Final Site Plan  
Special Permit  
PLPZ 2021 00317

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<tbody>
<tr>
<td>Location</td>
<td>51 Mayo Avenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Zoning</td>
<td>RA-1 (1-acre minimum lot size)</td>
<td></td>
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<tr>
<td>Parcel Size</td>
<td>1.110-acres (48,352 sq.ft.)</td>
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<tr>
<td>Utilities</td>
<td>Town Sewer, Public Water and Gas</td>
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Gross Square Feet: Not provided  
Floor Area Ratio: N/A  
Volume: N/A Over 150,000 cu.ft. needs a Special Permit +/- 244,499 cu.ft.
Green Area: 80.0% 72% 72.05%

### Dwelling

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<td>Height:</td>
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<td>40’</td>
<td>39’-10 7/16”</td>
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<tr>
<td>Size:</td>
<td>N/A</td>
<td>6,489.95 sq.ft.</td>
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Structure Setbacks (Min. Required/ Proposed):
- Front Yard Depth: 47.73’ 50’ +/- 64’
- Side Yard Width: 34.6’ and >25’ 25’ +/- 42’ and +/- 33’
- Rear Yard Setback: >50’ 50’ >50’

### Accessory Structure (Pool Pavilion)

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<td>Height:</td>
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<td>25’</td>
<td>14’-7 3/4”</td>
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<td>Size:</td>
<td>N/A</td>
<td>800 sq.ft.</td>
<td>36.55 sq.ft.</td>
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Structure Setbacks (Min. Required/ Proposed):
- Side Yard Setback: N/A 15’ +/- 23’
- Rear Yard Setback: N/A 15’ >15’

**APPLICATION SUMMARY:**

Final Site Plan and Special Permit applications are submitted by the applicant to construct a new single-family home and pool cabana that will collectively exceed 150,000 cubic feet in volume, requiring a special permit per Section 6-101(a) of the Town of Greenwich’s Building Code.
Zone Regulations (BZR). The project also includes many porches, extensive landscaping and site work including a rain garden on a 1.1-acre parcel located at 51 Mayo Avenue in the RA-1 Zone.

**ISSUES/RECOMMENDATIONS:**
1. **The Inland Wetlands Agency** issued a green sheet sigh off dated 6/29/2021 indicating no action is required.
2. **Sewer Division** issued remarks dated 9/10/2021 and does not have any comments to be addressed during the P&Z Phase of the project.
3. **The Zoning Enforcement Officer** issued comments on 9/8/2021 and has no concerns at this time.
4. **Engineering** – DWP issued comments on 9/8/2021, and the applicant responded to those comments on 9/17/2021. Revised comments from DPW are expected soon.
5. **Conservation** issued comments dated 10/15/2021 and lists their recommendations for the project in the attached memorandum highlighting the extensive site work and grading that is proposed.
6. **Pool.** The project plans to continue use of the pool that exists on the site.
7. **Site Grading.** Much of the site will be disturbed with this proposed effort. The Commission may ask the applicant to scrape the topsoil from the site and preserve it in piles to be reused as top dressing after the final grading to partially mitigate the impacts on the site’s soils.

**PROPOSAL:**
Final Site Plan and Special Permit applications are submitted by the applicant to construct a new single-family home and pool cabana that will collectively exceed 150,000 cubic feet in volume, requiring a special permit per Section 6-101(a) of the Town of Greenwich’s Building Zone Regulations (BZR). The project also includes many porches, extensive landscaping and site work including a rain garden on a 1.1-acre parcel located at 51 Mayo Avenue in the RA-1 Zone. The existing pool on the site is planned to remain.

51 Mayo Avenue is located on the northern side of Mayo Avenue and the parcel is currently improved with a single-family home (built in 1920), detached garage, pool (built in 1950), driveway and walks and landscaping with mature trees.

A special permit is required for this application for the below reason:
1) Per Section 6-101(a) of the BZR, as the total volume of buildings on the property is proposed to be greater than 150,000 cubic feet.

**DEPARTMENT COMMENTS:**
IWWA - see attached Green Sheet dated 6/29/2021
DPW - **updated comments are expected soon**
ZEO - see attached memo of 9/8/2021
CONSERVATION - see attached memo of 10/15/2021
SEWER - see attached memo of 9/10/2021

**DRAINAGE:** The documents note that the impervious coverage of the site will be 15,405.00 sq.ft., where existing conditions is 11,809.00 sq.ft.
The proposed development strategy utilizes Low Impact Development (LID) design principles and techniques as well as Best Management Practices (BMPs). The proposed roof and much of the driveway will be routed to a filtration raingarden. The proposed pavilion and terrace areas are routed to an infiltration cultec system. As the raingarden filtrates the water, it will drain to a connecting cultec system that will also collect a small portion of the driveway too.

**ZONING:** The proposed development looks to conforms to FAR, Green Area, and setback requirements for the RA-1 zone per Section 6-205 of the BZR.

**CONSERVATION:** Conservation issued comments dated 10/15/2021 and lists their recommendations for the project in the attached memorandum. Conservation has concerns regarding the extent of the site that is planned for disturbance. Perhaps some of this disturbance is aesthetically based and may be able to be limited in scope. It is recommended that the topsoil is scraped from the site and preserved in piles to be reused as a top dressing after the final grading to partially mitigate for the extent of impact. The Commission may request the applicant do this.

The Conservation Department also suggests the applicant look at an alternative location for the proposed raingarden. Conservation believes the current location may lead to soil erosion in large storm events and possibly reduce access around the residence for future landscape maintenance.

**BACKGROUND:** This is the first application to Planning & Zoning for this parcel.

**APPLICABLE ZONING REGULATIONS:**
- Section 6-5 – Definitions
- Section 6-10 – Zoning Permit Applications; Plans; Contents; Survey
- Section 6-13 – Site Plan Approval Required by Planning and Zoning Commission
- Section 6-14 – [Site Plan] Procedure
- Section 6-15 – [Site Plan] Standards
- Section 6-17 – Special Permit Standards and Procedures
- Section 6-95 – Permitted Accessory Uses
- Section 6-101(a) – Special Permit for Residential Zones
- Section 6-205 – Schedule of Required Open Spaces, Limiting Heights and Bulk of Bdgs.
MEMORANDUM

To: Jacalyn Pruitt, Planner II

From: Aleksandra Moch, Environmental Analyst (Wetland and Soil Scientist)

Date: October 15, 2021

Re: Alisa Brocklman, 51 Mayo Avenue, PLPZ 2021 00317
Site plan by S.E. Minor, Co., Inc, dated September 17, 2021 and landscape plan by Matteson Landscape Architects, dated June 11, 2021

I have reviewed the above-referenced plans and visited the site. The following comments are offered for your consideration:

1. The proposed site redevelopment will be associated with intensive site grading resulting in 100% disturbance. Site filling will result in the loss of native soil. This high level of disturbance will result in long-term impacts including a decline in storm water runoff quality due to the increased impervious surface and loss of native soils which are notably superior in storm water filtration, nutrient retention, support of microbial communities, and overall health of the vegetative cover. Fill rich in sand and gravel requires more intensive irrigation and landscape care. It is recommended the topsoil is scraped from the site and preserved in piles to be reused as a top dressing after the final grading to partially mitigate for the extent of impact.

2. The engineering plan provides a list of native species to be used for the rain garden, while the proposed landscape plan includes a variety of native trees, shrubs and herbaceous ground cover. The new trees will replace the lost ones and mitigate for the site disturbance and the increase of impervious surface. These trees and shrubs will also provide screening from the neighbors, restore the street scape, and enhance the environmental values of this site.

3. The proposed rain garden and an in-ground infiltration system in close vicinity of each other may generate an intensive overflow during the large storm events towards the steeply sloping street causing shoulder erosion. The rain garden may limit the access around the residence for the future landscape maintenance. For the above reasons finding an alternative location which could include the driveway island or decreasing the amount of impervious surface to reduce the size of this system is recommended. The size and lack of proper separation between these two systems directly reflects site overdevelopment and the diminished capacity of the land to support the project.

cc: Conservation Commission
Date: September 10, 2021

To: Katie Deluca, Director, Planning & Zoning

From: Richard C. Feminella, Wastewater Division Manager

Copy: Chris Mandras, Maintenance Manager - Sewer Division
      Al Romano, Environmental Asset Engineer – Sewer Division

Re: PLPZ202100317: 51 Mayo Avenue, Alisa Brockelman

We have prepared the following comments and questions regarding the proposed application.

Project Summary:
• Construction of a new residence and pool cabana that will collectively exceed 150,000 cubic feet in volume.

Sewer Division Comments:
Comments to be addressed during P&Z phase:
• None.

Comments to be addressed during Sewer and Building Permit phase:
• The applicant/owner will be required to obtain the necessary Sewer Permits. Please coordinate directly with the Sewer Division for permitting.
• The proposed development is required to utilize low flow plumbing fixtures. Written confirmation will be required during the Sewer Permitting process.
• The applicant/owner will be required to perform CCTV inspections of all of the sanitary sewer lateral(s) that serve the existing building to confirm there are no issues with the existing sanitary sewer lateral. Any televising of sanitary sewer laterals must be performed in the presence of the Sewer Inspector. Please coordinate with Sewer Division – Sewer Quality Control Inspector (203) 622-0963 extension 5. Make a DVD of this inspection. Submit a copy of the DVD to the Wastewater Division Manager. Failure to have the Sewer Inspector present during the TVing will result in the Sewer Division not accepting the DVD. Note: VHS format is not accepted. Only DVDs are accepted. Make a copy of the DVD for your records. The Town will not return DVDs. The Town cannot make copies of DVDs. The DVD should be submitted along with a site plan that identifies each investigation run on the DVD.
• The connection to the sewer main must be made in the same location as the existing sewer lateral that serves the existing dwelling. No new penetrations to the sewer manhole structure are permitted.
• NO outdoor sinks, showers, etc. are permitted to be connected to sanitary sewer. Should any be proposed, please contact the Sewer Division for further direction.
• The pool filtration system must be a closed loop system with no backwash permitted to discharge to sanitary sewer.
• Please note, sanitary sewers are designed for first floor elevations. Therefore, any plumbing fixtures in lower levels (basements) could be subject to sanitary sewer backups/overflows. The property owner is strongly recommended to consider and review this and plan accordingly to protect themselves in those situations. The Town is not responsible for damages as a result of these connections/installations. Please consider this and revise accordingly.

• Any sewer infrastructure installed within 10-feet of any drainage structures, permeable pavement, rain gardens, etc. requires concrete encasement. Please coordinate with the Sewer Division for details.

• Please note, in accordance with Town regulations and standard practice, all clear water sources cannot discharge to sanitary sewer. This includes air conditioning and high efficiency heating system condensate lines. Please confirm that the new development will not discharge any clear water sources to sanitary sewer.

Please NOTE: These comments are intended for P&Z review only. These comments do not take the place of Sewer Permit(s). Any Sewer Permit Applications receive thorough reviews and may result in additional comments/requirements at that time. In addition, please be reminded that in order to receive Building Permits, the applicant must have secured all other necessary permits, including, but not limited to, Sewer Permits PRIOR to obtaining their Building Permits.

Also, please note, the applicant should NOT submit for Sewer Permits until the project has received approval from P&Z.
ZONING ENFORCEMENT

Project No. PLPZ202100317

Reviewed for Planning and Zoning Commission.

TITLE OF PLAN REVIEWED: Brokelman

LOCATION: 51 Mayo Ave.

PLAN DATE:

ZONE: RA-1

☐ Ok for Zoning Permit Sign-off with the following revisions:

☐ Resubmit the following prior to Site Plan/ Subdivision approval:

☒ The subject site plan/subdivision meets the requirements of the Building Zone Regulations, excluding sections 6-15 and 6-17, and is Ok for Zoning Permit Sign-off.

Reviewed by: Jodi Couture
Date: 9/8/2021

Note: These comments do not represent Building Inspection Division approval. Plans subject to review by ZEO at time of building permit application.
DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION
SITE DEVELOPMENT REVIEW

Engineering Project No. 21-5(45)  Department Project No. PLPZ202100317
Submittal Received Date: 7/13/2021

Submittal Reviewed For: Planning and Zoning
Traffic Review Requested: No  Review Type: Final Site Plan

PLAN SET INFORMATION

Plan Title: Proposed Site Development Plan  Project Address: 51 Mayo Avenue
Engineering Firm: S.E. Minor and Co., Inc.  Original Plan Date: 5/7/2021
Latest Plan Revision Date: _____

DRAINAGE SUMMARY REPORT INFORMATION

Engineering Firm: S.E. Minor and Co., Inc.  Original Report Date: 5/7/2021
Latest Report Revision Date: _____

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.

Reviewed and Approved by: __________________________________________________________________ Date: 09/08/2021
Juan Paredes, P.E. - Civil Engineer II

COMMENTS AND CONDITIONS OF APPROVAL: Resubmit Prior to Final Site Plan Approval

The Engineering Division recommends the Commission/P&Z Staff discuss the following with the applicant:

a) Creating a staging area for both materials and construction vehicles as part of the e&s plan.
b) Generic planting plans for the rain gardens are proposed; species, quantities and a more detailed planting plan may be further discussed.

The following are comments for the site development review:

1. A revised Form SC-107 needs to be submitted.
2. The Drainage Summary Report
   a. A meeting with the Engineering Division is required to address the watershed delineation for the pre and post development conditions. Please send an email request to jparedes@greenwichct.org to schedule a meeting.
   b. The existing conditions surface areas are modeled as either impervious or grass; verify areas that may be modeled as wooded or meadows e.g. areas shown outside of “edge of grass”.
   c. The outlet structure of the rain garden may not be modeled as having the two (2) routing devices (grate and exfiltration) as primary; they both are throttled by 4” perforated pipe.
i. Test holes show mottling starting 50 to 60” deep. Bottom of rain garden appears to be above this restrictive layer, therefore, it must be revised as an infiltration practice to meet RRV.

d. The conveyance computations and outlet protection computations must be submitted; level spreader(s) may be required and are highly recommended.

e. Overflow from pump’s infiltration system must be directed to a level spreader and away from other infiltration BMPs so as to not overcharge them.

f. Peak elevations within rain garden CULTEC systems substantially overtop each BMP; the peak runoff mitigation rates may be inaccurate.

g. Compliance with the peak discharge runoff rate reduction standard cannot be verified because BMPs are overtopped.

h. The RRV standard is not met.

i. Revise all other computations as needed.

j. Additional comments may be issued upon resubmission.

3. A revised Form SC-107 needs to be submitted.

4. The construction plan set needs to be revised as follows:

a. Existing Conditions Survey Sheet

i. Submitted plan is dated 2005; aerial images of the subject property appear to show modification on the existing property not reflected on the survey.

b. Site Plan Sheets

i. Infiltration practices must be located ten feet (10’) away from all property lines at minimum.

ii. Show all control structures with the following in the callout:

1. Cover/grate elevation.

2. Invert elevation of each pipe.

3. Control structure type and size (orifice, rectangular weir, v-notch weir, etc.).

4. Pipe location in structure (n, s, e, w, etc.).

5. Pipe size.


iii. Show all level spreaders/scour holes’/riprap aprons with the following in the callout:

1. Dimensions (length and width); minimum 20-foot long.

2. Depth of stone.

3. Pipe/stone elevation.

4. Pipe size.

5. Pipe material.

5. The draft Operations and Maintenance Plan Report is acceptable.

**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).
September 17, 2021

S.E. MINOR & CO., INC.
Consulting Engineers & Surveyors
33 West Elm Street
Greenwich, CT 06830

Town of Greenwich
Department of Public Works – Engineering Division
Town Hall
101 Field Point Road
Greenwich, CT 06830
Att.: Juan Paredes, P.E., Civil Engineer II

Re: Property of Alisa Brockelman
51 Mayo Avenue
Greenwich, CT

Dear Mr. Paredes,

Enclosed you will find a copy of the proposed site development plan application showing revisions in response to your comments dated September 8, 2021 for the above referenced property:

1) The drainage report has been updated to reflect the following changes. The responses below follow the outline of your comments.
   a) Meeting Completed.
   b) The topography is dated 2005, the grades are still relatively consistent however ground area is predominantly lawn and impervious areas, as modelled.
   c) 4" Culverts added to rain garden as primary outlet.
   d) Rip rap and level spreader have been added to proposed outlets.
   e) Pump overflow was added.
   f) Outlets and capacity have been added to BMPs to ensure controlled overtopping.
   g) Compliance may now be verified
   h) See RRV calculation for details on how it has been met.
   i) Computations have been revised
   j) Noted
2) The construction plan has been updated to reflect the following changes. The responses below follow the outline of your comments.
   a) Existing condition survey is usable to model the drainage
   b) Site plan sheets have been revised and added as requested

Please contact us should you have any questions regarding this matter.

Sincerely,

[Signature]

Abed Yacoub

Project Engineer
June 30, 2021

Ms. Katie DeLuca, AICP
Town Planner – Director
Planning and Zoning Commission
Greenwich, CT

RE: Special Permit – Site Plan Application-Brockelman Property-51 Mayo Avenue, Greenwich

Dear Katie,

Please find enclosed in connection with the above referenced property an Application for Special Permit – Site Plan, including all required supporting documentation, authorizing the construction of a new residence and pool cabana that collectively will exceed 150,000 cubic feet in volume.

The existing dwelling as well as the existing detached garage / accessory building, with significantly deficient setbacks, will be removed. The new residence which is proposed at 6,526 square feet is approximately equal to the existing square footage of improvements on the property.

The property is located out of the Flood Hazard Zones, contains no wetlands and is served by sewer, water, gas and electric.

The parcel is located in the RA-1 zone and contains 1.110 acres. All proposed improvements comply with the Building Zone Regulations.

Please place this matter on the next available meeting of the Commission.

Sincerely,

Eric V.P. Brower, AICP
SPECIAL PERMIT APPLICATION

I, Eric V.P. Brower, AICP _____________________________ representing
(Authorized Agent)

Alisa Brockelman _____________________________ , hereby request application
(Applicant)

for Special Permit from the Planning and Zoning Commission of the Town of Greenwich for the project

at 51 Mayo Avenue, Greenwich, CT 06830 _____________________________.
(Address)

The Special Permit is required by the below noted section(s) of the Building Zone Regulations.

Signature ___________ Date 6.30.21

PLEASE MARK ALL APPLICABLE SECTIONS

☑ Section 6-17 — Special Permit standards and procedure
☑ Section 6-30 — Conservation Zone special provisions
☒ Section 6-94(b) — Non-residential Uses and Group Living Facilities permitted in Residential Zones including Resident Medical Professional Office
☑ Section 6-98 — Multi-Family Dwelling Units
☐ Section 6-100 — Use Groups: Group Living Facilities, Restaurants not between front and rear building lines, Supermarkets, Use Group 7b — subordinate to water dependent uses, Banks, Automotive Uses, Jobbers and Veterinarians
☑ Section 6-101, 107 — Buildings over 40,000 c.f. in Central Greenwich Impact Overlay Zone, Post Road Impact Overlay Zone, WB, LB or LBR Zones; and over 150,000 c.f. in all other zones
☐ Section 6-103.1 — Parking deficient uses in CGBR
☐ Section 6-104 — Parking Structures incl. underground in LB Zone and Height exceptions
☐ Section 6-105, 106 — Front Yard Parking in GB or GBO Zone
☐ Section 6-109, 109.1 — HO & HRO Zones
☐ Section 6-110 — Dwellings under special requirements for Business Zones
☐ Section 6-112 — IND-ZE Zone applications
☐ Section 6-113 — In Hospital Zones: certain accessory uses, expansions exceeding 4,000 s.f. or interior alterations or changes of use exceeding 20,000 s.f. (cumulative within 2 years)
☐ Section 6-114 — CCRC (Continuing Care Retirement Community)
☐ Section 6-118.1 — Uses within railroad rights of way
☐ Section 6-123 — Setbacks from Connecticut Turnpike in Business Zones
☐ Section 6-140.1 — Satellite Earth Stations which emit microwaves
☐ Section 6-141 — Changes in non-conforming uses, buildings
☐ Section 6-205 — Historic structures in CBG Zone exceeding FAR And Notes 7, 8 & 9

Town Project Number _____________________________ Special Permit Number assigned by Staff _____________________________

Accompanying fees _____________________________ Site Plan Number assigned by Staff _____________________________
**PRELIMINARY SITE PLAN APPLICATION**

- **Project Name**: 51 Mayo Avenue
- **Project Address**: 51 Mayo Avenue, Greenwich, CT 06830
- **Project Lot Number(s)**: 17-18
- **Property Owner(s)**: Alisa Brockelman
- **Tax Account Number(s)**: 02-1001/s
  - **Zone(s)**: RA-1
  - **Lot Area**: 1.11 acres

- [x] Special Permit – Complete special permit application form
- [ ] Coastal Zone
- [ ] Is project 500 feet from Municipal Boundary? (for notification)
- [ ] Amendment to Building Zone Regulations – Section(s)
- [ ] Amendment to Building Zone Map – Zone(s) affected
- [ ] Business Zone Plate Number
- [ ] Architectural Review Committee Application attached or Review needed
- [ ] Planning & Zoning Board of Appeals review needed
- [ ] Inland Wetlands and Watercourses Agency Review / Approval Required

**Estimated amount of time needed to present item to Commission at meeting:**

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**AUTHORIZED AGENT**

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<tr>
<th>Name</th>
<th>Firm name</th>
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<tbody>
<tr>
<td>Eric V.P. Brower, AICP</td>
<td>Eric V.P. Brower, AICP, Inc.</td>
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<td>Greenwich</td>
<td>CT</td>
<td>06831</td>
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<tr>
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**Signature**

[Signature]

**Date**: 6.30.21

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**PROPERTY OWNER(S) AUTHORIZATION**

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Alisa Brockelman</td>
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<th>Street Address</th>
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**ENGINEER**

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<tr>
<td>Peter Finkbeiner</td>
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**ARCHITECT**

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<tr>
<td>Dinyar Wadia</td>
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## SITE PLAN ZONING STATISTICS

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<th>PERMITTED / REQUIRED</th>
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<tr>
<td>Gross Floor Area</td>
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<td>Usable Floor Area</td>
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<tr>
<td>Parking Spaces</td>
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<td><strong>COMMERCIAL/RETAIL</strong></td>
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### NUMBER OF STORIES
- 2 1/2
- 2 1/2
- 2 1/2

### BUILDING HEIGHT
- 40'
- 40'
- 40'

### FLOOR AREA RATIO
- .142
- .135
- .135

### BUILDING COVERAGE AREA
- 72.3%
- 72%
- green

### LOT COVERAGE
- 72.3%
- 72%
- green

### TOTAL PARKING SPACES
- 0
- 0
- 0

### CHECK AS APPROPRIATE
- [ ] ADDITIONS
- [ ] ALTERATIONS
- [x] DEMOLITION
- [x] RE-CONSTRUCTION

This Site Plan Involves:
TOWN OF GREENWICH
Town Hall ~ 101 Field Point Road ~ Greenwich, CT 06830
Inland Wetlands & Watercourse Agency ~ 203-622-7736 ~ Fax.203-622-7764

PERMIT-NEED QUESTIONNAIRE

This form is NOT an IWWA Application

Project Address: 51 Mayo Ave Greenwich Tax ID: 02-1001/5
Property Owner: Alisa Brockett Address: 51 Mayo Ave
Contact information – Email or Cell Phone:
Authorized Agent: Eric R. Brower Address: 255 Glenville Rd G
Contact information – Email or Cell Phone: eric148@verizon.net 203 536 1049

Has there ever been an IWWA application for this site? YES NO Appl. #
ACTIVITY: (Circle) Addition Demolition Deck Garage Interiors renovations New residence Generator
Tennis Court Pool Site Work/Landscaping Septic Other (specify)
Will this activity require an addition to the septic system or a B100a? YES NO

FEE: $65 for reviews requiring a site visit

A PLOT PLAN IS REQUIRED SHOWING THE PROPOSED ACTIVITY.

IWWA staff will review the project proposal to determine if regulated activities are associated with the proposal and whether an IWWA permit is required. If an IWWA permit is required, the appropriate permit application packet will be provided.

Do not apply for a Building Permit until this review is complete.

No work may begin until an IWWA permit is issued and/or the “Building Permit Application Sign-Off Sheet” has been signed.

The issuance of a building permit alone does not constitute an authorization to proceed.

As the property owner □ or, authorized agent [ ] [check one] I believe the information I have submitted is correct.
Signature ___________________________ Date 6/29/21

STAFF NOTES

Office Rev Date 06/29/21 Field Inv Date ______/_____/______ WET/WC? YES □ NO TIDAL □
Action Required? YES □ NO ☐ If yes, DR AA AR SIA Staff J. Urena
Soils Report Date ______/_____/______ Author ___________________________ Soils ___________________________
Comments: no permit required.

Received
Jenn Urena

IWWA Questionnaire Revised 3/4/2020
1, Eric V.P. Brower, being first duly sworn, do hereby certify that on June 30, 2021 I caused to be mailed, postage prepaid, to those persons whose names are set forth on Exhibit A attached hereto, a copy of the notice attached hereto as Exhibit B. Said persons were the record owners, as of June 29, 2021 as shown on the Town Tax Assessor’s records of property abutting (as said term is defined in Sec. 6-14(a)(3) of the Greenwich Building Zone Regulations) the property belonging to Alisa Brockelman for which an application has been filed with the Planning and Zoning Commission.

Eric V.P. Brower

Subscribed and sworn to
Before me on
June 30, 2021

JAMES E CARNICELLI JR
Notary Public - State of New York
No. 01CA6072449
Qualified in Westchester County
My Commission Expires 06/07/2022
EXHIBIT A

BOUNDING OWNERS - 51 Mayo Avenue, Greenwich as of June 29, 2021

Lauren and Nathan Bohn
790 Briar Hill Road
Belleville, IL 62223

Lynne and Scott Smith
68 Bush Avenue
Greenwich, CT 06833

Victoria and Raphael Gonzalez
70 Bush Avenue
Greenwich, CT 06830

Kathleen Wasson
67 Mayo Avenue
Greenwich, CT 06830

Theodore Development Co. LLC
40 Bush Avenue
Greenwich, CT 06830

Jill Olson
44 Mayo Avenue
Greenwich, CT 06830

Stratford Wallace
68 Mayo Avenue
Greenwich, CT 06830

Ervin M.L.G. & P.J. Neckles
369 South Lake Drive Apt #3
Palm Beach, FL 33480-4571
June 30, 2021

To Whom It May Concern:

Notice is hereby given that Alisa Brockelman has filed a Special Permit - Site Plan Application with the Planning and Zoning Commission for property located at 51 Mayo Avenue, CT.

The existing residence will be replaced with a new dwelling, pool house and related site improvements. The existing detached garage-accessory building will be removed.

For further information concerning this application please contact the Planning and Zoning Commission office at 203-622-7894 or the undersigned at 203-536-1049.

Sincerely,

[Signature]

Eric V.P. Brower, AICP
<table>
<thead>
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<th>Article Number</th>
<th>Addressee (Name, Street, City, State, &amp; ZIP Code™)</th>
<th>Postage</th>
<th>Handling Charge</th>
<th>Actual Value if Registered</th>
<th>Insured Value</th>
<th>Due Sender if COD</th>
<th>ASR Fee</th>
<th>ASRD Fee</th>
<th>DC Fee</th>
<th>SC Fee</th>
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<td>Lowery Nathan Bahn 790 Briar Hill Rd Belleville, IL 62223</td>
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<td>Victoria + Raphael Gonzalez 70 Bush Ave Greenwich, CT 06830</td>
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<td>3.</td>
<td>Theodore Development LLC 40 Bush Ave Greenwich, CT 06830</td>
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<td>4.</td>
<td>Silas Olson 44 Mayo Ave Greenwich CT 06830</td>
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<td>5.</td>
<td>Jack Fenton 68 Mayo Ave Greenwich CT 06830</td>
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<td>6.</td>
<td>Ervin MCG + JS Neckles 369 South Lake Dr Apt 3 Palm Beach FL 33480-4571</td>
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<td>8.</td>
<td>Kathleen Wasso 67 Mayo Ave Greenwich CT 06830</td>
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Total Number of Places Listed by Sender: 8

Total Number of Places Received at Post Office: 8

PS Form 3877, June 2011 (Page 1 of 2)

Complete by Typewriter, Ink, or Ball Point Pen

See Privacy Act Statement on Reverse
AFFIDAVIT OF CONFIRMATION THAT PROPOSED PROJECT VOLUME EXCEEDS 150,000 CUBIC FEET

STATE OF CONNECTICUT )
   ) GREENWICH
COUNTY OF FAIRFIELD )

RICHARD SWIFT CAMPBELL
I, , being first duly sworn, do hereby certify, in accordance with Section 6-14 (c)(7) of the Greenwich Building Zone Regulations, that the proposed total cubic volume for all structures to be constructed at 51 Mayo Avenue, Greenwich for which an application has been filed with the Planning and Zoning Commission will exceed 150,000 cubic feet.

Print and sign
Architect of

record

Subscribed and sworn to
Before me on
May 19 , 2021

Lisa C. Keuker
Notary Public

Lisa C. Keuker
Notary Public, No. 175680
State of Connecticut
Commission Expires 01/31/2023
May 12, 2021

Ms. Katie DeLuca, AICP
Director – Town Planner
Planning and Zoning Commission
Town of Greenwich

RE: Special Permit - Coastal Site Plan Application – 51 Mayo Avenue, Greenwich, CT

Dear Ms. DeLuca,

Please be advised that Eric V.P. Brower, AICP is authorized to make application on my behalf for the above referenced property.

Sincerely,

[Signature]

Alisa Brockelman
PHYSICAL CHARACTERISTICS
Style: Colonial
Occupancy: Single family
Story Height: 2.5
Finished Area: 2541
Attic: None
Basement: 3/4

ROOFING
Material: Wood shingles
Type: Gable
Framing: Std for Class
Pitch: Not available

FLOORING
Slab: 3
Sub and joists: 1.0, 2.0, 2.5
Base Allowance: None

EXTERIOR COVER
Wood Siding: 1.0, 2.0, 2.5

INTERIOR FINISH
Normal for Class: 1.0, 2.0, 2.5

ACCOMMODATIONS
Finished Rooms: 11
Bedrooms: 4
Formal Dining Rooms: 1
Fireplaces: 4

HEATING AND AIR CONDITIONING
Primary Heat: Forced hot air-gas
Air Cond: 0 2441 2099 1001

PLUMBING
Bathrooms: 1

REMODELING AND MODERNIZATION
Amount Date
Interior: 1 01/16/2007
Kitchen: 1 01/16/2007
Bath Faciliities: 6 01/16/2007

SPECIAL FEATURES
Description Value
D: Remodel 2007
BASIC 7420
GAS 3930
MAS-STRK 7850
MAR-STRK 7850
WREBAR 1170

SUMMARY OF IMPROVEMENTS

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<td>WREBAR</td>
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Data Collector/Date
VM 05/15/2019

Appraiser/Date
TOC 10/01/2015

Neighborhood
Heigh 114020 AV

Supplemental Cards
TOTAL IMPROVEMENT VALUE: 2237900
RESIDENTIAL

VALUATION RECORD

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LAND DATA AND CALCULATIONS

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TOTAL LAND VALUE: $2781000

Supplemental Cards: TRUE TAX VALUE $2781000

Notes:
- BAH: Decrease Total value by 997,900
- BATH: BATHROOM ONLY IN UNFINISHED BMT.
- 2018: Sketch Revision, correct fireplace count, roof type
- Permit Number
- Filing Date
**ADMINISTRATIVE INFORMATION**

**OWNERSHIP**

**MAYO AVENUE 0051**

Tax ID 252/036

**TRANSFER OF OWNERSHIP**

Date

**VALUATION RECORD**

Assessment Year

Reason for Change

**VALUATION**

Site Description

**LAND DATA AND CALCULATIONS**

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Supplemental Cards

**TOTAL LAND VALUE**
## IMPROVEMENT DATA

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| Finished | Wood Frame | 0 Crawl | --- | 0 |

| TOTAL BASE | 9810 |

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<td>SUB-TOTAL 0 UNTS</td>
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| (LCM: 100.00) |

## HEATING AND AIR CONDITIONING
- Primary Heat: Forced hot air-gas
- Full Part
- Air Cond: 0 0 0 576

## PLUMBING
- 3 Fixt. Baths: 1 3
- Kit Sink: 1 1
- TOTAL: 4

## REMODELING AND MODERNIZATION
- Amount Date

## SPECIAL FEATURES

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<th>Description</th>
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<tbody>
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| Stry Const | Use | Str | Const | Year Year | Const | Year | Cond | Exe | 0.00  | 1920 | 2007 | EX | 0.00  | Y  | 0.00  | 768 | 228990 | 0 | 0 | 75 | 100 | 171100 |
|-------------|-----|-----|-------|----------|-------|------|------|-----|------|------|------|-----|-----|-----|-----|------|-----|------|-----|------|------|------|-----|
| D : DREN | 0.00 | 1 | Good | 1920 | 2007 | EX | 39.19 | N | 39.19 | 24x 32 | 30100 | 0 | 0 | 0 | 100 | 0 |
| 01 UTILIZED | 1.00 | 1 | Good | 1920 | 2007 | EX | 44.50 | N | 66.75 | 13x 32 | 27770 | 0 | 0 | 100 | 100 | 27800 |

## Data Collector/Date
- VM 05/16/2019

## Appraiser/Date
- TOG 10/01/2015

## Neighborhood
- Neigh 114020 AV

## Supplemental Cards
- TOTAL IMPROVEMENT VALUE 198900
Site Plan Application

Property Address: 51 Mayo Avenue, Greenwich, CT 06830
Tax ID: 02-1001/S

Property Owner: Alisa Brockelman
Address: 51 Mayo Avenue, Greenwich 06830

Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: 
Applicant: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich 06831

Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: 
Authorized Agent: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich 06831

Select One: □ Pre-Application  X Final
Zone(s): RA-1 Lot Area: 1.11 acres

Please select all relevant items below:

☐ Special Permit – Complete special permit application form
☐ Coastal Overlay Zone
☐ Property is within 500 feet of a Municipal Boundary of ___________ (for notification)
☐ Amendment to Building Zone Regulations – Section(s) ___________
☐ Amendment to Building Zone Map – Zone(s) affected ___________
☐ Health Department review needed
☐ Sewer Department review needed
☐ Architectural Review Committee Application attached or Review needed
☐ Planning & Zoning Board of Appeals review needed
☐ Inland Wetlands and Watercourses Agency Review / Approval Required
☐ Scenic Road Designation

To be completed by P&Z staff only:
Check # __________ Check Amount: $ ______
Application # ____________________________
<table>
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<td></td>
</tr>
<tr>
<td>Gross Floor Area</td>
<td></td>
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</tr>
<tr>
<td>Usable Floor Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Spaces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER USES</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Gross Floor Area</td>
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<td></td>
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<tr>
<td>Usable Floor Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Spaces</td>
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<td>1</td>
<td>1</td>
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<td>Number of Bedrooms</td>
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<td>6,526</td>
<td>6,528.6</td>
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<tr>
<td>Parking Spaces</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SQUARE FOOTAGE</td>
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<tr>
<td>BUILDING HEIGHT</td>
<td>40'</td>
<td>40'</td>
<td>40'</td>
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<tr>
<td>FLOOR AREA RATIO</td>
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<td>.135</td>
<td>.135</td>
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<td>BUILDING COVERAGE</td>
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<td></td>
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<td>TOTAL PARKING SPACES</td>
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<td>GREEN AREA</td>
<td>79%</td>
<td>72.3%</td>
<td>72%</td>
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<tr>
<td>AGE OF STRUCTURE</td>
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</tr>
<tr>
<td>THIS SITE PLAN INVOLVES:</td>
<td>□ Additions</td>
<td>□ Alterations</td>
<td>✗ Demolition</td>
</tr>
</tbody>
</table>

pzSitePlanApp 2020
TOWN OF GREENWICH
Town Hall ~ 101 Field Point Road ~ Greenwich, CT 06830
Planning & Zoning Department ~ 203-622-7894 ~ Fax 203-622-3795

Special Permit Application

Property Address: 51 Mayo Avenue, Greenwich, CT 06830

Property Owner: Alisa Brockelman
Address: 51 Mayo Avenue, Greenwich 06830

Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: ______________

Applicant: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich 06831

Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: ______________

Authorized Agent: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich 06831

Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: ______________

Zone(s): RA-1
Lot Area: 1.11 acres

PLEASE SELECT ALL RELEVANT ITEMS BELOW:

☒ Section 6-17 — Special Permit standards and procedure
  ☒ Section 6-30 — Conservation Zone special provisions
  ☒ Section 6-94(b) — Non-residential Uses and Group Living Facilities permitted in Residential Zones including Resident Medical Professional Office
  ☒ Section 6-98 — RMF Zone
  ☐ Section 6-100 — Use Groups for Business Zones
☒ Section 6-101, 107 — Buildings over 40,000 c.f. in Central Greenwich Impact Overlay Zone, Post Road Impact Overlay Zone, WB, LB or LBR Zones; and over 150,000 c.f. in all other zones
  ☐ Section 6-103.1 — Parking deficient uses in CGBR
  ☒ Section 6-104 — Parking Structures incl. underground in LB Zone and Height exceptions
  ☐ Section 6-105, 106 — Front Yard Parking in GB or GBO Zone
  ☐ Section 6-109 — HO & HRO Zones
  ☐ Section 6-110 — Dwellings under special requirements for Business Zones
  ☐ Section 6-112 — IND-RE Zone applications
  ☐ Section 6-113 — In Hospital Zones: certain accessory uses, expansions exceeding 4,000 s.f. or interior alterations or changes of use exceeding 20,000 s.f. (cumulative within 2 years)
  ☐ Section 6-114 — CCRC (Continuing Care Retirement Community)
  ☐ Section 6-118.1 — Uses within railroad rights of way
  ☐ Section 6-123 — Setbacks from Connecticut Turnpike in Business Zones
  ☐ Section 6-140.1 — Satellite Earth Stations that emit microwaves
  ☐ Section 6-141 — Changes in non-conforming uses, buildings
  ☐ Section 6-205 — Historic structures in CBG Zone exceeding FAR And Notes 7, 8 & 9

To be completed by P&Z staff only:
Check # __________________ Check Amount: $_________

Application # ____________________________

pzSpecialPermitApp 2020
Application Signature Page

Property Address: 51 Mayo Avenue, Greenwich 06830
Tax ID: 02-1001/S

Property Owner 1: Alisa Brockelman
Address: 51 Mayo Avenue, Greenwich
Email: 
Cell Phone: 
Other Phone: 
Signature: ATTACHED
Date: 

Property Owner 2: 
Address: 
Email: 
Cell Phone: 
Other Phone: 
Signature: 
Date: 

Property Owner 3: 
Address: 
Email: 
Cell Phone: 
Other Phone: 
Signature: 
Date: 

Property Owner 4: 
Address: 
Email: 
Cell Phone: 
Other Phone: 
Signature: 
Date: 

Applicant: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich
Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: 
Signature: 
Date: 6.30.21

Authorized Agent: Eric V.P. Brower, AICP
Address: 255 Glenville Road, Greenwich
Email: ericaicp@verizon.net
Cell Phone: 203 536 1049
Other Phone: 
Signature: 
Date: 6.30.21
May 7, 2021

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: Brockelman – 51 Mayo Avenue
Zone: RA-1
Dear Sir:

S. E. Minor & Co., Inc. (SEM) has established Proposed Grade Plane for the above referenced project to be 111.83 for a first floor elevation of 113.0 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 A.Y.
Att.: Grade Plane Worksheet & Sketch
# Proposed Grade Plane Computation

**Brockelman Residence**  
51 Mayo Avenue  
Greenwich, CT.

<table>
<thead>
<tr>
<th>6' O/S Line</th>
<th>Designation</th>
<th>Length</th>
<th>Lowest Elevation Within 6' Envelope</th>
<th>Length x Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>171.78</td>
<td>112.50</td>
<td>19325.25</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2.29</td>
<td>112.00</td>
<td>256.48</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>15.46</td>
<td>112.50</td>
<td>1739.25</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>38.58</td>
<td>112.50</td>
<td>4340.25</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>50.03</td>
<td>112.50</td>
<td>5628.38</td>
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<tr>
<td></td>
<td>F</td>
<td>12.99</td>
<td>112.00</td>
<td>1454.88</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>9.00</td>
<td>102.80</td>
<td>925.20</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>26.49</td>
<td>112.00</td>
<td>2966.88</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>18.47</td>
<td>112.50</td>
<td>2077.88</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>13.43</td>
<td>102.80</td>
<td>1380.60</td>
</tr>
</tbody>
</table>

| Total       | 358.52      | 40096.04 |

**Column 1**  
**Column 2**  
**Column 3**

**First Floor Elevation** = 113.00

**Column 3 / Column 1 = Grade Plane Elevation** = 111.83

**Differential** = 1.17

---

S. E. Minor & Co., Inc.
May 7, 2021

S. E. Minor & Co., Inc.
Consulting Engineers & Surveyors
33 West Elm Street, P.O. Box 92
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: Brockelman – 51 Mayo Avenue (Pool Pavilion)
Zone: RA-1

Dear Sir:

S. E. Minor & Co., Inc. (SEM) has established Proposed Grade Plane for the above referenced project to be 110.65 for a first floor elevation of 110.6 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 A.Y.
Att.: Grade Plane Worksheet & Sketch
<table>
<thead>
<tr>
<th>DESIGNATION</th>
<th>LENGTH</th>
<th>LOWEST ELEVATION WITHIN 6' ENVELOPE</th>
<th>LENGTH X ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>38.12</td>
<td>110.50</td>
<td>4212.26</td>
</tr>
<tr>
<td>B</td>
<td>21.60</td>
<td>110.50</td>
<td>2386.80</td>
</tr>
<tr>
<td>C</td>
<td>47.60</td>
<td>110.90</td>
<td>5278.84</td>
</tr>
<tr>
<td>D</td>
<td>21.60</td>
<td>110.50</td>
<td>2386.80</td>
</tr>
</tbody>
</table>

**TOTAL**

<table>
<thead>
<tr>
<th>COLUMN 1</th>
<th>COLUMN 2</th>
<th>COLUMN 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>128.92</td>
<td></td>
<td>14264.70</td>
</tr>
</tbody>
</table>

**FIRST FLOOR ELEVATION**

COLUMN 3 / COLUMN 1 = GRADE PLANE ELEVATION = 110.65

DIFFERENTIAL = -0.05

---

S. E. MINOR & CO., INC.
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA) CERTIFICATION
PRE-CONSTRUCTION

Property Address: 51 Mayo Avenue

Tax Account No.: 02-1001/S

Building Permit No.: ____________________________

PLANS & DRAINAGE SUMMARY REPORT INFORMATION

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

Design Plans Date: 9/17/2021

Drainage Report Date: 9/17/2021

PROPERTY INFORMATION FOR DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)

<table>
<thead>
<tr>
<th>Total Impervious Area Under Existing Conditions (SF)</th>
<th>Total Impervious Area Under Proposed Conditions (SF)</th>
<th>Total Disconnected Impervious Area Under Proposed Conditions (SF)</th>
<th>Total Directly Connected Impervious Area Under Proposed Conditions (SF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,809.00</td>
<td>15,405.00</td>
<td>15,125.00</td>
<td>280.00</td>
</tr>
</tbody>
</table>

1 Impervious 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.

2 All 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 (infiltrating/filtering), Constructed Stormwater Wetlands, Extended Dry Detention Basins (filtration required), Gravel Wetlands, Constructed Wet Stormwater Ponds, Sand/Organic Filters (sand filters, tree filters, stormwater planters, etc.), Infiltration Systems (drywells, Cultecs, etc.), Permeable Pavement Areas (infiltrating/filtering), Green Roofs, and Disconnected Impervious Area (must meet all the standards under Simple Disconnection on page 44 and 45 of the Drainage Manual).

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

Engineer's Signature ____________________________ Date 9/17/2021

Engineer's Seal

Form SC-107

February 2021
Drainage Summary Report
Property of
Alisa Brockelman
51 Mayo Avenue
Greenwich, Connecticut
September 17th, 2021
TABLE OF CONTENTS:

GENERAL DISCUSSION & SUMMARY REPORT 1
SOIL SURVEY DATA 2
LID CREDITS CHECKLIST 3
WATER QUALITY CALCULATIONS 4
RUNOFF REDUCTION CALCULATIONS 5
GROUNDWATER RECHARGE CALCULATIONS 6
CONVEYANCE CALCULATIONS 7
HYDROLOGICAL & HYDRAULIC CALCULATIONS EXISTING CONDITIONS 8
HYDROLOGICAL & HYDRAULIC CALCULATIONS PROPOSED CONDITIONS 9
STORMWATER MANAGEMENT OPERATIONS & MAINTENANCE PLAN 10
Drainage Summary Report

Property of
Alisa Brockelman
51 Mayo Avenue
Greenwich, Connecticut

The subject site is a residential building lot located on the North side of Mayo Avenue in Greenwich, between Otter Rock Drive and Field Point Road. It is proposed to construct a new residence, pool pavilion, new driveway, patio, and landscaping. Currently, the site consists of an existing residence, driveway, patio, walkway, and pool. The existing pool is to remain; all other structures will be demolished. As can be seen on the attached plan set, there are no wetlands on the property.

There is one point of concern on the property. The entire property drains to Mayo Avenue. This is labeled “1S” in the existing condition and “1L” in the proposed condition. All the proposed work will take place in the same watershed and the proposed grading will not alter the drainage areas.

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 Web Soil Survey, the site consists of Woodbridge-Urban land complex which is given a Hydrologic Soil Group classification of HSG C/D and Paxton-Urban land complex which is classified as HSG C soils. Deep soil testing and hydraulic conductivity testing done on the property proved infiltration is possible in the proposed locations.

The proposed development concept sought to utilize Low Impact Development (LID) design principles and techniques to the maximum extent practicable. 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 proposed storm water management system utilizes LID BMPs in order to meet the required standards. The proposed roof and most of the driveway will be routed to a filtering raingarden.
The proposed pavilion and terrace areas are routed to proposed infiltrating cultec system. The filtrating raingarden will underdrain into another infiltrating cultec system that will collect a small portion of the driveway as well.

**STANDARD 2: Protection of Natural Hydrology**

A. Site disturbance has been minimized as depicted on the enclosed Site Plan package. The limit of disturbance is delineated by construction fencing. No disturbance shall occur outside the fenced construction zone(s). No low areas on site are proposed to be dewatered or filled.

B. Construction notes to the contractor to limit soil compaction and the limits of disturbance are included on the Site Plan. Infiltrating storm water structures have been proposed in areas that should not experience loads from heavy construction traffic. These 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.

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 conditions, the site will continue to drain to Mayo Avenue.

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 flagged wetlands on site.

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. The proposed stormwater network has been designed to collect and treat runoff close to its source. 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 proposed storm water management system utilizes LID BMPs in order to meet the required standards. The proposed roof and most of the driveway will be routed to a filtrating raingarden. The proposed pavilion and terrace areas are routed to the proposed infiltrating cultec system. The filtrating raingarden will underdrain into another infiltrating cultec system that will collect a small portion of the driveway as well.
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 in order to meet the WQV.
C. The proposed junction boxes act as access points for maintenance and shutdown in an unexpected event.
D. No pumping of stormwater is proposed.
E. Pumping of groundwater is proposed.

STANDARD 4: Runoff Reduction Volume and Groundwater Recharge Volume

A. RRV – (Runoff Reduction Volume) calculations are enclosed.
B. GRV – (Groundwater Recharge Volume) calculations are enclosed.
C. RCV - (Runoff Capture Volume) calculations are not required for this project.

STANDARD 5: Peak Flow Control

A. The Storm 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 POC 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 POC 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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</tr>
</thead>
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<td>0.47</td>
<td>-61.2%</td>
<td>4825</td>
<td>3616</td>
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<td>5239</td>
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<tr>
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<tr>
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<td>5.95</td>
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<tr>
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<td>6.99</td>
<td>7.82</td>
<td>11.9%</td>
<td>27637</td>
<td>27001</td>
<td>-2.3%</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 junction boxes, a filtrating raingarden and infiltrating cultec systems.
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 Critical 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.

Respectfully submitted,
S.E. Minor & Co., Inc.

John P. Giancola, P.E., P.L.S.
Senior Project Engineer
Date: September 17th, 2021
SOIL SURVEY DATA
- NRCS Soil Data
- Site Feasibility Testing
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
- 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 20, Jun 9, 2020

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>Area in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>245B</td>
<td>Woodbridge-Urban land complex, 0 to 8 percent slopes</td>
<td>C/D</td>
<td>0.8</td>
<td>62.8%</td>
</tr>
<tr>
<td>284B</td>
<td>Paxton-Urban land complex, 3 to 8 percent slopes</td>
<td>C</td>
<td>0.5</td>
<td>37.2%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td></td>
<td><strong>1.3</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

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
Component Percent Cutoff: None Specified
Tie-break Rule: Higher
## SOIL EVALUATION TEST RESULTS

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

### TEST PIT #1  
#### GROUND ELEVATION: 103

<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>102.3</td>
<td>Topsoil</td>
<td>0-8&quot;</td>
</tr>
<tr>
<td>100.5</td>
<td>Fill</td>
<td>8&quot;-30&quot;</td>
</tr>
<tr>
<td>98.0</td>
<td>Brown Silty Loam</td>
<td>30&quot;-60&quot;</td>
</tr>
<tr>
<td>97.58</td>
<td>Mottled grey/brown silty loam</td>
<td>60&quot;-65&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**):
    - 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
    - Amoobazem et al. Amoobazegar (constant head) permeameter - Amoobazegar 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>98.0</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

**Mottling**

- Groundwater
- Ledge
- Roots

**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. Percolation 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 infiltrations.**

### 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:** A.Y.  
**Signature of Test Conductor:**  
**Date:** 4/26/2021
**SOIL EVALUATION TEST RESULTS**

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

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Soil Texture (Percent Sand, Silt and Clay)</th>
<th>Depth Range in Inches</th>
<th>Existing Ground Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>107.6</td>
<td>Topsoil</td>
<td>0'-8'</td>
<td>Top Elevation of Proposed Infiltration System:</td>
</tr>
<tr>
<td>106.0</td>
<td>Fill</td>
<td>8'-28'</td>
<td>Bottom Elevation of Proposed Infiltration System:</td>
</tr>
<tr>
<td>104.1</td>
<td>Brown Silty Loam</td>
<td>28'-50'</td>
<td>Elevation of Test*:</td>
</tr>
<tr>
<td>103.3</td>
<td>Mottled grey/brown silty loam</td>
<td>50'-60'</td>
<td>Test Method (check one of the following acceptable methods**):</td>
</tr>
</tbody>
</table>

- Borehole infiltration test (NHDES, 2008)
- Guelph permeameter - ASTM D5126-90 Method
- Falling Head Permeameter - ASTM D5126-90 Method
- Double ring permeator or infiltrometer - ASTM D3385-03, D5093-02, D5126-90 Methods
- Amoozegar 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>104.1</td>
<td>50'</td>
</tr>
</tbody>
</table>

**Groundwater**

**Ledge**

**Roots**

**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:** A.Y.  
**Signature of Test Conductor:**  
**Date:** 4/26/2021
S. E. Minor & Co., Inc.
33 West Elm Street
Greenwich, Connecticut 06830

SATURATED HYDRAULIC CONDUCTIVITY TEST

<table>
<thead>
<tr>
<th>Property Owner: Brockelman Residence</th>
<th>Perm. Hole Dia.: 6&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Address: 51 Mayo Avenue</td>
<td>Perm. Hole Depth: 36&quot;</td>
</tr>
<tr>
<td>Municipality: Town of Greenwich</td>
<td>Pre-Soak Time: 2 Hrs</td>
</tr>
<tr>
<td>Sanitarian: N/A</td>
<td>Date: 4/26/2021</td>
</tr>
</tbody>
</table>

SOIL PERMEABILITY TEST DATA REQUIRED TO BE SUBMITTED WITH APPLICATION

<table>
<thead>
<tr>
<th>Hole Number</th>
<th>Clock Time</th>
<th>Elapsed Time (Minutes)</th>
<th>Depth to Water from Top of Casing</th>
<th>Water Level Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>Stop</td>
<td>Start (Inches)</td>
<td>Stop (Inches)</td>
</tr>
<tr>
<td>C 1</td>
<td>8:30</td>
<td>9:30</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>9:30</td>
<td>10:30</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10:30</td>
<td>11:30</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>11:30</td>
<td>12:30</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average of Readings:</td>
<td>6.75/4 = 1.69</td>
</tr>
<tr>
<td>C 2</td>
<td>8:32</td>
<td>9:32</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>9:32</td>
<td>10:32</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10:32</td>
<td>11:32</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>11:32</td>
<td>12:32</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average of Readings:</td>
<td>6.25/4 = 1.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Design Factor of 2:</td>
<td>1.56 / 2 = 0.78</td>
</tr>
</tbody>
</table>
## 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>Minimizing Soil Compaction</td>
<td>• The &quot;no disturbance&quot; 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.</td>
<td>Areas that comply (i.e., &quot;no disturbance areas&quot;) 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>(Section 4.4.1)</td>
<td>• &quot;No disturbance&quot; areas are not to be stripped of existing topsoil.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• &quot;No disturbance&quot; areas are not to be stripped of existing vegetation.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Vehicle movement, storage, or equipment/material lay-down is not to be permitted in &quot;no disturbance&quot; areas.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• 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.</td>
<td></td>
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<tr>
<td></td>
<td>• Lawn and turf grass are acceptable uses. Planted meadow is an encouraged use.</td>
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<tr>
<td>Minimizing Site Disturbance</td>
<td>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.</td>
<td>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.</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>(Section 4.4.2)</td>
<td></td>
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</tr>
<tr>
<td>Protecting Sensitive Natural Areas</td>
<td>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.</td>
<td>The project proponent can subtract the conservation area from the total area in the Water Quality Volume calculation.</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>(Section 4.4.3)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Protecting Riparian Buffers</td>
<td>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.</td>
<td>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.</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>(Section 4.4.4)</td>
<td>• 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.</td>
<td></td>
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<tr>
<td></td>
<td>• The maximum contributing path shall be 150 feet for pervious surfaces and 75 feet for impervious surfaces.</td>
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<td></td>
<td>• The average contributing overland slope to and across the buffer shall be less than or equal to 5%.</td>
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<tr>
<td></td>
<td>• Runoff shall enter the buffer as sheet flow. A level spreader shall be utilized where local site conditions prevent sheet flow from being maintained.</td>
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<tr>
<td></td>
<td>• The stream buffer remains unmanaged other than routine debris removal.</td>
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<tr>
<td></td>
<td>• 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</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>
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</tr>
<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></td>
<td></td>
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</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></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></td>
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</tr>
<tr>
<td></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>
<td></td>
</tr>
<tr>
<td>LID Technique</td>
<td>Compliance Requirements</td>
<td>Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</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 16 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. | disconnected 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. | Subtract 50% of any restored areas (100% of any restored and reforested areas) from the total post development site area and re-calculate the Runoff Reduction Volume. |
## Credits for Low Impact Development (LID) Best Management Practices (BMPs)

<table>
<thead>
<tr>
<th>LID Technique</th>
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<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. 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. A minimum factor of safety equal to 1.2 must be applied to the calculated cistern volume required. 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. 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. 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. 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. Subtract 100% of the contributing drainage area from the total area in the Water Quality Volume calculation.</td>
<td></td>
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</tr>
<tr>
<td>LID Technique</td>
<td>Compliance Requirements</td>
<td>Credit</td>
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<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.</td>
<td></td>
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<tr>
<td></td>
<td>An appropriate pump shall be selected to provide adequate pressure for its designated uses.</td>
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<tr>
<td></td>
<td>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.</td>
<td></td>
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<tr>
<td></td>
<td>Irrigation water from a cistern shall be applied so that the water infiltrates into the ground.</td>
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</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
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<tr>
<td></td>
<td>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>
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<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

\[
\text{WQV} = \frac{(1 - \text{R})(\text{A})}{12 \text{ IN/FT.}}
\]
\[
\text{R} = (\text{Rvl} \times \%I) + (\text{RVT} \times \%T) + (\text{RvF} \times \%F)
\]
\[
\text{A} = \text{Site area}
\]

\[
\text{RVT} = (\text{RVT A} \times \%T \text{ OF HSG A}) + (\text{RVT B} \times \%T \text{ OF HSG B}) + (\text{RVT C} \times \%T \text{ OF HSG C}) + (\text{RVT D} \times \%T \text{ OF HSG D})
\]

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

### TURF RUNOFF COEFFICIENT CALCULATION

<table>
<thead>
<tr>
<th>Drain Area</th>
<th>OF TURF</th>
<th>( \text{RVT A} )</th>
<th>( \text{RVT B} )</th>
<th>( \text{RVT C} )</th>
<th>( \text{RVT D} )</th>
<th>%T A</th>
<th>%T B</th>
<th>%T C</th>
<th>%T D</th>
<th>( \text{RVT} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.15</td>
<td>0.2</td>
<td>0.22</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.15</td>
<td>0.2</td>
<td>0.22</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
</tbody>
</table>

### FOREST RUNOFF COEFFICIENT CALCULATION

<table>
<thead>
<tr>
<th>Drain Area</th>
<th>OF FORREST</th>
<th>( \text{RvF A} )</th>
<th>( \text{RvF B} )</th>
<th>( \text{RvF C} )</th>
<th>( \text{RvF D} )</th>
<th>%F A</th>
<th>%F B</th>
<th>%F C</th>
<th>%F D</th>
<th>( \text{RvF} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0.02</td>
<td>0.03</td>
<td>0.04</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.02</td>
<td>0.03</td>
<td>0.04</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
</tbody>
</table>

### WATER QUALITY VOLUME CALCULATION

<table>
<thead>
<tr>
<th>BMP#</th>
<th>Description</th>
<th>Drain Area</th>
<th>Total SF</th>
<th>( \text{Rvl} )</th>
<th>%I</th>
<th>( \text{RVT} )</th>
<th>%T</th>
<th>( \text{RvF} )</th>
<th>%F</th>
<th>( \text{R} )</th>
<th>WQV CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roof and Drive</td>
<td>4S</td>
<td>15.832</td>
<td>0.95</td>
<td>67.55</td>
<td>0.220</td>
<td>32.45</td>
<td>0.040</td>
<td>0.713</td>
<td>941</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Drive</td>
<td>5S</td>
<td>1.660</td>
<td>0.95</td>
<td>100</td>
<td>0.220</td>
<td>0</td>
<td>0.040</td>
<td>0.950</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pool, Patio, and Pavilion</td>
<td>6S</td>
<td>11.909</td>
<td>0.95</td>
<td>23.3</td>
<td>0.220</td>
<td>76.7</td>
<td>0.040</td>
<td>0.390</td>
<td>387</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>0.95</td>
<td>0</td>
<td>0.220</td>
<td>0</td>
<td>0.040</td>
<td>0.000</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

RAINGARDEN PROVIDES 1470 CF OF STORAGE AND TREATMENT
CULTEC SYSTEM C-2 PROVIDES 800 CF OF STORAGE

<table>
<thead>
<tr>
<th>IMPERV</th>
<th>TURF</th>
<th>FORREST</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSG A</td>
<td>0.95</td>
<td>0.15</td>
</tr>
<tr>
<td>HSG B</td>
<td>0.95</td>
<td>0.20</td>
</tr>
<tr>
<td>HSG C</td>
<td>0.95</td>
<td>0.22</td>
</tr>
<tr>
<td>HSG D</td>
<td>0.95</td>
<td>0.25</td>
</tr>
</tbody>
</table>
**TSS REMOVAL CALCULATION WORKSHEET**

Instructions:
2. Complete only highlighted cells

<table>
<thead>
<tr>
<th>Location</th>
<th>BMP ¹</th>
<th>TSS REMOVAL RATE ¹</th>
<th>STARTING TSS LOAD*</th>
<th>AMOUNT REMOVED (B*C)</th>
<th>REMAINING LOAD (C-D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Sump Manhole</td>
<td>20%</td>
<td>1</td>
<td>0.2</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Raingarden</td>
<td>80%</td>
<td>0.8</td>
<td>0.64</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Cultec</td>
<td>80%</td>
<td>0.16</td>
<td>0.128</td>
<td>0.032</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL TSS REMOVAL = 96.8%
Bioretention Area Sizing Calculation

Storm Water Quality Calculations - Bioretention Design - Per Standard Rain Garden Design Criteria

SURFACE AREA "STATIC METHOD"

\[ \text{SA} = \frac{\text{WQV}}{\text{PD} + (\text{SD} \times n) + (\text{GD} \times n)} \]

ENTER ALL VALUES IN FT.

- WQV = 941 As Calculated
- PD = 1 "A" soils=12" "B" soils=9" "C" soils=6" "underdrainage = 18"
- SD = 1.5 Bio Soil Depth
- GD = 0.5 Gravel Depth
- n = 0.3 Soil Mix
- n = 0.4 Gravel Layer

PD + (SD \times n) = 1.65

SA = 570.3
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 DA to Mayo Avenue

RRV = Vpos: (POST 1year, 24hr stc Subtract Vpre (PRE 1year, 24hr storm)

Vpos: 5,522 Proposed without BMPs
Vpre: 4,825 Existing
RRV = 697 Cubic Feet (cf)

Cultec System C-1 provides 1103 CF of storage
Cultec System C-2 provides 800 CF of storage
Total storage provided 1903 Cf of storage
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= Groundwater Recharge Volume:

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

\( A = \) Total Site Area: 1.11 Acres

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

- Proposed Impervious area = \( \frac{15405}{43560} = 0.35385 \) Acres
- Existing Impervious area = \( \frac{11809}{43560} = 0.271097 \) Acres

\( I = \frac{0.0826}{1.11} = 0.0744 \)

\( GRV = \frac{(F)(I)}{12} = 0.00241 \) Acre Feet

= 104.88 Cubic Feet Storage Required
Drawdown Calculation

BMP Drawdown Calculations - As defined in the "Greenwich Drainage Manual" (Appendix B)
Infiltration Rates (Use field infiltration rate for C soils or if the
Dynamic Field Method is used for sizing of the infiltration system)

Retention System No. 1

\[ T = \frac{V}{(K)(\text{Bottom Area})n} \]
\( T = \) Drawdown Time (hours)
\( V = \) Storage Volume (cf)
\( K = \) Infiltration Rate (in/hr)
\( \text{Bottom Area(BA)} = \) Bottom Area of Recharge Structure (sf)
\( n = \) Porosity of stone

\[ V = 1103 \]
\[ K = 0.85 \]
\[ \text{BA} = 552 \]
\[ n = 0.4 \]

\[ T = \frac{1103}{(0.85)(552)(0.4)} \]
\[ = 70.5 \text{ Hours} \]

Retention System No. 2

\[ T = \frac{V}{(K)(\text{Bottom Area})n} \]
\( T = \) Drawdown Time (hours)
\( V = \) Storage Volume (cf)
\( K = \) Infiltration Rate (in/hr)
\( \text{Bottom Area(BA)} = \) Bottom Area of Recharge Structure (sf)
\( n = \) Porosity of stone

\[ V = 566 \]
\[ K = 0.76 \]
\[ \text{BA} = 412.7 \]
\[ n = 0.4 \]

\[ T = \frac{566}{(0.76)(412.7)(0.4)} \]
\[ = 54.8 \text{ Hours} \]
### Conveyance Calculations

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

\( n = 0.01 \) (constant for PVC)

<table>
<thead>
<tr>
<th>DIAMETER</th>
<th>DIAMETER</th>
<th>RADIUS</th>
<th>AREA</th>
<th>SLOPE</th>
<th>HYDRAULIC RADIUS</th>
<th>FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>D (in)</td>
<td>D (ft)</td>
<td>r (ft)</td>
<td>A (ft^2)</td>
<td>S (ft/ft)</td>
<td>R (ft)</td>
<td>Q (cfs)</td>
</tr>
<tr>
<td>6</td>
<td>0.5</td>
<td>0.25</td>
<td>0.196</td>
<td>0.035</td>
<td>0.125</td>
<td>1.368</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>D (in)</th>
<th>D (ft)</th>
<th>r (ft)</th>
<th>A (ft^2)</th>
<th>S (ft/ft)</th>
<th>R (ft)</th>
<th>Q (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.3333333333</td>
<td>0.166666667</td>
<td>0.087</td>
<td>0.03</td>
<td>0.0833333333</td>
<td>0.430</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>D (in)</th>
<th>D (ft)</th>
<th>r (ft)</th>
<th>A (ft^2)</th>
<th>S (ft/ft)</th>
<th>R (ft)</th>
<th>Q (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>1.575</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pipe Run</th>
<th>25 yr cfs from Hydrocad</th>
<th>Min Slope</th>
<th>Min Pipe Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manhole to Raingarden</td>
<td>1.33</td>
<td>4%</td>
<td>6</td>
</tr>
<tr>
<td>Pavillon and Patio</td>
<td>0.4</td>
<td>3%</td>
<td>4</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
1S
Ex to Mayo Avenue

2L
Existing to Mayo

8S
OFFSITE GRASS
2021-09-10_51 Mayo Avenue
Prepared by {enter your company name here}
Type III 24-hr 25-YEAR Rainfall=6.40" 
Printed 9/17/2021
HydroCAD® 10.00-26 s/n 04499 © 2020 HydroCAD Software Solutions LLC

Page 2

Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 to Mayo Avenue
Runoff Area=48,360 sf  24.42% Impervious  Runoff Depth=4.13" 
Flow Length=230'  Tc=12.6 min  CN=80  Runoff=4.30 cfs  16,641 cf

Subcatchment 8S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=3.52" 
Tc=5.0 min  CN=74  Runoff=0.16 cfs  508 cf

Link 2L: Existing to Mayo
Inflow=4.40 cfs  17,150 cf
Primary=4.40 cfs  17,150 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 17,150 cf  Average Runoff Depth = 4.11"
76.42% Pervious = 38,282 sf  23.58% Impervious = 11,809 sf
Summary for Subcatchment 1S: Ex to Mayo Avenue

Runoff = 4.30 cfs @ 12.17 hrs, Volume= 16,641 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 2,615</td>
<td>98</td>
<td>Main Roofs, HSG C</td>
</tr>
<tr>
<td>* 1,233</td>
<td>98</td>
<td>Garage Roofs, HSG C</td>
</tr>
<tr>
<td>750</td>
<td>98</td>
<td>Water Surface, HSG C</td>
</tr>
<tr>
<td>5,132</td>
<td>98</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>* 385</td>
<td>98</td>
<td>Walkways, HSG C</td>
</tr>
<tr>
<td>* 1,694</td>
<td>98</td>
<td>Patio, HSG C</td>
</tr>
<tr>
<td>36,551</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>48,360</td>
<td>80</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>36,551</td>
<td></td>
<td>75.58% Pervious Area</td>
</tr>
<tr>
<td>11,809</td>
<td></td>
<td>24.42% Impervious Area</td>
</tr>
</tbody>
</table>

Tc (min) Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
--- | --- | --- | --- | --- | --- | --- |
10.6 | 75 | 0.0230 | 0.12 | | Sheet Flow, Grass: Dense n= 0.240  P2= 3.30"
2.0 | 155 | 0.0329 | 1.27 | | Shallow Concentrated Flow, Short Grass Pasture  Kv= 7.0 fps

Subcatchment 1S: Ex to Mayo Avenue

Hydrograph

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=48,360 sf
Runoff Volume=16,641 cf
Runoff Depth=4.13"
Flow Length=230'
Tc=12.6 min
CN=80
Summary for Subcatchment 8S: OFFSITE GRASS

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 508 cf, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,731</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>1,731</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc (min) Length (feet) Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description
5.0        50.00  0.05  0.67  1.0  1.0  Direct Entry,

Subcatchment 8S: OFFSITE GRASS

Hydrograph

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=1,731 sf
Runoff Volume=508 cf
Runoff Depth=3.52"
Tc=5.0 min
CN=74
Summary for Link 2L: Existing to Mayo

Inflow Area = 50,091 sf, 23.58% Impervious, Inflow Depth = 4.11" for 25-YEAR event
Inflow = 4.40 cfs @ 12.17 hrs, Volume = 17,150 cf
Primary = 4.40 cfs @ 12.17 hrs, Volume = 17,150 cf, Atten = 0%, Lag = 0.0 min

Primary outflow = Inflow, Time Span = 0.00-27.00 hrs, dt = 0.05 hrs

Inflow Area = 50,091 sf

Link 2L: Existing to Mayo

Hydrograph

Flow (cfs)

Time (hours)
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 to Mayo Avenue
- Runoff Area=48,360 sf
- 24.42% Impervious
- Runoff Depth=1.17"
- Flow Length=230'
- Tc=12.6 min
- CN=80
- Runoff=1.18 cfs
- 4,703 cf

Subcatchment 8S: OFFSITE GRASS
- Runoff Area=1,731 sf
- 0.00% Impervious
- Runoff Depth=0.85"
- Tc=5.0 min
- CN=74
- Runoff=0.04 cfs
- 122 cf

Link 2L: Existing to Mayo
- Inflow=1.21 cfs
- 4,625 cf
- Primary=1.21 cfs
- 4,625 cf

Total Runoff Area = 50,091 sf
Runoff Volume = 4,825 cf
Average Runoff Depth = 1.16"
76.42% Pervious = 38,282 sf
23.58% Impervious = 11,809 sf
2021-09-10_51 Mayo Avenue
Prepared by {enter your company name here}
HydroCAD® 10.00-26 s/n 04499 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-YEAR Rainfall = 3.40"  Printed 9/17/2021  Page 2

Time span = 0.00-27.30 hrs, dt = 0.05 hrs, 541 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 to Mayo Avenue
Runoff Area = 48,360 sf  24.42% Impervious  Runoff Depth = 1.55"
Flow Length = 230'  Tc = 12.6 min  CN = 80  Runoff = 1.59 cfs  6,237 cf

Subcatchment 8S: OFFSITE GRASS
Runoff Area = 1,731 sf  0.00% Impervious  Runoff Depth = 1.17"
Tc = 5.0 min  CN = 74  Runoff = 0.05 cfs  169 cf

Link 2L: Existing to Mayo
Inflow = 1.63 cfs  6,406 cf
Primary = 1.63 cfs  6,406 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 6,406 cf  Average Runoff Depth = 1.53"
76.42% Pervious = 38,282 sf  23.58% Impervious = 11,809 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 to Mayo Avenue**
- Runoff Area=48,360 sf  24.42% Impervious  Runoff Depth=2.28"  
  - Flow Length=230'  Tc=12.6 min  CN=80  Runoff=2.37 cfs  9,190 cf

**Subcatchment 8S: OFFSITE GRASS**
- Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=1.82"  
  - Tc=5.0 min  CN=74  Runoff=0.08 cfs  263 cf

**Link 2L: Existing to Mayo**
- Inflow=2.43 cfs  9,453 cf
- Primary=2.43 cfs  9,453 cf

**Total Runoff Area = 50,091 sf**  **Runoff Volume = 9,453 cf**  **Average Runoff Depth = 2.26"**

76.42% Pervious = 38,282 sf  23.58% Impervious = 11,809 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 to Mayo Avenue
Runoff Area=48,360 sf  24.42% Impervious  Runoff Depth=2.97"
Flow Length=230'  Tc=12.6 min  CN=80  Runoff=3.10 cfs  11,958 cf

Subcatchment 8S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=2.44"
Tc=5.0 min  CN=74  Runoff=0.11 cfs  353 cf

Link 2L: Existing to Mayo
Inflow=3.17 cfs  12,311 cf
Primary=3.17 cfs  12,311 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 12,311 cf  Average Runoff Depth = 2.95"
76.42% Pervious = 38,282 sf  23.58% Impervious = 11,809 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 to Mayo Avenue
Runoff Area=48,360 sf  24.42% Impervious  Runoff Depth=5.24'
Flow Length=230'  Tc=12.6 min  CN=80  Runoff=5.41 cfs  21,097 cf

Subcatchment 8S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=4.57'
Tc=5.0 min  CN=74  Runoff=0.21 cfs  659 cf

Link 2L: Existing to Mayo
Inflow=5.55 cfs  21,756 cf
Primary=5.55 cfs  21,756 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 21,756 cf  Average Runoff Depth = 5.21''
76.42% Pervious = 38,282 sf  23.58% Impervious = 11,809 sf
Subcatchment 1S: Ex to Mayo Avenue

Runoff Area = 48,360 sf  
24.42% Impervious  
Runoff Depth = 6.65''

Flow Length = 230'  
Tc = 12.6 min  
CN = 80  
Runoff = 6.81 cfs  
26,783 cf

Subcatchment 8S: OFFSITE GRASS

Runoff Area = 1,731 sf  
0.00% Impervious  
Runoff Depth = 5.92''

Tc = 5.0 min  
CN = 74  
Runoff = 0.28 cfs  
854 cf

Link 2L: Existing to Mayo

Inflow = 6.99 cfs  
27,637 cf  
Primary = 6.99 cfs  
27,637 cf

Total Runoff Area = 50,091 sf  
Runoff Volume = 27,637 cf  
Average Runoff Depth = 6.62''

76.42% Pervious = 38,282 sf  
23.58% Impervious = 11,809 sf
HYDROLOGICAL & HYDRAULIC CALCULATIONS

PROPOSED 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=0.05 hrs, 541 points x 2
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Runoff Area</th>
<th>Percent Impervious</th>
<th>Runoff Depth</th>
<th>Flow Length</th>
<th>Tc</th>
<th>CN</th>
<th>Runoff Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcatchment 3S: Pr to Mayo Avenue</td>
<td>20,690 sf</td>
<td>1.35% Impervious</td>
<td>3.56&quot;</td>
<td>327'</td>
<td>18.4 min</td>
<td>74</td>
<td>1.38 cfs</td>
</tr>
<tr>
<td>Subcatchment 4S: Roof and Drive</td>
<td>15,832 sf</td>
<td>67.55% Impervious</td>
<td>5.26&quot;</td>
<td>75'</td>
<td>8.5 min</td>
<td>90</td>
<td>1.93 cfs</td>
</tr>
<tr>
<td>Subcatchment 5S: PR-Drive</td>
<td>1,660 sf</td>
<td>100.00% Impervious</td>
<td>6.16&quot;</td>
<td>5.0 min</td>
<td>98</td>
<td>0.24 cfs</td>
<td>852 cf</td>
</tr>
<tr>
<td>Subcatchment 6S: Pr-Pool, Pavilion, Patio</td>
<td>10,178 sf</td>
<td>27.23% Impervious</td>
<td>4.20&quot;</td>
<td>70'</td>
<td>7.8 min</td>
<td>81</td>
<td>1.06 cfs</td>
</tr>
<tr>
<td>Subcatchment 9S: OFFSITE GRASS</td>
<td>1,731 sf</td>
<td>0.00% Impervious</td>
<td>3.52&quot;</td>
<td>5.0 min</td>
<td>74</td>
<td>0.16 cfs</td>
<td>508 cf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond 1P: Filtrating Raingrader</th>
<th>Peak Elev=106.39'</th>
<th>Storage=1,470 cf</th>
<th>Inflow=1.93 cfs</th>
<th>6,940 cf</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary=0.53 cfs</td>
<td>6,480 cf</td>
<td>Secondary=1.52 cfs</td>
<td>480 cf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pond 2P: Cultec System 1</th>
<th>Peak Elev=105.38'</th>
<th>Storage=1,178 cf</th>
<th>Inflow=0.58 cfs</th>
<th>7,312 cf</th>
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</thead>
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<tr>
<td></td>
<td>4.0&quot; Round Culvert</td>
<td>n=0.010</td>
<td>L=20.0'</td>
<td>S=0.0100 '/'</td>
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<table>
<thead>
<tr>
<th>Pond 3P: Cultec System 2</th>
<th>Peak Elev=111.15'</th>
<th>Storage=810 cf</th>
<th>Inflow=1.22 cfs</th>
<th>4,071 cf</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Outflow=1.20 cfs</td>
<td>3,270 cf</td>
<td>Primary=4.22 cfs</td>
<td>16,090 cf</td>
</tr>
</tbody>
</table>

Total Runoff Area = 50,091 sf  Runoff Volume = 17,996 cf  Average Runoff Depth = 4.31"
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf
Summary for Subcatchment 3S: Pr to Mayo Avenue

Runoff = 1.38 cfs @ 12.26 hrs, Volume= 6,133 cf, Depth= 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>98</td>
<td>Walkways, HSG C</td>
</tr>
<tr>
<td>20,410</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>20,690</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>20,410</td>
<td>98.65%</td>
<td>Pervious Area</td>
</tr>
<tr>
<td>280</td>
<td>1.35%</td>
<td>Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.9</td>
<td>40</td>
<td>0.0100</td>
<td>0.07</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 3.30&quot;</td>
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<tr>
<td>6.1</td>
<td>35</td>
<td>0.0200</td>
<td>0.10</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 3.30&quot;</td>
</tr>
<tr>
<td>3.5</td>
<td>252</td>
<td>0.0300</td>
<td>1.21</td>
<td></td>
<td>Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps</td>
</tr>
<tr>
<td>18.4</td>
<td>327</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment 3S: Pr to Mayo Avenue

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=20,690 sf
Runoff Volume=6,133 cf
Runoff Depth=3.56"
Flow Length=327'
Tc=18.4 min
CN=74
Summary for Subcatchment 4S: Roof and Drive

Runoff = 1.93 cfs @ 12.12 hrs, Volume= 6,940 cf, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,054</td>
<td>98</td>
<td>Roofs, HSG C</td>
</tr>
<tr>
<td>2,640</td>
<td>98</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>5,138</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>15,832</td>
<td>90</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>5,138</td>
<td></td>
<td>32.45% Pervious Area</td>
</tr>
<tr>
<td>10,694</td>
<td></td>
<td>67.55% Impervious Area</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5</td>
<td>75</td>
<td>0.0400</td>
<td>0.15</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 3.30&quot;</td>
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</tbody>
</table>

Subcatchment 4S: Roof and Drive

Hydrograph

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=15,832 sf
Runoff Volume=6,940 cf
Runoff Depth=5.26"
Flow Length=75'
Slope=0.0400 '/'
Tc=8.5 min
CN=90
Summary for Subcatchment 5S: PR-Drive

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 852 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,660</td>
<td>98</td>
<td>Paved parking, HSG C</td>
</tr>
<tr>
<td>1,660</td>
<td></td>
<td>100.00% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Direct Entry,

Subcatchment 5S: PR-Drive

Hydrograph

Type III 24-hr
25-YEAR Rainfall=6.40"
Runoff Area=1,660 sf
Runoff Volume=852 cf
Runoff Depth=6.16"
Tc=5.0 min
CN=98
Summary for Subcatchment 6S: Pr-Pool, Pavilion, Patio

Runoff = 1.06 cfs @ 12.11 hrs, Volume= 3,563 cf, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>685</td>
<td>98</td>
<td>Water Surface, HSG C</td>
</tr>
<tr>
<td>516</td>
<td>98</td>
<td>Roofs, HSG C</td>
</tr>
<tr>
<td>739</td>
<td>98</td>
<td>Patio, HSG C</td>
</tr>
<tr>
<td>831</td>
<td>98</td>
<td>Patio, HSG C</td>
</tr>
<tr>
<td>7,407</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>10,178</td>
<td>81</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>7,407</td>
<td></td>
<td>72.77% Pervious Area</td>
</tr>
<tr>
<td>2,771</td>
<td></td>
<td>27.23% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8</td>
<td>70</td>
<td>0.0430</td>
<td>0.15</td>
<td></td>
<td>Sheet Flow, Grass: Dense n= 0.240 P2= 3.30&quot;</td>
</tr>
</tbody>
</table>

Subcatchment 6S: Pr-Pool, Pavilion, Patio

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=10,178 sf
Runoff Volume=3,563 cf
Runoff Depth=4.20"
Flow Length=70'
Slope=0.0430 /'
Tc=7.8 min
CN=81
Summary for Subcatchment 9S: OFFSITE GRASS

Runoff = 0.16 cfs @ 12.08 hrs, Volume= 508 cf, Depth= 3.52" 

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs 
Type III 24-hr 25-YEAR Rainfall=6.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,731</td>
<td>74</td>
<td>&gt;75% Grass cover, Good, HSG C</td>
</tr>
<tr>
<td>1,731</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment 9S: OFFSITE GRASS

Hydrograph

Type III 24-hr 25-YEAR Rainfall=6.40"
Runoff Area=1,731 sf
Runoff Volume=508 cf
Runoff Depth=3.52"
Tc=5.0 min
CN=74
Summary for Pond 1P: Filtrating Raingrden

Inflow Area = 15,832 sf, 67.55% Impervious, Inflow Depth = 5.26" for 25-YEAR event
Inflow = 1.93 cfs @ 12.12 hrs, Volume= 6,940 cf
Outflow = 1.99 cfs @ 12.25 hrs, Volume= 6,940 cf, Atten= 0%, Lag= 7.9 min
Primary = 0.53 cfs @ 12.55 hrs, Volume= 6,460 cf
Secondary = 1.52 cfs @ 12.25 hrs, Volume= 480 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 106.39' @ 12.24 hrs Surf.Area= 1,400 sf Storage= 1,470 cf

Plug-Flow detention time= 22.9 min calculated for 6,927 cf (100% of inflow)
Center-of-Mass det. time= 22.9 min ( 807.1 - 784.2 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>105.00'</td>
<td>1,470 cf</td>
<td>Ponding (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>105.00</td>
<td>961</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>106.00</td>
<td>1,200</td>
<td>1,081</td>
<td>1,081</td>
</tr>
<tr>
<td>106.30</td>
<td>1,400</td>
<td>390</td>
<td>1,470</td>
</tr>
</tbody>
</table>

Device | Routing | Invert | Outlet Devices |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Device 3</td>
<td>105.00'</td>
<td>8.270 in/hr Exfiltration over Surface area below 105.01' Conductivity to Groundwater Elevation = 103.50' Phase-In= 0.01'</td>
</tr>
<tr>
<td>#2</td>
<td>Device 3</td>
<td>106.00'</td>
<td>14.4&quot; x 14.4&quot; Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads</td>
</tr>
<tr>
<td>#3</td>
<td>Primary</td>
<td>103.20'</td>
<td>4.0&quot; Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 103.20' / 100.50' S= 0.1080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf</td>
</tr>
<tr>
<td>#4</td>
<td>Secondary</td>
<td>106.33'</td>
<td>40.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.38 cfs @ 12.55 hrs HW=106.28' TW=105.25' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.38 cfs @ 4.36 fps)
2=Exfiltration (Passes < 0.34 cfs potential flow)
3=Orifice/Grate (Passes < 2.36 cfs potential flow)

Secondary OutFlow Max=1.45 cfs @ 12.25 hrs HW=106.39' TW=0.00' (Dynamic Tailwater)
4=Broad-Crested Rectangular Weir (Weir Controls 1.45 cfs @ 0.66 fps)
Pond 1P: Filtrating Rain Graden

Hydrograph

Inflow Area = 15,832 sf
Peak Elev = 106.39'
Storage = 1,470 cf

Stage-Discharge

Broad-Crested Rectangular Weir
Orifice/Grate
Exfiltration

Discharge (cfs)
### Stage-Area-Storage for Pond 1P: Filtrating Raingraden

<table>
<thead>
<tr>
<th>Elevation (feet)</th>
<th>Surface (sq-ft)</th>
<th>Storage (cubic-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>105.00</td>
<td>961</td>
<td>0</td>
</tr>
<tr>
<td>105.02</td>
<td>966</td>
<td>19</td>
</tr>
<tr>
<td>105.04</td>
<td>971</td>
<td>39</td>
</tr>
<tr>
<td>105.06</td>
<td>975</td>
<td>58</td>
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<tr>
<td>105.08</td>
<td>980</td>
<td>78</td>
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<td>97</td>
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<td>137</td>
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<td>105.18</td>
<td>1,004</td>
<td>171</td>
</tr>
<tr>
<td>105.20</td>
<td>1,009</td>
<td>197</td>
</tr>
<tr>
<td>105.22</td>
<td>1,014</td>
<td>217</td>
</tr>
<tr>
<td>105.24</td>
<td>1,018</td>
<td>238</td>
</tr>
<tr>
<td>105.26</td>
<td>1,023</td>
<td>258</td>
</tr>
<tr>
<td>105.28</td>
<td>1,028</td>
<td>278</td>
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<tr>
<td>105.30</td>
<td>1,033</td>
<td>299</td>
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<tr>
<td>105.32</td>
<td>1,037</td>
<td>320</td>
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<tr>
<td>105.34</td>
<td>1,042</td>
<td>341</td>
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<tr>
<td>105.36</td>
<td>1,047</td>
<td>361</td>
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<tr>
<td>105.38</td>
<td>1,052</td>
<td>382</td>
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<tr>
<td>105.40</td>
<td>1,057</td>
<td>404</td>
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<td>1,061</td>
<td>425</td>
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<td>1,066</td>
<td>446</td>
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<td>105.46</td>
<td>1,071</td>
<td>467</td>
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<td>489</td>
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<td>105.50</td>
<td>1,081</td>
<td>510</td>
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<tr>
<td>105.52</td>
<td>1,085</td>
<td>532</td>
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<tr>
<td>105.54</td>
<td>1,090</td>
<td>554</td>
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<tr>
<td>105.56</td>
<td>1,095</td>
<td>576</td>
</tr>
<tr>
<td>105.58</td>
<td>1,100</td>
<td>598</td>
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<tr>
<td>105.60</td>
<td>1,104</td>
<td>620</td>
</tr>
<tr>
<td>105.62</td>
<td>1,109</td>
<td>642</td>
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<tr>
<td>105.64</td>
<td>1,114</td>
<td>664</td>
</tr>
<tr>
<td>105.66</td>
<td>1,119</td>
<td>686</td>
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Summary for Pond 2P: C ultec System 1

Inflow Area = 17,492 sf, 70.63% Impervious, Inflow Depth = 5.02" for 25-YEAR event
Inflow = 0.58 cfs @ 12.35 hrs, Volume= 7,312 cf
Outflow = 0.57 cfs @ 12.40 hrs, Volume= 6,207 cf, Atten= 2%, Lag= 2.7 min
Primary = 0.57 cfs @ 12.40 hrs, Volume= 6,207 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 105.38' @ 12.40 hrs Surf.Area= 553 sf Storage= 1,178 cf

Plug-Flow detention time= 114.3 min calculated for 6,196 cf (85% of inflow)
Center-of-Mass det. time= 53.2 min (857.5 - 804.2)

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<th>Avail.Storage</th>
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<tbody>
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<td>100.00'</td>
<td>519 cf</td>
<td>17.00&quot;W x 32.50'L x 3.54'H Field A</td>
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<td>1,957 cf Overall - 659 cf Embedded = 1,297 cf x 40.0% Voids</td>
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<tr>
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<td>Effective Size= 47.8&quot;W x 30.0&quot;H =&gt; 7.45 sf x 7.00'L = 52.2 cf</td>
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<td>Overall Size= 52.0&quot;W x 30.5&quot;H x 8.50'L with 1.50' Overlap</td>
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<td>Row Length Adjustment= +1.50' x 7.45 sf x 3 rows</td>
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Storage Group A created with Chamber Wizard

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<td>n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf</td>
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Primary OutFlow  Max=0.57 cfs @ 12.40 hrs HW=105.38' TW=0.00' (Dynamic Tailwater)
T=1=Culvert (Barrel Controls 0.57 cfs @ 6.51 fps)
Pond 2P: Culatec System 1 - Chamber Wizard Field A

Chamber Model = Culatec R-330XLHD (Culatec Recharger® 330XLHD)
Effective Size = 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf
Overall Size = 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap
Row Length Adjustment = +1.50' x 7.45 sf x 3 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

4 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 29.50' Row Length +18.0" End Stone x 2 = 32.50'
Base Length
3 Rows x 52.0" Wide + 6.0" Spacing x 2 + 18.0" Side Stone x 2 = 17.00' Base Width
6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

12 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 3 Rows = 659.4 cf Chamber Storage

1,956.8 cf Field - 659.4 cf Chambers = 1,297.4 cf Stone x 40.0% Voids = 518.9 cf Stone Storage

Chamber Storage + Stone Storage = 1,178.4 cf = 0.027 af
Overall Storage Efficiency = 60.2%
Overall System Size = 32.50' x 17.00' x 3.54'

12 Chambers
72.5 cy Field
48.1 cy Stone
Pond 2P: Cultec System 1

Hydrograph

- Inflow Area = 17,492 sf
- Peak Elev = 105.38'
- Storage = 1,178 cf

Round Culvert
- n = 0.010
- L = 20.0”
- S = 0.0100 ’/”

Pond 2P: Cultec System 1

Stage-Discharge

- Culvert

Elevation (feet)

- 100 to 105

Discharge (cfs)

- 0 to 0.55
### Stage-Area-Storage for Pond 2P: Culatec System 1

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Summary for Pond 3P: Cuitec System 2

Inflow Area = 11,909 sf, 23.27% Impervious, Inflow Depth = 4.10" for 25-YEAR event
Inflow = 1.22 cfs @ 12.11 hrs, Volume= 4,071 cf
Outflow = 1.20 cfs @ 12.13 hrs, Volume= 3,270 cf, Attenuation= 1%, Lag= 1.2 min
Primary = 1.20 cfs @ 12.13 hrs, Volume= 3,270 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 111.15' @ 12.13 hrs Surf.Area= 564 sf Storage= 810 cf

Plug-Flow detention time= 115.0 min calculated for 3,264 cf (80% of inflow)
Center-of-Mass detention time= 40.2 min (853.7 - 813.5)

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<td>24.25'W x 23.25'L x 2.54'H Field A</td>
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<td>1,433 cf Overall - 394 cf Embedded = 1,039 cf x 40.0% Voids</td>
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<td>#2A</td>
<td>108.50'</td>
<td>394 cf</td>
<td>Cuitec R-150XLHD x 14 Inside #1</td>
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<td>Effective Size= 29.8&quot;W x 18.0&quot;H =&gt; 2.65 sf x 10.25'L = 27.2 cf</td>
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<td>Overall Size= 33.0&quot;W x 18.5&quot;H x 11.00'L with 0.75' Overlap</td>
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<td>Row Length Adjustment= +0.75' x 2.65 sf x 7 rows</td>
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<td>810 cf</td>
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Storage Group A created with Chamber Wizard

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<th>Outlet Devices</th>
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<td>6.0&quot; Round Culvert</td>
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<td>L= 35.0' CPP, square edge headwall, Ke= 0.500</td>
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<td>Inlet / Outlet Invert= 110.50' / 108.00' S= 0.0714 '/&quot; Cc= 0.900</td>
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<td>n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf</td>
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Primary OutFlow Max= 1.16 cfs @ 12.13 hrs HW= 111.12' TW= 0.00' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.58 cfs @ 2.94 fps)
2=Culvert (Inlet Controls 0.58 cfs @ 2.94 fps)
Pond 3P: Cultec System 2 - Chamber Wizard Field A

Chamber Model = Cultec R-150XLHD (Cultec Recharger® 150XLHD)
Effective Size = 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf
Overall Size = 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap
Row Length Adjustment = +0.75' x 2.65 sf x 7 rows

33.0" Wide + 6.0" Spacing = 39.0" C-C Row Spacing

2 Chambers/Row x 10.25' Long +0.75' Row Adjustment = 21.25' Row Length +12.0" End Stone x 2 = 23.25' Base Length
7 Rows x 33.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 24.25' Base Width
6.0" Base + 18.5" Chamber Height + 6.0" Cover = 2.54' Field Height

14 Chambers x 27.2 cf +0.75' Row Adjustment x 2.65 sf x 7 Rows = 394.0 cf Chamber Storage
1,433.0 cf Field - 394.0 cf Chambers = 1,039.0 cf Stone x 40.0% Voids = 415.6 cf Stone Storage

Chamber Storage + Stone Storage = 809.6 cf = 0.019 af
Overall Storage Efficiency = 56.5%
Overall System Size = 23.25' x 24.25' x 2.54'

14 Chambers
53.1 cy Field
38.5 cy Stone
Pond 3P: Cultec System 2

Inflow Area = 11,909 sf  
Peak Elev = 111.15'  
Storage = 810 cf
Pond 3P: Cultec System 2

Stage-Area-Storage

Elevation (feet)

Storage (cubic-feet)
# Stage-Area-Storage for Pond 3P: Cultec System 2

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<th>Elevation (feet)</th>
<th>Storage (cubic-feet)</th>
<th>Elevation (feet)</th>
<th>Storage (cubic-feet)</th>
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<td>90</td>
<td>111.00</td>
<td>810</td>
</tr>
<tr>
<td>108.45</td>
<td>101</td>
<td>111.05</td>
<td>810</td>
</tr>
<tr>
<td>108.50</td>
<td>113</td>
<td>111.10</td>
<td>810</td>
</tr>
<tr>
<td>108.55</td>
<td>135</td>
<td>111.15</td>
<td>810</td>
</tr>
</tbody>
</table>
Summary for Link 1L: Proposed to Mayo

Inflow Area = 50,091 sf, 30.75% Impervious, Inflow Depth = 3.85" for 25-YEAR event
Inflow = 4.22 cfs @ 12.25 hrs, Volume = 16,090 cf
Primary = 4.22 cfs @ 12.25 hrs, Volume = 16,090 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-27.00 hrs, dt= 0.05 hrs

Link 1L: Proposed to Mayo

Hydrograph

Inflow Area=50,091 sf
2021-09-10_51 Mayo Avenue
Prepared by {enter your company name here}
Type III 24-hr 1-YEAR Rainfall=2.90" 
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf 1.35% Impervious Runoff Depth=0.86"
Flow Length=327' Tc=18.4 min CN=74 Runoff=0.31 cfs 1,486 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf 67.55% Impervious Runoff Depth=1.91"
Flow Length=75' Slope=0.0400 '/' Tc=8.5 min CN=90 Runoff=0.73 cfs 2,520 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf 100.00% Impervious Runoff Depth=2.67"
Tc=5.0 min CN=98 Runoff=0.11 cfs 369 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf 27.23% Impervious Runoff Depth=1.21"
Flow Length=70' Slope=0.0430 '/' Tc=7.8 min CN=81 Runoff=0.30 cfs 1,025 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf 0.00% Impervious Runoff Depth=0.85"
Tc=5.0 min CN=74 Runoff=0.04 cfs 122 cf

Pond 1P: Filtrating Raingraden
Peak Elev=105.48' Storage=485 cf Inflow=0.73 cfs 2,520 cf
Primary=0.24 cfs 2,520 cf Secondary=0.00 cfs 0 cf Outflow=0.24 cfs 2,520 cf

Pond 2P: Cultec System 1
Peak Elev=103.87' Storage=1,178 cf Inflow=0.31 cfs 2,890 cf
4.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.29 cfs 1,785 cf

Pond 3P: Cultec System 2
Peak Elev=110.56' Storage=810 cf Inflow=0.34 cfs 1,147 cf
Outflow=0.03 cfs 346 cf

Link 1L: Proposed to Mayo
Inflow=0.47 cfs 3,616 cf
Primary=0.47 cfs 3,616 cf

Total Runoff Area = 50,091 sf Runoff Volume = 5,522 cf Average Runoff Depth = 1.32"
69.25% Pervious = 34,686 sf 30.75% Impervious = 15,405 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf  1.35% Impervious  Runoff Depth=1.19"
Flow Length=327'  Tc=18.4 min  CN=74  Runoff=0.44 cfs  2,053 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf  67.55% Impervious  Runoff Depth=2.37"
Flow Length=75'  Slope=0.0400 'f'  Tc=8.5 min  CN=90  Runoff=0.60 cfs  3,132 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf  100.00% Impervious  Runoff Depth=3.17"
Tc=5.0 min  CN=98  Runoff=0.13 cfs  438 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf  27.23% Impervious  Runoff Depth=1.59"
Flow Length=70'  Slope=0.0430 'f'  Tc=7.8 min  CN=81  Runoff=0.40 cfs  1,353 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=1.17"
Tc=5.0 min  CN=74  Runoff=0.05 cfs  169 cf

Pond 1P: Filtrating Raingraden
Peak Elev=105.67'  Storage=693 cf  Inflow=0.90 cfs  3,132 cf
Primary=0.27 cfs  3,132 cf  Secondary=0.00 cfs  0 cf  Outflow=0.27 cfs  3,132 cf

Pond 2P: Cultec System 1
Peak Elev=104.17'  Storage=1,178 cf  Inflow=0.34 cfs  3,570 cf
4.0" Round Culvert  n=0.010  L=20.0'  S=0.0100 'f'  Outflow=0.35 cfs  2,465 cf

Pond 3P: Cultec System 2
Peak Elev=110.64'  Storage=810 cf  Inflow=0.45 cfs  1,522 cf
Outflow=0.12 cfs  721 cf

Link 1L: Proposed to Mayo
Inflow=0.77 cfs  5,239 cf
Primary=0.77 cfs  5,239 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 7,145 cf  Average Runoff Depth = 1.71"
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf  1.35% Impervious  Runoff Depth=1.84" 
Flow Length=327'  Tc=18.4 min  CN=74  Runoff=0.70 cfs  3,179 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf  67.55% Impervious  Runoff Depth=3.23" 
Flow Length=75'  Slope=0.0400 '/'  Tc=8.5 min  CN=90  Runoff=1.21 cfs  4,256 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf  100.00% Impervious  Runoff Depth=4.06" 
Tc=5.0 min  CN=98  Runoff=0.16 cfs  562 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf  27.23% Impervious  Runoff Depth=2.34" 
Flow Length=70'  Slope=0.0430 '/'  Tc=7.9 min  CN=81  Runoff=0.59 cfs  1,982 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=1.82" 
Tc=5.0 min  CN=74  Runoff=0.08 cfs  263 cf

Pond 1P: Filtrating Raingarden
Peak Elev=106.01' Storage=1,090 cf  Inflow=1.21 cfs  4,256 cf 
Primary=0.32 cfs  4,256 cf  Secondary=0.00 cfs  0 cf  Outflow=0.32 cfs  4,256 cf

Pond 2P: Cultec System 1
Peak Elev=104.35' Storage=1,178 cf  Inflow=0.40 cfs  4,818 cf 
4.0" Round Culvert  n=0.010  L=20.0'  S=0.0100 '/'  Outflow=0.40 cfs  3,713 cf

Pond 3P: Cultec System 2
Peak Elev=110.89' Storage=810 cf  Inflow=0.67 cfs  2,244 cf 
Outflow=0.68 cfs  1,443 cf

Link 1L: Proposed to Mayo

Inflow=1.73 cfs  8,336 cf 
Primary=1.73 cfs  8,336 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 10,242 cf  Average Runoff Depth = 2.45"
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf  1.35% Impervious  Runoff Depth=2.47"
Flow Length=327'  Tc=18.4 min  CN=74  Runoff=0.95 cfs  4,262 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf  67.55% Impervious  Runoff Depth=4.00"
Flow Length=75'  Slope=0.0400 '/'  Tc=8.5 min  CN=90  Runoff=1.49 cfs  5,271 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf  100.00% Impervious  Runoff Depth=4.86"
Tc=5.0 min  CN=98  Runoff=0.19 cfs  673 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf  27.23% Impervious  Runoff Depth=3.03"
Flow Length=70'  Slope=0.0430 '/'  Tc=7.8 min  CN=81  Runoff=0.77 cfs  2,570 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=2.44"
Tc=5.0 min  CN=74  Runoff=0.11 cfs  353 cf

Pond 1P: Filtrating Raingraden
Peak Elev=106.26'  Storage=1,420 cf  Inflow=1.49 cfs  5,271 cf
Primary=0.46 cfs  5,271 cf  Secondary=0.00 cfs  0 cf  Outflow=0.46 cfs  5,271 cf

Pond 2P: Cultec System 1
Peak Elev=104.76'  Storage=1,178 cf  Inflow=0.48 cfs  5,944 cf
4.0" Round Culvert  n=0.010  L=20.0'  S=0.0100 '/'  Outflow=0.47 cfs  4,839 cf

Pond 3P: Cultec System 2
Peak Elev=111.05'  Storage=810 cf  Inflow=0.88 cfs  2,923 cf
Outflow=1.04 cfs  2,122 cf

Link 1L: Proposed to Mayo
Inflow=2.18 cfs  11,223 cf
Primary=2.18 cfs  11,223 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 13,129 cf  Average Runoff Depth = 3.15"
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf
Subcatchment 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf  1.35% Impervious  Runoff Depth=4.61"  
Flow Length=327'  Tc=18.4 min  CN=74  Runoff=1.78 cfs  7,942 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf  67.55% Impervious  Runoff Depth=6.44"  
Flow Length=75'  Slope=0.0400 '/'  Tc=8.5 min  CN=90  Runoff=2.34 cfs  8,492 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf  100.00% Impervious  Runoff Depth=7.36"  
Tc=5.0 min  CN=98  Runoff=0.29 cfs  1,018 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf  27.23% Impervious  Runoff Depth=5.31"  
Flow Length=70'  Slope=0.0430 '/'  Tc=7.8 min  CN=81  Runoff=1.33 cfs  4,506 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf  0.00% Impervious  Runoff Depth=4.57"  
Tc=5.0 min  CN=74  Runoff=0.21 cfs  659 cf

Pond 1P: Filtrating Raingraden
Peak Elev=106.43'  Storage=1,470 cf  Inflow=2.34 cfs  8,492 cf  
Primary=0.63 cfs  7,457 cf  Secondary=2.83 cfs  1,487 cf  Outflow=2.88 cfs  8,492 cf

Pond 2P: Cultec System 1
Peak Elev=107.31'  Storage=1,178 cf  Inflow=0.76 cfs  8,475 cf  
4.0'' Round Culvert  n=0.010  L=20.0'  S=0.0100 '/'  Outflow=0.81 cfs  7,370 cf

Pond 3P: Cultec System 2
Peak Elev=111.41'  Storage=810 cf  Inflow=1.53 cfs  5,165 cf  
Outflow=1.54 cfs  4,364 cf

Link 1L: Proposed to Mayo
Inflow=5.95 cfs  21,162 cf  
Primary=5.95 cfs  21,162 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 22,617 cf  Average Runoff Depth = 5.42"  
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf
Time span=0.00-27.00 hrs, dt=0.05 hrs, 541 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 3S: Pr to Mayo Avenue
Runoff Area=20,690 sf 1.35% Impervious Runoff Depth=5.96" Flow Length=327' Tc=18.4 min CN=74 Runoff=2.30 cfs 10,277 cf

Subcatchment 4S: Roof and Drive
Runoff Area=15,832 sf 67.55% Impervious Runoff Depth=7.92" Flow Length=75' Slope=0.0400 '" Tc=8.5 min CN=90 Runoff=2.84 cfs 10,444 cf

Subcatchment 5S: PR-Drive
Runoff Area=1,660 sf 100.00% Impervious Runoff Depth=8.86" Tc=5.0 min CN=98 Runoff=0.34 cfs 1,226 cf

Subcatchment 6S: Pr-Pool, Pavilion, Patio
Runoff Area=10,178 sf 27.23% Impervious Runoff Depth=6.73" Flow Length=70' Slope=0.0430 '" Tc=7.8 min CN=81 Runoff=1.67 cfs 5,707 cf

Subcatchment 9S: OFFSITE GRASS
Runoff Area=1,731 sf 0.00% Impervious Runoff Depth=5.92" Tc=5.0 min CN=74 Runoff=0.28 cfs 854 cf

Pond 1P: Filtrating Raingraden
Peak Elev=106.43' Storage=1,470 cf Inflow=2.84 cfs 10,444 cf Primary=0.63 cfs 8,715 cf Secondary=3.61 cfs 2,127 cf Outflow=4.15 cfs 10,444 cf

Pond 2P: Cultec System 1
Peak Elev=108.02' Storage=1,178 cf Inflow=0.85 cfs 9,941 cf 4.0" Round Culvert n=0.010 L=20.0' S=0.0100 '" Outflow=0.86 cfs 8,836 cf

Pond 3P: Cultec System 2
Peak Elev=111.76' Storage=810 cf Inflow=1.93 cfs 6,581 cf Outflow=1.91 cfs 5,760 cf

Link 1L: Proposed to Mayo
Inflow=7.82 cfs 27,001 cf Primary=7.82 cfs 27,001 cf

Total Runoff Area = 50,091 sf  Runoff Volume = 28,508 cf  Average Runoff Depth = 6.83"
69.25% Pervious = 34,686 sf  30.75% Impervious = 15,405 sf

2021-09-10_51 Mayo Avenue
Prepared by {enter your company name here}
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

Alisa Brockelman
[Owner(s) Name]

51 Mayo Avenue, Greenwich, CT
[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 Owner(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

COUNTY OF FAIRFIELD

}  ) ss: Greenwich

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
51 Mayo Avenue
9/17/2021

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 51 Mayo Avenue 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. **Bioretention/Biofiltration Basins and Rain Gardens:**
   a. Bioretention/Biofiltration basins and rain gardens shall be cleaned of debris and sediments upon the completion of construction. Any filter media (bioretention soil) impacted by the construction activities shall be removed and replaced at this time.
   b. The filter media (bioretention soil) shall be visually inspected on a monthly basis for the first 6 months. Any erosion or displacement of the filter media (bioretention soil) shall be promptly repaired and the cause of the problem shall be identified and corrected.
Monthly inspections shall continue until successful operation of the system is confirmed.
c. Bioretention/Biofiltration areas and rain gardens with grass shall not be mowed more than twice during the growing season, preferably only in late October. More frequent mowing will eliminate native forbs and sedges from the meadow cover.
d. Bioretention/Biofiltration areas and rain gardens with mulch and plantings shall be inspected during spring cleanup and one just prior to the winter season.
e. All dead plants and missing mulch shall be replaced and any necessary pruning of vegetation shall be completed.
f. The surface of these structures shall be inspected on a quarterly basis after the first six months of successful operation and after heavy runoff events (e.g. >3.0" in a 24-hour period). One inspection shall occur immediately following the completion of winter sanding and subsequent sweeping operations, and one shall occur just prior to the winter season. Any accumulated debris and sediments shall be removed.
g. Check draining time of bioretention/biofiltration areas and rain gardens annually. Check within 72 hours after a minimum one inch rain event. If there is no standing water, infiltration is acceptable. If draining time is excessive, quantitatively determine infiltration rate. Use a double ring infiltrometer or monitor drop in water level after a significant storm. If infiltration rate <0.5 in./hour, remedial action shall be taken.
h. A soil-core investigation may be used to identify the clogged portion of stormwater facility and depth of clogging. Remedial measures may include removal of clogged soil layer and replacement with suitable media, aeration, and mixing upper strata with lower soil strata. After corrective measures have been implemented, infiltration rate and draining time shall be retested.

6. 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.

7. Roof Gutters:
   a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.

8. Groundwater Pump System:
   a. Pump system shall be inspected for proper operation including all connections and force mains.
   b. The backup generator and electrical system must be inspected for proper operation by an electrician.
   c. Sump of the pump chamber shall be cleared of all debris and silt.
   d. The approved pump model is:

Form MD-100

February 2014
e. The existing pump can only be replaced with a pump matching the specifications of the existing pump listed above. A change to a different pump must be approved by the Engineering Division.

f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

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)
51 Mayo Avenue
9/17/2021

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)
51 Mayo Avenue
9/17/2021

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/repaid? □ Yes □ No □ N/A
- Have all erosion issues been repaired? □ Yes □ No □ N/A

Notes:

Bioretention/Biofiltration Basins/Rain Gardens:

- Have basins been cleared of debris/sediments? □ Yes □ No □ N/A
- Have draining times of basins been verified? □ Yes □ No □ N/A
- Has vegetation been mowed (twice/year max.)? □ Yes □ No □ N/A
- Has plantings and mulch been replaced (twice/year)? □ Yes □ No □ N/A

Notes:

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

Notes:
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

Notes:

Groundwater Pump System:

- Has the electrical connections been inspected? □ Yes □ No □ N/A
- Has the electrical connections for the generator been inspected? □ Yes □ No □ N/A
- Has the generator been exercised? □ Yes □ No □ N/A
- Has the sump been cleaned? (identify below): □ Yes □ No □ N/A

Notes:

Please make additional notes/observations and particular concerns below. Also record any additional maintenance that has been performed:

Signature of Inspector: ____________________________ Date: ________________

Form MD-100 February 2014
PROPOSED SITE DEVELOPMENT PLAN
ON PROPERTY OF
ALISA BROCKELMAN
51 MAYO AVENUE
GREENWICH, CONNECTICUT
MAY 7, 2021
TAX ACCOUNT No. 02-1001/S

REVISED: SEPTEMBER 17, 2021

LEGEND:

ZONE: RA-1
AREA = 1.110 ACRES

UTILITY NOTE:
Underground utilities, facilities and structures have been plotted from surface indications and record sources. The locations of all underground utilities are approximate only. Additionally, there may be other underground utilities the existence of which is presently unknown. Any party utilizing the utility information and data depicted on this survey shall call "CALL BEFORE YOU DIG" at 800-922-4455 a minimum of forty eight (48) hours prior to any construction activities to verify the location of underground utilities.

NOTES:
1. ENTIRE PROPERTY IS IN AN "X" ZONE AS SHOWN ON FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF GREENWICH, COMMUNITY NO. 090008, PANEL NO. 0494 G, EFFECTIVE JULY 8, 2013.
2. ELEVATIONS REFER TO A NATIONAL GEODETIC VERTICAL DATUM OF 1929 (N.G.V.D. 29)
3. PROPERTY IS SERVICED BY TOWN SEWER AND PUBLIC WATER SUPPLY.
4. EASEMENTS, RESTRICTIONS, AGREEMENTS AND/OR COVENS, IF ANY EXIST, HAVE NOT BEEN RESEARCHED OR PLOTTED HEREON.

ALISA BROCKELMAN
51 MAYO AVENUE
ON PROPERTY OF
PROPOSED SITE DEVELOPMENT PLAN

LEGEND:

SCALE: 1"=500'

S.E. MINOR & CO., INC. Engineers & Land Surveyors
33 West Elm Street
Greenwich, Connecticut 06830
203-869-0136
www.seminor.com

ESTABLISHED 1887

FILE No. COMPARED
33 WEST ELM STREET
Greenwich, Conn. 06830

date

S. E. Minor & Co., Inc. Engineers & Land Surveyors
UTILITY NOTE: Underground utilities, facilities and structures have been plotted from surface indications and record sources. The locations of all underground utilities are approximate only. Additionally, there may be other underground utilities the existence of which is presently unknown. Any party utilizing the utility information and data depicted on this survey shall call "CALL BEFORE YOU DIG" at 800-922-4455 a minimum of forty eight (48) hours prior to any construction activities to verify the location of underground utilities.

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2. ELEVATIONS REFER TO A NATIONAL GEODETIC VERTICAL DATUM OF 1929. (N.G.V.D. 29)
3. PROPERTY IS SERVICED BY TOWN SEWER AND PUBLIC WATER SUPPLY.
4. EASEMENTS, RESTRICTIONS, AGREEMENTS AND/OR COVENANTS, IF ANY EXIST, HAVE NOT BEEN RESEARCHED OR PLOTTED HEREON.
TOWN OF GREENWICH STANDARD CONSTRUCTION NOTES

SITE AND SUBDIVISION PLANS

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 ROAD CONSTRUCTION IS COMPLETED AND ACCEPTED, EVEN THOUGH PLANS MAY HAVE BEEN APPROVED WITHOUT SUBDRAINS AND/OR ROADWAY CONSTRUCTION HAS BEEN COMPLETED.
5. 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.
6. 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.
7. 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 SHALL APPROVE THE REVISED LOCATION. A REVIEW BY THE APPROVING AUTHORITY WILL BE REQUIRED.
8. EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE INFILTRATION.
10. ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL SHALE BE DETERMINED BY THE SITE ENGINEER.
11. COMPOST-AMENED SOILS MUST FOLLOW THE REQUIREMENTS AS STATED IN THE TOWN OF GREENWICH DRAINAGE MANUAL FEBRUARY 2012 AS AMENDED.
12. TO OBTAIN A CERTIFICATE OF OCCUPANCY THE SUBMITTAL MUST INCLUDE THE FOLLOWING:
   - IMPROVEMENT LOCATION SURVEY (ITEMS ON CHECKLIST FOR IMPROVEMENT LOCATION SURVEY DEPICTING "AS-BUILT" CONDITION - FORM CL-106 AND FORM SC-108)

UTILITY NOTE:
Underground utilities, facilities and structures have been plotted from surface indications and record sources. The locations of all underground utilities are approximate only. Additionally, there may be other underground utilities the existence of which is presently unknown. Any party utilizing the utility information and data depicted on this survey shall call "CALL BEFORE YOU DIG" at 800-922-4455 a minimum of forty eight (48) hours prior to any construction activities to verify the location of underground utilities.
TOWN OF GREENWICH STANDARD CONSTRUCTION NOTES

SITE AND SUBDIVISION PLANS

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 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.


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

9. THE CONTRACTOR MUST CONSTRUCT THE BIORETENTION AREA FOLLOWING THE SPECIFICATIONS IN APPENDIX G OF THE

10. 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.

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

   - "AS-BUILT" CONDITIONS - FORM CL-106 AND FORM SC-108
   - "AS-PLANNED" CONDITIONS - FORM CL-107 AND FORM SC-108
   - "AS-CONTRACTED" CONDITIONS - FORM CL-108 AND FORM SC-109

   UNDERGROUND UTILITIES, FACILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM SURFACE INDICATIONS AND RECORD SOURCES. THE LOCATIONS OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. ADDITIONALLY, THERE MAY BE OTHER UNDERGROUND UTILITIES THAT THE SITE ENGINEER SHALL CALL "CALL BEFORE YOU DIG" AT 800-922-4455 A MINIMUM OF FORTY EIGHT (48) HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES TO VERIFY THE LOCATION OF UNDERGROUND UTILITIES.

   "AS-BUILT" CONDITIONS - FORM CL-106 AND FORM SC-108
   "AS-PLANNED" CONDITIONS - FORM CL-107 AND FORM SC-108
   "AS-CONTRACTED" CONDITIONS - FORM CL-108 AND FORM SC-109
Note: The property is zoned "X" as shown on the Flood Insurance Rate Map (FIRM) for the Town of Greenwich, Community No. 090008, Panel No. 0494 G, effective July 8, 2013.

Underground utilities, facilities, and structures have been plotted from surface indications and record sources. The locations of all underground utilities are approximate only. Additionally, there may be other underground utilities the existence of which is presently unknown. Any party utilizing the utility information and data depicted on this survey shall call "CALL BEFORE YOU DIG" at 800-922-4455 a minimum of forty-eight (48) hours prior to any construction activities to verify the location of underground utilities.

Notes:
1. Entire property is in an "X" zone as shown on Flood Insurance Rate Map (FIRM) for the Town of Greenwich, Community No. 090008, Panel No. 0494 G, effective July 8, 2013.
2. Elevations refer to a National Geodetic Vertical Datum of 1929 (N.G.V.D. 29).
3. Property is serviced by town sewer and public water supply.
4. Easements, restrictions, agreements, and/or covenants, if any exist, have not been researched or plotted herein.

Utilities:
- Gas (G)
- Electric (E)
- Sewer (S)
- Storm Sewer (SS)
- Water (W)
- Fire Service (FS)
- Private Sewer (PS)
- Private Water (PW)
- Private Electric (PE)
- Private Gas (PG)
- Private Storm Sewer (PSS)
- Private Fire Service (PFS)
- Private Gas Service (PGS)
- Private Utility Service (PUS)

Legend:
- N:
- S:
- E:
- W:

Scale: 1" = 100'
UTILITY NOTE: Underground utilities, facilities and structures have been plotted from surface indications and record sources. The locations of all underground utilities are approximate only. Additionally, there may be other underground utilities the existence of which is presently unknown. Any party utilizing the utility information and data depicted on this survey shall call "CALL BEFORE YOU DIG" at 800-922-4455 a minimum of forty eight (48) hours prior to any construction activities to verify the location of underground utilities.

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4. EASEMENTS, RESTRICTIONS, AGREEMENTS AND/OR COVENANTS, IF ANY EXIST, HAVE NOT BEEN RESEARCHED OR PLOTTED HEREON.
### Plant Schedule: 51 Mayo Avenue

<table>
<thead>
<tr>
<th>Category</th>
<th>Sym.</th>
<th>No.</th>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Size</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Trees</td>
<td>JV</td>
<td>7</td>
<td>Juniperus virginiana</td>
<td>Eastern Red Cedar</td>
<td>14-16' HT.</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>IO</td>
<td>7</td>
<td>Ilex opaca</td>
<td>American Holly</td>
<td>12-14' HT.</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>QR</td>
<td>4</td>
<td>Quercus rubra</td>
<td>Red Oak</td>
<td>5.5&quot;-6&quot; CAL</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>2</td>
<td>Chamaecyparis thyoides</td>
<td>Atlantic White Cedar</td>
<td>14-16' HT.</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>NS</td>
<td>3</td>
<td>Amelanchier canadensis</td>
<td>Shadblow Serviceberry</td>
<td>10-12' MULTI</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>SA</td>
<td>3</td>
<td>Styrax americanus</td>
<td>American Snowbell</td>
<td>2.5&quot; CAL</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>NS</td>
<td>6</td>
<td>Amelanchier arborea</td>
<td>June Berry</td>
<td>4&quot;-4.5&quot; CAL</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>3</td>
<td>Cercis canadensis</td>
<td>Redbud</td>
<td>3&quot;-3.5&quot; CAL</td>
<td>B&amp;B</td>
</tr>
<tr>
<td>Native Shrubs</td>
<td>RM</td>
<td>8</td>
<td>Rhododendron maximum</td>
<td>Rosebay</td>
<td>4'-5' HT</td>
<td>B&amp;B</td>
</tr>
<tr>
<td></td>
<td>VP</td>
<td>35</td>
<td>Viburnum prunifolium</td>
<td>Blackhaw Viburnum</td>
<td>4-5'</td>
<td>B&amp;B</td>
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<tr>
<td></td>
<td>VT</td>
<td>14</td>
<td>Viburnum trilobum</td>
<td>American Cranberry Bush</td>
<td>7 GAL.</td>
<td>CONT</td>
</tr>
<tr>
<td></td>
<td>VTC</td>
<td>13</td>
<td>Viburnum trilobum 'Compactum'</td>
<td>Dwarf American Cranberry Bush</td>
<td>7 GAL.</td>
<td>CONT</td>
</tr>
<tr>
<td>Native Perennials</td>
<td>IV</td>
<td>20</td>
<td>Iris versicolor</td>
<td>Bluflag Iris</td>
<td>1 GAL.</td>
<td>CONT</td>
</tr>
<tr>
<td>Non Natives</td>
<td>TH</td>
<td>26</td>
<td>Taxus 'Hicksii'</td>
<td>Hicks Yew</td>
<td>4'-5' HT</td>
<td>B&amp;B</td>
</tr>
</tbody>
</table>

**Notes:**
- **Slope Sides of Hole:** Cut and remove burlap from the top 1/3 of root ball. If nonbiodegradable, remove completely.
- **Existing Grade:** 3" layer shredded pine bark mulch to outer edge of saucer. Keep mulch 2" from trunk.
- **Trunk Flare Junction:** Plant tree 2" above existing grade.
- **Deciduous Tree Planting:** Do not excavate below rootball. Backfill as per specification. 3x width of rootball.
- **Evergreen Tree Planting:** Do not bury stems or trunk. Roots at outer edge of rootball loosened to ensure proper backfill as per specification. Do not excavate below rootball. Backfill - to - root contact.
- **Shrub Planting:** Plant top of rootball 2" above surrounding grade. 3x width of rootball.
## L.A.R. Summary

- Site = **110 Acres**
- **1st Floor Area = 36,526 SF**
- **2nd Floor Area = 13,830 SF**
- **Attic Floor Area = 119,226 SF**

### First Floor

- **End Floor Area = 27,999 SF**
- **Basement does not count toward Floor Area**

### Attic Floor

- **Floor Area = 119,226 SF**
- **Maximum Non-FAR Attic Area = 119,226 SF**
- **119,226 SF - 110,954 SF = 3,158 SF**

*Attic is less than 40% of floor below and therefore does not count toward L.A.R.*

---

### Proposed Second Floor - Floor Area Ratio

<table>
<thead>
<tr>
<th>Polygon</th>
<th>Width</th>
<th>Height</th>
<th>Area</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

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### Proposed Attic Floor - Floor Area Ratio

<table>
<thead>
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<th>Polygon</th>
<th>Width</th>
<th>Height</th>
<th>Area</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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### Proposed First Floor - Floor Area Ratio

<table>
<thead>
<tr>
<th>Polygon</th>
<th>Width</th>
<th>Height</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ROOF PLAN

1/4" = 1'-0"

WADIA ASSOCIATES

Revision:
#7 May 2021
R Butscher
P&Z Application

A140

DATE
ADDENDUM #
DESCRIPTION
REVISION #
CARPORT ROOF PLAN

1/4" = 1'-0"
NORTH ELEVATION

1/4" = 1'-0"
<table>
<thead>
<tr>
<th>DATE</th>
<th>ADDENDUM #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/18/2021</td>
<td>2</td>
<td>NORTH ELEVATION - View From House</td>
</tr>
<tr>
<td>5/18/2021</td>
<td>3</td>
<td>EAST ELEVATION</td>
</tr>
<tr>
<td>5/18/2021</td>
<td>4</td>
<td>WEST ELEVATION - View From Pool</td>
</tr>
</tbody>
</table>

**NOTES:**
- EL (+10.05' (110.65))
- Average Grade
- EL 0'-0' (10.6')
- Finished First Floor

**SCALE:**
- 3/8" = 1'-0"