These pollutants include Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN), Zinc (Zn) as an indicator for other metals, and Total Petroleum Hydrocarbons (TPH). The CT DEEP has a goal of reducing post-development TSS loads by 80%. This goal was established back in 2004 when the 2004 Storm Water Quality Manual was released. At that time, it was assumed that other non-point source pollutants attached to sediment particles and thus if you trapped sediments, you would eliminate the other pollutants. In the past 20+ years, there has been a lot of research in this field which found that is not the case. When you look at pollutant removal efficiencies for any stormwater practices, you will observe that they are not the same which you would expect if simply trapping the sediment trapped all the other pollutants. The following provides a brief discussion of each pollutant and environmental impacts.
 - a. Total Suspended Solids (TSS) are fine soil particles, such as silt and clay which are dissolved in water. In excessive amounts it causes turbidity in water. The turbidity blocks light in the water column which causes reduced photosynthesis, which in turn reduces the oxygen levels in the water. Coarse and fine sediments can clog the gravel substrate in breeding streams thus affecting the biological community's ability to reproduce. Common sources of TSS and sediment are runoff from construction sites, winter sanding operations, atmospheric deposition, and decomposition of organic matter, such as leaves.
 - b. Phosphorus (TP) and nitrogen (TN) are commonly found in non-point runoff with the primary source being atmospheric deposition on impervious surfaces. Excessive levels of phosphorus in freshwater systems are a concern as this nutrient causes excess growth of non-native aquatic plants and algae in lakes. As a result of increased nutrient loads, toxic algae blooms are becoming more prevalent in lakes in Connecticut. These toxic algae blooms have resulted in beach closures as exposure to the algae blooms can cause adverse health issues in humans. A further problem occurs, when the algae die off, the decomposition process of organic matter removes oxygen from the water column, thus reducing oxygen levels in the water. The reduced oxygen levels in the waterbody can result in fish killings. Nitrogen, in the form of nitrate, is a direct human health hazard and an indirect hazard in some areas where it leads to a release of arsenic from sediments. As this site is in a water supply area and there are downgradient individual wells, the release of nitrogen into the groundwater will cause an adverse environmental impact. While not a major concern for freshwater systems, nitrate can cause environmental impacts in tidal regions, even though the source of nitrate can be far away from coastal regions. Additional sources of nutrients are organic and inorganic fertilizers, animal manure, bio solids and failing sewage disposal systems.
 - c. Metals (Arsenic, Cadmium, Chromium, Copper, Nickel, and Zinc) in non-point source runoff are very toxic to aquatic life. The primary source of these metals is automobiles. The adverse effects of metals are far reaching for both aquatic and human health. Many metals can bio accumulate in the environment, which can affect higher living organisms. While the concentration of zinc or copper in stormwater is not high enough to bother humans, these same concentrations can

be deadly for aquatic organisms. Many microorganisms in soil are especially sensitive to low concentrations of cadmium. Zinc, Copper, and Cadmium found in non-point source runoff result from the movement and wear and tear of automobiles on our roadways. Of the above discussed metals, zinc and copper are the two metals which are found dominantly in non-point source runoff.

- d. Total Petroleum Hydrocarbons (TPH) are highly toxic in the aquatic environment, especially to aquatic invertebrates. The primary sources of petroleum hydrocarbons are oil, grease drops from automobiles, gas spills, and vehicle exhaust. Polycyclic Aromatic Hydrocarbons (PAHs) are also toxic to aquatic life. PAHs can be discharged into the environment using coal tar asphalt sealants, commonly used by homeowners on residential driveways. The movement of vehicles or people walking over the sealed driveway can release dust particles containing PAH, which can then be washed off with the next rainfall into the stormwater management system. PAHs are also generated by the burning of fossil fuels and the airborne particles are then deposited by atmospheric deposition on an impervious surface, especially large flat roof areas. When it rains, the accumulations of PAHs due to atmospheric deposition are carried off in the stormwater.
- 97. The stormwater management system relies on structural components only, all of which are considered secondary practices under the CT DEP 2004 Storm Water Quality Manual. Secondary practices are not effective at reducing non-point source pollutants in the runoff.
- 98. As this site is in a Groundwater Protection Overlay District (GPOD) it is imperative that non-point source pollutants are significantly reduced prior to entering the soil. The stormwater management system as proposed does not reduce many of non-point source pollutants sufficiently to prevent adverse impacts to the groundwater on the site.
- 99. The StormTech system uses an Isolator row which is simply one row of StormTech units wrapped by geotextile. The StormTech system is the same as the isolator system used by Cultec. The Isolator rows are designed to trap sediment on the filter fabric surface, particularly on the bottom of the system. However, any trapped sediment on top of the fabric layer can be resuspended by new flows entering the Isolator row if maintenance is not properly performed. The University of New Hampshire Stormwater Center (UNHSC) tested the Stormtech Isolator Row at their facility and found that it would remove the following percentages of certain pollutants.
 - a. Total Suspended Solids 80%
 - b. Total Petroleum Hydrocarbons 88%
 - c. Zinc 55%
- 100. In this design, the Isolator Row is located after an off-line hydrodynamic separator and thus the above removal percentages will be less than those shown for the simple reason as a pollutant is reduced in the first practice and becomes cleaner, it is more difficult to further reduce the pollutant load. The Isolator Row does not reduce nitrogen. Based upon the UNHSC testing.
- 101. According to the manufacturer, the Barracuda S4 separator has a TSS removal percentage of 50% based upon testing by NJDEP. The Barracuda S4 does not reduce phosphorous, nitrogen, hydrocarbons, or metal loads.

- 102. Section 11-S12 of the CT DEP 2004 Storm Water Quality Manual concerns infiltration practices. In addition to this section of the 2004 Manual, the requirements found in Section 11-P3 (Infiltration Practices) must also be met. This section has the following requirements for Infiltration practices such as those proposed here:
 - a. Siting: Need to be located for easy maintenance and access. Only 6" diameter inspection ports are proposed on the many StormTech units which are not adequate to provide maintenance of these systems.
 - b. Siting: They should only be used in soils having suitable infiltration capacity (as confirmed through field testing) and for land uses, activities, or areas that do not pose a risk to groundwater contamination. First, no field infiltration testing consisting of double ring infiltration tests have been done for the stormwater management systems. Secondly, non-point source pollutants are not being adequately reduced prior to introduction into the groundwater on the site.
 - c. Pre-treatment: "Appropriate pretreatment (e.g., oil/particle separator, hydrodynamic device, catch basin inserts, or other secondary or primary treatment practices) should be provided to remove sediment, floatables, and oil and grease. An off-line hydrodynamic separator is proposed; however, it will not remove significant amounts of hydrocarbons, or metals and does not remove nitrogen and phosphorous loads.
 - d. Design Volume: "Underground infiltration structures should be designed as offline practices to infiltrate the entire water quality volume. A flow bypass structure should be located upgradient of the infiltration structure to convey high flows around the structure." The proposed stormwater management system using StormTech units does not meet this requirement as all runoff is being directed to the infiltration system, not just the full Water Quality Volume.
 - e. Infiltration Rates: "The minimum acceptable field measured soil infiltration rate is 0.3 inches per hour. Field-measured soil infiltration rates should not exceed 5.0 inches per hour...." As no double ring infiltration tests have been conducted by the applicant which are at or below the bottom of the proposed StormTech, this requirement has not been met.
- 103. Section 11-P3 of the CT DEP 2004 Storm Water Quality Manual requires the following criteria be met:
 - a. Infiltration rates need to be reduced to 50% of the observed rate to provide a factor of safety. The design does not meet this criteria.
 - b. For infiltration trenches (underground storage units meet this criteria), one field test and one deep test pit should be performed per 50 linear feet of trench. The design should be based on the slowest rate obtained from the infiltration tests performed at the site. This requirement has not been met by the applicant.
 - Infiltration practices should not be used to infiltrate runoff containing significant concentrations of soluble pollutants that could contaminate groundwater, without adequate pretreatment. An off-line hydrodynamic separator is proposed; however, it will not remove adequate amounts of hydrocarbons and metals which will adversely affect groundwater. Additionally, the pretreatment system does not reduce nitrogen loads which are a major concern when there are downgradient wells.

- d. The bottom of the infiltration facility should be located at least 3 feet above the seasonally high water table or bedrock, as documented by on-site soil testing. This criteria have not been met as more comprehensive soil testing and groundwater monitoring has not been done by the applicant.
- 104. A total of ten deep test holes were excavated on the site. Only one test pit is located within a footprint of a stormwater management system. This is an inadequate program of deep test holes for the stormwater management system.
- 105. Each underground stormwater management system must have at least one, if not two deep test holes performed within the footprint of the system.
- 106. The ten deep test holes were excavated on June 26th and 27th of 2023. The groundwater contours were developed from a singular measurement to the groundwater in each test hole. It is my professional opinion that the groundwater contours provided are not valid as the testing was done at a time when groundwater levels are not at their highest level.
- 107. Without a valid seasonal high groundwater table, it cannot be confirmed that all the underground stormwater management infiltration systems will provide the three (3) foot vertical separation from the seasonal high groundwater table to the lowest aspect of the stormwater practices (bottom of storage unit or bottom of crushed stone, whichever is set at the lowest elevation).
- 108. Page 4: it is stated that the three bedroom units will have a two-car garage and there will be additional parking outside most of the units. All parking spaces must be shown in and out of buildings and numbered sequentially to show the maximum number of spaces provided and will also show any potential conflicts with the parking spaces.
- 109. Page 11: It is stated that the maximum infiltration rate for sandy soils (5"/hr.) was used to model the existing drywells. This is not valid as you cannot assume an infiltration rate. As noted above, field double ring infiltration testing is required. Per the CT DEP 2004 Storm Water Quality Manual, double ring infiltration tests need to be done at or below the lowest aspect of the stormwater practice as this is the layer of soil where runoff will be directed. Also, only 50% of the slowest observed infiltration rate shall be used in the hydrologic model.
- 110. Page 12 & 13: The post development drainage areas are described on these pages. It is stated that PR-3A and PR-3B are roof drains directed to an underground infiltration system with no pretreatment. While the town engineer previously did not require pretreatment of the roof runoff, it is important to bring up the following point. 40% of the nutrient load, both nitrogen and phosphorous are the result of atmospheric deposition on impervious surfaces, so roof runoff will contain nitrogen and phosphorous. As the site is in the GPOD district, increased nitrogen loads need to be reduced prior to being introduced to the ground. Nitrogen moves easily and quickly in sandy soils and will migrate downgradient and can affect the water quality of individual wells and public water supply wells. It is my professional opinion that the roof runoff needs to be treated to reduce nutrient loads, particularly nitrogen prior to being directed in the soil.
- 111. Page 13: Post development area P-1 includes most of the site which is directed to multiple underground stormwater management systems. Modeling of all the system as one large system is not correct even though the systems are all set at the same elevation as separate and distinct drainage areas are directed to each of the underground systems. Each system must be modeled separately for the specific drainage area directed to it. The following two comments illustrate this point.

- 112. Stormwater System E only receives runoff from the building roofs with no pretreatment.
- 113. Stormwater System D only receives runoff in the driveway between Buildings #1 and #2 only and has pretreatment.
- 114. No consideration or discussion has been provided concerning the infiltration of most of the rainfall on the site and whether this will increase the groundwater table under the site, or potentially saturate the soils under the building foundations which could lead to structural issues.

Water Quality Aspects:

- 115. Page 14: It is stated on the bottom of this page the weir in the bypass manhole will direct only 25% of the Water Quality Volume (WQV) to the isolator row. This is not correct. As both the Barracuda S4 and the StormTech Isolator Row are flow through treatment systems, the bypass manholes must directed the full Water Quality Flow (WQF) to both systems. Off-line pretreatment systems must be sized using the WQF which is a flow rate based upon the full WQV. This requirement will likely affect the proposed pretreatment systems.
- 116. All the notes found on pages 16 to 22 must be part of the construction narrative in the plan set.
- 117. The tests holes performed on June 26-27, 2023 are not sufficient for the design of the stormwater management system for this project. There are not enough holes and the soils are questionable for infiltration.
 - a. Test #1 55" of fill, then only 45" deep in the original soil
 - b. Test #2 18" of fill, then only 78" deep in the original soil
 - c. Test #3 18" of fill, then only 78" deep in the original soil
 - d. Test #4 11" of fill, then only 37" deep in the original soil
 - e. Test #5 28" of fill, then only 32" deep in the original soil
 - f. Test #6 36" of fill, then only 72" deep in the original soil
 - g. Test #7 45" of fill, then only 51" deep in the original soil
 - h. Test #8 96" of fill only, did not extend into original soil
 - i. Test #9 32" of fill, then only 64" deep in the original soil
 - j. Test #10 18" of fill, then only 78" deep in the original soil
- 118. Redoximorphic Features (mottling) is observed in several of the test pits as stated below.
 - a. Test Pit #2: 24" below original ground surface
 - b. Test Pit #3: at the original ground surface below the fill layer
 - c. Test Pit #5: 6" below original ground surface
 - d. Test Pit #9: 15" below original ground surface
 - e. Test Pit #10: 28" below original ground surface
- 119. Based upon the presence of mottling at these depth, the seasonal high groundwater table could be quite shallow on the site, thus the soils do not appear suitable for infiltration of runoff.
- 120. As the bottom of the stormwater management systems are at 102.5' (bottom of stone), all test pits need to be at least four (4) foot lower than this elevation to confirm no

bedrock within three (3) feet of the bottom of the stone layer and a three (3) foot vertical separation to the seasonal high groundwater level.

- 121. An evaluation of the location and elevations for many of the stormwater management systems showed that they will be located fully or partially in structural fill which will affect their functionality as infiltration practices. It is highly recommended that cross sections in both a north/south and east/west orientation through all the proposed stormwater management systems be provided for review by the commission and the town's consultants. The cross sections need to show existing and proposed grades, the proposed stormwater practices, the depth to seasonal high groundwater and bedrock which result from a complete soil test program.
- 122. There are no detailed review comments on the routing of the post-development runoff it was stated above that it was inappropriate to model the stormwater systems as one big system as runoff from different impervious area are directed to variable sections of the system.
- 123. In Appendix C-5, there is a routing diagram for Pretreatment Areas 1 to 4, plus Modified PR-1. These areas are not defined on the watershed maps. For all five areas, no impervious area is called out. A better explanation and mapping of these areas need to be provided or they should be eliminated from the report.
- 124. For the sizing of the Barracuda S4 units, the full calculation for converting the WQV to the WQF needs to be provided. There are more steps to this conversion than provided by the applicant.
- 125. The applicant uses the pollutant concentrations for commercial land use for the developed condition. This is not correct, the concentrations for residential need to be used which are higher than those of a commercial use.
- 126. The analysis did not determine the pollutant loads for metals and hydrocarbons. These need to be added to this analysis for post-development conditions.
- 127. The use of Schueler Equation is an acceptable approach to determining the non-point source pollutant loads for this site.
- 128. Deep sump catch basins with a hooded outlet will only have a TSS removal rate of 9%, not 25% based upon monitoring data from University of New Hampshire Stormwater Center.
- 129. As noted above in numerous comments, there must be a high degree of pollutant reduction prior to being directed to an underground infiltration practice to prevent groundwater contamination. While TSS loads will be reduced, nutrients and metals have not even been evaluated which will be present on the site due to the amount of vehicles which will be on or using the site. The CT DEP 2004 Storm Water Quality Manual, strongly suggests that underground infiltration practices be used to fully infiltrate the Water Quality Volume only. In this case, the applicant is proposing to infiltrate most if not all the rainfall which falls on the site up to the 100-year rainfall event.
- 130. In the pollutant loading analysis, pollutant removal amounts for each pollutant and each stormwater practice (deep sump catch basin, off-line hydrodynamic separator, off-line Isolator Row) must be provided and then a summary provided. Removal rates for Infiltration systems shall not be used in the analysis as the site in located in the GPOD district and the runoff must be as clean as possible prior to entering the infiltration systems.

- 131. If there is well drained sand and gravels on the site, runoff directed to these soils moves very quickly through the soils, so no treatment is provided.
- 132. While I concur with the concept of reducing removal efficiencies in series, it is not appropriate to use the same reduction for all pollutants from a given system. Based upon discussions with researchers at water resource and LID conferences, the following approach is strongly recommended which is more appropriate than a uniform reduction per practice:
 - a. The removal efficiency of a practice for each pollutant must be considered separately.
 - b. If the removal efficiency of the first system for a pollutant is less than 20%, then the full removal efficiency for the second practice for that pollutant in series may be applied to the remaining load for that individual pollutant.
 - c. If the removal efficiency of the first system for a pollutant is between 21% and 50%, then the removal efficiency for the second practice for that pollutant shall be 75% of the stated removal efficiency for the second practice.
 - d. If the removal efficiency of the first system for a pollutant is between 51% and 80%, then the full removal efficiency for the second practice for that pollutant shall be 50% of the stated removal efficiency for the second practice.
 - e. If the combined calculated removal efficiency of the first two practices for a pollutant is less than 20%, then the removal efficiency for the third practice for that pollutant shall be 80% of the stated removal efficiency of the third practice.
 - f. If the combined calculated removal efficiency of the first two practices for a pollutant is between 21% and 50%, then the removal efficiency for the third practice for that pollutant shall be 65% of the stated removal efficiency of the third practice.
 - g. If the combined calculated removal efficiency of the first two practices for a pollutant is between 51% and 80%, then the removal efficiency for the third practice for that pollutant shall be 45% of the stated removal efficiency of the third practice.

Northeast Water Solutions, Inc. Report:

- 133. Groundwater recharge requirements are defined in the CT DEP 2004 Storm Water Quality Manual and are based upon actual soil types of the site and not the regional hydrologic setting.
- 134. It is stated on page 10 that the site is located slightly downstream of the Westerly wellfields. However, the movement of groundwater in sand and gravel soils (if present on the site) does not always follow surface topography.
- 135. Table 3-2 provides the pollutant removal percentage for this design. The results are stated below.
 - a. Total Suspended Solids 69%
 - b. Total Phosphorous 23%
 - c. Total Nitrogen 3.8%
- 136. The TSS reduction does not meet the CT DEP goal of 80% removal. Additionally, the nitrogen reduction is minimal which is a significant concern as the site is in the GPOD.

My current CV is attached for the record. Please contact my office if you have any questions concerning this review.

Respectfully submitted, Trinkaus Engineering, LLC

Sten D Teinhaus

Steven D. Trinkaus, PE



Raymond F. Cherenzia, P.E., L.S., Founder Sergio F. Cherenzia, P.E., President

February 14, 2024

Mr. Christopher Greenlaw, PE Town of Stonington 152 Elm Street Stonington, CT 06378

Subject: 3rd Party Engineering Response to Comments PZ2322SPA & GPP Fair Housing of Connecticut, LLC Site Plan & GWP Application Proposed Residential Housing Development Liberty Street, 207 Liberty Street & 215 Liberty Street Pawcatuck, Connecticut Map 16 Block 4 Lots 12, 12A & 13

Dear Mr. Greenlaw:

Cherenzia & Associates, Ltd. (Cherenzia) has reviewed the above-referenced third-party engineering review comments dated January 23, 2024 and offers our responses to these comments below. Revised and supplemental documents included with this resubmittal and are listed below:

- 1. Three (3) copies of
 - a. Pollutant Loading Calculation
 - Autoturn sketch dated October 24, 2023 revised February 14, 2024 prepared by Cherenzia & Associates, LTD.
 - Memorandum entitled Beachway Estates Report Addendum: Evaluation of Potential Impacts & Mitigation – GPOD; Nitrogen Reduction, prepared by Robert F. Ferrari, PE, dated February 12, 2024

TRINKAUS ENGINEERING COMMENTS:

EXECUTIVE SUMMARY:

A. Inadequate soil testing has been performed on the site to establish valid groundwater contours, types of soils, and infiltrative capacity of the soils. Thus, it cannot be confirmed that the site is appropriate for the stormwater management system proposed by the applicant and will function as intended.

<u>Response to Comment:</u> Additional soil testing was conducted on February 1, 2024 witnessed by the third-party reviewing engineer. Soil conditions were documented in addition to infiltrometer testing to calculate the infiltrate rate in the soil layers below the proposed subsurface infiltrator system. I believe the soil testing performed has been deemed adequate and the stormwater system will be modified accordingly. Generally, groundwater was to be found to be lower than

prior redoximorphic indicators due to a compacted subgrade and fill over from previous development. Areas with shallow depth to restrictive layer shall be under drained accordingly.

B. This site is in the Groundwater Protection Overlay District, so there must be a high degree of treatment provided for the runoff prior to being directed into the ground. While the stormwater management will reduce TSS loads, other pollutants, particularly nitrogen and metals are not being reduced adequately which will adversely affect the groundwater on the site and potentially impact downgradient public and private wells.

<u>Response to Comment:</u> See revised attached pollutant load calculation and memorandum. Per discussion with Town and third-party reviewing engineer, specific attention has been paid to nitrogen treatment and reduction. A pre- to post-development nitrogen analysis has been provided along with revised pollutant loading calculation.

C. The modeling of the multiple stormwater management systems as a single unit is not correct as a single drainage area for post-development conditions is directed to the multiple systems which are combined in the hydrologic model. Each system must be evaluated separately for the drainage areas directed to it.

Response to Comment: The model shall be modified as appropriate.

D. The applicant uses an assumed infiltration rate of 2.41"/hour for the proposed infiltration practices and makes a factual conclusion about the functionality of the stormwater system. This is not supported by actual field data.

<u>Response to Comment:</u> The infiltrate rate has been verified by infiltrometer testing. Generally, the infiltration rates were relatively fast. The stormwater calculations and design will be adjusted accordingly.

E. The stormwater management system does not comply with the CT DEP 2004 Storm Water Quality Manual as discussed in the detailed comments below.

<u>Response to Comment:</u> The CT DEP 2004 Storm Water Quality Manual is a guidance document. The system has been designed implementing good engineering practice and utilizing other acceptable design resources. The detailed comments are addressed herein.

F. The erosion control plan does not comply with the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control as discussed in the detailed comments below.

<u>Response to Comment:</u> The CT DEP 2002 Guidelines for Soil Erosion and Sediment Control is a guidance document. The system has been designed implementing good engineering practice and utilizing other acceptable design resources. The detailed comments are addressed herein.

G. The design of the site requires significant vehicular movements for residents, guests, and emergency services. The required movements are a significant safety concern in my professional opinion.

Parallel parking in front of units has been significantly reduced to improve and minimize vehicular movements required. See revised Autoturn sketch herewith.

AUTOTURN SKETCH:

1. The turning movement plan in the upper left of the plan sheet shows the movements on the ladder truck within the site. The outside limit of the turning movement is almost touching the corner of the
parallel parking space in front of Unit #21 as well as going over the curb. If the vehicle in the parallel space is not centered in the space, the ladder truck may not be able to make this turning movement. This is not an acceptable condition and poses a safety risk.

<u>Response to Comment:</u> Building #1 (Units 1 through 20) has no parallel parking allowed, this provides additional space for the turning movement.

2. This same turning movement also crosses the curb to the west and opposite Unit #21. The movement is located just outside the parking spaces on the west side of the driveway opposite Units #21 and #36. If someone is parking in these spaces and has not pulled all the way in, then the ladder truck does not appear capable of making the turning movement. If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.

<u>Response to Comment:</u> Building #1 (Units 1 through 20) and Building #3 (Units 36 through 49) has no parallel parking allowed, this provides additional space for the turning movement.

3. While a note states that there are parallel spaces in front of many of the units, no parking spaces are shown. All parallel parking spaces need to be shown with a typical length and width dimensions, assuming all spaces are the same.

<u>Response to Comment:</u> The spaces coincide with the front of each unit where parking is allowed, dimensions are shown and can be delineated with striping or other form of designation for visible cue.

4. The parallel spaces are only 8' wide by scaling on sheet C-3. It does not appear possible that a person on the building side of the car will be able to exit the car safely if the car is 6.0' to 6.5' in width.

<u>Response to Comment:</u> Parallel spaces may be adjusted to 9 feet, as space allocation allows.

5. According to the architectural plans (11/2/23) the garages take up all the front face of the units except for the entrance door. The parallel parking will block the garage doors which may pose a safety issue for emergency crews. The Fire Marshall should be consulted on this design for public safety reasons.

<u>Response to Comment:</u> The Fire Marshall has reviewed the plans and comments have been addressed.

6. According to architectural plans, the width of the garages is 16'. A typical sedan/small SUV is 6.5' in width, so two vehicles will be a combined width of 13.0'. Thus, there will be 2.0' or less between the two vehicles, and between the left side vehicle and stairway wall or the wall to the outside of the right side vehicle. It does not appear that you can open the car door and safely exit the vehicle in the garage.

<u>Response to Comment:</u> The residential structures shall meet building code requirements. Final architectural plans shall provide ample space for safe exit of the vehicle.

7. No parking areas are shown at several locations in front of the buildings. What will prevent people from parking in these areas? Painted hatch areas in parking lots are often ignored by drivers.

<u>Response to Comment:</u> Fire and no parking lanes will be indicated to the satisfaction of the Police and Fire Department.

8. The turning movement plan in the upper right of this sheet has many of the same issues discussed above If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.

<u>Response to Comment:</u> The additional no parking/fire lanes addresses this issue. See revised Autoturn sketch.

9. The turning movement plan in the lower right of this sheet has many of the same issues discussed above. If people do not park ideally, then the ladder truck will not be able to fully access the site, which is a safety issue.

<u>Response to Comment:</u> The additional no parking/fire lanes addresses this issue. See revised Autoturn sketch.

10. The turning movement plan showing the movement of a car pulling into and backing out of a garage requires a three-point turning movement at a minimum to accomplish this movement. This movement depends on drivers making precise movements in a constrained driveway area with cars in parallel spaces on one or both sides of the garage space. Making multiple turning movements to enter and exit a residential garage is less than ideal.

<u>Response to Comment:</u> The additional no parking/fire lanes addresses this issue. See revised Autoturn sketch.

11. As the garages will hold two vehicles, are the turning movements for the car on the left or the right? If another vehicle is already in the garage will this affect the movement of the second vehicle entering the garage?

<u>Response to Comment:</u> The additional no parking/fire lanes addresses this issue. See revised Autoturn sketch. Additional turning movements have been shown for both vehicles entering the garage.

12. While the turning movements of backing into and then pulling out of a garage are simpler, they still require precise movements of the driver in the constrained driveway area which are also not ideal.

<u>Response to Comment:</u> Entering front end first and back end first are both accommodated with minimal turning movements.

13. In both turning movements of cars entering and exiting garages can also be considered a safety issue as they do not allow for any errors in the judgement of the drivers.

<u>Response to Comment:</u> The additional no parking/fire lanes addresses this issue and impact to safety.

SITE PLAN COMMENTS:

ALL PLANS:

14. Each building needs to be labelled on the site plans (i.e., Building #1, #2, etc.), also the building type A or B should be noted for coordination with the architectural plans.

<u>Response to Comment:</u> The buildings and unit types shall be labeled and consistent with the Architectural plans.

15. The layer containing existing development on the site needs to be removed from all plans which show proposed development to increase the readability of the plans.

Response to Comment: The existing conditions layer(s) shall be removed as appropriate.

16. It appears that blasting will be necessary based upon the location of ledge outcrops on the site. No blasting plan has been prepared. With the number of single-family residences located to the north, west and south of the site, a pre-blast survey must be done. A blasting plan must be reviewed and approved by the Fire Marshall.

<u>Response to Comment:</u> A ledge removal and blasting plan shall be prepared and reviewed by the Fire Marshall. All applicable regulatory and legal requirements shall be met.

17. There is no note on the plan which requires the design engineer of record to provide inspection services and to certify that all improvements (stormwater management system, all underground utilities, pavement, sidewalks and building foundations) have been installed in compliance with the plans. Written Inspection reports and final certification shall be provided to the Town of Stonington. Along with this certification As-built drawings of these engineering improvements shall be prepared by a licensed land surveyor and provided to the Town of Stonington.

<u>Response to Comment:</u> A note shall be added to the plan to the satisfaction of the Town Engineer.

SHEET C-3:

18. The parking spaces in the internal garages need to be shown for all units with garages as well as all parallel spaces along the front of the buildings.

Response to Comment: All parking spaces shall be shown, and on a separate plan as necessary.

19. All parking spaces need to be numbered consequently so it is clear to the commission how many parking spaces are provided on the site. This information should be shown on this plan as well as the Autoturn Sketch plan.

Response to Comment: All parking spaces shall be numbered sequentially.

20. Typical dimensions for all internal or external parking spaces need to be shown on this sheet.

Response to Comment: Typical dimensions shall be shown.

21. All proposed drainage structures should be removed from this sheet.

Response to Comment: All proposed drainage structures shall be removed.

22. No dumpster pad was found on the plans. Where will the dumpster pad be located? How big will the dumpster pad be? If garbage and recycling containers are located within a garage, how can they be moved outside the garage if there is only two feet or less between the vehicles. Once the garbage/recycling containers are outside the garage, where will they be placed for pick up? If placed outside the garage door, this will prevent an owner from moving their car out of the garage. Also, if the garbage and recycling containers are placed outside the garages, then the garbage truck will be forced to stop in the driveway and thus will limit the movement of other vehicles in the driveway. If they are placed away from the garage door, they will block the front door. This is not a desirable condition.

<u>Response to Comment:</u> There shall be no dumpster pad. Garbage pickup and their locations shall be coordinated with Stonington Solid Waste Department. It is assumed garbage pickup will be at a specified time each week, minimizing the window for conflict between vehicles and garbage/recycling pickup.

23. Units #75 to #85 show trash enclosures at the rear of the unit. How will unit owners move the garbage/recycling containers from the rear of the building to the driveway in front of the building as there is no sidewalk from the rear of the building to the front?

Response to Comment: Trash enclosures shall be relocated to the front of the units.

24. There is proposed graded slope at the east side of the building which would make the moving of garbage/recycling containers difficult, if not impossible.

<u>Response to Comment:</u> Trash enclosures shall be relocated to the front of the units alleviating need to bring trash around the side of the building.

25. Provide a turning movement plan for the movement of the garbage truck to and from the dumpster pad and for individual pick up in front of the units.

<u>Response to Comment:</u> Turning movement for garbage truck shall be provided. There is no dumpster proposed. Individual pickups will likely take place in front of each unit.

26. It appears that several sidewalks are proposed between several of the buildings. They need to be labeled.

<u>Response to Comment:</u> Walkways and sidewalks are labeled, typ. Additional callouts can be added as appropriate.

27. Compliant ADA ramps must be shown for all sidewalk intersections with paved driveways.

Response to Comment: ADA ramps shall be shown, as appropriate.

28. It is understood that some handicap accessible units will be located in the building of units #75 to #85. What specific units will be handicap accessible?

<u>Response to Comment:</u> The units have first floor bedrooms, but are not necessarily ADA compliant. If required, modifications will be made to accommodate ADA design.

29. If some units are to be handicap accessible, there needs to be handicap parking spaces, including van accessible in front of the unit(s). No handicap spaces are shown to the north of this building.

<u>Response to Comment:</u> ADA spaces are not required since units are not specifically ADA compliant. If ADA spaces are required, the parking areas will have to be redesigned to accommodate.

30. Why is there no full crosswalk shown for the sidewalk between buildings #1 and #2, and #4 and #5 across the western driveway?

Response to Comment: Crosswalks shall be incorporated as appropriate.

31. Why are there no sidewalks from Buildings #6, #7, and #8 to the other sidewalks shown on the plan? With no sidewalks, residents will be forced to walk in the driveway.

<u>Response to Comment:</u> Units 92-102 (Building #8) may utilize the walkways between buildings #2 & #3 and #4 & #5. Building #6 and #7 (units 75-91) shall either walk behind the building or along their fronts to the walkway in front of Building #6.

SHEET C-4:

32. All proposed drainage structure and labels, sanitary sewer manholes and labels and outline of stormwater management systems should be removed from this sheet.

Response to Comment: All items referenced shall be removed, as applicable.

33. Many of the proposed contours are not labelled. Label all proposed contours on this sheet.

Response to Comment: Contours requiring labels shall be provided.

34. As there is a separate erosion control plan, remove erosion control measures from this sheet.

<u>Response to Comment:</u> Erosion control measures shall be removed from this sheet, as applicable.

35. No areas for the stockpiling of snow are shown on this plan or any other sheet. Where will snow be stockpiled on the site?

Response to Comment: Snow stockpile areas shall be labeled.

36. A graded (triangular cross section) swale is shown between at the rear of building #8. What will prevent concentrated flows from occurring in this swale?

<u>Response to Comment:</u> This area shall be graded to a less pronounced swale and more level.

37. What is the purpose of this swale?

Response to Comment: The purpose of the grading is to direct water away from the building.

SHEET C-5:

38. Remove sanitary sewer information from this sheet.

Response to Comment: Sanitary sewer shall be removed from this sheet as applicable.

39. Remove grading information and erosion control measures from this sheet.

<u>Response to Comment:</u> Grading information and erosion control measures shall be removed from this sheet as applicable. Drainage plans are important to drainage plans.

40. Remove hatching in front of buildings to improve readability of this sheet.

Response to Comment: Hatching shall be removed.

41. Remove all sanitary sewer and erosion control information from this sheet.

<u>Response to Comment:</u> Sanitary sewer and erosion control information shall be removed from this sheet, as applicable.

42. What is the purpose of the drainpipe shown between buildings #2 and #3? Only two clean outs are shown near the eastern end.

<u>Response to Comment:</u> The drainpipe is the roof drain conveyance pipe which downspouts will connect to; however, it is intended to integrate the drain into foundation planters to treat roof runoff and then underdrain those planters to the subsurface infiltration system, so this pipe may change.

43. What is the purpose of the drainpipe shown between buildings #4 and #5? Only two clean outs are shown near the eastern end.

<u>Response to Comment:</u> The drainpipe is the roof drain conveyance pipe which downspouts will connect to; however, it is intended to integrate the drain into foundation planters to treat roof runoff and then underdrain those planters to the subsurface infiltration system, so this pipe may change.

44. Several of the pipe runs have slopes less than 1.0%. To ensure self-cleaning velocities, all drainage pipes should have a minimum pitch of 1.0%.

<u>Response to Comment:</u> Pipes shall be revised to get a minimum of 1% slope where possible. If such cannot be achieved, the operation and maintenance plan shall address cleaning of those pipes.

45. The drainage table for the roof drains calls out rim and inverts for the clean outs on the lines, but in most cases, the pipe connections are not located at the actual clean out and no invert information has been provided at these connection points.

<u>Response to Comment:</u> Clean outs are in close proximity to the intersection invert. This difference in elevation is negligible.

46. It does not appear that all pipe runs for the roof drains are defined on the plan. All pipe runs between clean outs must have pipe size, length and slope defined on the plan in a clear fashion. As an example: CO-7F to CO-7E: pipe size, pipe length, pipe slope.

<u>Response to Comment:</u> A note is provided indicating that pipe sizes not indicated default to 6" PVC. Pipe lengths and slopes have been calculated, but if required to be identified on the plan, will require additional plan sheets. Typically, such detail is not necessary and roof drains are tied in accordingly.

47. It is assumed that the manholes shown at the end of the Isolator Rows are for maintenance access. A person working in this manhole will be in "confined space" and must wear special gear, including breathing equipment. No safety protocols for this work have been specified on the plan.

<u>Response to Comment:</u> A note shall be added to address safety protocols must be met for "confined space".

48. Stormwater system E is accepting runoff from the roof of building #2 (units 21-35), but roof drains are only shown on one side of the building, how will the other side be directed to this system? The area of the roof of building #2 directed to system E must be called out on the plan. Directional arrows on all roof drain pipes would make it clear which roof drains are directed to specific stormwater systems.

<u>Response to Comment:</u> Rear of building #2 is connected to the center pipe, but is subject to design modification.

49. Building #7 (units 86-91) are also directed to system E. It appears that some of this roof may be directed to another system. The watershed map shows the entire front half of the roof and 50% of the back half are being directed to system E which conflicts with the information shown on the grading/drainage plan for building #7. The area of the roof of building #7 directed to system E must be called out on the plan.

<u>Response to Comment:</u> Building #7 discharges to system "A". Revisions to the modeling will be addressed accordingly as required.

50. If the bottom of the chambers is set at 103.0' and the inverts of the pipes from DMH-2 and DMH-9 are also at 103.0', then the connecting pipe has no pitch. All drainage pipes must have a minimum pitch of 0.5% to ensure that no sediment can accumulate in the pipes. If a flow velocity is not self-cleaning at 0.5%, then the slope needs to increase as necessary to provide for a self-cleaning velocity of 2 feet per second (fps).

<u>Response to Comment:</u> The pipes referenced are short runs and are able to be cleaned out if required. Pitch to "self-clean" is not appropriate as the system needs to be level.

51. It appears that there are two separate components of stormwater system F. If they are not connected, they should be considered as two separate systems and not a singular system.

<u>Response to Comment:</u> The systems are connected by crushed stone, so treated as one singular system.

52. There is only one outlet control structure (DMH-16) for all the underground stormwater systems which depend upon the critical and accurate installation of all the StormTech units and associated piping. It is my professional opinion based upon forty years of experience that each underground system needs to have its own outlet control structure. As noted below in the comments under the Stormwater Management Report, it is not an appropriate approach to model all these systems as one which is stated in the stormwater report.

<u>Response to Comment:</u> The modeling of the system will be revisited and design modified accordingly.

53. All runoff is being directed to the Infiltration Gallery Level Spreader Outlet. No test holes have been made within the footprints of this system to confirm the soil conditions. No infiltration tests have been performed at this location.

<u>Response to Comment:</u> This area is not designed to infiltrate. Any additional infiltration is bonus, but not taken into account in the design.

54. What is the length of this system? The type of gallery is not specified on this plan.

<u>Response to Comment:</u> Length shall be specified. Type of galley is shown on the detail sheet (4'x4' galley).

SHEET C-6:

55. Remove all drainage, erosion information, sidewalks and hatching from this plan to improve readability.

<u>Response to Comment:</u> These items shall be removed from this plan for readability, as applicable.

56. No pipe sizes and slopes have been provided for the sanitary sewer.

Response to Comment: Pipe sizes and slopes have been provided in the plan, not on a table.

57. It must be demonstrated that self-cleaning velocities will be present in all sanitary sewer lines, which is 2 fps.

Response to Comment: These calculations shall be provided to the satisfaction of the WPCA.

58. Have the respective utility companies signed off on the alignment and horizontal and/or vertical separation for all the utilities?

<u>Response to Comment:</u> The utility plan shall be reviewed by respective utility companies subsequent to Town review and approval.

59. Have the locations of the proposed hydrants been approved by the Stonington Fire Marshall?

Response to Comment: Yes, hydrant locations have been reviewed by the Fire Chief.

SHEET C-7:

60. This erosion control needs to be split into two or more sheets. One sheet needs to show the proposed development and all erosion control measures at the same scale of all the other plans (1" = 20').

<u>Response to Comment:</u> Erosion control and phasing plan shall be split into multiple sheets as appropriate.

61. Only information which is relative to the erosion control plan should be shown to make it easy to read and follow.

Response to Comment: Only information relative to the erosion control plan shall be shown.

62. All erosion control details on a separate plan with the narrative on a third plan.

Response to Comment: Erosion control details shall be separated from the narrative.

63. The narrative shown on this plan is overly simplistic for a project such as this. The narrative must also follow the form and content found in the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control "2002 Guidelines".

<u>Response to Comment:</u> The narrative shall be modified as appropriate and emphasis shall be added for preconstruction meeting to coordinate with the contractor, specific to any changes that may be requested by the contractor for construction phasing, staging, erosion controls, etc.

64. A temporary sediment trap is shown on the plan. No grading is shown for the temporary sediment basin which must be provided.

<u>Response to Comment:</u> Grading shall be shown for temporary sediment trap.

65. According to the 2002 Guidelines vertical perforated risers are the outlet structure for a sediment basin whereas a riprap berm is used for a temporary sediment trap. What is the applicant's justification for the vertical riser for a temporary sediment trap?

<u>Response to Comment:</u> Vertical perforated risers are utilized for pumping when the traps are at capacity, as needed.

66. No riser or discharge pipe is shown on the plan view of the temporary sediment trap.

<u>Response to Comment:</u> This is typically not shown and generalized so that the contractor can hancle based on specific needs of the site. Additional notes can be added as appropriate.

67. The 2002 Guidelines (Section 5-11-25) require that calculations for wet and dry storage be done. No calculations have been provided.

<u>Response to Comment:</u> Sediment trap sizing has been provided in "Temporary Sediment Trap Sizing". Wet and dry volumes can be added to the notes.

68. The detail for the temporary sediment trap shows a discharge hose from the vertical perforated riser. Where will the hose discharge too? How will concentrated flows be reduced to non-erosive velocities at the outlet?

<u>Response to Comment:</u> This is typically left to the site contractor to handle in a non-erosive manner. Notes can be added, as appropriate.

69. How will construction runoff be conveyed to the temporary sediment trap?

<u>Response to Comment:</u> The temporary sediment trap is down gradient of the construction. Notes can be added to identify appropriate ways to convey stormwater to it, but generally it will be surface runoff flow.

70. There are five phases discussed in the construction sequence. The description of the phasing plan does not line up with the phasing limits shown on this plan. A separate plan showing the limits of each phase with a detailed description of the work to be done in each phase must be submitted.

<u>Response to Comment:</u> Additional sheets will be incorporated to separate phases to make it clearer.

71. Two areas are shown for "staging & stockpile area on the plan. Soil stockpiles, construction trailers, equipment and material storage area need to be clearly defined within each of these areas.

<u>Response to Comment:</u> Typically this is determined by the site contractor and covered by notes.

72. The detail of the silt fence backed straw bale is not an effective erosion control perimeter measure. If the straw bale is overtopped, it can easily overwhelm the siltation fence barrier. The applicant should consider a more effective and redundant perimeter erosion control measure. Hay/straw bales are a very ineffective erosion control measure.

<u>Response to Comment:</u> The recommendation was made by the Town Engineer. If there is a more effective perimeter control, we are happy to consider. Hay bales are typically not acceptable (because of invasive seeds), but straw bales are.

73. Each phase must erosion control measures for the work to be performed and cannot depend on the singular perimeter control measure to protect off-site areas.

<u>Response to Comment:</u> Additional perimeter controls shall be added when phase sheets are broken out, as appropriate.

74. The detail for the Temporary Sediment Trap Riser pipe shows perforated down to the bottom of the riser. This is not correct as it will result in the discharge of turbid runoff from the sediment trap. Only clean water is to be discharged from a temporary sediment basin or trap.

Response to Comment: The riser is surrounded by crushed stone providing sediment filtration.

75. There is grading and other work proposed within the CT DOT Right of Way. Has the applicant discussed this work with CT DOT? What will happen if the CT DOT does not permit this work to be done?

<u>Response to Comment:</u> A application shall be applied for at CT DOT, but Town approval is required prior to a permit being issued.

SHEET C-8:

76. What is the horizontal separation between the water lateral and sewer lateral in the detail showing them both in the same trench?

Response to Comment: 18" vertical if less than 10 feet separation, per the detail.

77. A detail of an ADA compliant ramp needs to be provided for where the sidewalk connects to the pavement perpendicularly.

<u>Response to Comment:</u> This detail shall be added if applicable. Currently it is not, but if changed, will be added.

78. A detail for a bollard has been provided, however, no bollards have been shown on the site plan. Where will the bollards be installed?

<u>Response to Comment:</u> Bollards are shown around the communication and transformer locations.

SHEET C-9:

79. What is the depth of the sump for a catch basin with a hood?

Response to Comment: Four feet, as indicated on the detail.

80. Will all catch basins have a hooded outlet or only select catch basins?

<u>Response to Comment:</u> Catch basin hoods shall be specified once the stormwater system is modified.

81. The Typical Roof Drain Connection conflicts with the information shown on the Drainage Plan. This detail shows a splash pad onto the ground surface which is not reflected on the Drainage Plan. How will the roof runoff get into the drainage system if discharged through the surcharge pipe? Corrugated HDPE pipe can be prone to clogging. Piping should be either double wall, smooth interior N-12 piping for PVC pipe (ASTM D3034, Sdr. 35). The detail must reflect the actual design.

<u>Response to Comment:</u> Splash pad will be removed. The surcharge pipe will drain to the catch basins. If the system is full and surcharging, there is either an issue with the system that needs to be addressed or it is full because of extensive rain event. All grading on site generally runs east to west and if the site surcharges, will overflow to Liberty Street and not into the buildings.

SHEET C-10:

82. The table called "Stormwater Treatment Data" has unconfirmed data in it. The elevations of seasonal high groundwater are not valid as discussed in the comments under the Stormwater Report.

<u>Response to Comment:</u> Additional data shall be applied to the design to verify it is designed to good engineering practice and applicable regulations.

83. There is a note under the "Stormwater Treatment Data" Table which states "Infiltration Note: An engineer shall conduct perc. And/or infiltration tests to verify infiltration rates of the soil prior to the construction activities. Stormwater modifications may be required based on results." This is not acceptable from an engineering standpoint. A comprehensive testing protocol consisting of deep test holes and double ring infiltration, not percolation tests must be done during the design stage to demonstrate that the current design will function as intended.

<u>Response to Comment:</u> This note was added per request of the Town Engineer. Infiltrometer tests have been subsequently conducted with coordination between yourself and the Town Engineer.

84. The details of the diversion weir manholes appear to have some typos on them. As an example, the detail for DMH-9 states "12" HDPE from HDS-2, Inv. 104.04". Based upon the Drainage Plan sheet, it should state "To HDS-2". All details should be checked for consistency with the information found on the Drainage Plan sheet.

Response to Comment: These details will be reviewed to confirm accuracy.

85. There is no thickness of the weir call defined in the details.

Response to Comment: A typical thickness can be added to the details.

86. Directional arrows should be added for all pipes into and out of these manholes to make the flow patterns clear.

Response to Comment: Directional arrows can be added to these details.

87. Section A-A of the weir walls should be so labeled. The top of bottom of the weir wall should be clearly labeled.

<u>Response to Comment:</u> Section A-A is labeled on all the details. Top elevation is labeled on all the details. A note shall be added that the weir wall shall extend to the floor of the manhole.

88. Calculations which show the water surface elevation for the Water Quality Flow in the pipe to the hydrodynamic separator need to be provided to confirm the top of weir elevation.

<u>Response to Comment:</u> Calculations for the water quality flow are provided on the Proposed Stormwater Pretreatment Table (Appendix D.1) with the elevations in the manholes calculated with a modified HydroCAD analysis based on the water quality flow (Appendix C.5) in the Stormwater Report. Additional text can be added to the report to describe these calculations.

89. For DHM-16, the invert of the low point of the outlet weir is called out as 103.3'. This is 0.8' higher than the invert of the 30" HDPE pipe from DMH-17 and will cause a backwater condition in this pipe. Why is the outlet invert set at 103.3'?

<u>Response to Comment:</u> The lowest outlet in the weir wall of the outlet control structure is 103.3 to control small storms as required as required by State and Town requirements. Stormwater below this elevation will infiltrate.

90. The detail of the Infiltration Gallery Level Spreader Outlet is not a level spreader, and the discharges will occur as concentrated flow through the sidewall knockouts on the gallery. A level spreader ensures uniform overland flow for all discharges over a level linear length.

<u>Response to Comment:</u> This design has been used at least one other location in the Town. The riprap outside the galleys will dissipate concentrated flow.

91. The detail for Stormwater Treatment Train Section – Stormwater Areas A-F which are infiltration practices shows an underdrain. If these systems are infiltration practices, why is the underdrain needed? Where will the underdrain be discharged? There are no invert elevations for the underdrain, please provide.

<u>Response to Comment:</u> Infiltration is not part of the design of all the areas due to groundwater separation. The underdrain pipe is intended that lower stone area (Elev 102.5 - 103.0) can drain from the areas that do not infiltrate to the areas that can infiltrate. The invert of the underdrain is provided on the plan on sheet C-5 and on the Stormwater Treatment Data table on sheet C-10 with the rest of the stormwater system elevations.

92. The detail for Stormwater Treatment Train Section – Stormwater Areas G & H which are to be lined with an impermeable liner also show an underdrain. When and how will the underdrain be connected to the outlet system? Inverts must also be provided for these systems.

<u>Response to Comment:</u> The underdrain pipe is intended that lower stone area (Elev 102.5 – 103.0) can drain from the areas that do not infiltrate to the areas that can infiltrate. The underdrain pipe does not connect to the outlet of the system. The invert of the underdrain is provided on the plan on sheet C-5 and on the Stormwater Treatment Data table on sheet C-10 with the rest of the stormwater system elevations.

SHEET C-11:

93. The detail of the Stormtech Inlet Scour Protection simply shows a layer of woven geotextile at the top of the stone under the units. Scour protection is a system to slow flow velocities down to prevent erosion of native soils. Flow over a geotextile layer does not slow down as there is less friction to flow so the velocities are not reduced. This system will not function to slow the flow velocities down.

Response to Comment: This detail is per the StormTech installation requirements.

LANDSCAPE PLANS (3 SHEETS):

94. Based upon the landscape plan, there do not appear to be any available areas for the stockpiling of snow which would not adversely affect the proposed plantings. There are no open areas with direct access to any of the internal driveways where snow could be stockpiled.

<u>Response to Comment:</u> Snow is expected to be stockpiled west of Building 6. Plans will be updated as needed.

95. It is important to note that deicing agents will cause mortality of the trees and shrubs proposed on this plan.

<u>Response to Comment:</u> Deicing alternatives that are environmentally friendly can be explored as alternatives. Plantings that do not survive will have to be replaced in kind.

STORMWATER REPORT:

GENERAL COMMENTS ON OVERALL DESIGN:

- 96. As this site is in the Groundwater Protection Overlay District, all non-point source pollutants must be significantly reduced prior to introduction into the ground. These pollutants include Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN), Zinc (Zn) as an indicator for other metals, and Total Petroleum Hydrocarbons (TPH). The CT DEEP has a goal of reducing postdevelopment TSS loads by 80%. This goal was established back in 2004 when the 2004 Storm Water Quality Manual was released. At that time, it was assumed that other non-point source pollutants attached to sediment particles and thus if you trapped sediments, you would eliminate the other pollutants. In the past 20+ years, there has been a lot of research in this field which found that is not the case. When you look at pollutant removal efficiencies for any stormwater practices, you will observe that they are not the same which you would expect if simply trapping the sediment trapped all the other pollutants. The following provides a brief discussion of each pollutant and environmental impacts.
 - a. Total Suspended Solids (TSS) are fine soil particles, such as silt and clay which are dissolved in water. In excessive amounts it causes turbidity in water. The turbidity blocks light in the water column which causes reduced photosynthesis, which in turn reduces the oxygen levels in the water. Coarse and fine sediments can clog the gravel substrate in breeding streams thus affecting the biological community's ability to reproduce. Common sources of TSS and sediment are runoff from construction sites, winter sanding operations, atmospheric deposition, and decomposition of organic matter, such as leaves.
 - b. Phosphorus (TP) and nitrogen (TN) are commonly found in non-point runoff with the primary source being atmospheric deposition on impervious surfaces. Excessive levels of phosphorus in freshwater systems are a concern as this nutrient causes excess growth of non-native aquatic plants and algae in lakes. As a result of increased nutrient loads, toxic algae blooms are becoming more prevalent in lakes in Connecticut. These toxic algae blooms have resulted in beach closures as exposure to the algae blooms can cause adverse health issues in humans. A further problem occurs, when the algae die off, the decomposition process of organic matter removes oxygen from the water column, thus reducing oxygen levels in the water. The reduced oxygen levels in the waterbody can result in fish killings. Nitrogen, in the form of nitrate, is a direct human health hazard and an indirect hazard in some areas where it leads to a release of arsenic from sediments. As this site is in a water supply area and there are downgradient individual wells, the release of nitrogen into the groundwater will cause an adverse environmental impact. While not a major concern for freshwater systems, nitrate can cause environmental impacts in tidal regions, even though the source of nitrate can be far away from coastal regions. Additional sources of nutrients are organic and inorganic fertilizers, animal manure, bio solids and failing sewage disposal systems.
 - c. Metals (Arsenic, Cadmium, Chromium, Copper, Nickel, and Zinc) in non-point source runoff are very toxic to aquatic life. The primary source of these metals is automobiles. The adverse effects of metals are far reaching for both aquatic and human health. Many metals can bio accumulate in the environment, which can affect higher living organisms. While the concentration of zinc or copper in stormwater is not high enough to bother humans, these same concentrations can be deadly for aquatic organisms. Many microorganisms in soil are especially sensitive to low concentrations of cadmium. Zinc, Copper, and Cadmium found in

non-point source runoff result from the movement and wear and tear of automobiles on our roadways. Of the above discussed metals, zinc and copper are the two metals which are found dominantly in non-point source runoff.

d. Total Petroleum Hydrocarbons (TPH) are highly toxic in the aquatic environment, especially to aquatic invertebrates. The primary sources of petroleum hydrocarbons are oil, grease drops from automobiles, gas spills, and vehicle exhaust. Polycyclic Aromatic Hydrocarbons (PAHs) are also toxic to aquatic life. PAHs can be discharged into the environment using coal tar asphalt sealants, commonly used by homeowners on residential driveways. The movement of vehicles or people walking over the sealed driveway can release dust particles containing PAH, which can then be washed off with the next rainfall into the stormwater management system. PAHs are also generated by the burning of fossil fuels and the airborne particles are then deposited by atmospheric deposition on an impervious surface, especially large flat roof areas. When it rains, the accumulations of PAHs due to atmospheric deposition are carried off in the stormwater.

<u>Response to Comment:</u> An updated pollutant loading has been provided based on these comments. Infiltration has been removed from the treatment and bioretention areas (planter beds) have been conceptually added for a portion of the roof runoff.

97. The stormwater management system relies on structural components only, all of which are considered secondary practices under the CT DEP 2004 Storm Water Quality Manual. Secondary practices are not effective at reducing non-point source pollutants in the runoff.

<u>Response to Comment:</u> Bioretention and planting beds can be added to treat some of the roof. Modifying the soil under the stormwater chambers can be explored to provide primary treatment or limit infiltration rates.

98. As this site is in a Groundwater Protection Overlay District (GPOD) it is imperative that non-point source pollutants are significantly reduced prior to entering the soil. The stormwater management system as proposed does not reduce many of non-point source pollutants sufficiently to prevent adverse impacts to the groundwater on the site.

<u>Response to Comment:</u> An updated pollutant loading has been provided based on these comments. Infiltration has been removed from the treatment and bioretention areas (planter beds) have been conceptually added for a portion of the roof runoff. Modifying the soil under the stormwater chambers can be explored to provide primary treatment or limit infiltration rates.

- 99. The StormTech system uses an Isolator row which is simply one row of StormTech units wrapped by geotextile. The StormTech system is the same as the isolator system used by Cultec. The Isolator rows are designed to trap sediment on the filter fabric surface, particularly on the bottom of the system. However, any trapped sediment on top of the fabric layer can be resuspended by new flows entering the Isolator row if maintenance is not properly performed. The University of New Hampshire Stormwater Center (UNHSC) tested the Stormtech Isolator Row at their facility and found that it would remove the following percentages of certain pollutants.
 - a. Total Suspended Solids 80%
 - b. Total Petroleum Hydrocarbons 88%
 - c. Zinc 55%

Response to Comment: Isolator rows have been added to the pollutant loading calculations.

100. In this design, the Isolator Row is located after an off-line hydrodynamic separator and thus the above removal percentages will be less than those shown for the simple reason as a pollutant is reduced in the first practice and becomes cleaner, it is more difficult to further reduce the pollutant load. The Isolator Row does not reduce nitrogen. Based upon the UNHSC testing.

<u>Response to Comment:</u> Based on conservation with the third party engineer, the Hydrodynamic Separators do not provided significant stormwater treatment as part of the design and will likely be eliminated. The isolator rows provide adequate treatment without the HDS.

101. According to the manufacturer, the Barracuda S4 separator has a TSS removal percentage of 50% based upon testing by NJDEP. The Barracuda S4 does not reduce phosphorous, nitrogen, hydrocarbons, or metal loads.

Response to Comment: The HDS structures will be removed from the design.

- 102. Section 11-S12 of the CT DEP 2004 Storm Water Quality Manual concerns infiltration practices. In addition to this section of the 2004 Manual, the requirements found in Section 11-P3 (Infiltration Practices) must also be met. This section has the following requirements for Infiltration practices such as those proposed here:
 - a. Siting: Need to be located for easy maintenance and access. <u>Only 6" diameter inspection</u> ports are proposed on the many StormTech units which are not adequate to provide <u>maintenance of these systems</u>.

<u>Response to Comment:</u> The inspection port is for inspection only. Access to the system for maintenance is from the proposed manholes.

b. Siting: They should only be used in soils having suitable infiltration capacity (as confirmed through field testing) and for land uses, activities, or areas that do not pose a risk to groundwater contamination. <u>First, no field infiltration testing consisting of double ring infiltration tests have been done for the stormwater management systems. Secondly, non-point source pollutants are not being adequately reduced prior to introduction into the groundwater on the site.</u>

<u>Response to Comment:</u> Modifying the soil under the stormwater chambers can be explored to provide primary treatment or limit infiltration rates.

c. Pre-treatment: "Appropriate pretreatment (e.g., oil/particle separator, hydrodynamic device, catch basin inserts, or other secondary or primary treatment practices) should be provided to remove sediment, floatables, and oil and grease. <u>An off-line hydrodynamic separator is proposed; however, it will not remove significant amounts of hydrocarbons, or metals and does not remove nitrogen and phosphorous loads</u>.

<u>Response to Comment:</u> Deep sump hooded catch basins and isolator rows are provided as pretreatment for all non-roof impervious areas.

d. Design Volume: "Underground infiltration structures should be designed as off-line practices to infiltrate the entire water quality volume. A flow bypass structure should be located upgradient of the infiltration structure to convey high flows around the structure." <u>The proposed</u> <u>stormwater management system using StormTech units does not meet this requirement as all runoff is being directed to the infiltration system, not just the full Water Quality Volume.</u>

<u>Response to Comment:</u> The underground structures are designed to manage both water quality treatment and to manage peaks discharges for the larger storm. Isolator rows and diversion manholes are designed to provide pretreatment of the first flush.

e. Infiltration Rates: "The minimum acceptable field measured soil infiltration rate is 0.3 inches per hour. Field-measured soil infiltration rates should not exceed 5.0 inches per hour...." <u>As no double ring infiltration tests have been conducted by the applicant which are at or below the bottom of the proposed StormTech, this requirement has not been met.</u>

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer. Modifying the soil under the stormwater chambers can be explored to provide primary treatment or limit infiltration rates.

- 103. Section 11-P3 of the CT DEP 2004 Storm Water Quality Manual requires the following criteria be met:
 - a. Infiltration rates need to be reduced to 50% of the observed rate to provide a factor of safety. <u>The design does not meet this criteria.</u>

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer.

b. For infiltration trenches (underground storage units meet this criteria), one field test and one deep test pit should be performed per 50 linear feet of trench. The design should be based on the slowest rate obtained from the infiltration tests performed at the site. <u>This requirement has not been met by the applicant</u>.

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer.

c. Infiltration practices should not be used to infiltrate runoff containing significant concentrations of soluble pollutants that could contaminate groundwater, without adequate pretreatment. <u>An off-line hydrodynamic separator is proposed; however, it will not remove adequate amounts of hydrocarbons and metals which will adversely affect groundwater. Additionally, the pretreatment system does not reduce nitrogen loads which are a major concern when there are downgradient wells.</u>

<u>Response to Comment:</u> Based on conservation with the third party engineer, the Hydrodynamic Separators do not provided significant stormwater treatment as part of the design and will likely be eliminated. The isolator rows provide adequate treatment without the HDS.

d. The bottom of the infiltration facility should be located at least 3 feet above the seasonally high water table or bedrock, as documented by on-site soil testing. <u>This criteria have not been met as more comprehensive soil testing and groundwater monitoring has not been done by the applicant</u>

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer. Generally, groundwater was to be found to be lower than prior redoximorphic indicators due to a compacted subgrade and fill over from previous development.

104. A total of ten deep test holes were excavated on the site. Only one test pit is located within a footprint of a stormwater management system. This is an inadequate program of deep test holes for the stormwater management system.

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer.

105. Each underground stormwater management system must have at least one, if not two deep test holes performed within the footprint of the system.

<u>Response to Comment:</u> Soil testing has been coordinated between the peer reviewing engineer and the Town Engineer.

106. The ten deep test holes were excavated on June 26th and 27th of 2023. The groundwater contours were developed from a singular measurement to the groundwater in each test hole. It is my professional opinion that the groundwater contours provided are not valid as the testing was done at a time when groundwater levels are not at their highest level.

<u>Response to Comment:</u> Additional soil testing has been coordinated between the peer reviewing engineer and the Town Engineer. Based on coordination with the peer reviewing engineer, the redox that was previously modeled as groundwater for the groundwater contours was not indicative of the groundwater table and groundwater should be considered the bottom of the test holes. The groundwater contours shall be updated accordingly.

107. Without a valid seasonal high groundwater table, it cannot be confirmed that all the underground stormwater management infiltration systems will provide the three (3) foot vertical separation from the seasonal high groundwater table to the lowest aspect of the stormwater practices (bottom of storage unit or bottom of crushed stone, whichever is set at the lowest elevation).

<u>Response to Comment:</u> Separations shall be updated based on the revised described groundwater modifications described above.

108. Page 4: it is stated that the three bedroom units will have a two-car garage and there will be additional parking outside most of the units. All parking spaces must be shown in and out of buildings and numbered sequentially to show the maximum number of spaces provided and will also show any potential conflicts with the parking spaces.

<u>Response to Comment:</u> An additional page will be added to the planset to sequentially number parking spaces.

109. Page 11: It is stated that the maximum infiltration rate for sandy soils (5"/hr.) was used to model the existing drywells. This is not valid as you cannot assume an infiltration rate. As noted above, field double ring infiltration testing is required. Per the CT DEP 2004 Storm Water Quality Manual, double ring infiltration tests need to be done at or below the lowest aspect of the stormwater practice as this is the layer of soil where runoff will be directed. Also, only 50% of the slowest observed infiltration rate shall be used in the hydrologic model.

<u>Response to Comment:</u> Additional soil testing has been coordinated between the peer reviewing engineer and the Town Engineer. The existing infiltration rate will be updated if required.

110. Page 12 & 13: The post development drainage areas are described on these pages. It is stated that PR-3A and PR-3B are roof drains directed to an underground infiltration system with no pretreatment. While the town engineer previously did not require pretreatment of the roof runoff, it is important to bring up the following point. 40% of the nutrient load, both nitrogen and phosphorous are the result of atmospheric deposition on impervious surfaces, so roof runoff will contain nitrogen and phosphorous. As the site is in the GPOD district, increased nitrogen loads need to be reduced prior to being introduced to the ground. Nitrogen moves easily and quickly in sandy soils and will

migrate downgradient and can affect the water quality of individual wells and public water supply wells. It is my professional opinion that the roof runoff needs to be treated to reduce nutrient loads, particularly nitrogen prior to being directed in the soil.

<u>Response to Comment:</u> Roof runoff shall be treated to the greatest extent practicable. Please also see memorandum regarding nitrogen reduction from pre- to post-development and pollutant loading calculation.

111. Page 13: Post development area P-1 includes most of the site which is directed to multiple underground stormwater management systems. Modeling of all the system as one large system is not correct even though the systems are all set at the same elevation as separate and distinct drainage areas are directed to each of the underground systems. Each system must be modeled separately for the specific drainage area directed to it. The following two comments illustrate this point.

<u>Response to Comment:</u> Modifying the HydroCAD model can be investigated if appropriate and feasible. If not, calculations shall be shown that the different sections on the system are free flowing between them and can be modeled together.

112. Stormwater System E only receives runoff from the building roofs with no pretreatment.

Response to Comment: Correct.

113. Stormwater System D only receives runoff in the driveway between Buildings #1 and #2 only and has pretreatment.

<u>Response to Comment:</u> Correct. This area is also directly adjacent to Stormwater Area C so stormwater will be free flowing through the stone between areas C+D.

114. No consideration or discussion has been provided concerning the infiltration of most of the rainfall on the site and whether this will increase the groundwater table under the site, or potentially saturate the soils under the building foundations which could lead to structural issues.

<u>Response to Comment:</u> Groundwater separation has been maintained. With the high infiltration rates found in the soils testing, water would be expected to infiltration quickly and would not be expected to be an issue. A geotechnical and/or structural engineer shall be coordinated with for adequate subgrade under the buildings.

WATER QUALITY ASPECTS:

115. Page 14: It is stated on the bottom of this page the weir in the bypass manhole will direct only 25% of the Water Quality Volume (WQV) to the isolator row. This is not correct. As both the Barracuda S4 and the StormTech Isolator Row are flow through treatment systems, the bypass manholes must directed the full Water Quality Flow (WQF) to both systems. Off-line pretreatment systems must be sized using the WQF which is a flow rate based upon the full WQV. This requirement will likely affect the proposed pretreatment systems.

<u>Response to Comment:</u> This is not correct and shall be clarified accordingly. The water quality flow in sized based on the modified curve number method described in the 2004 CT Stormwater Quality Manual with is based on 1 inch of rainfall. Additional per the CT Stormwater Quality Manual, pretreatment needs to be designed for 25% of the water quality volume therefore the isolator rows are designed to statically store 25% of the water quality volume.

116. All the notes found on pages 16 to 22 must be part of the construction narrative in the plan set.

<u>Response to Comment</u>: Operation and maintenance notes modified for the plan are provided on sheet C-1 of the planset.

- 117. The tests holes performed on June 26-27, 2023 are not sufficient for the design of the stormwater management system for this project. There are not enough holes and the soils are questionable for infiltration.
 - a. Test #1 55" of fill, then only 45" deep in the original soil
 - b. Test #2 18" of fill, then only 78" deep in the original soil
 - c. Test #3 18" of fill, then only 78" deep in the original soil
 - d. Test #4 11" of fill, then only 37" deep in the original soil
 - e. Test #5 28" of fill, then only 32" deep in the original soil
 - f. Test #6 36" of fill, then only 72" deep in the original soil
 - g. Test #7 45" of fill, then only 51" deep in the original soil
 - h. Test #8 96" of fill only, did not extend into original soil
 - *i.* Test #9 32" of fill, then only 64" deep in the original soil
 - *j.* Test #10 18" of fill, then only 78" deep in the original soil

<u>Response to Comment</u>: Additional soil testing has been coordinated between the peer reviewing engineer and the Town Engineer.

- 118. Redoximorphic Features (mottling) is observed in several of the test pits as stated below.
 - a. Test Pit #2: 24" below original ground surface
 - b. Test Pit #3: at the original ground surface below the fill layer
 - c. Test Pit #5: 6" below original ground surface
 - d. Test Pit #9: 15" below original ground surface
 - e. Test Pit #10: 28" below original ground surface

<u>Response to Comment:</u> This is what was assumed as groundwater depths originally. Based on correspondence with the peer reviewing engineer, these mottling features are not expected to be actual groundwater indications and the bottom of the test pits should be used and the assumed groundwater table. The analysis shall be updated accordingly.

119. Based upon the presence of mottling at these depth, the seasonal high groundwater table could be quite shallow on the site, thus the soils do not appear suitable for infiltration of runoff.

<u>Response to Comment:</u> Based on correspondence with the peer reviewing engineer, these mottling features are not expected to be actual groundwater indications and the bottom of the test

pits should be used and the assumed groundwater table. The analysis shall be updated accordingly.

120. As the bottom of the stormwater management systems are at 102.5' (bottom of stone), all test pits need to be at least four (4) foot lower than this elevation to confirm no bedrock within three (3) feet of the bottom of the stone layer and a three (3) foot vertical separation to the seasonal high groundwater level.

<u>Response to Comment:</u> Additional soil testing has been coordinated between the peer reviewing engineer and the Town Engineer. Generally, groundwater was to be found to be lower than prior redoximorphic indicators due to a compacted subgrade and fill over from previous development. Separations shall be reviewed to confirm the system meets applicable requirements.

121. An evaluation of the location and elevations for many of the stormwater management systems showed that they will be located fully or partially in structural fill which will affect their functionality as infiltration practices. It is highly recommended that cross sections in both a north/south and east/west orientation through all the proposed stormwater management systems be provided for review by the commission and the town's consultants. The cross sections need to show existing and proposed grades, the proposed stormwater practices, the depth to seasonal high groundwater and bedrock which result from a complete soil test program.

<u>Response to Comment:</u> Cross sections can be prepared if required by the Town Engineer and/or Board.

122. There are no detailed review comments on the routing of the post-development runoff it was stated above that it was inappropriate to model the stormwater systems as one big system as runoff from different impervious area are directed to variable sections of the system.

<u>Response to Comment:</u> Modifying the HydroCAD model can be investigated if appropriate and feasible. If not, calculations shall be shown that the different sections on the system are free flowing between them and can be modeled together.

123. In Appendix C-5, there is a routing diagram for Pretreatment Areas 1 to 4, plus Modified PR-1. These areas are not defined on the watershed maps. For all five areas, no impervious area is called out. A better explanation and mapping of these areas need to be provided or they should be eliminated from the report.

<u>Response to Comment:</u> These areas are used for water quality flow calculations and resulting bypass weir elevations based on the method described in the 2004 Stormwater Quality Manual. Additional narrative in the Stormwater Report shall be added to better describe the calculations and relevant appendices.

124. For the sizing of the Barracuda S4 units, the full calculation for converting the WQV to the WQF needs to be provided. There are more steps to this conversion than provided by the applicant.

<u>Response to Comment:</u> Calculations for the water quality flow are provided on the Proposed Stormwater Pretreatment Table (Appendix D.1) and the modified HydroCAD analysis based on the modified curve number (Appendix C.5) are included in the Stormwater Report. Additional text can be added to the report to describe these calculations.

125. The applicant uses the pollutant concentrations for commercial land use for the developed condition. This is not correct, the concentrations for residential need to be used which are higher than those of a commercial use. <u>Response to Comment:</u> The pollutant loading shall be updated using values for residential use for proposed conditions.

126. The analysis did not determine the pollutant loads for metals and hydrocarbons. These need to be added to this analysis for post-development conditions.

Response to Comment: The pollutant loadings have been updated to include Zn and TPH.

127. The use of Schueler Equation is an acceptable approach to determining the non-point source pollutant loads for this site.

Response to Comment: OK.

128. Deep sump catch basins with a hooded outlet will only have a TSS removal rate of 9%, not 25% based upon monitoring data from University of New Hampshire Stormwater Center.

<u>Response to Comment:</u> This has been added to the pollutant loading table. The 25% is from an excerpt from the RIDEM stormwater requirements. The Town Engineer previously indicated that we could use other guidance documents to preform the analysis since the 2004 CT Stormwater Quality Manual and Town stormwater ordinances do not describe how the calculation is performed.

129. As noted above in numerous comments, there must be a high degree of pollutant reduction prior to being directed to an underground infiltration practice to prevent groundwater contamination. While TSS loads will be reduced, nutrients and metals have not even been evaluated which will be present on the site due to the amount of vehicles which will be on or using the site. The CT DEP 2004 Storm Water Quality Manual, strongly suggests that underground infiltration practices be used to fully infiltrate the Water Quality Volume only. In this case, the applicant is proposing to infiltrate most if not all the rainfall which falls on the site up to the 100-year rainfall event.

<u>Response to Comment:</u> An updated pollutant loading has been provided based on these comments. Infiltration is not accounted for in the analysis.

130. In the pollutant loading analysis, pollutant removal amounts for each pollutant and each stormwater practice (deep sump catch basin, off-line hydrodynamic separator, off-line Isolator Row) must be provided and then a summary provided. Removal rates for Infiltration systems shall not be used in the analysis as the site in located in the GPOD district and the runoff must be as clean as possible prior to entering the infiltration systems.

<u>Response to Comment:</u> An updated pollutant loading has been provided based on these comments. Infiltration is not included in the analysis.

131. If there is well drained sand and gravels on the site, runoff directed to these soils moves very quickly through the soils, so no treatment is provided.

<u>Response to Comment:</u> An updated pollutant loading has been provided based on these comments. Infiltration is not included in the analysis.

- 132. While I concur with the concept of reducing removal efficiencies in series, it is not appropriate to use the same reduction for all pollutants from a given system. Based upon discussions with researchers at water resource and LID conferences, the following approach is strongly recommended which is more appropriate than a uniform reduction per practice:
 - a. The removal efficiency of a practice for each pollutant must be considered separately.

If the removal efficiency of the first system for a pollutant is less than 20%, then the full removal efficiency for the second practice for that pollutant in series may be applied to the remaining load for that individual pollutant.

- b. If the removal efficiency of the first system for a pollutant is between 21% and 50%, then the removal efficiency for the second practice for that pollutant shall be 75% of the stated removal efficiency for the second practice.
- c. If the removal efficiency of the first system for a pollutant is between 51% and 80%, then the full removal efficiency for the second practice for that pollutant shall be 50% of the stated removal efficiency for the second practice.
- d. If the combined calculated removal efficiency of the first two practices for a pollutant is less than 20%, then the removal efficiency for the third practice for that pollutant shall be 80% of the stated removal efficiency of the third practice.
- e. If the combined calculated removal efficiency of the first two practices for a pollutant is between 21% and 50%, then the removal efficiency for the third practice for that pollutant shall be 65% of the stated removal efficiency of the third practice.
- f. If the combined calculated removal efficiency of the first two practices for a pollutant is between 51% and 80%, then the removal efficiency for the third practice for that pollutant shall be 45% of the stated removal efficiency of the third practice.

<u>Response to Comment:</u> These series modifier have been incorporated into the pollutant loading analysis.

NORTHEAST WATER SOLUTIONS, INC. REPORT:

133. Groundwater recharge requirements are defined in the CT DEP 2004 Storm Water Quality Manual and are based upon actual soil types of the site and not the regional hydrologic setting.

Response to Comment: Test pit data was used to confirm the soil types.

134. It is stated on page 10 that the site is located slightly downstream of the Westerly wellfields. However, the movement of groundwater in sand and gravel soils (if present on the site) does not always follow surface topography.

<u>Response to Comment:</u> The statement is saying that the site is hydrologically downgradient of the Westerly wellfields. This does not provide any indication of the direction of groundwater flow under sustained pumping conditions.

- 135. Table 3-2 provides the pollutant removal percentage for this design. The results are stated below.
 - a. Total Suspended Solids 69%
 - b. Total Phosphorous 23%
 - c. Total Nitrogen 3.8%

<u>Response to Comment:</u> This table has been modified as attached.

136. The TSS reduction does not meet the CT DEP goal of 80% removal. Additionally, the nitrogen reduction is minimal which is a significant concern as the site is in the GPOD.

<u>Response to Comment:</u> The stormwater area that manages proposed pavement impervious areas provided greater than 80% TSS removal. Roof areas and untreated areas do not have this level of treatment which brings the overall average down.

I trust that these responses adequately address the comments received. Should you have any additional questions or concerns, please do not hesitate to contact me at 860-629-6500.

Sincerely,

Sergio F. Cherenzia, P.E. President

CC: Clifton J. Iler, AICP, Town Planer

Memo

To: Sergio Cherenzia, PE
From: Robert F. Ferrari, PE
CC: Gene Arganese
Date: February 12, 2024
Re: Beachway Estates Report Addendum: Evaluation of Potential Impacts & Mitigation – GPOD; Nitrogen Reduction

The purpose of this memo is to provide additional response to Engineering Peer Review Comments prepared on behalf of the Town of Stonington, regarding the subject project.

The peer review comments and subsequent discussion included the opinion that the proposed site improvements had minimal beneficial impact regarding reduction of nitrogen inputs to the groundwater aquifer underlying the project site. These comments focused upon stormwater treatment, and did not include any consideration of the elimination of the nitrogen load associated with sanitary wastewater discharged to the existing on-site wastewater treatment and disposal system (OWTS).

The project site has a long-standing restaurant/bar/nightclub facility that includes a kitchen, staff restrooms and public restrooms.

- The kitchen wastewater is disposed via a 1,000-gallon grease trap which overflows to a drywell.
- The sanitary wastewater generated on-site is disposed via a 2,000 gallon septic tank discharging to a leachfield.

A reasonable estimation of the sanitary wastewater generation and the associated nitrogen load can be made based upon the following assumptions:

(2,000 gpd) / (1.5) = 1,333 gpd

45 mg/L

- Restaurant/Bar/Club Occupancy: 335
- Restaurant/Bar/Club Staff: 15
- Operation: 6 days per week, 50 weeks per year
- Average Daily Sanitary Wastewater Vol.:
- Average Raw Wastewater Total N:

• Average Septic Tank Effluent Total N: 35 mg/L

• No nitrogen load in Kitchen wastewater (through grease trap)

The estimate of the historical, on-site, sanitary wastewater total nitrogen load to the aquifer, from conventional septic system treatment and leachfield return flow, is the following:

Existing Raw Sanitary Wastewater Total N Load:

 $(1,333 \text{ gpd}) \times (45 \text{ mg/L}) \times (8.34) \times (10^{-6}) = 0.500 \text{ lb./day}$

(0.500 lbs/day) x (300 day/year) = 150 lb./year

Existing Raw Sanitary Wastewater Total N Load to Aquifer:

 $(1,333 \text{ gpd}) \times (35 \text{ mg/L}) \times (8.34) \times (10^{-6}) = 0.389 \text{ lb./day}$

 $(0.389 \text{ lbs/day}) \ge 116.7 \text{ lb./year}$

A comparative evaluation of the Site Total Nitrogen Load to Aquifer (refer to Stormwater Report Calculations) is summarized in the table below.

	Existing Conditions	Proposed Conditions
Stormwater Total N	54.3 lb./yr.	62.3 lb./yr.
Sanitary Wastewater Total N	116.7 lb./yr.	0
Kitchen Wastewater Total N	Assume 0	0
TOTAL Annual Total N to GPOD	171.0 lb./yr.	62.3 lb./yr.
Net Total N Reduction		63.6 %

This calculation is believed to be extremely conservative for the following reasons:

- 1. The calculation assumes the kitchen wastewater has zero total nitrogen;
- The calculation assumes the raw sanitary wastewater total N concentration is 45 mg/L. Manufacturers of OWTS systems with nitrification/de-nitrification capability typically assume total N loading of 50 – 75 mg/L for residential/commercial applications. Experience by the writer has demonstrated raw sanitary wastewater total nitrogen loading of up to 90 mg/L, with annual average total N on the order of 45 – 50 mg//L;
- 3. The calculation assumes a sustained, conventional septic tank total N reduction of 10 mg, resulting in a net 35 mg/L total N discharge to the underlying aquifer. During periods of higher total N load in the raw wastewater, it is unlikely that a conventional OWTS septic system would sustain an effluent total N of 35 mg/L.

Pollutant Loading Rates, C

Pollutant,	High Density	Commorcial	Undov
mg/l	Residential	Commercial	ondev.
TSS	60	58	51
TP	0.3	0.25	0.10
TN	2.1	2.6	1.5
Zn	0.218	0.156	0.0
ТРН	1.5	3.0	0.0
DIN	0.344	0.324	0.215

Notes:

1. Pollutant Loading Units: lbs per year

2. Pollutant Loading = $P \times Pj \times (Rv/12) \times C \times A \times 2.72$ (P = 47 in, Pj = 0.9, Rv = 0.05 + 0.009 × Percent Impervious)

3. Wooded area is considered undeveloped.

	Subcatchment Area	EX-1		EX-2		EX-3		Total
	Land Use	Com.	Undev.	Com.	Undev.	Com.	Undev.	
	Area, ac	1.13	1.59	2.47	0.31	0.34	0.73	
Site Info	Imp. Area, ac	0.40	0.00	1.69	0.00	0.03	0.00	
	Percent Imp.	35.2%	0.0%	68.5%	0.0%	8.7%	0.0%	
	Rv	0.367	0.050	0.666	0.050	0.128	0.050	
	TSS	231.06	38.98	913.65	7.68	24.19	17.78	
Untropted	ТР	1.00	0.08	3.94	0.02	0.10	0.03	
Dellutant	TN	10.36	1.15	40.96	0.23	1.08	0.52	
Pollutant	Zn	0.62	0.00	2.46	0.00	0.07	0.00	
Loading	ТРН	11.95	0.00	47.26	0.00	1.25	0.00	
	DIN	1.29	0.16	5.10	0.03	0.14	0.07	
	TSS	270.04		921.33		41.97		1,233.34
Untroated	ТР	1.07		3.95		0.14		5.16
Pollutant	TN	11.50		41.18		1.61		54.29
	Zn	0.62		2.46		0.07		3.14
Loading	ТРН	11.95		47.26		1.25		60.46
	DIN	1.46		5.14		0.21		6.80

Existing Development Pollutant Loading

Proposed Development Pollutant Loading

	Subcatchment	00	1	4 חח	PR-1 Roof PR-1 Roof		Roof	-				Tetel
	Area	PR	-1	PK-1		Bioretention		rn-2		F N-SATSB		iotai
	Land Use	Res.	Undev.	Res.	Undev.	Res.	Unde.	Res.	Undev.	Re	es.	
	Area, ac	2.24	1.43	0.58	0.00	0.60	0.00	1.12	0.43	0.	17	
Site Info	Imp. Area, ac	1.63	0.00	0.58	0.00	0.60	0.00	0.35	0.00	0.	17	
	Percent Imp.	72.7%	0.0%	100.0%	0.0%	100.0%	0.0%	31.4%	0.0%	100	.0%	
	Rv	0.704	0.050	0.950	0.050	0.950	0.050	0.333	0.050	0.9	50	
	TSS	907.19	34.92	314.87 0.00		330.44	0.00	215.07 10.61		91.66		
Untreated	TP	4.54	0.07	1.57	0.00	1.65	0.00	1.08	0.02	0.4	46	
Dollutant	TN	31.75	1.03	11.02	0.00	11.57	0.00	7.53	0.31	3.	21	
Pollutant	Zn	3.30	0.00	1.14	0.00	1.20	0.00	0.78	0.00	0.	33	
Loading	TPH	22.68	0.00	7.87	0.00	8.26	0.00	5.38	0.00	2.29		
	DIN	5.20	0.15	1.81	0.00	1.89	0.00	1.23	0.04	0.	53	
	TSS	942	.11	314	.87	330	.44	225	.68	91	.66	1,904.77
Untreated	TP	4.	50	1.57		1.65		1.10		0.4	46	9.39
Pollutant	TN	32.78		11.02		11.	.57	7.8	84	3.	21	66.41
Funding	Zn	3.	30	1.:	14	1.2	20	0.1	78	0.	33	6.76
LOADING	TPH	22	.68	7.87		8.2	26	5.3	38	2.	29	46.48
	DIN	5.	35	1.81		1.8	1.89 1.2		1.28 0.53		53	10.85
	Treatment	Deep Sump	Catch Basins	Untre	eated	Biorete	ention	Untreated Untreated		eated		
		Treatmont	Series	Treatmont	Series	Treatmont	Series	Treatmont	Series	Treatmont	Series	
		rreatment	Modifier	rreatment	Modifier	rreatment	Modifier	rreatment	Modifier	rreatment	Modifier	
	TSS	9%	100%	-		82%	100%	-	-	-	-	
Treatment	TP	0%	100%	-		25%	100%	-	-	-		
	TN	0%	100%	-		36%	100%	-	-	-		
	Zn	0%	100%	-		65%	100%	-		-		
	TPH	14%	100%	-		65%	100%	-		-	-	
	DIN	0%	100%	-		41%	100%	-			-	
		Pollutant	Removal	Pollutant	Removal	Pollutant	Removal	Pollutant	Removal	Pollutant	Removal	
		i onatant	Efficiency	ionatant	Efficiency	i onatant	Efficiency	ionatant	Efficiency	i onutant	Efficiency	
Tractor	TSS	857.32	9.0%	314.87	0.0%	59.48	82.0%	225.68	0.0%	91.66	0.0%	1,549.02
Dellutert	TP	4.60	0.0%	1.57	0.0%	1.24	25.0%	1.10	0.0%	0.46	0.0%	8.97
Pollutant	TN	32.78	0.0%	11.02	0.0%	7.40	36.0%	7.84	0.0%	3.21	0.0%	62.25
Loading	Zn	3.30	0.0%	1.14	0.0%	0.42	65.0%	0.78	0.0%	0.33	0.0%	5.97
	ТРН	19.50	14.0%	7.87	0.0%	2.89	65.0%	5.38	0.0%	2.29	0.0%	37.94
	DIN	5.35	0.0%	1.81	0.0%	1.12	41.0%	1.28	0.0%	0.53	0.0%	10.07
	Treatment	Isolato	or Row	Untre	eated	Untre	Untreated Untreated		Untre	eated		
		_	Series	-	Series	_	Series	-	Series	- .	Series	
		Treatment	Modifier	freatment	Modifier	Treatment	Modifier	freatment	Modifier	freatment	Modifier	
	TSS	80%	100%	-		-	•	-	•		-	
Treatment	ТР	49%	100%	-				-				
	TN	0%	100%	-		-		-		· ·		
	Zn	55%	100%	-		-		-		-		
	ТРН	88%	100%	-				-				
	DIN	0%	100%								-	
		270	Removal		Removal		Removal		Removal		Removal	
		Pollutant	Efficiency	Pollutant	Efficiency	Pollutant	Efficiency	Pollutant	Efficiency	Pollutant	Efficiency	
	TSS	171.46	81.8%	314.87	0.0%	59.48	82.0%	225.68	0.0%	91.66	0.0%	863.16
Treated	ТР	2 35	49 0%	1 57	0.0%	1 74	25.0%	1 10	0.0%	0.46	0.0%	6 72
Pollutant		2.35	0.0%	11 02	0.0%	7.40	26.0%	7 8/	0.0%	2 21	0.0%	62.25
Loading	7~	1 40		1 1 4	0.0%	7.40	SU.U/0	0.79	0.0%	0.22	0.0%	1 16
-	2n	1.48	55.0%	1.14	0.0%	0.42	05.0%	0.78	0.0%	0.33	0.0%	4.10
	ТРН	2.34	89.7%	7.87	0.0%	2.89	65.0%	5.38	0.0%	2.29	0.0%	20.77
	DIN	5.35	0.0%	1.81	0.0%	1.12	41.0%	1.28	0.0%	0.53	0.0%	10.07

 Existing
 Pr Ur

 TSS
 1,233.34
 1

 TP
 5.16
 1

 TN
 54.29
 2

 Zn
 3.14
 1

 TPH
 60.46
 0

 DIN
 6.80
 1

Summary

		-	
roposed	Proposed	Change from	Removal Effeciency
ntreated	Treated	Existing	(Untreated to Treated)
1,904.77	863.16	-370.18	55%
9.39	6.72	1.55	28%
66.41	62.25	7.95	6%
6.76	4.16	1.02	38%
46.48	20.77	-39.69	55%
10.85	10.07	3.27	7%

