## Final Coastal Site Plan PLPZ 2019 00472
### Special Permit PLPZ 2019 00473

<table>
<thead>
<tr>
<th>Location:</th>
<th>21 Calhoun Drive, LLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone:</td>
<td>RA-1 (proposed to be RA-1-HO)</td>
</tr>
<tr>
<td>Lot Area:</td>
<td>1.8-acres</td>
</tr>
</tbody>
</table>

### FAR (Gross Floor Area in sq. ft.):

<table>
<thead>
<tr>
<th>Existing site:</th>
<th>Proposed Development:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.077 (6,059 not including garage TBR)</td>
<td>0.105</td>
</tr>
<tr>
<td>Remaining building (6,059)</td>
<td></td>
</tr>
<tr>
<td>New 2nd dwelling (2,182)</td>
<td></td>
</tr>
<tr>
<td>Total = 8,240.75 sq. ft.</td>
<td></td>
</tr>
<tr>
<td>0.135 (10,584.9) per RA-1</td>
<td></td>
</tr>
<tr>
<td>Up to 0.155 (12,153) by Commission under an HO</td>
<td></td>
</tr>
</tbody>
</table>

### Max Permitted:

- Existing = not provided
- Proposed = 74.4% or 58,395 sq. ft.
- Min. Required = 72% or 56,453 sq. ft.

### Minimum Green Area*:

- Existing = not provided
- Proposed = 74.4% or 58,395 sq. ft.
- Min. Required = 72% or 56,453 sq. ft.

### Number of Stories:

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Existing home – 2</td>
</tr>
<tr>
<td>2</td>
<td>2nd dwelling – 2</td>
</tr>
</tbody>
</table>

### Building Height:

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.5 feet</td>
<td>28 feet 1 and ¼ inch. (2nd dwelling)</td>
</tr>
</tbody>
</table>

### Max. Permitted:

- 40 feet

### Minimum Yard Setbacks*:

<table>
<thead>
<tr>
<th>For Existing dwelling</th>
<th>Existing</th>
<th>Proposed</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front:</td>
<td>+150 ft.</td>
<td>No change</td>
<td>67.34 ft.**</td>
</tr>
<tr>
<td>Side:</td>
<td>13.55 and 30</td>
<td></td>
<td>25 ft.</td>
</tr>
<tr>
<td>Rear:</td>
<td>28.05 ft.</td>
<td></td>
<td>50 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For 2nd dwelling:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Front:</td>
<td>67 ft.</td>
<td>67.34 ft.**</td>
</tr>
<tr>
<td>Side:</td>
<td>34 and 70</td>
<td>25 ft.</td>
</tr>
<tr>
<td>Rear:</td>
<td>+130 ft.</td>
<td>50 ft.</td>
</tr>
</tbody>
</table>

*The Commission may also modify setbacks and/or green area requirements per Sec. 6-109(d)(3).
** Increased minimum setbacks apply per Sec. 6-203(b) as the ROW width is less than 50 ft. wide.

### STAFF REPORT UPDATE:

The applicant was last heard at the Commission’s 6/2/2020 meeting. The item was left open so that the applicant may revise their plans and address outstanding comments, in particular, addressing the Engineering Division. The Commission heard from the applicant and the public...
regarding the proposal, and the Commission asked the applicant to address their proposal in the following ways:

- Look to reduce the size for second dwelling. In doing so it was suggested that the redesign seek to look more like a “carriage house” similar to the time the existing dwelling was constructed. The goal would be to make it feel “secondary” to the existing dwelling on the property.
- Reduce or reconsider the driveway circle proposed in front of the second dwelling.
- Design the site plan and provide the requisite drainage reports and plans to meet the Town’s Drainage Manual and comments from the Town’s Engineering Division.

The applicant has again revised their proposal to address comments received. The proposal has changed in the following ways:

- The proposed second dwelling has been redesigned to have a gross floor area of about 2,200 sq. ft.; a reduction from 3,416 sq. ft. as was last proposed.
- The proposed front circle has been eliminated for a two-car parking area. The sq. ft. area of this parking area is about half the area of the previously proposed circle.
- The proposed bedroom count has been changed to have three bedrooms proposed.
- Redesigned the second dwelling and architectural features, the net result is an 80 sq. ft. reduction in gross floor area.
- The location of the proposed second dwelling as shifted. It is now 5 feet closer to Calhoun Drive (was 72 ft. now 67 ft.) and further from the northern property line (was 25 ft. now 34 ft.)
- Revised landscaping plans are expected but have not yet been provided.
- Building height remains to be 28 feet 1 ¼ inch.

APPLICATION SUMMARY
The applicant is seeking final site plan and special permit approval to: remove a detached garage; construct a new single-family dwelling; and provide a façade easement to preserve and protect the exterior of the existing dwelling on the site, named “Park Hill” on a 1.8-acres property located at 21 Calhoun Drive in the RA-1 Zone (proposed to be rezoned to RA-1-HO).

ISSUES AND RECOMMENDATIONS:
1. ZONING – No outstanding comments have been noted from the ZEO on the proposed revisions.
2. IWWA – P & Z Staff has consulted with the IWWA staff regarding the proposed revisions. The proposed plans substantially comply with the IWWA’s decision on the matter.
3. ENGINEERING - The Engineering Division has reviewed the proposed plans and found the Drainage Report acceptable in concept but note revisions that would be required prior to the endorsement of any permits.
4. HDC - The proposal was twice forwarded to the Historic District Commission (the “HDC”) for comment as provided under Sec. 6-109(d)(3). The HDC took up the item at their 9/11/19 meeting and endorsed the request for HO (see letter dated 12/6/2019.)
current revised proposal was also sent to the HDC and a second letter, dated April 30, 2020, notes their support of the proposal.

5. The applicant is proposing to rezone the property from the RA-1 zone and placing it in the HO zone. Per Section 6-109(d)(3), “For structures on sites in the RA-4, RA-2, RA-1, R-20, R-12, R-7 and the R-6 residential zones, the Planning and Zoning Commission may authorize additional dwelling units in existing buildings or structures and/or in new construction that is complementary and secondary to the historic structure(s), provided the total number of units shall not exceed the density determined by dividing the total lot area by the minimum lot size for the underlying zone, and multiplying the result, by 1.50 in the RA-4, RA-2, RA-1, R-20, R-12 zones and by 1.2 in the R-7 and the R-6 residential zones. The Commission may consider any fraction of a unit as a whole unit. The Commission may also modify setbacks and/or green area requirements.”

In the RA-1-HO zone the maximum unit density for this site would be 2.7 (1.80-acres, divided by 1-acres (the minimum acreage in the zone) multiplied by 1.5) or a maximum of two (2) dwelling units. The applicant is seeking this incentive under the HO to have two dwelling units on a RA-1 zoned property.

6. The rezoning to HO would allow the Commission to consider exceeding the maximum gross floor area of HO property in the RA-1 zone an addition 15% of floor area. This would allow the Commission to grant an FAR up to a 0.155 where a 0.135 FAR is permitted in the underlying zone. Staff notes that the proposal does not seek the incentive floor area and would meet the standard zoning in the RA-1 zone.

7. The Commission will need to make a finding as to if the proposed application would meet the standards of Sections 6-15 and 6-17.

8. Per Sec. 6-109(b)11), the Commission should consider encouraging the property owner to seek designation of historic significance from local, state or federal organizations and to display appropriate historic plaques.

9. Per 6-109(b)10) the applicant has prepared a perpetual declaration of Preservation Restriction. This needs to be enforceable by the Commission and the HDC. It is recommended that the declaration be reviewed by the Law Department for accuracy and completeness.

DEPARTMENT COMMENTS:
ZEO - see attached
ENGINEERING - see attached
CONSERVATION - see previous attached
HEALTH - see previous attached
HDC - see attached

HO Rezoning
The HO zone’s purpose is stated in Sec. 6-109(a) and as follows:
“The purpose of a Historic Overlay Zone (“HO”) is to encourage the restoration, preservation, protection, enhancement, perpetuation and use of buildings and structures (hereinafter called “structures”) having historical or aesthetic value which represent or reflect elements of the
Town’s cultural, social, economic, political and architectural history. Such preservation promotes the general health and welfare by protecting property values, fostering a sense of history and civic pride, preserving architectural heritage and protecting community character. This overlay zone does not imply or result in the establishment of an historic district as detailed in Section 7-147a-1 of the General Statutes.”

The site contains an historic Tudor revival home, named “Park Hill”. The historic home was built, circa 1923. Per the HO regulations, the Commission will need to evaluate the proposal for consistency with the purposes of the regulation, the historic value of the building and or site features, and in consideration of comments from other Town agencies, or outside specialists. The Commission should act on the related rezoning application before acting on this site plan/special permit.

**PROPOSAL:**
The applicant’s proposal seeks to re-designate the property into the HO zone so that in exchange for preservation easement to protect the current dwelling as a home of historic value, in perpetuity, the Commission would grant them the permission to build a second residence on the property per the language of Sec. 6-109(d)(3) of the Building Zone Regulations. The proposal would not appear to change the historic home, but would remove a detached garage in the western portion of the parcel. A new 2nd dwelling would be constructed in the fronting portion of the parcel, in addition to a new septic system, and related site and landscaping improvements being proposed.

**ZONING CONFORMANCE:**
The existing building and its proposed development would appear to meet the required minimum setbacks of the underlying RA-1 Zone. The proposed FAR (0.105) does not appear to exceed the maximum FAR (0.135) permitted in the RA-1 zone but with rezoning to and HO, the applicant could request to expand, up to the incentive FAR of 0.155, which the Commission may permit under an HO designation. Staff notes that the applicant’s proposal would not exceed the maximum gross floor area permitted in the current zone and does not seek for incentive floor area under the HO. The Commission should refer to Sections 6-109(c) and (d)(4) for the standards related to structures in a residential zone under an HO. The proposal was twice forwarded to the Historic District Commission (the “HDC”) for comment as provided under Sec. 6-109(d)(3). The HDC took up the item at their 9/11/19 meeting and endorsed the request for HO (see letter dated 12/6/2019.) The current revised proposal was also sent to the HDC and a second letter, dated April 30, 2020, notes their support of the proposal. Per 6-109(b)(11), “The Commission encourages property owners to seek designation of historic significance from local, state or federal organizations and to display appropriate historic plaques.” Per this Section the Commission should consider if plaques, or additional designations should be sought for the property.

As an HO property, the minimum green area may be modified per Sec. 6-109(d)(3). The height of the existing building would to have not changed and the new 2nd dwelling would appear to be 2 stories and under the 40 ft. max. permitted in the zone, at about 28 feet.
The location of the proposed second dwelling is still in what most would consider the front yard of the site. It would not only add a building to the site of a long-standing home, but would alter the grade and landscaping between the existing home and the street. The Commission will need to consider Sec. 6-109(b)(9), “Any new construction shall be reviewed by consultants of the Commission’s choosing to assure that the design, location and size of the new structures are compatible with and protective of the site’s significant existing structures, features or natural resources, including those identified in any Environmental Assessment if required by the Planning and Zoning Commission.” In addition, the Commission should consider Sec. 6-109(c)(3), “The historic character of a property shall be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.” Furthermore, the Commission should consider Sec. 6-109(c)(10), “New additions, exterior alterations, or related new construction shall not destroy historic materials, features, and spatial relationships that characterize the property. The new work must be differentiated from the old and must be compatible with the historic materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.” Lastly, Commission should consider Sec. 6-109(d)(3), “…in new construction that is complementary and secondary to the historic structure(s)…”

A grade plane for existing dwelling has been provided noting and grade plane differential of 3.8 from the average grade to the first floor elevation of the home. This would appear to indicate that any basement would count at 50% towards gross floor area. No basement plans for the existing home have been provided, and would need to be, to confirm that all gross floor area is accounted for.

The proposed second dwelling has again been redesigned and reduced in size. The grade plan of the second dwelling has a proposed differential of less than 3 feet, meaning any basement space would not count towards gross floor area as permitted by the Regulations. The height of the building, from grade plane to the roof peak is proposed to be just above 28 feet. The size of the building has been reduced from the former, 3,400 sq. ft. design, to a design that has about 2,200 gross sq. ft. the location of the building has been shifted so that it almost 5 feet close to Calhoun Drive, and almost 10 feet further from the norther property line. The building is proposed to be no closer to the south property line. The grade around the buildings would be manipulated with a retaining wall to the north and west to set the grade plane. The parking circle has been removed and now a parking court and a small pull off have been proposed in its place. The applicant has indicated that this would be a reduction by half in impervious area, over the prior plan. It is not clear if that is referring to the area to be pervious pavement, or if the surface area is reducing in size by that amount. It would appear to staff that the surface area is being reduced, but the prior revisions plans were a landscaping plan and not a site development plan or survey so the level of detail was not as accurate as the current plans.
DRAINAGE:
The applicant is proposing a mix of three (3) cutlec systems and two (2) porous asphalt areas to mitigate stormwater. The second dwelling will be served by a new separate septic system. The design does not appear to change drainage patterns but does seek to treat the additional run-off created by the new impervious areas. The Engineering Division has reviewed the proposed plans and note several areas that need to be addressed/corrected to meet the Drainage Manual. However, all this can and would have to be addressed prior to any endorsement for permits.

ADDITIONAL AGENCY/DEPARTMENT REVIEWS:
IWWA – the applicant has received approval from the IWWA for the proposed development.

HDC - The proposal was twice forwarded to the Historic District Commission (the “HDC”) for comment as provided under Sec. 6-109(d)(3). The HDC took up the item at their 9/11/19 meeting and endorsed the request for HO (see letter dated 12/6/2019.) The current revised proposal was also sent to the HDC and a second letter, dated April 30, 2020, notes their support of the proposal.

APPLICABLE ZONING REGULATIONS:
Sections 6-15, 6-17, 6-94, 6-109, 6-111, 6-158, 6-185 and 6-205
LaRow, Patrick

No issues.

We got site plans and ZLS two weeks ago. Do you need it? I can send it right now.

Patrick LaRow
Deputy Director / Assistant Town Planner

Just the architectural drawings correct?

Also,

21 Calhoun provided revised plans on Monday. Are you going to have a chance to look at them before tomorrow?

Patrick LaRow
Deputy Director / Assistant Town Planner
Jacalyn <jacalyn.pruitt@greenwichct.org>
Subject: comments

I wasn’t sure who had Meadow Place.

Regards,
Jodi Couture
Zoning Enforcement Officer
Reviews provided by the Engineering Division are for compliance with the Town’s “Roadway Design Manual and Standard Construction Details” and “Drainage Manual” as amended. Reviews are based upon the information and plans provided. Comments pertaining to the Town’s manuals are not all encompassing. Other reviewing entities may provide additional comments regarding consistency with these manuals in accordance with their jurisdictions. Review of sanitary sewer and septic systems are not reviewed by the Engineering Division.

All New Submittals for Commission Meetings must be received by the Engineering Division four weeks before scheduled Commission Meeting.

All Revised Submittals for Commission Meetings must be received by the Engineering Division three weeks before scheduled Commission Meeting.

**COMMENTS AND CONDITIONS OF APPROVAL:**

1. If the runoff from the site causes an icing condition on the road, modifications to the site’s stormwater BMPs and stormwater/groundwater controls will be required to correct the icing condition.
2. A revised Form SC-100 needs to be submitted.
3. A revised Form SC-107 needs to be submitted.
4. The Drainage Summary Report is acceptable in concept regarding the types of BMPs proposed. The following comments need to be addressed:
   a. The Summary Table shall be revised as needed.
   b. The results for DT-6 needs to be added to the report.
   c. Based on DT-D1 the mottling layer is at elevation 152.30 and the proposed bottom of stone for PP2 is at 151.50. This system needs to have an impermeable liner installed.
   d. The RRV computation is correct but the provided volume is not correct. The proposed stormwater BMPs need to provide a total volume of 753 CF during the 1-year storm at or below the overflows. Cultec System C1, C2, and C3 only provide 148 CF + 149 CF + 149 CF = 446 CF. Revise the design to meet the required RRV of 753 CF.
   e. The HydroCad routing needs to be revised as follow:
i. PP1 shows a secondary discharge into PP2 in the diagram but the analysis does not show this. Revise as needed.

ii. PP2 uses three 6” vertical orifices as discharges but they all connect to a 6” outlet. This routing requires that the primary discharge be a 6” culvert/pipe with three devices.

iii. The TSS computations need to be revised. The proposed design has watersheds 2S, 3S, 4S, and 10S. Each one of these watersheds requires TSS computations. The following is how each should be:
   2. 3S – Deep Sump Catch Basin to Porous Pavement System 1 to Cultec System 2 to Cultec System 3.

iv. The 72-Hr Drawdown computations must use the volume provided at the overflow outlet.

v. The orifice sizes in the report must also match on the plans.

vi. Review and revise all other computations as needed.

vii. The potential connection to the storm drain within the road needs to be investigated and if possible, shall be used for the footing drain and storm drain discharges. If the connection is not possible a level spreader must be designed to replace the overflow catch basin and footing drain rip-rap pad.

5. The construction plan set needs to be revised as follows:
   a. Site Plan Sheets
      i. The potential connection to the storm drain within the road needs to be investigated and if possible, shall be used for the footing drain and storm drain discharges. If the connection is not possible a level spreader must be designed to replace the overflow catch basin and footing drain rip-rap pad.
      ii. Porous Pavement System 1 needs to have a control structure installed for the underdrain to connect to and for the outlet pipe with orifice to discharge from. A cap can be placed on the outlet pipe and the required orifice size and elevation can be drilled through the cap. This allows the system to be checked for maintenance and also allows modifications to the outlet if not constructed correctly.
      iii. Porous Pavement System 2 needs to have a control structure installed for the underdrain to connect to and for the outlet pipe with orifice to discharge from (see comment 4eii). This allows the system to be checked for maintenance and also allows modifications to the outlet if not constructed correctly.

   iv. Show all pipes with the following in the callout:
      1. Pipe size.
      2. Pipe material.
      3. Pipe slope.

   b. LID Sheet:
      i. Show each area of roof/drive with a callout specifying which BMP receives runoff.

   c. Driveway Profile & Sight Distance Sheet
      i. Show width of driveways at property line.
      ii. Show width of driveways at edge of road.
      iii. The profile shall include spot elevations of the finished pavement.

   d. Details Sheet
      i. The filter fabric shall be removed from the bottom of stone for the Cultec Details.
      ii. The porous pavement detail for the lower area needs to include an impermeable liner based on the soil test results.
      iii. The control structure details need to be added.
      iv. A level spreader detail needs to be added if the connection to the storm drain within the road is not installed.

6. The Operations and Maintenance Plan Report shall be revised and updated as needed based on changes.

**Standard Conditions for Each Submittal**

1. The Engineering Division will no longer keep any records for the submittals. All records for the submittal shall be obtained from the Town of Greenwich Department/Division that has taken in applications and/or submittals. These documents are maintained within each office (e.g. P&Z, IWWA, and DPW Building and Highway Divisions).

2. All revisions to the reports and plans must follow the requirements in the Town of Greenwich Drainage Manual February 2014 as amended.
3. All revisions must be accompanied by a point-by-point written response to the Engineering Division’s comments.

**Standard Conditions of Approval**

1. The Operations and Maintenance Plan Report must include the following for the Certificate of Occupancy:
   b. The final completed Exhibit A, and B
   c. The Maintenance Declaration needs to be filed on the Town of Greenwich Land Records prior to a Certificate of Occupancy. A review of the documents above must be completed before filing on the Town of Greenwich Land Records.

2. The Town of Greenwich – Standard Construction Notes for Site and Subdivision Plans are conditions that must be met.

3. All requests for a Temporary Certificate of Occupancy (T.C.O.) or a Certificate of Occupancy (C.O.) shall be submitted one month before the T.C.O. or C.O. is required.

4. The submittal for a Temporary or Final Certificate of Occupancy must include the following:
   c. Field Inspection Record (All required photos) – Form SC-106 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
   d. Bioretention Soil Testing Certification Sign-Off (as applicable with the bioretention soil gradation test and the phosphorous test for the mixed soil) – Form SC-104 – Sealed and Signed by a Connecticut Licensed Professional Engineer.
   h. A Letter discussing all the work that remains to be completed (Only for a Temporary Certificate of Occupancy Submittal).
MEMORANDUM

To: Patrick LaRow, Deputy Director, Planning and Zoning / Assistant Town Planner

From: Patricia Sesto, Director

Date: February 20, 2020

Re: 21 Calhoun Drive, LLC, 21 Calhoun Drive, PLPZ 2019 00472 and PLPZ 2019 00473
     Site plan by S.E. Minor & Co., Inc., dated July 5, 2019

The revised site plans have been reviewed and compared to the previously submitted comments. The revisions are responsive to the concerns pertaining to the superfluous driveway configuration and a house design that was in conflict with the existing grades on-site. The revised driveway, which utilizes a portion of the newly relocated driveway, has nearly 2,000 s.f. less coverage than originally proposed. Further, the house now aligns with the grades of the property and has better preserved the ledge to the west.

The commission is appreciative of the attention the applicant has given to their recommendations.

cc: Conservation Commission
Bianca, we have an approved 7 bedroom septic system for a new carriage house on the property to be supplied by public water. There exists a newly installed 7 bedroom septic system for the existing main house also supplied by public water. This office is satisfied with the proposal.

Michael

Hello Michael,

We have a final site plan and special permit application and proposed rezoning (PLPZ 201900472, 473, 474) for 21 Calhoun Drive to remove the detached garage and construct a new smaller single family dwelling between Park Hill and Calhoun Drive and rezone the property from RA-1 to RA-1-HO.

Tax ID: 07-2043
Owner: 21 Calhoun Drive LLC

Please let me know if you have comments on this application.

Thank you,

Bianca Dygert
Planner II

Town of Greenwich
Land Use - Planning & Zoning
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Ph. (203) 622-7894
Office Fax. (203) 622-3795
Direct Fax. (203) 861-6113
Bianca.Dygert@greenwichct.org

www.greenwichct.gov
John P. Tesei, Esq.  
Gilbride, Tusa, Last & Spelane LLC  
31 Brookside Drive  
Greenwich, CT 06870  

Via email: jpt@gtlslaw.com  

Re: 21 Calhoun Drive

Dear John:

At a recent review for an application submitted for change of zone at 21 Calhoun Drive (aka Park Hill) from Residential to Historic Overlay as well as an advisory design opinion regarding a proposed carriage house dwelling unit, extended driveway and new landscaping, the Historic District Commission by a majority vote continued its advocacy that the present structure

1. meets the appropriate guidelines to be considered for Historic Overlay (see comments “Explanation Of Support For Park Hill To Receive Historic Overlay—6-109 C”);

2. the proposed structure is in keeping with the architectural elements of the main structure but suggests a reduction of the size of the driveway, eliminating the circular portion; and

3. asks for more and larger plant material, especially along the drive.

Further, the Historic District Commission wishes to add further comments to the proposed additional structure on Park Hill’s property:

When Park Hill was developed in 1923, land use zoning was not yet in existence, so homes and accessory structures were designed and crafted mostly to the owner’s wishes. Examination of estates in Greenwich through the 1920 Sanborn map identifies a great many secondary structures close to or buttressing the road with wind-about drives leading to the main house (ex: “Wild Acres” (Montgomery Pinetum), “Windygoul” (Pomerance Park), “Edgewood Inn” (Valley Drive), “Boulders” (Glennville road), etc.). On Calhoun Drive, there were seven properties with secondary structures (four placed in the rear elevation (away from the road);
two placed close to the road; and one placed between the house and the road (see page/map 34 - 1920 Sanborn Map). In other words, there was no conformity.

When Park Hill was built in 1923, the locale of the site could best be described as having quite a number of naturalistic elements, and for the city dweller this would have held great fascination. New York’s Central Park would have given the introduction to what naturalistic design should be—a orchestration of woodlands and drives with residential structures in its immediate distance but at times not visible (exactly what Calhoun Drive offered). What John E. Rovensky felt first seeing his undeveloped property—a rolling hill, oversized rock, mature trees—was a calming influence upon the man who led the stressful life of a financier. That he wished to preserve this first view and have his home be the “second” viewpoint was incorporated into his property design.

The present owner’s appreciation of nature and the stewardship that has been passed from Park Hill’s original owner to the present day has resulted in the careful placement of an additional structure at the street rather than elsewhere on the site which would result in a desecration to the original owner’s intention as well as the site’s natural integrity.

Further, the possibility that the rear elevation of Park Hill being the one that buttresses the street is that it afforded the avoidance of watching automobile headlights from the front of the house.

It is the opinion of the Historic District Commission that having an “entrance court” with a carriage house is completely within the historicity of the Calhoun area as well as commonplace given the size of the house. It was, and still continues to be, customary to have secondary structures ‘away’/within a remote location in estate design. Further, the addition of landscaping/plantings to hide subsidiary structures is one that was advised by House & Garden (magazine) in 1921, and the Historic District Commission agrees with its present use today in the proposed design. It should not be the dictation of subsequent property design after 1923—evident front lawns and front facing street elevations (the present conformity)—to penalize what has already been laid out close to 100 years ago. The siting of Park Hill is reminiscent to that of The Edgewood Inn, located on top of a knoll with an elongated curved drive and the rear elevation facing the road, a reflection of a bygone day, which continues to disappear in Greenwich. The Historic District Commission fully supports the re-zoning from Residential to Historic Overlay Residential and the delicate addition and incorporation of 21st century living arrangements with proposed landscaping to the site as not disrupting the historic design nor the design of what was prevalent in 1923.

Sincerely,

[Signature]

Stephen L. Bishop
Chairman

cc: Katie DeLuca, Director Planning & Zoning
December 6, 2019

Historic District Commission

John P. Tesci, Esq.
Gilbride, Tusa, Last & Spellane LLC
31 Brookside Drive
Greenwich, CT 06830

Re: 21 Calhoun Drive (Park Hill)

Dear Mr. Tesci:

At its meeting on September 11, 2019, the Historic District Commission reviewed an application to rezone property from residential to Historic Overlay for 21 Calhoun Drive (“Park Hill”).

A motion was made that recommended Historic Overlay and that the proposed new structure modify the dormer features, have adequate screening on the street elevation to preserve the streetscape, that the roofline be adjusted on the street elevation (for the proposed structure so that the second peak should be lower than the top thus creating a “valley” (with modifications to the affected dormer)), and that the final design be submitted (which may be done electronically) for final approval by the Historic District Commission. The motion was approved unanimously.

Further the Historic District Commission believes that Park Hill has met the standards (“C”) as outlined in the Town of Greenwich Building Regulations Section 6-109 to which an explanation of support for Park Hill follows.

Sincerely,

Stephen L. Bishop
Chairman

Attachment

cc: Ms. Katie DeLuca – via email
William I. Haslun II, Esq. – via email
Mr. Patrick LaRowe – via email
The applicant noted that during the exterior removal of vine, multiple hand-carved human faces were discovered that adds a unique artistic decorative element. To date, only one notable documented structure encompassed this detail – Ernest Thompson Seton's designed Windygoul (since demolished by the Town of Greenwich).

Virtually all of the detailing of the original house is intact.

[Addition]
Since 1923 Park Hill has gained a north wing containing an indoor swimming pool and home gymnasium. An addition to the east houses a Great Room.

(A) The property may be a unique estate setting significant to the Town's history and worthy of preservation, and/or be associated with events that have made a significant contribution to the broad patterns of our history; and/or be associated with the lives of persons significant in our past.

Park Hill was an original part of the Edgewood Park Land Development that was founded by Nathaniel Witherell shortly after his development of Rock Ridge. Located on the roads of Edgewood, Valley, Upland and Calhoun, its star property was the Edgewood Inn, a luxurious hotel built in 1902 – twenty years prior to the Pickwick Hotel. John Edward Rovensky, Park Hill's first owner, founded Rovensky & Co. (private banking), in 1912 and shortly thereafter its sale in 1915 joined the National Bank of Commerce where he served as Vice President until 1926 when he joined Bank of America as its First Vice President and Vice Chairman. He next joined National City Bank of New York serving as its President from 1932 to 1940 (where J. Stillman Rockefeller (1902-2004) was Rovensky's assistant in the 1930s). In 1943 Rovensky became Chairman of the Executive Committee of American Car and Foundry where he reorganized the management and diversified the products of the company. He retired in 1954. During his lifetime, Mr. Rovensky was a member of the Indian Harbor Yacht Club, Greenwich Country Club and Trustee First Presbyterian Church and listed in Greenwich in 1940 (a town tri-centennial celebration book describing anecdotal and biographical information on its important citizens).

(2) The property must be used as it was historically, or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships. The applicant will be continuing Park Hill's original use as a residence.

(3) The historic character of a property shall be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

The applicant does not propose to make any changes nor remove to the original structure nor to its later addition.

(4) Each property must be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other buildings, shall not be undertaken.
historic materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.
The proposed new smaller single family dwelling being proposed by the applicant between the main house ("Park Hill") and Calhoun Drive will have similar Tudor architectural elements so as to relate to the main house. As it would be considered a "carriage house" (a term only to help associate its location 'away' from the main house but not its function), the proposed new structure would not depreciate Park Hill's built or natural environment.
Location: 21 Calhoun Drive
Application #2019-150

Applicant: S.E. Minor & Co., Inc. for 21 Calhoun Drive LLC
Tax Account #07-2043
Watershed: Horseneck Brook
Drinking Water Supply: No
Upland Review Area: 100 feet

Project & Regulated Activities
The applicant proposes to construct a guest house in the eastern portion of 21 Calhoun Drive. Related improvements which fall within the upland review area of the off-site pond across the street and to the east include the driveway (42'), drainage system (52'), and septic system (83').

Comments / Questions / Recommendation
The applicant's agent has been sent the following list of questions as to the proposed organization of activities on this site:

1. How are construction vehicles going to use the proposed construction access and stockpile without traveling over the septic area?
2. How are the infiltration and rain garden areas to be protected from compaction?
3. The main driveway has already been relocated, so how is the southeastern cullee system going to be installed?
4. What is the purpose of the silt fence at the west side of the construction envelope (i.e., the highest portion of the work zone)?

The plans should be adjusted as may be necessary to resolve these questions before site activities begin. After that, the proper installation and maintenance of erosion controls should be all that it required to protect the off-site watercourse from impacts during implementation of this project.

The DPW Engineering Division is in the process of reviewing the proposed stormwater management system. According to the drainage summary report, the two subsurface infiltration gallery systems and rain garden will reduce peak runoff rates and volumes through the 100-year storm.

The $1,500.00 outstanding balance of the filing fee for a new house should be submitted as a precondition of this permit.

This project presents no more than a minimal potential for impact to wetlands and watercourses if implemented as proposed and, therefore, qualifies for approval by an Authorized Agent with the Agency's Standard Conditions and the following Special Conditions.

SPECIAL CONDITIONS
Conditions in bold require action either prior to the start of clearing or construction activities or within a specified time period after the receipt of the permit.

1. Within two weeks of receipt of this approval, the permittee shall submit the $1,500.00 outstanding balance of the filing fee for a new house.

2. Prior to the commencement of any on-site permit related activity, the permittee shall provide the Agency with written approval from the DPW Engineering Division of the stormwater management system.
3. Final construction designs and locations shall be submitted for Wetlands Agency staff review and approval prior to the start of site activities. These plans shall address, as necessary, the following questions:
   a. How are construction vehicles going to use the proposed construction access and stockpile without traveling over the septic area?
   b. How are the infiltration and rain garden areas to be protected from compaction?
   c. How is the southeastern culvert system going to be installed, since the main driveway has already been relocated?
   d. What is the purpose of the silt fence at the west side of the construction envelope?

Approved plans shall be submitted in both paper and digital formats.

4. Prior to the commencement of any on-site permit related activity, a cash performance bond of $1,000,000 shall be submitted to the Agency to ensure compliance with the conditions of this permit. The bond shall be submitted in the form of a check payable to the Town of Greenwich. No portion of the bond shall be eligible for release until all Conditions of this permit are satisfied and staff has deemed the project to be in compliance with the approved plans.

5. Prior to the commencement of any on-site permit related activity, a Declaration of Regulated Areas, on a form provided by the Agency, shall be filed by the permittee on the Greenwich land records. This Declaration shall reference Inland Wetlands and Watercourses Permit #2019-150 and Application #2019-150 and require the preservation of the Upland Review Area of the wetland which is adjacent to the subject property in an undisturbed and natural state unless further permits are obtained. A copy of the filed Declaration shall be provided to the office of the Agency.

6. Prior to the commencement of any on-site permit related activity, the permittee shall cause to be prepared a packet for the homeowner describing the components of the stormwater management system, their purpose, and practical means to maintain them. The packet shall be submitted for review and approval by this Agency or its staff. If the permittee is not the project end user, verification the end user received the information packet shall be submitted to the office of the Agency.

7. Areas within the disturbance envelope where the soil is compacted during construction shall be restored to their original properties and porosity by incorporation of compost per recognized guidelines, such as the Virginia DEQ Stormwater Design Specification No. 4 “Soil Compost Amendment”. The certification of compliance required in Special Condition #7 below shall include certification this soil de-compaction was carried out as specified.

8. The stormwater drainage system shall be certified to have been constructed according to the approved plans and to be in compliance with the permit and conditions by a registered, professional engineer. Certification shall include verification of the soil de-compaction required in Special Condition #6 above. Certification shall be based upon regular on-site supervision of construction activities. A written certification report shall be submitted to Agency staff upon the completion of construction.

9. The permittee shall file a note on the Town Land Records requiring a licensed professional to inspect and certify the stormwater management structures every five years to ensure the system has been properly maintained, as required to sustain the designed goal. A copy of the filed note and copies of the periodic certifications shall be submitted to the Agency for its records.

10. A copy of the Health Department's "Permit to Discharge" and "as-built" septic plan depicting subsurface stormwater management features shall be submitted to Agency staff upon completion of the septic installation. Plans shall be submitted in both paper and digital formats.

11. Upon completion of construction activities, an "as-built" survey drawing locating foundations, other authorized structures, and surface stormwater management features with distances to inland wetland and watercourse areas shall be submitted. A copy of the plan shall be submitted in both paper and digital formats.


Wetland / Watercourse Description
No soils report was submitted with this application. The applicant’s agent states there are no wetlands or watercourses at 21 Calhoun Drive, and staff concur with this assessment. Some of the proposed activities fall within the upland review area of a pond located to the east on 24 Calhoun Drive.

Related Applications / Special Studies / Reports
No prior application has been reviewed for this property.

Additional File Information
1970 AIs #52/53 Photos: December 18, 2019
Lot Acreage: 1.8 acres / RA-1 zone Waste Disposal: Septic Water Supply: Public
Wetland Acreage on Lot: None
Activity(s) Proposed In: _ W1/WC X Upland Review Area X Beyond Upland Review Area
Area or Length of Wetland/Watercourse Lost: 0 Created: 0
Natural Diversity Data Base Area of Concern: _ Yes X No
Exemption claimed for 0-500 or 500-1,000 square foot increase in impervious surfaces? _ X No
Good morning, Pat.

Thanks for checking in on the changes to 21 Calhoun. The modification to the site plan is still consistent with the IWWA permit. We’re fine.

I appreciate P&Z’s commitment to consider the IWWA.

Pat

Hi Pat,

The plans for 21 Calhoun have been revised and now a part of a new parking area is proposed in the 100 ft upland review area. Does this change anything for you and the IWWA? The PZ Commission is taking this up on Tuesday.

(see plans attached)

Thank you

Patrick LaRow
Deputy Director / Assistant Town Planner

Town of Greenwich
Planning and Zoning
101 Field Point Road
Greenwich, CT 06878
Ph: 203-622-7894
Direct Fax: 203-861-6115
Email: patrick.larow@greenwichct.org

Town Hall is currently still operating under a State of Emergency. Starting June 1, the Public may be allowed to come to Town Hall to meet with individual staff, by appointment only, and on a Department by Department basis, if your request can be done over email, the internet, or phone, it shall continue to be done that way, in lieu of meeting in person. Please follow the Town’s website (www.Greenwichct.gov) for the most up to date information.

For immediate assistance, during business hours (8 a.m. to 4 p.m M-F), please email the Department via the Town’s website at: https://www.greenwichct.gov/FormCenter/Planning-
Zoning-11/Contact-Us-53; and select “Planning and Zoning” under the "select a category" tab to reach us. Again, Staff will be monitoring emails between 8 am - 4 pm weekdays.

If you are working with specific staff, please continue to call or email staff directly as they continue to be working remotely, on days they are not in the office.
Dear Pat and Katie,

You will find an updated engineering set (Site Plan and Drainage Report) relating to site plan changes made to address Commission member comments. In particular, the front circle has been eliminated with the substitution of a 2 car parking area that contains about half the impervious surface as the circle. Noe also there is a revised grade plan analysis for the dwelling; it is also in conjunction with changes to the dwelling that reduce the number of bedrooms and reduce the attic floor area and profile to the point where now the attic does not count toward FAR; the total floor of the dwelling will be now be well less than 2,500 square feet. The architectural plans should be delivered to you early next week.

I am copying Scott Marucci re the drainage report change.

Please advise, as noted below from our client’s engineer Rob Sandolo, if you are accepting hard copies and if so how many you would like delivered and to whom.

Thank you

John
Hi Annette,

Site Plan, Drainage Report, and Grade Plane attached. Let me know how many hard copies of each you would like.

Thank you,

Rob

--
PLEASE NOTE OUR NEW MAILING ADDRESS IS 33 WEST ELM STREET
and our temporary location at 15 Sherwood Place
--
Robert D. Sandolo Jr., EIT
Project Engineer
S.E. Minor & Co.
33 West Elm Street, Greenwich, CT
Phone: (203) 869-0136
Email: Robert.Sandolo@SEMinor.com

On 6/15/2020 12:21 PM, Annette Perry wrote:

CAUTION: This email originated from outside the Town email system. Do not click links or open attachments unless you have verified the sender and know the content is safe.
Town of Greenwich
Department of Public Works – Engineering Division
Town Hall – 101 Field Point Road, Greenwich, CT 06830
Phone 203-622-7767 – Fax 203-622-7747

Engineer of Record Certification

Project Name: 21 Calhoun Drive, LLC

Project Address: 21 Calhoun Drive - Carriage House

Engineer’s Name: John P. Giancola, P.E., P.L.S.

Engineering Firm’s Name: for S.E. Minor & Co., Inc.

Street Address: 81 Holly Hill Lane City: Greenwich State: CT Zip: 06830

Phone: 203-869-0136 Fax: 203-869-7869 Email: john.giancola@seminor.com

The undersigned Registered Professional Engineer of Record certifies that the Stormwater Management Report and Plans submitted herewith entitled:

Proposed Site Development Plan on Property of 21 Calhoun Drive, LLC

Stormwater Management Report Last Revision Date: 6/10/2020

Number of Plan Sheets: 8 Last Revision Date: 6/10/2020


Engineer’s Signature

Date: 6/10/2020

Engineer’s Seal

Form SC-100

February 2014
**DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA) CERTIFICATION**

**PRE-CONSTRUCTION**

Property Address: 21 Calhoun Drive - Lower House

Building Permit No.: 

Tax Account No.: 07-2043

**PLANS & DRAINAGE SUMMARY REPORT INFORMATION**

Engineering Firm: S.E. Minor & Co., Inc.

Design Plans Date: 8/10/20

Drainage Report Date: 6/10/20

**PROPERTY INFORMATION FOR DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)**

<table>
<thead>
<tr>
<th>Total Property Area (SF)¹</th>
<th>Total Proposed Site Disturbance Area (SF)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>78,408</td>
<td>17,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Impervious Area Under Existing Conditions (SF)³</th>
<th>Total Impervious Area Under Proposed Conditions (SF)³</th>
<th>Total Disconnected Impervious Area Under Proposed Conditions (SF)⁴</th>
<th>Total Directly Connected Impervious Area Under Proposed Conditions (SF)⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,077</td>
<td>11,481</td>
<td>5,148</td>
<td>6,313</td>
</tr>
</tbody>
</table>

¹The entire property area (i.e. parcel/lot area) based on property address and tax account number.

²The entire area being disturbed for the proposed construction activity (foundations, buildings, houses, stormwater systems, septic systems, pools, patios, accessory structures, vegetative soil cover modifications, etc.). The project disturbance area (delineated with construction/silt fence) shall be depicted on the design, construction, and mitigation plans, and shall be installed on-site prior to commencing land disturbance activities.

³Impervious surfaces include but are not limited to roofs (including green roofs), buildings, houses, walks, patios, walls, tennis/sport courts (all surface types must be counted), landscape ponds, pools, paved streets/drives/parking areas constructed with concrete, asphalt, compacted dirt, gravel, or permeable pavements.

⁴All impervious surfaces that are directed to stormwater BMPs that meet the water quality volume (WQV) standard will be considered disconnected impervious cover. Acceptable stormwater BMPs are Bioretention (infiltration/filtering), Constructed Stormwater Wetlands, Extended Dry Detention Basins (infiltration required), Gravel Wetlands, Constructed Wet Stormwater Ponds, Sand/Organic Filters (sand filters, tree filters, stormwater planters, etc.), Infiltration Systems (drywells, Culverts, etc.), Permeable Pavement Areas (infiltration/filtering), Green Roofs, and Disconnected Impervious Area (must meet all the standards under Simple Disconnection on page 44 and 45 of the Drainage Manual).

⁵Subtract the Total Disconnected Impervious Area Under Proposed Conditions (SF) from the Total Impervious Area Under Proposed Conditions (SF).

---

Engineer's Signature: [Signature]

Date: 8/10/20

[Stamp: STATE OF CONNECTICUT]

[Stamp: JOHN P. GIANCULLI]

[Stamp: Engineer's Seal]

June 2019

Form SC-107
Drainage Summary Report
Property of
21 Calhoun Drive, LLC
21 Calhoun Drive – Carriage House
Greenwich, Connecticut
June 10, 2020
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<td>HYDROLOGICAL &amp; HYDRAULIC CALCULATIONS EXISTING CONDITIONS</td>
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<td>9</td>
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<tr>
<td>STORMWATER MANAGEMENT OPERATIONS &amp; MAINTENANCE PLAN</td>
<td>10</td>
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</tbody>
</table>
The subject site is a residential building lot located on Calhoun Drive, a private neighborhood off of Glenville Road. Proposals include the construction of a new “Carriage House” in the lower portion of the lot. The existing driveway opening will be slightly relocated and will service both the main house and the Carriage House. The new house will be serviced by a new septic system. The proposed stormwater network consists of three infiltrating cultec systems and two porous asphalt areas. Existing coverage in the project area consists of the existing driveway, an open area of well-tended lawn, and surrounding vegetation and ledge outcrops upslope. As can be seen on the site plan package, there are no wetlands on the subject property. The entire scope of work is contained within a single watershed that drains toward Calhoun Drive.

In accordance with Appendix B of the Greenwich Drainage Manual, the NRCS Web Soil Survey was used to conduct the initial soils feasibility evaluation. According to the survey, the entire site consists of Charlton-Chatfield complex, 0-15 percent slopes, very rocky. This soil type is classified with a Hydraulic Soil Group “B”.

The proposed development concept sought to utilize Low Impact Development (LID) design principles and techniques to the maximum extent practicable. The new house will be serviced by a new septic system. The proposed stormwater network consists of three infiltrating cultec systems and two porous asphalt areas. The Stormwater Management Standards from the Town of Greenwich Drainage Manual – Low Impact Development and Stormwater Management, are outlined below.

**STANDARD 1: Low Impact Development**

Site disturbance was limited to the maximum extent practicable. Efforts were made to minimize the construction envelope to preserve existing vegetation where possible. The natural contours of the site are preserved to the maximum extent practicable. The overall drainage patterns will not be altered. Efforts will be made minimize the construction envelope and to maintain existing vegetation on the edges of the property.
STANDARD 2: Protection of Natural Hydrology

A. Site disturbance will be minimized to the maximum extent practicable. Majority of the site is proposed to be developed but efforts will be made to maintain existing grade and vegetation on the edges of the property.

B. Construction notes to the contractor to limit soil compaction and the limits of disturbance are included on the Site Plan. Proposed infiltration areas shall be delineated with construction fencing prior to installation and protected from heavy loading post installation. Construction traffic will be limited to areas proposed as hardscape. Areas disturbed that are not proposed as hardscape returned to a vegetated state. Any infiltration areas that do experience compaction during construction shall be tilled, scarified, decompacted, and amended as required before installation of BMPs.

C. The time of concentrations after development will approximate predevelopment values. There are no proposed steep slopes.

D. The enclosed Site Plan package illustrates how the development sought to follow the natural contours of the landscape. The proposed grading plan will not alter the existing overall watershed areas. As in the existing condition the entire project area will drain toward Calhoun Drive.

E. Areas of compost-amended soils have not been incorporated into the design, however, any pervious areas used for parking during construction shall have the soil tilled to a depth of 12 to 18 inches and amended with small amounts of organic matter if needed.

F. All areas disturbed, with the exception of the proposed impervious surfaces will be restored to a vegetated state upon completion of the project.

G. There are no existing surface waters on site. The upland review area from the wetland across the street is shown on the site plan package.

H. No roadway or driveway crossings of surface waters are proposed.

I. No roadway or driveway crossings of streams are proposed.

STANDARD 3: Stormwater Best Management Practices

A. Stormwater management practices were selected to accommodate the unique characteristics of the site and proposed plan. The culverts are proposed in areas of fill to ensure maximum infiltration despite the project area having areas of shallow ledge.

B. Calculations are enclosed showing how Pollutant Reduction, Peak Flow Control, RRV and GRV standards are met. All proposed storm water structures provide pollutant reduction and adequate storage to meet WQV, RRV, GRV, Peak Flow Attenuations, etc. requirements.

C. The proposed manholes and inlets on site act as access points for maintenance and shutdown in an unexpected event.

D. No pumping of stormwater is proposed.

E. No pumping of groundwater is proposed.

STANDARD 4: Runoff Reduction Volume and Groundwater Recharge Volume
A. RRV – The required RRV is 753cf. The proposed stormwater network consisting of three cultec systems that provide 706cf of storage. The filtrating porous asphalt areas will allow for some infiltration that is not accounted for. The RRV standard is met to the maximum extent practicable. Infiltration is difficult on site due to shallow depths to restrictive layers and limited available space in the project area. Calculations are enclosed.

B. GRV – The proposed stormwater network consisting of three cultec to provide adequate storage for GRV. Calculations are enclosed.

C. RCV - (Runoff Capture Volume) calculations are not required for this project.

STANDARD 5: Peak Flow Control

A. The Steam Channel Protection criteria are not required to be met for this project.

B. Conveyance calculations enclosed.

C. Using HydroCAD, which incorporates the SCS TR – 20 Unit Hydrograph Method, the peak rate of runoff discharging to the POCs were computed for a 1, 2, 5, 10, 25, 50, and 100-year 24-hour storm events, under existing and proposed conditions. The total peak rate of runoff discharging to the POCs after development will be maintained at or below current discharge levels for a 1, 2, 5, 10, 25-year 24-hour storm event. These results are summarized in Drainage Summary Table I.

DRAINAGE SUMMARY TABLE I
SUMMARY OF HYDROLOGICAL & HYDRAULIC ROUTING
CALCULATIONS FOR DRAINAGE AREA 1

<table>
<thead>
<tr>
<th></th>
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<td>1 - Year</td>
<td>0.48</td>
<td>0.37</td>
<td>-22.92%</td>
<td>1906.00</td>
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<td>2 - Year</td>
<td>0.75</td>
<td>0.60</td>
<td>-20.00%</td>
<td>2761.00</td>
<td>2825.00</td>
<td>2.32%</td>
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<tr>
<td>5 - Year</td>
<td>1.31</td>
<td>1.12</td>
<td>-14.50%</td>
<td>4515.00</td>
<td>4692.00</td>
<td>3.92%</td>
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<tr>
<td>10 - Year</td>
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<td>1.79</td>
<td>-3.76%</td>
<td>6250.00</td>
<td>6544.00</td>
<td>4.70%</td>
</tr>
<tr>
<td>25 - Year</td>
<td>2.82</td>
<td>2.72</td>
<td>-3.55%</td>
<td>9313.00</td>
<td>9699.00</td>
<td>4.14%</td>
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<tr>
<td>50 - Year</td>
<td>3.75</td>
<td>3.79</td>
<td>1.07%</td>
<td>12330.00</td>
<td>12836.00</td>
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</tr>
<tr>
<td>100 - Year</td>
<td>4.94</td>
<td>5.06</td>
<td>2.43%</td>
<td>16277.00</td>
<td>16827.00</td>
<td>3.88%</td>
</tr>
</tbody>
</table>

D. Conveyance protection and outlet protection is provided to ensure compliance.

STANDARD 6: Pollution Reduction

A. Calculations are enclosed. The proposed storm water Structures will remove pollutants by utilizing deep sump catch basins and junction boxes, infiltrating cultecs and filtrating porous asphalt areas.

STANDARD 7: High Load Areas
A. This site is not classified as a High Load Area.
B. This site is not classified as a High Load Area.
C. This site is not classified as a High Load Area.

STANDARD 8: Critical Areas

A. This site is not classified as a Critical Area.
B. This site is not classified as a High Load Area.

STANDARD 9: Redevelopment

A. The site has been evaluated as a redevelopment.
B. As previously discussed, this project meets the standards to the maximum extent practicable.
C. The entire property has been previously developed.
D. As previously discussed, this project meets the standards to the maximum extent practicable.
E. No known regulated or hazardous soils or materials were found on site during the onsite soil investigation, therefore, this standard is not applicable.

STANDARD 10: Construction Erosion and Sediment Control

A. Erosion control design and details are indicated in the site plan drawing set.
B. Erosion control design and details are indicated in the site plan drawing set.

STANDARD 11: Construction Inspections

A. If required by the approving authority, the proponent will post a bond, cash or other acceptable surety, in an amount deemed sufficient to ensure the work will be completed in compliance with the approved plans.
B. The proponent will be instructed to notify the approving authority before starting land-disturbing activity and before construction of key components of the stormwater management system.
C. The project engineer will conduct periodic inspections of the stormwater management system.
D. The project engineer will perform site inspections as required by the Field Inspection Record form SC-106.
E. Regardless of compliance with the approved plans, the stormwater management system design shall be revised if performance is not deemed adequate due to operational failure. This shall occur prior to final approval by approving authority.
F. Upon project completion, all required inspections and certifications necessary to document compliance to the approved plans shall be performed prior to approval being granted by the approving authority.

STANDARD 12: Operation and Maintenance
A. Refer to the Operations and Maintenance Plan Report for specific maintenance activities necessary to ensure functionality of the proposed stormwater management system.

B. The Operations and Maintenance Plan shall identify all applicable items in Section 5 and Section 7 of the Town of Greenwich Drainage Manual – Low Impact Development and Stormwater Management.

C. The Operations and Maintenance Plan Report will identify the parties legally responsible for implementing the Operations and Maintenance Plan.

D. The parties legally responsible for maintaining the stormwater management system will be instructed to keep records of all maintenance or repair activities necessary to ensure system functionality.

E. The parties legally responsible for maintaining the stormwater management system will be instructed to keep records of all maintenance or repair activities, and to provide these to the approving authority during inspections and/or upon request.

F. When the parties legally responsible fails to implement the Operation and Maintenance Plan, the municipality is authorized to assume responsibility for their implementation, and to secure reimbursement for associated expenses from the parties legally responsible, including, if necessary, placing a lien on the subject property.

STANDARD 13: Stormwater Management Report

This report satisfies this standard.

STANDARD 14: Illicit Discharges

Based on investigation of the site, there are currently no existing illicit discharges that could enter the stormwater management system. No illicit discharges are proposed.

Based on the above we can be assured that this development will not have any adverse hydrological or hydraulic impacts to any surrounding or downstream properties or drainage facilities. To the best of my knowledge, the drainage aspects of this proposal comply with the Town of Greenwich Roadway Design Manual, Drainage Manual, and Construction Standards.

Yours truly,

[Signature]

John P. Giancola, P.E., P.L.S.
Senior Project Engineer
SOIL SURVEY DATA
- NRCS Soil Data
- Site Feasibility Testing
### Soil Evaluation Test Results

**Engineer's Name:** ROBERT SANDOLO, EIT  
**Engineering Firm's Name:** S.F. Miller & CO., Inc.

**Test Pit #:** DT-D1  
**Ground Elevation:** 156.0

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Soil Texture (Percent Sand, Silt and Clay)</th>
<th>Depth Range in Inches</th>
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<tbody>
<tr>
<td>155.5</td>
<td>TOP SOIL</td>
<td>0 - 6&quot;</td>
</tr>
<tr>
<td>152.3</td>
<td>BROWN SANDY LOAM</td>
<td>6 - 45&quot;</td>
</tr>
<tr>
<td>150.3</td>
<td>GRAY BROWN SILTY SAND</td>
<td>45 - 68&quot;</td>
</tr>
</tbody>
</table>

**Saturated Hydraulic Conductivity Test Location #:**

- **Existing Ground Elevation:**
- **Top Elevation of Proposed Infiltration System:**
- **Bottom Elevation of Proposed Infiltration System:**
- **Elevation of Test:**
- **Test Method (check one of the following acceptable methods**):
  - Boerehole infiltration test (NHDES, 2008)
  - Guelph permeameter - ASTM D5126-90 Method
  - Falling Head Permeameter - ASTM D5126-90 Method
  - Double ring permeater or infiltrometer -
    ASTM D3385-03, D5093-02, D5126-90 Methods
  - Amoomezeter or Amoozegar (constant head) permeater -
    Amoozegar 1992

- **Attach field data form for the respective infiltration test method.**

- **Calculated Saturated Hydraulic Conductivity Rate:**

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Depth in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>152.3</td>
<td>45&quot;</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
</tr>
<tr>
<td>150.3</td>
<td>Ledge</td>
</tr>
<tr>
<td></td>
<td>68&quot;</td>
</tr>
<tr>
<td></td>
<td>Roots</td>
</tr>
</tbody>
</table>

**Notes:**
- "A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percollation tests overestimate the saturated hydraulic conductivity rate.

- "All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed. All percolation tests shall be done in the soil layer below bottom elevation of the proposed infiltrators.

---

**Test Certification**

I HEREBY CERTIFY THAT THE DATA CONTAINED IN THIS DEEP TEST AND PERCOLATION TEST REPORT IS TRUE AND CORRECT

**Name of Test Conductor:**  
**Signature of Test Conductor:**  
**Date:** 6/10/20
# Soil Evaluation Test Results

**Engineer's Name:** ROBERT SANDOLO, EIT  
**Engineering Firm's Name:** S.E. Minor & Co., Inc.

**Test Pit #:** DT-D2  
**Ground Elevation:** 153.5

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Soil Texture (Percent Sand, Silt and Clay)</th>
<th>Depth Range in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>153.0</td>
<td>TOP SOIL</td>
<td>0 - 6&quot;</td>
</tr>
<tr>
<td>149.3</td>
<td>BROWN SANDY LOAM</td>
<td>6 - 50&quot;</td>
</tr>
<tr>
<td>147.7</td>
<td>GREY BROWN SILTY SAND</td>
<td>50 - 70&quot;</td>
</tr>
</tbody>
</table>

- **Existing Ground Elevation:**
  - Top Elevation of Proposed Infiltration System:
  - Bottom Elevation of Proposed Infiltration System:
  - Elevation of Test:
  - Test Method (check one of the following acceptable methods**):
    - Borehole infiltration test (NHDES, 2008)
    - Guelph permeameter - ASTM D5126-90 Method
    - Falling Head Permeameter - ASTM D5126-90 Method
    - Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
    - Amoozometer or Amoozegar (constant head) permeameter - Amoozegar 1992

- Attach field data form for the respective infiltration test method.

**Calculated Saturated Hydraulic Conductivity Rate:**

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Depth in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>149.3</td>
<td>50&quot;</td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
</tr>
<tr>
<td>147.7</td>
<td>Ledge</td>
</tr>
<tr>
<td></td>
<td>Roots</td>
</tr>
</tbody>
</table>

**Note:** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percollation tests overestimate the saturated hydraulic conductivity rate.

*All test pit or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltrator system.

**Test Certification**

I HEREBY CERTIFY THAT THE DATA CONTAINED IN THIS DEEP TEST AND PERCOLATION TEST REPORT IS TRUE AND CORRECT

**Name of Test Conductor:** RDS  
**Signature of Test Conductor:**  
**Date:** 6/10/20
**SOIL EVALUATION TEST RESULTS**

**Engineer's Name:** ROBERT SANDOLO, EIT  
**Engineering Firm's Name:** S.E. Minor & Co., Inc.

<table>
<thead>
<tr>
<th>TEST PIT #: DT-G9</th>
<th>GROUND ELEVATION:</th>
<th>152</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Saturated Hydraulic Conductivity Test Location #:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Soil Texture (Percent Sand, Silt and Clay)</th>
<th>Depth Range in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>151.5</td>
<td>TOP SOIL</td>
<td>0 - 6&quot;</td>
</tr>
<tr>
<td>148.0</td>
<td>BROWN SANDY LOAM</td>
<td>6 - 48&quot;</td>
</tr>
<tr>
<td>146.3</td>
<td>GREY BROWN MOTTLED SILTY SAND</td>
<td>48 - 68&quot;</td>
</tr>
</tbody>
</table>

- **Existing Ground Elevation:**
- **Top Elevation of Proposed Infiltration System:**
- **Bottom Elevation of Proposed Infiltration System:**

**Elevation of Test**:
- **Test Method (check one of the following acceptable methods)**:
  - Borehole infiltration test (NHDES, 2008)
  - Guelph permeameter - ASTM D5126-90 Method
  - Falling Head Permeameter - ASTM D5126-90 Method
  - Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
  - Amoozometer or Amoozegar (constant head) permeator - Amoozegar 1992

**Attach field data form for the respective infiltration test method.**

**Calculated Saturated Hydraulic Conductivity Rate:**

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Depth in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>148.0</td>
<td>Mottling</td>
</tr>
<tr>
<td>147.4</td>
<td>Groundwater</td>
</tr>
<tr>
<td>146.6</td>
<td>Ledge</td>
</tr>
<tr>
<td>148.7</td>
<td>Roots</td>
</tr>
<tr>
<td></td>
<td><strong>48&quot;</strong></td>
</tr>
<tr>
<td></td>
<td><strong>55&quot;</strong></td>
</tr>
<tr>
<td></td>
<td><strong>65&quot;</strong></td>
</tr>
<tr>
<td></td>
<td><strong>40&quot;</strong></td>
</tr>
</tbody>
</table>

**Note:** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Perculation tests overestimate the saturated hydraulic conductivity rate.

**Note:** All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed. All percolation tests shall be done in the soil layer below bottom elevation of the proposed infiltrators.

**TEST CERTIFICATION**

I HEREBY CERTIFY THAT THE DATA CONTAINED IN THIS DEEP TEST AND PERCOLATION TEST REPORT IS TRUE AND CORRECT

**Name of Test Conductor:** [Signature]  
**Signature of Test Conductor:** [Signature]  
**Date:** 6/10/2020
SOIL EVALUATION TEST RESULTS

Engineer's Name: ROBERT SANDOLO, EIT  Engineering Firm's Name: S.F. Minor & Co., Inc.

<table>
<thead>
<tr>
<th>TEST PIT #: DT-D3</th>
<th>GROUND ELEVATION: 163.6</th>
<th>Saturated Hydraulic Conductivity Test Location #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>Soil Texture (Percent Sand, Silt and Clay)</td>
<td>Depth Range in inches</td>
</tr>
<tr>
<td>163.3</td>
<td>TOP SOIL</td>
<td>0 - 6&quot;</td>
</tr>
<tr>
<td>159.6</td>
<td>BROWN SANDY LOAM</td>
<td>6 - 50&quot;</td>
</tr>
</tbody>
</table>

Existing Ground Elevation:
- Top Elevation of Proposed Infiltration System:
- Bottom Elevation of Proposed Infiltration System:
- Elevation of Test**:
- Test Method (check one of the following acceptable methods)**:
  - Borehole infiltration test (NHDES, 2008)
  - Guelph permeameter - ASTM D5126-90 Method
  - Falling Head Permeameter - ASTM D5126-90 Method
  - Double ring permeameter or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
  - Amoozegar permeameter or Amoozegar (constant head) permeameter - Amoozegar 1992
- Attach field data form for the respective infiltration test method.

Calculated Saturated Hydraulic Conductivity Rate:

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Depth in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Mottling</td>
</tr>
<tr>
<td>-</td>
<td>Groundwater</td>
</tr>
<tr>
<td>159.6</td>
<td>Ledge</td>
</tr>
<tr>
<td>-</td>
<td>Roots</td>
</tr>
</tbody>
</table>

** A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percollation tests overestimate the saturated hydraulic conductivity rate.

* All field infiltration tests must be conducted in the actual location and soil layer where stormwater infiltration is proposed.

All percolation tests shall be done in the soil layer below bottom elevation of the proposed infiltrators.

*All test pit or soil borings shall be excavated to an elevation four feet below the proposed bottom elevation of the infiltration system

TEST CERTIFICATION

I HEREBY CERTIFY THAT THE DATA CONTAINED IN THIS DEEP TEST AND PERCOLATION TEST REPORT IS TRUE AND CORRECT

Name of Test Conductor: [Signature of Test Conductor:  
Date: 6/10/20]
MAP LEGEND

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: State of Connecticut

Survey Area Data: Version 18, Dec 6, 2018

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

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

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

<table>
<thead>
<tr>
<th>Map unit symbol</th>
<th>Map unit name</th>
<th>Rating</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>73C</td>
<td>Charlton-Chaffield complex 0 to 15 percent slopes, very rocky</td>
<td>B</td>
<td>3.1</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Totals for Area of Interest

3.1

100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition
Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

**Component Percent Cutoff: None Specified**

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

**Tie-break Rule: Higher**

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

<table>
<thead>
<tr>
<th>LID Technique</th>
<th>Compliance Requirements</th>
<th>Credit</th>
</tr>
</thead>
</table>
| **Minimizing Soil Compaction (Section 4.4.1)** | • The "no disturbance" areas are protected by having the limits of disturbance and access clearly shown on the Stormwater Management Plan, all construction drawings, and delineated/flagged/fenced in the field.  
  • "No disturbance" areas are not to be stripped of existing topsoil.  
  • "No disturbance" areas are not to be stripped of existing vegetation.  
  • Vehicle movement, storage, or equipment/material lay-down is not to be permitted in "no disturbance" areas.  
  • Use of soil amendments and additional topsoil is permitted in other areas being disturbed. Grading may be performed using low ground pressure equipment (less than 3 pounds per square inch) to reduce the potential for soil compaction.  
  • Lawn and turf grass are acceptable uses. Planted meadow is an encouraged use. | Areas that comply (i.e., "no disturbance areas") can use the forested cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients. |
| **Minimizing Site Disturbance (Section 4.4.2)** | Site disturbance including earthwork and clearing of vegetation should be limited to 40 feet beyond the building perimeter, 10 feet beyond the primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond areas of proposed infiltration in order to limit compaction in the proposed infiltration area. This guidance is not intended to limit lawn areas. | Areas that comply can use the forested cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients. |
| **Protecting Sensitive Natural Areas (Section 4.4.3)** | Sensitive natural areas should be conserved at development sites, thereby preserving predevelopment hydrologic and water quality characteristics. The area must be permanently protected under a conservation easement. | The project proponent can subtract the conservation area from the total area in the Water Quality Volume calculation. |
| **Protecting Riparian Buffers (Section 4.4.4)** | Effective treatment of stormwater runoff is achieved when pervious and impervious area runoff is discharged to a grass or forested buffer via overland flow. The use of a filter strip is recommended to treat overland flow in the green space of a development site.  
  • The minimum stream buffer width (i.e., perpendicular to the stream flow path) shall be 50 feet as measured from the top bank elevation of a stream or the boundary of a wetland.  
  • The maximum contributing path shall be 150 feet for pervious surfaces and 75 feet for impervious surfaces.  
  • The average contributing overland slope to and across the buffer shall be less than or equal to 5%.  
  • Runoff shall enter the buffer as sheet flow. A level spreader shall be utilized where local site conditions prevent sheet flow from being maintained.  
  • The stream buffer remains unmanaged other than routine debris removal.  
  • The buffer is protected by an acceptable conservation easement or other enforceable instrument that provides perpetual protection of the area. The easement must clearly specify how the natural area vegetation shall be | The area draining by sheet flow to a buffer can be subtracted from the total area in the Water Quality Volume calculation, and the impervious area draining to the buffer by sheet flow can be subtracted from the impervious area in the Groundwater Recharge Volume calculation and post-development impervious area in the Runoff Reduction Volume calculation. |

*Town of Greenwich Drainage Manual*  
*February 2014*
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

<table>
<thead>
<tr>
<th>LID Technique</th>
<th>Compliance Requirements</th>
<th>Credit</th>
<th>LID Used</th>
<th>Credit Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoiding Disturbance of Steep Slopes (Section 4.4.5)</td>
<td>Development on steep slope areas shall be avoided. Unnecessary grading should be avoided on all slopes, as should the flattening of hills and ridges. Development shall follow the natural contours of the landscape.</td>
<td>Undisturbed steep slope areas can use the forested cover and open space site cover runoff coefficient (R) when calculating the required Water Quality Volume. See Section 5.6.3 and Table 5-5, Site Cover Runoff Coefficients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siting on Permeable and Erodible Soils (Section 4.4.6)</td>
<td>Whenever possible, highly erodible soils should be left undisturbed and protected from disturbance during site construction. Gravel soils tend to be the least erodible. Also as clay and organic matter increase erodibility tends to decrease. Infiltration practices should be located on those portions of the site with the most permeable soils.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protecting Natural Flow Pathways (Section 4.4.7)</td>
<td>Site designs should use and/or improve natural drainage pathways whenever possible to reduce or eliminate the need for stormwater pipe networks. Natural drainage pathways should be protected from significantly increased runoff volumes and rates due to development. The design should prevent the erosion and degradation of natural drainage pathways through the use of upstream volume and rate control BMPs, if necessary. Level spreaders, erosion control matting, revegetation, outlet stabilization, and check dams can also be used to protect natural drainage features.</td>
<td>Reducing impervious surfaces reduces the Water Quality Volume, Runoff Reduction Volume, Groundwater Recharge Volume, and Peak Flow/Runoff Attenuation requirements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reducing Impervious Surfaces (Section 4.4.8)</td>
<td>By reducing the amount of paved surfaces, stormwater runoff is decreased while infiltration and evapotranspiration opportunities are increased.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stormwater Disconnection (Section 4.4.9)</td>
<td>Disconnecting roof leaders and routing road and driveway runoff from conventional stormwater conveyance systems allows runoff to be collected and managed onsite. Runoff can be directed to vegetated areas designed for onsite storage, treatment, and volume control. All design criteria from section 4.4.9 must be met in order to obtain the credits shown.</td>
<td>Methods to compute the resultant runoff volumes and peak runoff rates from disconnected impervious areas are discussed in Section 4.6 of this manual and the design references cited therein. For simple disconnection, subtract 100% of the disconnected area from the total area in the Water Quality Volume calculation if the receiving pervious area is HSG A or B soils or 50% of the area.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

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<tr>
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<th>LID Used</th>
<th>Credit Taken</th>
</tr>
</thead>
</table>
| Compost-Amended Soils         | Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of infiltration BMPs.  
  - Soil must be tilled to 12 to 16 inches and amended with small amounts of organic material.  
  - For mechanical aeration of lawns/turf to be effective:  
    - Utilize a soil aerator that has a mechanical action that not only penetrates the soil surface but also shatters the soil matrix, causing the soil to decompact and crack, thus creating void space and increasing infiltration. (Passive-type aerators which simply poke a hole into the soil, whether it removes a plug or simply spikes a hole, can create a hardpan effect at the depth of penetration.)  
    - Shatter-type aerators include vertidrain, soil reliever, agrivator, and groundbreaker. Shatter-type aerators should penetrate the soil at depths of 8 to 18 inches.  
  - The depth to water table or bedrock must be greater than 18 inches.  
  - Existing soils may not be saturated or seasonal wet.  
  - Slopes may not exceed 10%.  
  - Existing tree root systems shall be avoided, no deep till or amendment under the tree drip lines. | Disconnect area if the receiving pervious area is HSG C or D soils.  
For disconnection to LID BMPs, subtract 100% of the disconnected area from the total area in the Water Quality Volume calculation. |          |              |
| Rainwater Harvesting (Rain Barrels) | Rain barrels should hold a minimum of 50 gallons.  
Rain barrels can be connected in series to provide larger storage volumes.  
Equip rain barrels with a drain spigot near the bottom of the barrel with garden hose threading to allow easy hook up and use for watering.  
Provide an overflow pipe or hose near the top of the rain barrel.  
Provide removable, child-resistant covers.  
Provide mosquito screening on water entry holes to prevent mosquito breeding in standing water. | Subtract 25% of the contributing drainage area from the total area in the Water Quality Volume calculation. |          |              |
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

<table>
<thead>
<tr>
<th>LID Technique</th>
<th>Compliance Requirements</th>
<th>Credit</th>
<th>LID Used</th>
<th>Credit Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainwater Harvesting (Cisterns)</td>
<td>The rooftop runoff must be captured and either (1) used on site for irrigation of lawns and gardens, wash water and other non-potable uses, or (2) treated and released, or (3) infiltrated.</td>
<td>Subtract 100% of the contributing drainage area from the total area in the Water Quality Volume calculation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The cistern must be sized to treat the design rainfall from the roof area directed to the water harvesting system. If all of the design volume captured cannot be used, then a scaled reduction in credit will be given. The remaining volume must be treated by a properly designed BMP.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A minimum factor of safety equal to 1.2 must be applied to the calculated cistern volume required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All stormwater collected must have a dedicated, year-round, use to assure no overflow of the system during a design rainfall. A water balance calculation must be used to establish the dedicated use volumes and rates. The water balance calculation must demonstrate that the design volume can: (1) be drawn down (used) within 3 days to allow for available volume in the system for the next rain event to be captured and stored, or (2) have an overflow of no more than 14 percent of the annual average historic rainfall, or (3) be drawn down within 3 days and discharged to a properly designed BMP. On a case-by-case basis, reduced credit may be given if the design volume cannot be reliably drawn down within 3 days, or if a year-round reuse is not available. The dedicated water use system must be automated to ensure that the water will be used at the rate and volume designed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The overflow shall discharge flows in excess of the design volume to a vegetated or natural area, or to another properly designed BMP (e.g., rain garden). This discharge shall be non-erosive flow for the 10-yr rainfall event. It shall not discharge directly to impervious surfaces. The elevation of the overflow pipe from the cistern shall be at or above the design volume elevation. If a first flush diverter is used, the bypassed water must discharge to a properly designed BMP. The first flush can be directed to a relatively small BMP next to the water harvesting system, or it can be directed to and accounted for in other BMPs on the site.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At a minimum, a 1 mm or smaller screen at the entrance to the cistern from the gutter system shall be provided to filter out debris and to keep mosquitoes out of the cistern.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If the water reuse system is designed to accommodate basement sump/foundation drain water and roof runoff, the design must allow for adequate storage for the full volume of roof runoff for the next design storm and basement sump/foundation drain water.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LID Technique</td>
<td>Compliance Requirements</td>
<td>Credit</td>
<td>LID Used</td>
<td>Credit Taken</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------</td>
<td>--------</td>
<td>----------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>A properly designed footing for the cistern must be designed if the load of the cistern at full capacity is greater than the soils will support. If it is buried, buoyancy calculations must be provided to show the cistern will not float when empty. Buoyancy calculations and flotation constraints must be provided if any part of the buried cistern is below the seasonal high water table, or if the area is subject to flooding. An appropriate pump shall be selected to provide adequate pressure for its designated uses. Above ground cisterns shall be made of a material or color that prevents light from entering the cistern, which helps prevent algae growth within the cistern. Irrigation water from a cistern shall be applied so that the water infiltrates into the ground. If for any reason the designed dedicated end use becomes unavailable because of some change, it will be required that an approved alternative end use or a properly designed BMP treatment system be installed on site to manage the roof runoff. The harvesting system shall be labeled and identified as non-potable water. The harvesting system shall meet all local and state building and plumbing codes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WATER QUALITY CALCULATIONS

- WQV Worksheet
- TSS Worksheet
- Rain Garden Sizing Worksheet (if required)
Storm Water Quality Calculations - WQV - Water Quality Volume - As defined in "Town of Greenwich Drainage Manual" (Standard 6) see Table 5-5 of the Drainage Manual for Runoff Coefficients based on soil type

WQV = Water Quality Volume

\[
WQV = \frac{(1^*)R(A)}{12 \text{ IN/FT.}}
\]

\[
R = (RvI \times \%I) + (RvT \times \%T) + (RvF \times \%F)
\]

A = Site area

\[
RvT = (RvT \ A \times \%T \ OF \ HSG \ A) + (RvT \ B \times \%T \ OF \ HSG \ B) + (RvT \ C \times \%T \ OF \ HSG \ C) + (RvT \ D \times \%T \ OF \ HSG \ D)
\]

\[
RvF = (RvF \ A \times \%F \ OF \ HSG \ A) + (RvF \ B \times \%F \ OF \ HSG \ B) + (RvF \ C \times \%F \ OF \ HSG \ C) + (RvF \ D \times \%F \ OF \ HSG \ D)
\]

**WATER QUALITY VOLUME CALCULATION**

<table>
<thead>
<tr>
<th>BMP#</th>
<th>Description</th>
<th>Drain Area</th>
<th>Total SF</th>
<th>RvI</th>
<th>%I</th>
<th>RvT</th>
<th>%T</th>
<th>RvF</th>
<th>%F</th>
<th>R</th>
<th>WQV CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>c1</td>
<td>2s</td>
<td>1.125</td>
<td>0.95</td>
<td></td>
<td>100</td>
<td>0.200</td>
<td>0</td>
<td>0.030</td>
<td>0</td>
<td>0.950</td>
</tr>
<tr>
<td>2</td>
<td>c3</td>
<td>10s</td>
<td>753</td>
<td>0.95</td>
<td></td>
<td>100</td>
<td>0.200</td>
<td>0</td>
<td>0.030</td>
<td>0</td>
<td>0.950</td>
</tr>
<tr>
<td>3</td>
<td>pp1</td>
<td>3s</td>
<td>1.288</td>
<td>0.95</td>
<td></td>
<td>100</td>
<td>0.200</td>
<td>0</td>
<td>0.030</td>
<td>0</td>
<td>0.950</td>
</tr>
<tr>
<td>4</td>
<td>pp2</td>
<td>4s</td>
<td>2.382</td>
<td>0.95</td>
<td></td>
<td>83.21</td>
<td>0.200</td>
<td>0</td>
<td>0.030</td>
<td>0</td>
<td>0.790</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.790</td>
</tr>
</tbody>
</table>

**IMPERV**

- HSG A: 0.95
- HSG B: 0.95
- HSG C: 0.95
- HSG D: 0.95

**TURF**

- HSG A: 0.15
- HSG B: 0.22
- HSG C: 0.22
- HSG D: 0.25

**FORREST**

- HSG A: 0.02
- HSG B: 0.03
- HSG C: 0.04
- HSG D: 0.05
# TSS REMOVAL CALCULATION WORKSHEET

Instructions:
2. Complete only highlighted cells

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>TSS REMOVAL</td>
<td>STARTING TSS</td>
<td>AMOUNT REMOVED (B(C))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RATE</td>
<td>LOAD*</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>DEEP SUMP</td>
<td>C1</td>
<td>90%</td>
<td>0.75</td>
<td>0.675</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.075</td>
<td>0</td>
<td>0.075</td>
</tr>
</tbody>
</table>

TOTAL TSS REMOVAL = 92.5%

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>TSS REMOVAL</td>
<td>STARTING TSS</td>
<td>AMOUNT REMOVED (B(C))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RATE</td>
<td>LOAD*</td>
<td>0.25</td>
</tr>
<tr>
<td>DEEP SUMP</td>
<td>C2</td>
<td>90%</td>
<td>0.75</td>
<td>0.675</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.075</td>
<td>0</td>
<td>0.075</td>
</tr>
</tbody>
</table>

TOTAL TSS REMOVAL = 92.5%

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>TSS REMOVAL</td>
<td>STARTING TSS</td>
<td>AMOUNT REMOVED (B(C))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RATE</td>
<td>LOAD*</td>
<td>0.25</td>
</tr>
<tr>
<td>DEEP SUMP</td>
<td>C3</td>
<td>90%</td>
<td>0.75</td>
<td>0.675</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.075</td>
<td>0</td>
<td>0.075</td>
</tr>
</tbody>
</table>

TOTAL TSS REMOVAL = 92.5%

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>TSS REMOVAL</td>
<td>STARTING TSS</td>
<td>AMOUNT REMOVED (B(C))</td>
</tr>
<tr>
<td>DEEP SUMP DIST. BASIN</td>
<td>PP1 &amp; PP2</td>
<td>25%</td>
<td>1</td>
<td>0.25</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.075</td>
<td>0</td>
<td>0.075</td>
</tr>
</tbody>
</table>

TOTAL TSS REMOVAL = 92.5%
RUNOFF REDUCTION CALCULATIONS
- RRV Worksheet
Storm Water Quality Calculations - RRV - Runoff Volume Reduction - As defined in Town of Greenwich Drainage Manual (Standard 4)

RRV for CALHOUN DRIVE

RRV = \[ V_{post} \text{ (POST 1year, 24hr storm)} - V_{pre} \text{ (PRE 1year, 24hr storm)} \]

\[ V_{post} = 2,659 \text{ Proposed without BMPs} \]
\[ V_{pre} = 1,906 \text{ Existing} \]

RRV = 753 Cubic Feet (cf)

A total of 706cf of storage is provided in the three cultec systems. Although the porous asphalt areas are underdrained, some infiltration will occur but is not accounted for.
GROUNDWATER RECHARGE CALCULATIONS
- GRV Worksheet
- Drawdown Worksheet
Storm Water Quality Calculations - GRV - Groundwater Recharge Volume - As defined in "Town of Greenwich Drainage Manual" (Standard 4) see Table 5-2 of the Drainage Manual for Target Depth by Hydrologic Soil Group (Factor F)

\[ GRV = F \times I \]

Target Depth Factor F see Table 5-2, for Target Depth by Hydrologic Soil Group (Factor F)

- F = "A" Soils: 0.60 Inches
- F = "B" Soils: 0.35 Inches
- F = "C" Soils: 0.25 Inches
- F = "D" Soils: 0.10 Inches

\[ A = \text{Total Site Area} = 0.845 \text{ Acres} \]

Percent of Increase of Impervious area (decimal value used for computation):

- Proposed Impervious area = $\frac{11483}{43560} = 0.263154$ Acres
- Existing Impervious area = $\frac{8098}{43560} = 0.185904$ Acres

\[ I = \frac{0.0772}{0.845} = 0.0914 \]

\[ GRV = \frac{(F)(I)}{12} = 0.00225 \text{ Acre Feet} \]

\[ = 98.15 \text{ Cubic Feet Storage Required} \]
**Drawdown Calculation**

BMP Drawdown Calculations - As defined in the "Greenwich Drainage Manual" (Appendix B)
Infiltration DT-H7
Dynamic Field Method is used for sizing of the infiltration system

**C1**

\[
T = \frac{V}{(K)(Bottom Area)^n}
\]

\[
T = \text{Drawdown Time (hours)}
\]

\[
V = \text{Storage Volume (cf)}
\]

\[
K = \text{Infiltration Rate (in/hr)}
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = \text{Porosity of stone}
\]

\[
V = 268
\]

\[
K = 0.8
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = 0.4
\]

\[
T = \frac{268}{(0.8)(254)^{0.4}} = 39.6 \text{ Hours}
\]

**C2**

\[
T = \frac{V}{(K)(Bottom Area)^n}
\]

\[
T = \text{Drawdown Time (hours)}
\]

\[
V = \text{Storage Volume (cf)}
\]

\[
K = \text{Infiltration Rate (in/hr)}
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = \text{Porosity of stone}
\]

\[
V = 219
\]

\[
K = 0.8
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = 0.4
\]

\[
T = \frac{219}{(0.8)(204)^{0.4}} = 40.3 \text{ Hours}
\]

**C3**

\[
T = \frac{V}{(K)(Bottom Area)^n}
\]

\[
T = \text{Drawdown Time (hours)}
\]

\[
V = \text{Storage Volume (cf)}
\]

\[
K = \text{Infiltration Rate (in/hr)}
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = \text{Porosity of stone}
\]

\[
V = 219
\]

\[
K = 0.8
\]

\[
\text{Bottom Area (BA) = Bottom Area of Recharge Structure (sf)}
\]

\[
n = 0.4
\]

\[
T = \frac{219}{(0.8)(204)^{0.4}} = 40.3 \text{ Hours}
\]
CONVEYANCE CALCULATIONS
- Conveyance Worksheet
## Conveyence Calculations

Flow = \( Q(\text{max}) = (1.49 / n) \times A \times S^{(1/2)} \times R^{(2/3)} \)

\[
\begin{align*}
n &= 0.1 \quad \text{(constant for PVC)} \\
\end{align*}
\]

<table>
<thead>
<tr>
<th>DIAMETER (in)</th>
<th>DIAMETER (ft)</th>
<th>RADIUS (ft)</th>
<th>AREA (A (\text{ft}^2))</th>
<th>SLOPE (S (\text{ft/ft}))</th>
<th>HYDRAULIC RADIUS (R (\text{ft}))</th>
<th>FLOW (Q (\text{cfs}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.5</td>
<td>0.25</td>
<td>0.196</td>
<td>0.01</td>
<td>0.125</td>
<td>0.073</td>
</tr>
</tbody>
</table>

6 inch pipe can handle 0.73 cfs of flow @ 1%

<table>
<thead>
<tr>
<th>DIAMETER (in)</th>
<th>DIAMETER (ft)</th>
<th>RADIUS (ft)</th>
<th>AREA (A (\text{ft}^2))</th>
<th>SLOPE (S (\text{ft/ft}))</th>
<th>HYDRAULIC RADIUS (R (\text{ft}))</th>
<th>FLOW (Q (\text{cfs}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.3333333333</td>
<td>0.1666666667</td>
<td>0.087</td>
<td>0.01</td>
<td>0.0833333333</td>
<td>0.025</td>
</tr>
</tbody>
</table>

4 inch PVC can handle 0.24 cfs of flow @ 1%

<table>
<thead>
<tr>
<th>DIAMETER (in)</th>
<th>DIAMETER (ft)</th>
<th>RADIUS (ft)</th>
<th>AREA (A (\text{ft}^2))</th>
<th>SLOPE (S (\text{ft/ft}))</th>
<th>HYDRAULIC RADIUS (R (\text{ft}))</th>
<th>FLOW (Q (\text{cfs}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>0.6666666667</td>
<td>0.3333333333</td>
<td>0.349</td>
<td>0.01</td>
<td>0.1666666667</td>
<td>0.158</td>
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</tbody>
</table>

8 inch PVC can handle 1.57 cfs of flow @ 1%

### Pipe Run Summary

<table>
<thead>
<tr>
<th>Pipe Run</th>
<th>25 yr cfs from Hydrocadd</th>
<th>Min Slope</th>
<th>Min Pipe Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>to pp1</td>
<td>0.19</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>to pp2</td>
<td>0.34</td>
<td>1%</td>
<td>6</td>
</tr>
<tr>
<td>to c1</td>
<td>0.17</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>to c2</td>
<td>0.13</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>to c3</td>
<td>0.83</td>
<td>1%</td>
<td>4</td>
</tr>
</tbody>
</table>

### Pipe Run Summary

<table>
<thead>
<tr>
<th>Pipe Run</th>
<th>25 yr cfs from Hydrocadd</th>
<th>Min Slope</th>
<th>Min Pipe Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>pp1 out</td>
<td>0.13</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>pp2 out</td>
<td>0.65</td>
<td>1%</td>
<td>6</td>
</tr>
<tr>
<td>c1 out</td>
<td>0.12</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>c2 out</td>
<td>0.12</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>c3 out</td>
<td>0.43</td>
<td>1%</td>
<td>6</td>
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</tbody>
</table>
OUTLET PROTECTION CALCULATIONS

Rip Rap Pads
Note:

<table>
<thead>
<tr>
<th>X</th>
<th>W1</th>
<th>W2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A Rip Rap Apron</td>
<td>3</td>
<td>3Sp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3Sp+0.7 La</td>
</tr>
<tr>
<td>Type B Rip Rap Apron</td>
<td>5</td>
<td>3Sp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3Sp+0.4 La</td>
</tr>
</tbody>
</table>

Sp = Inner Dia. Of Pipe / Max. Inside Span
Do = Inner Dia. Of Pipe
Q = Flow (cfs)
La = Length of Apron = (1.7*Q) / (Do^(3/2)) + 8*Do
d50 = median stone diameter = (0.02/TW) * (Q/Do)^(4/3)
TW = Tailwater

C1 OUTLET

<table>
<thead>
<tr>
<th>Do (ft)</th>
<th>Q (cfs)</th>
<th>La (ft)</th>
<th>X</th>
<th>W1 (ft)</th>
<th>W2 (ft)</th>
<th>TW (ft)</th>
<th>d50 (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.33</td>
<td>0.12</td>
<td>3.72</td>
<td>3.00</td>
<td>0.99</td>
<td>3.59</td>
<td>0.38</td>
<td>0.01</td>
</tr>
</tbody>
</table>
HYDROLOGICAL & HYDRAULIC CALCULATIONS
EXISTING CONDITIONS

- 1, 2, 5, 10, 50 and 100 Year 24 Hour Storm Events Model
  o Node Listings
  o Node Totals

- 25 Year 24 Hour Storm Event Model
  o Routing Diagram
  o Summaries
  o Wizards
  o Hydrograph Plots
  o Stage-Discharge Plots
  o Stage-Storage Plots
  o Stage-Storage Tables
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method  - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EX-CALHOUN DRIVE  Runoff Area=36,747 sf  21.98% Impervious  Runoff Depth=0.62"
Flow Length=210'  Tc=7.8 min  CN=69  Runoff=0.48 cfs  1,906 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 1,906 cf  Average Runoff Depth = 0.62"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr
1-YEAR Rainfall=2.90"
Runoff Area=36,747 sf
Runoff Volume=1,906 cf
Runoff Depth=0.62"
Flow Length=210'
Tc=7.8 min
CN=69
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EX-CALHOUN DRIVE

Runoff Area=36,747 sf  21.98% Impervious  Runoff Depth=0.90"
Flow Length=210'  Tc=7.8 min  CN=69  Runoff=0.75 cfs  2,761 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 2,761 cf  Average Runoff Depth = 0.90"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr 2-YEAR Rainfall=3.40"  
Runoff Area=36,747 sf  
Runoff Volume=2,761 cf  
Runoff Depth=0.90"  
Flow Length=210'  
Tc=7.8 min  
CN=69
Subcatchment 1S: EX-CALHOUN DRIVE  
Runoff Area=36,747 sf  21.98% Impervious  Runoff Depth=1.47"
Flow Length=210'  Tc=7.8 min  CN=69  Runoff=1.31 cfs  4,515 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 4,515 cf  Average Runoff Depth = 1.47"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr
5-YEAR Rainfall=4.30"  
Runoff Area=36,747 sf  
Runoff Volume=4,515 cf  
Runoff Depth=1.47"  
Flow Length=210'  
Tc=7.8 min  
CN=69
Subcatchment 1S: EX-CALHOUN DRIVE

Runoff Area = 36,747 sf  21.98% Impervious  Runoff Depth = 2.04"
Flow Length = 210'  Tc = 7.8 min  CN = 69  Runoff = 1.86 cfs  6,250 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 6,250 cf  Average Runoff Depth = 2.04"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr 10-YEAR Rainfall=5.10"
Runoff Area=36,747 sf
Runoff Volume=6,250 cf
Runoff Depth=2.04"
Flow Length=210'
Tc=7.8 min
CN=69
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EX-CALHOUN DRIVE  
Runoff Area=36,747 sf  21.98% Impervious  Runoff Depth=3.04"
Flow Length=210'  Tc=7.8 min  CN=69  Runoff=2.82 cfs  9,313 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 9,313 cf  Average Runoff Depth = 3.04"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr
25-YEAR Rainfall=6.40" 
Runoff Area=36,747 sf 
Runoff Volume=9,313 cf 
Runoff Depth=3.04"
Flow Length=210'
Tc=7.8 min 
CN=69
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EX-CALHOUN DRIVE  Runoff Area=36,747 sf  21.98% Impervious  Runoff Depth=4.03"
Flow Length=210'  Tc=7.8 min  CN=69  Runoff=3.75 cfs  12,330 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 12,330 cf  Average Runoff Depth = 4.03"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr 50-YEAR Rainfall=7.60"  
Runoff Area=36,747 sf  
Runoff Volume=12,330 cf  
Runoff Depth=4.03"  
Flow Length=210'  
Tc=7.8 min  
CN=69
Subcatchment 1S: EX-CALHOUN DRIVE

Runoff Area = 36,747 sf  21.98% Impervious  Runoff Depth = 5.32"
Flow Length = 210'  Tc = 7.8 min  CN = 69  Runoff = 4.94 cfs  16,277 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 16,277 cf  Average Runoff Depth = 5.32"
78.02% Pervious = 28,670 sf  21.98% Impervious = 8,077 sf
Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr 100-YEAR Rainfall=9.10"
Runoff Area=36,747 sf
Runoff Volume=16,277 cf
Runoff Depth=5.32'
Flow Length=210'
Tc=7.8 min
CN=69
Summary for Subcatchment 1S: EX-CALHOUN DRIVE

Runoff = 2.82 cfs @ 12.11 hrs, Volume = 9,313 cf, Depth = 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-27.00 hrs, dt = 0.01 hrs
Type III 24-hr 25-YEAR Rainfall = 6.40"

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<td>&gt;75% Grass cover, Good, HSG B</td>
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<td>36,747</td>
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<td>Weighted Average</td>
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<tr>
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<td>78.02% Pervious Area</td>
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<td>21.98% Impervious Area</td>
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<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
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Subcatchment 1S: EX-CALHOUN DRIVE

Type III 24-hr
25-YEAR Rainfall=6.40"
Runoff Area=36,747 sf
Runoff Volume=9,313 cf
Runoff Depth=3.04"
Flow Length=210'
Tc=7.8 min
CN=69
HYDROLOGICAL & HYDRAULIC CALCULATIONS

PROPOSED CONDITIONS

- 1, 2, 5, 10, 50 and 100 Year 24 Hour Storm Events Model
  - Node Listings
  - Node Totals

- 25 Year 24 Hour Storm Event Model
  - Routing Diagram
  - Summaries
  - Wizards
  - Hydrograph Plots
  - Stage-Discharge Plots
  - Stage-Storage Plots
  - Stage-Storage Tables
Time span: 0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: PR-REAR ROOF
- Runoff Area = 1,125 sf
- 100.00% Impervious
- Runoff Depth = 2.67"
- Tc = 5.0 min
- CN = 98
- Runoff = 0.08 cfs
- 250 cf

Subcatchment 3S: PR-FRONT ROOF AND
- Runoff Area = 1,288 sf
- 100.00% Impervious
- Runoff Depth = 2.67"
- Tc = 5.0 min
- CN = 98
- Runoff = 0.09 cfs
- 286 cf

Subcatchment 4S: PR-SIDE ROOF AND
- Runoff Area = 2,382 sf
- 83.21% Impervious
- Runoff Depth = 2.05"
- Tc = 5.0 min
- CN = 92
- Runoff = 0.13 cfs
- 406 cf

Subcatchment 5S: PR-SITE
- Runoff Area = 31,199 sf
- 20.24% Impervious
- Runoff Depth = 0.60"
- Flow Length = 182'
- Tc = 8.5 min
- CN = 68
- Runoff = 0.37 cfs
- 1,549 cf

Subcatchment 10S: PR-SHARED DRIVE
- Runoff Area = 753 sf
- 100.00% Impervious
- Runoff Depth = 2.67"
- Tc = 5.0 min
- CN = 98
- Runoff = 0.05 cfs
- 167 cf

Pond C1: PR-CULTEC 1
- Peak Elev = 162.32'
- Storage = 161 cf
- Inflow = 0.08 cfs
- 250 cf
- Outflow = 0.01 cfs
- 101 cf

Pond C2: PR-CULTEC 2
- Peak Elev = 154.61'
- Storage = 162 cf
- Inflow = 0.07 cfs
- 286 cf
- Outflow = 0.03 cfs
- 136 cf

Pond C3: PR-CULTEC 3
- Peak Elev = 153.10'
- Storage = 161 cf
- Inflow = 0.20 cfs
- 393 cf
- Outflow = 0.03 cfs
- 243 cf

Pond PP1: PR-POROUS DRIVE 1
- Peak Elev = 155.88'
- Storage = 30 cf
- Inflow = 0.09 cfs
- 286 cf
- Outflow = 0.07 cfs
- 286 cf

Pond PP2: PR-POROUS DRIVE 2
- Peak Elev = 153.07'
- Storage = 338 cf
- Inflow = 0.13 cfs
- 406 cf
- Outflow = 0.03 cfs
- 82 cf

Link 9L: PR-CALHOUN
- Inflow = 0.37 cfs
- 1,893 cf
- Primary = 0.37 cfs
- 1,893 cf

Total Runoff Area = 36,747 sf
Runoff Volume = 2,659 cf
Average Runoff Depth = 0.87"
68.81% Pervious = 25,284 sf
31.19% Impervious = 11,463 sf
2020-6-10 - HYDROCAD - 21 CALHOUN - LOWER HOU  Type III 24-hr 2-YEAR Rainfall=3.40"
Prepared by S.E. Minor & Co., Inc.
HydroCAD® 10.00-18 s/n 04499 © 2016 HydroCAD Software Solutions LLC

PR SUMMARY

Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: PR-REAR ROOF
   Runoff Area=1,125 sf  100.00% Impervious  Runoff Depth=3.17"
   Tc=5.0 min  CN=98  Runoff=0.09 cfs  297 cf

Subcatchment 3S: PR-FRONT ROOF AND
   Runoff Area=1,288 sf  100.00% Impervious  Runoff Depth=3.17"
   Tc=5.0 min  CN=98  Runoff=0.10 cfs  340 cf

Subcatchment 4S: PR-SIDE ROOF AND
   Runoff Area=2,382 sf  83.21% Impervious  Runoff Depth=2.52"
   Tc=5.0 min  CN=92  Runoff=0.16 cfs  500 cf

Subcatchment 5S: PR-SITE
   Runoff Area=31,199 sf  20.24% Impervious  Runoff Depth=0.87"
   Flow Length=182'  Tc=8.5 min  CN=68  Runoff=0.59 cfs  2,258 cf

Subcatchment 10S: PR-SHARED DRIVE
   Runoff Area=753 sf  100.00% Impervious  Runoff Depth=3.17"
   Tc=5.0 min  CN=98  Runoff=0.06 cfs  199 cf

Pond C1: PR-CULTEC 1
   Peak Elev=162.37'  Storage=169 cf  Inflow=0.09 cfs  297 cf
   Outflow=0.03 cfs  148 cf

Pond C2: PR-CULTEC 2
   Peak Elev=154.67'  Storage=167 cf  Inflow=0.08 cfs  339 cf
   Outflow=0.05 cfs  190 cf

Pond C3: PR-CULTEC 3
   Peak Elev=153.14'  Storage=165 cf  Inflow=0.16 cfs  569 cf
   Outflow=0.04 cfs  419 cf

Pond PP1: PR-POOROUS DRIVE 1
   Peak Elev=155.91'  Storage=34 cf  Inflow=0.10 cfs  340 cf
   Outflow=0.08 cfs  339 cf

Pond PP2: PR-POOROUS DRIVE 2
   Peak Elev=153.10'  Storage=345 cf  Inflow=0.16 cfs  500 cf
   Outflow=0.04 cfs  176 cf

Link 9L: PR-CALHOUN
   Inflow=0.80 cfs  2,825 cf
   Primary=0.80 cfs  2,825 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 3,594 cf  Average Runoff Depth = 1.17"
68.81% Pervious = 25,284 sf  31.19% Impervious = 11,463 sf
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: PR-REAR ROOF
Runoff Area=1,125 sf 100.00% Impervious  Runoff Depth=4.06"
  Tc=5.0 min  CN=98  Runoff=0.11 cfs 381 cf

Subcatchment 3S: PR-FRONT ROOF AND
Runoff Area=1,288 sf 100.00% Impervious  Runoff Depth=4.06"
  Tc=5.0 min  CN=98  Runoff=0.13 cfs 436 cf

Subcatchment 4S: PR-SIDE ROOF AND
Runoff Area=2,382 sf 83.21% Impervious  Runoff Depth=3.39"
  Tc=5.0 min  CN=92  Runoff=0.22 cfs 672 cf

Subcatchment 5S: PR-SITE
Runoff Area=31,199 sf 20.24% Impervious  Runoff Depth=1.43"
  Flow Length=182’  Tc=8.5 min  CN=68  Runoff=1.05 cfs 3,721 cf

Subcatchment 10S: PR-SHARED DRIVE
Runoff Area=753 sf 100.00% Impervious  Runoff Depth=4.06"
  Tc=5.0 min  CN=98  Runoff=0.08 cfs 255 cf

Pond C1: PR-CULTEC 1
Peak Elev=162.46’ Storage=183 cf  Inflow=0.11 cfs 381 cf
  Outflow=0.07 cfs 232 cf

Pond C2: PR-CULTEC 2
Peak Elev=154.76’ Storage=175 cf  Inflow=0.10 cfs 436 cf
  Outflow=0.09 cfs 286 cf

Pond C3: PR-CULTEC 3
Peak Elev=153.31’ Storage=180 cf  Inflow=0.20 cfs 888 cf
  Outflow=0.16 cfs 738 cf

Pond PP1: PR-POROUS DRIVE 1
Peak Elev=155.96’ Storage=42 cf  Inflow=0.13 cfs 436 cf
  Outflow=0.10 cfs 436 cf

Pond PP2: PR-POROUS DRIVE 2
Peak Elev=153.33’ Storage=371 cf  Inflow=0.22 cfs 672 cf
  Outflow=0.14 cfs 347 cf

Link 9L: PR-CALHOUN
Inflow=1.12 cfs 4,692 cf
Primary=1.12 cfs 4,692 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 5,466 cf  Average Runoff Depth = 1.78"
68.81% Pervious = 25,284 sf  31.19% Impervious = 11,463 sf
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| Subcatchment  2S: PR-REAR ROOF | Runoff Area=1,125 sf  100.00% Impervious  Runoff Depth=4.86"  
|                             | Tc=5.0 min  CN=98  Runoff=0.13 cfs  456 cf   |
| Subcatchment  3S: PR-FRONT ROOF AND | Runoff Area=1,288 sf  100.00% Impervious  Runoff Depth=4.86"  
|                             | Tc=5.0 min  CN=98  Runoff=0.15 cfs  522 cf   |
| Subcatchment  4S: PR-SIDE ROOF AND | Runoff Area=2,382 sf  83.21% Impervious  Runoff Depth=4.16"  
|                             | Tc=5.0 min  CN=92  Runoff=0.26 cfs  827 cf   |
| Subcatchment  5S: PR-SITE | Runoff Area=31,199 sf  20.24% Impervious  Runoff Depth=1.99"  
|                             | Flow Length=182'  Tc=8.5 min  CN=68  Runoff=1.50 cfs  5,173 cf   |
| Subcatchment 10S: PR-SHARED DRIVE | Runoff Area=753 sf  100.00% Impervious  Runoff Depth=4.86"  
|                             | Tc=5.0 min  CN=98  Runoff=0.09 cfs  305 cf   |
| Pond C1: PR-CULTEC 1 | Peak Elev=162.53'  Storage=194 cf  Inflow=0.13 cfs  456 cf  
|                             | Outflow=0.10 cfs  307 cf   |
| Pond C2: PR-CULTEC 2 | Peak Elev=154.81'  Storage=180 cf  Inflow=0.11 cfs  521 cf  
|                             | Outflow=0.10 cfs  372 cf   |
| Pond C3: PR-CULTEC 3 | Peak Elev=153.72'  Storage=213 cf  Inflow=1.13 cfs  1,214 cf  
|                             | Outflow=0.31 cfs  1,084 cf   |
| Pond PP1: PR-POORUS DRIVE 1 | Peak Elev=156.02'  Storage=50 cf  Inflow=0.15 cfs  522 cf  
|                             | Outflow=0.11 cfs  521 cf   |
| Pond PP2: PR-POORUS DRIVE 2 | Peak Elev=153.56'  Storage=419 cf  Inflow=0.26 cfs  827 cf  
|                             | Outflow=0.51 cfs  502 cf   |
| Link 9L: PR-CALHOUN | Inflow=1.79 cfs  6,544 cf  
|                             | Primary=1.79 cfs  6,544 cf   |

Total Runoff Area = 36,747 sf  Runoff Volume = 7,283 cf  Average Runoff Depth = 2.38"
68.81% Pervious = 25,284 sf  31.19% Impervious = 11,463 sf
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

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<th>Impervious (%)</th>
<th>Runoff Depth</th>
<th>Tc (min)</th>
<th>CN</th>
<th>Runoff (cfs)</th>
<th>Storage (cf)</th>
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<td>100.00</td>
<td>6.16</td>
<td>5.0</td>
<td>98</td>
<td>0.17</td>
<td>578</td>
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<td>3S: PR-FRONT ROOF AND</td>
<td>1,288</td>
<td>100.00</td>
<td>6.16</td>
<td>5.0</td>
<td>98</td>
<td>0.19</td>
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<tr>
<td>4S: PR-SIDE ROOF AND</td>
<td>2,382</td>
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<td>92</td>
<td>0.34</td>
<td>1,080</td>
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<td>5S: PR-SITE</td>
<td>31,199</td>
<td>20.24</td>
<td>2.98</td>
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<td>10S: PR-SHARED DRIVE</td>
<td>753</td>
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<td>5.0</td>
<td>98</td>
<td>0.11</td>
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**Pond C1: PR-CULTEC 1**
- Peak Elev=162.63'
- Storage=206 cf
- Inflow=0.17 cfs
- Outflow=0.12 cfs
- Storage=578 cf

**Pond C2: PR-CULTEC 2**
- Peak Elev=154.89'
- Storage=186 cf
- Inflow=0.13 cfs
- Outflow=0.12 cfs
- Storage=661 cf

**Pond C3: PR-CULTEC 3**
- Peak Elev=154.21'
- Storage=219 cf
- Inflow=0.83 cfs
- Outflow=0.43 cfs
- Storage=1,676 cf

**Pond PP1: PR-POUROUS DRIVE 1**
- Peak Elev=156.12'
- Storage=64 cf
- Inflow=0.19 cfs
- Outflow=0.13 cfs
- Storage=661 cf

**Pond PP2: PR-POUROUS DRIVE 2**
- Peak Elev=153.70'
- Storage=491 cf
- Inflow=0.34 cfs
- Outflow=0.62 cfs
- Storage=1,080 cf

**Link 9L: PR-CALHOUN**
- Inflow=2.72 cfs
- Storage=9,699 cf
- Primary=2.72 cfs

Total Runoff Area = 36,747 sf
Runoff Volume = 10,450 cf
Average Runoff Depth = 3.41"
Time span=0.00-27.00 hrs, dt=0.01 hrs, 2701 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 2S: PR-REAR ROOF
Runoff Area=1,125 sf 100.00% Impervious  Runoff Depth=7.36″
Tc=5.0 min  CN=98  Runoff=0.20 cfs 690 cf

Subcatchment 3S: PR-FRONT ROOF AND
Runoff Area=1,288 sf 100.00% Impervious  Runoff Depth=7.36″
Tc=5.0 min  CN=98  Runoff=0.23 cfs 790 cf

Subcatchment 4S: PR-SIDE ROOF AND
Runoff Area=2,382 sf 83.21% Impervious  Runoff Depth=6.62″
Tc=5.0 min  CN=92  Runoff=0.41 cfs 1,315 cf

Subcatchment 5S: PR-SITE
Runoff Area=31,199 sf 20.24% Impervious  Runoff Depth=3.96″
Flow Length=182’  Tc=8.5 min  CN=68  Runoff=3.05 cfs 10,284 cf

Subcatchment 10S: PR-SHARED DRIVE
Runoff Area=753 sf 100.00% Impervious  Runoff Depth=7.36″
Tc=5.0 min  CN=98  Runoff=0.13 cfs 462 cf

Pond C1: PR-CULTEC 1
Peak Elev=162.73’ Storage=217 cf  Inflow=0.20 cfs 690 cf
Outflow=0.14 cfs 541 cf

Pond C2: PR-CULTEC 2
Peak Elev=155.13’ Storage=205 cf  Inflow=0.15 cfs 789 cf
Outflow=0.18 cfs 640 cf

Pond C3: PR-CULTEC 3
Peak Elev=155.35’ Storage=219 cf  Inflow=0.98 cfs 2,161 cf
Outflow=0.62 cfs 2,011 cf

Pond PP1: PR-POREOUS DRIVE 1
Peak Elev=156.22’ Storage=78 cf  Inflow=0.23 cfs 790 cf
Outflow=0.15 cfs 789 cf

Pond PP2: PR-POREOUS DRIVE 2
Peak Elev=153.74’ Storage=514 cf  Inflow=0.41 cfs 1,315 cf
Outflow=0.74 cfs 990 cf

Link 9L: PR-CALHOUN
Inflow=3.79 cfs 12,836 cf
Primary=3.79 cfs 12,836 cf

Total Runoff Area = 36,747 sf Runoff Volume = 13,540 cf Average Runoff Depth = 4.42″
68.81% Pervious = 25,284 sf 31.19% Impervious = 11,463 sf
Subcatchment 2S: PR-REAR ROOF
Runoff Area=1,125 sf  100.00% Impervious  Runoff Depth=8.86"  
Tc=5.0 min  CN=98  Runoff=0.24 cfs  831 cf

Subcatchment 3S: PR-FRONT ROOF AND
Runoff Area=1,288 sf  100.00% Impervious  Runoff Depth=8.86"  
Tc=5.0 min  CN=98  Runoff=0.27 cfs  951 cf

Subcatchment 4S: PR-SIDE ROOF AND
Runoff Area=2,382 sf  83.21% Impervious  Runoff Depth=8.11"  
Tc=5.0 min  CN=92  Runoff=0.49 cfs  1,609 cf

Subcatchment 5S: PR-SITE
Runoff Area=31,199 sf  20.24% Impervious  Runoff Depth=5.24"  
Flow Length=182'  Tc=8.5 min  CN=68  Runoff=4.04 cfs  13,611 cf

Subcatchment 10S: PR-SHARED DRIVE
Runoff Area=753 sf  100.00% Impervious  Runoff Depth=8.86"  
Tc=5.0 min  CN=98  Runoff=0.16 cfs  556 cf

Pond C1: PR-CULTEC 1
Peak Elev=162.87'  Storage=231 cf  Inflow=0.24 cfs  831 cf  
Outflow=0.17 cfs  682 cf

Pond C2: PR-CULTEC 2
Peak Elev=155.08'  Storage=201 cf  Inflow=0.18 cfs  950 cf  
Outflow=0.16 cfs  801 cf

Pond C3: PR-CULTEC 3
Peak Elev=157.56'  Storage=219 cf  Inflow=1.04 cfs  2,685 cf  
Outflow=0.88 cfs  2,534 cf

Pond PP1: PR-POOROUS DRIVE 1
Peak Elev=156.35'  Storage=97 cf  Inflow=0.27 cfs  951 cf  
Outflow=0.18 cfs  950 cf

Pond PP2: PR-POOROUS DRIVE 2
Peak Elev=153.80'  Storage=545 cf  Inflow=0.49 cfs  1,609 cf  
Outflow=0.77 cfs  1,284 cf

Link 9L: PR-CALHOUN
Inflow=5.06 cfs  16,827 cf  
Primary=5.06 cfs  16,827 cf

Total Runoff Area = 36,747 sf  Runoff Volume = 17,558 cf  Average Runoff Depth = 5.73"  
68.81% Pervious = 25,284 sf  31.19% Impervious = 11,463 sf
Summary for Subcatchment 2S: PR-REAR ROOF

Runoff = 0.17 cfs @ 12.07 hrs, Volume= 578 cf, Depth= 6.16''

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.40''

<table>
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<tr>
<th>Area (sf)</th>
<th>CN</th>
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Subcatchment 2S: PR-REAR ROOF

Type III 24-hr 25-YEAR Rainfall=6.40''
Runoff Area=1,125 sf
Runoff Volume=578 cf
Runoff Depth=6.16''
Tc=5.0 min
CN=98
Summary for Subcatchment 3S: PR-FRONT ROOF AND UPPER DRIVE

Runoff = 0.19 cfs @ 12.07 hrs, Volume = 661 cf, Depth = 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-27.00 hrs, dt = 0.01 hrs
Type III 24-hr 25-YEAR Rainfall = 6.40"

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

Subcatchment 3S: PR-FRONT ROOF AND UPPER DRIVE

Hydrograph

Type III 24-hr
25-YEAR Rainfall = 6.40"
Runoff Area = 1,288 sf
Runoff Volume = 661 cf
Runoff Depth = 6.16"
Tc = 5.0 min
CN = 98
Runoff = 0.34 cfs @ 12.07 hrs, Volume= 1,080 cf, Depth= 5.44''
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.40''

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Subcatchment 4S: PR-SIDE ROOF AND LOWER DRIVE

Type III 24-hr 25-YEAR Rainfall=6.40''
Runoff Area=2,382 sf
Runoff Volume=1,080 cf
Runoff Depth=5.44''
Tc=5.0 min
CN=92
Summary for Subcatchment 5S: PR-SITE

Runoff = 2.28 cfs @ 12.12 hrs, Volume= 7,745 cf, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

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<td>Patio, HSG B</td>
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<td>&gt;75% Grass cover, Good, HSG B</td>
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<td>Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps</td>
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8.5 182 Total
Subcatchment 5S: PR-SITE

Type III 24-hr
25-YEAR Rainfall=6.40"
Runoff Area=31,199 sf
Runoff Volume=7,745 cf
Runoff Depth=2.98"
Flow Length=182'
Tc=8.5 min
CN=68
Summary for Subcatchment 10S: PR-SHARED DRIVE

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 387 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

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<td>100.00% Impervious Area</td>
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Tc (min) 5.0
Length (feet) 100.00
Slope (ft/ft) 0.00
Velocity (ft/sec) 0.00
Capacity (cfs) 0.00

Direct Entry,

Subcatchment 10S: PR-SHARED DRIVE

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=753 sf
Runoff Volume=387 cf
Runoff Depth=6.16"
Tc=5.0 min
CN=98
Summary for Pond C1: PR-CULTEC 1

Inflow Area = 1,125 sf, 100.00% Impervious, Inflow Depth = 6.16" for 25-YEAR event
Inflow = 0.17 cfs @ 12.07 hrs, Volume = 578 cf
Outflow = 0.12 cfs @ 12.14 hrs, Volume = 429 cf, Atten = 27%, Lag = 4.1 min
Primary = 0.12 cfs @ 12.14 hrs, Volume = 429 cf

Routing by Dyn-Stor-Ind method, Time Span = 0.00-27.00 hrs, dt = 0.01 hrs / 2
Peak Elev = 162.63' @ 12.14 hrs Surf.Area = 254 sf Storage = 206 cf

Plug-Flow detention time = 183.3 min calculated for 429 cf (74% of inflow)
Center-of-Mass det. time = 94.4 min (837.7 - 743.3)

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<tr>
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<td>161.20'</td>
<td>132 cf</td>
<td>11.67'W x 17.50'L x 2.04'H Field A</td>
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<tr>
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<td>417 cf Overall - 87 cf Embedded = 330 cf x 40.0% Voids</td>
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<tr>
<td>#2A</td>
<td>161.70'</td>
<td>87 cf</td>
<td>Culfec C-100 x 6 Inside #1</td>
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<tr>
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<td>Effective Size = 32.1&quot;W x 12.0&quot;H =&gt; 1.86 sf x 7.50'L = 14.0 cf</td>
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<tr>
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<td></td>
<td>Overall Size = 36.0&quot;W x 12.5&quot;H x 8.00'L with 0.50' Overlap</td>
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<tr>
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<td></td>
<td>Row Length Adjustment = +0.50' x 1.86 sf x 3 rows</td>
</tr>
<tr>
<td>#3B</td>
<td>161.20'</td>
<td>35 cf</td>
<td>5.00'W x 10.00'L x 2.04'H Field B</td>
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<tr>
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<td></td>
<td>102 cf Overall - 15 cf Embedded = 87 cf x 40.0% Voids</td>
</tr>
<tr>
<td>#4B</td>
<td>161.70'</td>
<td>15 cf</td>
<td>Culfec C-100 Inside #3</td>
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<td>Effective Size = 32.1&quot;W x 12.0&quot;H =&gt; 1.86 sf x 7.50'L = 14.0 cf</td>
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<td>Overall Size = 36.0&quot;W x 12.5&quot;H x 8.00'L with 0.50' Overlap</td>
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<td>Row Length Adjustment = +0.50' x 1.86 sf x 1 rows</td>
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</table>

268 cf Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device | Routing | Invert  | Outlet Devices |
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</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>162.24'</td>
<td>3.0' Vert. Orifice/Grate C = 0.600</td>
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</tbody>
</table>

Primary OutFlow Max = 0.12 cfs @ 12.14 hrs HW = 162.63' TW = 0.00' (Dynamic Tailwater)
1 = Orifice/Grate (Orifice Controls 0.12 cfs @ 2.50 fps)
Pond C1: PR-CULTEC 1 - Chamber Wizard Field A

Chamber Model = Cultec C-100 (Cultec Contactor® 100, DISCONTINUED, Use C-100HD for new designs)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 3 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

2 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length
3 Rows x 36.0" Wide + 4.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.67' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

6 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 3 Rows = 86.6 cf Chamber Storage
416.8 cf Field - 86.6 cf Chambers = 330.3 cf Stone x 40.0% Voids = 132.1 cf Stone Storage

Chamber Storage + Stone Storage = 218.7 cf = 0.005 af
Overall Storage Efficiency = 52.5%
Overall System Size = 17.50' x 11.67' x 2.04'

6 Chambers
15.4 cy Field
12.2 cy Stone
Pond C1: PR-CULTEC 1 - Chamber Wizard Field B

Chamber Model = Cultec C-100 (Cultec Contactor® 100, DISCONTINUED, Use C-100HD for new designs)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 1 rows

1 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 8.00' Row Length +12.0" End Stone x 2 = 10.00'
Base Length
1 Rows x 36.0" Wide + 12.0" Side Stone x 2 = 5.00' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

1 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 1 Rows = 14.9 cf Chamber Storage

102.1 cf Field - 14.9 cf Chambers = 87.2 cf Stone x 40.0% Voids = 34.9 cf Stone Storage

Chamber Storage + Stone Storage = 49.8 cf = 0.001 af
Overall Storage Efficiency = 48.8%
Overall System Size = 10.00' x 5.00' x 2.04'

1 Chambers
3.8 cy Field
3.2 cy Stone
Pond C1: PR-CULTEC 1

Inflow Area = 1,125 sf
Peak Elev = 162.63'
Storage = 206 cf
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Summary for Pond C2: PR-CULTEC 2

Inflow Area = 1,288 sf, 100.00% Impervious. Inflow Depth > 6.15" for 25-YEAR event
Inflow = 0.13 cfs @ 12.14 hrs, Volume= 661 cf
Outflow = 0.12 cfs @ 12.23 hrs, Volume= 511 cf, Atten= 9%, Lag= 5.0 min
Primary = 0.12 cfs @ 12.23 hrs, Volume= 511 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 154.88' @ 12.23 hrs Surf.Area= 204 sf Storage= 186 cf

Plug-Flow detention time= 166.0 min calculated for 511 cf (77% of inflow)
Center-of-Mass det. time= 80.9 min (839.2 - 758.3)

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<td>153.25'</td>
<td>132 cf</td>
<td>11.67'W x 17.50'L x 2.04'H Field A</td>
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<td></td>
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<td></td>
<td>417 cf Overall - 87 cf Embedded = 330 cf x 40.0% Voids</td>
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<tr>
<td>#2A</td>
<td>153.75'</td>
<td>87 cf</td>
<td>Cultec C-100 x 6 Inside #1</td>
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<td>Effective Size= 32.1&quot;W x 12.0&quot;H =&gt; 1.86 sf x 7.50'L = 14.0 cf</td>
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<td>Overall Size= 36.0&quot;W x 12.5&quot;H x 8.00'L with 0.50' Overlap</td>
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<td>Row Length Adjustment= +0.50' x 1.86 sf x 3 rows</td>
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219 cf Total Available Storage

Storage Group A created with Chamber Wizard

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<td>Primary</td>
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<td>3.0' Vert. Orifice/Grate</td>
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Primary OutFlow Max=0.12 cfs @ 12.23 hrs HW=154.88' TW=153.74' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 0.12 cfs @ 2.49 fps)
Pond C2: PR-CULTEC 2 - Chamber Wizard Field A

Chamber Model = Cultec C-100 (Cultec Contactor® 100, DISCONTINUED, Use C-100HD for new designs)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 3 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

2 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50'
Base Length
3 Rows x 36.0" Wide + 4.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.67" Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

6 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 3 Rows = 86.6 cf Chamber Storage

416.8 cf Field - 86.6 cf Chambers = 330.3 cf Stone x 40.0% Voids = 132.1 cf Stone Storage

Chamber Storage + Stone Storage = 218.7 cf = 0.005 af
Overall Storage Efficiency = 52.5%
Overall System Size = 17.50' x 11.67' x 2.04'

6 Chambers
15.4 cy Field
12.2 cy Stone
Pond C2: PR-CULTEC 2

**Hydrograph**

- Inflow Area = 1,288 sf
- Peak Elev = 154.89'
- Storage = 186 cf

**Stage-Discharge**

- Elevation (feet)
- Discharge (cfs)
Pond C2: PR-CULTEC 2

Stage-Area-Storage

Elevation (feet)

Storage (cubic-feet)
## Stage-Area-Storage for Pond C2: PR-CULTEC 2

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Summary for Pond C3: PR-CULTEC 3

Inflow Area = 4,423 sf, 90.96% Impervious, Inflow Depth > 4.55" for 25-YEAR event
Inflow = 0.83 cfs @ 12.03 hrs, Volume = 1,676 cf
Outflow = 0.43 cfs @ 12.24 hrs, Volume = 1,525 cf, Atten= 48%, Lag= 12.6 min
Primary = 0.43 cfs @ 12.24 hrs, Volume = 1,525 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 154.21' @ 12.24 hrs  Surf.Area= 204 sf  Storage= 219 cf

Plug-Flow detention time= 76.4 min calculated for 1,525 cf (91% of inflow)
Center-of-Mass det. time= 29.9 min ( 856.1 - 826.3 )

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<td>11.67'W x 17.50'L x 2.04'H Field A</td>
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<td>417 cf Overall - 87 cf Embedded = 330 cf x 40.0% Voids</td>
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<tr>
<td>#2A</td>
<td>152.25'</td>
<td>87 cf</td>
<td>Cultec C-100 x 6 Inside #1</td>
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<td>Row Length Adjustment= +0.50' x 1.86 sf x 3 rows</td>
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219 cf  Total Available Storage

Storage Group A created with Chamber Wizard

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<td>Primary</td>
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<td>4.0' Vert. Orifice/Grate C= 0.600</td>
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Primary OutFlow Max=0.43 cfs @ 12.24 hrs  HW=154.19'  TW=0.00'  (Dynamic Tailwater)
1=Orifice/Grate  (Orifice Controls 0.43 cfs @ 4.88 fps)
Pond C3: PR-CULTEC 3 - Chamber Wizard Field A

Chamber Model = Cultec C-100 (Cultec Contactor® 100, DISCONTINUED, Use C-100HD for new designs)
Effective Size = 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size = 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment = +0.50' x 1.86 sf x 3 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

2 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length
3 Rows x 36.0" Wide + 4.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.67' Base Width
6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

6 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 3 Rows = 86.6 cf Chamber Storage

416.8 cf Field - 86.6 cf Chambers = 330.3 cf Stone x 40.0% Voids = 132.1 cf Stone Storage

Chamber Storage + Stone Storage = 218.7 cf = 0.005 af
Overall Storage Efficiency = 52.5%
Overall System Size = 17.50' x 11.67' x 2.04'

6 Chambers
15.4 cy Field
12.2 cy Stone
Pond C3: PR-CULTEC 3

Hydrograph

Inflow Area = 4,423 sf
Peak Elev = 154.21'
Storage = 219 cf

Stage-Discharge
Stage-Area-Storage for Pond C3: PR-CULTEC 3

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## Summary for Pond PP1: PR-POOROUS DRIVE 1

Inflow Area = 1,288 sf, 100.00% Impervious, Inflow Depth = 6.16" for 25-YEAR event

Inflow = 0.19 cfs @ 12.07 hrs, Volume= 661 cf
Outflow = 0.13 cfs @ 12.14 hrs, Volume= 661 cf, Atten= 30%, Lag= 4.4 min
Primary = 0.13 cfs @ 12.14 hrs, Volume= 661 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 156.12' @ 12.14 hrs Surf.Area= 356 sf Storage= 64 cf

Plug-Flow detention time= 15.8 min calculated for 661 cf (100% of inflow)
Center-of-Mass det. time= 15.1 min (758.3 - 743.3)

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349 cf Total Available Storage

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### Device Routing Invert Outlet Devices

#1 Primary 155.67' 3.0' Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.13 cfs @ 12.14 hrs HW=156.12' TW=154.86' (Dynamic Tailwater)
Orifice/Grate (orifice Controls 0.13 cfs @ 2.73 fps)
Pond PP1: PR-POOROUS DRIVE 1

Inflow Area = 1,288 sf
Peak Elev = 156.12'
Storage = 64 cf
### Stage-Area-Storage for Pond PP1: PR-POOROUS DRIVE 1

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Summary for Pond PP2: PR-POOROUS DRIVE 2

Inflow Area = 2,382 sf, 83.21% Impervious, Inflow Depth = 5.44" for 25-YEAR event
Inflow = 0.34 cfs @ 12.07 hrs, Volume= 1,080 cf
Outflow = 0.62 cfs @ 12.53 hrs, Volume= 755 cf, Atten= 0%, Lag= 27.6 min
Primary = 0.65 cfs @ 12.03 hrs, Volume= 778 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 153.70' @ 12.22 hrs Surge.Area= 1,611 sf Storage= 481 cf

Plug-Flow detention time= 180.2 min calculated for 755 cf (70% of inflow)
Center-of-Mass det. time= 88.1 min (863.3 - 775.2)

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Primary OutFlow Max=0.00 cfs @ 12.03 hrs HW=153.51' TW=153.53' (Dynamic Tailwater)

1=Orifice/Grate (Controls 0.00 cfs)
2=Orifice/Grate (Controls 0.00 cfs)
3=Orifice/Grate (Controls 0.00 cfs)
Pond PP2: PR-POUSORE DRIVE 2

Hydrograph

Inflow Area=2,382 sf
Peak Elev=153.70'
Storage=491 cf

Stage-Discharge

Initial Tailwater
Pond PP2: PR-POOROUS DRIVE 2

Stage-Area-Storage

FREEBOARD

POROUS ASPHALT

POROUS STONE SUB BASE
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Summary for Link 9L: PR-CALHOUN

Inflow Area = 36,747 sf, 31.19% Impervious, Inflow Depth > 3.17" for 25-YEAR event
Inflow = 2.72 cfs @ 12.12 hrs, Volume= 9,699 cf
Primary = 2.72 cfs @ 12.12 hrs, Volume= 9,699 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-27.00 hrs, dt= 0.01 hrs

Link 9L: PR-CALHOUN

Inflow Area=36,747 sf
STORMWATER MANAGEMENT
OPERATIONS & MAINTENANCE

- Maintenance Declaration (MD-100)
- Maintenance Plan
- Inspection Log

(Appended as a separate document)
Stormwater Management Practices Maintenance Declaration

THIS DECLARATION is made this date, ___________, 20___, by and between the Town of Greenwich, a municipal corporation with principal offices located at 101 Field Point Road, Greenwich, CT 06830 and

21 Calhoun Drive, LLC
[Owner(s) Name]
21 Calhoun Drive - Carriage House
[Address]

hereinafter referred to as “Owner(s)” of the “Property” as more fully described in a deed recorded in Book ______ at Page ______ of the Greenwich Land Records. In accordance with the Town of Greenwich Drainage Manual as Amended, the “Owner(s)” agree to install and maintain stormwater management practice(s) on the subject Property in accordance with approved plans and conditions. The Owner further agrees to the terms stated in this document to ensure that the stormwater management practice(s) continues serving the intended function in perpetuity. This Declaration includes the following exhibits located in the project files of one or all of the following Town of Greenwich Departments:

- Building Division – Permit #____________________
- Inland Wetlands and Watercourses Agency – Application #____________________
- Planning and Zoning – Application #____________________

Exhibit A: Long-term Maintenance Plan that prescribes those activities that must be carried out to maintain compliance with this Declaration. Approved Maintenance Plan dated ________________.

Exhibit B: Improvement Location Survey depicting “As-Built” conditions and showing an accurate location of each stormwater management practice affected by this Declaration. Approved Improvement Location Survey dated ________________.

Note: After construction has been verified and accepted by the Town of Greenwich for the stormwater management practices, this declaration shall be recorded by the Owner on the Greenwich Land Records and copies of the recorded document shall be submitted to all of the following Town of Greenwich Departments involved in the approval:

- Building Division
- Inland Wetlands and Watercourses Agency
- Planning and Zoning

Through this Declaration, the Owner(s) hereby subjects the Property to the following covenants, conditions, and restrictions:

1. The Owner(s), at its expense, shall secure from any affected owners of land all easements and releases of rights-of-way necessary for utilization of the stormwater practices identified in Exhibit B and shall record them with the Town Clerk. These easements and releases of rights-of-way shall
not be altered, amended, vacated, released or abandoned without prior written approval of the Town of Greenwich.

2. The Owner(s) shall be solely responsible for the installation, maintenance and repair of the stormwater management practices, drainage easements and associated landscaping identified in Exhibit B in accordance with the Operation and Maintenance Plan (Exhibit A).

3. No alterations or changes to the stormwater management practice(s) identified in Exhibit B shall be permitted unless they are deemed to comply with this Declaration and are approved in writing by the Town of Greenwich.

4. The Owner(s) shall retain the services of a qualified inspector (as described in Exhibit A) to operate and ensure the maintenance of the stormwater management practice(s) identified in Exhibit B in accordance with the Operation and Maintenance Plan (Exhibit A).

5. The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times. Inspection Documentation must be maintained as frequently as required in Exhibit A.

6. The Town of Greenwich or its designee is authorized to access the property as necessary to conduct inspections of the stormwater management practices or drainage easements to ascertain compliance with the intent of this Declaration and the activities prescribed in Exhibit A. Upon written notification by the Town of Greenwich or their designee of required maintenance or repairs, the Owner(s) shall complete the specified maintenance or repairs within a reasonable time frame determined by the Town of Greenwich. The Owner(s) shall be liable for the failure to undertake any maintenance or repairs so that the public health, safety, general welfare or the environment shall not be endangered.

7. If the Owner(s) does not keep the stormwater management practice(s) in reasonable order and condition, or complete maintenance activities in accordance with the Operation and Maintenance Plan contained in Exhibit A, or the required maintenance or repairs under 6 above within the specified time frames, the Town of Greenwich is authorized, but not required, to perform the specified inspections, maintenance or repairs in order to preserve the intended functions of the practice(s) and prevent the practice(s) from becoming a threat to public health, safety, general welfare or the environment. In the case of an emergency, as determined by the Town of Greenwich, no notice shall be required prior to the Town of Greenwich performing emergency maintenance or repairs. The Town of Greenwich may levy the costs and expenses of such inspections, maintenance, repairs and appropriate fees against the Owner(s). The Town of Greenwich at the time of entering upon said stormwater management practice for the purpose of maintenance or repair may file a notice of lien upon the property affected by the lien. If said costs and expenses are not paid by the Owner(s), the Town of Greenwich may pursue the collection of same through appropriate court actions.

8. The Owner(s) hereby conveys to the Town of Greenwich an easement over, on and in the Property for the purpose of access to the stormwater management practice(s) for the inspection, maintenance and repair thereof, should the Owner(s) fail to properly inspect, maintain and repair the practice(s). The Town of Greenwich's execution of any repair or maintenance does not alter the Owner(s) responsibility to maintain in future.
9. The Owner(s) agrees that this Declaration shall be recorded and that the land described in a deed recorded in Book ______ at Page ______ of the Greenwich Land Records shall be subject to the covenants and obligations contained herein, and this Declaration shall bind all current and future owners of the property.

10. The Owner(s) agrees in the event that the Property is sold, transferred, or leased to provide information to the new owner, operator, or lessee regarding proper inspection, maintenance and repair of the stormwater management practice(s). The information shall accompany the first deed transfer and include Exhibits A and B and this Declaration. The transfer of this information shall also be required with any subsequent sale, transfer or lease of the Property.

11. The Owner(s) agree that the rights, obligations and responsibilities hereunder shall commence upon execution of the Declaration.

12. The parties whose signatures appear below hereby represent and warrant that they have the authority and capacity to sign this declaration and bind the respective parties hereto.

13. The Proprietor, its agents, representatives, successors and assigns shall defend, indemnify and hold the Town of Greenwich harmless from and against any claims, demands, actions, damages, injuries, costs or expenses of any nature whatsoever, hereinafter “Claims”, fixed or contingent, known or unknown, arising out of or in any way connected with the design, construction, use, maintenance, repair or operation (or omissions in such regard) of the storm drainage system referred to in the permit as Exhibit “A” hereto, appurtenances, connections and attachments thereto which are the subject of this Declaration. The Proprietor, its agents, representatives, successors and assigns shall not be required to indemnify the Town, its officers, agents, servants, or employees, against any such damages occasioned solely by acts or omissions of the Town, its officers, agents, servants or employees, other than supervisory acts or omissions of the Town, its officers, agents; servants, or employees, in connection with such Claims or the enforcement of this Declaration.
IN WITNESS WHEREOF, the "Owner(s)" have executed this Declaration on this ______ day of 
___________________, 20____ .

By: __________________________
[Owner(s)]

By: __________________________
[Owner(s)]

STATE OF CONNECTICUT
    )
    ) ss: Greenwich
COUNTY OF FAIRFIELD

The foregoing instrument was acknowledged before me on this________ day of 
___________________, 20____ , by __________________________, the
[Owner(s)]

"Owner(s)" of __________________________.
 [Address]

______________________________
Notary Public

My Commission Expires On:

WHEN RECORDED RETURN COPY TO:
[All of the following departments involved in approval: 
Building Division, Inland Wetlands & Watercourses Agency, and Planning & Zoning]
Exhibit A
Operations and Maintenance Plan
21 CALHOUN DRIVE - CARRIAGE HOUSE
6/10/2020

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 21 CALHOUN DRIVE - CARRIAGE HOUSE are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

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

Qualified Inspector:

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

Service Procedures:

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

2. Storm Drainage Piping and Manholes/Junction Boxes:
   a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
   b. Manholes/Junction Boxes shall be inspected and repaired on an annual basis.
c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.

d. Any additional maintenance required per the manufacturer’s specifications shall also be completed.

3. **Stormwater Control Structures:**

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

4. **Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:**

   a. All outfalls shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs to outlet protection material (rip rap) shall be performed.
   
b. For the first year, outfalls shall be inspected on a quarterly basis.
   
c. Any accumulated debris shall be removed and any repairs made to the outfalls as required.
   
d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
   
e. Accumulated debris shall be removed and repairs made as required.
   
f. Any erosion shall be promptly repaired and the cause of the erosion shall be identified and corrected.
   
g. Any additional maintenance required per the manufacturer’s specifications shall also be completed.

5. **Drywells and Infiltration Systems:**

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

6. **Porous Pavement (Pervious Concrete, Porous Asphalt, Permeable Interlocking Concrete Pavers, Flexi pave, Etc.):**
a. Changing the porous pavement surface to an impervious surface requires the review and approval of the Town of Greenwich DPW Engineering Division.
b. Clean and vacuum (Regenerative Air Vacuum for Permeable Interlocking Concrete Pavers) the porous pavement upon the completion of construction.
c. Check for standing water on the surface of the pavement after a precipitation event. If standing water remains within 30 minutes after rainfall had ended, cleaning of porous pavement is recommended.
d. Vacuum sweeper shall be used regularly to remove sediment and organic debris on the pavement surface. The sweeper may be fitted with water jets.
e. Pavement vacuuming should occur during spring cleanup following the last snow event to remove accumulated debris, at a minimum.
f. Pavement vacuuming should occur during fall cleanup to remove dead leaves, at a minimum.
g. Power washing can be an effective tool for cleaning clogged areas. See manufacturer's specifications.
h. Check for debris accumulating on pavement, especially debris buildup in winter. For loose debris, a power/leaf blower or gutter broom can be used to remove leaves and trash.
i. In the event that the porous surface becomes clogged an engineer must be retained to determine how to restore the porous surface to its original condition.
j. Any additional maintenance required per the manufacturer's specifications shall also be completed.

7. Roof Gutters:

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

Disposal of Debris and Sediment:

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

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.
Operations and Maintenance Log (Page 1 of 3)
21 CALHOUN DRIVE - CARRIAGE HOUSE
6/10/2020

Type of Inspection: □ Spring  □ Fall  □ Other

Inspector's Name:________________________ Date of Inspection:____________________
Affiliation:________________________ Phone #:____________________

Catch Basins & Drainage Inlets:
• Has accumulated debris been removed from grates? □ Yes □ No □ N/A
• Do any basins require additional repair? (identify below): □ Yes □ No □ N/A
• Have sumps been cleaned of sediment? □ Yes □ No □ N/A

Notes:

Storm Drainage Piping and Manholes/Junction Boxes:
• Has accumulated debris been removed? □ Yes □ No □ N/A
• Do any manholes require additional repair? (identify below): □ Yes □ No □ N/A
• Is there any evidence of stormwater piping failure? □ Yes □ No □ N/A
• Has a comprehensive video inspection been completed? □ Yes □ No □ N/A

Notes:

Stormwater Control Structures:
• Has accumulated debris been removed? □ Yes □ No □ N/A
• Are any repairs required? (identify below): □ Yes □ No □ N/A
• Have orifices and weirs been cleaned of debris? □ Yes □ No □ N/A

Notes:
**Operations and Maintenance Log (Page 2 of 3)**

**21 CALHOUN DRIVE - CARRIAGE HOUSE**  
6/10/2020

### Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:
- Have all drainage outlets been cleared of debris?  
  - Yes □  No □  N/A □
- Have all outlet protections been inspected/repaiRed?  
  - Yes □  No □  N/A □
- Have all erosion issues been repaired?  
  - Yes □  No □  N/A □

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### Drywells and Infiltration Systems:
- Have units been cleared of debris/sediments?  
  - Yes □  No □  N/A □
- Do units require additional repair? (identify below):  
  - Yes □  No □  N/A □
- Has draining times of system been verified?  
  - Yes □  No □  N/A □

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### Porous Pavement:
- Has pavement been vacuumed?  
  - Yes □  No □  N/A □
- Has draining times been verified?  
  - Yes □  No □  N/A □

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### Roof Gutters:
- Has accumulated debris been removed from gutters?  
  - Yes □  No □  N/A □
- Do any gutters require additional repair? (identify below):  
  - Yes □  No □  N/A □

Form MD-100  
February 2014
Please make additional notes/observations and particular concerns below. Also record any additional maintenance that has been performed:

Signature of Inspector: _____________________________  Date: _____________________________
PROPOSED SITE DEVELOPMENT PLAN
ON PROPERTY OF

21 CALHOUN DRIVE, LLC

21 CALHOUN DRIVE - LOWER HOUSE
GREENWICH, CONNECTICUT

JULY 5, 2019
TAX ACCOUNT No. 07-2043

TAX ACCOUNT No. 07-2043

21 CALHOUN DRIVE, LLC

81 Holly Hill Lane
Greenwich, Connecticut 06830
203-869-0136
www.seminor.com

ENGINEERING     LAND SURVEYING
ENVIRONMENTAL SCIENTISTS

ESTABLISHED 1887

S.E. MINOR & CO., INC.

S.E. MINOR & CO., INC.

REV. 6/10/2020

DRAWING LIST

<table>
<thead>
<tr>
<th>SHEET NO.</th>
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<tr>
<td>1</td>
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<td>A2 SURVEY</td>
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ZONE: RA-1

AREA: 1.800 ACRES

LOCATION MAP
SCALE: 1" = 500'

1. PROPERTY IS IN "R" ZONE, AS SHOWN & FLOODED PER SEVERENCE DIST MAP (NOW FOR THE TOWN OF GREENWICH) Community No. 0095, Form 2-5 USE IS EFFECTIVE JUNE 2012.
2. PROPERTY IS SERVED BY PRIVATE SEPTIC SYSTEMS AND TOWN WATER.
3. EVERY RESTRICTION, AGREEMENTS AND/or COVERAGES, IF ANY EXIST, HAS NOT BEEN RESERVORED OR FLUTTERED HEREIN.
4. THE BUILDING SITE PLANS PROVIDED HEREIN ARE FOR DISCUSSION PURPOSES ONLY. FINAL DETERMINATION OF ZONING BOUNDARIES WILL BE MADE BY THE TOWN ZONING ENFORCER.
1. A HIGHWAY PERMIT IS REQUIRED FOR ALL WORK WITHIN TOWN OF GREENWICH - RIGHT OF WAY.

2. ALL WORK WITHIN THE TOWN OF GREENWICH - RIGHT OF WAY SHALL BE CONSTRUCTED TO TOWN OF GREENWICH STANDARDS.

3. CATCH BASINS FOR PRIVATE DRIVEWAYS SHALL HAVE A MINIMUM GRATE OF TWO FEET BY TWO FEET. IF THE CALHOUN DRIVEWAY IS CURBED THE CATCH BASIN SHALL HAVE A MINIMUM CURB INLET OF SIX INCHES. EACH DRIVEWAY CATCH BASIN SHALL ALSO HAVE A MINIMUM TWO-FOOT SUMP AND BELLTRAP.

4. ALL DRAINAGE CONNECTIONS TO THE TOWN DRAINAGE SYSTEM SHALL BE GRAVITY LINES. IF A DISCHARGE FROM A SUMP PUMP IS CONNECTED TO THE TOWN DRAINAGE SYSTEM IT MUST DISCHARGE TO A DRAINAGE STRUCTURE ON PRIVATE PROPERTY AND THEN BE CONNECTED TO THE TOWN DRAINAGE SYSTEM. ALL SUMP PUMPS REQUIRE A BACKFLOW PREVENTER (CHECK VALVE) BETWEEN THE PUMP AND THE DRAINAGE STRUCTURE. A DRAIN CONNECTION WITHOUT A PERMIT FROM THE HIGHWAY DIVISION IS REQUIRED FOR ALL CONNECTIONS TO THE TOWN DRAINAGE SYSTEM.

5. IN ROADWAY CUTS, SUBDRAINS SHALL BE REQUIRED IF SEEPAGE OCCURS DURING CONSTRUCTION OR WITHIN ONE YEAR AFTER ROAD CONSTRUCTION IS COMPLETED AND ACCEPTED, EVEN THOUGH PLANS MAY HAVE BEEN APPROVED WITHOUT SUBDRAINS AND/OR ROADWAY CONSTRUCTION HAS BEEN COMPLETED.

6. ALL RETAINING WALLS GREATER THAN THREE FEET ARE REQUIRED TO BE DESIGNED, AND INSPECTED DURING CONSTRUCTION BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.

7. ALL DETENTION/RETENTION SYSTEMS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS. ALL SYSTEMS SHALL USE A MANIFOLD SYSTEM TO DISTRIBUTE RUNOFF EVENLY INTO EACH ROW OF INFILTRATORS. DETENTION SYSTEMS WILL HAVE A MANIFOLD SYSTEM THAT CREATES THE LONGEST TRAVEL TIME TO THE CONTROL STRUCTURE. ALL DETENTION/RETENTION SYSTEMS MUST USE A STRUCTURE SUCH AS A MANHOLE FOR THE CONTROL STRUCTURE SO ALL FLOW CONTROL DEVICES CAN BE ACCESSED FOR MAINTENANCE.


9. EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE INFILTRATION.

10. THE CONTRACTOR MUST CONSTRUCT THE BIORETENTION AREA FOLLOWING THE SPECIFICATIONS IN APPENDIX G OF THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.

11. ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL TILLED 12 TO 16 INCHES AND AMENDED WITH SMALL AMOUNTS OF ORGANIC MATERIAL IF NEEDED. THE AREA TO BE RESTORED SHALL BE DETERMINED BY THE SITE ENGINEER.

12. COMPOST-AMENED SOILS MUST FOLLOW THE REQUIREMENTS AS STATED IN THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.
SITE AND SUBDIVISION PLANS

1. A HIGHWAY PERMIT IS REQUIRED FOR ALL WORK WITHIN TOWN OF GREENWICH - RIGHT OF WAY.

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4. A SUMP PUMP IS CONNECTED TO THE TOWN DRAINAGE SYSTEM IT MUST DISCHARGE TO A DRAINAGE STRUCTURE ON PRIVATE PROPERTY AND THEN BE CONNECTED TO THE TOWN DRAINAGE SYSTEM. ALL SUMP PUMPS REQUIRE A BACKFLOW PREVENTER (CHECK VALVE) BETWEEN THE PUMP AND THE DRAINAGE STRUCTURE. A DRAIN CONNECTION PERMIT FROM THE HIGHWAY DIVISION IS REQUIRED FOR ALL CONNECTIONS TO THE TOWN DRAINAGE SYSTEM.

5. IN ROADWAY CUTS, SUBDRAINS SHALL BE REQUIRED IF SEEPAGE OCCURS DURING CONSTRUCTION OR WITHIN ONE YEAR AFTER ROAD CONSTRUCTION IS COMPLETED AND ACCEPTED, EVEN THOUGH PLANS MAY HAVE BEEN APPROVED WITHOUT SUBDRAINS AND/OR ROAD CONSTRUCTION HAS BEEN COMPLETED.

6. CARRIAGE HOUSE DRIVEWAY PROFILE

7. ALL DETENTION/RETENTION SYSTEMS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS. ALL SYSTEMS SHALL USE A MANIFOLD SYSTEM TO DISTRIBUTE RUNOFF EVENLY INTO EACH ROW OF INFILTRATORS. DETENTION SYSTEMS WILL HAVE A MANIFOLD SYSTEM THAT CREATES THE LONGEST TRAVEL TIME TO THE CONTROL STRUCTURE. ALL DETENTION/RETENTION SYSTEMS MUST USE A STRUCTURE SUCH AS A MANHOLE FOR THE CONTROL STRUCTURE SO ALL FLOW CONTROL DEVICES CAN BE ACCESSED FOR MAINTENANCE.

8. ALL INFILTRATION SYSTEMS MUST MEET THE STORMWATER INFILTRATION/RECHARGE DESIGN REQUIREMENTS IN DISTANCE FROM THE BOTTOM OF STONE BELOW THE INFILTRATION STRUCTURE TO THE SEASONAL HIGH GROUNDWATER OR BEDROCK/LEDGE (THIS SEPARATION REQUIREMENT MAY BE WAIVED OR REDUCED BY THE APPROVING AUTHORITY ON A CASE-BY-CASE BASIS). A 3-FOOT SEPARATION DISTANCE IS REQUIRED FROM THE BOTTOM OF STONE BELOW THE INFILTRATION STRUCTURE TO SEASONAL HIGH GROUNDWATER FOR LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (HIGH LOAD AREAS). PRIOR TO THE INSTALLATION OF THE INFILTRATORS THE ENGINEER SHALL VERIFY THE INFILTRATION STRUCTURE IS BEING INSTALLED IN THE APPROVED LOCATION AND IF APPROVE THE REVISED LOCATION. A REVIEW BY THE APPROVING AUTHORITY WILL BE REQUIRED.

9. EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE

10. THE CONTRACTOR MUST CONSTRUCT THE BIORETENTION AREA FOLLOWING THE SPECIFICATIONS IN APPENDIX G OF THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED

11. ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL TILLED 12 TO 16 INCHES AND AMENDED WITH SMALL AMOUNTS OF ORGANIC MATERIAL IF NEEDED. THE AREA TO BE RESTORED SHALL BE DETERMINED BY THE SITE ENGINEER.

12. COMPOST-AMENDED SOILS MUST FOLLOW THE REQUIREMENTS AS STATED IN THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.

13. TO OBTAIN A CERTIFICATE OF OCCUPANCY THE SUBMITTAL MUST INCLUDE THE FOLLOWING:

- ITEMS ON THE CHECKLIST FOR CERTIFICATE OF OCCUPANCY - FORM CL-105

- IMPROVEMENT LOCATION SURVEY (ITEMS ON CHECKLIST FOR IMPROVEMENT LOCATION SURVEY DEPICTING "AS-BUILT" CONDITIONS - FORM CL-106)
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6. ALL RETAINING WALLS GREATER THAN THREE FEET ARE REQUIRED TO BE DESIGNED, AND INSPECTED DURING CONSTRUCTION BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.

7. ALL IN-FILL INFILTRATION SYSTEMS SHALL USE A MANIFOLD SYSTEM TO DISTRIBUTE RUNOFF EVENLY INTO EACH ROW OF INFILTRATORS. DETENTION SYSTEMS WILL HAVE A MANIFOLD SYSTEM THAT CREATES THE LONGEST TRAVEL TIME TO THE CONTROL STRUCTURE. ALL DETENTION/RETENTION SYSTEMS MUST USE A STRUCTURE SUCH AS A MANHOLE FOR THE CONTROL STRUCTURE SO ALL FLOW CONTROL DEVICES CAN BE ACCESSED FOR MAINTENANCE.

8. THE ENGINEER SHALL VERIFY THE INFILTRATION STRUCTURE IS BEING INSTALLED IN THE APPROVED LOCATION AND IF THE STRUCTURE HAS BEEN CHANGED ADDITIONAL SOIL TESTING SHALL BE PERFORMED AND THE ENGINEER SHALL APPROVE THE REVISED LOCATION. A REVIEW BY THE APPROVING AUTHORITY WILL BE REQUIRED.

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NOTE: THIS MAP IS TEMPORARILY CONTOUR AS BUILT SERVICE.
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June 10, 2020

S. E. Minor & Co., Inc.
Consulting Engineers & Surveyors
33 West Elm Street
Greenwich, CT 06830

Town of Greenwich
Department of Public Works
Building Inspection Department
Zoning Enforcement Division
101 Field Point Road
Greenwich, CT 06830
Attn: Zoning Enforcement Officer

RE: 21 Calhoun Drive, LLC
     21 Calhoun Drive – Carriage House
     Zone: RA-1

Dear Sir:

S. E. Minor & Co., Inc. (SEM) has established Proposed Grade Plane for the above referenced project to be 160.66 for a weighted first floor elevation of 163.50 as shown on attached worksheet and sketch by S. E. Minor & Co., Inc. and based on Planning and Zoning Regulations Section 6-5 (26). We have also determined that at no point is the finished floor more than 12' above grade.

Please feel free to call if you have any questions regarding this matter.

Respectfully submitted,

S. E. Minor & Co., Inc.

Prepared by R.D.S.
Att.: Grade Plane Worksheet & Sketch
## Proposed Grade Plane Computation

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Total: 258.33\(\times\)3888.30 = 41504.24

**Proposed First Floor Elevation**

\[
\text{Proposed First Floor Elevation} = \frac{\text{Column 3} \times \text{Column 1}}{\text{Grade Plane Elevation}} = \frac{163.50 \times 160.66}{2.84}
\]
LaRow, Patrick

[EXTERNAL]

Good morning Pat,

For the cottage - there are now two bedrooms on the second floor and one bedroom on the first floor; none in the basement.

Floor Area is now 2,182 square feet.

Landscape plans update will follow shortly– mainly to incorporate the comments re the native species and screening.

See also the additional comments of Annette below relating to the reduction of bulk and perceived bulk of the cottage.

Do you want again one set of hard copies?

Let us know if there are any further questions.

Thank you.

Best regards

John

John P. Tesei | Partner | Gilbride, Tusa, Last & Spellane LLC
jpt@gtlslaw.com | Bio www.gtlslaw.com

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From: Annette Perry [mailto:lolanicole@gmail.com]
Sent: Sunday, June 21, 2020 10:31 PM
To: Tesei, John <JPT@gtlslaw.com>
Cc: Jay Fain <elmst@optonline.net>; David Fish <davidfishny@gmail.com>
Subject: Fwd: 21 Calhoun revised full set 6-21-20
John,

Attached are the latest set.

Would you please submit to Pat.. Let me know if and how many copies are needed and what size.. We are at 2,181.75 FAR now.. We have have removed 17' from right roof front elevation and 6' from left foot elevation and 13' of roofing from side (street elevation) and brought down the A5r elevation front roof to 19' before it steps back (on sheet A6 on the left you can see just how much the bulk of roof above the arched side was taken out).. . I think we did our best to remove where we could.

Annette

--
Annette Nicole Perry
Grand Development, LLC
203-900-1012 (o)
203-550-3483 (c)

CAUTION: This email originated from outside the Town email system. Do not click links or open attachments unless you have verified the sender and know the content is safe.
FIRST FLOOR PLAN
2,181.75 SQ. FT.
SECOND FLOOR PLAN

1" = 1'-0"
Seal: Revisions:

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FRONT GABLE SECTION

FRONT ELEVATION

ARCHITECTURAL STYLE
ASPHALT SHINGLE ROOFING
CEMENT STUCCO FINISH
BRICK SOLDIER COURSES
STONE KEY STONE

RETAINING WALL
GRADE PLANE (ELEV. = 160.51)
FIRST FLOOR
BASEMENT SLAB (ELEV. = 153.0)
SECOND FLOOR

FRONT GABLE SECTION

9'-0" 1/4" = 1'-0"
28'-1 1/4" 35'-7 1/2"
10'-0"
8'-0"
6'-7 3/4"
BASEMENT LEVEL F.A.R. PLAN

2,181.75 SQ. FT. 1SR. FLR. F.A.R.

2,181.75 SQ. FT. PROPOSED TOTAL F.A.R.

ATTIC WILL NOT COUNT TOWARD F.A.R. ALL AREAS OF ATTIC ARE BELOW 5'-0" HIGH

537.63 SQ. FT. (25'-6" x 21'-1")
197.11 SQ. FT. (10'-8" x 18'-5 3/4")
40.67 SQ. FT. (8'-5" x 4'-3")
6.56 SQ. FT. (7'-10 1/2" x 10")
89.25 SQ. FT. (7'-10 1/2" x 11'-4")

871.22 SQ. FT. 2ND FLR. F.A.R.

BASEMENT WILL NOT COUNT TOWARD F.A.R. WITH THE GRADE PLANE BEING 2.99' BELOW FLOOR

2,181.75 SQ. FT. 1SR. FLR. F.A.R.

142.50 SQ. FT. (14'-3" x 10'-0")
1,401.29 SQ. FT. (41'-7.5" x 33'-8")
59.68 SQ. FT. (29'-10.5" x 2'-6")
99.56 SQ. FT. (7'-4.5" x 13'-4")
23.25 SQ. FT. (2'-0" x 11'-7.5")
15.50 SQ. FT. (3'-0" x 6'-0")
1,401.29 SQ. FT. (18'-4.5" x 36'-8")
59.55 SQ. FT. (2'-6" x 23'-9 3/4")

2,181.75 SQ. FT. 1SR. FLR. F.A.R.

F.A.R. 1

40% OF FIRST FLR = 872.70 SQ. FT. SECOND FLOOR IS 39.93% AND WILL NOT COUNT IN F.A.R.
SECOND FLOOR F.A.R. PLAN

537.63 SQ. FT. (15'-9" x 10'-8")
197.11 SQ. FT. (10'-8" x 18'-5 3/4")
40.67 SQ. FT. (8'-5" x 4'-0")
6.56 SQ. FT. (7'-10 1/2" x 10")
89.25 SQ. FT. (7'-10 1/2" x 11'-4")

871.22 SQ. FT. 2ND FLR. F.A.R.

2,181.75 SQ. FT. 1SR. FLR. F.A.R.
40% OF FIRST FLR. = 872.70 SQ. FT.
SECOND FLOOR IS 39.93% AND WILL NOT COUNT IN F.A.R.
18 Calhoun Drive  
Greenwich, CT 06831  
June 26, 2020

VIA EMAIL ONLY
Ms. Katie DeLuca, AICP  
Town Planner  
Planning & Zoning Commission  
Town of Greenwich  
101 Field Point Road  
Greenwich, CT 06830

Re: 21 Calhoun Drive: Rezoning/Site Plan/Special Permit Applications

Dear Ms. DeLuca:

We are writing regarding the above applications and the recently submitted plans and associated documents filed by the applicant.

While the applicant has once again “tweaked” the plans, we believe that the proposed second dwelling, because of its size and location, still does not appear to be subordinate to the main house and would negatively impact the neighborhood, contrary to the language and intent of Section 6-109(d)(3) of the Regulations.

While we recognize that the Commission might view its ultimate decision regarding this application as a stark choice between either the preservation of the neighborhood or the preservation of the existing structure, we believe that there is a suitable compromise that can serve both purposes to the satisfaction of the Commission, the neighbors and the applicant.

The applicant has represented to the Commission that the second dwelling cannot be sited at the top of the hill adjacent to the main house and away from the streetscape because of the location of the septic system. We ask that the Commission reconsider this assertion for the reasons set forth below.

As you know, this property was formerly composed of two lots totaling 2.96 acres and owned by the Flemings, the applicant’s predecessor in title. In January of 2019, the applicant and the Flemings applied for and received a final subdivision approval to confirm that the property consisted of two separate lots and to revise the lot line between the lots (i.e. 1.158 acres for what became 12 Turner Drive and 1.8 acres for 21 Calhoun Drive). As you can see from the attached approved and recorded map (see Attachment 1), at that time the main house of the combined property was served by a septic system located on what is now 12 Turner Drive. This septic system has since been abandoned. There was also a tennis court for the combined property on that lot. The new septic fields for the main house, as shown on the approved subdivision plan (see Attachment 1), were to be sited where the proposed second dwelling is now proposed. In the interim, therefore, the applicant moved the septic fields for the
main house up to where they are now shown adjacent to the existing driveway on the southwest (see page 8 of Attachment 2).

Clearly the applicant could have sited the septic fields for both the main house and the proposed second dwelling at the base of the hill to the east and along Calhoun Drive where the second dwelling is now proposed. The fact that they did not do so resulted in this “hardship,” which is therefore self-created. Even now, the applicants could just move the septic fields if, in fact, they are an impediment to locating the second dwelling on the top of the hill closer to the main house. There the second dwelling would appear more subordinate to the main house, in keeping with the purpose of a carriage house, and would have little impact on the streetscape. Instead, the applicant is seeking to exploit Historical Overlay to complete a de facto subdivision of the remaining 1.8 acres of 21 Calhoun Drive, obviating one-acre zoning, to build what will be a third, saleable home on the combined property that they purchased from the Flemings.

We suggest, though, that moving the septic fields might not even be necessary since there seems to be ample area for the second dwelling, perhaps slightly modified in design if necessary, to be located at the top of the hill to the southwest adjacent to the main house. If for any reason the applicant believes this would require a variance of the zoning regulations (although we have no reason to believe it would), the unique lot shape and other attributes of the property, together with the support of the neighbors, would suggest a positive reception from the Zoning Board of Appeals.

We request that the Commission further pursue this option with the applicant such that a solution might be arrived at that would result in both the preservation of the main house and the preservation of the neighborhood and its streetscape, while permitting the applicant to build a second dwelling that is truly a carriage house to the main house.

Otherwise, we respectfully request that the Commission deny the pending application. Because of its size and location, the proposed second dwelling would not appear subordinate to the existing dwelling, would alter the neighborhood’s essential characteristics, would undermine the letter and intent of Historic Overlay, and would create a precedent by which our historic neighborhood and other neighborhoods in town could be negatively impacted.

Sincerely,

Jennifer P. Matthews  James R. Matthews
1. A HIGHWAY PERMIT IS REQUIRED FOR ALL WORK WITHIN TOWN OF GREENWICH - RIGHT OF WAY.

2. ALL WORK WITHIN THE TOWN OF GREENWICH - RIGHT OF WAY SHALL BE CONSTRUCTED TO TOWN OF GREENWICH STANDARDS.

3. CATCH BASINS FOR PRIVATE DRIVEWAYS SHALL HAVE A MINIMUM GRATE OF TWO FEET BY TWO FEET. IF THE DRIVEWAY IS CURBED THE CATCH BASIN SHALL HAVE A MINIMUM CURB INLET OF SIX INCHES. EACH DRIVEWAY CATCH BASIN SHALL ALSO HAVE A MINIMUM TWO-FOOT SUMP AND BELLTRAP.

4. ALL DRAINAGE CONNECTIONS TO THE TOWN DRAINAGE SYSTEM SHALL BE GRAVITY LINES. IF A DISCHARGE FROM A SUMP PUMP IS CONNECTED TO THE TOWN DRAINAGE SYSTEM IT MUST DISCHARGE TO A DRAINAGE STRUCTURE ON PRIVATE PROPERTY AND THEN BE CONNECTED TO THE TOWN DRAINAGE SYSTEM. ALL SUMP PUMPS REQUIRE A BACKFLOW PREVENTER (CHECK VALVE) BETWEEN THE PUMP AND THE DRAINAGE STRUCTURE. A DRAIN CONNECTION PERMIT FROM THE HIGHWAY DIVISION IS REQUIRED FOR ALL CONNECTIONS TO THE TOWN DRAINAGE SYSTEM.

5. IN ROADWAY CUTS, SUBDRAINS SHALL BE REQUIRED IF SEEPAGE OCCURS DURING CONSTRUCTION OR WITHIN ONE YEAR AFTER ROAD CONSTRUCTION IS COMPLETED AND ACCEPTED, EVEN THOUGH PLANS MAY HAVE BEEN DRAWN WITHOUT SUBDRAINS.

6. ALL RETAINING WALLS GREATER THAN THREE FEET ARE REQUIRED TO BE DESIGNED, AND INSPECTED DURING CONSTRUCTION BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.

7. ALL DETENTION/RETENTION SYSTEMS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS. ALL SYSTEMS WILL HAVE A MANIFOLD SYSTEM THAT CREATES THE LONGEST TRAVEL TIME TO THE CONTROL STRUCTURE. ALL DETENTION/RETENTION SYSTEMS MUST USE A STRUCTURE SUCH AS A MANHOLE FOR THE CONTROL STRUCTURE SO ALL FLOW CONTROL DEVICES CAN BE ACCESSED FOR MAINTENANCE.


9. EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE INFILTRATION.

10. THE CONTRACTOR MUST CONSTRUCT THE BIORETENTION AREA FOLLOWING THE SPECIFICATIONS IN APPENDIX G OF THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.

11. ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL TILLED 12 TO 16 INCHES AND AMENDED WITH SMALL AMOUNTS OF ORGANIC MATERIAL IF NEEDED. THE AREA TO BE RESTORED SHALL BE DETERMINED BY THE SITE ENGINEER.

12. COMPOST-AMENED SOILS MUST FOLLOW THE REQUIREMENTS AS STATED IN THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.

13. TO OBTAIN A CERTIFICATE OF OCCUPANCY THE SUBMITTAL MUST INCLUDE THE FOLLOWING:
   - ITEMS ON THE CHECKLIST FOR CERTIFICATE OF OCCUPANCY - FORM CL-105
   - IMPROVEMENT LOCATION SURVEY (ITEMS ON CHECKLIST FOR IMPROVEMENT LOCATION SURVEY DEPICTING "AS-BUILT" CONDITIONS - FORM CL-106)
1. Property is in "X" zone as shown on the flood insurance rates map (FIRM) form for the Town of Greenwich, Community No. 260, Form No. C10060, Effective July 16, 2010.

2. Property is served by private septic system(s) and town water.

3. Easements, restrictions, agreements and/or covenants, if any exist, have not been researched or plotted herein.

4. The building setback lines provided herein are for discussion purposes only. Final determination of actual setback will be made by the Town (2003).

5. Pond and/or detention basin on 32 Calhoun Drive, taken from Town of Greenwich sewer records, approved and stamped by S.E. Minor & Co., Inc., May 29, 2003.

NOTES: The scale and shape of the property as shown herein are in accordance with the requirements of a Class "C" survey, as observed in the State of Connecticut, effective July 16, 2010.

DO MY KNOWLEDGE AND belief, this map is COORDINATELY CORRECT AS HEREIN SHOWN.
1. Property is to be used as an AS BUILT FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF GREENWICH, COMMUNITY DEVELOPMENT DIVISION (FIRM) EFFECTIVE JULY 1, 2016.
2. Property is to be used by private Septic Systems and Town Water.
3. Subdivision restrictive agreements must be approved if any exist, have not been recorded, and must be referenced.
4. The buildings exterior lines provided herein are for use only for purposes only. Final determination of zoning setbacks will be made by the Town's Zoning Enforcement Official.
5. Pond and retaining walls delineated on the map are taken from Town of Greenwich Zoning regulations.

1. Property is situated in the ZONE: RA-1
2. Area = 1.800 ACRES
3. Elevation = 100' NAVD
4. Site: 10.000'- 10.400' NAVD
5. Elevation: 100' NAVD
6. Building Section - Location
7. Construction Entrance: 50FT MIN.
8. Construction Fencing:
   - Wire Reinforced with Stone Berm
   - Tree Protection
   - Dirtbag 10' x 15' & Underlayment
9. Soil Stockpiling
10. Tree Protection
11. Inlet Protection
12. Silt Check Det. Detail
13. Ponds Backcountry Calhoun LLC
   - 81 Holly Hill Lane
   - 203-869-0136
   - www.seminor.com

1. Property is to be used in accordance with the standards of a Class "A" Subdivision as defined in the Town of Greenwich Zoning Regulations. Effective April 20, 2005.
2. Property is to be used in accordance with the standards of a Class "A" Subdivision as defined in the Town of Greenwich Zoning Regulations. Effective June 26, 1996.

To the best of knowledge and belief, this map is substantially correct as of June 26, 2005.
1. A highway permit is required for all work within Town of Greenwich - Right of Way.
2. All work within the Town of Greenwich - Right of Way shall be constructed to Town of Greenwich Standards.
3. Catch basins for private driveways shall have a minimum grate of two feet by two feet. If the driveway is curved, the catch basin shall have a minimum curb inlet of six inches. Each driveway catch basin shall also have a minimum two-foot sump and belltrap.
4. All drainage connections to the Town drainage system shall be gravity lines. If a discharge from a sump pump is connected to the Town drainage system, it must discharge to a drainage structure on private property and then be connected to the Town drainage system. All sump pumps require a backflow preventer (check valve) between the pump and the drainage structure. A drain connection permit from the Highway Division is required for all connections to the Town drainage system.
5. In roadway cuts, subdrains shall be required if seepage occurs during construction or within one year after road construction is completed and accepted, even though plans may have been approved without subdrains and/or road construction has been completed.
6. All retaining walls greater than three feet are required to be designed, and inspected during construction by a professional engineer registered in the State of Connecticut.
7. All detention/retention systems shall be installed per manufacturer’s specifications. All systems shall use a manifold system to distribute runoff evenly into each row of infiltrators. Detention systems will have a manifold system that creates the longest travel time to the control structure. All detention/retention systems must use a structure such as a manhole for the control structure so all flow control devices can be accessed for maintenance.
8. All infiltration systems must meet the stormwater infiltration/recharge design requirements in Appendix B of the Town of Greenwich Drainage Manual. There must be at least a 2-foot separation distance from the bottom of stone below the infiltration structure to the seasonal high groundwater or bedrock/ledge (this separation requirement may be waived or reduced by the approving authority on a case-by-case basis). A 3-foot separation distance is required from the bottom of stone below the infiltration structure to seasonal high groundwater for land uses with higher potential pollutant loads (high load areas). Prior to the installation of the infiltrators, the engineer shall verify the infiltration structure is being installed in the approved location and if the structure has been changed, additional soil testing shall be performed and the engineer shall approve the revised location. A review by the approving authority will be required.
9. Each BMP to be installed shall have the soils beneath the BMP scarified or tilled to improve infiltration.
10. The contractor must construct the bio retention area following the specifications in Appendix G of the Town of Greenwich Drainage Manual February 2012 as amended.
11. All areas that are used by construction equipment and used for contractor parking must have the soil tilled 12 to 16 inches and amended with small amounts of organic material if needed. The area to be restored shall be determined by the site engineer.
13. To obtain a certificate of occupancy, the submittal must include the following:
   - Items on the checklist for certificate of occupancy - Form CL-105
   - Improvement location survey (items on checklist for improvement location survey depicting "as-built" conditions - Form CL-106)
Mike & Alison Troy  
56 Calhoun Drive  
Greenwich, Ct

Dear P&Z Commissioners:

We are writing once again to state our views on the construction of another single family structure on the 21 Calhoun Drive property. The new rendition that has been submitted, unfortunately, still maintains the same foundation or footprint that has been put forth since the process began.
[EXTERNAL]

Dear Patrick,

Please see attached petition for intervention on environmental grounds with respect to the 21 Calhoun Drive application.

We are also in the process of engaging Risoli Planning and Engineering to conduct a peer review and request that the matter be left open beyond 6/30.

Thank you.

Regards,

Jeff

CAUTION: This email originated from outside the Town email system. Do not click links or open attachments unless you have verified the sender and know the content is safe.

Jeff Pribyl
(C) 646.467.4181
June 25, 2020

PETITION FOR INTERVENTION
UNDER GENERAL STATUTES SECTION 22A-19(a)

Jeffrey Pribyl ("Pribyl"), in his capacity as owner of real property located at 17 Calhoun Drive, Greenwich, Connecticut, hereby intervenes in the above-captioned matter pursuant to General Statutes Section 22a-19(a) and represents that:

1. The Connecticut Environmental Protection Act of 1971 provides in pertinent part at General Statutes Section 22a-19(a) that

   In any administrative . . . proceeding, and in any judicial review thereof made available by law . . . any person . . . may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.

2. The Town of Greenwich Planning and Zoning Commission ("Commission") is the town agency authorized to review and approve applications to re-zone and site plans and special permits.

3. 21 Calhoun Drive, LLC has filed with the Commission an Application for re-zoning and an application for site plan and special permit approvals for 21 Calhoun Drive,
Greenwich, PLPZ 2019 00474 + 00472 ("Applications"), under the Town of Greenwich Building Zone Regulations.

4. Pribyl asserts that the underlying proposed conduct of these Applications has, or is reasonably likely to have the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other resources of the state, as follows: We believe that the Applications are likely to be have a material adverse impact on a nearby pond and wildlife. There is a pond located directly across the street from the proposed second structure of 21 Calhoun Drive, which serves as an important catch basin for drainage (given the lack of proper street drains) and as a wildlife habitat. The effects to the water table (including potential flooding risk) and disruption to the area wildlife need to be further assessed.

5. Pribyl further requests, pursuant to General Statutes Section 1-227 that he be given written notice by mail of all hearings and/or meetings, including meetings between the Applicant and Town staff in connection with the investigation and proceedings pertaining to the above-captioned matter. Such notice and all correspondence shall be sent to Pribyl at the following address:

17 Calhoun Drive
Greenwich, CT 06831
June 25, 2020

VERIFICATION OF PETITION FOR INTERVENTION
UNDER GENERAL STATUTES SECTION 22a-19(a)

I, the undersigned, being duly sworn, depose and say that I have read the foregoing Petition for Intervention, and I verify that the allegations contained therein are true to the best of my knowledge and belief.

Dated at Westport, Connecticut, this 26 day of June 2020

INTERVENOR
JEFFREY PRIBYL

By:
Jeffrey Pribyl
17 Calhoun Drive
Greenwich, CT 06831

STATE OF CONNECTICUT
COUNTY OF FAIRFIELD

Subscribed and sworn to before me the undersigned this 26 day of June 2020.

Notary Public
My Commission Expires:

LAURA MOREA
NOTARY PUBLIC
Connecticut
My commission expires SEPTEMBER 30th, 2021
WHEREFORE, Pribyl respectfully intervenes in this proceeding pursuant to the Environmental Protection Act of 1971, upon the filing of this verified Petition for Intervention

INTERVENOR
JEFFREY PRIBYL

By:  
Jeffrey Pribyl  
17 Calhoun Drive  
Greenwich, CT  06831