INLAND WETLANDS COMMISSION
REGULAR MEETING
MINUTES

February 28, 2024 @ 7:00 p.m.
Multi-Purpose Room #3, Newtown Community Center
8 Simpson Street, Newtown CT

These Minutes are subject to approval by the Inland Wetland Commission

Present: Sharon Salling, Mike McCabe, Scott Jackson, Kendall Horch, Mark D'Amico, Suzanne Guidera, Craig Ferris

Staff Present: Steve Maguire, Deputy Director of Land Use, Dawn Fried, Clerk

Ms. Salling opened the meeting at 7:00 p.m.

Ms. Salling welcomed the public and gave an overview of the public hearing guidelines.

PENDING APPLICATION

IW Application #24-01 by Jaime Zhuno, property located at 123 Hanover Road, for a pond dredging and drainage work.

Mr. Zhuno presented his revised map.

Ms. Horch asked for confirmation that the lawn will not go past the wetland demarcation line. Mr. Zhuno confirmed.

Mr. D'Amico asked where the outlet of the pond will be located. Mr. Zhuno stated 20 feet into the woods. There will be no change downstream.

With no further questions Mr. McCabe moved to approve IW Application #24-01 by Jaime Zhuno, with standard conditions A, B, C, D, E, F, O and P. The approved plans are 'Improvement Location Survey, prepared for Luis Antonino Clavijo, 123 Hanover Road", dated received February 27, 2024 and all supporting documents. Mr. Ferris seconded. All in favor. IW Application #24-01 was approved.

PUBLIC HEARING

IW Application #23-31 by Castle Hill Real Estate Holdings, LLC, property located at 20 & 60 Castle Hill Road, to construct a cluster-home community consisting of 117 single family units, community center and associated site improvements.

Todd Ritchie, PE, SLR Consulting, Cheshire, CT, stated tonight's meeting will be a review of SLR's responses from the third party review, and the reports from Trinkaus Engeering on behalf of the Newtown Conservation Coalition and Newtown Forest Association.

Applicant, George Trudell, Castle Hill Real Estate Holdings, LLC, 48 S. Main Street, Newtown CT, stated the independent review by the engineering firm Tighe & Bond, requested by the Commission, has been completed. SLR has submitted responses to Tighe & Bond and Tighe & Bond has responded back, for the record. Mr. Trudell stated they have also received two reports from Trinkaus Engineering requested by Newtown Forest Association and Newtown Conservation Coalition, which SLR has also responded to and have been submitted to the Commission for review.

Mr. Trudell stated they are restricting the conservation area further than what is required by the Borough Zoning Regulations. The report has been submitted into the record (see attached).

Mr. Ritchie read his professional qualifications for the record (see attachment).

Mr. Ritchie stated the revised drainage report & site plans and the updated comments & responses have been submitted to the Commissioin.

Mr. Ritchie reviewed the high points from:

- SLR responses to Tighe & Bond (see attached).
- SLR responses to Trinkaus Engineering on behalf of Newtown Conservation Coalition (see attached).
- SLR responses to Trinkaus Engineering on behalf of the Newtown Forest Association (see attached).

Megan Raymond, Principal Soil Scientist, SLR Consulting, Cheshire, CT, read her professional qualifications for the record (see attachment).

Ms. Raymond reviewed the document titled "Low Impact Development (LID) Approaches to the Castle Hill Village Development site Design" (see attached).

Mr. Ferris asked for confirmation that SLR has accepted or have made changes to address all of Tighe and Bond's concerns. Mr. Ritchie stated that is correct.

Mr. Ferris stated the direct wetland impacts are minor. Mr. Ferris is concerned with the indirect impacts. Mr. Ferris asked SLR if they are convinced that no groundwater or hydrologic resources will be diverted from the wetlands and whether the wetlands will be maintained after the project is completed. Ms. Raymond stated yes, that is what she thinks. Ms. Raymond stated there will be no adverse impacts of wetlands and the maintenance of the hydrology on site will allow the wetlands to remain as they exist today.

Mr. D'Amico asked about a saturation area in the northwest corner of the site. Ms. Raymond stated all of the areas with poorly drained soils have been mapped as poorly drained. There are

certain features like seasonal ponding and small steeps that were not mapped. Ms. Raymond stated puddles are not wetlands or watercourses. She is confident that the systems marked as wetland and watercourses on the map are reflective of the conditions on the site.

Mr. D'Amico stated he would appreciate Tighe & Bond's final response to SLR's last response.

Mr. D'Amico noted that at the last meeting there was a request to have the entire parcel reviewed for wetlands. Mr. D'Amico asked if a wetland review or a revised plan has been included. Ms. Raymond stated she took another look at the area on top of the ridge line. The details of her observations were added to a comment letter. There were no changes to the initial findings.

Mr. D'Amico would like to have the gross calculation of wetlands for the entire property. Mr. Ritchie stated the determination of density is under the Borough Zoning regulations and is not the IWC purview. Mr. Ritchie stated you would need 30 acres of wetlands to exceed the density limitation for 117 units, there are only 4 acres of wetlands on site.

Mr. D'Amico asked if any runoff from 20 Castle Hill would have impacts to 60 Castle Hill. Mr. Ritchie stated no, the drainage from 20 Castle will not cross over the ridgeline into the lake.

Mr. D'Amico asked if any feasible alternative plans have been considered. Mr. Ritchie stated they submitted alternative plans at the last meeting. The impacted wetland area is .05 acres, which consists of two crossings.

Mr. Ferris asked the applicant if it would be safe to say that reasonable and prudent alternatives were part of the comments to Tighe & Bond. Mr. Ritchie stated absolutely, every time they make a change they consider that to be a feasible, prudent alternative.

Ms. Horch asked the applicant to point out the added vehicle gate on the site plans. Mr. Ritchie pointed out the gate, the berm and the basin near the driveway.

Ms. Horch noted the yard drain details were changed to show 4-ft sumps. Ms. Horch asked if the catch basin details on the map were changed as well. Mr. Ritchie noted the catch basins details had not been updated, the sumps were still at 24 inches. They will update the plans.

Ms. Horch would like to add a condition of approval for the completion of test pits in the basements before building approvals. Ms. Horch asked what will happens if/when you hit water and what is the plan. Mr. Ritchie does not anticipate deeper groundwater levels. Ms. Horch stated if you hit groundwater you shouldn't build the basement or you should build above the groundwater line.

Ms. Horch would like the original wetland application be updated to show the recalculated wetland numbers. She would like the numbers on the plans, in the report and on the application to be accurate.

Public

Dave Ackert, 6 Cider Mill Road – Mr. Ackert is representing the Newtown Conservation Coalition. He thanked the Commission for their efforts and he appreciated that the third party review was required. He stated that the Newtown Conservation Coalition has hired Trinkaus Engineering, a low-impact sustainable developer. Mr. Ackert respectfully asked if the public hearing can remain open for Mr. Trinkaus to have a chance to speak.

Rhonda Lehman Davenport, 4 Phyllis Lane – Ms. Davenport asked what "long term" meant? Can the proposed development handle 100-year storms? Has the following been considered: fertilizer run-off, climate change, archeology report? Have the neighbors been interviewed? Have they explored the hydrology?

Charles Zukowski, 4 Cornfield Ridge Road – Mr. Zukowski requested more time to review the new information. Mr. Zukowski noted the third party review did not mention the effects on the wetlands across the street from the development.

Ian Appleby, 105 Walnut Tree Hill Road – Mr. Appleby has concerns with pest management, lawn care and landscape management.

Elliott Taylor, 6 Castle Hill Road – Mr. Taylor has concerns with the long term impacts from the development for future generations.

Aaron Nezvesky, 13A Phyllis Lane – Mr. Nezvesky has seen Bald Eagles on the property. He is concerned with severe impacts to wildlife, the land and the water courses. He respectfully requests the Commission to deny the application. Mr. Nezvesky read aloud Newtown's Planning of Conservation and Development.

Jason Strano, 35 Taunton Lake Drive – Mr. Strano would like to work to save the environment and the Bald Eagles. He stated the land can't go back once it's changed. He stated the soil is saturated and the 100-year storms are occurring more frequently. Mr. Strano would like to look at the future impacts of the environment and the wildlife.

Jessica Kurose, 105 Walnut Tree Hill Road – Ms. Kurose thanked everyone for their efforts protecting the wetlands. Ms. Kurose stated this project will make a big impact on the wildlife, including endangered turtles, Bald eagles and the ecosystem in Newtown. Ms. Kurose has concerns with the runoff and pollutants entering the wetlands, water quality and density of the project. Ms. Kurose would like the public hearing continued.

Ms. Salling stated it is best to continue this public hearing to allow for more time for the applicant to respond to questions.

Mr. Trudell stated due to statutory limitations, the public hearing will be closed on March 13, 2024. Mr. Trudell requested that any new information be submitted one week prior to the public hearing in order for the applicant to add responses to the record.

Mr. Trudell submitted a letter of authorization to extend the public hearing.

Ms. Salling respectfully asked the Commission and the public to submit any questions or comments to the Land Use Agency by March 6, 2024.

Mr. McCabe moved to continue IW Application #23-31 by Castle Hill Real Estate Holdings, LLC. Mr. Jackson seconded. All in favor. IW Application #23-31 by Castle Hill Real Estate Holdings, LLC will be CONTINUED to March 13, 2024 at 7:00 pm, Multi- Purpose Room #3, Newtown Community Center, 8 Simpson Street, Newtown, CT.

PUBLIC HEARING

IW Application #24-03 by The Residence at Berkshire, LLC, property located at 296 Berkshire Road, to construct a new roadway with a stream crossing for an 11 single-family cluster-home development.

Mr. McCabe read the legal notice into the record.

Attorney Stephen R. Bellis, The Pellegrino Law Firm, 475 Whitney Avenue, New Haven, CT, spoke on behalf of the applicant. Atty. Bellis gave an overview of the 10-lot subdivision located at 296 Berkshire Road. The subdivision will be comprised of 39.5 acres, which 25 acres are being donated as open space. The proposed open space will abut existing town open space and keep the project away from wetlands. Most of the project is outside of the upland review area. There is one wetland crossing. Atty. Bellis stated this project will be beneficial from the Town's perspective because it will be protecting the wetlands, as well as obtaining town open space with no adverse impact on wetlands.

Jason Edwards, Edwards and Associates, Easton, CT, gave an overview of the site and described the surrounding properties. The property sits on a 39.5-acre parcel. The property is currently zoned for R2 but the applicant is proposing to change the zone to a cluster-subdivision zone which allows for the reduction of lot sizes in exchange for open space. In this case 60% of the land will be donated. There will be a total of 7 acres of disturbance on the site, which leaves 83% undisturbed.

Wetland #1 is a possible vernal pool which will have 275-ft. of separation from the project.

Wetland #2 is the Halfway River which will have 500-ft. of separation from the project.

Mr. Edwards stated a large portion of the site drains out towards Rt. 34. The rest will drain out to the river. The drainage areas will have bio-retention basins with sand filters. The water will filter through the sand at the bottom of the basin, which will treat the water before it exits.

Mr. Edwards stated there will be a pipe crossing in a wetland at the road, which is not a high quality wetland. All of the homes will be outside of the 100-ft review area.

A conservation easement is also proposed on the wetland buffer.

Matthew Popp, Landscape Architect, Environmental Land Solutions, LLC, 8 Knight Street, Norwalk, CT, gave an overview of the landscape plan and the proposed plantings. Mr. Popp stated 70 shade trees, 10 understory trees and deer-resistant shrubs will be planted. Mr. Popp briefly reviewed Mr. Danzer's Environmental Report (see attached).

Mr. Ferris stated a sediment basin is located on the pipe line. How will that be handled?
Mr. Edwards stated the entire basin is located within the fill.

Ms. Horch stated the well for house #3 is located outside the limit of disturbance. Mr. Edwards stated they will relocate the well to the front. Ms. Horch stated the reserve for septic #9 is within the well setback. Mr. Edwards noted.

Mr. Magurie stated he appreciates the revised plans and more of the development being pulled out of the review area. Mr. Maguire stated the site is hilly and tough and the sediment and erosion control plan will have to be paramount to this development.

Ms. Guidera asked the applicant if they have seen the Trout Unlimited document. There are concerns that should be addresssed.

Public

Neil Baldino, 18 Gelding Hill Road – Representing Candlewood Valley Trout Unlimited. Mr. Baldino thanked the Commissioners for listening to their concerns. Mr. Baldino presented a PowerPoint presentation (see attached).

Charles Zukowski, 4 Cornfield Ridge Road – Mr. Zukowski noted that a stream crossing was recently put in by the Town. Mr. Zukowski asked what will happen with the proposed crossing being so close to the exiting crossing. Mr. Edwards stated they are planning on talking to P&Z on the matter. They will have to modify the plans if it changes.

Mr. Ferris moved to continue IW Application #24-03 by The Residence at Berkshire, LLC. Mr. Jackson seconded. All in favor. IW Application #24-03 by The Residence at Berkshire, LLC will be CONTINUED to March 13, 2024 at 7:00 pm, Multi- Purpose Room #3, Newtown Community Center, 8 Simpson Street, Newtown, CT.

PENDING APPLICATIONS

IW Application #23-33 by Azeez Bhavnagarwala, Muslim Society Greater Danbury, property located at 115 Mt. Pleasant Road for the extension of the east building, the extension of the foundation of the west building, milling the surface of the parking lot and to regrade 113 Mt. Pleasant for soccer field.

This application will be heard at a later date to be determined.

APPROVAL OF MINUTES

Ms. Horch moved to accept the minutes from February 14, 2024. Mr. Ferris seconded. All in favor. The minutes from February 14, 2024 were approved.

ADJOURNMENT

With no additional business, Mr. Jackson moved to adjourn. Ms. Horch seconded. All in favor. The Regular IWC Meeting of February 28, 2024 was adjourned at 9:19 pm.

Respectfully Submitted, Dawn Fried

DECLARATION OF CONSERVATION RESTRICTION

The Declarant, **CASTLE HILL REAL ESTATE HOLDINGS, LLC**., a Connecticut Limited Liability Company, with an address of 48 South Main Street, Newtown, Connecticut 06470, for the consideration of One Dollar ($1) and other valuable consideration, does hereby establish a Conservation Restriction, as defined in section 47-42a(a) of the Connecticut General Statutes, upon the following described property in the Town of Newtown, County of Fairfield, and State of Connecticut, hereinafter called the "Conservation Area" for the benefit of the **Borough of Newtown:**

The Conservation Area consists of two areas of land, each designated as "Open Space Conservation Area", being 80.7 acres and 4 acres respectively, as shown and more particularly described on that certain map entitled "_____" , which map is to be filed in the Newtown Land Records.

The Declarant agrees to include in any deed conveying all or any portion of the 136 acre Castle Hill Village property ("Development Property") and/or within any Declaration of Restrictions governing the Development Property, a reference to this Declaration of Conservation Restriction, which shall run with the land.

It is the purpose of this Conservation Restriction to ensure that the Conservation Area remains in its present natural and open condition, and to prevent any activity or use of the Conservation Area that is inconsistent with that condition or that will significantly impair or interfere with the ecological, conservation or open space values of the Conservation Area, but specifically excepting any uses permitted on the portion of Reservoir Road that is subject to an easement in favor of the Town of Newtown from the prohibitions set forth in this Conservation Restriction.

The Conservation Restriction shall apply only within the Open Space Conservation Areas. The Conservation Restriction shall include the following limitations on the use of land within the Conservation Area: no building or structure of any kind, including no sewage disposal systems, wells, driveways or utilities shall be constructed or erected, nor shall the ground be excavated, graded or otherwise disturbed, and no topsoil, sand, gravel, rocks or minerals may be removed or deposited, and no natural or existing watercourses or drainage may be altered. There shall be no trails, bike paths, picnic tables, docks, storage of boats of any kind, and there shall be no use of motorized vehicles or any other form of motorized bike, ATV or other type of vehicle. There shall be no hiking, horseback riding, biking, or any other form of active recreation within the Conservation Area. The purpose of the Conservation Restriction is to maintain the Conservation Area in its natural condition, to prevent its development, and to limit uses permitted therein.

The prohibition against structures shall include fences, subsurface structures including storm water drainage systems, and the prohibitions shall also apply to the storage of any equipment or the use or storage of any vehicles or any other storage. The prohibition on excavating, grading, or disturbing the ground shall include any changes in the topography of

the land from its present condition, filling of land, the cutting of trees (with the exception of removal of dead or dangerous trees), or any change to the natural drainage patterns. The dumping of trash, debris, ashes, sawdust or other materials, and any use of pesticides and fertilizers, in the Conservation Area is prohibited.

The owner of the land restricted by the Conservation Restriction can continue to use the Conservation Area for all purposes not inconsistent with this restriction, including limited pruning or trimming of vegetation which does not have a significant adverse impact upon the Conservation Area. The imposition of the Conservation Restriction shall not change the character of private ownership of the Conservation Area, and the general public shall not have the right to use the Conservation Area.

The Conservation Commission or its agent may enter the area restricted by the Conservation Restriction at all reasonable times for the purpose of inspecting the Conservation Area to determine compliance with the terms hereof, and shall have the authority to enforce any violation of the above stated restrictions by injunction or proceedings in equity under sections 47-42b and 47-42c of the Connecticut General Statutes, and to recover any costs in enforcing this Declaration, including attorney's fees and costs of suit, from the owner of the property containing the Conservation Area.

The Declaration of Conservation Restriction shall run with the land and shall be binding upon the Grantor/Declarant, its successors, and assigns.

In witness whereof, the grantor/declarant, has set its hand and seal this ____day of _____, 2024.

Signed, Sealed and Delivered
In the Presence of:

_____

_____

Castle Hill Real Estate Holdings, LLC

By:_____
Joseph T. Draper, Manager

Dated:_____

STATE OF CONNECTICUT)
) ss: Newtown
COUNTY OF FAIRFIELD)

The foregoing instrument was acknowledged, before me, this _____day of _____, 2024, by Joseph T. Draper**,** as his free act and deed, and the free act and deed of the Limited Liability Company.

_____
Notary Public
Commissioner of the Superior Court

COLLINS HANNAFIN, P. C.
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February 27, 2024

Ms. Sharon Sailing, Chair
NEWTOWN INLAND WETLANDS COMMISSION
3 Primrose Street
Newtown, CT 06470

Re: Inland Wetlands Application #23-31
Property Location: 20 and 60 Castle Hill Road
Applicant: Castle Hill Real Estate Holdings, LLC

Dear Ms. Sailing and Members of the Commission:

As you know, I represent Castle Hill Real Estate Holdings, LLC. Enclosed please find a draft Conservation Restriction which we intend to file in the land records, subject to review and approval by the Borough of Newtown's attorney and Borough Zoning Commission approval.

Thank you.

Very truly yours,

Thomas W. Beecher

TWB/cms

Cc: George L. Trudell II

Todd D. Ritchie, PE, BCEE, CFM, REHS/RS

Principal Civil Engineer | Cheshire, CT

Todd Ritchie brings over 20 years' experience in land development, civil and wastewater infrastructure. He is an accomplished civil/environmental engineer and project manager with a professional reputation for integrity, dedication and commitment to project success and client service. He has experience in management and engineering capacities for a wide variety of municipal and private site development, civil infrastructure, and wastewater projects from inception through design, bidding and construction. He is a team-oriented leader with excellent communication and coordination skills and extensive experience working on multi-disciplinary projects.

Years of Experience

4 years with the firm | 21 years with other firms

Professional Registrations

- Professional Engineer - CT, MA, ME, NH, RI, VT
- Board Certified Environmental Engineer (BCEE)
- Certified Floodplain Manager (CFM)
- Registered Environmental Health Specialist/Registered Sanitarian (REHS/RS)
- Leadership in Energy and Environmental Design Accredited Professional (LEED AP)
- SITES Accredited Professional (SITES AP)
- Envision Sustainability Professional (ENV SP)
- Certified Professional in Erosion and Sediment Control (CPESC)
- Certified Professional in Stormwater Quality (CPSWQ)
- Certified Erosion, Sediment and Stormwater Inspector (CESSWI)
- Certified Soil Evaluator (MA Title 5)
- FAA Certified Unmanned Aircraft Systems Operator (14 CFR Part 107)
- OSHA 10-Hour Construction Safety and Health

Education

- Certificate of Graduate Study, Environmental Engineering, Worcester Polytechnic Institute
- MBA, Business Administration, University of New Haven
- BS, Civil Engineering, Clarkson University

Project Experience

Residential Development (Multi-Family)

Greenway Commons, Center Street, Southington, CT
Site planning, civil engineering and floodplain management services for a 48-unit (Building MR-2) multi-family apartment housing development.

Jack's Farm, South Main Street, Cheshire, CT
Site planning and civil engineering services for a 32-unit multi-family housing development.

Meadowview, East Main Street, Meriden, CT
Site planning and civil engineering services for a 45-unit affordable apartment housing development.

The Views, Burban Drive, Branford, CT
Site planning and civil engineering services for adaptive reuse of former monastery building and property for a 59-unit, age-restrictive apartment housing development.

Harbor Heights Phase II, Perkins Farm Drive, Stonington, CT
Site planning and civil engineering services for a 123-unit apartment building.

Residential Development (Single-Family)

Project Manager and Lead Engineer for 100+ residential estate (single family) development projects in Connecticut. Responsible for preparing and presenting application materials including site plans, erosion and sediment control plans, stormwater analysis and design, and environmental assessments. Projects have included design development, permitting, and construction administration of site plans for coastal and environmentally sensitive properties requiring innovative design approaches focused on Low Impact Development (LID) and Sustainable Site Development practices.

Mixed Use Development

Goodsell Point Marina, Branford, CT
Site planning and engineering services for proposed redevelopment of existing marina property along with several adjacent residential properties as a Planned Development District with 15 single-family residential units and a 155-slip marina, including maintenance and amenities buildings.

Commercial/Industrial Development

McDonalds, Todd Road, Shelton, CT
Site engineering including layout, grading, stormwater and utilities design for new restaurant and parking lot.

Cly-Del Manufacturing, Sharon Road, Waterbury, CT
Site engineering for design of exterior nitrogen and hydrogen bulk storage tanks support pads.

Trulieve Holdings, Kimberly Avenue, New Haven, CT
Site engineering including layout, grading, stormwater and utilities design for a proposed cannabis retail building and parking lot.

Trulieve Holdings, Kensington Avenue, Meriden, CT
Site engineering including layout, grading, stormwater and utilities design for 60,000-square-feet of building areas for a proposed indoor cannabis growing facility.

The Estate, Townsend Avenue, New Haven, CT
Site engineering including layout, grading and stormwater design for proposed driveways and parking lot for an onsite wedding facility.

Lime Rock Park, Lakeville, CT
Site engineering including grading, stormwater, septic and utilities design for a proposed 20-bay garages building and a new concessions building.

Wood-N-Tap, West Springfield, MA
Site planning for reuse of an existing restaurant building for a new expanded restaurant building.

Gridiron Capital, New Canaan, CT
Site engineering including grading, stormwater and utilities design for adaptive reuse of an existing manufacturing building in downtown New Canaan.

Hartford HealthCare, Stonington, CT

Site engineering including grading, stormwater and utilities design for a 72,000 g.s.f. building addition.

Drew Marine Manufacturing Facility, Waterbury, CT
Site engineering including grading, stormwater and utilities design, water and sewer main relocations for addition of a tank farm and chemical delivery station.

Theraplant Production Facility, Watertown, CT
Site engineering including stormwater and utilities design, water and sewer main relocations for a 30,000 g.s.f. building addition.

1292 Boston Post Road, Darien, CT**
Site engineering services for redevelopment of a commercial property into a new two-story retail building including site layout, grading, stormwater design, erosion and sediment control and local approvals.

First County Bank, Darien, CT**
Site engineering services for redevelopment of a commercial property into a new bank building including site layout, grading, stormwater design, erosion and sediment control and local approvals.

Defense Industries

Site design, permitting and construction administration for infrastructure projects at General Dynamics/ Electric Boat, Sikorsky/Lockheed Martin and Collins Aerospace facilities in Connecticut.

Roadway Rehabilitation

The Hollows Condominium Community, Hamden, CT
Evaluated existing bituminous asphalt roadway pavement areas and provided recommendations for rehabilitation including asphalt reclaiming and repaving. Responsible for design, bidding, and construction administration.

Parking Facilities

Spartan Restaurant and Bar, Chase parkway, Waterbury, CT
Site engineering services for expansion of the existing parking lot.

Child and Family Agency of Southeastern CT, Shaw Street, New London, CT
Site engineering and services for rehabilitation and expansion of the existing parking lot.

Wolcott Park Western Parking Lot, West Hartford, CT
Site engineering services for rehabilitation and expansion of the existing parking lot.

Prospect Street Parking Lot, Waterbury, CT
Site engineering services for a new municipal parking lot.

Municipal Facilities

Southington Library, Southington, CT
Site and stormwater design for a new 28,000 g.s.f. library building.

Hamden Middle School, Hamden, CT
Site engineering including grading, stormwater and utilities design, and water main relocation for a 27,800 g.s.f. building addition.

Darien Public Library, Darien, CT**
Site and stormwater design for a new 54,000 g.s.f. library building. This award-winning project was certified as a LEED Gold design by the U.S. Green Building Council.

Station 2 Firehouse, Weston, CT**
Site, stormwater and septic system design for a new fire house building. This project was located on

a very challenging site adjacent to the Saugatuck River subject to floodplain building regulations and requiring an onsite sewage disposal system and a stormwater treatment system with limited available land area.

Miscellaneous Development

Camp Yankee Trails, Tolland, CT
Site engineering including grading, stormwater and septic design for renovation of existing camp facilities and construction of new dining hall, cabins, shower house, driveways and parking lot.

O&G Industries Quarries, Woodbury & New Milford, CT
Site engineering for permitting improvements and expansions of quarry operations.

Sidewalk Replacement, Bethel, CT**
Design of replacement sidewalks as part of the Town's Local Transportation Capital Improvement Program (LOTCIP).

Sidewalk Replacement, Darien, CT**
Design of 300 feet of replacement sidewalks along Route 1 in the Town's downtown commercial district for the Department of Public Works.

Dam Inspections, Various Towns, CT**
Responsible for performing dam inspections and dam inspection reporting in compliance with the CT DEEP Dame Safety Program.

Saint Luke's Parish, Darien, CT**
Site engineering for new clergy housing and youth/community center including site layout, grading, utilities, stormwater management, and erosion and sediment control.

Storm Drains & Culverts

The Long Estate, Bloomfield, CT
Evaluation of existing storm drainage system in private community to determine conditions of corrugated metal drainage pipes based on CCTV inspection. Recommended phased implementation of cured-in-place pipe lining to address structural deficiencies in the drainage system.

Storm Drain Outfall Replacement, East Hartford, CT
Evaluation of existing storm drainage system on Springside Avenue and design of new 24-inch RCP outfall to replace existing deteriorated CMP outfall.

Storm Drain Rehabilitation, South Windsor, CT**
Cured-in-place-pipe lining of existing damaged and deteriorated reinforced concrete storm drainage pipes.

Culvert Condition Assessment, Woodlake Tax District, Woodbury, CT**
Performed a field evaluation and condition assessment of an existing 60-inch CMP culvert that the District was concerned could collapse due to erosion at the outfall. Responsible for preparing a summary report that documented deficiencies and provided recommendations for repair.

Culvert Replacement, Danbury, CT**
Analysis and design of a new 52-inch arch CMP culvert on a commercial property to replace the existing antiquated box culvert, which consisted of field stone walls and reinforced concrete top slabs. Responsible for design, permitting and construction administration.

Culvert Replacement, Weston, MA**
Design and permitting of a new 5'x5' precast culvert in a town roadway to replace the existing antiquated box culvert, which consisted of field stone walls and reinforced concrete top slabs. Responsible for design and permitting.

**Denotes experience completed at another firm

Wastewater Collection Systems and Pump Stations

Wastewater System Evaluation, Colebrook, CT**
Evaluation of the existing onsite wastewater system serving the YMCA Camp Jewell facility. Responsible for evaluating treatment plant flow and performance data and providing recommendations for upgrades including a new equalization tank, a new moving bed biofilm reactor and repairs to the denitrification process equipment. The recommended wastewater upgrades will allow the facility to achieve consistent compliance with CT DEEP wastewater discharge permit limits.

Pump Station Access Cover Evaluation, Waterford, CT**
Evaluation of existing access covers at ten of the Town's existing wastewater pump stations. Provided recommendations and budgetary cost estimates for replacement, and rehabilitation of the access covers based on field assessments.

Pump Station Flood Resiliency Review, South Windsor, CT**
Evaluation of three of the Town's wastewater pump stations for potential flooding impacts as part of the Town's wastewater pump station asset management plan. Provided recommendations for improvements to the stations for flood resiliency including elevating critical equipment, regrading, sealing of hatches, and installation of fixed or removeable flood barriers.

Pump Station Flood Resiliency Review, Norwalk, CT**
Evaluation of ten of the City's wastewater pump stations for potential flooding impacts as part of the City's wastewater pump station asset management plan. Provided recommendations for improvements to the stations for flood resiliency including elevating critical equipment, regrading, sealing of hatches, and installation of fixed or removeable flood barriers.

Sewer Collection System Extension and Meter Manhole, Canton, CT**
Sanitary sewer flow rerouting study for the Secret Lake and Southeast service areas. Responsible for the design, permitting, and bidding phases of the project, which included 400-linear-feet of new gravity sewers, decommissioning of existing gravity sewers, and addition of a flow metering manhole.

Trenchless Replacement of Sewer Force Main, Canton, CT**
Design, permitting, bidding, and construction phases of replacement of 500-linear-feet of 6-inch ductile iron force main under a watercourse via Horizontal Directional Drilling (HDD).

Trenchless Replacement of Sewer Force Main, Darien, CT**
Design and construction phases of replacement of 700-linear-feet of 10-inch ductile iron force main under a watercourse via Horizontal Directional Drilling (HDD).

Sewer Collection System Capacity Evaluation, Tolland, CT**
Desktop capacity evaluation of the Town's sanitary sewer collection system including 4-miles of gravity sewers, 4-miles of force mains, 0.5-miles of low-pressure sewers, and 4 pump stations. The purpose of this study was to approximate how much flow capacity remains in the Town's collection system for each of their service areas; evaluate whether the pump stations are currently operating at their design capacities; and provide recommendations for improvements.

The Metropolitan District Commission Clean Water Project, Hartford, CT**
Project Manager during design and CT DEEP permit phases for Upper Albany Avenue Area Contract 3 sewer separation and Phase 2 stormwater outfall project; construction phase of Garden Street Relief Sewer (micro-tunnel) project; and DEEP permit phase of the Granby 1 stormwater outfall project.

Sanitary Sewer Study and Replacement Design, Borough of Naugatuck, CT**
Sanitary sewer system study investigating sources of cross contamination between segments of sanitary and storm sewers utilizing dye testing, smoke testing, closed circuit television inspections, and sampling. A complete report of findings was prepared to comply with a CTDEEP consent order including recommendations for correction and cost estimates and presented to the local WPCA. Following selection of the replacement option, served as Project Manager for design and construction of the sewer replacement.

**Denotes experience completed at another firm

Sanitary Sewer Collection System, Easton, MA**
Design, permitting, bidding and construction for a sanitary force main project, which also included new gravity and low-pressure sewers and a carbon adsorption odor control system. The project was identified as a priority sewage disposal needs area based on the Town's Comprehensive Wastewater Management Plan. Included design and construction of over 4-miles of force main and sewers.

Sanitary Sewer Collection System & Pump Station, Easton, MA**
Design, permitting, and bidding of a new sewer collection system and pump station to serve the Town's commercial district. This project was identified as a priority sewage disposal needs area based on the Town's Comprehensive Wastewater Management Plan. Included design of over 1-mile of force main and gravity sewers, including a submersible pump station. Project is CWSRF funded through MA DEP.

Wastewater Pump Station Upgrades, Westborough, MA**
Design of upgrades to two of the Town's 25-year old wastewater pump stations with average daily flow capacities of 0.5 and 0.7 MGD. Design included extensive upgrades to address issues related to structural, mechanical, electrical, instrumentation and controls, heating and ventilation, cathodic protection, and flood resiliency.

Sanitary Sewer Collection Systems, Chatham, MA**
Design Manager for this sanitary sewer extension project. This design was completed on an expedited schedule to comply with requirements of the American Recovery and Reinvestment Act. The project included design of over 5-miles of gravity sewers and transmission force mains and over 1-mile of low-pressure sewers.

Sanitary Sewer Collection Systems, Barnstable, MA**
Design Manager for the Town's Area H-1 East and West sanitary sewer extension project. This design was completed on an expedited schedule to comply with requirements of the American Recovery and Reinvestment Act. The project included design of approximately 2-miles of gravity sewers; 2-miles of low-pressure sewers; and a new suction lift sewage pump station and force main.

Sanitary Sewer Service Planning Study, New Castle, NY**
Feasibility study to extend sewer to the Town's business district. The study included preparation of a preliminary wastewater infrastructure layout to serve the needs of the study area, along with a feasibility report including an economic analysis, review of funding options, and recommendations for further evaluation.

Sanitary Sewer Service Planning Study, Yorktown, NY**
Evaluation of existing septic systems and future sanitary sewer needs for areas located in the Hallocks Mill Sewer District. These areas were of concern to the Town because they were experiencing septic failures; may experience septic failures in the future because of density development and small lot sizes; and have environmental constraints that limit the use of septic systems. The results and recommendations from this study were submitted to the Town and the New York City Department of Environmental Protection for review and approval.

Sanitary Sewer Design, Lebanon, NH**
Design of approximately 5,000-linear-feet of new gravity sanitary sewer mains for Contract 12 of the City's CSO separation project.

Centralized Wastewater Treatment Facilities

Water Pollution Control Facility, Danbury, CT**
Civil design, including stormwater analysis and design, for the WPCF's design-build tertiary treatment process upgrade. Stormwater design included hydrologic and hydraulic analysis for replacement and upgrade of an existing drainage system with a new 60-inch HDPE stormwater stormwater conveyance pipe network to be interconnected with an existing stormwater outfall via a new overflow relief structure for flood control.

**Denotes experience completed at another firm

Water Pollution Control Facility and Pump Station Upgrades, Windsor Locks, CT**
Design of upgrades to the Town's main wastewater pumping station and WPCF with a combined estimated project construction value of $10 million. Responsible for project management, coordination, scheduling, budgeting, resource allocation, and monitoring of work progress.

On-Call Wastewater Consulting Services, Suffield, CT**
Project Manager for various on-call wastewater engineering assignments for the Town relative to the WPCF and collection system. Recent projects include design, bidding, and construction phase engineering services for replacement of the UV disinfection system for the WPCF and sewer system modifications including sewer extensions and addition of a flow meter manhole.

Water Pollution Control Facility, Aberdeen, MD**
Civil design, including stormwater analysis and design, for the WPCF's enhanced nitrogen removal upgrade project. Responsible for evaluation and design of onsite stormwater management systems for runoff conveyance, quantity control, and water quality treatment in compliance with strict regulatory requirements of the Maryland Department of the Environment. To meet these requirements, the stormwater design incorporated Green Infrastructure and Low-Impact Development (LID) practices into existing and proposed development site areas. Also responsible for preparation of detailed erosion and sediment control plans.

Ultraviolet and Sodium Hypochlorite Disinfection Systems, Manchester, CT**
Project Engineer during construction phase of these projects and responsible for project coordination, onsite construction monitoring and contract administration.

Water Pollution Control Facilities Planning, Westport, CT**
Responsible for evaluating future sewer need and defining the future sewer service area for the Town. This effort involved researching, compiling, and analyzing data on soil types, lot sizes, and septic system failures for various streets. The data was then incorporated into an analytical ranking system to develop a sewer service priority profile. This profile was a critical tool in the planning of future sewer expansion programs and development of a flow rationale for upgrading the existing wastewater treatment facility.

Odor-Control Biofilter and Floating Digester Cover, Westport, CT**
Project Engineer during construction phase of these projects and responsible for project coordination, onsite construction monitoring, and contract administration.

Water Pollution Control Facility Upgrade, Fairfield, CT**
Project Engineer during construction of $40 million WPCF upgrade responsible for shop drawing coordination, NPDES permit application, contract administration, construction monitoring, and field reporting.

Water Pollution Control Facility Outfall Repair, Fairfield, CT**
Study and design of repair to existing leaking 30-inch RCP outfall pipe.

Decentralized Wastewater Treatment and Disposal Facilities

Labonne's Market, Prospect, CT
Investigation of failed septic system serving existing supermarket and design of replacement septic system.

Southbury Plaza, Southbury, CT
Onsite wastewater systems evaluation, design and DEEP permitting associated with redevelopment of a 100,000-square-foot retail building and renovation of existing tenant spaces.

Onsite Wastewater Treatment & Disposal System Evaluation and Permitting, Guilford, CT**
Evaluation and permitting of an existing onsite wastewater treatment and subsurface disposal system for a high-profile private medical facility client. Responsible for technical evaluation, condition assessment, reporting, discharge permit re-application, and interfacing with CT DEEP.

**Denotes experience completed at another firm

Decentralized Wastewater Facilities Planning, Westbrook, CT**
Phase 3 of the Town's Business District Wastewater Infrastructure Study. Responsible for preparing a preliminary wastewater infrastructure layout including collection system, transmission mains, treatment, and subsurface disposal facilities to serve the needs of the study area. The study included preparation of a technical feasibility report including an economic analysis as well as presentation of the report findings at a meeting attended by the Town's land use agents, health director, WPCA members, and the public.

Wastewater Evaluation for Long-Term Planning, Wilton, CT**
Evaluation of an existing 10,000 gallon per day subsurface sewage disposal system for the Town's Miller Driscoll Elementary School. This study was part of an overall assessment of the school facility by the Town to determine the expansion capacity of the school site relative to subsurface sewage treatment and disposal.

Large Scale On-Site Wastewater Treatment and Disposal System Design, Stamford, CT**
Design and permitting of 8,000 gallon per day community subsurface sewage disposal system for private residential development with design approval and discharge permit issued by CT DEEP.

Large Scale On-Site Wastewater Treatment and Disposal System Design, Lakeville, MA**
Design of a centralized effluent leaching system for a private residential development in Lakeville, MA for full build-out leaching system design flow of 60,000 gallons per day in compliance with MA DEP and MA Title 5 requirements.

Advanced On-Site Wastewater Treatment and Disposal System Design, Putnam County, NY**
Project Manager and Lead Engineer selected by the Putnam County Septic Repair Program for on-call design of advanced septic system repair projects as part of the NYC DEP watershed management program with 30+ individual site evaluations and alternative technology septic designs completed and constructed.

Water Supply & Treatment Facilities

Chestnut Ridge Water Storage Tank, Bethel, CT**
Civil design for new public water supply storage tank including site layout, grading, utilities, stormwater design, and erosion and sediment control including local approvals.

Community Well Water Treatment Facility, Coventry, CT**
Civil design for new well water supply treatment facility including site layout, grading, utilities, stormwater management, filter backwash basin design, and erosion and sediment control including local approvals.

Water System Booster Station, Haverhill, MA**
Civil design for the City's new Crystal Springs water booster pump station including site layout, grading, and stormwater design.

Water Main Replacement, Barnstable, MA**
Design manager for water main replacements as part the Town's Area H-1 East and West sanitary sewer extension project. This design was completed on an expedited schedule to comply with requirements of the American Recovery and Reinvestment Act. The project included design of approximately 3-miles of water main replacements and extensions.

NYC DEP Shaft 18 Emergency Chlorine Dry Scrubber, Mount Pleasant, NY**
Project Manager during construction phase of new chlorine dry scrubber system . Project was under NYC DEP JOC program.

Sodium Hypochlorite Storage and Feed System, Danbury, CT**
Project Engineer during construction phase of these projects and responsible for project coordination, onsite construction monitoring and contract administration.

**Denotes experience completed at another firm

Solar-Powered Reservoir Mixing Study, Newburgh, NY**
Project Engineer during solar-powered reservoir mixing study at Chadwick Lake reservoir. This project was afforded to the Town by a grant from the New York State Energy Research and Development Authority (NYSERDA) to investigate the use of solar-powered lake circulators, as an alternative to mechanical aeration, in order to achieve reduced manganese levels in raw water entering the Town's water treatment plant. Responsible for biweekly sampling and field analysis of the reservoir, performance tracking of the rented solar-powered mixers, coordination of field efforts with Town personnel and equipment suppliers, and development of a final report of the project and results for submission to NYSERDA.

Engineering Peer Review

Responsible for completing engineering peer reviews on an as needed basis for Planning and Zoning Commissions, Inland Wetlands Commissions, Conservation Commissions, and Water Pollution Control Commissions. These reviews often involve an understanding of technical issues associated with complex site development projects and require knowledge of local and state regulations and permit requirements relative to stormwater management, stormwater quality, onsite sewage disposal, and erosion and sediment control. Participated in application peer reviews for the Towns of Bethel, Bridgewater, Middlebury, Fairfield, Westport, Easton, Redding, Weston, Darien, New Canaan, Southbury, Sherman, New Milford, and Groton, CT.

Memberships and Affiliations

- American Society of Civil Engineers
- American Academy of Environmental Engineers & Scientists
- Association of State Floodplain Managers
- National Environmental Health Association
- Connecticut Environmental Health Association
- International Erosion Control Association

Megan Raymond, MS, CFM, PWS, RSS

Principal Scientist, Wetlands & Waterways Lead | New Haven, CT

Megan Raymond is a technically proficient recognized expert in inland and tidal wetlands, geomorphology, and watershed science. Her strong academic background and extensive project experience allows for an efficient understanding of the form and function of project areas. Megan focuses on landscape position, hydrological support, vegetative extent, and existing and potential stressors to evaluate the capacity for ecosystem recovery and dictate intervention. She is a process-based thinker who commands strong communication skills and appreciates multi-disciplinary design teams in project development and implementation.

Years of Experience

6 years with the firm | 18 years with other firms

Professional Registrations

- Professional Wetland Scientist
- Registered Soil Scientist
- Certified Floodplain Manager

Education

- MS, Physical Science. College of William & Mary Virginia Institute of Marine Science
- BS, Geological Sciences & Environmental Sciences (Double Major), Tufts University

Project Experience

Mansfield Apartments Redevelopment Environmental Impact Evaluation, Mansfield, CT
Project Manager for the Mansfield Apartments Redevelopment Environmental Impact Evaluation (EIE). Prepared the EIE report, coordinated team meetings, presented the project in the scoping meeting, and presented the findings of the EIE, in addition to all other CEPA requirements.

Mill Brook Bog, Freetown, MA
Project Manager for the Mill Brook bog wetland restoration project in Freetown, Massachusetts. Working with the landowner and multiple project partners, Megan is leading a design team to develop detailed site drawings to facilitate the restoration of approximately 150-acres of a retired cranberry bog and an approximately one-mile reach of the perennial stream, Mill Brook, located in the Taunton River watershed. The design drawings relied on a robust data collection effort, which encompassed surface water and groundwater monitoring through data loggers, geotechnical investigation and QAPP preparation, ground and drone facilitated topographic survey, HEC-RAS modeling, and wetland delineation and characterization. The goal of the project is to create a minimally managed landscape and restore the natural capacity of the wetland systems by removing legacy impact from farming.

West River Tidal Wetland Restoration, Guilford, CT
Characterized and inventoried tidal wetlands to develop a permittee responsible mitigation project to compensate for roadway elevation project impacts. The selected site was within the West River estuary, at the start of the New England trail, and the project entails salt marsh restoration and salt marsh creation over a 7-acre area. Interventions include tidal creek restoration, common reed eradication, thin layer deposition (TLD), and excavation to create a tidal inlet. Utilized unmanned aerial system (UAS) to develop LiDAR topography mapping and color infrared spectrometry images for vegetation mapping. The use of infrared images will allow for efficient comparison of pre and post-project vegetation assemblages during the 10-year monitoring program.

Guilford Yacht Club, Guilford, CT
Project Manager for the Guilford Yacht Club basin. Working with water resource engineers, SLR developed a detailed model of the West River estuary south of a railroad bridge to determine sedimentation patterns within a man-made dock basin. Deployed dataloggers to measure water surface elevations over a six-week period. The purpose of the project was to develop alternatives to the basin design that would minimize the frequency of dredging, which currently measures 10,000 -12,000 CY annually. The management costs are increasing exponentially and presenting challenges to stakeholders.

High Street Bridge Replacement and Dam Removal, Bridgewater, MA
Inland wetland delineation and functional assessment and project permitting (MEPA, NOI for Ecological Restoration, 401 Water Quality Certification, Chapter 91) to authorize the removal of a dam and replacement of a bridge on the Town River in Bridgewater. The project will have a significant impact on fish passage as this is the most downstream dam on the Town River and its removal will provide an open connection to Narragansett Bay.

East Shore Park Living Shoreline, New Haven, CT
Project Manager of a benthic assessment to assist the City of New Haven in placing proposed rock sills along the 3,000 linear feet of shoreline on New Haven Harbor in conjunction with a living shoreline project. Working with the benthic data and geomorphology of the manipulated coastline, Megan instructed rock sill location, composition, and geometry.

Sachem's Head, Guilford, CT
Project Manager for a roadway elevation project in Sachem's Head community of Guilford. Megan led the coastal resources assessment and worked with roadway and coastal engineers to develop alternatives to adapt two existing sections of roadway in Sachem's Head for sea-level rise. Located within a mile of each other, the two roads were starkly different in energy regimes, with one located in a rocky headland land contact beach with persistent but variable wave field and the other low energy still water flooding under expected tidal amplitude oscillations. Deployed data loggers in each area to measure water surface elevations and prepared regression analyses to correct to NOAA tidal monitoring stations.

Savin Rock Beach Nourishment, West Haven, CT
Project Manager for state and federal beach nourishment permits at Savin Rock beach on Long Island Sound.

Fearing Brook Naturalization Project, Amherst, MA
Project Manager of the Fearing Brook Naturalization project, a project with the Massachusetts Division of Ecological Restoration, in Amherst, Massachusetts. The goal of the project is to improve water quality within Fearing Brook in order to minimize impacts to a downstream sensitive receptor, the Fort River, which has been identified as providing habitat to the federally endangered dwarf wedge mussel. Megan is managing all phases of the project and is directly involved with field work to identify existing geomorphic, ecological, and wetland conditions within the watershed, identifying restoration opportunities as well as implementing the selected restoration project.

McCabe's Brook Stormwater Planning, Shelburne, VT
Delineated and characterized wetland and watercourse resources as a component of a stormwater planning project. Classified wetlands in accordance with Vermont Wetland Rules and summarized existing wetland functions and values. Consideration was made as to the existing vegetative and hydrologic regime of existing wetland resources and informed stormwater modeling and design. Project goal was to maintain existing characteristics of adjacent wetland systems by modulating stormwater quality and quantity from existing and proposed site improvements.

Moon Brook Restoration, Rutland, VT
Delineated and characterized wetlands within two impounded systems – Piedmont Pond and

Combination Pond - in the Moon Brook watershed in central Vermont to facilitate a watershed planning project. Classified wetlands in accordance with Vermont Wetland Rules and identified primary wetland functions and values. Existing conditions data and resource area locations were utilized to inform project design to retain and enhance existing wetland functions.

Dartmouth College - Trescott Road & Oak Hill Solar Array Site Feasibility Study, Hanover, NH
Delineated USACE wetlands and waters of the US within several parcels totaling more than 400 acres. Completed desktop review of existing site conditions. Both field and graphically wetland delineations were completed on eight project sites on campus. Vernal pool surveys were completed during the spring to confirm the presence of obligate vernal pool breeding species. Compiled base mapping using LIDAR imagery, wetland boundaries, vernal pool boundaries, and Hanover zoning buffers to help the college determine potential solar array sites.

Groton Consolidated Middle School, Groton, CT
Delineated wetlands for the new construction of Groton Consolidated Middle School in the Poquonock Bridge section of Groton, CT.

Cutler School and Westside School, Groton, CT
Delineated wetlands for the construction of two new schools on sites with existing schools to be demolished.

Long-Range Facilities Plan for Wethersfield Schools, Wethersfield, CT
Delineated wetlands in support of site tests for the planning for new elementary schools in the Town of Wethersfield.

Central Middle School Athletic Fields, Greenwich, CT
Delineated wetlands for the conversion of the existing natural grass athletic fields into lighted synthetic turf fields at Central Middle School.

Greenwich Country Day School Athletic Fields, Greenwich, CT
Delineated wetlands in support of this project to renovate athletic facilities and development of a new parking lot at the Greenwich Country Day School.

I-84 Highway Corridor Study (CTDOT Project No. 34-349), Danbury, CT
Performed wetland delineation and functional assessment of state and federal wetlands located within the highway right of way. Prepared an inventory and analysis of the NEPA study area identified for the highway improvement project, which encompasses 16.74 square miles in western Connecticut. Assessed existing stormwater infrastructure to evaluate direct and indirect pollutant vectors. Inspected culverts within the highway right-of-way for conveyance potential from both a flood-flow and habitat perspective.

Greater New Haven Water Pollution Control Authority Environmental Impact Evaluation, New Haven, CT
Project Manager for the completion of an Environmental Impact Evaluation (EIE) for the Greater New Haven Water Pollution Control Authority (GNHWPCA) Phase 3 Water Quality Improvement Master Plan. Megan prepared the EIE report and completed all facets of the CEPA process.

Eversource Potential Solar Array, Dalton, MA
Completed wetland and watercourse delineation in accordance with the 310 CMR 10.00 Massachusetts Wetland Protection Act to pursue a feasibility assessment of a potential solar installation on an 80-acre parcel in Dalton. Confirmed wetland resource area boundaries and non-jurisdictional status.

Eversource Line 1043 Structure Replacement Project, Newtown, CT
Completed wetland and watercourse delineation services, vernal pool assessments, line lists, prepared comprehensive preliminary and final project corridor mapping, Natural Diversity Database correspondence, prepared USACE and CTDEEP permits for a 3.8 mile project corridor.

Eversource Line 1232 Structure Replacement Project, Newtown to Monroe, CT
Completed wetland and watercourse delineation services, vernal pool assessments, line lists, prepared comprehensive preliminary and final project corridor mapping, Natural Diversity Database correspondence, prepared USACE and CTDEEP permits for a 2.8 mile project corridor.

Eversource Optic Ground Wire Line, Stevenson Substation to Devon Substation, CT
Completed wetland and watercourse delineation services, vernal pool assessments, line lists, prepared comprehensive preliminary and final project corridor mapping, Natural Diversity Database correspondence, prepared USACE and CTDEEP permits for a 13.7 mile project corridor.

Eversource Line 1858, Agawam, MA to Enfield, CT
Completed wetland delineation services in accordance with CT and MA standards. Prepared a Sand Barren Habitat Management Plan for the state designated critical habitat that is located on a portion of this utility corridor.

Eversource Line 1856, Waterford to New London, CT
Completed wetland and watercourse delineation services, vernal pool assessments, line lists, prepared comprehensive preliminary and final project corridor mapping, Natural Diversity Database correspondence, prepared USACE and CTDEEP permits.

Salmon Brook Street, Granby, CT
Evaluated potential impacts to two wetland systems resulting from a residential improvement project consisting of new construction of a number of single-family dwellings and multi-unit apartment buildings on approximately 50 acres.

Johnson's Creek Living Shoreline, Bridgeport, CT
Project Manager of the Johnson's Creek Living Shoreline project. Completed tidal wetland delineation, coastal resources characterization and ecological community identification in the western branch of Johnson's Creek. Working with the City, designed a coastal access trail.

Congress Street Bridge, Bridgeport, CT
Tidal wetland delineation, coastal resources assessment, Federal, state and local permitting in support of the reconstruction of the Congress Street bridge.

Wetmore's Marina, Westbrook, CT
Coastal resources assessment, tidal wetland and intertidal flat delineation, state and local permitting relative to proposed improvements at a water dependent marina.

State-listed Flora and Fauna & Critical Habitats

Rentschler Field, East Hartford, CT
Conducted eastern box turtle sweeps in conjunction with land clearing and grubbing to facilitate a parking lot expansion. Relocated identified individuals in suitable adjacent habitat.

Residential Development, Danbury, CT
Conducted site assessments to identify the extent of state-listed species of special concern sub-shrub sand blackberry (Rubus cuneifolius). Following population mapping, prepared a species relocation and monitoring plan to transplant the complete population.

Residential Development, Middletown, CT
Conducted field work to map existing ecological communities on a 51-acre undeveloped property. Site work included habitat assessment for state-listed vascular plants, avian and reptilian species. Evaluated proposed project within context of mapped habitat to avoid encroachments into preferred habitat areas.

Institutional Development, Groton, CT
Conducted field work to map existing ecological communities on a 44.1-acre property, which was flagged for state-listed herbaceous, avian and reptilian habitat. Identified special wetland types and

worked with the design team to avoid direct and indirect disturbances to sensitive ecological areas and/or preferred habitat.

Tidal Estuary, West Haven, CT
Designed proposed dredging project to increase hydrologic conveyance within a densely developed landscape adjacent to an estuarine embayment. Suggested stormwater quality improvements. Designed dredging dewatering area to avoid conflict with state-listed critical habitat. Identified areas within an expansive tidal wetland complex for restoration that included hydrologic and vegetative means.

Flood Mitigation Projects

Living Shoreline, Bridgeport, CT
Conducted field work to flag tidal wetlands and identify coastal resources in order to design a living shoreline and propose public access within a densely developed neighborhood adjacent to a tidal estuary. Work included proposed stormwater improvements, establishing necessary earth work to realize a tidal wetland system and proposing suitable plant material.

Beach Nourishment, Milford, CT
Assisted in the design of two large-scale beach nourishment projects to assist in flood hazard mitigation. Completed necessary state and federal permitting to authorize the projects. Enhancement measures included habitat features to provide additional nesting habitat for state and federally listed shorebirds.

Bulkhead Replacement, Branford, CT
Conducted site assessments to flag tidal wetlands and map coastal resources on the Branford coast. Worked with design team to avoid impact to critical habitats and implement “soft” engineering techniques.

Permitting

Edith Reed Wildlife Sanctuary, Rye, NY
Permitting Manager and Lead Scientist for the Edith Reed Wildlife Sanctuary Living Shoreline project at Playland Park. Megan conducted a geomorphic assessment of the coastline, examining substrate, vegetation and energy regimes to 6-feet MSL. The observations provided the basis of design for an integrated living shoreline project that includes boulder sills, reef balls, tidal wetland planting and a coastal berm, vegetated with fruit-bearing woody species to support insects and migrating birds. Spoke at numerous public meetings and stakeholder and advisory conferences to develop community buy-in and support of the project.

Uncas Leap Heritage Park, Norwich, CT
Permitting Manager for improvements to Uncas Leap Heritage Park. Delineated watercourses and wetlands, and prepared local wetland and zoning applications to authorize enhancements at the Park.

Old Field Creek, West Haven, CT
Permitting Manager for the Old Field Creek restoration project. Delineated tidal and inland wetlands and prepared permit applications to authorize dredging and channel restoration. Prepared an invasive species management plan to address common reed and Japanese knotweed monocultures within the estuary.

Cove River Tide Gates and Public Access, West Haven, CT
Permitting Manager for the Cove River tide gate replacement and public access project. Delineated tidal wetlands and evaluated coastal resources. Led project strategy and permitting efforts to streamline review times. Completed state and federal permitting to authorize the project.

Town of Guilford, CT
Federal and state permitting assistance for a number of coastal roadways and structures in the Town

of Guilford. Working with the town engineer, evaluated a number of different permittee responsible mitigation options to compensate for direct tidal wetland impact.

Thames Shipyard and Repair Company, New London, CT
State and Federal permitting relative to routine maintenance and reconfiguration of a number of different shoreline structures within a water dependent shipyard.

Lake Success Business Park, Bridgeport, CT
Site evaluation, ecological community mapping, local and Federal permitting relative to the dredging of a 19.4-acre inland pond.

Coastal

Barnum Landing, Bridgeport, CT
Provided technical assistance for proposed ferry terminal relative to the Connecticut Coastal Management Act.

Cross Sound Ferry, New London, CT
Project Manager overseeing design and permitting of Cross Sound Ferry and Thames Shipyard maintenance and upgrade projects. Complete coastal resources assessments and essential fish habitat consultations to inform project design and permitting. Prepare state and Federal permit applications to authorize dredging, bulkheads and facility expansion in the Thames River and Orient Point.

National Coast Guard Museum, New London, CT
Project Manager for licensing and permitting the National Coast Guard Museum. Prepared a National Environmental Policy Act (NEPA) Supplemental Environmental Assessment (SEA) and state and Federal permits to authorize bulkhead and fill on Thames River. Complex project strategy was involved to satisfy Federal and non-governmental stakeholders as well as regulators.

Environmental Assessments & Environmental Impact Evaluations

Ridge Hill, Yonkers, NY**
Prepared a portion of the Environmental Impact Statement for a mixed-use commercial and residential development in Yonkers, New York. Prior field work included wetland delineation, vernal pool evaluation, and Indiana bat habitat assessment.

Chappaqua Crossing, Chappaqua, NY**
Prepared a portion of the Environmental Impact Statement for a mixed-use commercial and residential development in Chappaqua, New York, that included detailed ecological communities mapping and wildlife habitat evaluation. Prior field work included wetland delineation and bog turtle survey.

Sho Fu Den, Forestburgh, NY**
Delineated wetlands, mapped ecological communities and prepared impact assessment on 100-acre site in Sullivan County, New York, related to a site redevelopment.

Emerald Necklace, Boston, MA**
Conducted a wildlife habitat evaluation to identify the variety of habitats from Jamaica Pond to the Charles River in Boston, Massachusetts. Presented findings at a community meeting and in report format.

Franklin Park, Boston, MA**
Evaluated existing ecological communities in Franklin Park including dense assemblages of non-native vegetation. Using these data, management recommendations for the park were formulated including recommendations on the trail system, invasive vegetation, and forest management.

State University of New York Purchase, Purchase (Harrison), NY**
Prepared Environmental Assessment for campus improvements. Performed intensive report writing addressing existing site conditions, evaluation of potential impacts, and mitigation measures of

**Denotes experience completed at another firm

proposed project. Delineated inland wetland and watercourse resources on an 80-acre portion of a 500-acre campus. Verified wetland boundaries through a Jurisdictional Determination with the US Army Corps of Engineers. Assisted with design layout to buildings to minimize wetland impact.

Pace University, Pleasantville, NY**
Prepared Environmental Assessment for campus improvements. Performed intensive report writing addressing existing site conditions, evaluation of potential impacts, and mitigation measures of proposed project. Provided construction oversight of freshwater pond restoration.

CTDOT & Linear Trail Projects

Farmington Canal Heritage Trail, Cheshire, CT**
Conducted construction monitoring for eastern box turtle and eastern ribbon snake.

Housatonic Railroad, Newtown, CT **
Assisted Housatonic Railroad in addressing a number of areas requiring corrective measures on the site, including sedimentation and erosion control and invasive species management.

Bridge & Culvert Projects

Aspetuck Ridge Road, New Milford, CT**
Delineated wetlands and watercourses along project corridor. Reviewed CTDEEP NDDB GIS mapping and FEMA floodplain mapping to determine needs for federal and state permits. Assisted in local wetland permit application.

Mill Street, New Milford, CT**
Delineated wetlands and watercourses along project corridor. Reviewed CTDEEP NDDB GIS mapping and FEMA floodplain mapping to determine needs for federal and state permits. Assisted in local wetland permit application.

East Rock Road, New Haven, CT**
Delineated wetlands and watercourses along the project corridor. Assisted with local permit process.

Culvert Replacements Multiple Locations, New Haven, CT**
Delineated wetlands and prepared local and state permit applications to replace combined sewer outfalls on the Quinnipiac River.

Pond Restoration

Edgewood Park Pond, New Haven, CT**
Designed and permitted ecological restoration of a low-functioning tidally influenced inland pond. Prepared pond dredging conceptual plans, computed sediment removal volumes, collected sediment samples for chemical parameter analysis, and evaluated costs associated with preparing regulatory permits and final design plans. Relocated wildlife prior to dredging. Prepared and obtained regulatory permits from state agencies and local planning commission. Provided construction inspection oversight services including monthly site inspections, sediment and erosion control reports, and communication with local regulatory agencies.

Choate Pond Restoration, Pace University, Pleasantville, NY**
Designed and permitted ecological restoration of a low-functioning pond in central portion of university campus that served as a stormwater sink. Conducted preliminary bathymetric assessment. Prepared and obtaining necessary permits from U.S. Army Corps of Engineers and New York State Department of Environmental Conservation (NYSDEC). Conducted construction oversight including appropriate dewatering and sedimentation control techniques. Designed and supervised revegetation of the pond banks and upland island features.

Yorktown Middle / High School Campus Pond Restoration, Yorktown, NY**
Provided ecological consulting services to improve biological viability of the small (less than 0.5-acre) inland pond. Prepared and obtained ACOE permits. Relocated wildlife prior to dredging. Monitored site

**Denotes experience completed at another firm

during construction.

Westport Inland Pond to Tidal Wetland Conversion, Westport, CT**
Designed, permitted, and provided construction oversight to fill a low-functioning man-made freshwater pond and shift the resources seaward by breaching a berm that thwarted tidal flow on the property for decades. Obtained local, federal, and state permits. Area is a high functioning halophytic dominated tidal wetland occupying approximately 0.6-acres on the residential property.

Inland & Tidal Wetland Mitigation Design, Implementation & Post Construction Monitoring

Sabine Farm, Greenwich, CT**
Designed a wetland mitigation package comprising restoration, creation and preservation components into the site design in order to mitigate direct wetland impact for nine wetland crossings on the site. The mitigation package was of import due to number of sensitive resources on the property, including box turtle habitat, slimy salamander habitat and six vernal pools.

Westport Tidal Wetland Creation, Westport, CT**
Provided post-construction monitoring for tidal wetland creation that allowed for the genesis of high marsh, low marsh and tidal pool components. Monitored the site for five years and submitted annual monitoring reports to CT DEEP and ACOE.

Commercial Development, Monroe, CT**
Created a wetland mitigation design that allowed for the restoration of a non-vegetated man-made pond in concert with permitting a large commercial development on the property.

Forest Avenue, Rye, NY**
Developed and permitted a dune restoration project on 400-feet of shoreline in the Parsonage Point section of Rye. Shoreline had been affected by recent large-scale storms resulting in extensive shoreline destabilization. Permitted the project through town land-use agencies and state entities.

Riverine, Palustrine, Lacustrine, and Estuarine Studies

Echo Bay, New Rochelle, NY**
Conducted an existing conditions survey of a 25-acre former armory parcel with direct frontage on Echo Bay, an estuarine water body that is fed by Long Island Sound. Characterized coastal resources in conjunction with New York State Department of Environmental Conservation (NYSDEC). Participated in design team charrettes to identify appropriate concepts for land-use within the upland portion of the site and identify potential options for shoreline stabilization and enhancement.

Stony Brook Restoration, Darien, CT**
Prepared design, impact evaluation and assessment and regulatory permits for the improvement of the Stony Brook corridor in order to address flooding concerns. Project involved daylighting sections of piped watercourse and creating floodplain habitat where appropriate.

Trout Brook Restoration, Southbury, MA**
Delineated inland wetlands and identified brown trout habitat along sections of a high quality watercourse. Monitored adjacent road reconstruction. Directed field crews to recreate stream bed and bank habitat consistent with existing conditions.

Listed Species Flora & Fauna Surveys

Proposed Mixed-Use Commercial & Residential Development, Chappaqua, NY**
Performed a Phase II Bog Turtle survey in accordance with the requirements of US Fish and Wildlife Service (USFWS) within a 4-acre wetland meadow in Chappaqua, New York.

**Denotes experience completed at another firm

Proposed Residential Subdivision, Greenwich, CT**
Biological survey completed for amphibian threatened species, the Northern slimy salamander (Plethadon glutinosus). Numerous populations were observed and the preferred slimy salamander habitat was mapped and prioritized for conservation.

Eastern Box Turtle Survey, Northeastern United States**
Conducted numerous surveys for the eastern box turtle in Connecticut, Massachusetts, and New York.

Shellfish Survey, Housatonic River Valley, CT**
Conducted surveys for state listed tidewater mucket and eastern pond mussel in various locations along the Housatonic River.

Tree Surveys

Wilton Sewer Line, Simsbury, CT**
Conducted extensive tree survey on a 1-mile section of road and identified tree species and size of trees. Trees greater than 15 inches in diameter breast height (DBH) received numbered identification tags.

Proposed Residential Development, Stratford, CT**
Conducted extensive tree survey to identify species and size of trees. In addition, all trees greater than 15 inches in diameter breast height (DBH) received numbered identification tags.

Invasive Species Management & Revegetation Plans

Middle Farms, Fishers Island, NY**
Prepared invasive species management plan to address small colonializations of black swallow wort and porcelain berry within a native 40-acre grassland. Supervised annual burn of approximately one third of the meadow on a rotating basis.

Chappaqua Crossing Invasive Species Management Plan, Chappaqua, NY**
Inventoried existing non-native vegetation over a multi-year period within a 5-acre wet meadow in Chappaqua, New York.

Shellfish and Eelgrass Surveys

Woods Hole Residential Properties, Woods Hole, MA**
Conducted fieldwork to evaluate existing populations of commercially viable shellfish as well as presence of absence of eel grass to evaluate potential impacts of private residential piers within the Penzance Point area and adjacent properties.

Long Island Sound & Connecticut River Shoreline, CT**
Conducted site surveys for the presence of submerged aquatic vegetation (SAV) adjacent to residential and water dependent marina facilities to document existing site condition and facilitate permitting of private piers and marina infrastructure improvements.

State & Federal Permitting

Tilcon Connecticut, North Branford, Groton, & Plainville, CT**
Prepared state permits to authorize water for non-consumptive use for a number of facilities, such as sand and gravel mining operations, throughout Connecticut for Tilcon.

Office of Long Island Sound Permits (OLISP)**
Prepared OLISP permits to authorize activities along the shoreline, primarily private or communal piers and docks through a Certificate of Permission (COP) or Structures, Dredge and Fill permit.

Magellan Terminal, New Haven, CT**

**Denotes experience completed at another firm

Prepared permit applications and coordinated contractors to facilitate improvement dredging in New Haven Harbor. Coordinated with various entities to ensure appropriate off-shore disposal sites.

Gateway Terminal, New Haven, CT**
Prepared permit applications and coordinated contractors to facilitate improvement dredging in New Haven Harbor. Coordinated with various entities to ensure appropriate off-shore disposal sites.

Water Quality

Pace University Water Quality Sampling, Pleasantville, NY**
Project leader overseeing water quality sampling and preparation of water quality report. Water quality data was collected in 2015 to ascertain the water quality of surface water vectors entering a one-acre pond. Fieldwork included water sample collection and analysis. Prepared a report summarizing field data results and provided recommendations to improve freshwater pond water quality.

Wetland Delineation / Environmental Assessment

Concord Monster Golf Course, Monticello, NY**
Completed inland wetland and watercourse delineation on 1,800-acre property in Monticello, New York. Confirmed wetland boundary with Army Corps of Engineers.

Pace University, Pleasantville, NY**
Delineated inland wetlands and watercourses on the 170-acre property. Conducted a functional assessment of each wetland area. Evaluated potential impacts to each wetland area based on a proposed plan of development.

Stanwich School, Greenwich, CT**
Delineated inland wetlands and watercourses on the 25-acre site. Identified functional vernal pool habitat. Permitted campus expansion through local, state and federal entities.

Greenwich Academy, Greenwich, CT**
Completed wetland delineation and impact assessment for athletic facility.

Reader's Digest, Chappaqua, NY**
Delineated wetlands on the 120-acre site. Conducted a functional assessment of each wetland area. Evaluated potential impacts to each wetland area based on a proposed plan of development.

Salt Marsh Creation, Bridgeport, CT**
Prepared tidal wetland creation plan to mitigate for small area of halophytic vegetation loss along the Yellow Mill Channel.

Memberships and Associations

- Society of Wetland Scientists
- Society of Soil Scientists of Southern New England
- Association of Floodplain Managers
- Governor's Council on Climate Change Resilient Infrastructure and Nature Based Solutions Working Group Member, 2022

**Denotes experience completed at another firm

Low Impact Development (LID) Approaches to the Castle Hill Village Development Site Design

1. Minimize Site Disturbance

- By designing a more compact cluster-type development on the combined 138.5 acre project site, 97.7 acres (70%) of the property will remain entirely undisturbed and of those 97.7 acres, 80.7 acres (58% of the overall site) will become part of the town open space conservation area.

2. Protecting Sensitive Natural Areas

- No disturbance is proposed within 100' of the onsite vernal pool.
- No stormwater discharges will drain towards the vernal pool.
- Total temporary and permanent wetland impacts are limited to approximately 0.05 acres. These impacts are associated with the proposed replacements for the existing antiquated pipe culvert and farm drain wetlands crossings and construction in area of a wetland seep.
- Stormwater Best Management Practices (BMPs) have been designed for stormwater discharge rate control and water quality treatment in accordance with applicable guidelines of the 2004 Stormwater Quality Manual.
- Holistic Landscape Management Practices – serves to minimize cumulative indirect wetland impacts over time.

3. Preserving Vegetative Buffers

- 99% of buildings are outside of the 100' upland review area from wetlands.

4. Avoiding Disturbance of Steep Slopes

- The limit of disturbance for the proposed development includes approximately 0.6 acres of steep slopes, out of the approximately 25 acres of steep slopes located on the combined 138.5 acres site.

5. Protecting Natural Flow Pathways

- The proposed culvert across Meadow View Lane includes an oversized pipe partially filled with a wetland substrate material to provide a natural travel corridor for wetland dependent species.
- Stormwater Best Management Practices (BMPs) have been designed for stormwater discharge rate control and water quality treatment in accordance with applicable guidelines of the 2004 Stormwater Quality Manual.

6. Minimize Total Impervious Coverage

- Proposed onsite impervious coverage does not exceed 10-20%, which is considered a threshold to maintain healthy streams. The total proposed onsite impervious coverage is approximately 13.2 acres, which is **9.5%** of the overall 138.5-acre site and is **19.8%** of the 66.4-acre parcel comprising 20 Castle Hill Road. All new site development is proposed within the existing property boundary of 20 Castle Hill Road.

IWC mtg
2/28/24
#7

SLR International Corporation
99 Realty Drive, Cheshire, Connecticut, 06410

February 20, 2024

Mr. Steve Maguire
Deputy Director of Land Use
Town of Newtown
3 Primrose Street
Newtown, CT 06470

SLR Project No.: 141.20080.00003

RE: Comment Response Letter
Third-Party Engineering Review of Castle Hill Village
Residential Open Space Development
Newtown, Connecticut

Dear Mr. Maguire,

SLR International Corporation (SLR) is in receipt of correspondence addressed to you from Joseph Canas, PE, LEED AP, CFM, Principal Engineer of Tighe & Bond, Inc. dated February 6, 2024, regarding the above-referenced project. We offer the following responses to Tighe & Bond's review comments along with the accompanying enclosures, including revised site plans.

A. General Comments

C1. During our site visit, groundwater seeps were observed throughout the site, including two pipes that discharge groundwater to the lower wetland along Johnnie Cake Lane. It appears that the proposed units will have basements. The contribution of groundwater from the dewatering of the proposed basements has the potential to be significant, and some of the units may have basements below the groundwater elevation. For example, Unit 13 (Drawing GR-1) is 5 to 7 feet below existing grade, and the nearby test pit (SLR-TP-14) shows that groundwater is 2.5 feet below grade. We recommend that the applicant re-consider basements in areas below observed groundwater because of the constant need to intercept and move water from the basement wall, which results in surface discharges.

R1. The upland site soils are predominantly comprised of Paxton, Montauk, and Woodbridge fine sandy loams above dense gravely loamy sand (glacial till). A perched fluctuating groundwater table occurs above the compact glacial till layer. The perched groundwater table is already intercepted by existing farming drains across the property with discharges to wetlands along Johnnie Cake Lane. These groundwater drainage conditions will be maintained with the installation of foundation drainage systems for the new homes. The developer will conduct test pits at each proposed house location to determine whether a deeper groundwater table exists within the glacial till layer so that it can be avoided on a case-by-case basis for individual house designs.

C2. Two drainage pipes were observed entering the wetland just upstream of the driveway culvert crossing at Johnnie Cake Lane. At the time of our visit on the afternoon of January 29, 2024, the pipes were flowing approximately half full. We believe that these are likely old farm drains. Are the origins of these pipes known? Is the intent to keep the pipes in place or remove them? If the pipes are removed, how will their removal impact the downstream wetlands?

R2. The origins of these pipes are unknown. SLR uncovered stone- and boulder-filled trenches on site at various test pit locations, which in our opinion are functioning farm drains used to drain perched groundwater in the fields. The pipe outlets are likely discharge locations from the stone-filled farm drains. The pipes are not proposed to be removed; however, it is anticipated that the stone-filled farm drains discharging to them will be disrupted during construction. This is not anticipated to impact the downstream wetlands since base flow to these wetlands will be similarly provided via the proposed discharge from the house foundation drainage collection system near this location.

B. <u>Stormwater Management Comments</u>

C1. The detention basins have an 8' wide crest which is sufficient for maintenance access. The slopes of the basins are at a slope of 3 horizontal to 1 vertical, which is appropriate, and sufficient for mowing. The proposed detention basins are generally benched into the slope, such that one side is cut into the slope, and the downslope side is an earthen fill berm. This is a common practice to help balance cuts and fills on a site. The fill berms include impervious materials that will minimize seepage. Inflow into the basins is doubly pre-treated, with hydrodynamic separators placed before the outlet into the basin, and riprap forebay berms located just beyond the outlets. Together, these measures combine to minimize the amount of sediment that enters the basin.

a. The outlet from Detention Basin 130 discharges to a preformed scour hole on the slope above the wetland west of the Johnnie Cake Lane / Castle Village Road intersection. In lieu of the scour hole, and creating a potential point of scour on the slope above the wetland, is it possible to discharge the outlet from Detention Basin 130 directly to Manhole 104 or 105?

b. The emergency riprap overflow for Detention basins 130 could potentially flow overland into the intersection of Johnnie Cake Lane and Castle Village Road, and possibly toward Units 14 and 15. Is there an opportunity to relocate the overflow toward the north or northwest?

c. Some of the proposed detention basins appear to be located such that the bottom of the pond is below groundwater:

(1) Test pit SLR-TP-14 is located within the footprint of Detention Basin 130. The test pit indicates the presence of groundwater at 30 inches below the surface. Existing grade is approximately elevation 701.0, which indicates that groundwater was observed at elevation 698.5. The bottom of the basin is at elevation 694.0, and therefore, we expect that up to 4.5 feet of the detention basin will be in groundwater. As a result, the full volume of the basin will not be available for storage. Please review. We also note that test pit SLR-TP-15 is also located in the footprint of the same basin, and indicates groundwater is 42 inches below the surface, at elevation 697.5.

(2) The bottom of Detention Basin 120 is above observed groundwater, but

below observed redoximorphic features.

(3) At Detention Basin 410, SLR-TP-10 indicates a depth to groundwater of 37" (approximately elevation 697.0), and SLR-TP-9 indicates a depth to groundwater of 46" (approximately elevation 695.0). The bottom of the basin is at elevation 692.0, therefore, this basin will also likely be in groundwater.

(4) At Detention Basin 310, SLR-TP-1 indicates a depth to groundwater of 60" (approximately elevation 710.0) and SLR-TP-2 indicates a depth to groundwater

of 48” (approximately elevation 711.0). The bottom of the basin is at elevation 708.0, therefore, this basin will also likely be in groundwater.

d. At Detention Basin 510, the roof leader outlet from Units 60 and 61 appears to discharge into the bottom of the pond and will be backwatered during nearly every rainfall event. Is there an opportunity to raise the roof leader outlet elevations?

e. Confirm the drawdown time in a 50-year storm event for each of the proposed detention basins. It is important that the ponds drain within 72 hours so that the full volume of the pond is available for subsequent storm events that may occur in quick succession.

f. Some of the detention basins may require a dam construction permit from CTDEEP due to potential downstream hazard. For example, Detention Basin 170 is 14 feet high and sits above a public right-of-way and a state highway.

g. Nearly all proposed detention basins have dedicated maintenance access roads. Detention Basin 130 does not have a maintenance access road, which will make maintenance access more challenging. How will Detention Basin 130 (Drawing GR-1) be accessed for maintenance?

h. Detention Basin 170 has a series of outlets and riprap splash pads for footing drains and roof leaders. Could the roof leaders and footing drains be tied into collector systems and discharge to either Manhole 2 and/or Manhole 16 to avoid a series of obstacles that would making maintenance mowing on the pond slope more difficult?

i. Is fencing warranted around the ponds?

j. Check the proposed outlet control structures for buoyancy. Our concern is that when the basin is full, uplift buoyancy forces could cause the structures to float. If buoyancy is a problem, it typically can be remedied by adding additional weight to the structure, such as thickened walls or base slab.

R1. a. Leaving the outlet of Detention Basin 130 as a daylight condition to a scour hole was selected over connecting it to the drainage system to maintain flow to the wetland on the western side of the entrance drive.

b. The emergency overflow spillway for Detention Basin 130 has been relocated.

c1. The grading of Detention Basin 130 has been revised to minimize the depth of cut for the basin. In addition, a curtain drain has been added on the uphill side of the basin to intercept groundwater and bypass it around the detention basin. The curtain drain will maintain the groundwater level 3 feet below the bottom of the basin.

c2. A curtain drain has been added on the uphill side of basin 120 to intercept groundwater and bypass it around the detention basin. The curtain drain will maintain the groundwater level 3 feet below the bottom of the basin.

c3. The grading of Detention Basin 410 has been revised to minimize the depth of cut for the basin. A curtain drain has been added on the uphill side of the basin to collect groundwater and bypass it around the detention basin. The curtain drain will maintain the groundwater level 3 feet below the bottom of the basin.

c4. The grading of Detention Basin 310 has been revised to minimize the depth of cut for the basin. A curtain drain has been added on the uphill side of the basin to collect groundwater and bypass it around the detention basin. The

curtain drain will maintain the groundwater level 3 feet below the bottom of the basin.

d. The roof leader outlets have been revised at Detention Basin 510 to be above the 100-year water surface elevation in the basin.

e. Detention basins will empty down to the invert of the low-flow orifice approximately 3 hours after the end of the 24-hour design storm per the hydrographs in Appendix G. Drawdown calculations for the volume between the low-flow orifice and the bottom of the basin have been provided in Appendix E, with a drawdown time range between 10 hours and 67 hours for the basins. Furthermore, routing of the hydrology models were started at the basin water elevations at the invert of the low-flow orifice, so no credit is taken for the basin volume between the low-flow orifice and the bottom of the basin in the event that the water has not been drained.

f. Following approvals by the Town of Newtown (Town), the developer will coordinate with the Connecticut Department of Energy & Environmental Protection (CTDEEP) to obtain all necessary CTDEEP permits prior to the start of construction.

g. A dedicated maintenance access driveway to Detention Basin 130 has been added to Sheet LA-1 near the entrance to Castle Hill Village Lane.

h. The roof drain and footing drains that outlet to Detention Basin 120 have been revised to outlet through an 18"-high end wall located at the top of the basin to protect the pipe outlets during basin maintenance activities. Similar walls have been added to Detention Basins 310 and 410.

i. A 4'-high chain link fence with 12'-wide access gate has been added around each of the detention basins.

j. The following note has been added to the Detention Basin Outlet Structures detail on Sheet SD-7 "Precast structure manufacturer to provide buoyancy analyses for all outlet structures and provide necessary anti-buoyancy design measures."

C2. Expand upon the maintenance and operation plan presented on the cover sheet of the plan set and in the Drainage Report. Although maintenance and operation information is presented in various locations in the plans and the report, we recommend that they be consolidated into a single document for the HOA, where maintenance records can also be stored.

a. Include who is responsible for the post-construction maintenance plan.

b. Identify maintenance measures for each of the stormwater best management practices on the site, such as catch basins, outlet aprons, yard drains, and gross particle separators.

c. Provide narrative on maintenance at the detention basins berms, such as mowing, elimination of woody vegetation, and repair of animal burrows.

R2. A draft postconstruction stormwater systems operations and maintenance document has been included in the enclosed revised Drainage Report.

a. The Homeowners Association president will be responsible for the postconstruction maintenance plan.

b. Refer to draft O&M document.

c. Refer to draft O&M document.

C3. A crossing is proposed over the watercourse at Meadowview Lane.

a. Computations were included on page 90 of the revised Drainage Report to analyze the crossing, but it was not clear which storm design frequency was used. What is the water surface elevation of the watercourse crossing during a 50-year and 100-year storm event? Meadowview Lane will not have a connection to the surrounding street network, and the watercourse crossing the only means of emergency ingress and egress for the 14 units located west of the crossing.

b. The proposed watercourse crossing will be subject to the USACE Connecticut General Permit. It does not appear that the crossing meets the Connecticut General Permit Stream Crossing Best Management Practices for openness ratio, and possibly bank full width.

R3. a. The crossing for the watercourse at Meadowview Lane is designed for the 100-year storm. The upstream water surface elevation for the 50-year storm is 712.32 and for the 100-year storm is 712.39.

b. The United States Army Corps of Engineers Connecticut General Permit Stream Crossing Best Management Practices are typically intended for perennial streams and less so for intermittent/ephemeral watercourses. Our design team has re-reviewed this existing intermittent watercourse crossing location along with the Best Management Practices and are providing a larger (36-inch-diameter) pipe that will be filled with approximately 6 inches of a natural substrate consisting of a mixture of organic and glacial till materials (as approved by the project wetland scientist). This larger culvert with natural substrate condition will provide and enhance opportunities for smaller-sized aquatic species to migrate between the wetlands that are located on either side of the proposed roadway.

C4. In our review of the plans, we have the following comments regarding storm drainage pipe routing and potential conflicts:

a. There are lengths of pipe where several inlets are connected in series before reaching a manhole, in some cases ten or eleven. As the number of inlets connected in series increases, so does the risk of a blockage clogging the line. Are there opportunities to reduce the number of inlets connected in series? This is particularly important for the system east of the proposed residences on Pine Ridge Road, above the steep slope on King Street.

b. The applicant's engineer has clearly made an effort to minimize the encroachment of the roof drainage outlets into the upland review area. West of Unit 69, Meadowview Lane, the roof drain discharges into the tree line. Is it possible to move the discharge location toward the east, outside of the tree line?

c. There appear to be potential conflicts between the sanitary and storm systems. Sanitary Sewer Manhole #40 discharges at an invert elevation of 718.0, and the invert of the pipe discharging from Yard Drain 41 is 718.1. The two pipes cross a short distance from downstream, and appear to conflict.

d. Manhole 68 (Drawing UT-2) has five pipes entering within a 90 degree segment. The manhole diameter will likely need to be increased to accommodate the large number of pipes in the limited space.

e. The footing drains for several units are connected together. We suggest that cleanouts be added at junctions for maintenance purposes.

R4. a. Due to the larger inlet capacity of the proposed yard drains compared to smaller area drains and the 4-foot sumps as specified on the yard drain detail, the potential for clogging is minimal.

b. Due to the elevations around Unit 69, the roof drain needs to extend to the 714.0 contour as shown to be able to daylight and maintain cover on the pipe.

c. The storm drainage and sanitary have been adjusted so they no longer cross.

d. Manhole 68 has been revised to be a 5-foot-diameter manhole on Sheet UT-2.

e. Cleanouts have been added at footing drain junctions on all utility sheets.

C5. Provide additional construction details on some of the proposed drainage structures.

a. The plans show catch basins, yard drains, and area drains, with associated details for the catch basins and yard drains. Provide details for the proposed area drains. We are looking to confirm the sump depth and if the proposed area drains are large enough to accommodate the pipes that are routed through them.

b. Provide details on the roof drain splash pads.

R5. a. A detail for the area drains has been added to Sheet SD-4.

b. Details have been provided for the roof drain splash pads on Sheet SD-5.

C6. What is the proposed surface of the playground? If it is a resilient surface, show underdrains and confirm that the surface is accounted for in the hydrologic computations.

R6. The playground surface is anticipated to be wood chips. Underdrains are shown on Sheets UT-2 and UT-3. This area has been modeled accordingly in the hydrologic computations.

C7. The CTDOT Drainage Manual recommends that storm drains have a minimum velocity of 3 feet per second to maintain cleansing velocity. A few locations have pipe velocities that are slower. We note that this is not a strict design criteria, but a recommendation, and ask the applicant to review opportunities to improve velocities.

a. Storm System 510, Lines 8 and 9

b. Storm System 410 . Lines 16 and 17

c. Storm System 311, Lines 3 and 4

d. Storm System 310, Lines 10 to 13, and 15 through 24

e. Storm System 130, Lines 9, 10, and 16 through 19

f. Storm System 121, Lines 12, 19, and 20

g. Storm System 120, Lines 11, 12, 13, 15, 16, 17, 19, 20 and 21

R7. a. Velocities for lines 8 and 9 of Storm System 510 are 2.39 feet per second (ft/s) and 2.88 ft/s, respectively. We feel these velocities are acceptable, and achieving a higher velocity would require reducing the pipe size below a standard 12”-diameter minimum.

b. Velocities for lines 16 and 17 of Storm System 410 are 2.56 ft/s and 2.83 ft/s, respectively. We feel these velocities are acceptable, and achieving a

higher velocity would require reducing the pipe size below a standard 12"-diameter minimum.

c. Lines 3 and 4 of Storm System 311 have little flow, and even reducing the pipe size does not increase the velocity above 3 ft/s. Line 4 already has a slope of 6.39 percent, and increasing the slope does not increase the velocity above 3 ft/s.

d. Lines 10 through 13 and 15 through 24 have very little flow for the 10-year storm. To increase the velocity to greater than 3 ft/s would require reducing the pipe sizes to smaller than 12" diameter.

e. Lines 16 and 19 have velocities greater than 3 ft/s. Lines 9, 10, 17, and 18 have very little flow and would require reducing the pipe sizes to smaller than 12" diameter to achieve a velocity greater than 3 ft/s.

f. Lines 12, 19, and 20 have very little flow for the 10-year storm. To increase the velocity to greater than 3 ft/s would require reducing the pipe sizes to smaller than 12" diameter.

g. Lines 11 and 12 have velocities greater than 3 ft/s. Lines 13, 15, and 20 have velocities of 2.54 ft/s, 2.54 ft/s, and 2.83 ft/s, respectively, which we feel are acceptable. Lines 16, 17, 19, and 21 would require a reduction in pipe diameter to achieve velocities greater than 3 ft/s.

C8. The velocity of certain segments of the storm sewer system exceed 15 ft/s. Again, this is not a strict design criteria, but a rule of thumb of design to minimize scour damage inside closed pipe systems. Can the inverts be adjusted to reduce the velocity?

a. Storm System 120, Line 2

b. Storm System 130 Outlet, Line 2

R8. a. Line 2 of Storm System 120 has been revised to reduce the velocity below 15 ft/s.

b. The outlet of Detention Basin 130 has been revised to have velocities not exceeding 15 ft/s.

C9. The upstream end hydraulic grade line elevation exceeds the ground elevation at the following locations, meaning that there is potential for runoff to bubble out of the catch basin during the design storm.

a. Storm System 121, Line 20

b. Storm System 410, Line 2

R9. a. Storm System 121 has been revised, and the hydraulic grade line (HGL) no longer exceeds the ground elevation.

b. Storm System 410 has been revised, and the HGL no longer exceeds the ground elevation.

C10. Proposed CCB 108 and CCB 109 discharge to the wetland along Johnnie Cake Lane. CCB 108 is a hydrodynamic separator with an inlet that provides water quality flow treatment for the discharging flow, which is an appropriate treatment for the limited contributing area. The outlet consists of a flared end section. Review to determine if a riprap apron is needed to reduce exit velocities and scour.

R10. A riprap apron has been added at the outlet for CCB 108 and CCB 109 on Sheet UT-1.

C11. Proposed CCB 108 and CCB 109 are located at the base of a 10 percent grade, therefore, runoff flowing along the roadway gutter will have significant velocity and momentum as it travels down the roadway. Review the plans to determine if a Type I double catch basin may be warranted to improve interception capacity.

R11. CCB 108 and CCB 109 have been revised to be Type I double catch basins on Sheet UT-1.

C12. The 2004 Connecticut Stormwater Quality Manual will be replaced with the 2023 Connecticut Stormwater Quality Manual effective March 30, 2024. Although not required, since it is not yet effective, the applicant is encouraged to meet the updated water quality volume requirements in the new manual to the maximum extent practicable.

R12. The *2024 Connecticut Stormwater Quality Manual* does not become effective until March 30, 2024. As stated in the 2024 manual, projects that have already completed preliminary design phase (approximately 50 percent of full design) as of the effective date will not be subject to the updated guidance. The current stormwater design exceeds the requirements of the *2004 Stormwater Quality Manual* for stormwater treatment since water quality flow is being treated in addition to water quality volume prior to discharge from each detention basin.

C. <u>Grading Comments</u>

C1. Review the swale on the west side of Castle Village Road. The swale is well developed, and is well-conceived given its location at the base of a long, steep slope. The grading between contour 672 and 670 suggests that it will discharge into the roadway, which we don't believe is the intent. A drainage structure may be necessary to intercept the runoff above the entry monument sign.

R1. Yard Drain 104 was added on Sheet UT-1 to intercept the runoff from the swale.

C2. A few relatively low-height retaining walls are proposed on the site. Where will the wall underdrains discharge for:

a. The wall behind Units 28 – 34.

b. The wall near the 56 inch beech tree.

R2. a. The underdrain for the retaining wall behind Units 28 through 34 will discharge into the newly added Yard Drain 105.

b. The underdrains for the walls near the 56" beech tree will discharge into adjacent Manhole 68 or else these walls will be designed with weep holes discharging to the surface of the ground.

C3. Review the grading between several of the units at the end of Meadowview Lane. For example:

a. The area between Unit 66 and 65 appears to drain directly toward the north wall of Unit 65.

b. A low point will exist along the north wall of Unit 64 without any inlet to intercept runoff.

c. There is no shoulder on the west side of Meadowview Lane in front of Unit 64. The grade slopes immediately downward from the back of the curb. The typical section on Drawing SD-1 indicates a 4' wide shoulder at ¼ inch per foot sloped toward the roadway.

R3. a. Swales and a low point with yard drain have been created to direct runoff away from Unit 65 as shown on revised Sheet GR-4.

b. Swales have been created to direct runoff away from Unit 64 as shown on revised Sheet GR-4.

c. The proposed contours were changed to show a 4'-wide shoulder in front of Unit 64.

C4. Review the grading between units on Pine Ridge Road:

a. Between Unit 116 and 117, grading seems to be directed northeasterly to the wall of Unit 116, with no positive outlet.

b. Consider adding an inlet to the west of Unit 117 as the proposed swale rounds the corner.

c. Between Unit 41 and 42, it appears as if runoff will accumulate against the wall of Unit 41.

R4. a. Contours have been revised to create a low point with a yard drain to direct runoff away from Unit 116 as shown on revised Sheet GR-2.

b. Yard Drain 106 was added to collect runoff from the swale west of Unit 117 as shown on revised Sheet UT-2.

c. Swales have been created to direct runoff away from Unit 41 as shown on revised Sheets GR-2 & GR-5.

C5. Review the grading between units on Castle Village Road. In front of Units 94 and 95, the east shoulder of the roadway appears to grade toward the residences.

R5. Swales have been created to direct runoff away from Unit 94 as shown on revised Sheet GR-2.

C6. Consider adding spot elevations at the corners of the parking spaces located along the interior island at the parking area on the west end of Boxwood Court. (Opposite spot elevations 731.5 and 731.9)

R6. Spot elevations were added at these locations on Sheet GR-2.

C7. A swale will be graded at the base of Detention Basin 510. Consider adding riprap lining to the swale to protect the toe of the detention basin fill slope from scour and erosion.

R7. A riprap-lined swale was added to the base of Detention Basin 510 as shown on Sheet GR-4.

D. <u>Sediment & Erosion Control Comments</u>

C1. Develop a water handling plan for the construction of the stream crossings at Johnnie Cake Lane and Meadowview Lane. Show how stream flows will be diverted around the work area while the new crossings are constructed. Include supporting details and provide temporary hydraulic facilities data in accordance with Chapter 6.F of the Connecticut DOT Drainage Manual.

R1. Water handling plans will be prepared and submitted to the Town by the contractor performing the work. It is anticipated that water handling will be minimal at each culvert location, consisting of temporary sandbagging of the open channel and bypass pumping with bypass discharge into the existing downstream channels. The work will be scheduled during the dry season of the

year when the channels are flowing minimally. For the crossing at Johnnie Cake Lane, it is anticipated the existing pipe culvert will remain active while Manhole 105, Manhole 106, and associated pipes are constructed. Then the remaining pipe segments and manhole structure for this culvert will be completed within 1 day of work when rainfall is not forecasted. For the crossing at Meadowview Lane, the precast headwall and 36" pipe culvert will also be constructed on consecutive days in the dry season when the channel is flowing minimally and no rainfall is forecasted. Upon completion, the underground utilities and roadway will be constructed without interruption of the flow of water in the pipe or channel.

C2. We recommend further subdividing each of the three phases into smaller divisions of five acres to better illustrate how the site will be disturbed and developed.

R2. The three phases were divided into two smaller divisions, including Phases 1A and 1B, Phases 2A and 2B, and Phases 3A and 3B. However, the smaller phases are still greater than 5 acres. Phases larger than 5 acres are mainly due to areas of disturbance necessary the construction of the temporary sediment basins, which will be built and stabilized before road and house construction. These basins will eventually be converted to permanent stormwater basins. Refer to updated construction sequence on Sheet SE.

C3. On Drawing SE, General Note 1 states that "At least thirty days prior to the state of construction, the developer is to submit to the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) a completed General Permit Registration…" The project is a Locally Approvable Project under the General Permit. Section 4(c)(A), Registration Procedure, notes that the registration must be submitted 60 days prior to the planned commencement of construction activity.

R3. On Drawing SE, General Note 1 – "30 days" was replaced with "60 days."

C4. On slopes below sediment traps and detention basins, add erosion control blankets.

R4. Erosion control blankets were added below temporary sediment traps 1, 2, 3, 6, 7, and 8.

C5. Add stone check dams in the proposed diversion swales to reduce the amount of sediment transported.

R5. Stone check dams were added to proposed diversion swales.

C6. Show baffles in temporary sediment traps to elongate flow paths as shown in Temporary Sediment Trap detail on Drawing SE-6.

R6. Baffles are now shown on all temporary sediment traps.

C7. The diversion swale will pass through a low spot near elevation 690 to the east of proposed Unit 31. Can the grade of the swale be maintained through this area?

R7. The grade of the swale would not have been able to be maintained in this area. Temporary Sediment Trap #10 was added in the low spot. As a result of this new feature, the size of Temporary Sediment Trap #7 was reduced.

C8. Drawing SE-6 shows a dewatering outlet for sediment traps, but these are not indicated on the plans. Please show.

R8. Temporary dewatering underdrains will not be used for the proposed temporary sediment traps, and the detail has been removed from Sheet SE-6.

C9. Show washout areas for concrete trucks near construction entrances.

R9. Washout areas for concrete trucks have been added to revised Sheets SE-1 and SE-5.

C10. Indicate duration of each phase in months or weeks.

R10. Once the site contractor has been selected, the contractor will submit a detailed construction schedule to the Town, including sequencing narrative prior to the start of construction.

E. <u>Miscellaneous Comments</u>

C1. A portion of Johnnie Cake Lane west of the new roadway will be removed. The roadway abandonment may require a formal abandonment process through the Town.

R1. Comment acknowledged.

C2. Encase the force main and sanitary sewer for 10 feet on either side of the crossing to minimize groundwater infiltration into the line.

R2. The force main and sanitary sewer are now encased in concrete for the wetland crossing along Meadow View Lane as shown on revised Sheet UT-4.

C3. Sanitary Sewer Manhole #3 is missing a top of frame elevation.

R3. A top of frame elevation has been added to Sanitary Sewer Manhole #3.

C4. Clarify the dashed line that runs roughly parallel to the proposed 706 contour between Pine Ridge Drive and Castle Village Road.

R4. The dashed line is an intermediate 707 contour and is now labeled.

C5. The 6-space parking area southwest of Unit 117 is atop a 13 foot high, 3H:1V slope. Is a guiderail warranted at this location?

R5. Timber guide rail has been added to the plans and details.

Please feel free to contact me directly if you should have any questions.

Regards,

SLR International Corporation

Todd D. Ritchie, PE, BCEE, CFM, REHS/RS
Principal Civil Engineer
tritchie@slrconsulting.com

cc: George Trudell – Castle Hill Real Estate Holdings, LLC
Thomas Beecher – Collins Hannafin, PC

Enclosures: Site Plans (revision date 2/20/2024)
Drainage Report (revision date 2/20/2024)

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SLR International Corporation
99 Realty Drive, Cheshire, Connecticut, 06410

February 27, 2024

Mr. Steve Maguire
Deputy Director of Land Use
Town of Newtown
3 Primrose Street
Newtown, CT 06470

SLR Project No.: 141.20080.00003

RE: Comment Response Letter
Tighe & Bond Third Party Engineering Review
Castle Hill Village Residential Open Space Development
Newtown, Connecticut

Dear Mr. Maguire,

SLR International Corporation is in receipt of correspondence addressed to you from Joseph Canas, PE, LEED AP, CFM, Principal Engineer of Tighe & Bond, Inc. dated February 23, 2024. We offer the following responses to comments in Tighe & Bond's letter that were noted as requiring additional information, along with the accompanying revised site plans and drainage report.

Comments Requiring Additional Information

Comment B.1.(g):

A vehicle gate has been added to the existing driveway at Castle Village Lane.

(1) The limits of the access driveway south of the gate are not shown, and it is not clear how the pond crest may be accessed.

(2) Maintenance vehicles will need to traverse a standard curb for access from Castle Village Lane. Consider mountable curb.

(3) The access road climbs a 33% grade, which his inaccessible for standard maintenance vehicles.

We recommend that this comment be resolved prior to approval because it will impact work within the upland review area, and depending on how it is resolved, could result in additional earth moving activity within the upland review area.

Response B.1.(g):

Refer to enclosed revised site plans and drainage report dated February 27, 2024.

(1) The maintenance access driveway and vehicle gate have been removed from Castle Hill Village Lane. The accessway entrance has been relocated to the north end of Boxwood Court and includes a driveway apron and vehicle gate. The revised site layout plans show the proposed grass lawn access pathway to Basin 130 from the driveway apron to the basin, which does not exceed 10% slope. The driveway apron,

vehicle gate and accessway are not within the 100-foot regulated upland review area from wetlands.

(2) Refer to response B.1.(g)(1).

(3) Refer to response B.1.(g)(1).

Comment D.1:

The applicant's engineer indicates that water handling plans will be prepared and submitted to the Town by the contractor. Although the contractor ultimately develops the water handling plans, it is up to the engineer to show the feasibility of water handling during the approvals. The method of construction of a temporary sandbag cofferdam across the watercourse, and then bypass pumping is a typical approach that would work well for the proposed crossing. The narrative provided in the response is acceptable, though the applicant's engineer should confirm that tabulated wetland disturbances included temporary disturbance from proposed water handling operations.

We recommend that this comment be resolved prior to taking action on the application. Specifically, the applicant's engineer should confirm that the tabulated disturbance areas include disturbances related to water handling activities, since these activities occur directly in wetlands and watercourses.

Response D.1:

Refer to Sheet SV included in the enclosed revised site plans dated February 27, 2024. A schematic layout for (temporary) sandbags, pump inlet, pump discharge pipe and discharge outlet associated with (temporary) bypass pumping during the installation of the drainage pipe culverts across Meadow View Lane and Castle Village Lane (at Johnnie Cake Lane) are shown in the plan views, along with boundary lines showing the limits of wetlands disturbance. For the culvert at Meadow Lane, a total of approximately 0.027 acres of wetlands will be impacted by the culvert installation, including the associated temporary bypass pumping. For the culvert at Castle Hill Village Lane, approximately 0.012 acres of wetlands will be impacted by the culvert installation, including the associated temporary bypass pumping.

<u>Tighe & Bond's Recommended Conditions of Approval</u>

Comment A.1:

The applicant's engineer indicates that the groundwater table is perched and intercepted by existing farm drains. Based on our observations, we concur with this assessment. Farm drain interception of the groundwater and discharge to the wetland system along Johnnie Cake Lane has historically maintained the hydrology of the wetland system. Intercepting groundwater in the deeper glacial till layer could contribute more groundwater as surface runoff to the wetland system.

The developer has offered to excavate test pits at each individual proposed house location to determine if groundwater extends into the glacial till layer. We believe this is reasonable, and preferable to disturbing the site at this time to excavate 117 test pits. We believe that the potential downstream impacts will be lessened if such test pits could be undertaken while construction vehicles are mobilized on the site and sediment and erosion controls are in place.

We suggest that the Commission consider making the test pits a condition prior to obtaining a building permit. Typically, building permits will be taken out for smaller groups of units, as opposed to 117 all at once.

Response A.1:

The applicant does not object to this condition of approval.

Comment B.1.a:

The applicant's preference is to leave the scour hole to maintain surface flow to the existing wetland system. We understand the reasoning for the decision and do not disagree with it.

As a potential condition of approval, we suggest that the applicant modify the stormwater operations and maintenance plan to specifically monitor the outlet from Detention Basin 130 for signs of erosion and scour after significant rain events (exceeding 1.3 inches).

Response B.1a:

Refer to the revised draft Stormwater Operations and Maintenance Manual included in the enclosed revised Drainage Report dated February 27, 2024, which incorporates the requested statements regarding monitoring of the outlet from Detention Basin 130.

Comment B.1.c.(1):

The bottom of the detention basin was raised to elevation 700.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we suggest the curtain drain be extended to curve northerly to where the existing and proposed 704 contours meet to fully cut off groundwater from the west.

Response B.1.c(1):

Refer to enclosed revised site plans dated February 27, 2024. The curtain drain associated with Detention Basin 130 has been extended as requested.

Comment B.1.c.(3):

The bottom of the detention basin was raised to elevation 696.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we suggest the curtain drain be extended to curve southwesterly toward the existing 702 contour to fully cut off upstream groundwater flow.

Response B.1.c(1):

Refer to enclosed revised site plans dated February 27, 2024. The curtain drain associated with Detention Basin 410 has been extended as requested.

Comment B.1.c.(4):

The bottom of the detention basin was raised to elevation 710.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we offer the following comments as a potential condition of approval:

(a) Extend the proposed curtain drain to the east and west, extending around the curve of the contour to fully cut off groundwater flow to the pond.

(b) Revise Drawing GR-5. The call-out for Detention Basin 310 does not align with the computations or drawn contours. The call out lists the top of berm and bottom of basin as 714.0 and 708.0, respectively, but should be elevations 716.0 and 710.0.

Response B.1.c(4):

(a) Refer to enclosed revised site plans dated February 27, 2024. The curtain drain associated with Detention Basin 310 has been extended as requested.

(b) Refer to revised drawing Sheet GR-5 in the enclosed revised site plans dated February 27, 2024. The call-out for Detention Basin 310 has been revised as requested.

Comment C.6:

Spot elevations have been added as requested to clarify the grades within the parking area. Drawing GR-2 should be revised to add a proposed 732 contour across the parking island.

Response C.6:

Refer to revised drawing Sheet GR-2 in the enclosed revised site plans dated February 27, 2024. The 732 contour has been added across the parking island as request.

Comment D.10:

A detailed sequencing narrative and construction schedule will be submitted to the Town once a site contractor has been selected.

Response D.10:

The applicant does not object to this condition of approval.

Please feel free to contact me directly if you should have any questions.

Regards,

SLR International Corporation

Todd D. Ritchie, PE, BCEE, CFM, REHS/RS
Principal Civil Engineer
tritchie@slrconsulting.com

cc: George Trudell - Castle Hill Real Estate Holdings, LLC
Thomas Beecher – Collins Hannafin, P.C.

Enclosures: Site Plans (revision date 2/27/2024)
Drainage Report (revision date 2/27/2024)

SLR International Corporation
99 Realty Drive, Cheshire, Connecticut, 06410

February 27, 2024

Ms. Sharon Salling, Chair
Inland Wetlands Commission
Town of Newtown
3 Primrose Street
Newtown, CT 06470

SLR Project No.: 141.20080.00003

RE: Comment Response Letter
Trinkaus Engineering Review Letter on Behalf of Newtown Forest Association
Castle Hill Village Residential Open Space Development
Newtown, Connecticut

Dear Ms. Salling,

SLR International Corporation (SLR) is in receipt of correspondence addressed to you from Steven D. Trinkaus, PE, Trinkaus Engineering, LLC dated February 21, 2024, on behalf of the Newtown Forest Association regarding the above referenced application. We offer the following responses to Mr. Trinkaus' comments, along with the accompanying revised site plans and drainage report.

Trinkaus Comments

C1. Basin 310: This basin is located on the eastern side of the site and will ultimately discharge onto the NFA property.

a. The discharge from Basin 310 is a direct piped connection to drainage on Castle Hill Road. The drainage system on this portion of Castle Hill Road discharges onto property owned by the Newtown Forest Association. Has the Castle Hill Road drainage system been evaluated for its ability to handle increased runoff volumes?

b. There are vegetated swales on the Newtown Forest Association property which convey the existing runoff from Castle Hill Road to the downgradient wetland area. Have the swales been evaluated for the increased runoff volumes which will be directed to them?

c. The swales on the NFA land discharge to a wetland system at the bottom of the slope. The applicant has not evaluated the impact on this off-site wetland system which will be impacted by increased runoff volumes and increased pollutant loads.

d. The applicant is increasing runoff volumes and pollutant loads on the NFA property, has the applicant obtained as easement from NFA to permit these changes?

e. The increased runoff volumes will cause erosion of the existing swales as they were not designed to handle more runoff. If the swales are eroded by the increased concentrated flow, it will affect the ability of NFA to maintain their property. The

eroded material will be deposited at the base of the swale within the limits of the delineated inland wetlands on the NFA property.

f. The only water quality treatment devices for the runoff direct to Basin 310 are catch basins with 48" sumps and online hydrodynamic separators. Both practices are considered "secondary" by the 2004 Manual as they do not provide much reduction in non-point source pollutant loads. This will result in the discharge of increased non-point source pollutant loads to the NFA property and the wetlands located on their property. In addition to Total Suspended Solids (TSS), other non-point source pollutants include total phosphorous (TP), total nitrogen (TN), total petroleum hydrocarbons (TPH) and metals (Zinc as an indicator metal for other metals). All of these pollutants will cause adverse impacts to the wetland system on the NFA property.

R1a. Drainage pipe conveyance capacity is directly correlated to the peak stormwater runoff flow rate from the drainage area contributing flow to the pipe – not the total volume of flow from the contributing drainage area. As shown in the table on page 5 of the enclosed Drainage Report (included below), peak stormwater runoff rates for the drainage area contributing stormwater runoff to Analysis Point C – Caste Hill Road Storm Drainage (East), [including discharges from proposed Stormwater Basin 310 into the town drainage system], are significantly reduced from existing to proposed conditions for the Castle Hill Village development for the 2, 10, 25, 50 and 100 year storms. These discharges to the town drainage system from the proposed Castle Hill Village will be reduced by 30%-35% under post development conditions compared to existing conditions.

Analysis Point C – Castle Hill Road Storm Drainage (East)					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Existing Conditions	4.6	14.2	21.2	26.8	33.2
Proposed Conditions	2.7	9.3	14.2	18.1	23.7

R1b. SLR visited the Nettleton Preserve property at 13 Castle Hill Road on February 25, 2024 (refer to following photos). At the time of our visit there was approximately 2" of snow cover in areas of the site, including at the location of the town storm drainpipe outlet, which will convey stormwater discharges from the proposed Castle Hill Village development (via discharge from proposed Stormwater Basin 310 to the town drainage system). The location of this storm drain outlet is approximately 300 feet from the intersection of Old Castle Drive, on the south side of Castle Hill Road. At this location there appeared to be a ground surface depression on the property around the drainpipe outlet. The depression was densely vegetated, and the vegetation had grown to roughly 3'+ tall and appeared to be unmaintained relative to the adjacent mowed non-forest property areas. The depression appeared to level out with the downhill grade within approximately 30' to 40' of the pipe outlet, where the vegetation is then mowed within an area between the depression and some small trees. A meandering strip of non-maintained vegetation then continued from the vicinity (south) of the small trees, across the Nettleton Preserve property in the southeasterly direction, to the eastern wood line. Although the formation of a swale was not clearly discernable in this area due to dense vegetation and snow cover, based on our review of available aerial

photography and contours from the UCONN Environmental Conditions Online website it appears this area is a broad (+/-10' wide) and shallow (6"-12") conveyance pathway consistent with the formation of a vegetated swale. SLR staff walked along the established grass footpath (between the orchard trees and eastern woodline) in the area of the swale and did not observe a location where concentrated stormwater flow crossed the trail.

Based on SLR's field observations, it is our opinion that the existing wide and shallow surface conveyance pathway (i.e. swale), which extends southeasterly across the Nettleton Preserve property from the town storm drainpipe outlet, appears to be thoroughly and densely vegetated and does not show signs of erosion due to existing town storm drain discharge flow rates. These observations are based on areas observed lacking snow cover and where snow was removed by SLR for observation of the ground surface. As discussed in our response R1b above, the proposed stormwater discharge rates from the Castle Hill Village development will be reduced between 30%-35% for the 2-year through 100-year storms. Since erosion of vegetated stormwater conveyance channels such as swales is directly correlated with the rate of flow being discharged to the channel, the proposed reduction in stormwater flow rates onto the Nettleton Preserve property following completion of the Castle Hill Village development will effectively reduce the potential for erosion on the Nettleton Preserve property.

Photo 1 – Town Drainage Pipe Outlet (from Castle Hill Road)

Photo 2 – View Toward Southeast from Town Drainage Pipe Outlet

Photo 3 – View Toward Town Drainage Pipe Outlet from Southwest

Photo 4 – View South Along Footpath Towards Area Downhill of Swale

R1c. **The 2004 Connecticut Stormwater Quality Manual states the design of stormwater management basins is dictated by local stormwater quantity control requirements. The Town and Borough of Newtown Inland Wetlands and Watercourses Regulations (Rev. 11/14/2022) and Borough of Newtown Zoning Regulations (Rev. 11/11/2020) do not include criteria for design of stormwater management systems. In *Article VIII – Section 7 – Ponds and Drainage Basins* of the Town of Newtown Zoning Regulations (Rev. 11/2023), stormwater drainage basins are required to be designed to attenuate peak watershed flow rates from pre-development to post-development for the 2, 10, 25 and 100-year, 24-hour storms and stormwater systems should incorporate appropriate stormwater treatment consistent with the 2004 Connecticut Stormwater Quality Manual. SLR has designed all proposed stormwater detention basins in accordance with local regulations and appropriate guidelines included in the 2004 Connecticut Stormwater Quality Manual.**

R1d. **Refer to response R1c.**

R1e. **Swale conveyance capacity is directly correlated to the peak stormwater runoff flow rate from the drainage area contributing flow to the swale – not the total volume of flow from the contributing drainage area. As discussed in our response R1a above, stormwater discharge rates entering the town drainage system along Castle Hill Road downstream of Stormwater Basin 310 are significantly reduced from existing to proposed conditions for the Castle Hill Village development for the 2, 10, 25, 50 and 100 year storms. These reductions in stormwater discharge rates to the Castle Hill Road drainage system will effectively reduce the flow rates onto the**

Nettleton Preserve property by 30%-35%, thereby reducing the potential for erosion along concentrated flow paths across the property.

R1f. Refer to enclosed revised Site Plans and revised Drainage Report both dated February 27, 2024. In addition to deep sump catch basins and an online hydrodynamic separator (with internal bypass providing offline flow configuration) for treatment of water quality flow prior to Stormwater Basin 310, Basin 310 will function as an extended detention basin providing pollutant removal, groundwater recharge and flow rate control.

The Schuler (Simple) Method for estimating pollutant export from urban development sites has been performed to determine the pollutant removal effectiveness of the proposed stormwater treatment train for each drainage area. Per the 2004 CT Stormwater Quality Manual, CTDEEP requires an 80% removal rate of total suspended solids (TSS) on an annual basis and does not have a specific removal rate standard for other pollutants such as Total Nitrogen (TN), Total Phosphorous (TP), metals, or Total Petroleum Hydrocarbons. The Borough of Newtown and Town of Newtown also have no such pollutant removal rate requirements. The Schuler Method results demonstrate the proposed systems will achieve a greater removal rate for TSS than the 80% required by CTDEEP. Though not required by the State or the Town, the removal rates of the other pollutants will provide an overall net benefit. The pollutant removal efficiencies of the proposed stormwater treatment practices for each contributing drainage area are listed in the following table and supporting calculations are included in the Appendix of the revised Drainage Report dated February 26, 2024.

Pollutant Removal Efficiency (%)					
Pollutant	**WS 12**	**WS 13**	**WS 31**	**WS 41**	**WS 51**
Total Suspended Solids	95.5	95.5	95.5	95.5	95.5
Total Nitrogen	30.0	30.0	30.0	30.0	30.0
Total Phosphorous	50.0	50.0	50.0	50.0	50.0
Zinc	-	-	-	-	-
Copper	-	-	-	-	-
Petroleum Hydrocarbons	92.0	92.0	92.0	92.0	92.0

In conclusion, SLR has visited the Nettleton Preserve property and observed the existing conditions down gradient of the existing town storm drain outlet onto the property and in our opinion there are no existing erosion concerns presently due to the town drainage discharge. Our analysis further concludes the rate of stormwater runoff onto the Nettleton Preserve property from the proposed Castle Hill Village development (via the town drainage system) will be reduced following construction of the development. With a reduction in the rate of runoff into the town drainage system at this location, we can conclude there will be a reduction in the velocity of stormwater entering the Nettleton Property, thereby reducing the

potential for erosion. Furthermore, we have analyzed the proposed stormwater treatment system contributing stormwater to this property from the proposed Castle Hill Village development and the analysis results show the proposed stormwater system pollutant removal efficiency meets and exceeds the 80% Total Suspended Solids removal threshold prescribed by the 2004 Connecticut Stormwater Quality Manual.

Please feel free to contact me directly if you should have any questions.

Regards,

SLR International Corporation

Todd D. Ritchie, PE, BCEE, CFM, REHS/RS
Principal Civil Engineer
tritchie@slrconsulting.com

cc: George Trudell - Castle Hill Real Estate Holdings, LLC
Thomas Beecher – Collins Hannafin, P.C.

Enclosures: Site Plans (revision date 2/27/2024)
Drainage Report (revision date 2/27/2024)

SLR International Corporation
99 Realty Drive, Cheshire, Connecticut, 06410

February 27, 2024

Ms. Sharon Salling, Chair
Inland Wetlands Commission
Town of Newtown
3 Primrose Street
Newtown, CT 06470

SLR Project No.: 141.20080.00003

RE: Comment Response Letter
Trinkaus Engineering Review Letter on Behalf of Newtown Conservation Coalition
Castle Hill Village Residential Open Space Development
Newtown, Connecticut

Dear Ms. Salling,

SLR International Corporation (SLR) is in receipt of correspondence addressed to you from Steven D. Trinkaus, PE, Trinkaus Engineering, LLC dated February 21, 2024, on behalf of the Newtown Conservation Coalition regarding the above referenced application. We offer the following responses to Mr. Trinkaus' comments, along with the accompanying revised site plans and drainage report.

Trinkaus Comments

C1. A summary of cut and fill volumes is provided on this sheet. The summary table calls out the excavation necessary for building basements and road base separately from general earth work on this site. There is a significant amount of grading around all the proposed units. The data is as follows:

a. Cut volume = 66,810 cubic yards b. Fill volume = 60,410 cubic yards

c. Net cut volume = 6,400 cubic yards

d. Basement excavation volume = 34,330 cubic yards

e. Road base excavation volume = 13,430 cubic yards

f. Total excavation for basements and road construction = 54,160 cubic yards

R1. Refer to enclosed revised site plans prepared by SLR dated February 27, 2024 including the following earthwork calculations:

EARTHWORK SUMMARY:

	VOLUME (CY)
CUT	64,025
FILL	63,390
NET	635 (CUT)
BASEMENT EXCAVATION VOLUME	34,330 (CUT)
ROAD BASE	13,430 (CUT)
TOTAL EXCAVATION	48,395 (CUT)*

*TOTAL EXCAVATION = NET + BASEMENT EXCAVATION VOLUME + ROAD BASE
OF THE 48,395 CY TOTAL CUT 34,800 CY IS COMMON FILL AND 13,595 CY IS TOPSOIL

C2. The excavation volume for basements and road construction is NOT part of the 66,810 cubic yards cited above, therefore the actual excavation volume would be 120,970 cubic yards. If this is the case then the volume to be removed from the site will be approximately 60,000 cubic yards, not 6,400 cubic yards. At 17 cubic yards per dump truck load, this means that there will be over 3,500 truck trips over the local roads.

R2. The existing ground surface to finished ground surface cut and fill volumes are included in the Earthwork Summary on lines 1 and 2. Approximately 64,025 cubic yards will be excavated and approximately 63,390 cubic yards will be filled to establish the final grades. This results in a net of approximately 635 cubic yards of soil material to be removed from the site. In addition, approximately 34,330 cubic yards of soil material will be removed below finished grades for basements and approximately 13,430 cubic yards will be removed below the finished grades for roadways and parking areas and replaced with road base material. Therefore, the net volume of soil material to be removed from the site is approximately 48,395 cubic yards (635 CY + 34,330 CY + 13,430 CY). It should be noted that the transport of excavated basement and road base replacement materials from the site will occur over the entire duration of the project.

C3. Since the road which previously divided the 136 acres into two parcels has been abandoned so that the two parcels could be merged into a single parcel, the entire parcel must provide all the required data called for in the Newtown land use regulations. This has not been done. This would include boundary survey, delineation of all wetlands, watercourses, and vernal pools, steep slopes, etc.

R3. According to Section 7.6 of the Inland Wetlands and Watercourses Regulations of the Town and Borough of Newtown, site plan requirements are at the discretion of the Agency or its agent. It is SLR's understanding that during the Inland Wetlands Commission public hearing for this application held on January 10, 2024 the only additional information requested by the Commission was for an SLR soil scientist to conduct a site visit to determine if any wetland resources are located offsite within 100 feet of the western property boundary of 20 Castle Hill Road. A soil scientist from SLR conducted a site visit on January 30, 2024 and determined that no wetland resources were identifiable within 100-feet west of the western property line of 20 Castle Hill Road (supplemental wetland soil investigation report provided under separate cover).

<u>Utility Plans General Comments</u>

C4. Existing contours need to be labeled to facilitate reading of the plans. Proposed contours for the proposed stormwater basins also need to be labeled on the utility plans.

R4. Existing and proposed contours are labeled on the grading plans (Sheets GR-1 through GR-5).

C5. Why aren't all roof drains directed to a catch basin and then stormwater management practice?

R5. There is no requirement for all roof drains to be connected to a centralized stormwater collection system. Roof drainage does not contain significant amounts (if any) of total suspended solids and all roof drainage discharges are directed to stormwater basins.

C6. Discharge of footing drains on the slopes will result in concentrated flow onto a slope above a wetland will cause erosion on the upland slope and result in the deposition of the eroded material into the wetland.

R6. Refer to enclosed revised site plans dated February 27, 2024. All foundation drain, curtain drain and stormwater drain outlets include riprap apron energy dissipators and will not result in eroded soil or soil material entering down gradient wetlands.

C7. The applicant is using scour holes at the ends of pipes when entering a stormwater basin and at the end of the basin discharge pipes on the original grade. Scour holes are not the appropriate measure for these applications as they do not spread the flow out as a riprap apron does. Scour holes result in a more concentrated flow onto the natural ground surface than a riprap apron does.

R7. Refer to enclosed revised site plans dated February 27, 2024. All stormwater pipes discharge riprap aprons.

C8. The applicant sized outlet protection using the CT DOT drainage manual. The CT DEP 2002 Guidelines for Soil Erosion and Sediment Control "2002 Guidelines" is the controlling document. The 2002 Guidelines require that outlet aprons be used which are sized for the 25-year flow rate.

R8. There is no governing document for design of outlet protection. The State of Connecticut has published various documents providing guidelines for their design. SLR has designed the outlet protection riprap aprons in accordance with the CT DOT Drainage Manual (latest revisions relative to outlet protection design issued in 2003), since the manual's design criteria are for permanent outlet protection and result in more conservatively designed (i.e. longer riprap aprons) than the design criteria included in the 2002 Guidelines for Erosion and Sediment Control.

C9. A summary of cut and There are five proposed stormwater basins, the following issues are applicable to all five of the basins as currently proposed:

a. Riprap berms across bottom of basin do not create a forebay. A forebay is a depressional storage area at the inlet of a stormwater management practice which is four (4) feet to six (6) feet in depth, a minimum length to width ratio of 2:1 and hold a minimum of 10% of the Water Quality Volume (WQV) directed to a basin.

b. The lack of a depressional forebay will cause re-suspension of any settled sediment on the uphill side of the stone filter berm for subsequent rainfall events. This turbid water will pass through the stone filter berm and not be trapped.

c. The design of this basin does not conform to any of the practices found in the CT DEP 2004 Storm Water Quality Manual "2004 Manual".

d. As the basin design does not conform to any of the practices found in the 2004 Manual, no water quality treatment can be applied to this basin.

e. The only water quality treatment devices for the runoff directed to all basins are catch basins with 48" sumps and online hydrodynamic separators. Both practices are considered "secondary" by the 2004 Manual as they do not provide much reduction in non-point source pollutant loads.

R9a. Refer to enclosed revised site plans dated February 27, 2024. The riprap berm design for the stormwater basins has been revised to include an earthen core.

R9b. Refer to R9a and revised site plans dated February 27, 2024. All stormwater basins are designed with a depressional forebay.

R9c. Refer to enclosed revised site plans dated February 27, 2024. All stormwater basins are designed as extended detention basins in accordance with the 2004 Stormwater Quality Manual guidelines.

R9d. All stormwater basins are designed as extended detention basins in accordance with the 2004 Stormwater Quality Manual guidelines. Refer to enclosed revised Drainage Report dated February 27, 2024, including the pollutant removal efficiencies and associated calculations for the proposed stormwater treatment train associated with each drainage area based on the Schuler (Simple) Method for estimating pollutant export from urban development sites.

C10. Each stormwater basin also has specific issues as discussed in the following sections which reduce their intended functionality.

R10. No response required.

<u>Basin 120</u>

C11. a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.

b. The bottom of Basin 120 is located at elevation 668', the outlet control structure is located at proposed contour 674'. However, the invert of the low flow outlet is set at 668.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The discharge from Basin 120 is just south of the property line above Johnny Cake Lane and then flows down the slope to the delineated off-site wetland. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.

d. The bottom of Basin 120 is two (2) feet to six (6) feet below grade. According to TP-19 which is in the bottom of Basin 120, mottling (seasonal high groundwater level) "SHGWL" was observed at 36" below grade, so the bottom of the basin will be located below the SHGWL.

e. The berm is set at elevation 676' which is six (6) feet to ten (10) feet above the existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

R11a. According to Section 1.2 of the 2004 Stormwater Quality Manual, the manual is intended by CTDEEP to be used as a planning tool and design guidance document and the information and recommendations are intended to augment, rather than replace, professional judgement. Therefore, the manual has no "requirements" as asserted by Mr. Trinkaus.

According to Section 7.4 of the manual, *"The pollutant reduction criterion is designed to improve the water quality of stormwater discharges by treating a prescribed water quality volume or associated peak flow, referred to as the water quality flow."* Furthermore, section 7.4.2 states that when planning to treat the water quality flow (WQF) *"a stormwater treatment facility must have a flow rate capacity equal to or greater than the WQF in order to treat the entire water quality volume*." This means that treating the calculated water quality flow rate provides treatment for the entire water

quality volume. The proposed stormwater treatment trains for all site drainage areas provide treatment for the water quality flow rate prior to further treatment within the extended detention basins.

R11b. Refer to revised site plans dated February 27, 2024. The outlet control structure for Basin 120 has been relocated to ensure proper function.

R11c. Refer to revised site plans dated February 27, 2024. A riprap apron has been designed at the pipe discharge from Basin 120 to dissipate stormwater discharges prior to entering the wetlands.

R11d. Refer to revised site plans dated February 27, 2024. A curtain drain has been added upgradient of Basin 120 to ensure the seasonal high groundwater level will be at least 3 feet below the bottom of the basin.

R11e. Following approvals by the Town of Newtown, the developer will coordinate with CTDEEP to obtain all necessary CTDEEP permits prior to the start of construction.

Basin 130

C12. a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.

b. The bottom of Basin 130 is located at elevation 694', the outlet control structure is located at proposed contour 701'. However, the invert of the low flow outlet is set at 694.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The discharge from Basin 130 is just south of the property line above Johnny Cake Lane and then flows down the slope to the delineated off-site wetland. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.

d. The bottom of Basin 130 is six (6) feet to ten (10) feet below grade. According to TP-14 which is in the bottom of Basin 120, mottling (seasonal high groundwater level) "SHGWL" was observed at 24" below grade, so the bottom of the basin will be located below the SHGWL.

e. The berm is set approximately eight (8) feet above existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

R12a. Refer to response R11a., which applies to all proposed stormwater basins.

R12b. Refer to revised site plans dated February 27, 2024. The bottom of Basin 130 has been elevated and the outlet control structure has been relocated accordingly to ensure proper function.

R12c. Refer to revised site plans dated February 27, 2024. A riprap apron has been designed at the pipe discharge from Basin 130 to dissipate stormwater discharges prior to entering the wetlands.

R12d. Refer to revised site plans dated February 27, 2024. The bottom of Basin 130 has been raised to elevation 700 and a curtain drain has been added upgradient of the basin to ensure the seasonal high groundwater level will be at least 3 feet below the bottom of the basin.

R12e. Following approvals by the Town of Newtown, the developer will coordinate with CTDEEP to obtain all necessary CTDEEP permits prior to the start of construction.

Basin 310

C13. a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.

b. The bottom of Basin 310 is located at elevation 708.0', the outlet control structure is located at proposed contour 712.0'. However, the invert of the low flow outlet is set at 708.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The bottom of Basin 310 is located between six (6) feet and eight (8) feet below existing grade. According to TP-1 and TP-2 which are in the bottom of Basin 310, mottling (seasonal high groundwater level) "SHGWL" was observed at 48" below grade respectively, so the bottom of the basin will be located below the SHGWL.

d. The discharge from Basin 310 is a direct piped connection to drainage on Castle Hill Road. The drainage system on this portion of Castle Hill Road discharges onto property owned by the Newtown Forest Association. Has the Castle Hill Road drainage system been evaluated for its ability to handle increased runoff volumes?

e. There are vegetated swales on the Newtown Forest Association property which convey the runoff from Castle Hill Road to the downgradient wetland area. Have the swales been evaluated for the increased runoff volumes which will be directed to them?

f. The swales on the NFA land discharge to a wetland system at the bottom of the slope. The applicant has not evaluated the impact on this off-site wetland system which will be impacted by increased runoff volumes and increased pollutant loads.

g. The applicant is increasing runoff volumes and pollutant loads on the NFA property, has the applicant obtained as easement from NFA to permit these changes?

R13a. Refer to response R11a., which applies to all proposed stormwater basins.

R13b. Refer to revised site plans dated February 27, 2024. The bottom of Basin 310 has been elevated and the outlet control structure has been relocated accordingly to ensure proper function.

R13c. Refer to revised site plans dated February 27, 2024. The bottom of Basin 310 has been raised to elevation 710 and a curtain drain has been added upgradient of the basin to ensure the seasonal high groundwater level will be at least 3 feet below the bottom of the basin.

R13d. As shown in the table on page 5 of the Drainage Report (included below), peak stormwater runoff rates for the drainage area contributing stormwater runoff to Analysis Point C – Caste Hill Road Storm Drainage (East), [including discharges from proposed Stormwater Basin 310 into the town drainage system], are significantly reduced from existing to proposed conditions for the proposed Castle Hill Village development for the 2, 10, 25, 50 and 100 year storms. These reductions in stormwater discharge rates to the Castle Hill Road drainage system will effectively increase the capacity of this town drainage system network during these design storms by approximately 30%-35%.

Analysis Point C – Castle Hill Road Storm Drainage (East)					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	**2**	**10**	**25**	**50**	**100**
Existing Conditions	4.6	14.2	21.2	26.8	33.2
Proposed Conditions	2.7	9.3	14.2	18.1	23.7

R13e. **SLR visited the Nettleton Preserve property at 13 Castle Hill Road on February 25, 2024. At the time of our visit there was approximately 2" of snow cover in areas of the site, including at the location of the town storm drainpipe outlet, which will convey stormwater discharges from the proposed Castle Hill Village development (via discharge from proposed Stormwater Basin 310 to the town drainage system). The location of this storm drain outlet is approximately 300 feet from the intersection of Old Castle Drive, on the south side of Castle Hill Road. At this location there appeared to be a ground surface depression on the property around the drainpipe outlet. The depression was densely vegetated, and the vegetation had grown to roughly 3'+ tall and appeared to be unmaintained relative to the adjacent mowed non-forest property areas. The depression appeared to level out with the downhill grade within approximately 30' to 40' of the pipe outlet, where the vegetation is then mowed within an area between the depression and some small trees. A meandering strip of non-maintained vegetation then continued from the vicinity (south) of the small trees, across the Nettleton Preserve property in the southeasterly direction, to the eastern wood line. Although the formation of a swale was not clearly discernable in this area due to dense vegetation and snow cover, based on our review of available aerial photography and contours from the UCONN Environmental Conditions Online website it appears this area is a broad (+/-10' wide) and shallow (6"-12") conveyance pathway consistent with the formation of a vegetated swale. SLR staff walked along the established grass footpath (between the orchard trees and eastern woodline) in the area of the swale and did not observe a location where concentrated stormwater flow crossed the trail.**

Based on SLR's field observations, it is our opinion that the existing wide and shallow surface conveyance pathway (i.e. swale), which extends southeasterly across the Nettleton Preserve property from the town storm drainpipe outlet, appears to be thoroughly and densely vegetated and does not show signs of erosion due to existing town storm drain discharge flow rates. These observations are based on areas observed lacking snow cover and where snow was removed by SLR for observation of the ground surface. As discussed in our response R1b above, the proposed stormwater discharge rates from the Castle Hill Village development will be reduced between 30%-35% for the 2-year through 100-year storms. Since erosion of vegetated stormwater conveyance channels such as swales is directly correlated with the rate of flow being discharged to the channel, the proposed reduction in stormwater flow rates onto the Nettleton Preserve property following completion of the Castle Hill Village development will effectively reduce the potential for erosion on the Nettleton Preserve property.

R13f. **The 2004 Connecticut Stormwater Quality Manual states the design of stormwater management basins is dictated by local stormwater quantity control requirements. The Town and Borough of Newtown Inland Wetlands and Watercourses Regulations (Rev. 11/14/2022) and Borough of Newtown Zoning Regulations (Rev. 11/11/2020) do not include criteria for design of stormwater management systems. In *Article VIII – Section 7 – Ponds and Drainage Basins* of the Town of Newtown Zoning Regulations (Rev. 11/23), stormwater drainage basins are required to be designed to attenuate peak watershed**

flow rates from pre-development to post-development for the 2, 10, 25 and 100-year, 24-hour storms and incorporate appropriate stormwater treatment consistent with the 2004 Connecticut Stormwater Quality Manual. SLR has designed all proposed stormwater detention basins in accordance with local regulations and appropriate guidelines included in the 2004 Connecticut Stormwater Quality Manual.

Basin 410

C14. a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 1.0' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.

b. The bottom of Basin 410 is located at elevation 692', the outlet control structure is located at proposed contour 697'. However, the invert of the low flow outlet is set at 693.0', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The discharge from Basin 410 is directed to a stone fill trench above a delineated inland wetland area. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.

d. The bottom of Basin 410 is ten (10) feet to twelve (12) feet below grade. According to TP-9 and TP-10 which are in the bottom of Basin 410, mottling (seasonal high groundwater level) "SHGWL" was observed at 24" below grade, so the bottom of the basin will be located below the SHGWL.

R14a. Refer to response R11a., which applies to all proposed stormwater basins.

R14b. Refer to revised site plans dated February 27, 2024. The bottom of Basin 410 has been elevated and the outlet control structure has been relocated accordingly to ensure proper function.

R14c. Refer to revised site plans dated February 27, 2024. The pipe discharge area from Basin 410 has been changed to a riprap apron.

R14d. Refer to revised site plans dated February 27, 2024. The bottom of Basin 410 has been raised to elevation 696 and a curtain drain has been added upgradient of the basin to ensure the seasonal high groundwater level will be at least 3 feet below the bottom of the basin.

Basin 510

C15. a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.

b. The bottom of Basin 510 is located at elevation 682.0', the outlet control structure is located at proposed contour 684.0'. However, the invert of the low flow outlet is set at 682.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The discharge from Basin 510 is directed to a stone fill trench above a delineated inland wetland area. The existing slope currently only sees overland flow from the forested site.

The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.

d. The bottom of Basin 510 is two (2) feet below grade on the north side and in a four (4) feet of fill on the south side. According to TP-4 and TP-5 which are in the bottom of Basin 510, mottling (seasonal high groundwater level) "SHGWL" was observed at 23" and 24" below grade respectively, so a portion of the bottom of the basin will be located below the SHGWL.

e. The berm is set approximately ten (10) feet above existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

R15a. Refer to response R11a., which applies to all proposed stormwater basins.

R15b. Refer to revised site plans dated February 27, 2024. The outlet control structure has been relocated accordingly to ensure proper function.

R15c. Refer to revised site plans dated February 27, 2024. The pipe discharge area from Basin 510 has been changed to a riprap apron.

R15d. Refer to revised site plans dated February 27, 2024. A curtain drain has been added upgradient of the basin to ensure the seasonal high groundwater level will be at least 3 feet below the bottom of the basin.

R15e. Following approvals by the Town of Newtown, the developer will coordinate with CTDEEP to obtain all necessary CTDEEP permits prior to the start of construction.

SE Sheet Comments

C16. a. This plan shows that each phase of the proposed construction is greater than five (5) acres, which is the limit under CT General Permit (GP) for Construction Activities. If the area proposed for disturbance at one time is greater than five (5) acres, a much more robust and detailed erosion control plan is required. CT DEEP could also require that an Individual Permit is applicable and not the GP.

b. It is proposed to use all five stormwater basins as temporary sediment basins (TSTs). How will the TSTs be converted to post-development basins with specified plantings when runoff will be directed to them?

R16a. Following approvals by the Town of Newtown, the developer will coordinate with CTDEEP to obtain all necessary CTDEEP permits prior to the start of construction.

R16a. Conversion of the temporary sediment basins to permanent stormwater basins will occur during periods of forecasted periods of dry weather and will be facilitated by temporary bypass pumping from the sediment forebay to the outlet control structure, as required.

Drainage Report Comments

C17. a. From the results of the deep test holes, it is noted that permeability tests were conducted at many of the deep test pits. No results of these permeability tests were found on the plan set or in the drainage report. This is a critical omission in the submission.

b. No information has been provided as to how the permeability tests were conducted. Were Double Ring Infiltration tests done in the field or were soil samples taken and tested in a laboratory? If tube samples were taken in the field, were the samples taken horizontally or vertically in the soil profile?

c. It is stated that infiltration was included in the routing of Basins 130 (0.33"/hr.); Basin 310 (0.66"/hr.); Basin 410 (1.26"/hr.); and Basin 510 (0.1"/hr.). The bottoms of Basins 130, 310, and 410 are located well below the seasonal high groundwater table, thus there will be no infiltration as the bottom is in a saturated zone where infiltration simply does not occur.

d. In the case of Basin 510, a portion of the basin is in up to four (4) feet of fill, no specifications have been provided for this fill material, so no infiltration rate can be attributed to this material and the routing of the basin.

e. No pollutant analysis has been provided which would demonstrate that the CT DEP goal of 80% reduction of Total Suspended Solids (TSS) has been met. In addition to TSS, the analysis needs to include total phosphorous (TP), total nitrogen (TN), total petroleum hydrocarbons (TPH) and metals (Zinc as an indicator metal for other metals). 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 practice, you will observe that the removal rates are not the same for all the various pollutants which you would expect if simply trapping the sediment trapped all the other pollutants.

f. The Groundwater Recharge Volume (GRV) was calculated for each stormwater basin, it has not been demonstrated that the GRV will infiltrate back into the ground which is the requirement of this standard to maintain pre-development infiltration rates of rainfall for post-development conditions. No infiltration will occur as the bottom of the basins are located below the seasonal high groundwater table. The design is not in compliance with the 2004 Manual.

g. The Water Quality Volume (WQV) was calculated for each stormwater basin, it has not been demonstrated that the WQV is being "captured and treated" within each stormwater basin. The Water Quality Flow (WQF) is a rate of runoff based on the WQV and is used to size structural practices such as hydrodynamic separators and providing the WQF does not eliminate the need to provide the WQV in each basin. The design is not in compliance with the 2004 Manual.

h. As discussed above, the full WQV is not being "captured and treated" per the 2004 Manual in four of the five proposed basins. The data for each basin is provided below:

i. Basin 120, pool depth = 0.5', volume provided = 3,639 cubic feet; WQV directed to Basin 120 = 15,201 cubic feet; criteria has not been met.

ii. Basin 130, pool depth = 0.5', volume provided = 2,183 cubic feet; WQV directed to Basin 130 = 6,882 cubic feet; criteria has not been met.

iii. Basin 310, pool depth = 0.5', volume provided = 2,842 cubic feet, WQV directed to Basin 310 = 3,876 cubic feet; criteria has not been met.

iv. Basin 410, pool depth = 1.0', volume provided = 3,218 cubic feet, WQV directed to Basin 410 = 8,537 cubic feet, criteria has not been met.

v. Basin 510, pool depth = 0.5', volume provided = 4,468 cubic feet, WQV directed to Basin 510 = 4,138 cubic feet; criteria has been met.

i. It is clear from the above data taken from the applicant's plans and reports that the WQV has not been provided in four of the stormwater basins per the 2004 Manual.

R17a. Permeability test results have been included in the Drainage Report Appendix (following the NOAA Atlas 14 precipitation data table) since the report was initially submitted.

R17b. A total of 15 undisturbed tube samples were obtained from test pits by a Todd Ritchie of SLR, who is a professional engineer, certified soil evaluator and registered environmental health specialist/registered sanitarian. The tube samples were analyzed by trained SLR staff at our in-office soils laboratory. Falling head permeability tests were performed with the results included in the Drainage Report Appendix. The permeability results are consistent with the infiltration ranges published for the onsite soils at the locations of the basins based according to NRCS Web Soil Survey data.

R17c. Refer to revised site plans dated February 27, 2024 which include curtain drains upgradient of stormwater basins to ensure the bottoms of the basins are 3 feet above seasonal high groundwater.

R17d. The infiltration rate of Basin 510 used for design is 0.1 inches per hour, which equates to a SLR tested infiltration rate of 0.2 inches per hour for the glacially compacted subsoil. A note has been added to the Basin 510 callout on Sheet GR-4 of the enclosed revised site plans dated February 27, 2024 stating the basin bottom fill material shall provide an infiltration rate of greater than or equal to 0.2 inches per hour based on field testing of the installed fill material following installation.

R17e. Refer to enclosed revised Drainage Report dated February 27, 2024, including the pollutant removal efficiencies and associated calculations for the proposed stormwater treatment train associated with each drainage area based on the Schuler (Simple) Method for estimating pollutant export from urban development sites.

R17f. Refer to responses R17a., R17b. and R17c.

R17g. Refer to response R11a.

R17h. Refer to response R11a.

<u>Wetland and Watercourse Impact Assessment</u>

C18. It is stated on the bottom of page 10 that the stormwater basins "will serve several purposes, including stormwater renovation and providing groundwater recharge volume (GRV). Providing the GRV maintains the pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff to maintain water table levels, stream baseflow, and wetland moisture levels." This statement is not supported by factual evidence or analysis. As noted above, none of the basins comply with the design requirements found in the CT DEP 2004 Storm Water Quality Manual. No pollutant renovation analysis has been provided by the applicant to demonstrate that renovation of the stormwater will occur. As stated above, the bottom of four basins is located below the seasonal high groundwater table and infiltration does not occur into a saturated zone, thus the GRV is not met on the site.

R18. Refer to responses R11a. and R17c. The stormwater basins are designed in accordance with applicable requirements of the 2004 Connecticut Stormwater Quality Manual. Refer to enclosed revised Drainage Report dated February 27, 2024 which includes a pollutant removal summary for the proposed stormwater treatment trains based on the Schuler (Simple) Method, including supporting calculations.

C19. Level spreaders do not improve water quality as they are a discharge system to ensure that overland and not concentrated flow occurs on the undisturbed area downhill of a basin.

R19. Level spreaders are not included on the enclosed revised site plans dated February 27, 2024.

C20. It is stated on page 11 that the site under conventional zoning would support 136 units, 1 unit per acre. This is not correct. First, The Borough of Newtown Zoning regulations, Section 4.05.1C.1 states the following: "*The maximum number dwelling units permitted shall not exceed 1.5 times the Developable Acreage, which is the total (gross) acreage of the parcel(s) minus any land having wetlands, watercourse, ponds, or steep slopes over 25%. In addition, the total number of units cannot exceed one per acres of the total (gross) acreage of the parcel(s).*" No calculations were found on the plans which provide the required calculation from the Borough Zoning Regulations. The maximum permitted density under the Open Space Concept should be the more restrictive density based upon the above analysis in my professional opinion.

R20. The maximum development density is within the purview of the Borough Zoning Commission. However, a licensed surveyor at SLR has conducted a boundary survey associated with the proposed merger of the 20 Castle Hill Road (+/- 66.4 acres), 60 Castle Hill Road (+/-70.3 acres), and the abandoned undeveloped town right-of-way associated with Reservoir Road (+/-1.8 acres) located between 20 and 60 Castle Hill Road. The merger will be completed following approval of the proposed residential open space development. Based on an analysis of survey contours within the 20 Castle Hill Road property and the former town roadway right-of-way, along with Town of Newtown GIS contours overlaid on the 60 Castle Hill Road property, SLR has determined that approximately 25 acres of the total combined +/-138.5 acres consists of steep slopes. Existing wetlands delineated within 20 Castle Hill Road and within 100-feet west of the western 20 Castle Hill Road property line total approximately 3.7 acres. Although wetlands have not been delineated on the 60 Castle Hill property, based on the maximum dwelling units criteria for a Residential Open Space Development, there would need to be over 32.5 acres of wetlands on the 60 Castle Hill Road property to result in a maximum dwelling unit total below 117. This equates to approximately almost 50% of the 60 Castle Hill Road property being wetlands, which is not possible based on the extent of steep slopes and the predominance of well drained Charlton and Chatfield fine sandy loam soils (according to the NRCS Web Soil Survey) on the property. Therefore, the proposed 117 units are below the maximum number of dwelling units allowed to be permitted for the Castle Hill Village development.

C21. Furthermore, Section 4.05.1.C.6 states the following: "*Site layout should be designed to minimize development upon and re-contouring of slopes having twenty-five (25) percent or more grades. Disturbance of steep slope and the creation of steep slopes shall be avoided to the greatest extent possible.*" It needs to be pointed out that 2:1 slopes are a 50% grade, a 3:1 slope is a 33.3% grade both of which exceed 25%. Thus, much of the proposed grading on the site does not meet this requirement.

R21. The proposed development has been almost entirely laid out within site areas where existing slopes are less than 25%. The proposed finished ground slopes are minimized to the extent practicable based on necessity to provide flattened areas for home sites in existing site areas with slopes generally ranging from 5% to 10% or greater. Maximum mowable slopes of 3:1 (33%) have been provided where necessary, mainly limited to stormwater basin embankments, berm embankments, and transition areas around proposed homes where existing grades are greater than 10%. The only area of maximum 2:1 (50%) vegetated slope (to remain unmowed) is an area on the west side of Basin 410, where the basin embankment transitions to the existing grade. This area will be treated

with erosion control blankets for stabilization until the vegetation has fully developed and stabilized.

Please feel free to contact me directly if you should have any questions.

Regards,

SLR International Corporation

Todd D. Ritchie, PE, BCEE, CFM, REHS/RS
Principal Civil Engineer
tritchie@slrconsulting.com

cc: George Trudell - Castle Hill Real Estate Holdings, LLC
Thomas Beecher – Collins Hannafin, P.C.

Enclosures: Site Plans (revision date 2/27/2024)
Drainage Report (revision date 2/27/2024)

23-5003-004-01
February 6, 2024

Mr. Steve Maguire
Zoning Enforcement Officer
Town of Newtown
3 Primrose Street
Newtown, Connecticut 06470

Re: **Castle Hill Village**
Third Party Engineering Review

Dear Mr. Maguire:

In accordance with our proposal dated January 22, 2024, Tighe & Bond has reviewed the submission drawings and engineering report for Castle Hill Village, a proposed 117-unit residential open space subdivision to be located on properties at 20 and 60 Castle Hill Road.

The project proposes the construction of 117 single family residential units on two parcels of land (Assessor ID numbers 19-8-1 and 18-7-8) and totaling approximately 136 acres. The parcels are separated by an unimproved right-of-way known as Reservoir Road. The subject properties are generally bounded by Mount Pleasant Road (US 6/CT 25) on the north, properties on the west side of King Street to the east, Castle Hill Road to the south, and Taunton Pond and the Taunton Lake Drive neighborhood to the west. The proposed development will occur on the eastern portion of the subject properties, with the entirety of the property west of Reservoir Road to remain as open space.

Further information is needed to conclude the proposal complies with the requirements of the Newtown Zoning Regulations and the State of Connecticut Stormwater Quality Manual. Our most significant comments identify concerns with the design with respect to groundwater at the proposed detention basins, the size of the watercourse crossing at Meadowview Lane, sediment and erosion control phasing, and water handling at the proposed culvert crossing. Other comments request further information and clarifications regarding certain elements of the design. Tighe & Bond cannot offer its opinion regarding the suitability of the design until these comments are addressed.

Our remaining comments call attention to technical design matters that can be resolved with minor design changes. The application in concept utilizes appropriate stormwater treatment practices and generally follows appropriate methodologies for hydrologic and hydraulic analyses, but additional information is needed to confirm that the practices have been appropriately sized. In general, we do not envision that significant re-design efforts will be required to address the comments presented herein.

Basis of Review

Our review is based upon the following documents, in addition to our site visit on January 26, 2024:

1. Cover Sheet, Castle Hill Village, Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

2. "Proposed Open Space Conservation Area Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing CP, prepared by SLR International Corporation, dated November 8, 2023.

3. "Property & Topographic Survey, Map of Land, 20 Castle Hill Drive, Newtown, Connecticut," Drawing 1 of 1, prepared by SLR International Corporation, dated August 2023.

4. "Compilation Plan, Map Showing Portion of Reservoir Road to be Discontinued, Newtown, Connecticut, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated August 2023.

5. "Site Plan - Overall, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SP, prepared by SLR International Corporation, dated November 8, 2023.

6. "Index Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing IN, prepared by SLR International Corporation, dated November 8, 2023.

7. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

8. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

9. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

10. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

11. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

12. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

13. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

14. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

15. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

16. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

17. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

18. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

19. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

20. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

21. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

22. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

23. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

24. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

25. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

26. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

27. "Sediment & Erosion Controls – Construction Phasing, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

28. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

29. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

30. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

31. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

32. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

33. "Sediment & Erosion Control Notes & Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-6, prepared by SLR International Corporation, dated November 8, 2023.

34. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-1, prepared by SLR International Corporation, dated November 8, 2023.

35. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-2, prepared by SLR International Corporation, dated November 8, 2023.

36. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-3, prepared by SLR International Corporation, dated November 8, 2023.

37. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-4, prepared by SLR International Corporation, dated November 8, 2023.

38. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-5, prepared by SLR International Corporation, dated November 8, 2023.

39. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-6, prepared by SLR International Corporation, dated November 8, 2023.

40. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-7, prepared by SLR International Corporation, dated November 8, 2023.

41. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-8, prepared by SLR International Corporation, dated November 8, 2023.

42. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-1, prepared by SLR International Corporation, dated November 8, 2023.

43. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-2, prepared by SLR International Corporation, dated November 8, 2023.

44. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-3, prepared by SLR International Corporation, dated November 8, 2023.

45. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-4, prepared by SLR International Corporation, dated November 8, 2023.

46. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-5, prepared by SLR International Corporation, dated November 8, 2023.

47. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-6, prepared by SLR International Corporation, dated November 8, 2023.

48. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-7, prepared by SLR International Corporation, dated November 8, 2023.

49. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-8, prepared by SLR International Corporation, dated November 8, 2023.

50. "Site Plan – Culvert Cross Section, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SC, prepared by SLR International Corporation, dated January 6, 2024.

51. "Site Plan – Tree Clearing Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing TC, prepared by SLR International Corporation, dated January 6, 2024.

52. "Castle Hill Village – Residential Open Space Development, 20 Castle Hill Road, Newtown, Connecticut, Drainage Report, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024.

53. Letter to Inland Wetlands Commission, re: Responses to Commission Member Public Hearing Comments, from Todd Ritchie, PE, BCEE, CFM, REHS/RS and Megan Raymond, MS, PWS, CFM, SLR International Corporation, dated January 5, 2024.

54. "Castle Hill Village – Wetland and Watercourse Impact Assessment, 20 Castle Hill Road, Newtown, Connecticut, Drainage Report, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated November 22, 2023.

Comments

The application is for an open space development, which aggregates development activity on a smaller portion of the site, allowing the larger portion to be preserved in a natural state. The development occurs on portions of the property that are wooded, and also disturbs areas that have been previously disturbed and cleared. Wetland encroachments are limited to watercourse crossings, though portions of the work occur within the 100-foot upland review area.

The topography of the project site varies from moderately to steeply sloping. The development is generally limited such that the steepest portions of the site remain undisturbed. Open space developments are encouraged by the 2004 Connecticut Stormwater Quality Manual, Section 4.3.2, because they limit disturbance and have a lower level of impervious coverage compared to their conventional development counterparts.

The development interior roadways utilize mountable concrete curb, which has a sloped face, and is easier for small animals to cross.

Stormwater is managed by proposed detention basins, which infiltrate a portion of the stormwater runoff. The hydrologic analysis used appropriate rainfall depths, obtained from NOAA Atlas 14. Runoff was analyzed at five analysis points, representing the multiple directions in which the proposed development area drains. The drainage report shows no increase in peak rate of runoff at all five analysis points. We note that the analysis will need to be revised based upon our comments below.

The UCONN CLEAR Connecticut MS4 Data Viewer[1] indicates that the vast majority developed portion of the property lies within CTDEEP Watershed No. 6019-01-1, Deep Brook. The ridge line separating the Deep Brook watershed from Taunton Pond runs roughly along Reservoir Road, meaning that no development will occur within the Taunton Pond watershed.

The proposed stormwater treatment practices have been designed to meet the groundwater recharge volume per the 2004 Connecticut Stormwater Quality Manual.

A. General

1. During our site visit, groundwater seeps were observed throughout the site, including two pipes that discharge groundwater to the lower wetland along Johnnie Cake Lane. It appears that the proposed units will have basements. The contribution of groundwater from the dewatering of the proposed basements has the potential to be significant, and some of the units may have basements below the groundwater elevation. For example, Unit 13 (Drawing GR-1) is 5 to 7 feet below existing grade, and the nearby test pit (SLR-TP-14) shows that groundwater is 2.5 feet below grade. We recommend that the applicant re-consider basements in areas below observed groundwater because of the constant need to intercept and move water from the basement wall, which results in surface discharges.

2. Two drainage pipes were observed entering the wetland just upstream of the driveway culvert crossing at Johnnie Cake Lane. At the time of our visit on the afternoon of January 29, 2024, the pipes were flowing approximately half full. We believe that these are likely old farm drains. Are the origins of these pipes known? Is the intent to keep the pipes in place or remove them? If the pipes are removed, how will their removal impact the downstream wetlands?

[1] https://cteco.uconn.edu/viewers/ctms4/

B. Stormwater Management

1. The detention basins have an 8' wide crest which is sufficient for maintenance access. The slopes of the basins are at a slope of 3 horizontal to 1 vertical, which is appropriate, and sufficient for mowing. The proposed detention basins are generally benched into the slope, such that one side is cut into the slope, and the downslope side is an earthen fill berm. This is a common practice to help balance cuts and fills on a site. The fill berms include impervious materials that will minimize seepage. Inflow into the basins is doubly pre-treated, with hydrodynamic separators placed before the outlet into the basin, and riprap forebay berms located just beyond the outlets. Together, these measures combine to minimize the amount of sediment that enters the basin.

    a. The outlet from Detention Basin 130 discharges to a preformed scour hole on the slope above the wetland west of the Johnnie Cake Lane / Castle Village Road intersection. In lieu of the scour hole, and creating a potential point of scour on the slope above the wetland, is it possible to discharge the outlet from Detention Basin 130 directly to Manhole 104 or 105?

    b. The emergency riprap overflow for Detention basins 130 could potentially flow overland into the intersection of Johnnie Cake Lane and Castle Village Road, and possibly toward Units 14 and 15. Is there an opportunity to relocate the overflow toward the north or northwest?

    c. Some of the proposed detention basins appear to be located such that the bottom of the pond is below groundwater:

        (1) Test pit SLR-TP-14 is located within the footprint of Detention Basin 130. The test pit indicates the presence of groundwater at 30 inches below the surface. Existing grade is approximately elevation 701.0, which indicates that groundwater was observed at elevation 698.5. The bottom of the basin is at elevation 694.0, and therefore, we expect that up to 4.5 feet of the detention basin will be in groundwater. As a result, the full volume of the basin will not be available for storage. Please review. We also note that test pit SLR-TP-15 is also located in the footprint of the same basin, and indicates groundwater is 42 inches below the surface, at elevation 697.5.

        (2) The bottom of Detention Basin 120 is above observed groundwater, but below observed redoximorphic features.

        (3) At Detention Basin 410, SLR-TP-10 indicates a depth to groundwater of 37" (approximately elevation 697.0), and SLR-TP-9 indicates a depth to groundwater of 46" (approximately elevation 695.0). The bottom of the basin is at elevation 692.0, therefore, this basin will also likely be in groundwater.

        (4) At Detention Basin 310, SLR-TP-1 indicates a depth to groundwater of 60" (approximately elevation 710.0) and SLR-TP-2 indicates a depth to groundwater of 48" (approximately elevation 711.0). The bottom of the basin is at elevation 708.0, therefore, this basin will also likely be in groundwater.

    d. At Detention Basin 510, the roof leader outlet from Units 60 and 61 appears to discharge into the bottom of the pond, and will be backwatered during nearly

every rainfall event. Is there an opportunity to raise the roof leader outlet elevations?

e. Confirm the drawdown time in a 50-year storm event for each of the proposed detention basins. It is important that the ponds drain within 72 hours so that the full volume of the pond is available for subsequent storm events that may occur in quick succession.

f. Some of the detention basins may require a dam construction permit from CTDEEP due to potential downstream hazard. For example, Detention Basin 170 is 14 feet high and sits above a public right-of-way and a state highway.

g. Nearly all proposed detention basins have dedicated maintenance access roads. Detention Basin 130 does not have a maintenance access road, which will make maintenance access more challenging. How will Detention Basin 130 (Drawing GR-1) be accessed for maintenance?

h. Detention Basin 170 has a series of outlets and riprap splash pads for footing drains and roof leaders. Could the roof leaders and footing drains be tied into collector systems and discharge to either Manhole 2 and/or Manhole 16 to avoid a series of obstacles that would making maintenance mowing on the pond slope more difficult?

i. Is fencing warranted around the ponds?

j. Check the proposed outlet control structures for buoyancy. Our concern is that when the basin is full, uplift buoyancy forces could cause the structures to float. If buoyancy is a problem, it typically can be remedied by adding additional weight to the structure, such as thickened walls or base slab.

2. Expand upon the maintenance and operation plan presented on the cover sheet of the plan set and in the Drainage Report. Although maintenance and operation information is presented in various locations in the plans and the report, we recommend that they be consolidated into a single document for the HOA, where maintenance records can also be stored.

   a. Include who is responsible for the post-construction maintenance plan.

   b. Identify maintenance measures for each of the stormwater best management practices on the site, such as catch basins, outlet aprons, yard drains, and gross particle separators.

   c. Provide narrative on maintenance at the detention basins berms, such as mowing, elimination of woody vegetation, and repair of animal burrows.

3. A crossing is proposed over the watercourse at Meadowview Lane.

   a. Computations were included on page 90 of the revised Drainage Report to analyze the crossing, but it was not clear which storm design frequency was used. What is the water surface elevation of the watercourse crossing during a 50-year and 100-year storm event? Meadowview Lane will not have a connection to the surrounding street network, and the watercourse crossing the only means of emergency ingress and egress for the 14 units located west of the crossing.

b. The proposed watercourse crossing will be subject to the USACE Connecticut General Permit. It does not appear that the crossing meets the Connecticut General Permit Stream Crossing Best Management Practices[2] for openness ratio, and possibly bank full width.

4. In our review of the plans, we have the following comments regarding storm drainage pipe routing and potential conflicts:

   a. There are lengths of pipe where several inlets are connected in series before reaching a manhole, in some cases ten or eleven. As the number of inlets connected in series increases, so does the risk of a blockage clogging the line. Are there opportunities to reduce the number of inlets connected in series? This is particularly important for the system east of the proposed residences on Pine Ridge Road, above the steep slope on King Street.

   b. The applicant's engineer has clearly made an effort to minimize the encroachment of the roof drainage outlets into the upland review area. West of Unit 69, Meadowview Lane, the roof drain discharges into the tree line. Is it possible to move the discharge location toward the east, outside of the tree line?

   c. There appear to be potential conflicts between the sanitary and storm systems. Sanitary Sewer Manhole #40 discharges at an invert elevation of 718.0, and the invert of the pipe discharging from Yard Drain 41 is 718.1. The two pipes cross a short distance from downstream, and appear to conflict.

   d. Manhole 68 (Drawing UT-2) has five pipes entering within a 90 degree segment. The manhole diameter will likely need to be increased to accommodate the large number of pipes in the limited space.

   e. The footing drains for several units are connected together. We suggest that cleanouts be added at junctions for maintenance purposes.

5. Provide additional construction details on some of the proposed drainage structures.

   a. The plans show catch basins, yard drains, and area drains, with associated details for the catch basins and yard drains. Provide details for the proposed area drains. We are looking to confirm the sump depth and if the proposed area drains are large enough to accommodate the pipes that are routed through them.

   b. Provide details on the roof drain splash pads.

6. What is the proposed surface of the playground? If it is a resilient surface, show underdrains and confirm that the surface is accounted for in the hydrologic computations.

7. The CTDOT Drainage Manual recommends that storm drains have a minimum velocity of 3 feet per second to maintain cleansing velocity. A few locations have pipe velocities

[2] https://portal.ct.gov/-/media/DOT/documents/dpolicy/WaterResources/ConnecticutUSACEStreamCrossingBMPsAugust2016pdf.pdf

that are slower. We note that this is not a strict design criteria, but a recommendation, and ask the applicant to review opportunities to improve velocities.

a. Storm System 510, Lines 8 and 9
b. Storm System 410 . Lines 16 and 17
c. Storm System 311, Lines 3 and 4
d. Storm System 310, Lines 10 to 13, and 15 through 24
e. Storm System 130, Lines 9, 10, and 16 through 19
f. Storm System 121, Lines 12, 19, and 20
g. Storm System 120, Lines 11, 12, 13, 15, 16, 17, 19, 20 and 21

8. The velocity of certain segments of the storm sewer system exceed 15 ft/s. Again, this is not a strict design criteria, but a rule of thumb of design to minimize scour damage inside closed pipe systems. Can the inverts be adjusted to reduce the velocity?

a. Storm System 120, Line 2
b. Storm System 130 Outlet, Line 2

9. The upstream end hydraulic grade line elevation exceeds the ground elevation at the following locations, meaning that there is potential for runoff to bubble out of the catch basin during the design storm.

a. Storm System 121, Line 20
b. Storm System 410, Line 2

10. Proposed CCB 108 and CCB 109 discharge to the wetland along Johnnie Cake Lane. CCB 108 is a hydrodynamic separator with an inlet that provides water quality flow treatment for the discharging flow, which is an appropriate treatment for the limited contributing area. The outlet consists of a flared end section. Review to determine if a riprap apron is needed to reduce exit velocities and scour.

11. Proposed CCB 108 and CCB 109 are located at the base of a 10 percent grade, therefore, runoff flowing along the roadway gutter will have significant velocity and momentum as it travels down the roadway. Review the plans to determine if a Type I double catch basin may be warranted to improve interception capacity.

12. The 2004 Connecticut Stormwater Quality Manual will be replaced with the 2023 Connecticut Stormwater Quality Manual effective March 30, 2024. Although not required, since it is not yet effective, the applicant is encouraged to meet the updated water quality volume requirements in the new manual to the maximum extent practicable.

C. Grading

1. Review the swale on the west side of Castle Village Road. The swale is well developed, and is well-conceived given its location at the base of a long, steep slope. The grading between contour 672 and 670 suggests that it will discharge into the roadway, which we don't believe is the intent. A drainage structure may be necessary to intercept the runoff above the entry monument sign.

2. A few relatively low-height retaining walls are proposed on the site. Where will the wall underdrains discharge for:

   a. The wall behind Units 28 – 34.
   b. The wall near the 56 inch beech tree.

3. Review the grading between several of the units at the end of Meadowview Lane. For example:

   a. The area between Unit 66 and 65 appears to drain directly toward the north wall of Unit 65.

   b. A low point will exist along the north wall of Unit 64 without any inlet to intercept runoff.

   c. There is no shoulder on the west side of Meadowview Lane in front of Unit 64. The grade slopes immediately downward from the back of the curb. The typical section on Drawing SD-1 indicates a 4' wide shoulder at ¼ inch per foot sloped toward the roadway.

4. Review the grading between units on Pine Ridge Road:

   a. Between Unit 116 and 117, grading seems to be directed northeasterly to the wall of Unit 116, with no positive outlet.

   b. Consider adding a inlet to the west of Unit 117 as the proposed swale rounds the corner.

   c. Between Unit 41 and 42, it appears as if runoff will accumulate against the wall of Unit 41.

5. Review the grading between units on Castle Village Road. In front of Units 94 and 95, the east shoulder of the roadway appears to grade toward the residences.

6. Consider adding spot elevations at the corners of the parking spaces located along the interior island at the parking area on the west end of Boxwood Court. (Opposite spot elevations 731.5 and 731.9)

7. A swale will be graded at the base of Detention Basin 510. Consider adding riprap lining to the swale to protect the toe of the detention basin fill slope from scour and erosion.

D. Sediment and Erosion Control

In total, the project will disturb approximately 40.8 acres, and therefore is subject to registration under the Connecticut General permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activity. The General Permit requires a Stormwater Pollution Control Plan which documents site-specific erosion controls and stabilization, as well as weekly inspections by a qualified professional. The permit also stipulates that inspections be performed weekly and 24 hours after rainfall events exceeding 0.5 inches in depth. Additionally, since the area of disturbance exceeds 15 acres, the registration supporting documents are to be reviewed by an independent, qualified professional as a condition of registration.

The sediment and erosion control plans show prudent measures to enhance the protection of wetlands, for example the use of redundant barriers near wetlands and watercourses. However, further information is requested.

1. Develop a water handling plan for the construction of the stream crossings at Johnnie Cake Lane and Meadowview Lane. Show how stream flows will be diverted around the work area while the new crossings are constructed. Include supporting details, and provide temporary hydraulic facilities data in accordance with Chapter 6.F of the Connecticut DOT Drainage Manual.

2. We recommend further subdividing each of the three phases into smaller divisions of five acres to better illustrate how the site will be disturbed and developed.

3. On Drawing SE, General Note 1 states that "At least thirty days prior to the state of construction, the developer is to submit to the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) a completed General Permit Registration…" The project is a Locally Approvable Project under the General Permit. Section 4(c)(A), Registration Procedure, notes that the registration must be submitted 60 days prior to the planned commencement of construction activity.

4. On slopes below sediment traps and detention basins, add erosion control blankets.

5. Add stone check dams in the proposed diversion swales to reduce the amount of sediment transported.

6. Show baffles in temporary sediment traps to elongate flow paths as shown in Temporary Sediment Trap detail on Drawing SE-6.

7. The diversion swale will pass through a low spot near elevation 690 to the east of proposed Unit 31. Can the grade of the swale be maintained through this area?

8. Drawing SE-6 shows a dewatering outlet for sediment traps, but these are not indicated on the plans. Please show.

9. Show washout areas for concrete trucks near construction entrances.

10. Indicate duration of each phase in months or weeks.

E. Miscellaneous

1. A portion of Johnnie Cake Lane west of the new roadway will be removed. The roadway abandonment may require a formal abandonment process through the Town.

2. Encase the force main and sanitary sewer for 10 feet on either side of the crossing to minimize groundwater infiltration into the line.

3. Sanitary Sewer Manhole #3 is missing a top of frame elevation.

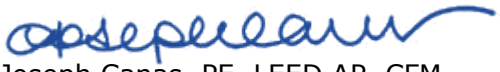
4. Clarify the dashed line that runs roughly parallel to the proposed 706 contour between Pine Ridge Drive and Castle Village Road.

5. The 6-space parking area southwest of Unit 117 is atop a 13 foot high, 3H:1V slope. Is a guiderail warranted at this location?

We hope that these comments will be helpful to guide both the Commission and the applicant in evaluating the plans.

Sincerely,

TIGHE & BOND, INC.



Joseph Canas, PE, LEED AP, CFM
Principal Engineer

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23-5003-004-01
February 8, 2024

Mr. Steve Maguire
Zoning Enforcement Officer
Town of Newtown
3 Primrose Street
Newtown, Connecticut 06470

Re: **Castle Hill Village**
Third Party Engineering Review
Wetland Impact

Dear Mr. Maguire:

As discussed yesterday, we understand that it would be helpful to further guide the Inland Wetland Commission's evaluation of the application by focusing on comments from our February 6, 2024 review letter that impact wetlands and watercourses.

The following comments from our February 6, 2024 letter have wetland and watercourse impacts and should be addressed by the applicant as part of the current application. We have repeated the relevant comments, followed by a commentary with additional information.

A. General

1. [02/06/2024] During our site visit, groundwater seeps were observed throughout the site, including two pipes that discharge groundwater to the lower wetland along Johnnie Cake Lane. It appears that the proposed units will have basements. The contribution of groundwater from the dewatering of the proposed basements has the potential to be significant, and some of the units may have basements below the groundwater elevation. For example, Unit 13 (Drawing GR-1) is 5 to 7 feet below existing grade, and the nearby test pit (SLR-TP-14) shows that groundwater is 2.5 feet below grade. We recommend that the applicant re-consider basements in areas below observed groundwater because of the constant need to intercept and move water from the basement wall, which results in surface discharges.

   Commentary: Where basements are placed beneath the groundwater elevation, footing drains are used to remove groundwater from the basement wall to relieve hydrostatic pressure on the wall. The footing drains discharge to the surface, discharging the groundwater to surface wetlands and watercourses, creating sustained, and in some instances, continuous flows of water into the wetlands and watercourses. The continuous flow has the potential to change watercourse hydrology and cause downstream erosion.

   At the time of our visit there were two pipes discharging into the wetland upstream of the crossing at Johnnie Cake Lane, which appeared to be groundwater, so there already likely is a groundwater contribution. We asked a subsequent question of the applicant (Comment A.2) about the origin of those pipes. Ultimately, we are looking for the applicant to confirm that the amount of groundwater that reaches the wetland as surface water will not change in any adverse manner.

B. Stormwater Management

1. [02/06/2024] The detention basins have an 8' wide crest which is sufficient for maintenance access. The slopes of the basins are at a slope of 3 horizontal to 1 vertical, which is appropriate, and sufficient for mowing. The proposed detention basins are generally benched into the slope, such that one side is cut into the slope, and the downslope side is an earthen fill berm. This is a common practice to help balance cuts and fills on a site. The fill berms include impervious materials that will minimize seepage. Inflow into the basins is doubly pre-treated, with hydrodynamic separators placed before the outlet into the basin, and riprap forebay berms located just beyond the outlets. Together, these measures combine to minimize the amount of sediment that enters the basin.

   a. The outlet from Detention Basin 130 discharges to a preformed scour hole on the slope above the wetland west of the Johnnie Cake Lane / Castle Village Road intersection. In lieu of the scour hole, and creating a potential point of scour on the slope above the wetland, is it possible to discharge the outlet from Detention Basin 130 directly to Manhole 104 or 105?

      Commentary: Currently, the plan shows the outlet from Detention Basin 130 discharging to the slope above the wetland. Although there is a preformed scour hole to mitigate erosive velocities at the outlet, the discharging stormwater must still flow down a steep slope into the wetland channel, and increase velocity, and potential cause a scour problem. Instead, we have asked the applicant's engineer to review the potential to connect the outlet directly to the piped drainage system that is being installed for the wetland crossing to eliminate the potential of scour associated with the proposed outfall.

   c. [02/06/2024] Some of the proposed detention basins appear to be located such that the bottom of the pond is below groundwater:

      (1) Test pit SLR-TP-14 is located within the footprint of Detention Basin 130. The test pit indicates the presence of groundwater at 30 inches below the surface. Existing grade is approximately elevation 701.0, which indicates that groundwater was observed at elevation 698.5. The bottom of the basin is at elevation 694.0, and therefore, we expect that up to 4.5 feet of the detention basin will be in groundwater. As a result, the full volume of the basin will not be available for storage. Please review. We also note that test pit SLR-TP-15 is also located in the footprint of the same basin, and indicates groundwater is 42 inches below the surface, at elevation 697.5.

      (2) The bottom of Detention Basin 120 is above observed groundwater, but below observed redoximorphic features.

      (3) At Detention Basin 410, SLR-TP-10 indicates a depth to groundwater of 37" (approximately elevation 697.0), and SLR-TP-9 indicates a depth to groundwater of 46" (approximately elevation 695.0). The bottom of the basin is at elevation 692.0, therefore, this basin will also likely be in groundwater.

      (4) At Detention Basin 310, SLR-TP-1 indicates a depth to groundwater of 60" (approximately elevation 710.0) and SLR-TP-2 indicates a depth to groundwater of 48" (approximately elevation 711.0). The bottom of the

basin is at elevation 708.0, therefore, this basin will also likely be in groundwater.

Commentary: The computations assumed that the entire volume of the pond would be available for runoff storage. However, if a portion of the pond is below groundwater, the portion of the pond in groundwater is not available for runoff storage because it will be inundated by groundwater. The reduced storage availability impacts the hydrologic computations, and therefore, the ponds will need to be enlarged to provide the needed storage, and will result in additional earthwork, and potentially a greater area of disturbance within the upland review area. The enlarged disturbance area can likely be addressed with additional sediment and erosion controls.

3. [02/06/2024] A crossing is proposed over the watercourse at Meadowview Lane.

   a. Computations were included on page 90 of the revised Drainage Report to analyze the crossing, but it was not clear which storm design frequency was used. What is the water surface elevation of the watercourse crossing during a 50-year and 100-year storm event? Meadowview Lane will not have a connection to the surrounding street network, and the watercourse crossing the only means of emergency ingress and egress for the 14 units located west of the crossing.

      Commentary: Our concern is that the watercourse crossing be sufficiently sized for emergency vehicles, but also for the passage of water such that the proposed culvert does not create a hydraulic restriction that impedes the flow of water. Such a restriction may cause water to overtop the roadway, and to back up behind the crossing, inundating the upstream wetlands.

D. Sediment and Erosion Control

1. [02/06/2024] Develop a water handling plan for the construction of the stream crossings at Johnnie Cake Lane and Meadowview Lane. Show how stream flows will be diverted around the work area while the new crossings are constructed. Include supporting details, and provide temporary hydraulic facilities data in accordance with Chapter 6.F of the Connecticut DOT Drainage Manual.

   Commentary: This comment addresses the construction of the proposed watercourse crossings. The construction of the new watercourse crossings requires management of the stream flow during construction so that the work can be accomplished in dry conditions. Typically, where new culverts are installed, a temporary cofferdam (sandbags, but could be other materials) is installed upstream of the crossing to block the stream flow. The flow reaching the cofferdam is then pumped around the work area to a stabilized, temporary outlet downstream of the work area, back in to the watercourse. Since the temporary cofferdam will need to be installed in wetlands and watercourses, it factors into the area and scope of disturbance, therefore, such water handling elements are important to identify up front.

2. [02/06/2024] We recommend further subdividing each of the three phases into smaller divisions of five acres to better illustrate how the site will be disturbed and developed.

Commentary: The 2002 Connecticut Erosion and Sediment Guidelines recommend that land disturbance at any one time be limited to 5 acres. The proposed phases are large in size, up to 18 acres, which would be considered a large project on its own. Sediment and erosion control is important to maintaining the existing quality of the wetlands on the site, and one of the most effective practices is limiting the area that is disturbed at once. We have asked the applicant to further subdivide the phases shown on Drawing SE to illustrate how the disturbance of land at any one time can be minimized. It may not be entirely feasible to limit some areas, such as roadway construction to exactly 5 acres, because of the nature of the work.

The balance of our comments, while they would lead to small design changes, and are important for functional reasons, will not impact wetlands and watercourses in a measurable way.

We hope that these comments will be helpful to guide both the Commission and the applicant in evaluating the plans.

Sincerely,

TIGHE & BOND, INC.

Joseph Canas, PE, LEED AP, CFM
Principal Engineer

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23-5003-004-01
February 23, 2024

Mr. Steve Maguire
Zoning Enforcement Officer
Town of Newtown
3 Primrose Street
Newtown, Connecticut 06470

Re: **Castle Hill Village**
Third Party Engineering Review

Dear Mr. Maguire:

We are in receipt of responses to our February 6, 2024 comments on the proposed residential open space development at 20 Castle Hill Road.

The vast majority of our comments have been addressed in full. Other comments require minor plan modifications and details that can be addressed as potential conditions of approval. There are only two comments that need further supporting information to confirm feasibility and design intent.

Basis of Review

Our review is based upon the following documents, in addition to our site visit on January 26, 2024:

1. Cover Sheet, Castle Hill Village, Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

2. "Proposed Open Space Conservation Area Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing CP, prepared by SLR International Corporation, dated November 8, 2023.

3. "Property & Topographic Survey, Map of Land, 20 Castle Hill Drive, Newtown, Connecticut," Drawing 1 of 1, prepared by SLR International Corporation, dated August 2023.

4. "Compilation Plan, Map Showing Portion of Reservoir Road to be Discontinued, Newtown, Connecticut, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated August 2023.

5. "Site Plan - Overall, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SP, prepared by SLR International Corporation, dated November 8, 2023.

6. "Index Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing IN, prepared by SLR International Corporation, dated November 8, 2023.

7. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-1, prepared by SLR International

Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

8. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

9. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

10. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

11. "Site Plan - Layout, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LA-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024

12. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

13. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

14. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

15. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

16. "Site Plan - Landscaping, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing LS-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

17. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

18. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

19. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

20. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

21. "Site Plan - Grading, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing GR-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

22. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

23. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

24. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

25. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

26. "Site Plan - Utilities, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing UT-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

27. "Sediment & Erosion Controls – Construction Phasing, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

28. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-1, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

29. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-2, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

30. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-3, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

31. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-4, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

32. "Sediment & Erosion Controls, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-5, prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

33. "Sediment & Erosion Control Notes & Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SE-6, prepared by SLR International Corporation, dated November 8, 2023, revised February 20, 2024.

34. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-1, prepared by SLR International Corporation, dated November 8, 2023, revised February 20, 2024.

35. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-2, prepared by SLR International Corporation, dated November 8, 2023, revised February 20, 2024.

36. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-3, prepared by SLR International Corporation, dated November 8, 2023.

37. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-4, prepared by SLR International Corporation, dated November 8, 2023, revised February 20, 2024.

38. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-5, prepared by SLR International Corporation, dated November 8, 2023, revised February 20, 2024.

39. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-6, prepared by SLR International Corporation, dated November 8, 2023.

40. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-7, prepared by SLR International Corporation, dated November 8, 2023.

41. "Site Details, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SD-8, prepared by SLR International Corporation, dated November 8, 2023.

42. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-1, prepared by SLR International Corporation, dated November 8, 2023.

43. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-2, prepared by SLR International Corporation, dated November 8, 2023.

44. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-3, prepared by SLR International Corporation, dated November 8, 2023.

45. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-4, prepared by SLR International Corporation, dated November 8, 2023.

46. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-5, prepared by SLR International Corporation, dated November 8, 2023.

47. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-6, prepared by SLR International Corporation, dated November 8, 2023.

48. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-7, prepared by SLR International Corporation, dated November 8, 2023.

49. "Site Plan – Road Profile, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing PR-8, prepared by SLR International Corporation, dated November 8, 2023.

50. "Site Plan – Culvert Cross Section, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing SC, prepared by SLR International Corporation, dated January 6, 2024.

51. "Site Plan – Tree Clearing Plan, Castle Hill Village Residential Open Space Development, 20 & 60 Castle Hill Road, Newtown, Connecticut," Drawing TC, prepared by SLR International Corporation, dated January 6, 2024.

52. "Castle Hill Village – Residential Open Space Development, 20 Castle Hill Road, Newtown, Connecticut, Drainage Report, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated November 8, 2023, revised January 5, 2024, revised February 20, 2024.

53. Letter to Inland Wetlands Commission, re: Responses to Commission Member Public Hearing Comments, from Todd Ritchie, PE, BCEE, CFM, REHS/RS and Megan Raymond, MS, PWS, CFM, SLR International Corporation, dated January 5, 2024.

54. "Castle Hill Village – Wetland and Watercourse Impact Assessment, 20 Castle Hill Road, Newtown, Connecticut, Drainage Report, Prepared for Castle Hill Real Estate Holdings, LLC," prepared by SLR International Corporation, dated November 22, 2023.

55. Letter to Steve Maguire, re: Comment Response Letter, Third-Party Engineering Review of Castle Hill Village Residential Open Space Development, Newtown, Connecticut, dated February 20, 2024.

Comments

We have repeated our comments from our February 6, 2024 memo below, with the disposition of each comment following in bold type.

We have assigned each comment a status:

Comment addressed. The initial comment has been addressed in its entirety, and no further information is requested. The vast majority of our initial comments fall into this category.

Suggested Potential Condition of Approval. The applicant has substantially addressed the comment, though minor plan changes and corrections are requested. This status is used when the design intent is clear, and the plan changes requested will not change the design or impacts of the design in any measurable manner. Should the Commission be decide to approve the project, we suggest that resolution of these comments be made a condition of approval before obtaining final construction permits.

More information is requested. We request that the applicant provide additional information to support the application and demonstrate that there will be no adverse impacts as a result of the project. We recommend that these comments be resolved prior to the Commission taking action on the application. There are only two comments that fall into this category, Comments B.1.g, and D.1.

A. General

1. [02/06/2024] During our site visit, groundwater seeps were observed throughout the site, including two pipes that discharge groundwater to the lower wetland along Johnnie Cake Lane. It appears that the proposed units will have basements. The contribution of groundwater from the dewatering of the proposed basements has the potential to be significant, and some of the units may have basements below the groundwater elevation. For example, Unit 13 (Drawing GR-1) is 5 to 7 feet below existing grade, and the nearby test pit (SLR-TP-14) shows that groundwater is 2.5 feet below grade. We recommend that the applicant re-consider basements in areas below observed groundwater because of the constant need to intercept and move water from the basement wall, which results in surface discharges.

   [02/20/2024] Suggested Potential Condition of Approval. The applicant's engineer indicates that the groundwater table is perched, and intercepted by existing farm drains. Based on our observations, we concur with this assessment. Farm drain interception of the groundwater and discharge to the wetland system along Johnnie Cake Lane has historically maintained the hydrology of the wetland system. Intercepting groundwater in the deeper glacial till layer could contribute more groundwater as surface runoff to the wetland system.

   The developer has offered to excavate test pits at each individual proposed house location to determine if groundwater extends into the glacial till layer.

We believe this is reasonable, and preferable to disturbing the site at this time to excavate 117 test pits. We believe that the potential downstream impacts will be lessened if such test pits could be undertaken while construction vehicles are mobilized on the site and sediment and erosion controls are in place.

We suggest that the Commission consider make the test pits a condition prior to obtaining a building permit. Typically, building permits will be taken out for smaller groups of units, as opposed to all 117 at once.

2. [02/06/2024] Two drainage pipes were observed entering the wetland just upstream of the driveway culvert crossing at Johnnie Cake Lane. At the time of our visit on the afternoon of January 29, 2024, the pipes were flowing approximately half full. We believe that these are likely old farm drains. Are the origins of these pipes known? Is the intent to keep the pipes in place or remove them? If the pipes are removed, how will their removal impact the downstream wetlands?

[02/23/2024] **Comment addressed.** **The applicant's engineer concurs that the two observed drains were part of an old farm drain system on the site. The intent is to keep the drains in place, to maintain the flow to the wetland system. We concur with the approach.**

B. Stormwater Management

1. The detention basins have an 8' wide crest which is sufficient for maintenance access. The slopes of the basins are at a slope of 3 horizontal to 1 vertical, which is appropriate, and sufficient for mowing. The proposed detention basins are generally benched into the slope, such that one side is cut into the slope, and the downslope side is an earthen fill berm. This is a common practice to help balance cuts and fills on a site. The fill berms include impervious materials that will minimize seepage. Inflow into the basins is doubly pre-treated, with hydrodynamic separators placed before the outlet into the basin, and riprap forebay berms located just beyond the outlets. Together, these measures combine to minimize the amount of sediment that enters the basin.

   a. [02/06/2024] The outlet from Detention Basin 130 discharges to a preformed scour hole on the slope above the wetland west of the Johnnie Cake Lane / Castle Village Road intersection. In lieu of the scour hole, and creating a potential point of scour on the slope above the wetland, is it possible to discharge the outlet from Detention Basin 130 directly to Manhole 104 or 105?

      [02/23/2024] **Suggested Potential Condition of Approval.** **The applicant's preference is to leave the scour hole to maintain surface flow to the existing wetland system. We understand the reasoning for the decision and do not disagree with it.**

      As a potential condition of approval, we suggest that the applicant modify the stormwater operations and maintenance plan to specifically monitor the outlet from Detention Basin 130 for signs of erosion and scour after significant rain events (exceeding 1.3 inches).

   b. [02/06/2024] The emergency riprap overflow for Detention basins 130 could potentially flow overland into the intersection of Johnnie Cake Lane and Castle Village Road, and possibly toward Units 14 and 15. Is there an opportunity to relocate the overflow toward the north or northwest?

[02/23/2024] Comment addressed. The emergency riprap overflow from Detention Basin 130 has been relocated such that flow would not adversely impact the roadway or adjacent units.

c. Some of the proposed detention basins appear to be located such that the bottom of the pond is below groundwater:

(1) [02/06/2024] Test pit SLR-TP-14 is located within the footprint of Detention Basin 130. The test pit indicates the presence of groundwater at 30 inches below the surface. Existing grade is approximately elevation 701.0, which indicates that groundwater was observed at elevation 698.5. The bottom of the basin is at elevation 694.0, and therefore, we expect that up to 4.5 feet of the detention basin will be in groundwater. As a result, the full volume of the basin will not be available for storage. Please review. We also note that test pit SLR-TP-15 is also located in the footprint of the same basin, and indicates groundwater is 42 inches below the surface, at elevation 697.5.

[02/23/2024] Suggested Potential Condition of Approval. The bottom of the detention basin was raised to elevation 700.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we suggest the curtain drain be extended to curve northerly to where the existing and proposed 704 contours meet to fully cut off groundwater from the west.

(2) [02/06/2024] The bottom of Detention Basin 120 is above observed groundwater, but below observed redoximorphic features.

[02/23/2024] Comment addressed. Similar to Detention Basin 130, a curtain drain has been added to control groundwater entry into the detention basin.

(3) [02/06/2024] At Detention Basin 410, SLR-TP-10 indicates a depth to groundwater of 37" (approximately elevation 697.0), and SLR-TP-9 indicates a depth to groundwater of 46" (approximately elevation 695.0). The bottom of the basin is at elevation 692.0, therefore, this basin will also likely be in groundwater.

[02/23/2024] Suggested Potential Condition of Approval. The bottom of the detention basin was raised to elevation 696.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we suggest the curtain drain be extended to curve southwesterly toward the existing 702 contour to fully cut off upstream groundwater flow.

(4) [02/06/2024] At Detention Basin 310, SLR-TP-1 indicates a depth to groundwater of 60" (approximately elevation 710.0) and SLR-TP-2 indicates a depth to groundwater of 48" (approximately elevation 711.0). The bottom of the basin is at elevation 708.0, therefore, this basin will also likely be in groundwater.

[02/23/2024] Suggested Potential Condition of Approval. The bottom of the detention basin was raised to elevation 710.0, and a curtain drain has been added on the upslope side to intercept groundwater. We believe that these measures will allow the full volume of the pond to be available for stormwater management, and provide sufficient vertical clearance above groundwater.

However, we offer the following comments as a potential condition of approval:

(a) Extend the proposed curtain drain to the east and west, extending around the curve of the contour to fully cut off groundwater flow to the pond.

(b) Revise Drawing GR-5. The call-out for Detention Basin 310 does not align with the computations or drawn contours. The call out lists the top of berm and bottom of basin as 714.0 and 708.0, respectively, but should be elevations 716.0 and 710.0.

d. [02/06/2024] At Detention Basin 510, the roof leader outlet from Units 60 and 61 appears to discharge into the bottom of the pond, and will be backwatered during nearly every rainfall event. Is there an opportunity to raise the roof leader outlet elevations?

[02/23/2024] Comment addressed. The roof leader discharges to Detention Basin 510 have been raised so that they are above the 100-year water surface elevation of the pond.

e. [02/06/2024] Confirm the drawdown time in a 50-year storm event for each of the proposed detention basins. It is important that the ponds drain within 72 hours so that the full volume of the pond is available for subsequent storm events that may occur in quick succession.

[02/23/2024] Comment addressed. The captured storage volumes in all of the proposed detention basins will draw down within 72 hours.

f. [02/06/2024] Some of the detention basins may require a dam construction permit from CTDEEP due to potential downstream hazard. For example, Detention Basin 170 is 14 feet high and sits above a public right-of-way and a state highway.

[02/23/2024] Comment addressed. The applicant's engineer has indicated that the developer will coordinate permits with the Connecticut Department of Energy and Environmental Protection after local approvals have been obtained. It is common practice to secure state and federal approvals only after local approvals have been obtained.

g. [02/06/2024] Nearly all proposed detention basins have dedicated maintenance access roads. Detention Basin 130 does not have a maintenance access road, which will make maintenance access more challenging. How will Detention Basin 130 (Drawing GR-1) be accessed for maintenance?

[02/23/2024] More information is requested. A vehicle gate has been added to the existing driveway at Castle Village Lane.

(1) The limits of the access driveway south of gate are not shown, and it is not clear how the pond crest may be accessed.

(2) Maintenance vehicles will need to traverse a standard curb for access from Caste Village Lane. Consider a mountable curb.

(3) The access road climbs a 33% grade, which is inaccessible for standard maintenance vehicles.

We recommend that this comment be resolved prior to approval because it will impact work within the upland review area, and depending on how it is resolved, could result in additional earth moving activity within the upland review area.

h. [02/06/2024] Detention Basin 120 has a series of outlets and riprap splash pads for footing drains and roof leaders. Could the roof leaders and footing drains be tied into collector systems and discharge to either Manhole 2 and/or Manhole 16 to avoid a series of obstacles that would making maintenance mowing on the pond slope more difficult?

[02/23/2024] Comment addressed. A low headwall has been added at the outfall locations to better facilitate maintenance.

i. [02/06/2024] Is fencing warranted around the ponds?

[02/23/2024] Comment addressed. Fencing is now shown around all of the detention basins.

j. [02/06/2024] Check the proposed outlet control structures for buoyancy. Our concern is that when the basin is full, uplift buoyancy forces could cause the structures to float. If buoyancy is a problem, it typically can be remedied by adding additional weight to the structure, such as thickened walls or base slab.

[02/23/2024] Comment addressed. A note has been added to Drawing SD-7, that requires the manufacturer to provide buoyancy analyses. This is acceptable, as anti-buoyancy measures will not change the hydrologic and hydraulic design.

2. Expand upon the maintenance and operation plan presented on the cover sheet of the plan set and in the Drainage Report. Although maintenance and operation information is presented in various locations in the plans and the report, we recommend that they be consolidated into a single document for the HOA, where maintenance records can also be stored.

a. [02/06/2024] Include who is responsible for the post-construction maintenance plan.
[02/23/2024] Comment addressed. The Operations and Maintenance Plan identifies the Homeowners Association President as the responsible for the implementation of the plan.

b. [02/06/2024] Identify maintenance measures for each of the stormwater best management practices on the site, such as catch basins, outlet aprons, yard drains, and gross particle separators.

[02/23/2024] Comment addressed. Maintenance measures have been identified for each of the propose types of stormwater management measures.

c. [02/06/2024] Provide narrative on maintenance at the detention basins berms, such as mowing, elimination of woody vegetation, and repair of animal burrows.

[02/23/2024] Comment addressed. The requested narratives have been provided in the operations and maintenance plan.

3. A crossing is proposed over the watercourse at Meadowview Lane.

a. [02/06/2024] Computations were included on page 90 of the revised Drainage Report to analyze the crossing, but it was not clear which storm design frequency was used. What is the water surface elevation of the watercourse crossing during a 50-year and 100-year storm event? Meadowview Lane will not have a connection to the surrounding street network, and the watercourse crossing the only means of emergency ingress and egress for the 14 units located west of the crossing.

[02/23/2024] Comment addressed. The upstream elevation for the 100-year storm is 712.39. The low point of the roadway is at elevation 713.3. Therefore, the crossing will not be overtopped during a 100-year storm event, which exceeds CTDOT standards for a small watercourse crossing.

b. [02/06/2024] The proposed watercourse crossing will be subject to the USACE Connecticut General Permit. It does not appear that the crossing meets the Connecticut General Permit Stream Crossing Best Management Practices[1] for openness ratio, and possibly bank full width.

[02/23/2024] Comment addressed. The proposed crossing has been improved with a larger culvert that includes a natural substrate bottom which aligns more favorably with the stream crossing best management practices.

4. In our review of the plans, we have the following comments regarding storm drainage pipe routing and potential conflicts:

a. [02/06/2024] There are lengths of pipe where several inlets are connected in series before reaching a manhole, in some cases ten or eleven. As the number

[1] https://portal.ct.gov/-/media/DOT/documents/dpolicy/WaterResources/ConnecticutUSACEStreamCrossingBMPsAugust2016pdf.pdf

of inlets connected in series increases, so does the risk of a blockage clogging the line. Are there opportunities to reduce the number of inlets connected in series? This is particularly important for the system east of the proposed residences on Pine Ridge Road, above the steep slope on King Street.

[02/23/2024] Comment addressed. Four foot sumps have been specified on the yard drain detail, which will minimize the potential for clogging.

b. [02/06/2024] The applicant's engineer has clearly made an effort to minimize the encroachment of the roof drainage outlets into the upland review area. West of Unit 69, Meadowview Lane, the roof drain discharges into the tree line. Is it possible to move the discharge location toward the east, outside of the tree line?

[02/23/2024] Comment addressed. The applicant's engineer explained that in order to maintain minimum cover over the roof drainage outlet, it must extend to the elevation 714 contour.

c. [02/06/2024] There appear to be potential conflicts between the sanitary and storm systems. Sanitary Sewer Manhole #40 discharges at an invert elevation of 718.0, and the invert of the pipe discharging from Yard Drain 41 is 718.1. The two pipes cross a short distance from downstream, and appear to conflict.

[02/23/2024] Comment addressed. Pipe alignments have been revised to resolve the conflicts.

d. [02/06/2024] Manhole 68 (Drawing UT-2) has five pipes entering within a 90 degree segment. The manhole diameter will likely need to be increased to accommodate the large number of pipes in the limited space.

[02/23/2024] Comment addressed. The manhole diameter has been increased to accommodate the pipe sizes and corresponding entry angles.

e. [02/06/2024] The footing drains for several units are connected together. We suggest that cleanouts be added at junctions for maintenance purposes.

[02/23/2024] Comment addressed. Cleanouts have been added to the utility drawings as requested.

5. Provide additional construction details on some of the proposed drainage structures.

a. [02/06/2024] The plans show catch basins, yard drains, and area drains, with associated details for the catch basins and yard drains. Provide details for the proposed area drains. We are looking to confirm the sump depth and if the proposed area drains are large enough to accommodate the pipes that are routed through them.

[02/23/2024] Comment addressed. An area drain (Drainage Basin 12") detail has been added to Drawing SD-4.

b. [02/06/2024] Provide details on the roof drain splash pads.

[02/23/2024] Comment addressed. The dimensions for roof drain riprap splash pads has been added to Drawing SD-5.

6. [02/06/2024] What is the proposed surface of the playground? If it is a resilient surface, show underdrains and confirm that the surface is accounted for in the hydrologic computations.

[02/23/2024] Comment addressed. The playground surface will be wood chips, and additional underdrains will not be necessary.

7. [02/06/2024] The CTDOT Drainage Manual recommends that storm drains have a minimum velocity of 3 feet per second to maintain cleansing velocity. A few locations have pipe velocities that are slower. We note that this is not a strict design criteria, but a recommendation, and ask the applicant to review opportunities to improve velocities.

   a. Storm System 510, Lines 8 and 9
   b. Storm System 410 . Lines 16 and 17
   c. Storm System 311, Lines 3 and 4
   d. Storm System 310, Lines 10 to 13, and 15 through 24
   e. Storm System 130, Lines 9, 10, and 16 through 19
   f. Storm System 121, Lines 12, 19, and 20
   g. Storm System 120, Lines 11, 12, 13, 15, 16, 17, 19, 20 and 21

[02/23/2024] Comment addressed. The applicant's engineer has provided explanations regarding the impacts of trying to achieve the 3 feet per second recommended minimum velocity. Some of the impacts include reduction of pipe diameter, and in other instances the contributing area is so small, a 3 feet per second velocity may never be achieved. As stated in the original comment, the 3 ft/s velocity is a recommendation. In all cases, a minimum of 2 ft/s is achieved.

8. [02/06/2024] The velocity of certain segments of the storm sewer system exceed 15 ft/s. Again, this is not a strict design criteria, but a rule of thumb of design to minimize scour damage inside closed pipe systems. Can the inverts be adjusted to reduce the velocity?

   a. Storm System 120, Line 2
   b. Storm System 130 Outlet, Line 2

[02/23/2024] Comment addressed. The pipe inverts have been revised to reduce pipe velocities below 15 ft/s.

9. [02/06/2024] The upstream end hydraulic grade line elevation exceeds the ground elevation at the following locations, meaning that there is potential for runoff to bubble out of the catch basin during the design storm.

   a. Storm System 121, Line 20
   b. Storm System 410, Line 2

[02/23/2024] Comment addressed. The pipe inverts have been revised such that the hydraulic grade line no longer exceeds the ground elevations.

10. [02/06/2024] Proposed CCB 108 and CCB 109 discharge to the wetland along Johnnie Cake Lane. CCB 108 is a hydrodynamic separator with an inlet that provides water quality flow treatment for the discharging flow, which is an appropriate treatment for the limited contributing area. The outlet consists of a flared end section. Review to determine if a riprap apron is needed to reduce exit velocities and scour.

    [02/23/2024] Comment addressed. A riprap apron has been added as requested.

11. [02/06/2024] Proposed CCB 108 and CCB 109 are located at the base of a 10 percent grade, therefore, runoff flowing along the roadway gutter will have significant velocity and momentum as it travels down the roadway. Review the plans to determine if a Type I double catch basin may be warranted to improve interception capacity.

    [02/23/2024] Comment addressed. Proposed catch basins CCB 108 and CCB 109 have been converted to Type I double catch basins as requested.

12. [02/06/2024] The 2004 Connecticut Stormwater Quality Manual will be replaced with the 2023 Connecticut Stormwater Quality Manual effective March 30, 2024. Although not required, since it is not yet effective, the applicant is encouraged to meet the updated water quality volume requirements in the new manual to the maximum extent practicable.

    [02/23/2024] Comment addressed. The applicant's engineer has responded that the new stormwater quality manual does not become effective until March 30, 2024, and since the proposed project has achieved 50 percent of full design, the provisions of the new manual do not apply. We concur with this opinion. Most elements of the design exceed the minimum standards of the 2024 manual, including four foot sump depths, groundwater recharge volumes, and treating for water quality flow in addition to water quality volume.

C. Grading

1. [02/06/2024] Review the swale on the west side of Castle Village Road. The swale is well developed, and is well-conceived given its location at the base of a long, steep slope. The grading between contour 672 and 670 suggests that it will discharge into the roadway, which we don't believe is the intent. A drainage structure may be necessary to intercept the runoff above the entry monument sign.

    [02/23/2024] Comment addressed. A yard drain was added to Drawing UT-1 to intercept runoff from the swale.

2. [02/06/2024] A few relatively low-height retaining walls are proposed on the site. Where will the wall underdrains discharge for:

    a. The wall behind Units 28 – 34.
    b. The wall near the 56 inch beech tree.

    [02/23/2024] Comment addressed. The applicant's engineer has identified the underdrain and/or weep hole locations.

3. Review the grading between several of the units at the end of Meadowview Lane. For example:

   a. [02/06/2024] The area between Unit 66 and 65 appears to drain directly toward the north wall of Unit 65.

      [02/23/2024] Comment addressed. A yard drain has been added between Units 65 and 66 to collect runoff.

   b. [02/06/2024] A low point will exist along the north wall of Unit 64 without any inlet to intercept runoff.

      [02/23/2024] Comment addressed. A swale will be graded north of Unit 64 to provide positive drainage.

   c. [02/06/2024] There is no shoulder on the west side of Meadowview Lane in front of Unit 64. The grade slopes immediately downward from the back of the curb. The typical section on Drawing SD-1 indicates a 4' wide shoulder at ¼ inch per foot sloped toward the roadway.

      [02/23/2024] Comment addressed. The grading has been revised to accommodate a 4-foot wide shoulder consistent with the roadway typical section.

4. Review the grading between units on Pine Ridge Road:

   a. [02/06/2024] Between Unit 116 and 117, grading seems to be directed northeasterly to the wall of Unit 116, with no positive outlet.

      [02/23/2024] Comment addressed. A new yard drain has been added between Units 116 and 117 to provide positive drainage.

   b. [02/06/2024] Consider adding a inlet to the west of Unit 117 as the proposed swale rounds the corner.

      [02/23/2024] Comment addressed. A new yard drain was added to the west of Unit 117.

   c. [02/06/2024] Between Unit 41 and 42, it appears as if runoff will accumulate against the wall of Unit 41.

      [02/23/2024] Comment addressed. Drawing UT-4 has been revised to better define a swale between Units 41 and 42.

5. [02/06/2024] Review the grading between units on Castle Village Road. In front of Units 94 and 95, the east shoulder of the roadway appears to grade toward the residences.

   [02/23/2024] Comment addressed. A swale has been added to direct runoff away from the residential units.

6. [02/06/2024] Consider adding spot elevations at the corners of the parking spaces located along the interior island at the parking area on the west end of Boxwood Court. (Opposite spot elevations 731.5 and 731.9)
[02/23/2024] **Suggested Potential Condition of Approval.** **Spot elevations have been added as requested to clarify the grades within the parking area. Drawing GR-2 should be revised to add a proposed 732 contour across the parking island.**

7. [02/06/2024] A swale will be graded at the base of Detention Basin 510. Consider adding riprap lining to the swale to protect the toe of the detention basin fill slope from scour and erosion.

[02/23/2024] **Comment addressed.** **A riprap swale has been added as requested.**

D. Sediment and Erosion Control

In total, the project will disturb approximately 40.8 acres, and therefore is subject to registration under the Connecticut General permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activity. The General Permit requires a Stormwater Pollution Control Plan which documents site-specific erosion controls and stabilization, as well as weekly inspections by a qualified professional. The permit also stipulates that inspections be performed weekly and 24 hours after rainfall events exceeding 0.5 inches in depth. Additionally, since the area of disturbance exceeds 15 acres, the registration supporting documents are to be reviewed by an independent, qualified professional as a condition of registration.

The sediment and erosion control plans show prudent measures to enhance the protection of wetlands, for example the use of redundant barriers near wetlands and watercourses. However, further information is requested.

1. [02/06/2024] Develop a water handling plan for the construction of the stream crossings at Johnnie Cake Lane and Meadowview Lane. Show how stream flows will be diverted around the work area while the new crossings are constructed. Include supporting details, and provide temporary hydraulic facilities data in accordance with Chapter 6.F of the Connecticut DOT Drainage Manual.

[02/23/2024] **More information is requested.** **The applicant's engineer indicates that water handling plans will be prepared and submitted to the Town by the contractor. Although the contractor ultimately develops the water handling plans, it is up to the engineer to show the feasibility of water handling during the approvals. The method of construction of a temporary sandbag cofferdam across the watercourse, and then bypass pumping is a typical approach that would work well for the proposed crossing. The narrative provided in the response is acceptable, though the applicant's engineer should confirm that tabulated wetland disturbances include temporary disturbance from proposed water handling operations.**

We recommend that this comment be resolved prior to taking action on the application. Specifically, the applicant's engineer should confirm that the tabulated disturbance areas include disturbances related to water handling activities, since these activities occur directly in wetlands and watercourses.

2. [02/06/2024] We recommend further subdividing each of the three phases into smaller divisions of five acres to better illustrate how the site will be disturbed and developed.

   [02/23/2024] Comment addressed. The sediment and erosion control plans have been subdivided into smaller phases. Some phases exceed 5 acres, due to the work to create the sediment basins, but the 5-acre phasing is a general guideline.

3. [02/06/2024] On Drawing SE, General Note 1 states that "At least thirty days prior to the state of construction, the developer is to submit to the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) a completed General Permit Registration…" The project is a Locally Approvable Project under the General Permit. Section 4(c)(A), Registration Procedure, notes that the registration must be submitted 60 days prior to the planned commencement of construction activity.

   [02/23/2024] Comment addressed. Drawing SE, General Note 1 has been updated.

4. [02/06/2024] On slopes below sediment traps and detention basins, add erosion control blankets.

   [02/23/2024] Comment addressed. Erosion control blankets have been added as requested.

5. [02/06/2024] Add stone check dams in the proposed diversion swales to reduce the amount of sediment transported.

   [02/23/2024] Comment addressed. Stone check dams are now shown on the proposed diversion swales.

6. [02/06/2024] Show baffles in temporary sediment traps to elongate flow paths as shown in Temporary Sediment Trap detail on Drawing SE-6.

   [02/23/2024] Comment addressed. Baffles are shown in the temporary sediment traps.

7. [02/06/2024] The diversion swale will pass through a low spot near elevation 690 to the east of proposed Unit 31. Can the grade of the swale be maintained through this area?

   [02/23/2024] Comment addressed. A new sediment trap has been added at the low spot to maintain a positive slope on the diversion swale.

8. [02/06/2024] Drawing SE-6 shows a dewatering outlet for sediment traps, but these are not indicated on the plans. Please show.

   [02/23/2024] Comment addressed. The dewatering outlet detail is no longer proposed and has been removed from the plan set.

9. [02/06/2024] Show washout areas for concrete trucks near construction entrances.

   [02/23/2024] Comment addressed. Wash out areas for concrete trucks have been added to Drawings SE-1 and SE-5.

10. [02/06/2024] Indicate duration of each phase in months or weeks.

[02/23/2024] Suggested Potential Condition of Approval. A detailed sequencing narrative and construction schedule will be submitted to the Town once a site contractor has been selected.

E. Miscellaneous

1. [02/06/2024] A portion of Johnnie Cake Lane west of the new roadway will be removed. The roadway abandonment may require a formal abandonment process through the Town.

[02/23/2024] Comment addressed. The applicant has acknowledged the comment. No action is necessary for the purposes of the inland wetlands permit.

2. [02/06/2024] Encase the force main and sanitary sewer for 10 feet on either side of the crossing to minimize groundwater infiltration into the line.

[02/23/2024] Comment addressed. The force main and sanitary sewer are proposed to be encased in concrete for the wetland crossing as shown on Drawing UT-4.

3. [02/06/2024] Sanitary Sewer Manhole #3 is missing a top of frame elevation.

[02/23/2024] Comment addressed. The top of frame of Sanitary Sewer Manhole #3 has been added.

4. [02/06/2024] Clarify the dashed line that runs roughly parallel to the proposed 706 contour between Pine Ridge Drive and Castle Village Road.

[02/23/2024] Comment addressed. The dashed line corresponds toe intermediate contour elevation 707.

5. [02/06/2024] The 6-space parking area southwest of Unit 117 is atop a 13 foot high, 3H:1V slope. Is a guiderail warranted at this location?

[02/23/2024] Comment addressed. A guiderail has been added to the subject parking area.

We commend the applicant for their thorough response to the plans, and hope that these comments will be helpful to guide the Commission as it continues its evaluation of the plans.

Sincerely,

TIGHE & BOND, INC.

Joseph Canas, PE, LEED AP, CFM
Principal Engineer
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February 22, 2024

Ms. Sharon Salling, Chairman
Inland Wetlands Commission
3 Primrose Street
Newtown, Connecticut 06470

Re: Castle Hill Village
Castle Hill Road
Newtown, Connecticut

Dear Ms. Salling and Members of the Inland Wetlands Commission,

At the request of the Newtown Conservation Coalition, I have reviewed the following documents for the above referenced project. The focus of my review is on the design of the stormwater management system and impacts on inland wetlands and downgradient properties.

The Coalition is concerned that the proposed development does not incorporate any aspects of Low Impact Development (LID). One of the most important aspects of LID is to have the development plan respect the natural landform and the environment. This plan does not meet this critical aspect of LID as the natural landform is being significantly modified for the proposed residential development. This is evidenced by the substantial cut and fill volumes cited by the applicant for the project.

The project relies on the use of conventional, structural stormwater management practices which do not adequately address the reduction of non-point source pollutants. Additionally, there is no reduction of the significant increases of runoff volume which will be generated by the project.

Documents Reviewed:

1. Drainage Report by SLR, revised to 1/5/24.
2. Plan set by SLR, revised to 1/5/24.
3. Wetland and Watercourse Impact Assessment by SLR of 11/22/23.
4. Engineering Review by Tighe & Bond of February 6, 2024.

Executive Summary:

A. The stormwater management will not adequately reduce non-point source pollutant loads which will be directed to delineated inland wetland/watercourse corridors on and off the

subject property. Summary information based upon the applicant's data is found in Appendix A.

B. The bottom of all five proposed stormwater basins is located at or below the seasonal high groundwater table thus, no infiltration will occur in a saturated zone. No infiltration means that there is no reduction of substantial increases of runoff volume which will be directed to wetlands and watercourses. It is well documented in professional literature that increased runoff volumes when coupled with increased flow durations cause erosion of native stream channels both perennial and intermittent. Supporting documentation is provided in Appendix A.
C. The design of the proposed stormwater management systems does not conform to any of the practices found in the CT DEP 2004 Storm Water Quality Manual. The design of the stormwater management systems is not in compliance with the CT DEP 2004 Manual.
D. Based upon the Borough of Newtown Zoning Regulations it does not appear that proposed density complies with the requirements of the Open Space Subdivision Regulation.
E. This project as currently proposed has a high probability of causing adverse impacts to wetlands and watercourses because of the development proposed in the upland areas of the site. These impacts include degradation of water quality in wetlands and watercourses, erosion of stream channel banks and downstream deposition of eroded material.

Review Comments
Site Plans:
Title sheet

1. A summary of cut and fill volumes is provided on this sheet. The summary table calls out the excavation necessary for building basements and road base separately from general earth work on this site. There is a significant amount of grading around all the proposed units. The data is as follows:
    a. Cut volume = 66,810 cubic yards
    b. Fill volume = 60,410 cubic yards
    c. Net cut volume = 6,400 cubic yards
    d. Basement excavation volume = 34,330 cubic yards
    e. Road base excavation volume = 13,430 cubic yards
    f. Total excavation for basements and road construction = 54,160 cubic yards
2. The excavation volume for basements and road construction is NOT part of the 66,810 cubic yards cited above, therefore the actual excavation volume would be 120,970 cubic yards. If this is the case then the volume to be removed from the site will be approximately 60,000 cubic yards, not 6,400 cubic yards. At 17 cubic yards per dump truck load, this means that there will be over 3,500 truck trips over the local roads.
3. Since the road which previously divided the 136 acres into two parcels has been abandoned so that the two parcels could be merged into a single parcel, the entire parcel must provide all the required data called for in the Newtown land use regulations. This has not been done. This would include boundary survey, delineation of all wetlands, watercourses, and vernal pools, steep slopes, etc.

Utility plans:

General comments:

4. Existing contours need to be labeled to facilitate reading of the plans. Proposed contours for the proposed stormwater basins also need to be labeled on the utility plans.
5. Why aren't all roof drains directed to a catch basin and then stormwater management practice?
6. Discharge of footing drains on the slopes will result in concentrated flow onto a slope above a wetland will cause erosion on the upland slope and result in the deposition of the eroded material into the wetland.
7. The applicant is using scour holes at the ends of pipes when entering a stormwater basin and at the end of the basin discharge pipes on the original grade. Scour holes are not the appropriate measure for these applications as they do not spread the flow out as a riprap apron does. Scour holes result in a more concentrated flow onto the natural ground surface than a riprap apron does.
8. The applicant sized outlet protection using the CT DOT drainage manual. The CT DEP 2002 Guidelines for Soil Erosion and Sediment Control "2002 Guidelines" is the controlling document. The 2002 Guidelines require that outlet aprons be used which are sized for the 25-year flow rate.
9. There are five proposed stormwater basins, the following issues are applicable to all five of the basins as currently proposed:
    a. Riprap berms across bottom of basin do not create a forebay. A forebay is a depressional storage area at the inlet of a stormwater management practice which is four (4) feet to six (6) feet in depth, a minimum length to width ratio of 2:1 and hold a minimum of 10% of the Water Quality Volume (WQV) directed to a basin.
    b. The lack of a depressional forebay will cause re-suspension of any settled sediment on the uphill side of the stone filter berm for subsequent rainfall events. This turbid water will pass through the stone filter berm and not be trapped.
    c. The design of this basin does not conform to any of the practices found in the CT DEP 2004 Storm Water Quality Manual "2004 Manual".
    d. As the basin design does not conform to any of the practices found in the 2004 Manual, no water quality treatment can be applied to this basin.
    e. The only water quality treatment devices for the runoff directed to all basins are catch basins with 48" sumps and online hydrodynamic separators. Both practices are considered "secondary" by the 2004 Manual as they do not provide much reduction in non-point source pollutant loads.
10. Each stormwater basin also has specific issues as discussed in the following sections which reduce their intended functionality.

11. Basin 120:

    a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.
    b. The bottom of Basin 120 is located at elevation 668', the outlet control structure is located at proposed contour 674'. However, the invert of the low flow outlet is

set at 668.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The discharge from Basin 120 is just south of the property line above Johnny Cake Lane and then flows down the slope to the delineated off-site wetland. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.
d. The bottom of Basin 120 is two (2) feet to six (6) feet below grade. According to TP-19 which is in the bottom of Basin 120, mottling (seasonal high groundwater level) "SHGWL" was observed at 36" below grade, so the bottom of the basin will be located below the SHGWL.
e. The berm is set at elevation 676' which is six (6) feet to ten (10) feet above the existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

12. Basin 130:

a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.
b. The bottom of Basin 130 is located at elevation 694', the outlet control structure is located at proposed contour 701'. However, the invert of the low flow outlet is set at 694.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.
c. The discharge from Basin 130 is just south of the property line above Johnny Cake Lane and then flows down the slope to the delineated off-site wetland. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.
d. The bottom of Basin 120 is six (6) feet to ten (10) feet below grade. According to TP-14 which is in the bottom of Basin 120, mottling (seasonal high groundwater level) "SHGWL" was observed at 24" below grade, so the bottom of the basin will be located below the SHGWL.
e. The berm is set approximately eight (8) feet above existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

13. Basin 310:

a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.
b. The bottom of Basin 310 is located at elevation 708.0', the outlet control structure is located at proposed contour 712.0'. However, the invert of the low flow outlet

is set at 708.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.

c. The bottom of Basin 310 is located between six (6) feet and eight (8) feet below existing grade. According to TP-1 and TP-2 which are in the bottom of Basin 310, mottling (seasonal high groundwater level) "SHGWL" was observed at 48" below grade respectively, so the bottom of the basin will be located below the SHGWL.
d. The discharge from Basin 310 is a direct piped connection to drainage on Castle Hill Road. The drainage system on this portion of Castle Hill Road discharges onto property owned by the Newtown Forest Association. Has the Castle Hill Road drainage system been evaluated for its ability to handle increased runoff volumes?
e. There are vegetated swales on the Newtown Forest Association property which convey the runoff from Castle Hill Road to the downgradient wetland area. Have the swales been evaluated for the increased runoff volumes which will be directed to them?
f. The swales on the NFA land discharge to a wetland system at the bottom of the slope. The applicant has not evaluated the impact on this off-site wetland system which will be impacted by increased runoff volumes and increased pollutant loads.
g. The applicant is increasing runoff volumes and pollutant loads on the NFA property, has the applicant obtained as easement from NFA to permit these changes?

14. Basin 410:

a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 1.0' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.
b. The bottom of Basin 410 is located at elevation 692', the outlet control structure is located at proposed contour 697'. However, the invert of the low flow outlet is set at 693.0', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.
c. The discharge from Basin 410 is directed to a stone fill trench above a delineated inland wetland area. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.
d. The bottom of Basin 410 is ten (10) feet to twelve (12) feet below grade. According to TP-9 and TP-10 which are in the bottom of Basin 410, mottling (seasonal high groundwater level) "SHGWL" was observed at 24" below grade, so the bottom of the basin will be located below the SHGWL.

15. Basin 510:

a. Based upon the elevations of the bottom of the basin and the invert of the lowest outlet invert, the permanent pool will be 0.5' in depth which does not appear adequate to fully contain full WQV, minus the storage in the forebays. The 2004 Manual requires that the WQV be "captured and treated", not just provided by a storage volume in the basin.
b. The bottom of Basin 510 is located at elevation 682.0', the outlet control structure is located at proposed contour 684.0'. However, the invert of the low flow outlet is set at 682.5', so runoff cannot enter the outlet structure based upon the proposed contours shown on the plan. The basin will not function as intended.
c. The discharge from Basin 510 is directed to a stone fill trench above a delineated inland wetland area. The existing slope currently only sees overland flow from the forested site. The discharge will create concentrated flow which will cause erosion of the upland soil and result in deposition of eroded material in the off-site wetland area.
d. The bottom of Basin 510 is two (2) feet below grade on the north side and in a four (4) feet of fill on the south side. According to TP-4 and TP-5 which are in the bottom of Basin 410, mottling (seasonal high groundwater level) "SHGWL" was observed at 23" and 24" below grade respectively, so a portion of the bottom of the basin will be located below the SHGWL.
e. The berm is set approximately ten (10) feet above existing grade. This is considered a Dam by CT DEEP and thus the berm must be designed as a dam.

16. SE sheet:

a. This plan shows that each phase of the proposed construction is greater than five (5) acres, which is the limit under CT General Permit (GP) for Construction Activities. If the area proposed for disturbance at one time is greater than five (5) acres, a much more robust and detailed erosion control plan is required. CT DEEP could also require that an Individual Permit is applicable and not the GP.
b. It is proposed to use all five stormwater basins as temporary sediment basins (TSTs). How will the TSTs be converted to post-development basins with specified plantings when runoff will be directed to them?

17. Drainage Report:

a. From the results of the deep test holes, it is noted that permeability tests were conducted at many of the deep test pits. No results of these permeability tests were found on the plan set or in the drainage report. This is a critical omission in the submission.
b. No information has been provided as to how the permeability tests were conducted. Were Double Ring Infiltration tests done in the field or were soil samples taken and tested in a laboratory? If tube samples were taken in the field, were the samples taken horizontally or vertically in the soil profile?
c. It is stated that infiltration was included in the routing of Basins 130 (0.33"/hr.); Basin 310 (0.66"/hr.); Basin 410 (1.26"/hr.); and Basin 510 (0.1"/hr.). The bottoms of Basins 130, 310, and 410 are located well below the seasonal high

groundwater table, thus there will be no infiltration as the bottom is in a saturated zone where infiltration simply does not occur.

d. In the case of Basin 510, a portion of the basin is in up to four (4) feet of fill, no specifications have been provided for this fill material, so no infiltration rate can be attributed to this material and the routing of the basin.
e. No pollutant analysis has been provided which would demonstrate that the CT DEP goal of 80% reduction of Total Suspended Solids (TSS) has been met. In addition to TSS, the analysis needs to include total phosphorous (TP), total nitrogen (TN), total petroleum hydrocarbons (TPH) and metals (Zinc as an indicator metal for other metals). 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 practice, you will observe that the removal rates are not the same for all the various pollutants which you would expect if simply trapping the sediment trapped all the other pollutants.
f. The Groundwater Recharge Volume (GRV) was calculated for each stormwater basin, it has not been demonstrated that the GRV will infiltrate back into the ground which is the requirement of this standard to maintain pre-development infiltration rates of rainfall for post-development conditions. No infiltration will occur as the bottom of the basins are located below the seasonal high groundwater table. The design is not in compliance with the 2004 Manual.
g. The Water Quality Volume (WQV) was calculated for each stormwater basin, it has not been demonstrated that the WQV is being "captured and treated" within each stormwater basin. The Water Quality Flow (WQF) is a rate of runoff based on the WQV and is used to size structural practices such as hydrodynamic separators and providing the WQF does not eliminate the need to provide the WQV in each basin. The design is not in compliance with the 2004 Manual.
h. As discussed above, the full WQV is not being "captured and treated" per the 2004 Manual in four of the five proposed basins. The data for each basin is provided below:
    i. Basin 120, pool depth = 0.5', volume provided = 3,639 cubic feet; WQV directed to Basin 120 = 15,201 cubic feet; criteria has not been met.
    ii. Basin 130, pool depth = 0.5', volume provided = 2,183 cubic feet; WQV directed to Basin 130 = 6,882 cubic feet; criteria has not been met.
    iii. Basin 310, pool depth = 0.5', volume provided = 2,842 cubic feet, WQV directed to Basin 310 = 3,876 cubic feet; criteria has not been met.
    iv. Basin 410, pool depth = 1.0', volume provided = 3,218 cubic feet, WQV directed to Basin 410 = 8,537 cubic feet, criteria has not been met.
    v. Basin 510, pool depth = 0.5', volume provided = 4,468 cubic feet, WQV directed to Basin 510 = 4,138 cubic feet; criteria has been met.

i. It is clear from the above data taken from the applicant's plans and reports that the WQV has not been provided in four of the stormwater basins per the 2004 Manual.

Wetland and Watercourse Impact Assessment:

18. It is stated on the bottom of page 10 that the stormwater basins "will serve several purposes, including stormwater renovation and providing groundwater recharge volume (GRV). Providing the GRV maintains the pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff to maintain water table levels, stream baseflow, and wetland moisture levels." This statement is not supported by factual evidence or analysis. As noted above, none of the basins comply with the design requirements found in the CT DEP 2004 Storm Water Quality Manual. No pollutant renovation analysis has been provided by the applicant to demonstrate that renovation of the stormwater will occur. As stated above, the bottom of four basins is located below the seasonal high groundwater table and infiltration does not occur into a saturated zone, thus the GRV is not met on the site.
19. Level spreaders do not improve water quality as they are a discharge system to ensure that overland and not concentrated flow occurs on the undisturbed area downhill of a basin.
20. It is stated on page 11 that the site under conventional zoning would support 136 units, 1 unit per acre. This is not correct. First, The Borough of Newtown Zoning regulations, Section 4.05.1C.1 states the following: "*The maximum number dwelling units permitted shall not exceed 1.5 times the Developable Acreage, which is the total (gross) acreage of the parcel(s) minus any land having wetlands, watercourse, ponds, or steep slopes over 25%. In addition, the total number of units cannot exceed one per acres of the total (gross) acreage of the parcel(s).*" No calculations were found on the plans which provide the required calculation from the Borough Zoning Regulations. The maximum permitted density under the Open Space Concept should be the more restrictive density based upon the above analysis in my professional opinion.
21. Furthermore, Section 4.05.1.C.6 states the following: *"Site layout should be designed to minimize development upon and re-contouring of slopes having twenty-five (25) percent or more grades. Disturbance of steep slope and the creation of steep slopes shall be avoided to the greatest extent possible."* It needs to be pointed out that 2:1 slopes are a 50% grade, a 3:1 slope is a 33.3% grade both of which exceed 25%. Thus, much of the proposed grading on the site does not meet this requirement.

A copy of my professional qualifications is attached for the record.

Respectfully Submitted,
Trinkaus Engineering, LLC

Steven D. Trinkaus, PE

APPENDIX "A"
POLLUTANT LOADING INFORMATION AND WATER QUALITY IMPACTS DUE TO INCREASED POLLUTANT LOADS OF NON-POINT SOURCE POLLUTANTS

The treatment train is the same for all five stormwater basins. The first practice is a catch basin with a 48" deep sump. The second practice is an online hydrodynamic separator. No credit for the stormwater basins can be applied as the type of basin cannot be determined.

Pollutant removal rates for catch basin with 48" sump:
TSS – 9.0%
TP – 0%
TN – 0%
TPH – 0%
Zn – 0%

Pollutant removal rates for online hydrodynamic separator:
TSS – 38.0%
TP – 23%
TN – 1.8%
TPH – 42.0%
Zn – 26.0%

In summary, TSS loads will be reduced by 47%. TP by 23%, TN by 1.8%, TPH by 42%, and Zn by 26%. The TSS removal rates do not meet the CT DEP goal of 80% removal. The increased pollutant loads which will be discharged to multiple wetland system on and off the subject property will degrade the water quality in these systems which has an adverse physical impact to a wetland or watercourse.

The following is a summary of the potential water quality impairments that will occur in the receiving wetlands and watercourses. A discussion of the impacts of increased runoff volume on aquatic systems is also provided.

Total Suspended Solids (TSS)

Total Suspended Solids 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. Turbidity is measured as NTU.

Nutrients

Phosphorus and nitrogen are commonly found in non-point runoff with the primary source being lawn fertilizers. 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. 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. Sources of nutrients are organic and inorganic fertilizers, animal manure, bio solids and failing sewage disposal systems.

Metals

Metals in non-point source runoff are very toxic to aquatic life. 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. Metals commonly bind themselves to sediment and organic matter in stormwater and thus are transported to the receiving waters. Since natural rainfall is slightly acidic, metal roofs or components on the roof can be a significant source of the zinc or copper concentrations in stormwater.

Hydrocarbons

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.

Runoff Volumes

It is well documented in professional literature that increased runoff volumes will have adverse environmental impacts on receiving wetlands and watercourses. These impacts are as follows:

- Reduced groundwater recharge
- Reduced stream base flow due to groundwater
- Increased frequency of bank full and overbank floods
- Increase flow velocity during storms resulting in erosion of channel banks.
- Increase frequency and duration of high stream flows.

Newtown Forest Association, Inc.

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www.newtownforestassociation.org

A Century of Conservation
Founded 1924

Trent McCann
Executive Director

The Newtown Forest Association, Inc is a 501(c)3 nonprofit organization.

EIN # 06-6079549

February 23, 2024

To: Newtown Inland Wetlands Commission
Ms. Sharon Salling (Chair), Mr. Craig Ferris, Ms. Suzanne Guidera, Ms, Kendall Horch, Mr. Michael McCabe, Mr. Scott Jackson, & Mr. Mark D'Amico

Re: IW Application #23-31 by Castle Hill Real Estate Holdings, LLC

The Newtown Forest Association (NFA) Board of Directors has received information that strongly suggests that this application will impact our iconic Nettleton preserve on 13 Castle Hill Road. Please see attached review and assessment from Trinkaus Engineering, LLC.

This Preservation is a conserved property of 26 acres with a 50+ year old orchard, meadows, public trails & famous views of the town center flag pole & church steeples. Open space in Newtown is a limited resource. The NFA works hard to protect and preserve our open spaces, and while we do not oppose any and all new development, this particular project's potential impact directly to our property and the wetland ecology is of significant concern.

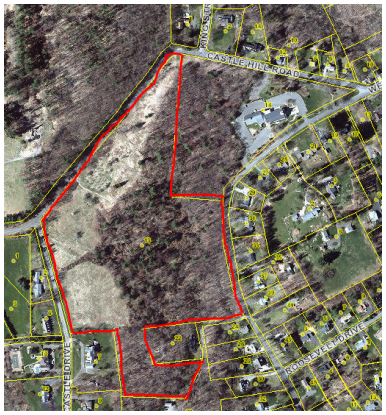
The NFA has been managing drainage issues on this property for years and has already spent substantial stewardship funds to manage the current situation. **Any additional runoff volume & pollutant load will be to the detriment of this Preservation**. No easements will be granted by the NFA that threatens to impact our conserved properties.

The NFA requests that this commission consider subsequent, downgradient, properties that may have impacts such as this in their review and decisions of this application. As this application currently stands, the NFA does not believe an adequate storm water management system is planned to sufficiently protect inland wetlands or our downgradient property. As such we urge you to reject this proposal as it is currently presented.

Sincerely,

Bart Smith

NFA President



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February 21, 2024

Ms. Sharon Salling, Chairman
Inland Wetlands Commission
3 Primrose Street
Newtown, Connecticut 06470

Re: Castle Hill Village
Castle Hill Road
Newtown, Connecticut

Dear Ms. Salling and Members of the Inland Wetlands Commission,

At the request of the Newtown Forest Association, I have reviewed the following documents for the above referenced project. The focus of my review is on the design of the stormwater management system which will direct runoff to the drainage system on Castle Hill Road and then onto the Nettleton Preserve owned by the Newtown Forest Association.

I was retained by the NFA back in 2015 to develop a plan to prevent erosion which was occurring because of the three discharges from the Town of Newtown drainage system on Castle Hill Road. This plan consists of forebays at the end of the existing pipes and vegetated swales with portions of riprap to the bottom of the slope.

Documents Reviewed:

1. Drainage Report by SLR, revised to 1/5/24.
2. Plan set by SLR, revised to 1/5/24.
3. Wetland and Watercourse Impact Assessment by SLR of 11/22/23.
4. Engineering Review by Tighe & Bond of February 6, 2024.

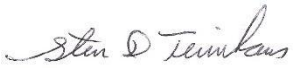
Review Comments:

1. Basin 310: This basin is located on the eastern side of the site and will ultimately discharge onto the NFA property.
    a. The discharge from Basin 310 is a direct piped connection to drainage on Castle Hill Road. The drainage system on this portion of Castle Hill Road discharges onto property owned by the Newtown Forest Association. Has the Castle Hill Road drainage system been evaluated for its ability to handle increased runoff volumes?
    b. There are vegetated swales on the Newtown Forest Association property which convey the existing runoff from Castle Hill Road to the downgradient wetland area. Have the swales been evaluated for the increased runoff volumes which will be directed to them?
    c. The swales on the NFA land discharge to a wetland system at the bottom of the slope. The applicant has not evaluated the impact on this off-site wetland system which will be impacted by increased runoff volumes and increased pollutant loads.
    d. The applicant is increasing runoff volumes and pollutant loads on the NFA property, has the applicant obtained as easement from NFA to permit these changes?

e. The increased runoff volumes will cause erosion of the existing swales as they were not designed to handle more runoff. If the swales are eroded by the increased concentrated flow, it will affect the ability of NFA to maintain their property. The eroded material will be deposited at the base of the swale within the limits of the delineated inland wetlands on the NFA property.
f. The only water quality treatment devices for the runoff direct to Basin 310 are catch basins with 48" sumps and online hydrodynamic separators. Both practices are considered "secondary" by the 2004 Manual as they do not provide much reduction in non-point source pollutant loads. This will result in the discharge of increased non-point source pollutant loads to the NFA property and the wetlands located on their property. In addition to Total Suspended Solids (TSS), other non-point source pollutants include total phosphorous (TP), total nitrogen (TN), total petroleum hydrocarbons (TPH) and metals (Zinc as an indicator metal for other metals). All of these pollutant will cause adverse impacts to the wetland system on the NFA property.

Please contact my office if you have any questions concerning this information.

Respectfully Submitted,
Trinkaus Engineering, LLC



Steven D. Trinkaus, PE

STEVEN DANZER, PHD & ASSOCIATES LLC
Wetlands & Environmental Consulting
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WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES

Environmental Report

296 Berkshire Road, Newtown, CT

Date: February 14, 2024

By: Steven Danzer Ph.D.

- Soil Scientist – Certified Nationally by the Soil Science Society of America (#353463).
  – Registered with the Society of Soil Scientists of Southern New England.
- Senior Professional Wetland Scientist - PWS #1321, Society of Wetland Scientists.
- Arborist - CT DEEP License S-5639; ISA Certified NE-7409A.

- Ph.D. - Renewable Natural Resource Studies.

EXECUTIVE SUMMARY

A residential subdivision is proposed in Newtown, Connecticut. The development proposal was reviewed by Steven Danzer PhD & Associates LLC to document existing conditions and to assess any potential environmental impacts to wetlands/watercourses.

The site is located on the east side of Berkshire Road (Route 34) near the Monroe border. Six wetland or watercourse systems are located within proximity of the proposed development. Three additional wetland/watercourse systems are located within the Open Space, far from the proposed development.

Ten residential lots are proposed on the site, along with driveways, utilities, wastewater disposal systems, lawn area, a common road, and stormwater management systems. 15.3 acres will be developed (39% of the site) while 24.2 acres of open space (61% of the site) will be preserved.

All of the residences will be located outside of the 100 upland review area. The only intrusion into the 100 foot review zone besides from the initial access way will be some grading, driveways, septic systems, and stormwater management systems.

The 15.3 acre development will be largely concentrated within the central region of the property and will avoid development on the expansive western slope and terrace above the Halfway River. The rest of the site will be preserved as open space. The open space will be particularly valuable to future conservation efforts as it will be contiguous to existing open space to the north, and contiguous with the Halfway River corridor to the east.

INTRODUCTION

Regulated activities are proposed adjacent to the wetlands and watercourses located at 296 Berkshire Road, Berkshire, Connecticut.

Activities associated with the development of the site include ten residences, along with driveways, utilities, wastewater disposal systems, lawn area, a common road, and a stormwater management system, spanning 15.3 acres, all as indicated by submitted engineering plans prepared by J. Edwards & Associates LLC.

Nine wetland and/or watercourse areas are located within proximity of the work area or within the proposed open space. Several of these areas (areas 2,3,4 and areas 7,8,9 labeled as per the map within this report) are interconnected. The wetland and watercourse areas include:

Wetland 1 – Forested wetland and potential vernal pool located in Open Space in southern region of the property

Wetland 2 – Forested wetland located in eastern region of property partly within the Open Space.

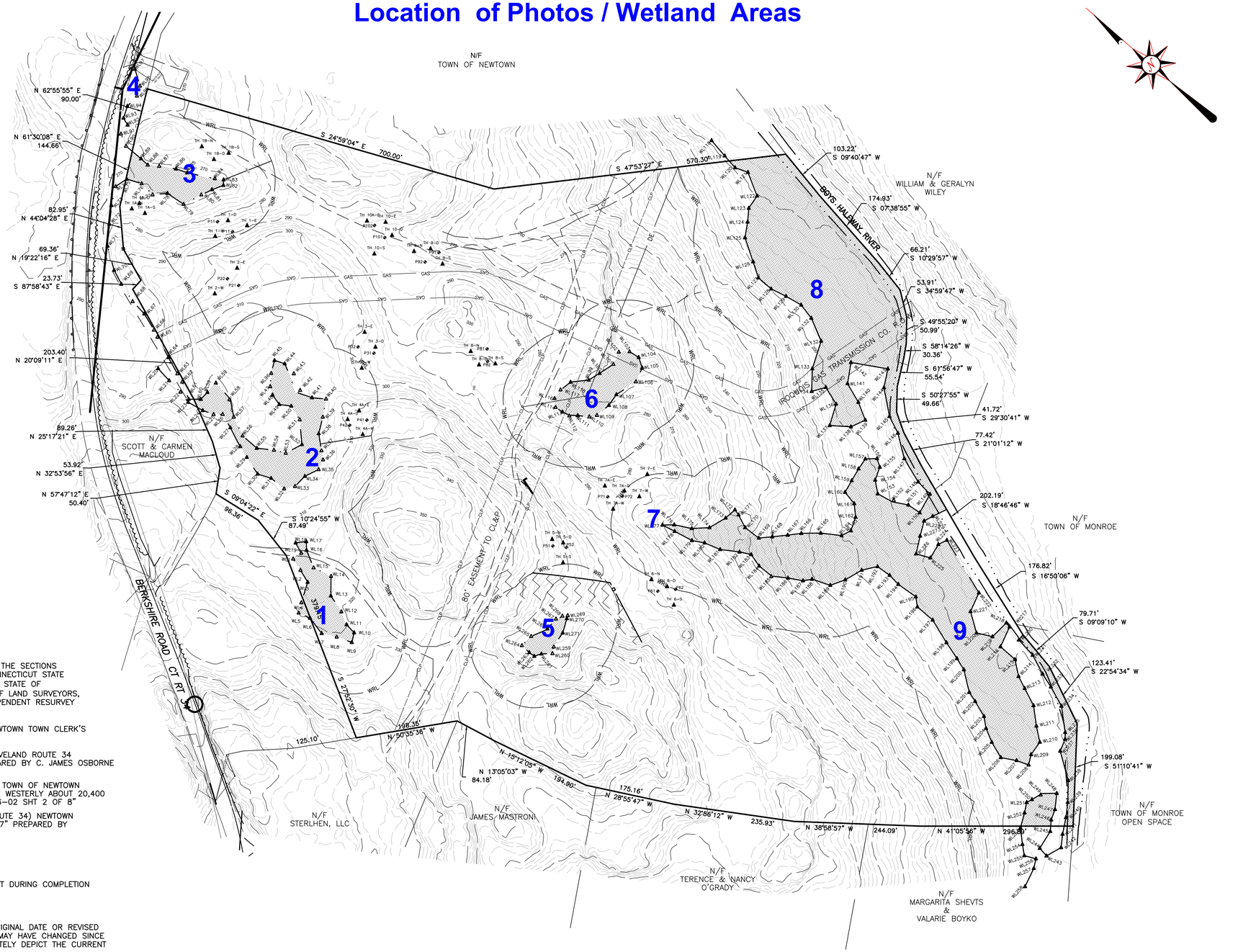
Wetland 3 – Forested wetland located near proposed road entrance in the northern region of the property.

Wetland/Watercourse 4 – watercourse area where the driveway entrance will be located in northern edge of the property, parallel to Berkshire Road frontage.

Wetland 5 - Forested wetland depression located in southern region of property.

Wetland 6 – Powerline Wetlands - Shrubby wetland depression located adjacent to and within the powerline right-of-way in the central region of property.

Location of Photos / Wetland Areas



NOTES:

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH THE SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEY AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS AN IMPROVEMENT LOCATION SURVEY BASED UPON A DEPENDENT RESURVEY AND CONFORMS TO HORIZONTAL ACCURACY CLASS A-2.
2. REFERENCE IS MADE TO THE FOLLOWING MAPS ON FILE IN THE NEWTOWN TOWN CLERK'S OFFICE:
   A. "MAP SHOWING PORTION OF PROPERTY OWNED BY ETHEL R. LOVELAND ROUTE 34 NEWTOWN, CONNECTICUT SCALE 1"=100' MAY 15, 1972" PREPARED BY C. JAMES OSBORNE ON FILE AS MAP #4040.
   B. "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF NEWTOWN STEVENSON-SANDY HOOK ROAD FROM THE MONROE TOWN LINE WESTERLY ABOUT 20,400 FEET ROUTE No. 34 SCALE 1"=40' OCT. 31, 1933 NUMBER 96-02 SHT 2 OF 8"
   C. "PROPERTY SURVEY LOCATED ON BERKSHIRE ROAD (C.D.O.T. ROUTE 34) NEWTOWN CONNECTICUT PREPARED FOR RALPH H. LOVELAND 12-15-1987" PREPARED BY TRACY H. LEWIS ON FILE AS MAP #7116.
3. THE LOCATION OF UNDERGROUND UTILITIES, IF ANY, IS UNKNOWN
4. PLAN PREPARED FOR THE RESIDENCE AT BERKSHIRE LLC.
5. LOT CORNER MARKERS DEPICTED HEREON WERE FOUND AND/OR SET DURING COMPLETION OF THIS SURVEY.
6. BEARING BASED ON CONNECTICUT STATE PLANE.
7. CERTIFICATION OF THIS MAP APPLIES TO CONDITIONS AS OF THE ORIGINAL DATE OR REVISED DATE DEPICTED HEREON. EXISTING CONDITIONS ON THIS PROPERTY MAY HAVE CHANGED SINCE THAT DATE AND AN UPDATED SURVEY IS RECOMMENDED TO ACCURATELY DEPICT THE CURRENT CONDITIONS.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

THIS MAP IS NOT VALID UNLESS EMBOSSED WITH THE SEAL OR AFFIXED WITH THE LIVE STAMP OF THE SIGNATORY.

J. EDWARDS & ASSOCIATES, LLC
Engineering and Surveying
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Easton, CT. 06612
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JASON EDWARDS, L.S. No. 70308

0 100 200 300

Prepared by Steven Danzer PhD

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JASON S. EDWARDS
No. 10937
LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JASON EDWARDS
LICENSED LAND SURVEYOR

296 BERKSHIRE ROAD
NEWTOWN, CONNECTICUT

PREPARED FOR
THE RESIDENCE AT BERKSHIRE, LLC

REVISIONS

#	DATE	DESCRIPTION
	2.10.24	RED. IMPACT

DATE: AUGUST 1, 2023
PROJECT #: 2960
DRAWING FILE:
DRAWN BY: NDC
SCALE: 1"=100'

TITLE

EXISTING CONDITIONS PLAN

SHEET NUMBER

1.0

K:\PROJECTS\2960-SHAPIRO-296 BERKSHIRE ROAD, NEWTOWN, CT\DRAWINGS\2960-SI

Wetland 7 – Steep intermittent stream and sloped wetland complex draining towards the Halfway River located in the eastern region of property.

Wetlands 8 & 9 – Forested lowlands on the terrace above the Halfway River within the Open Space.

The purpose of this report is to document existing conditions and to assess any potential impacts to the wetland resources due to the proposed activities.

1.0 Landscape, Land Use, and Watershed Context

The 39.5 acre site is located on the east side of Berkshire Road (Route 34). The Halfway River and Monroe municipal boundary bounds the site to the east. Existing residences within predominately wooded lots are located to the south, and an existing residence is located to the west. Open Space with trailhead parking to the Newtown Halfway River Trail is located to the north.

The undeveloped site is currently forested with a mature tree canopy, with the exception of an open shrubby powerline right-of way (ROW) that bisects the site roughly north to south, and a shrubby gas pipeline easement that bisects the site from west to east. The powerline ROW is serviced by an unimproved road.

The western region of the site is gently hilly with numerous wetlands and rocky features. The central region is more steeply hilly with several bedrock controlled peaks. There is a watershed divide between the western and central regions of the site. The eastern region of the site, where most of the open space will be, consists of the steeply wooded eastern slope above the Halfway River, as well as the flat wooded terraces above the river. The Halfway River flows northerly along the edge of the site.

Wetland areas 1, 2, 3 and 4 generally drain towards northerly towards Berskshire Road into a small watercourse that eventually drains into the Halfway River up the road, east of the site (though wetland 1 is mainly internally drained). Wetland areas 5 and 6 are mainly internally drained except for excessive storm events. These areas are located above the east bank Halfway River and therefore technically part of that local watershed. Wetland areas 7, 8, and 9 drain directly towards the Halfway River which is located along the site's eastern boundary.

2.0 Wetland/Watercourse Descriptions

The wetlands/watercourses on the site were delineated by Steven Danzer PhD & Associates during the weeks of November 14 and 21, 2022. Field work is documented in

a soils report dated November 23, 2022. Wetland soils in the hilly regions are best characterized as within the Ridgebury, Leicester, and Whitman soils, extremely stony mapping unit (3). Upland soils include Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes (mapping unit 75E) within the hilly regions and Ninigret fine sandy loam, 3 to 8 percent slopes (mapping unit 701B) along the river.

Wetland/watercourse descriptions are as follows:

2.1 Wetland 1– Forested wetland located in Open Space in southern region of the property

Physical Characteristics and Hydrology:

This wooded wetland area (**Photo 1**), entirely located within the proposed Open Space, is a potential vernal pool. The area is mainly internally drained. The water levels are largely maintained by the berming effect of the unimproved powerline access road which skirts the wetland's north side. During excessive rain events water does appear to sheet flow over the road towards wetland area 2. The wetland receives a large portion of its hydration from runoff from the hills to the south and east.

Vegetation and Wetland Functions:

Wetland 1, as a potential vernal pool, is a valuable wetland resource. Identifiable vegetative dominants included Red maple, Hemlock and Black Birch. Undoubtedly there are additional understory and herbaceous plants that grow in this area, but the survey was conducted during winter when the herbaceous layer is dormant.

The existing functions and values of the wetland area were evaluated using the New England Army Corp Highway Methodology Descriptive Approach, as modified for application to local conditions. This methodology has been proven useful in similar projects intended for review by municipal wetland commissions, and was chosen as the most appropriate methodology for the assessment of the area due to the assessment's descriptive emphasis. The functions and values of the system are described below, in order of most prominent to least prominent for the watercourse system.

Wetland/watercourse functions and values performed by the system include *wildlife habitat* and possibly *threatened or endangered species habitat* due to probability that the area serves as a breeding ground for amphibians, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* if the adjacent area is ever developed (though no development is being proposed in this area), and *production export* due to the plant life present within the corridor that can serve as food for wildlife and benthic organisms.

Proposed activities:

Wetland 1 is located entirely in the Open Space. The nearest land disturbance to this wetland will be the rear grading for lot 4, which will be roughly 300 feet away and in a different watershed. There is no work proposed within the wetland's contributing watershed. As such, there will be no alteration of existing conditions and therefore no anticipated impacts, direct or indirect, to this valuable wetland resource.

2.2 Wetland 2 – Forested wetland located in eastern region of property

Physical Characteristics and Hydrology:

Wetland 2 (**Photo 2**) is a horseshoe shaped wetland complex partially located in the Open Space and partially located within lot 3 and the edge of lot 4. The wetland area has two lobes. The eastern lobe is shrubby. The western lobe is more wooded and is seasonally saturated or sometimes temporally flooded/inundated. The western lobe drains into a watercourse which flows northerly along the site's boundary and parallel to the road frontage of Berkshire Road. This wetland area is likely not a vernal pool despite the pooling of water due to its shallowness and the fact is has a defined outlet. The wetland area is sustained by seasonal groundwater and by surface runoff from the surrounding slopes.

A significant portion of the wetland buffer is already developed and/or its vegetation periodically managed. An existing residence and driveway is located less than 100 feet to the west. The shrubby gas pipeline easement is located to the north. It is assumed that the easement is periodically mowed or maintained to prevent woody dominants.

Vegetation and Wetland Functions:

The western lobe of the wetland area is wooded with Red Maple, Hemlock, Black and Yellow Birch, with Sedge and Skunk Cabbage within its understory. The eastern lobe is more shrubby with dense thickets of Sweet Pepperbush.

Wetland/watercourse functions and values performed by the system include, *wildlife habitat* due to the wetlands length and that more than 40% of the wetland edge is bordered by forested upland wildlife habitat at least 500 feet in width, a limited amount of *floodwater alteration* due to the system's connection to the downstream watercourse, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* due to the system's proximity to the existing residence to the west, and *production export* due to the plant life present within the corridor that can serve as food for wildlife. Though no reptiles or amphibians were noted during the field investigation conducted in winter, it

would be expected that the wetland would be host to these species. The wetland area is too shallow and isolated to support a fish population.

Proposed activities:

The only physical activity proposed within the 100 foot review area to this wetland system is the septic to lot 4. It should be noted however that grading for the residence for lot 3 and the grading for lot 4 will both be located at the outside edge of the 100 foot review line as well. None of those activities except for the septic will be in the same local watershed as the wetland area. As such, the wetland will be undisturbed from proposed activities.

2.3 Wetland 3 –Forested wetland located near proposed road entrance

Physical Characteristics and Hydrology:

Wetland 3 is located in the northern region of the site (**Photo 3**) near the proposed road entrance and within proximity of the northern property boundary. The wetland is located in a depressional lowland and drains westerly towards the small watercourse parallel to the Berkshire Road frontage. The wetland is seasonally saturated with periodic inundation. This wetland area is likely not a vernal pool despite the pooling of water, due to its shallowness and the presence of a defined outlet. The wetland area is sustained by seasonal groundwater and by surface runoff from the surrounding slopes.

Vegetation and Wetland Functions:

Identifiable vegetative dominants within the forested wetland area included Red maple, Tussock sedge, Cinnamon fern, Skunk cabbage, Spicebush, and Sweet pepperbush. Immediately adjacent to the wetlands, the area was vegetated by intermediately sized Red Maples, Black Birch and Beech.

Wetland/watercourse functions and values performed by the system include, *wildlife habitat* due to the corridor's linear length and that more than 40% of the wetland edge is bordered by forested upland wildlife habitat at least 500 feet in width, a limited amount of *floodwater alteration* due to the system's connection to the watercourse corridor, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* if the adjacent area is ever developed, and *production export* due to the plant life present within the corridor that can serve as food for wildlife. Though no reptiles or amphibians were noted during the field investigation, it would be expected that the wetland would be host to these species. The wetland area is too shallow and isolated to support a fish population.

Proposed activities:

Lot 1 will be the closest residential lot to this wetland area. The residence of lot 1 will be located outside the 100 foot review area. The rain gardens, side yard, and septic will be located a few feet within the 100 foot review area, while the driveway grading will be located at the outside edge of the review zone. These are all relatively minor intrusions into the review area and will not be expected to physically impact the wetlands.

Bio-retention area #1 will be located 40-50 feet from the northeastern side of the wetland area. This will result in the removal of several mature or intermediately sized trees from the upland adjacent to the wetland area, including Red maple, Black Birch and Beech. The habitat eliminated is not wetland habitat, and as such the proposed activities will not be expected directly impact the physical ability of the wetland to support wetland dependent wildlife. However, there will still be a notable decrease of contiguous upland habitat in proximity of the wetlands, which will affect wildlife opportunity and usage. The hydrology of the wetland area will be maintained or improved.

2.4 Watercourse / Wetland 4 - Crossing

Physical Characteristics and Hydrology:

This watercourse area is located parallel to the Berkshire Road frontage in close proximity to the northern property boundary (**Photo 4**). The watercourse in the area of the proposed crossing is approximately 6 feet wide and relatively shallow. The watercourse drains northerly from below the residence and eventually discharges into the Halfway River north of the site. The watercourse has a small contributing watershed and is mainly sustained by surface flow originating from Wetland Area 2, with a small component from Wetland Area 3 which also drains towards this stream. It is unknown if this watercourse is intermittent or perennial.

Vegetation and Wetland Functions:

Identifiable vegetation within this area included Red Oak, Black Tupelo, Sweet Pepperbush, Skunk Cabbage, and Multiflora rose. The watercourse is only a few feet from Berkshire road, allowing the wetland buffer and watercourse to receive road salts and other non-point polluted runoff. This limits the quality of its habitat on the western side parallel to the road. The eastern side of the watercourse is contiguous with the rest of the wooded site and less susceptible to pollutants from the road, and as such provides higher quality upland habitat.

Proposed activities:

A small section of this watercourse (57 feet) will be piped with a 36 inch reinforced concrete pipe (RCP) to accommodate the entrance road crossing into the interior of the site. Several trees will need to be removed including a large Red Oak.

2.5 Wetland 5 - Forested Wetland in Southern region

Physical Characteristics and Hydrology:

Wetland 5 (**Photo 5**) is a relatively narrow forested wetland located in the southern region of the property, within in a small ravine at the base of steep rocky hills. The wetland is located entirely within the Open Space. The wetland area is mainly internally drained though runoff from excessive storm events may also sheetflow out to the east. A channel is located within the wetland's center which collects seepy runoff from the adjacent hills. Adjacent to the channel are an abundance of mossy boulders. The area is too shallow and too narrow to be a vernal pool.

Vegetation and Wetland Functions:

Identifiable woody vegetation within and adjacent to the wetlands included Hemlock and Beech.

Wetland/watercourse functions and values performed by the system include *wildlife habitat* due to the corridor's linear length and that more than 40% of the wetland edge is bordered by forested upland wildlife habitat at least 500 feet in width, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* if the adjacent area is ever developed. The wetland area also has high *visual quality/aesthetics* due to its position in a small hemlock dominated ravine.

Proposed activities:

No activities are proposed within the 100 foot review area.

The wetland is located entirely within the Open Space. Lots 5 and 6 are the closest residential lots. The septic for lot 5 extends to edge of the 100 foot upland review area. The edge of the driveway and grading for the residence of lot 6 also extends to the edge of the 100 foot upland review area. It should be noted that this is by *purposeful design*, as an earlier version of the site plan had the residence, driveway, grading and rain garden for Lot 5 fifty (50) feet closer and within the upland review. That configuration was then adjusted to the current proposed location at the recommendation of Steven Danzer PhD & Associates LLC to improve protection of the wetland area. As such, there are no activities now proposed within the 100 foot review area.

2.6 Wetland 6 - Powerline Wetlands

Physical Characteristics and Hydrology:

Wetland 6 (**Photo 6**) is contains a shrubby interconnected network of boulders and mossy small wetland depressions. It is located partly within and partly adjacent to the powerline right-of-way in the central region of property. Part of the wetland is within Lot 7 and part of the wetland is within the Open Space.

The area is mainly internally drained but too shallow to hold water for any period of time. During periods of excessive rainfall, the surface water from the wetland may sheetflow to the east and eventually drain down the hill, but under less extreme circumstances, the water appears to infiltrate on site within the wetland area. The wetland is maintained by surface flow and seepage from the powerline to the west, and the two hills to the north and south.

Vegetation and Wetland Functions:

Identifiable woody vegetation within the area included Multiflora Rose, Euonymus, with Yellow Birch and Black Birch on the periphery.

Wetland/watercourse functions and values performed by the headwaters area include include, *wildlife habitat* due to the corridor's linear length and that more than 40% of the wetland edge is bordered by upland wildlife habitat at least 500 feet in width, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* if the adjacent area is ever developed. The area does not have any characteristics of a vernal pool and usage of the area by amphibians or reptiles is likely very limited.

Overall, the wetland is impaired by the density of invasive shrub species and unlike any of the wetlands closer to Berkshire Road or to the Halfway River, too isolated to be ecologically part of any larger wetland drainage system. Since the wetland has virtually no storage capacity due to its irregular surface, the habitat is not conducive for most wetland dependent species.

Proposed activities:

The only activities proposed within the 100 foot review area are the common driveways to Lots 5,6 and 7, and the eastern edge of the grading for those driveways. These activities are to be roughly 50 feet from the wetland line.

Several activities are proposed outside but at the edge of the 100 foot review line; the northern side of the residence at Lot 7, its raingarden; the edge of grading for the cul-de-sac and the edge of grading for Bio-Retention Area #2.

2.7 Wetland 7 - Intermittent Watercourse Headwaters and Sloped wetlands

Physical Characteristics and Hydrology:

Wetland 7 (Photo 7) is a steep intermittent watercourse and sloped wetland complex draining towards the Halfway River, located in the eastern region of property. The upper 60 feet of its forested headwaters are located in the rear of Lot 6. The rest of the wetland area is located within the Open Space, on the slope and terrace that drains into the Halfway River.

The upper portion of the intermittent watercourse is narrow and steep. The watercourse drains over a small cliff and then widens out to a more expansive complex of sloped wetlands. The sloped wetlands / intermittent watercourse eventually flows into an interconnected series of forested lowland depressions located on the terrace above the Halfway River.

Vegetation and Wetland Functions:

Identifiable woody vegetation within the headwaters area of the watercourse included Red Maple, beech, Red Oak, Skunk Cabbage, Christmas Fern, and Japanese Barberry.

Wetland/watercourse functions and values performed by the system include *wildlife habitat* due to the corridor's linear length and that more than 40% of the wetland edge is bordered by upland wildlife habitat at least 500 feet in width, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, and the *conveyance of that water* downstream to the more expansive wetland areas.

Proposed activities:

The only activity proposed within the 100 foot review area is the septic to Lot 7, which is located approximately 75 feet from the edge of the headwaters to the stream.

Several activities are proposed outside but at the edge of the 100 foot review line; the southern side of the residence at Lot 7, the septic and raingarden to Lot 6.

Protection of the headwaters area is important as it serves as a hydrologic conduit to the wetlands below the slope and eventually as a conduit to the Halfway River itself. An earlier site plan proposed the residence of Lot 6 closer to the wetlands. *The residence has now been pulled substantially farther back*, out of the 100 foot review area and off the slope as per a recommendation from Steven Danzer PhD & Associates LLC during an initial review of the site plan. This adjustment to the lot configuration will permit more protection for the headwaters area.

2.8 Wetlands 8 & 9 – Forested lowlands on the terrace above the Halfway River

Physical Characteristics and Hydrology:

Wetland Area 8 (**Photo 8**) and Wetland Area 9 (**Photo 9**) are both located on the terrace above the Halfway River, within the Open Space. Wetland area 8 is located downstream to the north while Wetland area 9 is located upstream to the south.

Both areas receive runoff and seepage from the forested slope east of the river. Wetland Area 9 also receives surface water from the intermittent watercourse/sloped in Wetlands Area 7. Both Wetland Areas 8 and 9 also are susceptible to flooding from the Halfway River as well.

Vegetation and Wetland Functions:

Identifiable dominant woody vegetation within Wetland Area 8 included Hemlock and Yellow Birch, with Skunk Cabbage within the understory. Wetland Area 9 contained Hemlock, Beech, Skunk Cabbage, Moss spp., and Christmas Fern.

Wetland/watercourse functions and values performed by the system include *wildlife habitat* due to the corridor's linear length and that more than 40% of the wetland edge is bordered by upland wildlife habitat at least 500 feet in width, *groundwater recharge/discharge* due to its position relative to the adjacent upland slopes, *floodwater alteration* due to the system's connection to river corridor, *sediment/toxicant/pathogen retention* and *nutrient removal/retention/transformation* if the adjacent area is ever developed (though no development is being proposed as the area is to be preserved for open space), and *production export* due to the plant life present within the corridor that can serve as food for wildlife. Though no reptiles or amphibians were noted during the field investigation, it would be expected that the wetland areas would be host to these species.

Proposed activities:

There are no activities proposed within this area as it is located entirely within the Open Space. The nearest developmental activities are more than 350 feet away, and away from the steep slopes located above this area.

The wetland resources within this area are incorporated within the Open Space by design. The Open Space comprises 24.2 acres, and is particularly valuable to future conservation efforts as the area will be contiguous to existing open space to the north. The Open Space will also be contiguous with the Halfway River corridor to the east.

3.0 NDDB Search

The NDDB was queried on 2/14/2024 for a preliminary site assessment (please see attached letter at end of this report). The web generated response indicated that no populations of State Endangered, Threatened, or Special Concern species, and no Critical Habitats have been documented within or in close proximity to the site. A detailed field survey for wildlife was beyond the scope of work for this project at this winter time.

4.0 Conclusions

The site is 39.5 acres. Only 15.3 acres of the site will be developed. The development will be largely concentrated within the central region of the property and will avoid the expansive western wooded slope and the terrace above the Halfway River. The rest of the site will be preserved as open space. The open space will comprise 24.2 acres, 61% of the site. The open space will be particularly valuable to future conservation efforts as it will be contiguous to existing open space to the north, and contiguous with the Halfway River corridor to the east.

Most of the proposed activities on the site will be outside of the 100 foot upland review area. All of the residences will be located outside of the review area. The only direct intrusion into wetlands or watercourses will be the piped stream crossing for the entrance road. There will be other minor intrusions into the 100 foot upland review zone including some grading, driveways, septic systems, and stormwater management systems, none of which are anticipated to have adverse impacts on the wetland resources.

Thank you for the opportunity to comment.

Respectfully submitted,
Signed,

Steven Danzer Ph.D.

Professional Wetland Scientist, Soil Scientist, Arborist,
Ph.D. in Renewable Natural Resource Studies

CPSS
Certified Professional Soil Scientist

3 attachments – Photo Key, Photos, NDDB

Photos

Photo 1. Wetland area 1. Forested wetland, possibly a potential vernal pool (PVP) , looking south, back is to dirt access road to easment. 2/12/24.

Photo 2. Wetland area 2. Forested wetland, eastern lobe. Seasonally saturated/innundated but likely too shallow to be a vernal pool. Looking north. 2/12/24.

Photo 3. Wetland area 3. Forested wetlands in proximity of driveway entry and stormwater basin. At northeastern edge looking south. 2/12/24.

Photo 4. Wetland area 4. Watercourse where driveway entry crossing will be located. Looking east, back to Berkshire Road. 2/12/24.

Photo 5. Wetland area 5. Internally drained forested wetland depression with channel in center. Looking south from northern boundary. 2/12/24.

Photo 6. Wetland area 6. Mainly internally drained shrubby wetland depression adjacent and within powerline ROW. Looking north from southern boundary. 2/12/24.

Photo 7. Wetland area 7. Headwaters of intermittent watercourse / sloped wetlands complex which drains down slope towards the river. Looking southeast. 2/12/24.

Photos 8 (top)and 9 (bottom). Wetland Area 8. Wetlands on terrace above river. Photo 8 is looking west, inland, from northern branch of wetlands. Photo 9 is looking east towards river from southern branch. 2/12/24.

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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Generated by eNDDB on:
2/14/2024

Steven Danzer
Towns: Newtown,Monroe
Preliminary Site Assessment: 1788018419

Subject: 296 Berkshire

Current data maintained by the Natural Diversity Database (NDDB) and housed in the DEEP ezFile portal, indicates that no populations of State Endangered, Threatened, or Special Concern species (RCA Sec. 26-306), and no Critical Habitats have been documented within or in close proximity to the area delineated.

Please be advised that this is a preliminary assessment and not a Natural Diversity Database determination. The purpose of this information is to provide a general planning tool which identifies those species that have been reported and may occur on or near the mapped area. A more detailed application and review will be necessary to move forward with any environmental authorization, permit, license, or registration applications submitted to DEEP. If such review is required, please return to the DEEP's ezFile Portal and select Natural Diversity Database Review to begin the review process.

This Preliminary Site Assessment does not preclude the possibility that species not previously reported to the Natural Diversity Database may be encountered on the site. You are encouraged to report incidental observations to the Natural Diversity Database using the appropriate survey form and follow the instructions for submittal. We recommend field surveys be conducted in order to evaluate potential habitat and species presence. Field surveys should be performed by a qualified biologist with the appropriate scientific collecting permits at a time when these target species are identifiable. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component vascular plant and animal species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State listed species
6. Statement/résumé indicating the biologist's qualifications

The site surveys report should be sent to the CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by program biologists.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units

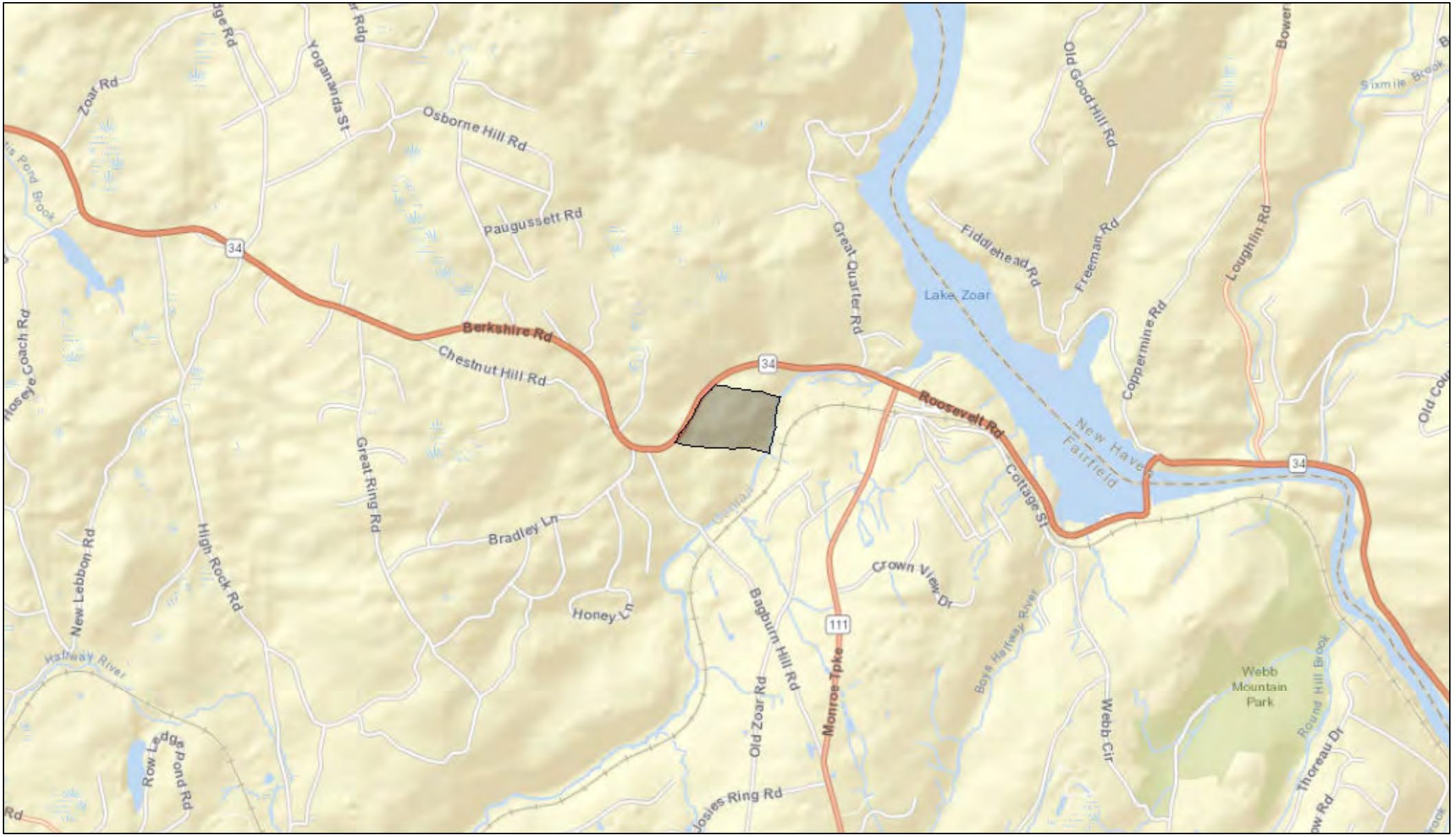
of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available.

This letter is computer generated from our existing records and carries no signature. If however, any clarification/error is noted, or, if you have further questions, please contact the following:

CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3011
deep.nddbrequest@ct.gov

Please include a snapshot of the map, your last name, and the subject area town when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

296 Berkshire Map



February 14, 2024

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Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

STEVEN DANZER, PHD & ASSOCIATES LLC
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WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES

Soil Report

Date: November 23, 2022

By: Steven Danzer Ph.D.

- Soil Scientist, Senior Professional Wetland Scientist, Arborist
    - Nationally certified by the Soil Science Society of America (#353463).
    - Registered with the Society of Soil Scientists of Southern New England.
    - Certified PWS #1321 by the Society of Wetland Scientists
    - Certified Arborist by the International Society of Arboriculture (ISA) NE-7409A
    - CT Licensed Arborist DEEP S-5639
- Ph.D. in Renewable Natural Resource Studies.

Project: 296 Berkshire Road, Newtown, CT.

INTRODUCTION

A wetlands investigation was performed at the above-referenced properties to locate and identify any inland wetland soils or watercourses.

The purpose of this report is to document that the field work for the site investigation was conducted using professionally accepted methods and procedures. This report is intended for submission by the owner(s) of the property or their designated agent to the local municipal regulatory agency.

DEFINITIONS

The Connecticut General Statutes Ch. 440 Sections 22a-36 and 22a-45 (as amended) define **inland wetlands** as land, including submerged land (except for tidal wetlands) which consist of any of the soil types designated by the National Cooperative Soil Survey as *poorly drained, very poorly drained, floodplain, or alluvial.*

Poorly drained and **very poorly drained** are soil drainage classes that are defined by specific technical criteria in the Soil Survey Manual, Ch. 3 of the USDA Natural Resources Conservation Service. Generally speaking, *poorly drained soils* are wet at shallow depths periodically during the growing season, or remain wet for long periods, while in *very poorly drained soils* water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season.

Floodplain refers to the land bordering a stream or river that is subject to flood stage inundation, and **alluvial** refers to soil deposited by concentrated running water (Soil Survey Manual, Part 629).

Watercourses are defined by the Connecticut General Statutes Ch. 440 Sections 22a-36 and 22a-45 (as amended) to include rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private. **Intermittent watercourses** are a type of watercourse that typically do not flow year-round, and are specifically defined within the CT statutes by the presence of a defined permanent channel and bank, and the occurrence of two or more of the following characteristics:

a) Evidence of scour, or deposits of recent alluvium or detritus;
b) The presence of standing or flowing water for a duration longer than a particular storm incident;
c) The presence of hydrophytic vegetation.

Uplands are land areas that are not inland wetlands, watercourses, or subject to tides.

The **soil series** is a soil label that refers to the lowest category of the National Soil Classification System. It is used as a specification for identifying and classifying soils within a soil map unit. The descriptions are standardized by the USDA-NRCS, and contain soil properties that define and distinguish them from the other soil series.

METHODS

All soils were sampled to a depth of at least 22 inches with spade and augur unless noted otherwise during a field investigation conducted during the week of November 14 and 21, 2022. Soils were classified according to the nomenclature presented within the NRCS Web Soil Survey, with additional reference to the National Cooperative Soil Survey, and the local Soil Survey.

The wetland boundaries were marked on site with flagging tape and/or stakes (Wetland Flags1-19, 20-98, 99-119, 118-258, 259-271) and a sketch map prepared (attached).

SITE DESCRIPTION AND DISCUSSION

The roughly 42 acre site is located on the east side of Berkshire Road, Newtown. The site is currently undeveloped, primarily forested with a shrubby powerline ROW extending east/west, and a shrubby natural gas pipeline ROW running north/south. The powerline ROW is serviced by an unimproved road. The site is located within DEEP drainage basin 6022-00, within the Halfway River subregional watershed. The Halfway River flows northeasterly along the southern property boundary.

Wetlands/watercourses within the site include

1) Forested depression (flags 1-19) bifurcated by unimproved road
2) Forested wetland/watercourse corridor including three depression/sloped areas (flags 20-98)
3) Forested and shrubby depression, isolated (flags 99-119)
4) Halfway River including adjacent sloped wetlands and large intermittent stream corridor draining from the hills (118-258)
5) Forested depression, isolated (flags 259-271)

SOILS

Wetland soils in all three wetlands are best characterized as within the ***Ridgebury, Leicester, and Whitman soils, extremely stony*** mapping unit (3). Upland soils include Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes (mapping unit 75E) within the hilly regions and Ninigret fine sandy loam, 3 to 8 percent slopes (mapping unit 701B) along the river.

WETLAND SOIL UNIT DESCRIPTIONS

The Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in till derived mainly from granite, gneiss and schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in low areas in uplands. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity ranges from moderately low to high in the solum and very low to moderately low in the substratum. Mean annual temperature is about 49 degrees F. and the mean annual precipitation is about 45 inches.
TAXONOMIC CLASS: Loamy, mixed, active, acid, mesic, shallow Aeric Endoaquepts

The Leicester series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainageways and low-lying positions on hills. Slope ranges from 0 to 8 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderate to rapid in the substratum. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, acid, mesic Aeric Endoaquepts

The Whitman series consists of very deep, very poorly drained soils formed in lodgement till derived mainly from granite, gneiss, and schist. They are shallow to a densic contact. These soils are nearly level or gently sloping soils in depressions and drainageways on uplands. Saturated hydraulic conductivity is moderately high or high in the solum and very low through moderately high in the substratum. Mean annual precipitation is about 45 inches (1143 millimeters) and mean annual temperature is about 49 degrees F. (9 degrees C.). TAXONOMIC CLASS: Loamy, mixed, superactive, acid, mesic, shallow Typic Humaquepts

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LIMITATIONS

All observations and conclusions within this report are opinion and were based upon the field conditions at time of investigation and best professional judgment. Field conditions may change over time. All wetland boundary lines established by the undersigned Soil Scientist are subject to change until officially adopted by the appropriate local, state and federal regulatory agencies.

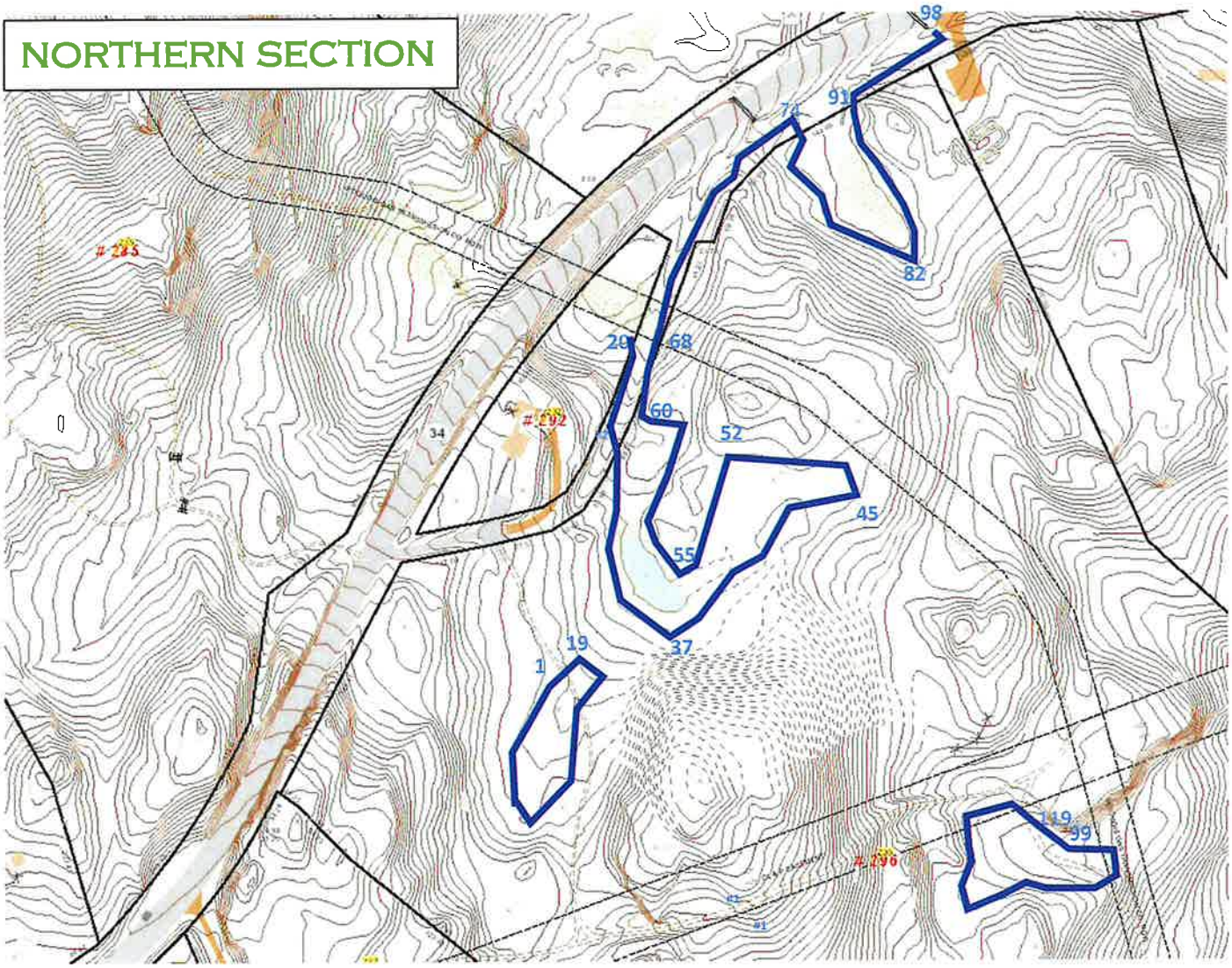
CERTIFICATION

Signed,

Steven Danzer Ph.D., Certified Professional Soil Scientist (CPSS #353463)

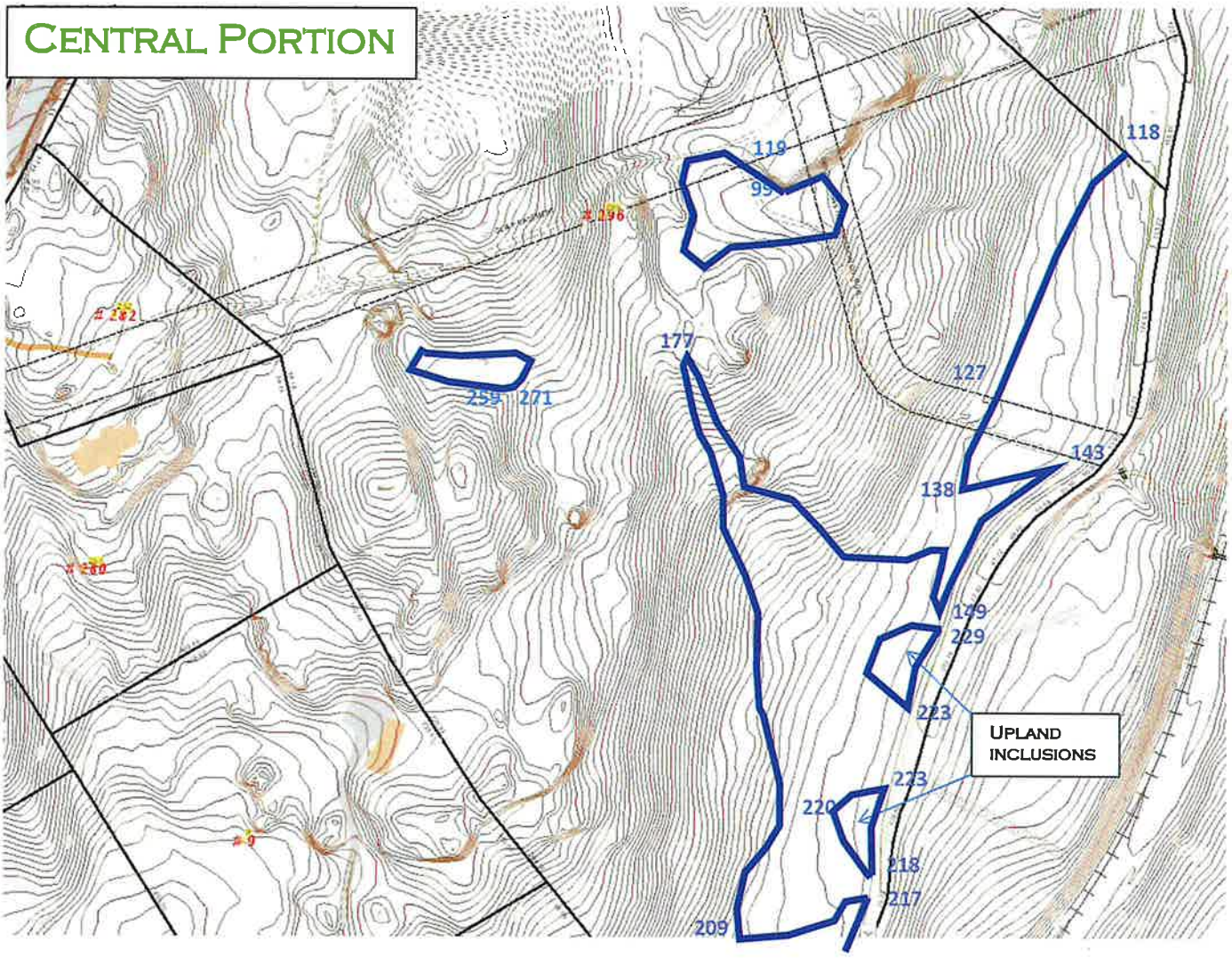
CPSS
Certified Professional Soil Scientist

296 Berkshire Road, Newtown



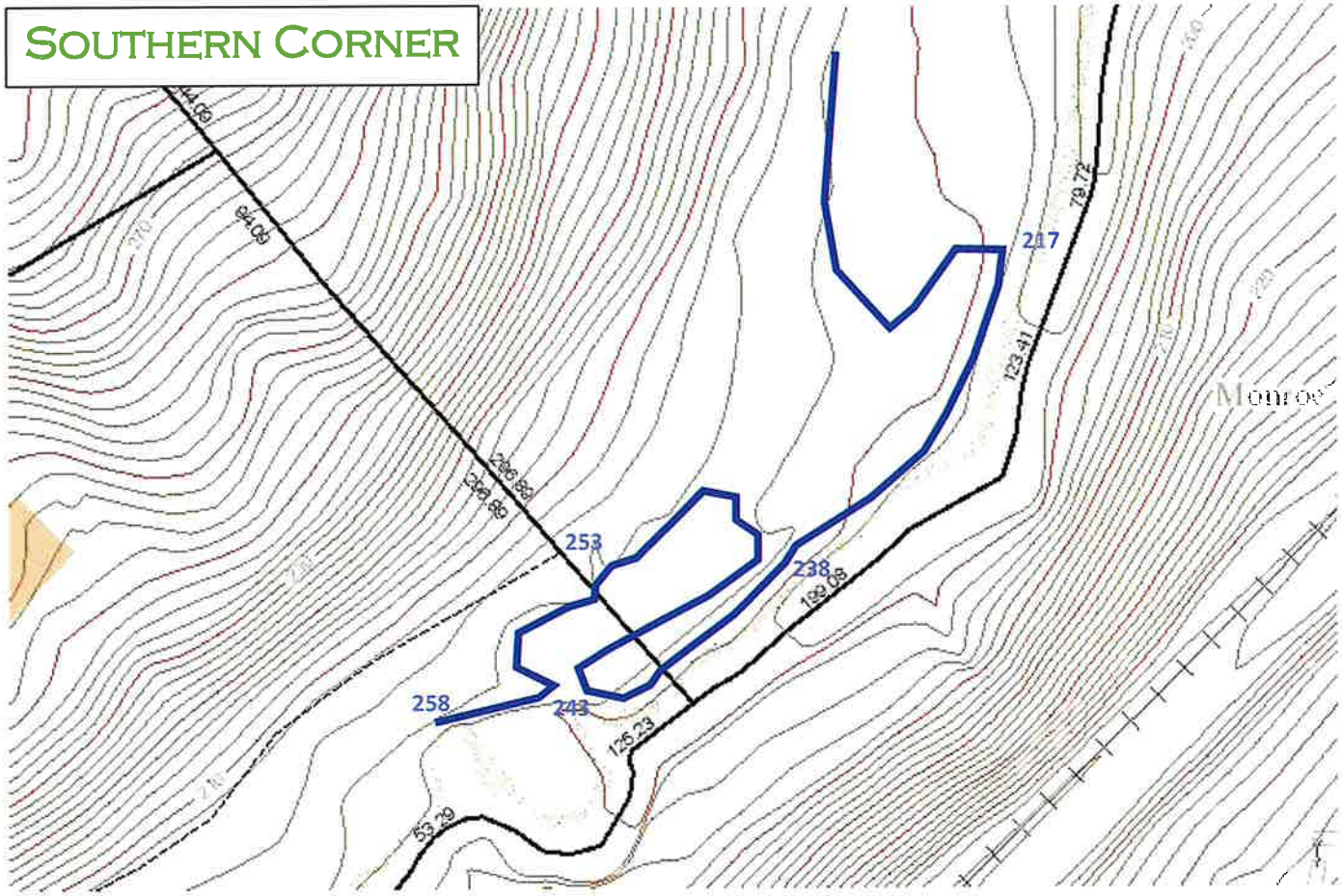
Sketch Map - not to scale
Steven Danzer Ph.D. & Associates LLC
11/23/22

296 Berkshire Road, Newtown



Sketch Map - not to scale
Steven Danzer Ph.D. & Associates LLC
11/23/22

296 Berkshire Road, Newtown



Sketch Map - not to scale
Steven Danzer Ph.D. & Associates LLC
11/23/22

TROUT UNLIMITED

CANDLEWOOD VALLEY

The Halfway River – A Special "Blueline"

Newtown Inland Wetlands Commission Public Hearing
Regarding IW Application #24-03 – The Residence at Berkshire, LLC, property located at 296 Berkshire Road
Wednesday, February 28, 2024

IWC Mtg 2/28/24 #7

Why the Halfway River Watercourse Is a Special "Blueline"

TROUT UNLIMITED
CANDLEWOOD VALLEY

- **Has an unusually strong, stable and resilient wild population of cold-water trout.**
- **Presence of native Brook trout – A clear indicator of a high-quality water course.**
- **Presence of a highly diverse, macroinvertebrate ecosystem – Consistent "4+ Most Wanted" species identified = Very healthy and clean waterway.**
- **Surrounded by a large, undeveloped forest contributing to lower water temperatures, minimal thermal shocking, slower rising water levels during high rain events and a well shaded canopy.**

Concerns with 296 Berkshire Road Project
Impacts on the Halfway River Watercourse

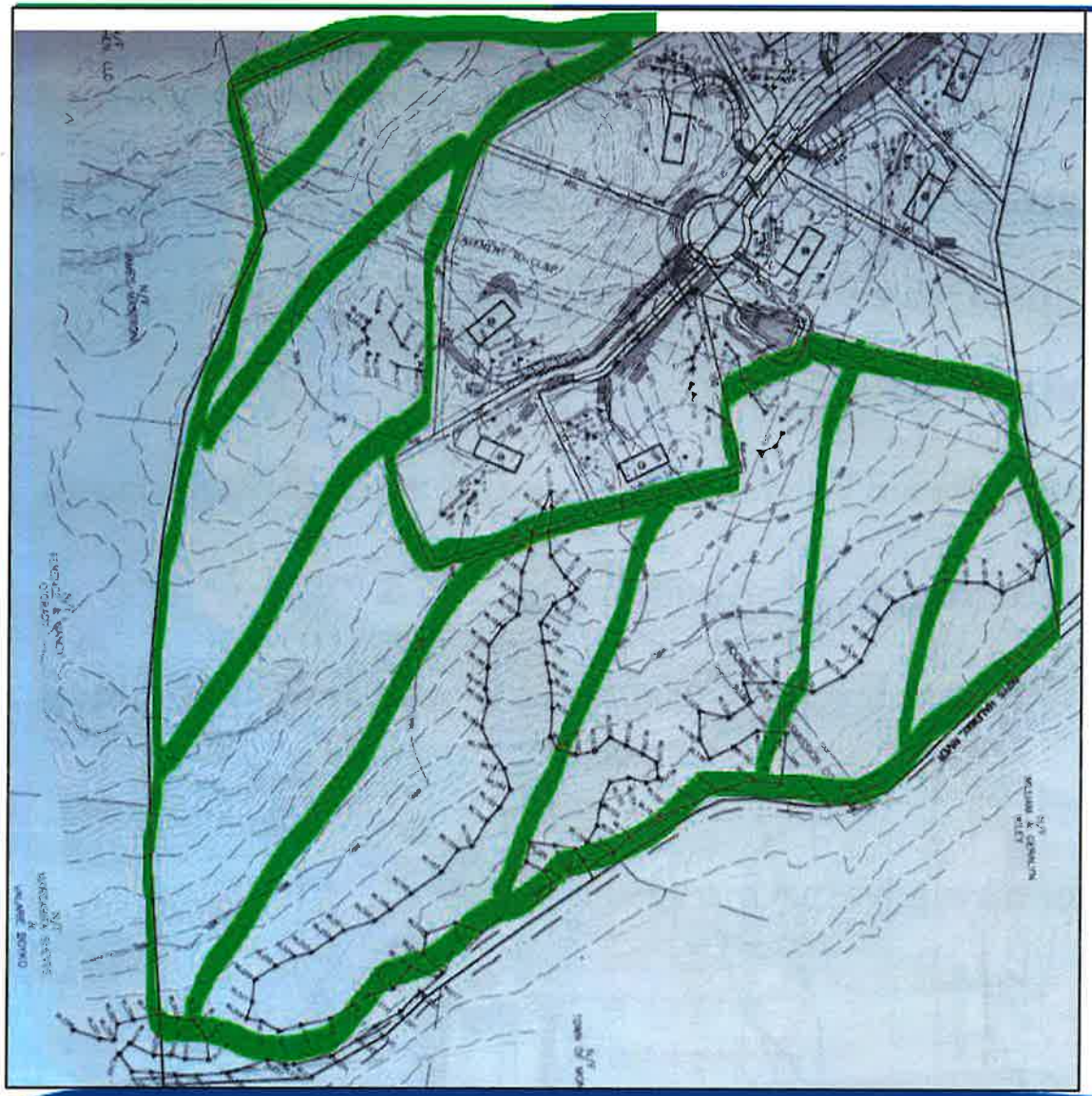
(NOTE: Not in any order of importance)

TROUT UNLIMITED
CANDLEWOOD VALLEY

- **Minimize the amount of forest and canopy being cut. Keeping a well shaded valley.**
- **Ledge blasting and ground disruption – This site has very steep grades - Concerns with runoff, during and after construction. This can lead to unwanted silt, sediment and thermal shocking entering the watercourse.**
- **Maintenance of water catch basins and rain gardens (During and after construction).**
- **Amount of additional fill that may be required for building lot's #6 & #7**
- **Containment of biohazards during construction; Diesel fuels, grease and oils, building materials…**
- **Snow Containment – Road salts entering watercourse**

Open Space Consideration – A Protective Buffer

TROUT UNLIMITED
CANDLEWOOD VALLEY

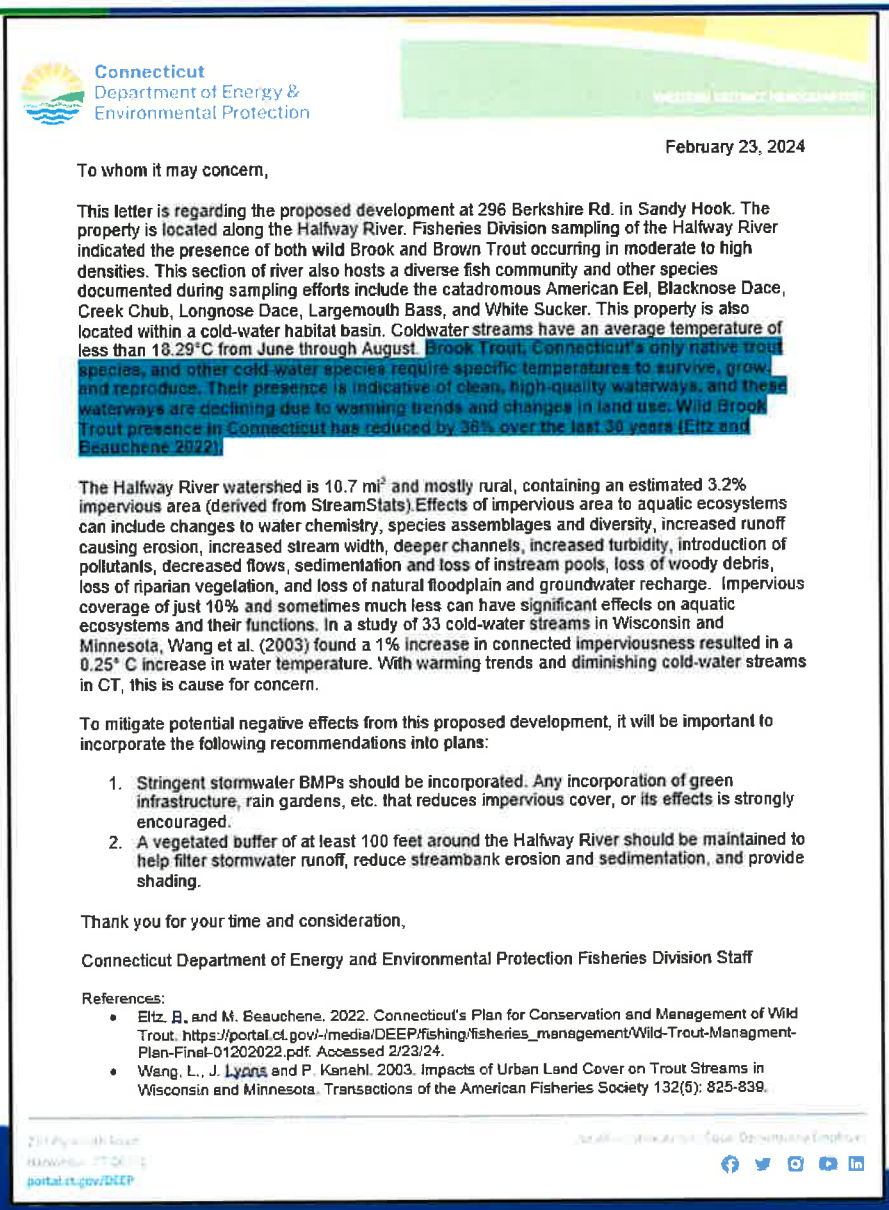


- **Consider the "green" shaded area around the housing development to be designated "Open Space" and add to the already 12.25 acres of Open Space downstream.**
- **This would provide a substantial protective buffer for the Halfway River.**

Matt Devine – CT DEEP Fisheries Biologist

Halfway River Cold-water Attributes and Construction Considerations Letter

TROUT UNLIMITED
CANDLEWOOD VALLEY



Connecticut
Department of Energy &
Environmental Protection

February 23, 2024

To whom it may concern,

This letter is regarding the proposed development at 296 Berkshire Rd. in Sandy Hook. The property is located along the Halfway River. Fisheries Division sampling of the Halfway River indicated the presence of both wild Brook and Brown Trout occurring in moderate to high densities. This section of river also hosts a diverse fish community and other species documented during sampling efforts include the catadromous American Eel, Blacknose Dace, Creek Chub, Longnose Dace, Largemouth Bass, and White Sucker. This property is also located within a cold-water habitat basin. Coldwater streams have an average temperature of less than 18.29°C from June through August. Brook Trout, Connecticut's only native trout species, and other cold-water species require specific temperatures to survive, grow, and reproduce. Their presence is indicative of clean, high-quality waterways, and these waterways are declining due to warming trends and changes in land use. Wild Brook Trout presence in Connecticut has reduced by 36% over the last 30 years (Eitz and Beauchene 2022).

The Halfway River watershed is 10.7 mi^2 and mostly rural, containing an estimated 3.2% impervious area (derived from StreamStats).Effects of impervious area to aquatic ecosystems can include changes to water chemistry, species assemblages and diversity, increased runoff causing erosion, increased stream width, deeper channels, increased turbidity, introduction of pollutants, decreased flows, sedimentation and loss of instream pools, loss of woody debris, loss of riparian vegetation, and loss of natural floodplain and groundwater recharge. Impervious coverage of just 10% and sometimes much less can have significant effects on aquatic ecosystems and their functions. In a study of 33 cold-water streams in Wisconsin and Minnesota, Wang et al. (2003) found a 1% increase in connected imperviousness resulted in a 0.25° C increase in water temperature. With warming trends and diminishing cold-water streams in CT, this is cause for concern.

To mitigate potential negative effects from this proposed development, it will be important to incorporate the following recommendations into plans:

1. Stringent stormwater BMPs should be incorporated. Any incorporation of green infrastructure, rain gardens, etc. that reduces impervious cover, or its effects is strongly encouraged.
2. A vegetated buffer of at least 100 feet around the Halfway River should be maintained to help filter stormwater runoff, reduce streambank erosion and sedimentation, and provide shading.

Thank you for your time and consideration,

Connecticut Department of Energy and Environmental Protection Fisheries Division Staff

References:

- Eitz, B. and M. Beauchene. 2022. Connecticut's Plan for Conservation and Management of Wild Trout. https://portal.ct.gov/-/media/DEEP/fishing/fisheries_management/Wild-Trout-Managment-Plan-Final-01202022.pdf. Accessed 2/23/24.
- Wang, L., J. Lyons and P. Kanehl. 2003. Impacts of Urban Land Cover on Trout Streams in Wisconsin and Minnesota. Transactions of the American Fisheries Society 132(5): 825-839.

portal.ct.gov/DEEP

Michael Humphreys – CT DEEP Fisheries Biologist for 30 yrs. (Currently retired)

Halfway River Cold-water Attributes and Construction Considerations Letter

TROUT UNLIMITED
CANDLEWOOD VALLEY

February 25, 2024

To: Newtown Land Use Commissions

From: Michael Humphreys, retired CT DEEP Fisheries Biologist

RE: Proposed new development near the Halfway River in Newtown

The Candlewood Chapter of Trout Unlimited has informed me about a housing development proposal on a hillside near the lower Halfway River in Newtown, CT, and has asked me to weigh in with comments and suggestions in support of rigorous protections for the sensitive high-quality fisheries resource supported by the river. As a CT DEEP Fisheries Biologist for 32 years, I sampled the lower Halfway River at a standard site just above the route 34 crossing annually from 2000 to 2019, as well as some earlier sampling dating back to 1991. As the statewide wild trout biologist, I was responsible for evaluation and managing wild naturally reproducing trout populations, and monitoring and assessing changes to trout populations throughout the State.

My sampling, using electrofishing equipment, revealed an unusually strong, stable, and resilient wild reproducing Brown Trout population in the lower portion of the river, with very few comparable resources around the State. The strength and stability of this trout population appears due in large part to the undeveloped nature of much of the watershed, especially along the sides of the valley adjacent to the lower 2-3 miles of the river. Undeveloped forested watershed land results in lower water temperatures, slower rise and fall of stream flows, and markedly reduced inputs of silt and sediment. These are all critical to healthy wild trout populations.

If the proposed housing development proceeds forward, I strongly encourage Newtown's land use commissions to keep this in mind, while deliberating prudent measures to reduce or eliminate impacts. Of particular importance will be minimizing the effects of new stormwater runoff, eliminating warmer temperatures, higher volumes, and increased turbidity. Even small increases in these parameters can have detrimental effects.

In my retirement, I look forward to continuing to fish the lower Halfway River recreationally, along with many other anglers who currently cherish this rare wild trout fishing opportunity. I hope that the town commissions will feel justified in requiring the most stringent protections for the Halfway River, and as I meet with fishing success on the river in the future, I will be able to feel that I have contributed in some small way to the continued preservation of this sensitive resource.

Sincerely,

Michael Humphreys

retired CT DEEP Fisheries Biologist