



October 21, 2020

Mr. Andrew Bevilacqua, P.E.
Town Engineer
Town of North Haven
18 Church Street
North Haven, Connecticut 06473

Re: Applicant - GBRSTORZ, LLC
Resubdivision of Anderson Sunnyside Farm
318 Kings Highway

At our meeting at the town hall with the town planner, yourself and the applicant, we received a copy of your review comments dated 09/18/2020 with a Date of Meeting: 09/23/2020.

During the meeting there was discussion about the existing drainage system in Hartford Turnpike, failing septic systems on the properties to the east of the subject property, stormwater runoff (existing & potential) and the inclusion of underground detention to handle the water quality volume of the proposed roof areas in the design plans.

The following are your review comments in italics font and our response is provided in normal font. Also, enclosed are revised plans which reflect the review comments.

- 1. Although not strictly an Inland Wetlands issue, we have concerns over the historic effects of direct stormwater runoff from this site on down stream properties to the east. Neighboring residents have reported excessive sheet runoff from this site that has been exacerbated by past clearing and other activities on the property. The developer's Engineer has provided a distribution system of rain gardens designed to retain the first 1" of runoff from the proposed impervious areas. Due to the downstream drainage concerns, an overall analysis is needed to review the effectiveness of this system on overall site runoff. Items for further consideration include:*
 - a. Ability of the existing site soils to effectively infiltrate site runoff within the proposed rain gardens. The design narrative discusses soils testing that has been performed in support of on-site septic disposal systems. Please provide details on this soil testing indicating soil types, seasonal high groundwater levels and infiltration rates.*

The existing soil types are shown and described on the Site Development Plan, sheet SDP-1. The soil types and descriptions are referenced from the United States Department of Agriculture National Resources Conservation Service Web Soil Survey. A copy of the plan is enclosed for reference.

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Over the years, a substantial number of testholes have been dug throughout the property. The soil testing results provided by the Quinnipiack Valley Health District have been compiled and are shown on the "Soil Testing Data", Sheet DN-3 for reference.

- b. *Understanding the movement of groundwater within the existing soils, and the overall effect of the distributed rain garden approach on groundwater levels, downstream basements, and possible groundwater surface breakout.*

Per our meeting, the stormwater runoff from the proposed roof areas will discharge to an underground chamber system to treat the first 1" of runoff for water quality. The underground systems shown on the "Site Development Plan", sheet SDP-1 for each lot consist of (6) Stormtech SC-310 chambers on a 6" subbase of crushed stone. A detail of the system is shown on the "Detail Sheet", sheet DN-2.

Excavated rain gardens shall remain a design feature to treat the first 1" of runoff for water quality for the driveway areas. The "Rain Garden Detail" is provided on the detail sheet, DN-1.

The sizing and location are based upon the proposed house and driveway depicted on the plan (enclosed is a copy of the Engineering Summary Report which contain the sizing calculations).

Plot plans to be prepared in the future will be required to size the underground chamber systems based upon the proposed house and driveway being constructed and be approved by the Land Use & Engineering Departments. The historic soil testing data shall be used in the design of the underground system, i.e. height above restrictive layers, groundwater and/or mottling. If no soil testing has been conducted in the area, soil testing maybe required and can be conducted prior to site development.

A grass lined swale has been added along the eastern portion of the property to direct surface stormwater runoff away from the adjacent properties. It is our understanding that the adjacent properties have septic system issues, in part due to surface runoff. The construction of the swale should lessen the impact and aid in the function of the septic system.

The soil data shows varying depths to mottling and groundwater or no groundwater at all and that the soils are relatively permeable. The construction of the proposed houses with the installation of a foundation drain will aid in lowering the groundwater levels in the area, if it exists. Curtain drains could be added on the lots if the potential property owner wanted their home in a particular location on the lot which would require excavation in an area of high groundwater. Grass lined swales are proposed on the lots to direct groundwater and stormwater runoff away from the proposed houses.

- c. *The proposed stormwater management approach relies on the action of individual residents for long term maintenance of the individual rain garden system. How will property owners within this development be compelled to perform the long-term maintenance that these systems will need to ensure proper long-term function? The Town does not have the resources to inspect and track each individual system on an annual basis to ensure that the required maintenance is performed.*

Maintenance agreements will be included in the individual lots deeds which describe the responsibilities of the property owners for inspection, maintenance and repairs of the rain gardens.

2. *The proposed design plans show a direct connection of the site drainage to an existing Town drainage system in Hartford turnpike. Calculations must be provided to show that this drainage system has adequate capacity to properly convey drainage from this site. Analysis of this system should extend to the system outfall, and include an assessment of the ability of downstream channels and features to convey post development flows.*



Existing conditions and developed conditions drainage area maps and HydroCAD Stormwater Modeling System computer program by Applied Microcomputer Systems was used to analyze the drainage system in Hartford Turnpike. HydroCAD uses the TR-55 curve number method to estimate the quantity and peak rates of runoff produced by each drainage area to each catch basin in the drainage system. This information is shown in tabular form for each catch basin for the 2-year, 10-year & 25-year storm event on the drainage area maps. Runoff rates chosen from the NOAA Atlas 14, Volume 10, Version 3 located in North Haven, CT.

3. *Based on review of the above requested information, further Engineering comments may be forthcoming.*

So noted.

Sincerely,

LRC Engineering & Surveying, DPC

A handwritten signature in blue ink, appearing to read "Richard Reynolds", is written over the printed name below.

Richard Reynolds
Project Engineer